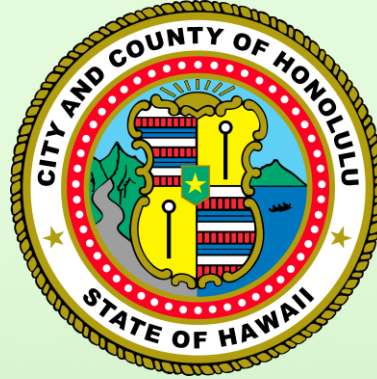




# **Honolulu Board of Water Supply East Honolulu Watershed Management Plan**

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Mayor Rick Blangiardi

# East Honolulu Watershed Management Plan (EHWMP)

City Council Housing, Sustainability, and Health Committee Meeting #1

August 21, 2024

# Presentation Agenda

1. EHWMP Overview & Planning Process
2. Community Involvement
3. EHWMP Public Review & Final Draft
4. Adoption Process
5. Q&A

# EHWMP Overview & Planning Process



# EHWMP Goal & Objectives

## GOAL

Develop a holistic WMP that will provide a balance between: 1) the preservation, restoration, and management of O'ahu's watersheds; and 2) sustainable ground water and surface water use and development to serve present users and future generations.

## OBJECTIVES

Promote sustainable watersheds

Protect and enhance water quality and quantity

Protect Native Hawaiian rights and traditional and customary practices

Facilitate public participation, education, and project implementation

Meet water demands at reasonable costs

# OWMP Framework

## STATE WATER CODE

### HAWAII WATER PLAN

- Statewide Framework to Update HWP
- Water Resource Protection Plan
- Water Quality Plan
- State Water Projects Plan
- Agricultural Water Use and Development Plan
- County Water Use and Development Plans

## O'AHU GENERAL PLAN

### 8 Development Plan (DP)/ Sustainable Communities Plan (SCP)

### Legal/ Regulatory/Policy Guidance

- Act 152: Watershed Protection
- Waiāhole Ditch Decision
- Ch 30, ROH Water Management
- BWS Mission Ka Wai Ola
- Mayor's Climate Change & Sea Level Rise Directive 2018
- Ola O'ahu Resilience Strategy

### O'AHU WATER MANAGEMENT PLAN (BY DP/SCP DISTRICT)

Wai'anae

Ko'olau  
Loa

Ko'olau  
Poko

North  
Shore

'Ewa

Central  
O'ahu

PUC

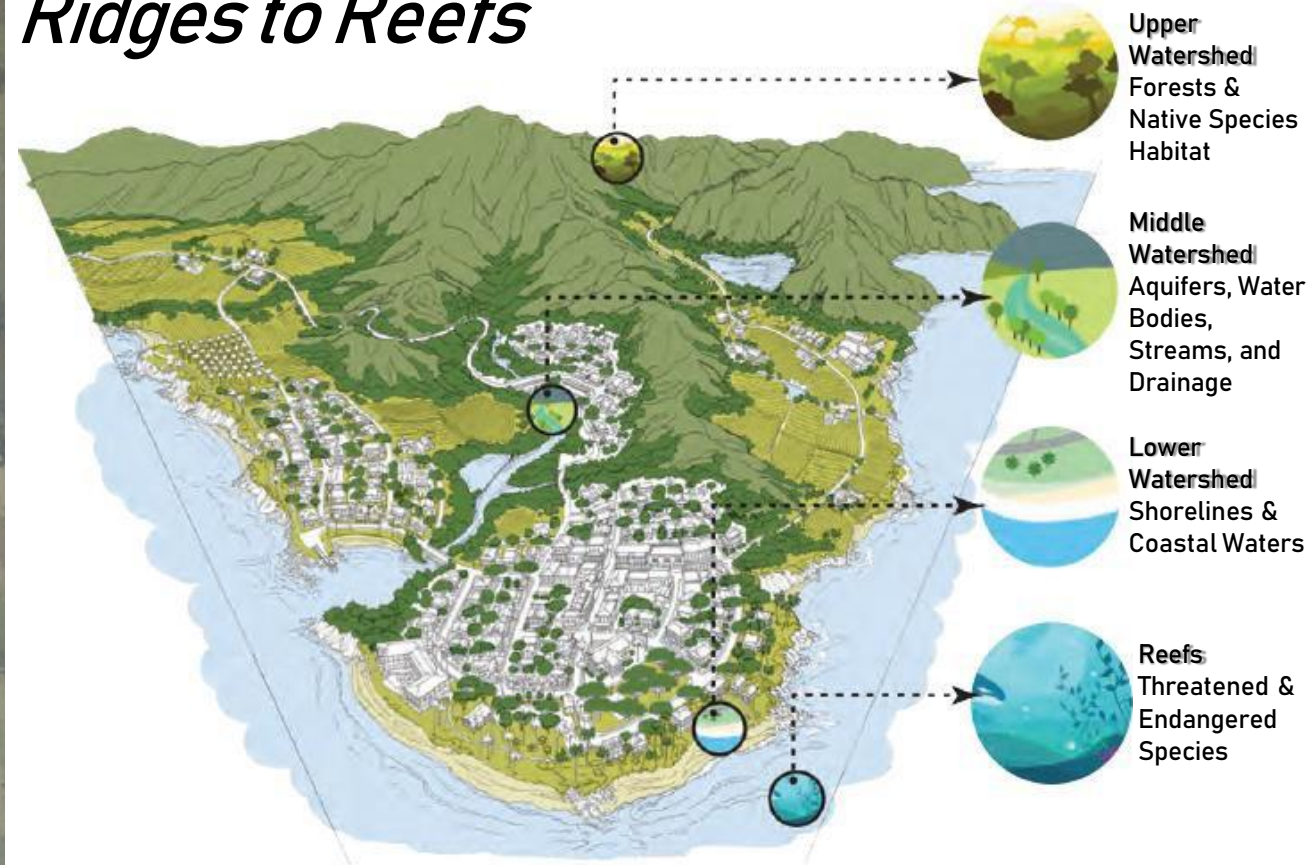
EAST  
HONOLULU

# Ahupua'a Model

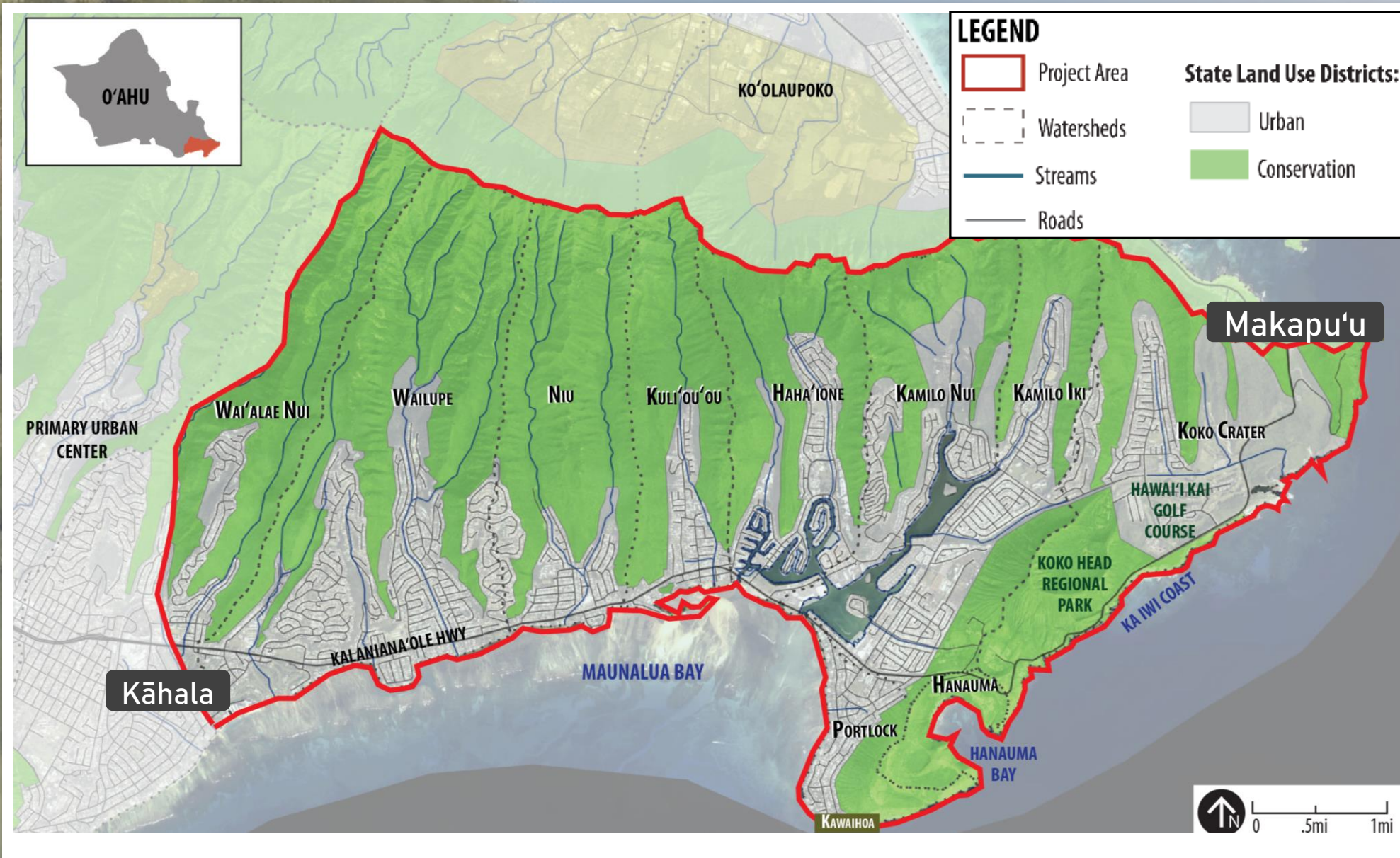
Planning concept based on Native Hawaiian ahupua'a model (systems-thinking), emphasizing:

- Watershed health
- Holistic resource management
- Self-sufficient and sustainable communities
- Inter-relationship of mauka and makai resources
- Stewardship and kuleana of land, water, people & culture

## *Ridges to Reefs*



# East Honolulu Planning District Kāhala to Makapu'u



# EHWMP Planning Process

Research & Identify Key Water Resource Issues



Preliminary Watershed Analysis &  
Water Demand Forecasting



Water Supply Options & Watershed  
Management Policies, Projects & Strategies



Agency Review & Public Review Draft EHWMP



We Are  
Here

Final Draft EHWMP & Adoption Process

Community  
Meeting #1

Community  
Meeting #2

Community  
Meeting #3

Community  
Meeting #4

Stakeholder Consultations



# EHWMP Schedule

 Community Meeting

|                                      | 2019 |                                                                                   |   |                                                                                   | 2020 |   |   |   | 2021 |                                                                                     |   |   | 2022 |   |   |   | 2023 |   |                                                                                       |   | 2024 |   |   |
|--------------------------------------|------|-----------------------------------------------------------------------------------|---|-----------------------------------------------------------------------------------|------|---|---|---|------|-------------------------------------------------------------------------------------|---|---|------|---|---|---|------|---|---------------------------------------------------------------------------------------|---|------|---|---|
| Year Quarter                         | 1    | 2                                                                                 | 3 | 4                                                                                 | 1    | 2 | 3 | 4 | 1    | 2                                                                                   | 3 | 4 | 1    | 2 | 3 | 4 | 1    | 2 | 3                                                                                     | 4 | 1    | 2 | 3 |
| Stakeholder Consultation             |      |  |   |                                                                                   |      |   |   |   |      |                                                                                     |   |   |      |   |   |   |      |   |                                                                                       |   |      |   |   |
| Watershed Profile                    |      |                                                                                   |   |                                                                                   |      |   |   |   |      |                                                                                     |   |   |      |   |   |   |      |   |                                                                                       |   |      |   |   |
| Water Demand Analysis                |      |                                                                                   |   |  |      |   |   |   |      |                                                                                     |   |   |      |   |   |   |      |   |                                                                                       |   |      |   |   |
| Projects & Strategies                |      |                                                                                   |   |                                                                                   |      |   |   |   |      |  |   |   |      |   |   |   |      |   |                                                                                       |   |      |   |   |
| Implementation Plan                  |      |                                                                                   |   |                                                                                   |      |   |   |   |      |                                                                                     |   |   |      |   |   |   |      |   |                                                                                       |   |      |   |   |
| Agency Review & Public Review Drafts |      |                                                                                   |   |                                                                                   |      |   |   |   |      |                                                                                     |   |   |      |   |   |   |      |   |  |   |      |   |   |
| Final EHWMP & Approvals Process      |      |                                                                                   |   |                                                                                   |      |   |   |   |      |                                                                                     |   |   |      |   |   |   |      |   |                                                                                       |   |      |   |   |

We are here

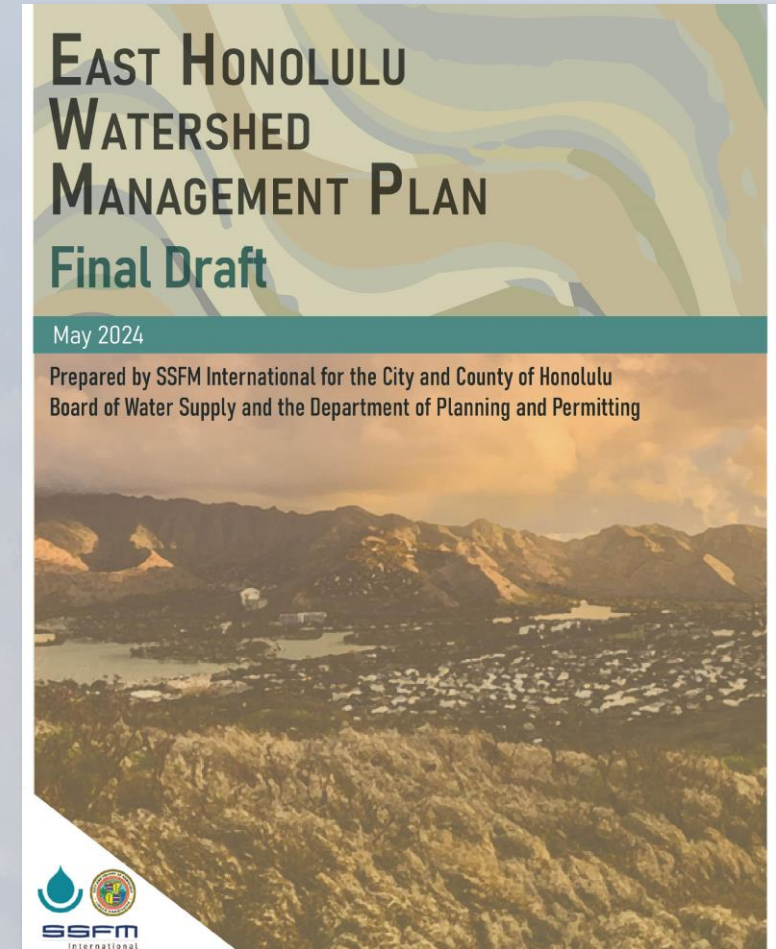


# EHWMP Overview

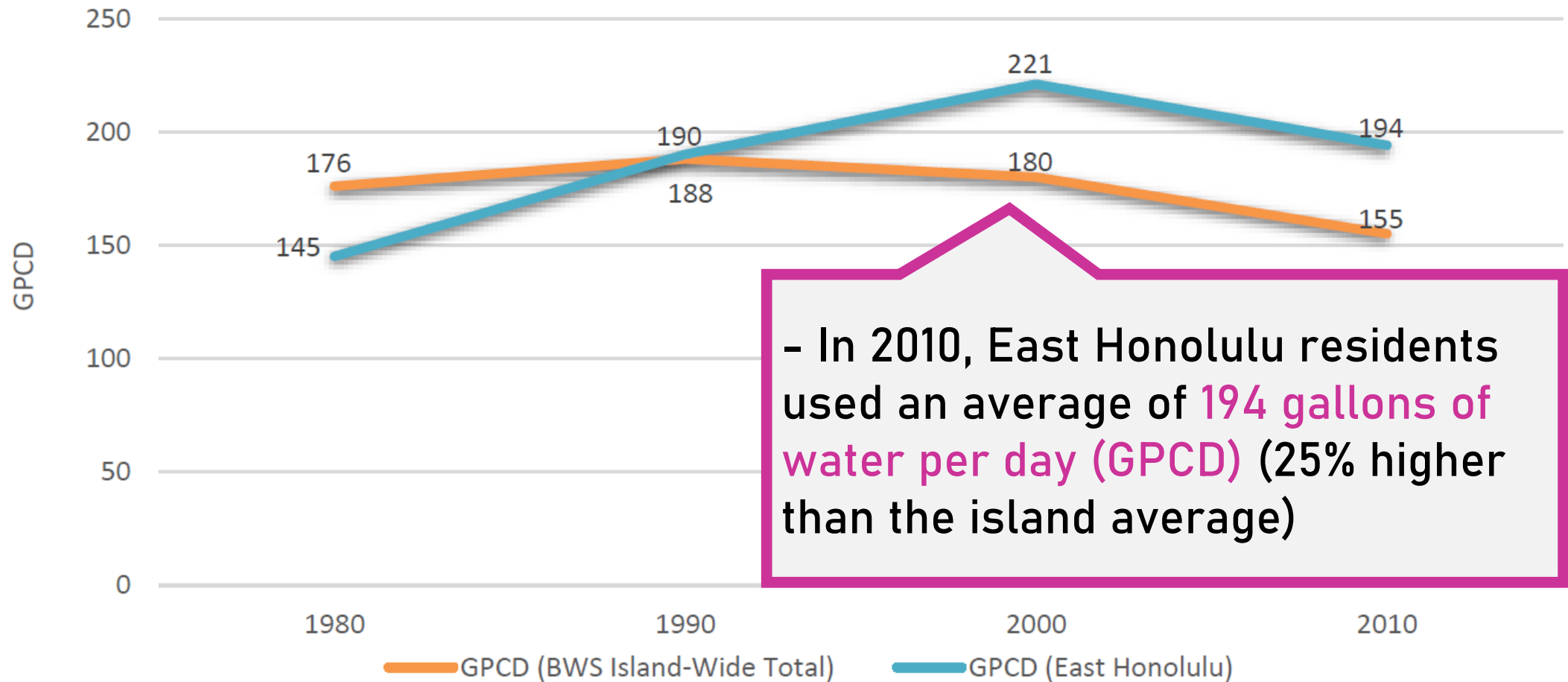


# Elements of the EHWMP

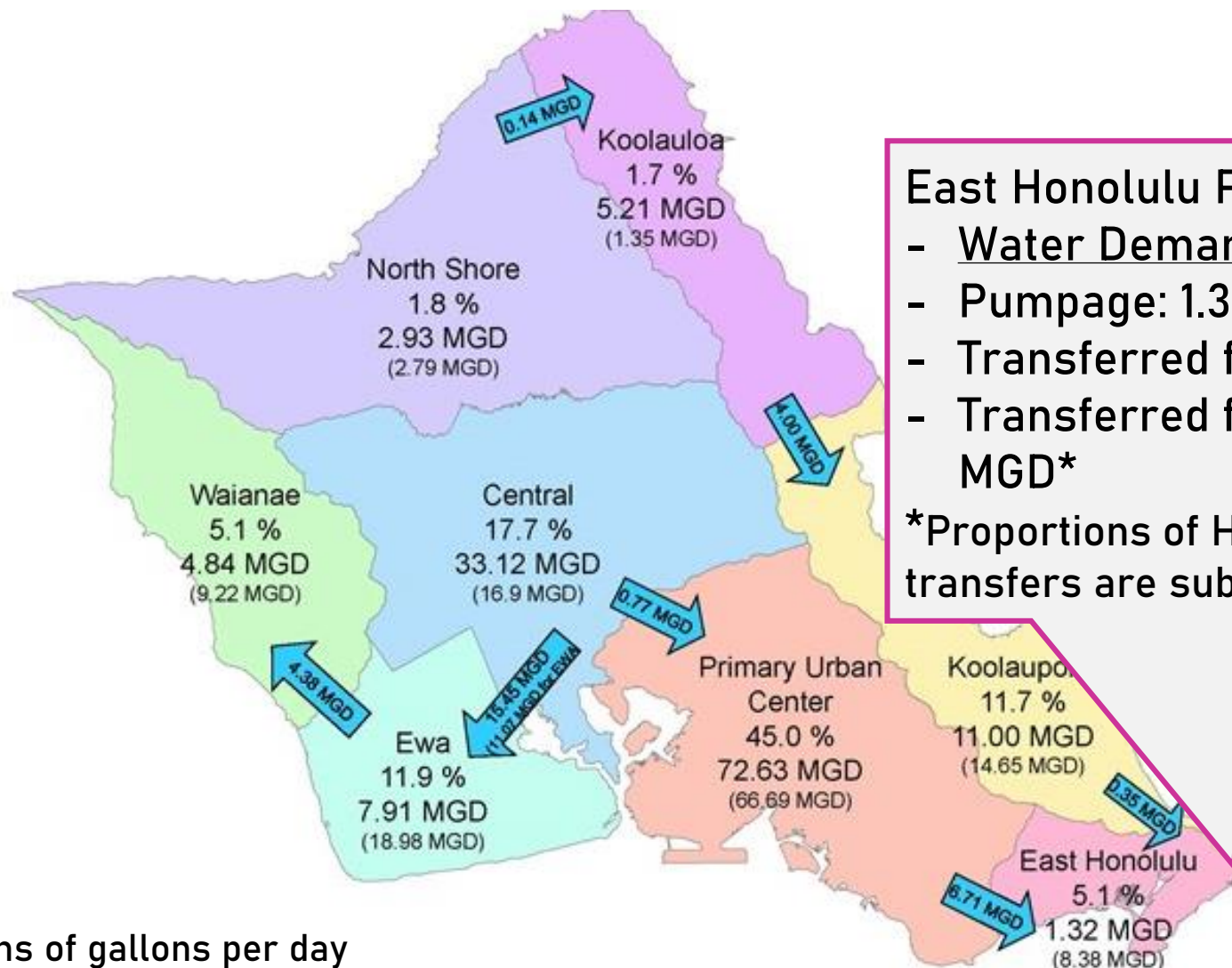
- **Ch. 1:** O'ahu-Wide Overview
- **Ch. 2:** East Honolulu Watershed Profile
- **Ch. 3:** East Honolulu Water Demand/Supply
- **Ch. 4:** Policies, Projects & Strategies
- **Ch. 5:** Implementation



# Historical Projected Per Capita Water Demand



# BWS Water Transfer Map (2013-2017 average)



## East Honolulu Planning District:

- Water Demand: 8.38 MGD
- Pumpage: 1.32 MGD
- Transferred from PUC: 6.71 MGD\*
- Transferred from Windward: 0.35 MGD\*

\*Proportions of Honolulu and Windward transfers are subject to change

mgd= millions of gallons per day

# East Honolulu Future Water Demand Projections

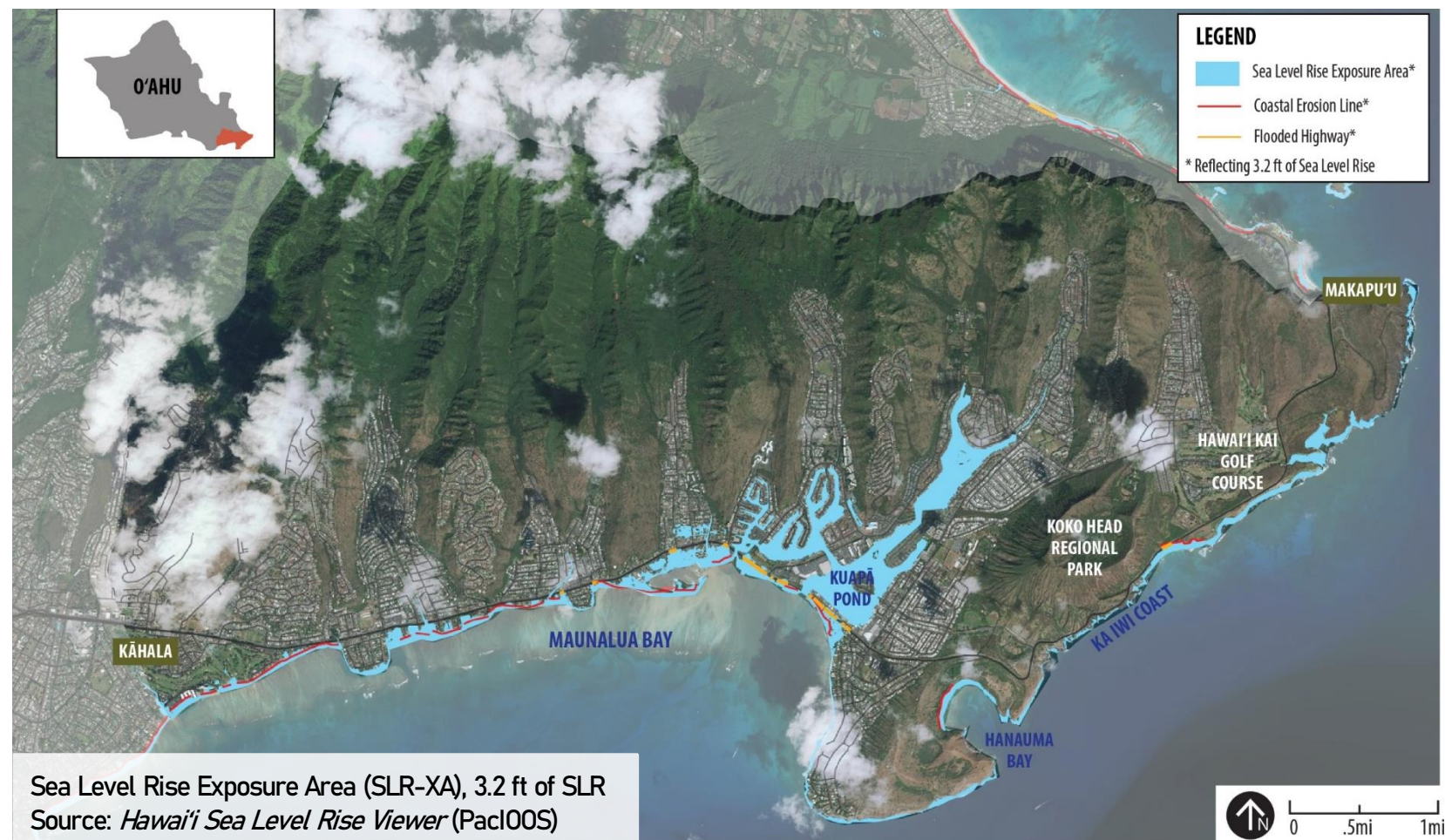
## Three Scenarios for the Year 2040

- Low Demand (most probable)
- Mid Demand
- High Demand

## One Scenario for the Year 2100

- “Ultimate” Demand
  - “Dry” Rainfall Scenario
  - “Wet” Rainfall Scenario

# Sea Level Rise Impacts



Ultimate  
Demand  
Scenarios  
accounts for  
3.2 ft or more  
of sea level  
rise

# Water Source Adequacy

## 2040

- Low (“Most Probable”) Demand Scenario – existing water supply is adequate
- Mid- and High-Demand Scenarios – would require additional water resources / improved water efficiency

## 2100 Ultimate

- Wet Scenario – adequate water supply (anticipated)
- Dry Scenario – would require improved water efficiency

# East Honolulu's Shared Water Kuleana

## Issues

East Honolulu  
relies on Honolulu  
and Windward  
water sources

Water transfers can  
be impacted by  
drought and  
contamination, etc.

Ko'olau Poko has  
dike aquifers which  
are more  
vulnerable to  
drought

Transfers can be  
detrimental to  
Windward's streams  
and cultural uses

## Kuleana

Responsibly to use  
transferred water  
efficiently

# Relationship of Watershed Issues, Policies, Projects & Strategies



# East Honolulu Water Resource Issues & Concerns

Climate Change

Sea Level Rise

Nearshore  
Water Quality

Water  
Conservation  
Efforts

Maintaining  
Traditional &  
Customary  
Practices

Flooding &  
Drainage

Access to  
Mauka &  
Makai Areas

Wildfires

# Example of District Sub-Objectives

## 1: Promote Sustainable Watersheds

1.1: Increase native reforestation and implement measures to slow the spread of invasive species and ungulates...

1.2: Implement preventative measures that reduce wildfire risks

1.5 Conserve natural shorelines to protect beaches and coastal ecosystems....

## 2: Protect and Enhance Water Quality and Quantity

2.1: Encourage the use of xeriscaping and other low impact development...

2.2: Improve the water quality of Maunalua Bay by capturing stormwater runoff...

2.5: Reduce ground water contamination through cesspool conversion...

## 3: Protect Native Hawaiian Rights and Traditional and Customary Practices

3.1: Restore fishponds and springs for cultural and educational use

3.3: Improve public shoreline access...

## 4: Facilitate Public Participation, Education and Project Implementation

4.2: Provide educational opportunities to learn about protecting and preserving water resources

4.3: Collaborate among government agencies, landowners, and other stakeholders to implement mutually beneficial projects....

## 5: Meet Public Water Demands at a Reasonable Cost

5.2: Adapt and plan for drought...

5.3: Implement conservation measures to improve water efficiency...

# EHWMP Projects with Champions

- #1 Kalauha'īha'i Fishpond Restoration
- #2 Wailupe Stream Restoration
- #3 Kuli'ou'ou Watershed Retrofit
- #4 Kamilo Nui Watershed Kipuka Reforestation
- #5 Kamilo Nui Watershed Sustainable Agriculture Pilot Project
- #6 Kamilo Nui Watershed Kuapā Pond Restoration
- #7 Keawāwa Wetland & Hawea Heiau Restoration
- #8 Ka Iwi Coast Mauka Lands Preservation
- #9 Restoration of Upper Niu and Wailupe Watersheds
- #10 Maunalua Kaiwi Watershed Hui
- #11 Maunalua Watershed Talk Stories
- #12 Mālama Maunalua Programs
- #13 Coral Assisted Evolution Project
- #14 Community Cleanups and Water Quality App
- #15 Work-4-Water Initiative
- #16 DFM Community Programs
- #17 Low Impact Design and Green Infrastructure Standards and Guidelines

- #18 Stormwater Utility O'ahu
- #19 Watershed Boulder Basins and Detention Basins
- #20 Drainage System Upgrades
- #21 Implement Mayor's Directive on Climate Change and Sea Level Rise
- #22 Climate Change Sustainable Yield Scenarios
- #23 Infrastructure Planning in the Sea Level Rise Exposure Area
- #24 O'ahu Climate Adaptation Strategy
- #25 Wastewater Long Range Master Plans
- #26 Drainage and Stormwater Master Plans
- #27 BWS Long Range Water Master Plan and Infrastructure Renewal and Replacement Program
- #28 BWS Water Conservation Incentives Program
- #29 One Water Collaboration for Climate Resilience
- #30 R-1 Recycled Water for Irrigation in Hawai'i Kai
- #31 Ka Lapa O Maua (Paikō Ridge) Preservation

# EHWMP General Strategies & Programs

A: Southern Ko'olau Mountains Native Species  
Reforestation Program

B: Stream Restoration, Dechannelization &  
Maintenance

C: Stream Debris Educational Program

D: Coordinated Pig Hunting Program

E: Trail Educational Program

F: Trail Erosion Mitigation

G: Kuli'ou'ou Ridge Trail Entrance Improvements

H: Firebreak Program

I: Golf Course Xeriscaping and Water Efficiency Plan

J: Lateral Shoreline Access Plan

K: Awāwāmalu Access Improvements

L: Agricultural Water Use Plans

M: Grey Water Reuse Plan

N: Climate Adaptation Neighborhood Plans

O: Climate Change and Resilience Education

P: Restoration of Freshwater Spring Flows to  
Nearshore Coastal Waters

Q: Strengthen Building Codes and Standards for  
Building Resilience

R: Build Back Better and Smarter

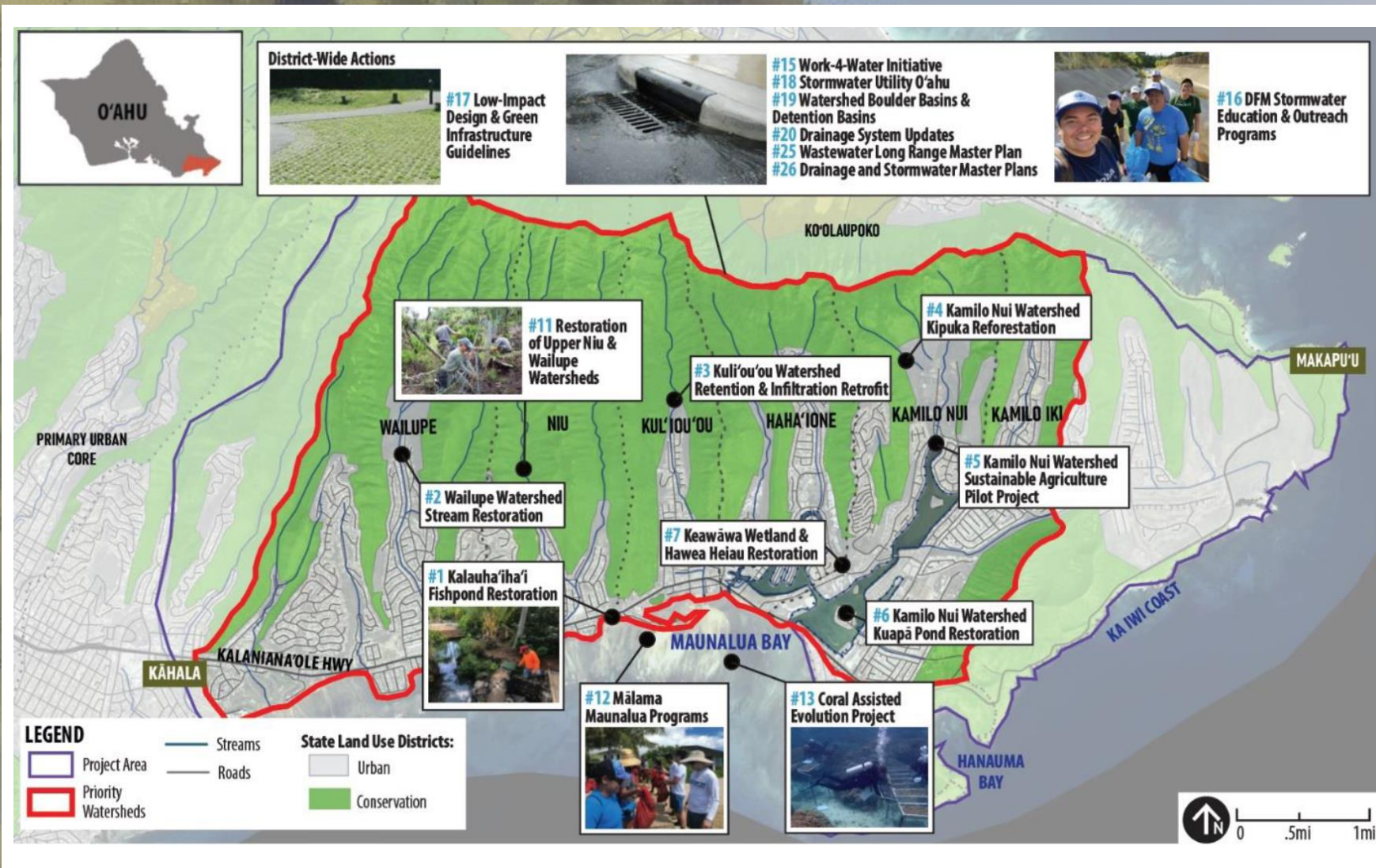
S: Restrictions on Shoreline Armoring

T: Redevelopment District

# EHWMP Catalyst Projects

- **Catalyst Project #1:** Improve water quality in Maunaloa Bay
  - Priority watersheds for implementation: 1) Wailupe 2) Niu 3) Kuli'ou'ou 4) Haha'ione 5) Kamilo Nui and 6) Kamilo Iki
- **Catalyst Project #2:** Increase water efficiency in East Honolulu
  - District-wide implementation

# Catalyst Project #1: Priority Watersheds & Key Actions



- Key actions within these watersheds are being prioritized as they represent the highest pollution reduction benefits
- Most site-specific actions have been previously identified by the Maunalua Watershed Hui

## Catalyst Project #2: Increase water efficiency in East Honolulu

### Goals:

- #1: Maintain East Honolulu's per capita water demand at 170 gallons per person per day (GPCD) through 2040.
- #2: Reduce per capita water demand to 130 GPCD by 2100.

# Catalyst Project #2: Increase water efficiency in East Honolulu

## District-Wide Key Actions:

### Water Distributor

- BWS Infrastructure Renewal and Replacement Program (Project #27)

### Water Users

- BWS Water Conservation Incentives Program (Project #28)
- Developing R-1 Recycled Water for Irrigation Users in Hawai'i Kai (Project #30)

# Community Involvement



# East Honolulu Stakeholder Outreach as of July 2024

**26** Stakeholder Consultations



**12** Neighborhood Board Presentations



**4** Community Meetings

## Community Organizations:

- Kaiwi Maunalua Watershed Hui
- Livable Hawai'i Kai Hui
- Aloha ' Āina O Kamilo Nui
- Mālama Maunalua Bay
- Hui o Ko'olaupoko
- UH Sea Grant
- Ka Iwi Coast Coalition
- Maunalua Fishpond Heritage Center
- Roth Ecological
- Sierra Club
- WAI
- Kamehameha Schools
- Kamilo Nui Farmers

## Agencies:

- CCH Office of Climate Change, Sustainability & Resiliency
- CCH Dept. of Facilities Maintenance
- DLNR Division of Forestry & Wildlife
- DLNR Nā Ala Hele Program
- Ko'olau Mountains Watershed Partnership
- DLNR Commission on Water Resource Management

## Neighborhood Boards / Elected Officials:

- Hawai'i Kai (NB District #1)
- Kuli'ou'ou-Kalani Iki (NB District 2)
- Wai'alaie-Kāhala (NB District #3)
- Stanley Chang (Senate District #9)
- Gene Ward (Senate District #17)
- Mark Hashem (Rep. District #18)
- City Councilmember Tommy Waters

# Community Meeting Participation

Community  
Meeting #1  
MARCH 2019  
(In-Person)

~ 45 attendees

Community  
Meeting #2  
NOVEMBER 2019  
(In-Person)

~ 20 attendees

Community  
Meeting #3  
WINTER 2021  
(Virtual Open House  
and Q/A Sessions)

~ 190 participants

Community  
Meeting #4  
AUGUST 2023  
(Virtual)

~ 20 attendees



4 SMALL GROUP MEETINGS  
with members of the Kaiwi Maunalua Watershed Hui  
and Kamilo Nui Farmers (~10-15 attendees / meeting)

# EHWMP Public Review & Final Draft



# Engagement for Public Review Draft (July–October 2023)

- Neighborhood Board Announcements/Presentations
- Posting of draft plan and public comment period on BWS website and social media
- E-mail blasts to project mailing list
- Transmittal of plan to County and State agencies
- Community Meeting #4
- Two-month public comment period

# How Public Input was Incorporated into the EHWMP Final Draft (Jan 2024)

## INPUT RECEIVED ON PUBLIC REVIEW DRAFT (43 comments tabulated):

- Updates to data, study/plan, project information, references, etc.
- Updates and additions to community projects
- Requests to add more specificity to place names (ex: Define if referring to Wailupe Stream, Valley or Watershed)
- Additional information needed for Ka Pa'akai Analysis for project



## INCORPORATED CHANGES:

- Updated data, project information, and references where appropriate
  - Preliminary census data incorporated into water demand analysis
- Referenced additional community watershed projects provided by the Maunaloa Ka Iwi Watershed Hui
- Updated place name references where appropriate
- Emphasized that Ka Pa'akai Analysis for projects was preliminary and may require further study

# Neighborhood Board Presentations & Endorsement of Final Draft (Feb-May 2024)

- **Hawai'i Kai Neighborhood Board No. 1:**
  - February 2024: Unanimous endorsement
- **Kuli'ou'ou-Kalani Iki Neighborhood Board No. 2:**
  - May 2024: 7 votes in favor, 2 against
- **Wai'alae-Kāhala Neighborhood Board No. 3:**
  - May 2024: 4 votes in favor, 4 abstained

# Input Incorporated into Final Draft for Council (dated May 2024)

## SUMMARY OF INPUT RECEIVED ON FINAL DRAFT (28 comments tabulated):

- Revise ahupua'a to show Maunalua
- Mālama Maunalua priority project description needs updating
- Request to recognize Kamilo Nui Firewise community
- Recognize all champions for priority projects in the project list
- Correct place names (Kaiwi) and update organization names (Kaiwi Maunalua Watershed Hui)
- Corrections to tables and figures
- Add Paiko Ridge restoration



## SUMMARY OF CHANGES INCORPORATED:

- Revisions to ahupua'a maps and boundaries to match updated State GIS ahupua'a layer
- Incorporated updates to Mālama Maunalua priority project
- Added references to Kamilo Nui Firewise
- Added project champions to project list
- Updated place name and organization names throughout
- Corrected tables/figures as applicable
- Added Paiko Ridge Preservation as Project #31

# Adoption Process



# Adoption Timeline (2024)

JUNE

Final Draft  
to  
Council

JULY

1<sup>st</sup>  
Council  
Reading  
(7/10)

AUGUST

HSH  
Committee  
Meeting 1  
(8/21)

SEPT

2<sup>nd</sup>  
Council  
Reading  
(9/4)

OCT

CWRM  
Public  
Hearing  
(9/18)

HSH  
Committee  
Meeting 2  
(9/25)

Council 3<sup>rd</sup>  
Reading &  
Approval  
(10/9)

WE  
ARE  
HERE

# Council First Reading (7/10/24): Bill 038(24), FD1

AMENDED TO FD1, PASSED FIRST READING:

- 6 ayes: DOS SANTOS-TAM, KIA'ĀINA, OKIMOTO, SAY, WATERS, WEYER
- 3 absent: CORDERO, TULBA, TUPOLA

TESTIMONY:

- 1 support
- 2 comments: Elizabeth Reilly, Maunalua Fishpond Heritage Center
- BWS testified that comments received will be integrated.

# Project Contact Information



Honolulu Board of Water Supply

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For more information, please visit:  
<http://www.boardofwatersupply.com/water-resources/watershedmanagement-plan/east-honolulu>