



VOL. 2 ISSUE 1 · MARCH 2024

KEĀLIA POND NATIONAL WILDLIFE REFUGE (NWR)

Winter & Spring 2024 Edition

M. Woodward/USFWS Image of the pink water at Keālia Coastal boardwalk.

Why was the Water Pink?

Keālia Pond received an unexpected call on October 30th, a call that brought a bright splash of color and a whole lot of commotion; the outlet channel, Palalau, underneath the bridge along the Coastal Boardwalk had mysteriously turned bubblegum pink.

The U.S. Fish and Wildlife Service (USFWS) staff at Keālia Pond immediately took action and partnered with the University of Hawai'i (UH). Parties were determined to discover the cause of the color.

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M. Woodward/USFWS Image of the Refuge manager, Bret Wolfe.

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B. Wolfe/USFWS Image of the pink water.

Why was the Water Pink?

Samples of the water were sent to multiple partnerships, and according to preliminary analyses from UH Mānoa and George Washington University, more than “50% of the microbes in the water samples belonged to bacterial genus *Thiohalocapsa*,” which belongs to a larger group known as purple sulfur bacteria, (PSB).

PSB commonly inhabit anoxic wetlands and other habitats that are depleted of dissolved oxygen (DO), where hydrogen sulfide accumulates. PSB typically engages in anoxygenic photosynthesis, meaning it utilizes light energy to carry out metabolic processes without producing oxygen. This is in contrast to eukaryotic organisms (such as animals, plants, fungi) that rely on oxygenic photosynthesis.

PSB are pigmented with bacteriochlorophylls and carotenoids, which creates the color. PSB are not all purple, it can also be purple, red, orange, and brown.

The public questions if PSB is a health risk to humans, wildlife, or the environment. In actuality, PSB is crucial in nutrient cycling in the environment, particularly in the sulfur cycle. PSB can help reduce environmentally harmful compounds and odor emissions that can build up in anoxic water (Froján et al. 2021).

Over the course of Veterans Day weekend, more than 11,000 visitors arrived to see the natural phenomenon located at the Coastal Boardwalk---the first in Keālia Pond’s history.

By late January, the wet season was in full swing. Rainfall brought fresh water into the outlet, diluting the pink color.

Is purple sulfur bacteria a health risk to humans, wildlife, or the environment?



V. Nedomansky / USFWS Image of the pink water.

Waterbird Count & Rainfall

Frequent guests to Keālia Pond will notice that the diversity and abundance of native and migratory birds varies greatly throughout the year.

In the fall and winter months, during their non-breeding season, waterbirds, shorebirds, and ducks migrate from Alaska and make landfall in Hawai'i.

The numbers of resident waterbirds found at the refuge changes seasonally, mainly due to the water levels, which have been severely impacted by a prolonged drought.

From September through November the refuge's monthly bird count observed virtually no 'Alae Ke'oke'o (Hawaiian Coot) present. By December, 40 had returned to the refuge once water level began to rise again. The number of Ae'o (Hawaiian Stilt) increased from 80 to 350 in the same period. Staff are not sure where the birds go, but they likely seek other active wetlands where food is plentiful and may even travel between islands. The table on the right shows the stark difference between summer and winter counts of our resident waterbirds and migratory shorebirds and ducks.

Keālia Pond has reached depths not seen in at least 5 years with recent rainfall. In fact, the Keālia Pond weather station recorded more rain in the month of January than in the previous 12 months combined. This is great news for our birds and the health of the pond.

Species	2023		
	July	November	December
Alae' ke'oke'o	73	1	40
Ae'o	612	80	350
Auku'u	77	4	2
Wandering tattler	2	2	8
Ruddy turnstone	16	39	88
Sanderling	0	22	50
Kolea	0	67	80
Migratory ducks	0	0	60

Figure I. Monthly bird counts at Keālia Pond.

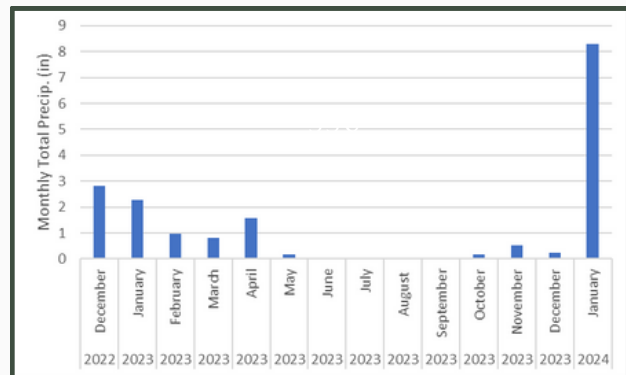


Figure. II. Monthly rainfall totals at the Keālia Pond weather station since December 2022.



Main Pond on November 17 (left) and January 27 (right). Photos via Chronolog.com.



M. Poppick/USFWS Image of artificial nest.

Nesting Season 'Alae Ke'oke'o (Hawaiian Coot)

Nesting Season Has Begun!

The Hawaiian Coot, otherwise known as the 'Alae Ke'oke'o, breeds year-round, mainly from February to September, relying on higher water levels for successful nesting. They typically construct floating nests on open water using aquatic vegetation, such as Kahulā and Hilo Grass, or anchored platforms attached to emergent vegetation, such as buoyant stems. Preferring low salinity and deeper waters, the Hawaiian Coot favors freshwater and brackish wetlands during the rainy season.

Keālia means salt-crusting due to its natural geological composition. Rock and soil deposits and underground water in this region have higher salt content. Salinity in the pond ranges from 7 to 75 ppt (parts per thousand).

During low water levels, especially from August to December, salinity is higher in concentration. This decreases Hawaiian Coot presence. However, with increased rainfall, such as observed in January 2024 (Figure II.), the pond receives fresher water that derives from Waikapū Stream from the West Maui Mountains. Consequently, there are better breeding conditions and population growth.

The endangered status of Hawaiian Coots requires habitat restoration and water level monitoring. Staff have focused on building artificial floating nests to help increase successful nesting numbers. Nests are assembled using PVC (polyvinyl chloride) pipes and mesh nets. Once built, staff wade into the water and install the artificial nest into the ground, then covering the top with vegetation.

In 2023, there was only a total of four successful Hawaiian Coot fledglings. Staff are hopeful that these recent efforts will be proven with with an increase in nest success.



M. Poppick/USFWS Image of artificial nest.

Featured Species Sighting: Long-Tailed Duck

A Rare Bird?

Our current guest of honor is a Long-tailed Duck; a diving-duck that can dive to an impressive 200 feet, deeper than any other duck! This duck arrived to Keālia Pond in December 2023 by traveling approximately 2,500 miles out of its normal range. It is categorized as a “short-to-medium” distance migratory bird and will typically stay in the Arctic region. Therefore, its appearance is rare, making it a vagrant.

Overview

The Long-tailed ducks are the only ducks that use their wings to dive when foraging for food. This ability allows them to dive up to 60 seconds! They spend 3 to 4 times as long underwater as on the surface. They are the most vocal of sea ducks, their call emitting an “Ow Ow Owoolett” sound. Since

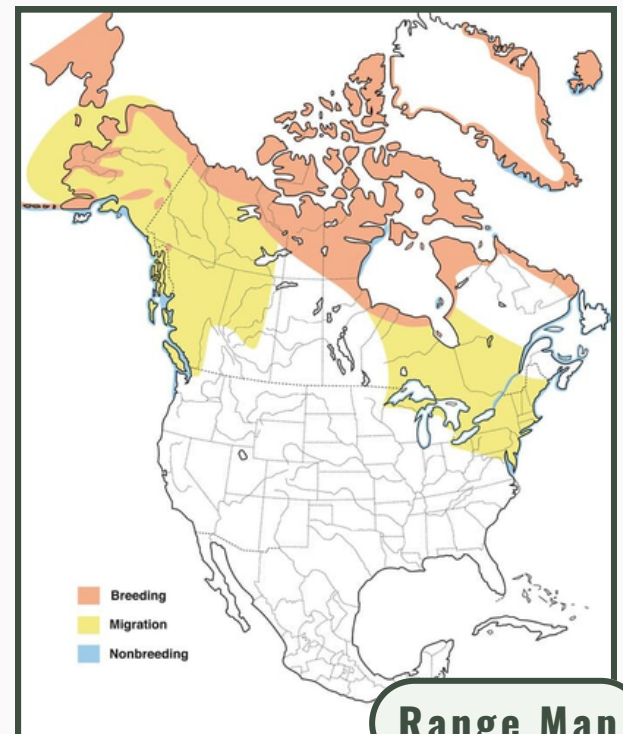


M. Woodward/USFWS Image of the Long-Tailed Duck.

this duck inhabits offshore, they are poorly monitored. Its North America population is roughly one million, though is on the decline due to oil spills, bycatching, and wetland drainage, causing its status to become vulnerable.

Description	Adult males have slender tail feathers. Females and immature males do not have a long tail. Both are black, brown, gray, and white.
Habitat	<u>Non-breeding Season</u> : They winter offshore on the ocean, along coastlines, freshwater and saltwater wetlands, and even the Great Lakes. <u>Breeding Season</u> : By late May/June, they return to their breeding grounds on the Arctic Tundra (Siberia, Alaska, Northern Canada, Europe).
Diet	Carnivores: Invertebrates and small fish.
Nesting	Nests in small, tight clusters on islands in arctic lakes. Typically lays 5-9 eggs.
Migration	“Migration routes are largely unknown, but are presumably coastal.” Travels in flocks of hundreds.

https://seaduckiv.org/wp-content/uploads/2015/01/ltdu_sppfactsheet.pdf



https://www.allaboutbirds.org/guide/Long-tailed_Duck

What is KUPU?

KUPU's mission is to empower young adults to serve their communities through character-building, service-learning, and environmental stewardship opportunities.

Q: Where are you from?

A: I was born in Eureka, California and spent my formative years in the Redwoods of Del Norte county near Jed Smith State Park, which inspired my love of nature.

Q: What is your educational background?

A: I have my Bachelor's degree in Zoology from Cal Poly Humboldt & a CI-certification in the German language from Tübingen University.

Q: What is your job at Kealia Pond?

A: I am a Habitat Restoration Technician primarily tasked with Burn Area Rehabilitation, i.e. removing invasive flora, outplanting native plants, & managing pests.

Q: What sparked your interest in conservation?

A: From taking hunter safety at 11-years-old to hearing from the foresters, loggers, native tribes, & commercial fishermen in my community, I was fortunate enough to learn about the current state of the land from multiple perspectives.

Q: What are your goals by the end of your Kupu term?

A: To have a comprehensive portfolio on how to effectively restore & rehabilitate disrupted habitats.

Q: Long-term goals?

A: To start a family and expand my experience in restoring ecosystems and animal populations to their optimal state.

Vincent Emilio Keenan Jackson



M. Woodward/USFWS Image of Americorps member.

Position:

Habitat Restoration
Technician

Favorite bird:

Pueo
(Hawaiian short-eared
Owl)

Favorite plant:

'ilima

Caden Fulford

Q: Where are you from?

A: I was born and raised in Seattle, Washington but have lived on O‘ahu for the past three years.

Q: What are some of your hobbies?

A: I tend to spend my time outdoors, whether it’s hiking or at the beach. I also enjoy writing music and playing guitar, especially since I’m in a band.

Q: Why did you apply to Kupu?

A: Some of my friends on O‘ahu recommended the program to me, and it seemed like a perfect entry position that would allow me to gain experience and network with others.

Q: What sparked your interest in conservation?

A: As my appreciation for animals has grown, so has my awareness of biodiversity loss, land misuse, and their impacts on ecosystems. This has sparked an interest in the importance of conservation, particularly in Hawai‘i.

Q: What are your goals as a Kupu?

A: One of my short term goals is to gain a deeper understanding of Hawaiian ecology. After Kupu I hope to pursue a career in conservation, whether it is restoration projects or natural resource management.

Q: Who are your inspirations?

A: One of my conservation inspirations include Sam Gon, who has helped bring Hawai‘i conservation into the spotlight. Other inspirations include more Internet personalities such as Joey Santore (crime pays but botany doesn’t) and Kyle Lybarger of Native Habitat project



Position:

Habitat Restoration
Technician

Favorite bird:

‘Alae ke‘oke‘o
(Hawaiian Coot)

Favorite plant:

Hala

KUPU: Conservation
Leadership Development
Program (CLDP)

CLDP Participants serve at
a host site that matches
their interests and
prepares them for a career
in the conservation field.

Rick Woodford



M. Woodward/USFWS Image of USFWS Volunteer.

Rick has dedicated over six years to volunteering at Keālia Pond. Fueled by his love for birding and the opportunity to engage with visitors worldwide, he devotes his time to two shifts a week. Rick also conducts a monthly visitor count, which assists the USFWS in visitor data collection.

Currently, Rick is on the board of Maui Friends of the library (MFOL) and volunteers at the bookstore in Queen Ka'ahumanu Center. In the 80s, Rick and his friends established a recycling group with the purpose of reducing the amount of solid waste that enters our landfills.

Rick has lived on Maui for 50 years, though he is originally from Southern California. Most of his time was spent as a restaurant owner operator.

Volunteer Position:
Visitor Center Docent

Favorite bird:
Mōlī (Albatross)
& the
'Auku'u (Black-crowned
Night Heron)

**Interested in becoming a
volunteer?**
Contact
kealiapondnwr@fws.gov
for more information.



M. Woodward/USFWS Image of Black-Crowned Night Heron.



A. Morris/USFWS Image of field trip.

Ongoing Events on the Refuge

First Saturday at Keālia Pond

The first Saturday of every month, 9:00am - 3:00pm. Free guided tours with staff through the Native Pollinator Garden and Kanuimanu Wildlife Viewing Ponds. The first tour is 9:30am, the second tour is at 1:30pm. All day Keiki (kids) educational crafts and activities!

Field Trips

Schools visits include hands-on learning activities, such as waterbird identification, visitor center scavenger hunts, walks through our Pollinator Garden and Viewing Ponds, removing invasive plants, and much more!

Photo Contest:

Friends of Keālia Pond is hosting their annual photo contest! Take your best shot, whether its of wildlife, a scenic view, or people in action. Winning photos are displayed at the Visitor Center. Deadline March 31st, 11:59pm.



Volunteer: Outplanting Native Hawaiian Dry Land Forest Ecosystem Plants

Help restore native habitat on the refuge. Typical duties consist of outplanting, invasive species removal, and propagating in the greenhouse. Tools are provided. Snacks provided by Friends of Keālia Pond. Every Thursday, 9:00am - 12:00pm.

Volunteer: Native Pollinator Garden

Help enhance the visitor experience in the Native Pollinator Garden. Responsibilities include trimming plants, basic trail maintenance, and weeding. Tools are provided. Snacks provided by Friends of Keālia Pond. Every Friday, 9:00am - 11:00am.



Interested in participating?
Contact our Refuge by
either emailing
KealiaPondNWR@fws.gov
or calling (808) 875-1582
for more information.

M. Woodward/USFWS Image of Volunteers.

