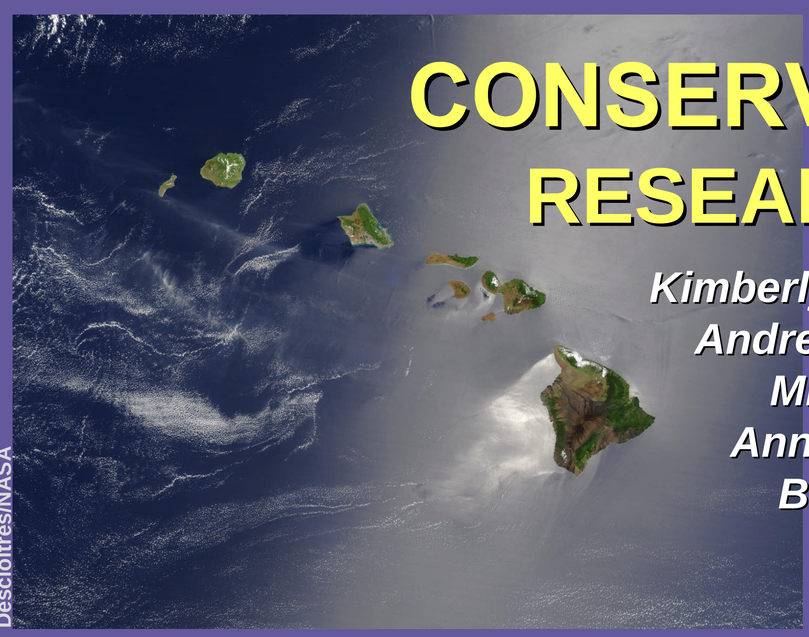
CONSERVATION OF HAWAIIAN DUCK: RESEARCH & MANAGEMENT NEEDS

Kimberly J. Uyehara, Hawai`i Cooperative Studies Unit
Andrew Engilis, Jr., University of California, Davis
Michelle Reynolds, U.S. Geological Survey
Ann P. Marshall, U.S. Fish and Wildlife Service
Bruce D. Dugger, Oregon State University


Descloitres/NASA

Hawai`i is the most isolated island chain on earth (3860 km from CA); 70% of Hawaii's resident native birds are endemic.

Background

Island waterfowl are a globally threatened taxa and lack of information on the basic ecology of many of these nonmigratory species hinders recovery efforts. The Hawaiian Islands once fostered a diverse assemblage of waterfowl. Today, 1 endemic duck, the Hawaiian Duck or Koloa maoli (*Anas wyvilliana*), remains in the main islands. About 2,200 pure Koloa remain on 3 islands, with a predominance of Mallard/Koloa (*A. platyrhynchos*/*A. wyvilliana*) hybrids on other islands. The Koloa is found from sea level to 3,000 m elevation in diverse wetland habitats. It also frequents montane wetlands and skillfully maneuvers winding river corridors, stream plunge pools, and forest canopy where there is little to no human activity. Little is known about the breeding ecology, home range, movements, or population dynamics of this endangered duck. In the absence of this information, conservationists must determine: *How to prioritize recovery actions for this rare and declining duck?* Based on our experience with Koloa and knowledge of successful recovery actions for other rare waterfowl, we identify current management and research needs from recovery plans (such as Mitchell et al. 2005, USFWS 2005) and offer a means to begin tackling the tough issues facing the Koloa today.

Zaun

Koloa are small dabbling ducks related to but genetically distinct from the North American Mallard. Differing in size, plumage, and behavior, Koloa are 20-30% smaller, a deeper, richer brown, and more secretive.

Threats

Hybridization with Feral Mallard

Recent evidence indicates even pure populations of Koloa contain hybrids.

Habitat Loss

Hawai`i has lost >31% of its coastal wetlands, primarily to agricultural, urban, military, and resort development.

Introduced Predators

At least 10 introduced predators, including the small Indian mongoose (*Herpestes auropunctatus*), occur in the Hawaiian Islands.

Lack of Knowledge about Basic Ecology

Koloa is one of the least known of the Hawaiian birds and least studied of the world's waterfowl. Research should be conducted in conjunction with management due to the critical status of Koloa.

Management Needs

Removing feral Mallards is a primary recovery objective for Koloa because Mallards have the potential to undermine all other conservation efforts. Actions needed include:
1. Public outreach program.
2. Humane removal of feral Mallards and hybrids.
3. Ensure Mallards are not imported or produced instate.

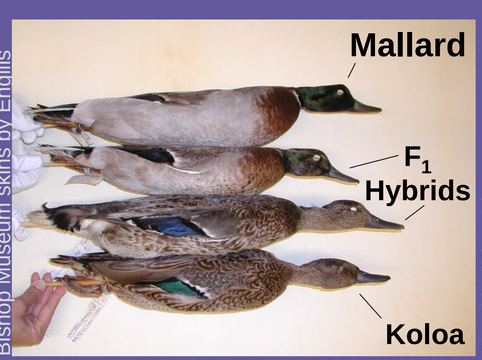
1. Restore and manage protected areas, particularly core wetlands essential to larger populations.
2. Use government incentive programs (e.g., WRP, NAWCA) to increase habitat availability on private lands, particularly habitat that supports completion of the annual life cycle.
3. Use innovative conservation tools (e.g., Programmatic Multi-species Safe Harbor Agreements, experiment with market-based approaches) to build new conservation coalitions.
4. Develop habitat management plans that consider the needs of all endemic Hawaiian waterbirds.

1. Provide predator-free or predator-reduced refugia.
2. Prevent introductions of new predators.
3. Prevent establishment of mongoose populations on the Island of Kaua`i, which supports 91% of the Koloa population.

Research Needs

"The Koloa maoli or true native duck of the islands is a most interesting species, and it is remarkable that it has received scant attention from the resident ornithologists…" (Perkins 1903:458).

Hybridization



Bishop Museum skins by Engilis

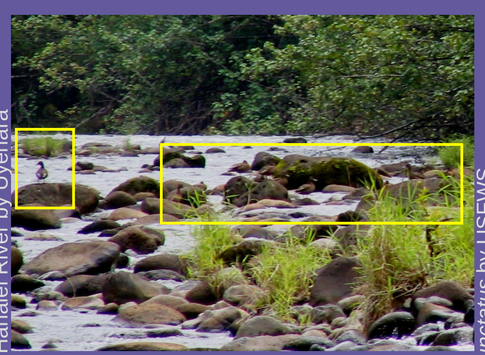
1. Field test recently developed morphological keys to differentiate Koloa from hybrids.
2. Survey public attitudes about Mallard removal.
3. Estimate abundance and distribution of Mallards and hybrids.
4. Estimate home range and extent of inter-island movement of Koloa.

Habitat Needs


Opae`ula Pond by Higashino

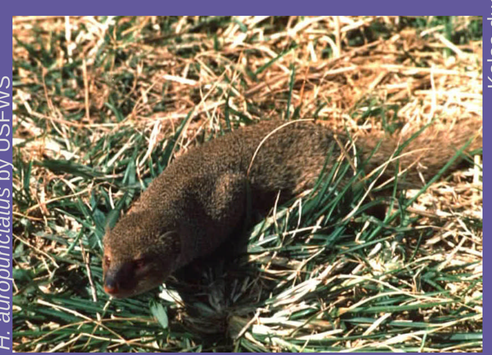
1. Ecology of invasive wetland plants (e.g., *Urochloa mutica*).
2. Develop management guidelines to optimize habitat and minimize maintenance.
3. Increase understanding of tropical, insular wetlands ecology.

Survey & Monitoring


Hanalei River by Uyehara

1. Develop survey methods for riverine habitats.
2. Determine role of streams in the life cycle of Koloa.
3. Describe linkages between lentic and lotic habitats.

Predator Control


H. auropunctatus by USFWS

1. ID primary predators for each life stage of Koloa.
2. Develop cost-effective methods to control small mammals.
3. Measure the response of Koloa to control efforts.

Vital Rates & Basic Ecology

Koloa ducklings by Zaun

1. ID the vital rate most limiting population recovery.
2. Characterize life-cycle specific habitat needs.
3. Reproductive ecology and mating system.
4. Determine daily and seasonal movement patterns.
5. ID types and relative importance of causes of mortality.