LĀNA‘I

Lāna‘i is the third smallest of the Main Hawaiian Islands. Because of the history of overgrazing by cattle, goats, and axis deer, most of the island has suffered from extensive soil erosion and few native-dominant natural communities remain. Though many species once native to Lāna‘i are now gone, the last major remnant of the olopua/lama dryland forest that once covered large portions of the lowlands of Maui Nui (composed of Maui, Lāna‘i, Moloka‘i, and Kaho‘olawe) occurs on Lāna‘i. This forest is habitat to several taxa of native invertebrates. The upland area surrounding the island’s highest point, Lāna‘ihale, contains most of the remaining native-dominated mesic forest and is habitat for the ‘ua‘u (*Pterodroma sandwichensis* [Hawaiian petrel]), ‘apapane (*Himatione sanguinea*), and rare land snails. Waterbird species rely primarily on man-made reservoirs (e.g., the Lāna‘i Sewage Treatment Plant), rather than natural wetlands.

OVERVIEW

Geology and Hydrology

Lāna‘i was formed from a single dome-shaped shield volcano that last erupted over one million years ago. Only 29 kilometers (18 miles) long and 21 kilometers (13 miles) wide, the island is approximately 36,520 hectares (90,500 acres). The highest point is Lāna‘ihale, at 1,027 meters (3,370 feet). The northeastern coast is fringed with broad sandy beaches, while the southwestern coast is marked by sea cliffs. Approximately 25 percent of the island is below 150 meters (500 feet) in elevation; only 6 percent of the island is above 610 meters (2,000 feet) in elevation. Lāna‘i has five offshore islets. There are no perennial streams or lakes.

Climate

Located in the rain shadow of Maui, Lāna‘i is generally dry, with an average rainfall of 75 to 100 centimeters (30 to 40 inches) over Lāna‘ihale and less than 25 centimeters (ten inches) on the southwestern (leeward) side of the island. A large portion of the water in the island’s aquifer comes from “fog drip,” moisture pulled from clouds by trees and ferns in upper elevations. Strong tradewinds funneled from Maui and Moloka‘i increase evaporation of moisture and contribute to soil erosion, particularly on the western side of the island.

Land and Water Use

Approximately 42 percent (15,457 hectares or 38,197 acres) of the island is in the Conservation District, located primarily around Lāna‘ihale and on the western end of the island. This area partly overlaps the Lāna‘i Cooperative Game Management Area. Most of the remaining acreage is in the Agricultural District (52%), with about four percent in the Urban District (concentrated around Lāna‘i City, Mānele Bay and the airport) and two percent in the Rural District (located primarily along remote coastlines). Nearly the entire island (98%) is privately owned by Castle and Cooke, Inc. Four of the five offshore islands are in the State Seabird Sanctuary. Approximately 12,140 hectares (30,000 acres) are leased by State Division of Forestry and Wildlife (DOFAW) for use as the Lāna‘i Cooperative Game Management Area.

Human Landscape

In 2000, the residential population of the island was estimated at 3,193 persons. A majority of the population is centered in Lānai City. In the early 1990s, with the closure of a large pineapple plantation and opening of two resorts at Kō‘ele and Mānele Bay, the island’s economic base

shifted from agriculture to tourism and resort-residential development. The number of annual visitors grew from 46,052 in 1990 to a high of 106,036 in 1997.

SPECIES AND HABITATS OF IMPORTANCE

Habitats on Lānaʻi are primarily lowland dry communities and coastal communities. While few areas of native-dominant vegetation remain, there are opportunities for habitat restoration through a combination of fencing to exclude ungulates (hooved animals), outplanting of native species, and invasive plant control.

Appendix A provides information on the wildlife Species of Greatest Conservation Need present on Lānaʻi and its associated offshore islands. Species endemic to Lānaʻi include several species of Lānaʻi tree snail (*Partulina* spp.). Although once abundant, these species are currently near extinction due to loss of habitat, recreational collecting, and predation by non-native carnivorous snails. Waterbirds and migratory shorebirds use remnant wetlands, and the ʻuaʻu (*Pterodroma sandwichensis* [Hawaiian petrel]) is believed to nest on the sea cliffs. Historically, Lānaʻi was home to eight species of forest birds. Although several are now extinct, the possibility exists for re-introduction of ʻiʻiwi (*Vestiaria coccinea*), ʻamakihi (*Hemignathus virens*), and ʻōʻū (*Psittirostra psittacea*). The U.S. Fish and Wildlife Service (USFWS) has designated critical habitat for two plants: *Tetramolopium remyi* and *Bidens micrantha kalealaha*.

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 Lānaʻi are listed below. Because Lānaʻi has no perennial streams, there are no identified threats specific to freshwater species on Lānaʻi.

- Habitat degradation caused by feral ungulates, specifically axis deer (*Axis axis*), sheep (*Ovis aries*), and goats (*Capra hircus*), which contributes to erosion and sedimentation of near-shore reefs;
- Introduction of invasive species via the ferry from Maui;
- Degradation of habitat by introduced plant species, with kāhili ginger (*Hedychium gardnerianum*), strawberry guava (*Psidium cattleianum*), fountain grass (*Pennisetum setaceum*), and molasses grass (*Melinis minutiflora*) among the most important;
- Threat of fire, exacerbated by non-native grasses;
- Predation of nesting ʻuaʻu (Hawaiian petrel) by feral cats (*Felis silvestris*), dogs (*Canis familiaris*), barn-owls (*Tyto alba*), cattle egrets (*Bubulcus ibis*), and rodents (e.g., *Rattus* spp.);
- Predation of endemic tree snails by alien carnivorous snails (e.g., *Euglandina rosea*);
- Localized excessive recreational use (e.g., Mānele Bay);
- Human and boat interactions with marine mammals.

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 Lānaʻi 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 Lānaʻi;
    - Increase active management in, or acquisition of, extremely rare habitats on Lānaʻi;
    - Increase the total acreage of ungulate-free and predator-free areas;
    - Assess potential reintroduction of native birds historically found on Lānaʻi;
    - Institute landscape-level predator management (primarily rodent and feral cat) around suspected ʻuaʻu (Hawaiian petrel) nesting colonies;
    - Evaluate methods to maintain old plantation roads as firebreaks;
    - Support restoration efforts on the island, particularly of native habitats and areas adjacent to watershed;
    - Erosion control and restoration/reforestation of northeast portion of island to minimize sedimentation and runoff into coastal area and ocean;
    - Develop management plans for all Marine Managed Areas.
- Combat invasive species through a three-tiered approach combining prevention and interdiction, early detection and rapid response, and ongoing control or eradication.
    - Improve 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 Lānaʻi; explore the feasibility of inspection of persons and materials arriving via the ferry from Maui;
    - Inventory existing terrestrial and aquatic invasive species and prioritize control actions.
- Develop and implement programs to obtain, manage, and disseminate information needed to guide conservation management and recovery programs.
    - Improve dissemination of research and data regarding native species populations and habitat condition;
    - Conduct surveys and inventories for invertebrates in currently managed areas;
    - Conduct forest bird survey to update information on populations.
- Strengthen existing and create new partnerships and cooperative efforts.
    - Support efforts to develop community-based management;
    - Support projects to deal with Non-Point Source Pollution;
    - Collaborate with NOAA to ensure the protection of marine mammal populations.
- Expand and strengthen outreach and education to improve understanding of our native wildlife resources among the people of Hawaiʻi.
    - Explore opportunities for community-based wildlife surveys and monitoring;
    - Maintain existing outreach and educational programs at managed conservation areas;
    - Improve conservation education of visitors and the tourism industry on the appropriate use of natural areas, particularly sensitive habitats and 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;
    - Review other species and habitat for inclusion in Hawaiian Islands Humpback Whale National Marine Sanctuary, increase research, education, and enforcement.

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:

- Long-range management plan for Natural Area Partnership Preserve: Kānepuʻu Preserve (2004);
- 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 Revised Recovery Plan for Hawaiian Forest Birds (2003), and the Draft Revised Recovery Plan for Hawaiian waterbirds (1999);
- 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/;
- The Interim State Strategic Plan for Invasive Species Prevention, Control, Research, and Public Outreach;
- Coastal Zone Management plans, including Hawaiʻi Implementation Plan for Polluted Runoff Control (2000), Hawaiʻi Unified Watershed Assessment (1998);
- Hawaii's Local Action Strategy to Address Land-based Pollution Threats to Coral Reefs (2004);
- 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 Hawaiʻi;
- The Hawaiʻi Biodiversity and Mapping Program (formerly the Hawaiʻi 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 Lānaʻi. The discussion of future management needs is highlighted within each current managed area. In comparison to other islands, Lānaʻi has few areas managed for the long-term conservation of native wildlife. There are no National Parks or Wildlife Refuges, State Forest Reserves, Natural Area Reserves, or Wildlife Sanctuaries, and no on-island Invasive Species Committee.

Kānepuʻu Preserve (590 acres), TNC and ʻIke ʻĀina

Species: ʻApapane, pueo, kōlea (Pacific golden plover).
Habitats: Lowland dry communities, particularly olopua/lama dryland forest.
Current Management: Management plan exists. Maintenance of fencing; deer control, invasive plant control, outplanting of native plants as part of Natural Area Partnership Program.
Future Needs: Maintenance of existing fencing, weed control, community involvement.

Lānaʻi Watershed Partnership **(20,000 acres), Public-Private Partnership (Castle & Cooke, DOFAW, USFWS, NRCS, TNC, County of Maui Department of Water Supply, Bishop Museum)**

Species: ʻApapane, ʻuaʻu (Hawaiian petrel), tree snails.
Habitats: Lowland mesic communities, lowland dry communities.
Current Management: Management strategy exists but no formalized plan. Fencing of 1,450 hectare (3,600 acres) at Lānaʻihale summit, ungulate (primarily deer) removal, native outplanting and reforestation.
Future Needs: Funding to complete fencing and ungulate removal, reforestation.

State Seabird Sanctuary **(4 offshore islets), DOFAW**

Species: Nesting seabirds, primarily noio (black noddy), koaʻe ʻula (red-tailed tropicbird).
Habitats: Coastal community.
Current Management: No management plan exists. Surveys and monitoring of seabird populations.
Future Needs: Continue surveys, predator control.

Hawaiian Islands Humpback Whale National Marine Sanctuary **(about 900,000 acres), Co-Managed by NOAA and DLNR.**

***Species*:** Humpback whale.
Habitats: Marine ecosystems.
***Current Management*:** Management Plan exists. Humpback whale 100 yard (91 meter) approach rule and other regulations protecting humpback whales and their habitat, increased fines for violating provisions of the Endangered Species Act, lead agency for the MHI component of the Structure of Populations, Levels of Abundance and Status of Humpbacks (SPLASH) project to determine population size, volunteer whale counts and other community events, and other educational activities, research support, and enforcement.
***Future needs*:** Review other marine species, including seabirds, and habitats for inclusion in Sanctuary and increase research, education, and enforcement actions.

Mānele-Hulopoʻe Marine Life Conservation District (MLCD), **DAR**

***Species*:** Species associated with shallow coral reef, sandy beach, and rocky habitats, Hawaiian monk seals, green sea turtles, spinner dolphins, and other marine mammals.
Habitats: Marine ecosystems, including shallow coral reef, sandy beach, and rocky habitats.
***Current Management*:** Allow fishing throughout MLCD and fish monitoring.
Future Needs: Evaluate all MLCDs for purpose and management effectiveness and consider need for new Marine Managed Areas.

Mānele Harbor Fishery Management Area (FMA), **DAR**

***Species*:** Some or all regulated fish species.
Habitats: Marine and estuary ecosystems.
***Current Management*:** Limited take, gear, size, season, and/or area restrictions.

Future Needs: Evaluate all FMAs for purpose and management effectiveness and consider need for new Marine Managed Areas.

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