

HB 2020,
HD1

DAVID Y. IGE
GOVERNOR OF
HAWAII



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

Testimony of
SUZANNE D. CASE
Chairperson

Before the Senate Committee on
WATER, LAND, AND AGRICULTURE

Wednesday, March 16, 2016
3:00 PM

State Capitol, Conference Room 224

In consideration of
HOUSE BILL 2020, HOUSE DRAFT 1
RELATING TO THE CAUSES OF DECLINE IN LIMU AND REEF FISH

House Bill 2020, House Draft 1, proposes to appropriate general funds for the Department of Land and Natural Resources (Department) to conduct and contract for studies to identify the causes of decline in limu and reef fish along the Ewa coast. **The Department supports this measure provided that this appropriation does not adversely impact appropriations for other priorities in the Executive Supplemental Budget request.**

As outlined in its report to the Legislature, submitted in November 2015 in response to House Concurrent Resolution 119, Senate Draft 1, the Department believes that a combination of factors may be responsible for the decline in limu and reef fish along the Ewa coast. These potential factors include overharvesting, the decrease in groundwater recharge due to the closure of Oahu Sugar Company, the change in land use along the Ewa plain, and a prolonged drought which has led to a reduction in surface and ground water flows and less nutrients going into the ocean. Further research will be helpful in determining what factors have the greatest impact to the marine resources along the Ewa coast.

The Department wishes to acknowledge that we do not have water chemistry or other historical data to explain why limu and reef fish were more abundant in the past. Such baseline data is necessary to compare past and current conditions. However, research supported by this measure will assist in analyzing current conditions in which may have an impact on these marine resources.

Thank you for your consideration of this testimony.

**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

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

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).



**Department of Land and Natural Resources
Aha Moku Advisory Committee
State of Hawaii
Post Office Box 621
Honolulu, Hawaii 96809**

Testimony of
Shad Kane
Ewa Moku Representative – Moku O Kakuhihewa (O’ahu)

Before the Senate Committee on
Water, Land and Agriculture

Wednesday, March 16, 2016
3:00 P.M.
State Capitol, Conference Room 224

**In Consideration of
HOUSE BILL 2020 HD 1
RELATING TO THE CAUSES OF DECLINE IN LIMU AND REEF FISH**

Aloha Chair and Committee Members. My name is Shad Kane and I am the ‘Ewa Moku Representative in the State of Hawaii Aha Moku Council and speaking in support of this bill. I was born at place anciently known as Manana, recently known as Pearl City Peninsula. Today it is a training facility for the Navy Seals. My mom was a hula dancer for Pan AM when the “flying boats” used to land in Pearl Harbor. My dad used to fish, gather limu, gather shell fish in Pearl Harbor. They had to sell their house to the Navy subsequent to the bombing of Pearl Harbor. House Bill 2020 HD 1 appropriates general funds for the department of land and natural resources to conduct and contract for studies to identify the causes of decline in limu and reef fish along the Ewa coast.

Aha Moku supports this measure and offers the following comments.

The Ewa Moku, the largest moku on the island of O’ahu was once known as the “breadbasket” of the island. The produce harvested from the plains of Ewa, and the limu and fish that was gathered and caught on the reefs and near-shore areas of the Moku was so plentiful that it supplied the needs of the entire moku, as well as much of the island. Historically all outer island chiefs sought control over the island of O’ahu for one reason. ‘Ewa Moku had an abundance of resources as compared to any of the other islands and that was all due to the abundance of fresh water. No other island had the amount of fresh water as compared to ‘Ewa.

Amongst these chiefs were not just Kamehameha but Kahekili, Kalauniuhua and many others. When Thomas Edison invented the light bulb there was no longer a market for whale oil. It was at this point when our economy shifted to agriculture and capitol moved from Lahaina to O’ahu for one reason. The abundance of fresh water. We all know one aspect of this that James Campbell sealed many low elevation springs to increase the water pressure at the higher elevation springs and the construction of reservoirs to irrigate lower agricultural lands by gravity. However it was only until recently when the water stopped reaching the sea via the coral karst system. I remember as recently as the early 1970s limu piled on the beaches along a stretch once called Hau Bush. In 1985 I stabled my horses at Barbers Point NAS Stables and recall a live spring in an area a short distance from the stables. 1996 I leased 10 acres of land at Pohakea, Kunia and rode my horses in the area of the Pohakea and Lihue. I got my water from a spring. Today there are no water at any of these former springs. Sinkholes at the Kalaeloa Heritage Park today still has walls stained green from former algae. Signs of water within the karst and the drying up of springs slowly disappeared in the 1990s. It is difficult to say

with any kind of certainty what specifically caused this decline however what can be said it occurred this recently. In my conversation with Dr. Alan Ziegler who was involved in the archaeology, geology and ancient zoological study done as part of the construction of the Deep Draft Harbor at Ko Olina they found signs of ancient habitation in close proximity to the ocean. They also found one large sinkhole that was a short distance from the ocean with fresh water in it. Today that sinkhole is in the Deep Draft Harbor. It is important to also understand that all the rivers and all the fresh water from all the ahupua'a (12 ahupua'a) all fed today's Pearl Harbor and the 'Ewa shoreline. Nowhere else in the Hawaiian Islands. Only in 'Ewa. Which is why Kalaunuiohua, Kahekili and Kamehameha wanted control of the island of O'ahu to accommodate their growing populations. The question needs to be asked regarding the decline of the shoreline fresh water that passed many miles underground within the karst from the Waianae Mountains to the 'Ewa shoreline. The only answers that makes sense are "obstruction" in the karst and or "diversion".

The lack of fresh water at the shoreline means several things will occur. An alteration of the ancient vegetation along this coast as supported by the limited native vegetation as compared to anciently; the decline in limu especially limu lipoa which was once abundant along the 'Ewa coast line, the decline in opaeula which reef fish fed on which in turn larger ocean fish come close to shore to feed on reef fish. It was an ancient subsistence lifestyle around the mingling of salt and fresh. The mingling of Kane and Kanaloa as supported in the stories of the travels of Kane and Kanaloa. Different concentrations of salt and fresh support to different food resources to include, limu, crab, lobster, shell fish and large ocean fish. They can no longer be found.

Tasked with providing a report to the Legislature in 2015, the Department of Land and Natural Resources (DLNR) stated that they believed a number of factors contributed to the decline of limu and reef fish on the Ewa coast. DLNR named some of these factors as overharvesting, decrease in groundwater recharge, change in land use along the Ewa plain, and drought. Aha Moku agrees with all of this, but believe that one of the most important factors to cause the decline of limu and reef fish is the blockage of surface and ground water by development from entering the ocean.

DLNR needs the historical baseline data to compare past and current conditions in order to fulfill the mandate of this measure. We believe that the generational and traditional knowledge of the ocean resources that is held by Ewa kupuna and practitioners can help the DLNR with compiling some of the data they need. But in order for DLNR to complete their task, this measure must be passed.

Aha Moku supports HB 2020 HD 1 and ask it pass. Mahalo nui loa.

Chase DeCoite
51-A Alapio Place
Makawao, Hawaii 96768
Phone: (808) 344-8230
Email: decoite_chase@yahoo.com

Testimony Before The
House Committee on Water, Land, and Agriculture
IN STRONG SUPPORT OF HB2020, HD1
Wednesday March 16, 2016, 3:00pm, Room 224

My name is Chase DeCoite. I am a resident from the island of Maui and this is my testimony in strong support of HB2020, HD1.

For many of us in Hawaii, limu is most commonly brought to mind as an essential ingredient in our lunchtime poke bowls. For me, these plants of the sea means much more than a poke bowl. Limu is a critical cultural and ecological piece of Hawaii's ocean. Less known is that limu and reef fish serve as a key indicator for environmental health. Limu are food for fish, forming part of the foundation of a complex trophic web which we as people, especially in Hawaii derive our food from. Personally, I have learned from my elders skilled in limu. They can tell when certain fish have come in and where freshwater is flowing simply from observing the limu. As a youth in this generation I have observed a significant decline in limu and reef fish on Maui's shorelines.

I wish to strongly urge passage of HB2020, HD1, Relating to the Causes of Decline in Limu and Reef Fish to generate appropriate funds so the Department of Land and Natural Resources can conduct studies contracted to identify the causes of decline in limu and reef fish along the Ewa coast. Though I am a resident from the island of Maui I still strongly support this bill no matter the study's location. It's critical to fund this study in order to determine solutions to save what little now remains of a once abundant limu and reef fish resource. Conducting the study in Ewa will solidify evidence proving why limu and reef fish is declining beyond lack of nutrients and lay the groundwork to create future strategies to sustain this predominate resource to Hawaii and its culture.

Mahalo for recognizing limu's importance and for the opportunity to testify.

Chase DeCoite

From: mailinglist@capitol.hawaii.gov
To: [WLA Testimony](#)
Cc: nathanabe@yahoo.com
Subject: *Submitted testimony for HB2020 on Mar 16, 2016 15:00PM*
Date: Friday, March 11, 2016 11:50:44 AM

HB2020

Submitted on: 3/11/2016

Testimony for WLA on Mar 16, 2016 15:00PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Nathan Abe	Individual	Oppose	No

Comments:

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

Do not reply to this email. This inbox is not monitored. For assistance please email webmaster@capitol.hawaii.gov

From: mailinglist@capitol.hawaii.gov
To: [WLA Testimony](#)
Cc: shyla.moon@ymail.com
Subject: Submitted testimony for HB2020 on Mar 16, 2016 15:00PM
Date: Sunday, March 13, 2016 1:31:38 PM

HB2020

Submitted on: 3/13/2016

Testimony for WLA on Mar 16, 2016 15:00PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Shyla Moon	Individual	Oppose	No

Comments: Why only in Ewa beach?

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

Do not reply to this email. This inbox is not monitored. For assistance please email webmaster@capitol.hawaii.gov

From: mailinglist@capitol.hawaii.gov
To: [WLA Testimony](#)
Cc: tony@pop-hawaii.com
Subject: Submitted testimony for HB2020 on Mar 16, 2016 15:00PM
Date: Tuesday, March 15, 2016 7:59:58 AM

HB2020

Submitted on: 3/15/2016

Testimony for WLA on Mar 16, 2016 15:00PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
Tony Costa	Individual	Oppose	No

Comments: Why the reference to reef fish? Reef fish not demonstrated to be in decline - to the contrary actually. Oppose

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

Do not reply to this email. This inbox is not monitored. For assistance please email webmaster@capitol.hawaii.gov

From: mailinglist@capitol.hawaii.gov
To: [WLA Testimony](#)
Cc: bcsc@hawaii.rr.com
Subject: *Submitted testimony for HB2020 on Mar 16, 2016 15:00PM*
Date: Friday, March 11, 2016 9:42:33 AM

HB2020

Submitted on: 3/11/2016

Testimony for WLA on Mar 16, 2016 15:00PM in Conference Room 224

Submitted By	Organization	Testifier Position	Present at Hearing
William K.Chang	Individual	Oppose	No

Comments:

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

Do not reply to this email. This inbox is not monitored. For assistance please email webmaster@capitol.hawaii.gov