

KAHO‘OLAWE

Kaho‘olawe is the smallest of the eight Main Hawaiian Islands. The island was historically inhabited by several hundred Native Hawaiians who farmed and fished for subsistence. Kaho‘olawe also was important as a religious center where the navigators and *kahuna* (priests) responsible for guiding the ocean voyages of early Hawaiians were trained. Consequently, Kaho‘olawe is listed on the National Register for Historical Places, containing 544 archaeological and historical sites with over 2,000 features including some of the largest and oldest *heiau* (Hawaiian shrines) in the State. After the arrival of Europeans, the island was used as a penal colony, for ranching, and for military training, including extensive bombing practice. These activities resulted in severe ecological degradation, and much of the soil (particularly on the eastern side and along the ridge crests) is exposed and lost to strong, easterly winds. Alien-dominated vegetation covers most of the island and includes kiawe forest and buffel grasslands. Remaining native habitats include coastal dry shrubland dominated by ma‘o (*Gossypium tomentosum* [Hawaiian cotton]), ‘ilima (*Sida fallax*), and ‘aki‘aki (*Sporobolus virginicus*), lowland dry grassland, mixed shrub coastal dry cliff, a high salinity anchialine pool, intermittent streams, and ephemeral pools. Nearshore marine resources include substantial coral reefs and intertidal natural communities. Native wildlife species on the island include an endangered moth, seabirds, and monk seals.

OVERVIEW

Geology and Hydrology

Kaho‘olawe is 11,520 hectares (28,800 acres) in total area, 17.6 kilometers (11 miles) long and 11.2 kilometers (seven miles) wide at its broadest point. The island is gently sloped with a diagonal ridge running across it. Steep sea cliffs mark the southern and eastern coastlines while sloping ridges with bays and beaches characterize the northern and western coasts. The highest point of the island is on the northeast end, at 450 meters (1,477 feet). Approximately 39 percent of the island is below 150 meters (500 feet) in elevation. Kaho‘olawe has two offshore islands. There are no perennial streams.

Climate

Located in Maui’s rain shadow, Kaho‘olawe is very dry and arid, receiving no more than 65 centimeters (25 inches) of rain annually with most occurring on the eastern side of the ridge.

Land and Water Use

The Navy had used Kaho‘olawe for several decades of military bombing exercises which ceased in 1990. The following ten year Navy clean-up resulted in approximately ten percent subsurface clearance of the island and 69 percent surface clearance of unexploded ordnance from the island. In 2003, management and ownership of the island was officially transferred from the U.S. Navy to the Kaho‘olawe Island Reserve Commission (KIRC), a State agency administratively attached to DLNR, for management. The entire island is designated Conservation District under the State Land Use Code.

The island of Kaho‘olawe and the waters two miles from the shoreline are designated as the Kaho‘olawe Island Reserve, owned by the State of Hawai‘i. KIRC manages Kaho‘olawe in trust for a future Native Hawaiian sovereign entity. Access to the island is restricted due to

unexploded ordnance, and commercial use is strictly prohibited. The island is managed and maintained in perpetuity for the following purposes: 1) preservation and practice of all rights customarily and traditionally exercised by the Native Hawaiians for cultural, spiritual, and subsistence purposes; 2) preservation and protection of its archaeological, historical, and environmental resources; 3) rehabilitation, revegetation, habitat restoration, and preservation; and 4) education. Overall activities on the island are guided by the following principles: traditional ecological knowledge, ecosystem succession, strategic restoration, keeping practices in line with the island's geography and natural systems, and integrated research and action.

Human Landscape

Although the island has no permanent residents, barracks provide accommodations for about 50 workers who are flown in for conservation and management activities or visitors coming to volunteer for conservation activities or participate in cultural practices.

SPECIES AND HABITATS OF IMPORTANCE

Historically, Kaho'olawe was home to a range of vegetation communities that included dry forest and shrublands, grasslands, coastal vegetation, and possibly a mesic forest. However, due to 200 years of grazing by introduced ungulates, followed by decades of military bombings, the habitat on the island has been reduced to over 80 percent barren or hardpan soil and/or alien-dominated vegetation. In addition to the two islets, the western coastal area is the only area where native vegetation remains. Despite this, Kaho'olawe is still home to 14 rare plants as well as a new species, *Kanaloa kahoolawensis*, in a new genus. Under the island's management plan, five native terrestrial communities have been identified: 'Aki'aki Coastal Dry Grassland, the Hawaiian Mixed Shrub Coastal Dry Cliff, the 'Ilima Coastal Dry Shrubland, the Ma'o Coastal Dry Shrubland, and the Pili Lowland Dry Grassland. Most of the rare plant populations that are known can be found on the southern and eastern seacliffs.

For wildlife in particular, important areas on the island include coastal areas such as Honokanai'a, Kūheia, Lae o Kuikui, Hakioawa, and the uplands. In addition, the USFWS designated 1,701 hectares (4,252 acres) of critical habitat for Blackburn's sphinx moth (*Manduca blackburni*). Vegetation within this area consists of mixed-species, mesic and dry grass and shrubland communities with a high percentage of non-native vegetation interspersed with native vegetation. There are also several wetland areas on the island (e.g., Lua Keāliialalo, Lua Keāliialuna, Lua Makika) that can provide habitat for migratory shorebirds and waterbirds. Kaho'olawe is also home to two islets, Pu'u koae and 'Ale'ale, both of which are significant habitats for nesting seabirds (e.g., 'ua'u [*Pterodroma sandwichensis* or Hawaiian petrel], 'akē'akē [*Oceanodroma castro* or band-rumped storm petrel]) and migratory birds (e.g., kioea [*Numenius tahitiensis* or bristle-thighed curlew]) and contain native shrub coastal dry cliff communities.

Appendix A provides information on the wildlife Species of Greatest Conservation Need present on Kaho'olawe and its associated offshore islands. KIRC has plans to also reintroduce species such as birds, invertebrates, 'ōpe'ape'a (*Lasiurus cinereus semotus* [Hawaiian hoary bat]), and marine reptiles.

SUMMARY OF KEY THREATS TO SPECIES AND HABITATS

Many general threats to native wildlife are discussed in Chapter 4 (Statewide Conservation Needs) and Chapter 5 (Marine Conservation Needs). Threats more acute or specific to Kaho‘olawe are listed below. Because Kaho‘olawe has no perennial streams, there are no identified threats specific to freshwater species on Kaho‘olawe.

- Feral cats (*Felis silvestris*), barn owls (*Tyto alba*), and rodents that prey on ground nesting seabirds;
- Established populations of alien ants, wasps, and parasites that negatively affect native invertebrates;
- Wide-spread non-native vegetation and soil erosion threaten habitat restoration (an estimated 1.9 million tons of soil is lost each year);
- Unexploded ordnance that limit conservation activities;
- Fire that can exacerbate the distribution of alien vegetation and disrupt current native vegetation restoration efforts;
- Marine debris accumulation;
- Sedimentation due to historic grazing and land degradation;
- Lack of compliance with fishing regulations.

ISLAND STRATEGIES

In addition to the statewide strategies identified in association with the seven conservation objectives in Chapter 4 (Statewide Conservation Needs) (main bullet), additional island-specific strategies for Kaho‘olawe include the following (sub-bullet):

- Maintain, protect, manage, and restore native species and habitats in sufficient quantity and quality to allow native species to thrive.
 - Support existing conservation management and implement future needs as identified below in ‘Management Needs’ section;
 - Develop and/or implement recovery plans for threatened and endangered species on Kaho‘olawe;
 - Secure permanent, long-term funding for KIRC;
 - Eradication of mammalian predators, particularly feral cats, and avian predators (e.g., barn owls, cattle egrets) from the island;
 - Enhance existing wetlands (e.g., fencing, restoration, control of alien vegetation);
 - Reintroduce appropriate native species (e.g., waterbirds, Laysan duck, native passerines, native invertebrates, Hawaiian hoary bat, native plants);
 - Implement fire suppression measures and protocols for post-fire restoration;
 - Increase marine debris removal capacity and collaborate with experts on marine debris issues;
 - Suppress fires and implement fire management protocols.
- Combat invasive species through a three-tiered approach combining prevention and interdiction, early detection and rapid response, and ongoing control or eradication.
 - Improve prevention measures and early detection and rapid response capacity for species not yet established in the islands (e.g., brown treesnake, West Nile virus, Argentine fire ant) or present in the MHI but not yet established on Kaho‘olawe;
 - Support efforts to strengthen marine alien species prevention and control.
- Strengthen existing and create new partnerships and cooperative efforts.
 - Support ongoing projects to address Non-Point Source Pollution.

- Expand and strengthen outreach and education to improve understanding of our native wildlife resources among the people of Hawai‘i.
 - Maintain existing outreach and educational programs at managed conservation areas.
- Support policy changes aimed at improving and protecting native species and habitats.
 - Evaluate all current Marine Managed Areas for purpose and management effectiveness and consider need for new Marine Managed Areas;
 - Increase enforcement capacity and education on the value of the Reserve.

PLANS AND TOOLS TO AID MANAGEMENT

Management plans and tools exist to address some of the threats listed in the Summary of Key Threats to Species and Habitats section and include the following:

- Specific management plans developed by KIRC, including the Kaho‘olawe Use Plan (1995), the Kaho‘olawe Ocean Management Plan (1997), the Kaho‘olawe Environmental Restoration Plan (1998), and the Draft Access and Risk Management Plan (2001);
- Species Conservation Plans prepared by the USFWS, including the Regional Seabird Conservation Plan (2005), U.S. Pacific Islands Regional Shorebird Conservation Plan (2004), the Draft Recovery Plan for Blackburn’s sphinx moth (2003);
- Critical habitat designations by the USFWS for the Blackburn’s sphinx moth;
- A summary of research and information on individual offshore islands, prepared by the Offshore Island Restoration Committee, and found at <http://www.botany.hawaii.edu/gradstud/eijzenga/OIRC/>;
- Bishop Museum has a comprehensive database of invertebrates;
- The Audubon Society maintains a Sightings database of bird species observed in the State;
- The Pacific Basin Information Node maintains a database of information on species and habitats in Hawai‘i;
- The Hawai‘i Biodiversity and Mapping Program (formerly the Hawai‘i Natural Heritage Program) maintains a database of rare species and habitats.

MANAGEMENT NEEDS

Current Management of Species and Habitats

The following section addresses the current management actions and future needs of key habitats on Kaho‘olawe. The discussion of future management needs is highlighted within each current managed area. Unlike other islands (except Ni‘ihau), Kaho‘olawe is managed by one entity, the Kaho‘olawe Island Reserve Commission (KIRC).

Kaho‘olawe Island Reserve (28,800 terrestrial acres-entire island), KIRC

Species: Native invertebrates including Blackburn’s sphinx moth and koa butterfly, seabirds, migratory birds.

Habitats: Coastal dry grasslands, dry cliff, dry shrublands, anchialine pool, wetlands.

Current Management: Management plans exist. Erosion control, revegetation and habitat restoration, predator control.

Future Needs: Continue existing management. Adequate funding to implement management plan. Eradication of cats.

Kaho‘olawe Island Reserve (marine waters up to two miles from shoreline), KIRC

Species: Hawaiian monk seals, coral reef organisms, pelagic and bottomfishes, green sea turtles.

Habitats: Marine ecosystems including shallow coral reef, deeper reefs, sandy beach, and rocky habitats.

Current Management: Limited access and take, no commercial activity, monitoring, water quality improvements.

Future needs: Additional monitoring, increased enforcement.

References:

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