

For Information Only:  
Status of request for a surface water reservation of 2.00 million gallons per day for The Department of Hawaiian Home Lands from Honokōhau Stream;  
Establishment of interim instream flow standards for Honokōhau and Kaluanui Streams in the surface water hydrologic unit of Honokōhau (6014) and Honolua Stream in the surface water hydrologic unit of Honolua (6013) Maui

Item C-5

April 20, 2021

Ayron M. Strauch

Hydrologist, Stream Protection and Management Branch









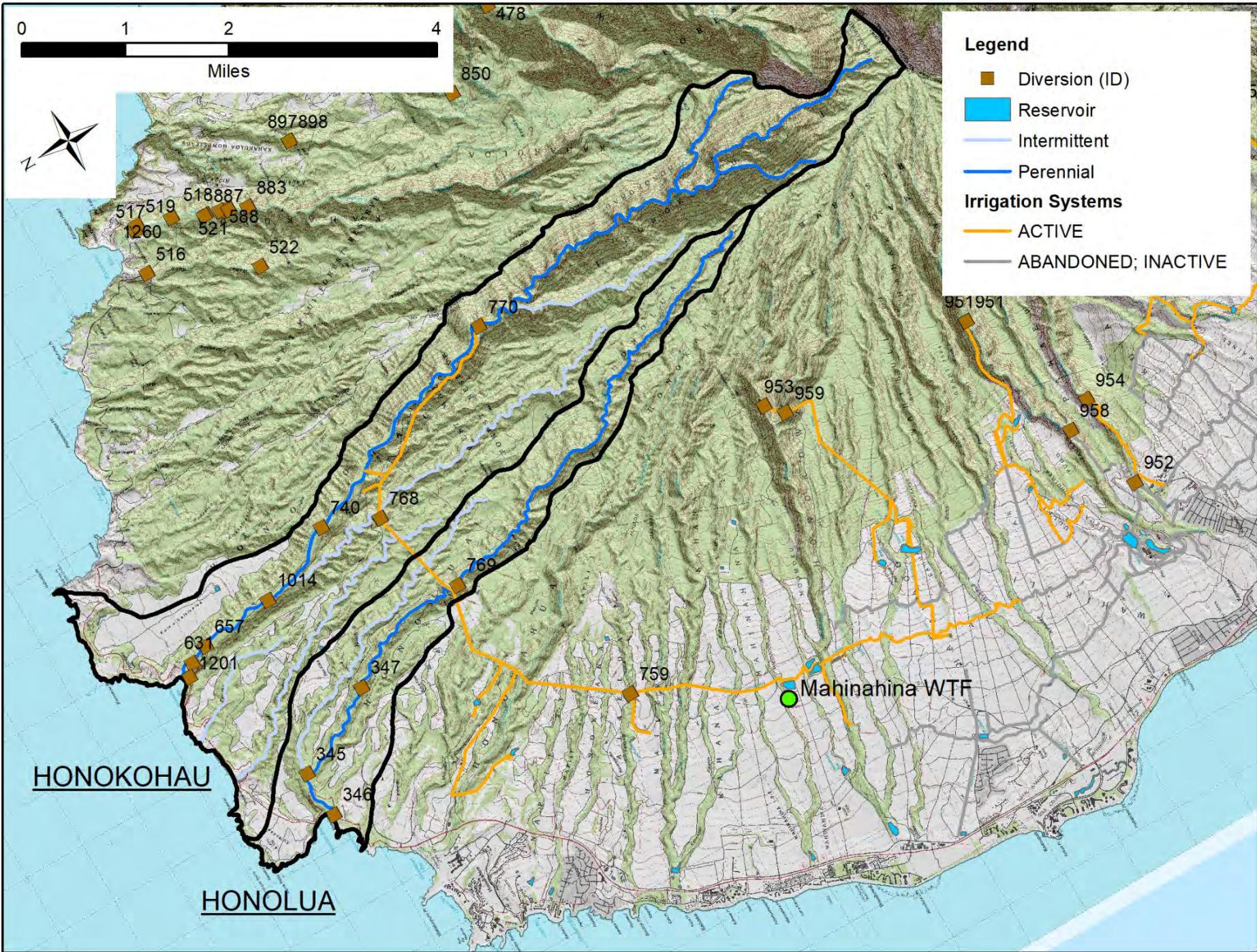
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Miles



**Legend**

-  Diversion (ID)
-  Reservoir
-  Intermittent
-  Perennial
- Irrigation Systems**
-  ACTIVE
-  ABANDONED; INACTIVE



HONOKOHAU

HONOLUA

Mahinahina WTF

## Timeline of Interim IFS Establishment in Honokōhau and Honolulu

- **2014** USGS published West Maui low-flow study
- **2017** CWRM initiated fieldwork to study instream uses in West Maui
- **Aug 2018** Initial West Maui Surface Water Users Meeting
- **Apr 2019** Formal complaint filed
- **July 2019** DRAFT IFSAR completed and available online
- **Aug 2019** Follow-up West Maui Surface Water Users Meeting
- **Sep 2019** Public fact-gathering meeting
- **Nov 2019** Commission meeting to address complaint
- **Aug 2020** Commission meeting to address abandonment of diversion 768 (Honolulu) & diversion 769 (Kaluanui)
- **Jan 2021** Consultation with Maui DWS regarding Honokōhau IFS, DHHL reservation, and MLP water delivery to Mahinahina
- **Feb 2021** Follow-up meeting with MLP regarding diversion abandonment and system monitoring
- **Mar 2021** Consultation with DHHL regarding IFS and non-potable reservation
- **Mar 2021** Follow-up meeting with MLP regarding IFS and DHHL reservation

# Outline

- **Update on Formal Complaint Timeline**
- **DHHL Reservation**
- **Other uses of Honokōhau Stream water**
- **CWRM fieldwork to address formal complaint**
  1. Survey of instream uses
  2. Monitoring of Honokōhau Ditch at Adit 6
  3. Monitoring of Honokōhau Ditch at Māhinahina
  4. Monitoring of Honokōhau Stream above Honokōhau residents
- **Recommendations to address formal complaint**

# Waste Complaint

- **August/September 2018**

  - Hurricanes Lane and Olivia generated flooding conditions in West Maui

  - Damage to Diversion 769 on Honolua Stream (Honokōhau Ditch Intake #3)

  - Damage to Diversion 770 on Honokōhau Stream (Honokōhau Ditch Intake #1)

- **September 2018**

  - MLP lost its ditch manager for the Honokōhau Ditch

- **October 2018**

  - CWRM/Maui Co/MLP site visit to view damage to Intake #1

- **April 2019**

  - Formal Complaint filed by Ka Malu o Kahalawai and West Maui Preservation Association (Community)

    - 1. Lack of control over intake resulting in water diverted in excess of needs**

    - 2. Lack of flow in Honokōhau Stream affecting instream uses**

- **July 2019**

  - Real-time gage installed on Honokōhau Ditch at Māhinahina

- **May-Sept 2019**

  - Discussions with MLP and Community to seek a resolution

- **November 2019**

  - Honokōhau Site Visit with MLP and contractors to discuss intake upgrades

  - Real-time gage installed on Honokōhau Ditch at Adit 6

  - Commission requires improvements to Diversion 770, better monitoring, and abandonment of Diversion 768 & 769

# November 2019 Commission Order

1. Submit a stream diversion works permit to abandon Diversion 769 at Honolua Stream  
→SDWP approved September 2020
2. Submit a stream diversion works permit to abandon Diversion 769 at Kaluanui Stream  
→ SDWP approved September 2020
3. Replace existing damaged intake at Aotaki Wier on Honokōhau Stream with one that can be remotely operated  
→not accomplished
4. Provide real-time metering of each distribution point from Honokōhau Ditch.  
→ Metering installed in early 2021
5. In consultation with Maui DWS, submit a plan that includes the maintenance of Honokahua Siphon  
→as part of new water purchase agreement, MLP and Maui DWS have an MOU that they will monitor for leaks, the maintain siphon, and coordinate its replacement when necessary

# Honokōhau Stream: Intake #1 (Aotaki Weir)

July 7, 2017



June 11, 2019

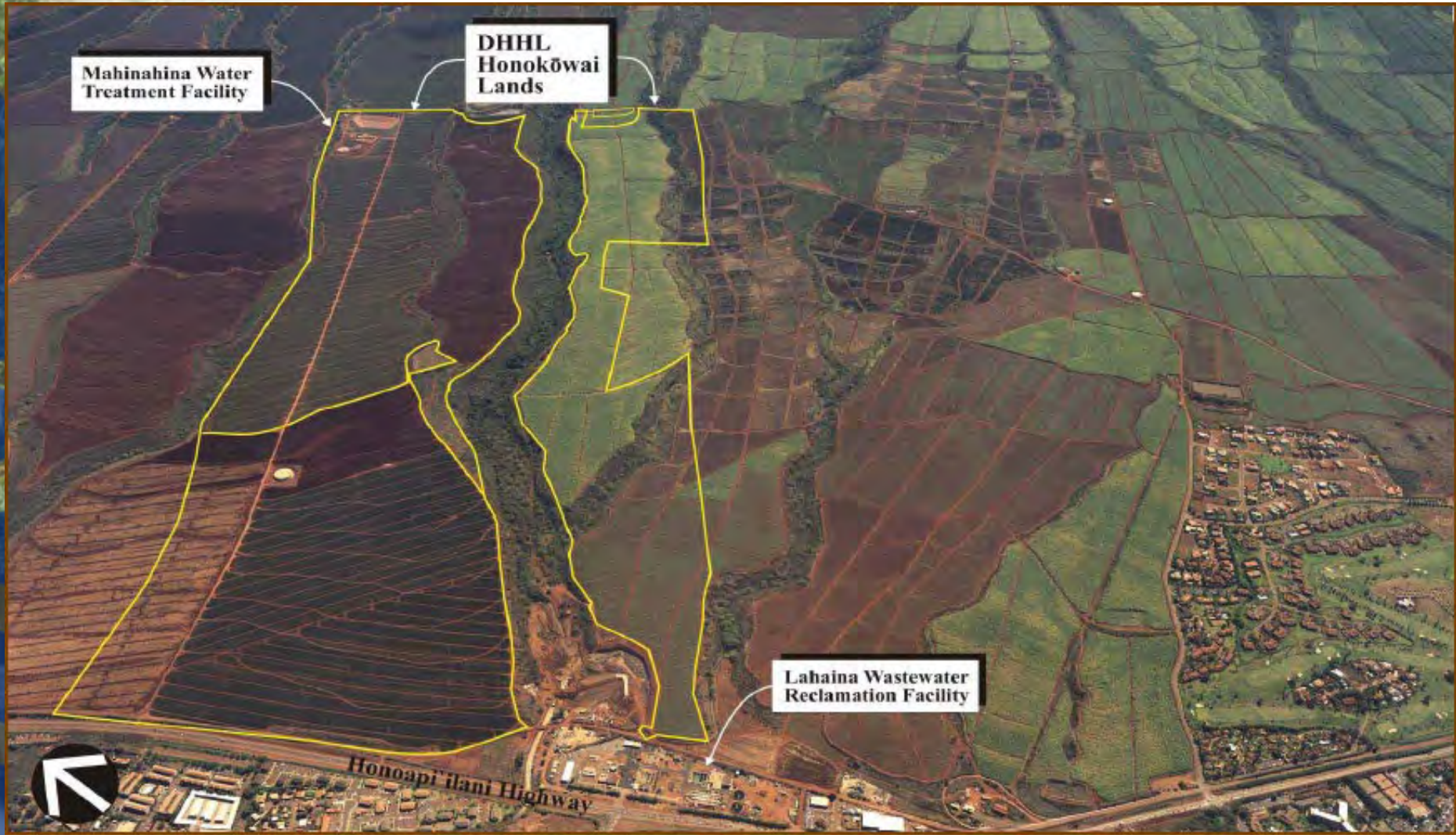


# Honokōhau Stream: Intake #1 (Aotaki Weir)

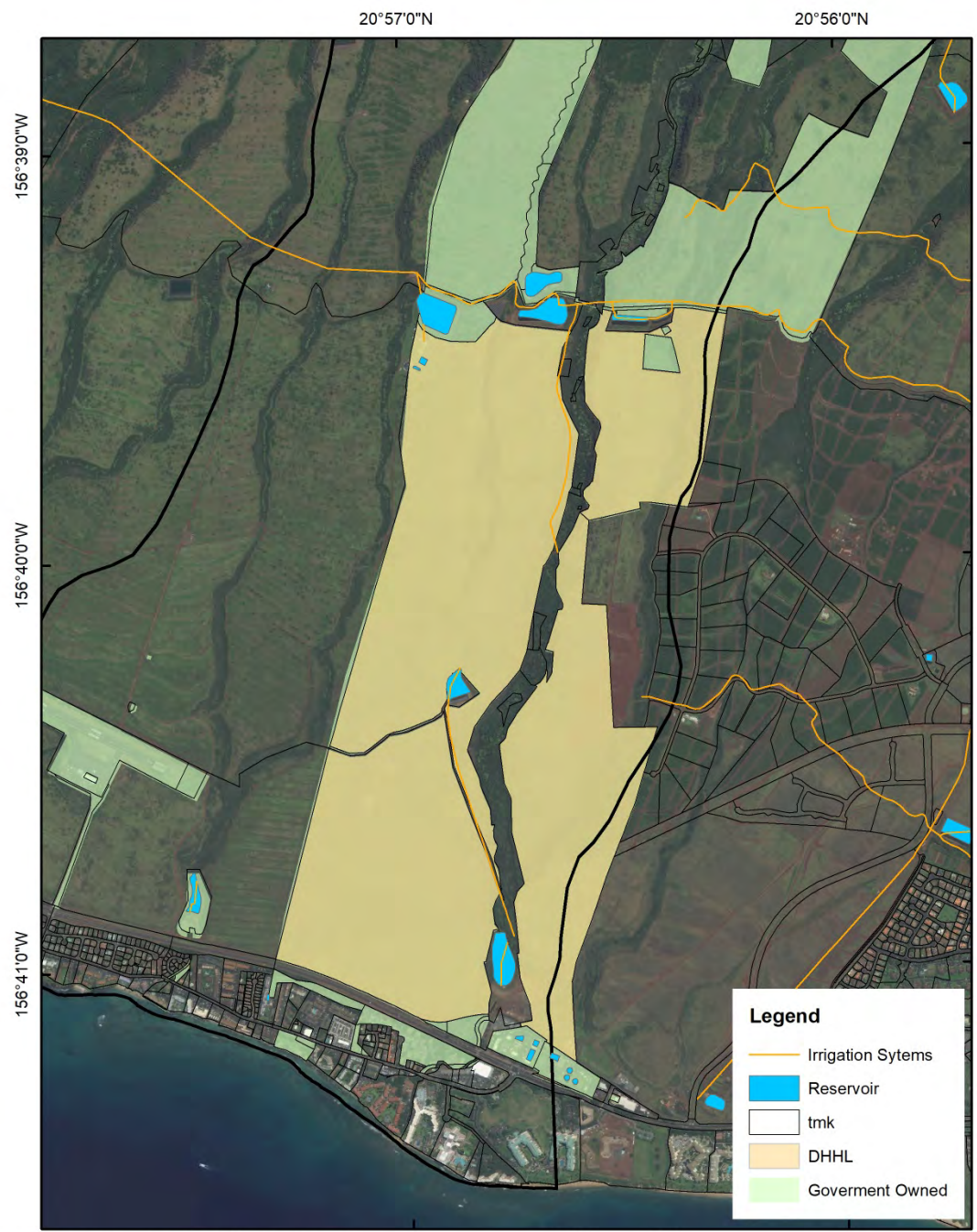




# DHHL Honokōwai Lands



# DHHL Honokōwai Reservation



Prepared by the Department of Land and Natural Resources,  
Commission on Water Resource Management  
Transverse Mercator Projection, Zone 4, North American Datum 1983



# DHHL Honokōwai Reservation

20°57'0"N

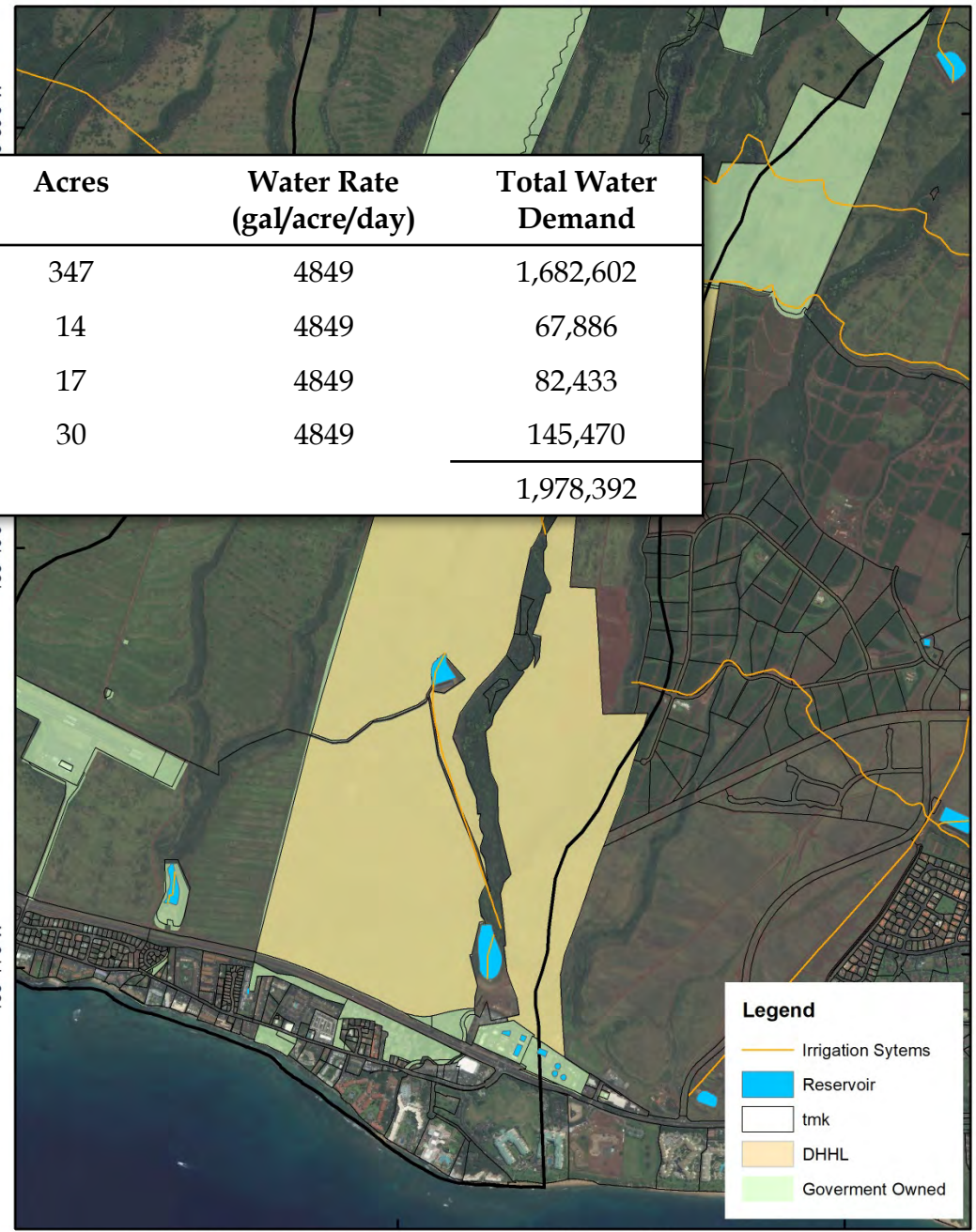
20°56'0"N

156°39'0"W

156°40'0"W

156°41'0"W

Type	Land Use	Acres	Water Rate (gal/acre/day)	Total Water Demand
Private Homestead	Subsistence Ag	347	4849	1,682,602
Private Homestead	Supplemental Ag	14	4849	67,886
Community Use	Communal Agriculture	17	4849	82,433
Community Use	Parks	30	4849	145,470
				1,978,392



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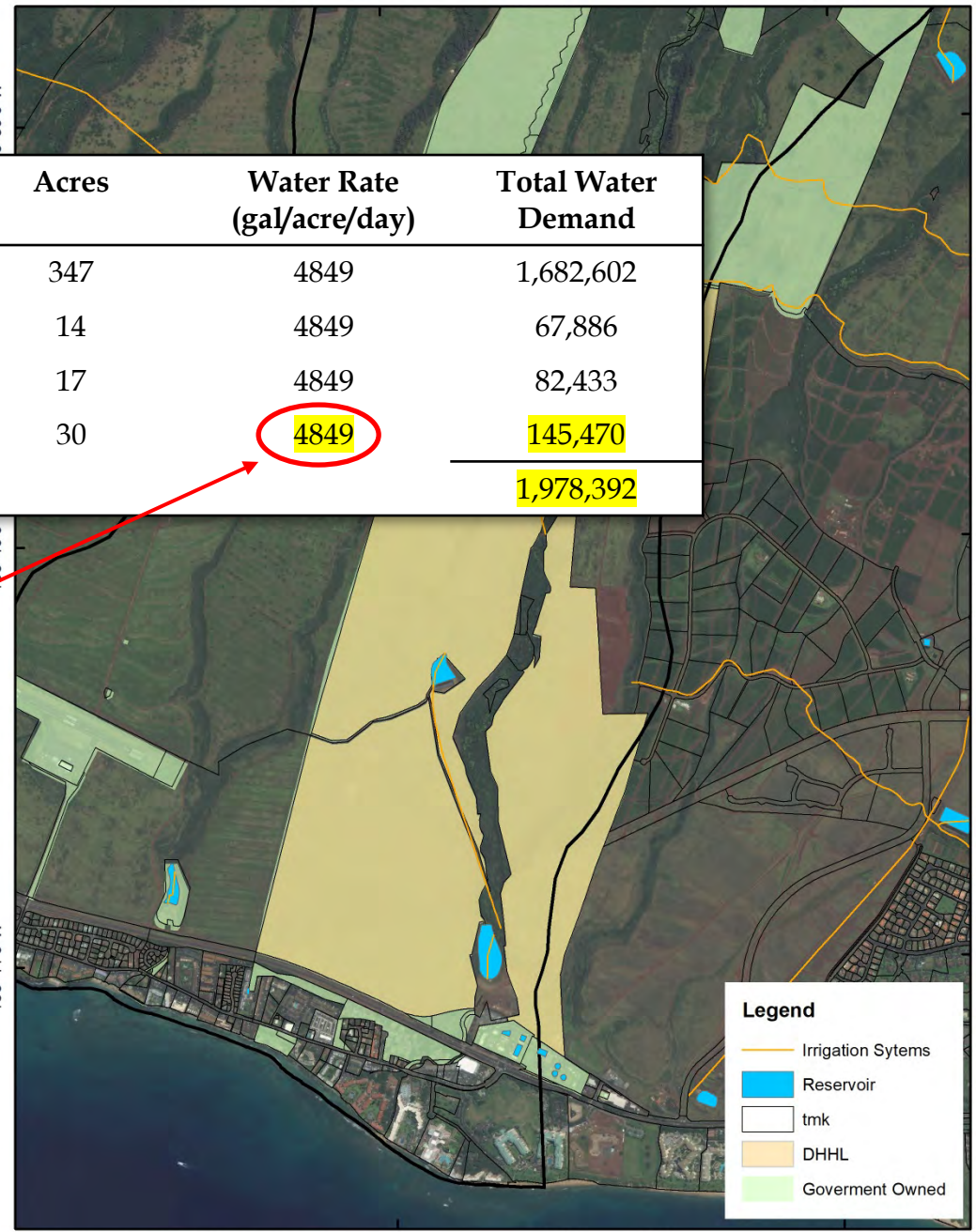
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2500 gpad?



**Legend**

- Irrigation Systems
- Reservoir
- tmk
- DHHL
- Government Owned



# DHHL Honokōwai Reservation

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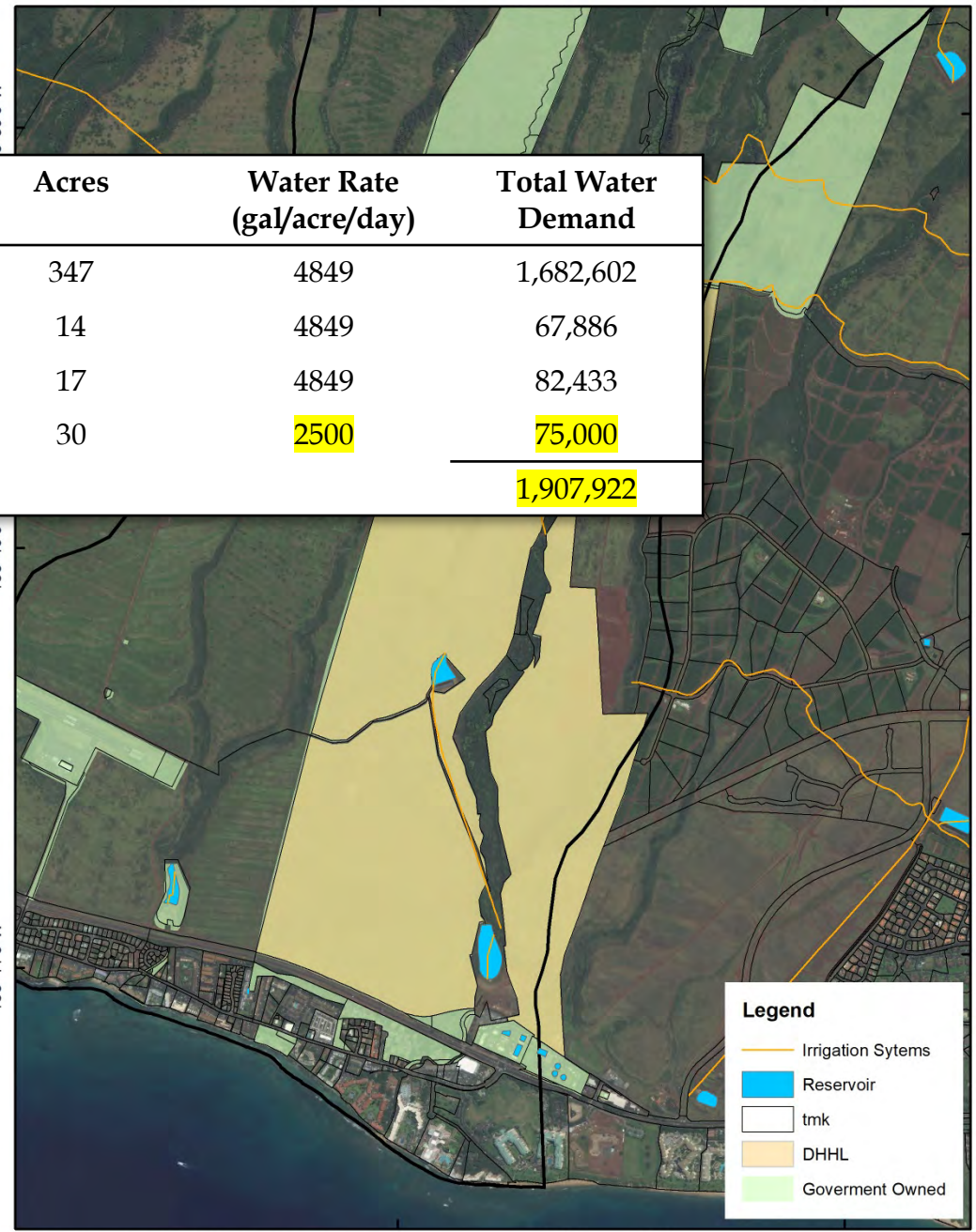
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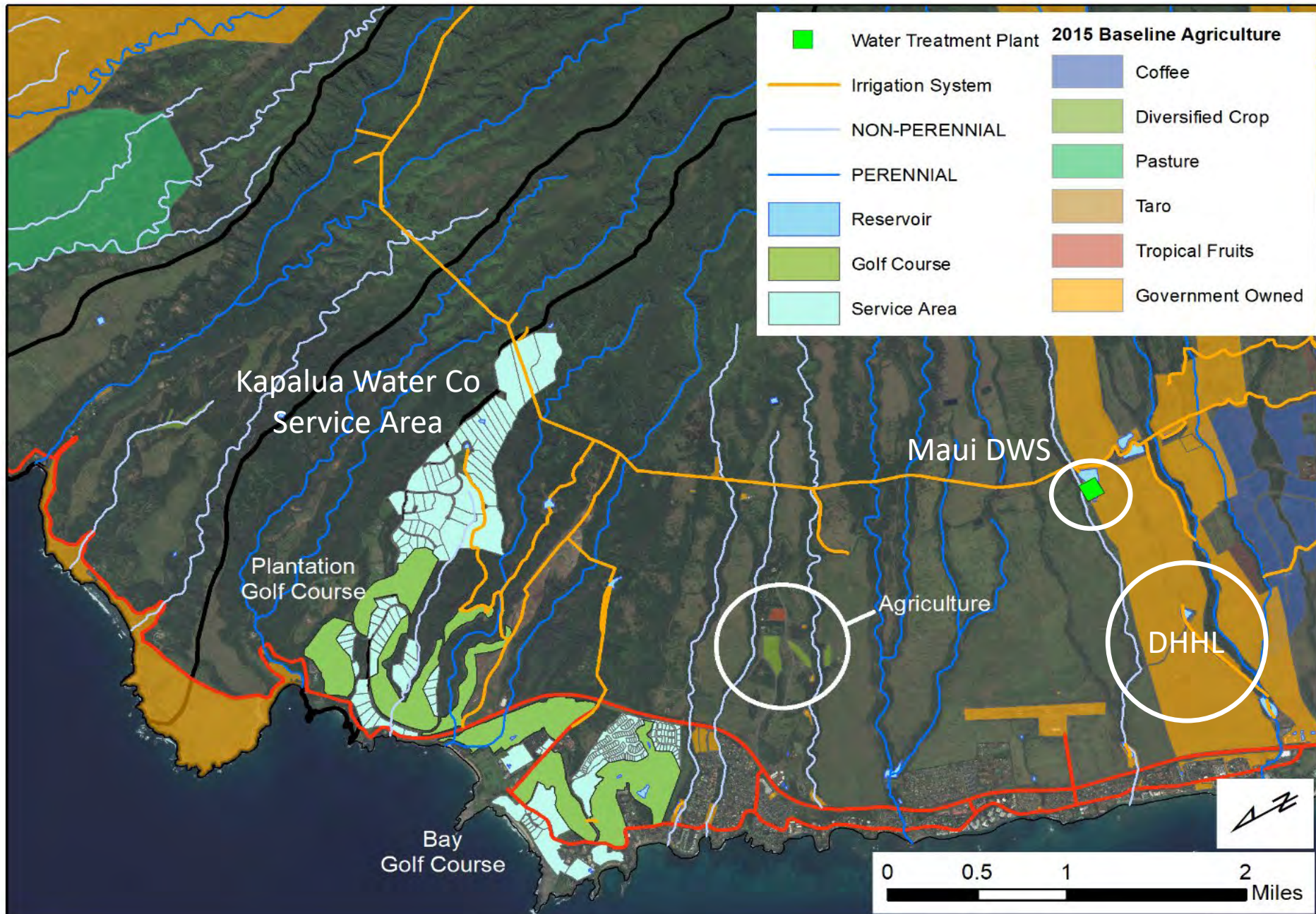
**Legend**

- Irrigation Systems
- Reservoir
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# Non-instream uses of Honokōhau Stream water



# Non-instream Uses of Honokōhau Stream Water

User	Description	2017 (mgd)	2018 (mgd)	2019 Est. (mgd)
<b>Kapalua Golf Courses:</b>				
Plantation Golf Course	107 acres, irrigation	0.31	0.24	0.26
Kapalua Bay Golf Course	100 acres, irrigation	0.36	0.23	0.30
Kapalua Golf Academy	25 acres, irrigation	0.24	0.04	0.05
	<b>Sub-Total</b>	<b>0.91</b>	<b>0.51</b>	<b>0.61</b>
<b>Kapalua Resort:</b>				
Plantation Estates	36 single-family homes, irrigation, fire hydrants			
Honolua Ridge	50 single-family homes, irrigation, fire hydrants			
Bay Villas	141 multi-family units, common area irrigation, fire hydrants			
Golf Villas	186 multi-family units, common area irrigation, fire hydrants			
Ridge Villas	161 multi-family units, common area irrigation, fire hydrants			
Ironwoods	40 multi-family units, common area irrigation, fire hydrants			
Pineapple Hill	100 single-family homes, common area irrigation, fire hydrants			
Coconut Grove	36 multi-family units, common area irrigation, fire hydrants			
Kapalua Place	6 single family homes, irrigation, fire hydrants			
Ritz-Carlton Kapalua	550 unit hotel, irrigation, fire hydrants			
Montgage Kapalua	200 unit hotel/condo, irrigation, fire hydrants			
Commercial Buildings	Village Center, Honolua Village, Merriman's Honolua Store, irr., fire hyd.			
Kapalua Resort Association	Common area irrigation			
	<b>Sub-Total</b>	<b>0.91</b>	<b>0.78</b>	<b>0.74</b>
<b>West Maui</b>				
	Mailepai, MPA, Napili Gardens, PKW, small farms and homes			
	<b>Sub-total</b>	<b>0.25</b>	<b>0.11</b>	<b>0.04</b>
	<b>Total Use</b>	<b>2.06</b>	<b>1.40</b>	<b>1.39</b>

# Non-instream Uses of Honokōhau Stream Water

- ~ 0.7 mgd for golf courses\*
- ~ 0.8 mgd for resort irrigation, common area landscaping, irrigation of luxury estates\*
- ~ 0.13 mgd of other: agriculture, cemetery, Napili gardens\*
- ~ 0.6 mgd system loss
- Up to 2.5 mgd for Maui DWS Mahinahina Water Treatment Facility

**Total existing demand = ~ 4.55 mgd**



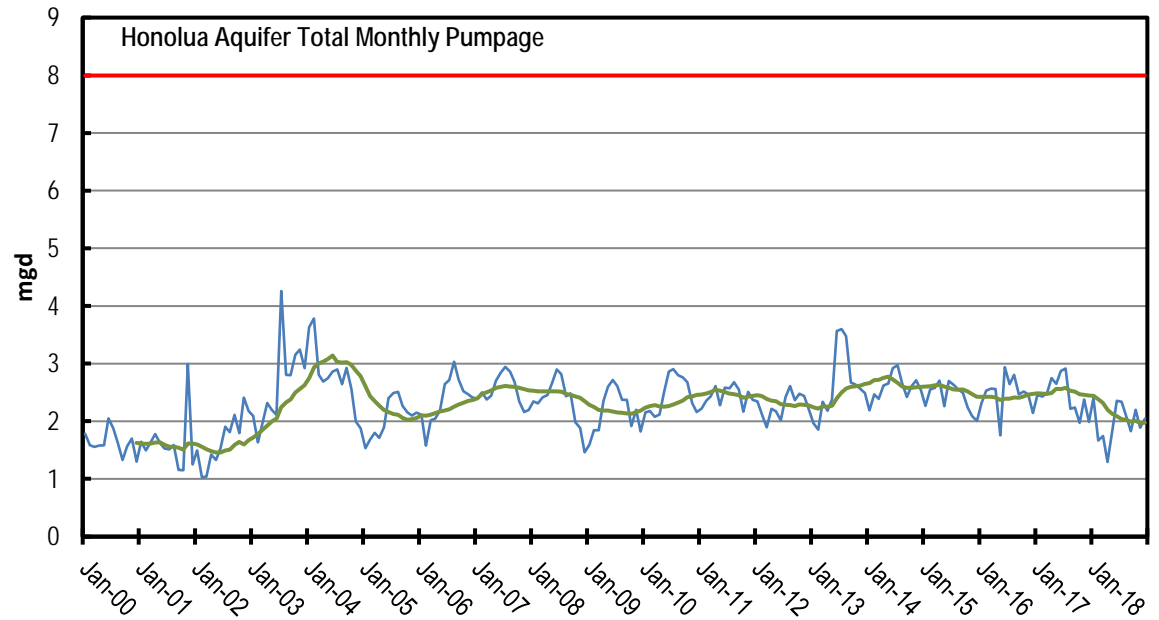


# Kapalua Water Co. Public Water System

## Potable Water

- from 3 wells
- One drilled but unused
- Serves 4,200 people

Well name	number	year	Elevation (ft)	Capacity (mgd)	12-MAV (mgd)
Kapalua 1	5938-002	1989	764	1.152	0.257
Kapalua 2	5938-003	1991	771	1.152	0.258
Kapalua 3B	5938-004	1998	788	no pump	n/a



# Maui Water Use and Development Plan

Figure 19-12 MDWS Lahaina System

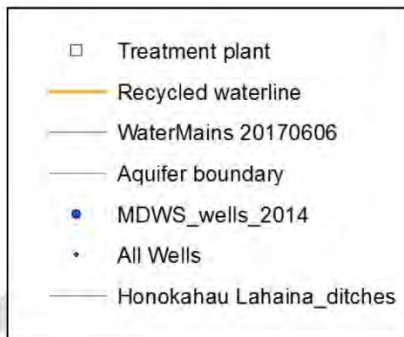
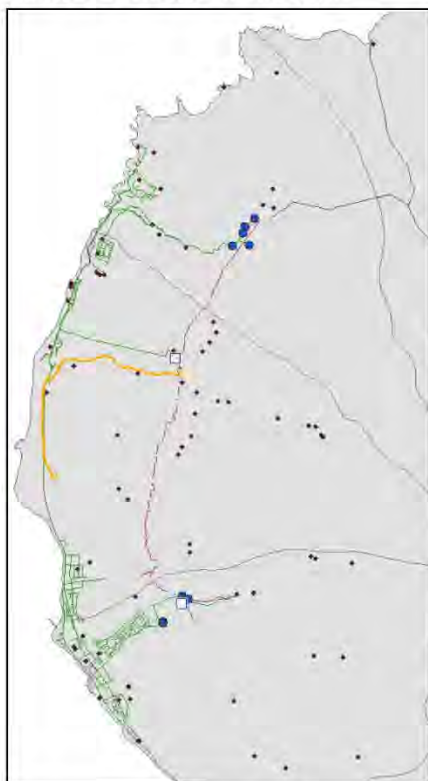


Table 19-13 MDWS Water Consumption by CWRM Category, Lahaina System, 2014  
Source: MDWS Metered Consumption Data, 2014

CWRM Categories	MGD	% of Total
Domestic	5.082	94.3%
Industrial	0.153	2.6%
Municipal	0.14	2.4%
Agriculture	0.005	0.1%
Irrigated	0.005	0.1%
Military (Usm)	0.002	0.0%
Unknown	0.002	0.0%
<b>Total</b>	<b>5.388</b>	<b>100.0%</b>

## Lahaina-Nāpili System

- Water blended from 2 surface water sources and 9 wells
- 2014 mean production: 5.4 mgd
- 54% surface water; 46% groundwater
- Napili subsystem
- Māhinahina WTF (1.70 ± 0.28 mgd)
- 5 basal aquifer wells

The Lahaina System is divided into sub districts as described below.

Table 19-14 Consumption by MDWS Lahaina System Subdistricts, 2014

Subdistricts	GPD	MGD	% of Total	Single Family (gpd)	Single Family % of Total
Lahaina 511	2,355,746	2.356	44%	435,098	8%
Honokowai 513	2,022,400	2.022	38%	179,658	17%
Alaeloa 515	1,007,878	1.008	19%	417,639	40%
Honokōhau 517	2,378	0.002	0%	2,378	0%
<b>Total</b>	<b>5,388,402</b>	<b>5.388</b>	<b>100%</b>	<b>1,034,773</b>	<b>100%</b>

Source: MDWS Metered Consumption Data, 2014 daily average.

Figure 19-12 MDWS Lahaina System

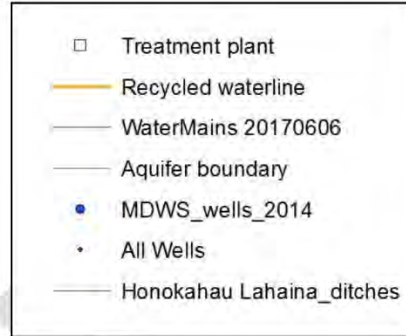
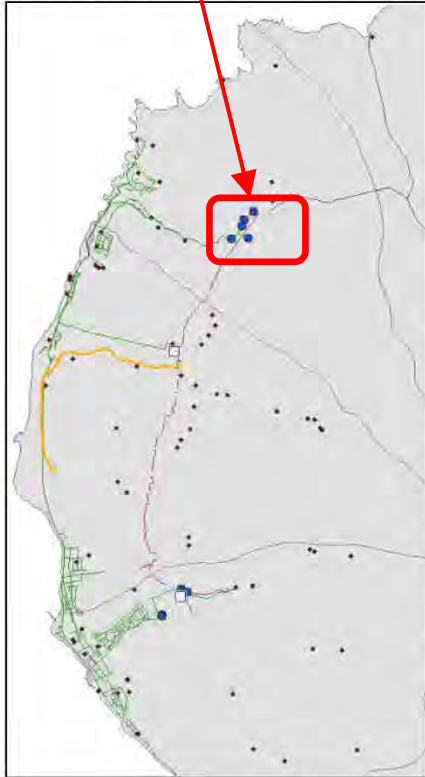


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94% is domestic use

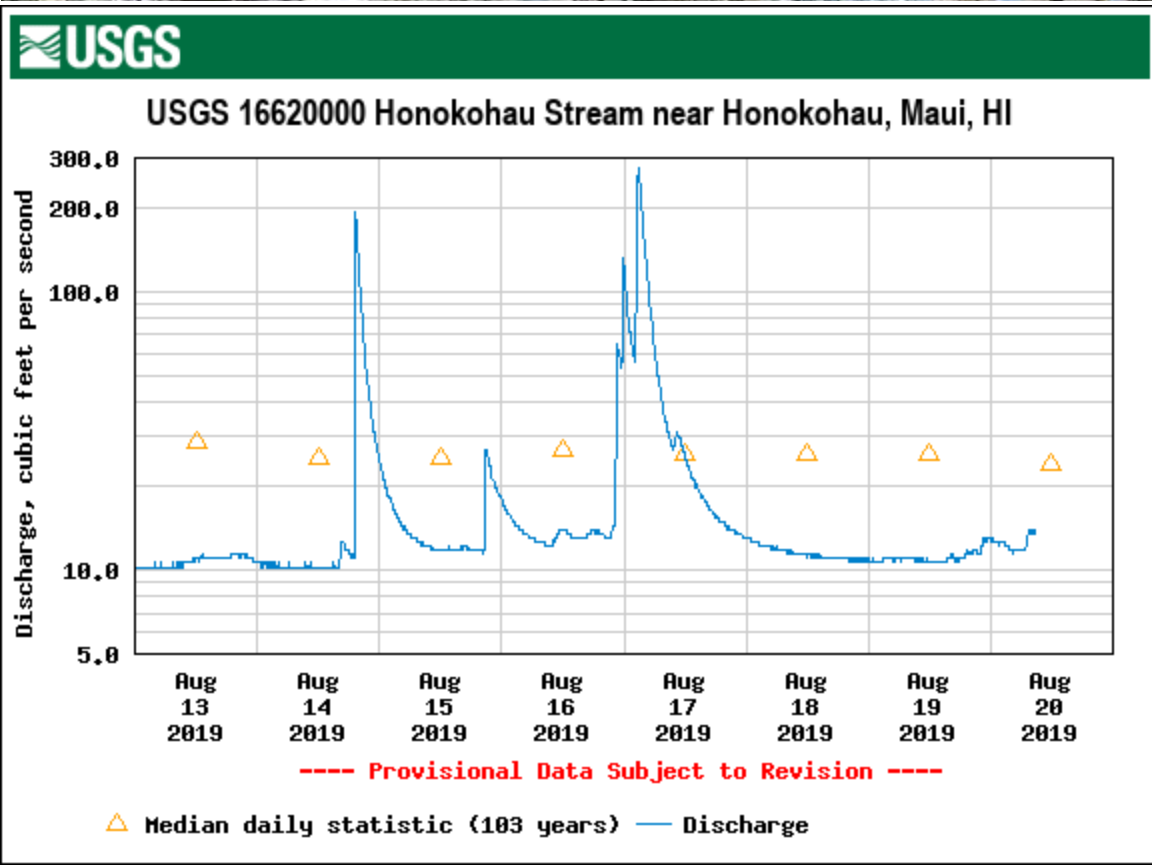
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Source: MDWS Metered Consumption Data, 2014 daily average.

# Honokōhau Stream at USGS 16620000



# Honokōhau Development Tunnels

Honokōhau: Tunnel 22

Honokōhau: Tunnel 21



Honokōhau Spring Discharge



USGS\* total flow estimates from tunnels:

$Q_{50}$ : 3.4 mgd

$Q_{70}$ : 2.8 mgd

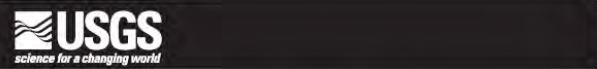
$Q_{90}$ : 2.3 mgd

\*USGS WRIR 03-4060

# Low-flow duration characteristics above Honokōhau Ditch intakes in cubic feet per second (million gallons per day)

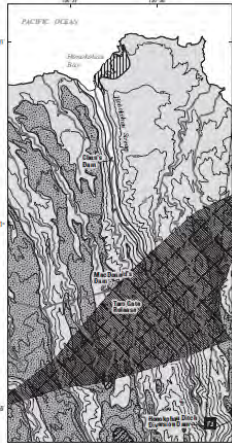

Stream	Estimated natural-flow $Q_{50}$	Estimated natural-flow $Q_{60}$	Estimated natural-flow $Q_{70}$	Estimated natural-flow $Q_{80}$	Estimated natural-flow $Q_{90}$
Honokōhau <sup>1</sup>	30 (19.4)	26 (16.8)	23 (14.9)	20 (12.9)	17 (11.0)

<sup>1</sup>USGS WRIR 03-4060; sum of USGS 16622000 and groundwater gains above Aotaki Weir (Diversion 770)



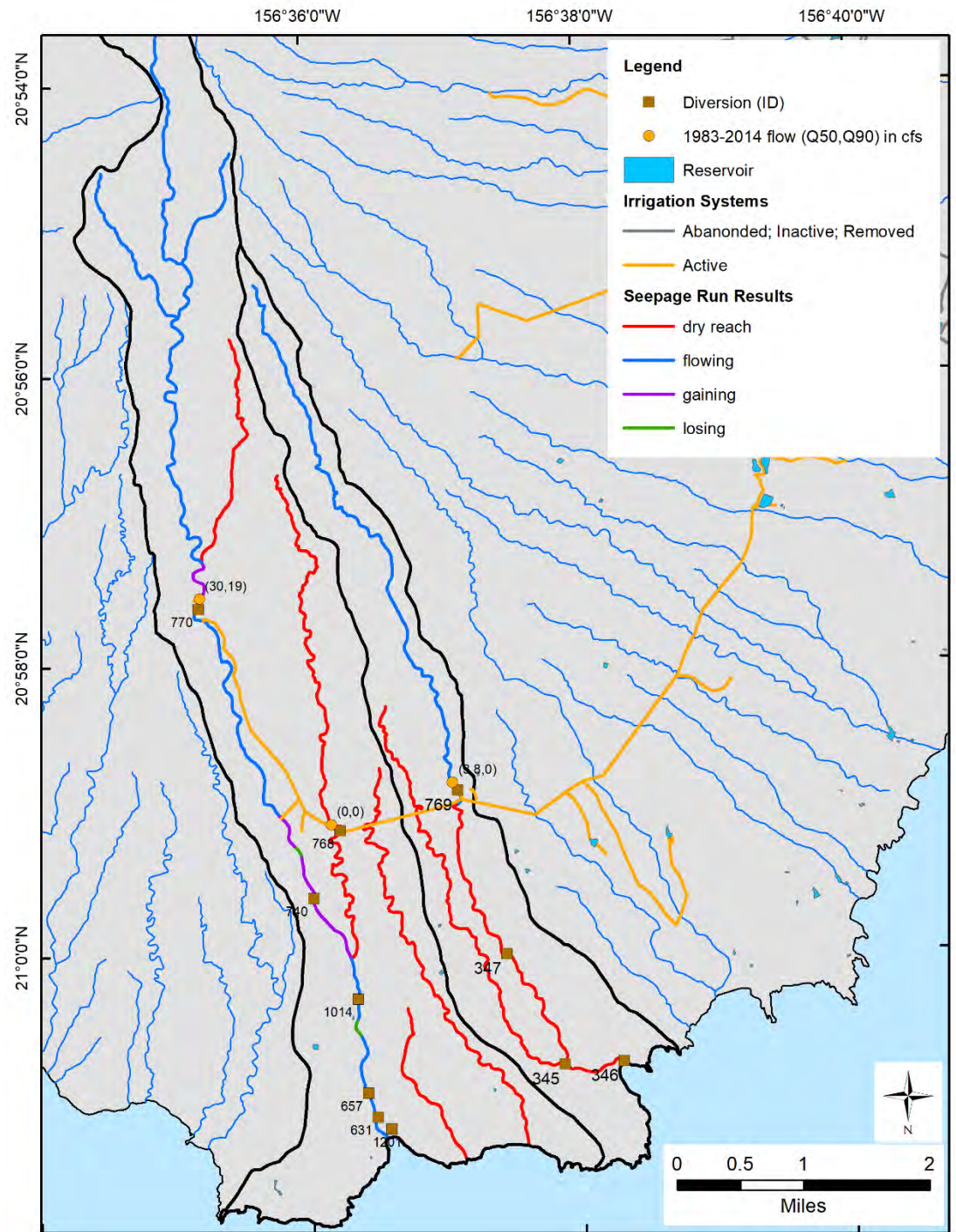
### Availability and Distribution of Base Flow in Lower Honokohau Stream, Island of Maui

U.S. Department of the Interior  
U.S. Geological Survey  
Water-Resources Investigations Report 03-4060

Prepared in cooperation with the  
STATE OF HAWAII OFFICE OF HAWAIIAN AFFAIRS

USGS WRIR 30-4060



# Instream Use Assessment Summary: Honokōhau Stream

- **Hydrology**  
Perennial throughout (mostly gaining stream)
- **Fish and Wildlife Habitat**  
Abundant native aquatic biota (nākea, nopili, alamo'o, 'opae)  
Endemic damselfly species (*M. pacificum*)
- **Recreational Uses**  
Ranked Substantial (3 out of 4), swimming, hiking
- **Maintenance of Water Quality**  
Low stream temperatures important for lo'i kalo production
- **Domestic Uses**
- **Traditional and Customary Practices**  
Ranked Outstanding (4 out of 4); one of the largest concentrations of historic lo'i kalo in Hawai'i  
Currently less than 5 acres, but expansion likely with increased flow





# Instream Use Assessment Summary: Honokōhau Stream

- historic uses



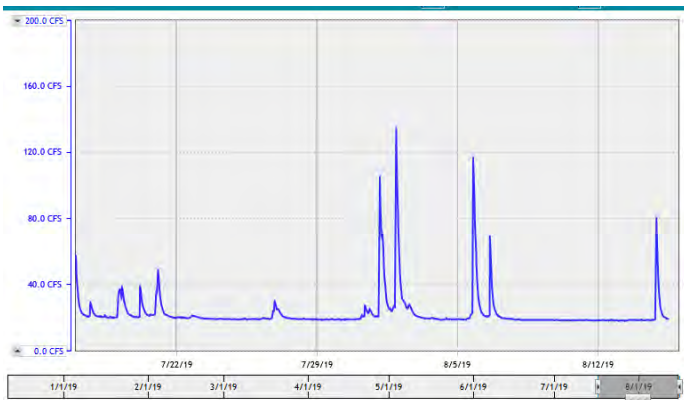
# Honokōhau Ditch Management

## Taro Gate (adit 15) on Honokōhau Ditch

Until ~2005 <1 mgd released at Taro Gate (adit 15)

2005-2018 average of 2.45 mgd released at Taro Gate





Real-Time Monitoring:  
Honokōhau Stream at McDonald's Dam  
Below Taro Gate Release  
→ Proposed IIFS in Honokōhau Stream

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# Honokōhau Ditch Management

Aotaki Weir (Honokōhau Ditch Intake #1)

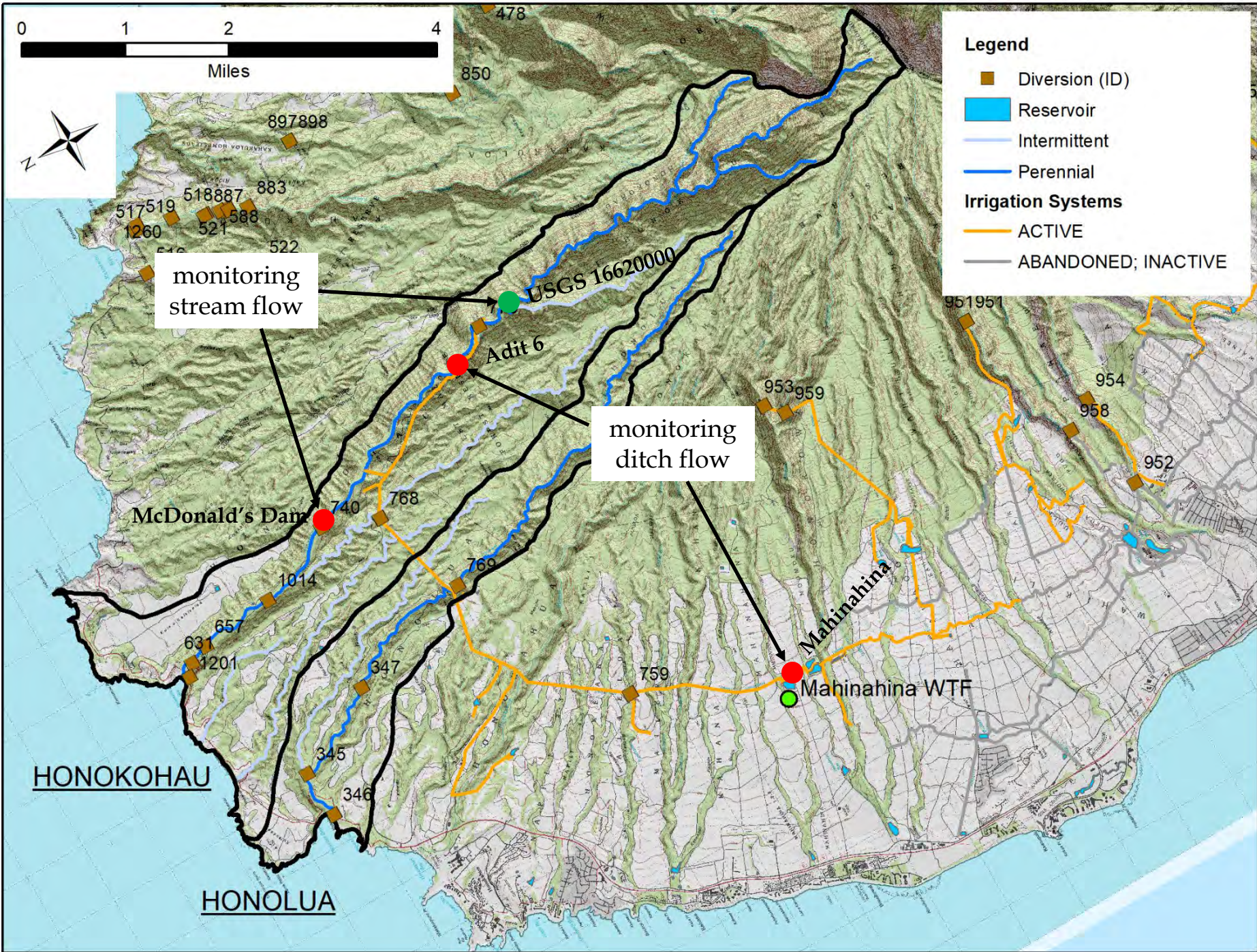
2005-2016 about 1.2 mgd released at Aotaki Weir





Real-Time Monitoring:  
Honokōhau Ditch at Adit 6  
→ Flow diverted from Honokōhau Stream

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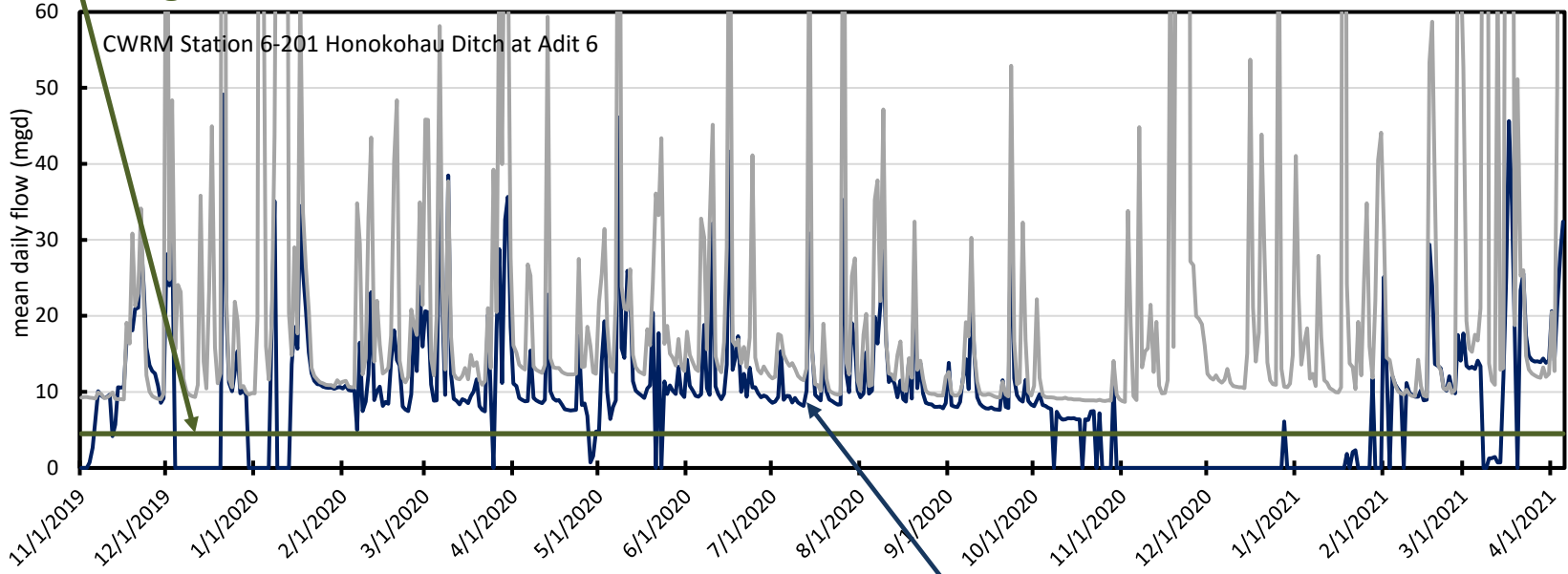


demonstrated use

# Honokōhau Ditch at Adit 6

\*2.5-3.5 mgd gain in flow between USGS and Aotaki Weir (Honokohau Ditch Intake)

~ 4.55 mgd



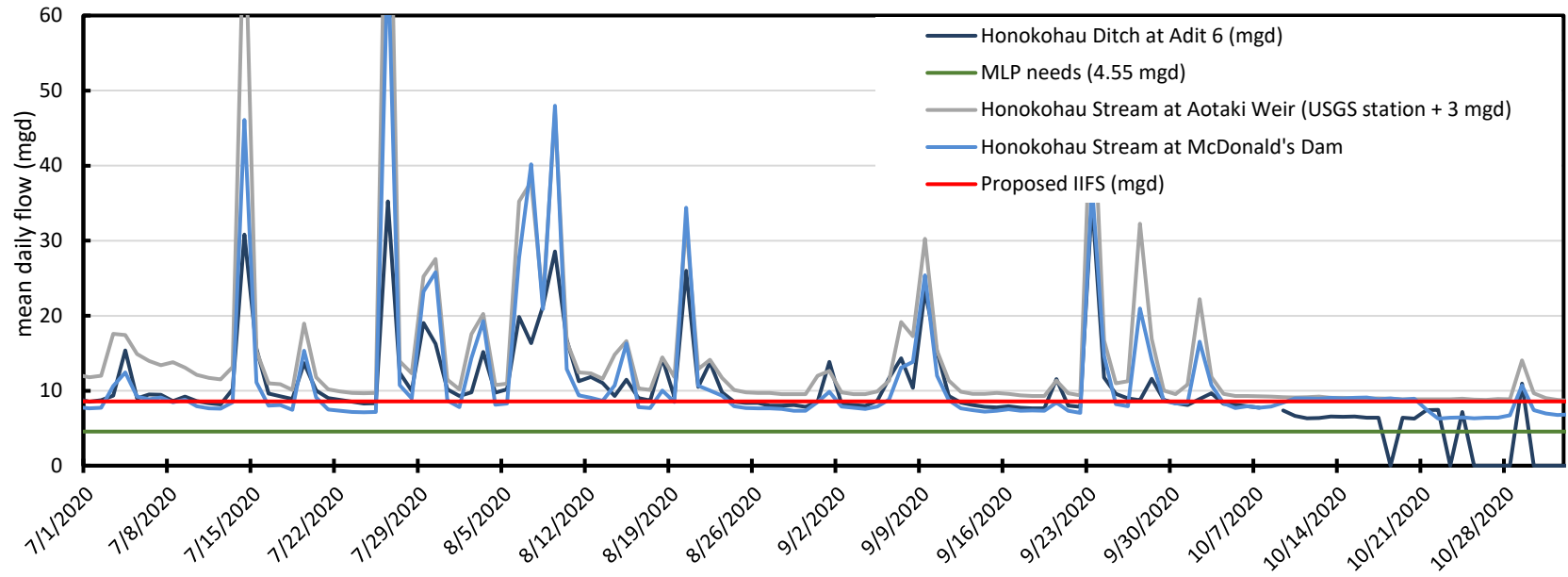
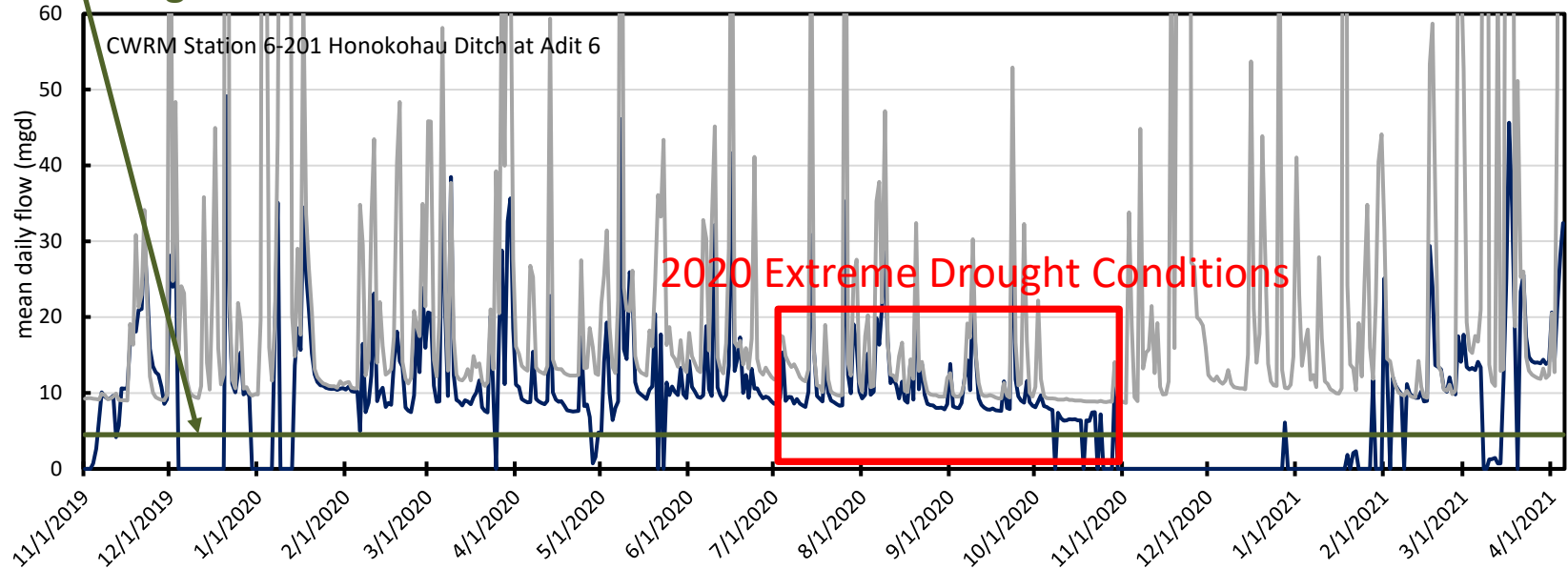
Honokohau Ditch at  
Adit 6

demonstrated use

# Honokōhau Ditch at Adit 6

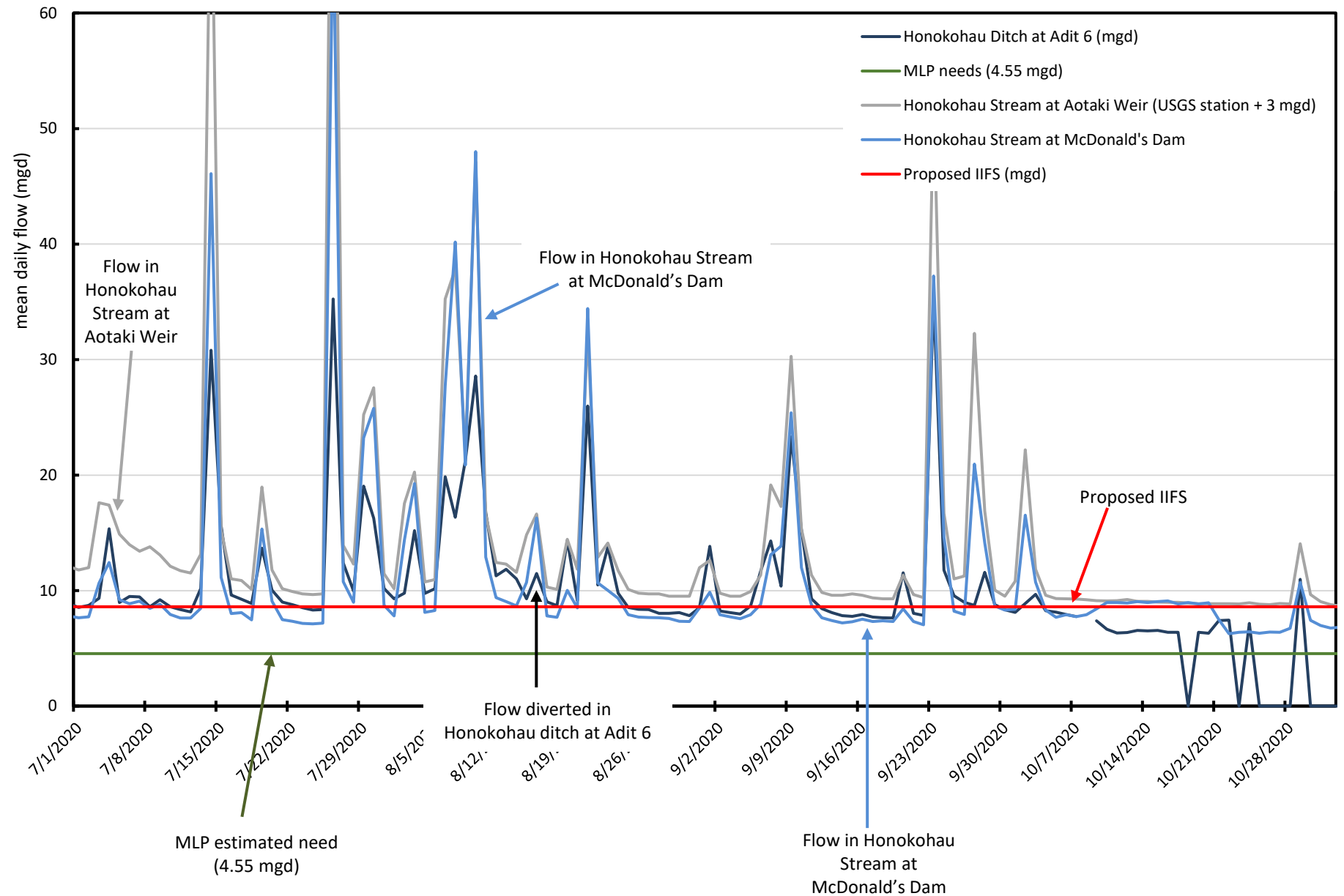
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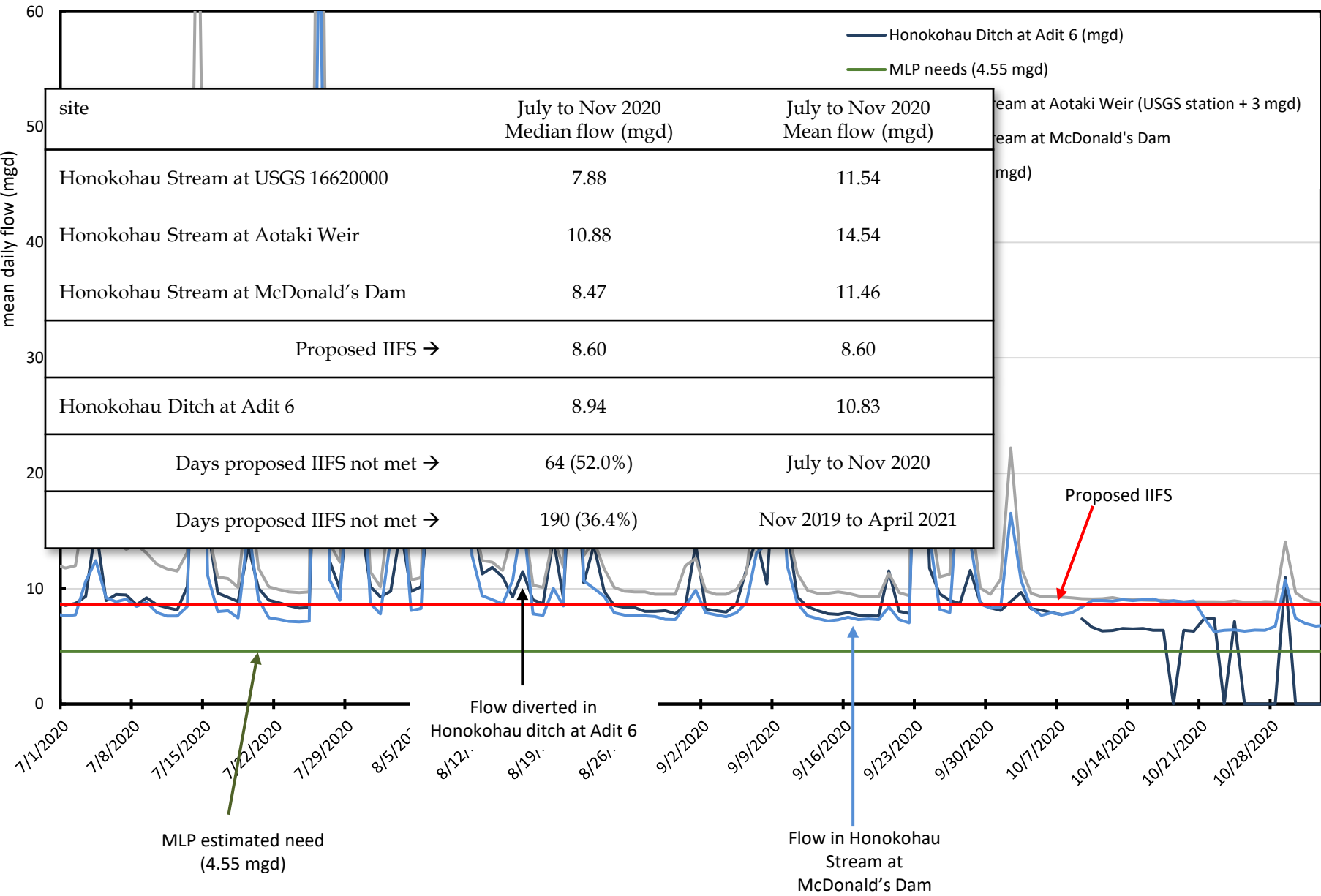




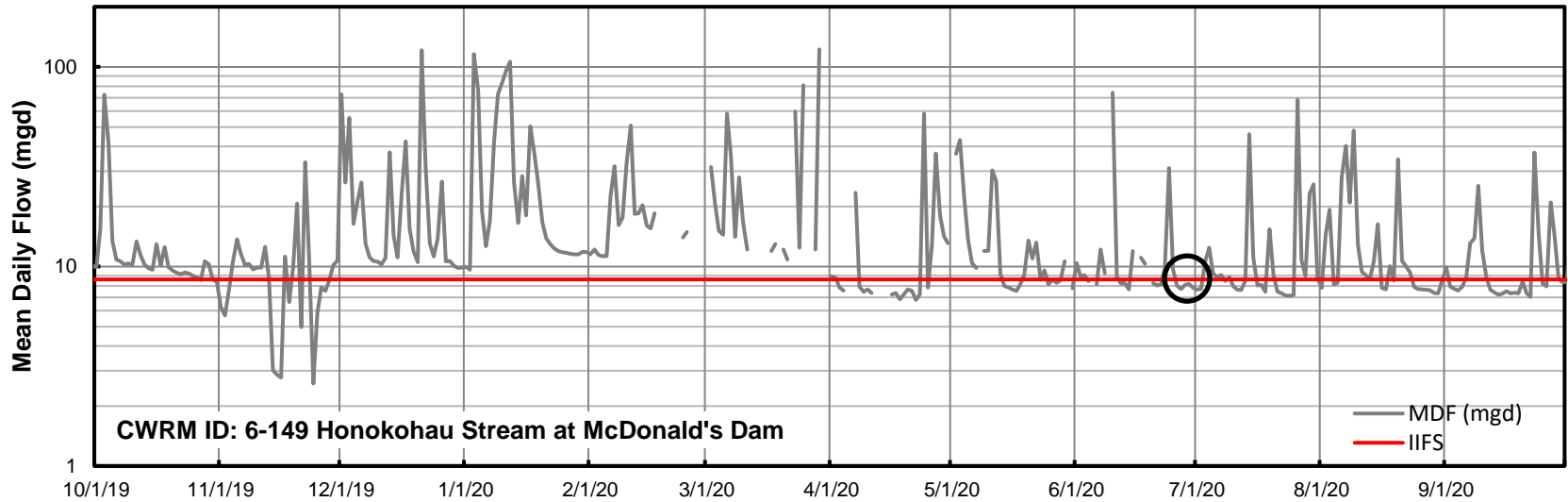
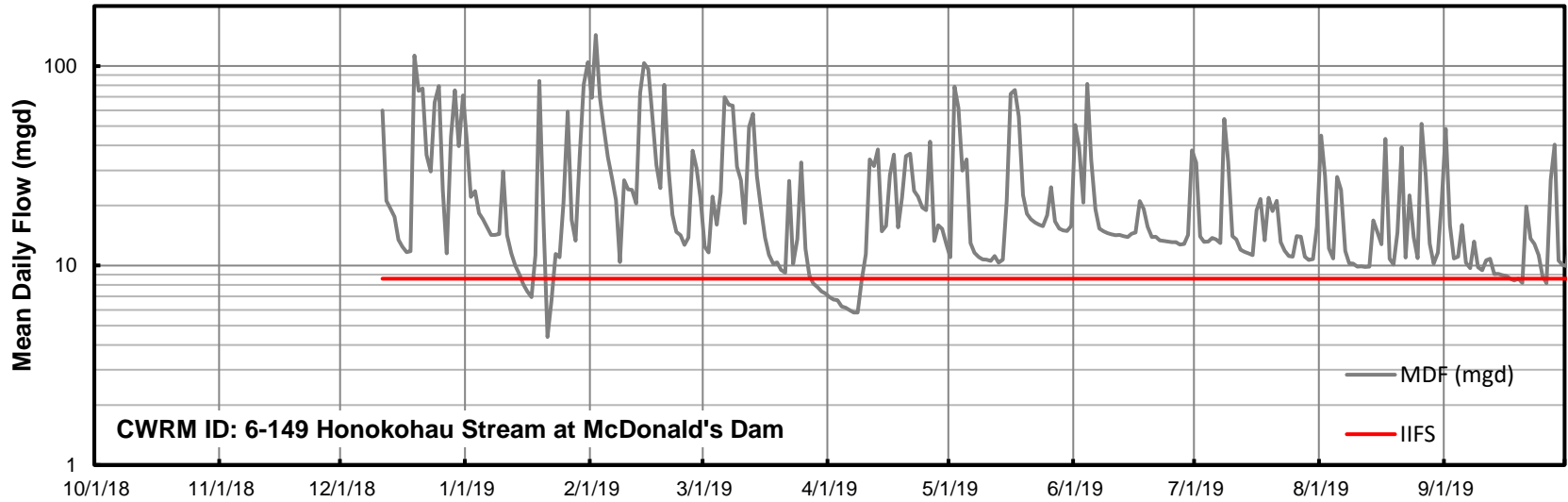
# Honokōhau Stream at McDonald's Dam and Honokohau Ditch at Adit 6



# Honokōhau Stream at McDonald's Dam and Honokohau Ditch at Adit 6



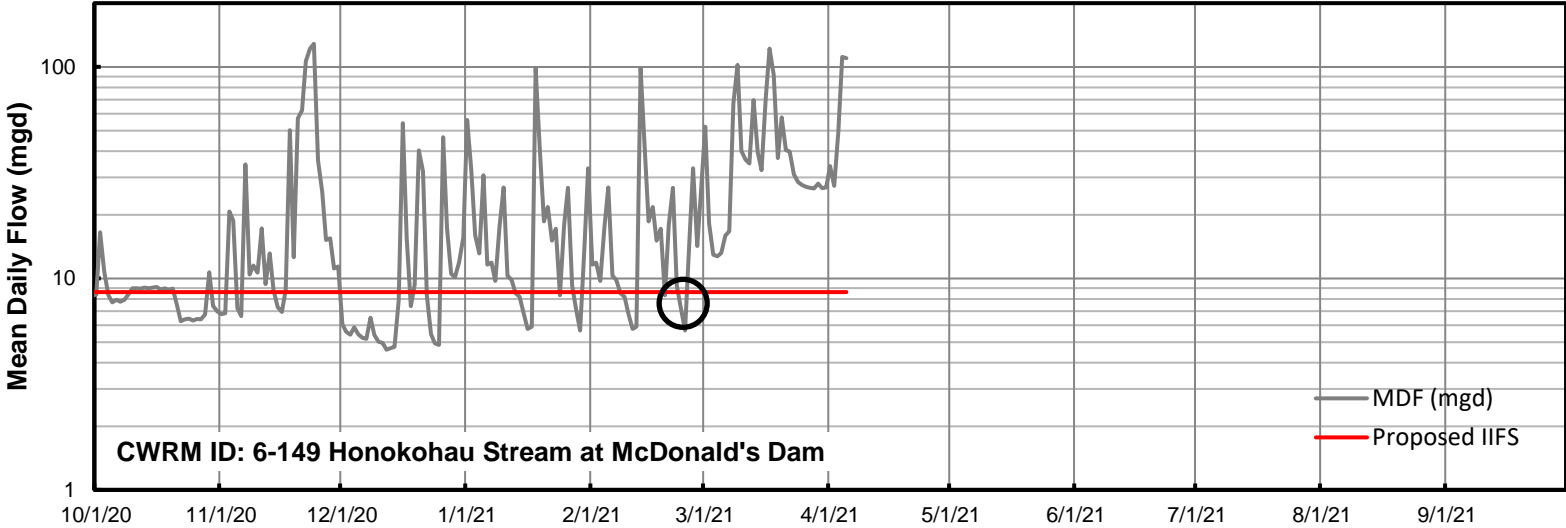
# Honokōhau Stream at McDonald's Dam



June 2020

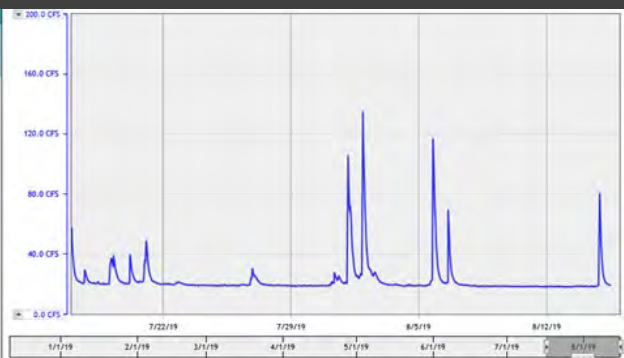


# Honokōhau Stream at McDonald's Dam



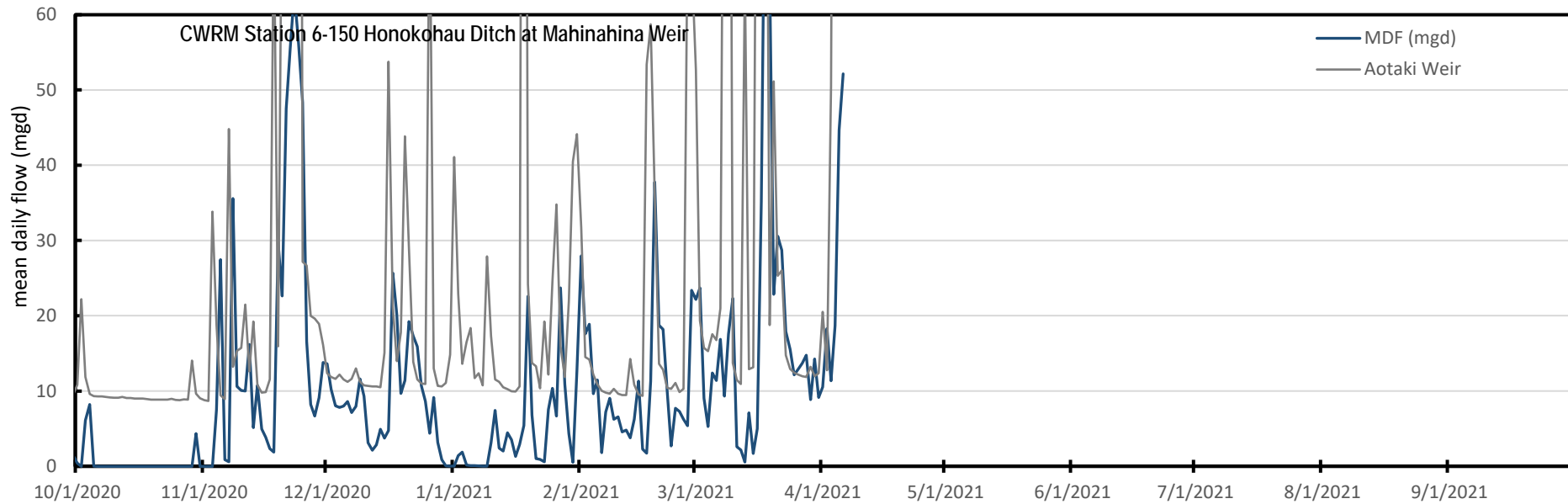
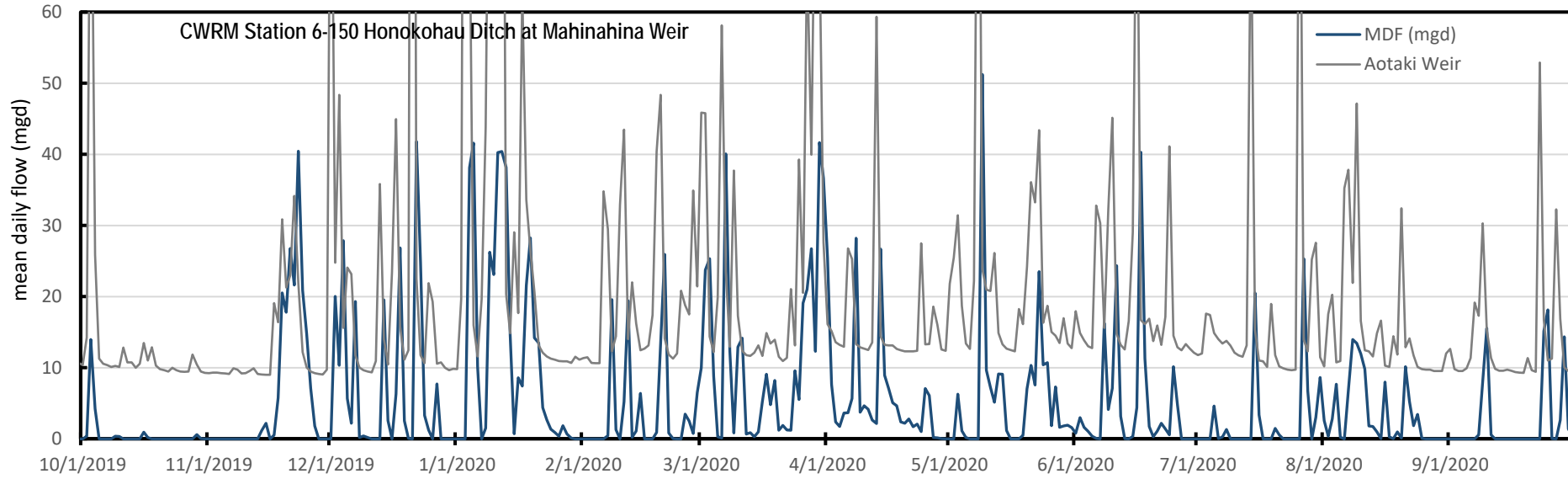
February 2021





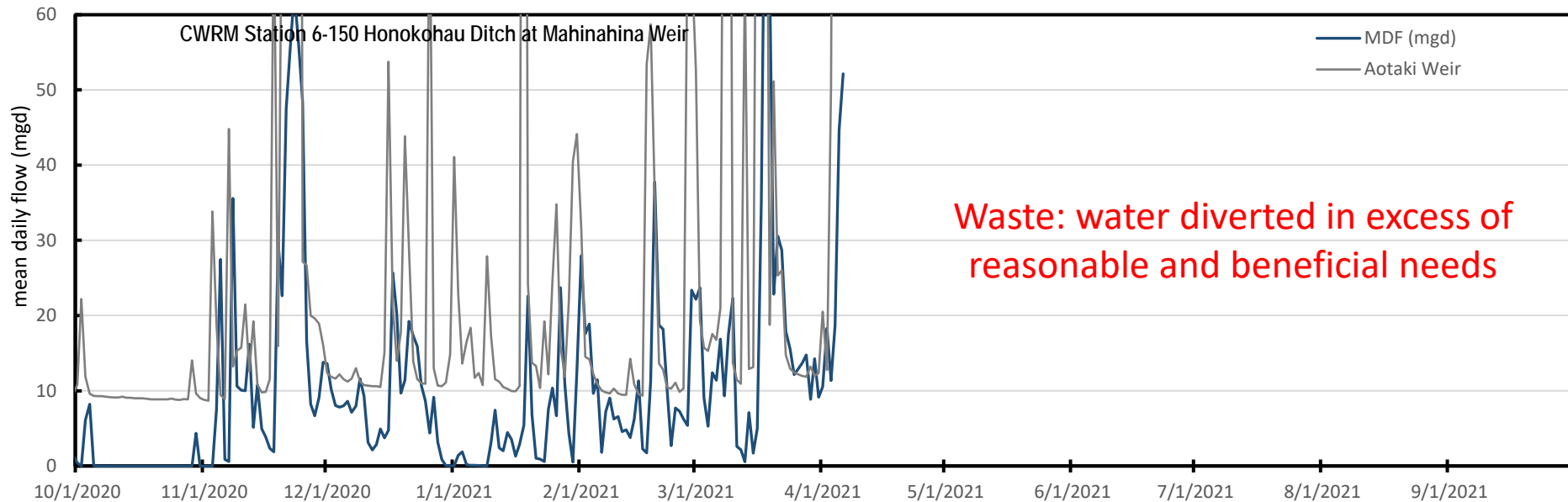
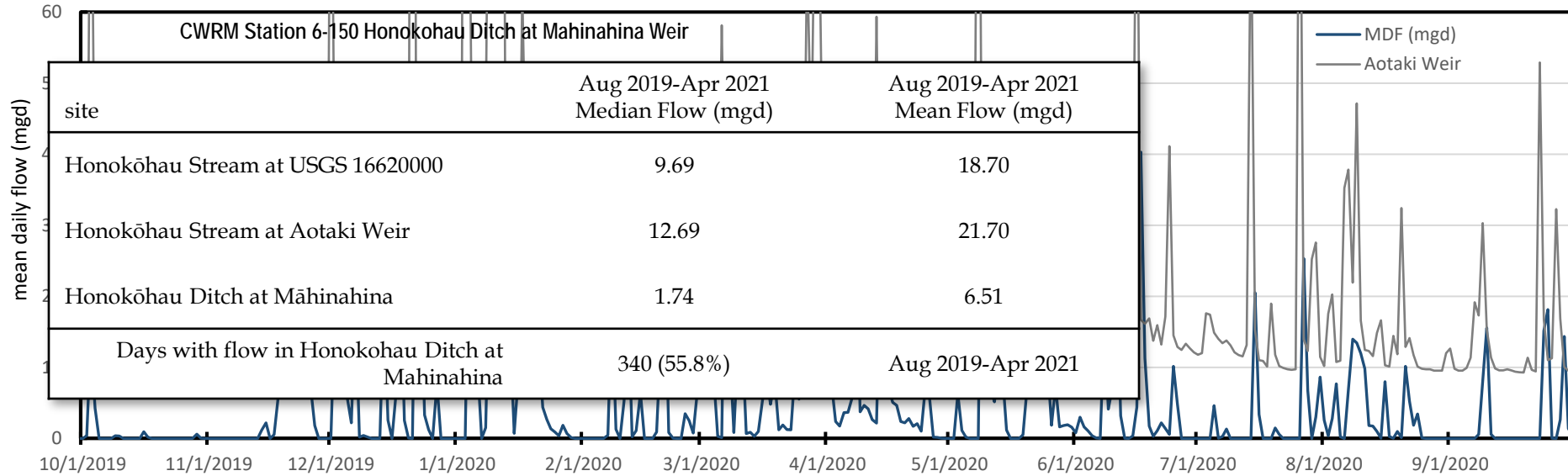
Real-Time Monitoring:  
Honokōhau Ditch at Māhinahina  
→ Flow diverted from Honokōhau  
Stream past Maui DWS to DHHL

# Honokōhau Ditch at Māhinahina Weir



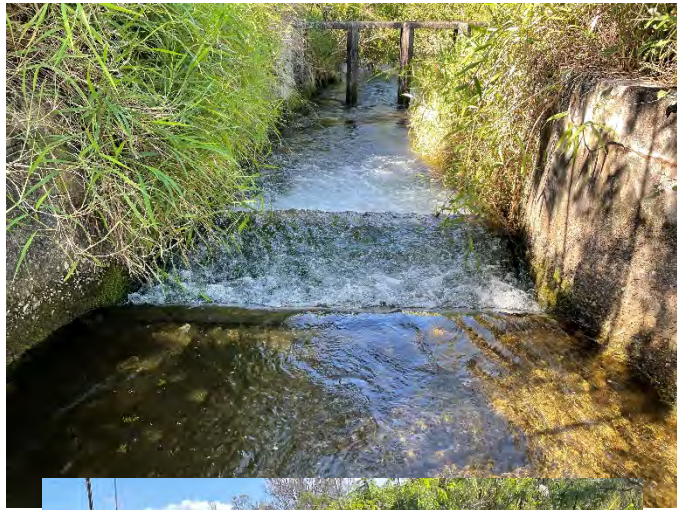


# Honokōhau Ditch at Māhinahina Weir



# Honokōhau Ditch at Māhinahina Weir

February 2021



February 2020





**Conclusion:** water is being removed from Honokōhau Stream in excess of existing demands that does not meet the reasonable-beneficial use criteria

**HRS § 174C-3**

**Reasonable-beneficial use**

The use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is both reasonable and consistent with the state and county land use plans and the public interest

**HAR § 13-167-82**

**Citizen complaints**

If any person files a complaint with the Commission that any other person is wasting or polluting water...the Commission shall cause an investigation to be made, take appropriate action, and notify the complainant thereof.

# Establishment of Instream Flow Standards

## **HRS § 174C-71**

Establish instream flow standards on a stream-by-stream basis whenever necessary to protect the public interest in waters of the State

## **HRS § 174C-3**

Flows necessary to protect instream uses including maintenance of fish and wildlife habitat, recreational activities, maintenance of ecosystems, aesthetic or scenic values, navigation, instream hydropower, maintenance of water quality, conveyance of irrigation or domestic water supply downstream, and the protection of traditional and customary Hawaiian rights



**The protection of instream uses statewide shall be guided by the following principles:**

- (1) Streams should be maintained with water sufficient to preserve fish, wildlife, scenic, aesthetic, recreational, and other instream uses, and stream systems should be retained substantially in their natural condition
  
- (4) In determining flow requirements to protect instream uses...consideration should be given to the maintenance of existing non-instream uses of economic importance...
  
- (5) ...the Commission shall consider physical solutions, including water exchanges, modifications of project operations, changes in points of diversion, changes in time and rate of diversion, uses of water from alternative sources, or any other solutions.

# Alternatives Analysis

## **Groundwater**

Kapalua Water Co has current installed capacity in two groundwater wells and an additional unused well to meet increased demand

## **R1 Water**

Kapalua Wastewater Co has treated water which can be upgraded to R1 standards to meet non-potable needs

Maui County's Lahaina Wastewater Treatment Facility as capacity to provide R1 water

Maui County has R1 treated water in Honokōwai that could be brought to Kapalua

# Recommendations: Kaluanui Stream

Interim IFS: natural flow

Location: at Honokōhau Ditch diversion (diversion 768)

Implementation: Commission has approved the formal abandonment of the stream diversion works by MLP



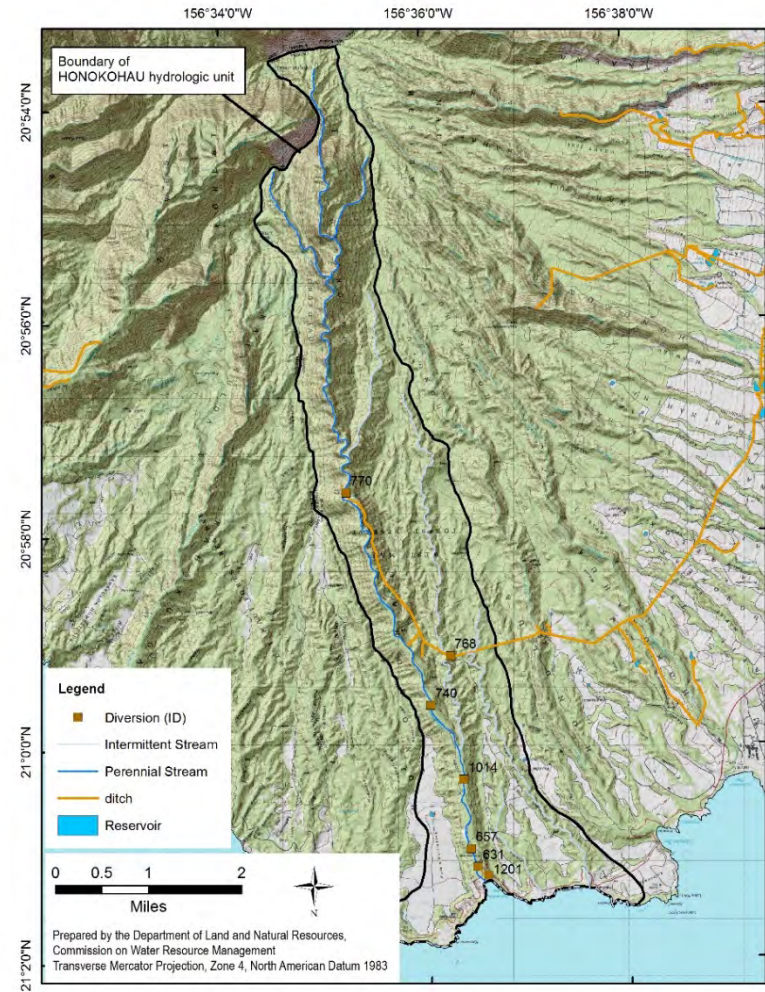
## Honokōhau IIFS Two-phased approach

- **Phase One**: What can be implemented tomorrow
  - Flows necessary to protect instream uses
- **Phase Two**: What needs to be done to protect public trust uses of water
  - Keep 50% of the water in the stream at all times
  - 50% of water available for domestic needs, DHHL, other reasonable and beneficial uses
  - Stream has no alternative source



# Recommendations: Honokōhau Stream

Interim IFS:           phased approach  
Location:               at McDonald's Dam (elevation of 340 feet)  
Implementation:       →Phase 1 within 1 year of approval



## Recommendations: Honokōhau Stream

Interim IFS:       phased approach

Location:           at McDonald's Dam (elevation of 340 feet)

Implementation:   modification of stream diversion works needed to ensure IIFS is met

Flow currently  
Bypassing  
Aotaki Weir



# Recommendations: Honokōhau Stream

Interim IFS:           phased approach  
 Location:               at McDonald's Dam (elevation of 340 feet)  
 Implementation:   →Phase 1 within 120 days of approval  
                               IIFS = 8.6 mgd at McDonald's Dam

Phase One	Water Use	mdf	Q <sub>50</sub>	Q <sub>70</sub>	Q <sub>90</sub>
flow at USGS 1662000	instream	22.6	16.0	12.1	8.7
groundwater gains	instream	3.4	3.4	2.8	2.3
available above DIV 770	instream	26.0	19.4	14.9	11.0
groundwater gains	instream	1.4	1.4	1.4	1.4
interim IFS at McDonald's Dam	instream	<b>8.6</b>	<b>8.6</b>	<b>8.6</b>	<b>8.6</b>
amount available off stream	non-instream	18.8	12.2	7.7	3.8
<b>Uses met</b>					
	Maui DWS domestic water supply	2.5	2.5	2.5	2.5
	DHHL non-potable water demand <sup>1</sup>	0.0	0.0	0.0	0.0
	MLP non-instream uses	1.8	1.8	1.8	1.8
	<b>system loss:</b>	0.6	0.6	0.6	0.6
	<b>total off-stream demand:</b>	4.3	4.3	4.3	4.3
	<b>total off-stream demand met:</b>	4.3	4.3	4.3	3.2
	<b>unmet demand:</b>	0.0	0.0	0.0	1.1

\*Not all values add due to rounding

# Recommendations: Honokōhau Stream

Interim IFS:           phased approach

Location:               at McDonald's Dam (elevation of 340 feet)

Implementation:   →Phase 2 when DHHL begins its non-potable usage  
                           IIFS = 50% of streamflow measured at McDonald's Dam

<b>Phase Two</b>		<b>mdf</b>	<b>Q<sub>50</sub></b>	<b>Q<sub>70</sub></b>	<b>Q<sub>90</sub></b>
flow at USGS 1662000	instream	22.6	16.0	12.1	8.7
groundwater gains abv Aotaki	instream	3.4	3.4	2.8	2.3
available at Aotaki	instream	26.0	19.4	14.9	11.0
groundwater gains blw Aotaki	instream	1.4	1.4	1.4	1.4
interim IFS at McDonald's Dam	instream	<b>13.7</b>	<b>10.4</b>	<b>8.5</b>	<b>6.8</b>
amount available off stream	off stream	13.7	10.4	7.9	5.7
<b>Uses met</b>					
	Mauí DWS domestic water supply	2.5	2.5	2.5	2.5
	DHHL agriculture water demand	2.0	2.0	2.0	2.0
	MLP non-instream uses	1.8	1.8	1.8	1.8
	system loss:	0.6	0.6	0.6	0.6
	<b>total off-stream demand:</b>	6.3	6.3	6.3	6.3
	<b>total off-stream demand met:</b>	6.3	6.3	6.3	5.1
	<b>unmet demand:</b>	0.0	0.0	0.0	1.3

\*Not all values add due to rounding

# Recommendations: Honolulu Stream

Interim IFS: natural flow

Location: at Honokōhau Ditch diversion (Diversion 769)

Implementation: Commission has approved the formal abandonment of the stream diversion works by MLP



# Honokōhau Stream above Aotaki Weir

July 7, 2017



June 11, 2019





# Public Trust Doctrine

**“...all public natural resources  
are held in trust by the State  
for the benefit of its people.”**

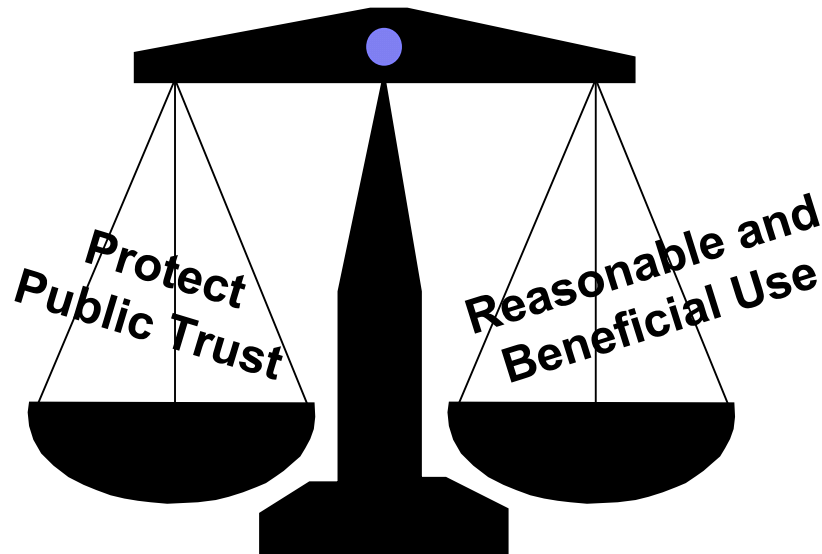
**“The State has an obligation to protect,  
control and regulate the use of Hawaii's water  
resources for the benefit of its people.”**

***State Constitution, Article XI***



# Commission on Water Resource Management

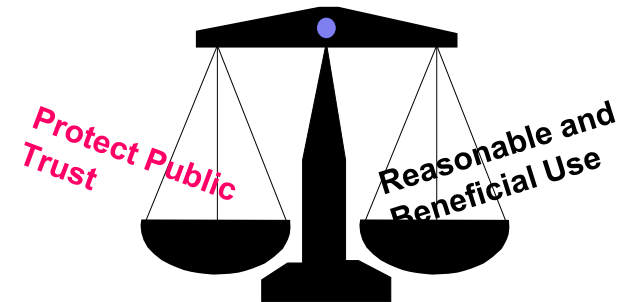
**Must Balance Protection of the Public Trust and  
Provide for Reasonable and Beneficial Uses**



# Protection of the Public Trust

## ■ 4 Public Trust Purposes

- Maintenance of Water in its Natural State
- Domestic use (individuals)
- Traditional and Customary Rights
- DHHL Reservations



# Ensure uses are Reasonable and Beneficial

- Purpose
- Justified Quantity
- Efficient
- Lack of practicable alternatives
- Consistent with the public interest
- Consistent with state and county land use plans

