



# Nihoa Millerbird Translocation Project



## Frequently Asked Questions (FAQs)

Source: NIHOA MILLERBIRD (*Acrocephalus familiaris kingi*) - TRANSLOCATION PROTOCOLS FINAL August 2011  
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### 1. How many Nihoa Millerbirds will be captured and translocated to Laysan Island?

*Twenty-four (24) birds will be moved in the first translocation and at least one subsequent translocation is planned to achieve the target of 50 Millerbird founders released on Laysan. Based on captive feeding trials conducted on Nihoa, we believe 24 birds are the maximum that can be cared for safely through all the steps of the translocation. Millerbirds are highly territorial and sedentary, so 50 founders should provide a sufficient selection of mates for successful breeding.*

### 2. Will the removal of birds from Nihoa negatively impact the specie's small population?

*No. The impact to the Nihoa Millerbird source population will be minimized by conducting the translocations over a period of at least two years. The 2010 population estimate was 507 birds, so removing 24 birds (4.7% of the population) should have minimal, acceptable impacts to the source population.*

### 3. How will project success be determined?

*A final report will be produced in December 2012 that will evaluate the effectiveness of the project methods, and will provide a preliminary assessment of the success of the translocation and the need, timing, and procedures for additional translocations. The evaluation will be based upon: 1) survival of birds for one year post-release, 2) successful reproduction in the first year, and 3) implications of habitat use, territoriality, and movement patterns for the long-term persistence of Millerbirds on Laysan. This evaluation is a necessary preliminary benchmark, but determining the longer term success and creation of a self-sustaining Millerbird population will require monitoring for at least 5 years.*

### 4. How many of the translocated birds will be male and female?

*We plan to move an even sex ratio (12 females, 12 males) of those birds that have best acclimated to captivity. Birds that have brood patches, cloacal protuberances, dependent juveniles, or other indications of breeding will not be brought into captivity.*

### 5. What impact is climate change expected to have on the Millerbird?

*Laysan, and the other Northwestern Hawaiian Islands (NWHI), will be vulnerable to an increased frequency and severity of catastrophic weather events associated with global climate change. Climate change will also cause a rise in sea level, increased shoreline erosion, and storm surges. Preliminary projections suggest Laysan Island could lose up to 5% of its area by 2100 depending on the amount of sea level rise. The maximum sea level rise considered was 0.88 meters, but other research suggests that sea level could rise more than 2 meters. Laysan's coastline could be reduced, the interior inundated and the lagoon shore expanded. Exactly how this combination of climate change factors and interactions will affect Laysan and its communities is unclear. Creating a second population of Millerbirds on Laysan is a short-term solution. Long-term recovery strategy for this species and multiple translocations to other, higher islands will be*

necessary. The high island sites recommended as long-term objectives are Kahoʻolawe, Lehua, Lānaʻi, and Niʻihau. At present none of these (or any other high island in Hawaiʻi) are suitable due to the combination of mosquitoes and avian disease, exotic mammalian predators, and socio-political considerations

#### **6. What are the threats to the Nihoa Millerbird?**

The threats the Nihoa Millerbird faces are: the accidental introduction of alien plants and animals and environmental catastrophes such as hurricanes, severe drought, or fire. Alien species such as rats or mosquitoes could be accidentally introduced by ships or shipwrecks, such as occurred on Laysan in 1969, and cause extinction or extirpation of Nihoa's birds. An example of such an alien species that has had profound effects on Nihoa is the non-native, gray bird grasshopper which was first detected on the island in 1977. Expeditions in 2002 and 2004 estimated that 90% of the island's vegetation was denuded by the grasshoppers which likely had a negative impact on the availability of arthropod food resources.

#### **7. What is the population size for the Nihoa Millerbird?**

When the Nihoa Millerbird was first discovered in 1923, the population was estimated to number about 100 birds. The USFWS Wildlife Refuges has opportunistically monitored Millerbirds (as well as Nihoa Finches) over the past several decades. Between 1967 and 2010, population estimates from these surveys have fluctuated widely, from as few as 31 birds to as many as 814, with an associated high level of variability. The 2010 population estimate was 507 birds.

#### **8. When is the breeding season for Millerbirds?**

The Millerbird breeding season can extend from January through September; occurrence and timing of breeding are likely dependent on rainfall. In some years breeding was not detected during the summer and fall, and based upon molt and remnant nests, the peak was likely during the winter months. Nests are built in the available dense shrubs, but the birds do not seem to show a preference for a particular species of plant. Clutch size is usually two eggs and both sexes incubate, brood chicks, and provision nestlings and juveniles.

#### **9. What do Nihoa Millerbirds eat?**

The Nihoa Millerbird is a generalist insectivore which gleans both native and non-native insects from shrubs and other plants. It also forages in leaf litter, on the soil surface, and has been observed eating insects from bird carcasses. Captive feeding trials and associated husbandry conducted on Nihoa in 2009 and 2010 indicate that Millerbirds will consume any suitably sized arthropods (less than 4cm length), including flies, moths, beetles, and cockroaches.

#### **10. Why move Nihoa Millerbirds to Laysan Island?**

The purpose of the translocation is to establish a self-sustaining population of Millerbirds on Laysan that will achieve three important objectives: (1) increase the abundance and distribution of Millerbirds and thus reduce the threat of extinction; (2) implementing translocation is explicitly stated within the Papahānaumokuākea Marine National Monument's (PMNM) Management Plan as an action necessary to safeguard and recover the Monument's endangered animals; and (3) restore or recreate functionality within the native ecosystem of Laysan.

#### **11. Why was Laysan Island chosen as the site for the first translocation?**

In 2007, 18 experts evaluated potential translocation sites for Millerbirds in the NWHI. The assessment identified Laysan as the first choice, because it previously supported an ecologically equivalent subspecies and had no additional risk factors. The consensus was the species would not have a negative influence on

the current ecosystem because Laysan once supported Millerbirds. This recommendation was accepted by PMNM, and their management plan states that Laysan is the top choice for the initial translocation of Millerbirds. Other advantages of selecting Laysan include the absence of avian diseases (e.g., pox, malaria), mammalian predators, and introduced avian species, as well as vegetation structure and composition suitable for Millerbirds.

#### **12. How do the scientists determine the bird's sex?**

Two methods will be utilized to sex the birds, a discriminant function analysis (DFA) using wing and tail measurements and a portable polymerase chain reaction (PCR) lab or genetics testing. The DFA will allow us to sex birds immediately upon capture and adjust our capture effort to obtain an even sex ratio. The DFA is 87.7% accurate, so the technique cannot successfully sex all birds. The results from PCR are more reliable, but will take longer to process and be more logistically challenging. Employing both methods will ensure that all captured birds are properly sexed and that the correct sex ratio was chosen for the translocation group. If we do not have an even sex ratio available for translocation, we will still move a full group of 24 birds. These birds will be selected based upon their condition and adjustment to captivity.

#### **13. Why conduct the translocation at this time of the year?**

Nihoa is a steep, rocky island that requires a challenging landing, and July–September offer the best opportunity to get safely ashore. Conducting the translocation in September will minimize the chances of removing Millerbirds with dependent young. During September seabird breeding activity is nearing its annual low, and translocation-related disturbance of seabirds with eggs or nestlings on both islands will be minimized. The translocation will occur in September, but future translocations and expeditions will examine the feasibility of an August trip to further minimize the dangers from high seas and rough weather.

#### **14. How will the birds be captured?**

The birds will be captured using the mist-netting method. This uses a modified net with three trammels that is shortened to 3 m in length. The poles are only as high as the vegetation, and the shortened length facilitates quick set-up and movement in dense shrubs. Millerbirds will be attracted using call playback and flushed into the net by capture team members. Birds will be weighed, measured, and banded with aluminum and unique color band combinations, and sexed using DFA; breast feathers will be collected for genetic sexing in the shipboard PCR lab, and archived for later genetic analysis. The birds targeted for translocation will be captured and managed by at least four teams, three capture teams and one aviculture team. The capture teams will be deployed to different areas of the island to maximize the number of candidate birds collected, while minimizing the likelihood that captured birds are related, local impacts to the territorial breeders, and the transport time to the base camp. The aviculture team will remain at base camp to receive and care for the birds. The primary goal during capture and transfer to base camp will be to minimize stress on the birds. Mist-netting will take place only during the morning and late afternoon when temperatures are cool. In the evening, capture will halt once there is no longer time for the birds to acclimate to captivity before nightfall.

#### **15. Once captured, what happens to the birds?**

Millerbirds will be held for 2–5 days on Nihoa, 3 days on the boat, and 1 day prior to release on Laysan, so that the total holding time could be as long as 9 days. The birds will be monitored for several days on Nihoa prior to departure while we capture the full group for translocation and conduct the PCR sexing. Individuals that do not acclimate based upon their behavior, will be released where they were captured. This pre-departure monitoring is important to ensure the birds can tolerate the time in captivity and the necessary

handling until their release on Laysan. Once the target number is reached and acclimated to captivity, the group will be transported to the ship. The Nihoa holding cages (four connected cells) will be transferred to the transport ship for the majority of the journey. The morning of the disembarkation at Laysan the birds will be transferred to the Laysan holding cages; during this process the birds will be inspected to make sure no arthropod food items are transferred to Laysan. The Laysan holding cages are duplicates of the Nihoa holding cages, but this transfer is required due to PMNM quarantine protocols. The Laysan holding cages will be transported to a secluded, quiet area of Laysan, and the bird's health and stress level assessed. If the birds are stable and appear healthy, they will be transferred to the release cages, which are smaller, lighter weight, single-celled and have an easy opening release mechanism, and then hand-carried to the release site. We will do everything possible to minimize both the handling and holding times throughout the process. All holding and transporting of birds will be supervised by an aviculturist and supported by a veterinarian and additional biologists.

#### **16. What will the captured birds eat?**

Each Millerbird will be held and fed using techniques developed during captive feeding trials on Nihoa in 2009 and 2010. These birds were acclimated to a captive diet using a combination of non-live food supplemented with locally-caught live food (primarily Diptera or flies). External live food is not an option on either island due to PMNM quarantine protocols, but while on the boat the birds will be fed live mealworms and waxworms in addition to the non-live food.

#### **17. What is the size of the transmitter, how long will it last, and how will it be attached to the birds?**

Millerbirds are small birds, with a mass of approximately 18 g, and a minimum of 15 g. Although radio-transmitters can negatively impact birds, transmitters less than 3% of a bird's mass minimize potential adverse impacts to the bird. Therefore, transmitters must be less than 0.54 g for the average bird, and less than 0.45 g for a light-weight bird. Transmitters of this mass include a temperature sensor to provide a proxy for mortality data have a 21 day nominal battery life. Radio transmitters will be attached to half of the birds (12) using the glue-on method the morning of the release. A small piece of cloth will be attached to the bottom of the transmitter to increase the contact area. The feathers on the bird's interscapular region will be trimmed from an area slightly larger than the transmitter and the feathers cleaned with acetone. SkinBond® adhesive will be applied to both the transmitter and feathers, and then the transmitter gently, but firmly, held on the back until secure (2–5 min).

#### **18. Where will the birds be released on Laysan?**

The area on Laysan chosen for the first release of Millerbirds is located in the middle of the southern edge of a large patch Beach naupaka which is protected by a berm to the north. This site will expose the released Millerbirds to a large, homogenous area of Beach naupaka to the north, and a high level of species and structural diversity to the south, providing the birds a wide variety of options for establishing territories. This area is surrounded by Eragrostis (perennial grass that is the dominant habitat on Laysan) and contains nearly every habitat type on Laysan, so the birds will be able to disperse, sample, and settle into whichever habitat is preferred.

#### **19. How will the birds be released on Laysan?**

Birds will be transferred the short distance from the staging area to the release site early the morning of release. The release cages will be designed and positioned so that the bird can be observed and released from a distance. Once the release cages have been placed in the habitat, the Millerbirds behavior will be monitored using binoculars. When the bird has settled down in the release cages and its behavior appears normal, the trapdoor will be opened. The cage will be oriented so that the bird exits directly into dense

*suitable habitat. The full group will be released in small sub-groups (six birds each, four sub-groups total) over the course of one morning, with the release cages arrayed in the selected release site. The releases will begin in the early morning (06:00 HST), with subsequent subgroups staggered by 30–60 min to allow for monitoring the birds' behavior and dispersal, as well as transport of the next sub-group to the release area. Supplemental food stations will be distributed throughout the release area prior to release, and once the birds are released the stations' locations will be adjusted so that no territory has more than one. We will resupply the stations at least twice daily (morning and evening), and monitor the Millerbirds' visitation and food consumption to assist in determining survival, habitat use, and potentially nest locations.*

## **20. How will scientists monitor the birds once they are released?**

*Long-term post-release monitoring is critical to provide the data on the status and fates of released birds. The data collected will allow the managers and scientists to understand the underlying causes of success or failure of the translocation, and suggest how future releases should be modified. As the project progresses through its first year, monitoring will allow us to assess the different stages in the establishment of a Millerbird population on Laysan, and adapt our methods to improve future translocations. Radio transmitters will operate for approximately 21 days post-release. Once the transmitter batteries die, collecting high-quality data for assessment of the translocation will require making repeated, reliable observations of color bands.*