



Interim Instream Flow Standards in Hawai‘i

***Ecology, Restoration, and Management of
Hawaiian Stream and Riparian Systems
May 20-22, 2008***

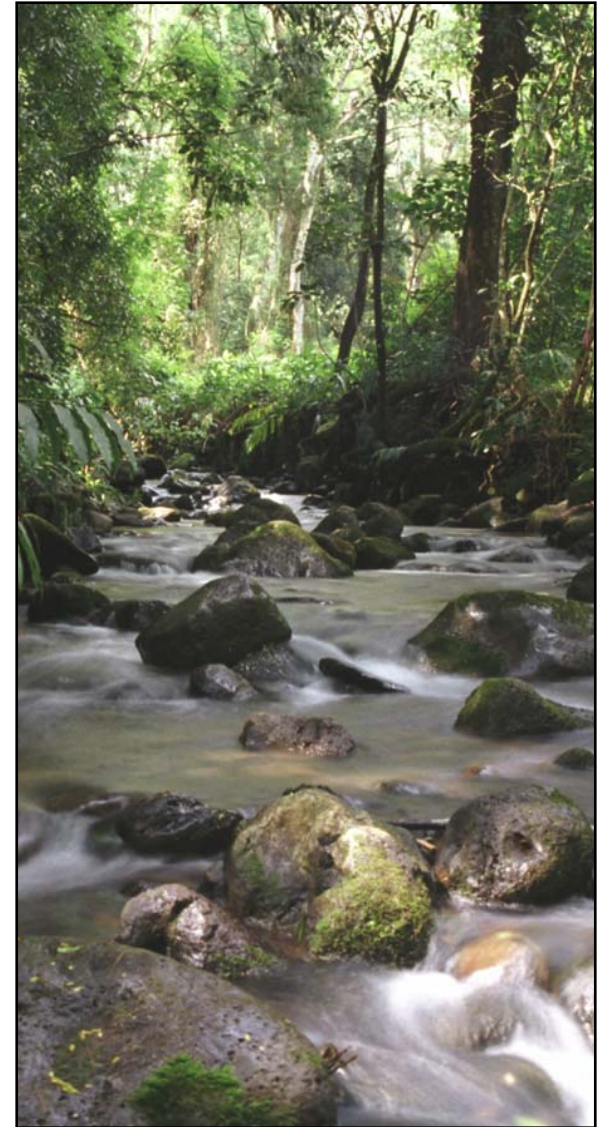


Overview

- ❖ **What is the SPAM Program?**
- ❖ **Surface Water Hydrologic Units**
- ❖ **What are Instream Flow Standards?**
- ❖ **Setting Instream Flow Standards**
- ❖ **The Interim IFS Process**
- ❖ **Why Interim IFS?**
- ❖ **Case Study: East Maui Interim IFS**

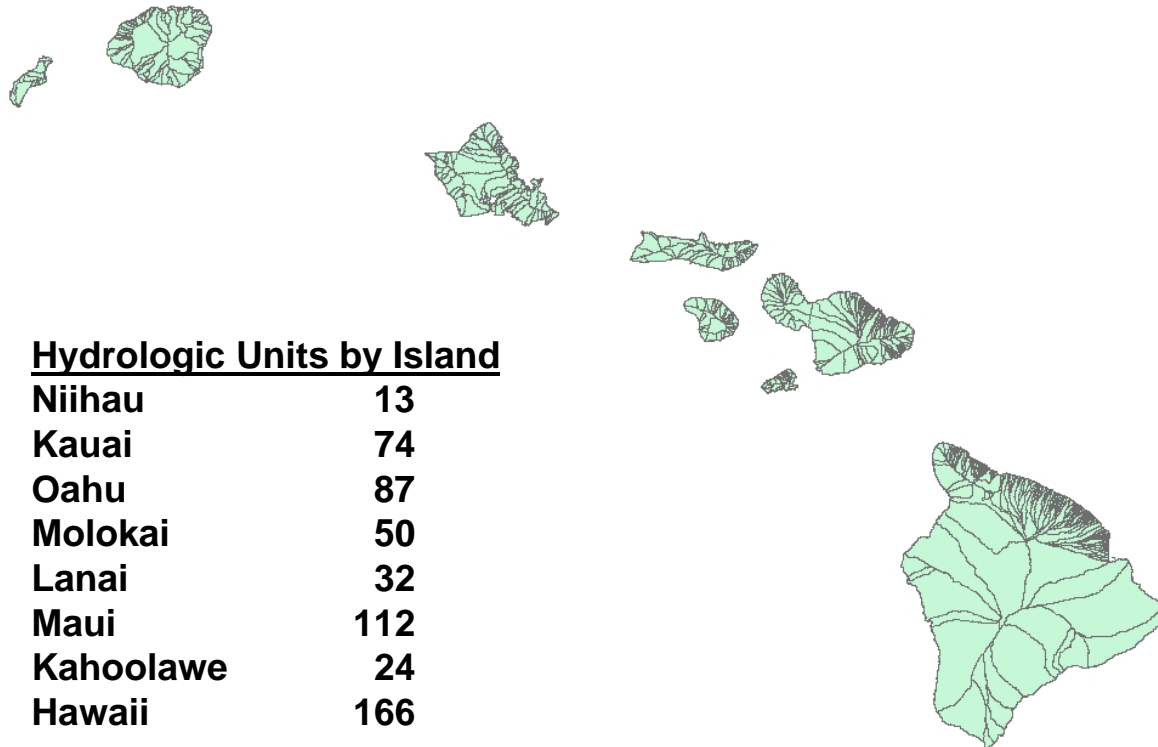
What is the SPAM Program?

- In July 2002, the Commission established the Stream Protection and Management Branch.
- Comprised of two Sections:
 - Instream Use Protection Section
 - Surface Water Regulation Section
- Originally consisted of 3 full-time staff with statewide responsibilities.
- Program expanded in 2007 with 2 additional full-time staff.
- Expansion addresses needs of instream flow standard program.



Surface Water Hydrologic Units

- In 2005, the Commission adopted 558 surface-water hydrologic units statewide.
- Hydrologic units provide an organizational framework for data collection and management.



What are Instream Flow Standards?

- **Definition**

“A quantity or flow of water or depth of water which is required to be present at a specific location in a stream system at certain specified times of the year to protect fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses.”

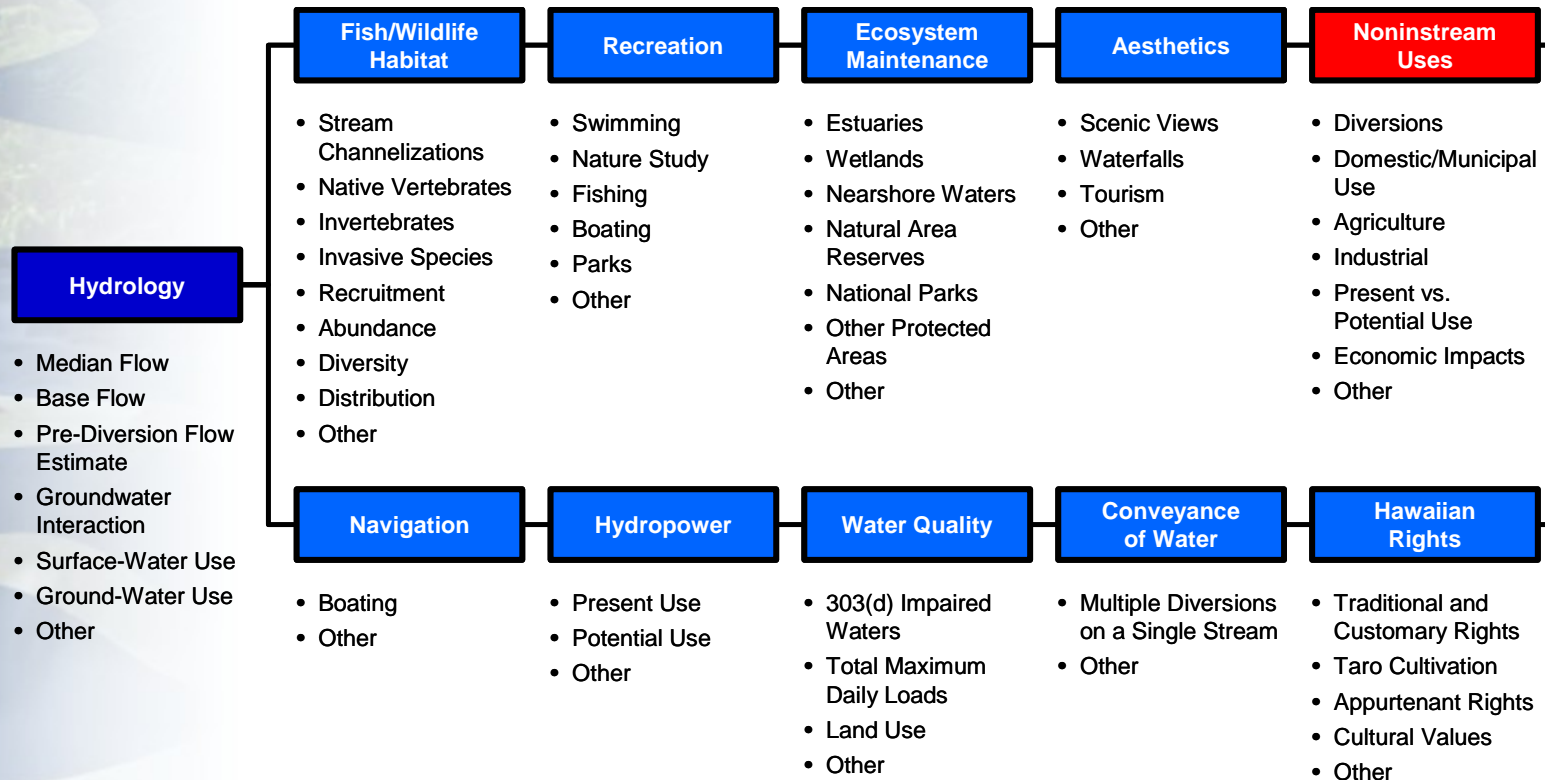
- **Balancing Act**

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



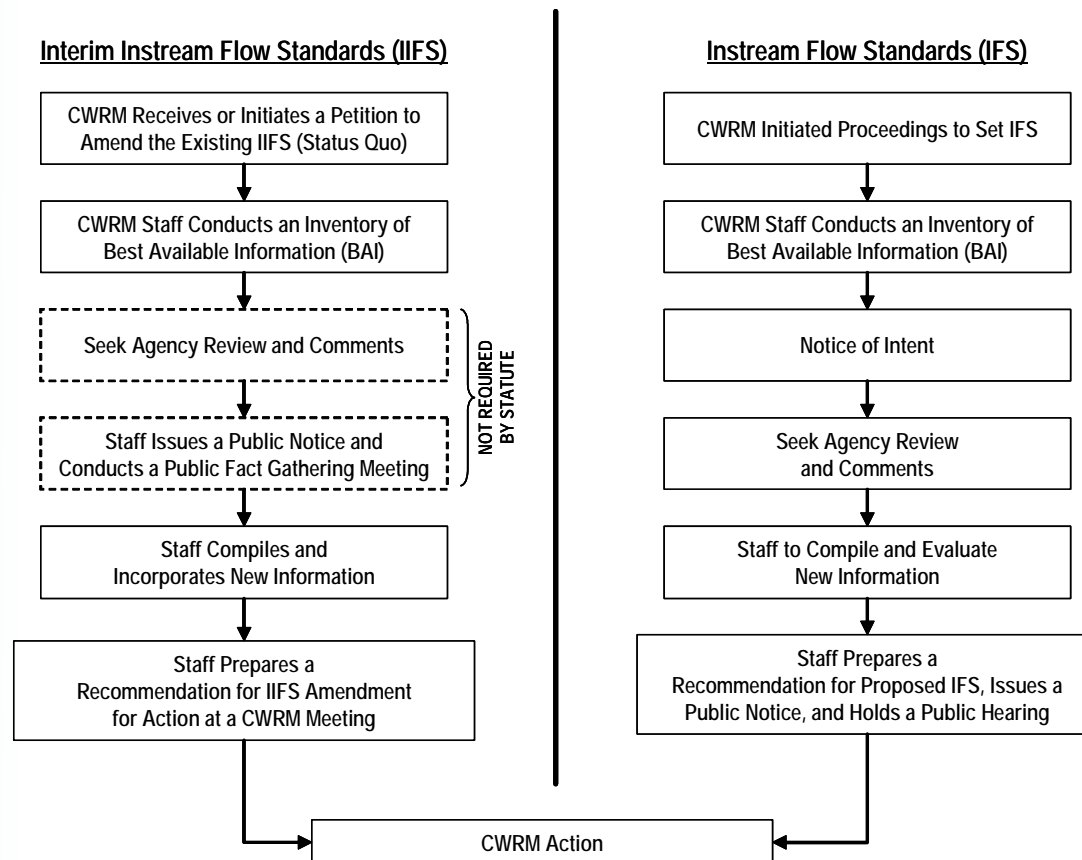
Setting Instream Flow Standards

- The Commission has the responsibility of weighing competing uses for a limited resource in a legal realm that is continuing to evolve.



The Interim IFS Process

- In December 2006, the Commission recognized the complexity of establishing measurable IFS.
- Staff proposed a modified interim IFS process





Why Interim IFS?

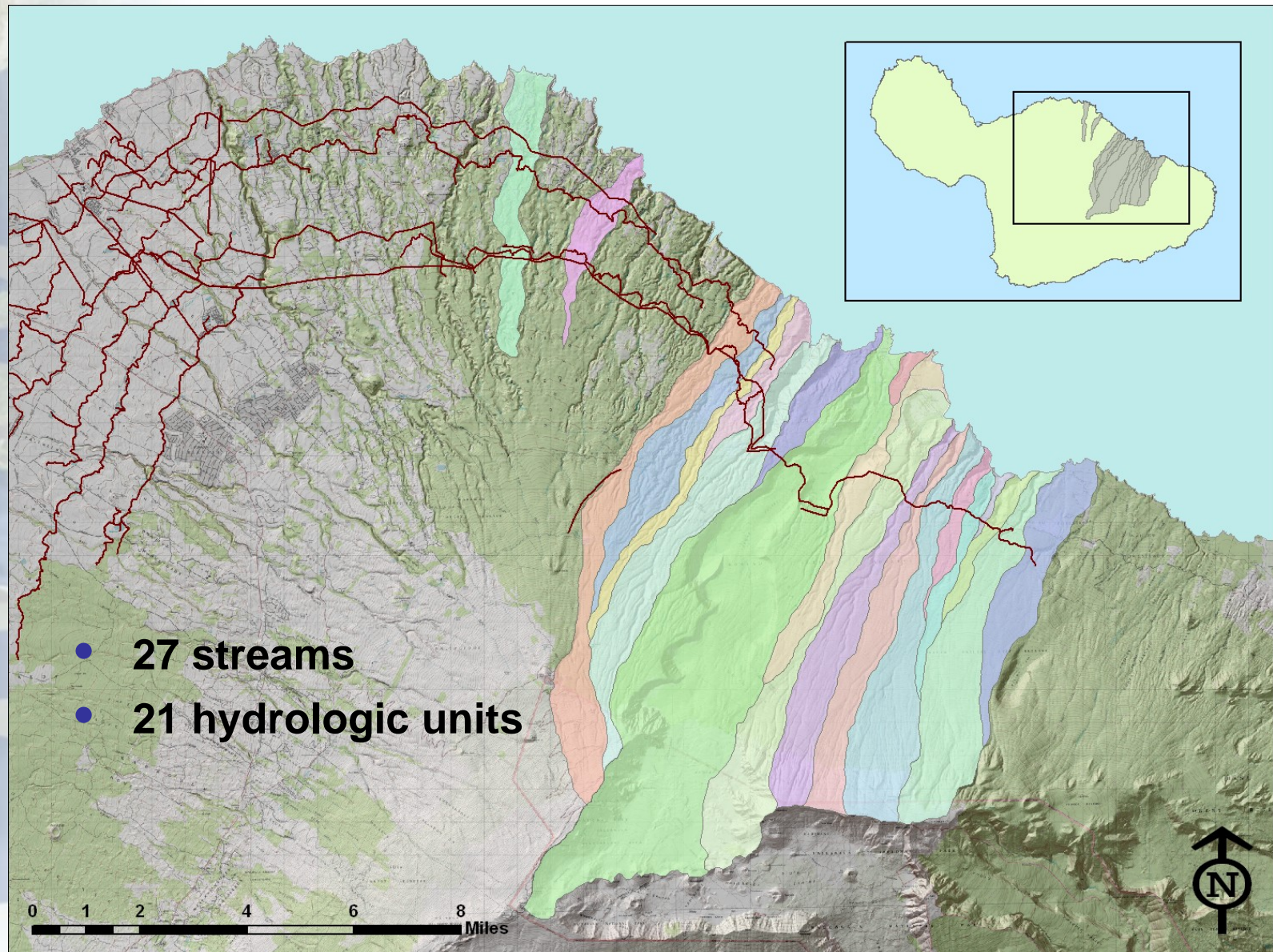
- **The Commission is developing interim IFS based on best available information.**
- **Permanent IFS requires a lengthy notification and public hearing process.**
- **The modified interim IFS process gives the Commission staff greater flexibility in developing more measurable standards statewide.**
- **The modified process allows for agency/public review and comment.**
- **Particularly important should the Commission need to reevaluate and established interim IFS based upon new information.**



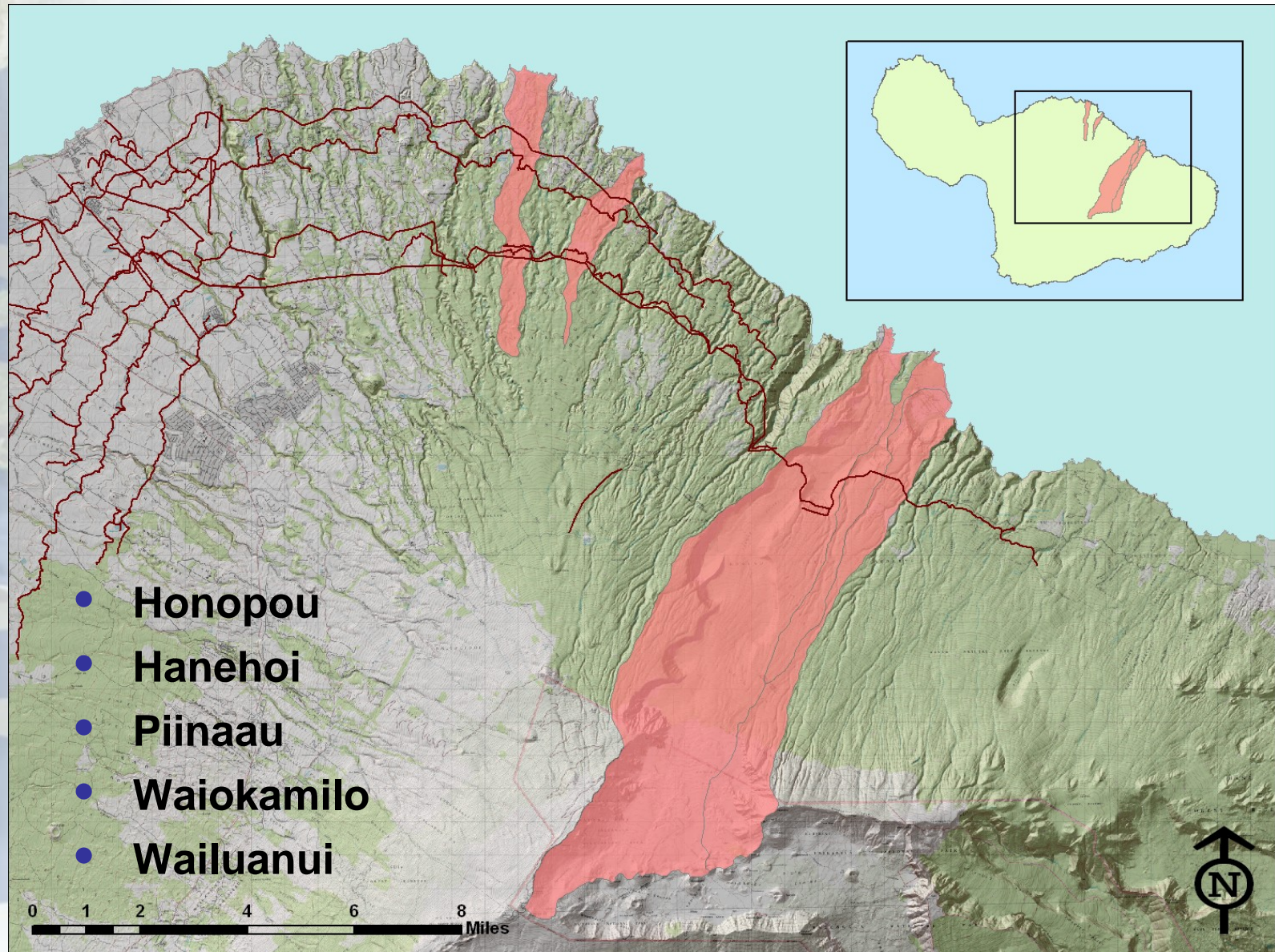
East Maui Interim IFS

- ***June 2001***
Native Hawaiian Legal Corporation (NHLC) filed a Petition to Amend the Interim Instream Flow Standard for each of 27 streams in East Maui.
- ***July 2001***
NHLC asked the Commission to focus its efforts on seven priority streams.
- ***March 2002***
U.S. Geological Survey (USGS), in cooperation with various partners, initiated a study to assess stream flow in East Maui and impacts of restoration to native stream organisms.
- ***January 2006***
USGS released the second of two studies on the *Effects of Surface-Water Diversions on Habitat Availability for Native Macrofauna, Northeast Maui, Hawaii*.

East Maui Hydrologic Units

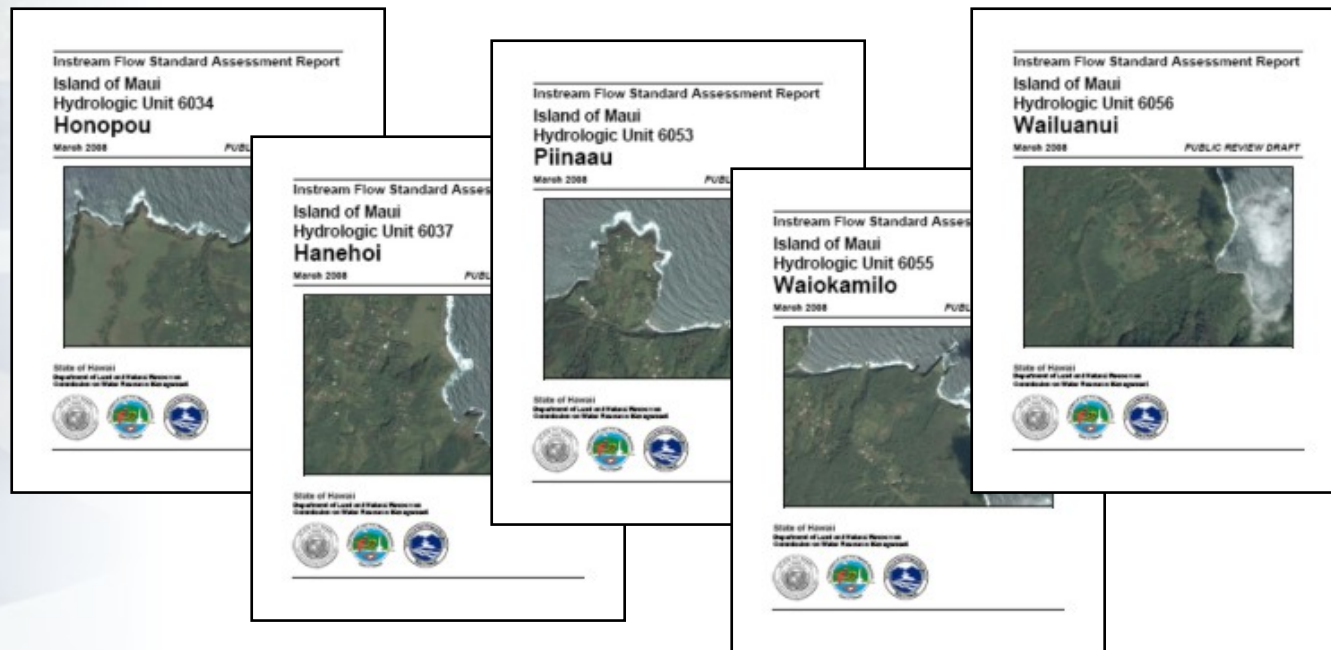


Five Priority Hydrologic Units



East Maui Interim IFS

- Instream Flow Standard Assessment Reports were prepared for each of five priority hydrologic units:
 - Honopou – Honopou Stream
 - Hanehoi – Hanehoi and Puolua Streams
 - Piinaau – Piinaau and Palauhulu Streams
 - Waiokamilo – Waiokamilo and Kualani Streams
 - Wailuanui – East and West Wailuanui Streams



1.0 Introduction

Instream Flow Standard Assessment Report Island of Maui Hydrologic Unit 6034 Honopou

March 2008

PUBLIC REVIEW DRAFT

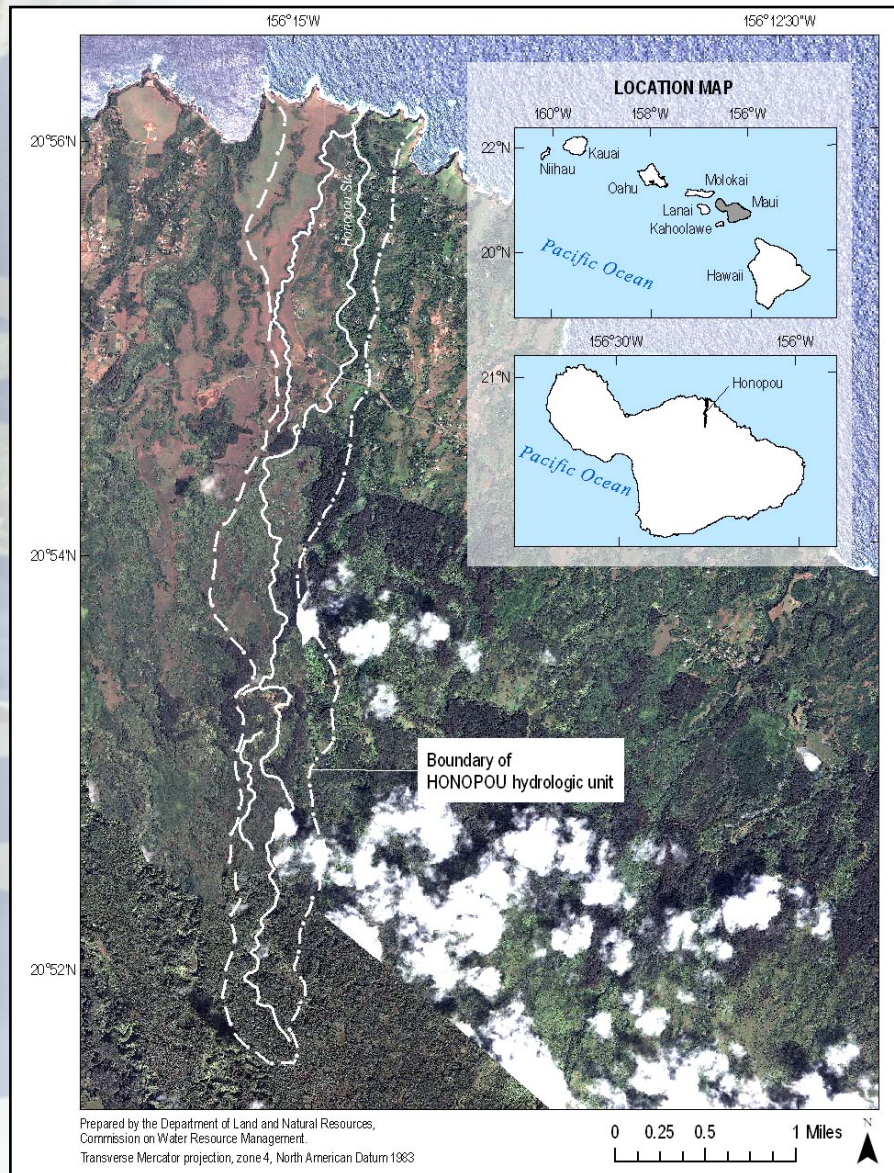


State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management



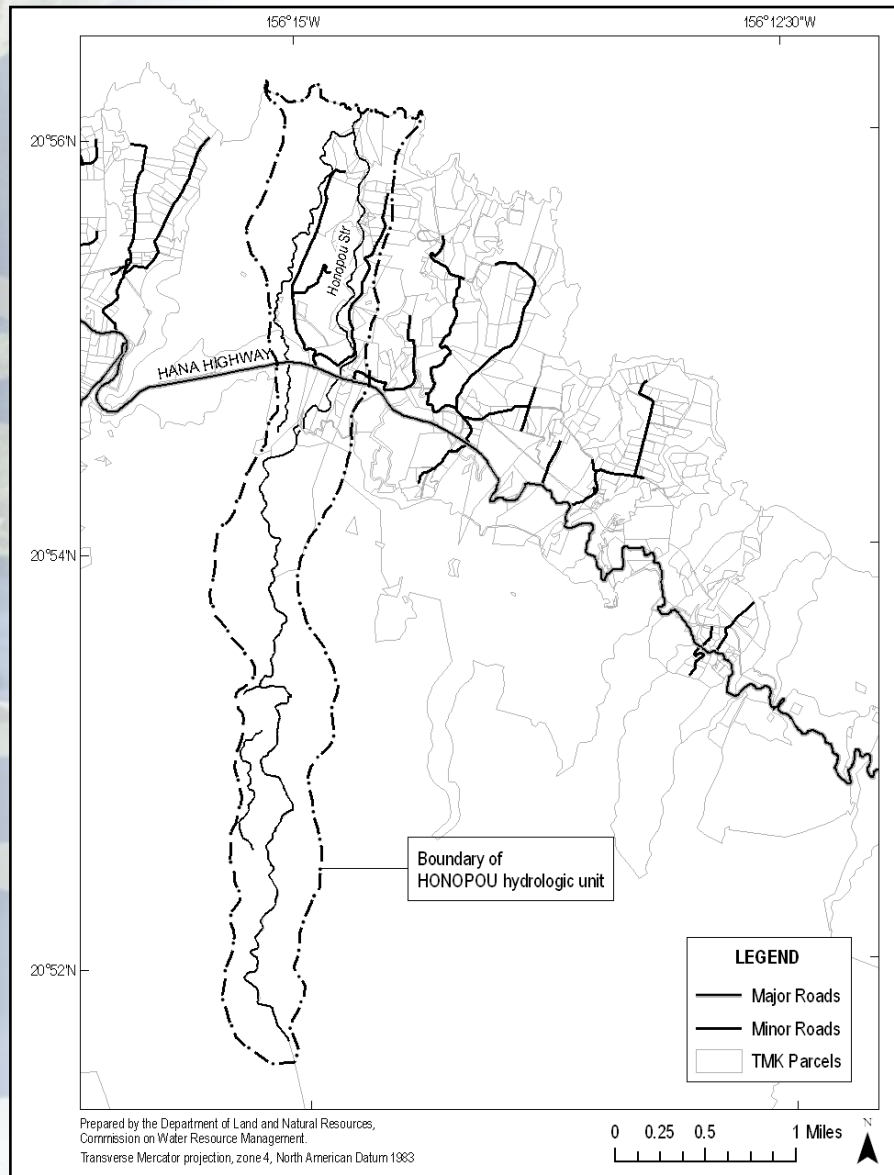
- General Overview
- Current Instream Flow Standard
- Instream Flow Standards
- Interim IFS Process
- IFS Assessment Report
- Surface Water Hydrologic Units
- Surface Water Definitions

1.0 Introduction



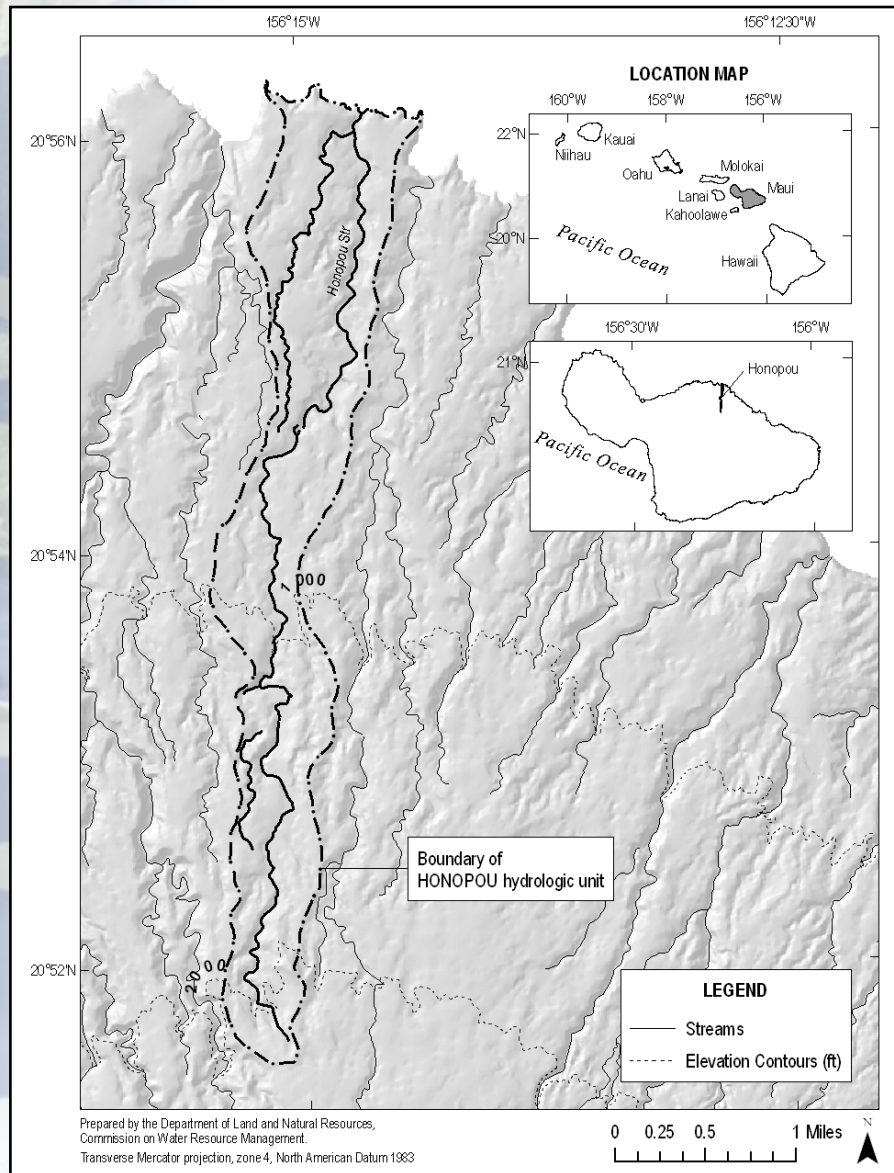
- The hydrologic unit of Honopou covers an area of 2.7 sq. mi.
- Honopou is located on the northwestern flank of Haleakala.
- Honopou is roughly 4 miles in length.
- Puniawa Stream is an intermittent tributary.

1.0 Introduction



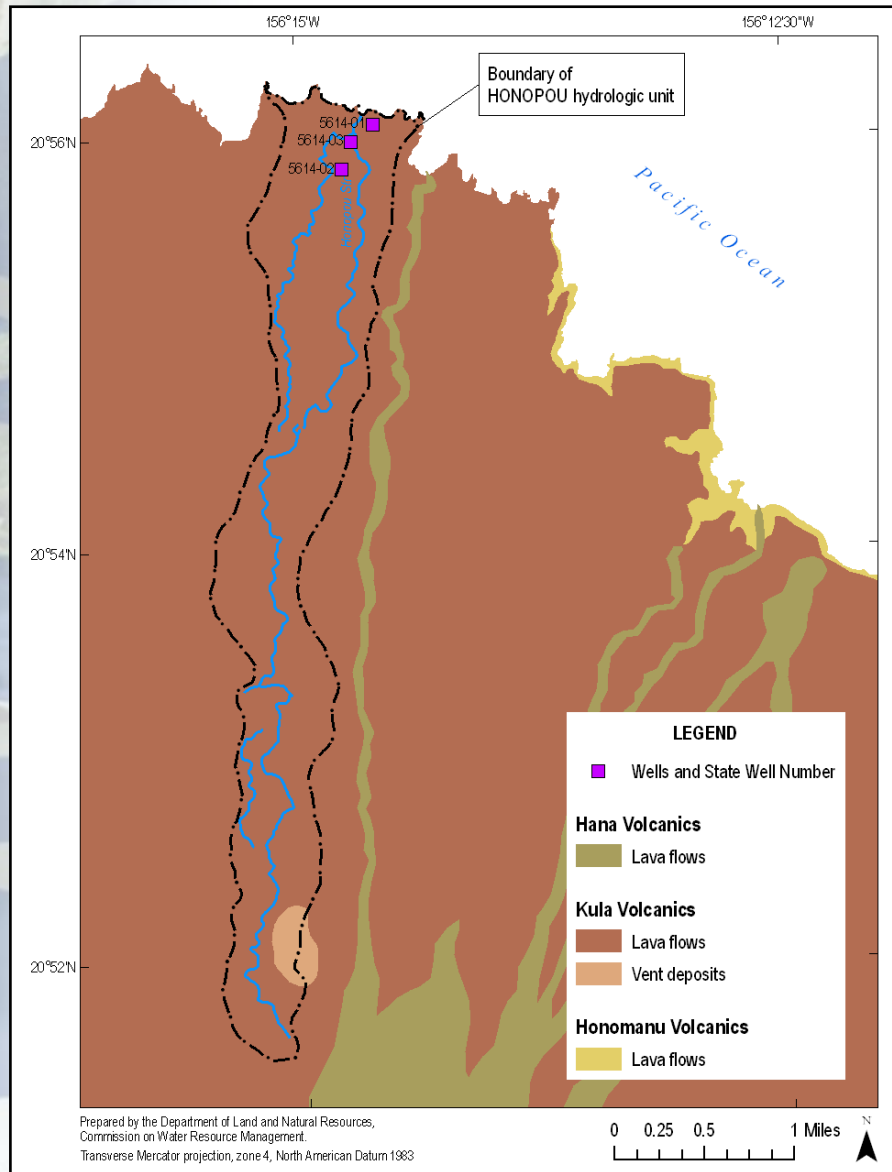
- Population is roughly 146 people.

2.0 Unit Characteristics



- **Geology**
- **Soils**
- **Rainfall**
- **Solar Radiation**
- **Evaporation**
- **Land Use**
- **Land Cover**
- **Flood Hazard**
- **Drought**
- **Ground Water**

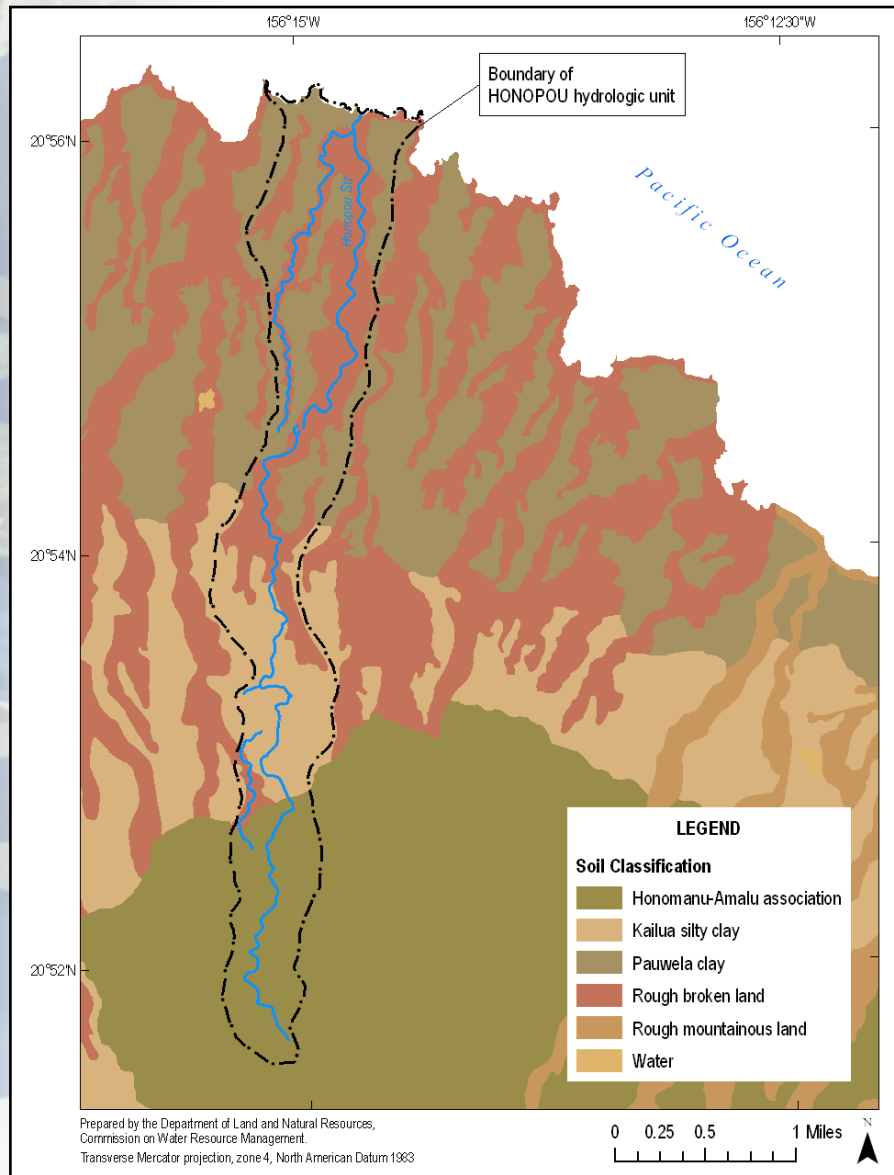
2.0 Unit Characteristics



Geology

- Majority of Honopou characterized by Kula volcanics, mainly aa flows.
- Kula volcanics are fairly permeable.

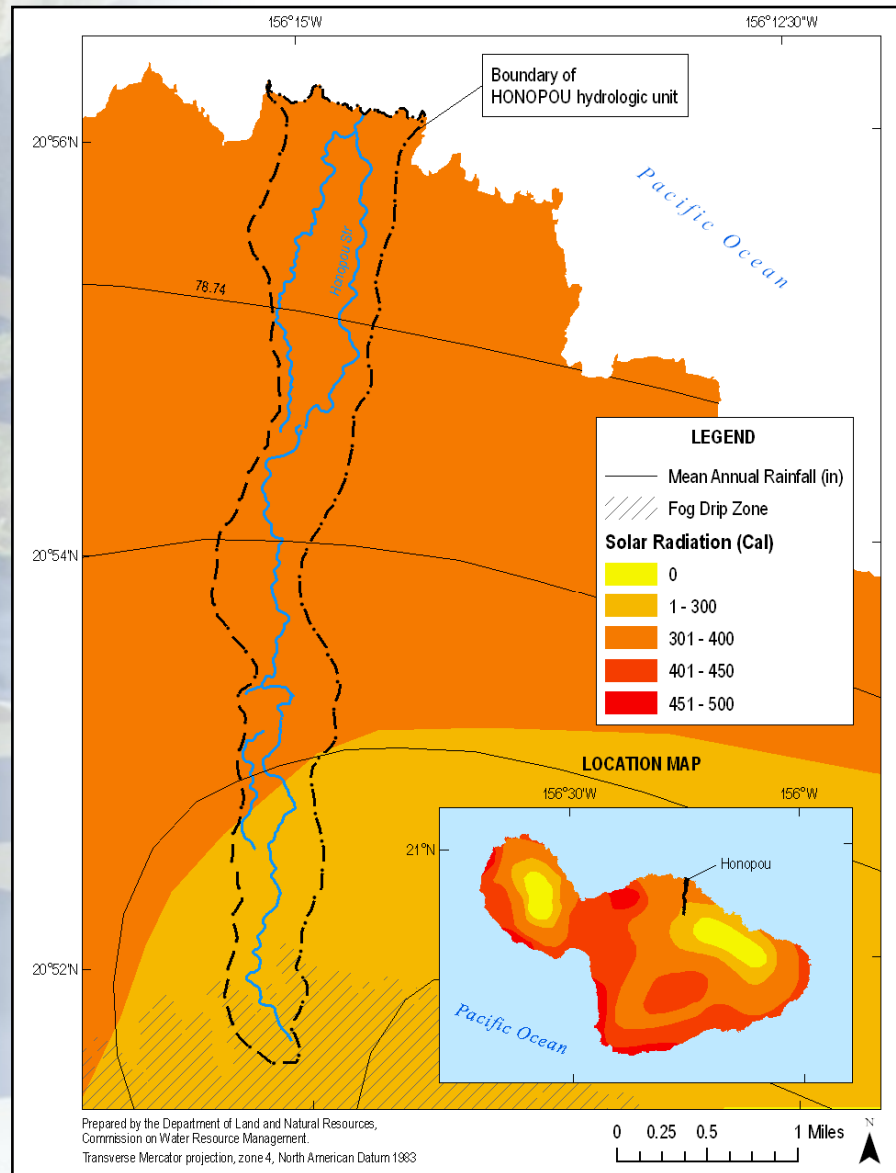
2.0 Unit Characteristics



Soils

- Honopou consists largely of soils that are fairly permeable.
- Lower half of stream channel flows over rough broken land.
- Runoff is rapid, and erosion is actively occurring.

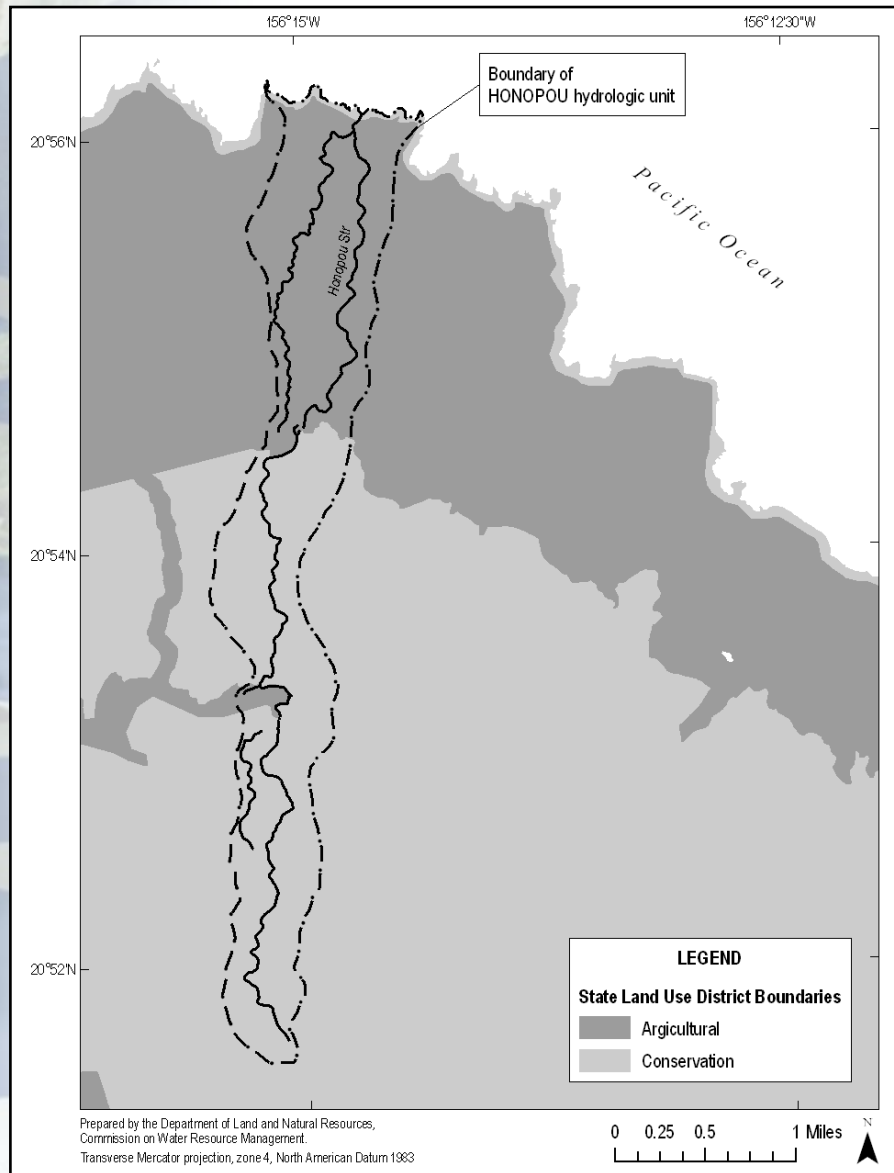
2.0 Unit Characteristics



Rainfall/Solar Radiation

- Rainfall distribution is governed by the orographic effect.
- Unit receives near-daily rainfall of 170-190 inches per year in the upper slopes.
- Little or no rainfall at the coast.
- Solar radiation ranges from 300-350 calories per square centimeter per day.

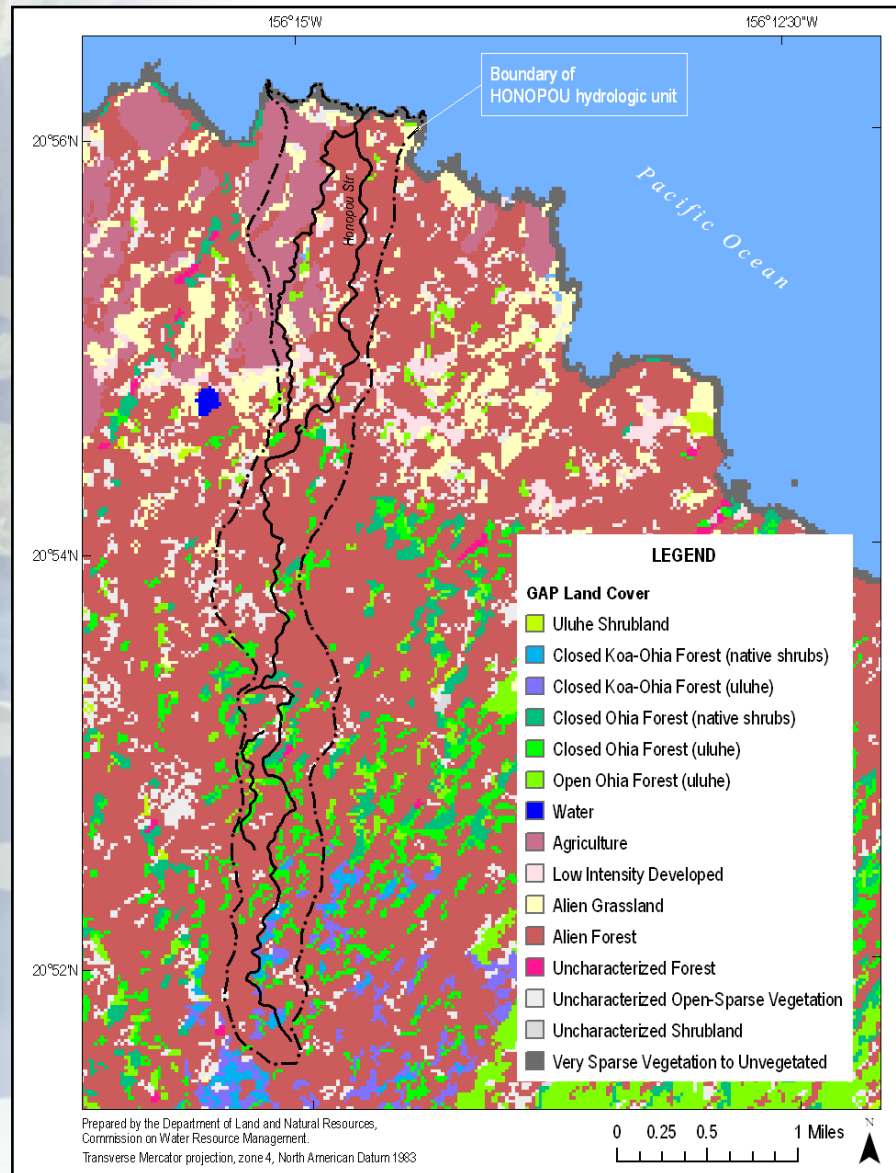
2.0 Unit Characteristics



Land Use

- 57.4% of unit is zoned Conservation.
- Conservation zone occurs in the uplands and along the coast.
- 42.6% of unit is zoned Agricultural.

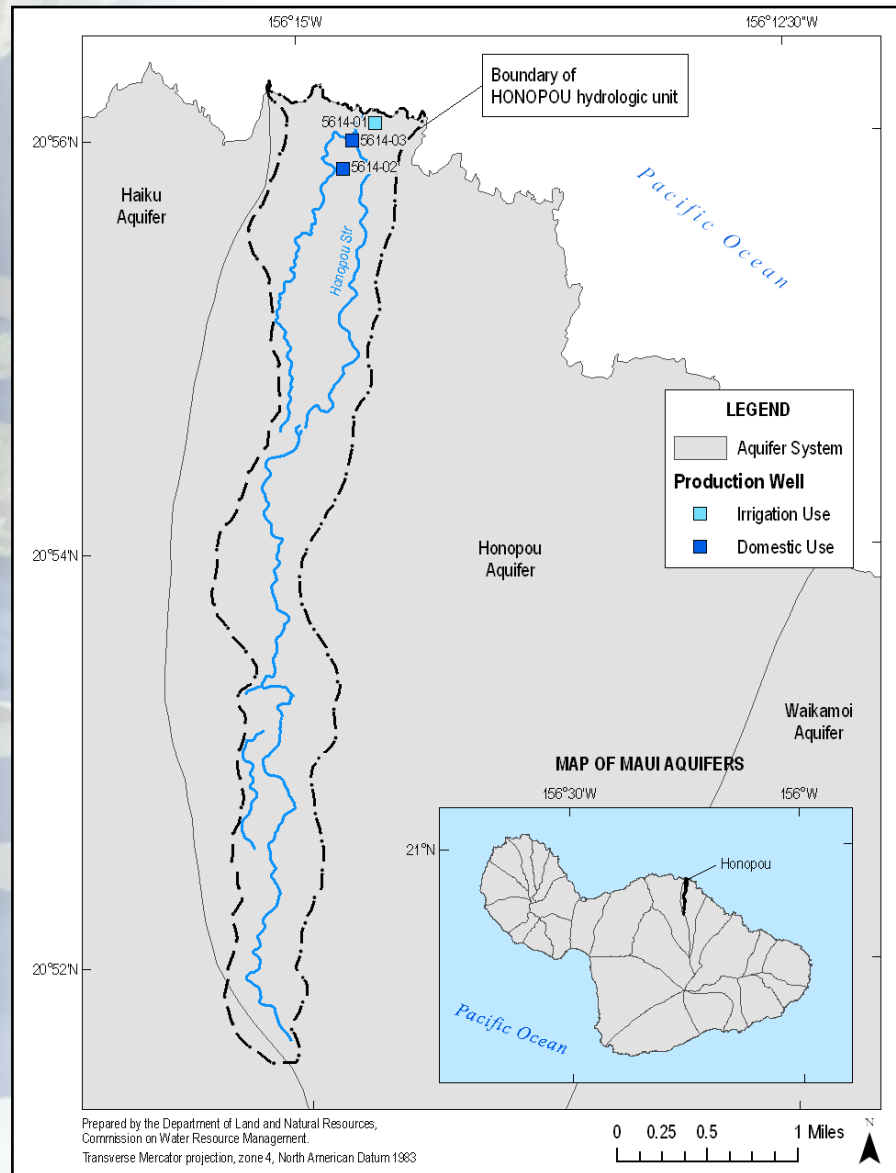
2.0 Unit Characteristics



Land Cover

- Honopou consists mainly of forested areas.
- Unit is largely comprised of alien forests (65.5%).
- Native koa-ohia forests are spread throughout the upper slopes.
- 10.5% of unit is characterized as agriculture.

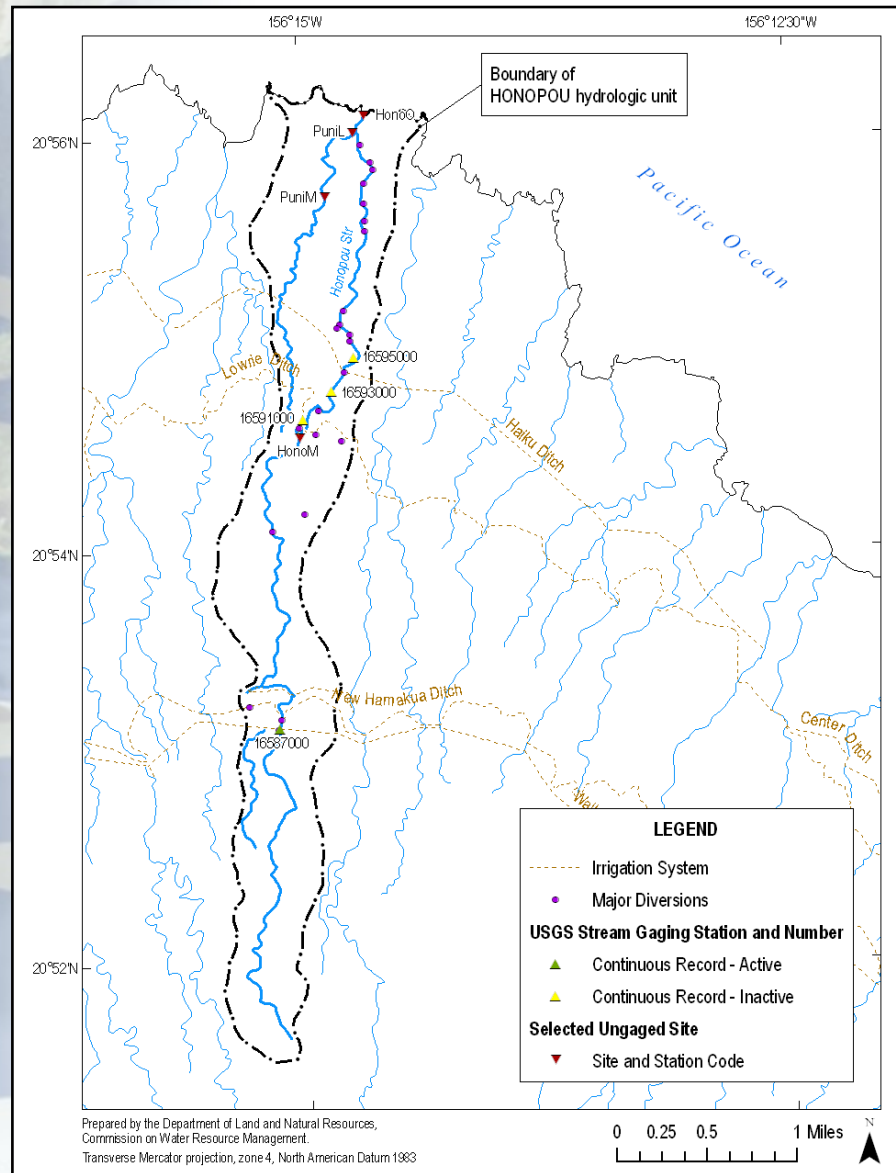
2.0 Unit Characteristics



Ground Water

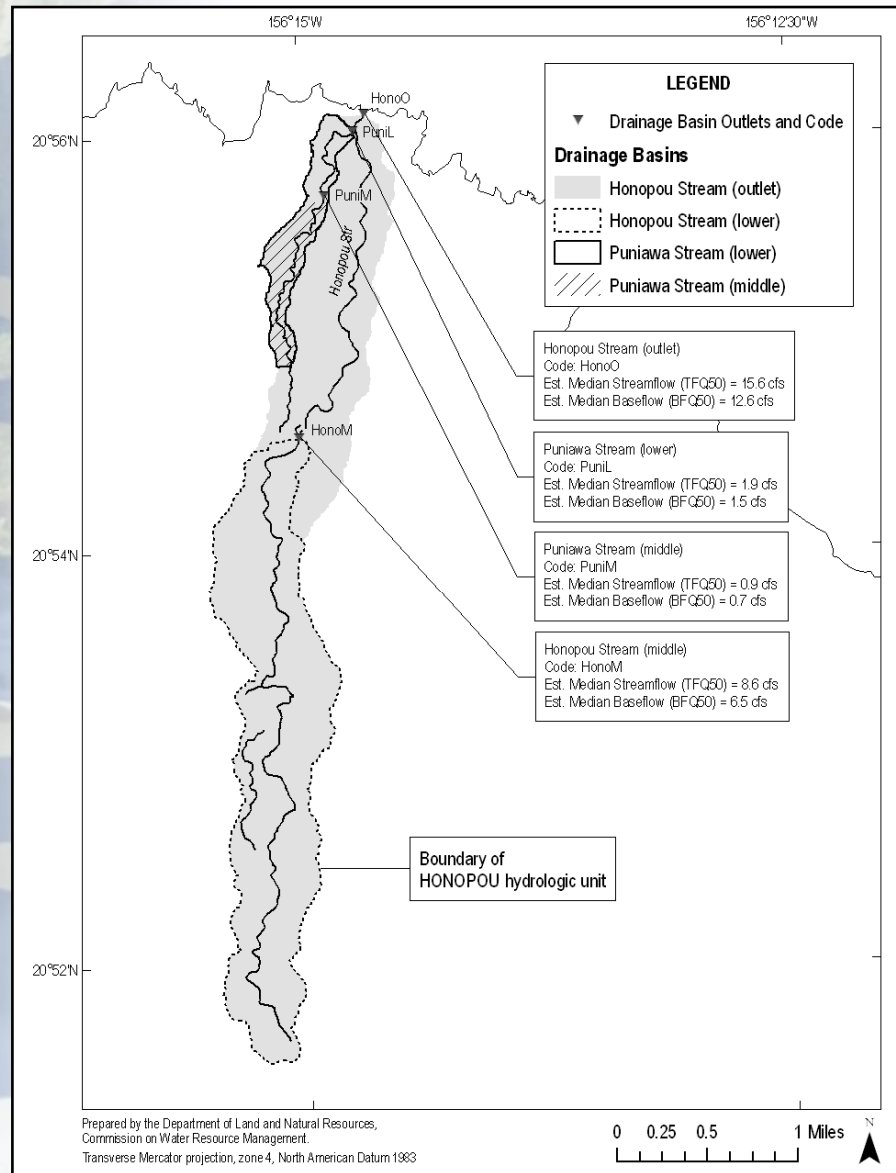
- Unit lies within the Honopou aquifer system.
- Sustainable yield: 29 mgd.
- Current demand: 0.012 mgd.
- Three production wells located near the coast.

3.0 Hydrology



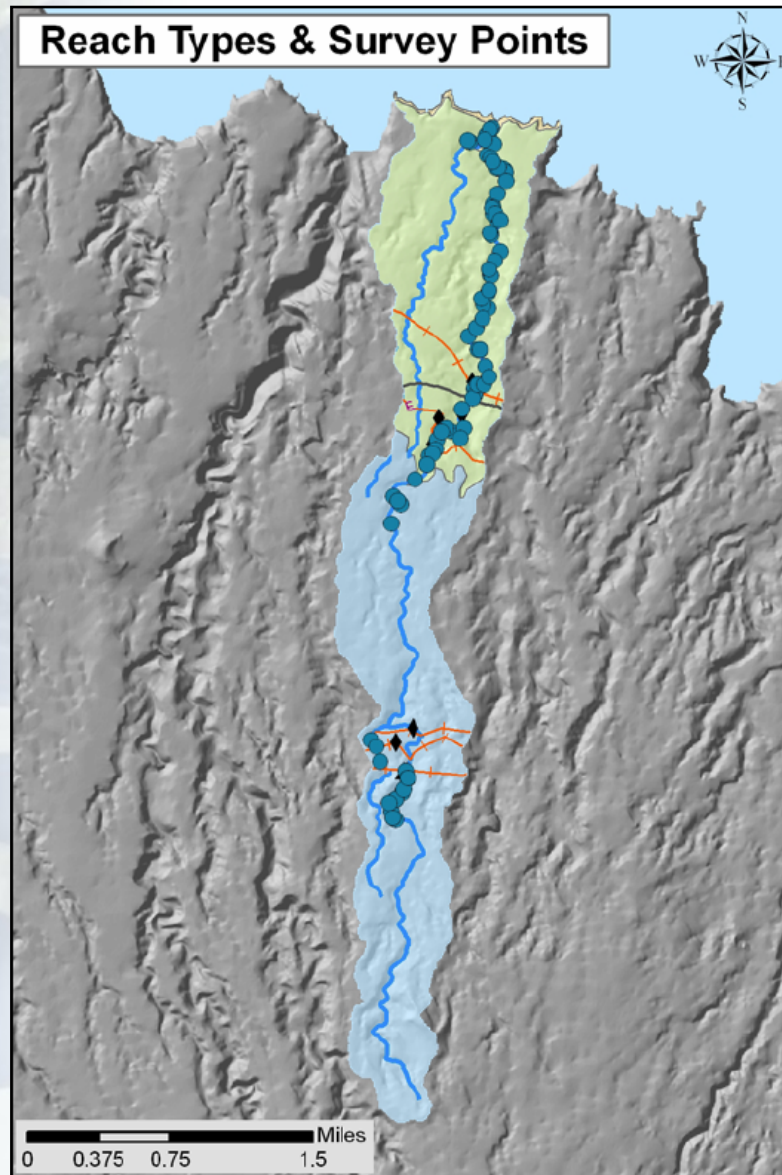
- **Four USGS continuous-record gaging stations on Honopou, only 1 still active.**
- **Honopou is generally a gaining stream.**
- **Median flow statistic (Q50) was used to characterize streamflow.**
- **USGS estimated natural streamflow at its lowest gage in 1946 as 1.42 mgd.**

3.0 Hydrology



- Regression equations were used to estimate natural (undiverted) flow for ungaged sites on Honopou and Puniawa Streams.
- TFQ₅₀, BFQ₅₀, TFQ₉₅, and BFQ₉₅ calculated for 4 sites.
- TFQ₅₀ natural flow at the Honopou outlet was 15.59 cfs.
- TFQ₅₀ natural flow at Honopou middle was 8.56 cfs.

4.0 Maintenance of Fish/Wildlife Habitat

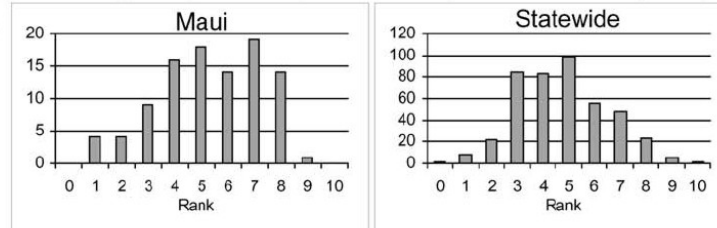


- Honopou was not included in the 1990 Hawaii Stream Assessment (HSA).
- No critical habitat areas for fish/wildlife.
- DAR has 26 survey locations from lower to upper reaches.
- Four (of 5) native stream fish species are present.
- Some introduced fish species present.

4.0 Maintenance of Fish/Wildlife Habitat

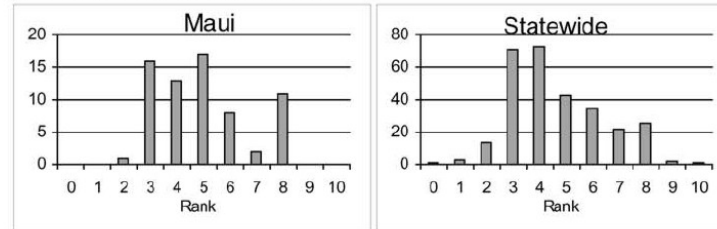
Total Watershed Rating: Rating is based on combination of Land Cover Rating, Shallow Waters Rating, Stewardship Rating, Size Rating, Wetness Rating, and Reach Diversity Rating.

Watershed Rating
5



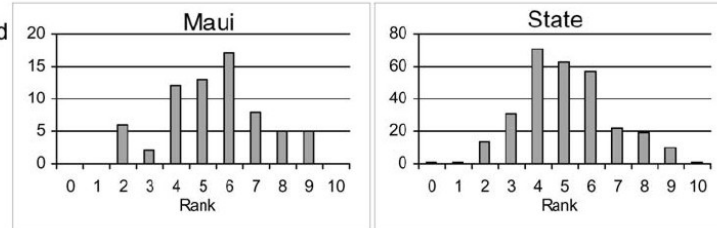
Total Biological Rating: Rating is the combination of the Native Species Rating, Introduced Genera Rating, and the All Species' Score Rating.

Stream Rating
5



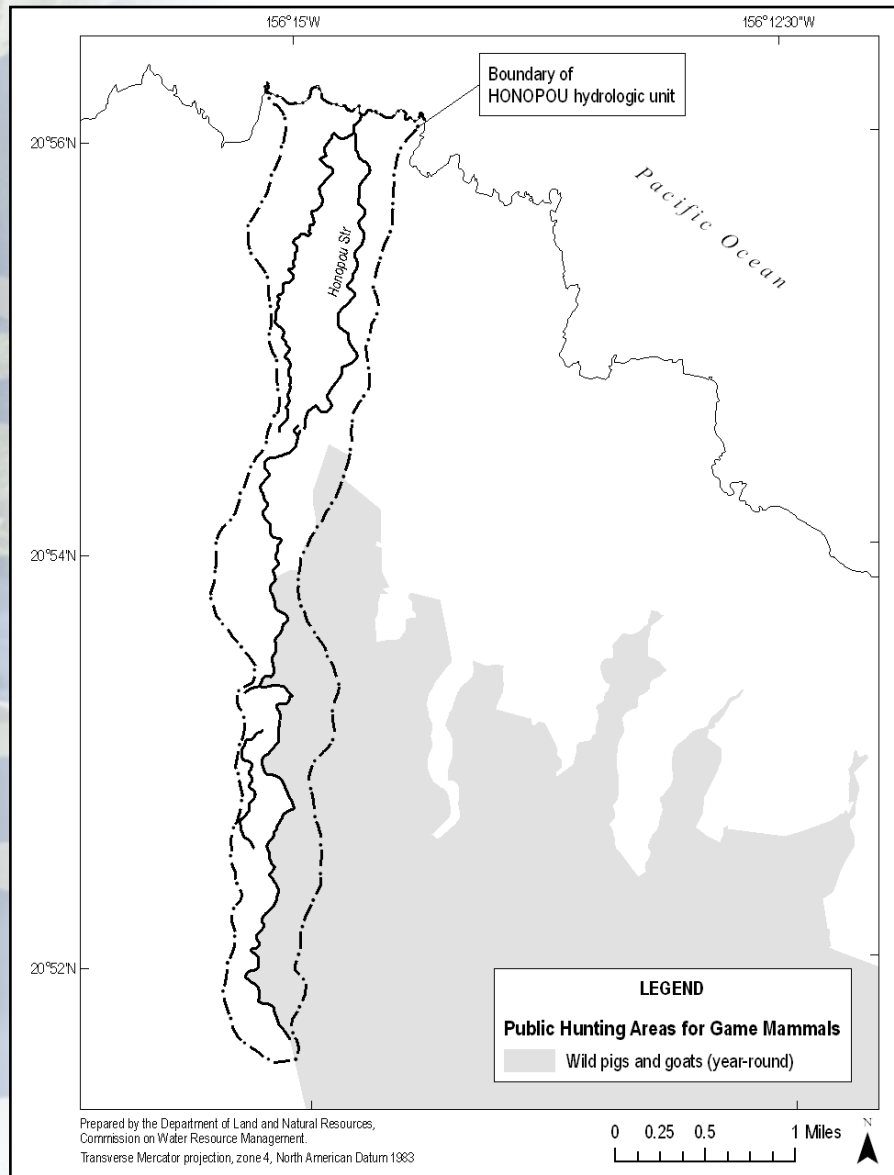
Overall Rating: Rating is a combination of the Total Watershed Rating and the Total Biological Rating.

Watershed Rating
5



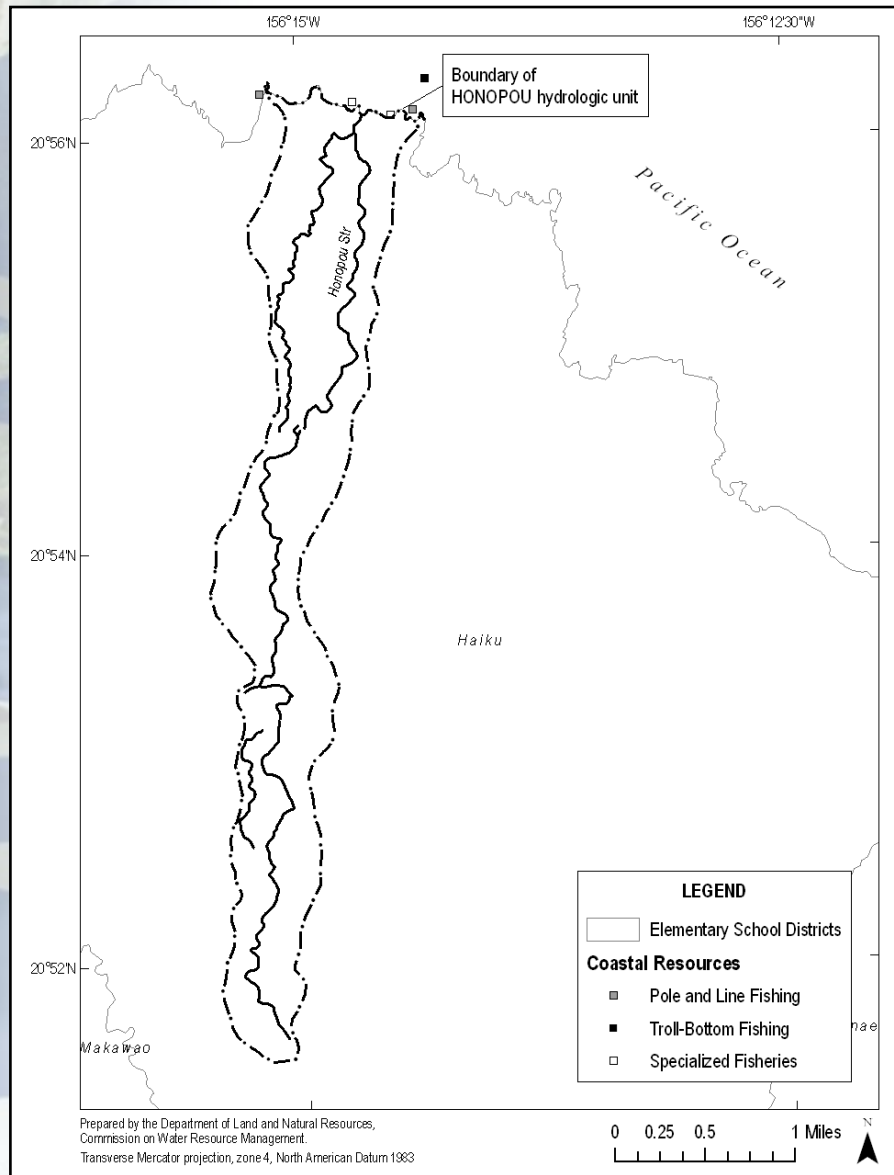
- Revised DAR Watershed Atlas was completed in April 2008.
- Glenn Higashi will present in more detail on Wednesday.
- A Rating Strength was also developed to estimate overall study effort in the stream.
- Rating Strength: 6

5.0 Outdoor Recreational Activities



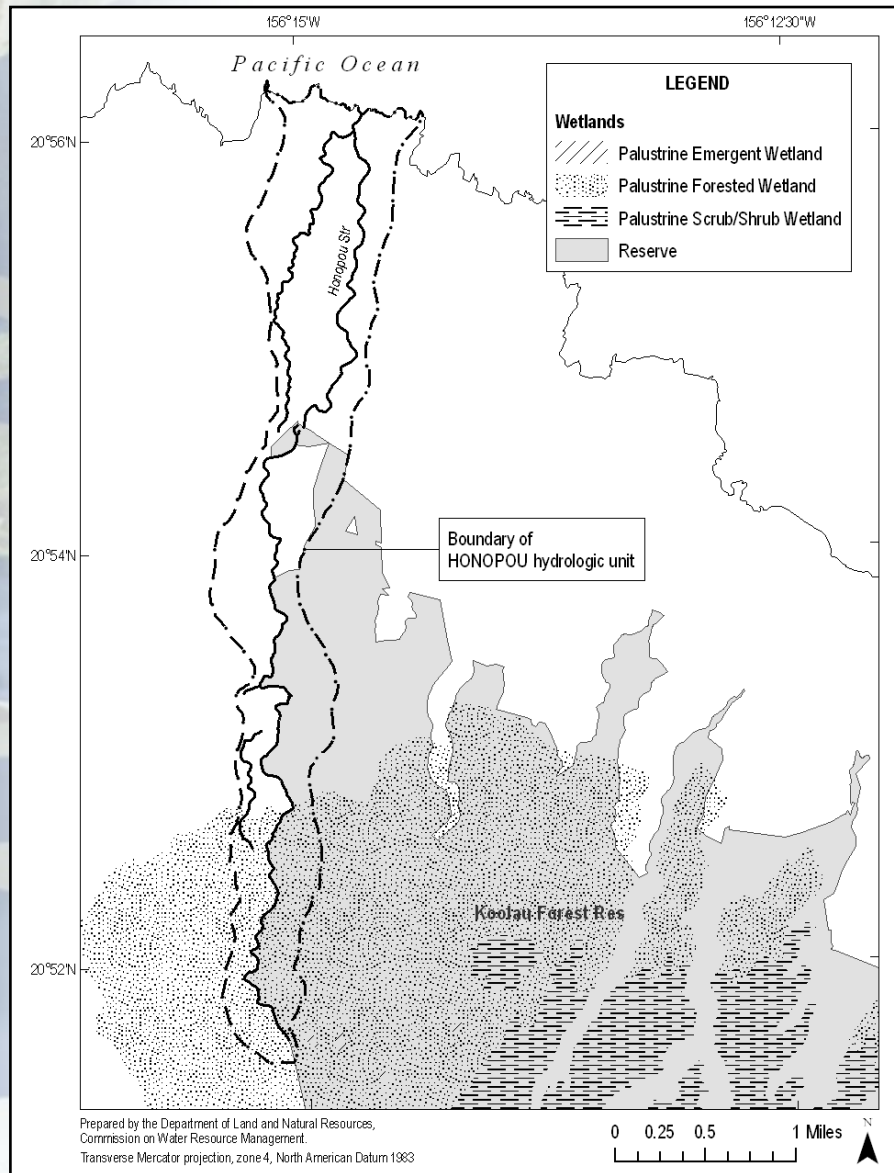
- Recreation resources were classified as moderate by HSA.
- Swimming was the only opportunity identified by HSA.
- 23.5% of unit falls within Hunting Unit B for hunting pig or goat.

5.0 Outdoor Recreational Activities



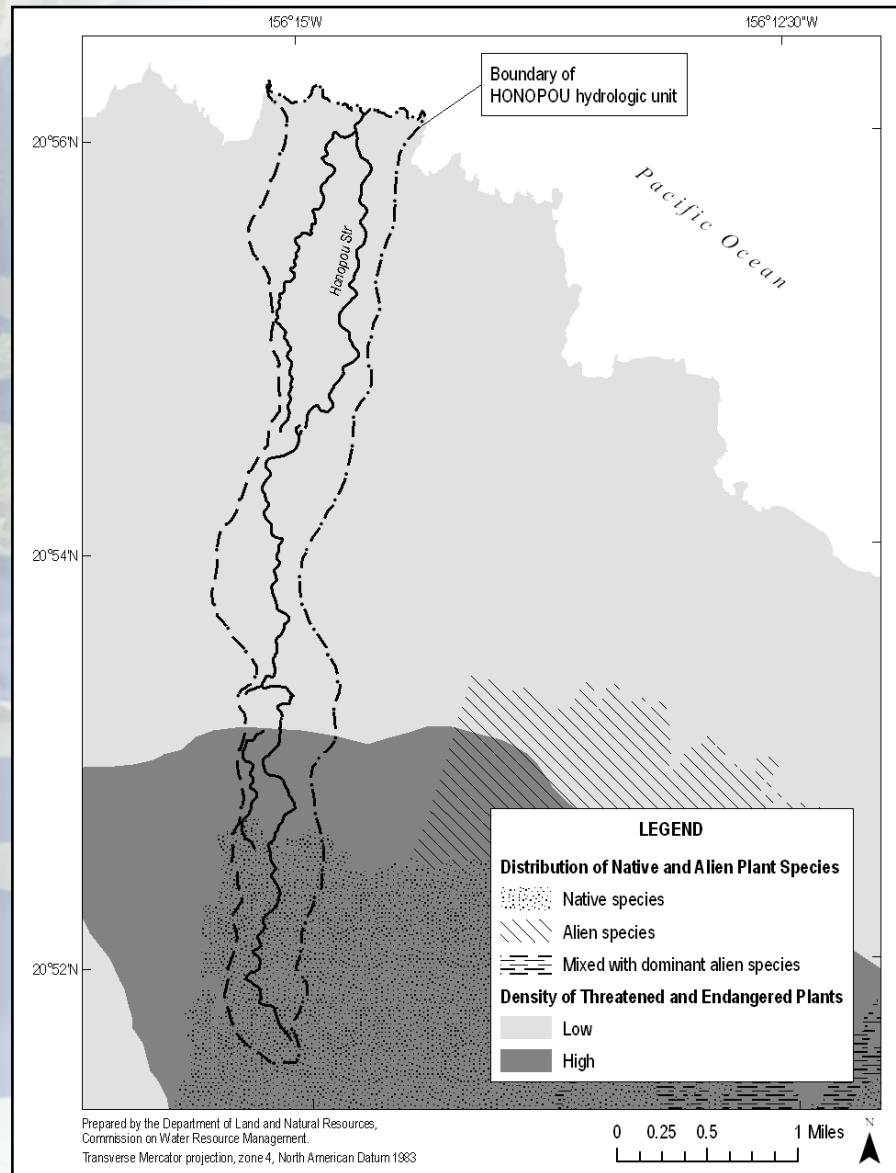
- Shoreline is characterized by high, steep sea cliffs.
- Shoreline access is limited.
- Coastal recreation includes pole/line fishing, trolling/ bottom fishing, and some specialized fisheries.
- No known educational facilities in the area.

6.0 Maintenance of Ecosystems



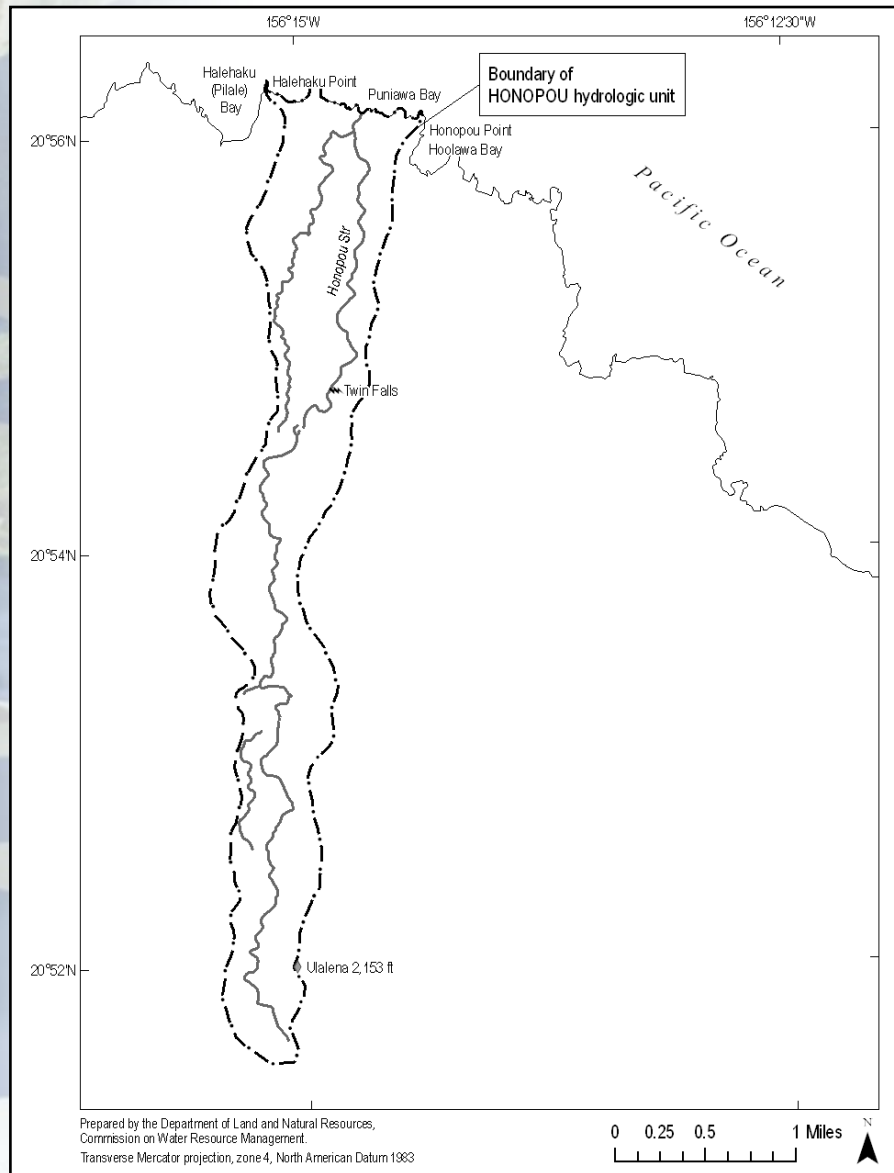
- Riparian resources were not classified by HSA.
- 20.9% of unit is palustrine, forested wetland.
- 24.5% of unit is in the State-managed Koolau Forest Reserve.
- 39.3% is managed under the East Maui Watershed Partnership.

6.0 Maintenance of Ecosystems



- UHERO valued Koolau forest (Oahu) at \$7.44 tp \$14.03 billion.
- East Maui is believed to have greater value.
- 18.7% of unit is dominated by native plant species.
- 27.9% of unit has a high concentration of threatened or endangered species.

7.0 Aesthetic Values



- **Twin Falls, on Honopou, is a popular tourist attraction.**
- **No major parks or scenic viewpoints in Honopou.**

8.0 *Navigation*



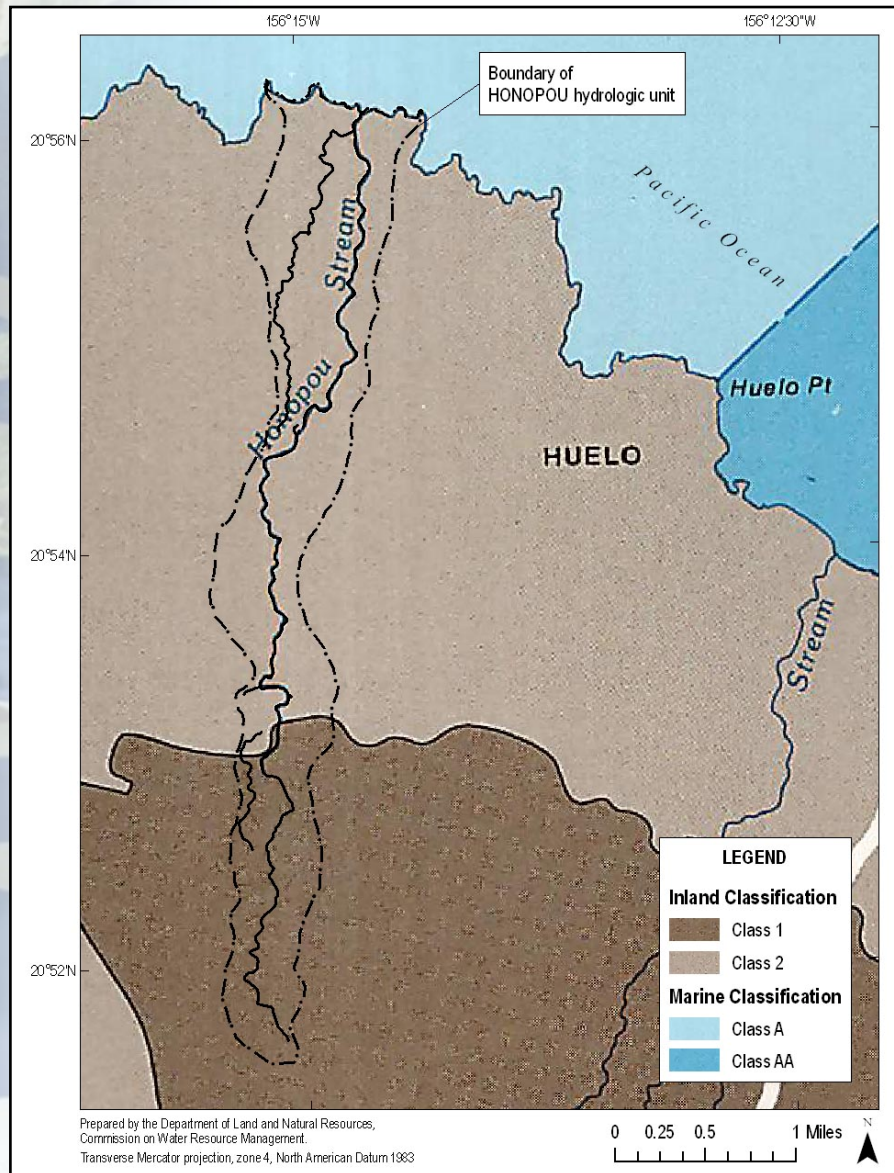
- Honopou is not known to support any instream uses of navigation.

9.0 Instream Hydropower Generation



- No known instream hydropower systems on Honopou Stream.
- HC&S operates three hydroelectric facilities on Wailoa Ditch.
- Power generated serves sugar mill requirements first.
- Remaining electricity sold to Maui Electric.
- Estimated savings of 16,200 barrels/year.

10.0 Maintenance of Water Quality



- Honopou does not appear on 2006 List of Impaired Waters in Hawaii.
- Honopou is Class 2 from coast to ~1400' elevation.
- Class 1 above 1400'.
- Marine waters at the mouth of Honopou are Class A.
- Class A waters protected for recreation, aesthetics, and wildlife.

11.0 Conveyance of Irrigation...



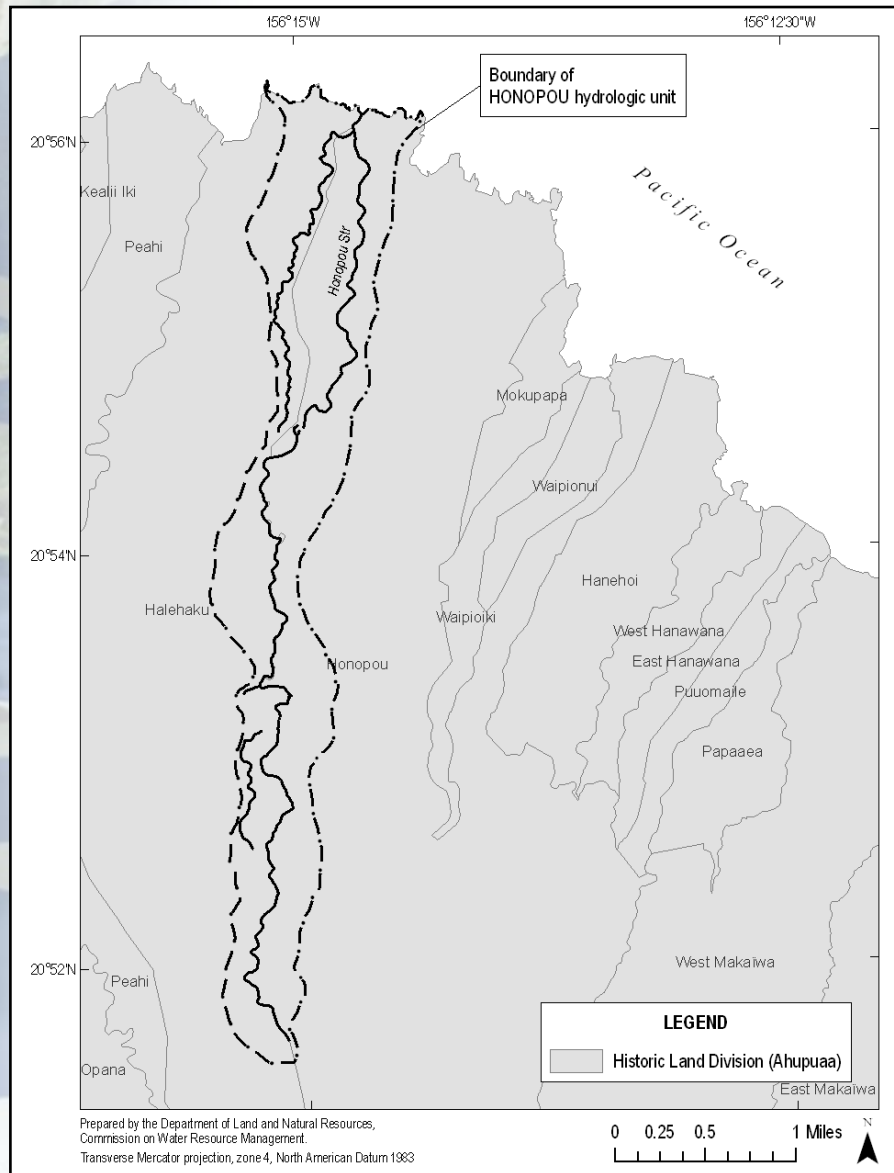
- Total of 22 registered diversions.
- 15 are non-East Maui Irrigation Company (EMI) diversions.
- 13 of 15 diversions were declared for domestic purposes (with a total of 15 service connections).
- All 15 diversions are used for irrigation of various crops, including taro.

12.0 Protection of... Hawaiian Rights



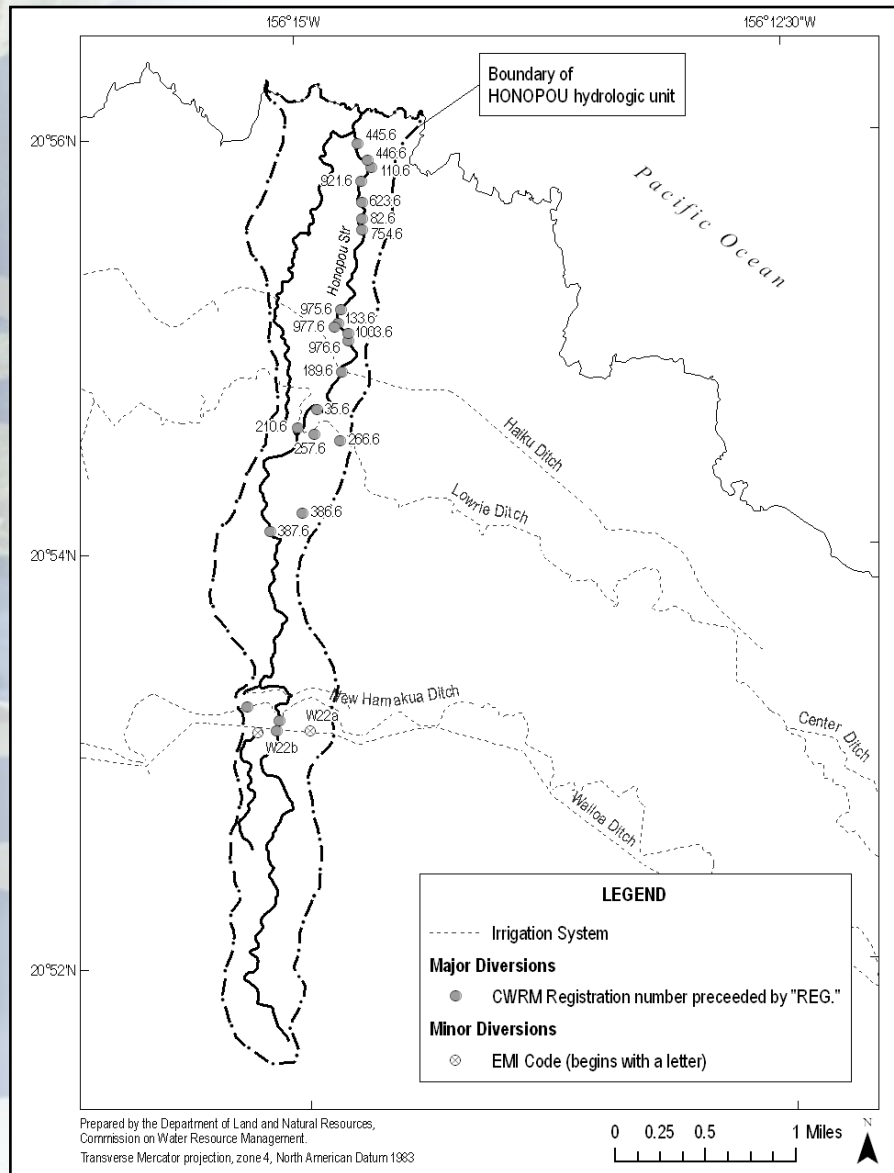
- Two appurtenant rights claims.
- Six registrants declared water use for taro cultivation of 34.55 acres.
- Average water use for selected Maui taro loi complexes is 230,000 gad.
- 27°C is the threshold temperature at which wetland taro becomes susceptible to root rot.

12.0 Protection of... Hawaiian Rights



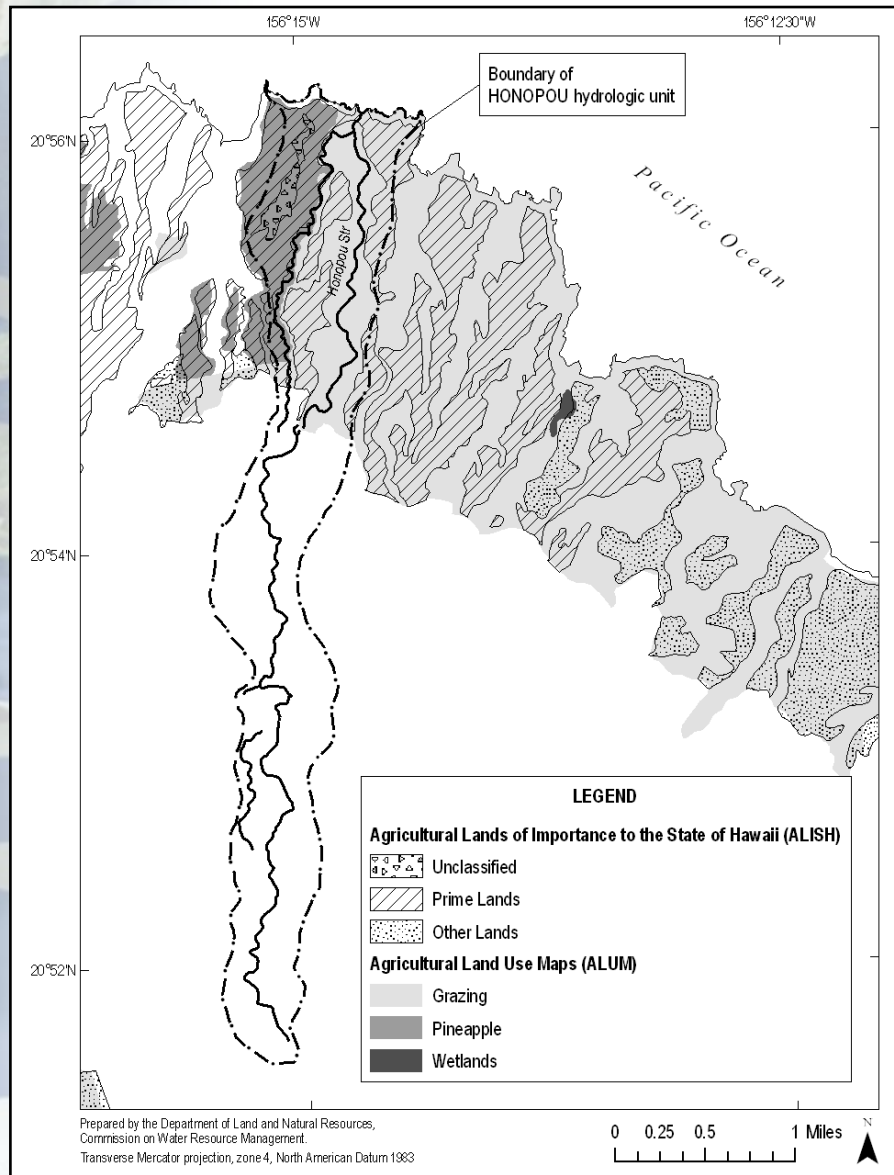
- 64 parcels are associated with Land Commission Awards or Grants/Leases.
- Cultural resources were defined as very limited by HSA.
- No fishponds exist.
- Unit spans two traditional ahupuaa: Honopou and Haleaku.

13.0 Noninstream Uses



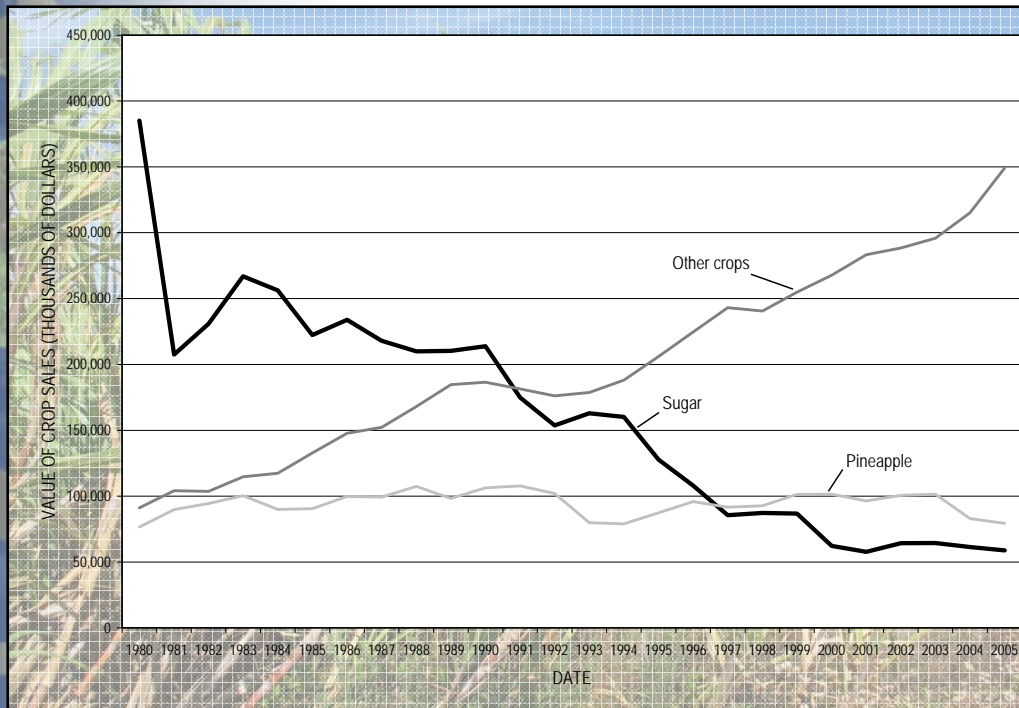
- 22 total registered diversions.
- Two "minor" diversions not registered by EMI.
- Seven EMI diversions from Honopou feed four irrigation ditches.
- Wailoa Ditch has the highest median flow when it crosses Honopou at 168.4 cfs.

13.0 Noninstream Uses



- **1977 ALISH identified 19.7% of unit as prime agricultural land.**
- **In 1980, 11.6% of the unit was in pineapple and 28.1% in ranching.**
- **The EMI system consists of 388 separate intakes, 24 miles of ditch, 50 miles of tunnel, and 12 inverted siphons.**

13.0 Noninstream Uses



- HC&S employs ~800 full-time workers, while EMI employs 17 workers.
- HC&S water needs range from 134 mgd in winter to 268 mgd in summer.
- Sugar crop sales have declined dramatically as plantations close over last 25 years.
- Diversified agriculture steadily increasing.

13.0 Noninstream Uses



- **HC&S receives revenue from Maui Electric for sale of electricity.**
- **HC&S also delivers water to Maui Dept. of Water Supply's Upcountry system and Maui Land and Pineapple Co. (MLP) for its east Maui pineapple fields.**
- **The last year MLP's pineapple operations had an operating profit was in 1999.**

14.0 Bibliography

Instream Flow Standard Assessment Report Island of Maui Hydrologic Unit 6034 Honopou

March 2008

PUBLIC REVIEW DRAFT



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



- This report is a comprehensive summary of all information for a given hydrologic unit.
- People are expected to use the bibliography to reference more detailed information.



East Maui Interim IFS

- **March**

- Public notice was issued to seek comments on the reports and to announce the public fact gathering meeting to be held on Maui.
- Hard copies and digital copies on CD were sent to numerous stakeholders for review and comment.

- **April**

- Public fact gathering meeting was held on Maui to receive additional comments from the community.
- Staff has begun compiling comments.

- **June**

- Comments period will end. Staff will compile and incorporate all comments received via the public fact gathering process.
- Staff will begin preparation of recommendations for the Commission.



East Maui Interim IFS

- County of Maui, Mayor's Office
- County of Maui, County Council
- County of Maui, Department of Water Supply
- Dept. of Agriculture
- Dept. of Business, Economic Development & Tourism
- Dept. of Hawaiian Home Lands
- Dept. of Health
- Dept. of Land and Natural Resources
 - Division of Aquatic Resources
 - Division of Forestry and Wildlife
 - Division of State Parks
 - Historic Preservation Division
 - Land Division
 - NARS Commission
- Earthjustice
- East Maui Irrigation Co., Ltd.
- Haleakala Ranch Company
- Haleakala National Park
- Hawaii Public Library System, Maui
- Hawaii Tourism Authority
- Hawaiian Commercial & Sugar
- Maui Farm Bureau (Hawaii Farm Bureau Federation)
- Maui Tomorrow
- Na Moku Aupuni O Koolau Hui
- Native Hawaiian Legal Corporation and Clients
- The Nature Conservancy
- Office of Hawaiian Affairs
- Tri-Isle Resource Conservation and Development Council
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. Geological Survey, Biological Resources Div.
- U.S. Geological Survey, Water Resources Div.
- U.S. Natural Resources Conservation Service
- University of Hawaii
 - Cooperative Fishery Unit
 - Environmental Center

Thank you!



The screenshot shows the homepage of the Hawaii Stream Management Commission website. The header features a blue and white wavy design on the left and a photograph of a stream on the right. The text 'COMMISSION ON WATER RESOURCE MANAGEMENT' is centered at the top. Below it, the Hawaiian name 'Ke Kahuwai Pono' is displayed, followed by the tagline 'The trustee who oversees the rightful sharing of water.' and the Department of Land and Natural Resources logo. A navigation bar contains links for ABOUT US, NEWS & EVENTS, RESOURCES, PLANNING, SURFACE WATER, and GROUND WATER. The main content area is divided into three sections: 'Water News' with a mountain and river graphic, 'QUICK LINKS' with a leaf graphic, and 'Web Updates' with a wavy line graphic. The 'Water News' section contains two paragraphs of text about instream flow standards and the designation of Na Wai Eha. The 'QUICK LINKS' section lists five items: Permits & Applications, Commission Meetings, Water Resource Bulletin, 2008 Water Resource Protection Plan Update, and Instream Flow Standard Assessment Reports. The 'Web Updates' section lists three items: April Commission meeting agenda, February Commission meeting minutes, and April Water Resource Bulletin. The Department of Land and Natural Resources logo is also present at the bottom right, along with a 'WEATHER FORECAST' button.

COMMISSION ON WATER RESOURCE MANAGEMENT

Ke Kahuwai Pono
"The trustee who oversees the rightful sharing of water."

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

Water News

The Commission is preparing to develop interim instream flow standards for five surface water hydrologic units in east Maui: Honopou, Hanehoi, Piinaau, Waiokamilo, and Wailuanui. Prior to developing the recommendations, staff at the Stream Protection and Management Branch have compiled Instream Flow Standard Assessment Reports (IFSAR) to present the best available information for each unit. Drafts of these reports are now available for public review. [Read more...](#)

On March 13, the Commission designated Na Wai Eha as the first surface water management area. Surface water use in these management areas are now regulated by the Commission by means of water use permits. [Read more...](#)

QUICK LINKS

- Permits & Applications
- Commission Meetings
- Water Resource Bulletin
- 2008 Water Resource Protection Plan Update
- Instream Flow Standard Assessment Reports

Web Updates

The following are now available on our website. Please check back for more updates.

- April Commission meeting agenda
- February Commission meeting minutes
- April Water Resource Bulletin

WEATHER FORECAST

<http://www.hawaiistreams.com>