

Freshwater Invertebrates



Mountain shrimp 'Ōpaekala'ole *Atyoida bisulcata*

SPECIES STATUS:
IUCN Red List - Not considered
Endemic

SPECIES INFORMATION: 'Ōpaekala'ole (mountain shrimp) is a spineless shrimp that grows to about five centimeters (two inches) in length. They filter small food items from the water column in fast flow areas and scavenge material from the bottom in slower flow environments. Reproduction is year-round with females carrying up to 3000 eggs on their swimmeret legs. Incubation period is about two months. After hatching, larvae are washed downstream into the ocean where they spend a few months developing to a size of about five millimeters (one-fifth of an inch) long before they return to stream habitats to mature. Peak recruitment coincides with the rainy season. They are excellent climbers, climbing artificial structures and waterfalls of moderate size.

DISTRIBUTION: Historic distribution includes all the main islands with perennial streams. Currently they occur in high water quality streams on Kaua'i, O'ahu, Moloka'i, Maui, and the island of Hawai'i.

ABUNDANCE: Numbers are high in good quality streams but these are much less common than occurred historically. They are also less common than they used to be, even in many high quality streams. Reduced stream flow and in-stream obstructions have restricted their range compared to historical times.

LOCATION AND CONDITION OF KEY HABITAT: 'Ōpaekala'ole (mountain shrimp) are found in areas of fast flowing water in streams either in the current or in the lee of rocks and boulders. They are great climbers and can accommodate a series of tall waterfalls such as in Kaluanui Stream. They do not require a water flow layer to climb, but can climb completely out of the water. Thus, they are found in the upper reaches of streams down to near stream mouths, but are not common in estuaries. Reduced stream flow and in-stream obstructions have decreased their abundance and range compared to historical times.

THREATS:

- Habitat destruction and pollution from development and agriculture have reduced available habitat for mountain shrimp;
- Stream channelization and diversions have reduced stream flow and in-stream obstructions prevent their movement upstream;

- 'Ōpaekala'ole (mountain shrimp) are traditionally eaten by Native Hawaiians and remain prized as a food source today;
- A number of introduced shrimps and other species may compete with them for food or habitat. Introduced fishes may be a predatory threat.

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 statewide and island conservation actions, specific actions include:

- Work to clean streams with significant pollution;
- Improve altered or diverted streams;
 - Modify or remove gratings or diversions to allow for instream passage;
 - Restore riparian vegetation to help decrease instream heating and reduce sediment loads;
 - Create pools in frequently dewatered stretches to provide safe usable habitat between flows.
- 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;
- Continue on-going partnerships focused on environmental and fisheries education and conservation and expand partnerships;
- Maintain healthy populations with appropriate fishing regulations and education;
- Restore habitat.

MONITORING:

- Establish survey schedule to determine population size and distribution.

RESEARCH PRIORITIES:

- Improve understanding of life history of 'ōpaekala'ole (mountain shrimp) including lifespan;
- Understand the ecological importance of interactions with introduced competitors and predators;
- Research the life history of introduced competitors and predators to develop removal or control strategies.

References:

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- McIntosh MD, Benbow M, Burky AJ. 2002. Effects of stream diversion on riffle macroinvertebrate communities in a Maui, Hawaii, stream. *River Research and Applications* 18(6):569-581.
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