3.10 BIOLOGICAL RESOURCES

The isolated nature and volcanic origin of the Hawaiian Islands has resulted in a truly unique diversity of habitats and species. Hawai'i's habitats range from alpine deserts to tropical rainforests, to coastal dunes and coral reef systems, to active volcanoes. Over ninety percent of the native (naturally found) species of plants and wildlife are endemic, that is, found only in the Hawaiian Islands. These unique organisms are adapted to Hawai'i's natural habitats and conditions and to sharing habitat with other native species—those that evolved on the islands but that may also be found elsewhere. These species arrived on the islands by wind, waves, and flight.

- The islands' 100 endemic land birds evolved from as few as 20 original colonizers;
- A thousand kinds of flowering plants evolved from 272 successful colonizers;
- Over 1,000 mollusks evolved from at least 22 ancestors; and
- About 10,000 insect and spider species evolved from 350 to 400 ancestors (GORP 2003).

Mammals, amphibians, reptiles, and freshwater fish were less successful in their colonization of the islands' suitable habitats. Only the monk seal and the hoary bat succeeded for the mammals. Of the millions of attempts at colonization by organisms, few made it to Hawai'i, and fewer survived. Of these surviving colonizers, many gave up their natural defenses because of little threat from predators.

Nonnative species were brought to the Hawaiian Islands by the earliest Polynesian settlers or were introduced after contact with the western world, often as intended or incidental cargo on boats and aircraft, on clothing, and by people themselves. Hawaiian ecosystems are threatened by the introduction of nonnative species, particularly by those classified as "invasive", i.e., nonnative species that compete with and often replace native species and native communities. Increased human presence and activity over the last two centuries, in the form of commercial, residential, and military development, and the agricultural transformation of land, has contributed to the spread of nonnative species and to the loss of native species and habitats. The islands of O'ahu and Hawai'i have lost a great deal of native natural diversity, leaving many of the endemic and native species in peril.

3.10.1 Introduction/Region of Influence

This section describes biological resources in the SBCT project areas and surrounding areas. Biological resources include plant and animal species and the habitats or communities in which they occur. Discussion of resources occurring in the SBCT ROI includes general wildlife, vegetation, and habitat types, as well as sensitive wildlife, vegetation, and habitats. The SBCT ROI for biological resources is composed of the direct area where SBCT actions are proposed, and surrounding areas that would likely be affected by these actions (Figures 3-12 and 3-13). The ROIs are based on the extent of fire, erosion, and boat and helicopter activity. All other impacts, including construction and training related impacts, would occur.

Figure 3-12
Terrestrial Biological Resources Region of Influence Overview

Figure 3-13
Aquatic Biological Resources Region of Influence

Natural resources in the project area were evaluated in accordance with the applicable provisions of numerous statutes, executive orders, permits, and regulations, which are presented in Appendix N. Throughout the document, species listed in the biological resource sections are identified as federally listed, if protected by the ESA, and state listed, if considered threatened or endangered species by the state of Hawai'i.

3.10.2 Resource Overview

Information on biological resources within the ROI was collected from numerous sources, including the USFWS, DLNR, Hawai'i Biological Survey (HBS), Hawai'i Natural Heritage Program (HINHP), and various biological surveys and environmental documents. The ROI is largely made up of disturbed areas, with minimal natural communities. The vast majority of the species that inhabit these areas are nonnative, having been introduced in the Hawaiian Islands both intentionally and incidentally. Many of the native species have been wiped out or have decreased substantially due to habitat modification and problems associated with exotic and invasive species. For this reason Hawai'i contains a greater number of federally listed endangered and threatened species per square mile than anywhere else in the U.S. Hawai'i has 317 listed species, including 44 animals and 273 plants. Federal and state special status and rare species have been analyzed to determine the likelihood of their occurrence in the ROI. Those special status and rare species that have been recorded in the ROI or that have the potential to occur, based on documented accounts and/or the presence of suitable habitat, are listed in Appendix I-3.

The Hawaiian Islands are among the most remote groups of islands in the world. The oceanic waters around the main seven-island chain support a variety of marine biological resources, including both marine wildlife (such as marine mammals and sea turtles) and coral reefs. Whales, dolphins, seals, and sea turtles can be found in the Pacific waters of the Hawaiian Islands. Seals and sea turtles may occur on the shores of some of the islands.

Coral reef stands occur throughout the island chain, many of which are in decline from overuse (over-fishing, anchor damage, diver damage/human recreation activities, etc.); decline in water quality (sedimentation, pollution, nutrient loading, coastal construction, urbanization); catastrophic natural events (storm wave impact, lava flows); global warming (bleaching); introduced species; and disease outbreaks.

The Hawaiian environment and the species that have inhabited it have played an important part in Hawaiian culture. Polynesian settlers used the endemic plants and animals in their religious and social lives; for instance, they carved canoes and surfboards out of wood from the native koa *(Acacia koa)* trees and used o'hia *(Metrosiderous polymorpha)* trunks for building simple temples. Feathers of native birds moho and 'oo'oo *(Moho* sp. and *Drepanis* sp.*)* were used for cloaks that adorned only the highest status individuals. (Additional cultural resource information is provided in Section 3.11). Many of these practices gradually were discontinued after western influences became widespread and native landscapes were changed by development and farming. Though the earliest of these introduced plants were essential to the islander's livelihood, providing food, shelter, and clothing, continued introductions of plants and animals have devastated the fragile communities and habitats of the Hawaiian Islands.

Army stewardship of the land is an essential part of its mission (USARHAW and 25th ID[L] 2001a). Army use of lands for training has reduced native natural habitats and the species on them. The Army recognizes its effects on the land and consistently strives to protect and manage these resources. This has led to innovative strategies for conservation and sustainable management of their land holdings. Such management is absolutely necessary in Hawai'i to preserve the integrity of the natural surroundings while maintaining a high standard of military excellence. The INRMPs (INRMPs for 2002-2006) outline current and proposed management plans and specific actions for natural resources stewardship of Army lands. They use up-to-date scientific information, past achievements, and adaptive management when developing the programs outlined within.

As outlined in the INRMPs, Army resource management includes endangered species management, biodiversity and ecosystem integrity, watershed management, pest management, wildland fire management, recreation, education, and outreach. The number and type of funded programs varies by sub-installation and USARHAW priority.

One important component of Army resource management is the ITAM program. ITAM management in Hawai'i is focused on training lands and is the formal strategy that the Army uses on all installations to achieve sustainable use of these lands. The ITAM program incorporates the land condition trend analysis (LCTA), land rehabilitation and maintenance (LRAM), training requirements integration (TRI), and sustainable range awareness (SRA) components. ITAM incorporation began in Hawai'i in 1989 in PTA and has increased ever since. The number of ITAM projects varies by sub-installation and USARHAW priority. The sub-installations outlined in this EIS include SBMR, WAAF, KLOA, KTA, DMR, and PTA. A more detailed discussion of ITAM can be found in Section 2.1.5.

Sensitive Species

Sensitive species include special status, or regulated, species such as USFWS or state of Hawai'i listed endangered, threatened, candidate species, or proposed species, Marine Mammal Protection Act species, federal and state species of special concern, and locally regulated species. Also considered sensitive species are rare species that have had rapid population decline or whose habitat has markedly decreased in recent years. The location of sensitive species in the SBCT ROI is based on the HINHP database (HINHP 2002), USARHAW INRMPs (USARHAW and 25th ID[L] 2001a, USARHAW and 25th ID[L] 2001b) and yearly natural resources surveys (PCSU 1999, 2000, 2001, 2002).

Recovery Plans

Recovery plans are documents prepared by the USFWS that detail the specific management practices and tasks needed to recover special status species, as required by the ESA. They offer guidelines for private, federal, and state cooperation in conserving threatened and endangered species and areas on which they are presently or historically distributed. Under current law, recovery plans are to be developed for endangered and threatened species, unless the plan would not promote the conservation of the species. Approximately 57 plant and animal species with recovery plans occur in the SBCT ROI. They are identified in Appendix I-2.

A recovery plan must include the following components:

- A description of site-specific management actions necessary to achieve the plan's goal;
- Objective measurable criteria that, when met, would result in a determination that the species no longer needs the protection of the ESA and can be removed from the lists; and
- Estimates of the time and costs required to carry out the plan and to achieve intermediate steps toward the goal.

Critical Habitat

Areas of habitat considered essential to the conservation of a listed endangered or threatened species may be designated as critical and are protected under the ESA. These areas may require special management considerations or protection. Although critical habitat may be designated on private or government land, activities on these lands are not restricted, unless there is federal involvement in the activities or direct harm to listed wildlife. Federal agencies are required to conduct Section 7 consultation if a proposed action could affect designated critical habitat, even if the effects are expected to be beneficial. The Army, as a federal agency, is prohibited from adversely modifying critical habitat. The Army has entered Section 7 consultations for proposed SBCT actions on Oʻahu and the island of Hawaiʻi. Reasonable and prudent measures, as determined by the USFWS, will be incorporated into the Proposed Action.

The USFWS has proposed plant critical habitat for 99 species of plants on Oʻahu and 47 plants on the island of Hawaiʻi. The proposed habitat covers 111,364 acres (45,068 hectares) and is mostly in remote rugged locations of no real development value (USFWS 2002a). Six percent of the land is controlled by the Department of Defense and includes land on Army, Navy, National Guard, and USFWS properties. More than ninety percent of the land is already restricted for development because it is part of the State Conservation District. There are 32,113 acres of proposed plant critical habitat within the Oʻahu ROI and 53,701 acres within the PTA ROI on the island of Hawaiʻi. There are two bird species, the Oʻahu ʻelepaio and the palila, that have federally designated critical habitat within the SBCT ROI. There are 1,147 acres of ʻelepaio critical habitat within the SBCT ROI, all of which occurs on Oʻahu, and 1,850 acres of palila critical habitat in the ROI, occurring exclusively on the island of Hawaiʻi. Federally designated and proposed critical habitat that overlaps with the SBCT ROI is shown in Figure 3-14 for Oʻahu, and in Figure 3-15 for the island of Hawaiʻi. A total of 91,660 acres of federally designated and proposed critical habitat for plants and wildlife occur within the ROI.

3.10.3 Biologically Significant Areas

Biologically Significant Areas (BSA) are areas containing varying levels of sensitive plants established as a formal rating system by TNC. The abundance and diversity of sensitive plants within an area is used to classify sensitivity. BSA 1 areas contain a high density of federally listed endangered, proposed endangered, or candidate species. BSA 2 areas contain

Figure 3-14
Overview of Federally Designated and Proposed Critical Habitat on O'ahu

Figure 3-15
Overview of Federally Designated and Proposed Critical Habitat on Island of Hawai'i

lower densities of known federally listed endangered, proposed endangered, or candidate taxa, or contain candidate taxa or other species of concern that are expected to be upgraded to federally protected status within the next few years. BSA 3 areas contain stands of intact, relatively common native vegetation types with few or no known occurrences of rare elements.

Important habitat for sensitive snail species also exists in the SBCT ROI. Although this habitat has not been federally designated or proposed as critical habitat, it has been identified as containing the habitat requirements necessary for supporting the federally listed and snail species of concern on O'ahu. Figure 3-16 shows an overview of sensitive snail habitat and BSAs in the SBCT ROI.

Figure 3-16
Biologically Significant Areas found in the Region of Influence