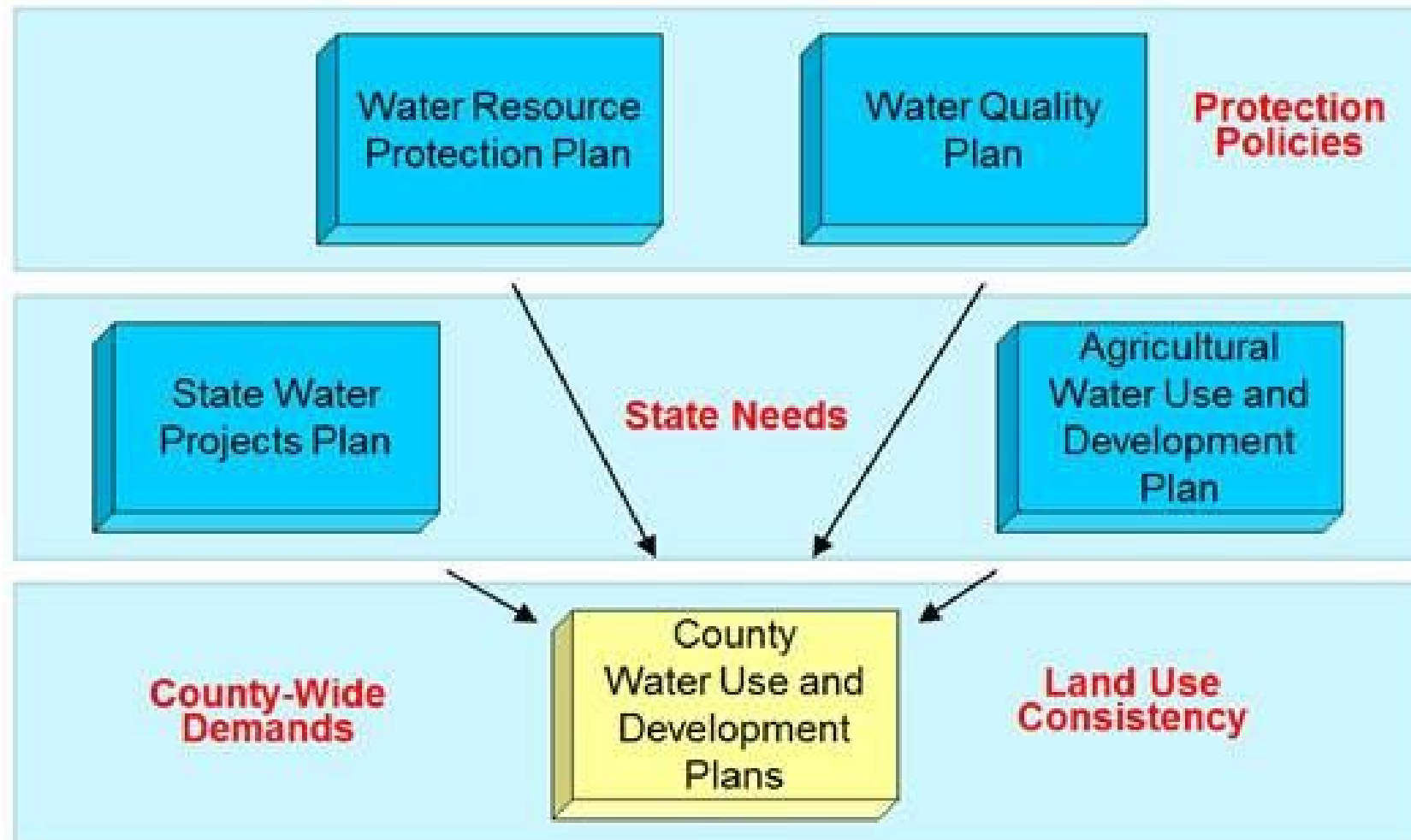


Agricultural Water Use and Development Plan Update December 2019, Revised 2021

For the Commission on Water Resource Management
November 19, 2024



Hawaii Water Plan Components



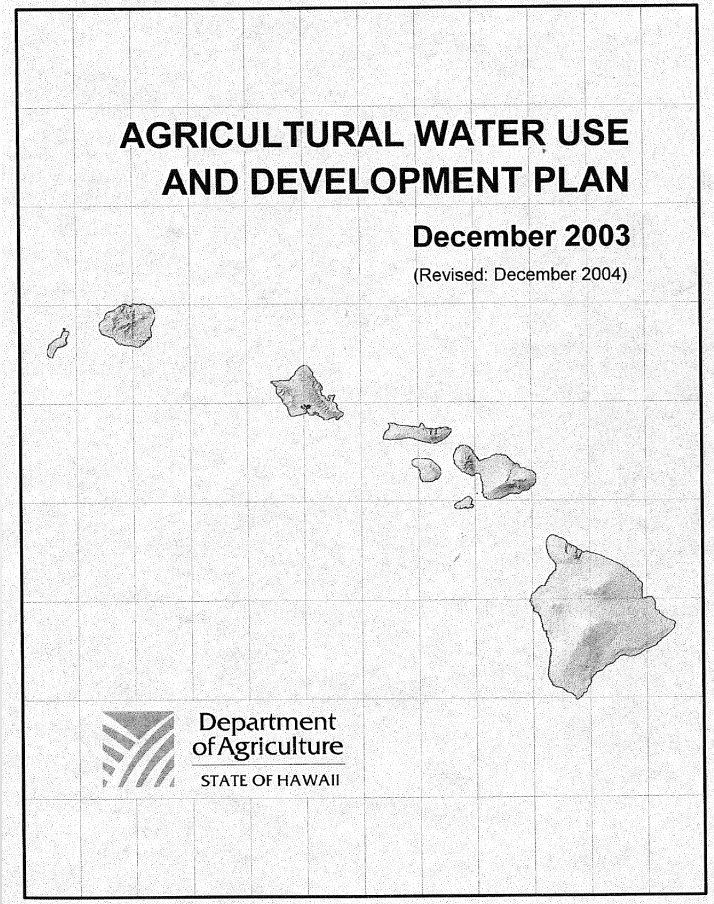
Objectives of the AWUDP

Address HRS, 174C-31e

- Inventory public and private irrigation water systems;
- Identify the extent of rehabilitation needed for each system;
- Identify source of water used by agricultural operations, especially IALs;
- Identify current and future water needs for agricultural operations, especially IALs;
- Subsidize the cost of repair and maintenance of the systems;
- Establish criteria to prioritize the rehabilitation of the systems
- Develop a 5-year program to repair the systems
- Set up a long-range plan to manage the systems



2004 AWUDP



Development of Subsequent AWUDP

- Began February 2014
- Supplement to the 2004 AWUDP
- 2017 In-Progress Briefing to CWRM Board
- 2019 Pre-Final Consultation with Agricultural Industry and Water System Managers
- 2019 AWUDP Update submitted to CWRM in June 2020



2019 AWUDP Update

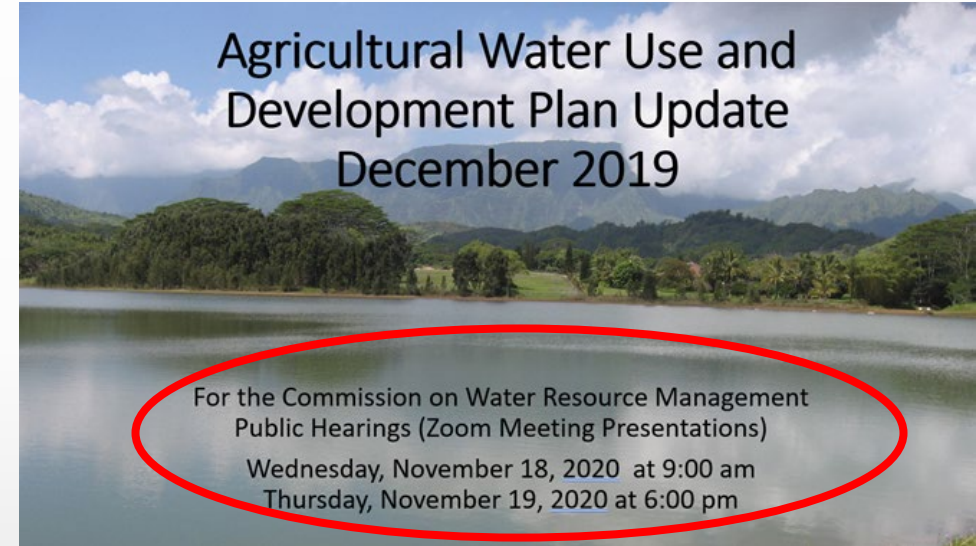


- Presentation to CWRM Board on July 21, 2020
- HDOA considers AWUDP Update complete and final
- CWRM: Public Comment Period and Hearings



CWRM Public Review and Hearing

- Public review period
August 4–December 18, 2020
- Public hearings via Zoom
 - November 18 at 9 am
 - November 19 at 6 pm

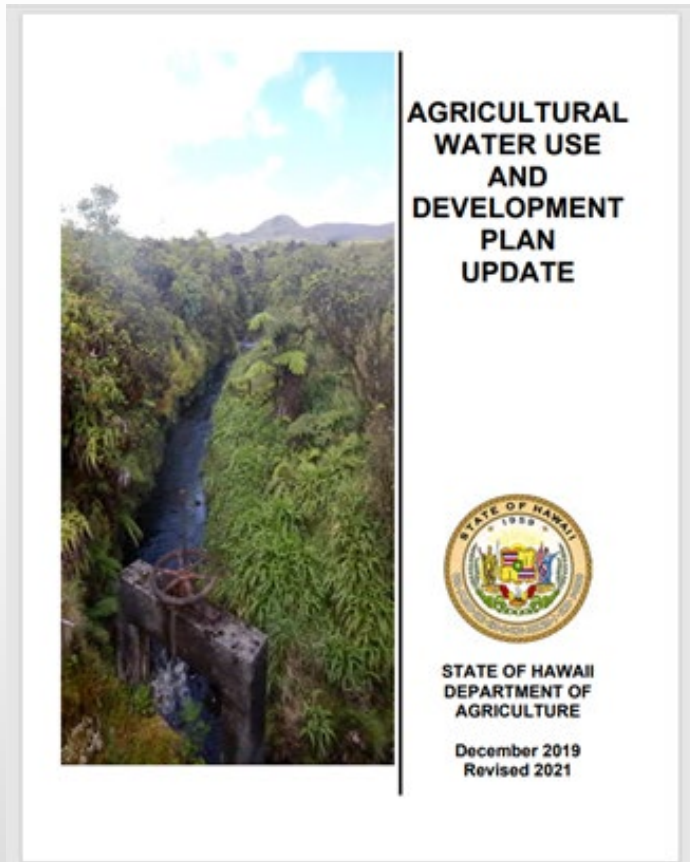


Public Comments and Responses

- Commenters:
 - Commission on Water Resource Management
 - Department of Hawaiian Homelands
 - Division of Forestry and Wildlife
 - County of Maui, Department of Water Supply
 - Four (4) Individuals/Private Entities
- HDOA sent responses to all commenters
- Copy of all comments and responses in Appendix F



Revised 2021 AWUDP Update



- Revised 2021 Update submitted to CWRM in January 2023 and posted on HDOA website
- November 2024 – Presentation to CWRM Board



2021
AWUDP
UPDATE
HIGHLIGHTS



Irrigation Systems Studied

AWUDP 2021 Update	2004 AWUDP
<p>Kaua'i</p> <ul style="list-style-type: none"> - Kilauea Sugar (Kaloko, Pu'u Ka Ele, Morita, Stone Dam and Kalihiwai Irrigation Subsystems) - Anahola Ditch - Upper and Lower Līhu'e Ditches and portion of Waiahi-'Ili'ili'ula Ditch - Upper and Lower Ha'ikū Ditches - Wai'aha-Ku'ia Aqueduct, por. Waiahi-'Ili'ili'ula Ditch, and Kōloa-Wilcox Ditch - Olokele Ditch 	<p>Kaua'i</p> <ul style="list-style-type: none"> - East Kaua'i Irrigation System - Kekaha Ditch Irrigation System - Kōke'e Ditch Irrigation System - Kaua'i Coffee Irrigation System
<p>O'ahu</p> <ul style="list-style-type: none"> - O'ahu Ditch (Wahiawā, Helemano, Tanaka, and Ito Ditches) - 'Ōpae'ula, and Kamananui Ditches - Kahuku Irrigation System - Galbraith Lands Irrigation System 	<p>O'ahu</p> <ul style="list-style-type: none"> - Waiāhole Ditch Irrigation System - Waimānalo Irrigation System
<p>Hawai'i</p> <ul style="list-style-type: none"> - Ka'ū Agribusiness Irrigation System - Kohala Ditch - Kehena Ditch 	<p>Molokai</p> <ul style="list-style-type: none"> - Moloka'i Irrigation System <p>Maui</p> <ul style="list-style-type: none"> - Maui Land and Pineapple/Pioneer Mill Irrigation System - East Maui Irrigation System - West Maui Irrigation System - Upcountry Maui Irrigation System <p>Hawai'i</p> <ul style="list-style-type: none"> - Lower Hāmākua Ditch Irrigation System - Waimea Irrigation System



Access Allowed

Kauai

- Kalihiwai (Stone Dam portion)
- Kalihiwai (Porter portion)
- Anahola (DHHL Portion)
- Waiaha-Kula (A&B) (portion)

Oahu

- Oahu Ditch
- Kahuku (ARMD)
- Galbraith Lands Irrigation System (ADC)

Hawaii

- Kehena Ditch

Not Allowed

Kauai

- Kalihiwai (Kaloko portion)
- Upper and Lower Lihue Ditches
- Upper and Lower Haiku Ditches
- Waiaha-Kula (portions)
- Olokele Ditch

Oahu

- Opaepala, Kamananui, and Ito Ditches

Hawaii

- Kohala Ditch



Kalihiwai Irrigation Subsystem

System Ownership and Service Area

Description	Information
Owners	<p>Various owners</p> <p>Kalihiwai Reservoir – Kalihiwai Ridge Community Associations</p> <p>Porter Irrigation System (System Manager)</p>
Source	Pohakuhonu Stream
Estimated Current Water Use (annual average)	<p>100,000 gpd</p> <p>During plantation era – estimated at 10 MGD</p>
Estimated Service Area	794 acres
Farms Area Served	<p>200 acres – mahogany trees</p> <p>150 acres – community farms</p>
Potential Farming	Potential increase if water available
Important Agricultural Lands	None



Kalihiwai Irrigation Subsystem

General System Information

Description	Information	
System Length (feet) / status	17,380 (Active)	
Intake	Kalihiwai Intake 1	Kalihiwai Mauka Intake
Source	Pohakuhonu Stream	Pohakuhonu Stream
Hydrologic Unit	Kīlauea	Kīlauea
Intake Status	Active	Inactive
Reservoirs	Kalihiwai Reservoir	
Capacity (acre-feet / MG)	141 / 46	
Status	Active	
Visual inspection undertaken	Yes	
Irrigation system condition	Poor to Good – see Table 15	
Rehabilitation Potential	Good	
Rehabilitation Cost / CIP	See Table 16	



Kalihiwai Irrigation Subsystem Overgrowth



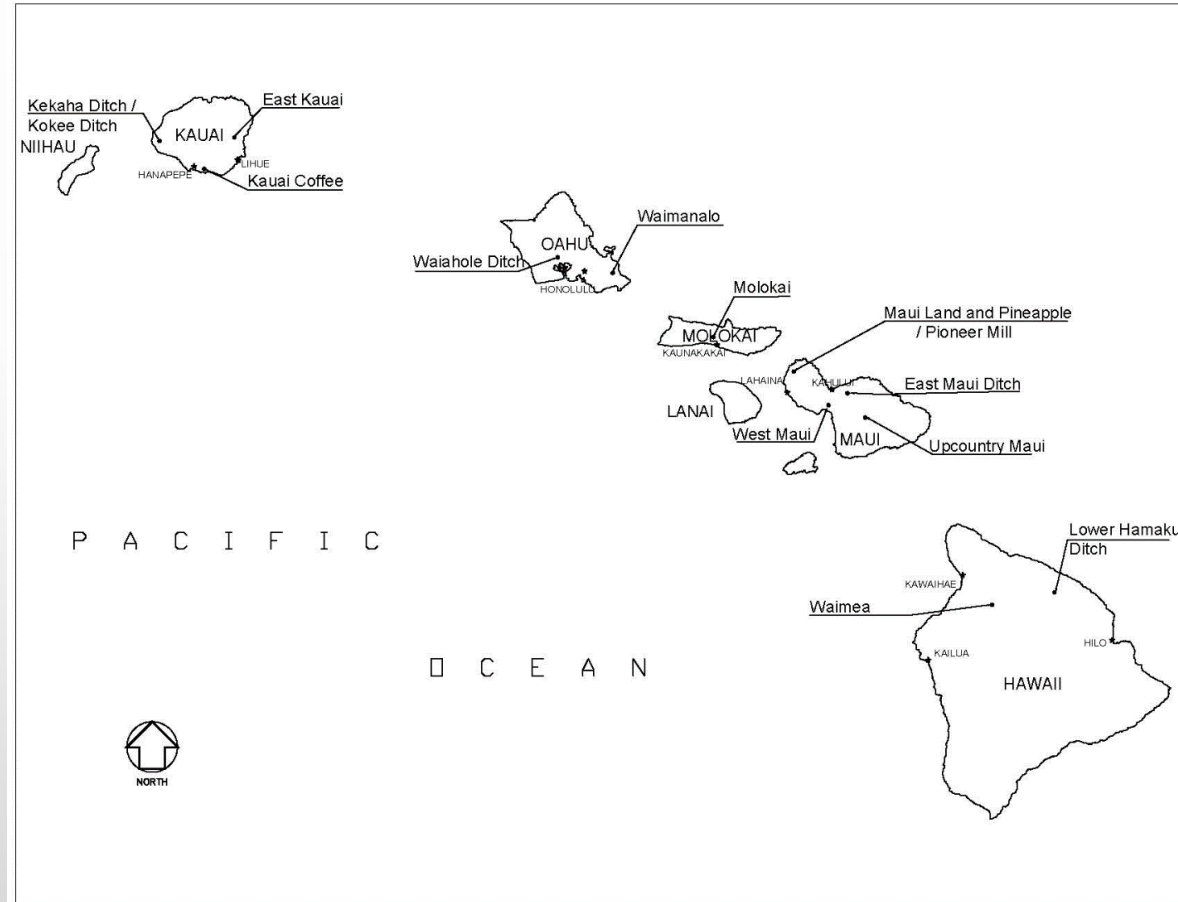
Kalihiwai Irrigation Subsystem

Proposed Capital Improvement Projects

Project Description	ESTIMATED COST (2018 dollars)
	Short-term
Re-establish upper intake	\$110,000
Clear ditch sections from overgrowth and rehabilitate ditches and tunnels	\$110,000
Establish Kīlauea Agricultural Park water source	To be determined



Update to Systems Studied in the 2004 AWUDP



Waimānalo Irrigation System

2004-2014 Capital Improvement Projects

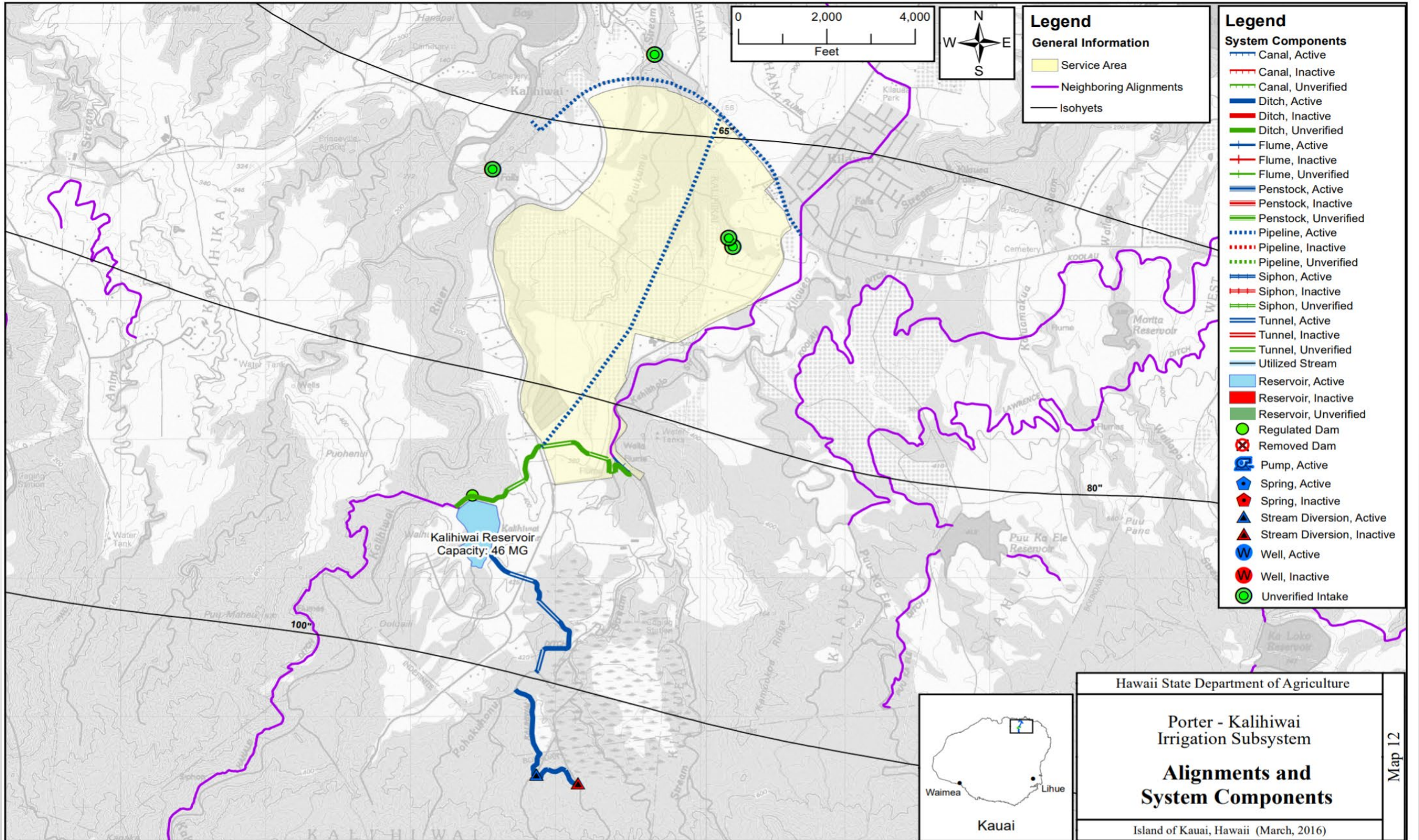
No.	Item	Improvements	Status
1	Land	DLNR land transfer	Ongoing
2	Distribution	Pipeline stabilization	Completed
3	Distribution	Extend pipeline (Wong Ditch)	Completed
4	Safety	Miscellaneous safety improvements	Completed
5	Baseyard	Renovations at HDOA baseyard	Ongoing
6	Ditch	Miscellaneous ditch repairs	Completed
7	Source	Install Emergency Pump Well No. 1	Completed



Waimānalo Irrigation System 2018 Capital Improvement Projects

Project Description	ESTIMATED COST (2018 dollars)	
	Phase I	Phase II
Renovation of baseyard and miscellaneous improvements	\$3,500,000	
Replace remaining ditch portion with pipeline		
Design		\$1,000,000
Construction		To be determined
Tayli Reservoir Improvements	\$1,300,000	





Legend

General Information

- Service Area
- Neighboring Alignments
- Isohyets

Legend

System Components

- Canal, Active
- Canal, Inactive
- Canal, Unverified
- Ditch, Active
- Ditch, Inactive
- Ditch, Unverified
- Flume, Active
- Flume, Inactive
- Flume, Unverified
- Penstock, Active
- Penstock, Inactive
- Penstock, Unverified
- Pipeline, Active
- Pipeline, Inactive
- Pipeline, Unverified
- Siphon, Active
- Siphon, Inactive
- Siphon, Unverified
- Tunnel, Active
- Tunnel, Inactive
- Tunnel, Unverified
- Utilized Stream
- Reservoir, Active
- Reservoir, Inactive
- Reservoir, Unverified
- Regulated Dam
- Removed Dam
- Pump, Active
- Spring, Active
- Spring, Inactive
- Stream Diversion, Active
- Stream Diversion, Inactive
- Well, Active
- Well, Inactive
- Unverified Intake

Hawaii State Department of Agriculture

Porter - Kalihiwai
Irrigation Subsystem

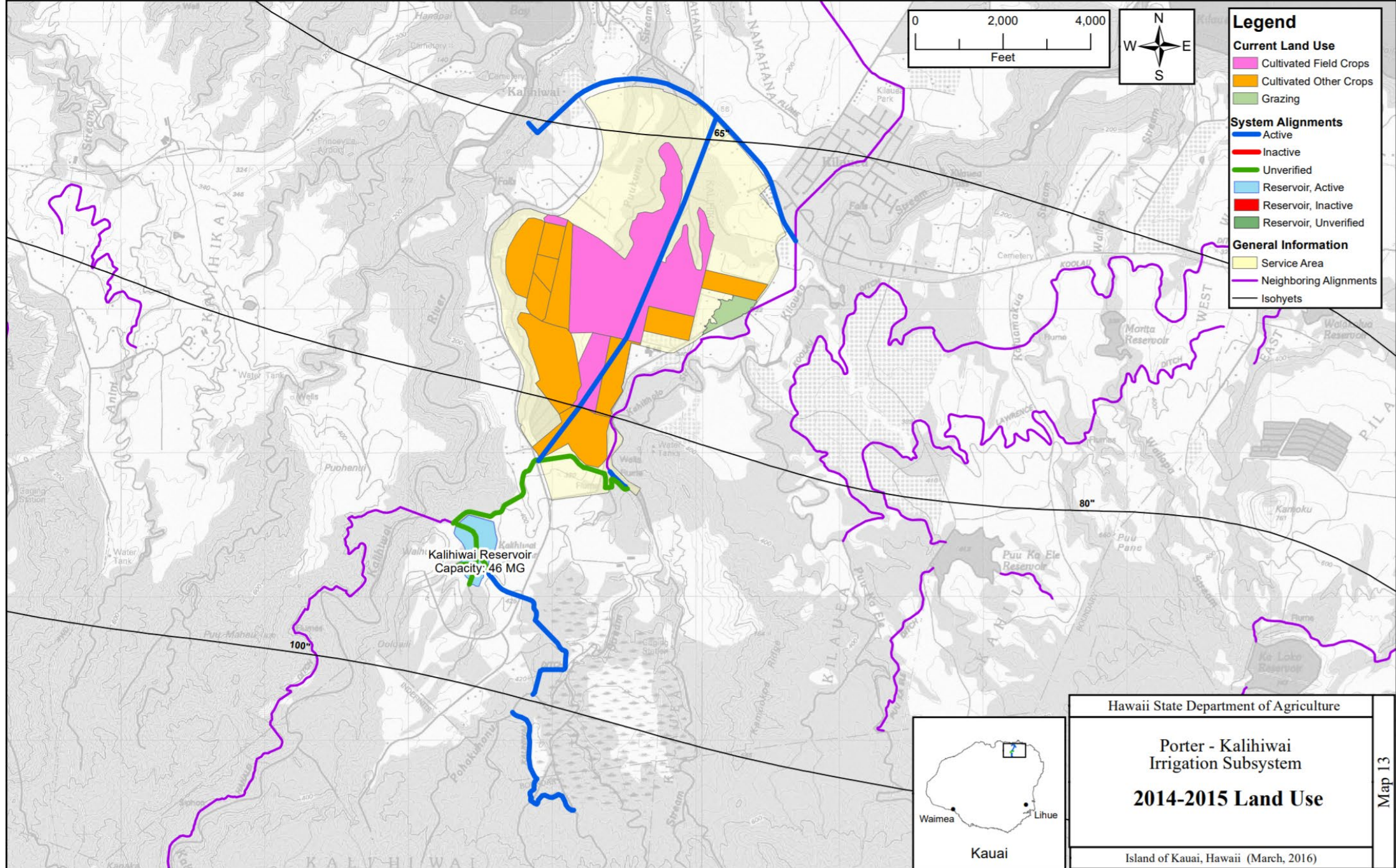
**Alignments and
System Components**

Island of Kauai, Hawaii (March, 2016)

Kauai

Waimea

Lihue



Legend

Current Land Use

- Cultivated Field Crops
- Cultivated Other Crops
- Grazing

System Alignments

- Active
- Inactive
- Unverified
- Reservoir, Active
- Reservoir, Inactive
- Reservoir, Unverified

General Information

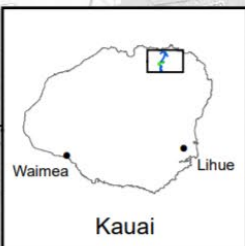
- Service Area
- Neighboring Alignments
- Isohyets

Hawaii State Department of Agriculture

Porter - Kalihiwai
Irrigation Subsystem

2014-2015 Land Use

Island of Kauai, Hawaii (March, 2016)



2004 AWUDP Water Demand



- Based on farm meter data in Lālāmilo
- 3,461 (3,400) gpd/acre
- 2,500 gpd/acre in December/January
- 4,600 gpd/acre in September



Reported Water Demand

- Same methodology as 2004 AWUDP
- Farm Survey Data from over 113 respondents
 - Waimānalo
 - Kahuku
 - Mililani
 - Kula
 - Pāhoa
 - Panaʻewa
 - Hāmākua
 - East Kauaʻi
 - Molokaʻi
- Lālāmilō, Hawaiʻi and Kunia, Oʻahu



Agricultural Water Demand Planning Rates (at the farm meter)

Description	Water Demand (gpd/acre)
Diversified agriculture (for usable acreage that is 50 percent planted)(average condition) (e.g. leafy vegetables and truck crops)	3,900
Diversified agriculture (for usable acreage that is 100 percent planted) (e.g. nursery, feed, and forage crops)	7,800
Diversified agriculture (for usable acreage that is 50 percent planted) under drought conditions or in dry areas	8,100
Diversified agriculture (for usable acreage that is 100 percent planted) under drought conditions or in dry areas	16,200
Irrigated (managed) pastures (for usable acreage that is 100 percent planted)	8,000
Aquaculture, taro, and other wet crops	Dependent on crop and location



Irrigation Systems Forecast

- No action scenario
- Maintained water system scenario (status quo)
- Large capital investment scenario



Development Plan

- Short term (5-years): CIP for existing infrastructure
- Long term
- Management Strategies
- Funding



Goals

- Diversifying the economy
- Sustainability and self-sufficiency
- Support of diversified agriculture





AWUDP Update on the HDOA Website

The AWUDP Update can be found at: *hdoa.hawaii.gov/arm*

<https://hdoa.hawaii.gov/arm/files/2020/08/1-AWUDP-FINAL-Main.pdf>

[Appendix A Maps 1 – 16, Chapter 3](#)

[Appendix A Maps 17-45, Chapter 3](#)

[Appendix A Maps 46- 83, Chapter 3](#)

[Appendix A Maps 84-125, Chapter 4](#)

[Appendices B – E](#)

[Appendix F – Maps F-1 to F-6](#)

[Appendix F – Maps F-7 to F-11](#)



Mahalo!

Janice Fujimoto
Department of Agriculture
Agricultural Resource Management Division
1428 S. King Street
Honolulu, Hawai'i 96814
(808) 973-9473
janice.fujimoto@hawaii.gov

