

## Mālama Maunalua Project. Stakeholder. and Ecosystem Services List

### **Stakeholder List:**

1. Fishing community (Commercial, recreational, and subsistence)
2. Recreational Ocean User (Swimmers, surfers, snorkelers)
3. Commercial Ocean User (Tours, marinas, etc.)
4. Bay-side Businesses (Restaurants, retail, etc.)
5. Farmers
6. K-12 Student/Schools
7. Researchers/Scientist/University Student
8. Local Resident
9. Forest users (Hikers, bikers)
10. Cultural practitioners

### **Ecosystem Services:**

1. Marine water quality improvement
2. Healthy native ecosystems
3. Reduced runoff
4. Livelihoods
5. Perpetuation and preservation of cultural practices
6. Climate mitigation and resilience
7. Hazard mitigation

### **Programs:**

#### **1. Huki Program**

Tags: Education, Habitat Restoration, Volunteer Opportunity, Community Engagement

Summary: Our flagship program, huki are large-scale, organized community events to remove invasive alien algae (IAA) from Maunalua Bay. Every year, approximately 3,000 volunteers including 2,000 students participate in our 30+ community and educational huki. The removed IAA is donated as a soil amendment at our local farms.

**Stakeholders:** Fishing Community, Recreational Ocean Users, Commercial Ocean User, Cultural Practitioners, K-12 Student/Schools, Farmers, Local restaurants/retail

**Ecosystem Services:** Marine water quality improvement, Healthy native ecosystems, Livelihoods, Perpetuation and preservation of cultural practices

## **2. Internship Program**

Tags: Education, Research, Volunteer Opportunity

Summary: We annually host student interns interested in all aspects of marine conservation through our internship program. Interns gain valuable field experience and staff mentorship as they take the initiative on various research and educational projects that help further our mission.

**Stakeholders:** Researchers/Scientist/University Student

**Ecosystem Services:** Range of benefits, depending on the interns position

## **3. Classroom Education**

Tags: Education, Community Involvement

Summary: Our educators visit classrooms in the Maunalua Bay region to teach students about the biology, geology, and cultural significance of the Maunalua Bay watershed. By bringing hands-on activities appropriate to grade-level like our algae touch tank, erosion demonstration, and invasive species games, we work with teachers to bring the Bay to the classroom. We also table at campus and community outreach events.

**Stakeholders:** K-12 Student/Schools

**Ecosystem Services:** Healthy native ecosystems, Livelihoods, Perpetuation and preservation of cultural practices

## **4. Rain Gauges**

Tags: Research

Summary: In 2020 we greatly expanded the rain gauge data collection network in the Maunalua Bay watershed. New rain gauges have been deployed from mauka to makai where they will continue to record and upload rainfall data to the Hawaii Rainfall Atlas. With increased rainfall data, we have more data to make informed decisions about watershed management.

**Stakeholders:** Farmers, Researchers/Scientists/University Students, Local Residents, Forest Users

**Ecosystem Services:** Climate mitigation and resilience, Hazard mitigation

## **5. Water Quality**

Tags: Research

Summary: Monitoring water quality in Maunalua Bay continues to be an ongoing effort. In addition to several PaclOOS sensors deployed in the Bay, in 2019 a large-scale, partner-driven data collection effort analyzed water samples from over 150 sites.

**Stakeholders:** Fishing community, Recreational Ocean Users, Commercial Ocean Users, Researchers/Scientists/University Students, Local Residents

**Ecosystem Services:** Marine water quality improvement, Healthy native ecosystems, Livelihoods, Climate change mitigation and resilience

## **6. Oysters**

Tags: Research, Community Engagement, Volunteer Opportunity

Summary: In 2021 we will deploy Pacific Oysters in specially designed oyster cages into Koko Marina to act as biofilters and improve water quality. Volunteers and community partners will help monitor the health of the oysters as they filter the marina's water.

**Stakeholders:** Fishing community, Recreational Ocean Users, Researchers/Scientists/University Students, Local Residents

**Ecosystem Services:** Marine water quality improvement, Healthy native ecosystems

## **7. Rain Gardens**

Tags: Habitat Restoration, Community Engagement, Education

Summary: MM has been responsible for the creation of several community rain gardens (Koko Head Park, Kuliouou Beach Park, Koko Marina Shopping Center, Kalani Highschool), replacing invasive plants with native vegetation that more readily retains water and reduces urban runoff. We also work with schools to plant rain gardens on their campuses, using their creation and maintenance as teaching tools to educate students on the importance of native plants to reduce water pollution.

**Stakeholders:** Fishing community, Recreational Ocean Users, Commercial Ocean Users, Bay-side Businesses, K-12 Student/Schools, Researchers/Scientist/University Students, Cultural practitioners

**Ecosystem Services:** Marine water quality improvement, Healthy native ecosystems, Reduced runoff, Livelihoods, Perpetuation and preservation of cultural practices

## **8. Limu Hui**

Tags: Research, Cultural Knowledge

Summary: The Limu Hui is a consortium of local experts, researchers, community members, and cultural practitioners that exchange knowledge about the various species of limu in Maunalua Bay, and work to restore native populations. The Hui gathers to discuss ongoing research, conservation strategies, and historical changes with a special focus on restoring the limu landscape to a more natural state.

**Stakeholders:** Fishing community, K-12 Student/Schools, Researchers/Scientist/University Students, Cultural practitioners, Local Residents

**Ecosystem Services:** Healthy native ecosystems, Livelihoods, Perpetuation and preservation of cultural practices

## **9. AlgaeVac**

Tags: Habitat Restoration, Research

Summary: In 2019 we deployed the AlgaeVac to run in Maunalua Bay. Taking inspiration from the Supersucker, which cleared invasive algae in Kaneohe Bay, our AlgaeVac was designed by core volunteer Ralph Dykes and board member Leighton Taylor. It launched during summer 2019 and was crewed in offshore waters, clearing invasive algae from deeper, less accessible sections of the Bay.

**Stakeholders:** Recreational Ocean Users, Fishing Community

**Ecosystem Services:** Marine water quality improvement, Healthy native ecosystems, Livelihoods, Perpetuation and preservation of cultural practices

## **10. Pulama Wai**

Tags: Education, Community Engagement

Summary: Through our Pulama Wai program, students, homeowners, and community members learn how to reduce land-based runoff through green infrastructure. The program includes campus and property runoff assessments and discussions on how to implement “bay-friendlier” landscaping changes.

**Stakeholders:** Fishing community, Recreational Ocean User, Researchers/Scientist/University Student, Local Resident, Forest users

**Ecosystem Services:** Marine water quality improvement, Healthy native ecosystems, Reduced runoff

### **11. Adopt-a-Plot**

Tags: Habitat Restoration, Community Engagement, Volunteer Opportunity

Summary: In addition to our huki program we also offer the chance for volunteers to adopt their own 10X10m plot in Maunalua Bay to restore on their own time. Volunteers attend a training session to learn how to manage their plot, obtain their plot coordinates, and then work to maintain their plot on their own schedule. Plots can be adopted by individuals, groups, or students.

**Stakeholders:** K-12 Student/Schools, Researchers/Scientist/University Student

**Ecosystem Services:** Marine water quality improvement, Healthy native ecosystems

### **12. Cherish, Protect, Restore Campaign**

Tags: Education, Community Engagement, Volunteer Opportunity

Summary: In 2020 we helped launch the Cherish, Protect, and Restore the ahupua’a of Maunalua Bay (or CPR) initiative. This community-focused campaign promotes monthly actions that residents can take to reduce urban and storm-water runoff. It also partners with local businesses who offer discounts, rewards, or other incentives to the participants who have completed the featured action.

**Stakeholders:** Recreational Ocean User K-12 Student/Schools, Researchers/Scientist/University Student. Local Resident

**Ecosystem Services:** Marine water quality improvement, Healthy native ecosystems, Reduced runoff

### **13. Seagrass Transplanting Project**

Tags: Habitat Restoration, Research

Summary: Maunalua Bay is home to *Halophila hawaiiiana*, an endemic seagrass found nowhere else in the world. As part of our habitat restoration initiative, we are conducting research on the best transplantation methods to seed *H. hawaiiiana* from donor beds to recently cleared habitat to increase propagation.

**Stakeholders:** Fishing community, Recreational Ocean User, K-12 Student/Schools, Researchers/Scientist/University Student

**Ecosystem Services:** Marine water quality improvement, Healthy native ecosystems, Reduced runoff, Livelihoods, Perpetuation and preservation of cultural practices

### **14. Coral Restoration**

Tags: Education, Habitat Restoration, Research, Community Engagement, Volunteer Opportunity

Summary: In 2021, partnering closely with HIMB, we will be part of a coral planting initiative that aims to seed Maunalua Bay with climate-resilient corals. The process will involve collecting coral nubins and broken coral pieces from Maunalua Bay, growing them out on an underwater nursery platform in the Bay, testing them for thermal tolerance, and then replanting them when large enough. The initiative offers an exciting chance for volunteers to help us collect and prepare coral fragments for their new life back in the Bay!

**Stakeholders:** Fishing community, Recreational Ocean User, Commercial Ocean User, Bay-side Businesses

**Ecosystem Services:** Marine water quality improvement, Healthy native ecosystems, Reduced runoff, Livelihoods

### **15. Plant a Tree, Save the Sea**

Tags: Education, Habitat Restoration, Community Engagement

Summary: The Plant a Tree, Save the Sea initiative encourages residents to reduce urban runoff by giving away free trees. In partnership with Project Lemon, XXX number of trees were sent home with Maunalua Bay residents in 2019 including a variety of native and drought-tolerant species.

**Stakeholders:** Fishing community, Recreational Ocean User, Commercial Ocean User, Bay-side Businesses, Farmers, K-12 Student/Schools, Researchers/Scientist/University Student, Local Resident, Forest users, Cultural practitioners

**Ecosystem Services:** Marine water quality improvement, Healthy native ecosystems, Reduced runoff, Livelihoods, Perpetuation and preservation of cultural practices, Climate mitigation and resilience, Hazard mitigation

### **16. Pia Valley Restoration**

Tags: Education, Habitat Restoration, Volunteer Opportunity, Community Engagement

Summary: Removal of invasive vegetation, replanting of native species.

**Stakeholders:** Local Resident, K-12 Student/Schools, Forest users, Cultural practitioners

**Ecosystem Services:** Climate mitigation and resilience, Hazard mitigation, Reduced runoff, Healthy native ecosystems