*Cultivating a golden future for Belize* - Eucheuma isiforme *seaweed*

*© Julianne Robinson*

# BELIZE SUSTAINABLE SEAWEED: FINAL REPORT

Project Period: January 1st, 2017 – December 31st, 2017
Prepared for Anthropocene Institute

The Nature Conservancy

# Key Accomplishments

*Seaweed industry partner meeting, January 27, 2017.*

*© BELTRAIDE*

**The Nature Conservancy Hosted the First Seaweed Industry Meeting** with fishing community associations on January 26th, 2017 where we convened 14 fishers and seaweed growers from seven towns/communities. During the one-day meeting, each association gave a presentation on their current status, which gave us a better understanding of the level of interest, investment and permitting needs, challenges, and opportunities. From this meeting, we identified 75 fishers from eight associations as targets for expanded seaweed pilots.

**Launched the National Seaweed Working Group.** The Working Group is a small think tank composed of The Conservancy, Beltraide, the Belize Fisheries Department, the Belize Department of Cooperatives, the Belize Federation of Fishers and the Placencia Producers Cooperative. The Working Group represents a balance of Government and fishing communities across the country and is being led by The Conservancy and Beltraide. To date, we have hosted five bi-monthly meetings. The Government's involvement signifies their commitment to seaweed aquaculture development. The Seaweed Working Group is currently informing a World Bank-funded project on how best to invest their resources to support the seaweed industry in Belize.

*Experimental seaweed raft established at Hatchet Caye, Belize*

*© Julianne Robinson*

**Curriculum Creation, Training, and Certification.** A total of 27 people were certified (11 women and 16 men) representing six of Belize's six districts, extending from the northern to the most southern communities.

- The final version of the Seaweed Cultivation Training Curriculum, written and sponsored by the Nature Conservancy (the Conservancy), the Placencia Producers Cooperative, Fragments of Hope, GEF-SGP and other partners was released in January. The training curriculum (enclosed with report) is a living document and will be revised to incorporate new information on farming techniques and design that we learned in 2017.
- The Conservancy and Beltraide sponsored a training session on March 3rd – 5th, 2017 on the cultivation of edible seaweeds in Belize. As a follow up to the January industry meeting, the Conservancy co-hosted a three-day interactive session in which ten stakeholders from five coastal communities were certified. Those certified included six commercial fishermen, two young adults from fishing families and two technical staff providing support to the seaweed project. The communities represented included Sarteneja Village, Belize City/Turneffe Atoll, San Ignacio Town, Belmopan City, Dangriga Town and Hopkins Village.
- The Conservancy sponsored and assisted with the certification at two additional training sessions in Placencia. On November 21st – 23rd, 2017, nine women from the coastal communities of Placencia, Seine Bight, and Punta Gorda became certified in sustainable seaweed aquaculture. Our partner,

# Key Accomplishments

Beltraide provided a short summary of the training. On December 9th – 10th, 2017, eight fishermen who utilize Turneffe Atoll as their fishing grounds and represent the communities of Belize City and Orange Walk Town, travelled to Placencia to to receive training and certification.

**Establishment of New Farms and Completion of Baseline Monitoring.** The Turneffee Seaweed Growers established a new farm in Turneffe Atoll and the Conservancy completed baseline monitoring at both the Placencia and Turneffe farm sites.

- Monitoring of the Turneffe Atoll farm will play an important role in determining best management practices that will be incorporated into national policy. The project included five test plots, allowing us to monitor which designs were most productive for seaweed culture. One of the greatest challenges the Turneffe growers face is lack of available seed stock, which limits the ability of the farm to scale to commercial size in the short term. Unfortunately, all test seaweed within the plots were later stolen, but plans are underway to re-establish the farm and ensure greater vigilance to prevent further theft.
- Permanent transects were established at both pilot seaweed farming sites and data was collected on water quality parameters, irradiance, and benthic and fish assemblages. Information on species abundance, density, and diversity are now available as a baseline (baseline report enclosed with report) against which we will monitor any changes. This will enable us to measure any positive or negative changes to the environment and adjust the design of the farm accordingly. We had planned to show results for before and after the establishment of farms through the use control sites. However, after establishing the sites, we realized that the heterogeneity of the area would not allow for this comparison within the grant period. Sites will be surveyed again one year from the initial survey date, at which point we'll be able to compare changes over time.

*Seaweed attracts juvenile spiny lobsters and fish, helping to sustain fisheries and improve reef health*

*© James R. Foley*

**Science partnership with University of New England.** The Conservancy has made significant steps towards establishing a formal partnership with the University of New England (UNE) to build science capacity to evaluate the ecosystems services provided by seaweed farms.

- The Conservancy conducted our first meeting in February, 2017 during the Aquaculture America Conference in San Antonio, Texas. The Conservancy staff also met with UNE's Center for Excellence in the Marine Sciences in Maine in April, 2017 to learn about seaweed farming practices in Maine and to agree to a partnership. UNE conducted a site visit of the Conservancy pilot sites from July 24th – 28th, 2017 to gather data and scope the development of a science platform for this project. The Conservancy/UNE partnership has been drafted and approved by UNE, with the Conservancy anticipating formalizing signatures soon.
- Scientists from UNE conducted a preliminary seaweed line field assessment to understand recruitment potential for macroinvertebrates and juvenile fish. Initial findings were encourag-

# Key Accomplishments

ing, with over 15 unique reef dwelling species encountered living in the seaweed, including juvenile parrotfish, shrimps, and most importantly, four algal phased spiny lobsters. This is preliminary evidence that supports our hypothesis that the seaweed farms provide post-larval settlement habitat for ecologically and commercially important species. We successfully secured funding to more rigorously test this hypothesis in 2018 with experiments that we will conduct in consultation with the Smithsonian Institute.

**Completion of Aquaculture by Design Belize Video.** We completed the production of two versions of the Aquaculture by Design: Belize video to increase awareness and build national and international support for the project in Belize. This video is the third in a series of the Conservancy's Aquaculture by Design videos, highlighting the Conservancy's in-the-water sustainable aquaculture pilot projects and industry/university partnerships that are developing the science of restorative aquaculture.

*Mariko Wallen, a very excited trainee, on her way to cultivate seaweed*

*© Wilbur F. Dubon*

*In-water training of fishing groups from across Belize, March 3-5, 2017*

*© The Nature Conservancy*

## Challenges

The greatest challenge we have faced during this project period has been theft of seaweed. Seaweed is a highly valuable commodity and if left unattended, transitory fishers may steal the crop. Given enough time, entire rafts can be taken. The Conservancy is currently working with local managers and the Belize Fisheries Department to address this issue. Due to theft, it has been difficult to increase production to meet market demands.

## Next Steps

Due to the high-level of demand within Belize to further develop the seaweed industry, the Conservancy is committed to retaining a critical role in ensuring that the industry grows in a sustainable manner. We will continue to:

- build the capacity of coastal communities, resource managers and authorities in how best to expand, monitor and regulate the seaweed industry so that it remains ecologically, socially and economically responsible;
- strengthen our science base to monitor and demonstrate the ecological benefits of sustainable seaweed aquaculture farming and use our design as a model to expand to other countries in Central America;
- develop a dialogue to create a financial mechanism with a local development bank to provide access to loans for small producers who meet our sustainability criteria; and
- foster our partnerships that have been instrumental in our progress towards ecological and economic sustainability for the seaweed industry, applying and incorporating the knowledge we have gained over the past year into a national policy for the country