

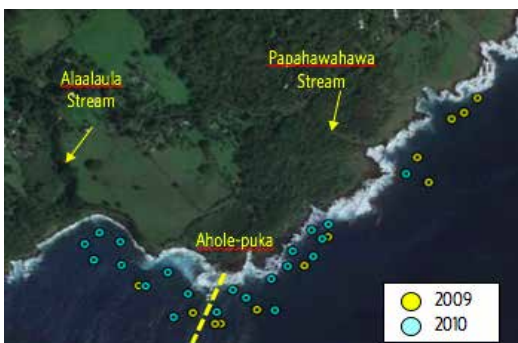
Summary of Findings

2009-2010 Coral Reef and Fish Surveys: Mū'olea, Maui

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Mū'olea on Maui's rugged Hāna coast, once the summer residence of King David Kalākaua, is steeped in cultural heritage and tradition. Careful tending of its shoreline and reefs has ensured sustainable food supplies for generations of Hawaiians. But in recent decades, the traditional systems and practices that helped maintain abundance have started to erode. A group of lineal descendants and local residents known as Nā Mamo O Mū'olea (NMOM) is working to promote traditional values, management systems, and practices so the 'ohana of Mū'olea can continue to rely on these lands and waters for sustenance.

At their request, The Nature Conservancy assessed coral and reef fish in 2009 and 2010. Our surveys measured size and abundance of total and target (prized) fish, prime spawners (fish with the highest reproductive potential), and reef organisms, including coral and algae. These snapshots provide valuable baseline data from which to measure changes in coral reefs and fish populations at Mū'olea.



Key Findings

CORAL

- The reef was comprised of turf algae and small colonies of cauliflower and lobe corals, commonly found in high-wave energy environments.
- The area had abundant new coral, which suggests a healthy reef with high recruitment and a high recovery potential if damaged.

FISH

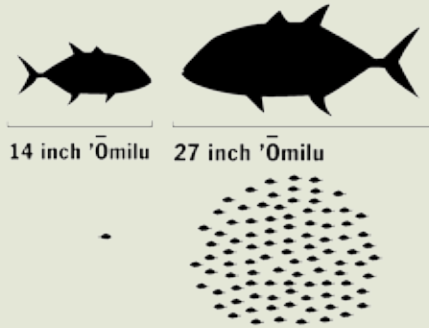
- The biomass of total fish, target fish, and prime spawners was higher than other survey sites open to fishing, but lower than sites closed to fishing and well below reports from long-time residents on the condition of the fishery 25 years ago.
- Though target fish biomass is lower than areas closed to fishing, non-target fish biomass is slightly higher. While other factors may impact fish populations, only fishing pressure would selectively impact levels of target fish.
- The average size of many target species, such as parrotfish, goatfish, and soldierfish, was at or below legally harvestable size, further suggesting fishing pressure may be having a measureable impact on these populations.
- A few large schools of introduced ta'ape were recorded at Mū'olea, but roi and to'au were rarely observed.

DIFFERENCES BETWEEN SITES SURVEYED EAST AND WEST OF AHOLE-PUKA

- Sites to the west of Ahole-puka had half the coral cover as sites to the east.
- Sites to the west of Ahole-puka had lower total and target fish biomass than sites to the east, likely due to different coral cover and water quality, as well as additional fishing pressure at more accessible sites to the west.
- Biomass at sites to the west of Ahole-puka was comprised primarily of surgeonfish, large wrasses, and goatfish, while biomass at sites to the east had a more even distribution of surgeonfish, parrotfish, apex predators (species at the top of the food chain), large wrasses and goatfish.

Bigger Fish Make More Fish

Older, larger fish, referred to as prime spawners, produce more and healthier larvae and are responsible for the vast majority of reproduction. A 27-inch 'ōmilu, for example, makes 86 times the number of eggs produced by an 'ōmilu half its size.



Indicators of Stress West of Ahole-puka

At Mūolea, many fish do not reach their ideal reproductive age or size.



Only 9% of *uhu 'ele'ele* and *palukaluka* (male and female ember parrotfish), one of the most abundant species of uhu in the Main Hawaiian Islands, were large enough to reproduce.

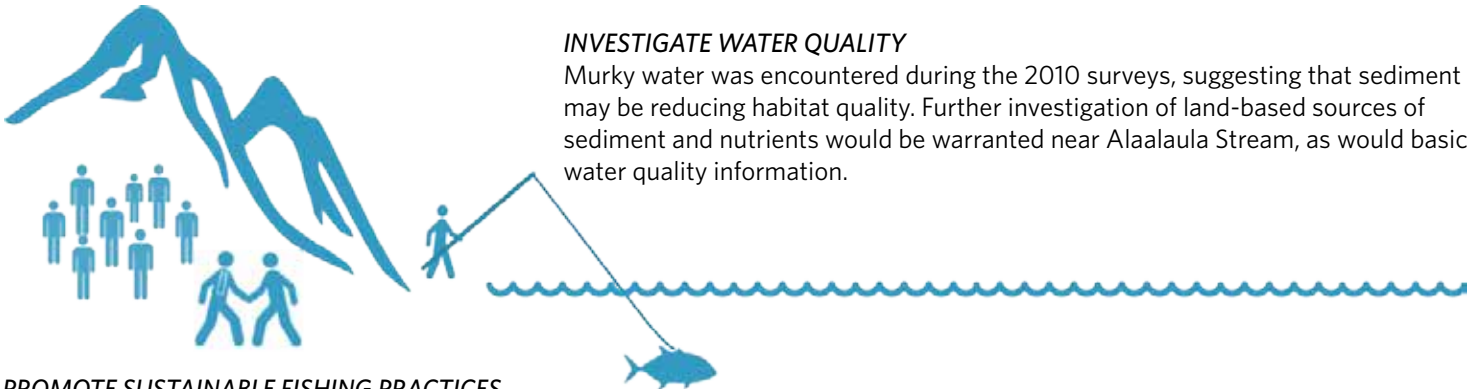


Only 2.4% of the *manini* (convict tang) population was greater than 5.9 inches— nearly 1 inch too small for average females to reproduce.



The average size of *moano* (manybar goatfish) were at or below legal harvest size.

Management Recommendations



INVESTIGATE WATER QUALITY

Murky water was encountered during the 2010 surveys, suggesting that sediment may be reducing habitat quality. Further investigation of land-based sources of sediment and nutrients would be warranted near Alaalaula Stream, as would basic water quality information.

PROMOTE SUSTAINABLE FISHING PRACTICES

The community planning process identified unsustainable harvesting occurring in the area and the surveys support this observation. With management actions to reduce fishing pressure, fish populations would likely increase.

If fishing access increases without additional management in place, Mū'olea could experience significant declines in fish abundance and biomass.

CONSIDER LONG-TERM STABILITY

The distinct fish populations east and west of Ahole-puka are likely related to the differences in bottom topography, referred to as rugosity, and known to be an important factor affecting fish populations.

Areas with high rugosity, like the habitat to the east of Ahole-puka, tend to be better fish habitat, whereas areas with low or no rugosity, like the habitat to the west of Ahole-puka, have lower potential to support fish populations.

For Additional Information

Contact Roxie Sylva, The Nature Conservancy's Maui Marine Coordinator, at rsylva@tnc.org or 808-856-7669.



How You Can Help

Nā Mamo O Mū'olea is committed to perpetuating traditional management of the ahupua'a of Mū'olea. The group works to restore and maintain the natural, cultural, scenic, historic, and marine resources of Mū'olea for the benefit, education, and enjoyment of the community and future generations. Contact Board President Hank Eharis at 808-357-8023 to find out how to support these efforts.