



## Lehua Restoration Project: Frequently Asked Questions (FAQs)

### Why are invasive rats a problem on Lehua?

Lehua Island is one of the largest and most diverse seabird colonies in the main Hawaiian Islands. It provides habitat for 17 seabird species, including three on the IUCN Red List of Threatened Species, including the IUCN<sup>1</sup> Endangered (US-Threatened<sup>2</sup>) Newell's Shearwater and two more which are also Federal Species of Concern – the Black-footed Albatross (ICUN Near Threatened) and the Laysan Albatross (Near Threatened). Lehua Island is also home to 11 plant species found only in Hawai'i (endemic) and 14 native plant species.

Invasive, alien rats can and do climb trees and shrubs, eat bird eggs, and prey on hatchlings and adult birds. They are a leading cause of the accelerated decline and extirpation of endemic Hawaiian forest birds and are a major factor limiting present populations of endangered birds. Invasive rats are also known to prey on ground-nesting seabird adults, eggs, and hatchlings. On Lehua Island, rats are negatively impacting the seabird colonies as well as the native and endemic vegetation. The rats eat seeds, bark, fruits, leaves, and shoots of Hawaiian plants, hindering native plant communities.

### Who is conducting the Lehua Restoration Project?

The Lehua Restoration project is being led by the Hawai'i Department of Land and Natural Resources Division of Forestry and Wildlife (DOFAW), the United States Fish and Wildlife Service (USFWS), the United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (WS), the United States Coast Guard (USCG), the National Tropical Botanical Gardens (NTBG), the Robinson Family (owners of Ni'ihau), people of Ni'ihau, and Island Conservation (IC).

A Steering Committee composed of members from the above cooperators was established in 2012 to provide a decision-making forum for the Lehua Restoration Project and to promote transparency. The project is funded by some of the cooperators (direct and in-kind) and through a generous grant provided by the National Fish and Wildlife Foundation (NFWF).

### Is the eradication of Pacific rats on Lehua feasible?

Yes, the proposed project is modeled after more than 500 successful rodent eradications that have been conducted around the globe. An eradication requires all rats to be removed from an island.



<sup>1</sup> <http://www.iucnredlist.org/>

<sup>2</sup> US Endangered Species Act Listed

Based on past experiences of rodent eradications around the world, the project's guiding principles include:

1. Placement of a bait containing a rodenticide into every potential territory on the island.
2. Minimize risks to non-target species wherever possible.
3. Ensure that all environmental compliance is completed, and the project is acceptable to the community.

#### **What type of rat bait are we considering?**

We are using bait that includes the rodenticide, diphacinone, a pesticides that is lethal to rodents, including rats. The vast majority of rodent eradications utilize the anticoagulant rodenticides. The bait is formulated to consist of 99.995 percent of natural cereal grains and other human food grade items and are designed to attract rodents. The rodenticide is an extremely small percentage of the approximately 11 tons of bait that will be distributed on the island.

#### **Why are rodenticides proposed to be used on Lehua?**

Rodenticides have been safely used in over 500 islands to successfully eradicate rodents. Rodenticides offer the best chance to completely eradicate Pacific rats from Lehua Island. Alternatives, such as traps, are ineffective on islands like Lehua. Except for very small islands, no rodent eradications have been successfully completed with traps or other mechanical means. Further, the steep slopes of Lehua make it impossible to safely deploy traps over the entire island.

#### **Why will helicopters be used to apply the rodenticide bait?**

Lehua Island's steep cliffs and difficult terrain pose logistical challenges that make solely employed bait stations and/or hand application inappropriate. Bait cannot be delivered into every potential territory using a ground-based approach.

A ground-based eradication strategy would also require the implementation team to spend several months on Lehua. To hand-deliver the bait into every potential rat territory would require navigating the island's steep terrain, putting the safety of island restoration personnel at risk. By comparison, aerial broadcast of bait requires fewer personnel to be on the island, and overall poses fewer hazards for project personnel.

#### **When is the eradication going to take place?**

The timing of the eradication takes into account many factors, including the Pacific rats' biology, vegetation trends on Lehua, presence of non-target native species, and weather conditions. In order to minimize risks to non-target species while maximizing the probability of success, the ideal eradication window is during the summer months (July, August, and early September). The current target for this project is to commence in August 2017, pending receipt of all permits. A Final Environmental Assessment FEA was issued by the Department of Land and Natural Resources and the US Fish and Wildlife Service in July 2017.

#### **Has this been attempted before on Lehua?**

Yes, an attempt was made to eradicate rodents from Lehua in 2009. While the rodent population was substantially reduced, some rodents survived and repopulated the island. The operational plan used in 2009 differs from the one proposed for use in 2017. The FEA discusses the likely factors that contributed

to the survival of some rats. For example, in 2009 rodenticide was applied to the island in winter rather than summer. Recent rains prior to application of rodenticide supported plant growth on the island that provided food to the rodents, decreasing the likelihood that they would eat the rodenticide.

**Were the dead fish and whale calf found on Ni`ihau beaches in 2009 related to the use of Diphacinone on Lehua in the same year?**

No. Triggerfish samples were collected from Ni`ihau beaches for testing, and no residues of Diphacinone were found in the fishes' tissues. Furthermore, studies being conducted by United States Geological Survey (USGS) have shown that Triggerfish will not consume bait containing diphacinone and they are some of the least sensitive species to diphacinone, meaning they would need to consume hundreds of pellets of bait in one feeding to receive lethal doses of the toxicant. This would have been difficult given the limited availability of pellets and that many pellets would be several times more than these fish ordinarily would consume. Given the age of the whale calf, it would have still been nursing, and its mother would not have been eating anything at the time, as this whale species does not feed during the winter months spent in Hawaiian waters. Taken altogether, the available evidence suggests that despite the coincidental timing of both events, the operations on Lehua could not have caused the death of either the fish or the whale calf.

**What are the risks to non-target species?**

The risks to non-target species are a function of the toxicity of the rodenticide and the exposure pathway. If there is no pathway of exposure, there is no risk. Likewise, if there is no toxicity, exposure to the rodenticide will have no consequences. The anticoagulant rodenticides being considered for Lehua are toxic to mammals, birds and fish, with limited-to-no known toxicity to invertebrates and reptiles. Typical pathways of exposure are direct (primary exposure) through consumption of bait and indirect (secondary exposure) through consumption of contaminated prey such as dead rats or invertebrates that have consumed bait.

No native mammals exist on Lehua, and the terrestrial birds are all introduced, non-native species. The only native species that could be at risk of exposure are the seabirds, however, their behavioral ecology is such that they forage offshore in the marine environment, lowering their risk of exposure. Migration of small amounts of bait into the marine environment is unavoidable, however, the bait is designed to breakdown quickly in the presence of rain or water, and the toxicant is not soluble in water. What little bait may find its way into the nearshore environment will quickly break down and is unlikely to be consumed by local marine life. A recent study on native Hawaiian triggerfish in captivity demonstrated that the fish will not consume toxic bait, and thereby do not present a risk of transferring residues through the food web. Due to the nature of the project, there will be no need for additional bait to be placed on the island following the conclusion of operations and confirmation of total eradication. Any residual rodenticide that may linger in the ecosystem (on land or in the ocean) will eventually be transferred to the soil layer or ocean silt, where, subject to microbial degradation, will break down to its base components of water and carbon-dioxide within as little as 30 days.