HAWAII AUDUBON SOCIETY

‘ELEPAIO

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For the Protection of Hawai‘i’s Native Wildlife

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Predator Trap Efficiencies at Kealia Pond National Wildlife Refuge

By Mike Nishimoto, Biologist, Kealia National Wildlife Refuge

This article first appeared in the spring 2011 Hawaii Wetland Monitor – the Newsletter of the Hawaii Wetland Joint Venture (PCJV)

The U.S. Fish and Wildlife Service Recovery Plan for Endangered Waterbirds (2005) states that predation may be the greatest threat to recovery of Hawaiian coots (*Fulica alai*), Hawaiian common moorhens (*Gallinula chloropus sandvicensis*) and Hawaiian stilts (*Himantopus mexicanus knudseni*). In Hawai‘i, cage traps are used for capturing predators such as mongooses, but in the summer of 2009 biologists from the New Zealand Department of Conservation introduced staff at the Kealia Pond National Wildlife Refuge (NWR) to the DOC 250 lethal trap. In New Zealand, the traps are used to control ferrets (*Mustela furo*). Published trap efficiency studies examine canines and small mammals, but none compare the effectiveness between cage traps and lethal traps for mongooses.

In order to find out how well the DOC 250 worked on Indian mongooses (*Herpestes auropunctatus*), this study compared the effectiveness of the DOC 250 against the cage traps used at Kealia Pond NWR. The study area of Kealia Pond NWR is located on the south coast of the isthmus that separates east and west Maui, Hawai‘i. The portion of the pond inland from North Kihei Road consists of ~640 acres. Within this area is 209 acres of open water. The former Kealia Fish Farm (Kanuimanu ponds), where most of the trapping occurred, is 20 acres.

METHODS

The DOC 250 trap (15.5” x 12.5” x 11.0”) was paired with either a Tomahawk model 606 transfer live trap (26” x 9” x 9”), Tomahawk model 107double door live trap (32” x 9” x 9”) or a Tru-catch model 30ltd live trap (30” x 11” x 9. The live (cage) trap selection was random. Trap pairs were not more than three feet apart (Figure 1). We set twelve pairs of traps at Kanuimanu ponds from mid-June to mid-July and through August and September of 2009. At the access road to Kanuimanu ponds, five pairs of traps were set during August through November 2009. These experimental trap pairs were part of a larger refuge predator control program.

Figure 1. Paried cage and DOC 250 traps.

All traps were baited with dry cat food placed in canning jars with small mesh screens instead of lids. Normally baits are replaced weekly, but not longer than every two weeks. Traps were usually checked daily and at least every second day.

Because the trap mechanism of the DOC 250 was enclosed in a box, we conducted another experiment for the box effect. To run this test, a cage trap was placed in a wooden box that had openings at the front and back (box trap) and placed side by side with a DOC 250 and a cage trap (Figure 2). Five stations with triple traps were set from mid-January to mid-May 2010.

Figure 2. Three trap set.

RESULTS

In the first experiment, both the DOC 250 and cage traps caught mongooses for the first month of trapping at Kanuimanu ponds (Figure 3). However, from late July mongooses were only caught in the DOC 250s. Overall the DOC 250s caught 78% of the mongooses trapped at Kanuimanu ponds. The trapping rate was 0.010 mongoose/trap day. The cage trap catch rate was 0.003 mongoose/trap day. The DOC 250s were also the only successful traps along the access road. There was 0.015 mongoose/trap day with the DOC 250 and no mongoose with cage traps.

When we used box traps in 2010 in the second experiment, they were the most successful traps catching 58.3% of the mongooses (Figure 3). The DOC 250s caught 33.3% and had a trapping rate of 0.007 mongoose/trap day. Box traps caught 0.012 mongoose/trap day and cage traps had a catch rate of 0.002 mongoose/trap day.

DISCUSSION

Although DOC 250s trapped more mongooses than cage traps at Kanuimanu ponds in the paired trap test, box traps caught more mongooses than the DOC 250 or cage traps in the three-trap experiment. Results from this study suggest that cage traps consistently had the lowest catch rate. By making side by side comparisons, we eliminated the bias of trapping strategy (trap density, perimeter trapping, grid trapping). The triple trap test had a small sample size so although the box trap results were promising, they require further testing.

Few boxes were built due to time constraints. Besides being labor intensive to construct, box traps are unwieldy so they would be difficult to deploy off the road/dike system. There are commercially available trap covers that may be an alternative to building wood boxes. Besides their apparent high catch rate, box traps have the advantage of keeping baits dry and providing shade to trapped animals. The DOC 250s also would keep baits dry. By adjusting the entry hole and baffle screen, capture of non-target species can be avoided. However, the trap is not easy to set due to its strong spring. A setter tool should be used. The trigger mechanism periodically requires adjusting by bending the trigger arm with large channel lock pliers or vise grip.

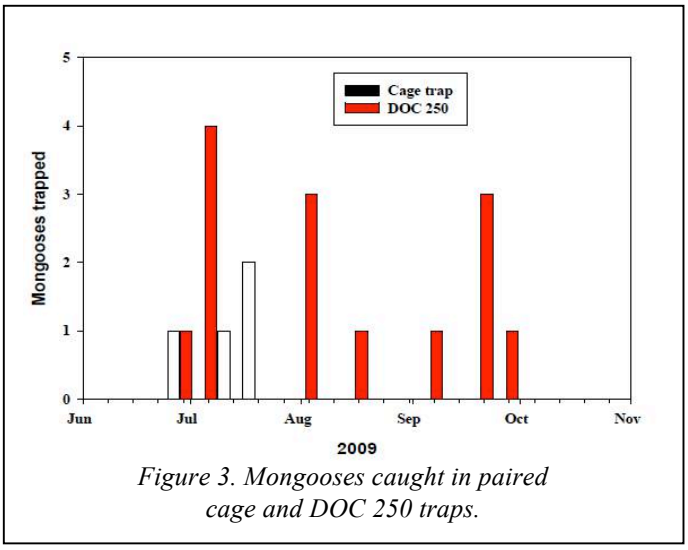

Figure 3. Mongooses caught in paired cage and DOC 250 traps.

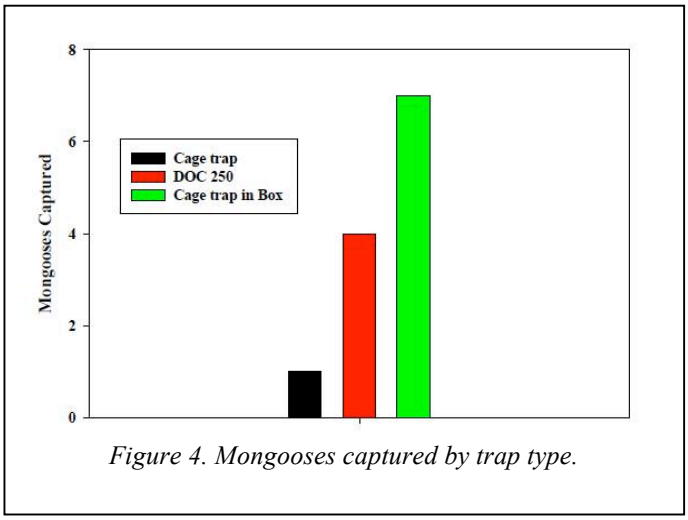

Figure 4. Mongooses captured by trap type.

REFERENCES AND ADDITIONAL READING:

Dizney, Laurie, Philip D. Jones and Luis A. Ruedas. 2008. Efficacy of three types of live traps used for surveying small mammals in the Pacific Northwest. Northwestern Naturalist 89:171-180.

Lee, Ling-Ling. 1997. Effectiveness of live traps and snap traps in trapping small mammal in Kinmen. Acta Zoologica Taiwanica 8(2): 79-85.

Pendleton, Grey W. and Robert P. Davison. 1982. Relative efficiency of three small-mammal traps in prairie wetlands. The Prairie Naturalist 14(1):9-12.

Shivik, John A., Daniel J. Martin, Michael J. Pipas, John Turnan and Thomas J. DeLiberto. 2005. Initial comparison: jaws, cables and cage-traps to capture coyotes. Wildlife Society Bulletin 33(4):1375-1383.

Special thanks to Darren Peters and Lindsay Wilson of the New Zealand Department of Conservation for demonstrating the DOC 250 trap as well as offering suggestions on predator trapping strategies.

Headwater Spring For Paikō Lagoon Sanctuary Protected

Kānewai Spring in Kuli'ou'ou purchased for community stewardship

By Chris Cramer, President of the Maunalua Fishpond Heritage Center

After a lengthy community effort, Kānewai Spring, the headwater source for Paikō Lagoon Wildlife Sanctuary is now permanently protected. The spring is one of the last functioning springs in East Honolulu. The announcement made by the City and County of Honolulu, State of Hawai'i, The Trust for Public Land and Maunalua Fishpond Heritage Center, ends the threat of development and secures the spring's future for conservation and education. The spring purchase by the Maunalua Fishpond Heritage Center for $2.3 million dollars was made possible through the generous cooperation of the former corporate landowner Rikuo USA.

Fresh Water for Spawning Migrations

Kānewai Spring is a survivor from the tapestry of spring-fed fishponds that once sustained many people on O'ahu. Every season, the '*anae-holo* or travelling mullet would exit in massive schools from their ancient birthing grounds at Pu'uloa, (Pearl Harbor). The multitudes of fish would travel towards Maunalua in East O'ahu to spawn at the freshwater springs. It was at these noted places where Hawaiians constructed fishponds. "The water would literally turn black with fish" says Sandra Park, a descendant of the Lukela family who managed the konohiki fishery in Maunalua Bay.

The crystal-clear spring of Kānewai has always fed the nursery pond at Paikō Lagoon Wildlife Sanctuary. Before the sanctuary existed, mullet were scooped as babies in the Lagoon and raised in Kuapā, Hawaii's largest fishpond. The waters were replenished yearly by migratory 'anae (adult mullet) drawn to the fresh water.

Attraction For North American Birds

These freshwater resources held an equal attraction for waterbirds journeying thousands of miles from Canada and Alaska. "The ducks use to come, plenty ducks. Come every winter time. Wild ducks, big ducks, the kind that comes from Canada. They fly all around the world" reminisced kupuna Samuel Mai'i of Palolo about the ducks he used to hunt. In a 1987 interview with Maria Kaina, he described their arrival. "There used to be lots of ducks. So many the sky would almost change color. When they flew in they would be so skinny". Former Maunalua resident Mickey Waddoups

Kanewai Spring, Hidden Spring Source for Paikō Lagoon Wildlife Sanctuary. Photo by of Maunalua Fishpond Heritage Center.

still remembers the beautifully colored ducks. "We had wigeons, pintails and teals from the different North American flyways. This was back in the early 1960's".

Rare Visit by Cackling Goose to Kanewai Spring. Photo by Maunalua Fishpond Heritage Center.

By 1969, the skies of Maunalua went silent. Gone were the honking Canada Geese and visiting waterfowl. The mullet in the ocean followed suit. They reversed their ancient course to go to Waianae according to longtime fisherman Leo Ohai. The V formations of waterbirds were replaced by giant dredges inside the 523-acre Kuapā Fishpond. As the new suburb of Hawaii Kai arose, counts for endangered ae'o (Hawaiian stilts) dropped from 68 in 1959, to 0 in 1969. The final census notation for Kuapā on Dec. 28, 1969 read simply, "*Bid Good Bye Pau*".

Protection For Our Remaining Water Resources

This was not the end of the road for nearby Kānewai Spring and the water dependent resources in Paikō Lagoon. Soon afterwards the community defeated a planned highway over coral reef from Paikō Lagoon to downtown Honolulu. Following that victory, the community blocked a plan to convert the estuary of Paikō Lagoon into a luxury yacht harbor. Today things look brighter as education and stewardship efforts take hold. Kānewai Spring remains a hidden window into our past where native o'opu and rare hapawai (limpets) still thrive. Green limu ele'ele grows on stones turned gold by mineral-rich groundwater. It has taken decades for the life-giving headwaters for Paikō Lagoon to be protected. The reappearance of a North American Cackling Goose this year at Kānewai Spring is a positive sign of good things to come. Kānewai Spring has survived and adapted to the surrounding urbanization and is now protected in perpetuity.

The Best Trail Camera's for Observing and Protecting Hawai'i's Wildlife

By Sally Writes

Just how can we help protect and monitor Hawaii's stunning and all too often under threat wildlife? There's many options and one of these is using trail cameras to observe wildlife and people interacting with it. Designed for hunters on the mainland, these cameras are great for capturing images of anything passing by or on timers, and some can send back video footage. There's a lot of cameras out there, so it's worth investigating the best available now:

1. Browning Strike Force Sub-Micro 10MP Game Camera
2. Moultrie A-20 Mini Game Camera
3. Stealth Cam G42 No-Glo Game Camera STC-G42NG
4. Stealth Cam P18 7 Megapixal Compact Scouting Camera with Batteries and SD Card
5. Bushnell Trophy Cam HD Essential E2 12MP Game Camera
6. Bushnell 14MP Trophy Cam HD Aggressor Low Glow Game Camera
7. TEC.BEAN 12MP 1080P HD Game & Trail Hunting Camera
8. Crenvoa Game and Trail Hunting Camera 12MP 1080P HD
9. Bushnell 14MP Trophy Cam HD Aggressor
10. Bestguarder HD Waterproof IP66 Infrared Night Vision Game & Trail Hunting Scouting Ghost Camera

Of course this is just a list and not a detailed breakdown of pros and cons, functions and so on. To get that, take a quick look at this article on the 10 best trail cameras of 2017 at the following link: http://www.10hunt.com/best-trail-cameras/

Marine Debris Kills Wildlife – The Hawai‘i Audubon Society

By Linda Paul (HAS President)

Marine debris has been identified as a global area of concern for coastal habitats and is known to accumulate in large quantities in the North Pacific Ocean. The location of the Hawaiian Islands in relation to the North Pacific subtropical gyre exposes Hawaii's coastlines to high debris loads. As a result, Hawaii receives 2-3 times the amount of debris accumulation of other regions along the U.S. Pacific coast. In the Papahanaumokuakea Marine National Monument marine debris largely consists of discarded or lost fishing nets from distant fleets and plastic trash, which threatens and damages coral reef and habitats and entangles and chokes marine life. It also aids in the transport of alien species that may arrive on debris from around the world. The introduction of alien species to the Northwestern Hawaiian Islands has led to the establishment of invasive species that crowd out native species, altering habitat and food webs.

The Monument provides nesting habitat and extensive foraging habitat for over 14 million seabirds including the Laysan albatross, the black-footed albatross, the great frigatebird, the sooty tern, the grey-backed tern, the brown noddy, the Bonin petrel, Bulwers petrel, the red-footed booby, the masked booby and the Christmas shearwater. The Monument also includes portions of the migratory paths and feeding grounds for five species of marine turtles, including the critically endangered Hawksbill and Leatherback turtles, and the endangered Olive Ridley and Loggerhead turtles. All of these species are known to consume marine debris. Seabirds feed it to their chicks who cannot regurgitate it and die. Seabirds, turtles and Monk seals become entangled in it and die.

In 2013 the Hawaii Audubon Society co-sponsored the Pacific Rim Marine Debris Conference, which featured not only scientists tracking marine debris and organizations cleaning up debris, but representatives from industries that use marine debris for energy and new products from the many materials found in debris. It urged conference participants to consolidate tracking and reporting data, coordinate collection efforts and response plans, and develop a rapid response plan for future catastrophic events such as the 2011 Japanese tsunami, which sent large volumes of marine debris into the North Pacific ocean. The Pacific Whale Foundation beach cleanup program, one of many in Hawaii, was initiated in 2015 and, since then citizen scientists have removed over 15,300 debris items from Maui's coastline.

The threat of marine debris has been ignored for too long -- its seriousness has only recently been recognized by governments and managers around the world. It is now clear that the environmental effects of plastics have been underestimated, and that the abundance of marine life and the size of our oceans cannot prevent this potential hazard from seriously damaging eco-systems and wildlife.

HAS Seeking Nominations for 2017 Board of Directors

The 2017 HAS Board elections Nominating Committee is seeking Society members who are willing to serve on the Board of Directors for an initial one year term. Several seats will become vacant and open for nomination. Candidates must meet the following criteria:

1) HAS member for at least five continuous years prior to the date of the election; **2)** Hawai‘i resident; **3)** Attended at least one Board meeting and one field trip; **4)** Give written consent to be nominated and stand for election to a seat on the Board.

All members of the Board are expected to attend five two-hour meetings per year and a weekend Leaders' Retreat in January. If you are a Society member and interested in becoming a candidate, please submit a letter of interest and brief resume of your background and activities to the attention of the Nominating Committee at the Hawai‘i Audubon Society's address by **October 15th, 2017**.

UH Scientists Researching Pueo in Citizen Science Project

By Frederika Bain

This article first appeared in spring 2017 on the University of Hawai'i News website

Two scientists in the department of Natural Resources and Environmental Management at the University of Hawai'i at Mānoa have launched a new citizen science initiative, the Pueo Project. With the help of interested members of the community, post-doctoral researcher Javier Cotin and assistant professor Melissa Price are investigating the population size, distribution and habitat use of the pueo, also known as the Hawaiian short-eared owl (*Asio flammeus sandwichensis*), on O'ahu. Cotin and Price are both in the College of Tropical Agriculture and Human Resources (CTAHR). The project was formed with support from the State of Hawai'i Division of Forestry and Wildlife.

Pueo Owl. Photo by © Nigel/Wikimedia Commons (CC 2.0).

An endangered native bird

Pueo are found on all the main Hawaiian Islands from sea level to 8,000 feet in a variety of habitats, including wet and dry forests, but are most common in open habitas such as grasslands, marshlands, shrublands and montane parklands, including urban areas. Unlike most owls, they are active during the day, especially in the early morning and evening, as well as night, and they are commonly seen hovering or soaring over open areas.

Even though the pueo's ability to live in lowland, non-native and rangeland habitats suggests that they may be less vulnerable to extinction than other native birds, they are state-listed as endangered on O'ahu and are likely susceptible to many of the same factors that threaten other native Hawaiian birds, including loss and degradation of habitat, predation by introduced mammals and disease. They are also at risk of car collisions, owing to their hunting behavior, and something called "sick owl syndrome," which is killing off owls on Kaua'i. Little is known about the syndrome, but it may be related to pesticide poisoning or food shortages. Become involved: Citizen scientists can help

Pueo. Photo by © Nigel/Wikimedia Commons (CC 2.0).

The Pueo Project aims to add to the scanty knowledge about this native bird. Interested members of the public can access the project's website, which provides information about the project and the species, a pueo distribution map, sound files of the pueo's various calls, and a gallery of pictures of pueo and the more common introduced barn owl, with which it can be confused.

Citizen scientists can report sightings through a web app or downloadable form, participate in organized surveys, and use photography to document behaviors, including when and where the pueo breed and the animals they prey on, and more. The website also offers contact information for the two researchers.

"It's wonderful to work on a project where the community is so interested and supportive of conservation efforts," said Price. "The behavior of this owl is truly fascinating! I hope to unravel the mysteries of the seldom-seen pueo and look forward to collaborating with the local community to protect this unique species," said Cotin.

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Thank you for your concern and commitment to protecting Hawaii's native wildlife and ecosystems.

Rapid ‘Ōhi‘a Death

has the potential to kill ‘ōhi‘a trees statewide

Clean your Gear * Wash your Vehicle * Don't Transport ‘Ōhi‘a

BIRDERS and HIKERS: Clean your shoes, and clothing. Decontaminate shoes by dipping the soles in 10% bleach or 70% rubbing alcohol to kill the ROD fungus. Other gear can be sprayed with the same proven cleaning solutions. Wash clothing in hot water and detergent.

ROD Fact Sheet
http://go.hawaii.edu/J1

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Upcoming Events, Field-Outings, & Volunteer Opportunities

For full descriptions of our Events, Field Trips and Volunteer Opportunities, go to our website: http://www.hawaiiaudubon.org

EVENTS

The Pueo Project: Insights into the life and distribution of the Hawaiian Short-eared Owl

Where: KCC STEM Center, Kokio Bulding, Room 202, Kapi'olani Community College, 4303 Diamondhead Road, Honolulu, 96816
When: October 12, 2017 4:00pm
Description: Dr. Javier Cotin will be presenting the Pueo project, which investigates the population size, distribution, and habitat use of the Hawaiian Short-eared Owl (Asio flammeus sandwichensis) on O'ahu. The project is supervised by Dr. Melissa Price (UH) and Afsheen Siddiqi (DOFAW). Dr. Cotin will present the results of the citizen science project, the ongoing Pueo surveys, will give insights into the Pueo biology and it's interesting behavior, and will let you know how you can help towards the conservation of this incredible species. This event is co-sponsored by the Hawaii Audubon Society and Hawaii Conservation Alliance. This event is OPEN TO THE PUBLIC.

FIELD-OUTINGS

Service Trip at Mount Ka‘ala

When: August 26, 2017 7:30am – 4:00pm, at Mount Ka‘ala
Leader: Wendy Kuntz (HAS Board Member)
Description: Work with Natural Area Reserve (NAR) staff to remove non-native species on the top of Waianae mountain range Mount Ka‘ala is home to many of Hawai‘i’s rare and endemic species. Work can be strenuous.
RSVP: *Space is limited. RSVP to Wendy Kuntz (wkuntz@hawaii.edu) for reservations and instructions.*

Welcome Home to Shorebirds: Paikō Lagoon Wildlife Sanctuary

When: September 16th, 2017 6:30am - approximately 8:00am, East Honolulu,
Leader: Alice Roberts (HAS Board Member)
Description: Enjoy fall at Paikō! Let’s welcome our unique and beautiful migratory shorebirds as they return from their extensive travel to enjoy the Hawaiian Islands for the fall and winter months.
RSVP: *Please RSVP to Alice with your name and phone number at 808-864-8122.*

Hike at Haleakala National Park: The Nature Conservancy at Hawai‘i's Waikamoi Preserve, MAUI

When: September 29th, 8am - approximately 1:00pm-3:00pm
Where: The Nature Conservancy of Hawai‘i's Waikamoi Preserve, Maui
Description: Hike meets at Hosmer Grove in Haleakala National Park. We will then hike along a 4WD road to a trail that eventually leads to a boardwalk in the native forest. This hike gives one the chance to see native forest and native birds (Hawaii Amakihi, Apapane, Maui Alauahio, Iiwi, Kiwikiu, and Akohekohe). Kiwikiu and Akohekohe are rare and endangered, so we do not guarantee seeing them. The hike starts at about 6800 ft in elevation and descends to about 6300 ft. We then go back up the way we came. It can be steep and muddy. Be prepared for 4-5 miles of hiking. Your guide will be one of the biologists from the Maui Forest Bird Recovery Project. Expect the hike to be done between 1pm-3pm.
What to Bring: Please refer to HAS website www.hawaiiaudubon.org/get-ouside
RSVP: *Please RSVP to Hawai‘i Audubon Society at hiaudsoc@pixi.com, subject line MAUI - Nature Conservancy Field-Trip. Space is limited; please RSVP ASAP to reserve your spot.*

UPCOMING FIELD-OUTINGS

We have some other exciting field-outings coming up. Please check the HAS website on how to RSVP and for more information www.hawaiiaudubon.org/get-outside:

- Hawai‘i Audubon Society Volunteer Day with Oahu Army Natural Resources Program (OANRP) on October 6, 2017; 8am-5pm
- Nature Hike to Kahuku Point & Wetland at Turtle Bay on December 30th, 2017; meet outside the Helipad at 8:45pm

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For a presentation on the Pueo project, which investigates the population size, distribution, and habitat use of the Hawaiian Short-eared Owl (Asio flammeus sandwichensis) on O'ahu. This event will be lead by Dr. Javier Cotin is open to the public.

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WHERE: KCC STEM Center, Kokio Bulding, Room 202, Kapi'olani Community College, 4303 Diamond-head Road, Honolulu, 96816