

# Climate Action, Resilience, and Environment Committee on 2021-09-01 9:00 AM - End time: 11:59 a.m.

Meeting Time: 09-01-21 09:00

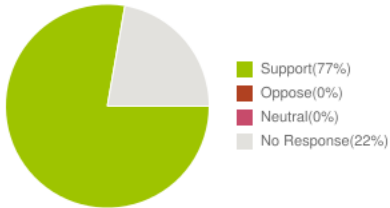
## eComments Report

Meetings	Meeting Time	Agenda Items	Comments	Support	Oppose	Neutral
Climate Action, Resilience, and Environment Committee on 2021-09-01 9:00 AM - End time: 11:59 a.m.	09-01-21 09:00	5	9	7	0	0

### Sentiments for All Meetings

The following graphs display sentiments for comments that have location data. Only locations of users who have commented will be shown.

#### Overall Sentiment



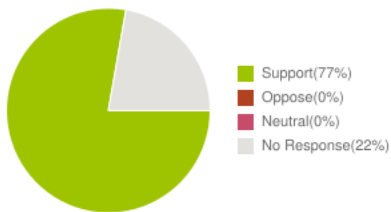
**Climate Action, Resilience, and Environment Committee on 2021-09-01 9:00 AM - End time: 11:59 a.m.**  
**09-01-21 09:00**

Agenda Name	Comments	Support	Oppose	Neutral
A G E N D A	7	7	0	0
CARE-55 CC 21-358 WETLANDS RESTORATION (CARE-55)	2	0	0	0

**Sentiments for All Agenda Items**

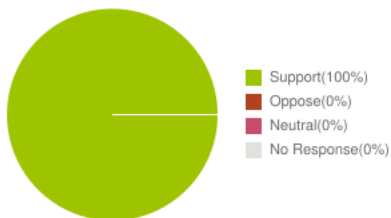
The following graphs display sentiments for comments that have location data. Only locations of users who have commented will be shown.

**Overall Sentiment**



**Agenda Item: eComments for A G E N D A**

**Overall Sentiment**



**Guest User**

Location:  
 Submitted At: 10:58am 09-01-21

The South Maui Save the Wetlands Hui would like to add the following comments:

To discover and define wetland maps:

- A review of various online information in the public domain,
- A review of Maps diagrams from the Drainage master plans, and Watershed reports and management plans.
- Historical aerial imagery analysis, and comparison with contemporary satellite imagery and aerial imagery, to see hydrology, flooding, surface water, and vegetation.
- On site visits by various experts.
- Inclusion of local knowledge from the community, historical information and experience.

Intensions of this bill:

This bill is intended primarily to protect remaining wetlands on "vacant lots/lands.

It is not intended to affect existing developments /improvements on wetlands.

Some TMK sites may already be partially developed, but have some wetland on part of a site. This bill would only affect the undeveloped portion of the land.

Provide room for wetlands to expand during flood, and to allow wetlands to migrate.

We would like to include protection for "flow through" systems, and Ephemeral streams.

To create an expanded definition of wetlands for Maui County to include all the various types of wetlands.

#### Compatible Uses:

Compatible uses or allowed uses might include non-destructive uses, such as agriculture where it already exists. For example, Yee's Orchard is a wetland and a working orchard. This use should be allowed to continue under this bill, but grading or changing the use to housing for example should not be allowed.

Existing Infrastructure such as power, sewerage stormwater, culverts, roads, and sidewalks, would be allowed to remain and to be maintained.

Open spaces such as parks would be allowed to remain as parks, as long as no grading,, or drainage improvements were made without a permit. Some requirements for parks in wetlands might include the use of non-toxic herbicides and pesticides, etc.

#### Wetland Characteristics:

Wetland Characteristics that can be observed, include vegetation types and condition of vegetation, salt deposits, soil types, streambeds, drainage markings from surface water flow and previous flood heights, visible surface water, proximity to other wetlands, contiguous elevations with known wetlands, Subsurface water level observations from site visits, the context of sites within watershed nexus, observations of flooding from various photos and videos, etc.

Mahalo.

#### **Guest User**

Location:

Submitted At: 10:13am 09-01-21

I am writing to support the preservation of Maui's endangered wetlands. Wetlands are a critical component of Maui's ecosystem. It is vital that we preserve our remaining streams and wetlands, and even restore the ones that have already been damaged by uncontrolled and irresponsible growth. Please support this measure for the sake of Maui's future and the continued well being of human and non-human life on Maui. Even If you only care about tourism, development and economic growth there is reason to protect our wetlands. Tourists come here to enjoy the beaches and scenic beauty. If you allow it to be destroyed, we will simply become another concrete jungle like Waikiki.

Aloha,

Joy Kaaz

Kihei resident

#### **Emily Pallanes**

Location:

Submitted At: 9:17am 09-01-21

Hawaiian Wetlands are endangered which means our city infrastructure within the original 210 acres of South Maui Wetlands is at risk for serious potential flooding. As the weather continues to change and storm strength continues to, flooding is a factor in our future of Kihei that cannot be ignored. I was born and raised on the island of Maui and it is absolutely devastating to watch as the years go by and Kihei remains to be the fastest growing city in the State of Hawaii. Responsibility for preserving and protecting streams and gulchs seems to have been breached. I can drive down south kihei road and watch developers remove ancient streambed rocks that can never be replaced and those features to our island is what keeps the current infrastructure i.e. neighborhoods safe. When we remove the water's natural streamlines in turn beaches and reefs have been detrimentally affected by the flooding which leads to the killing of so much shoreline marine life. Parks and shopping centers, parking lots within the wetlands are in danger. Sea levels are rising and our wet season is only going to get wetter. Watching developers on Maui have no consideration about the fragility of our island's one-of-a-kind ecosystem is more than disappointing. When I am in the middle of kihei and I study the grounds within the wetlands, I find water almost instantly on a hot summer day. I can still remember the days when the ponds were

in much better condition and kids could fish along the sides of the ponds. The importance of Hawaiian Wetlands is unspeakable. These wetlands are what keep our island community safer and the natural features surrounding all streamlines and gulches should be harnessed and preserved for the safety of our future. Because more than 50% of South Maui's Hawaiian Wetlands have been lost since approx 1963 it has never more important to act collectively. To protect and preserve endangered hawaiian wetlands is to protect the safety of everyone residing in South Maui.

## **Guest User**

Location:

Submitted At: 9:20pm 08-31-21

### **CARE-55 CC 21-358 WETLANDS RESTORATION (CARE-55)**

#### **Wetlands role in protecting beaches:**

Coastal wetlands in Maui play a critical role in protecting beaches and other valuable near-shore natural resources by providing a number of important ecosystem services, including regulating and attenuating sediment flow in nearshore waters, creating a nutrient sink that prevents nitrogen and phosphorous pollution from entering the ocean and harming coral reefs, provisioning of habitat for indigenous and endemic Hawaiian waterbirds, providing for groundwater aquifer recharge, and flood mitigation.

Wetlands play a significant role in the lives of the Hawaiian people (Kanaka Maoli), as both the domain of aumakua (particularly Kihawahine in the South Maui area), and the establishment of landscapes that serve important economic, social, and ritual purposes, such as lo'i kalo (taro patches), and loko i'a (fishponds).

#### **We need wetlands as part of our drainage infrastructure, to help handle stormwater runoff:**

Stormwater from flash flooding can create nuisance flooding. Ponding on roadways can disrupt the transport infrastructure. Flooding and stormwater runoff are natural events, so open space such as gulches and wetlands must be preserved to give the water somewhere to go. If you remove the wetlands the water will flow into homes, roads, and the ocean.

#### **We need a broader definition for wetlands:**

Many types of Wetlands are not currently designated and have very few protections. Maui has a wide variety of wetlands that provide important functions. Many of these wetlands are degraded or have been disturbed. Many of our remaining wetlands have had some partial destruction from modifications such as, drainage ditches, removal of vegetation, or loss of wildlife, so that they may not currently meet all the specific criteria of the narrow definitions for wetlands. However many of these temporarily degraded wetlands could easily be restored to meet the criteria of the more narrow wetlands definitions. Maui needs to create its own set of wetland definitions that include all of our types of wetlands so that degraded and stressed wetlands will also be preserved, and ultimately restored.

#### **The majority of Maui's wetlands are on private property.**

Many wetlands consist of several TMK parcels, often with multiple land owners. One of the challenges in wetland protection is seeing the whole picture and not treating each individual parcel as a separate issue. The collective system must be protected, and the cumulative effects of development must be properly considered.

#### **Wetlands role in Climate Change:**

In the face of climate change and sea-level rise the wetlands provide important protection of land and water. Unfortunately, for well over a century, wetlands have been filled in, cut up, and disconnected resulting in these vital ecosystem services being lost to development. We need to preserve wetlands and open space. We need to create buffer zones around wetlands so that they can expand and migrate. Sea Level Rise will also bring rising water tables that will cause wetlands to migrate shoreward and upward. Our gulches, and streambeds are all part of the wetland and watershed infrastructure, and these are places where future wetlands will likely appear.

#### **Saving the remaining Wetlands:**

The importance of protecting, restoring, and expanding, Maui's remaining wetland ecosystems cannot be overemphasized. We need a County-wide program has to assess, identify, and prioritize the remaining wetlands for restoration. We also need a program to work with landowners to protect wetlands on their property, and seek to link wetlands into a corridor that functions as an interconnected ecological system for the mutual benefit of the

County. We need to protect the wetlands from destruction and development. If we do not act now, there will be few ecologically viable wetlands left within the coming decade.

Mahalo,  
David Dorn

### **Guest User**

Location:

Submitted At: 10:03am 08-31-21

We should be thinking about how to restore the wetlands, haven't we gone far enough.

**\*\*We need the TOP 10+ Bullet Points for this Bill.**

**\*\* 1) This bill does not go far enough to protect our wetlands on Maui.**

2) We need a county-specific definition of Wetlands, as recommended for specific areas. that do not fit standard definitions.

3) Wetlands Must be protected and NOT developed.

4) Wetlands are absolutely vital part of the watershed.

5) COunty needs an EA Assessment and County-Wide wetlands Study, and Inventory, similar to the South Maui Save the wetlands Study (not finalized).

6) FInal determination of Wetlands needs to be determined by An appointed "Wetlands Committee" (not just the Planning director).

7)Wetlands Committee must consist of Watershed experts, as well as Environmental Groups and Ahupua'a Stakeholders, and Cultural Representatives. Wetlands need the oversight of the "watershed konohiki".

8) The burden of proof needs to be on any developer to prove no harm to watershed or wetland functions.

9) Who is going to prepare "the Map"?, it should be Wetland Experts and Watershed professionals, (\*Note they could get Michael Reyas to do it, and it will be BAD).

10) A Map seems like a BAD Idea, A broad Definition would be Better, with eth Onus of proving no degeneration of Wetland Services.

11) Maybe we should Protect ANY piece of land that Provides "Wetland Services" instead of just protecting "Wetlands". If we protected "Wetland Services" and "Wetland Functions", that would Include all Gulches, Streams, Floodways AND Wetlands.

### **Robin Knox**

Location:

Submitted At: 10:00am 08-31-21

Testifying on behalf of the South Maui Save the Wetlands Hui. Please see attached comments on the proposed bill

### **Guest User**

Location:

Submitted At: 9:40am 08-31-21

My name is Robert Aldrich. I have lived full-time in Maui County for 13 years – six years on Moloka'i and seven years on Maui.

I previously worked for the California Department of Fish & Wildlife for 20 years, five years of which included working with biologists to protect five northern California wetlands: Laguna de Santa Rosa Preserve, the San Francisco Estuary, the Napa-Sonoma Wildlife Area, the Petaluma Wetlands, Grizzly Island Wildlife Area.

I strongly support the preservation, protection & restoration of Maui County wetlands. They are distinct ecosystems. One of the most important services that wetlands provide is the inherent capacity to avoid, minimize, or mitigate the impacts of climate change by sequestering large quantities of carbon from the atmosphere, which may have been accumulating for hundreds to thousands of years. The loss or degradation of a wetland means not only the demise of that particular carbon sink, but also that the carbon stored in that wetland will be released.

Too many wetlands in Maui County have been destroyed to make way for businesses, yet more wetlands are being planned for development. We have a wetland emergency. They need preserved and restored. In my

professional opinion, they are more precious than market values or commercial profits.

Maui County not only needs to approve an ordinance to preserve, protect, & restore all wetlands, but also adopt its own wetland definitions and framework because:

1. The State of Hawaii does not have a management plan or a statute to restore & protect wetlands.
2. The Clean Water Act (CWA) might, and has been gutted by changing political climates.
3. Many of our wetlands do not qualify as Waters of the U.S. (WOTUS) per the criteria set by the U.S. Army Corps of Engineers.
4. Federal case laws (Rapanos v United States, and others) opened the door for the county to regulate wetlands where the wetland has no continuous surface connection to a permanent navigable waterway.
5. The CWA does not have primacy over states re. wetlands - 33 USC section 1251 (b) & (g) recognizes the rights of states to plan the restoration and preservation of land and water resources.

I strongly suggest the following definition, or something similar:

“An area of land having one the three following attributes:

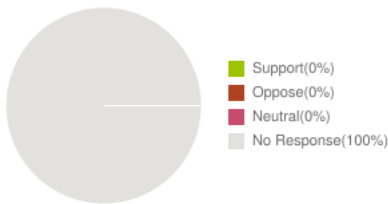
1. At least periodically, the land supports wetland vegetation typically adapted for life in saturated soil conditions (hydrophytic vegetation);
2. The substrate is saturated or covered by shallow water at some time;
3. The substrate is predominantly undrained hydric soil (soil that is saturated or flooded long enough to produce the anaerobic conditions that wetland vegetation requires.

On the subject of shielding wetlands from nearby construction, my experience is that protection buffers and devices around and between wetland resources disturb the natural streamflow, including the functioning wetland. Developers should be prevented from any development in or around wetlands. Wetlands are connected to other watershed features within an ahupua'a and protective devices interfere with that network. The entire drainage area, including such aspects as the floodplain and groundwater, must be considered when estimating drainage impacts on a wetland within the ahupua'a.

The approval/disapproval of proposed wetland-related projects and the development of a wetland management plan must involve coordination with local residents, especially with native tenants of the respective ahupua'a.

#### Agenda Item: eComments for CARE-55 CC 21-358 WETLANDS RESTORATION (CARE-55)

#### Overall Sentiment



#### CARE Committee

Location:

Submitted At: 6:07am 11-30-21

#### Testimonies Received from CARE Committee

#### Robin Knox

Location:

Submitted At: 10:29am 09-01-21

#### Definition of Wetlands

(I) “Wetlands” are defined to include:

(A) Areas where water is the primary factor controlling the environment and the associated animal and plant life; where for any duration of time, at a frequency including non-consecutive years, the water table is at or near the surface and the land is saturated by:

- (i) Subsurface water including, but not limited to the water table, subsurface kahawai, or springs; or
- (ii) The land is covered by water.
- (B) Areas of marsh, fen, peatland or water. The waterbody can be:
  - (i) natural or artificial;
  - (ii) permanent, temporary, Intermittent or ephemeral
  - (iii) static or flowing
  - (iv) fresh, brackish, or salt;
  - (v) above or below ground
  - (vi) groundwater, precipitation, or surface water-driven hydrology
- (C) Areas of marine water the depth of which at low tide does not exceed 6 meters, including fishponds and coral reefs .
- (D) Areas of riparian zone and floodplain, including flowing, intermittent or ephemeral streams, and streambeds.
- (E) Areas of coastal zones adjacent to wetlands, islands, or bodies of marine water deeper than 6 m at low tide lying within the wetlands.
- (F) Areas where hydric soils are present
- (G) Areas where there is surface or subsurface water that is hydrologically connected to wetlands.
- (H) Areas described by the six wetlands classifications including:
  - (i) Marine: coastal wetlands, coastal lagoons, rocky shores, seagrass beds, coral reefs; anchialine pools
  - (ii) Estuarine: muliwai, deltas, tidal marshes, mudflats, mangrove swamps;
  - (iii) Lacustrine: wetlands near natural lakes or ponds;
  - (iv) Riverine; wetlands near rivers, streams, and gulches
  - (v) Palustrine; marshes, swamps, bogs;
  - (vi) Human-made; Loko I'a (Hawaiian fish ponds), Lo\_i Kalo, shrimp ponds, farm ponds, paddies, dams.
- (I) Areas that provide wetland functions including:
  - (i) Conveyance of stormwater
  - (ii) Flood attenuation and storage
  - (iii) Sediment attenuation and reduction
  - (iv) Nutrient and chemical attenuation and reduction
  - (v) Plant community abundance and diversity
  - (vi) Fish and wildlife habitat
  - (vii) Groundwater recharge and discharge
  - (viii) Shoreline or stream bank anchoring
  - (iv) Carbon sequestration
- (J) Areas that formerly had wetland characteristics or functions but have been altered or degraded by channelization, filling, draining, dredging, grading, grubbing, deep ripping, groundwater pumping, hardening of surfaces, or introduction of non-native or aggressive-invasive plant and animal species.

## CARE Committee

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**From:** Jordan Hart <Jordan.Hart@co.maui.hi.us>  
**Sent:** Monday, August 30, 2021 5:03 PM  
**To:** CARE Committee  
**Cc:** Michele McLean; Kelly King; Shane M. Sinenci  
**Subject:** CARE-55, Planning Testimony

Aloha Chair,

Please excuse the informal nature of these comments due to time limitations.

The Planning Department respectfully requests that the details of this bill and the overall intended function be worked on further in committee in order to better ensure intended outcomes.

19.47.010 – The areas being described are already zoned. An overlay or overlay district are a more appropriate description of the proposal. The bill does not provide information on how the Council will establish the overlay, by ordinance or other measure. The criteria for determining which areas should be subject to the overlay should be defined.

19.47.020 – This policy should be repeated in titles 18 and 20.

19.47.030 -- the title 18 (#1) and 20 (#7) items should be removed, and the requirement for the report should be put in those titles since we don't administer them. This section also excludes actions allowed by ministerial permits that could have greater impacts on wetlands than some of the other actions listed. CUPs that don't involve ground altering shouldn't have to do this report, so that should be qualified. Also, B6 needs to be clarified that it relates to wetlands, not the project in general.

19.47.040 -- B. An ordinance should not include a narrative on findings or conclusions, that information should be documented on the record in other places (such as staff or committee reports). If there are wetland impacts or mitigation is needed, conditions should be placed on the approval. Conditions of approval could be recorded with a UA, if appropriate.

19.47.050. A should be deleted. It is foreseeable that a need could arise for structures necessary to protect the wetlands, promote habitat or facilitate restoration.

19.47.060 – Guidelines, a process or criteria should be provided as the basis for determining the overlay area. There are resources available providing information about wetlands -- which of those should be used by the County for mapping? The map should be updated periodically. Details contained and criteria for production should be specified. If the map is going to be used to establish overlay districts, the bill should spell-out any criteria that the map needs.

19.47.070 should state that if there is a conflict, then the more restrictive applies.

18.08.100.E – "Consider" is a subjective term without a measurable verification in this context. The criteria of creating a summary of findings following consideration or adding conditions to mitigate impacts may be appropriate. Same comment for 20.08.080.

19.06.010 – A completely different subsection may be needed for overlays. A cultural overlay is anticipated to be created. Overlays should not be confused with zoning districts which are distinctly different. Similar to parking and STRHs, this can be in title 19 but is not a zoning district.

Mahalo for your consideration,

Jordan E. Hart, Deputy Director  
Department of Planning



County of Maui

[Jordan.Hart@co.maui.hi.us](mailto:Jordan.Hart@co.maui.hi.us)

(808) 270-7821

## CARE Committee

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**From:** robin.s.knox@gmail.com  
**Sent:** Wednesday, September 01, 2021 10:43 AM  
**To:** CARE Committee  
**Subject:** Additional details from HUI for Discussion  
**Attachments:** comment.docx; Criteria for mapping.docx

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

You don't often get email from robin.s.knox@gmail.com. [Learn why this is important](#)

I tried submitting in ecomment but not sure everything uploaded – kept getting server error message  
The attached document entitled comment includes the detailed definition, technical guidance on classification of wetlands, and wetland indicators  
The document entitled mapping criteria includes the guidance we used when preparing our maps on the grant project

Robin S. Knox, QEP  
Project Manager  
South Maui Save the Wetlands Hui  
(808)866-6659

- (I) "Wetlands" are defined to include:
- (A) Areas where water is the primary factor controlling the environment and the associated animal and plant life; where for any duration of time, at a frequency including non-consecutive years, the water table is at or near the surface and the land is saturated by:
- (i) Subsurface water including, but not limited to the water table, subsurface kahawai, or springs; or
  - (ii) The land is covered by water.
- (B) Areas of marsh, fen, peatland or water. The waterbody can be:
- (i) natural or artificial;
  - (ii) permanent, temporary, Intermittent or ephemeral
  - (iii) static or flowing
  - (iv) fresh, brackish, or salt;
  - (v) above or below ground
  - (vi) groundwater, precipitation, or surface water-driven hydrology
- (C) Areas of marine water the depth of which at low tide does not exceed 6 meters, including fishponds and coral reefs .
- (D) Areas of riparian zone and floodplain, including flowing, intermittent or ephemeral streams, and streambeds.
- (E) Areas of coastal zones adjacent to wetlands, islands, or bodies of marine water deeper than 6 m at low tide lying within the wetlands.
- (F) Areas where hydric soils are present
- (G) Areas where there is surface or subsurface water that is hydrologically connected to wetlands.
- (H) Areas described by the six wetlands classifications including:
- (i) Marine: coastal wetlands, coastal lagoons, rocky shores, seagrass beds, coral reefs; anchialine pools
  - (ii) Estuarine: muliwai, deltas, tidal marshes, mudflats, mangrove swamps;
  - (iii) Lacustrine: wetlands near natural lakes or ponds;
  - (iv) Riverine; wetlands near rivers, streams, and gulches
  - (v) Palustrine; marshes, swamps, bogs;
  - (vi) Human-made; Loko I'a (Hawaiian fish ponds), Ps' n' Dep \$ Shrimp ponds, farm ponds, paddies, dams.
- (I) Areas that provide wetland functions including:
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  - (vii) Groundwater recharge and discharge
  - (viii) Shoreline or stream bank anchoring
  - (iv) Carbon sequestration
- (J) Areas that formerly had wetland characteristics or functions but have been altered or degraded by channelization, filling, draining, dredging, grading, grubbing, deep ripping, groundwater pumping, hardening of surfaces, or introduction of non-native or aggressive-invasive plant and animal species.

## Wetlands classifications:

- A. "Marine" systems are defined to be open ocean overlying continental shelf and its associated high-energy coastline, exposed to waves and currents of the open ocean with salinity greater than 30 ppt.
- (i) Marine systems include, but are not limited to, coastal wetlands, coastal lagoons, rocky shores, seagrass beds, coral reefs, shallow coastal indentations, bays, coasts with exposed rocky islands.
  - (ii) Marine System Limits - the outer edge of the continental shelf shoreward to one of three lines:
    - a. The landward limit of tidal inundation (extreme high water or spring tides) including the splash zone from breaking waves;
    - b. The seaward limit of wetland emergent, trees, or shrubs; or
    - c. The seaward limit of the estuarine system, determined by factors other than vegetation.
  - (iii) Marine subsystems:
    - a. Subtidal - substrate is continuously covered with tidal water; and
    - b. Intertidal - substrate is flooded and exposed by tides, including the wave splash zone
  - (iv) Marine classes: rock bottom, unconsolidated bottom, aquatic bed, reef, rocky shore, and unconsolidated shore.
- B. "Estuarine" systems are deepwater tidal habitats adjacent to tidal wetlands that may usually be semi-enclosed by land where water regimes and chemistry are affected by oceanic tides, precipitation, freshwater runoff or submarine springs, evaporation, and wind. Estuarine systems are subject to at least sporadic access to open ocean, and ocean water is at least occasionally diluted by freshwater runoff from land or submarine springs. Salinity may be higher than the ocean and along some low-energy coastlines there is appreciable dilution of seawater. Salinity may be hyperhaline to oligohaline.
- (i) Estuarine systems include, but are not limited to, deltas, tidal marshes, and mudflats.
  - (ii) Estuarine System Limits -
    - a. Upstream and landward to where ocean-derived salts measure less than 0.5 ppt during average annual low flow;
    - b. Seaward to an imaginary line closing the mouth of a river, bay, sound, or other indentation;
    - c. To the seaward limit of wetland emergent, shrubs, or trees where they are not included in (b); and
    - d. Offshore areas of Continuously diluted seawater.
  - (iii) Estuarine Subsystems:
    - a. Subtidal - see II(A)(iii)(a).
    - b. Intertidal - see II(A)(iii)(b).
  - (iv) Estuarine Classes: rock bottom, unconsolidated bottom, aquatic bed, reef, streambed, rocky shore, unconsolidated shore, emergent wetland, scrub-shrub wetland, and forested wetland.
- (C) "Lacustrine" systems are deepwater habitats with all of the following: they are situated in a topographic depression or dammed river channels, they lack trees, shrubs, and persistent emergent, emergent mosses or lichens with 30% or greater area coverage, total area is at least 8 hectares (20 acres) (less than 8 ha included if an active wave-formed or bedrock shoreline feature makes up all or part of the boundary and the deepest depth of the basin exceeds 2.5 m (8.2 ft) at low water).
- (i) Lacustrine systems include, but are not limited to, lakes, reservoirs, intermittent lakes, tidal lakes with ocean-derived salinities and the wetlands near those features.
  - (ii) Lacustrine System Limits:

a. Bounded by upland or by wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. Dammed river channels are bounded by a contour approximating the normal spillway elevation or normal pool elevation.

(iii) Lacustrine Subsystems:

- a. Limnetic - all deepwater habitats in the lacustrine system; and
- b. Littoral - all wetland habitats in the lacustrine system.

(iv) Lacustrine Classes: rock bottom, unconsolidated bottom, aquatic bed, rocky shore, unconsolidated shore, and emergent nonpersistent wetland.

(D) "Riverine" systems are all wetlands and deepwater habitats contained within a channel that has not been artificially channelized, narrowed, or concreted. A channel is an open conduit which may periodically or continuously contain moving water, or which forms a connecting link between two standing bodies of water. Water may usually flow, but the channel may also be dry for long periods of time.

(i) Riverine systems include, but are not limited to, gulches, streambeds, and wetlands near rivers, streams, and gulches.

(ii) Riverine System Limits:

- a. Bounded on the landward side by upland, the channel bank, or wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens;
- b. Terminates at the downstream end where concentration of ocean-derived salts is greater or equal to 0.5 ppt during average annual low flow, or where the channel enters a lake;
- c. Terminates at the upstream end where the tributary streams originate, or where the channel leaves a lake, including springs; and
- d. Braided streams are bounded by the banks forming the outer limits of depression within which braiding occurs.

(iii) Riverine Subsystems:

- a. Tidal - upstream limit of tidal fluctuations down to upper boundary of the estuarine system. Ocean derived salts reach 0.5 ppt during average annual low flow, the gradient is low, water velocity fluctuates under tidal influence, stream bottoms are mainly mud with occasional sand patches, oxygen deficits may occur, and the floodplain is well developed;
- b. Lower Perennial - high gradient, no tidal influence, some water flows all year, except during drought, sand and mud, oxygen deficits sometimes occur, fauna reach maximum abundance in still water, true planktonic organisms are common, and the floodplain is well developed;
- c. Upper Perennial - high gradient, no tidal influence, some water flows all year, except during extreme drought, rock, cobbles, or gravel with occasional sand, oxygen concentration near saturation, fauna characteristic of running water, little to no planktonic forms, and the flood plain is minimally developed; and
- d. Intermittent - flowing water part of the year, isolated pools when not flowing or absent.
- e. Ephemeral - flowing water in response to precipitation, isolated pools occur when not flowing but may not always be present during dry periods

(E) "Palustrine" systems are all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. Includes all wetlands lacking such vegetations but with the following four characteristics: less than 8 ha, active wave-formed or bedrock shoreline features lacking, water depth in the deepest part of the basin is less than 2.5 m at low water, and salinity due to ocean-derived salts is less than 0.5 ppt.

(i) Palustrine systems include, but are not limited to, marshes, swamps, fens, prairies, bogs, and small, shallow, permanent or intermittent ponds.

(ii) Palustrine System Limits - bounded by upland and any of the other four systems.

(iii) Palustrine Subsystems: none.

(iv) Palustrine Classes: rock bottom, unconsolidated bottom, aquatic bed, unconsolidated shore, moss-lichen wetland, emergent wetland, scrub-shrub wetland, and forested wetland.

(F) "Human-made" systems are any artificial water systems that perform some similar functions to wetlands.

(i) Human-made systems include, but are not limited to, Native Hawaiian fish ponds, shrimp ponds, farm ponds, paddies, detention areas, dams and artificially channelized, narrowed, or concreted channels

## Wetlands Diagnostic Indicators –

The following indicators may be used to identify wetlands, however it is not necessary to identify indicators from each and every category to classify land as wetlands.

A. Vegetation - Hydrophytic species, due to morphological, physiological, and/or reproductive adaptations, have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions.

(i) Indicators:

- a. More than 50% of the dominant species are obligate wetland plants (OBL), facultative wetland plants (FACW), and facultative plants (FAC);
- b. Visual observation of plant species growing in areas of prolonged inundation and/or soil saturation;
- c. Morphological adaptations;
- d. Technical literature including taxonomic references, botanical journals, technical reports, technical workshops, conferences, and symposia, and/or wetland plant database;
- e. Physiological adaptations; and/or
- f. Reproductive adaptations.

A. Soil: soils are present that have been classified as hydric, or they possess characteristics that are associated with reducing soil conditions.

(i) Nonsandy soil indicators:

- a. >50% of top 32 inches are Organic Material;
- b. Histic epipedon, an 8 to 16 inch layer at or near surface of mineral soil saturated for at least 30 consecutive days in a year with at least 20% OM (30% when clay is 60% or more);
- c. Sulfidic material;
- d. Aquic or peraquic moisture, reducing one, oxygen free;
- e. Reducing soil conditions;
- f. Gleyed soils, bright mottles, low matrix chroma;
- g. Hydric soil list appearance;

(ii) Sandy soil indicators:

- a. High OM in surface horizon;
- b. Streaking of subsurface horizons by OM;
- c. Organic pans;

B. Hydrology: the area is inundated either permanently or periodically at mean water depths less than or equal to 6.6 ft, or the soil is saturated close to the surface at some time during the growing season of the prevalent vegetation.

(i) Indicators:

- a. Recorded data from CE District Offices, USGS, state, local, and county agencies, Soil Conservation Service Small Watershed Projects, and planner developing documents.
- b. Visual observation of inundation;
- c. Visual observation of soil saturation;
- d. Watermarks;
- e. Drift Lines;
- f. Oxidized root channels;
- g. Water-stained leaves;
- h. FAC-Neutral Test;
- i. Salt deposits;
- j. Sediment deposits; and
- k. Drainage patterns within wetlands.

## Criteria for mapping

Review of various Online information in the public domain, which included specifically: Wetland maps diagrams from the SMDMP and SM Watershed plan. Plus Historical aerial imagery analysis, and comparison with contemporary satellite imagery and aerial imagery, Preliminary site visits, and local knowledge.

More wetlands than the 20 or so studied were revealed, but many wetlands had already been built over.

So only the remaining wetlands on "vacant lots/lands were considered for this study.

The study group is a sample sub-set of all wetlands and is not exhaustive, complete, or absolute as there are many smaller lots, and partial lots remaining that are likely worthy of further study and preservation/restoration.

The sites selected include only the South Maui /Kula Kai study area, which did not extend past Kalama Park/Charlie Young.

There are more sites farther south, and Mauka that deserves further attention, and inclusion in an expanded

Per my brief, Specific attention was paid to the "most at risk wetlands", \*at risk from destruction by development.

Wetland Characteristics observed, included vegetation, including the types and condition of vegetation, salt deposits, soil types, streambeds, drainage markings from surface water flow and previous flood heights, visible surface water, proximity to other wetlands, contiguous elevations with known wetlands, Subsurface water level observations from site visits, the context of sites within watershed nexus, observations of flooding from various photos and videos, etc.