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Bodyboards as artificial nesting islands for Hawaiian Coot at the County of Maui Kaunakakai Wastewater Reclamation Facility, Molokaʻi, Hawaiʻi

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The endangered Hawaiian Coot (*Fulica alai*) typically nests on mats of floating vegetation. At the County of Maui Kaunakakai Wastewater Reclamation Facility, Molokaʻi, Hawaiʻi, where sites to construct nests are at a premium due to pond maintenance, bodyboards are used as a substitute. The use of bodyboards as nesting islands is attributed to Guy Joao, the facility's operator since 1989. Joao explains that a few coots would occasionally visit the facility and attempt to build nests on the flexible floating pump hose in the ponds, however, the nest material would blow off as it couldn't be secured and the birds would leave. He searched the Internet for information on the species and discovered its preference for floating nests. In 1996, while at the local landfill, Joao spotted a dilapidated Boogie Board™ and surmised it would work well as a nesting island for the birds. He tied a rope to the board and an anchor of welded rebar, attached grass roots to the top of the board, and placed it in the pond adjacent to the maintenance building. The board was immediately requisitioned by a pair of Hawaiian Coots and it wasn't long before the facility hatched its first chicks. Since then, the conservation of Hawaiian Coots has been incorporated into the facility's operations management plan.

Site location

The County of Maui Kaunakakai Wastewater Reclamation Facility is situated on approximately five acres of a 23-acre oceanfront property (Tax Map Key 2-5-3-05:002) adjacent to the Kaunakakai Stream estuary on the western boundary of the town of Kaunakakai on the island of Molokaʻi. The facility was constructed in 1973 in a wetland which was used from 1901 (Anonymous 1901) to the late-1950s (USGS 1916. Wright, Harvey & Wright 1924. Anonymous 1941. USGS 1950. USGS 1964.) as a saltworks, and then became an unofficial rubbish dump site (Anonymous 1977, Souza pers. comm.). A four-acre settling pond was initially constructed and in 1986, it was divided into two ponds by the construction of a rock rubble berm (Barrett Consulting Group 1996). The facility is designed to reclaim 300,000 gallons of water per day, and currently treats 240,000 gallons per day to R-2 (secondary) quality (Souza pers. comm.).

Island construction and installation

After the initial nesting success at the facility, maintenance staff Collette Kalawe would purchase bodyboards at garage sales, and experiment with transforming these into islands of various shapes and sizes. In 2004, Wade Nakayama inherited island construction: a few have screened openings to the water below for growing makaloa (*Cyperus laevigatus*), while others receive a 'starter kit' with twigs and other nesting material attached with stainless steel fishing lead. Seashore grass (*Paspalum sp.*) is periodically grown on bodyboards in the nursery before placement in the ponds. The grass eventually covers the board, becoming a visually pleasing island.

The bodyboard islands have evolved through trial and error, with anchoring being the biggest issue. If the fastener for the bodyboard strap is missing, a hole is punched and threaded with a 5/8" poly rope, which is tied to a brick or cast iron pipe to serve as an anchor. The rope is slightly longer in length than the depth of the water (about two feet). This keeps the bodyboard in place yet allows for slight fluctuation in water levels following heavy rains or for pond maintenance.

Half the open water at the facility is in a tradewind breezeway, so boards in this area must be anchored at both ends. These receive a 4" PVC pipe 'keel' (open at both ends) attached with stainless steel wire to the underside of the boards to prevent flipping on gusty days. Few turnover losses have occurred, although eggs in two nests have been smashed, and several chicks have been killed when blown into the territories of other adult pairs. Still, the gain for the species far exceeds these minor losses.

Bodyboard islands only last about two years after which excessive amounts of nesting material cause the boards to sink. The settling ponds are drained alternately and dried every four to six years, and the sunken bodyboards and sludge is scraped from the pond bottom and trucked to the landfill, then refilled. As wading into a wastewater pond poses a risk to human health, Nakayama trailers his small boat to the facility and launches it in the pond to install new islands. Typically five or six boards per pond are anchored at about 30 feet from one another to allow

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for a safe route between nesting territories to the berm which is used as a loafing and roosting area by young or unpaired coots.

Population explosion

The Hawaiian Coot is mobile and will quickly populate new wetlands. However, from September 1973 to January 1996, only 77 Hawaiian Coots were recorded at the facility during the Hawai'i Division of Forestry and Wildlife's biannual statewide waterbird surveys (HIFAG 1973-1977. DOFAW 1978-1996), with a high count of 21 on 19 January 1994. Within a year after bodyboards were installed the population rapidly increased to an average of 46 birds (DOFAW 1996-1997). By August 2002, it had doubled (DOFAW 2002). On the fall 2003 waterbird count, 172 coots (DOFAW 2003) were observed. In December of that year, a confirmed avian botulism outbreak at the County of Maui 'Ōhi'apilo Pond Bird Sanctuary spread to the facility, killing 188 Hawaiian Coots; only 32 birds survived (Dibben-Young unpubl. data). In January 2004, control of non-native mammalian predators was initiated as mongooses and feral cats were observed depredating birds roosting on the berm or pond edges. A marking/movement study (Dibben-Young, unpubl. data) documented immigration and dispersal of banded coots at the facility, which typically occurs after heavy rainfall. However, fluctuations are minor and since 2004, the population has increased steadily even with occasional dispersal events. In 2009, 22 coots fledged from the eight installed bodyboards (Dibben-Young unpubl. data.). All chicks hatched at the seven nests constructed on pond edges vanished and were believed to have been depredated by Black-crowned Night-Herons (*Nycticorax nycticorax*) that roost at the mangrove forest abutting the facility. The current population averages 100 birds, a direct result of predator control efforts and the use of bodyboards for nesting islands as well as the installation of a predator-free loafing platform for chicks and juveniles.

There have been a few instances when an exceptionally aggressive pair has ousted an established pair from their island. The disputes are vicious but short-lived and no deaths have occurred. After a pair of Hawaiian Coots begins using a bodyboard they generally produce and hatch three to four clutches per year.

The boards also have been used by Hawaiian Stilts (*Himantopus mexicanus knudseni*) for nesting. Chicks hatched on a bodyboard placed a few feet from the pond's edge in shallow water swim to land when a few days old.

Community involvement

Employees of the County of Maui Kaunakakai Wastewater Reclamation Facility observe the comical antics of the Hawaiian Coot and enjoy the other waterbirds that utilize the ponds. John Souza, facility supervisor since 1987, encourages local schools to conduct field trips to the facility so that children can learn about the importance of water conservation and how the recycled water in the settling ponds provides habitat for waterbirds. Once a year colorful fliers are posted around town and a press release is published in the local newspaper for a bodyboard drive to 'help save the endangered Hawaiian Coot'. This results in the donation of a dozen or so intact and broken bodyboards (even half a board can be used by combining the scrap with other pieces). Occasionally boards are received from other islands or the mainland, with the mailing address written in permanent marker below the postage stamps.

The County of Maui staff – Guy Joao, Collette Kalawe, Wade Nakayama, and John Souza – have enhanced habitat for Moloka'i's Hawaiian Coot population and developed a creative method of improving nesting success that can be used at similar sites. Their efforts have not been recognized until now, and what grew out of thoughtful curiosity has the potential to benefit Hawaiian waterbirds across the state. Mahalo nui loa!

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Kaunakakai saltworks 1901, photographer unknown.

Hawaiian Coot and chicks on bodyboard island, photo by Arleone Dibben-Young.

Hawaiian Coot on bodyboard island with eggs, photo by Arleone Dibben-Young.

Bodyboard nesting islands ready for installation, photo by Arleone Dibben-Young.

Citations and References:

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A Pintail Duck Story

By Ann Viets

I parked in front of an old gray warehouse at the Maui County base yard. I'd received a call earlier that morning about a pintail duck found at Kanaha Pond that appeared to be paralyzed. A dirty tan kennel was loaded into the back of my car with "DLNR Live Animal" written on top with a black permanent marker. I peered through the door into the darkness and saw a small chestnut brown duck lying in the corner. He looked weak, cold and scared. There were tears running down his soft cheeks from deep black eyes. I didn't know ducks could cry.

I turned on the heat in my car even though it was 80 degrees outside, hoping to warm up the pintail as I drove home to Kihei. I'd heard that every winter a few Northern Pintails make the long migration from Siberia and the Bering Sea to the Hawaiian Islands—a difficult 3000-mile journey across the open ocean. Once in Hawaii, they enjoy the warm weather and abundant food supply. Males change into their colorful breeding plumage while the females remain a camouflage brown before heading north to the breeding grounds in the spring.

When I arrived home, the duck was limp as I removed him from the kennel and placed him on a heating pad on the kitchen counter. He was covered with mites, the inside of his mouth was pale gray suggesting anemia, and his feathers were dirty and dull. There were no obvious injuries or pellet shot wounds that I could find, but he was sick and declining fast. It was critical that Dr. Roger Kehler, my avian vet, see him immediately.

I was concerned by Dr. Kehler's uneasy expression as he examined the bird.

"He's dying," he said. "Let's administer fluids, run some tests, and try to determine what's wrong. He doesn't appear to have botulism because he can hold up his head, but something is draining the life out of this bird."

Two hours later, after a series of tests, it was determined the pintail had giardia and Echinuria Uncinata, an endoparasitic nematode that feeds off blood - the same parasite that nearly destroyed a population of Laysan ducks on Laysan Island in 1993. He was also suffering from an internal secondary infection, starvation, and anemia. Dr. Kehler recommended ivermectin to destroy the nematode, metronidazole to cure

giardia, enrofloxacin for the secondary infection, and vitamin B-complex to improve his recovery from anemia and starvation. The pintail was stressed and weak from the examination and desperately needed food, warmth and rest. When I got home, I crop-fed him 20 ml of warm Exact, administered his medications and supplements, and left him to rest quietly for the remainder of the afternoon. Later that evening, I crop-fed another 20 ml of warm Exact, and continued crop-feeding every four hours until midnight.

Over the next two weeks, the pintail grew stronger as I continued with his medications and crop-feedings. However, he was still unable to stand or move his wings. Soon he began dabbling at poultry crumbles from his food dish that he dropped into his water bowl. Daily swims in the bathtub were especially fun; I supported his body while he paddled around with his big webby feet. He was definitely making progress.

Dr. Kehler's second set of tests indicated the pintail had recovered from disease and gained weight, yet was still extremely anemic. Anemia possibly explained his weakness and inability to walk or move his wings. Perhaps his bone marrow had been damaged by illness and he was now unable

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to produce red blood cells. This was a very grim prospect because without enough red blood cells, he would die. Only time would tell.

Fortunately, the pintail continued to improve over the next few weeks. He ate entirely on his own, swam unassisted in the tub, and propelled himself along the living room carpet using his wings. Then, after nearly 40 days in rehab, he stood up—a huge accomplishment and a turning point in his recovery. He was going to make it! Brilliant colors and shine returned to his feathers and the inside of his mouth turned a healthy soft pink color.

Every day the pintail improved. Soon he effortlessly walked across the living room floor to the sliding glass door where he could watch the pigeons on the deck eating seeds. The sliding glass door, with a view of the ocean and other birds, became his favorite spot and he spent most of the afternoon there on a towel, a bowl of water and dish of food beside him. When I approached he would lower his head, hissing and honking at the same time. This was an awful noise sure to send enemies and predators away in the opposite direction - he was quickly developing the skills he would need to survive in the wild. Our strange human environment was now becoming increasingly stressful to him as he paced back and forth, staring longingly out the window. It was time to go.

I released the pintail at Kanaha Pond Wildlife Sanctuary on a cool, rainy December afternoon. I placed his carrier on a gentle bank where the water lapped softly against the mud and grass. As I opened the door, he hesitated for a moment and crept cautiously out on his belly to the edge of the water and carefully slipped in. He dipped his head into the water and then arched back, letting silvery beads of pond water roll across his glossy brown feathers. He was at home here flapping and splashing happily in the cool water. I remained for a while, enjoying his freedom along with him. As I turned to go, he stopped splashing and gazed at me with his dark, knowing eyes. I looked back. He cocked his head slightly to the side and swam slowly off across the pond.

I returned to Kanaha Pond every day that week. Sometimes he was there, dabbling around in the mud where he'd been released. Other times he was nowhere to be found. It was a warm, quiet afternoon when I last saw him. He was resting on a soft grass island in the middle of the pond, enjoying the warm sun and friendly companionship of a mallard sitting beside him. If all goes well, I suppose he will make the long journey back to Siberia in the spring.

December 2009

Membership in Hawaii Audubon Society 2010

Regular Member:	$ 25.00	Foreign Membership (Airmail)	
Student Member:	$ 15.00	Mexico	$ 26.00
Supporting Member:	$100.00	Canada	$ 28.00
Family Membership	$40.00	All other countries	$ 33.00

These are annual membership dues, valid January 1 through December 31.
Donations are tax deductible and gratefully accepted.

Name _____

Address _____

City, State, Country, Zip _____ _____

Phone _____ Email _____ _____

Membership $ + Donation $ = Total $

New Membership ☐ Renewal ☐

Please make checks payable to Hawaii Audubon Society and mail to us at 850 Richards St., #505, Honolulu, HI 96813.
PLEASE LET US KNOW IF YOUR ADDRESS CHANGES.

Freeman Seabird Preserve Update

The Shearwaters have returned!

We noticed they returned at our last cleanup. So once again Mahalo Nui Loa to all of the volunteers that made it out there to help us get the property ready for their arrival. We were able to remove the Chinese violet that spreads over the rocks blocking great nesting spots as well as clear out and trim back some of the grape seed and iron wood trees on the property. We cleared out lots of great spots for the birds to nest so hopefully we will be able to see a great turnout and a large number of chicks this year! We also want to thank everyone that donated to Phase 1 since we were able to reach our goal of $15,000 to meet our match grant requirements!! Many, many thanks to all who helped and we look forward to continuing making improvements to FSP in the years to come**!**

Calling all Birders

I have been receiving many calls from visiting birders that would like to meet up with local birders to go out birding for a day while they are visiting. If you are willing to take out visitors please contact Casey at 528-1432 or by email at hiaudsoc@pixi.com. Please let me know what days are best for you as well as what island you are on and the best way to contact you!

Upcoming Earth Day Events where Hawaii Audubon Society can be found:

Kailua Earth day Saturday April 10
from 10am to 2 pm
Honolulu Zoo Earth day Sunday April 18
from 10am to 3 pm

Please come visit us at these events and create your own bird nest. Once dry please place in your yard for a bird to use!! We look forward to meeting members and recruiting new members so bring some friends too !

Your favorite Kolea is busy this time of year donning breeding plumage and putting on weight for a long journey to the summer breeding grounds near the Arctic Circle.

Learn more about where they go and what they do at a lecture on the windward side of Oahu.

Kolea Research: Where Did the Kolea Go?
by Dr. Wally Johnson

Monday, April 26, 2010
from 7:00pm to 8:30pm
Windward Community College 45-720
Keaahala Road Hale `Akoakoa, Room 105

The Sierra Club O`ahu Group, the Hawaii Audubon Society, and Windward Community College are hosting this lecture. There is plenty of parking in the lot next to Hale `Akoakoa.

Dr. Johnson's Kolea research last spring consisted of attaching tiny data loggers (geolocators) to leg bands on Kolea in Punchbowl Cemetery. Each logger records sunrise/sunset times daily from which researchers can calculate latitude and longitude of where the bird has been. Last fall the banded Kolea were recaptured when they returned from the far north, geolocators were removed, data were downloaded to a computer and analyzed. This is the first geolocator study on transpacific Kolea migration and your opportunity to learn the results of the research.

Hawaii Audubon Society Program Title:

"Midway Atoll: How do you count a million albatrosses? One, two, three…"

Date: April 19, 2010

Time: 6:30 pm to 8:00 pm

Location: University of Hawaii, Manoa
St.John Hall room 011

Presenter's Biography:
Marine science writer Susan Scott earned a bachelor's degree in biology from the University of Hawaii in 1985, and a certificate in marine journalism from the university's Marine Option Program. She has been writing a weekly column, "Ocean Watch," for the Honolulu Star-Bulletin since 1987. Besides her weekly newspaper column, Susan has authored and co-authored six books about nature in Hawaii. Periodically, Susan works as a volunteer biologist for the U.S. Fish and Wildlife Service. In January 2010, she volunteered for the second time to help count more than a million albatrosses on Midway Atoll.

Talk summary:
Susan will describe her experiences with the flora and fauna on Midway including techniques for counting over a million albatrosses.

Upcoming Fieldtrip

Saturday April 17th at 9am
"Farewell to Shorebirds"
Low tide walk at Paiko Lagoon
To sign up please call Alice Roberts at 864-8122

Saturday May 15th 9am
BYUH Museum of Natural History
Please sign up with Casey at 528-1432 or by email hiaudsoc@pixi.com

Elepaio Submissions

We are currently accepting submissions for the Elepaio. Please send in your scientific articles, short stories, poems, and photos. Email submissions to hiaudsoc@pixi.com

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Calendar of Events

April 10th
Kailua Earth Day

April 17th
Paiko lagoon field trip

April 18th
Earth Day at the Honolulu Zoo

April 19th
Program lecture at UH Manoa
"Midway Atoll: How do you count a million albatrosses? One, Two, Three...." By Susan Scott

April 26th
Program lecture at Windward Community College
Kolea Research: Where Did the Kolea Go?
By Dr. Wally Johnson

May 15th
Fieldtrip to BYUH
Museum of Natural Science

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