

## **Predator Focus:**

**Feral Cats (*Felis catus*):** The Kauai County Feral Cat Colony Ordinance Committee estimated that there are 52 cat colonies on Kauai (Map 1). Feral cats are known to roam up to several miles a day on recurring routes and are recorded throughout the high elevation landscapes on Kauai (Photo 1 & 2) (Map 2); and very large populations in lower elevations near beaches and cities. An average cat has 1-8 kittens per litter and 2-3 litters per year. One female cat could have more than 100 kittens. A single pair of cats and their kittens can produce as many as 420,000 kittens in just 7 years. It is estimated that Oahu Island (nearly the same size as Kauai) has 300,000 feral cats. The feral cat population on Kauai is unknown but if left unchecked the numbers will continue to rise. Trap, spade and neuter (TNR) programs are active on Kauai, as well as the desire to develop a feral cat ordinance to reduce the number of reproductively active feral cats particularly through the removal of feral cat colonies which act as source populations for the islands at-large ferals. However, these programs need to be bolstered by active removal, especially in remote wilderness areas.



Feral cat with dead Hawaiian Petrel in mouth.



Hawaiian Petrel killed by a feral cat - signature evisceration pattern.



Feral cat dragging adult Newell's Shearwater out of a Burrow.



Feral cat Hawaiian Petrel chick in mouth.

**Barn Owls (*Tyto alba*):**

Barn Owls are found throughout the Hawaiian Islands. Twenty-eight adults were released on Kauai between the summers of 1959 to 1963. After being introduced for rodent control, they failed to impact rodent populations. The Kauai population now ranges between one and two thousand individuals. Barn Owls eat small mammals and will opportunistically prey on native birds. They breed year-round in Hawaii, beginning in their first year. They often lay multiple clutches per year, averaging 4-6 eggs per attempt. Nests with over 10 eggs have been observed. Barn Owls have been observed to predate heavily upon breeding seabirds at Lehua Island, eating both adults and fledglings. More research and monitoring is needed to better understand these animals and how to control them.



Barn owl in Swedish Goshawk trap.



Barn Owl on a "Predator Sink".

**Black (*Rattus rattus*), Polynesian (*Rattus Exulans*), and Norwegian (*Rattus norvegicus*) Rats:**

All rat species are found throughout the island. Black rats and Polynesian rats are the most common found in wilderness areas, however, recently substantial numbers of Norway rats have been detected in high altitude forest. Populations grow rapidly with availability of resources, however, continued management pressure at a landscape level has been shown to slow population growth. There is also anecdotal evidence that suppressing rodent populations may decrease the suitability of an area for cats thus, rodent control may decrease the number of cats entering an area.



Black Rat



Polynesian Rat



Norwegian Rat



**Feral Pigs (*Sus scrofa*):**

Found throughout the State primarily in wet forests but do well in lower dry forest, as well as scrub and pasture lands. Being omnivores affords them opportunity to a variety of foods including animals, plants, roots, fruit and earthworms. They reach puberty at 3-5 months and bear litters of 2-14 piglets. Gestation periods are 110-116 days. They have been recorded predating endangered seabirds.



Feral pigs and piglets.



Avian malaria & pox carrying mosquitos breed in feral pig wallows in native & non-native forests.



Mosquito infecting a bird's eye.

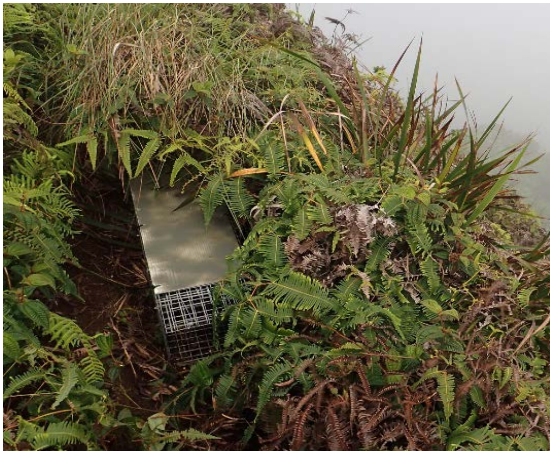


A dead Apapane infected with avian pox. *Photo Jim Denny*



## Predator Control Methods:

- Various Traps



Tomahawk Trap for Feral Cats



Swedish Goshawk Trap for Barn Owls



Bal-chatri Trap for Barn Owls



Modified Conibear Trap for Feral Cats



"Predator Sink" for Barn Owls, Cats & Rats (*Patent Pending*)





Goodnature Trap™ - Rat Control

- Deployment of control teams in remote locations of primary conservation need via helicopter.
- Deployment of specially trained predator detection dog(s) and handler teams.
- Traditional fire arms (*currently on RCUH “stand down”*).
- Non-traditional air guns, net guns, etc.

#### Research & Data Collection:

- Evaluating success vs costs of Baiting Stations, traps and other technologies.
- Efficiency Studies.
- Pre & Post control surveying for predator presence as determined by sign, live detections and possibly acoustic monitoring.
- Use Predictive models using various data sources to predict predator concentrations
- Use collared & satellite tagged animals to track and locate animals.
- Analyze stomach content of captured predators, necropsy.
- Predator control method training.
- Automated electronic trap sensors and camera.
- Genetic sampling of cats (Ohio State University and Colorado State University) to assess familial genetics among inland mountain, edge of mountain and lowland area cats. This will help us determine the cat movement ranges and what they are eating.

#### Technology Development:

- Open Patent development for “Predator Sink” trap design allowing multiple agencies to give design input and increase efficiency.
- Explore and develop technologies to expand knowledge of terrain and predator foraging patterns and movements using LiDAR, satellite and radio collars, FLIR surveys, etc.
- Explore and develop new baiting systems including food, scents and sounds.
- Develop methods to deploy owl capture nets up to 80 ft.
- Explore the use of various technologies to remotely monitor traps and game cameras.
- Test the utility of detection dog and handler teams for target sample collection.
- Develop GIS models that aim to predict areas of high predator abundance or movement routes.