

## Marine Invertebrates

### Snails

*Charonia tritonis*  
*Chicoreus insularum*  
*Conus abbreviatus*  
*Cypraea burgessi*  
*Cypraea gaskoini*  
*Cypraea granulate*  
*Cypraea mauiensis*  
*Cypraea ostergaardi*  
*Cypraea rasleighana*  
*Cypraea semiplota*  
*Cypraea sulcidentata*  
*Cypraea tessellata*  
*Cypraea tigris*  
*Duplicara gouldi*  
*Epitonium ulu*  
*Nerita picea*  
*Nerita plicata*  
*Nerita polita*  
*Smaragdia bryannae*  
*Strombus vomer hawaiiensis*  
*Turbo sandwicensis*



*Duplicara gouldi*  
Courtesy Keoki Stender



*Nerita polita*  
Courtesy Keoki Stender

#### SPECIES STATUS:

IUCN Red List - Not considered

All Endemic except for *Charonia*, *Cypraea tigris*, and *Nerita polita*

**SPECIES INFORMATION:** The species common names and Hawaiian names are: pu or triton's trumpet (*Charonia tritonis*), burnt murex (*Chicoreus insularum*), pūpū'ala or abbreviated cone (*Conus abbreviatus*), Burgess' cowry (*Cypraea burgessi*), leho or Gaskoin's cowry (*C. gaskoini*), leho or granulated cowry, (*C. granulate*), leho or Maui cowry (*C. mauiensis*), leho or Ostergaard's cowry (*C. ostergaardi*), leho or Rasleigh's cowry (*C. rasleighana*), puleholeho or half-swimmer cowry (*C. semiplota*), leho or groove-toothed cowry (*C. sulcidentata*), leho or checkered cowry (*C. tessellata*), tiger cowry (*C. tigris*), pūpū loloa or Gould's auger (*Duplicara gouldi*),

fungiid wentletrap (*Epitonium ulu*), pipipi or black nerite (*N. picea*), *N. plicata* (none), kūpe'e or polished nerite (*N. polita*), Hawaiian seagrass snail (*Smaragdia bryannae*), alīlea or Hawaiian stromb (*Strombus vomer hawaiiensis*), and pūpū mahina or Hawaiian turban (*Turbo sandwicensis*). Pu reaches twenty inches in length (second largest snail in the Pacific) and feeds on sea stars and sea urchins, including crown-of-thorns starfish. *Chicoreus* and pūpū'ala are carnivores. *Chicoreus* feeds exclusively on bivalves drilling through the bivalve's shell and inserts a digestive enzyme and ingests the tissues through its proboscis. Pupu'ala feeds exclusively on polychaete worms using its teeth that are connected to a venom gland and paralyzes its prey and swallows it whole. Leho or cowries are nocturnal and can be herbivores and omnivores as well as sponge feeders (*C. gaskoini* and Puleholeho). Hawaiian individuals of *C. tigris* are the largest in the world. Pūpū loloa feed solely on the yellow acorn worm (*Ptychodera flava*). The fungiid wentletrap (*Epitonium*) is associated with a solitary coral *Fungia scutaria*. Nerites (*Nerita* and *Smaragdia*) and alīlea are exclusively herbivores and feed on algae. Kūpe'e is nocturnal. Pūpū'ala egg capsules are laid in clusters ranging from 80 to 1000 eggs. Female leho lay eggs in triangular capsules that are attached to the substrate. Eggs develop for one to two weeks. The fungiid wentletrap pelagic stage lasts about 39 days. Nerites lay eggs in capsules that adhere tightly to the surface of rocks and shells. Settlement of nerite veligers peaks in the winter.

**DISTRIBUTION:** Pu, the burnt murex, *Conus*, lehos, pipipi and kūpe'e, alīlea, pūpū mahina, and pūpū loloa are found throughout the Archipelago; however, pūpū loloa is rare or possibly absent on the island of Hawai'i. The fungiid wentletrap is found only in Kāne'ohē Bay, O'ahu. *Nerita plicata* is found only on the Northwestern Hawaiian Islands and *Smaragdia bryannae* is found specifically at Anini, Kaua'i; Kāne'ohē Bay, O'ahu; and near Kaunakakai, Moloka'i.

**ABUNDANCE:** Specific abundance for cowries is unknown, but many are rare such as pu, *Cypraea mauiensis*, *C. ostergaardi*, and *C. tigris*. Alīlea is also very rare today.

**LOCATION AND CONDITION OF KEY HABITAT:** The burnt murex is found at depths of 18 meters (60 feet) or more. Pūpū'ala key habitat is on benches and sandy substrate of reef platforms. Most Lehos including (*C. gaskoini*, *C. granulata*, Pulholeho, and *C. tessellata*) are found in shallow waters to 60 meters (200 feet). *C. mauiensis* is restricted to shallow waters, while *C. rashleighana* and *C. sulcidentata* are found in more moderately deep waters. *C. ostergaardi* is the only cowry found exclusively in deep waters. *C. mauiensis* has additional key breeding habitat on the leeward side of Maui. Pūpū loloa inhabits the casting of large acorn worms. The fungiid wentletrap lives on a solitary coral *Fungia scutaria* in Kāne'ohē Bay, an area that has been severely degraded. Key habitat for both pipipi and *N. plicata* is intertidal areas, but kūpe'e is found under sand at the high tide line. *Smaragdia bryannae* is found on fringing and patch reefs only in association with the marine angiosperm *Halophila hawaiiiana*. Alīlea lives up to 25 meters (80 feet) deep in sand. Pūpū mahina is common to 18 meters (60 feet) deep.

#### **THREATS:**

- Localized excessive harvesting of these species for their shells by collectors and for cultural uses is the primary threat to these snail species. Kūpe'e was eaten by native Hawaiians and used in shell lei. *Cypraea mauiensis* is extremely rare due to over collection;
- Pollution is another threat for those found in intertidal areas and shallow waters.

**CONSERVATION ACTIONS:** The goals of conservation actions are to not only protect current populations, but to also establish further populations to reduce the risk of extinction. In addition to common state-wide and island conservation actions, specific actions include:

- Maintain healthy populations with appropriate fishing regulations, enforcement, and education.

**MONITORING:**

- Survey for populations and distribution in known and likely habitats.

**RESEARCH PRIORITIES:**

- Improve understanding of factors affecting the species population size and distribution.

**References:**

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