



**Team Name:**

Aloha Limu

**Team School/Organization:**

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**Abstract:**

In the Hawaiian Islands prior to Western contact, limu (Hawaiian word for plant growing in a wet place) was a regular part of the people's diet and accompanied most meals. At least 63 species of limu were utilized by Hawaiians, of which only 29 species can be identified by both their Hawaiian and scientific names (Abbott 1996). Nutritionally, seaweeds were essential in the traditional Hawaiian diet because the limu may have contributed vitamins and important elements not found in the primary food items. In 1996, 18 seaweed species were in use, seven of which could be found in fish markets (Abbott 1996); however, by 2018, only two genera are regularly for sale: *Gracilaria* and *Asparagopsis*. Only two commercial seaweed farms are currently operating in Hawaii, hence there is a need to diversify opportunities for limu farmers. The future of aquaculture of Hawaiian seaweeds is in jeopardy with so few growers and so few species in cultivation. Developing aquaculture methods for native macroalgal species will provide opportunities for industry development, provide nutritious food sources, assist in reef restoration by providing outplanting "starts," and maintain unique traditions.

The design of vertical seaweed cultivation is a new approach to scale up seaweed production on terrestrial landscapes and small footprint farms. Microalgae are commonly grown in vertical bag systems, utilizing 360 degrees of light to increase production. Based on this successful method, our plan is to cultivate the native, edible species *Halymenia hawaiiiana* in a vertical system upcycled from previous microalgal culture. In addition we will utilize effluent from cultured native Hawaiian fish to fertilize the macroalgae.

Our goals are to: (1) provide scientifically tested cultivation information for a native species for commercial applications; (2) increase the number of native species in cultivation; and (3) Scale up production of native species to pilot commercial-scale production.

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