

**NORTH SHORE
WATERSHED MANAGEMENT PLAN**

**Community & Agency
Issues and Strategies**

May 23, 2013

Working Group Meeting #3

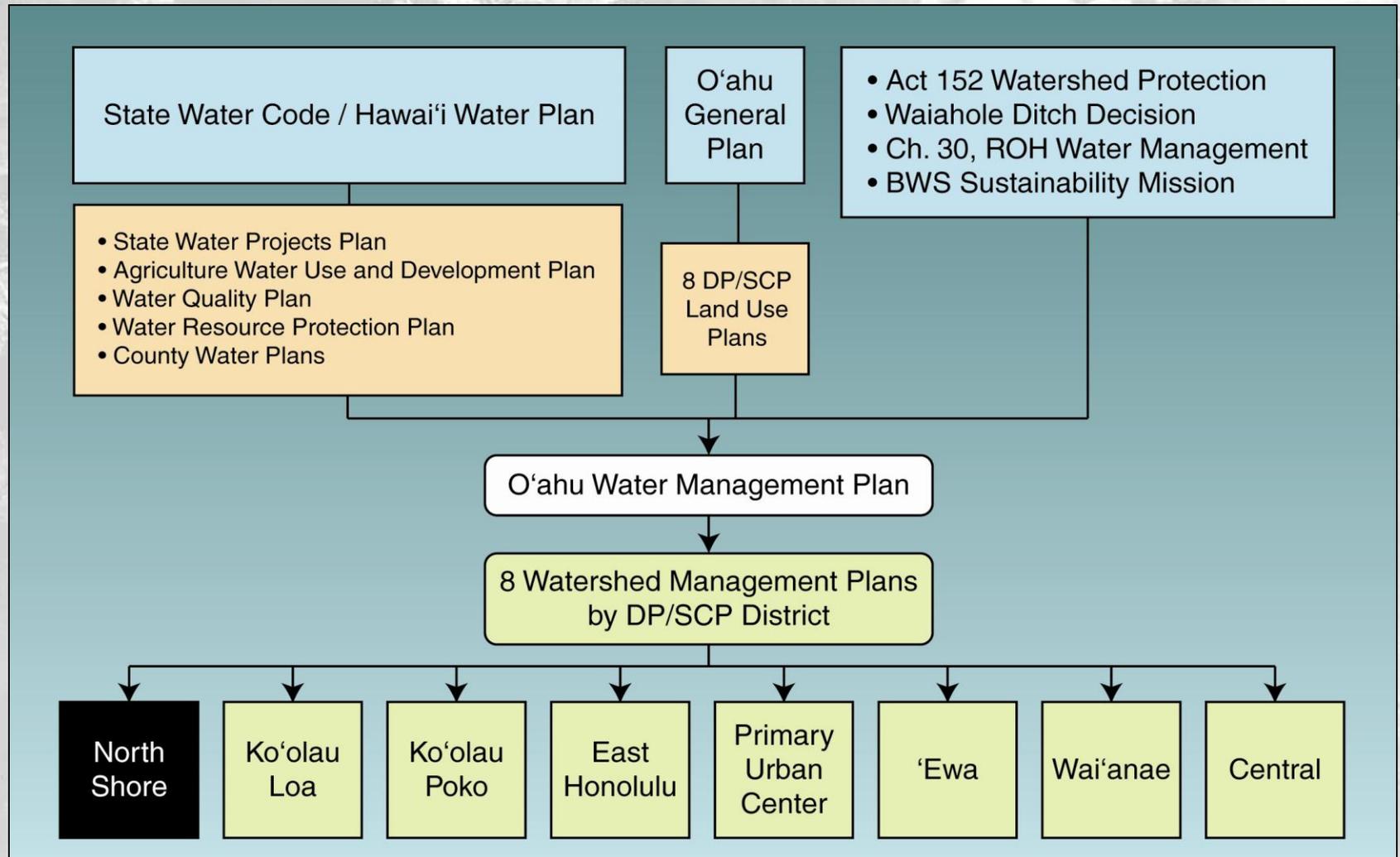


Intro: Background and Context

- County “**Water Use and Development Plans**” required by **State Water Code**
- **Revised Ordinances of Honolulu Chapter 30 - “O’ahu Water Management Plan”** by DPP
- Guidance includes the **Hawai’i Water Plan & City Development / Sustainable Communities Plans**
- BWS & DPP develop Watershed Management Plans & Development/Sustainable Communities Plans **by District** to provide community-specific strategies



Intro: O'ahu Water Management Plan



Intro: Watershed Management Plan

Goal

To formulate an **environmentally holistic, community based**, and **economically viable** watershed management plan that will provide a balance between:

- (1) the protection, preservation and management of O'ahu's watersheds
- (2) sustainable ground and surface water use and development to serve present users & future generations



Intro: Watershed Management Plan Objectives

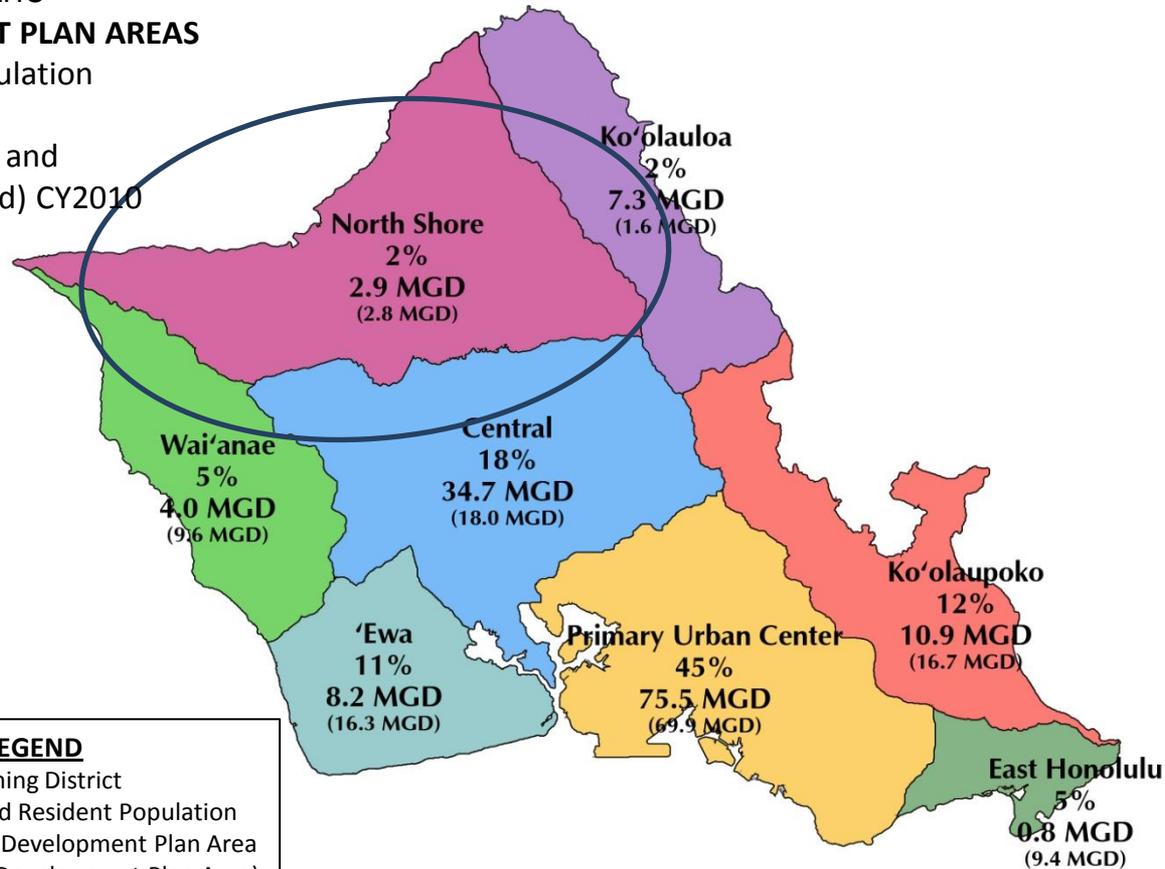
1. Promote Sustainable Watersheds
2. Protect and Enhance Water Quality & Quantity
3. Protect Native Hawaiian Rights and Traditional & Cultural Practices
4. Facilitate Public Participation, Education & Project Implementation
5. Meet Future Water Demands at Reasonable Costs



Intro: O'ahu Water Management Plan North Shore

ISLAND OF O'AHU DEVELOPMENT PLAN AREAS

Estimated Population
Distribution,
BWS Pumpage and
(Water Demand) CY2010

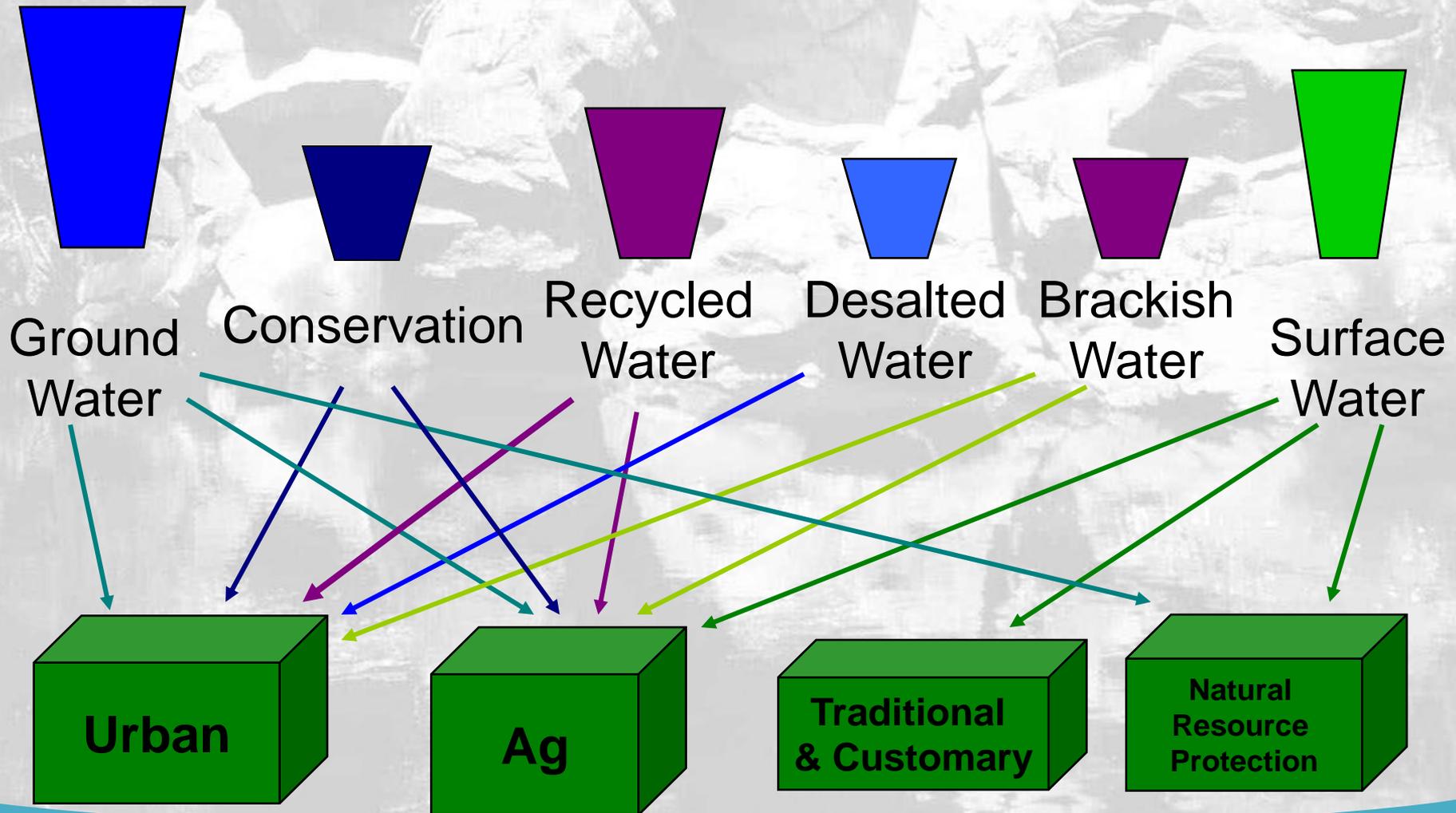


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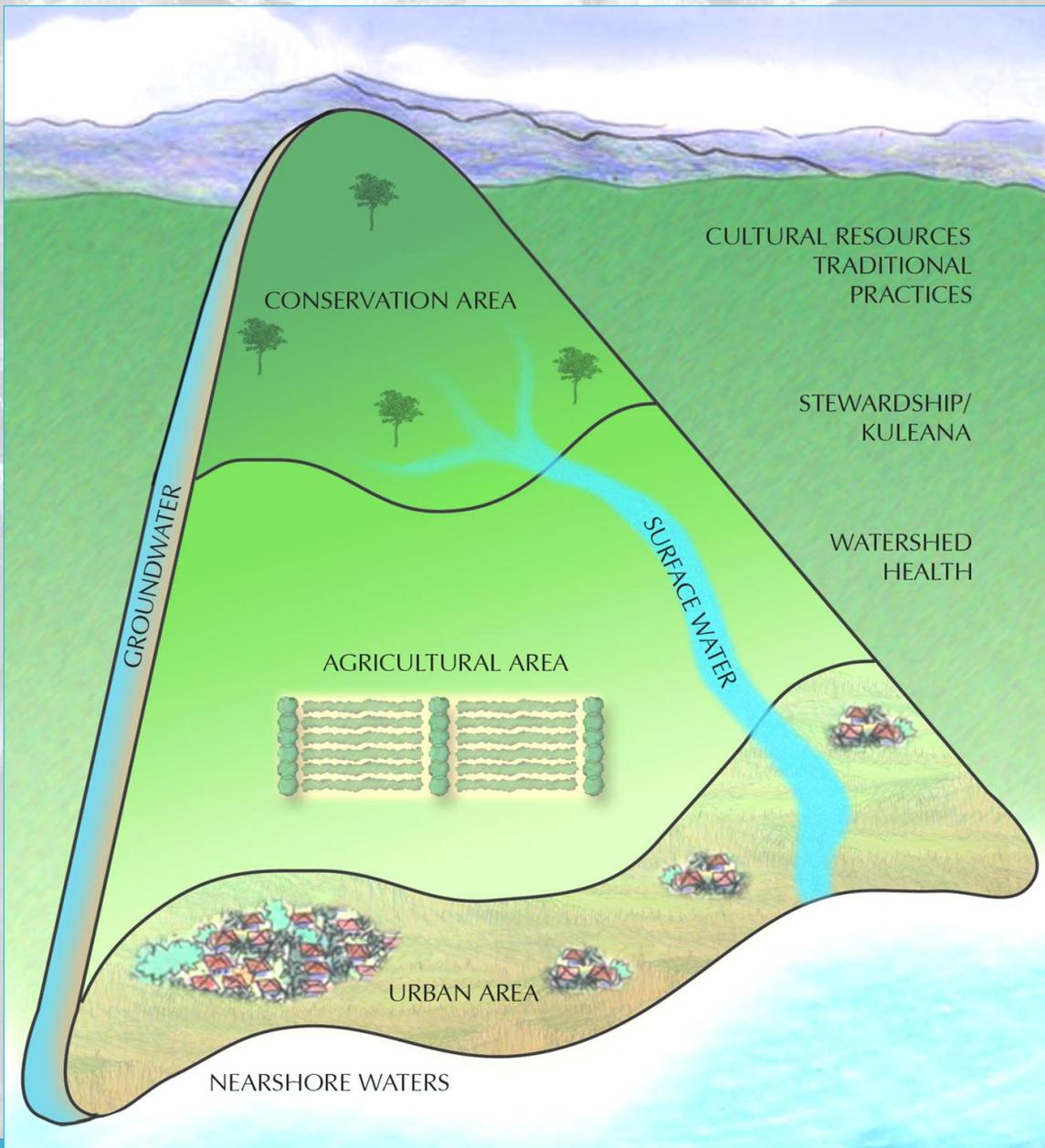
Planning District
Percent of Island Resident Population
BWS Pumpage in Development Plan Area
(Net demand for Development Plan Area)



Intro: Water Supply Matched with Appropriate Use



Intro: Watershed Management Projects, Strategies & Policies



Meeting Goals

- Verify and identify
 - Issues
 - Strategies to address issues
- Review Policies
- Express working group strategy priorities



Identification of Issues & Strategies

- Stakeholder Consultation
 - Public Meetings
 - July 2012
 - November 2012
 - Interviews / Phone or email communication
 - Community members
 - Landowners
 - Agencies
- Literature review
- Review of other districts' WMP issues and strategies for applicability to the North Shore



ISSUE: Ground Water Quality

STRATEGIES:

- **Potable Wellhead Protection**

Track land uses & permissible activities and characterize chemicals, fertilizers & recycled water applied on all agricultural lands above drinking water wells

- **Agricultural Best Management Practices**

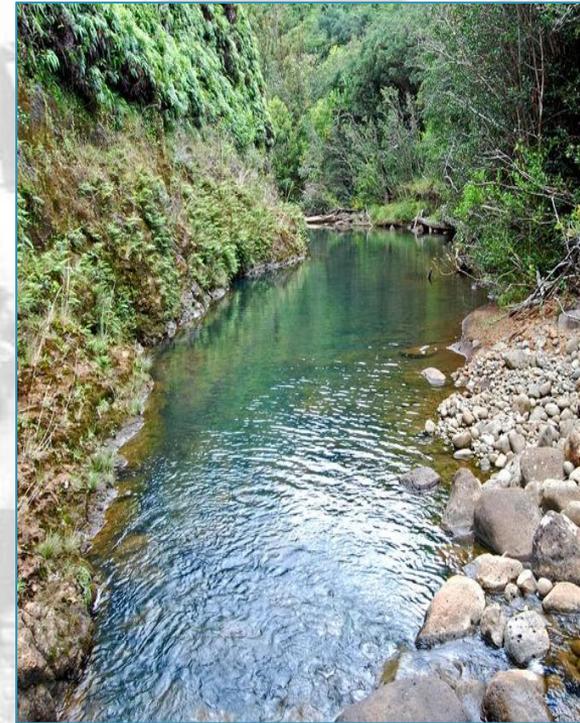
Implement agricultural Best Management Practices (BMPs) including integrated pest management techniques, soil and water conservation



ISSUE: Surface Water Quality & Biota

STRATEGIES:

- **TMDL Studies Implementation** (by DOH, 2009)
Implement the TMDL studies recommendations for North and South Kaukonahua Streams
- **Establish Measurable Instream Flow Standards**
Through an extensive study and consultation process, replace the current status quo streamflow standards with measurable ones.
- **Stream Ecosystem Health**
Conduct Biological Assessments of stream ecosystem health for selected streams (e.g. Anahulu, Waimea)



ISSUE: Surface Water Quality & Biota (cont'd)

STRATEGIES:

- **Pollution Prevention Awareness and Education**
Provide public awareness and education outreach to reduce polluting behaviors
- **Low Impact Development Techniques**
Integrate Low Impact Development (LID) concepts into existing and future developments to minimize run-off water quantity and improve water quality



ISSUE: Recognize the connection between land and sea

STRATEGIES:

- **Feral Pig and Goat Management Planning**

Provide feral pig management planning and implementation techniques

- **Waialua-Kaiaka Watershed Area Study** (by ENV, 2010)

Implement the Study strategies including:

- Strawberry guava biocontrol
- Recommended BMPs for crop lands, orchards, rangeland & pastures
- Forest ecosystem & water resource soil erosion documentation



ISSUE: Recognize the connection between land and sea (cont'd)

STRATEGIES:

- **Off-Road Vehicle Restriction**

Restrict off-road vehicles in ecologically sensitive areas



- **Pūpūkea-Paumalū Risk Management Planning and Implementation**

Develop and implement a risk management plan for Pūpūkea-Paumalū that identifies, evaluates, reduces and prevents wildfire, drainage, erosion, and rock falls



ISSUE: Irrigation Water Quality and Quantity

STRATEGIES:

- **Drought Mitigation Strategies**

Implement high priority recommendations from the City and County of Honolulu Drought Mitigation Strategies for Agriculture

- **Agricultural Water Reliability: Water Storage, Back-up Wells, Stormwater Reclamation**

Assess water storage options, mechanism for back-up well allocation and use, and potential stormwater reclamation projects



ISSUE: Irrigation Water Quality and Quantity (cont'd)

STRATEGIES:

- **Wahiawa Wastewater Treatment Plant Improvements**
Improve WWTP effluent to R-1 quality so that Lake Wilson discharge is not restricted and can be used to irrigate any crop type
- **Wahiawā Irrigation System Improvements**
Identify water losses, make improvements to minimize water losses, form a Farmer's Irrigation System User Association, and address the potential of supplying Galbraith Lands



ISSUE: Flooding in Waialua and Hale'iwa

STRATEGIES:

- **Kaiaka Bay Watershed Participatory Assessment and Action Project** (by UH Manoa, 2008)

Support projects from the Assessment and Action Project such as:

- Construct wetlands, storage ponds, and other flood mitigation works
- Conduct a feasibility study regarding long term flood mitigation strategies
- Gather information on additional dams for flood mitigation
- **Dredging Study & Maintenance of Key Areas**
 - Conduct dredging studies to evaluate flood mitigation approaches and costs
 - Support systematic maintenance/dredging of key areas
- **Drainage Master Plan for Waialua Watershed**

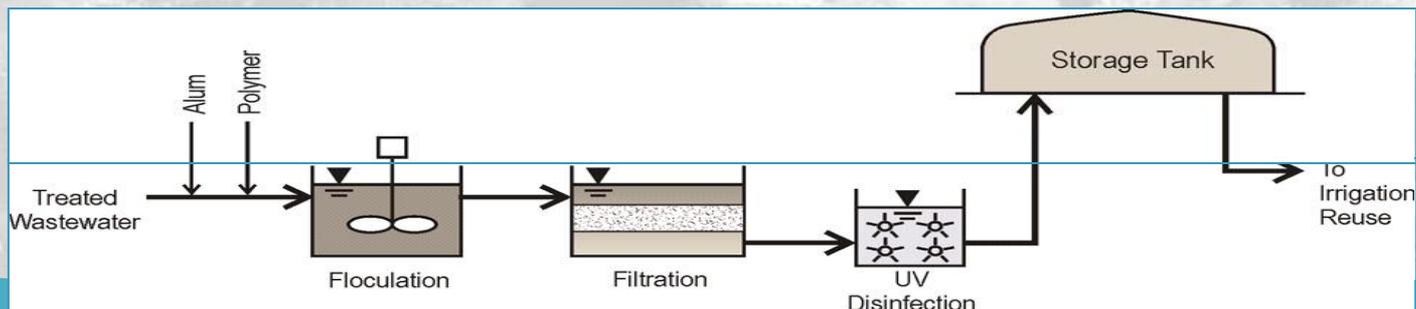
Develop a Waialua watershed drainage master plan to address erosion and flood concerns



ISSUE: Nearshore Water Quality

STRATEGIES:

- **Agricultural Best Management Practices**
Implement agricultural Best Management Practices (BMPs) including soil and water conservation
- **North Shore Regional Wastewater Alternatives** (by ENV, 2012)
Implement strategies, such as:
 - Upgrade cesspool systems
 - Injection wells or reuse for neighborhood clusters
 - Upgrade existing wastewater systems
 - Small WWTF for larger commercial and residential areas



ISSUE: Nearshore Water Quality (cont'd)

STRATEGIES:

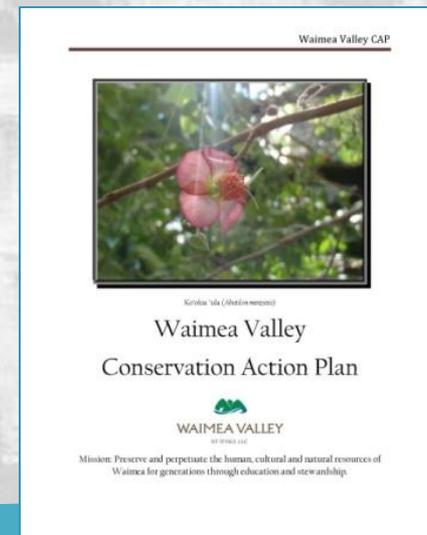
- **Mālama Pūpūkea-Waimea**
Support the Mālama Pūpūkea-Waimea educational outreach at the Pūpūkea MLCD, including the Makai Watch Program
- **Waialua Natural Reserve / Reef Preserve Designation**
Designate a natural reserve / reef preserve off of Waialua Beach



ISSUE: Invasive Non-native Species

STRATEGIES:

- **Ko'olau & Wai'anae Mountains Watershed Partnerships**
Support these partnerships that protect native forest species and functionality and work to eliminate invasive species.
- **Native Forest/Ecosystem Restoration**
Restore native forest/ecosystem and watershed with a plan that prioritizes areas, identifies native species for replanting, and replaces alien plants with native species
- **Waimea Valley Conservation Action Plan**
Support the invasive species control management priorities from the Conservation Action Plan.



ISSUE: Wildfires

STRATEGIES:

- **Drought Mitigation Strategies**

Implement high priority recommendations from the City and County of Honolulu Drought Mitigation Strategies for Wildland Fire and Environment



ISSUE: Sustain North Shore History & Native Hawaiian Practices

STRATEGIES:

- **North Shore Oral History Studies**

Conduct North Shore Oral History Studies to utilize local knowledge in resource management while preserving the legacy and traditions

- **Kalo Restoration Projects**

Support kalo restoration projects within the community

- **KS Loko Ea Fishpond and 'Uko'a Marsh Restoration**

Support restoration programs for 'Uko'a Marsh and Loko Ea Fishpond with educational and ecosystem components

- **North Shore Ahupua'a Boundary / Stream Marker Project**

Identify and mark the traditional ahupua'a boundaries and streams of the North Shore to educate and raise public awareness about Hawaiian traditional land boundaries and land management.

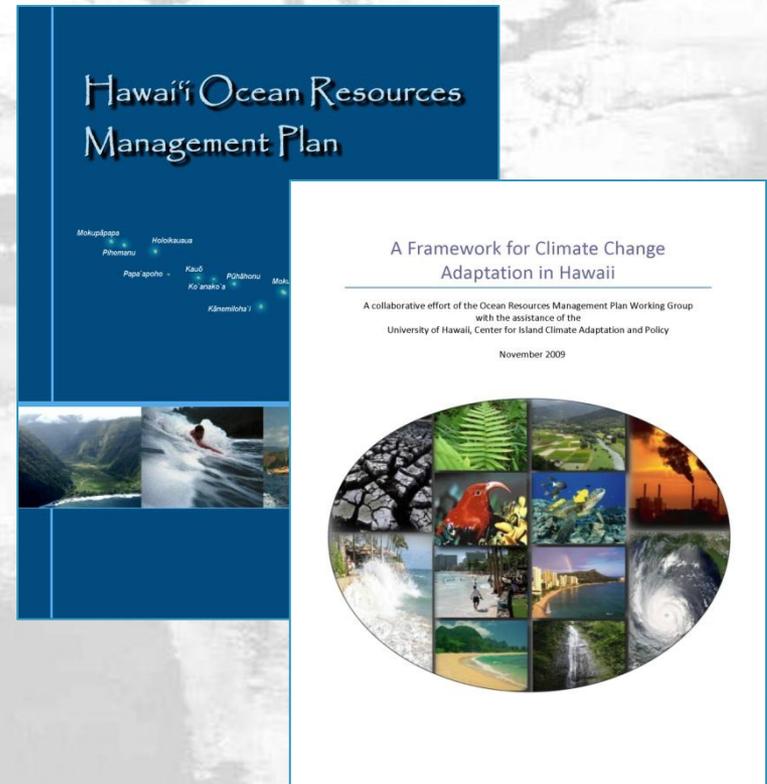


ISSUE: Climate Change

STRATEGY:

- **Climate Change Plans and Initiatives**

Implement the Hawaii Ocean Resources Management Plan (by CZM and NOAA, 2006), A Framework for Climate Change Adaptation in Hawaii (by CZM and ICAP, 2009), and other initiatives for long-term planning



ISSUE: Potable Water Systems

STRATEGIES:

- **BWS & State Conservation Programs**

Support the programs and strategies developed within the BWS & State Conservation Programs

- **BWS Capital Program**

Support the BWS Capital Program projects on the North Shore

- **Mokulē'ia Potable Water System Improvements**

Creation of a Mokulē'ia Potable Water Long-Term Plan to provide reliable and clean water delivery to Mokulē'ia customers and meet fire protection requirements

- **Gray Water Reuse**

Promotion of gray water reuse techniques to the extent allowable



Review

- Did we hear you correctly?
- What else should we know?



WMP Goal and Objectives

GOAL: To formulate an environmentally holistic, community-based, and economically viable watershed management plan that will provide a balance between:

- (1) the preservation and restoration of Oahu's watersheds, and
- (2) sustainable ground water and surface water use and development to serve present and future generations.

OBJECTIVE #1: Promote Sustainable Watersheds

OBJECTIVE #2: Protect and Enhance Water Quality and Quantity

OBJECTIVE #3: Protect Native Hawaiian Rights and Traditional and Customary Practices

OBJECTIVE #4: Facilitate Public Participation, Education, and Project Implementation

OBJECTIVE #5: Meet Future Water Demands at Reasonable Cost



North Shore-Specific Sub-Objectives Development



Identification of Sub-objectives

- Stakeholder Consultation
- Literature review
- Review of other districts' WMP sub-objectives for applicability to the North Shore



OBJECTIVE #1: PROMOTE SUSTAINABLE WATERSHEDS

- 1.1 Remove invasive species and increase areas of **healthy native forests**
- 1.2 Protect and restore **wetlands and streams** for ecological, cultural & recreational values
- 1.3 Adapt to & plan for **climate change** & sea level rise



OBJECTIVE #2: PROTECT AND ENHANCE WATER QUALITY AND QUANTITY

- 2.1 Recognize the **connection between land & sea** and improve stream, coastal & ground water quality
- 2.2 Maintain and improve the **quantity of groundwater & surface waters**
- 2.3 Collaborate with responsible agencies to identify and implement measures to **alleviate flooding issues**



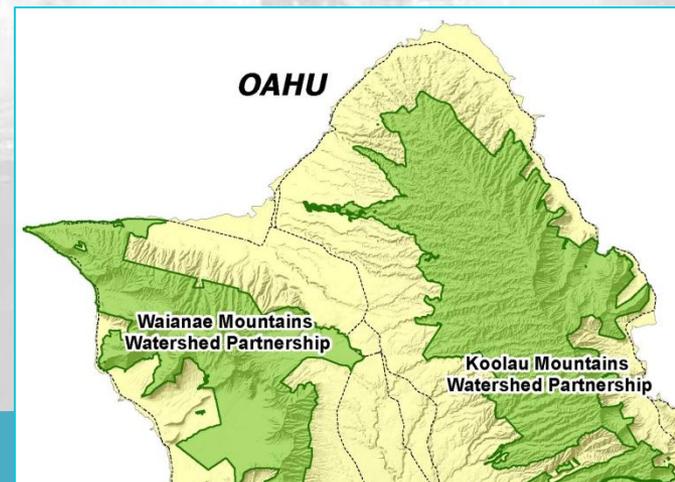
OBJECTIVE #3: PROTECT NATIVE HAWAIIAN RIGHTS AND TRADITIONAL CUSTOMARY PRACTICES

- 3.1 Provide support to place-based **natural & cultural resources management** and Native Hawaiian cultural educational programs in North Shore
- 3.2 **Restore** and utilize **kalo lands & fishponds** for food production and cultural educational use



OBJECTIVE #4: FACILITATE PUBLIC PARTICIPATION, EDUCATION, AND PROJECT IMPLEMENTATION

- 4.1 Promote **public participation** in planning of watershed management projects and programs
- 4.2 Increase **public awareness** and educational efforts of watershed management
- 4.3 Foster **community / government partnerships** for plan implementation



OBJECTIVE #5: MEET FUTURE WATER DEMANDS AT REASONABLE COSTS

- 5.1 Ensure **adequate and cost-effective agricultural water supplies** and promote water conservation and delivery efficiency
- 5.2 Maintain and improve potable water **system reliability, adequacy and efficiency**
- 5.3 Develop strategies to deal with **longer periods of drought** that may occur from climate change



Review

- Do these sub-objectives capture the North Shore issues & values?



Next steps

- Group 70 - project/strategy descriptions
- Meeting #4 on Implementation Plan - Fall 2013





MAHALO!

