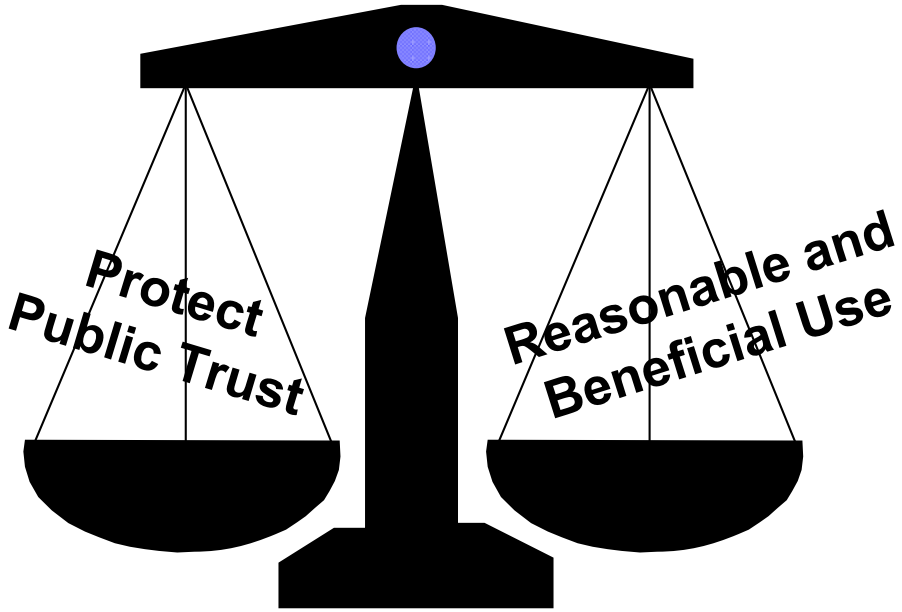
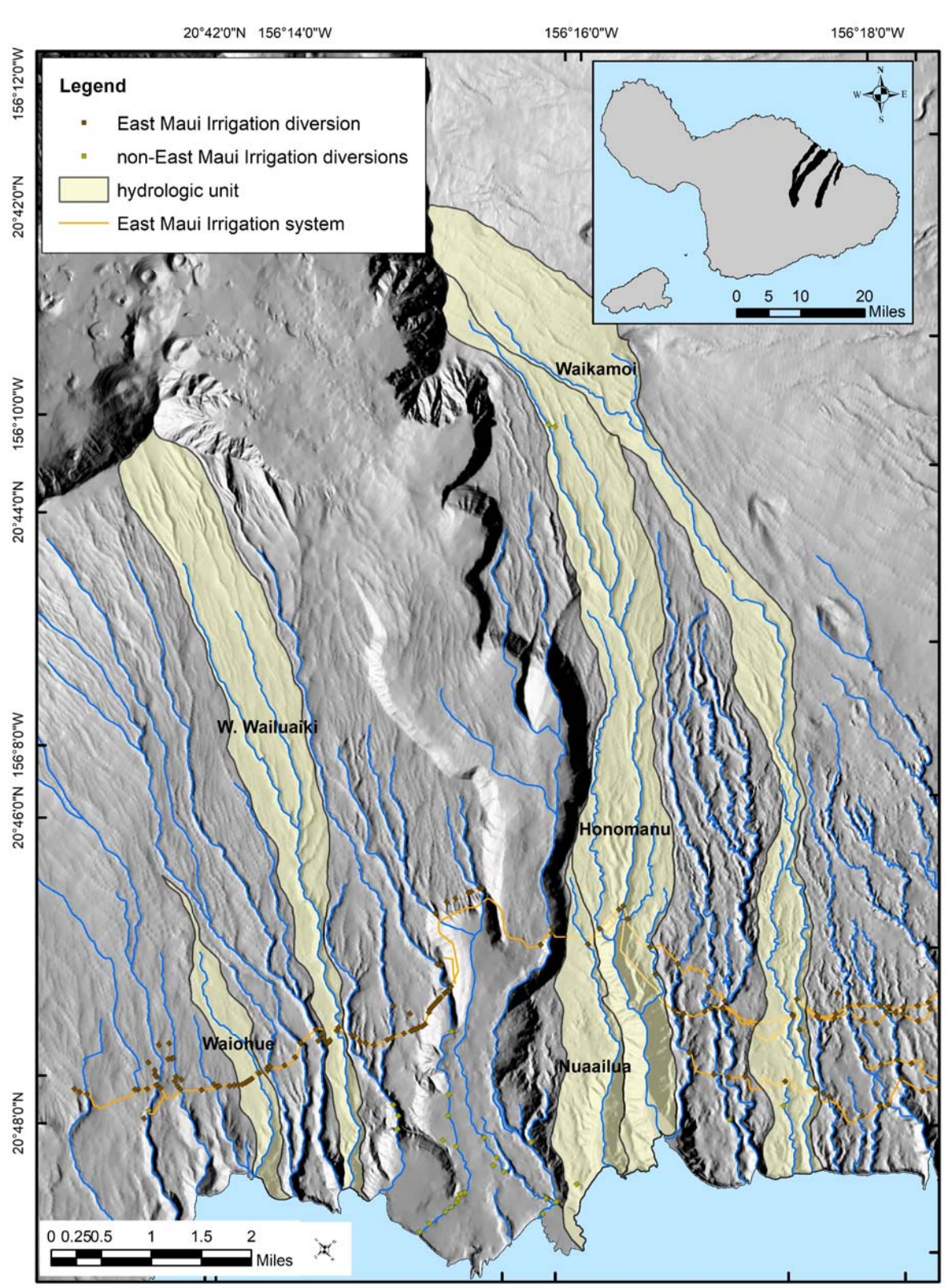
Reservation of non-potable water for the Department of Hawaiian Home Lands from East Maui streams and amended interim instream flow standards for Waikamoi, Honomanū, Nua‘ailua, West Wailuaiki, Waiohue in the Ke‘anae, and Honomanū regions, Maui

November 15, 2022
Item B-6

Ayron M. Strauch, Hydrologist
Stream Protection and Management Branch

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




20°42'0"N
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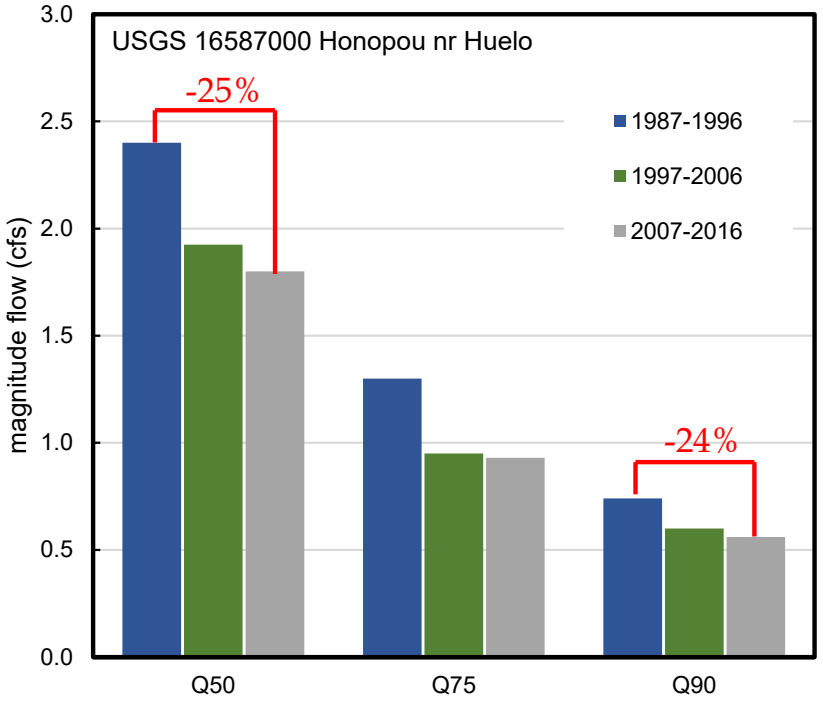
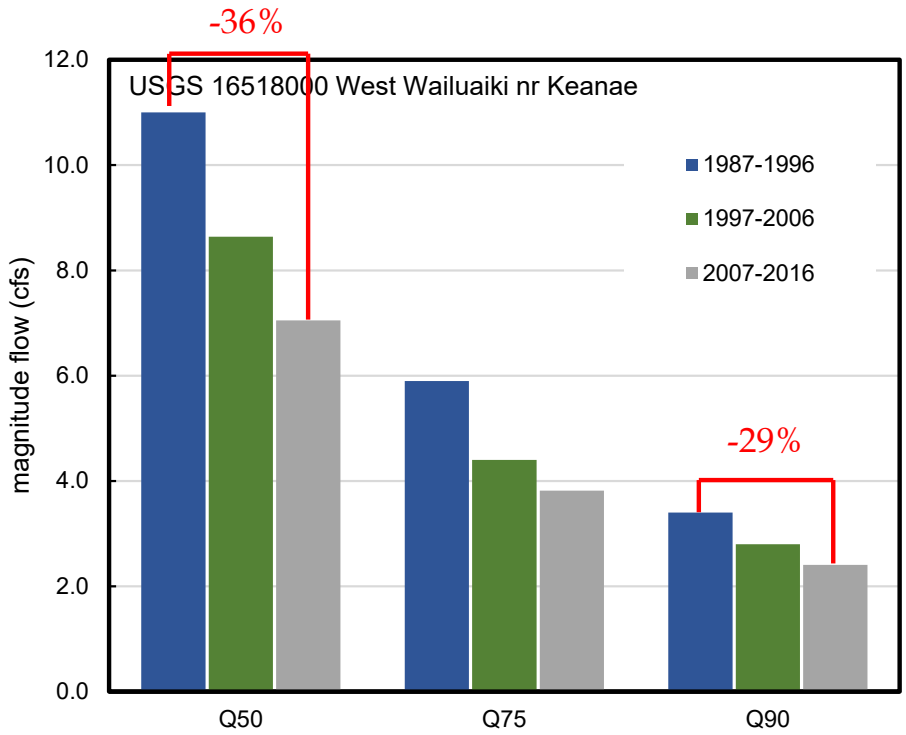
20°44'0"N
156°8'0"W
20°46'0"N
20°48'0"N
Legend
East Maui Irrigation diversion
non-East Maui Irrigation diversions
hydrologic unit
East Maui Irrigation system
N
W
E
S
0 5 10 20
Miles
Waikamoi
W. Wailuaiki
Honomanu
Waiohue
Nuaailua
0 0.250.5 1 1.5 2
Miles

Revisiting Interim Instream Flow Standards in East Maui

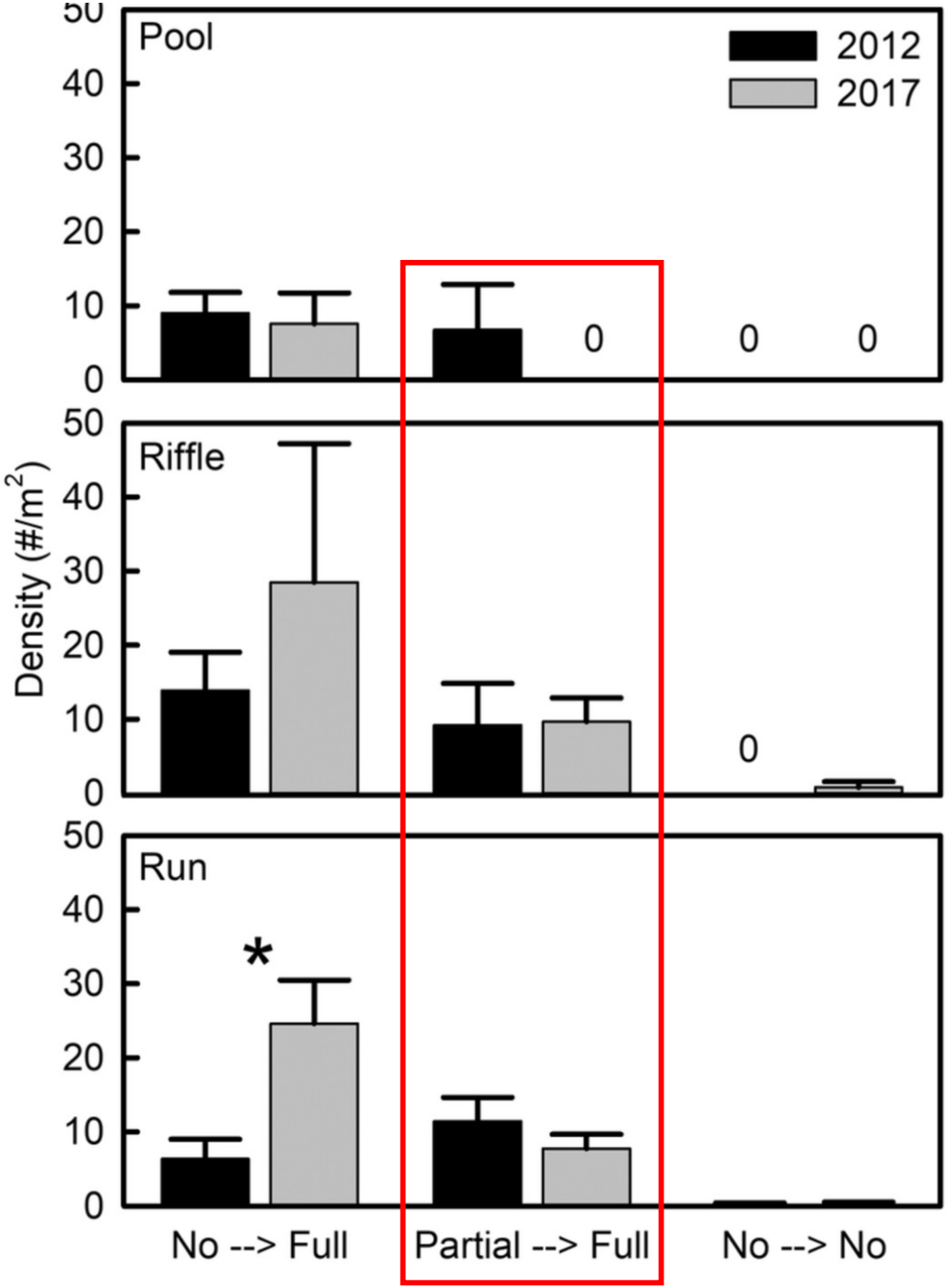
1. "Interim" standards are temporary and need to be revisited periodically
   → Every 4-5 years it's worth revisiting
2. Original IIFS were established based on only the data available in the Contested Case Hearing
   → Hydrological data based on 1942-2001 period of record and didn't consider the consequences of climate change
   → Shift in rainfall since the early 1970s; extended drought
3. Additional information not part of the Contested Case Hearing
   → The 2008-2011 DAR biota surveys were not designed to test hypotheses regarding recruitment and habitat use

Change in Hydrology



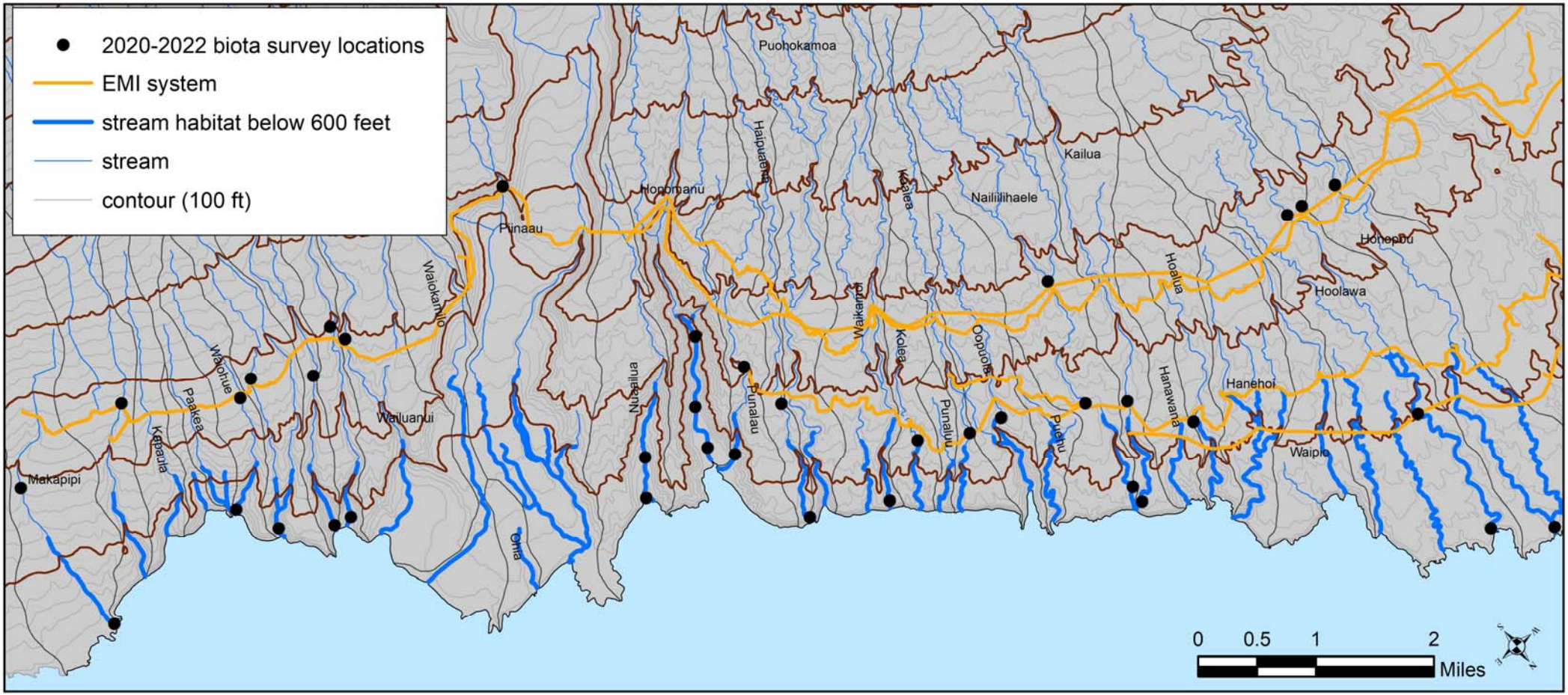


‘ōpae kala‘ole



no increased benefit of full restoration compared to partial restoration

2020-2022 DAR/CWRM biota surveys



2020-2022 DAR/CWRM biota surveys

Goals:

1. To quantify the current use of habitat by native biota under natural conditions
   → while streams East of Waikamoi are not being diverted
2. To evaluate the assumptions used in the Contested Case Hearing regarding the value of specific streams for aquatic habitat
3. To quantify the consequences of terminal waterfalls on upstream migration

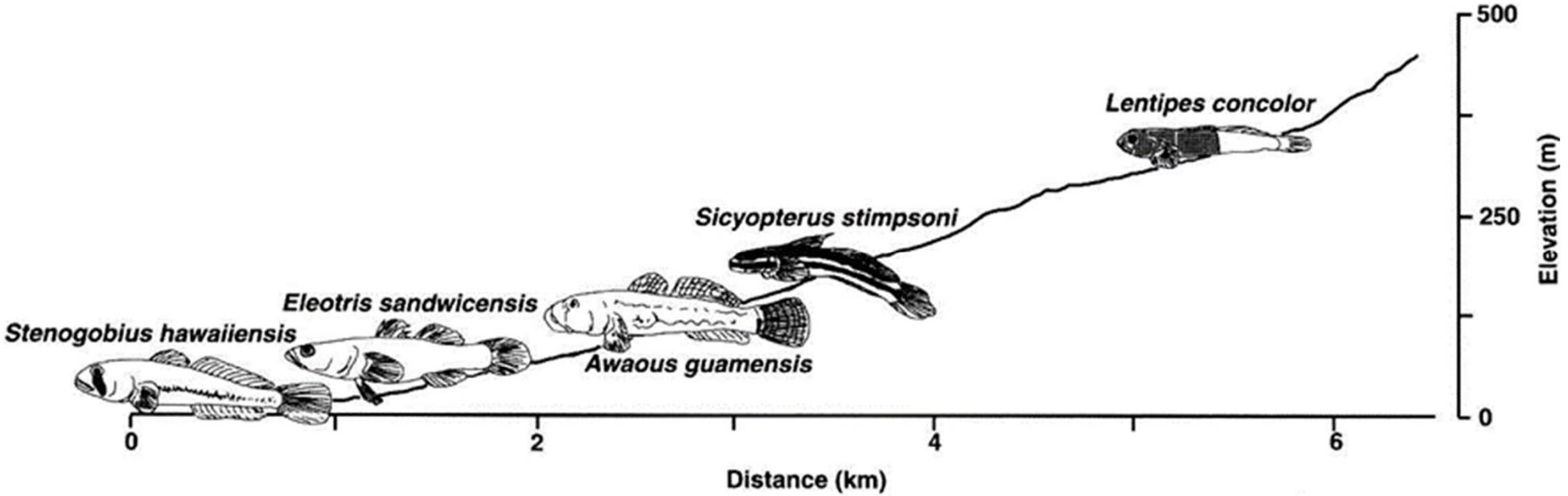
factors affecting species distribution:
estuaries enhance recruitment

Life history and adaptations

species have an **amphidromous** life history

Migratory abilities differ based on physical adaptations

(e.g., fused pelvic fins)



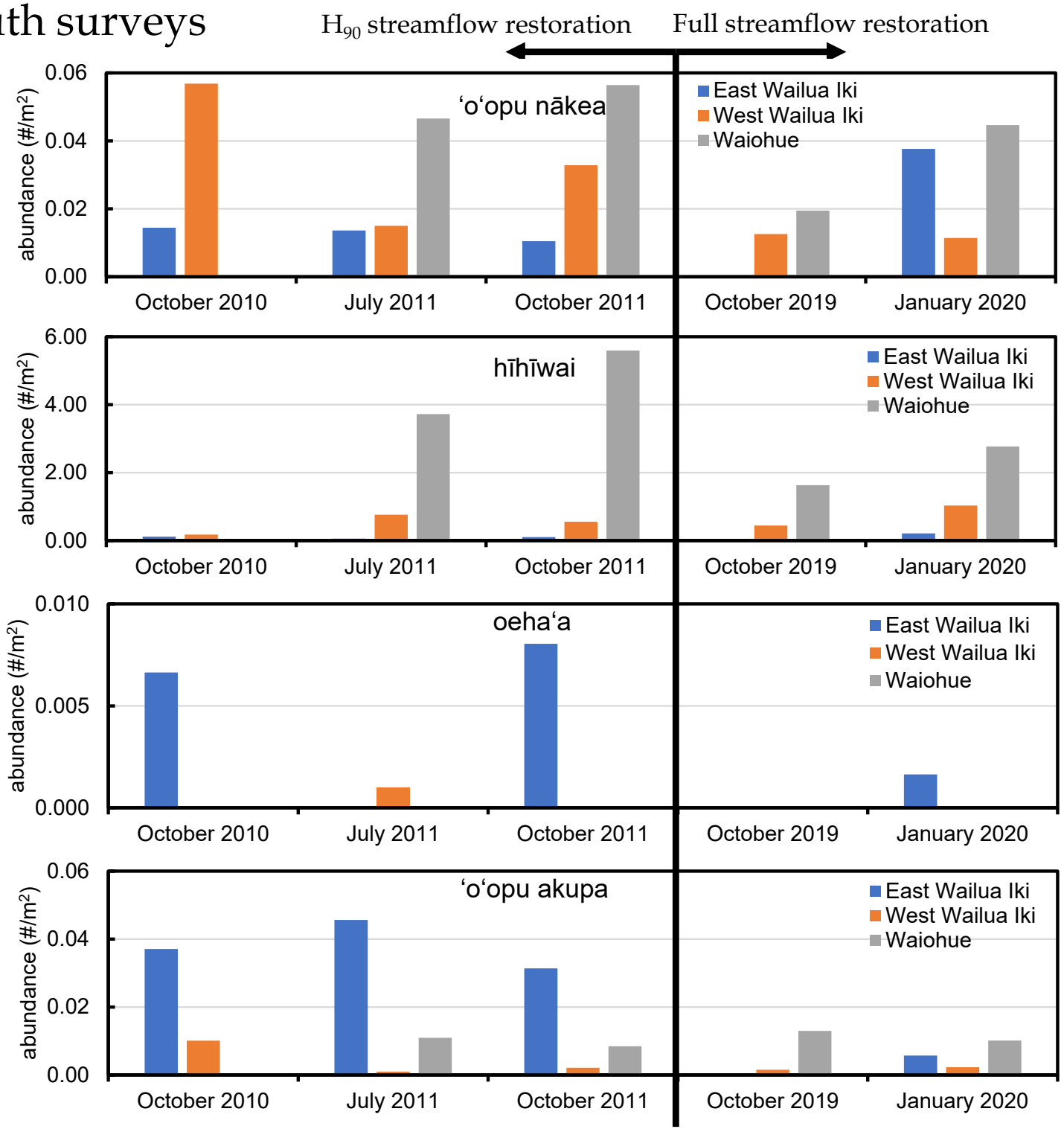
factors affecting species distribution: barriers to migration

Haipua‘ena

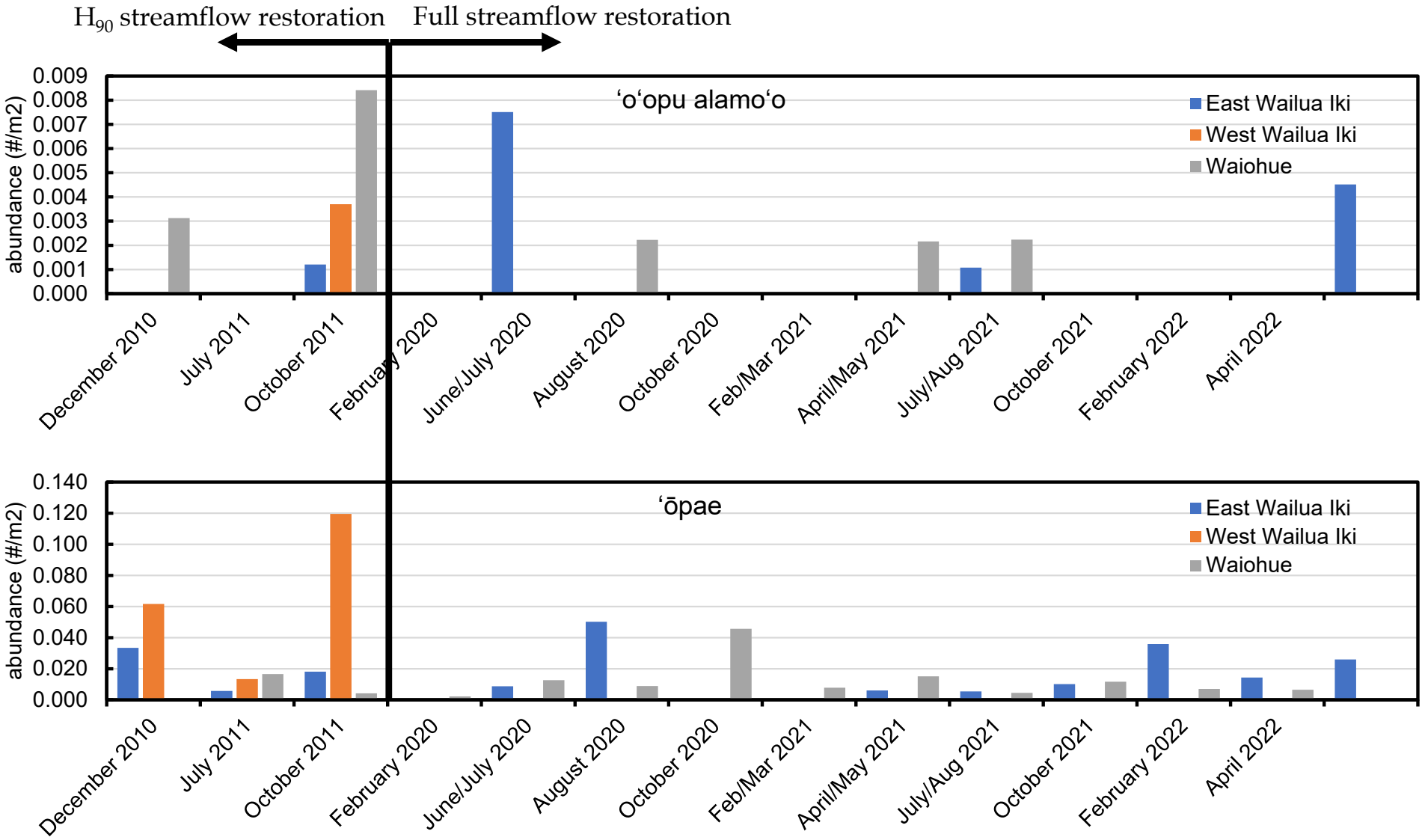
o‘opu alamo‘o

Waikamoi mouth

stream mouth surveys



mauka stream surveys



Conclusions from stream surveys

1. Full restoration has not changed the abundance of species in low- or high-elevation habitat in Waiohue, East Wailuaiki, or West Wailuaiki

2. Streams with greatest abundances of ʻakupa, nākea, and nōpili at the stream mouth have estuaries
   →Honomanū, Punalau, Nuaʻailua, Honopou

3. Streams with greatest abundances of alamoʻo and ʻōpae mauka have estuaries
   →Piʻinaʻau, Honomanū, Punalau, Nuaʻailua, Honopou

4. Waikamoi supports little to no recruitment of native biota

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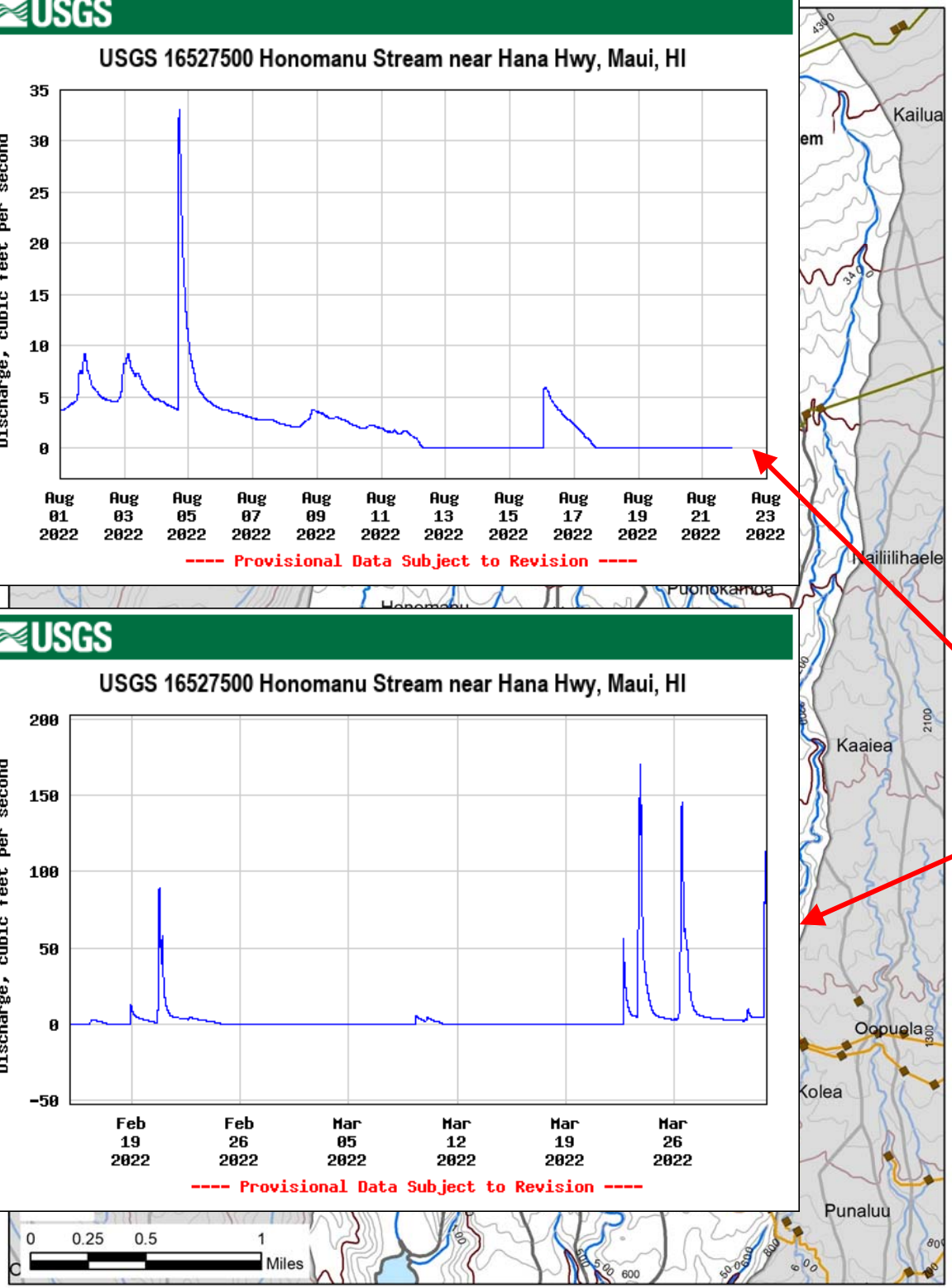


Honomanū

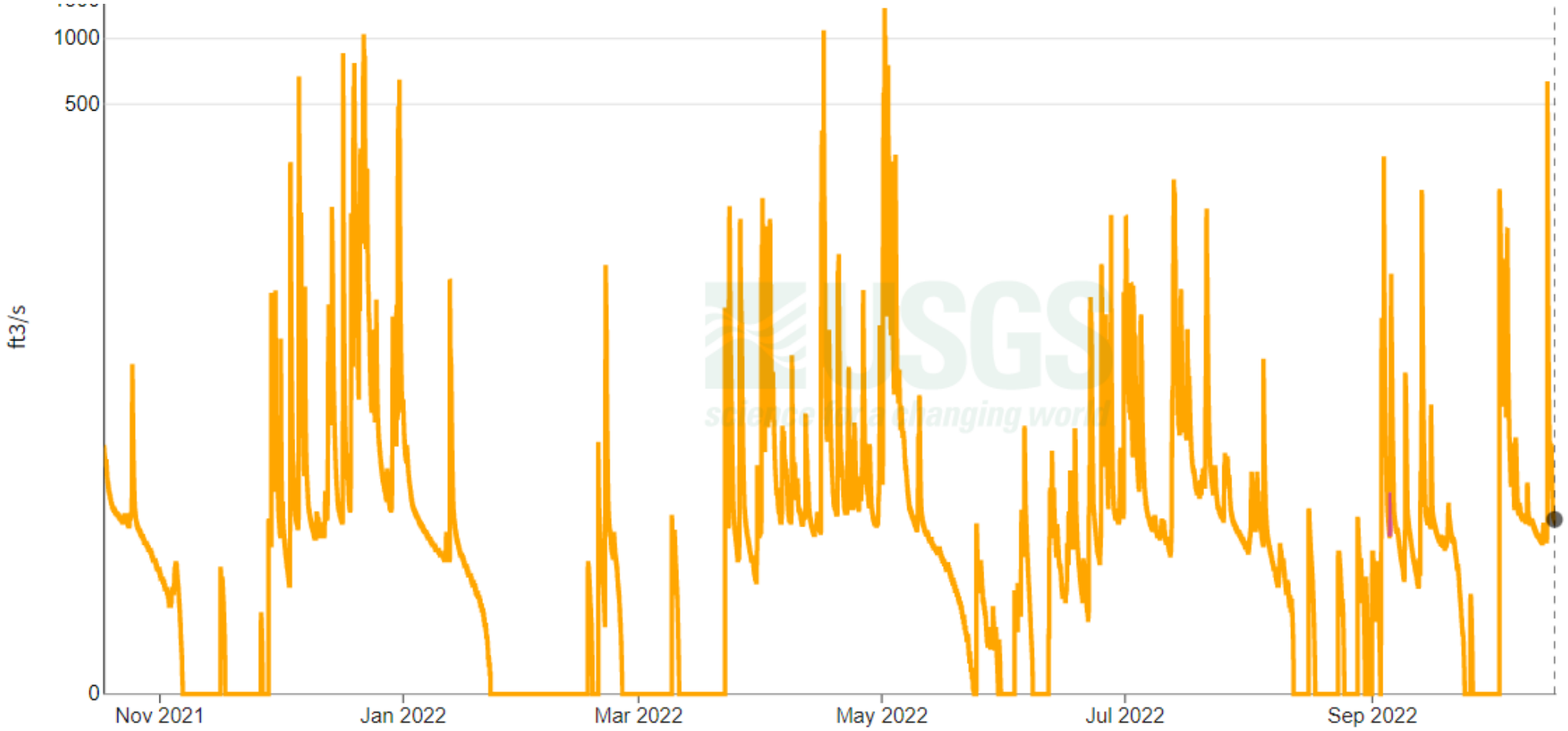
<u>4 main intakes:</u>
Banana Falls
Center Falls
Main Honomanū
High Falls

Current IIFS = H_{90} = 64% BFQ_{50}
*Stream reach below waterfalls incises Honomanu volcanics
Stream loses flow to groundwater

During drought periods, stream dries up naturally

*can't enforce the numerical IIFS

USGS 16527500 Honomanū at Hana Highway



Banana Intake→ abandon

Center Falls Intake → abandon

Main Honomanū Intake → utilize

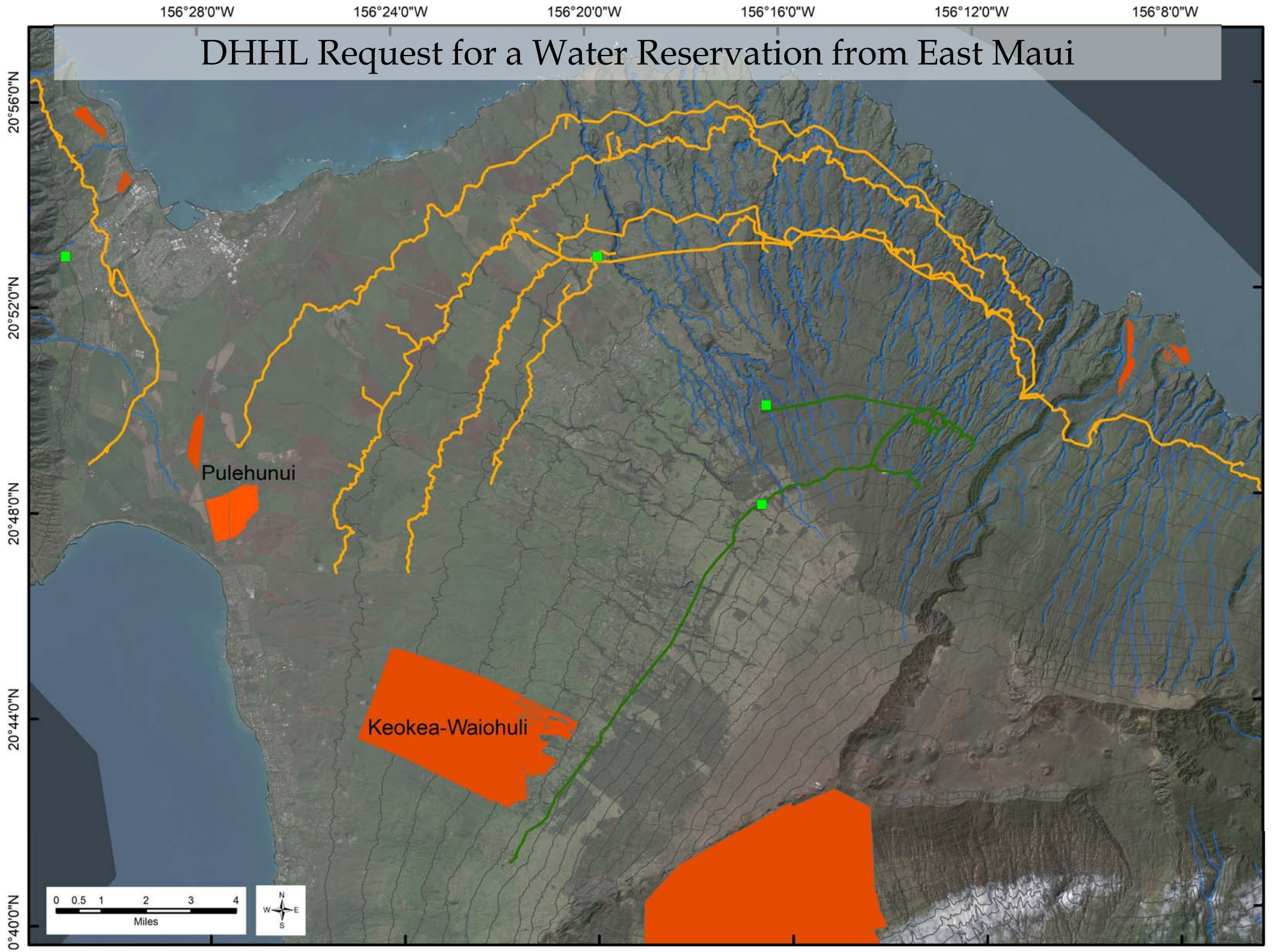
High Falls Intake → abandon

Take Home From New Data

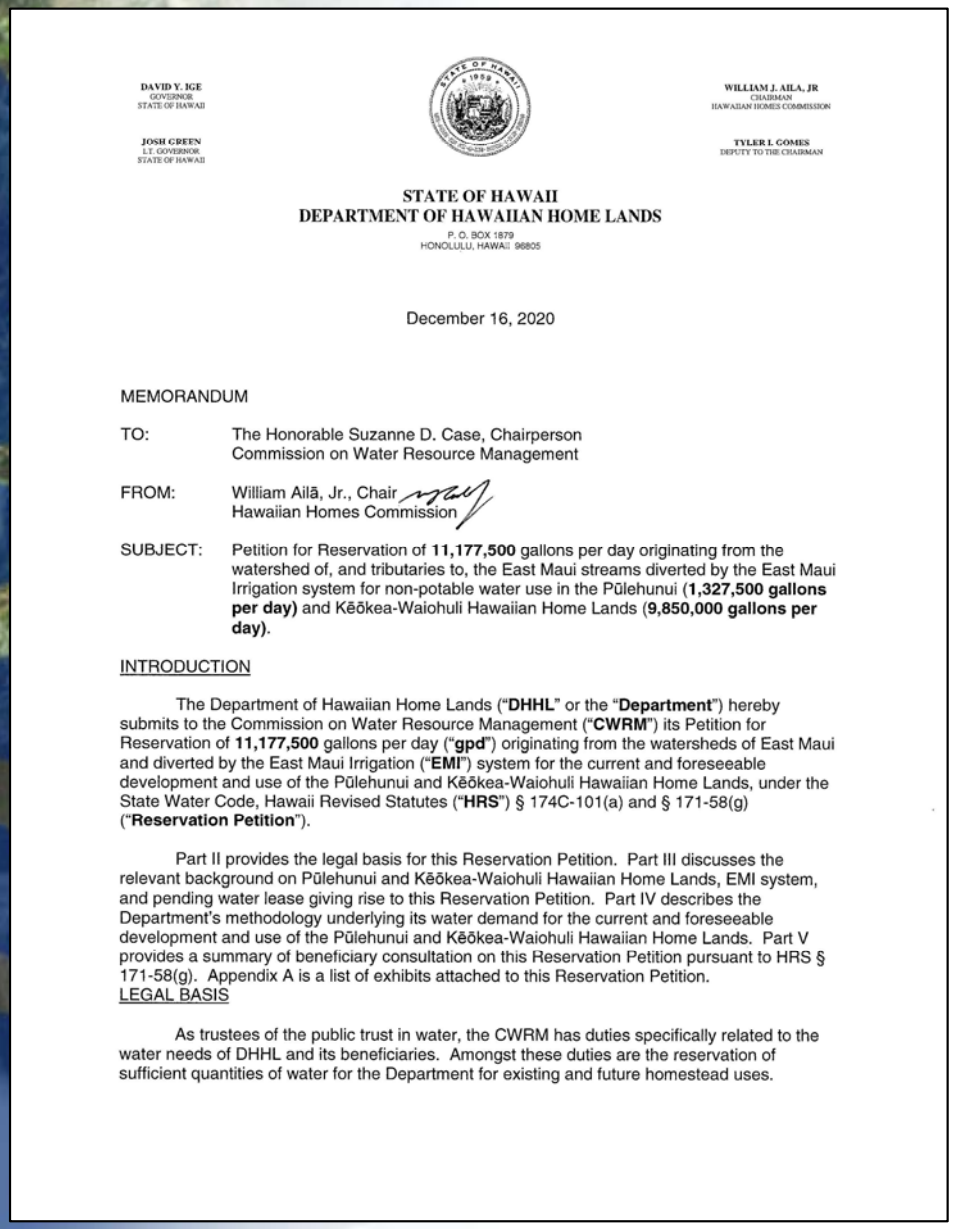
1. Need to modify Honomanū and Nuaʻailua interim IFS to protect the freshwater, estuary, and nearshore ecosystem
   → Protect traditional and customary gathering
   → New kalo cultivation in Honomanū

2. Modify Waiohue, West Wailuaiki, and Waikamoi interim IFS to balance stream protection with non-instream uses

DHHL Request for a Water Reservation from East Maui



DHHL Request for a Water Reservation from East Maui: Pūlehunui and Kēōkea-Waiohuli Reservation Request



DAVID Y. IGE
GOVERNOR
STATE OF HAWAII

JOSH GREEN
LT. GOVERNOR
STATE OF HAWAII

WILLIAM J. AILA, JR
CHAIRMAN
HAWAIIAN HOMES COMMISSION

TYLER I. GOMES
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

December 16, 2020

MEMORANDUM

TO: The Honorable Suzanne D. Case, Chairperson
Commission on Water Resource Management

FROM: William Ailā, Jr., Chair
Hawaiian Homes Commission

SUBJECT: Petition for Reservation of **11,177,500** gallons per day originating from the watershed of, and tributaries to, the East Maui streams diverted by the East Maui Irrigation system for non-potable water use in the Pūlehunui (**1,327,500 gallons per day)** and Kēōkea-Waiohuli Hawaiian Home Lands (**9,850,000 gallons per day)**.

INTRODUCTION

The Department of Hawaiian Home Lands ("**DHHL**" or the "**Department**") hereby submits to the Commission on Water Resource Management ("**CWRM**") its Petition for Reservation of **11,177,500** gallons per day ("**gpd**") originating from the watersheds of East Maui and diverted by the East Maui Irrigation ("**EMI**") system for the current and foreseeable development and use of the Pūlehunui and Kēōkea-Waiohuli Hawaiian Home Lands, under the State Water Code, Hawaii Revised Statutes ("**HRS**") § 174C-101(a) and § 171-58(g) ("**Reservation Petition**").

Part II provides the legal basis for this Reservation Petition. Part III discusses the relevant background on Pūlehunui and Kēōkea-Waiohuli Hawaiian Home Lands, EMI system, and pending water lease giving rise to this Reservation Petition. Part IV describes the Department's methodology underlying its water demand for the current and foreseeable development and use of the Pūlehunui and Kēōkea-Waiohuli Hawaiian Home Lands. Part V provides a summary of beneficiary consultation on this Reservation Petition pursuant to HRS § 171-58(g). Appendix A is a list of exhibits attached to this Reservation Petition.

LEGAL BASIS

As trustees of the public trust in water, the CWRM has duties specifically related to the water needs of DHHL and its beneficiaries. Amongst these duties are the reservation of sufficient quantities of water for the Department for existing and future homestead uses.

non-potable reservation request	
Pūlehunui	**1.328 mgd**
Kēōkea-Waiohuli	**9.85 mgd**
	11.178 mgd

How much water is available in total?

location	Discharge in $ft^3 s^{-1}$ (mgd) for selected percentages of time (from 50 to 95 percent) the indicated discharge was equaled or exceeded									
	Q_{50}	Q_{55}	Q_{60}	Q_{65}	Q_{70}	Q_{75}	Q_{80}	Q_{85}	Q_{90}	Q_{95}
1984-2013 estimated water available in EMI system	168 (109)	143 (92)	126 (81)	110 (71)	98 (63)	85 (55)	73 (47)	63 (41)	53 (34)	41 (27)
1984-2013 estimated water available after 2018 D&O IIFS implementation	107 (69)	88 (57)	75 (48)	64 (41)	56 (36)	48 (31)	39 (25)	33 (21)	27 (17.5)	20 (13)
1984-2013 estimated water available after 2022 Huelo recommendations are implementation	86 (56)	68 (44)	56 (36)	47 (30)	40 (26)	33 (21)	30 (19)	25 (16)	20 (13)	15 (10)
1984-2013 estimated water available after the 2022 Huelo recommendations and the 2022 Keanae, and Honomanū recommendations are implemented	98 (64)	75 (49)	61 (40)	51 (33)	44 (28)	34 (22)	30 (19)	24 (15)	19 (12)	13 (9)
Maui DWS Kamole Water Treatment Facility*	4.8 (3.12)	4.9 (3.17)	5.0 (3.21	5.1 (3.27)	5.2 (3.36)	6.0 (3.86)	6.4 (4.16)	6.6 (4.26)	6.7 (4.32)	6.8 (4.41)
DHHL's water reservation	17.3 (11.18)	17.3 (11.18)	17.3 (11.18)	17.3 (11.18)	17.3 (11.18)	17.3 (11.18)	17.3 (11.18)	17.3 (11.18)	17.3 (11.18)	17.3 (11.18)
Total non-instream public trust use	22.1 (14.3)	22.2 (14.4)	22.3 (14.4)	22.4 (14.5)	22.5 (14.5)	23.3 (15.1)	23.7 (15.3)	23.9 (15.5)	24 (15.5)	24.1 (15.6)

*assuming Maui DWS use remains constant

How much water is available in total?

location	Discharge in $ft^3 s^{-1}$ (mgd) for selected percentages of time (from 50 to 95 percent) the indicated discharge was equaled or exceeded									
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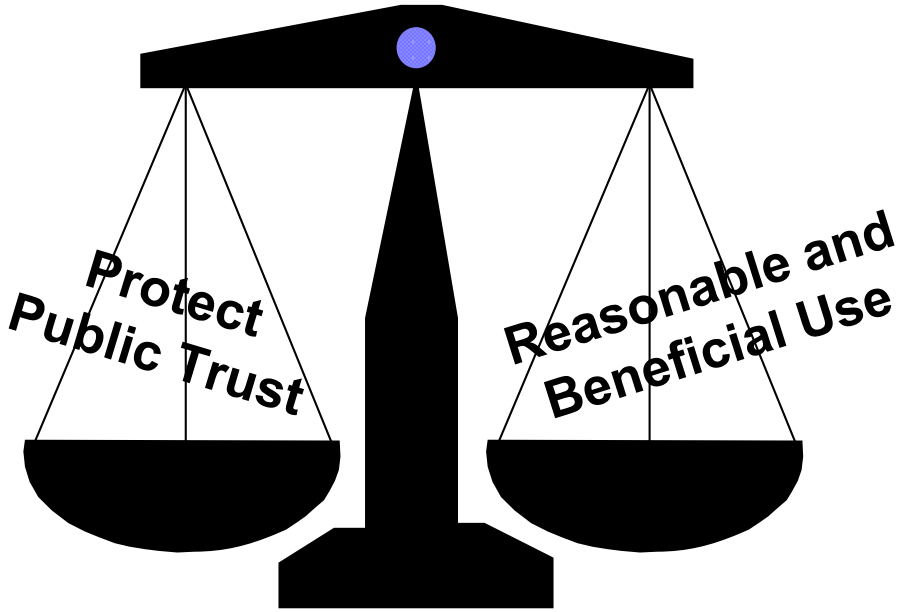
*assuming Maui DWS use remains constant

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



Summary of Recommendations

Waikamoi

→Reduce interim IFS from H90 flow (2.46 mgd) to connectivity flow (0.17 mgd)

Reason: Stream does not support high quality habitat

Q_{50}		Q_{75}		Q_{95}	
1942-2001	1984-2013	1942-2001	1984-2013	1942-2001	1984-2013
7.0	6.6	3.5	1.3	1.1	0.22

2010 Interim IFS	2018 Decision & Order	2022 Recommendation
2.8 cfs (1.81 mgd) wet season 0.0 cfs (0.00 mgd) dry season	H_{90} flow (64% of BFQ_{50}) = 3.8 (2.46)	20% BFQ_{50} (regulated Q_{75}) for connectivity = 0.26 (0.17)

Honomanū

→eliminate interim IFS at Hana Hwy

Abandon Banana Falls intake, Center Falls intake, High Falls intake

Reason: Interim IFS not achievable/enforceable

stream supports some of the highest quality, low-elevation habitat and estuary

Q_{50}		Q_{75}		Q_{95}	
1942-2001	1984-2013	1942-2001	1984-2013	1942-2001	1984-2013
5.7	3.8	2.8	1.6	1.1	0.47

2010 Interim IFS	2018 Decision & Order	2022 Recommendation
0.0 (0.00)	H_{90} flow (64% of BFQ_{50}) = 4.2 (2.71)	Full restoration at 3 of 4 diversions

Nua'ailua

Abandon Spreckels Ditch intake (S-1)

Reason: stream supports some of the highest quality, low-elevation habitat and estuary

Q_{50}		Q_{75}		Q_{95}	
1942-2001	1984-2013	1942-2001	1984-2013	1942-2001	1984-2013
0.56	0.46	0.28	0.22	0.19	0.19

2010 Interim IFS	2018 Decision & Order	2022 Recommendation
3.1 (2.00)	Connectivity = 0.28 (0.18)	Full restoration

Summary of Recommendations

West Wailuaiki

→Reduce interim IFS from full restoration to H90 flow (2.62 mgd)
Reason: full restoration has not improved either low-elevation or high-elevation habitat compared to partial restoration

Q_{50}		Q_{75}		Q_{95}	
1942-2001	1984-2013	1942-2001	1984-2013	1942-2001	1984-2013
10	8.9	6.0	2.5	3.0	2.2

2010 Interim IFS	2018 Decision & Order	2022 Recommendation
3.8 (2.46) wet season 0.4 (0.26) dry season	Full restoration	80% of Q_{75} (BFQ_{50}) = 3.6 (2.33)

Waiohue

→Reduce interim IFS from full restoration to H90 flow (3.33 mgd)
Reason: full restoration has not improved either low-elevation or high-elevation habitat compared to partial restoration

Q_{50}		Q_{75}		Q_{95}	
1942-2001	1984-2013	1942-2001	1984-2013	1942-2001	1984-2013
6.2	5.2	5.0	3.7	3.0	3.2

2010 Interim IFS	2018 Decision & Order	2022 Recommendation
3.2 (2.10) wet season 0.1 (0.06) dry season	Full restoration	80% of Q_{75} (BFQ_{50}) = 2.96 (1.91)

Under Implementation:

The Interim IFS will be divided into two phases:

Phase 1: Staff acknowledge that the DHHL reservation will not be acted upon for many years and therefore the interim IFS on Waiohue and West Wailuaiki will remain as full restoration and the interim IFS on Waikamoi will remain as designated (3.8 cfs, 2.46 mgd).

Phase 2: When DHHL starts to act on their reservation, the interim IFS on Waiohue and West Wailuaiki will be 80% of the medium baseflow and 20% of medium baseflow on Waikamoi based on hydrology under the 1984-2013 climate regime:

Waiohue Stream: 2.96 cfs (1.91 mgd)

West Wailuaiki Stream: 3.6 cfs (2.33 mgd)

Waikamoi Stream: 0.26 cfs (0.17 mgd)