PACIFIC BIRDS
HABITAT JOINT VENTURE

Native Hawaiian Waterbird Birds - Culture, History, and Indigenous Partnership to Recovery

Hoku Cody

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A Report for Pacific Birds Habitat Joint Venture

About Hoku Cody

Hoku Cody is a Native Hawaiian biologist and a lifelong advocate for conservation. She champions community stewardship and traditional rights in Hawai'i's natural and cultural resource management. Her work bridges technology, community, and conservation to create lasting impacts for future generations in Hawai'i. Hoku holds degrees in Digital Graphics & New Media from Providence, RI, and Marine Science from UH-Hilo. She co-founded Nā Kia'i Nihokū, a community-based stewardship and education program in partnership with the USFWS Kīlauea Point National Wildlife Refuge. She also leads the Kiamanu Project, which fosters community engagement in seabird conservation, and collaborates with Resource Mapping Hawai'i, specializing in aerial mapping, remote sensing, and GIS solutions. Additionally, she has worked with the Division of Forestry and Wildlife on outreach efforts to protect and recover the 'Alae'ula.

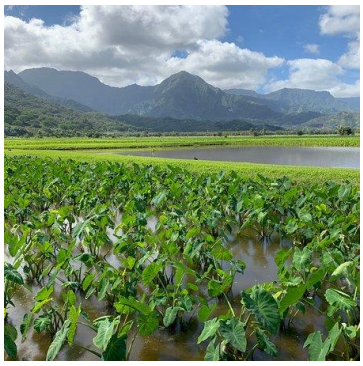
About Pacific Birds Habitat Joint Venture[1]

Migratory Bird Habitat Joint Ventures are cooperative, regional partnerships located in the United States, Canada, and Mexico. Pacific Birds Habitat Joint Venture (Pacific Birds) includes the Hawaiian and other Pacific Islands, Alaska, and the coastal regions of the Pacific Northwestern USA and British Columbia, Canada.

Joint Ventures work through partnerships to improve habitats for birds and people. In Hawai'i, Pacific Birds is focused on advancing the conservation and restoration of wetlands for the benefit of birds, native wildlife, ecosystem services, and people.

[1] *Pacific Birds is primarily funded through the U.S. Fish and Wildlife Service (USFWS) Migratory Bird Program and led by an International Management Board. Pacific Birds has two fiscal sponsors, Ducks Unlimited and Oregon Wildlife Foundation. Pacific Birds operates independently from these two organizations, with a mission to "create the ideal environment for bird habitat conservation." Pacific Birds' work in Hawai'i is guided by the leadership of the board and two key committees; the Pacific Birds U.S. Steering Committee, comprised of U.S.-based board members, and the Hawai'i Wetland Committee, comprised of U.S.- based board members, Pacific Birds staff, and Hawai'i partners.*

Introduction


Managed wetlands on refuges and sanctuaries have been the cornerstone of Hawaiian waterbird recovery from very small global populations (down to less than 50 birds for some species in the 1950s (Griffin et al., 1989)), to the relatively larger populations present today. Without managed wetlands, it is likely that these endemic wetland birds would be much nearer to extinction. However, conventional wetland restoration and management alone is unlikely to result in abundant populations of Hawaiian waterbirds, given the escalating anthropogenic challenges and continued habitat losses occurring (Harmon et al, 2021). A mosaic of interconnected wet habitats, comprising both managed wetlands and indigenous agricultural spaces, supporting both people and wildlife, is needed to provide enough habitat that is managed in perpetuity to support Threatened and Endangered waterbirds in Hawai'i (Engilis and Pratt, 1993, Harmon et. al, 2021, Olson and James, 1982, Raine et. al, 2024).

Lo'i kalo (wetland taro patches) and loko i'a (fishponds) increased the footprint of wet habitats along the Hawaiian coast for waterbirds (Burney et al., 2001; Drexler et al., 2023, Engilis and Pratt, 1993, Harmon et al., 2021, Olson and James, 1982). The reduction of these agricultural areas, compounded with additional wetland losses and introduced threats, has contributed to a precipitous decline in waterbird populations (Griffin et al., 1989). Further, lo'i kalo and loko i'a have great cultural importance in Hawai'i and generate enthusiasm and engagement with the community for wetland agroecological restoration, a critical component needed for long-term management. Lo'i kalo and loko i'a provide multiple benefits for birds and people, including providing additional wet habitat for waterbirds on the landscape, eco-system services such as flood control and water quality improvements, supporting Indigenous values and traditions, engaging local communities in site management and supporting food sovereignty (Watson, T.K., 2013, Winter et al, 2020b, Winter et al., 2023).

This report by Hoku Cody explores how the inclusion of lo'i and loko i'a in waterbird conservation planning is already contributing to, and can contribute even further, to ensuring a durable and sustainable future for these species, while providing sustainable food and ecosystem benefits to local communities.

Hawai‘i’s Waterbirds

‘Alae‘ula, koloa maoli, ‘alae ke‘oke‘o, ae‘o and nēnē. A. Raine and H. Osterlund.

- **Koloa Maoli** or Hawaiian Duck (*Anas wyvilliana*), world population ~673
- **‘Alae‘ula** or Hawaiian Common Gallinule (*Gallinula galeata sandvicensis*), world population ~712
- **‘Alae Ke‘oke‘o** or Hawaiian Coot (*Fulica alai*), world population ~1654
- **Ae‘o** or Hawaiian Stilt *(Himantopus mexicanus knudseni*), world population ~1500;)
  (all Gorreson et al., 2024)
- **Nēnē** (Branta sandvicensis), world population ~ 3864
  (NRAG, 2021).

Kaua‘i is home to much of the Koloa Maoli population (and those under least threat from hybridization with feral Mallards), as well as the majority of Nēnē. Only Kaua‘i and O‘ahu support ‘Alae‘ula, with the bird extirpated from all other islands (van Rees and Reed, 2018b).

Birds and People – We All Need Wetlands

Four endemic waterbirds and the nēnē goose are culturally and ecologically important species in Hawai‘i. Their relatively high-profile presence in refuges, sanctuaries, lo‘i, loko i‘a and semi urban areas means that their persistence can be taken for granted but in fact, they have extremely small global populations and require intensive conservation management. High quality wetland habitat combined with predator control are vital for these species to be maintained and recover and requires consistent, long-term commitments of staff and resources statewide. Fortunately, that investment pays dividends for both wildlife and people, from ground water recharge to reduced impacts to infrastructure from flooding and storm events to improved water quality, recreation opportunities, and much more. Hoku’s report provides context for considering lo‘i and Loko i‘a as part of the conservation solution for Hawai’i’s endangered waterbirds.

Native Hawaiian Waterbird Birds: Culture, History, and the Path to Recovery

Hoku Cody

1. The Historic Footprint of Native Hawaiian Wetland Birds in Loko iʻa and Loʻi

Various authors have commented on the likelihood that native Hawaiian aquaculture and wetland agriculture significantly contributed to the pre-contact abundance of waterbirds throughout the archipelago (Olson and James 1982, 48-49**;** Kirch 1982, 5-6; Engilis and Pratt 1993, 148-149, 153). A handful of studies on waterbirds seem to support that idea. In her seminal work on the ethnoecology of waterbirds on Kauaʻi, Greer (2005, 341) noted an association between healthy loʻi kalo and more robust populations of Aeʻo. ʻAlaeʻula also apparently prefer cultivated loʻi over "wild" habitat (Greer 2005, 281-286), though ʻAlae keʻokeʻo seem to prefer Loko iʻa over loʻi kalo (Ibid., 282-285; Banko 1987a). Greer also found that the presence of farmers in loʻi kalo is only very weakly correlated with reductions in numbers of birds (2005, 341; 354), suggesting that human presence probably has a negligible effect on these birds. In Bankoʻs (1987b, 8) account for the ʻAlaeʻula for Oʻahu he notably mentioned "a substantial population was counted in Haleʻiwa lotus and taro fields… many more than in all other habitats on Oʻahu combined." In this same account, when writing about the island of Maui, Banko also mentions that the apparent last wild habitat of the ʻAlaeʻula on that island was in a loʻi kalo in Keʻanae (1987b, 11). Through these findings we can infer that many native waterbirds do seem to benefit directly from anthropogenic habitat actively cultivated and maintained by humans in Hawaiʻi.

It is, however, unclear exactly to what degree native waterbirds depend on anthropogenic habitat. If some species really do prefer Loko iʻa and loʻi kalo respectively, then they have suffered greatly in the last few centuries as native Hawaiian agriculture and aquaculture have severely declined. When James Cook arrived in 1778, native Hawaiian use of available arable land for wetland agriculture and aquatic resources for fishponds must have been significant. Assessment of known fishponds on Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi counted 370 known fishponds (Wyban 1992, 120). Undoubtedly this number is a gross underestimate of the actual number of fishponds and fish traps that existed at the peak of Hawaiian civilization, many of which would have been small and difficult to detect in the modern era.

The true extent of wetland Kalo cultivation is similarly incalculable. It seems likely that every possible lowland locality available for Kalo cultivation was utilized at some point, which would have transformed most valleys, gulches and irrigable land into suitable wetland habitat for all native Hawaiian wetland bird species. Handy and Handy (1972) note, "wherever it was possible to grow taro, even though it necessitated complex arrangements, Polynesians did so, for taro was the basic - the original - staple of life for these people." The sheer amount of

habitat available for native waterbirds during this period would have been astounding, and waterbird numbers very likely reflected that.

2. The Ethnohistoric Cultural Associations of ʻAlaeʻula

Some native waterbirds have an important role in the legendary history and cultural zeitgeist of native Hawaiian society. ʻAlaeʻula are perhaps the most culturally significant of the endangered wetland birds in Hawaiʻi. Gomes (2024) made an extensive search for legendary literature related to the ʻAlaeʻula. The number of stories and cultural associations described in Gomes' report is probably indicative of a high level of synanthropy between that species and humans. It is likely that there are similar legendary references to Aeʻo, Koloa and ʻAukuʻu in archival Hawaiian language materials, and it is possible that similar patterns of cultural significance may be found in a more thorough survey of those materials.

The report deals with the historically spiritual and religious affiliations of ʻAlaeʻula in native Hawaiian culture, especially in relation to the spiritual, legendary, and preternatural entities called akua, which includes Kapo, Uli, Maui, and Hina. Through these personages, ʻAlaeʻula have an interesting historical association with esoteric knowledge, death, "sorcery," healing, and innovation. Though no real survey of the use of ʻAlaeʻula in native Hawaiian poetry, metaphor, or social-political commentary was made, Gomes did also include some interpretation of the role of ʻAlaeʻula in the Hawaiian cosmological chant, the Kumulipo in his report, because that chant is foundational to the native Hawaiian world view.

3. The Current Cultural Associations of ʻAlaeʻula and Other Native Waterbirds

We know that when ecosystems collapse, so, too, do the knowledge systems associated with them. In Hawaiʻi, the valiant efforts of the ongoing social, political, and cultural movements by Native Hawaiians against the rapid anthropogenic changes in the last 100 years still outpaces all attempts to slow the extinction of critical flora and fauna. All birds - key megafauna for spiritual and subsistence traditions - are critical to the ecological and cultural integrity of the people who call Hawaiʻi their home. Without the presence of feathered wildlife, who are we as islanders? As a people? What is Hawaiʻi without native Hawaiians in mutual exchange with the environment? These are important questions we must ask ourselves in conservation and Hawaiʻi.

In ʻolelo Hawaiʻi, the term to describe the abundance of freshwater is the same word used to describe wealth. This simple link between these two themes displays a significant concept for

Native Hawaiians - that the abundance of water is a sign of wealth. Hāloanakalaukapalili, the taro plant, is identified as the older sibling of kanaka maoli. In this way, wetlands, such as taro patches and fishponds, are fundamental to the sustainability and identity of Native Hawaiians. In the genealogical creation chant the Kumulipo, birds are the first to emerge from the ocean where all life began. This shows birds as a critical link between land, water, and the atmosphere.

In Hawaiian Proverbs, birds are frequently utilized to speak of abundance, such as the plentifulness of feathers representing the multitudes of generations, or elders, often implying the abundance of mana or spiritual power. In cultural expressions, feathers were symbols and conduits of mana, representing the link between ancestors, gods, and messengers to their human counterparts. Their importance was also represented in archetypes of high-ranking dignitaries and spiritual leaders that would adorn themselves in feathered formal regalia such as feather leis, capes, standards, etc., thereby distinguishing rank, order, and role in political and ceremonial spaces. Within traditional Hawaiian stewardship practices, a fundamental understanding amongst the working class was the profound and intimate link between seasonal patterns and bird phenology as a critical component to decision-making towards a well-balanced bioeconomic social structure.

The importance of native waterbirds within the context of modern cultural social and cultural importance is not as easily understood. For the last 100 years, federal protections for Hawai‘i’s native birds disrupted the reciprocal relationship between Native Hawaiians and this feathered wildlife. The kua‘aina, native Hawaiians in rural communities, celebrated for preserving cultural kipuka (sources of cultural resiliency), were not exempt from this disruption. The resulting relationship was mainly shaped to avoid any persecution or consequence under federal law.

4. Wetland Conservation Today

Concerning wetland conservation, water rights regarding restoring fishponds and taro fields are an important issue for Native Hawaiians. Wetland conservation faces an unconventional scenario where there is an opportunity to develop hybrid systems that cultivate mutually beneficial resiliency for native species and the traditional practices that ensure their longevity. In this way, wetland ecosystems can be both vital hotspots of biodiversity and ongoing integral epicenters of native Hawaiian resilience.

Current wetland management standards today lack a resemblance to a cultural framework, value system, or community. And industrial-scale monocrop farming today has little resemblance to a wetland system with a traditional cultural framework. This is an ongoing issue for wetland birds around the world.

In Hawaii, lo‘i kalo spaces that employ industrial-scale mono-crop farming practices aim for high economic profit over cultural techniques, frameworks, and community connection. It is about doing what makes the most profit as opposed to what makes the most sense. In the

current political landscape of conservation, removed of a small subset of local yet private funding, it is unclear where any capital or political support exists to support native Hawaiian cultural knowledge and traditional practices within wetland habitat management and stewardship.

The looming extinction of many of Hawai'i's native birds rests on the success and quality of the many different models of partnerships, public, private, cultural, science, and community coming together and building a new way forward. Advocating at all levels of government for equitable co-management models, and representation of indigenous voices, values, and lifeways. These hybrid systems yield more beneficial results for all parties involved. (Kurashima, 2019)

5. Shaping the Future Through Indigenous Partnership

Some of the viewpoints shared here occurred during conversations held with indigenous experts across the state and could contribute to a road map of a future in wetland conservation inclusive of Native Hawaiians' rights, and traditional ecological and cultural knowledge.

- *Develop and sustain partnerships for hybridized systems*
    - Incorporate cultural protocols into decision-making, logistics, and field operations.
    - Diversify working groups to have representation from stakeholder communities including native Hawaiians.
    - Support management frameworks, working groups, and grassroots organizations with Indigenous and community representation.
    - Utilize culturally grounded facilitation (trained lawyers in culturally grounded mediation techniques) in high-level meetings, working group meetings, as well as planning meetings to ensure equitable hybridization of ideas.
    - Capacity-building with small-scale partnerships/co-operatives/coalitions that work towards educational pathways, workforce increase (internships and bird schools), and collective large-scale wetland stewardship (co-management models, public-private partnerships, small networks of local communities).

- *Policy changes incorporating more co-management models and Native Hawaiian traditional ecological knowledge within management decision-making processes.*
    - Capital support for local leaders and talent to spearhead specific actions within overall wetland bird conservation and associated legislation.
    - Targeted collaboration with local, respected, community members and talent that can advocate for wetland birds at every level – local community, state and federal government.
    - Private sector support for developing Biological Opinions and Habitat Restoration Plans with FWS to alleviate the byzantine administrative federal process.
    - Improved federal hiring practices to recruit more local candidates

- *Support more archival research to improve narratives around conservation and cultural knowledge of native birds*
    - Focus archival research for a broad sweep of terms associated with targeted bird species, relevant locations, mythologies, editorials, observations, etc.
    - Utilize findings to improve narratives for conservation outreach education around cultural messaging.

- *Collaborate with the native Hawaiian community to hold a roundtable discussion about native Hawaiian rights, federal protection, and conservation frameworks*.
    - There has never been a primarily Hawaiian-centered discussion that focuses on these intersections of federal protections, native rights, and environmental stewardship practices of wetlands.
    - The most favorable outcome is to have concrete ideas of what can be done among the participants (both Hawaiian and non-Hawaiian) toward the single goal of hybridized systems of biocultural frameworks for the betterment of wetlands and native birds.

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