Commission Meeting
UH Maui College
March 20, 2018

Staff presentation to

Amend the Interim Instream Flow Standards for the Surface Water Hydrologic Units of Ukumehame, Olowalu, Launiupoko, Kauaʻula
“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

CWRM Receives or Initiates a Petition to Amend the Existing IIFS (Status Quo)

CWRM Staff Conducts an Inventory of Best Available Information

Seek Agency Review and Comments

Staff Issues a Public Notice and Conducts a Public Fact Gathering Meeting

Staff Compiles and Incorporates New Information

Staff Prepares a Recommendation for IIFS Amendment for Action at a CWRM Meeting

CWRM Action

NOT REQUIRED BY STATUTE
Presentation Outline

1. Background on West Maui
   - USGS Report
   - Hydrology/Geology: Rainfall/Groundwater

2. Hydrologic Unit Summary and recommendation

3. Implementation of IIFS
Instream Uses

- Traditional and customary Hawaiian rights
  - Mauka-to-makai flow
  - Gathering of native species
  - Taro cultivation
- Fish Habitat & Ecosystem Services
- Aesthetic & Recreational Value
- Water Quality
- Navigation
- Hydropower
## Native Stream Biota

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Hawaiian Name</th>
<th>Type</th>
<th>Biogeographic status</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stenogobius hawaiiensis</td>
<td>‘O’opu naniha</td>
<td>Goby</td>
<td>Endemic</td>
<td>●</td>
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<tr>
<td>Awaous guamensis</td>
<td>‘O’opu nakea</td>
<td>Goby</td>
<td>Indigenous</td>
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<tr>
<td>Sicyopterus stimpsoni</td>
<td>‘O’opu nopili</td>
<td>Goby</td>
<td>Endemic</td>
<td>● ●</td>
</tr>
<tr>
<td>Eleotris sandwicensis</td>
<td>‘O’opu akupa (okuhe)</td>
<td>Eleotrid</td>
<td>Endemic</td>
<td>● ●</td>
</tr>
<tr>
<td>Lentipes concolor</td>
<td>‘O’opu hi’ukole (alamo‘o)</td>
<td>Goby</td>
<td>Endemic</td>
<td>● ● ●</td>
</tr>
<tr>
<td>Macrobachium grandimanus</td>
<td>‘Opa‘oeha’a</td>
<td>Prawn</td>
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<td>●</td>
</tr>
<tr>
<td>Atyoida bisulcata</td>
<td>‘Opa‘eka‘ole</td>
<td>Shrimp</td>
<td>Endemic</td>
<td>● ● ●</td>
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<tr>
<td>Neritina vespertina</td>
<td>Hapawai</td>
<td>Snail</td>
<td>Endemic</td>
<td>●</td>
</tr>
<tr>
<td>Neritina granosa</td>
<td>Hiihiwai</td>
<td>Snail</td>
<td>Endemic</td>
<td>● ●</td>
</tr>
</tbody>
</table>
80% of median baseflow (BFQ$_{50}$) provides 100% of useable habitat
Habitat Availability

$Q_{70}$ provides 100% of useable habitat
60% of $Q_{70}$ provides about 80% of useable habitat
Flow Duration Curves

Linear scale

Logarithmic scale

Time-series data
Background - USGS Report

Low-Flow Characteristics of Streams in the Lahaina District, West Maui, Hawai‘i

Scientific Investigations Report 2014–5087

U.S. Department of the Interior
U.S. Geological Survey
1. Orographic rainfall driven by trade winds at high elevations contributes runoff

2. Dike-impounded groundwater and development tunnels contributes baseflow

→ Gaining reaches at high elevations, losing reaches at lower elevations
Background - Hydrology

Stream intersects the water table, creating a gaining stream reach. Arrows below stream indicate groundwater discharge.

Stream is above the water table, creating a losing stream reach. Arrows below stream indicate groundwater recharge.

Gaining stream reaches

Losing stream reaches

Dikes and ground surface are transparent, revealing differences in water levels in the freshwater lens and dike-impounded groundwater systems.
Background - USGS gages

1. Honokohau Stream (16620000)
   Active: 1913-present

2. Other stations only active 1911-1917
   Honolua Stream (16623000)
   Honokowai Stream (16630000)
   Kahoma Stream (1663400)
   Kanaha Stream (16636000)
   Ukumehame (16647000)
   Kauaula Stream (16641000)

East Maui & Nā Wai ‘Ehā used long-term continuously gaged stations for development of stream statistics

Need to use a different method to develop low-flow stream statistics → partial-record gaging stations
Ukumehame

Ka‘akau Auwai: ~16 active lo‘i

Former plantation diversion:
4 active lo‘i
2 commercial farms (9.089 acres)
45 proposed agriculturally-zoned lots (only two built)

Unregistered diversion: domestic use
Ukumehame- Stream
Ukumehame- Stream
Based on the seepage run conducted on September 20, 2006, the reach between sites H1 and H2 is a losing reach.

Based on the seepage run conducted on May 25, 2006, the reach between sites H2 and H9 is a gaining reach.
Ukumehame - Simplified

- **Elevation**
  - 410 ft
  - 270 ft
  - 210 ft
  - 180 ft

- **Legend**
  - Gaining reach
  - Flowing reach
  - Pipeline
  - Auwal flow
  - Abandoned

- **USGS measurement site**

- **Diversion**

- **Undocumented Diversion**

- **Proposed IIFS site**

- **6004 Ukumehame**

- **Ukumehame Ditch**
  - Converted to pipeline

- **Maui Cultural Lands Ioi**
  - Reported 0.0432 mgd

- **Other Ioi**
  - Estimated 0.0432 mgd

- **Abandoned reservoir (#1)**

- **Reservoir (#2)**

- **Reservoir (#3)**

- **Non-potable water**
  - (1 current connection)

- **Diversified agriculture**

- **Makai**

- **2 wells**

- **质感: map not drawn to scale**
Ukumehame- Kaʻakau Auwai
Ukumehame- Kaakau Auwai
Ukumehame- loi in use
Ukumehame- Plantation Diversion
Ukumehame- Plantation Diversion
Ukumehame - loʻi in use
Ukumehame- lo‘i in use
Ukumehame- historic loʻi
# Ukumehame - freshwater habitat

Aquatic species surveys

<table>
<thead>
<tr>
<th>Species</th>
<th>1994</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atyoida bisulcata (opae kalaole)</td>
<td>Present</td>
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<tr>
<td>Macrobrachium grandimanus (oheaa)</td>
<td>--</td>
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<td>Sicyopterus stimpsoni (nopili)</td>
<td>Present</td>
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</tr>
<tr>
<td>Lentipes concolor (alamoo)</td>
<td>Present</td>
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</tr>
<tr>
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<td>Neritina vespertina (hapawai)</td>
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<td>Present</td>
</tr>
</tbody>
</table>
## Ukumehame- groundwater resources

### Well Log

<table>
<thead>
<tr>
<th>Well number</th>
<th>Well Name</th>
<th>Well Owner</th>
<th>Year drilled</th>
<th>Pump rate (mgd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4834-01</td>
<td>Environmental</td>
<td>Army National Guard</td>
<td>2003</td>
<td>0.101</td>
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<tr>
<td>4835-01</td>
<td>Ukumehame-Pump P</td>
<td>Pioneer Mill</td>
<td>1934</td>
<td>4.694</td>
</tr>
<tr>
<td>4835-02</td>
<td>Sugar Way 1</td>
<td>Uka LLC</td>
<td>2003</td>
<td>0.036</td>
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<tr>
<td>4835-03</td>
<td>Sugar Way 2</td>
<td>Uka LLC</td>
<td>2004</td>
<td>0.058</td>
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<tr>
<td>4835-04</td>
<td>Ukumehame 3</td>
<td>Uka LLC</td>
<td>2005</td>
<td>0.058</td>
</tr>
</tbody>
</table>

- **Total installed pump capacity:** 0.116 mgd
- **12-month moving average (2017):** 0.062 mgd
- **Aquifer sustainable yield:** 2.0 mgd
Ukumehame- off-stream use
Ukumehame- off-stream use

Uka, LLC

• 4 potable service connections
• 4 non-potable service connections
  ▪ 2 commercial farms:
    Maui Sunset Farm: 1.484 acres → 0.0074 mgd
    Ukumehame Nursery: 7.605 acres → 0.038 mgd

• Landscaping Demand: 0.813 acres → 0.004 mgd (estimated)

Non-potable system damaged in 2016 fire → total water demand for potable and non-potable needs supplied by groundwater for 2017 (0.062 mgd)
Ukumehame- proposed IIFS

<table>
<thead>
<tr>
<th></th>
<th>$Q_{50}$</th>
<th>$Q_{60}$</th>
<th>$Q_{70}$</th>
<th>$Q_{90}$</th>
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<tbody>
<tr>
<td>Q50 cfs</td>
<td>5.0 cfs</td>
<td>4.5 cfs</td>
<td>4.0 cfs</td>
<td>3.2 cfs</td>
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<tr>
<td>(3.23 mgd)</td>
<td>(2.91 mgd)</td>
<td>(2.59 mgd)</td>
<td>(2.07 mgd)</td>
<td></td>
</tr>
</tbody>
</table>

2016 Estimated Amount Diverted

- Proposed IIFS: 2.9 mgd
- Location: below diversion

Note: Map not drawn to scale.
verification of attainability of IIFS
Upper Plantation Diversion: intake destroyed by flood 9/2016

Lower Plantation Diversion:
- 9-12 inactive lo‘i
- multiple commercial farms
- agriculturally-zoned parcels (49.41 acres)
- Landscape irrigation (28.3 acres)
- Cattle pasture
Olowalu- Stream
Olowalu - Hydrology

![Map of Olowalu Hydrology]

- Upper diversion
- Lower diversion

![Graph comparing magnitude vs. exceedance for Upper and Lower diversion]
Olowalu- Lower Diversion
Olowalu- Lower Diversion
Olowalu- Lower Diversion
Olowalu- Lower Diversion
## Olowalu- freshwater habitat

### Aquatic species surveys

<table>
<thead>
<tr>
<th>Species</th>
<th>1994</th>
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<tr>
<td>Atyoida bisulcata (opae kalaole)</td>
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<td>Present</td>
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</tbody>
</table>
Olowalu- groundwater resources

Total installed pump capacity: 0.36 mgd
12-month moving average (2017): 0.104 mgd
Aquifer sustainable yield: 2.0 mgd

<table>
<thead>
<tr>
<th>Well number</th>
<th>Well Name</th>
<th>Well Owner</th>
<th>Year drilled</th>
<th>Pump rate (mpm)</th>
<th>status</th>
</tr>
</thead>
<tbody>
<tr>
<td>5134-01</td>
<td>Olowalu Tun</td>
<td>Pioneer Mill</td>
<td>--</td>
<td></td>
<td>Not active</td>
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<tr>
<td>5035-01</td>
<td>Olowalu Tunnel</td>
<td>Pioneer Mill</td>
<td>1912</td>
<td></td>
<td>Not active</td>
</tr>
<tr>
<td>4937-01</td>
<td>Olowalu Pump N</td>
<td>Olowalu Elua A</td>
<td>1933</td>
<td>36.1</td>
<td>Active</td>
</tr>
<tr>
<td>4936-01</td>
<td>Olowalu Elua</td>
<td>Olawalu Elua</td>
<td>1999</td>
<td>250</td>
<td>Active</td>
</tr>
<tr>
<td>4837-01</td>
<td>Olowalu Pump O</td>
<td>Olowalu Elua A</td>
<td>1905</td>
<td>280</td>
<td>Active</td>
</tr>
</tbody>
</table>
Olowalu - off-stream use
Olowalu Water Company

- 57 potable service connections
- 44 non-potable service connections
  - Average metered use: 0.281 mgd
  - PUC application for 0.273 mgd non-potable use

- Current Agricultural Demand (estimated)
  - Pasture: 300 acres (~10 head) → 0.002 mgd
  - Pig farm: 1.6 acres
  - Diversified Agriculture: ~35 acres → 0.119 mgd
  - Tree crops: ~19 acres → 0.055 mgd

- Landscaping Demand: 28.3 acres → 0.141 mgd
Olowalu- proposed IIFS

At lower diversion

<table>
<thead>
<tr>
<th>Q₅₀</th>
<th>Q₆₀</th>
<th>Q₇₀</th>
<th>Q₉₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0 cfs</td>
<td>4.1 cfs</td>
<td>3.4 cfs</td>
<td>2.3 cfs</td>
</tr>
<tr>
<td>(3.23 mgd)</td>
<td>(2.65 mgd)</td>
<td>(2.20 mgd)</td>
<td>(1.49 mgd)</td>
</tr>
</tbody>
</table>

Average metered use: 0.281 mgd

2017 Estimated Amount Diverted

<table>
<thead>
<tr>
<th>Proposed IIFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
</tr>
<tr>
<td>at USGS 16646200 below diversion</td>
</tr>
</tbody>
</table>

- Will meet agricultural demand at least 50% of time without the use of groundwater
Launiupoko

Plantation Diversion:

Commercial agriculture
Agriculturally-zoned homes
Landscaping

→ water combined with Kaua‘ula non-potable water for service area supplied by Launiupoko Irrigation Company
Launiupoko- Stream
Launiupoko- Hydrology
Launiupoko- Simplified

Elevation
1340 ft
USGS measurement site

1320 ft
Diversion

330 ft
Agriculturally-zoned parcels

875 ft
Launiupoko well 2

From Kaulua
non-potable water distribution

potable water distribution

Launiupoko well 1

potable water distribution

Launiupoko Reservoir

Launiupoko Ditch

Diversion

6006 Launiupoko

Q_{60} = 0.47 cfs (0.30 mgd)
Q_{70} = 0.41 cfs (0.26 mgd)
Q_{80} = 0.35 cfs (0.23 mgd)

note: map not drawn to scale
Launiupoko- Diversion
Launiupoko- Diversion
Launiupoko- Diversion
# Launiupoko- freshwater habitat

## Aquatic species surveys

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<td>Neritina vespertina (hapawai)</td>
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</tr>
</tbody>
</table>
Launiupoko - Groundwater resources

Total installed pump capacity: 4.019 mgd
12-month moving average (2017): 0.864 mgd
Aquifer sustainable yield: 7.0 mgd

<table>
<thead>
<tr>
<th>Well number</th>
<th>Well Name</th>
<th>Well Owner</th>
<th>Year drilled</th>
<th>Pump rate (gpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5136-001</td>
<td>Launiupoko Tunnel</td>
<td>Pioneer Mill</td>
<td>--</td>
<td>0</td>
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<tr>
<td>5137-001</td>
<td>Launiupoko 2</td>
<td>Launiupoko Water Co.</td>
<td>2000</td>
<td>100</td>
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<tr>
<td>5138-001</td>
<td>Launiupoko 1</td>
<td>Launiupoko Water Co.</td>
<td>1979</td>
<td>500</td>
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</table>
Launiupoko- proposed IIFS

<table>
<thead>
<tr>
<th>Q&lt;sub&gt;50&lt;/sub&gt;</th>
<th>Q&lt;sub&gt;60&lt;/sub&gt;</th>
<th>Q&lt;sub&gt;70&lt;/sub&gt;</th>
<th>Q&lt;sub&gt;90&lt;/sub&gt;</th>
</tr>
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<tbody>
<tr>
<td>0.47 cfs</td>
<td>0.44 cfs</td>
<td>0.41 cfs</td>
<td>0.35 cfs</td>
</tr>
<tr>
<td>(0.30 mgd)</td>
<td>(0.28 mgd)</td>
<td>(0.26 mgd)</td>
<td>(0.23 mgd)</td>
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2017 Estimated Amount Diverted

<table>
<thead>
<tr>
<th></th>
<th>Proposed IIFS</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017 Estimated</td>
<td>0.24 mgd</td>
<td>0 mgd</td>
</tr>
<tr>
<td>Amount Diverted</td>
<td>0 mgd</td>
<td>below diversion</td>
</tr>
</tbody>
</table>
Kaua‘ula

Plantation Diversion:
- Replaced piilani auwai
- Kamehameha Schools lessees
- Hydropower plant
- Commercial farms
- Agriculturally-zoned parcels (88.2 acres)
- Landscape irrigation (193.8 acres)
- Return to stream at siphon

Auwai:
- 6 active loi
- 25 inactive loi
Kauaʻula- Stream
Kauaʻula- Hydrology

[Map and graph showing hydrological data with magnitude on the y-axis and exceedance on the x-axis.]
Kaua‘ula- Diversion
Kauaula- Diversion
Kaua‘ula- stream below diversion
Kauaʻula- Hydropower Plant
Kaua‘ula - return to stream
Kaua‘ula- auwai
Kauaʻula- auwai
Kauaʻula- loi waiting for water
Kauaʻula- loi in use
## Kauaʻula- freshwater habitat

### Aquatic species surveys

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## Kauaʻula- groundwater resources

Total installed pump capacity: 4.019 mgd
12-month moving average (2017): 0.864 mgd
Aquifer sustainable yield: 7.0 mgd

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<th>Well Owner</th>
<th>Year drilled</th>
<th>Pump rate (gpm)</th>
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<tbody>
<tr>
<td>5140-02</td>
<td>Puamana Comm 2</td>
<td>Puamana Comm</td>
<td>1987</td>
<td>0.290</td>
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<tr>
<td>5140-01</td>
<td>Puamana Comm 1</td>
<td>Puamana Comm</td>
<td>1987</td>
<td>0.290</td>
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<tr>
<td>5240-08</td>
<td>Lahaina Rec Ctr</td>
<td>Maui Parks &amp; Recreation</td>
<td>1986</td>
<td>0.144</td>
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<tr>
<td>5240-07</td>
<td>Lahaina Park</td>
<td>Maui Parks &amp; Recreation</td>
<td>2002</td>
<td>0.158</td>
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<tr>
<td>5238-01</td>
<td>Launiupoko 3</td>
<td>Makila Land Co.</td>
<td>2003</td>
<td>0.72</td>
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<tr>
<td>5240-04</td>
<td>Lahaina</td>
<td>Shaw P</td>
<td>1956</td>
<td>0.22</td>
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<tr>
<td>5240-03</td>
<td>Lahaina-Pump B</td>
<td>Pioneer Mill</td>
<td>1897</td>
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<tr>
<td>5240-02</td>
<td>Lahaina-Pump A</td>
<td>Pioneer Mill</td>
<td>1897</td>
<td>10.00</td>
</tr>
<tr>
<td>5240-05</td>
<td>Lahaina UMC</td>
<td>Lahaina UMC</td>
<td>1989</td>
<td>0.04</td>
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<tr>
<td>5236-01</td>
<td>Kauaula Tunnel</td>
<td>Pioneer Mill</td>
<td>1897</td>
<td>2.00</td>
</tr>
<tr>
<td>5240-01</td>
<td>Mill Pump C</td>
<td>Pioneer Mill Co., LLC</td>
<td>1897</td>
<td>10.00</td>
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<tr>
<td>5237-02</td>
<td>Kauaula TH 2</td>
<td>State DLNR-Engineering</td>
<td>1970</td>
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<tr>
<td>5237-01</td>
<td>Kauaula TH 1</td>
<td>State DLNR-Engineering</td>
<td>1970</td>
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<tr>
<td>5339-02</td>
<td>Waipuka 2</td>
<td>Maui DWS</td>
<td>1963</td>
<td>0.36</td>
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<tr>
<td>5339-01</td>
<td>Waipuka 1</td>
<td>Maui DWS</td>
<td>1962</td>
<td>0.324</td>
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</tbody>
</table>

Kauaʻula & Launiupoko- off-stream uses
Kauaʻula & Launiupoko- off-stream uses
Kauaʻula & Launiupoko - off-stream uses

Legend
- stream

Percent Landscaping
- 0% - 5.8%
- 5.9% - 17.7%
- 17.8% - 28.4%
- 28.5% - 37.9%
- 38% - 49.4%
- 49.5% - 61.9%
- 62% - 79%

Prepared by the Department of Land and Natural Resources,
Commission on Water Resource Management
Transverse Mercator Projection, Zone 4, North American Datum 1983
Kauaula & Launiupoko- off-stream uses

Launiupoko Water Company
- 280 existing potable service connections → 0.800 mgd

Launiupoko Irrigation Company
- 280 non-potable service connections
  - Average metered use: 1.512 mgd (2,566 acres)
  - PUC application for 1.331 mgd when fully developed
- Current Agricultural Demand
  - Irrigated Pasture: ~10 acres → 0.025 mgd
  - Diversified Agriculture: ~43 acres → 0.147 mgd
  - Tree crops: ~35 acres → 0.102 mgd
- Landscaping Demand: ~194 acres → 1.5 mgd

Kamehameha Schools lessees
- Diversified Agriculture: 13 acres → 0.078 mgd
- Cacao: 53 acres → 0.318 mgd
Kauaʻula - IIFS

<table>
<thead>
<tr>
<th>Q_50</th>
<th>Q_60</th>
<th>Q_70</th>
<th>Q_90</th>
</tr>
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<tbody>
<tr>
<td>9.5 cfs</td>
<td>8.1 cfs</td>
<td>7.1 cfs</td>
<td>5.2 cfs</td>
</tr>
<tr>
<td>(6.14 mgd)</td>
<td>(5.24 mgd)</td>
<td>(4.59 mgd)</td>
<td>(3.36 mgd)</td>
</tr>
</tbody>
</table>

2017 Estimated Amount Diverted

- **Proposed IIFS**
  - Location
    - below diversion: 3.36 mgd
    - below siphon: 4.1 mgd

- **Will meet Kamehameha Schools lessees needs 100% of time**
- **Will meet Launiupoko Irrigation Co ag demand 100% of time with Lauiniupoko Stream water (0.24 mgd)**
## Summary Proposed IIFS

<table>
<thead>
<tr>
<th>Hydrologic Unit</th>
<th>Estimated $Q_{50}$</th>
<th>2017 Estimated Amount Diverted</th>
<th>Proposed IIFS</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ukumehame</td>
<td>5.0 cfs (3.23 mgd)</td>
<td>0.025 cfs (0.016 mgd)</td>
<td>2.9 mgd</td>
<td>below diversion</td>
</tr>
<tr>
<td>Olowalu</td>
<td>6.1 cfs (3.94 mgd)</td>
<td>2.25 cfs (1.45 mgd)</td>
<td>2.33 mgd</td>
<td>below diversion at USGS 16646200</td>
</tr>
<tr>
<td>Launiupoko</td>
<td>0.47 cfs (0.30 mgd)</td>
<td>0.37 cfs (0.24 mgd)</td>
<td>0 mgd below diversion</td>
<td>below diversion</td>
</tr>
<tr>
<td>Kaua'ula</td>
<td>9.5 cfs (6.14 mgd)</td>
<td>7.09 cfs (4.58 mgd)</td>
<td>3.36 mgd</td>
<td>below diversion</td>
</tr>
<tr>
<td>Kaua'ula</td>
<td></td>
<td></td>
<td>4.1 mgd</td>
<td>below siphon</td>
</tr>
</tbody>
</table>
Implementation

Short-term Actions (1 year)

- Ukumehame: currently nothing needs to be done
- Olowalu: modification of lower diversion intake gate to limit excess diverted water (flow through from reservoir)
- Launiupoko: nothing (status quo)
- Kaua‘ula: return flow to stream at diversion
  - Monitor hydrology below diversion and below siphon
  - Determine how much needs to be released from siphon

Long-term Actions (3 years)

- Resurvey streams for native fauna
- With more monitoring data, determine accuracy of USGS low-flow statistics
- Re-evaluate IIFS
Implementation

Index stations
- Ukumehame
- Kanahā
- Olowalu?
- Kauaʻula?

Monitoring stations
- Installed at IIFS sites
- Rating curves developed
Monitoring - New Index Stations

Ukumehame at 410 ft (USGS station 16647000)
Monitoring - New Index Stations

Ukumehame at 410 ft (USGS station 16647000)

Mean Daily Flow (mgd)

Ukumehame at 410ft (USGS 16647000)
CWRM ID: 6-118
Adaptive Management

1. Establish Objectives
2. Implement Management
3. Monitor Effectiveness
4. Evaluate Results
5. Revise Management
QUESTIONS