Report to the Twenty-Eighth Legislature
Regular Session of 2016

RECOMMENDATIONS TO STOP THE DECLINE AND REPLENISH THE SUPPLY OF LIMU AND REEF FISH IN CERTAIN AREAS OF THE EWA COAST OF OAHU

Prepared by
Department of Land and Natural Resources
State of Hawaii

In response to
House Concurrent Resolution 119, Senate Draft 1
Regular Session of 2015

November 2015

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PURPOSE

House Concurrent Resolution (HCR) 119, Senate Draft (SD) 1, adopted during the Regular Session of 2015, requested the Department of Land and Natural Resources (Department) to provide a report of its recommendations on what actions are needed to stop the decline in and replenish the supply of limu and reef fish from the easternmost point of Pu'uloa to Barber's Point, Oahu.

BACKGROUND

The Department notes that the Ewa area used to be the most productive limu grounds in the State but no longer produces limu in such amounts. The Department suspects that a reduction in the high productivity of the grounds may have been due to a loss of nutrients.

Given the limited data, it would be very difficult to scientifically prove why limu no longer grows in such abundance. The Department would have had to determine the causes for why limu was so abundant when it was abundant under past conditions, then compare those past conditions to current conditions to quantify the differences and understand the problem better. Because the Department does not have past baseline ocean nutrient information in the area, the Department had nothing to which the Department can compare current conditions.

What was causing the decline in limu and reef fish in certain areas of the Ewa coast of Oahu may have been due to several factors:

- Changes in land use along the Ewa coast with the cessation of intensive agriculture by Oahu Sugar being replaced by urban development;
- Land use changes would also change the amount and types of nutrients in the surface and groundwater runoff in the Ewa coastal area;
- Re-routing and re-alignment of outfall from wastewater treatment plants (WWTP), including the Honouliuli WWTP wastewater being re-routed to Pearl Harbor and the Pearl Harbor WWTP wastewater being re-aligned into deeper waters of the coast; and
- Prolonged drought has likely contributed to the reduction in surface and ground water flow to the ocean.
- Invasive species competition for nutrients and habitat.
- Disease impacting native species.
- Continued harvesting at rates no longer sustainable.

RECOMMENDATIONS

Without the availability of baseline data to compare the impacts of land use changes and nutrient changes, it would be difficult to determine the causes of decline in limu and reef fish in the Ewa coast areas. However, studies can be proposed to look at other possible causes of the decline in limu and reef fish in the Ewa area.

Objectives and Estimated Time Frame:

- Contract a study (multi-year (3 years)) to survey, inventory, and monitor the macro-algae community along the Ewa coast line. Study the nutrient requirements for the desired native macro-algae species and look at any invasive algae species (*Avranvilla amadelphia*) which are present that may out compete native algal species for nutrients or space. ($600k total budget).

- Research, review and analyze previous hydrological studies in the Ewa coastline area to determine what is already known and if additional hydrological studies are needed to identify causes for the decline of limu and reef fish. (1 year, $100k total budget).

  The study should include, but not be limited to:
  - Determine if groundwater flows have changed;
  - Determine if there was a nutrient change;
  - Determine if the groundwater and nutrient levels are connected; and
  - Determine if nutrient levels are the reason that limu and reef fish have declined.

- Conduct a study to review and analyze the decline in commercial limu and reef fish landings in the Ewa area. (1 year).