

Terrestrial Invertebrates

O'ahu Tree Snails

Achatinella spp.



Photo: W. P. Mull; *Achatinella* spp.

SPECIES STATUS:

Federally listed as Endangered

State listed as Endangered

State recognized as Endemic

NatureServe Heritage Rank G1 - Critically imperiled

IUCN Red List Ranking - Critically endangered

Recovery Plan for the O'ahu Tree Snails of the Genus *Achatinella* - USFWS 1992

SPECIES INFORMATION: The entire genus *Achatinella* consisting of 41 species of small, colorful tree snails (Family: Achatinellidae), is endemic to O'ahu; 22 species are believed to be extinct and 18 are near extinction. Although varied in color patterns and shapes, all are approximately two centimeters (.75 inch) in length, and most have smooth, glossy oblong or ovate shells that are decorated with various colors. Based on their occurrence in Native Hawaiian stories and their use in leis, O'ahu tree snails must have been very abundant when Polynesians arrived in Hawai'i. O'ahu tree snails are nocturnal and graze on fungus that grows on the leaves of native plants. Although native snails are sometimes found on non-native plants it is not known if the fungus on these introduced species is sufficient to support healthy populations. Adult snails are hermaphroditic and can live for many years, although growth rates and fecundity are very low. For example, *A. mustelina* does not become sexually mature for three to five years, may live for over ten years, and only produces four to seven offspring per year. Young are born alive.

DISTRIBUTION: Currently, O'ahu tree snails are restricted to remnant native forest on the highest ridges of the Ko'olau and Wai'anae ranges on the island of O'ahu. Historically, the genus was widely distributed from near sea level along the windward coast to the central plains and throughout the Ko'olau and Wai'anae mountains.

ABUNDANCE: Unknown. A lack of systematic, island-wide surveys impedes any effort to estimate the population sizes of most of the remaining species. However, a loss of 75 to 95 percent of native habitats supports a conclusion that the remaining populations are restricted and small. Two species, *A. mustelina* and *A. sowerbyana*, are believed to be the most abundant of the extant species. Population estimates for *A. mustelina* are just under 1,000 individuals.

LOCATION AND CONDITION OF KEY HABITAT: All *Achatinella* are arboreal, living in trees and bushes where they feed on fungi on the leaves and trunks. O'ahu tree snails occur in a variety of habitats including dry, mesic, and wet forests and shrublands. Condition of occupied habitat varies considerably. Currently, lands managed by the State of Hawai'i, the U.S. Military, and The Nature Conservancy support populations of O'ahu tree snails.

THREATS: Historically, the loss of native forest habitat and the introduction of rats (*Rattus exulans*) likely affected snail populations; the impact of collecting for leis and other ornaments

on snail populations is unknown but likely contributed to some declines. In the recent past, the introduction of additional rat species, over-collection, and the introduction of the carnivorous snail *Euglandina rosea* have resulted in declines in the genus. Ironically, *E. rosea* was introduced to control the giant African snail (*Achatina fulica*) a non-native, agricultural pest. Current threats include the continued degradation of habitat by non-native, invasive vegetation, especially strawberry guava (*Psidium cattleianum*), Christmas berry (*Schinus terebinthifolius*), silk oak (*Grevillea banksii*), shrub verbena (*Lantana camara*), and Koster's curse (*Clidemia hirta*). Pigs (*Sus scrofa*) also degrade habitat and predation by rats and introduced snails continues to be a problem. Low reproductive rates and limited dispersal abilities increase the vulnerability of this genus.

CONSERVATION ACTIONS: The goals of conservation actions are not only to protect current populations and key breeding habitats, but also to establish additional populations, thereby reducing the risk of extinction. A captive breeding program at the University of Hawai'i at Mānoa supports at least two species, *A. apexfulva* and *A. fuscobasis*, that are extinct in the wild. This facility has been successful in breeding snails. The U.S. Army is actively managing populations of *A. mustelina* under a Biological Opinion regarding continued military training issued by the USFWS. In addition to common statewide and island conservation actions, specific management directed toward O'ahu tree snails should include:

- Protection of all existing habitat and restoration and management of potentially suitable but degraded habitat, including rat and *E. rosea* control.
- Continuation of captive propagation and the initiation of a program to re-introduce snails to restored habitats.
- Preserve, maintain, and restore habitats supporting existing populations.

MONITORING:

- Continue surveys of populations and their distribution in known and potential habitats.
- Continue surveys of predator populations and non-native vegetation.

RESEARCH PRIORITIES:

- Conduct life history studies to quantify growth, population size, age distribution, and habitat needs.
- Develop and refine survey protocols to facilitate the collection of useful population data.

References:

U.S. Fish and Wildlife Service. 1992. Recovery plan for the O'ahu Tree Snails of the genus *Achatinella*. Portland, (OR): U.S. Fish and Wildlife Service. 64 pp. + 64 pp. of Appendices + 5 figures.