U.S. Fish & Wildlife Service

Waihee Stream Fish Passage

Partners Restore Fish Habitat Together

Project Location: Koolaupoko District, Oahu, HI
Congressional District: Hawaii 2nd District
Fish Passage Barriers Removed: 1
Miles of fish passage re-opened: 1

Engaging a Community in Conservation

In 1935, on windward Oahu Island, a barrier was constructed blocking upstream fish passage to upper Waihee Stream. Thankfully, U.S. Fish and Wildlife Service recently completed the Waihee Stream Fish Passage Project which restored migratory native fish passage to over a mile of high-quality stream habitat.

The U.S. Fish and Wildlife Service did not work alone on this project. The *Waihee Ahupuaa Initiative*-- a watershed-based environmental and educational organization composed of community members, local educators, large landowners and resource agency participants--initiated the project. Participation by area residents (including students and interns) increased the community's awareness, knowledge and understanding of the

Volunteers, and partners prepare the Waihee site for construction. Credit: Gordon Smith/USFWS

conservation needs of native aquatic species. A nearby community center provided critical assistance for completing the project efficiently by coordinating community and student volunteers, offering meeting space and providing a base yard for equipment and supplies.

The project was completed with financial and technical assistance from the agency's National Fish Passage Program and Hawaii Fish Habitat Partnership, the Honolulu Board of Water Supply (landowner), the Hawaii Department of Land and Natural Resources, and other partners.

Accessing a High Quality Habitat

Residential and agricultural development in Waihee Stream's lower reaches moderately impacts the encompassing watershed. Federal and state aquatic resource managers ran water quality studies, indicating Waihee Stream has high quality water compared to other Oahu streams. However, diadromous fish and invertebrates migrating up through the mouth of Waihee Stream were blocked from the preserved and conserved stream and surrounding lands of the relatively undisturbed headwater.

The modified instream structure providse a surface native species can ascend. Credit: Gordon Smith/USFWS

Leadership provided by the *Waihee Ahupuaa Initiative* ensured that community members were integral to conceiving, planning and implementing the project.

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This species of native migratory goby can ascend waterfalls. Inset: pelvic fins that are fused to form a suction cup. Gordon Smith/USFWS

A Unique Migration

The two-part life cycle of native Hawaiian stream animals--5 fish, 2 shrimp, and 2 snail species--begins when adults lay eggs in freshwater habitats. The eggs hatch and larvae disperse downstream to the ocean. Later, the juveniles return, swimming into a stream, starting a rigorous upstream migration. Three of the native Hawaiian stream fish have pelvic fins that fuse into a ventral suction disk. They use the suction to cling to rock surfaces and to climb vertical waterfalls. The native shrimp *opae kalaole* and the snail *hihiwai* are also adept climbers and easily scale steep stream channels.

Restoring Waihee Ahupuaa Aquatic Fauna

In 1935, to monitor stream flow, a massive concrete water control structure associated with a stream gage was built in Waihee Stream. In the late 1970s, this behemoth lay abandoned, looming over Waihee Stream. The erosion of time scoured the downstream edge of the structure into a sharply overhanging slab of concrete impenetrable to native fish and invertebrates. This massive building blocked nearly 30% of available fish habitat in Waihee stream. Part of the fish passage project features a "concrete-rubble-masonry" (CRM) rock wall. The newly-created steep CRM face will continue to exclude non-native species that are present in the lower reaches of Waihee Stream, but is designed to be ascended by native stream organisms.

Native Aquatic Species Benefitted

Hawaiian stream gobies: Oopu nopili (*Sicypterus stimpsoni*), Oopu nakea (*Awous stamineus*); Hawaiian freshwater shrimp: Opae kalaole (*Atyoida bisulcata*)

Upstream movement of fish and invertebrates is monitored using small fish traps. Credit: Paula Levin/USFWS

Project Partners

Honolulu Board of Water Supply (grant recipient); Hawaii Fish Habitat Partnership; KEY Project; Waihee Ahupuaa Initiative.

For More Project Information:

- Hawaii Fish Habitat Partnership information
- National Fish Passage Program fact sheet
- Hui o Koolaupoko

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