WIT.Committee

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Please find attached the Department of Water Supply's presentation to WIT 1/6/20.

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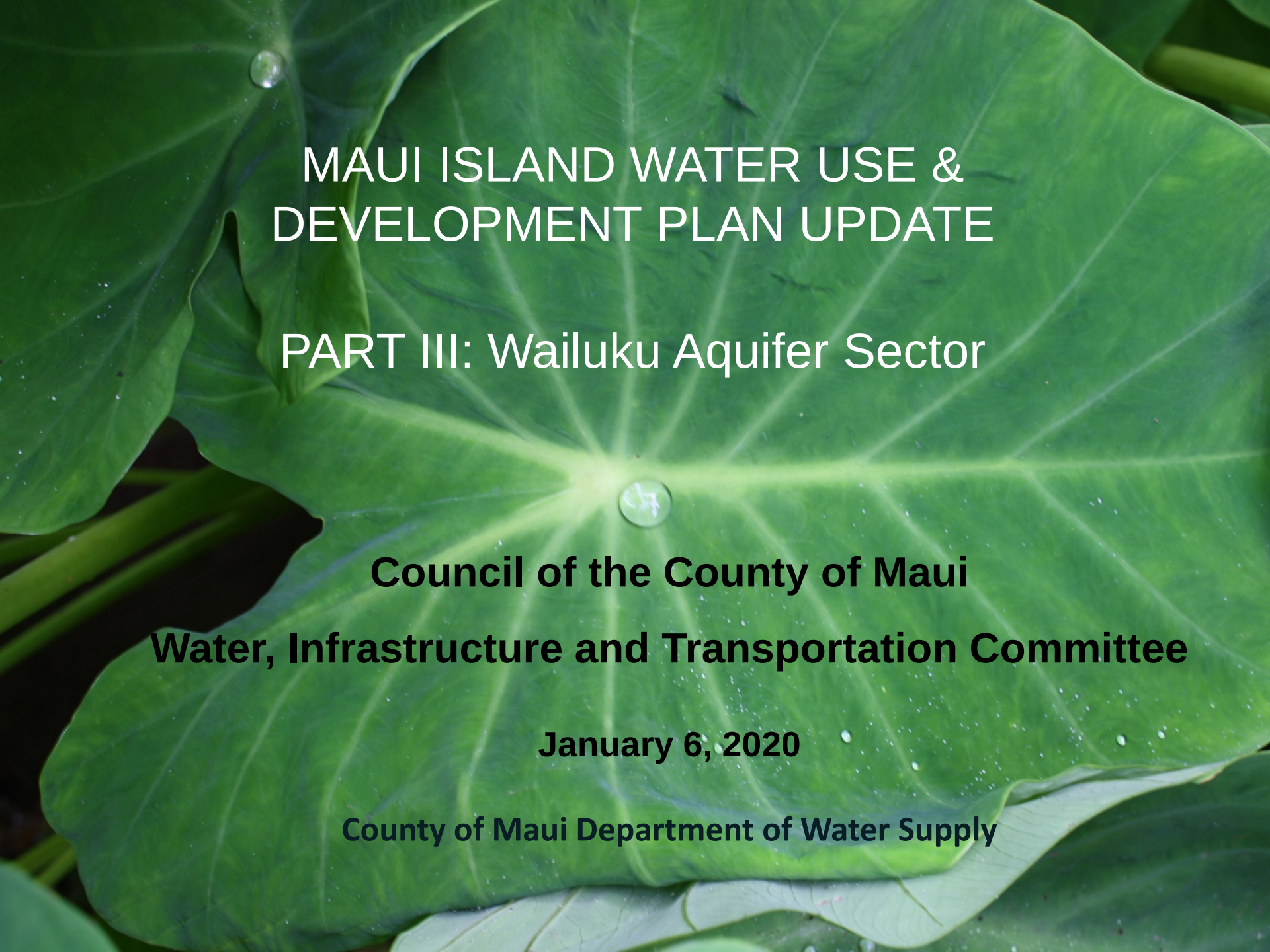


MAUI ISLAND WATER USE & DEVELOPMENT PLAN UPDATE

PART III: Wailuku Aquifer Sector

Council of the County of Maui

Water, Infrastructure and Transportation Committee

January 6, 2020

County of Maui Department of Water Supply

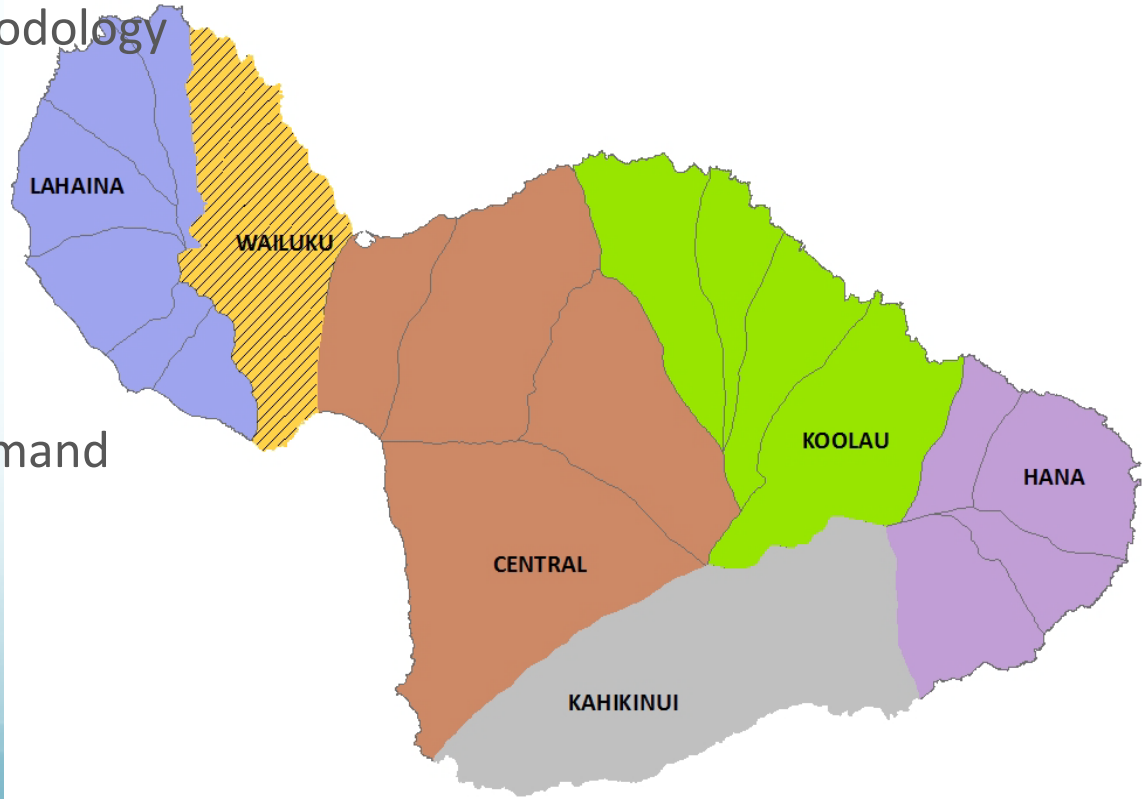
Presentation Outline

Part I: Introduction and Technical Approach

Part II: Water Resource Adequacy, Island Wide Strategies and Recommendations

Part III: Regional Sector Reports: **Wailuku Aquifer Sector**

- WUDP Purpose and Methodology
- Key Issues
- Water Resources
- Water Use & Distribution
- Projected Growth and Demand
- Strategies
- Implementation



WUDP Purpose and Requirements

Guide and advise the Maui County Council and the State Commission on Water Resource Management in planning, management, development, use and allocation of the island's water resources

Ensure that the future water needs of the county are met by allocating water to land use

The plan shall serve as the primary **guide** to the council, the department, and all other agencies of the County:

1. In approving or recommending to other agencies the use or commitment of the water resources in the county;
2. In using public funds to develop water resources to meet existing and projected future demands on the public water system as set forth in the plan

HRS§174C-31, HAR §13-170-30 – 32

Maui County Code Chapter 14.02

KEY ISSUES

Adequate long term resource supply to meet projected demand while maintaining watershed, stream and aquifer sustainability and replenishment

- Return of streamflow and cultural use of stream waters
- Lack of aquifer information in regions that are not designated groundwater management areas.
- Saltwater intrusion
- Maximize use of alternative sources of water (R-1 wastewater, rainwater, greywater, etc.) while minimizing well and surface water use.
- Mitigate water transport

MAJOR UNCERTAINTIES/CONSTRAINTS:

Na Wai ‘Eha contested case

- Scenario used: Hearing officer’s November 2017 recommendation
- Adjust strategies as needed when decision on IIFS and water use permits

Resource Assessment

GROUNDWATER

- Sustainable Yield 36 mgd
- Water Quality
- Climate change impacts
- Designated management areas

SURFACE WATER

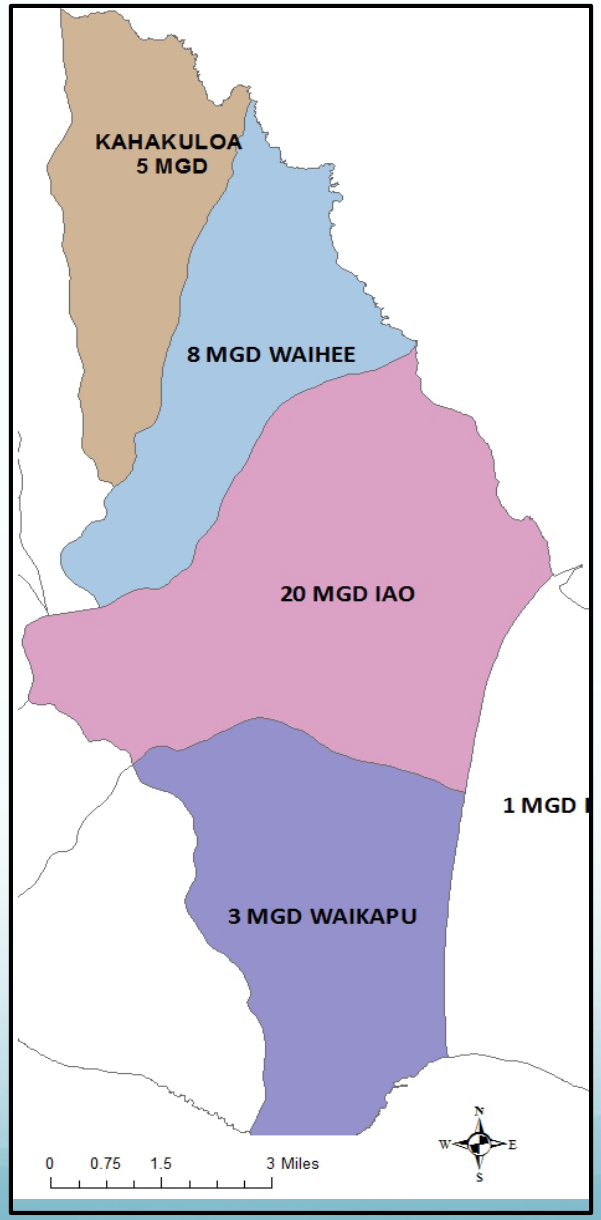
- Interim Instream Flow Standards
- Low flow conditions
- Base flow vs Total Flow
- Climate change impacts

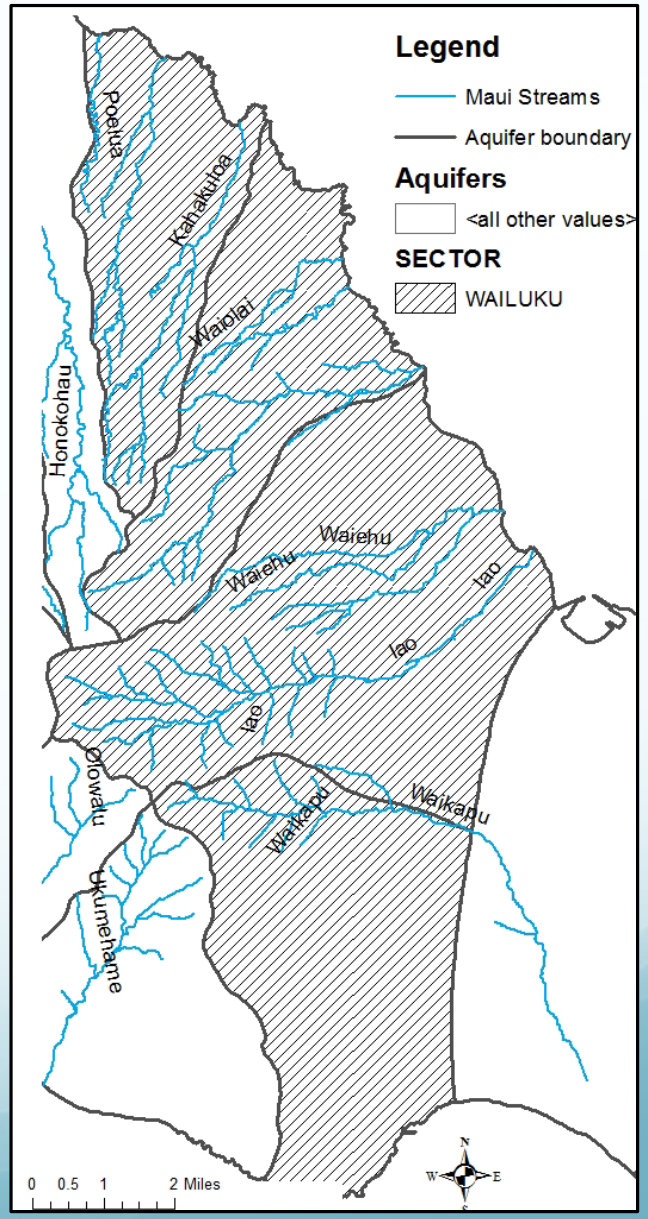
Median Flow 74.5 mgd
Drought Flow: 45.8 mgd

STORMWATER

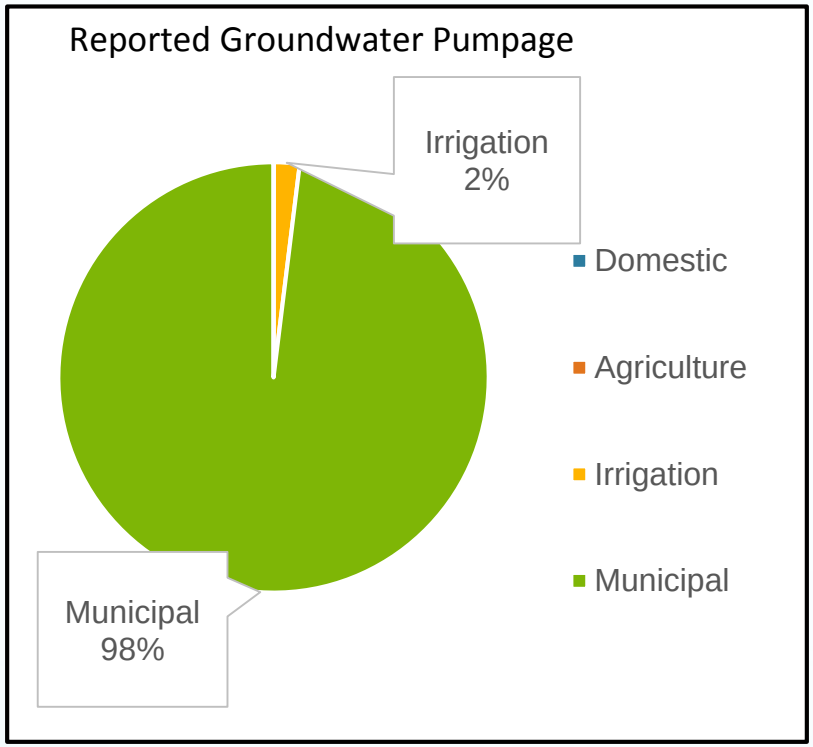
RECYCLED WATER

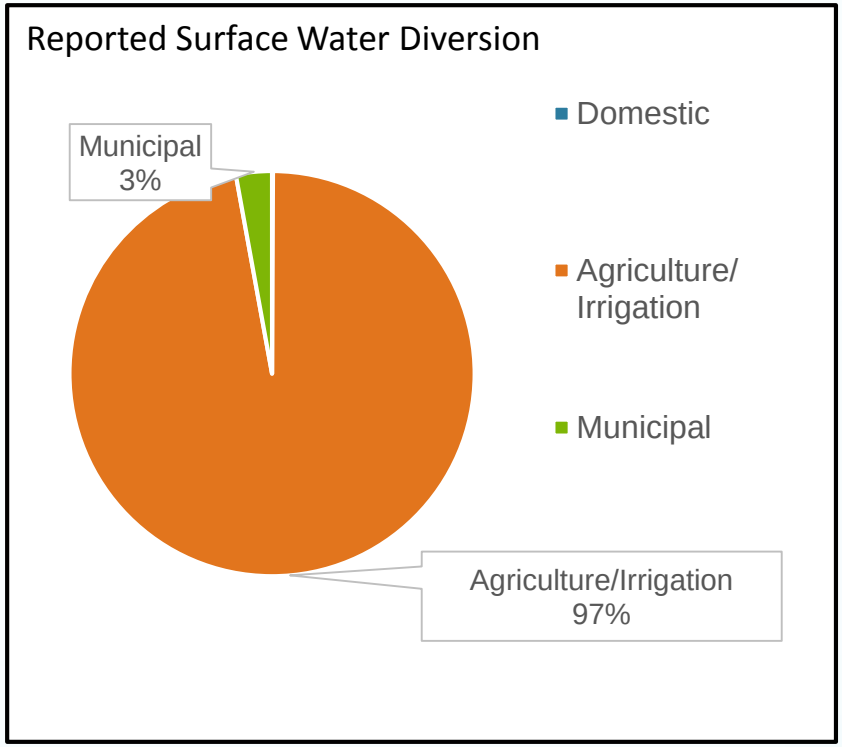
AMBIENT RAINFALL AND RAINWATER CATCHMENT





Water Use 2014 - 2016



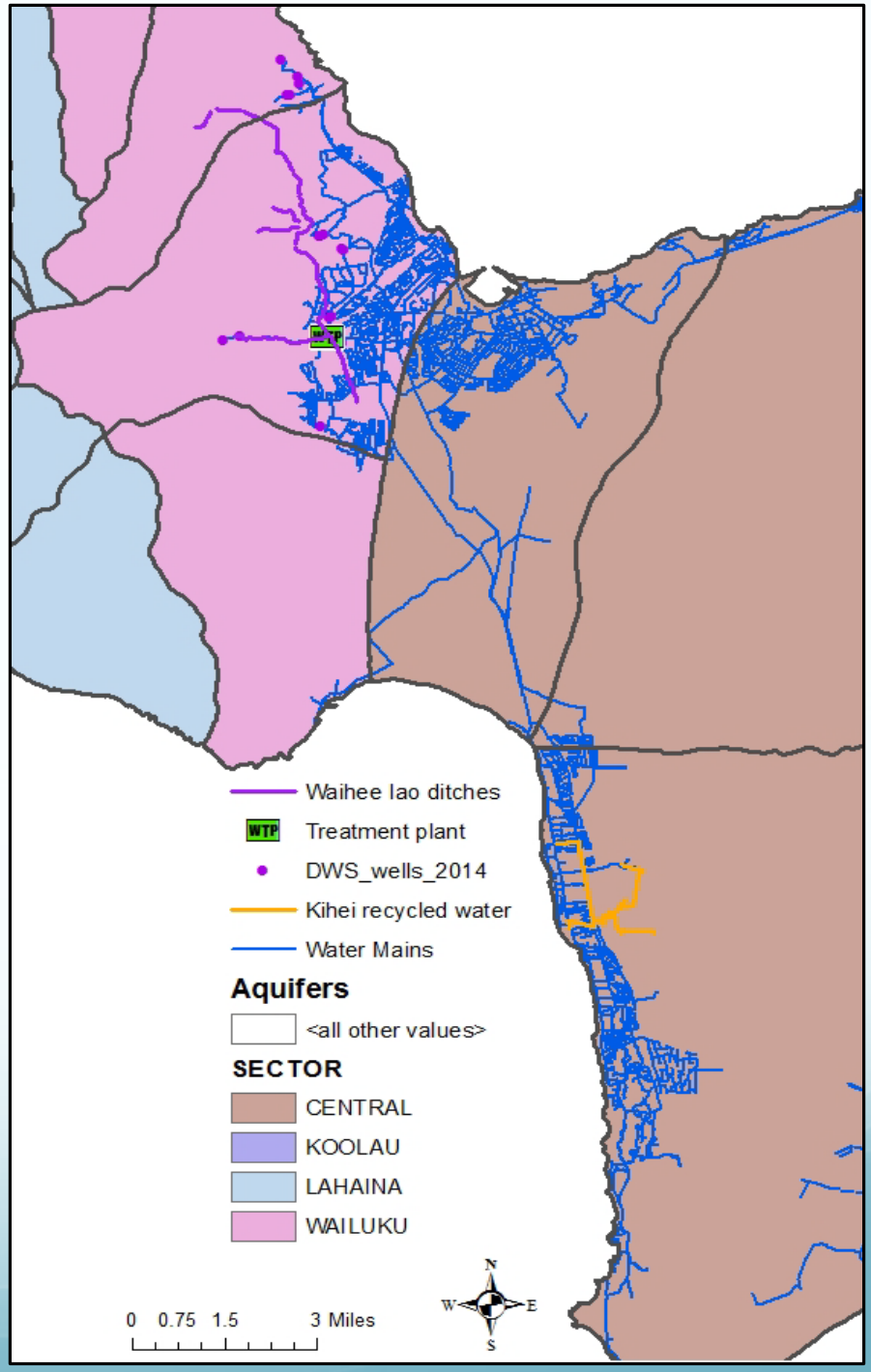


Aquifer System	Pumpage mgd	Pumpage as % of SY
Waikapū	0.000	0.0
`Iao	17.281	86.4
Waihe`e	3.480	43.5
Kahakuloa	0.000	0.0
Total	20.761	57.7

Surface Water	DOM	AG/ IRR	MUN	Total
Waikapū Stream	0.03	1.38	--	1.41
Wailuku River		10.49	0.99	11.48
Waiehu Stream		3.99	--	3.99
Waihee River		17.62	--	17.62
Total Diverted	0.03	33.48	0.99	34.49

Water Distribution

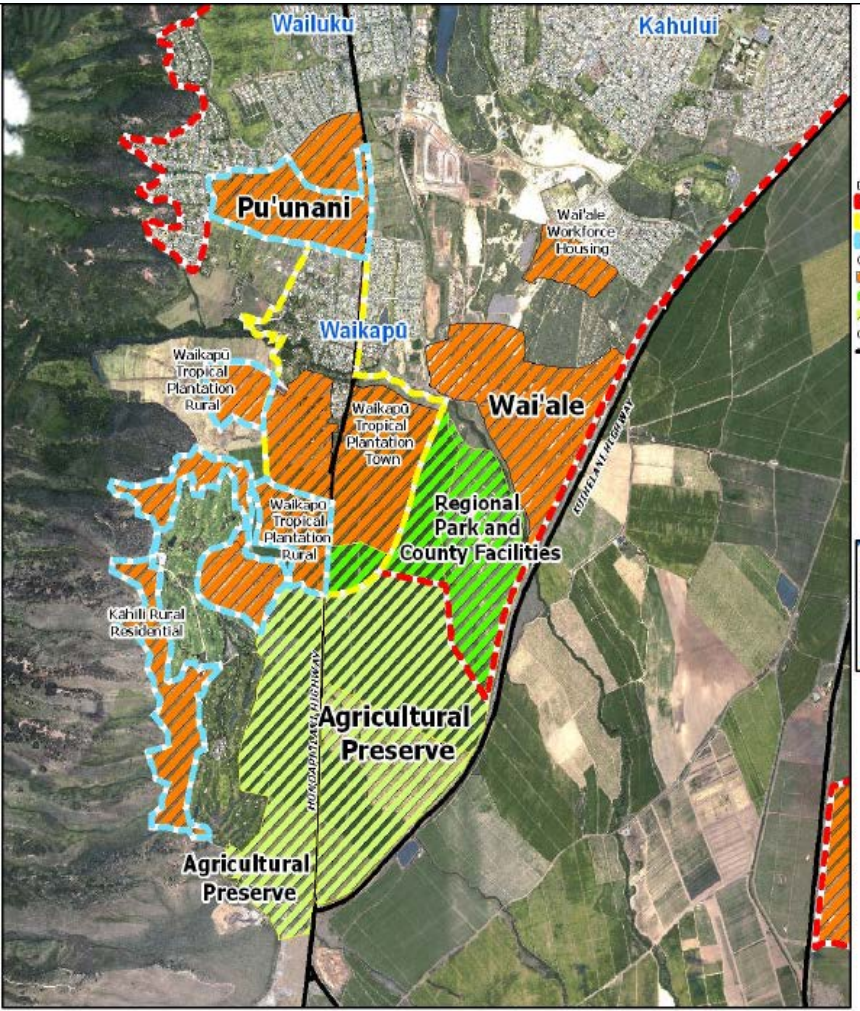
Wailuku ASEA Resource	Wailuku ASEA Discharge	Central ASEA Discharge	Total
Surface Water	15 - 17	16 - 18	34.5
Groundwater	5	15.7	20.7
Total:	25 - 27	31 – 33.7	55.2

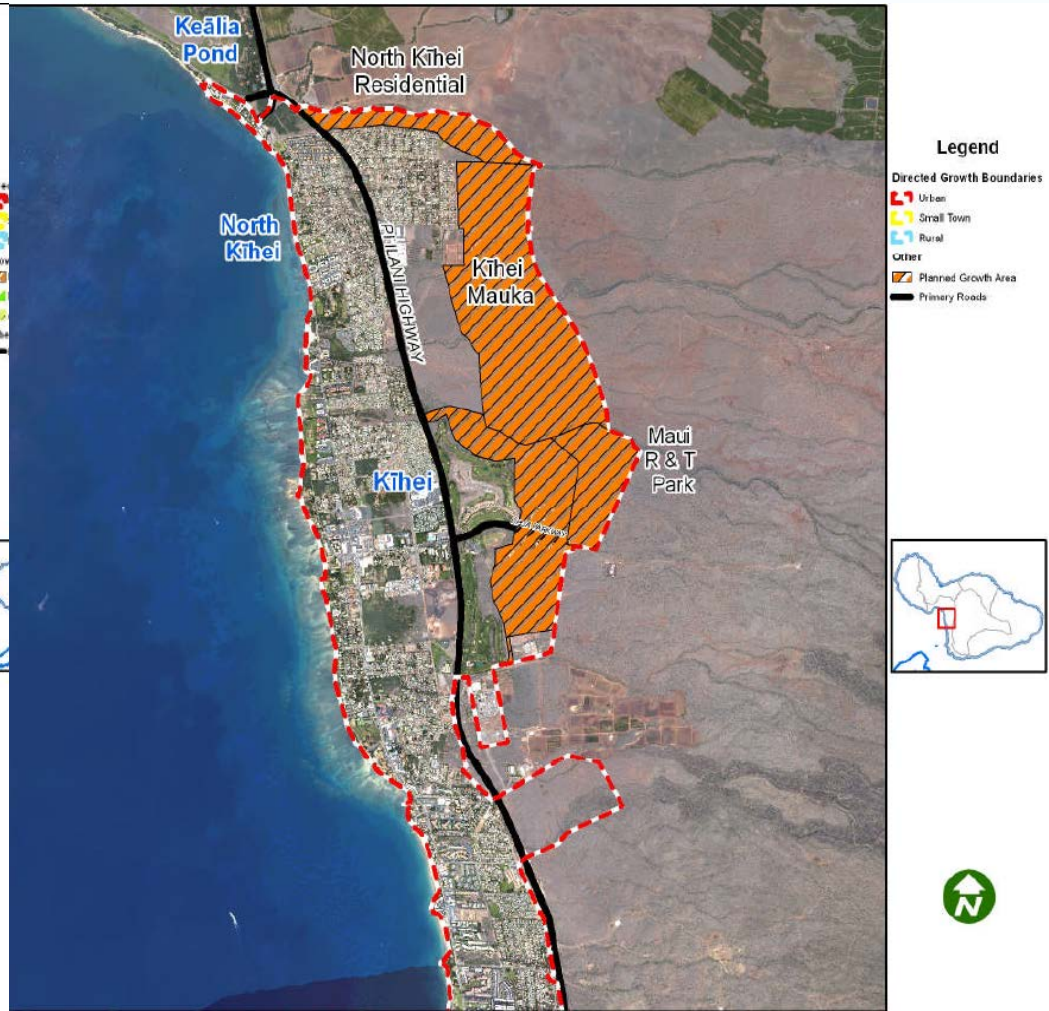


Projected Growth & Demand

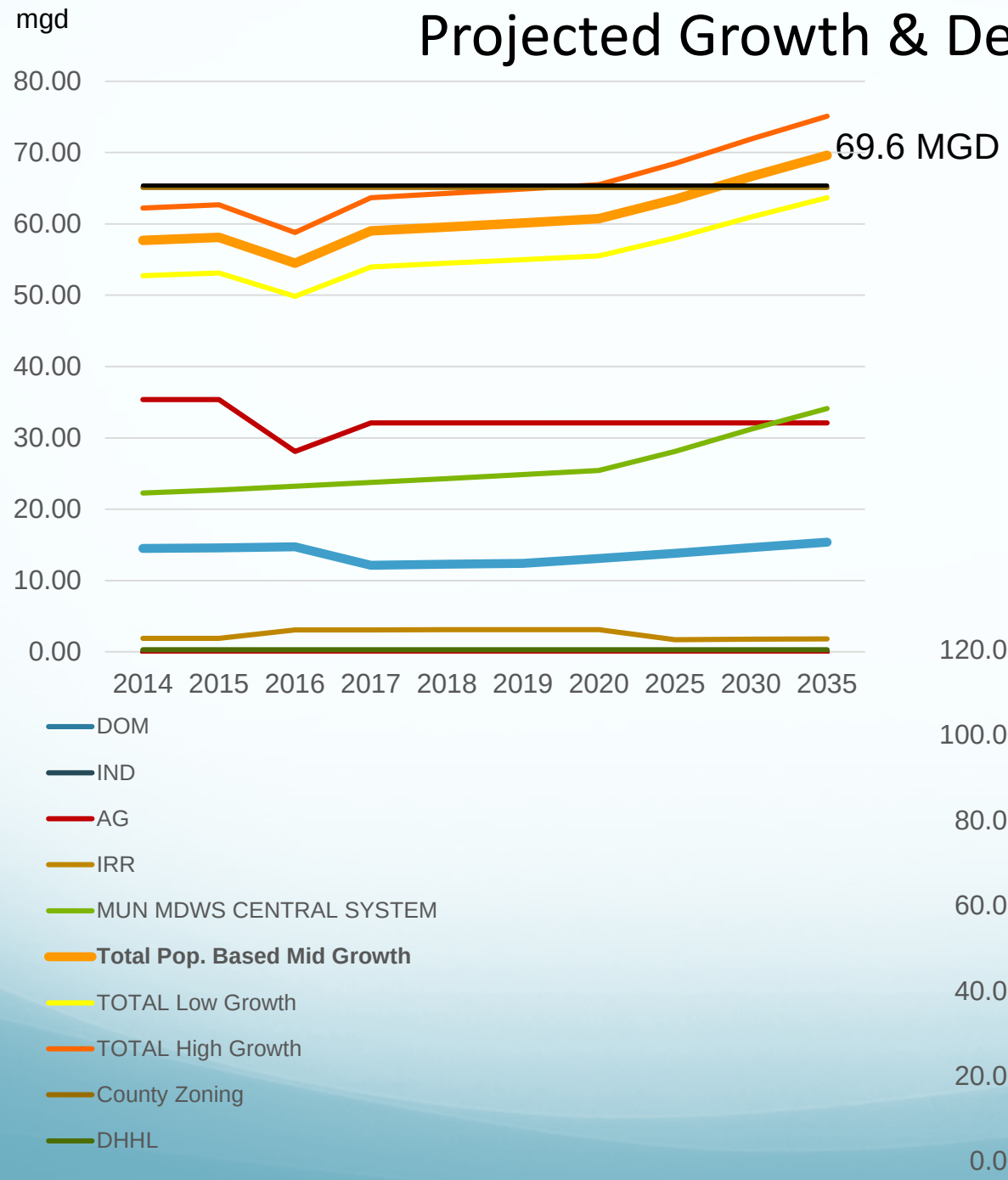
PLANNED GROWTH IN WAILUKU ASEA AND DWS CENTRAL SYSTEM

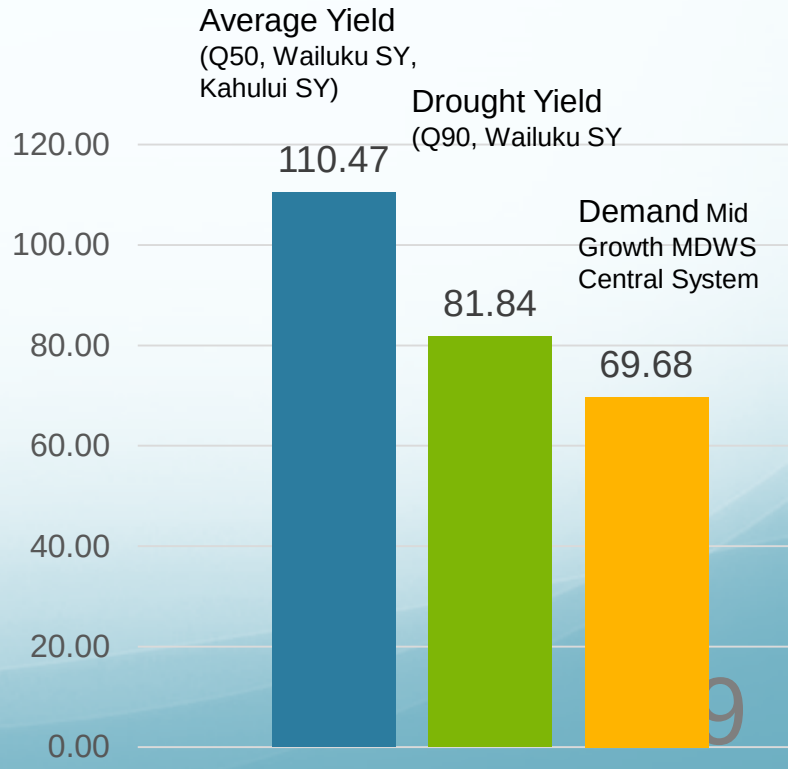
3,228 ACRES, 7787+ HOUSING UNITS: 9.6 – 11 MGD





Projected Growth & Demand





Water Resource Adequacy

Adequate long term resource supply to meet projected demand while maintaining watershed, stream and aquifer sustainability and replenishment

- **Groundwater** sustainable yield (SY) can serve municipal demand including DWS Central Maui System.
- **Kahakuloa** aquifer and stream development is not desirable
- **Surface water** under low flow conditions can generally meet recommended IIFS, domestic uses, Category 1 surface water use permits and water losses
- Category 2 and 3 permits may require backup and alternative resources during low flow conditions. (Adjust as needed when CWRM adopts decision)
- Potable and brackish quality water in **Kahului aquifer** is uncertain
- Remaining groundwater yield in **Kamaole aquifer** is uncertain
- **Recycled water** in Kihei (0.7 mgd) and Kahului (3 mgd) can offset potable water source
- **Conservation** measures can delay but not substitute source development needs

Source Development Needs

Aquifer System (Sustainable Yield)	2035 **Municipal & Domestic** supply (capacity)
Waikapū (3)	26.05
`Īao (20)	
Waihe`e (8)	
Kahakuloa (5)	0.00
Maui Lani Wells/ Kahului (1)	1.20
High Level Sources	1.89
Wailuku River/`Īao WTF	3.20
Nā Wai `Ehā	0.08
Unmet demand	-1.84
Total	**34.26**

34.26 mgd 2035 Municipal and Domestic Demand + Peak Factor 20% = 41.11 mgd

- 32.42 mgd Available Source Capacity

= **8.69 mgd Source Needed**

Selected Demand and Supply Strategies: Wailuku Aquifer Sector and DWS Central System

DEMAND (MGD)	2014	2035
MDWS Potable Wailuku and Central ASEA*	22.274	34.134
MDWS Potable export to Central ASEA	17.664	28.828
MDWS Potable Wailuku ASEA only	4.610	5.307
Total Potable:	22.274	34.134
Non-Potable (AG, IRR, DOM)	35.411	35.495
Other, Non-Potable (water losses)	2.730	2.730
Total Non-Potable	38.141	38.225
TOTAL DEMAND	**60.415**	**72.360**

"Develop groundwater within sustainable yield to provide for growth, maintaining a buffer to account for potential future drought impact and prospective adjustments in aquifers lacking hydrologic studies"

SUPPLY (MGD)	2014	2035
Potable Groundwater Wailuku ASEA	20.353	16.493
`Īao Aquifer GWMA	17.28	9.593
Waihe`e Aquifer	3.479	4.900
Waikapu Aquifer	0.000	2.000
Potable Groundwater Central ASEA/Kahului Aquifer/Maui Lani Wells	0.930	1.090
Non-Potable Groundwater	0.400	0.613
`Īao Aquifer GWMA	0.341	0.493
Waihe`e Aquifer	0.058	0.12
Potable surface water	0.990	3.200
Non-Potable surface water	36.161	36.032
Waikapu Stream	2.957	2.957
Wailuku River	5.438	3.228
Waiehu Stream	0.833	0.833
Waihe`e River	8.327	8.327
Na Wai Eha multiple sources	18.606	20.687
Recycled Water (South Maui MDWS Service Area)	1.580	2.280
Water Conservation (8% per capita)	0.000	4.651
Potable Groundwater Import Ko`olau ASEA/Ha`ikū Aquifer	0.000	8.000
TOTAL SUPPLY	**60.414**	**72.360**

Strategies

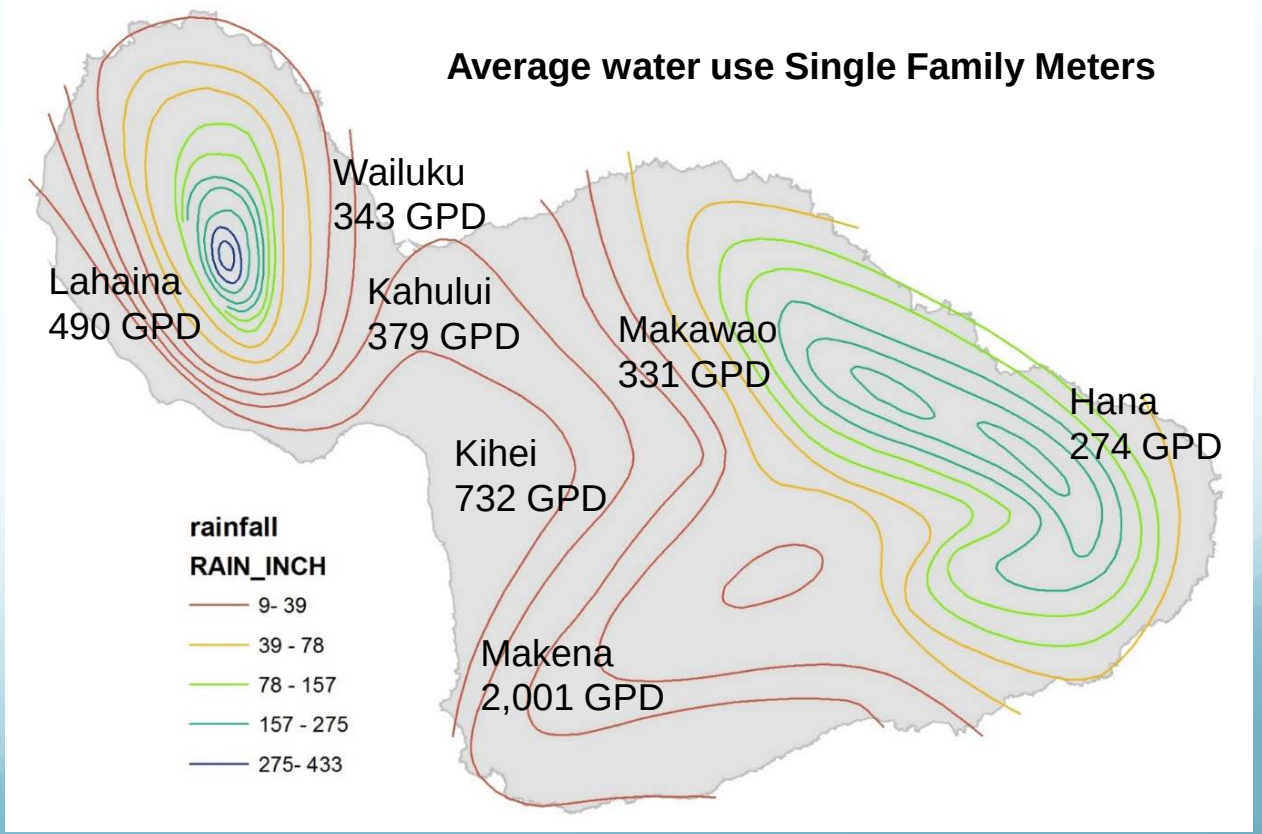
Strategy	Estimated Cost	Lead Agency
RESOURCE MANAGEMENT		
1. Continue Maui County financial support for watershed management partnerships' fencing and weed eradication efforts.	$1.1M to $1.7M - per year (from all funding sources)	MDWS Maui County
2. Establish a diverse working group to address alternative structures for future management of the watershed lands and sustained operations of the WWC ditch system	N/A	Aha Moku Hui O Na Wai Eha OHA Maui County WWC
CONVENTIONAL WATER SOURCE STRATEGIES		
3. Adapt pumpage of constructed wells in Waikapu aquifer with guidance from the 2015 USGS groundwater flow model results, when available	$4.25* /1,000 gallons	MDWS Waikapu Properties LLC USGS
4. Explore new basal well development in the southern portion of Waihee aquifer based on results of USGS groundwater model and best pumping scenarios. (Monitor impact on existing production wells and aquifer transition zone from development of Mendez wells)	N/A (costs only assessed for northern portion of aquifer)	MDWS
5. Continue exploration of East Maui well development in consideration of reliable capacity for planned growth areas, including the MDWS Central Maui System. Initiate a hydrologic study to determine any negative impact on existing ground and surface water sources, stream flow and influences from dikes.	$3.71*/1000 gallons	CWRM USGS MDWS

Strategies

Strategy	Estimated Cost	Lead Agency
6. Reduce non potable use of Wailuku aquifer sector basal and high level water to the extent feasible. Prioritize available recycled water and brackish water for non-potable uses where available in the Central aquifer sector.		CWRM MDWS MDEM MDP
7. Monitor outcome of the East Maui Streams contested case and final Instream Flow Standards, available ditch flow and water quality implications of blending the water source to determine benefits and viability of interconnecting the MDWS Central Maui and Upcountry systems.	N/A	MDWS
ALTERNATIVE WATER SOURCE STRATEGIES		
8. Expand distribution from the Kahului WWTF and the application for planned energy crops	$6.7M	MDEM HC&S
9. Identify private-public partnerships, state and federal funding sources to maximize utilization of recycled water produced at the Kihei WWTF and supplemental non-potable sources for seasonal use of R-1 water.	(Transmission South Kihei to Wailea $21M)	MDEM MDWS
10. Explore the Wai`ale Road Stormwater Drainage as potential to offset stream diversions associated with Spreckels and Waihe`e Ditches and supplement irrigation sources for agricultural water demands in Central Maui.	$10.0M	DPW DOA HC&S

Island Wide Conservation Strategies

10 – 15: Retrofits/direct installations, distribution of water-efficient fixtures, smart meter retrofits, landscaping and irrigation incentives, public education and recognition programs
16: Require high efficiency fixtures in all new construction. Develop a comprehensive water conservation ordinance to include xeriscaping regulations.
21 – 22: Require and/or incentives for water conserving design and landscaping in new development (xeriscaping/water efficient irrigation) and building design integrating alternative sources (greywater, catchment)



Implementation and Funding

- Recommendations provide guidance for land use and capital improvement program budgeting
- Implementing actions should be developed over the planning period for near term (1 – 5 years) and long-term (5 – 20 years) timeframes
- Conservation programs defer but don't replace costly investments
- Funding shared between state and county agencies, with greatest burden on DWS (water service fees, water system development fees, bond financing and State Revolving Fund loans)

Implementation – Performance Measures

Criteria	Planning Objectives							
	Sustainability Resources Streams Environment	**Ag**	**Equity DHHL Culture**	**Availability**	**Quality**	**Reliability**	**Efficiency Cost**	**Plan Viability Conformity**
Groundwater sustainable yield levels are maintained over time	X			X				X
Stream flows restored to level to support stream ecosystems	X		X	X				X
Watersheds protected from invasive animals and plants	X			X				
Interim flow standards adopted for watersheds	X		X					
Scientific studies for aquifer systems complete (support science-based SY)	X							
Water resources and water system use is based on aquifer recharge and stream flows under drought conditions	X		X		X	X		
Chloride levels in wells remain stable (salt water intrusion)	X	X		X	X	X	X	
Use of recycled water increased	X			X		X		
Graywater and catchment systems installed	X			X				
Infrastructure projects increase recycled water use and stormwater capture	X			X				
Watershed collaboration increased	X			X				X
Native Hawaiian community consultation process instituted			X					X
Per capita water use decreased	X			X		X	X	
MDWS prioritize DHHL needs over lower priority needs			X					

Approval Process