As the amount of living reef has declined, so too have Maui’s native reef fish populations. Since 1995, the biomass (amount, by weight) of culturally and economically important reef fish species found on Maui’s reefs has declined significantly. As with other main islands, some fish stocks around Maui have seen declines of more than 90% over the past century. As a result, the average amount of reef fish found around Maui’s reefs is the second lowest in the State, behind only O’ahu (see Figure 1).

The quality of Maui’s coastal waters is also a concern for coral reefs because reefs require clean clear water and bottom substrate for growth and reproduction. Nearly 90% of water quality samples taken around Maui in the period 2012—2014 exceeded State Water Quality Standards for turbidity, nutrients, and/or bacteria. Maui’s impaired waters are a public health concern for humans and for marine life. Improving coastal water quality is essential to the survival and recovery of reefs.

The reasons for these declines relate to the increasing use of Maui’s coastal lands and waters. There are three primary drivers behind these negative trends: (1) introduced land-based pollutants and sediments onto reefs; (2) overfishing coupled with poor enforcement of current fishing regulations; and (3) insufficient ‘resting’ (kapu) sites that protect marine life by providing adequate time and space to recover from stresses, and then ‘spill over’ and replenish adjacent areas.

In addition, there are emerging impacts beyond Hawai’i’s control that threaten to further damage Maui’s reefs: increasing ocean temperatures that result in coral bleaching, rising sea levels, ocean acidification, and increasing frequency and intensity of coastal storms.

Our best hope to protect Maui’s corals from global threats is to reduce local stressors like pollution and overfishing. Similar to monitoring human health, we can periodically ‘check-up’ on the health of Maui’s coral reefs. Like people, healthier reefs have a greater chance of recovery from periodic illnesses than ones that are continually stressed and/or diseased. Summary check-up results regarding the current health of Maui’s reefs are presented below (Box 1). They are deeply alarming.

**Our Diagnosis in 2015**
The status of Maui’s coral reef health is poor. In the absence of increased treatment and effective management, continued declines in reef health are expected in coming years.

---

**Figure 1: Resource fish biomass across the main Hawaiian Islands. Data courtesy of Friedlander et al. 2015.**

*Healthy reefs are more resilient and have a greater chance of recovery following disturbances and ocean change.*

---

**Box 1: Summary results on the current health of Maui’s coral reefs (trends in key diagnostics of health: 1995–2015)**

- **Living Reef**
  - The Coverage and proportion of live coral observed, per unit area

- **Fish Biomass**
  - The amount of resource reef fishes observed on Maui’s reefs

- **Water Quality**
  - The degree of coastal waters free of pollutants and pathogens

- **Species Diversity**
  - The proportion of native versus non-native marine species found
REVERSING THE DECLINE

Why We Should Care About Maui's Reefs

Maui is home to some of the largest and most complex coral reefs in the main islands. These reefs provide innumerable cultural, economic, and recreational benefits to the people and the visitors of Maui. Continued losses will forever alter the economic value, quality of life, and traditional and cultural connections of these irreplaceable resources for Maui's people.

Simply acknowledging that there is a problem is not enough to solve it. Through the customary and shared native Hawaiian value of kuleana, we feel strongly compelled to let the public know about the observed declines in the health of Maui's coral reefs. Fortunately, Hawai‘i and other places around the world have shown us how to reverse such declines, and we believe that it is not too late to do so. Accordingly, we must act immediately to reverse and stop these alarming trends.

We are encouraged by the recent increased local engagement and action that has been taken to restore reefs in people’s communities. The creation of community-managed makai areas (CMMAs) starting in 2010 and the initiation of the Maui Community Managed Makai Area Network in 2013 hold great promise.

At Kahekili a new preserve is protecting herbivorous reef fish. New rules were also recently passed limiting the number of parrot and goatfish that can be fished. We also have a much stronger scientific understanding of the status and trends in the health of Maui's reefs and fish populations than we did a generation ago, providing us with an improved level of precision to guide our actions and objectively measure the outcomes of our management efforts. For example, we know through a recent comparison of 310 sites around the world that using resting areas (kapu) in modern times typically helps to restore both reef fish populations and coral habitat. Despite these successes, we remain deeply concerned.

This report has been written for you, because you can help to reverse Maui's declining reef health.

There are 5 priority actions that we must increase beyond current levels of effort (see Box 2) during the next 3 years: (1) building the capacity and increasing the number of CMMAs around Maui to implement coral reef recovery strategies through collaborative efforts; (2) enhance enforcement of current marine resource rules and regulations within Maui's coastal waters; (3) expand the network of coral reef areas under protection around Maui, with a target of protecting 20% of Maui's coral reef ecosystems sustainably managed by 2020 (currently < 2%); (4) implementing policies and practices to reduce sediment and nutrients flowing onto Maui's reefs; and (5) promote a collaborative approach to marine resource management around Maui.

If we take appropriate action, Maui's reefs will recover. This hope depends on our collective commitment to do so.

Our Recommendation for 2016+

The current level of action to restore the health of Maui’s reefs is insufficient; we must commit fully to taking the actions necessary to protect Maui’s coral reefs by urgently expanding the level and scope of protection and community involvement.

All footnoted references are available online at: http://www.mnmrc.org/mauis-coral-reefs-declining-trends-report

---

**Box 2: Taking Action for Maui's Coral Reefs**

<table>
<thead>
<tr>
<th>Action Description</th>
<th>Degree of Action to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Build the capacity and number of Maui's CMMAs</strong></td>
<td>LOW</td>
</tr>
<tr>
<td>Community-Managed Marine Areas (CMMAs) organized and implemented by local</td>
<td></td>
</tr>
<tr>
<td>communities and their partners around Maui</td>
<td></td>
</tr>
<tr>
<td><strong>Enhance enforcement of current rules and regulations</strong></td>
<td>LOW</td>
</tr>
<tr>
<td>Increase the effectiveness of local enforcement of current coastal and marine</td>
<td></td>
</tr>
<tr>
<td>resource rules and regulations by designated authorities</td>
<td></td>
</tr>
<tr>
<td><strong>Expand network of coral reef protected areas around Maui</strong></td>
<td>LOW</td>
</tr>
<tr>
<td>Coral reef sites that have been designated as kapu to allow the necessary time and</td>
<td></td>
</tr>
<tr>
<td>space for corals and reef fish to recover</td>
<td></td>
</tr>
<tr>
<td><strong>Reduce sediment and nutrients flowing onto reefs</strong></td>
<td>LOW</td>
</tr>
<tr>
<td>Implement best management practices to control storm- and waste-water runoff</td>
<td></td>
</tr>
<tr>
<td>onto coral reefs adjacent to Maui's coastline</td>
<td></td>
</tr>
<tr>
<td><strong>Promote collaborative marine resource management</strong></td>
<td>LOW</td>
</tr>
<tr>
<td>Shift marine resource management authority and responsibility from State-only to</td>
<td></td>
</tr>
<tr>
<td>a collaboration between State and local Maui communities</td>
<td></td>
</tr>
</tbody>
</table>


Our Vision: The waters of Maui Nui are clean, our coral reefs healthy, and our native fishes abundant.

Learn more and get involved at http://www.mnmrc.com and https://www.facebook.com/MNMRC

All footnoted references are available online at: http://www.mnmrc.org/mauis-coral-reefs-declining-trends-report

October 2015
REFERENCES

This report was prepared by the Maui Coral Recovery Team:
A voice for the health of Maui’s reefs

We have created this report both for Hawai‘i’s decision makers and the public. Our team is comprised of Hawai‘i’s preeminent coral reef scientific and management experts from across the islands. We work together on a voluntary basis driven by our shared concern regarding the fate of Maui’s coral reefs. We support decision makers and local communities to take action that effectively manages Maui’s coral reefs for the benefit of current and future generations.


CRAMP map for Maui Nui


Hoese et al. 2011. “Projected changes to growth and mortality of Hawaiian corals over the next 100 years.” PLoS ONE 6(3).


Neilson, B. 2014. “Coral bleaching rapid response surveys September to October 2014.” Hawai‘i State Department of Land and Natural Resources.


Maui Nui Coral Recovery Team Members

Thorne Abbott  Coastal Planners LLC
Ka'au Abraham  HI Humpback Whale National Marine Sanctuary
Eric Brown PhD  National Park Service
Jay Carpio  Wailuku CMMA
Rhiannon Chandler  UH Richardson School of Law
Mia Charleston  Maui Restoration Group
Eric Conklin PhD  The Nature Conservancy
Mark Deakos PhD  Hawaii Association for Marine Education and Research
Mike Field PhD  Senior Scientist Emeritus, U.S. Geological Survey
Alan Friedlander PhD  Pristine Seas, National Geographic Society; Fisheries Ecology Research Lab, University of Hawaii, UH Manoa
John Gorman  Maui Ocean Center
Elia Herman  DLNR HI Humpback Whale National Marine Sanctuary
Mary Jorgensen  Maui County Planning Dept
Robin Knox  Water Quality Consulting, Inc
Ekolu Lindsey  Polanui Hiu CMMA
Manuel Mejia  The Nature Conservancy
Robin Newbold  Chair Maui Nui Marine Resource Council
John Parks  Marine Management Solutions
Dan Polhemus PhD  US Fish and Wildlife Service
Tony Povilitis  Life Net Nature
Dana Reed  Engineer
Bob Richmond PhD  Kewalo Marine Lab UH Manoa
Rina Sampson  Polanui and Wailuku CMMA
Celia Smith PhD  UH Manoa
Russell Sparks  DLNR Division of Aquatic Resources Maui
John Summers  Maui County Long Range Planning Dept
Brian Tissot  Washington State University Benthic Ecology Lab
Darla White  DLNR Division of Aquatic Services
Wendy Wiltse PhD  Environmental Protection Agency

Additional Peer Review By:

Rich Brunner  Kim Hum  Larry Stevens
Tova Callender  Jack Kittinger PhD  Curt Storlazzi PhD
Lucienne De Naie  Tara Owens  Rob Toonen PhD
Emily Fielding  Rob Parsons
Harry Hecht  Ku’ulei Rogers PhD

Our vision: the waters of Maui Nui are clean, our coral reefs healthy, and our native fishes abundant.
Learn more and get involved at http://www.mnmrc.com and https://www.facebook.com/MNMRC

This document was prepared by the Maui Coral Recovery Team: a voice for the health of Maui’s reefs. We have created this report both for Hawaii’s decision makers and the public. Our team is comprised of Hawaii’s preeminent coral reef scientific and management experts from across the islands. We work together on a voluntary basis driven by our shared concern regarding the fate of Maui’s coral reefs. We support decision makers and local communities to take action that effectively manages Maui’s coral reefs for the benefit of current and future generations.