



**FOREST**

**BIRD FACTS**

# What's so cool about forest birds?

**Pollinators** Before a plant can create seeds or fruit, it must be pollinated. Birds are very important pollinators. Without pollinators, plants couldn't reproduce.

**Seed Dispersal** Some seeds stick to the feathers of birds so that they get dispersed to other areas. Seed eating birds also disperse seeds in their poop!

**Bug control** Some birds eat insects!

**Fertilizer** Bird guano is an important component of the forest ecosystem, contributing rich nutrients.

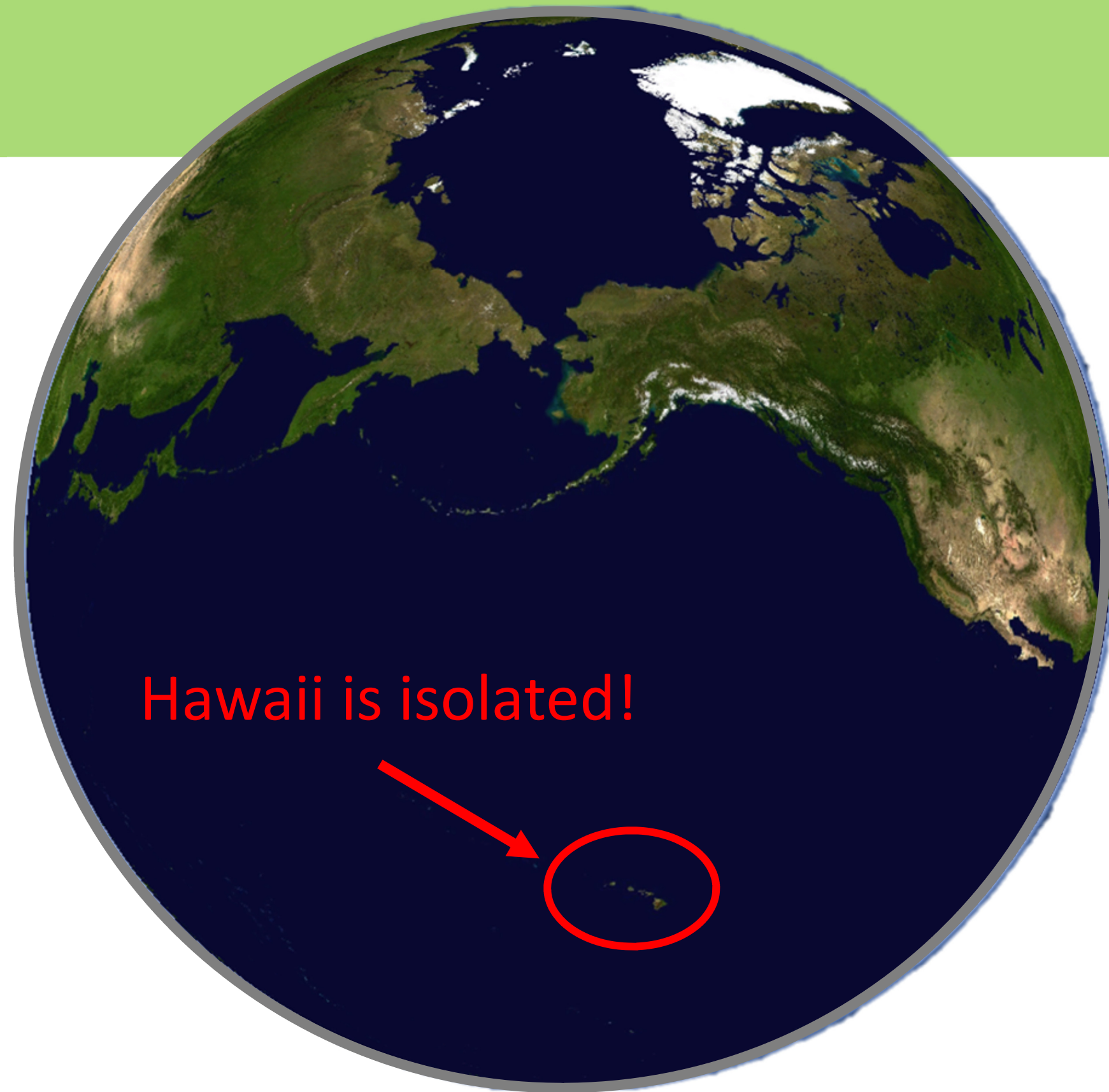
**Beauty** Forest birds are enjoyable simply because of their beauty. Bird enthusiasts travel to Maui just to see the unique species here!

**Biodiversity** Every species contributes valuable benefits to the biodiversity of Hawai'i's wildlife.

**Cultural** The cultural significance of forest birds in Hawai'i is important and there are numerous references historically to their relevance serving as 'Aumakua as well as in the intricate art of Hawaiian feather work.



## How did forest birds get to Hawai'i?



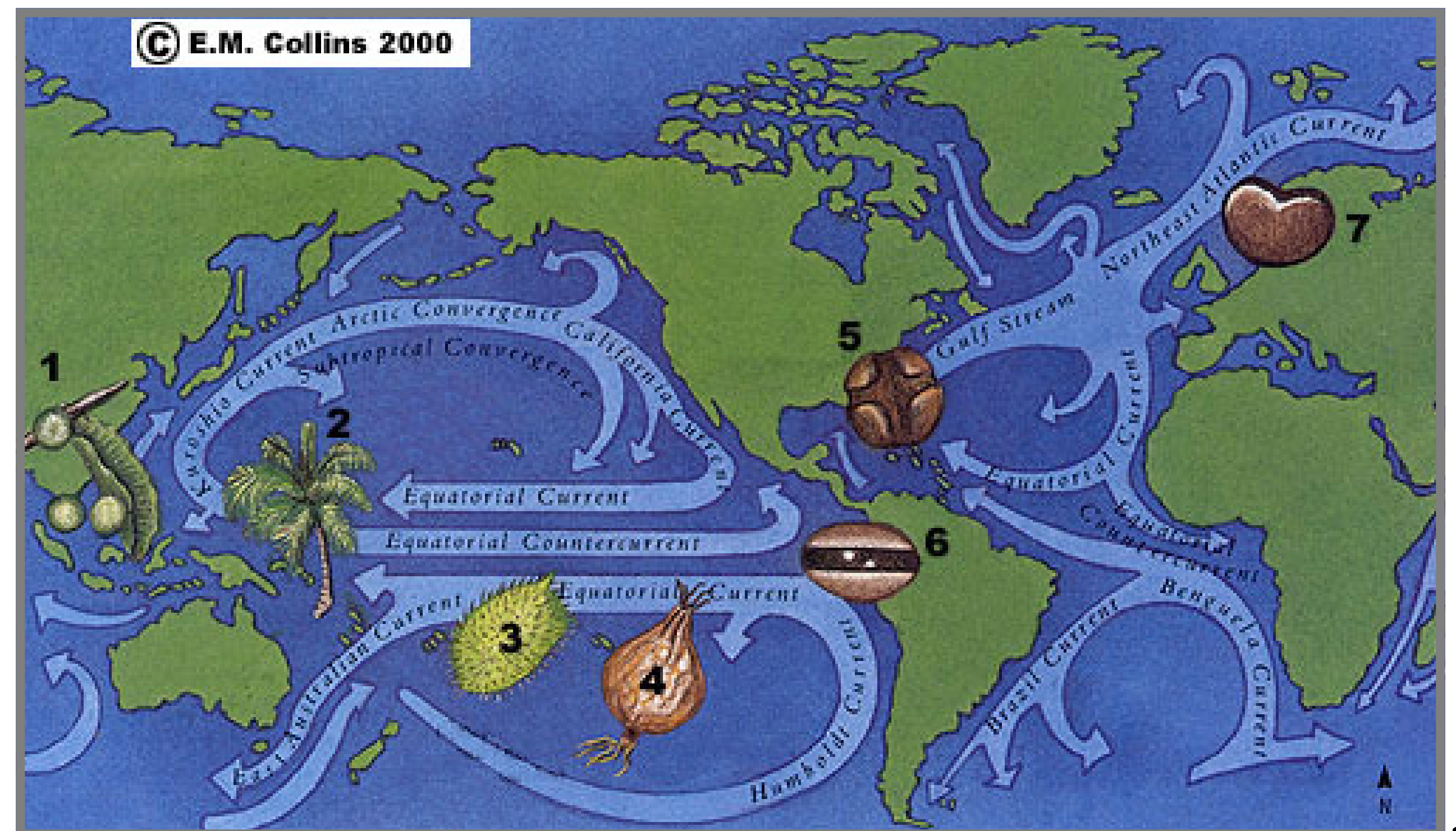
Hawai'i is the most isolated archipelago in the world. Here, we are more than 2,000 miles away from the nearest continent. The Pacific Ocean operates much like a moat, keeping out many plants and animals that may be common on continents.

**Animal & Plant species arrived in Hawai'i by :**

**W**ind—drifting in the jet stream

**W**ater—floating or swimming in the ocean

**W**ings—as a bird, or *on* a bird



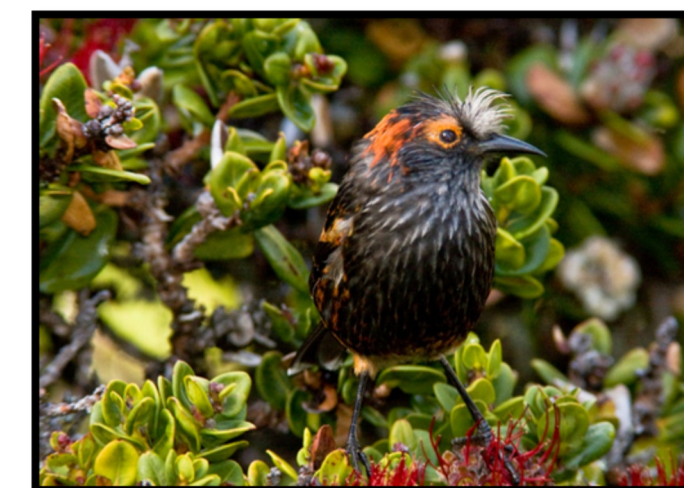
# What does endemic mean?

***Endemic* means, “Found nowhere else in the world.”**

Most Hawaiian forest birds are endemic to Hawai‘i.



Some Hawaiian forest birds are even endemic to Maui.



**Are all native species endemic to Hawai‘i?**

No. *Native* means, “arrived here on its own.” Some native species are found in other parts of the world, so not all native species are endemic.

# What kind of forest birds came to Hawai'i?

**Before Maui even existed**, 3-5 million years ago, a flock of Eurasian rosefinch was blown off-course and landed in the Hawaiian islands.

**Most of Hawai'i's native forest birds evolved from this one species of finch.**

Over time, birds with certain characteristics, such as slightly different beak shapes, were able to successfully exploit certain food types and habitats. The birds with those characteristics thrived and reproduced, passing these characteristics along to future generations. This is an example of *natural selection*.

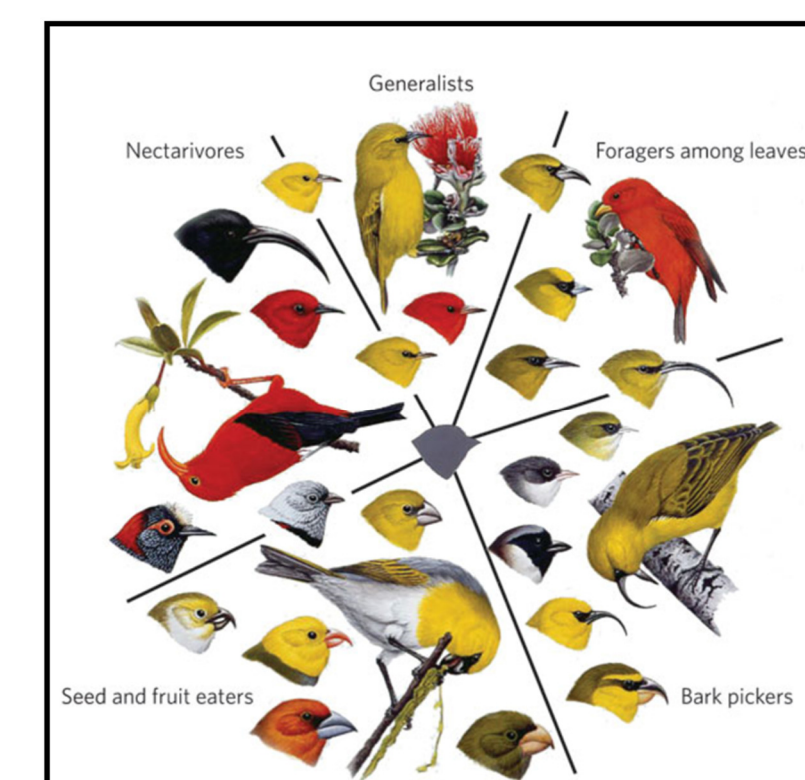
**Isolation + Millions of years + a wide variety of habitats + changes over time**

As time went on, these characteristics became so pronounced that different species emerged from the original flock of birds.

1 species



50+ endemic species!

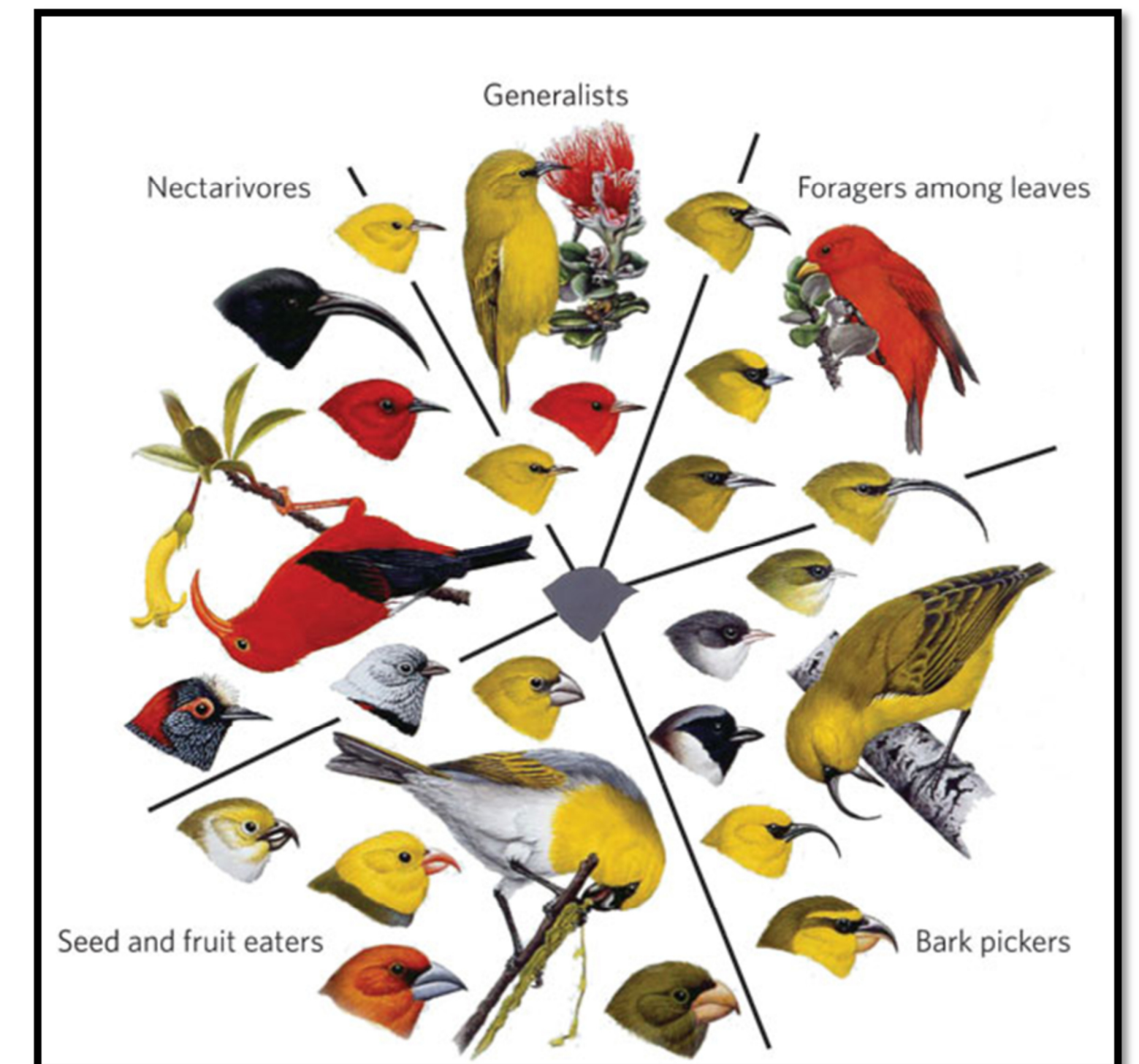


# How did one species become many species?

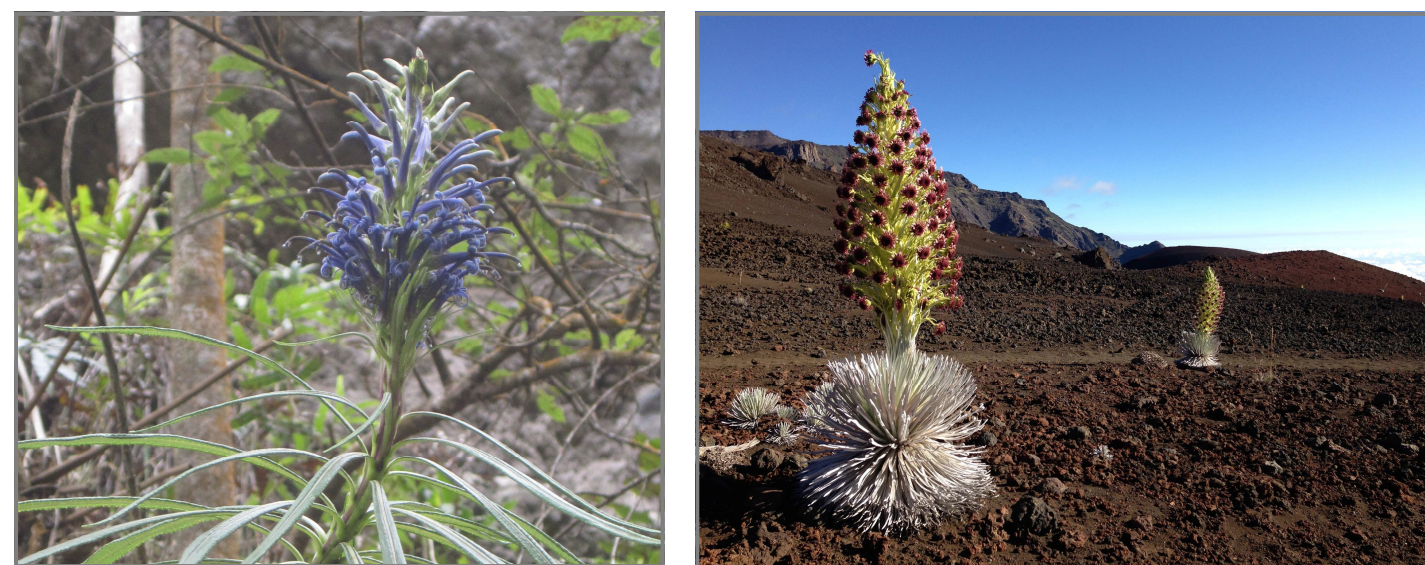
The tendency of a group of animals to evolve in response to selective pressures (predators, food availability, climate) and *adapt to their environments in different ways*, sometimes becoming completely new species, is called **adaptive radiation**.

Adaptive radiation results in many *endemic species* that are closely related to each other because of their common ancestor.

Because species are evolving in response to local conditions, adaptive radiation may result in species that are *narrowly endemic*, or restricted to a small range or a single island.



This is how **more than 50 unique honeycreeper species evolved in the Hawaiian islands**.



Other examples of adaptive radiation include Hawaiian lobelioids and 'ahinahina (Haleakalā silversword).

# What makes a bird successful?

The success of a species can be measured by its ability to survive and reproduce fertile offspring.

Survival = FOOD

Seeds

Fruit

Nectar

Insects

**The variation in the beak shape of native Hawaiian forest birds is directly linked to the foods they eat.**

*Generalists* have a wide range of food sources. Their beak shape allows them to prod, nip, and probe, taking advantage of all food sources. However, they may have lower feeding efficiency than the specialists for each type of food, making it slightly more difficult for them to obtain food from particular sources.

The Eurasian Rosefinch was a *generalist*.



*Specialists* have a limited range of food items and are well-adapted for that kind of food.

**Seed & Fruit Eater** Beak crushes, slices, and pries to get through the husks, pods, and fleshy fruits surrounding the seeds they eat.

**Nectar Sipper** A tubular tongue and petal-probing beak is well-suited to sipping nectar from flowers. The probing beak and feathers also transfer pollen from one flower to another, providing a function important to plant reproduction.

**Insect eaters** Beak probes the nooks and crannies of shrubs and trees, sometimes probing beneath the bark to search out insects that hide there.

## Where are all of these unique birds now?

Out of more than 50 known endemic honeycreeper species, **only 14 species still exist today.**

**Many surviving species are classified as endangered or threatened.**

Fossils provide evidence of past life—just like the dinosaurs! The fossil record enables scientists to identify previously unknown species and to establish their relationships with existing species.

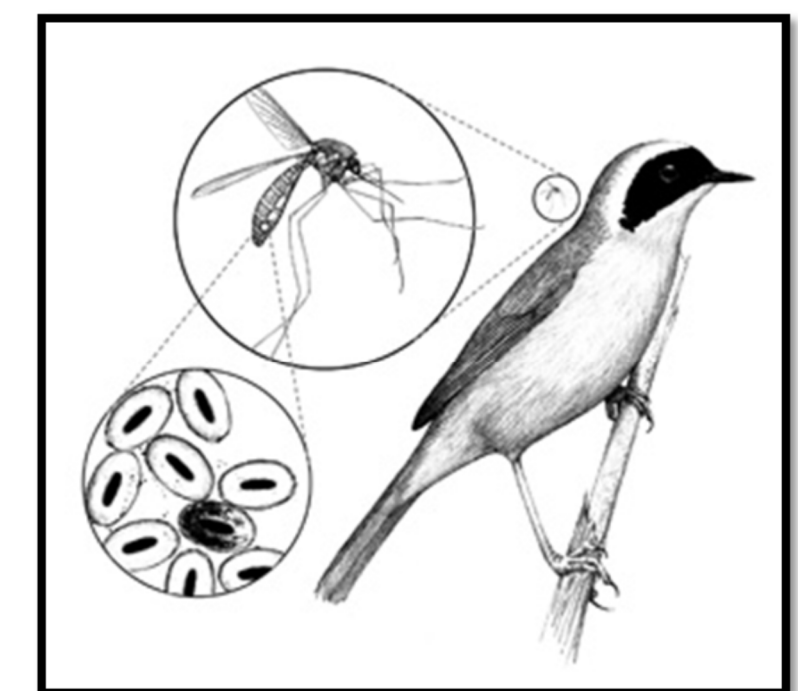
**Many species of Hawaiian forest birds are known only from fossil records.**

Land use change and the introduction of non-native species have had a high impact on Hawai'i's native forest birds.

Fewer native forests = less food and for native birds.

Introduced species = forest destruction, competition for food and habitat, and predation.

**Many native birds are forced to live exclusively at upper elevations because mosquitoes carrying bird diseases inhabit lower elevations.**





# What endemic Hawaiian forest birds are on Maui?

**6** Hawaiian honeycreeper species are found on Maui.

**3** Are endemic to the Hawaiian islands.

**3** Are endemic to Maui.

Hawai'i 'Amakihi



'Apapane



'I'iwi



Maui 'Alauahio



'Akohekohe



Kiwikiu



## 'I'iwi

The 'I'iwi is a brilliant scarlet bird with a long, deeply curved, peach-colored bill.

**Population:** ~350,000.

**Found on:** All main Hawaiian Islands, except for Moloka'i and Lana'i. Rare on O'ahu.

**Diet:** Nectarivorous, often found in flowering 'Ōhi'a lehua and Māmane. Also feeds on Hawaiian lobelioids, which have flowers that are curved exactly like the 'I'iwi's bill.

**Sounds and Calls:** You can hear the wings of an 'I'iwi flutter while it is in flight! The 'I'iwi has a lot of creaks, whistles, gurgles, and reedy notes which are often joined into a halting song. Some random calls sound like a rusty harmonica or a rusty hinge. 'I'iwi may also give human-like whistles or imitate other native birds.

**Where can you see 'I'iwi?** Hosmer Grove in Haleakalā National Park and Polipoli Spring State Recreational Park.



Photos by Mike Neal and Robby Kohley

## Maui 'Alauahio

The Maui 'Alauahio is a bright yellow or green bird, also called the Maui Creeper. Named for its feeding habit of creeping along trunks, branches, and twigs, it is often seen flipping over bark and lichen in search of insects and grubs.

**Population:** ~55,000

**Found on:** Maui

**Diet:** Generalist insectivore.

**Sounds and Calls:** Male Maui 'Alauahio have a distinct song that is often given during short display flights. The song may be heard all year round, but is most frequent from April through July, when birds are nesting. The species also makes a loud and often rapidly repeated *chip* call that may be used to keep in contact with family members, neighboring birds, and to warn of danger, especially while nesting.

**Where can you see Maui 'Alauahio?** Kula Forest Reserve and Hosmer Grove within Haleakalā National Park.



Photos by Mike Neal and Robby Kohley

## Hawai'i 'Amakihi

The Hawai'i 'Amakihi is a green to yellow bird.

**Population:** Unknown. Common on the islands it inhabits.

**Found on:** Hawai'i, Maui, and Moloka'i.

**Diet:** Generalist.

**Sounds and Calls:** The Hawai'i 'Amakihi call is a whiny “reeeeeeee,” and its song is a “sweet-sweet-sweet-sweet-sweet” trill.

**Where can you see Hawai'i 'Amakihi?** Hosmer Grove within Haleakalā National Park, Kula Forest Reserve, Garden of Eden along the Hāna highway, Waihe'e Ridge Trail, and some other locations on West and East Maui.



Photos by Mike Neal and Robby Kohley

## 'Apapane

The 'Apapane is a deep red bird with black on its tail and wingtips and white underneath its tail.

**Population:** Most abundant honeycreeper. Common on all islands it inhabits.

**Found on:** All of the main Hawaiian Islands, though rare on Lāna'i.

**Diet:** Nectarivorous. Feeds mostly on 'Ōhi'a lehua.

**Sounds and Calls:** 'Apapane have incredibly varied calls and songs including squeaks, whistles, rasping notes, clicking sounds, and melodic trills. Some songs are pleasant and rather canary-like; others are harsh and mechanical sounding.

**Where can you see 'Apapane?** Commonly seen on the forested high elevation slopes of Haleakalā and at lower elevations around Kula and Olinda as well as West Maui.



Photos by Mike Neal and Robby Kohley

## Kiwikiu

The Kiwikiu is also called the Maui Parrotbill, named for its large, parrot-like bill which it uses to split branches to find insect larvae, its primary prey. It is mostly olive-green above and yellow below with a very short tail and a distinctive yellow eye-stripe.

**Population:** ~500. Critically Endangered.

**Found on:** Maui.

**Diet:** Kiwikiu feed mostly on insects, insect larvae, and other invertebrates. They prefer to search for insects on Koa trees, in 'Ākala stems and in Kanawao fruit.

**Sounds and Calls:** The Kiwikiu's song is a descending, "*CHEWY-chewy-chewy-chewy.*" Only the male sings.

**Where can you see Kiwikiu?** Kiwikiu can sometimes be seen on hikes led by The Nature Conservancy in Waikamoi Preserve.



Photos by Mike Neal and Robby Kohley

## ‘Akohekohe

The ‘Akohekohe is one of the largest honeycreepers in the forest, with a bright orange ring of feathers around its eye and a whiteish-yellow crest of hair that looks like a mohawk.

**Population:** ~3,800. Critically Endangered.

**Found on:** Maui.

**Diet:** The ‘Akohekohe is mostly nectarivorous and gets almost all of its food from the ‘Ōhi‘a lehua. They can also be seen picking insects from branches.

**Sounds and Calls:** The most common call is a whistle. Other calls include a low “*peter-peter gluk gluk*” and “*AH-kohay-kohay.*”

**Where can you see ‘Akohekohe?** ‘Akohekohe can sometimes be seen at Hosmer Grove in Haleakalā National Park as well as hikes led by The Nature Conservancy in Waikamoi Preserve.



Photos by Mike Neal and Robby Kohley

# Why are these birds threatened and endangered?

Factors attributed to the species' decline include:

**Habitat destruction** by humans, feral animals, and other invasive species.

- ◆ Habitat destruction alters the food supply and climatic conditions.



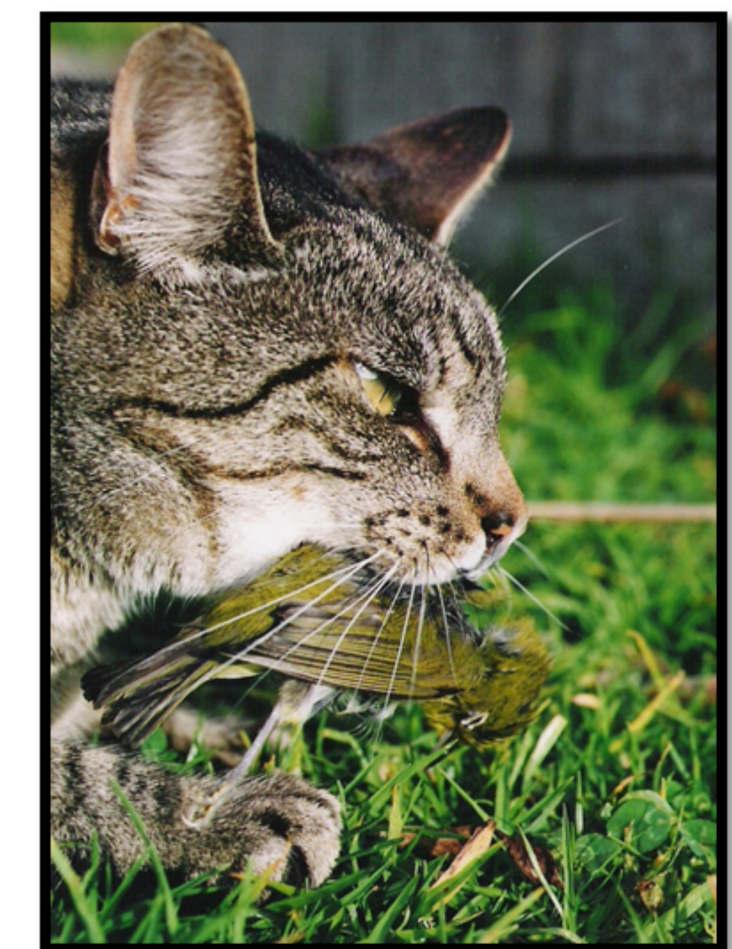
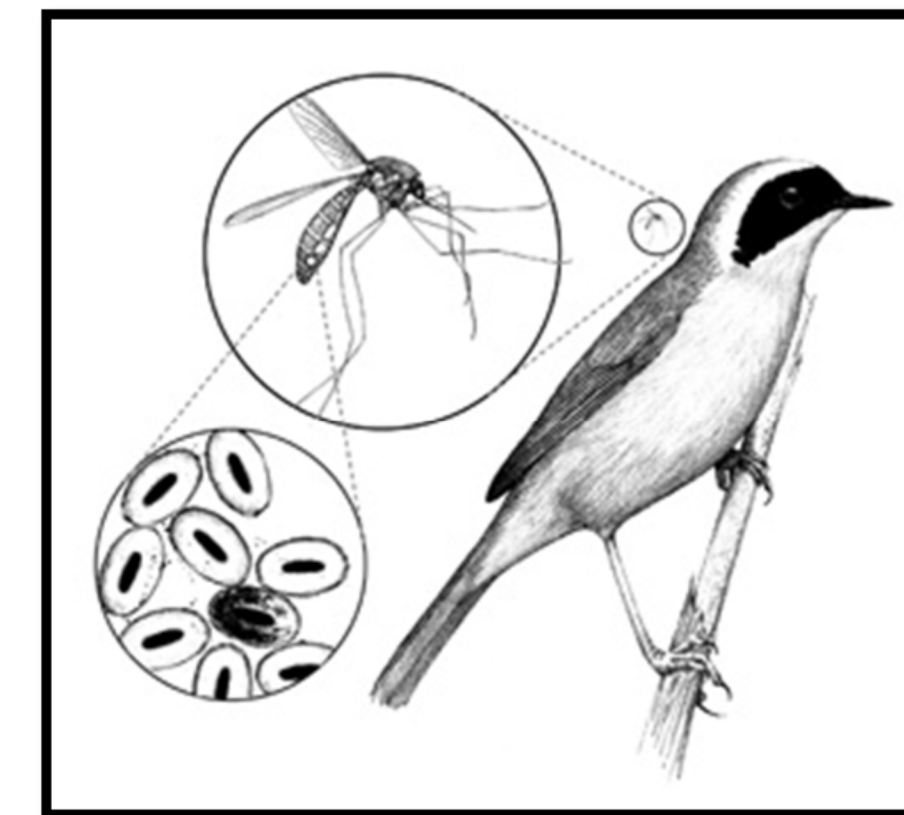
**Predation** from introduced predators such as rats, cats, and mongooses.

- ◆ These birds existed with very few predators for millions of years.



**Avian diseases** caused by the introduction of the mosquito and non-native birds.

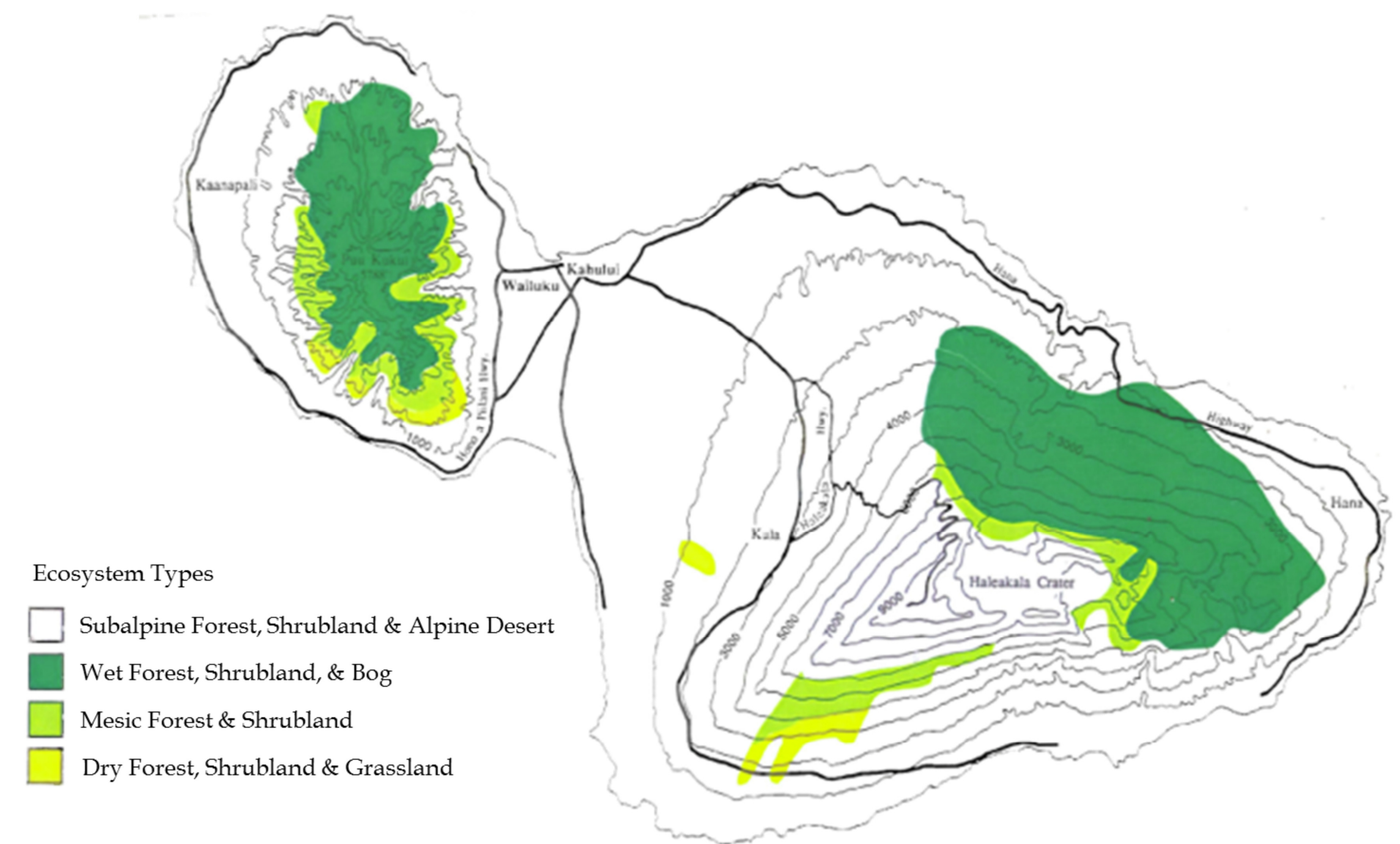
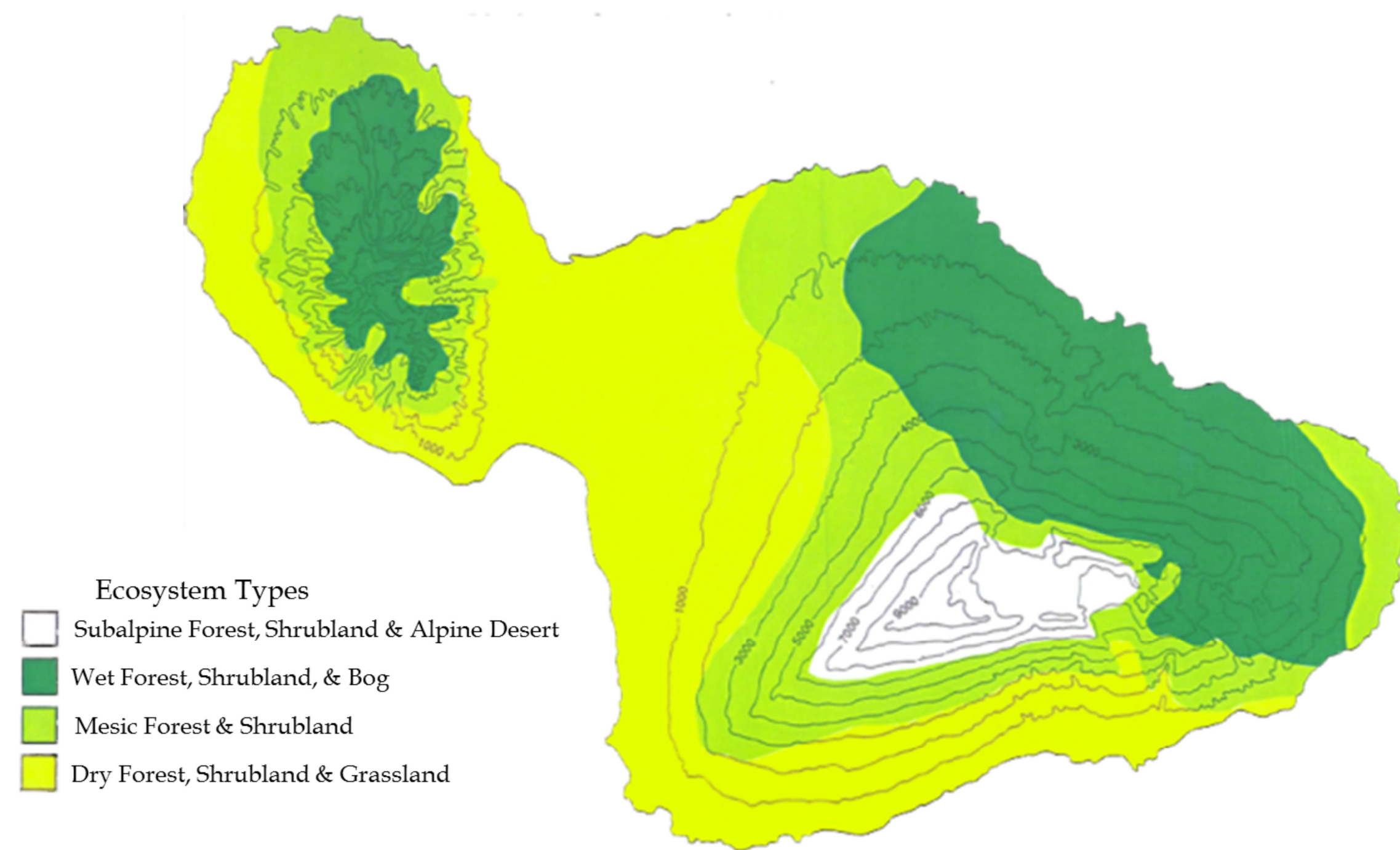
- ◆ The honeycreepers are restricted to high-elevation forest free of mosquitoes.





# Where are the native forests on Maui?

Native forests once covered almost all of Maui. Today, less than 25% of those forests remain.



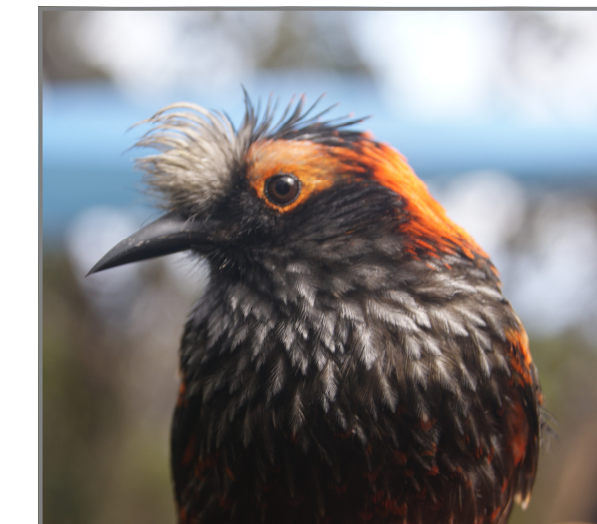
# Where do the endangered native forest birds live?

The Kiwikiu and 'Akohekohe are restricted to a relatively small area on the northeast slopes of Haleakalā.

**Kiwikiu Habitat**



**'Akohekohe Habitat**



# What common non-native forest birds live on Maui?



Red-billed Leiothrix



Japanese White-eye



Japanese Bush Warbler

Common non-native birds, found at both low and high elevations, that may compete with native birds.

Other common non-native birds at lower elevations.



Zebra Dove



House Sparrow



Spotted Dove



Myna



Java Sparrow



Brazilian Cardinal



Northern Cardinal

# What do we know about native birds?

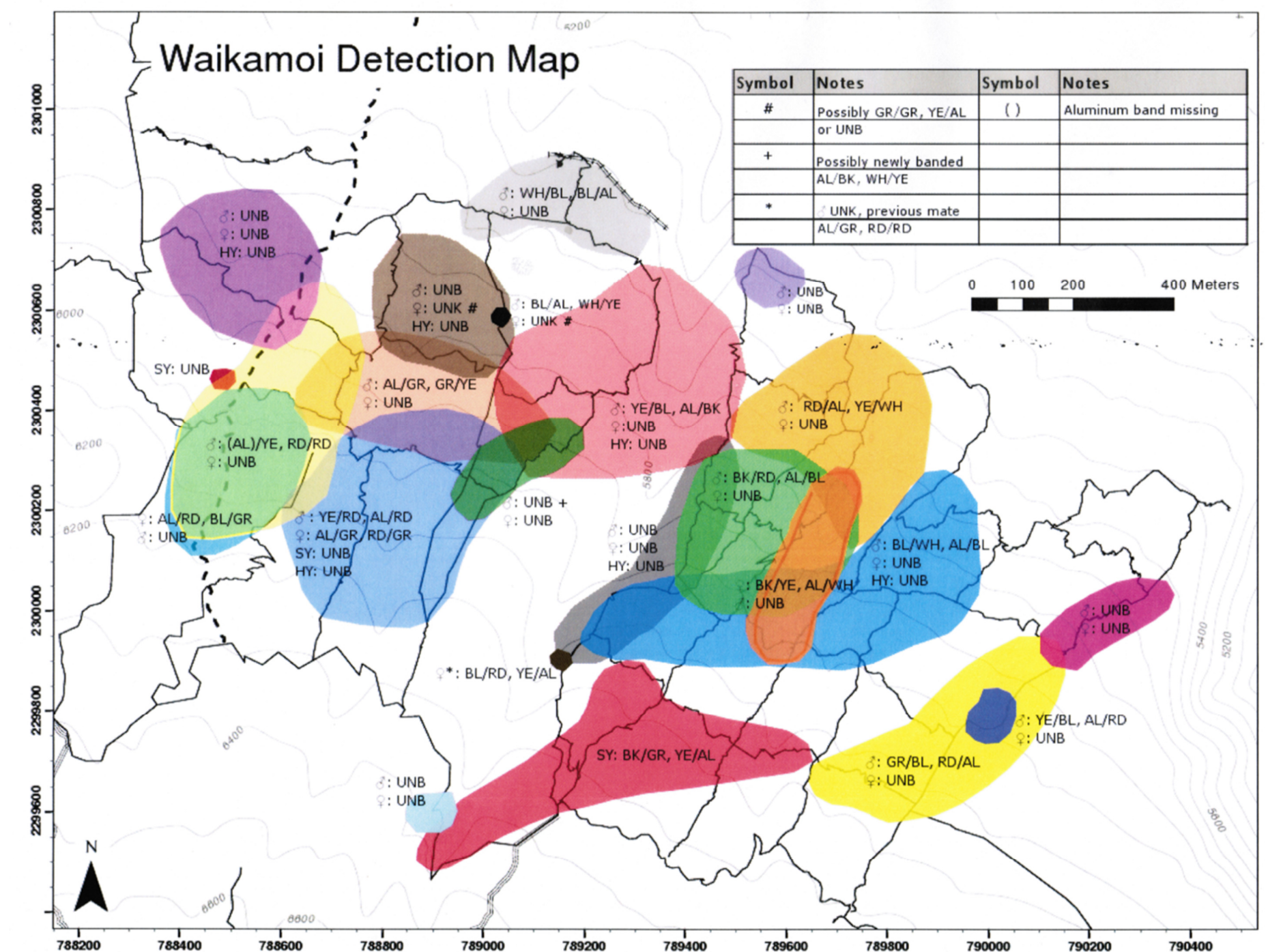
**Populations** — Is the population of each species growing or shrinking?

- ◆ Individual birds are given unique color band combinations so that biologists can monitor reproduction and survival without ever having to catch them again.



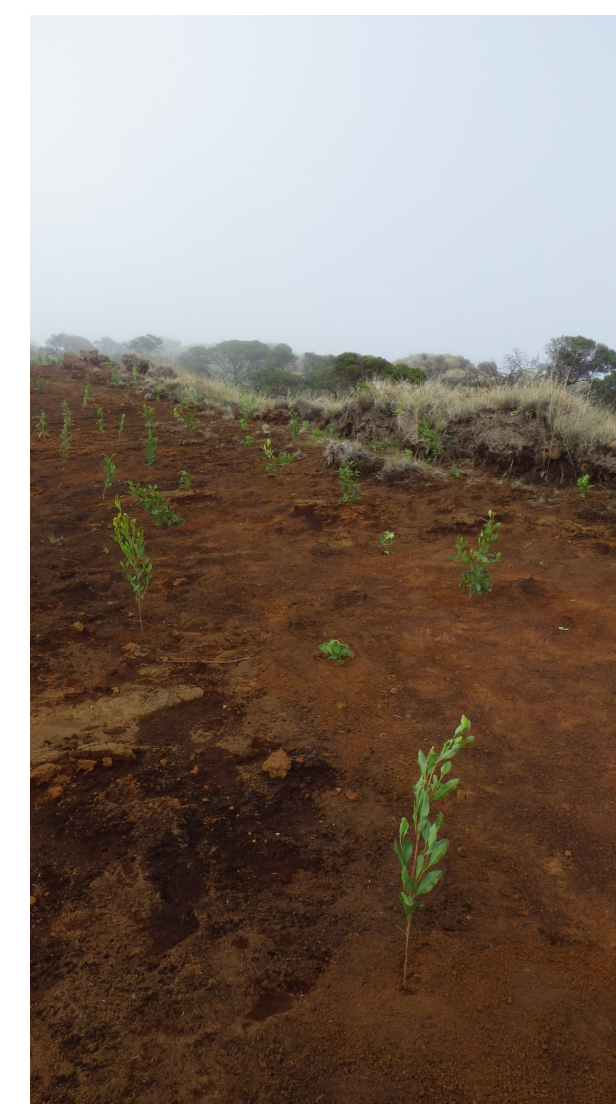
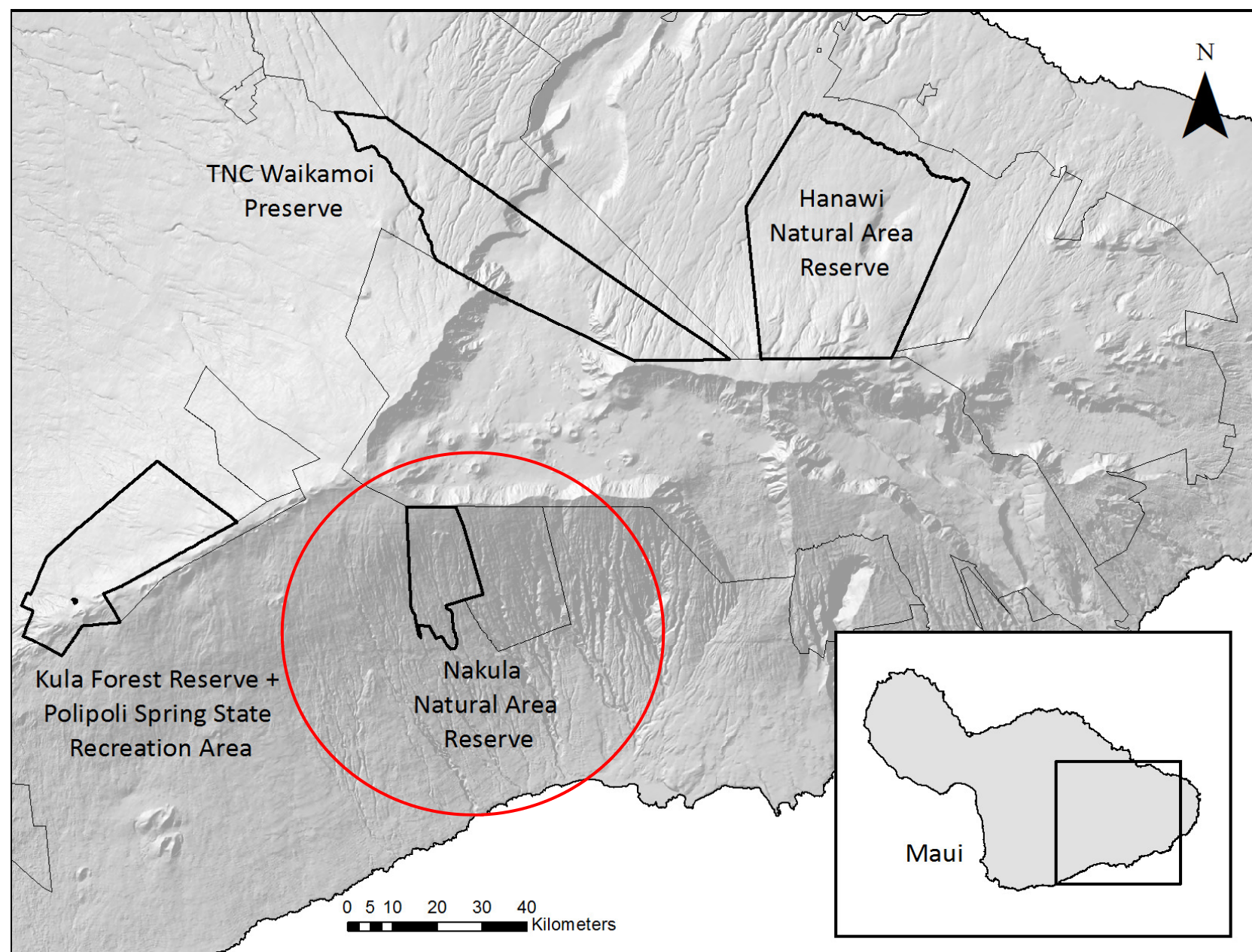
**Threats** — What is effecting the food supply and reproduction success of each species?

- ◆ Biologists track individual birds and pairs to monitor reproduction success and habitat use.



# How can we make more habitat for native forest birds?

Maui Forest Bird Recovery Project is restoring native forest in Nakula Natural Area Reserve on the leeward slope of Haleakalā, with the goal of reintroducing a second population of Kiwikiu.



## What can *everyone* do to help the native forest birds?

- ◆ Reduce your ecological footprint by using less non-renewable resources
- ◆ Buy local.
- ◆ Plant native plants in your yard.
- ◆ Prevent invasive plants and animals from getting to Maui and spreading.
- ◆ Clean camping gear and shoes to reduce the spread of invasive species.
- ◆ Learn about nature and share your knowledge with friends and family.
- ◆ Volunteer or donate to local environmental organizations.
- ◆ Spay and neuter your pets. Keep pets on leashes or inside to prevent wildlife deaths.
- ◆ Reduce mosquito habitat by preventing stagnant pools of water.
- ◆ Experience native forests.



# How can I learn more about native forest birds?

**Maui Forest Bird Recovery Project** has a mission to develop and implement conservation techniques to recover endangered forest birds and to restore their habitats through research and management.



[www.mauiforestbirds.org](http://www.mauiforestbirds.org)

