

Thesis Defense

TESTING NOVEL TECHNIQUES TO MANAGE THE INVASIVE GREEN ALGA *Avrainvillea erecta*
(Berkeley) A.Gepp & E.S.Gepp IN COASTAL WATERS OF O'AHU

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Marine algal introductions threaten the biodiversity of Hawaiian reefs. With heavy shipping traffic occurring on the south shore of O'ahu, non-native plants are transported to near shore habitats. Coastal urbanization has further degraded the native benthic ecosystem. Psammophytic, or soft bottom habitats occur adjacent to Hawai'i fringing reefs, starting at about 15-18 m depth, and remain poorly studied. These seagrass / algal meadows adjacent to coral reefs occupying as much as 50 % of benthos in Hawaiian shallow waters (<30m). This research focuses on the psammophytic plant community. A newly introduced species of green alga, *Avrainvillea erecta*, has established meadows on O'ahu and spread to Maui, and Hawai'i Island communities. The goal of this research was to monitor the growth and spread of *A. erecta* and investigate management techniques to control its populations. Physical removal treatments were applied over two years from 2020-2022, yet none of these removal treatments significantly reduced the density of the plant within the study area. However, initial abundance positively influenced the number of plants that did recover. Chemical management, using 10 ml injections of 3% hydrogen peroxide, were tested in mesocosm and *in situ* experiments. While the mesocosm experiment did not result in a significant outcome, the outcome of *in situ* experiment were statistically significant, using a linear regression model to show negative effects of hydrogen peroxide treatment over time. Early detection and rapid response coordinated with hydrogen peroxide treatments appear to be critical actions managers might consider when working to control this alga.