

---

Friday, April 21, 2017 at 4:01:32 PM Hawaii-Aleutian Standard Time

---

**Subject:** Lehua Island Ecosystem Restoration Project

**Date:** Wednesday, April 5, 2017 at 6:15:15 PM Hawaii-Aleutian Standard Time

**From:** Robert Boesch

**To:** DLNR.FW.LehuaRestoration

**CC:** Enright, Scott, CleanWaterBranch, oeqc@doh.hawaii.gov, theresadawson@hawaiiantel.net

Thank you for the opportunity to comment on the Lehua Island Ecosystem Restoration Project. The project is an ambitious undertaking that, if successful, and does not need to be repeated with each new rat introduction will be well worth the effort. Unfortunately, the DEA does not adequately address issues concerning "coincidental" or collateral damage. The aerial application of rodenticide baits has been tried three (3) times in Hawaii. Each application resulted in "coincidental" or collateral damage.

#### **Not Detected Does not Mean No Death - Just Inadequate Methods**

In 2003, KSBE aerially applied diphacinone rodenticide to the Keahou Ranch. Pigs in the area were tracked by the National Wildlife Research Center. Most of the pigs that were tracked were killed and some had diphacinone detected in their livers most had no diphacinone detected in their muscle tissue. Method limits of detection ranged from 30 to 50 parts per billion. The attitude of the applicator was "We just killed a few pigs." (Pigs are not one of the more vulnerable species to diphacinone poisoning).

#### **Anticoagulants are Imprecise. Toxic Doses are Different Species and Individuals within Species Groups**

Cattle have been injected with diphacinone to kill vampire bats. The cattle were not harmed, but the vampire bats were "controlled". Where do marine mammals and fin fish fit in?

In February 2008, USDA aerially applied diphacinone rodenticide to Mokapu Island. Weeks later (within the window of toxicity for diphacinone) a juvenile whale was discovered moribund on a Maui Beach. USGS tested the whale for diphacinone and reported that diphacinone concentrations in the liver samples from the beached juvenile whale were below the limits of detection for the matrix and method (15 parts per billion).

#### **Testing for the Correct Chemical?**

Was the lab still looking for diphacinone weeks after the application? Poisons are metabolized and change structure and composition. Methods must be able to detect metabolites of diphacinone.

What are the method limits of detection for diphacinone, hydroxylated diphacinone, and brodifacoum and its metabolites?

#### **What Happens if Coincidental or Collateral Damage Occurs?**

Coincidental with treatment of Lehua Island in 2009, fish kills and dead juvenile whales were reported. Citizens of Kauai and Niihau sought the assistance from the Hawaii Department of Health to determine when it would be safe to consume fish. Assistance in determining a safe level was requested, but never provided from the U.S. Environmental Protection Agency (no level of anticoagulant is considered "safe").

A New Zealand study suggests that pigs should not be hunted within 160 days of a diphacinone bait application to reduce residues. What should be the interval in a marine environment? Are predatory fish to be sampled? Or will the project continue to sample limpets, herbivorous fish and water to show no detectable residues?

Anticoagulants bioaccumulate. Higher level predators are at greatest risk at lower doses. What happens if a pregnant Hawaiian woman eats a predatory fish?

Page 1 of 2

Robert Boesch  
Visiting Colleague