



*Clithon cariosus*  
Courtesy Annette Tagawa

## Freshwater Invertebrates

### Snails

Pīpīwai or *Clithon cariosus*

Hihiwai or Pipipi or *Clithon neglectus*

*Neritilia hawaiiensis*

#### SPECIES STATUS:

IUCN Red List – Not considered  
Endemic

**SPECIES INFORMATION:** These are snails that can tolerate high levels of salinity. They likely feed on algae and vegetation growing on submerged rocks. Pīpīwai grow to about two or three centimeters (one inch) in length. Eggs are deposited in capsules that are about one millimeter (0.04 inch) in diameter and contain about 50 to 75 eggs. After hatching, the larvae wash into the ocean where they develop planktonically for a few months before they move upstream to adult habitat. Little else is known about their life history.

**DISTRIBUTION:** Historically, they were found on all the main islands. Currently, Pīpīwai can still be found on all the main islands except that they are rare on O‘ahu. Because of their salinity tolerance these species are often found in estuaries. Pīpīwai have been found in some anchialine ponds. *N. hawaiiensis* is more exclusively found in anchialine ponds.

**ABUNDANCE:** Unknown. There are no formal quantitative surveys for these species.

**LOCATION AND CONDITION OF KEY HABITAT:** Pīpīwai occur in the lower reaches of streams and extend more into estuaries. Unknown for the other species. Habitat condition has been degraded in many streams and anchialine ponds.

#### THREATS:

- Pīpīwai are used by Hawaiians as a food source where they are still common;
- Decreased water quality from sedimentation, pollution, and stream alterations are likely but need to be confirmed with detailed research.

**CONSERVATION ACTIONS:** In addition to common statewide and island conservation actions, specific actions include:

- Continue developing GIS database and making it web-accessible;
- Collaborate with the Commission on Water Resources Management and the Land Board to ensure adequate Instream Flow and biological integrity of riparian areas;
- Work to clean estuaries with significant pollution;
- Continue on-going partnerships focused on environmental education and conservation;

- Restore habitat.

**MONITORING:**

- Establish survey schedule to determine population size and distribution.

**RESEARCH PRIORITIES:**

- Improve understanding of the life history, biology, and ecology of these snails.

**References:**

Kinzie RA III. 1990. Species profiles: life histories and environmental requirements of coastal vertebrates and invertebrates, Pacific Ocean region; Report 3, Amphidromous macrofauna of island streams. Technical Report EL-89-10. Vicksburg, MS: US Army Engineer Waterways Experiment Station.

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