



## Freshwater Fishes

### 'O'opu naniha *Stenogobius hawaiiensis*

**SPECIES STATUS:**  
IUCN Red List – Not considered  
Endemic

**SPECIES INFORMATION:** 'O'opu naniha (*Stenogobius hawaiiensis*) are a smaller goby reaching ten to 13 centimeters (four to five inches) in length. As an omnivore, it feeds on algae, worms, crustaceans, and insect larvae that it takes from the bottom sediments using their snouts. 'O'opu naniha display sexual dimorphism and elaborate courtship rituals. Spawning occurs year round. Average-sized 'o'opu naniha will lay 6,000-8,000 eggs in crevices guarded by males. Eggs hatch after one day and are carried out to sea. Within five days they will develop enough to be able to begin feeding. They spend approximately 135 days as oceanic plankton. Post-larvae or hinana recruit indiscriminately back to freshwater streams during all hours, utilizing the incoming tide. Recruitment is most prevalent in the spring. 'O'opu naniha are poor climbers and swimmers compared to the other native gobies.

**DISTRIBUTION:** Historically, 'o'opu naniha were found on all the Main Hawaiian Islands. Today, they also are found on all the Main Hawaiian Islands in the lower reaches of streams and in estuaries that are not blocked by man-made obstructions. Post-larvae are found in oceanic waters, but little is known of its oceanic distribution.

**ABUNDANCE:** Most common on O'ahu. Abundance has declined in many areas and is affected by the threats listed below.

**LOCATION AND CONDITION OF KEY HABITAT:** Key habitat for 'o'opu naniha is along margins of streams and in low flow areas in the lower reaches of streams and stream mouths. Although they prefer clear, cool streams like the other gobies, they are better adapted than most gobies to live in soft substrates in degraded habitat. For specific information on stream biota, the Division of Aquatic Resources of the Department of Land and Natural Resources has a database of surveyed streams. Oceanic waters are important to the survival of post-larvae, but little is known of its oceanic distribution or habitat requirements.

#### THREATS:

- Habitat degradation results from water diversion, stream channelization, and dams. Water diversion, stream channelization, and dams result in habitat degradation through altered stream flows, which also causes a loss of riparian vegetation, shelter and erosion control; higher water temperatures; and lower dissolved oxygen levels. 'O'opu naniha are not as threatened by altered streams as other Hawaiian gobies, although reduced water flows still can limit larvae from reaching the ocean and recruiting back into streams;

- Non-point source water pollution, such as nutrients, sedimentation, and chemicals may threaten 'o'opu naniha; however, the consequence of these pollutants is relatively unknown and needs to be further studied;
- Introduction of exotic species, diseases and parasites such as tilapia are significant threats to 'o'opu naniha. Historical introductions of game fish and more recent unwanted exotic fish from the aquarium trade are both problems. These exotic fish species prey on native fish, outcompete native fish for food, and spread parasites and diseases;
- Fishing for 'o'opu naniha occurs and could become a more severe threat in combination with the above threats.

**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. Past actions to restore fish populations have consisted of a ban on gill, drag, draw, and seine netting; stream clean-up efforts, and public outreach. In addition to common state-wide and island conservation actions, specific actions include:

- Improve altered streams;
  - Restore riparian vegetation to help decrease instream heating and reduce sediment loads;
  - Remove alien species;
  - Create pools in frequently dewatered stretches to provide safe usable habitat between flows.
- 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 streams with significant pollution;
- Continue developing GIS database and making it web-accessible;
- Use science-based management of recreational fishing;
- Increase education and outreach efforts, particularly on issues of fishing-related life history, water pollution, and how to deal with unwanted aquarium pets;
- Continue on-going partnerships focused on environmental and fisheries education and conservation and expand partnerships.

**MONITORING:**

- Establish survey schedule to determine population size and distribution;
- Monitor number of returning hinana.

**RESEARCH PRIORITIES:**

- Research conservation-relevant biology and ecology;
- Better understand the role of estuaries in species ecology;
- Determine effects of pollution on population;
- Continue research efforts on marine life stage;
- Initiate research to study source-sink population structure;
- Research impacts and methodologies to deal with alien species;
- Continue researching effects of stream channelization and diversion, specifically how this goby is able to have high numbers in altered streams;
- Research effect of fishing on total population size and distribution.

**References:**

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