



Photo: USFWS

## Terrestrial Mammal

# 'Ōpe'ape'a or Hawaiian Hoary Bat

*Lasiurus cinereus semotus*

### SPECIES STATUS:

Federally listed as Endangered

State listed as Endangered

State recognized as Indigenous (at the species level  
and Endemic at the subspecies level)

NatureServe Heritage Rank G2/T2 – Species secure/Subspecies imperiled

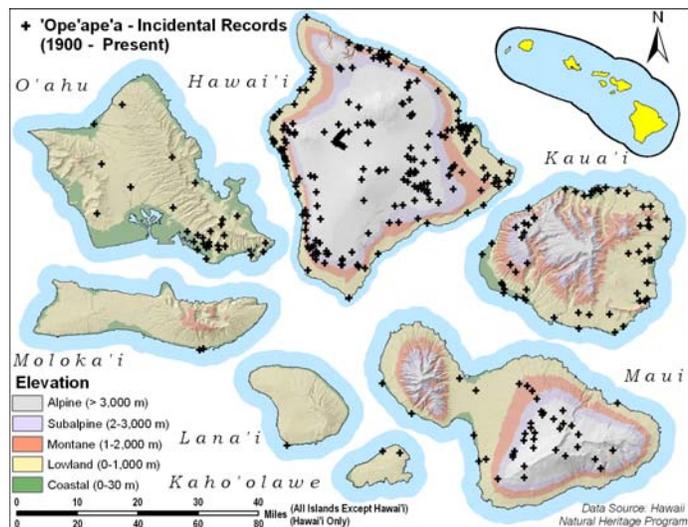
Recovery Plan for the Hawaiian Hoary Bat – USFWS 1998

**SPECIES INFORMATION:** The 'ōpe'ape'a, or Hawaiian hoary bat (Family: Vespertilionidae), is Hawaii's only native terrestrial mammal, although fossil evidence indicates that at least one other bat species was native to the islands. Males and females have a wingspan of approximately one-third of a meter (one foot), and females are typically larger than males. Both sexes have a coat of brown and gray fur. Individual hairs are tipped or frosted with white; "hoary" means frosted. The Hawaiian name refers to a half taro leaf or canoe sail shape; these being somewhat similar to the shape of the bat. Little research has been done on the 'ōpe'ape'a, and little is known about its habitat requirements or population status. Fewer than 30 accounts of roosting are known statewide, but these indicate that 'ōpe'ape'a roost in native and non-native vegetation from one to nine meters (3 – 29 feet) above ground level; the species is rarely observed using lava tubes, cracks in rocks, or man-made structures for roosting. While roosting during the day, 'ōpe'ape'a are solitary, although mothers and pups roost together. They begin foraging either just before or after sunset depending on the time of year; altitude also may affect activity patterns. 'Ōpe'ape'a feed on a variety of native and non-native night-flying insects, including moths, beetles, crickets, mosquitoes, and termites; and similar to other insectivorous bats, prey is located using echolocation. Water courses and edges (e.g., coastlines and forest/pasture boundaries) appear to be important foraging areas; the species also is attracted to insects that congregate near lights. Breeding has only been documented on the islands of Hawai'i and Kaua'i. Mating most likely occurs between September and December, and females give birth to twins during May or June. Mother bats likely stay with their pups until they are six to seven weeks old. Little is known regarding dispersal or movements, but inter-island dispersal is possible.

**DISTRIBUTION:** The hoary bat is the most widely distributed bat in North America. In Hawai'i, 'ōpe'ape'a has been reported from all the MHI except for Ni'ihau, although specimen records only exist for Kaua'i, O'ahu, Maui, Moloka'i, and the island of Hawai'i; currently the species may be extirpated from O'ahu, and Moloka'i. Evidence of breeding populations (e.g., pregnant or lactating individuals) is limited to Kaua'i and the island of Hawai'i. 'Ōpe'ape'a occur in a wide range of habitats across a wide elevation gradient. On the island of Hawai'i, bats

are found primarily from sea level to 2,288 meters (7,500 feet) elevation, although they have been observed near the island's summits (above 3,963 meters or 13,000 feet).

**ABUNDANCE:** Unknown. Survey methods to count or estimate populations of solitary roosting bats have not been developed. Although based on incomplete data, Kaua'i and the island of Hawai'i may support the largest populations. Population estimates for all islands have ranged from hundreds to a few thousand, however, they were not based on systematic surveys.



## LOCATION AND CONDITION OF

**KEY HABITAT:** 'Ōpe'ape'a have been found roosting in 'ōhi'a (*Metrosideros polymorpha*), pu hala (*Pandanus tectorius*), coconut palms (*Cocos nucifera*), kukui (*Aleurites moluccana*), kiawe (*Proscopis pallida*), avocado (*Persea americana*), shower trees (*Cassia javanica*), pūkiawe (*Styphelia tameiameia*), and fern clumps; they are suspected to roost in Eucalyptus (*Eucalyptus* spp.) and Sugi pine (*Cyrtomeria japonica*) stands. Recent work on the island of Hawai'i found that bat activity varied with season and altitude, and the greatest level of activity occurred at low elevations (below 1,280 meters or 4,200 feet) from April to December. Because warm temperatures are strongly associated with reproductive success in this and other bat species, it has been suggested that key breeding habitat is likely to occur at sites where the average July minimum temperature is above 11°C (52°F). If true, key breeding habitat on the island of Hawai'i would occur below 1,280 meters (4,200 feet) elevation. Because bats use both native and non-native habitat for foraging and roosting, the importance of non-native timber stands, particularly those at low elevations, should be determined. Breeding sites are known for Mānuka Natural Area Reserve and scattered areas along the Hāmākua Coast.

**THREATS:** Bats are affected by habitat loss, pesticides, predation, and roost disturbance. A reduction in tree cover (e.g., roost sites) might be the primary reason for the species' decline in Hawai'i. Pesticides also may have reduced populations.

**CONSERVATION ACTIONS:** The goals of conservation actions are to not only protect current populations and key breeding habitats, but also to establish additional populations thereby reducing the risk of extinction. In addition to common statewide and island conservation actions, specific management directed toward 'ōpe'ape'a should include:

- Conservation of known occupied habitat.
- Development and implementation of conservation plans that guide the management and use of forests to reduce negative effects to known bat populations.
- Continued support for the Hawaiian Hoary Bat Research Cooperative.

**MONITORING:** Continue surveys of population and distribution in known and likely habitats.

**RESEARCH PRIORITIES:** Given that little is known about 'ōpe'ape'a any research would contribute to the understanding of and ability to conserve this species. Research priorities for the 'ōpe'ape'a include:

- Development of a survey methodology that will allow the accurate estimation of populations.
- Identify key breeding and over-wintering sites.
- Quantify roost site characteristics and preferences.
- Continue efforts to track and monitor movements and behaviors.
- Determine the importance of temperature on reproductive success.
- Determine the extent to which bats use torpor.

**References:**

Hawaiian Hoary Bat Research Cooperative. Available at:

<http://www.dofaw.net/fbrp/projects.php?id=39>.

Hawai'i Natural Heritage Program [Hawai'i Biodiversity and Mapping Program]. 2004. Natural diversity database. University of Hawai'i, Center for Conservation Research and Training. Honolulu, HI.

U.S. Fish and Wildlife Service. 1998. Recovery plan for the Hawaiian hoary bat. Portland, (OR): U.S. Fish and Wildlife Service. 50 pp.