Commission Meeting
DLNR Board Room
September 24, 2009

Staff briefing on the

Update on the Implementation of East Maui Interim Instream Flow Standards

State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management

TRIAL EXHIBIT AB-152

Presentation Outline

Background

- Timeline
- Interim IFS Process
- Amendments
- Adaptive Management

Update

- Honopou
- Hanehoi
- Piinaau
- Waiokamilo
- Wailuanui

Timeline

October 8, 1988

- Initial “status quo” interim IFS for east Maui streams

May 24, 2001

- NHLC filed 27 Petitions to Amend the Interim IFS

July 23, 2001

- Focus on 5 hydrologic units, 8 petitions

March 20, 2002

- Commission approved Water Resource Investigations for Northeast Maui Streams

Timeline

June 2005

- USGS study on streamflow characteristics in northeast Maui

January 2006

- USGS study on habitat availability for native species in northeast Maui

December 13, 2006

- Approval of the interim IFS process

April 10, 2008

- Public fact gathering meeting for the first 5 hydrologic units

Timeline

September 2 - 3, 2008

- Commission site visit (EMI System, properties of taro farmers)

September 24 - 25, 2008

- Commission approval of amended interim IFS for first 5 units

Today: September 24, 2009

Assess implementation of interim IFS for the first 5 units

Draft IFSARs on the remaining 16 hydrologic units

Petition to Amend IIFS

HONOPOU

- Honopou Stream

HANEHOI

- Hanehoi and Puolua Streams

PIINAAU

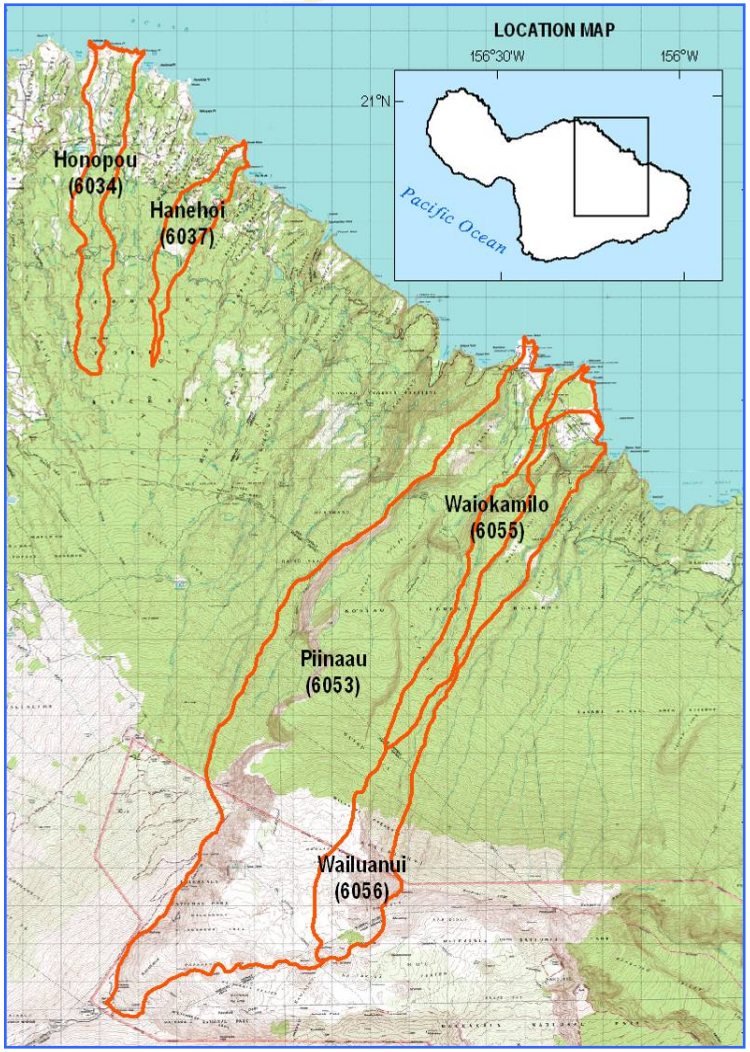
- Piinaau Stream
- Palauhulu Stream

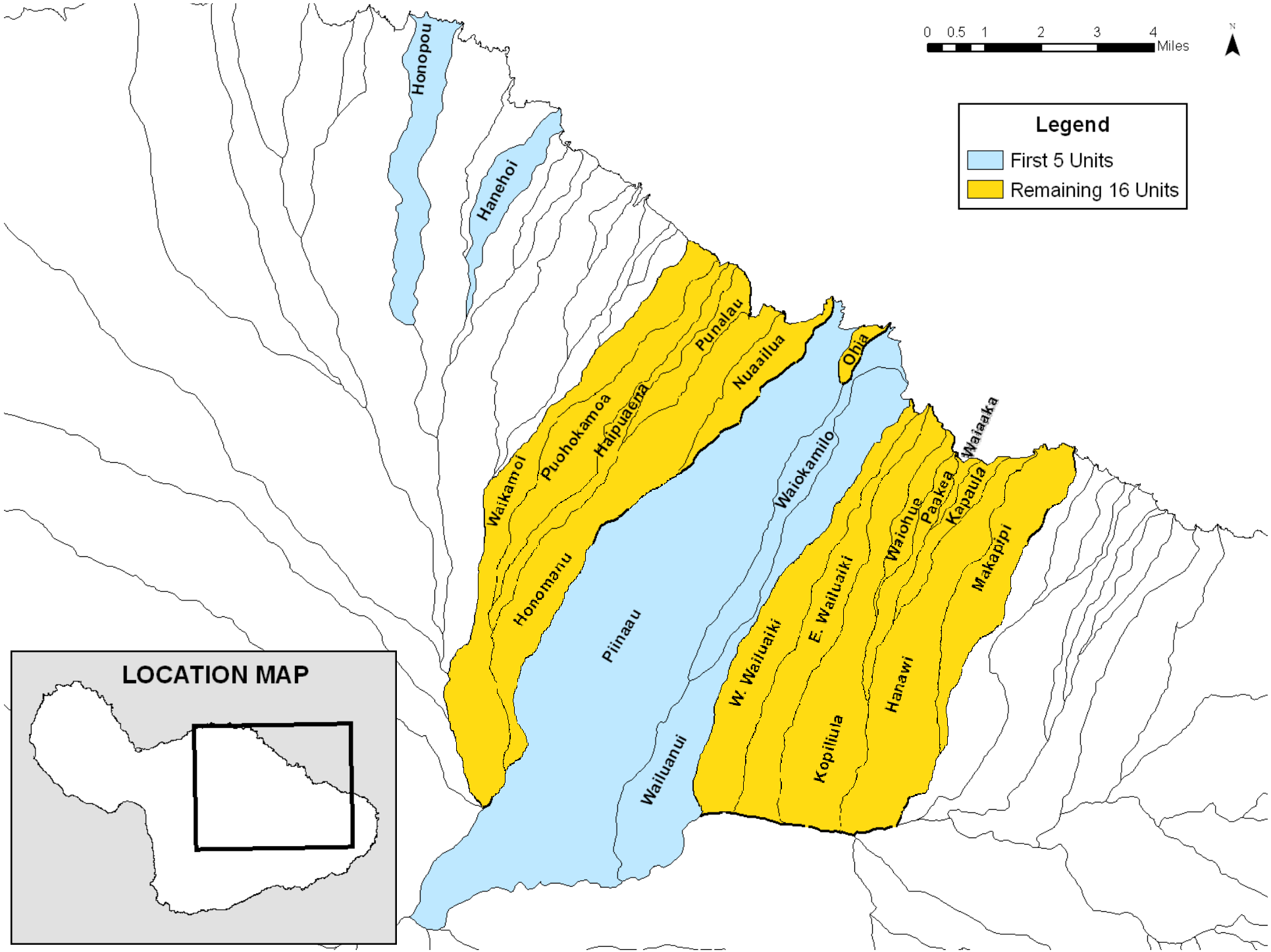
WAIOKAMILO

- Waiokamilo Stream
- Kualani Stream

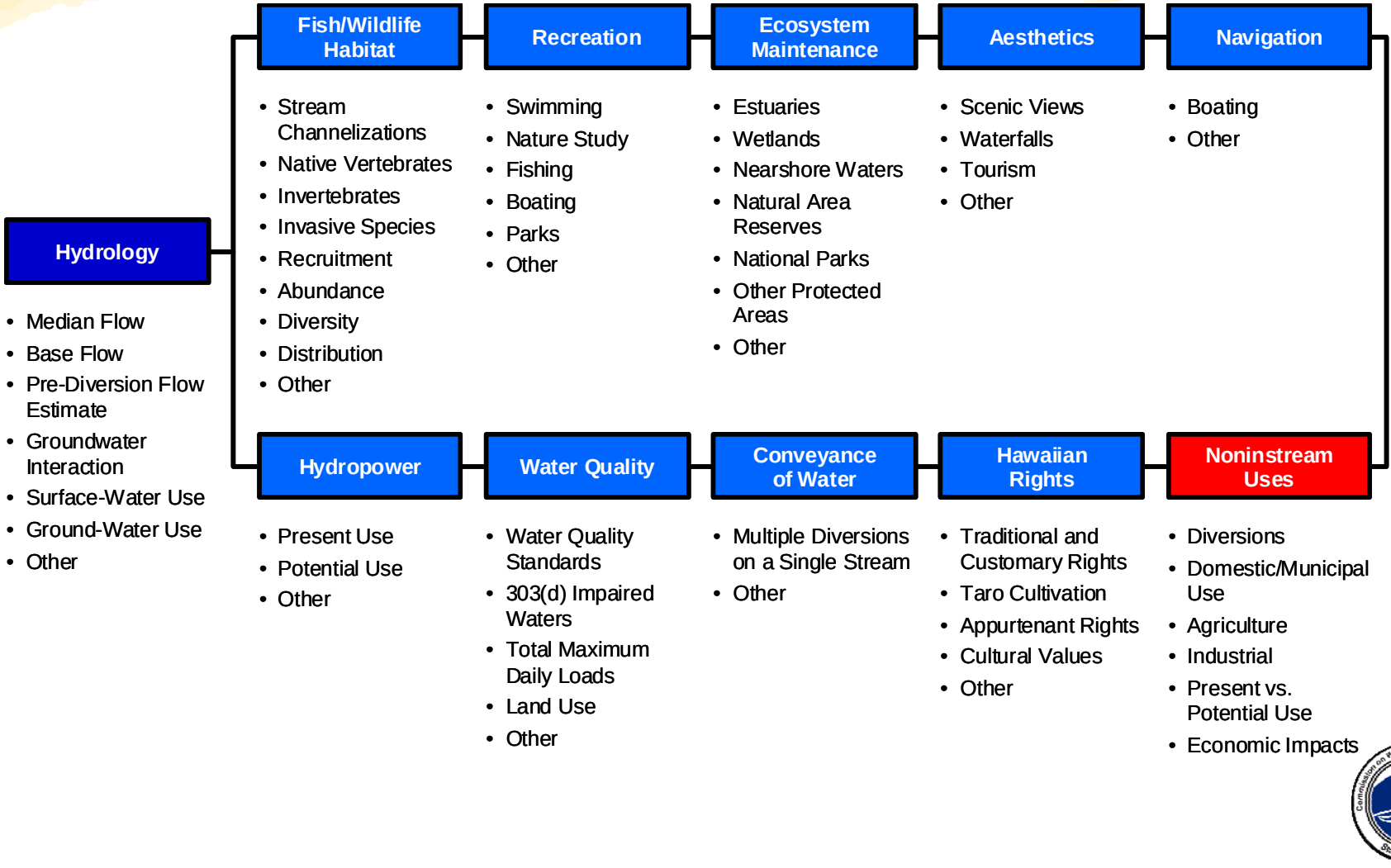
WAILUANUI

- East and West Wailuanui Streams
- Waikani Waterfall [Stream]



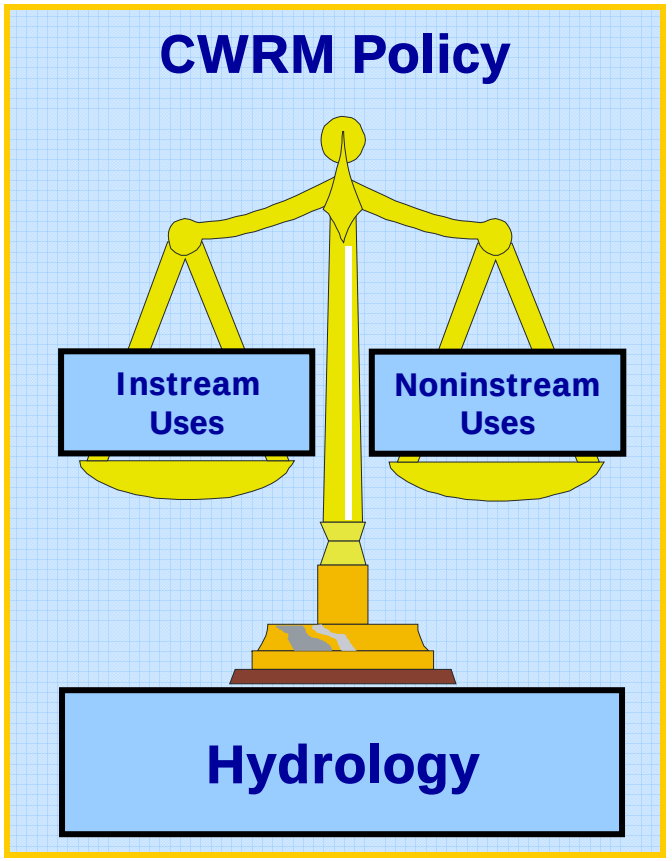

0 0.5 1 2 3 4
Miles
N
Legend
First 5 Units
Remaining 16 Units
Honopou
Hanehoi
Punalau
Nuaailua
Ohia
Waiaaka
Waikamoi
Puohokamoa
Haipuaena
Waiokamilo
Honomanu
Piinaau
Wailuanui
W. Wailuaiki
E. Wailuaiki
Waiohue
Paakea
Kapaula
Makapipi
Kopiliula
Hanawi
LOCATION MAP

Balancing the Needs

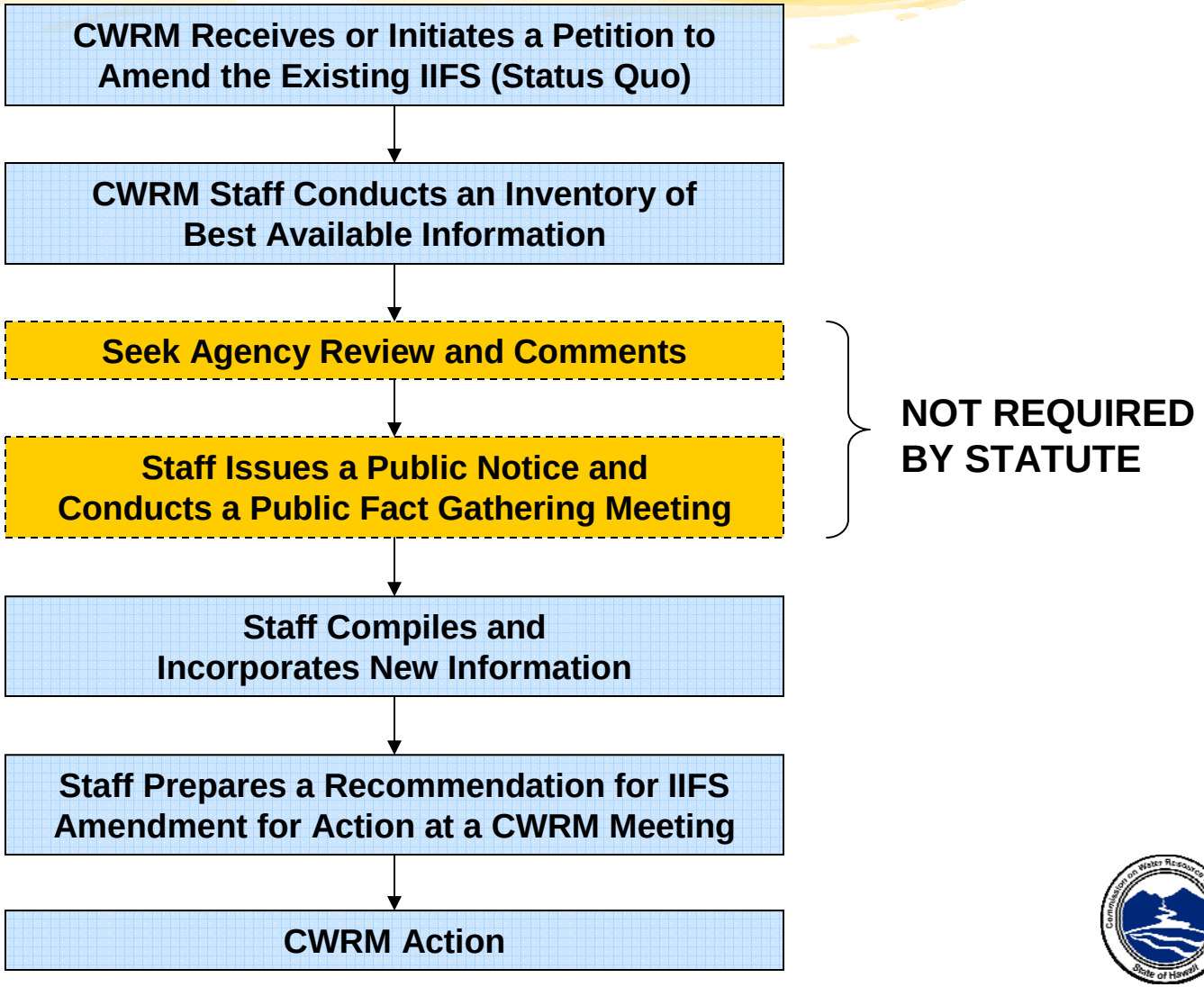


State Water Code

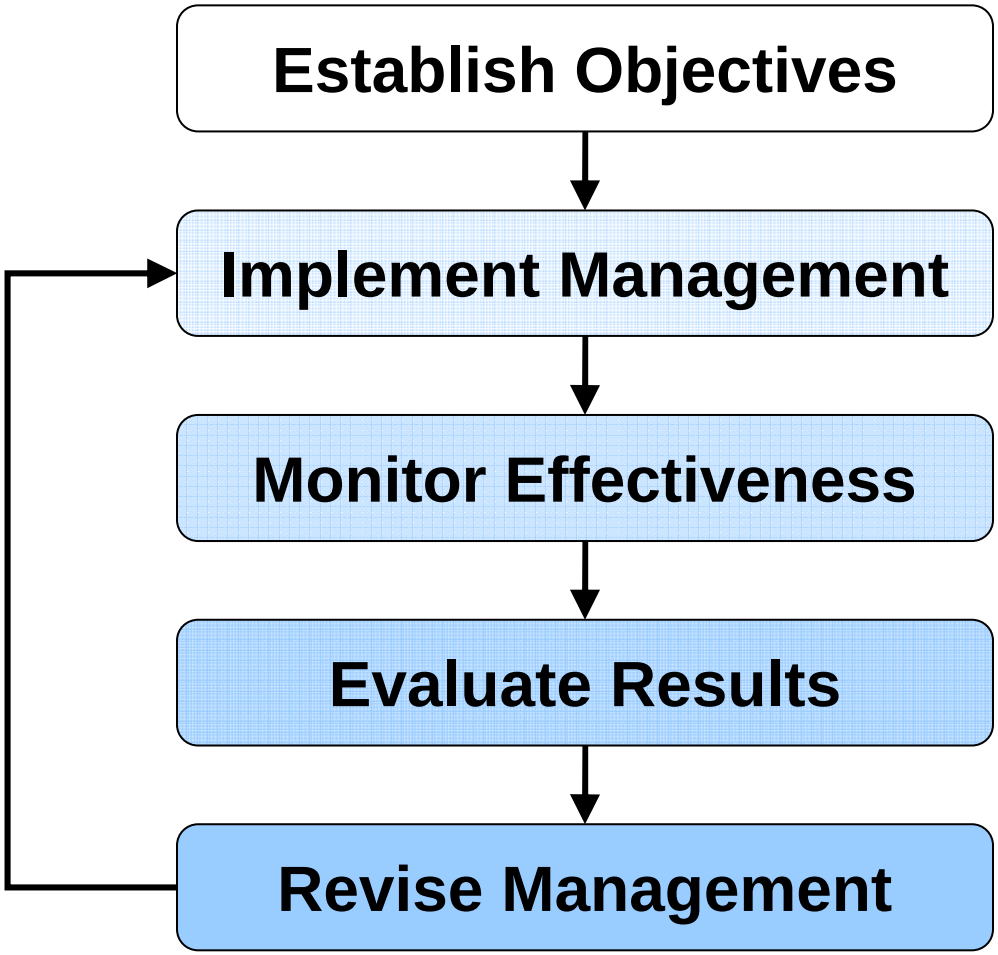
"The Commission shall weigh the importance of the present or potential instream values with the importance of present or potential uses of water for noninstream purposes, including the economic impact of restricting such uses."



Interim IFS Process



Adaptive Management



Adaptive Management

Implementation

- Comply with State Water Code for unregistered diversions
- Collaborate with agency staff and registered diversion owners to determine appropriate actions
- Coordinate with EMI and DAR to assess existing conditions and status of EMI diversions

Adaptive Management

Monitoring

- Monitor streamflow by taking periodic measurements
- Conduct periodic biological surveys
- Affected parties monitor and document the negative impacts of diversions or adopted interim IFS
- Conduct investigations with granted access to stream channels and private property

Adaptive Management

Evaluation

- Report to Commission within one year from date of adoption
- Assess implementation of adaptive management strategies
- Prepare long-term management framework

Amendments

- Moving forward on the staff's recommendation is the first step in an integrated approach to all 27 streams that are subjects of these petitions

- Staff shall provide progress reports to the Commission at regularly scheduled meetings during the year

- In cases of return of water to losing streams, staff and all parties shall monitor and report whether there are increases in either downstream flow or ground water in the vicinity

HONOPOU

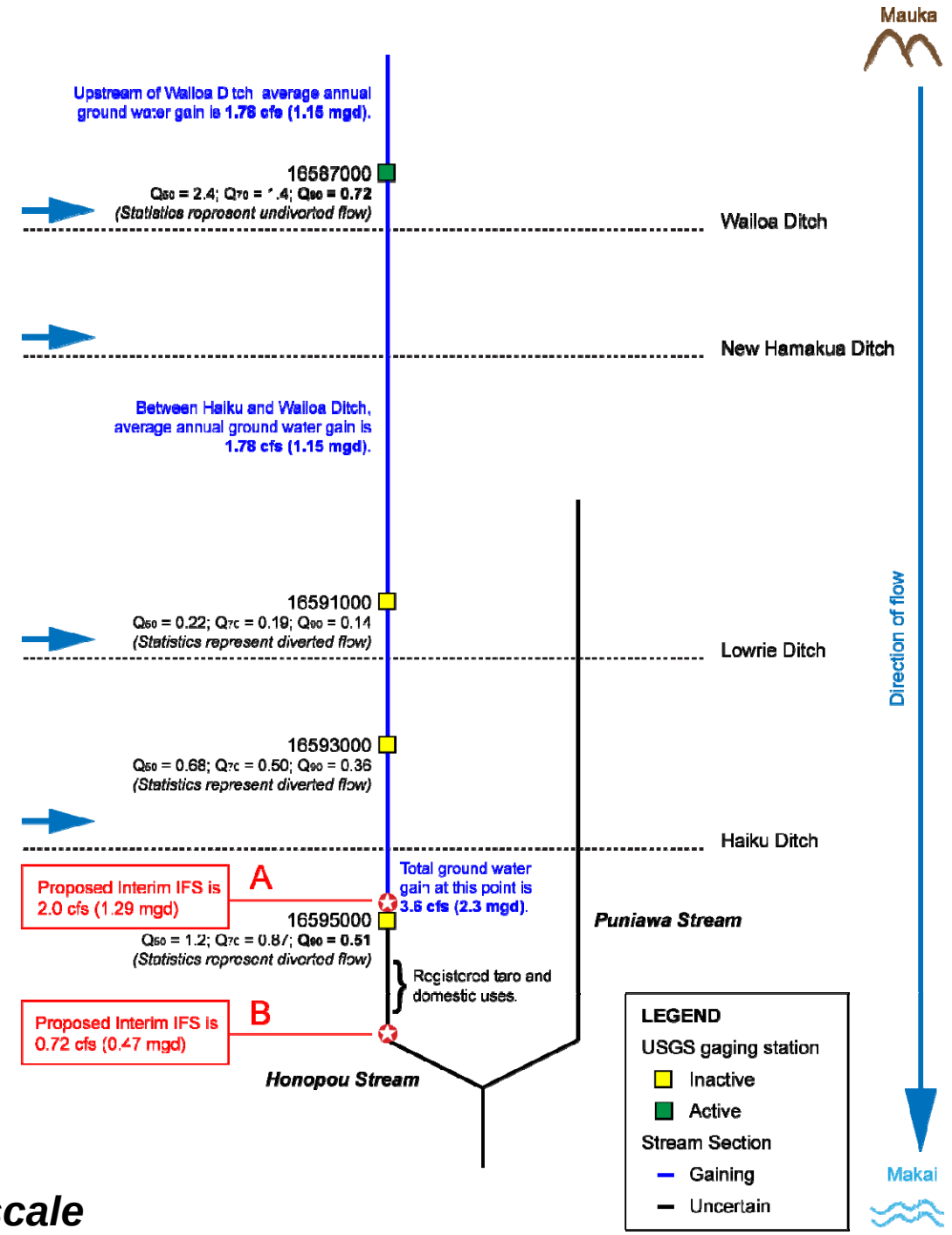


Diagram not to scale

Honopou Field Visits

October 2008

- Site selection with USGS, locate reference point
- Flow measurements
- Interim action at Haiku and Lowrie Side Ditch

March 2009

- Low flow bypass channel at Haiku Ditch

July 2009

- USGS install staff gage at interim IFS sites

Honopou Site A

Oct. 2008

Staff Gage at Site A

July 2009

Measurements at Site A

Date	Time	Discharge
10/23/08	0830 hr	0.229 cfs (meter)
10/27/08	0911 hr	0.242 cfs (meter)
10/28/08	0825 hr	0.060 cfs (meter)
10/29/08	1045 hr	0.093 cfs (bucket)
10/29/08	1730 hr	0.085 cfs (bucket)
11/18/08		high flow
11/19/08		high flow
02/11/09	1312 hr	1.223 cfs (meter)
07/20/09		0.450 cfs (meter)
Interim IFS		2.000 cfs

Honopou Site B

Oct. 2008

Honopou Site B

Oct. 2008

Dam at Honopou Stream upstream from site B

Staff Gage at Site B

July 2009

Measurements at Site B

Date	Time	Discharge
10/23/08	1109 hr	0.189 cfs (meter)
10/27/08	1038 hr	0.139 cfs (meter)
10/28/08	1000 hr	0.151 cfs (meter)
07/21/09		0.390 cfs (meter)
Interim IFS		0.72 cfs

Interim Action at Haiku Ditch

Oct. 2008

Berm consists of boulders stacked on top of banana stumps

Flow Conditions at Haiku Ditch

Sep. 2008 Nov. 2008

Low flow (left) and high flow (right) at Honopou Stream near Haiku Ditch.
During high flows, the berm held up.

Interim Action at Lowrie Ditch

Oct. 2008

Sluice gate opening is 17-in(W) x 14-in(H)

Low Flow Bypass Channel

Mar. 2009

Low Flow Bypass Channel

Mar. 2009

First water flowing past the low flow bypass channel

Summary

Interim IFS not achieved

- Site A = 1.22 CFS
- Site B = 0.39 CFS

Issues

- Leak on the CRM wall downstream from Site A affects measurements
- Claims that flow is not enough to maintain adequate temperature for taro cultivation

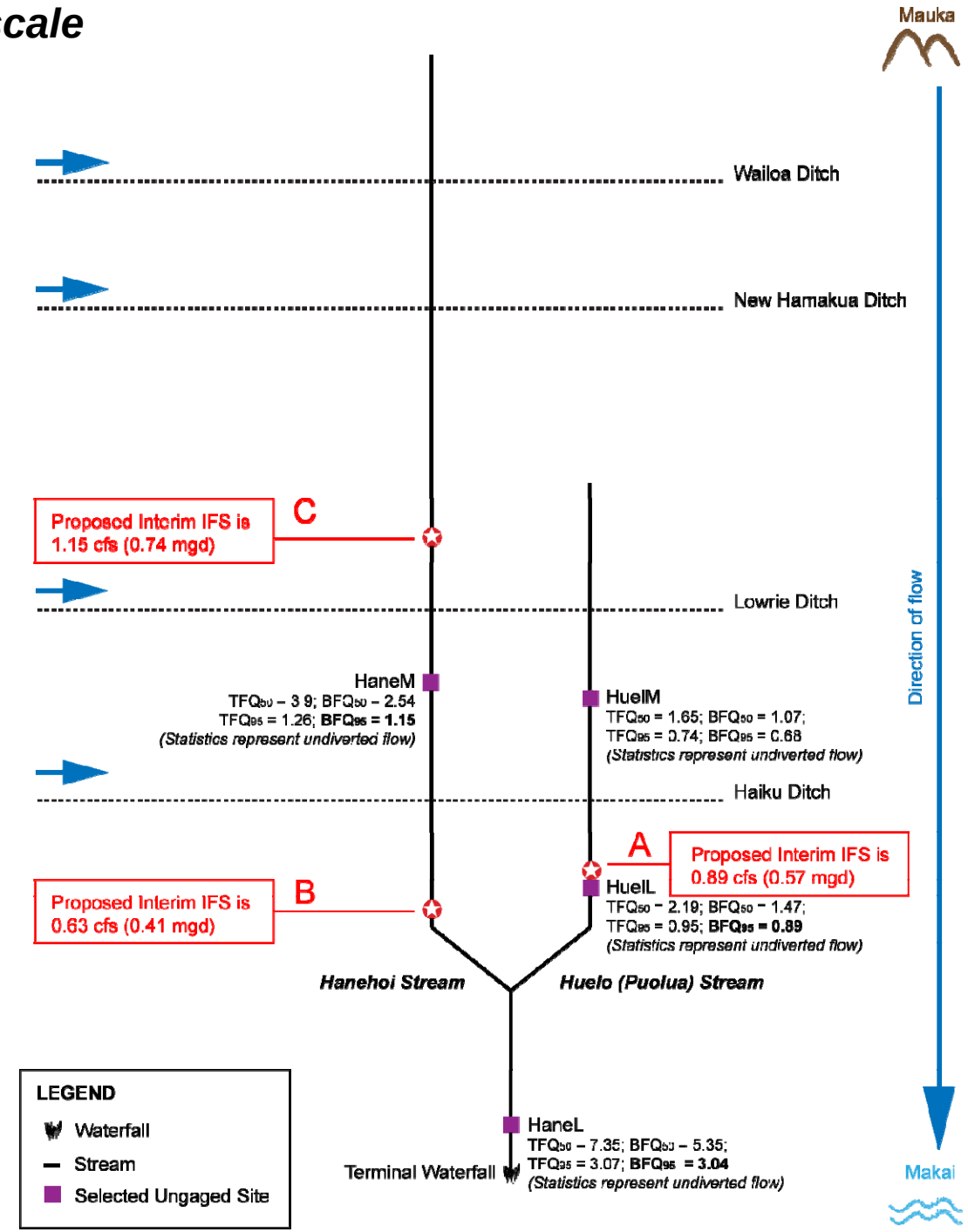
Summary

Next Steps

- Flow measurements and rating curve (USGS)
- Re-evaluate interim IFS at both sites
- Determine height of bypass lip at Haiku Ditch
- Flow restoration at New Hamakua and Wailoa Ditch
- Meet with USGS, Land Division, and NHLC to discuss temperature in the stream

HANEHOI

Diagram not to scale



Hanehoi Field Visits

October 2008

- Site selection with USGS, locate reference point
- Flow measurements
- Interim action at Haiku Ditch

February 2009

- Adjust sluice gate opening at Haiku Ditch

September 2009

- USGS install staff gage at Site C

Puolua Site A

Oct. 2008

Interim Action at Haiku Ditch

Oct. 2008

Feb. 2009

Opening of gate in Oct. 2008 (left) and adjusting height in Feb. 09 (right)

Measurements at Site A

Date	Time	Discharge
10/23/08	1404 hr	0.052 cfs (meter)
10/27/08	1403 hr	0.047 cfs (meter)
10/27/08	1430 hr	0.063 cfs (bucket)
10/28/08	1130 hr	0.062 cfs (bucket)
10/28/08	1312 hr	0.055 cfs (meter)
11/19/08	1340 hr	0.244 cfs (meter)
02/10/09	1114 hr	0.380 cfs (meter)
Interim IFS		0.890 cfs

Hanehoi Site B

Oct. 2008

Interim Action at Haiku Ditch

Oct. 2008

Sluice gate opening is 2-ft(W) x 1.37-ft(H)

Flow at Site B

Nov. 2008

Interim Action at Haiku Ditch

Feb. 2009

Measurements at IFS Site B

Date	Time	Discharge
10/24/2008	0800 hr	Dry
11/19/2008	1544 hr	4.711 cfs (meter)
Interim IFS		0.630 cfs

Hanehoi Site C

Oct. 2008

Site C is directly above a waterfall

Hanehoi Site C

Oct. 2008

The Huelo community intake is in this plunge pool

Staff Gage at Site C

Sep. 2009

Measurements at Site C

Date	Time	Discharge
10/24/2008	1043 hr	0.065 cfs (meter)
Interim IFS		1.150 cfs

Summary

Interim IFS not achieved

- Site A = 0.38 CFS
- Site B = mostly dry stream
- Site C = 0.35 CFS

Issues

- Little is known about Hanehoi Stream
- Only 0.24 CFS of flow at Site A with heavy rain in Nov and sluice gate opened
- Access to Site C on private lands (working on ROE)

Summary

Next Steps

- Staff gage and rating curve
- Re-evaluate interim IFS at all sites
- Work with EMI on restoring low flows at Lowrie, New Hamakua and Wailoa Ditch

PIINAAU

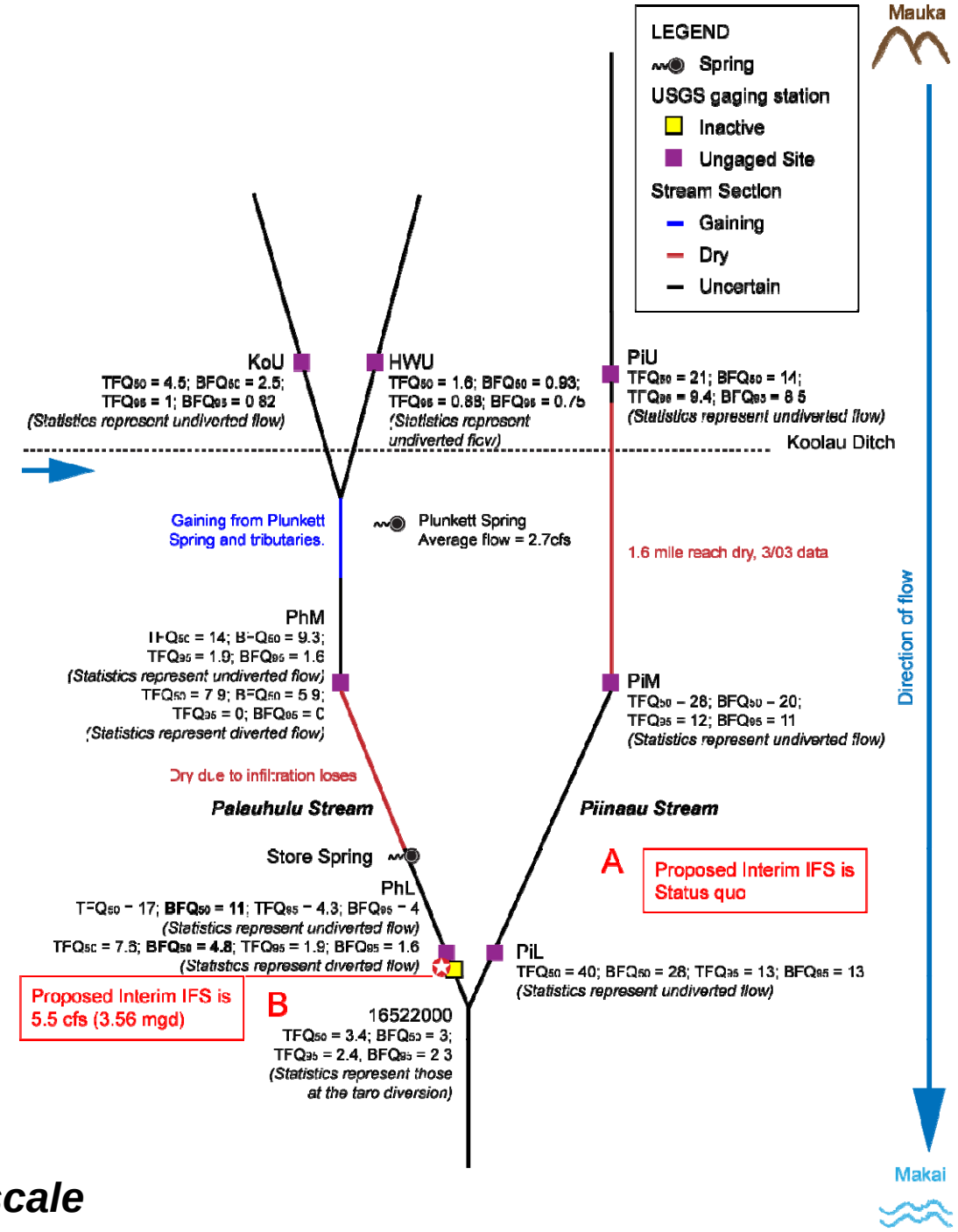


Diagram not to scale

Piinaau Field Visits

October 2008

- Site selection with USGS, flow measurements

November 2008

- Interim action at Koolau Ditch, Kano intake

December 2008

- Install reference point
- Locate Kaleomaui Stream and verify if diverted
- View major and minor diversions on Piinaau Stream

Piinaau

February 2009

- Keanae Arboretum, diversion for taro

July 2009

- USGS install staff gage at Site B

Palauhulu Site B

Oct. 2008

Flow Conditions at Site B

Oct. 2008

Nov. 2008

Low (left) and high (right) flow at site B on Palauhulu Stream

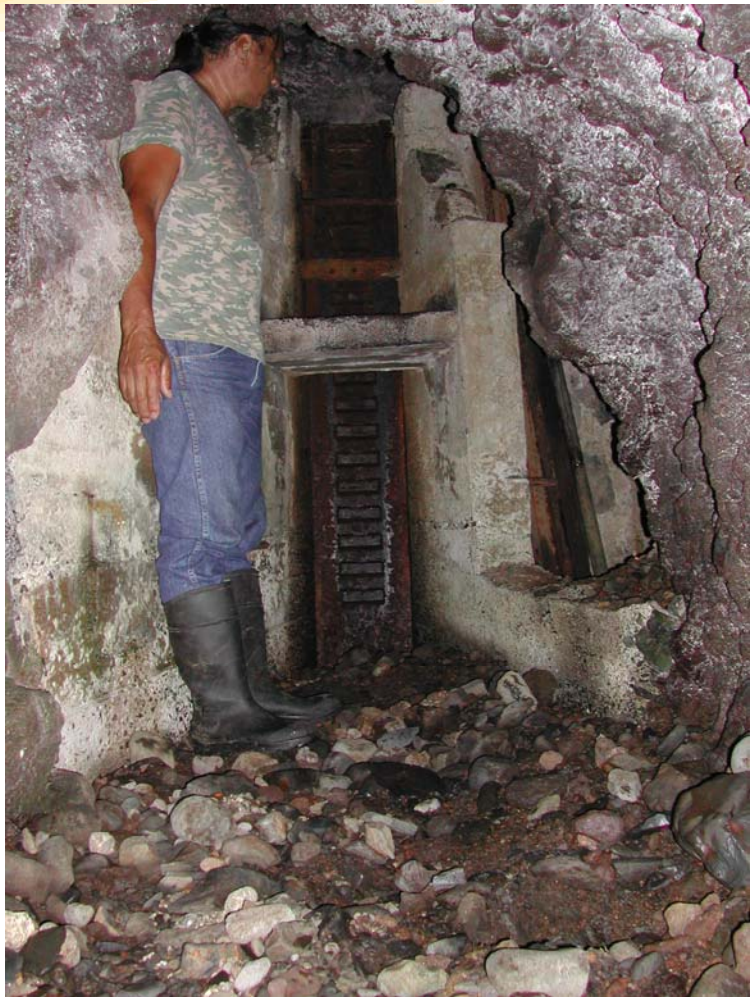
Interim Action at Koolau Ditch

Nov. 2008

Tributary Kano Stream and waterfall

Interim Action at Koolau Ditch

Nov. 2008



Kano Stream sluice gate opening is 1.1ft(W) x 0.45-ft(H)

Measurements at Site

Date	Time	Discharge
10/28/08	1555 hr	1.951 cfs (meter)
11/17/08	0921 hr	2.133 cfs (meter)
11/18/08		High flow
11/19/08		High flow
12/09/08	0906 hr	2.033 cfs (meter)
02/11/09	1531 hr	3.191 cfs (meter)
Interim IFS		5.500 cfs

Kaleomaui Stream

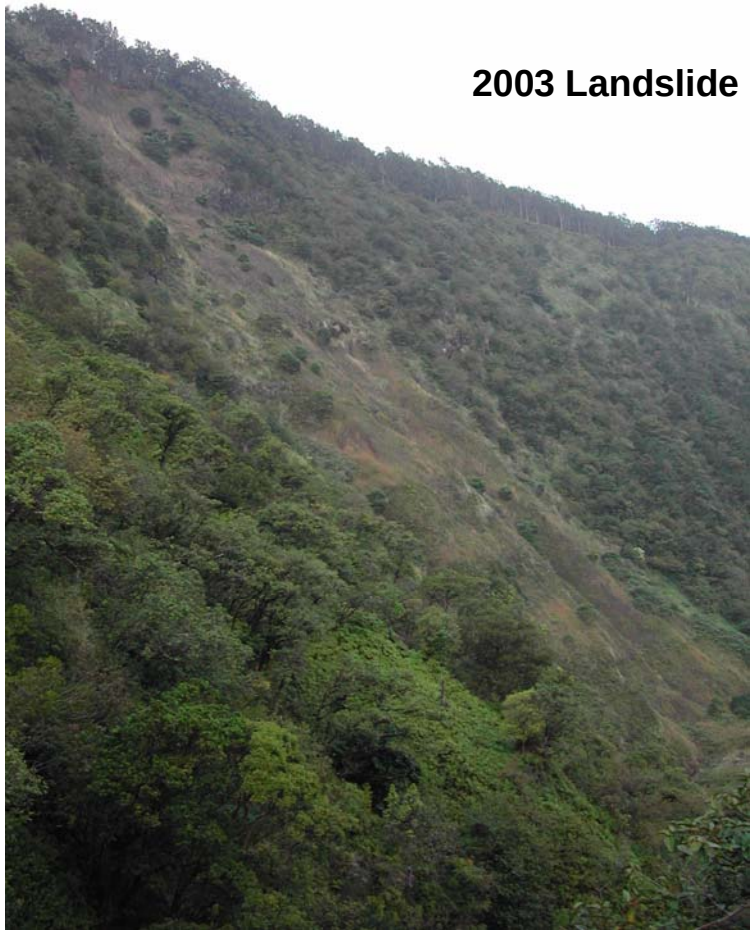
Dec. 2008

Kaleomaui Stream is mostly dry, not diverted

Dry Reach on Piinaau Stream

Dec. 2008

2003 Landslide



Dry reach below the landslide

Keanae Arboretum

Feb. 2009

Mostly overgrown, more taro loi in the mauka side

Keanae Arboretum Intake

Feb. 2009

Diversion on Piinaau Stream for the arboretum

Kuo Stream

Feb. 2009

Tributary Kuo Stream flowing through steeply dipping basalt unit

Summary

Interim IFS not achieved

- Site B = 3.19 CFS

Issues

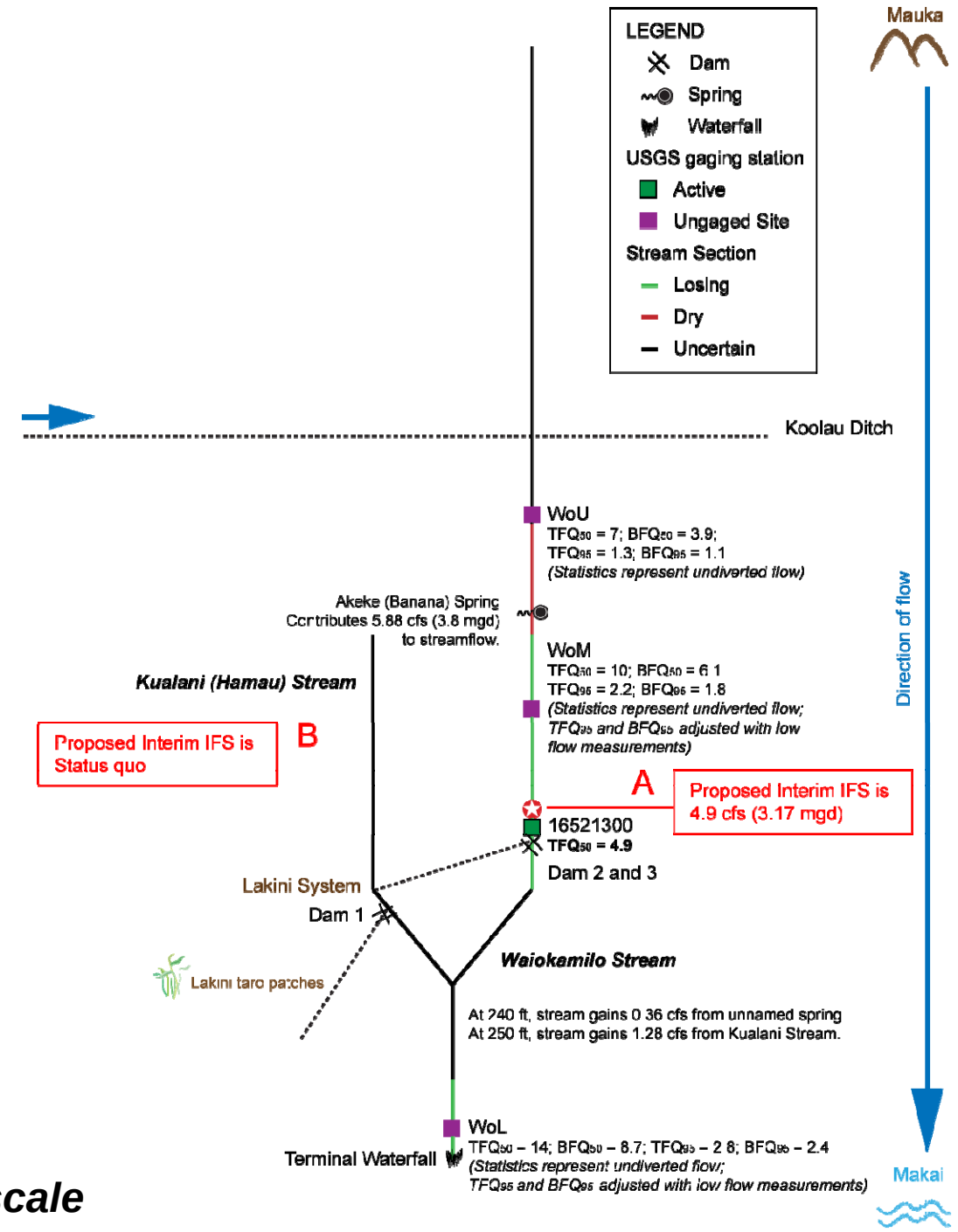
- Difficult to assess affects of interim action on flow due to large losing reach upstream from Site B
- Verified that tributary Kaleomaui Stream is not diverted

Summary

Next Steps

- Flow measurements and rating curve
- Re-evaluate interim IFS due to upstream losing reach
- Evaluate impacts of interim action at Kano intake
- Work with EMI on restoring flow at Hauolo Ditch

WAIOKAMILO



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Waiokamilo Field Visits

November 2008

- Lakini taro patch and auwai
- Locate Kualani Stream mauka of Lakini

December 2008

- Verify that major and minor diversions on Waiokamilo Stream are sealed
- Locate headwaters of Kualani Stream

Waiokamilo Field Visits

February 2009

- View terminal waterfall and stream mouth
- View losing sections of the stream
- Determine convergence of Kualani and Waiokamilo streams
- Visit Na Moku Project taro loi

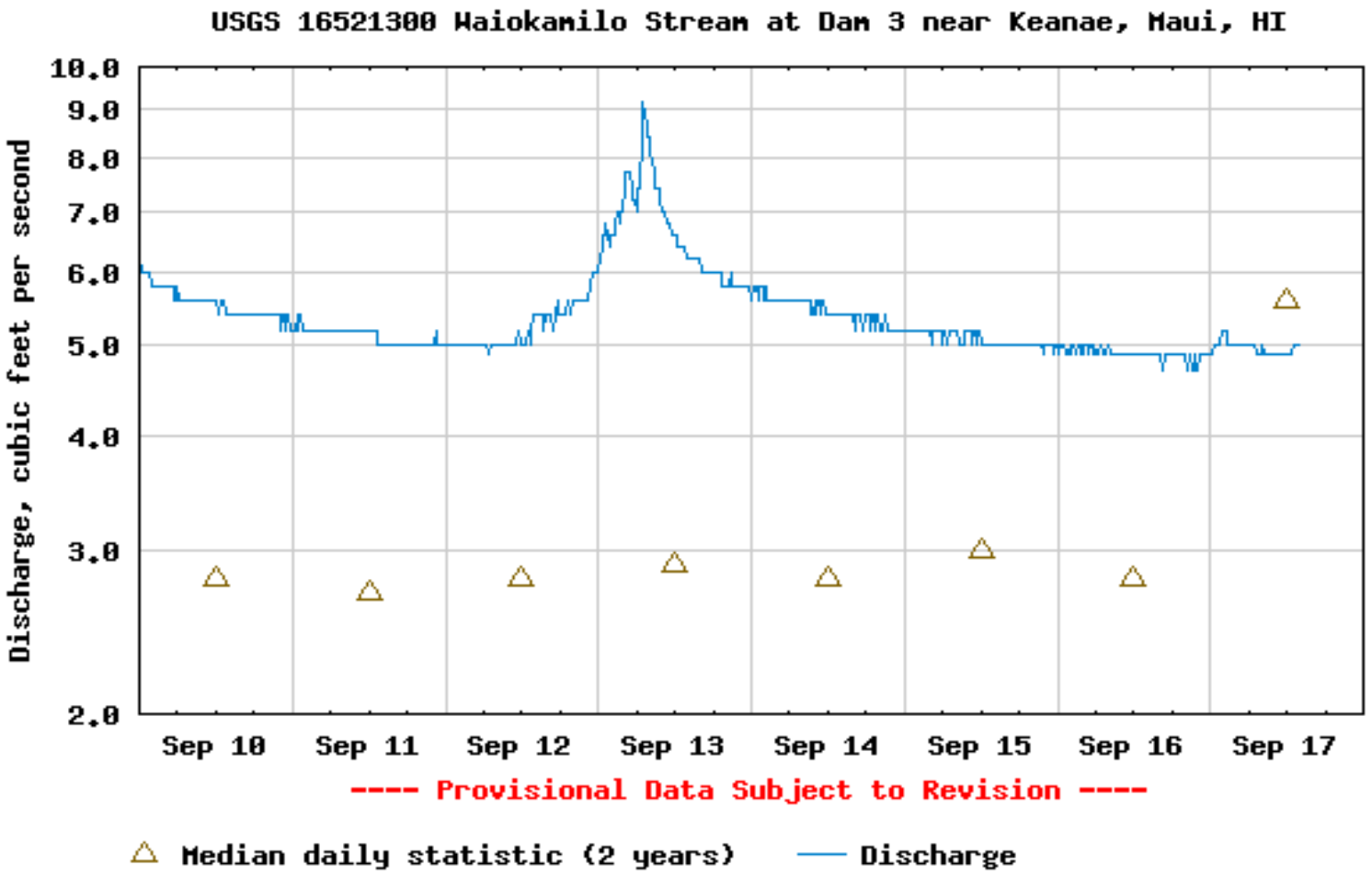
Waiokamilo Site A

Feb. 2009

USGS continuous gaging station located on left bank of the stream

Waiokamilo Site A

Sep. 2009



Median streamflow was 5.6 cfs, recorded September 17, 2009

Waiokamilo K-23 Intake

Dec. 2008

EMI staff sealed leak at K-23, #11 intake with mud and vegetation

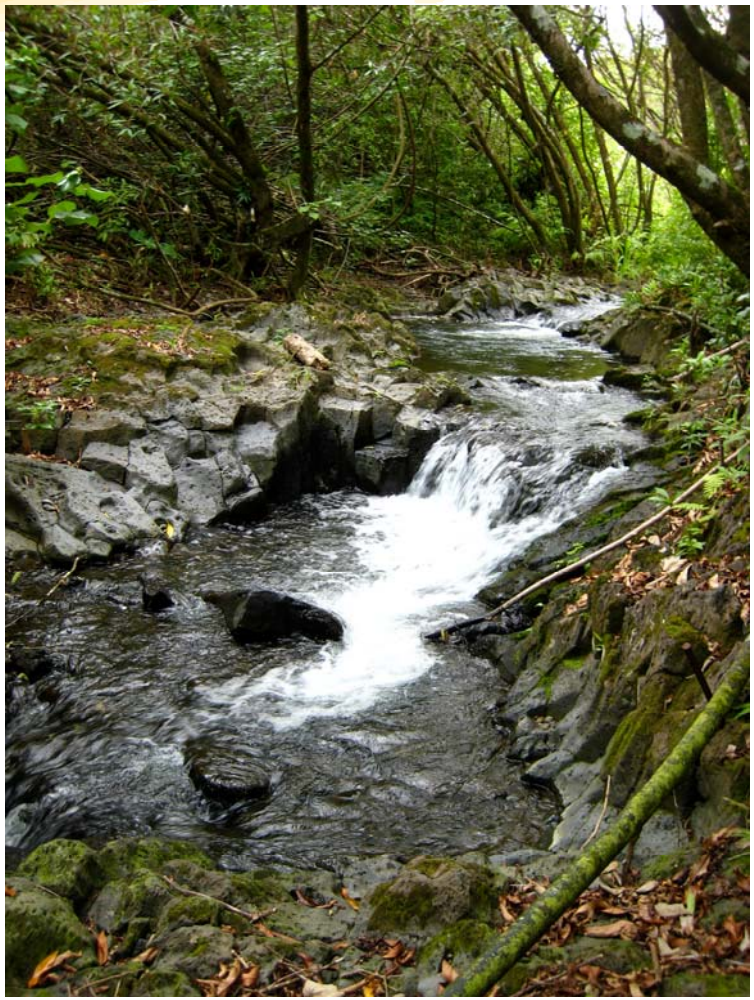
Waiokamilo Kikokiko Intake

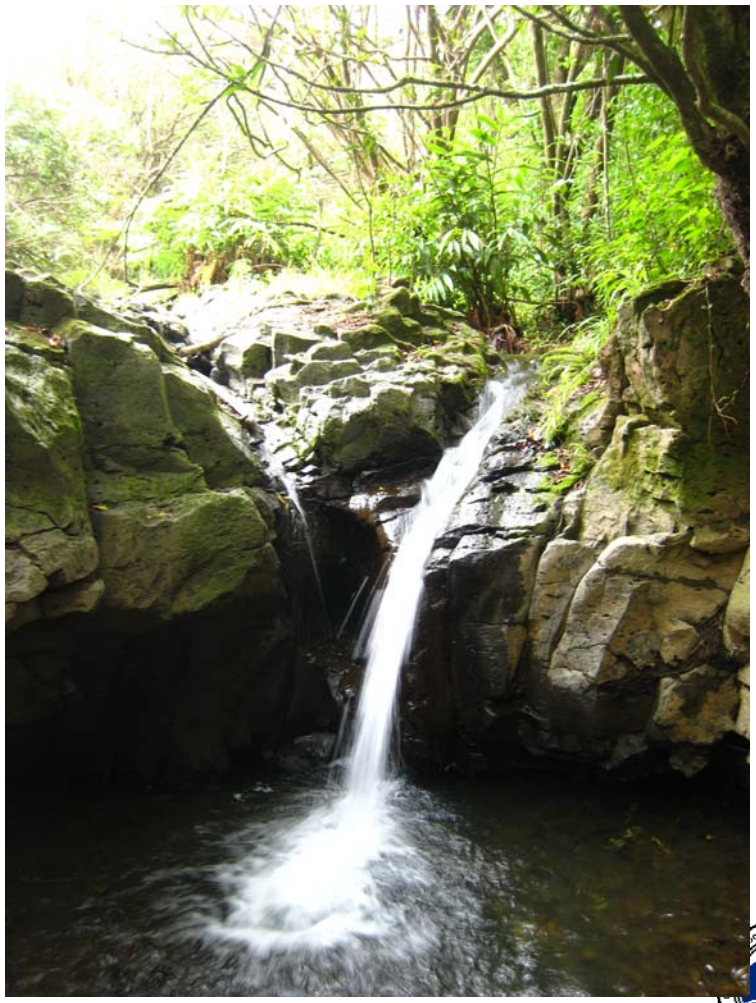
Dec. 2008

Main Kikokiko 6-in intake pipe - severed and no longer operational

Losing Sections

Aug. 2008





Losing pond on Waiokamilo Stream

Losing Sections

Feb. 2008

Another location water is dropped into the losing pond

Blockage

Feb. 2008

Upstream from Dam 3 on Waiokamilo Stream.
Water from this pond used to spilt into two branches.
At the Feb. field visit, the left branch (left photo) was completely blocked by cobbles.

Terminal Waterfall

Feb. 2009

According to Ms. Wender, there are 3 spring-fed ponds above waterfall

Taro Cultivation

Nov. 2008

Feb. 2009

Kualani Stream

Dec. 2008

Feb. 2009

Headwaters (left) of Kualani Stream. Kualani Falls (right). Stream is not diverted by EMI

Kualani Stream

Feb. 2009

Diversion dam where Waiokamilo and Kualani streams converge

Summary

Interim IFS achieved

- Site B = 5.6 CFS (2-year median flow as of Sept. 17)

Issues

- EMI major and minor diversion all sealed
- Losing reaches and blockage upstream from IIFS Site
- Walked almost full length of Kualani Stream
- Verified Kualani Stream is not diverted by EMI

Summary

Next Steps

- Re-evaluate interim IFS since all EMI diversion intakes are sealed
- Work with NHLC and the taro farmers on options to keep more water in the stream versus in the losing reaches

WAILUANUI

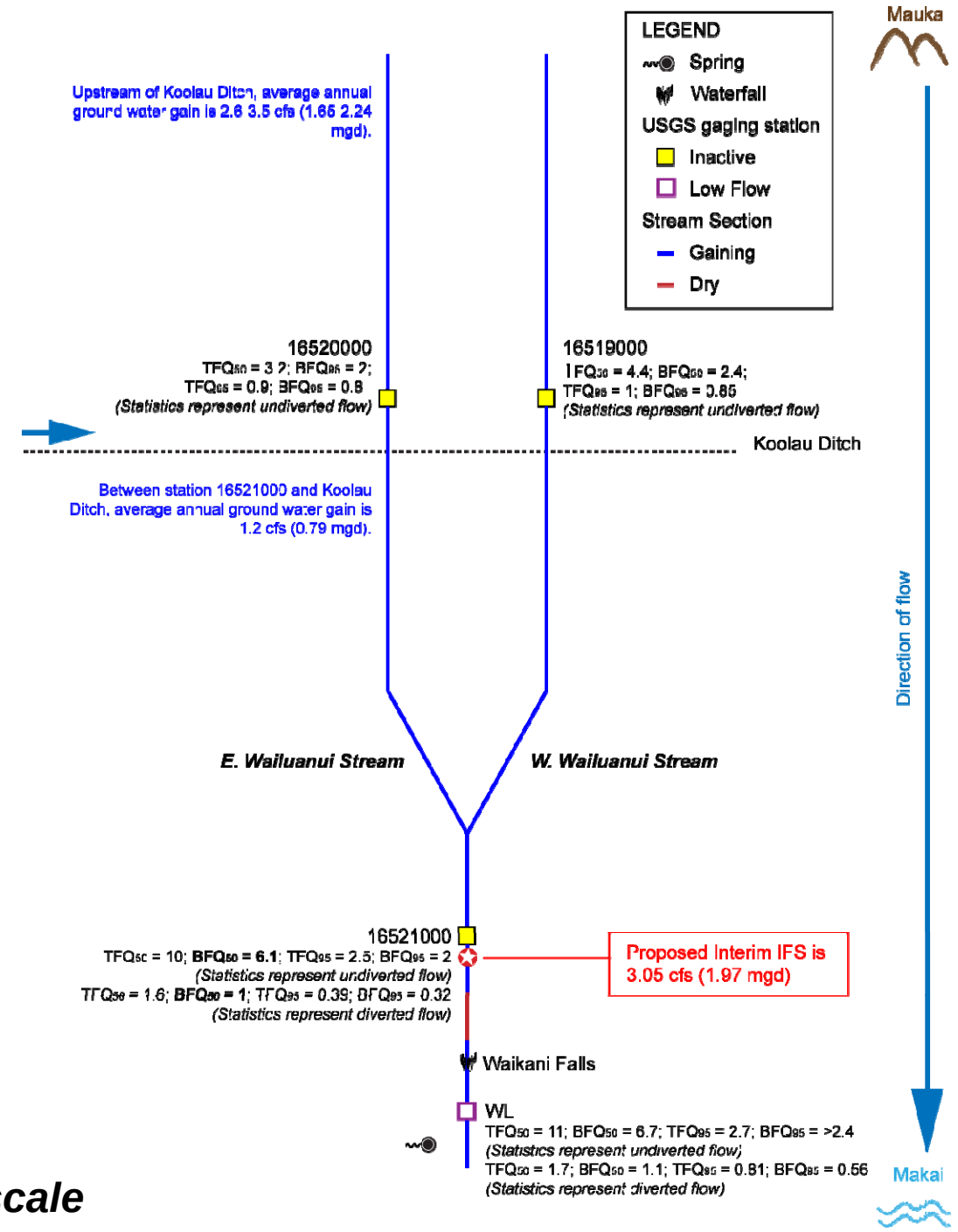


Diagram not to scale

Wailuanui Field Visits

October 2008

- Site selection with USGS, flow measurements

December 2008

- Install reference point
- Interim action at East and West Wailuanui streams

February 2009

- Visit Wailua Valley taro patches, cleared intake

July 2009

- USGS install staff gage at interim IFS site

Wailuanui Site

Dec. 2008

The site is located below Hana Highway

Staff Gage

July 2009

Flow Conditions

Oct. 2008

Nov. 2008

Low (left) and high (right) flows upstream from the interim IFS site

Interim Action at Koolau Ditch

Dec. 2008

Interim action at East (left) and West (right) Wailuanui streams

Wailua Valley

Oct. 2008

Wailua Valley Taro Auwai

Feb. 2009

Flow before (left) and after (right) the auwai intake was cleared

Flow Measurements

Date	Time	Discharge
10/29/08	1437 hr	2.293 cfs (meter)
11/18/08		High flow
11/19/08		High flow
12/08/08	1502 hr	2.803 cfs (meter)
12/09/08	1037 hr	2.392 cfs (meter)
12/10/08	0920 hr	2.076 cfs (meter)
07/21/09		5.910 cfs (meter)

Interim IFS	3.050 cfs

Summary

Interim IFS achieved

- USGS recorded 5.9 CFS in July 2009

Issues

- Dry conditions – no significant increases in streamflow two days following restoration
- Auwai and intake maintenance crucial in optimizing water flow to taro loi

Summary

Next Steps

- Flow measurements and rating curve (USGS)
- Re-evaluate interim action on streamflow and IIFS
- Assess biota after restoration (awaiting DAR data)

Other Field Visits

April 2009

- Maui DWS water treatment facilities and reservoirs
- Kula Agricultural Park
- HC&S Sugar Mill

June 2009

- Maui Land & Pineapple Company
- Kula Agricultural Park
- MCFB Water Meeting at Maui

Upcoming Activities

Tomorrow

- Open public review for the remaining 16 draft IFSARs

October 15

- East Maui Public Fact Gathering Meeting

October 21-22

- East Maui Commission Site Visit

October 30, 2009

- Close of public review period

December 2009

- Commission Meeting in Maui

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Implementation of Interim Instream Flow Standards for Five Hydrologic Units in East Maui

Commission staff are currently implementating the interim instream flow standard (IIFS) for 8 streams in the hydrologic units of **Honopou**, **Hanehoi**, **Piinaau**, **Waiokamilo**, and **Wailuanui**. The eight petitioned streams are:

Hydrologic Unit	Stream Name
Honopou	Honopou Stream
Hanehoi	Hanehoi Stream
	Puolua (Huelo) Stream
Piinaau	Piinaau Stream
	Palauhulu Stream
Waiokamilo	Waiokamilo Stream
	Kualani Stream
Wailuanui	Wailuanui Stream

Since the adoption of the IIFS for these eight streams back in September 2008, CWRM staff has been working with the community, government and private agencies to carry out the recommended adaptive management strategies, as described in the staff submittal, that can be applied towards regulation and management of the IIFS. The following sections contain information on the **upcomming events** and the **current progress** related to the implementation of the IIFS. Information on the background and history of the petition can be found **here**.

- Commission Meetings
- Public Notices
- News Releases
- Water Resource Bulletin
- Current Issues

http://hawaii.gov/dlnr/cwrm
dlnr.cwrm@hawaii.gov

Civil No. 19-1-0019-01 (JPC)

Defendant A&B/EMI's Exhibit AB-152

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