Staff briefing on the

Petition to Amend the Interim Instream Flow Standards for the Surface Water Hydrologic Units of

Honopou (6034), Hanehoi (6037), Piinaau (6053), Waiokamilo (6055), and Wailuanui (6056), Maui

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

Petition to Amend IIFS

HONOPOU

- Honopou Stream

HANEHOI

- Hanehoi and Puolua Streams

PIINAAU

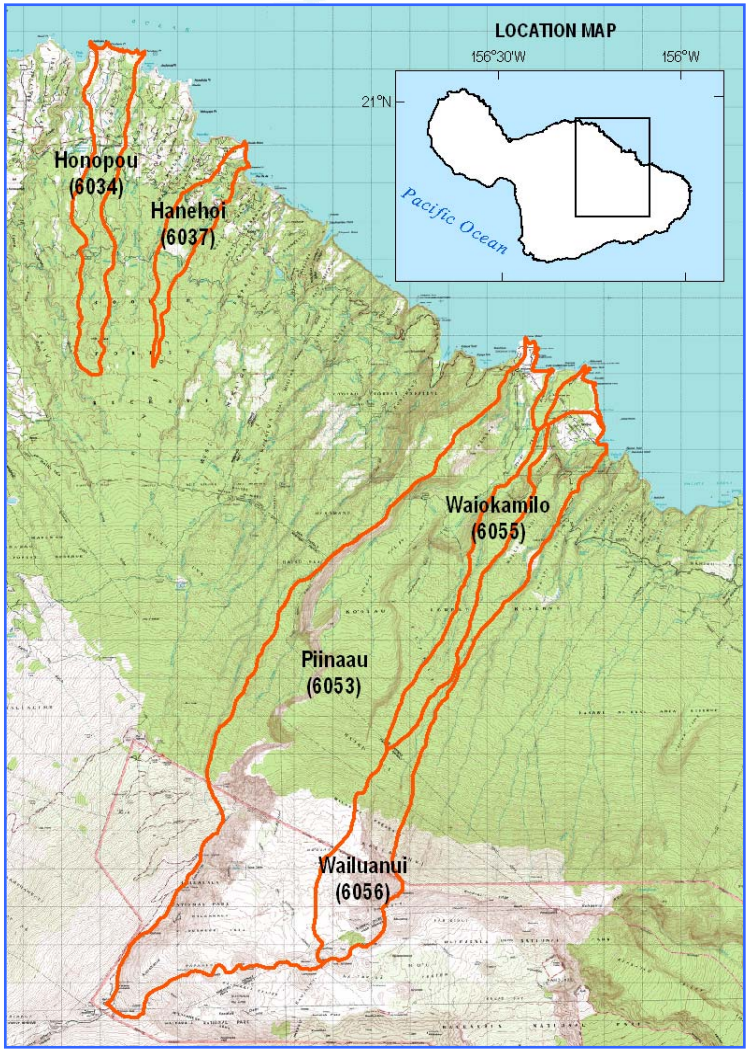
- Piinaau Stream
- Palauhulu Stream

WAIOKAMILO

- Waiokamilo Stream
- Kualani Stream

WAILUANUI

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



Presentation Overview

- **Background**
  - Timeline
  - Interim IFS process
  - Adaptive Management
  - Hydrology
- **Issues and Analysis**
  - General Considerations
  - Hydrologic Unit-Specific Considerations
- **Additional Data Needs**

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
- **December 13, 2006**
  - Approval of Interim IFS process

Timeline

- **April 10, 2008**
  - Public fact gathering meeting
- **September 24 & 25, 2008**
  - Commission approval of amended IIFSs
- **Late 2009, October (Tentative)**
  - Commission meeting to see information on remaining stream petitions
  - Assess implementation of first 5 IIFSs

Balancing the Needs

Hydrology

- Median Flow
- Base Flow
- Pre-Diversion Flow Estimate
- Groundwater Interaction
- Surface-Water Use
- Ground-Water Use
- Other

Fish/Wildlife Habitat

- Stream Channelizations
- Native Vertebrates
- Invertebrates
- Invasive Species
- Recruitment
- Abundance
- Diversity
- Distribution
- Other

Recreation

- Swimming
- Nature Study
- Fishing
- Boating
- Parks
- Other

Ecosystem Maintenance

- Estuaries
- Wetlands
- Nearshore Waters
- Natural Area Reserves
- National Parks
- Other Protected Areas
- Other

Aesthetics

- Scenic Views
- Waterfalls
- Tourism
- Other

Navigation

- Boating
- Other

Hydropower

- Present Use
- Potential Use
- Other

Water Quality

- Water Quality Standards
- 303(d) Impaired Waters
- Total Maximum Daily Loads
- Land Use
- Other

Conveyance of Water

- Multiple Diversions on a Single Stream
- Other

Hawaiian Rights

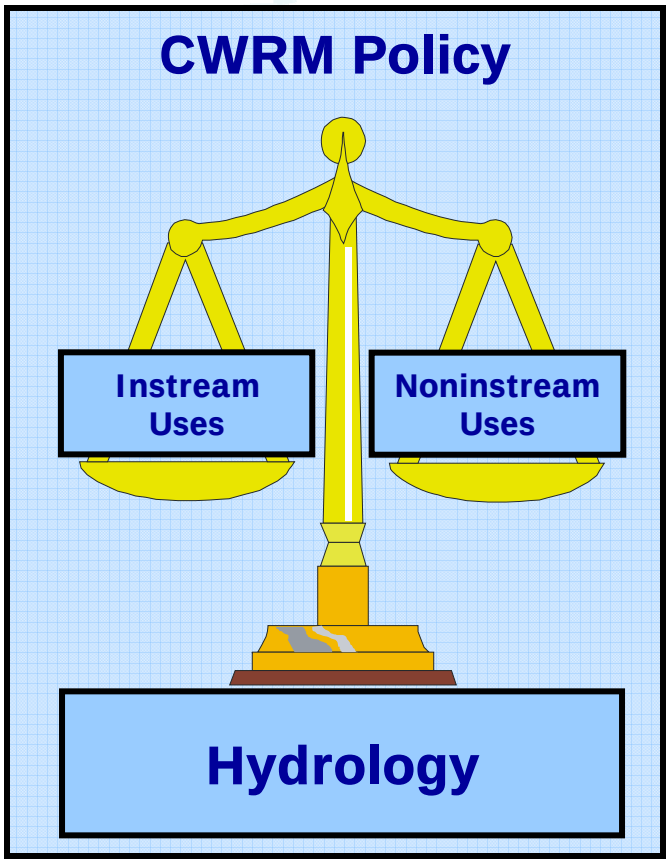
- Traditional and Customary Rights
- Taro Cultivation
- Appurtenant Rights
- Cultural Values
- Other

Noninstream Uses

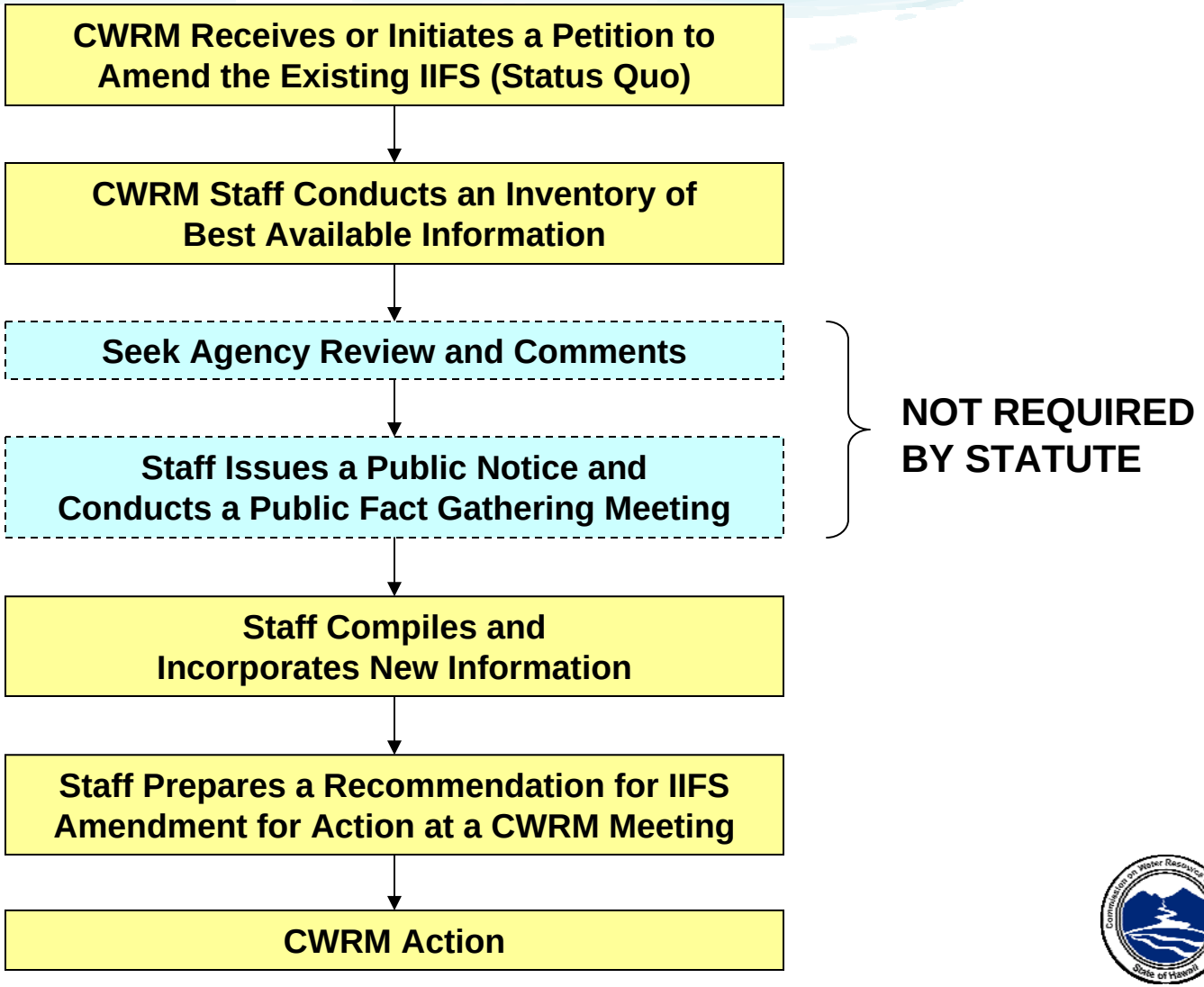
- Diversions
- Domestic/Municipal Use
- Agriculture
- Industrial
- Present vs. Potential Use
- Economic Impacts

State Water Code

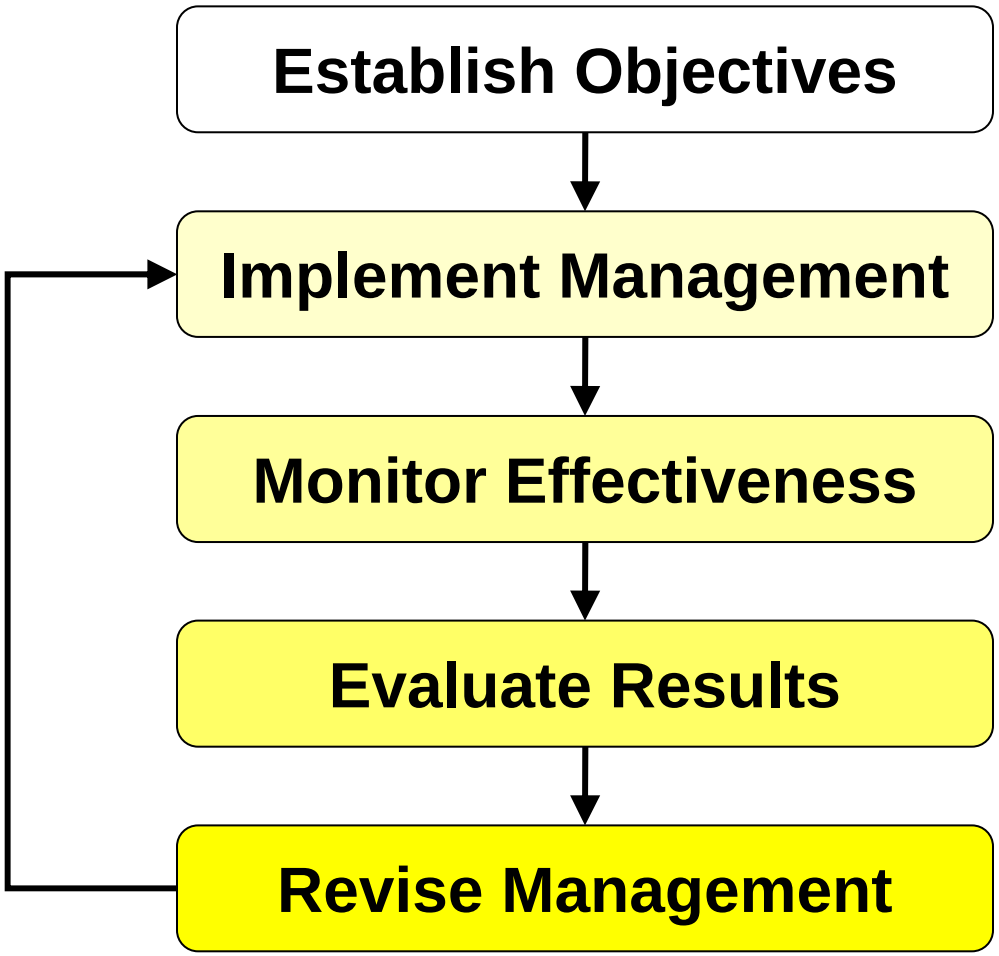
"The Commission shall weigh the importance of the present or potential instream values with the importance of present or potential uses of water for noninstream purposes, including the economic impact of restricting such uses."



Interim IFS Process

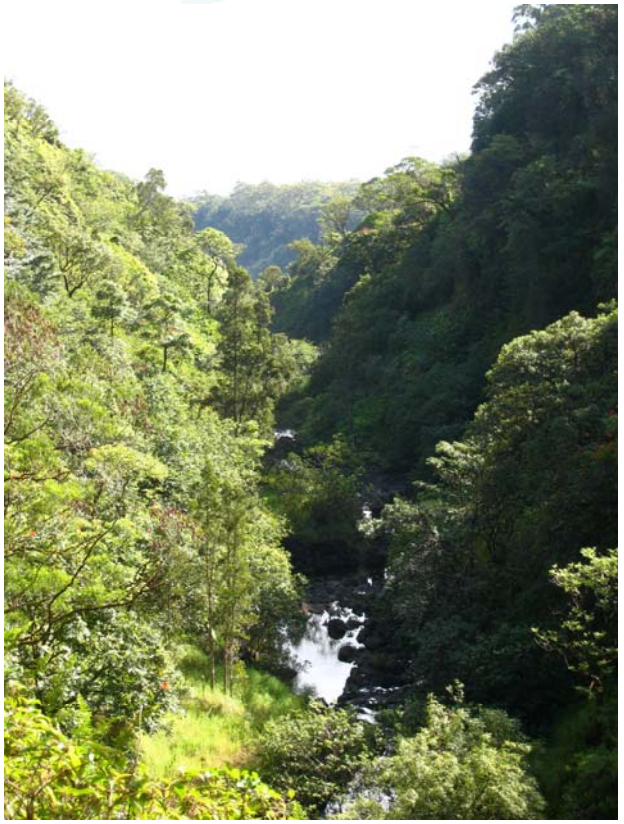


Adaptive Management



General Considerations

- **Sustainability**
  - Agriculture
- **Public health**
  - Health risks of stagnant water
  - Nutrition
- **Decreased streamflow**
  - Reduction in ground water storage and recharge
  - Decreased annual rainfall
  - Increased water demand
  - Climate change
  - Landcover change



East Wailuanui Stream, Maui

General Considerations

- **Ongoing water issue**
  - Dates back to the 1881 petition
- **Status quo interim IFS**
  - Initial establishment
  - Differing opinions
  - Lack of data
- **Cultural landscape study**
  - Support return of water and taro farming
- **EMI cultural study**
  - Relationship between EMI and community

General Considerations

- **HC&S water needs**
  - Accuracy of information
  - Other sources of water
- **Agricultural subsidies**
  - Economics of HC&S / EMI operations
- **Upcountry Maui**
  - Residents rely on EMI water
- **Energy**
  - Sales to MECO
  - Renewable energy - hydroelectric and biomass

Wailoa Ditch siphon at Maliko Gulch. It transports water to west and central Maui

General Considerations

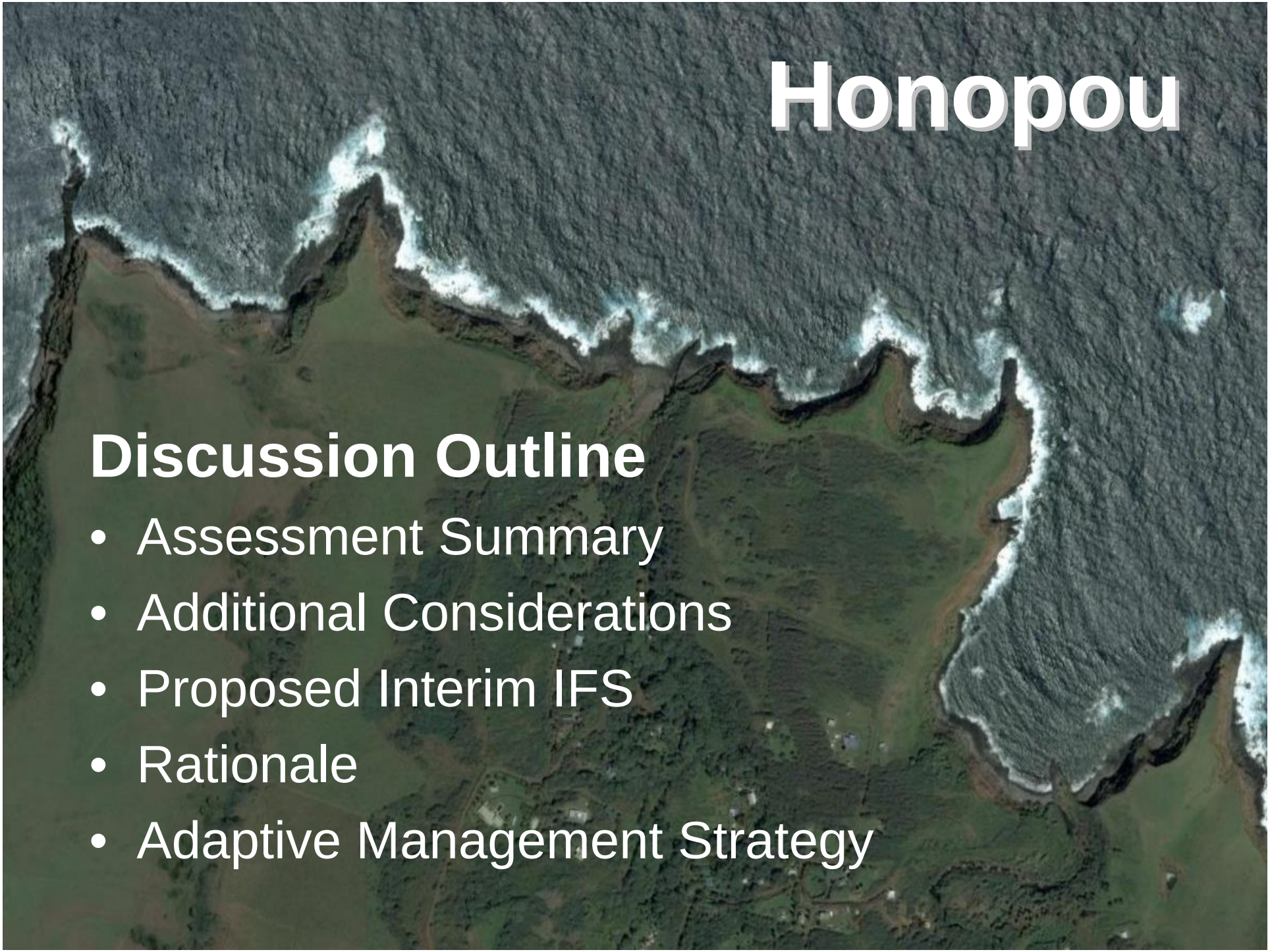
- **Alternative water sources (HC&S)**
  - Brackish water from wells
- **Viability of HC&S**
  - Land size and location
  - Revenue from energy sales
  - Other sources of water
  - Product diversity line

HC&S Co., sugar mill, Maui

Discussion Outline

Hydrologic Unit-Specific Considerations

- Assessment Summary
- Additional Considerations
- Rationale
- Diagrams
- Adaptive Management Strategy



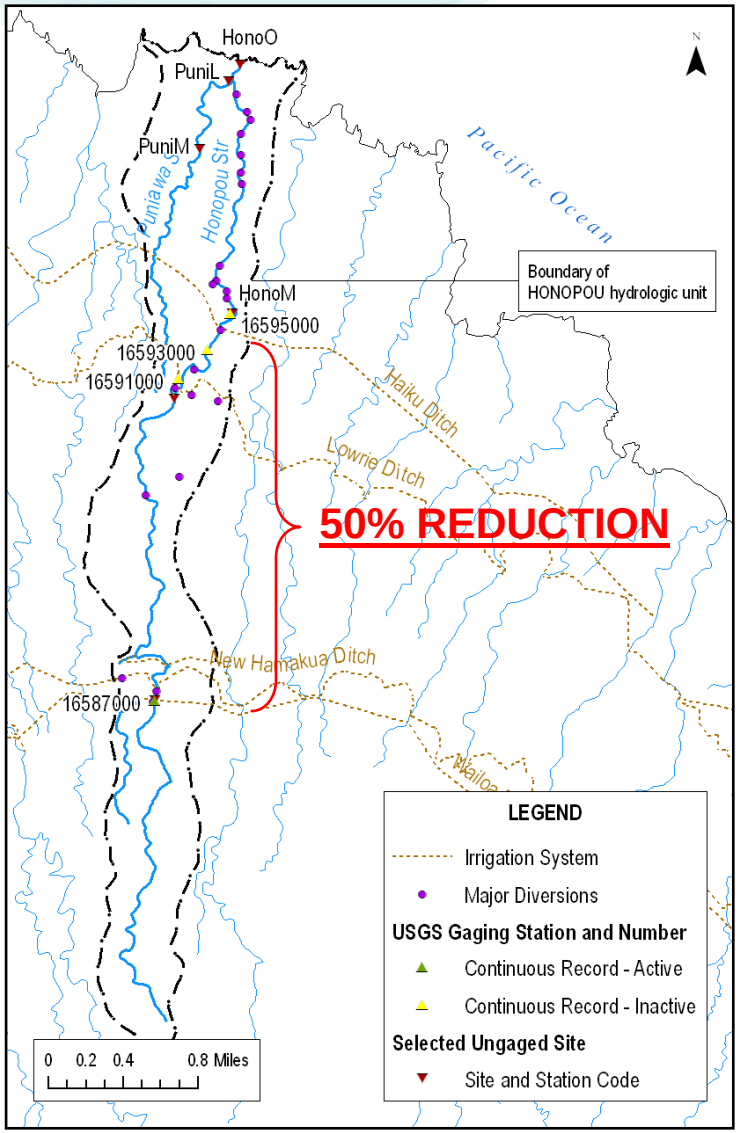
Honopou

Discussion Outline

- Assessment Summary
- Additional Considerations
- Proposed Interim IFS
- Rationale
- Adaptive Management Strategy

Assessment Summary

- **Hydrology**
  - Gaining stream
  - Gain: 2.3 MGD
  - Diversions: 50% reduction
  - Bypass pipes at Haiku Ditch
  - Decreasing long-term trend in streamflow



MGD = million gallons per day

Assessment Summary

- **Fish and Wildlife**
  - Poor diversity
  - Oopu alamoo in upper reaches
  - Lack of streamflow continuity
  - Deep pools and dewatered sections
  - Pipes in diversion structures

Native Hawaiian fish: Oopu alamoo (Lentipes concolor)

- **Recreational**
  - HSA - swimming

Assessment Summary

- **Ecosystem Maintenance**
  - 40% is East Maui Watershed Partnership area
  - 25% is Koolau Forest Reserve
- **Aesthetic**
  - Limited
- **Water Quality**
  - Class 2 - Puniawa, lower reaches of Honopou Stream
  - Class 1 - Upper reaches of Honopou Stream

Honopou Stream upstream of Haiku Ditch

Assessment Summary

- **Irrigation and Domestic**
  - Total of 15 non-EMI diversions
  - 12 registered domestic uses (no access to county water service)
  - All 15 registered for cultivation of other crops and/or livestock
- **Traditional and Customary**
  - 2 appurtenant rights claimants
  - 6 registered for taro cultivation
  - Gathering

Kekahuna's taro loi, Honopou

Assessment Summary

- **Noninstream**
  - EMI diversions - 7 major, 2 minor
  - EMI supplies water to:
    - HC&S
    - Makawao DWS system
    - MLP
  - Effects of decreasing water diverted
    - Irrigation in west and central Maui
    - Long-term trends in ground water levels

EMI diversions at Wailoa Ditch and New Hamakua Ditch, Honopou Stream

Additional Considerations

- **BLNR Contested Case**
  - Appurtenant rights
  - Accuracy of flow measurements
  - Taro water needs
- **Public testimony**
  - Stream is diverted 4 times by EMI
  - Water temperature
  - Taro root rot
- **Other sources of water**
  - No county water system

Kekahuna / Wallett auwai, Honopou

Rationale

- **Why restore flow?**
  - Increase flow continuity for stream biota
  - Improve recreational and aesthetic opportunities
  - Ecosystem maintenance (Koolau Forest Reserve)
  - Downstream surface water users
  - Potential water use

Waterfall at Honopou Stream

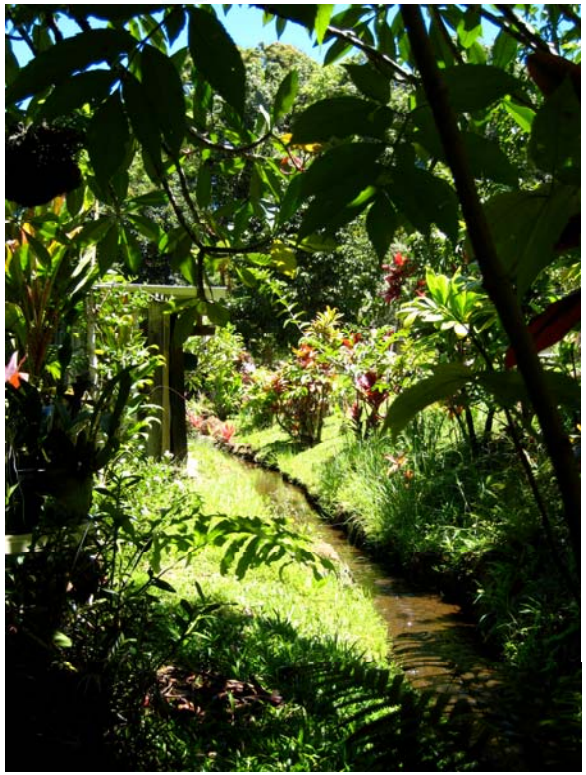
Rationale

- **Why not full restoration?**
  - Upcountry Maui - domestic use, agriculture
  - Central Maui - agriculture
  - Power to MECO
  - Diversified agriculture
  - Sustainability

Sugarcane cultivation

Rationale

- **Interim IFS A**
  - Estimate: Based on average annual ground water gain
  - Purpose: Water for downstream users
- **Interim IFS B**
  - Estimate: Based on Q_{90} natural (undiverted) flow
  - Purpose: Biological integrity



Kekahuna / Wallett auwai, Honopou

Proposed Interim IFS

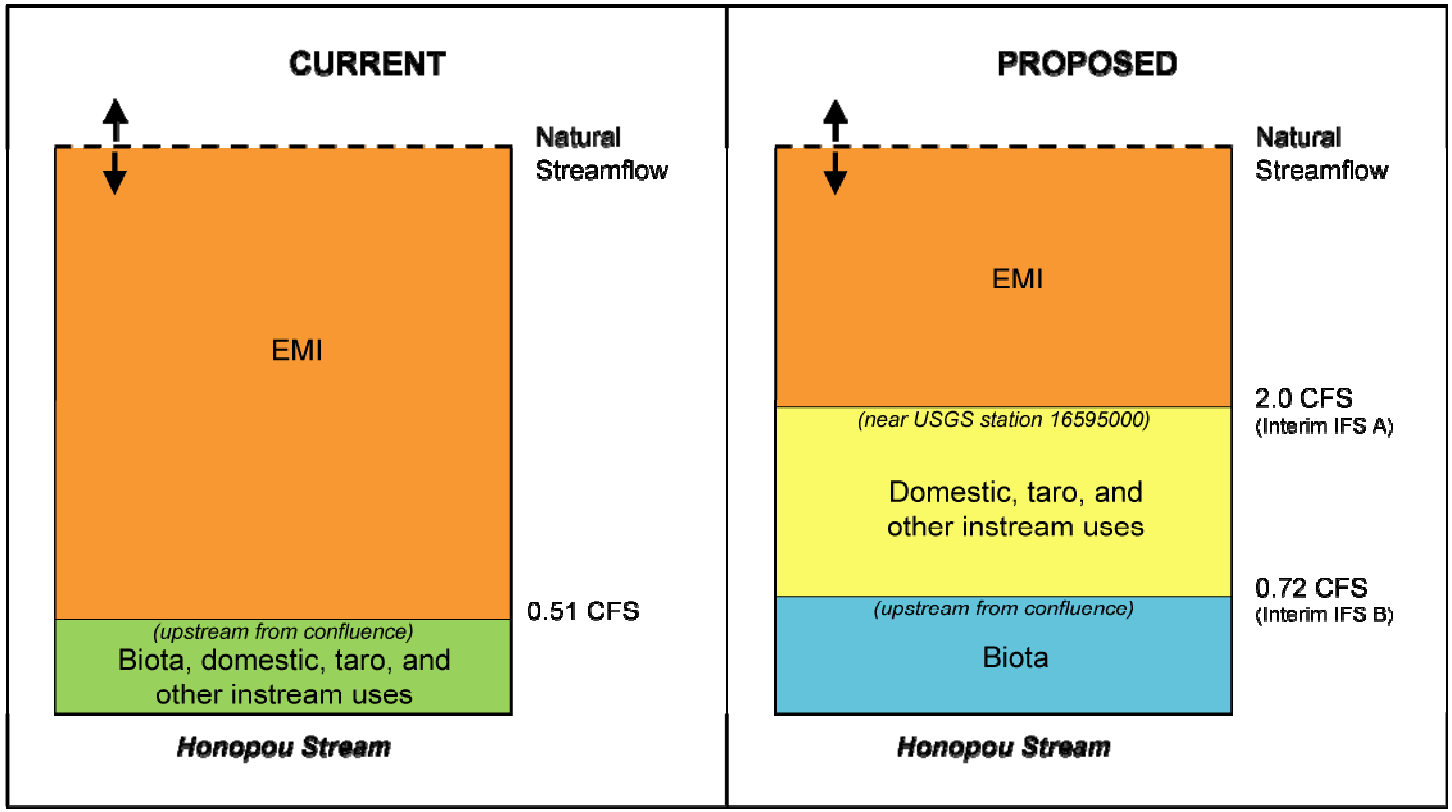


Diagram not to scale

Adaptive Management

- **Hydrologic Unit-Specific**
  - Alter bypass pipes at Haiku Ditch to allow upstream migration of native species

Bypass pipes at Haiku Ditch, Honopou Stream

Adaptive Management

- **General Strategies**
  - 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

- **General Strategies**
  - 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

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

Amendments

Approved with the following amendments

- Moving forward on the staff's recommendation is the first step in an integrated approach to all 27 (twenty-seven) streams that are subjects of these petitions
- Staff shall provide progress reports to the Commission at regularly scheduled meetings during the course of 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

ABOUT US | NEWS & EVENTS | RESOURCES | PLANNING | SURFACE WATER | GROUND WATER

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

HONOPOU – Haiku Ditch, Interim action, 10/27,2008

HONOPOU – Haiku Ditch, Interim action, 10/27,2008

HONOPOU – Lowrie Ditch, Interim action, 10/27,2008

HONOPOU – Lowrie Ditch, Interim action, 10/27,2008

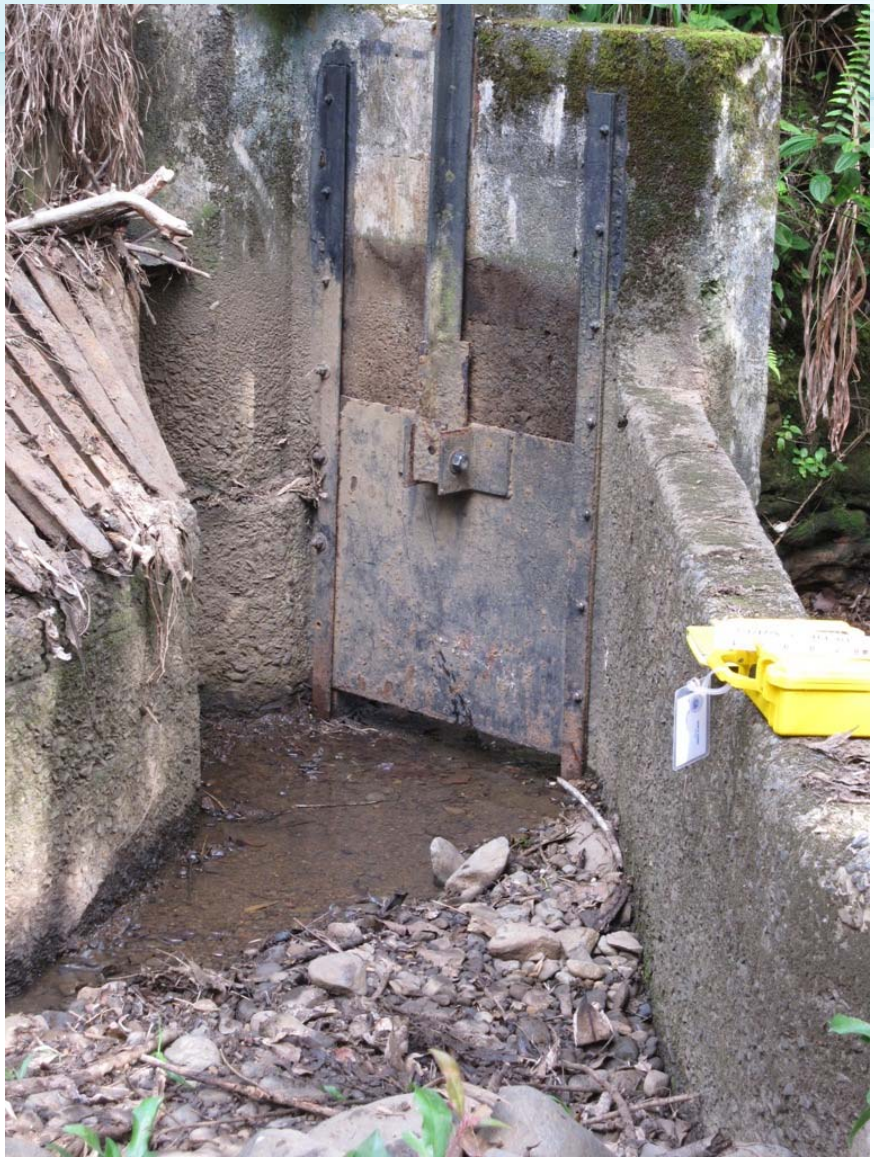
HONOPOU – Haiku Ditch, Installation of bypass, 03/23/2009

HONOPOU – Haiku Ditch, Completed bypass structure, 03/23/2009

HANEHOI, Haiku Ditch, Interim action, 10/28/2008

HANEHOI, Haiku Ditch, Interim action, 02/11/2009

HANEHOI, Haiku Ditch, Interim action, 02/11/2009



EAST WAILUANUI, Koolau Ditch, Interim action, 12/10/2008

EAST WAILUANUI, Koolau Ditch, Interim action, 12/10/2008

EAST WAILUANUI, Koolau Ditch, Interim action, 12/10/2008

WEST WAILUANUI, Koolau Ditch, Interim action, 12/10/2008

WEST WAILUANUI, Koolau Ditch, Interim action, 12/10/2008

WEST WAILUANUI, Koolau Ditch, Interim action, 12/10/2008

Additional Data Needs

Water Use

- Historical trends – may indicate seasonal changes; staff may correlate with annual rainfall trends
- Current use
- Future demands

Additional Data Needs

Water Use Purpose

- Who is using the water? What is water used for?
- If applicable, provide the following:
  - Domestic – geographic area, # of end users
  - Agriculture – # of acres, type of crop, farming practices
  - Livestock – type of animal, # of pastures, farming practices
  - Traditional – # of acres, type of crop, farming practices
  - Hydroelectric – energy capacity, average amount of power generated (per day, month, and/or year), any surplus power sales, revenue generated, users of this power
  - Recreation / ornamental - type of recreation (golf course, landscape, water features), # of acres

Additional Data Needs

Water Requirement

- Minimum water requirement
- Prioritize water use purposes (i.e. if water is used for agriculture, which fields are watered first or crop changes)

Water Supply

- Sources of water
- Contractual obligations
- Minimum amount of water supplied (i.e. via system) during drought conditions
- Alternate water sources (e.g. recycled water, why/why not?)

Additional Data Needs

Economic Impact

- When water supply drops 25%, 50%, 75%
- Restricting offstream uses

Additional Data Needs

Water Use Efficiency

- Irrigation efficiency
- Ways to decrease water use and water needs
- Past experiences:
  - What has been done to cope with decreasing water supply?
  - During drought conditions, what has been done to decrease water use or needs?
- Future demands:
  - Are there any future plans that would change water use or needs, i.e. changes in farm acreage, capacity of system, urban development, etc…

Questions?

Discussion