

Appendix 10: Generalized Assessment of Impacts of Preliminary Measures and Strategies on Traditional and Customary Practices of Native Hawaiians

See tracked changes to make it easier:

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|--|--|--|---|
| WATERSHED AND AQUIFER PROTECTION | | | |
| <p>1. Invasive alien plant control, ungulate (pigs, deer, etc.) control (fencing, etc.), reforestation. Implement via watershed partnership programs</p> <p>(DWS supports and funds programs. Leveraging state and private funding. Invasive plants and animals and ungulates disturb watershed resources and functions by displacing or removing native plants and animals, disturbing the soil, increasing runoff and sediment, and decreasing aquifer recharge potential)</p> | <p>Native Hawaiian rights include gathering (PASH): 1) invasive Polynesian canoe plants and other invasive non-native plant species used by cultural practitioners including trees, ferns, flowers, bark, branches, vines and fruit; 2) introduced and native animals used for food and cultural practices; and 3) native Hawaiian trees, ferns, flowers, bark, branches, vines and fruit.</p> | <p>1) Native Hawaiian gathering rights (PASH) are impacted by: 1) Eradicating or reducing invasive Polynesian canoe plants (kukui nut tree for example) and other invasive non-native plant species used by cultural practitioners including trees, ferns, flowers, bark, branches, vines and fruit; 2) Eradicating or reducing introduced animals used for food and cultural practices; and 3) fencing, which limits or prohibits native Hawaiian cultural practitioners from accessing areas to hunt and gather cultural resources, including stones (pohaku), and native and introduced plants and animals used for food and cultural practices.</p> <p>2) Native plant and tree reforestation enhances natural ecosystem health and increases underground fog drip flows, which helps support thriving</p> | <p>1) Per PASH court decision, native Hawaiians should be allowed gathering and access rights in areas where cultural resources exist. Incorporate gathering access points into watershed fencing.</p> <p>2) Fencing should be installed in remote areas inaccessible to hunters. This typically applies to higher elevation fencing above 3,000 feet but is not as easy to accomplish in the lower elevations.</p> <p>3) Obtain input from individuals and groups familiar with the areas fences are to be constructed.</p> <p>4) Fences and access points need to have signs posted that warn hunters that active feral</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|-------------------------------------|--|---|--|
| | | <p>native Hawaiian ecosystems from forests to reefs, thereby providing more abundant resources for native Hawaiian cultural practitioners.</p> <p>Based on discussions with East Maui residents in the EIS planning phase of the East Maui Watershed Fenceline, fences above the 3,000 foot elevation are unlikely to be encountered due to the fact animals are caught well before anyone needs to traverse higher up the mountain.</p> <p>Efforts to create a healthier eco-system through invasive species eradication benefit all water users.</p> | <p>ungulate animal control is in progress and that the area may be hazardous to dogs due to the control methods being employed, i.e. the use of tools and methods that may be fatal to pets and hunting dogs.</p> <p>5) State land above constructed fences in the forest reserves should have signage that indicates it remains classified as "public hunting," and hunters should still be permitted to enter the areas for subsistence purposes.</p> <p>6) Watershed programs and watershed plan development should incorporate advisors with expertise in native Hawaiian cultural practices.</p> <p>7) Support conservation land trusts, nonprofit organizations that undertake or assist in land or conservation easement acquisition or stewardship of land or easements.</p> <p>8) Strategy 2, expanding watershed protection to lower</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|--|---|--|
| | | | <p>elevations could foster productive environments to produce more cultural resources at lower elevations.</p> <p>9) Strategy 3, ahupua`a management, if it creates more connectivity and includes native Hawaiian access rights. Strategy 5, native Hawaiian consultations, are an opportunity to address gathering and use access.</p> |
| <p>2. Expand watershed protection to lower elevations</p> <p>(Programs now focus on higher elevations (3000+))</p> | <ol style="list-style-type: none"> 1) Native Hawaiian rights include gathering (PASH) - See Footnote 1. 2) Increased access to hunters may help control feral ungulate damage in the lowland native forests. | <ol style="list-style-type: none"> 1) Expanding watershed protection to lower elevations could foster productive environments to produce more of the resources available at higher elevations. 2) Expands invasive alien plant and ungulate control conflicts stated in Strategy 1 to lower elevations. 3) Expands reforestation benefits and potential conflicts in Strategy 1 to lower elevations. | <p>Same as Strategy 1 mitigations, applied to lower elevations.</p> |
| <p>3. Ahupua'a watershed-based planning and management approach</p> <p>(Ridge to ocean approach focused on stream systems)</p> | <p>Native Hawaiian rights include gathering (PASH) - See Footnote 1.</p> <p>Public Trust doctrine protections</p> <p>State Water Code protections</p> | <p>No adverse impacts. Ahupua`a management creates more connectivity and eco system health. Strategy supports PASH court decision and public trust doctrine.</p> | <p>No mitigation necessary. Indigenous resource management practices should be integrated with western management practices in each moku. Strategy can be strengthened by:</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|-------------------------------------|---|---|---|
| | <p data-bbox="688 342 1108 976">Native Hawaiian cultural rights also include protection under Hawaii State Constitution Article X1 Section 1: 'For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect Hawaii's natural beauty, and all natural resources, including land, water, air, minerals, and energy sources, and shall promote the development and utilization of these resources in a manner consistent with their conservation and in furtherance of the self-sufficiency of the state.</p> <p data-bbox="688 1016 1108 1227">All public natural resources are held in trust by the State for the benefit of the people." (Cite recent Na Wai Eha case as most recent application of this principle)</p> | | <p data-bbox="1633 342 2053 594">1) Support conservation land trusts, nonprofit organizations that undertake or assist in land or conservation easement acquisition or stewardship of land or easements.</p> <p data-bbox="1633 610 2053 984">2) Consult Native Hawaiian Groups, including 'Aha Moku Councils, to better understand traditional land management practices and assist with integration of those policies and techniques into current western management.</p> <p data-bbox="1633 1032 2053 1333">1)3) Prioritize Ahupua'a management practices of ecosystem health and mauka to makai connectivity, water for cultural uses, including taro cultivation, conservation, and regional use of water to achieve sustainability.</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|--|--|--|
| <p>4. Consultation with Native Hawaiian community and local experts on resource management</p> <p>(Water representative of each moku, advisory role and partnership)</p> | <p>Native Hawaiian rights include gathering (PASH) - See Footnote 1.</p> <p>Public Trust doctrine</p> <p>State Water Code</p> | <p>1) Due diligence consultation with native Hawaiian communities and expertise should include adopting recommended strategies and actions and have a positive impact upon the access to and management of natural resources used by cultural practitioners.</p> <p>2) –Competing resource utilization could occur as a result of expanding access to more practitioners, as a result of actions resulting from consultation.</p> | <p>No mitigation necessary. The consultation process should ensure diverse, holistic, and comprehensive consultation with the larger native Hawaiian community in addition to the aha mokus. Policies and strategies recommended by those being consulted should take priority when implementation is done.</p> |
| <p>5. Scientific studies to support decision making in tandem with local traditional Native Hawaiian empirical data and observations.</p> <p>(Study hydrogeologic and ecological conditions; increased monitoring)</p> | <p>Native Hawaiian rights impacted by ground or surface water use. Traditional generational Hawaiian knowledge of the area must be taken into consideration.</p> | <p>Improved understanding of ground and water resource benefits resource management and potentially improves understanding of impacts on native uses. Only relying upon scientific data and not historical traditional knowledge can lead to incorrect data capture.</p> | <p>No mitigation necessary Adopt policies to incorporate traditional Native Hawaiian knowledge of an area and combine with scientific studies.</p> |
| <p>6. Use drought conditions as baseline to evaluate water supply and effects of water use</p> <p>(Determine projections to use; may vary geographically.)</p> | <p>1) Auwai systems that travel great distances from the stream and do not return water to the stream.</p> <p>2) Native Hawaiian rights impacted by ground or surface water use during drought conditions.</p> | <p>No adverse impacts. 1) Using drought conditions as a baseline would be more protective over use of average conditions as presently occurs. Long-term hydrologic drought could impact sustainable yield of groundwater which is interconnected with surface water resources.</p> | <p>No mitigation necessary.</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|--|--|--|
| | | 2) If drought conditions were used as a baseline for IIFS or sustainable yield, if drought conditions do not supply sufficient flow to auwai's, if restrictions limit auwai use, or if certain auwai systems are deemed "non- instream uses," kalo growers and other native Hawaiian cultural crops could be impacted. | |
| <p>7. Quantify the impact of watershed management on groundwater recharge and distribute funding proportionally</p> <p>(Prioritize efforts by impact, expand funding from private purveyors, state and other beneficiaries.)</p> | Native Hawaiian rights include gathering (PASH) - See Footnote 1. | No adverse impacts. Quantifying the impact of groundwater recharge, which relates to base streamflow, can assist in monitoring whether programs that support healthy watershed conditions and accordingly cultural practices are beneficial. | No mitigation necessary. |
| <p>8. Improved ground and surface water resources and diversion monitoring by CWRM.</p> | | No adverse impacts. Improved monitoring supports effective protection of resources. | No mitigation necessary. Permit conditions to require system owner to install stream monitors, and allow access to the property to facilitate monitoring and enforcement. |
| <p>9. Restrict land uses with high risk of well contamination near drinking water wells</p> <p>(Proposed Wellhead Protection ordinance based on the capture zone of well)</p> | Traditional animal husbandry such as keeping pigs and goats. | Locations with traditional animal husbandry could be impacted by their proximity to groundwater resources and restrictions implemented to protect drinking water wells. http://co.maui.hi.us/222/Wellhead-Protection | 1) Ensure regulations do not prohibit non-commercial operations consistent with traditional and customary native Hawaiian rights. Allow |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|--|---|--|--|
| | | | limited numbers of animals in close proximity to wells. ¹ |
| <p>10. Protect and recharge ground water during non-drought periods to stabilize supply</p> <p>(Reduce pumping- increased surface water use after public trust uses are met, aggressive conservation and alternative sources)</p> | <p>Kuleana farmers dependent on auwai's and diversions grow kalo and other plants used by cultural practitioners.</p> | <p>Protection of groundwater resources which contributes to base streamflow is beneficial. Potential secondary impacts may occur relating to increased surface water use after public trust uses are met (Strategy 13).</p> | <p>1) Strategy 8, improved CWRM monitoring.</p> <p>2)</p> |
| <p>11. No new stream diversions for non-instream uses until interim flow standards are adopted.</p> <p>(Could extend to no new diversion or increased diversion)</p> | <p>Kuleana farmers dependent on auwai's and diversions grow kalo and other plants used by cultural practitioners. Auwai systems that travel great distances from the stream and do not return water to the stream.</p> | <p>No adverse impacts. Areas and resources used to gather will be expanded and return of base streamflow will facilitate native Hawaiian cultural practitioners by supporting a thriving native ecosystem that supports cultural practices with its abundance of resources produced.</p> | <p>No mitigation necessary.</p> |
| <p>12. Stream restoration- municipal and agricultural water returned to stream</p> <p>(Decrease municipal and agricultural use of streams)</p> | <p>1) Native Hawaiian gathering rights (PASH) - See Footnote 1.</p> <p>1)2) Public Trust Doctrine</p> <p>2)3) Agricultural water users who receive surface water and grow crops such as Polynesian</p> | <p>No adverse impacts. The intent of this strategy is to reduce diversion by large ag users and municipal users during low flow conditions.</p> <p>1) Native Hawaiian gathering rights (PASH) are positively impacted by</p> | <p>No mitigation necessary.</p> |

¹ Within the proposed regulated areas, the proposed Wellhead Protection Ordinance would allow the following located more than 50 feet from wells or well fields that supply public water systems: a lot or facility (other than an aquatic animal production facility) where animals will be stabled or confined and fed or maintained for a total of 45 days or more in any 12 month period, and where crops, vegetation forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility (excludes pasture).

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|-------------------------------------|---|---|--|
| | <p>canoe plants, non-native plant species, and native plants used by cultural practitioners.</p> <p>3)4) Increased streamflow facilitates Native Hawaiian cultural practitioners by supporting a thriving native ecosystem that supports cultural practices with its abundance of resources produced.</p> | <p>increased stream flows due to enhancing instream growth of: 1) invasive Polynesian canoe plants and other invasive non-native plant species used by cultural practitioners including trees, ferns, flowers, bark, branches, vines and fruit; 2) introduced animals used for food and cultural practices; and 3) native and introduced plants and animals used for food and cultural practices.</p> <p>2) Return of base streamflow generally facilitates native and non-native plant and animal life within the stream, thereby providing more abundant resources for native Hawaiian cultural practitioners.</p> <p>3) Cultural practitioners and resources along long-diverted streams may be affected by potential flooding associated with removal of diversions</p> <p>4) If base flows are returned to the streams and restrictions are placed upon lo`i kalo waters that are returned to the stream after use (i.e. not geographically removed due to</p> | |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|--|--|---|---|
| | | <p>auwai systems separated by distances from the stream); cultural practitioners may be affected. Alternatively, water pipes can be used to return water to the streams for those practitioners whose auwai systems move water significant distances from the stream.</p> <p>5) As the strategy is intended, cultural practitioners located in areas such as the Kula Agricultural Park that receive untreated agricultural water would not be negatively impacted.</p> | |
| CONVENTIONAL WATER SOURCE DEVELOPMENT | | | |
| <p>13. Increase use of surface water for municipal needs during wet season when all public trust uses are satisfied, including kuleana and traditional and cultural users.</p> <p>(Expand treatment facilities and obtain reservoirs. Permitting and dam liability issues.)</p> | <p>Agricultural water users who receive treated water through surface water sources and grow crops such as Polynesian canoe plants, native plants and non-native plant species used by cultural practitioners.</p> | <p>1) The measure proposes to use surface water <i>in excess</i> of the base flow necessary for kuleana and public trust uses and should therefore <i>not</i> impact native Hawaiian agricultural and traditional and customary uses.</p> <p>2) The measure may reduce water flowing to the ocean during the wet season, thereby affecting nearshore ecosystems and cultural resources.</p> | <p>1) Consider potential effects to nearshore ecosystems for areas potentially affected by reduced stream water prior to increased diversion.</p> <p>2) Strategy 8, improved CWRM monitoring.</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|---|---|--|
| <p>14. When IFS adopted protecting kuleana and instream uses, then support water transport for diversified ("sustainable") agriculture</p> <p>(Support diversified ag economy with low cost untreated source)</p> | <p><u>Native Hawaiian rights include gathering (PASH) State Water Code Public Trust Doctrine</u></p> <p><u>Diversified sustainable agriculture farming is non-commercial cultural agriculture, kalo and other nourishing foods cultivation, limu picking, fishing, and related activities.</u></p> <p><u>Other uses of water remove it from the eco-system and result in less water for protected rights.</u></p> <p>Diversified agriculture farming.</p> | <p>No adverse impacts. This is a policy statement indicating a priority for water transport for diversified ag over other nonpublic trust uses. Supports availability of water for Native Hawaiian diversified farming; provide low cost untreated source reducing dependence on potable water in some areas.</p> <p><u>Kanaka maoli rights are negatively affected when water is used for activities other than stream restoration and eco system recharge. Cultural practices and responsibility require an abundant stream connectivity and ocean near shore water environments. No adverse impacts. This is a policy statement indicating a priority for water transport for diversified ag over other nonpublic trust uses. Supports availability of water for Native Hawaiian diversified farming; provide low cost untreated source reducing dependence on potable water in some areas.</u></p> | <p>No mitigation necessary. Require full stream restoration prior to any new permits or uses allowed.</p> <p><u>Monitor water uses: survey kuleana users, require stream monitors and system upgrades, access for enforcement, and other policies.</u></p> <p><u>Kuleana input: establish a system for kuleana and local resident notification of well or diversion permits.</u></p> <p>No mitigation necessary.</p> |
| <p>15. Increase county oversight of well drilling in non-designated groundwater management areas</p> | <p>Kuleana and cultural uses in East Maui, Na Wai `Eha and West Maui.</p> | <p>The intent of this strategy is to increase the meaningful evaluation of and opportunity for input on wells in non-designated areas. It was suggested at community meetings that an early</p> | <p>This strategy should be redefined. Encourage CWRM to increase analysis of well permits, including spatial distribution and evaluation of well impacts on quantity and</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|---|---|--|
| (Holistic review including water quality, quantity and land use impact addressed before well construction permit issued) | | <p>process led by the County could assist in addressing the problem. CWRM well and pump permits are required for all wells, with notice provided on the CWRM website; any party may request to be placed on the notification list.</p> <ol style="list-style-type: none"> 1) Wells may adversely affect spring and other well water availability and quality. 2) Kuleana and cultural users reliant upon streams could be negatively affected by reduced base flows feeding streams and springs due to nearby wells with hydrogeological connections. | <p>quality of nearby water resources. Amendment to state law may be required to grant the County authority to undertake a large role in the well permit process.</p> <p>Require consultation with local Native Hawaiians as part of the oversight process.</p> <p>The County should affirm a commitment to exercise its ability to comment on all well permits, public and private, on behalf of cultural users and local communities.</p> |
| 16. Manage well development and operations to reduce seawater intrusion and chlorides | Native Hawaiian stream users. | No adverse impacts. Increased reliance on well water could translate into decreased reliance on surface water, positively impacting Native Hawaiian rights and resources. | No mitigation necessary. |
| 17. Ha`iku aquifer well development (Potential resource/medium-term; within sustainable yield. For regional use and transport to growth areas.) | Kuleana and cultural uses in East Maui. Native Hawaiian rights include gathering (PASH) State Water Code Public trust doctrine | Increased ground water withdrawal potentially negatively affecting streams and near shore ecosystems which decrease ability for Native Hawaiians to have adequate water for living and cultural practices. Reduction of transport from water abundant to dryer areas would | Ha`iku aquifer: Maintain buffer to sustainable yield pending IFS and Require USGS studies of the interaction between ground and surface water and potential impact from pumpage on stream flows prior to funding well development. <u>All well development:</u> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|--|---|---|---|
| | | maintain more water in the streams of wet areas which supports Native Hawaiian cultural and kuleana users who depend on surface water. | <ol style="list-style-type: none"> 1) Strategy 15, increase oversight of well distribution in non-designated groundwater management areas. 2) Strategy 5, scientific studies and traditional historical knowledge. 3) Strategy 8, improved CWRM monitoring. 4) Strategy 10, protect and recharge ground water during non-drought periods to stabilize supply. 5) Strategy 16, manage well development and operations to reduce seawater intrusion and chlorides. 6) Strategies 38-60, alternative water sources, conservation to reduce source development needs. |
| <p>18. Makawao aquifer basal well development at 1500 ft + elevation for growth and backup regionally</p> <p>(Aquifer not well studied. High elevation pumping costs)</p> | <p>No perennial streams west of Maliko; no known kuleana uses. Potential gathering and cultural uses. Kailua stream is a major cultural feature of the area.</p> | <ol style="list-style-type: none"> 1) Regional use of basal groundwater. 2) Reduction of transport from water abundant to dryer areas would maintain more water in the streams of wet areas which supports Native Hawaiian cultural | <p>Same as all well development mitigation for Measure 17.</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|--|---|---|--|
| | | and kuleana users who depend on surface water. | |
| <p>19. Waikapu Aquifer basal well development</p> <p>(Private wells drilled for available sustainable yield)</p> | <p>Kuleana and cultural uses in Na Wai `Eha.</p> <p>CWRM Na Wai Eha D&O prioritizes stream restoration and cultural uses over private domestic water uses.</p> | <p>1) Increased ground water withdrawal potentially affecting streams and near shore ecosystems.</p> <p>2) Reduction of transport from water abundant to dryer areas would maintain more water in the streams of wet areas which supports Native Hawaiian cultural and kuleana users who depend on surface water.</p> | <p>Same as all well development mitigation for Measure 17.</p> |
| <p>20. Waihe`e Aquifer basal well development</p> <p>(High capital cost, smaller wells for limited yield of N Waihe`e per USGS study)</p> | <p>Kuleana and cultural uses in Na Wai `Eha.</p> | <p>1) Increased ground water withdrawal potentially affecting streams and near shore ecosystems.</p> <p>2) Reduction of transport from water abundant to dryer areas would maintain more water in the streams of wet areas which supports Native Hawaiian cultural and kuleana users who depend on surface water.</p> | <p>Same as all well development mitigation for Measure 17.</p> |
| <p>21. High level well development (within sustainable yield)</p> <p>(Avoid transport between aquifer units)</p> | <p>Kuleana and cultural uses in East Maui and Na Wai `Eha.</p> | <p>Kuleana and cultural users of streams could be affected by reduced base flows primarily fed by high level water.</p> | <p>Same as all well development mitigation for Measure 17.</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|---|---|---|
| <p>22. Honopou, Waikamoi, Ke`anae basal well development</p> <p>(Extend transmission for medium elevation well development. Aquifers not studied, sustainable yield likely to be adjusted down)</p> | <p>Kuleana and Native Hawaiian cultural uses in East Maui.</p> | <p>Increased ground water withdrawal potentially affecting streams and nearshore ecosystems.</p> | <p>Same as all well development mitigation for Measure 17.</p> |
| <p>23. Kamaole Aquifer, basal well development</p> <p>(Brackish wells for non-potable uses for new development. Dual or private systems Brackish quality appropriate for irrigation, desal and other nonpotable uses. Reported pumpage incomplete to assess available sustainable yield)</p> | <p>Nearshore native Hawaiian cultural practitioners' resources.</p> | <p>Nearshore ecosystem could be affected by a potential reduction in freshwater mixing with seawater.</p> | <p>Same as all well development mitigation for Measure 17.</p> |
| <p>24. Honokowai aquifer well development (within sustainable yield)</p> <p>(Avoid transport between aquifer units; Honokowai may be close to sustainable yield)</p> | <p>Kuleana and cultural uses in West Maui.</p> | <ol style="list-style-type: none"> 1) Increased ground water withdrawal potentially affecting streams and nearshore ecosystems. 2) Reduction of transport from water abundant to dryer areas would maintain more water in the streams of wet areas which supports Native Hawaiian cultural and kuleana users who depend on surface water. | <p>Same as all well development mitigation for Measure 17.</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|--|--|--|--|
| <p>25. Honolulu aquifer well development (within sustainable yield)</p> <p>(Transmission to growth area within aquifer sector; optimize well/aquifer management)</p> | <p>Kuleana and cultural uses in West Maui.</p> | <p>1) Increased groundwater withdrawal potentially affecting streams and nearshore ecosystems.</p> <p>2) Reduction of transport from water abundant to dryer areas would maintain more water in the streams of wet areas which supports Native Hawaiian cultural and kuleana users who depend on surface water.</p> | <p>Same as all well development mitigation for Measure 17.</p> <p>Optimize well aquifer management and prioritize public facilities and affordable owner-occupied residential housing projects.</p> |
| <p>26. Launiupoko aquifer wells development (within sustainable yield)</p> <p>(Reduce demand on Honokowai aquifer- optimize well/aquifer management)</p> | <p>Kuleana and cultural uses in West Maui.</p> <p>Extreme water conflicts currently exist in Launiupoko aquifer over both streams and groundwater between cultural users and area subdivisions.</p> | <p>Increased ground water withdrawal potentially affecting streams and nearshore ecosystems.</p> | <p>Same as all well development mitigation for Measure 17.</p> |
| <p>27. Add raw surface water storage at Kamole, Olinda or Pi'iholo Water Treatment Facilities</p> <p>(IFS, EMI diversion permits, EMI contract, land and critical watershed issues)</p> | <p>1) Kuleana and native Hawaiian cultural uses due to continued diversions.</p> <p>2) Native Hawaiian rights including gathering (PASH) - See Footnote 1.</p> <p>3) IIFS's be established in 12 remaining East Maui streams and all Haiku streams. IIFS values must be enforced and adequately monitored, in</p> | <p>1) Kuleana and native Hawaiian cultural uses could be enhanced by reducing diversion and enhancing continuous streamflow due to increased storage capabilities.</p> <p>2) Native Hawaiian gathering rights (PASH) are impacted by reduced instream abundance of cultural resources: 1) Polynesian canoe plants and other invasive non-native plant species used by cultural</p> | <p>1) Strategy 10, protect and recharge ground water during non-drought periods to stabilize supply.</p> <p>2) Strategy 11, no new or increased stream diversions on East Maui streams for non-instream uses until interim flow standards are adopted.</p> <p>3) Strategy 14, when IFS adopted, protecting kuleana and</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|--|---|--|--|
| | accordance with the State Water Code. | practitioners including trees, ferns, flowers, bark, branches, vines and fruit; and 2) native and introduced plants and animals used for food and cultural practices. | instream uses, support water transport for diversified ("sustainable") agriculture. |
| <p>28. Increase capacity at 'Iao Water Treatment Facility for wet season use</p> <p>(Appurtenant rights, water use permits)</p> | <p>1) Kuleana and native Hawaiian cultural uses due to continued diversion.</p> <p>2) Native Hawaiian rights including gathering (PASH) - See Footnote 1.</p> | <p>Native Hawaiian gathering rights (PASH) are impacted by reduced instream abundance of cultural resources: 1) Polynesian canoe plants and other invasive non-native plant species used by cultural practitioners including trees, ferns, flowers, bark, branches, vines and fruit; and 2) native and introduced plants and animals used for food and cultural practices.</p> | <p>Same as mitigation for Measure 28.</p> |
| <p>29. Increase capacity at Kamole Water Treatment Facility for wet season use</p> <p>(Flow characteristics of Wailoa Ditch and intake structure configuration, IFS, EMI diversion permits, EMI contract)</p> <p>(Discussions should include modifications of EMI contracts to reflect 21st century water policies, or transition to a publicly-managed East Maui system)</p> | <p>1) Kuleana and native Hawaiian cultural uses due to continued diversion.</p> <p>2) Native Hawaiian rights including gathering (PASH) - See Footnote 1.</p> | <p>Native Hawaiian gathering rights (PASH) are impacted by reduced instream abundance of cultural resources: 1) Polynesian canoe plants and other invasive non-native plant species used by cultural practitioners including trees, ferns, flowers, bark, branches, vines and fruit; and 2) native and introduced plants and animals used for food and cultural practices.</p> | <p>Same as mitigation for Measure 28.</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|--|--|--|
| <p>30. Connect Kamole WTF to Central Maui System</p> | <p>1) Kuleana and native Hawaiian cultural uses due to continued diversion.</p> <p>2) Native Hawaiian rights including gathering (PASH) - See Footnote 1.</p> <p>2) 3) This would contradict the strategic goals to have more ahupua'a-based water management. Further discussion is required to reach a sustainable balance.</p> | <p>Native Hawaiian gathering rights (PASH) are impacted by reduced instream abundance of cultural resources: 1) Polynesian canoe plants and other invasive non-native plant species used by cultural practitioners including trees, ferns, flowers, bark, branches, vines and fruit; and 2) native and introduced plants and animals used for food and cultural practices.</p> | <p>Same as mitigation for Measure 28.</p> |
| <p>31. Expand Mahinahina WTF</p> <p>(Obtain MLP reservoirs; upfront costs, being sure to abide by Honokōhau IIFS)</p> | <p>1) Kuleana and native Hawaiian cultural uses due to continued diversion.</p> <p>2) Native Hawaiian rights including gathering (PASH) - See Footnote 1.</p> | <p>Native Hawaiian gathering rights (PASH) are impacted by reduced instream abundance of cultural resources: 1) Polynesian canoe plants and other invasive non-native plant species used by cultural practitioners including trees, ferns, flowers, bark, branches, vines and fruit; and 2) native and introduced plants and animals used for food and cultural practices.</p> | <p>Same as mitigation for Measure 28.</p> |
| <p>INCREASE WATER SYSTEM RELIABILITY & FLEXIBILITY</p> | | | |
| <p>32. Develop and maintain back-up wells even if more expensive</p> | <p>Kuleana and cultural uses in East Maui and Na Wai `Eha.</p> | <p>No adverse impacts. Kuleana and cultural uses in East Maui and Na Wai `Eha could be enhanced by others' reduction in dependence on surface water use.</p> | <p>Same as mitigation for Measure 17.</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|--|--|--|--|
| <p>(Drought, equipment failure, chlorides or other source or supply problems. Avoid use restrictions)</p> <p>(Also consider and discuss the alternative of utilizing existing private wells with unused capacity during drought emergencies by mutual agreement of the parties)</p> | | | |
| <p>33. Develop wells for increased reliable source Upcountry (reduce surface water transport)</p> <p>(Drought, equipment failure, chlorides or other source or supply problems. Avoid use restrictions and mitigate stream use in dry season)</p> <p>(Well locations should be discussed as part of ongoing communications with stakeholders, including Hawaiian groups)</p> | <p>East Maui Native Hawaiian cultural practitioners' resources.</p> | <p>Potential decreased use of surface water resulting in less transport.</p> | <p>Same as mitigation for Measure 17.</p> |
| <p>34. Diversify to the most cost-effective combination of groundwater, surface water, and aggressive conservation</p> <p>(Policy statement. Some temporary cutbacks acceptable in situations of drought/equipment failure)</p> | <p>Kuleana and cultural uses in East Maui and Na Wai `Eha.</p> | <p>Kuleana and cultural uses in East Maui and Na Wai `Eha could be affected if surface water is deemed more cost-effective and is not returned to the streams.</p> | <p>Same as mitigation for Measure 17.</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|---|--|---|
| <p>35. Require private public systems to develop in a manner facilitating potential interconnection with Maui DWS systems or integrated management</p> <p>(Amend County Code; increase costs of private systems)</p> | --- | No adverse impacts. Policy statement. | No mitigation necessary. |
| <p>36. Increase connection between Maui DWS subdistricts</p> | Kuleana and cultural uses in East and West Maui and Na Wai `Eha. | <p>1) Increased connection which facilitates development may result in increased use of water resources, including surface water, affecting kuleana and cultural uses.</p> <p>2) Increased connection which improves efficiency of use may result in decreased use of water resources.</p> | <p>1) Strategy 11, no new or increased stream diversions for non-instream uses until interim flow standards are adopted.</p> <p>2) Strategy 13, increase use of surface water for municipal needs during wet season when all public trust uses are satisfied, including kuleana and traditional and cultural users.</p> |
| <p>37. Expand capacity of Water Treatment Plants for seasonal use</p> | Kuleana and cultural uses in East and West Maui and Na Wai `Eha. | Kuleana and cultural uses could be affected if surface water use increases. | <p>1) Strategy 11, no new or increased stream diversions for non-instream uses until interim flow standards are adopted.</p> <p>2) Strategy 13, increase use of surface water for municipal needs during wet season when all public trust uses are satisfied, including kuleana and traditional and cultural users.</p> |
| INCREASE ALTERNATIVE RESOURCES | | | |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|--|---|--|---|
| <p>38. Maximize R-1 reclaimed wastewater system capacity and use</p> <p>(Limited supply, relatively high cost, less reliable. Minimize underground injection)</p> | <p>Nearshore native Hawaiian cultural practitioners' resources.</p> | <p>More R-1 production could decrease use of surface water, but use of injection wells may potentially increase pollution impacts to nearshore water resources of native Hawaiian cultural practitioners. Increasing the use of R-1 water, rather than injection, should reduce impacts.</p> | <ol style="list-style-type: none"> 1) Obtain and conform to NPDES permit requirements addressing discharges (injection). 2) Offset injection by maximizing beneficial use of excess recycled water (e.g., expand use requirements, land application, potential to treat to drinking water standards, etc.). |
| <p>39. Expand requirement for commercial properties within 100 feet of reclaimed water system to connect and use R-1 water for landscape irrigation</p> <p>(Amend Maui County Code, Chapter 20.30- requires connection within 100 feet)</p> | <p>Nearshore native Hawaiian cultural practitioners' resources.</p> | <p>More R-1 production and use could decrease use of surface water, but use of injection wells may potentially increase pollution impacts to nearshore water resources of native Hawaiian cultural practitioners. Expanding requirements for use of R-1 water will reduce injection.</p> | <ol style="list-style-type: none"> 1) Obtain and conform to NPDES permit requirements addressing discharges (related to injection). 2) In addition to increasing use requirements, offset injection by maximizing beneficial use of excess recycled water (e.g., land application, potential to treat to drinking water standards, etc.). |
| <p>40. Expand R-2 Kahului Wastewater Treatment Facility distribution and/or upgrade to R-1</p> <p>(Upgrade to R-1 needed, limited service areas)</p> | <p>Nearshore native Hawaiian cultural practitioners' resources.</p> | <p>More recycled water production and use could decrease use of surface water on Central isthmus, but use of injection wells may potentially increase pollution impacts to nearshore water</p> | <p>Same as mitigation for Strategy 38.</p> |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|--|---|--|---|
| | | resources of native Hawaiian cultural practitioners. | |
| <p>41. Expand R-1 system from Kihei Wastewater Treatment Facility</p> <p>(Committed service connections in dry season use leaves 0.7 mgd unused capacity. Restricted nonpotable uses)</p> | Nearshore native Hawaiian cultural practitioners' resources. | More R-1 production and use could decrease use of surface water, but use of injection wells may potentially increase pollution impacts to nearshore water resources of native Hawaiian cultural practitioners. | Same as mitigation for Strategy 38. |
| <p>42. Implement R-1 expansion from Mahinahina Wastewater Treatment Facility</p> <p>(Offset potable water use)</p> | Nearshore native Hawaiian cultural practitioners' resources. | More R-1 production and use could decrease use of surface water, but use of injection wells may potentially increase pollution impacts to nearshore water resources of native Hawaiian cultural practitioners. | Same as mitigation for Strategy 38. |
| <p>43. Program to use small greywater systems for small residential/commercial</p> <p>(Amend State and possibly County regulations)</p> | -- | No adverse impacts. Positive impacts may occur if resulting in reduced ground and surface water use and transport. | No mitigation necessary. |
| <p>44. Incentives for residential/small commercial catchment systems</p> <p>(Roof, tank, underground storage systems can be used for landscape water use. Water quality issues)</p> | -- | No adverse impacts. Positive impacts may occur if resulting in reduced ground and surface water use and transport. | No mitigation necessary. |
| <p>45. Low impact project design for onsite water retention</p> | -- | No adverse impacts. Positive impacts may occur if resulting in reduced ground and surface water use and transport. | No mitigation necessary. |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|---|--|---|
| (Permeable surfaces, etc. Amend County code. Cost effective) | | | |
| <p>46. Desalination of brackish or sea water for agricultural irrigation</p> <p>(Energy costs. Disposal of brine)</p> | Kuleana and cultural uses in East and West Maui and Na Wai `Eha. | <p>1) Potential pollution impacts from brine disposal to nearshore water resources of native Hawaiian cultural practitioners.</p> <p>2) Positive impacts may occur if kuleana and cultural uses have access to more water due to decreased surface water use and reduced transport of surface water.</p> | Obtain and conform to NPDES permit requirements addressing discharges (brine). |
| <p>47. Maintain/manage plantation ditch systems for continued potable and non-potable water conveyance</p> <p>(Invest in existing systems, resolve ownership, management issues)</p> | Kuleana and cultural uses in East and West Maui and Na Wai `Eha. | <p>1) Continued use of ditch systems perpetuates transport of surface water (and limited groundwater).</p> <p>2) Continued use of ditch systems facilitates conveyance to some to kuleana and cultural uses.</p> | <p>1) Strategy 11, no new or increased stream diversions for non-instream uses until interim flow standards are adopted.</p> <p>2) Strategy 13, increase use of surface water for municipal needs during wet season when all public trust uses are satisfied, including kuleana and traditional and cultural users.</p> |
| <p>48. Stormwater reuse</p> <p>(Capture flash supply as raw water storage for treatment or utilize reservoirs to store irrigation supply for diverse ag)</p> | Kuleana and cultural uses in East and West Maui and Na Wai `Eha. | <p>1) Positive impacts may occur if kuleana and cultural uses have access to more water due to decreased surface water use and reduced transport of surface water.</p> <p>2) Reductions in nonpoint flow to the ocean serving nearshore resources</p> | Ensure capture limited to flash supply without impacts to streamflow or nearshore resources. |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|--|--|--|
| | | would be mitigated by capturing only 'flash' stormwater. | |
| INCREASE CONSERVATION | | | |
| <p>49. WaterSense (water efficiency) standard for new development and existing retrofits</p> <p>(Amend County code. 20%-30% more water efficient than standard)</p> | Kuleana and cultural uses in East Maui and Na Wai `Eha, and West Maui. | No adverse impacts. Kuleana and cultural uses could be enhanced by a reduction in dependence on surface water use through conservation. | No mitigation necessary. |
| <p>50. Retrofit programs for existing development</p> <p>(Rebate, retrofit, give-away programs for residential and small commercial uses)</p> | Kuleana and cultural uses in East Maui and Na Wai `Eha, and West Maui. | No adverse impacts. Kuleana and cultural uses could be enhanced by a reduction in dependence on surface water use through conservation. | No mitigation necessary. |
| <p>51. Outdoor water wasting and use controls</p> <p>(Amend County code, disallow overspray, washing without hose nozzle, etc.)</p> | Kuleana and cultural uses in East Maui and Na Wai Eha, and West Maui. | No adverse impacts. Kuleana and cultural uses could be enhanced by a reduction in dependence on surface water use through conservation. | No mitigation necessary. |
| <p>52. Water conserving landscape requirements for resorts, golf courses, public facilities</p> <p>(Amend County code and adjust rates and fees to set standard)</p> | <p>Kuleana and cultural uses in East Maui and Na Wai Eha, and West Maui.</p> <p>Current allocation of water to resorts is much higher those for cultural and residential use and</p> | <p>No adverse impacts.</p> <p>1) Kuleana and cultural uses in could be enhanced by a reduction in dependence on surface water use through conservation.</p> <p>2) Nearshore water cultural resources may benefit from better</p> | No mitigation necessary. |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|--|---|--|
| | reduce water available for all other uses. | water/nutrient management practices. | |
| <p>53. Incentive programs to convert existing landscape to water conserving</p> <p>(Turf removal programs for example)</p> | Kuleana and cultural uses in East Maui and Na Wai Eha, and West Maui. | No adverse impacts. Beneficial impacts same as Measure 52. | No mitigation necessary. |
| <p>54. Require climate adapted plants for large new developments</p> | Kuleana and cultural uses in East Maui and Na Wai Eha, and West Maui. | No adverse impacts. Beneficial impacts same as Measure 52. | No mitigation necessary. |
| <p>55. Require aggressive conservation in new development in all areas</p> <p>(Craft program to carry out policy)</p> | Kuleana and cultural uses in East Maui and Na Wai Eha, and West Maui. | No adverse impacts. Beneficial impacts same as Measure 52. | No mitigation necessary. |
| <p>56. More aggressive landscape water conservation measures in dry areas than wet areas</p> <p>(Some standards or programs vary geographically)</p> | Kuleana and cultural uses in East Maui and Na Wai Eha, and West Maui. | No adverse impacts. Beneficial impacts same as Measure 52. | No mitigation necessary. |
| <p>57. Pursue a policy of aggressive water conservation at all times (not just during drought)</p> <p>(Craft program to carry out policy)</p> | Kuleana and cultural uses in East Maui and Na Wai Eha, and West Maui. | No adverse impacts. Beneficial impacts same as Measure 52. | No mitigation necessary. |
| <p>58. Use water rates as means to encourage conservation</p> | Kuleana and cultural uses in East Maui and Na Wai Eha, and West Maui. | No adverse impacts. Beneficial impacts same as Measure 52. | No mitigation necessary. |

| Preliminary Measures and Strategies | Extent to which traditional and customary native Hawaiian rights are exercised in the area which may be affected | Extent to which those resources and rights will be affected or impaired by the proposed measure | Feasible action to be taken to reasonably protect native Hawaiian cultural resources if they are found to exist. |
|---|---|--|---|
| (Tiered pricing can have this effect; equity is an issue) | | | |
| 59. Surface water efficiency programs (Improvements to diversions, conveyances, storage, meters to reduce loss) | Kuleana and cultural uses in East Maui and Na Wai Eha, and West Maui. | No adverse impacts. Beneficial impacts same as Measure 52. | No mitigation necessary. |
| 60. Reduce water loss of potable and nonpotable systems | Kuleana and cultural uses in East Maui and Na Wai Eha, and West Maui. | No adverse impacts. Beneficial impacts same as Measure 52. | No mitigation necessary. |

Notes:

1. Native Hawaiian rights include gathering (PASH): A) invasive Polynesian canoe plants (e.g. kukui nut tree) and other invasive non-native plant species used by cultural practitioners including trees, ferns, flowers, bark, branches, vines and fruit; B) introduced and native animals used for food and cultural practices; and C) native Hawaiian trees, ferns, flowers, bark, branches, vines and fruit.
2. Existing tools and processes to protect water resources and Native Hawaiian rights and resources are not stated here such as monitoring permit applications and proceedings, public access preservation, conservation land trusts, and other actions. For example, CWRM provides information on its website regarding permitting and notification of public notices, and its staff can be apprised of well use and diversion issues, and the Hawai'i State Ombudsman may be consulted on actions that may potentially affect or harm Native Hawaiian traditional and customary rights or practices.
3. Increased conservation, use of alternative sources (Strategies 39-61) reduce impacts to ground and surface water resources and are therefore generally applicable to a number of strategies. However these strategies are not always referenced as mitigation.

Prepared by County of Maui Department of Water Supply, Water Resources and Planning Division

Table 13-1 Summary of Recommended Strategies

Yellow indicates areas with Appendix 10 strategies.

Blue indicates strategies based on Aha Moku input.

Purple indicates strategies based upon community input.

Document to be renumbered after committee review

| STRATEGY | | PLANNING OBJECTIVES | ESTIMATED COST | IMPLEMENTATION | |
|-----------------------------|---|--|--|--|-------------|
| | | | | 1: Short-term 1 – 5 years 2: Long-term 5 – 20 years | |
| | | | | AGENCY* | TIME-FRAME* |
| RESOURCE MANAGEMENT | | | | | |
| Watershed Management | | | | | |
| 1. | Continue Maui County financial support for watershed management partnerships' fencing, alien plant control (A 10. Strategy 1) and weed eradication efforts. | Maintain sustainable resources Protect water resources Protect and restore streams | \$2 million per year/\$8 per watershed acre (249,362 ac) | MDWS Maui County | 1 |
| 2. | Promote increased distribution of funding for watershed protection and active reforestation to reflect multiple values and ecosystem services. | Maintain sustainable resources Protect water resources Protect and restore streams | N/A | Private water purveyors Land owners DLNR | 1 |
| A10 Strat 2 | Expand watershed protection to lower elevations below 3,000 feet with financial support from Maui County and other private grant sources. | Maintain sustainable resources Protect water resources Protect and restore streams | Need data | MDWS Maui County Land owners DLNR | 1 |
| 3. | Expand watershed protection to incorporate the ahupua`a as a whole and utilize ahupua`a resource management practices. | Maintain sustainable resources Protect water resources Protect and restore streams Protect cultural resources | N/A | Public-private partnerships Aha Moku DLNR Maui County | 1 |
| 4. | Support stream restoration in all county testimony to state agencies and court briefs and increased use of kalo lands. (Add per Aha Moku) | Maintain sustainable resources Protect water resources Protect and restore streams | N/A Lo`i restoration projects can start from \$50,000. Site specific | CWRM Aha Moku Community grassroots Maui County | 1 |

| | | | | | |
|--------|--|---|--|---|---|
| | | Protect cultural resources Minimize adverse environmental impact | | | |
| 5. | <p>Enable and assist in providing for Native Hawaiian water rights and cultural and traditional uses through active consultation and participation.</p> <p>Add per Aha Moku: The County shall advocate for public water trust uses, including kuleana use, cultural usage, stream restoration when providing testimony to state agencies or court briefs in addition to supporting domestic uses.</p> | Protect and restore streams Protect cultural resources | N/A | CWRM Mayor's office Maui County Corporation Counsel | 1 |
| A10 #4 | <p>Consultation with Native Hawaiian community, including kanaka maoli, and local experts on resource management.</p> <p>Establish water representative of each Moku, create advisory role, and a partnership.</p> | Maintain sustainable resources Protect water resources Minimize adverse environmental impacts | N/A Policies and strategies recommended by those being consulted should take priority during plan implementation. | MDWS Council Aha Moku | 1 |
| A10 #5 | <p>Use scientific studies to support decision making in tandem with local traditional Native Hawaiian empirical data and observations.</p> <p>Study hydrogeologic and ecological conditions and increase monitoring to create timely and more accurate data for decision making.</p> | Maintain sustainable resources Protect water resources Minimize adverse environmental impacts | N/A Adopt policies to incorporate traditional Native Hawaiian knowledge of an area and combine with scientific studies. | MDWS Council Aha Moku USGS | 1 |
| A10 #6 | Use drought conditions as baseline to evaluate water supply and effects of water use | Maintain sustainable resources Protect water resources Minimize adverse environmental impacts | N/A | MDWS | 1 |
| A10 #7 | Quantify the impact of watershed management on groundwater recharge and | Maintain sustainable resources Protect water resources | Need data on costs | MDWS | 1 |

| | | | | | |
|----------------|---|--|---|--------------------------------|---|
| | <p>distribute funding proportionately.</p> <p>Prioritize efforts by impact, expand funding from private purveyors, state and other beneficiaries</p> | | | | |
| A10 #8 | <p>Improve ground water and surface water resources and diversion monitoring by CWRM</p> <p>Add: Encourage CWRM to enforce. Provide stream monitoring gauges for streams. Act as ombudsman for stream users who report non-compliance.</p> | <p>Maintain sustainable resources</p> <p>Protect water resources</p> | <p>N/A</p> <p>Adopt water permit condition and policies that require system owners to install stream monitors and allow access to the property to facilitate monitoring and stream standards enforcement.</p> | <p>MDWS</p> <p>Maui County</p> | 1 |
| A10 #9 | <p>Restrict land uses with high risk of well contamination near drinking wells</p> <p>Note: Within the proposed regulated areas, the proposed Wellhead Protection Ordinance would allow the following located more than 50 feet from wells or well fields that supply public water systems: a lot or facility (other than an aquatic animal production facility) where animals will be stabled or confined and fed or maintained for a total of 45 days or more in any 12 month period, and where crops, vegetation forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility (excludes pasture).</p> | <p>Protect water resources</p> <p>Minimize adverse environmental impacts</p> | <p>N/A</p> <p>Develop and adopt well head protection ordinance</p> | <p>Council</p> | 1 |
| A10 #10 | <p>Protect and recharge ground water during non-drought periods to stabilize supply</p> <p>Reduce pumping- increased surface water use after public trust uses are met, aggressive</p> | <p>Maintain sustainable resources</p> <p>Protect water resources</p> <p>Minimize adverse environmental impacts</p> | <p>N/A</p> | <p>MDWS</p> | 1 |

| | | | | | |
|----------------|--|---|--|---|-----|
| | conservation and alternative sources. | | | | |
| A10 #11 | No new stream diversions for non-instream uses until interim flow standards are adopted. (Could extend to no new diversion or increased diversion) | Maintain sustainable resources Protect water resources Minimize adverse environmental impacts | N/A | MDWS CWRM BLNR | 1 |
| A10 #12 | Stream restoration- municipal and agricultural water returned to stream <u>as much as is practical</u> . (Decrease municipal and agricultural use of streams) | Maintain sustainable resources Protect water resources Minimize adverse environmental impacts | N/A | MDWS CWRM | 1 |
| A10 #13 | Increase use of surface water for municipal affordable housing needs during wet season when all public trust uses are satisfied, including kuleana and traditional and cultural users. (Expand treatment facilities and obtain reservoirs. Permitting and dam liability issues.) | Manage water equitably Reflect Mayor’s policy and upcoming codification of water allocation for additional municipal water allocation based on Na Wai Eha CWRM ruling. | N/A | Maui County | 1 |
| A10 #14 | When adopted IFS for protected kuleana and instream uses have been satisfied, then support water transport for affordable housing use. Support diversified ag economy with low cost untreated source. | Manage water equitably Reflect Mayor’s policy and upcoming codification of water allocation for additional municipal water allocation based on Na Wai Eha CWRM ruling. | N/A | Maui County | 1 |
| A10 #15 | Increase county oversight of well drilling in non-designated groundwater management areas. Encourage CWRM to increase the analysis of well permits, including spatial distribution and evaluation of well impacts on the quantity and quality of nearby water resources. Affirm the County’s commitment to exercise its ability to comment on all well permits in Maui County, including both public and | Maintain sustainable resources Protect water resources Protect and restore streams Minimize adverse environmental impacts | Adopt ordinance Provide funding for oversight and well surveys Add stream monitors to non designated streams – need data on costs. | MDWS Council Mayor’s office Corporation Counsel | 1,2 |

| | | | | | |
|-----------------|---|---|--|------------------|---|
| | <p>private, on behalf of cultural users and local communities.</p> <p>Amend state law to grant the County the authority to undertake a large role in the well permit process.</p> <p>Require consultation with local Native Hawaiians as part of oversight process.</p> | | | | |
| Aha Moku | Protect dry native forests and wetlands. | <p>Maintain sustainable resources</p> <p>Minimize adverse environmental impacts</p> | <p>Provide funding for management</p> <p>Develop and adopt ordinances to protect these areas</p> | MDWS Council | 1 |
| Aha Moku | <p>Provide training for all MDWS employees on traditional Hawaiian resource management, including ahupua'a resource management strategies, importance of eco system health, ability to create additional water through resource management, near shore and stream eco systems, public trust responsibilities, kanawai policies, and connection between water and Hawaiian culture and spirituality (mo'o) .</p> | <p>Maintain sustainable resources</p> <p>Protect water resources</p> <p>Protect and restore streams</p> | <p>Need data on program costs</p> | MDWS | 1 |
| Aha Moku | Add: Keep storm water drainage in same area for aquifer recharge | <p>Maintain sustainable resources</p> <p>Protect water resources</p> <p>Minimize adverse environmental impacts</p> | <p>Develop and adopt an ordinance</p> | MDWS DPW Council | 1 |
| Aha Moku | Add: Prohibit cementing of wetland areas | <p>Maintain sustainable resources</p> <p>Protect water resources</p> <p>Protect and restore streams</p> <p>Minimize adverse environmental impacts</p> | <p>Develop and adopt an ordinance</p> | MDWS Council | 1 |
| Aha Moku | Add: establish and maintain regular communication with Aha Moku Councils to assess the effect of water development and water | <p>Maintain sustainable resources</p> <p>Protect water resources</p> <p>Protect and restore streams</p> | N/A | MDWS | 1 |

| | | | | | |
|-----------------|---|--|---------------------------|---|---|
| | development policies on kanaka maoli rights and Hawaiian culture and practices. Actively seek input from those practicing their culture and those with historical knowledge. Create an advisory group to address these policies and provide accountability. | Protect cultural resources Minimize adverse environmental impacts | | | |
| Aha Moku | Add: Seek generational knowledge along with scientific data. | Maintain sustainable resources Protect water resources Protect and restore streams Protect cultural resources Minimize adverse environmental impacts | N/A | MDWS | 1 |
| Aha Moku | Add: Protect underground water by: 1. Establishing a blasting permit process 2. Surveying private well users to find out water being taken from aquifers 3. 3. Provide more oversight over private well users. | Maintain sustainable resources Protect water resources Minimize adverse environmental impacts | Need data on survey costs | MDWS Council | 1 |
| Aha Moku | Add: Notify kuleana water users and neighboring property owners when well permits are applied for. | Maintain sustainable resources Protect water resources Protect cultural resources Minimize adverse environmental impacts | N/A | CWRM | 1 |
| Aha Moku | Add: Limit or prohibit development in areas with insufficient water resources in their own area to prevent unsustainable development. | Maintain sustainable resources Minimize adverse environmental impacts | N/A Develop ordinances | MDWS MDPW Council | 1 |
| Aha Moku | Add: Encourage and assist CWRM with enforcement IIFS and IFS. If policies are being set based upon unenforced standards then not enough water will be available. | Maintain sustainable resources Protect water resources Protect and restore streams Protect cultural resources Minimize adverse environmental impacts | N/A | MDWS Mayor's Office Aha Moku Local community members | |
| Aha Moku | Add: Provide stream monitors for all streams to ensure accurate data is being used in decision making and as an enforcement mechanism. | Maintain sustainable resources Protect water resources Protect and restore streams | Need data on costs | MDWS USGS | |

| | | | | | |
|-----------------------------------|---|---|---|------------------------------------|--------|
| | | Minimize adverse environmental impacts | | | |
| Aha Moku | Add: Use a buffer with all sustainable yields to account for future IFS and climate change. | Maintain sustainable resources Protect water resources | N/A Develop buffer percentage formula | MDWS | 1 |
| Water Quality Management | | | | | |
| 6. | Implement well siting criteria to avoid contaminated groundwater supplies and unnecessary risks to public health. | Maximize water quality | Potentially increased pumping costs for higher elevation wells, site specific | MDWS Public Water Systems | 1 |
| 7. | Adopt wellhead protection measures for potable wells. | Protect water resources Maximize water quality | DOH grant funded public outreach and research completed | MDWS Maui County | 1 |
| 8. | Educate the farming community in sustainable farming practices to reduce impact from agricultural practices on water resources. | Protect water resources Maximize water quality | Outreach within multiple agency budgets. From \$5,000 annually | DOA DOH MDWS HRWA SWCD | 1 |
| 9. | Update assessment of potential contaminating activities around drinking water supply and support increased monitoring of potable wells as needed. | Maximize water quality | \$10,000 - \$20,000, five year updates | Maui County MDWS | 1 |
| Community | Explore options to replace the use of chloramines in the Upcountry system. | Maximize water quality | Need cost data | MDWS | 1 |
| Conservation – Demand Side | | | | | |
| 10. | Retrofits/direct installation and sub-metering programs, distribution of water-efficient fixtures and retrofits for existing users and facilities | Maintain sustainable resources Maximize efficiency of water use Minimize cost of water supply | MDWS ongoing and pilot programs \$108,000 year 1 - 3 | MDWS | 1 |
| 11. | Smart meters retrofits | Maintain sustainable resources Maximize efficiency of water use Minimize cost of water supply | Depends on existing meters and model, conversion from \$150/meter | Private water purveyors MDWS | 2 |
| 12. | Landscaping and irrigation system incentives <u>and</u> | Maintain sustainable resources | \$245,000 annually for incentives | Maui County Parks Dept. MDWS | 2 1 |

| | | | | | |
|-----|---|--|---|--|--|
| | <p><u>requirements</u>, targeting dry areas.</p> <p>Incentivize or require turf removal policies (A10 #53)</p> <p>Require low impact project design for onsite water retention, such as xeriscaping improvements rebate, irrigation controllers, residential greywater program, permeable surfaces with required maintenance and native and climate change adaptable plant use. A10 # 45/#54 and community input.</p> | <p>Maximize efficiency of water use</p> <p>Minimize cost of water supply</p> <p>Manage water equitably</p> | \$0 for requirements | County Council | Community Input |
| 13. | <p>Public information and education: sustainability working group; technology/innovation transfer programs; recognition program; public events; participation in recognized federal and industry programs (WaterSense); advertising</p> | <p>Maintain sustainable resources</p> <p>Maximize efficiency of water use</p> <p>Minimize cost of water supply</p> | <p>MDWS ongoing programs</p> <p>\$50,000 annually</p> | <p>MDWS</p> <p>HRWA</p> <p>Public Water Systems</p> | 1 |
| 14. | <p>Landscaping guidelines, audit and retrofit, landscape ordinance.</p> | <p>Maintain sustainable resources</p> <p>Maximize efficiency of water use</p> <p>Minimize cost of water supply</p> | <p>Staff time.</p> <p>Retrofit depends on audit</p> | MDWS | 1 |
| 15. | <p>Market/customer surveys followed by rebates and incentives: high efficiency fixtures, washing machines, toilets and urinals; hotel awards program</p> | <p>Maintain sustainable resources</p> <p>Maximize efficiency of water use</p> <p>Minimize cost of water supply</p> | <p>\$70,000 annually (excl. outdoor incentives)</p> | MDWS | 1 |
| 16. | <p>Revise county code to require high efficiency fixtures in all new construction.</p> <p>Develop a comprehensive water conservation ordinance to include xeriscaping regulations.</p> <p>Water efficient home, est. added construction cost \$25K (6% increase in property value)</p> <p>LEED certified home, est. added construction cost \$86K (18% increase in property value)</p> | <p>Maintain sustainable resources</p> <p>Maximize efficiency of water use</p> <p>Minimize cost of water supply</p> <p>Manage water equitably</p> | N/A | <p>Maui County</p> <p>MDWS</p> <p>County Council</p> | <p>2</p> <p>1</p> <p>Community Input</p> |

| | | | | | |
|-----|--|--|--|--|--------|
| | | | | | |
| 17. | <p>Aggressive tiered rate structure based on audit and rate study.</p> <p>A10 #58, Aha Moku and community: Create large resort water user tier and tax at high rate to encourage conservation. Study Honolulu rates for guidance.</p> <p>Aha Moku and community: Meet with other high water users to determine if high use is due to need or system repairs are needed. Develop strategies for encouraging the repair of water leaks for high water users.</p> | <p>Maintain sustainable resources</p> <p>Maximize efficiency of water use</p> <p>Minimize cost of water supply</p> <p>Manage water equitably</p> | N/A | Maui County MDWS | 1 |
| 18. | <p>Agricultural programs: Irrigation efficiency audits, technical assistance and rebates. Ag technical working groups.</p> | <p>Maintain sustainable resources</p> <p>Maximize efficiency of water use</p> <p>Minimize cost of water supply</p> <p>Provide for agricultural needs</p> | <p>Outreach within multiple agency budgets. From \$10,000 annually</p> | <p>DOA</p> <p>DOH</p> <p>MDWS</p> <p>HRWA</p> <p>SWCD</p> | 1 |
| 19. | <p>Greywater incentives</p> | <p>Maintain sustainable resources</p> <p>Maximize efficiency of water use</p> | <p>MDWS 2 year pilot program \$80,000</p> | <p>Maui County</p> <p>MDWS</p> | 2 1 |
| 20. | <p>Rainwater catchment for irrigation – educational.</p> | <p>Maintain sustainable resources</p> <p>Maximize efficiency of water use</p> | N/A | <p>DOH</p> <p>Private water purveyors</p> <p>Maui County</p> | 2 2 |
| 21. | <p>Revise County Code and/or incentives: water conserving design and landscaping in new development (xeriscaping targets dry areas), water efficient irrigation systems</p> | <p>Maintain sustainable resources</p> <p>Maximize efficiency of water use</p> <p>Minimize cost of water supply</p> <p>Manage water equitably</p> | N/A | <p>Maui County</p> | 2 1 |
| 22. | <p>Revise County Code and/or incentives: Water-efficient building design integrating alternative sources (grey water, catchment).</p> | <p>Maintain sustainable resources</p> <p>Maximize efficiency of water use</p> <p>Minimize cost of water supply</p> | N/A | <p>Maui County</p> | 2 2 |

| | | | | | |
|-----------------------------------|---|---|--|---------------------------------------|---|
| | | Manage water equitably | | | |
| 23. | Restrict outdoor water waste (disallow overspray and runoff, water wasting, and require hose nozzles). A10 #51 Aha Moku: Charge higher rates for daytime irrigation. | Maintain sustainable resources Maximize efficiency of water use Minimize cost of water supply | N/A | Maui County MDWS drought rules | 2 |
| 24. | Targeted conservation programs in dry areas and drought conditions. Replace above with: Create aggressive conservation policies for all areas at all times. A10 #55, #57 | Maintain sustainable resources Maximize efficiency of water use Minimize cost of water supply Manage water equitably | N/A | Maui County MDWS water shortage rules | 1 |
| 25. | "Lead by Example" conservation and efficiency projects. | Maintain sustainable resources Maximize efficiency of water use Minimize cost of water supply Manage water equitably | N/A | MDWS Maui County Parks Dept. | 2 |
| A10 #49 | Require WaterSense (efficiency) standard for new development and existing retrofits. 20-30% more water efficiency than standard. | Maximize efficiency of water use | N/A Amend County code | MDWS County Council | |
| A10 #52 | Require water conservation landscape measures for resorts, golf courses and public facilities. | Maximize efficiency of water use | N/A Amend County Code | MDWS County Council | 1 |
| Aha Moku | Prohibit water features | Maximize efficiency of water use | N/A Adopt ordinance | MDWS MDPW Council | 1 |
| Aha Moku | Prohibit new pools | Maximize efficiency of water use | N/A Adopt ordinance | MDWS MDPW Council | 1 |
| Conservation – Supply Side | | | | | |
| 26. | Perform annual comprehensive water audits. | Maximize efficiency of water use Minimize cost of water supply | Staff costs only, free software and training | MDWS Public Water Systems | 1 |
| 27. | Fund and implement a continuous leak detection program. | Maximize efficiency of water use Minimize cost of water supply | From \$100,000 annually | MDWS Large Public Water Systems | 1 |
| 28. | Maintain and operate the water system to minimize the sources of water loss. | Maximize efficiency of water use Minimize cost of water supply | N/A | MDSWS Private water purveyors | 1 |

| | | | | | |
|---|--|---|--|-------------------------|------------|
| <p>A10 #59, #60</p> <p>Aha Moku</p> | <p>Reduce water loss of potable and non-potable systems.</p> <p>Implement/advocate for surface water efficiency programs, such as improvements to diversions, conveyances, storage and meters to reduce water loss. Line or reline leaking reservoirs and ditches.</p> | <p>Maximize efficiency of water use</p> | <p>Need date on costs</p> <p>\$0 for advocacy role</p> | <p>Maui County MDWS</p> | <p>1,2</p> |
|---|--|---|--|-------------------------|------------|

Conservation – Agricultural Uses

| | | | | | |
|---|--|---|--------------------------------|---|----------|
| <p>29.</p> | <p>Research, support and use of less water consumptive crops and climate adapted crops.</p> | <p>Maintain sustainable resources Maximize efficiency of water use Manage water equitably</p> | <p>N/A</p> | <p>DOA</p> | |
| <p>30.</p> | <p>Improve irrigation management and efficiency.</p> | <p>Maintain sustainable resources Maximize efficiency of water use Manage water equitably</p> | <p>N/A</p> | <p>UH CTAHR USDA SWCD Hawai'i Farm Bureau Hawai'i Organic Farmers Association</p> | |
| <p>31.</p> | <p>Maintain the integrity of plantation irrigation systems including reservoirs.</p> | <p>Maximize efficiency of water use Provide for agricultural needs</p> | <p>N/A</p> | <p>Public-private partnerships (EMI, MLP, WWC, West Maui Land) Maui County DLNR DOA</p> | |
| <p>32.</p> | <p>Augment agricultural water supplies with alternative resources.</p> | <p>Maintain sustainable resources Manage water equitably Provide for agricultural needs</p> | | <p>Maui Dept. of Public Works DLNR</p> | |
| <p>Aha Moku And community</p> | <p>Require non potable and R-1 water to be used for agriculture where available (such as north Kihei Bayer fields)</p> | <p>Maintain sustainable resources</p> | <p>N/A Adopt ordinance</p> | <p>MDWS Council</p> | <p>1</p> |

Conservation – Energy

| | | | | | |
|------------|--|---|-----------------------|---|----------|
| <p>33.</p> | <p>Pursue comprehensive energy management.</p> | <p>Minimize adverse environmental impacts Minimize cost of water supply</p> | <p>N/A</p> | <p>MDSWS Public Water Systems Maui County Energy Management Program</p> | |
| <p>34.</p> | <p>Increase energy efficiency and improve load management.</p> | <p>Minimize adverse environmental impacts</p> | <p>Being assessed</p> | <p>MDSWS</p> | <p>2</p> |

| | | | | | |
|----------------------------------|---|--|--|--|---|
| | | Minimize cost of water supply | | Public Water Systems Maui County Energy Management Program | |
| 35. | Increase alternative energy generation and use. | Minimize adverse environmental impacts | N/A | MDSWS Public Water Systems Maui County Energy Management Program | 2 |
| CONVENTIONAL WATER SOURCE | | | | | |
| 36. | Support collaborative hydrogeological studies to inform impact from climate change and future well development on groundwater health. | Maintain sustainable resources Protect water resources | From \$600,000, joint funding. Site and resource specific | CWRM MDWS Public Water Systems USGS | 1 |
| 37. | Develop groundwater within sustainable yield to provide sufficient supply for growth, maintaining a buffer to account for potential future drought impact and prospective adjustments in aquifers lacking hydrologic studies. | Maintain sustainable resources Maximize reliability of water service | Site specific, see regional sectors | CWRM MDWS Private water purveyors | 1 |
| 38. | Promote the highest quality water for the highest end use | Manage water equitably | N/A | CWRM MDWS Private water purveyors | 1 |
| 39. | Protect and prioritize public trust uses in allocating groundwater in regions of limited resources and conflicting needs. | Manage water equitably Provide for Department of Hawaiian Homelands needs | N/A | CWRM MDWS DHHL | 1 |
| 40. | Increase monitoring of groundwater sources to assess water, reduce seawater intrusion (A 10 #16) , and chloride levels in potable and non-potable wells throughout developed aquifers. | Maintain sustainable resources Add: Minimize adverse environmental impacts | From \$50,000 annually monitoring, site specific | CWRM USGS | 2 |
| 41. | Promote well siting and distribution strategies for all public water systems to ensure optimal spacing and withdrawals for aquifer health and equitable use. | Maintain sustainable resources Manage water equitably | N/A | CWRM Maui County MDWS Private water purveyors | 2 |
| 42. | Formalize demand response plans for water purveyors that | Maintain sustainable resources | None | CWRM MDWS | 2 |

| | | | | | |
|-----|--|---|----------------------|---|---|
| | address water shortage and aquifer changes. | Maximize reliability of water service | | Private water purveyors | |
| 43. | Develop a water availability rule to provide certainty in land use planning and ensure that reliable source and infrastructure capacity is provided within reasonable time for planned growth. | Maximize reliability of water service Maintain consistency with General and Community Plans | None | Maui County MDWS | 2 |
| 44. | Increase system flexibility so that regional sources can be moved to support areas of need, both within the municipal systems and between regional public water systems. | Maximize reliability of water service Maximize efficiency of water use | See regional sectors | MDWS | 2 |
| 45. | Ensure that public/private groundwater development agreements reflect the public trust needs and are in keeping with the water allocation priorities of the MIP. | Maximize reliability of water service Manage water equitably Maintain consistency with General and Community Plans | N/A | Maui County MDWS Public Water Systems | 2 |
| 46. | Develop groundwater to maximize reliability of potable supply and as contingency in areas currently dependent on surface water. | Maximize reliability of water service | See regional sectors | MDWS Public Water Systems | 2 |
| 47. | Diversify supply for agricultural use to increase reliability | Provide for agricultural needs Maximize reliability of water service | See regional sectors | DOA Maui County Private water purveyors | 2 |
| 48. | Encourage CWRM to prioritize establishing IFS for diverted streams with potential conflicting uses. | Protect and restore streams Minimize adverse environmental impacts Manage water equitably Protect cultural resources | N/A | CWRM | 2 |
| 49. | Defer any new surface water diversions to meet new projected demand. | Protect and restore streams Protect cultural resources | N/A | CWRM Maui County | 1 |
| 50. | Balance existing diversions with alternative sources for agriculture to mitigate low-flow stream conditions. | Provide for agricultural needs Maximize reliability of water service | N/A | DOA Maui County Private water purveyors | 2 |
| 51. | Maximize efficiencies in surface water transmission, distribution and storage. | Maximize efficiency of water use | N/A | Private water purveyors (EMI, MLP, WWC, West Maui Land) | 2 |
| 52. | Add raw water storage to increase reliable supply once | Maximize reliability of water service | See regional sectors | MDWS | 2 |

| | | | | | |
|---------------|--|--|--------------------------|---|---|
| | instream flow standards are established. | | | | |
| 53. | Increase treatment plan capacity at water treatment plant facilities to accommodate additional treatment in wet season. | Maximize reliability of water service Minimize cost of water supply | See regional sectors | MDWS | 2 |
| 54. | Support plans and programs to develop additional sources of water for irrigation purposes. | Provide for agricultural needs Maximize reliability of water service | See regional sectors | DOA Maui County Private water purveyors | 1 |
| 55. | Prioritize delivery and use of agricultural water within County agricultural parks to cultivation of food crops for local consumption. | Provide for agricultural needs Maximize reliability of water service | N/A | Maui County EMI MDWS | 2 |
| A10 #17-31 | Regional basal well development 1. Require studies to show adequate capacity to meet cultural uses, kuleana uses, stream restoration, resident and ag needs within the district for prior to transport. 2. Outreach to cultural users to survey their water needs and establish their water usage based upon needs, not actual usage. (Many streams are dry due to diversions which hamper cultural usage. With additional water cultural usage will increase.) 3. Assess well capacity and number of wells needed and perform cost benefit analysis. 4. Require surveys of private wells to increase accuracy of aquifer withdrawal rates. 5. Maintain a buffer to sustainable yield. 6. Require USGS studies of the interaction between ground and surface water and potential impacts from pumping prior to funding well development. | Maintain sustainable resources Manage water equitably Protect cultural resources Minimize adverse environmental impacts | Need data on study costs | MDWS | 1 |
| A10 #32 | Develop and maintain back up wells even if more expensive to mitigate drought, equipment | Maximize efficiency of water use | Need data on well costs | MDWS | 1 |

| | | | | | |
|------------------------|--|--|--------------------------|--|---|
| | <p>failure, chlorides or other source or supply problems and avoid use restrictions.</p> <p>Consider and discuss the alternative of utilizing existing private wells with unused capacity during drought emergencies by mutual agreement of the parties.</p> | Maximize reliability of water service | | | |
| A10 #34 | Diversify to the most cost-effective combination of groundwater, surface water, and aggressive conservation with some temporary cutbacks acceptable during drought and equipment failure. | <p>Maximize efficiency of water use</p> <p>Maximize reliability of water service</p> | Need cost data | MDWS | 2 |
| A10 #35 | Require private public systems to develop in a manner of facilitating potential connection to Maui DWS system or integrated management. | Maximize reliability of water service | N/A Amend county code | MDWS County Council Private water system owners | 1 |
| A10 #36 | Increase connection between Maui DWS subdistricts ADD per Aha Moku: with in same Ahupuaha. | Maximize reliability of water service | Need cost data | MDWS | 1 |
| A10 #47 | Maintain/manage plantation ditch systems for continued potable and non-potable water conveyance. Explore issues of cost of investing in existing system, resolving ownership issues and management issues. | Maximize reliability of water service | Need cost data | | 1 |
| Aha Moku | Research land title when acquiring property for water system use or development to ensure lands were legally transferred to current owner. | <p>Manage water equitably</p> <p>Protect cultural resources</p> | N/A | MDWS Managing Director's office/ Principal Archeologist Corporation Counsel | 1 |
| Community input | Conduct study of water system ownership and management models, such as water authority and public company. Use Wailuku water system and East Maui water system | <p>Manage water equitably</p> <p>Maximize efficiency of water use</p> | \$50,000 - \$100,000 | MDWS | 1 |
| Community input | Explore policy of allowing fire sprinklers in lieu of fire hydrants for fire protection. | Maximize efficiency of water use | N/A Code amendment | MDWS County Council | 1 |

ALTERNATIVE WATER SOURCE

| | | | | | |
|----------------|---|--|--|-----------------------------|---|
| 56. | Expand requirement for new development to connect to recycled water infrastructure if practical. | Protect water resources Maintain consistency with General and Community Plans | N/A | Maui County | 2 |
| 57. | Promote closer collaboration between MDWS and MDEM to master plan and utilize DWSRF funding to maximize recycled water use. | Maximize efficiency of water use, Maintain consistency with General and Community Plans | N/A | Maui County MDEM MDWS | 2 |
| 58. | Explore expansion of “scalping plants” (small-scale membrane filter systems that put effluent closer to reuse locations) in designated growth areas. | Maximize efficiency of water use, Maintain consistency with General and Community Plans | N/A | MDEM | 2 |
| 59. | Inform and educate the residential and commercial community of easy, affordable rainfall catchment for recharge and garden use. | Protect water resources | Outreach within multiple agency budgets. From \$5,000 annually | DOH MDWS | 2 |
| 60. | Provide incentives for residential <u>or small commercial</u> rainwater catchment systems <u>such as roof systems, tanks, underground storage systems for landscape use. Evaluate water quality issues prior to adoption of strategy. (A10 #44)</u> Allow water catchment systems on properties with water meters provided no connection between the two. Community input. | Protect water resources Maintain consistency with General and Community Plans | MDWS pilot program \$45,000 over 2 years | MDWS | 2 |
| 61. | Explore and promote opportunities for large volume stormwater runoff for agricultural irrigation. <u>Capture flash supply as raw water storage for treatment or utilize reservoirs to store irrigation supply for diverse ag. (A10 #48)</u> | Provide for agricultural needs | N/A | DLNR DOA MDPW | 2 |
| A10 #38 | Explore maximizing R-1 reclaimed wastewater system capacity and use. Evaluate limited supply, relatively high costs and low reliability and minimized use of underground injection wells. | Maximize reliability of water service | N/A Conduct an internal study | MDWS | 2 |
| A10 #40 | Explore expanding R-2 Kahului Wastewater Treatment facility | Maximize reliability of water service | N/A | MDWS | |

| | | | | | |
|--|--|---|--|------------------------|---|
| | distribution and/or upgrade to R-1. Explore the need and identify service areas that could benefit. | | Conduct an internal study | | |
| A10 #43 | Explore a program to use small grey water systems for small residential and commercial use. | Maximize reliability of water service | N/A Amend state and possibly county regulations | MDWS County Council | 1 |
| A10 #46 Community input | Explore desalination of brackish or seawater <u>and mixing with R-1 if possible</u> for agricultural and <u>landscaping irrigation where practical</u> . Consider energy costs and environmental effects of disposal of residual brine. | Maximize reliability of water service | Internal study or consultant study | MDWS | 2 |
| AREA SPECIFIC STRATEGIES – to go into corresponding WUDP chapters | | | | | |
| Haiku A10 #17 | <p>Ha'iku aquifer well development (Potential: resource/medium term; within sustainable yield. For regional use and transport to growth areas)</p> <p>Maintain buffer to sustainable yield pending IFS adoption.</p> <p>Require studies and gather traditional historical knowledge of the interaction between ground and surface water and potential impact from aquifer pumping on stream flows prior to well development.</p> <p>Discourage groundwater withdrawal that would affect streams and near shore eco systems and decrease the ability of Native Hawaiian practices that require water for domestic and cultural practices.</p> <p>Reduction of transport from water abundant areas to dryer areas would maintain more water in streams of wet areas which supports Native Hawaiian cultural and kuleana users who depend on surface water.</p> <p>Community input: Regional domestic and agricultural uses</p> | <p>Maintain sustainable resources</p> <p>Protect water resources</p> <p>Protect and restore streams</p> <p>Minimize adverse environmental impacts</p> | Need data on costs | MDWS | 2 |

| | | | | | |
|---|---|---|--------------------|------|---|
| | <p>to be satisfied prior to transporting water to growth areas.</p> <p>Reevaluate data accuracy for area and confidence rating for Haiku aquifer prior to decision making.</p> | | | | |
| <p>Makawao</p> <p>A10</p> <p>#18</p> | <p>Makawao aquifer basal well development at 1500 ft + elevation for growth and back-up regionally</p> <p>Amendment: Add: Assess impacts to Kailua stream prior to decision making. It is a major cultural feature of the area and should be protected.</p> | <p>Maintain sustainable resources</p> <p>Protect water resources</p> <p>Protect and restore streams</p> <p>Minimize adverse environmental impacts</p> | Need data on costs | MDWS | 2 |
| <p>Waikapu</p> <p>A10</p> <p>#19</p> | <p>Waikapu Aquifer basal well development (private wells drilled for available sustainable use)</p> <p>Add Na Wai Eha decision as Appendix</p> | <p>Maintain sustainable resources</p> <p>Protect water resources</p> <p>Protect and restore streams</p> <p>Minimize adverse environmental impacts</p> | Need data on costs | MDWS | 2 |
| <p>Waihe'e</p> <p>A10</p> <p>#20</p> | <p>Waihe'e Aquifer basal well development (High capital cost, smaller wells for limited yield of N Waihe'e per USGS study)</p> <p>Add: 1. Require USGS aquifer studies prior to decision making.</p> | <p>Maintain sustainable resources</p> <p>Protect water resources</p> <p>Protect and restore streams</p> <p>Minimize adverse environmental impacts</p> | Need data on costs | MDWS | 2 |
| <p>East Maui</p> <p>A10</p> <p>#22</p> | <p>Honopua, Waikamoi, Ke'anae basal well development</p> <p>(Extend transmission for medium elevation well development. Aquifers not studied, sustainable yield likely to be adjusted down)</p> <p>Add this strategy</p> | <p>Maintain sustainable resources</p> <p>Protect water resources</p> <p>Protect and restore streams</p> <p>Minimize adverse environmental impacts</p> | Need data on costs | MDWS | 2 |

| | | | | | |
|--|--|--|---------------------------|-------------|----------|
| <p>Kamaole</p> <p>A10 #23</p> | <p>Kamaole Aquifer basal well development</p> <p>(Brackish wells for non-potable uses for new development. Dual or private systems. Brackish water quality appropriate for irrigation, desal and other non potable uses) Reported pumpage incomplete to assess available sustainable yield.)</p> <p>Add: 1. Require survey of private well pumpage prior to decision making 2. Explore mixing brackish water with R-1 to increase non-potable water availability. R-1 reduces salinity.</p> | <p>Maintain sustainable resources Protect water resources Protect and restore streams Minimize adverse environmental impacts</p> | <p>Need data on costs</p> | <p>MDWS</p> | <p>2</p> |
| <p>Honokowai</p> <p>A10 #24</p> | <p>Honokowai aquifer well development (within sustainable yield) (Avoid transport between aquifer units; Honokowai may be close to sustainable yield)</p> <p>Add: Require USGS studies of aquifer capacity prior to funding well development.</p> | <p>Maintain sustainable resources Protect water resources Protect and restore streams Minimize adverse environmental impacts</p> | <p>Need data on costs</p> | <p>MDWS</p> | <p>2</p> |
| <p>Honolua</p> <p>A10 #25</p> | <p>Honolua aquifer well development (within sustainable yield with buffer)</p> <p>(Transmission to growth area within aquifer sector; optimize well/aquifer management)</p> | <p>Maintain sustainable resources Protect water resources Protect and restore streams Minimize adverse environmental impacts</p> | <p>Need data on costs</p> | <p>MDWS</p> | <p>2</p> |
| <p>Launiupoko</p> <p>A10 #26</p> | <p>Launiupoko aquifer well development (within sustainable yield with buffer)</p> <p>Reduce demand on Honokowai aquifer- optimize well/aquifer management</p> <p>Acknowledge that extreme water conflicts currently exist in Launiupoko aquifer over both streams and groundwater</p> | <p>Maintain sustainable resources Protect water resources Protect and restore streams Minimize adverse environmental impacts</p> | <p>Need data on costs</p> | <p>MDWS</p> | <p>2</p> |

| | | | | | |
|----------------|---|--|--------------------|--------------|---|
| | between cultural users and area subdivisions. | | | | |
| A10 #27 | <p>Add raw surface water storage at Kamole, Olinda or Pi'iholo Water Treatment Facilities</p> <p>Acknowledge IFS, EMI diversion permits, EMI contract, land and critical watershed issues.</p> <p>IIFS to be established in 12 East Maui remaining streams and all Haiku streams.</p> <p>IIFS values be enforced and adequately monitored in accordance with the State Water Code.</p> | <p>Maximize reliability of water service</p> <p>Maintain sustainable resources</p> <p>Protect water resources</p> <p>Protect and restore streams</p> <p>Minimize adverse environmental impacts</p> | Need data on costs | MDWS CWRM | 2 |
| A10 #28 | <p>Increase capacity at 'Iao Water Treatment Facility for wet season use</p> <p>(Appurtenant rights, water use permits)</p> | Maximize reliability of water service | Need data on costs | MDWS | 2 |
| A10 #29 | <p>Increase capacity at Kamole Water Treatment Facility for wet season use</p> <p>Understand flow characteristics of Wailoa Ditch and intake structure configuration, IFS, EMI diversion permits, EMI contract in decision making.</p> <p>Discuss modifications of EMI contracts to reflect 21st century water policies and transition to a publicly managed East Maui system.</p> | Maximize reliability of water service | Need data on costs | MDWS | 2 |
| A10 #31 | <p>Expand Mahinahina WTF</p> <p>Obtain MLP reservoirs and determine upfront costs.</p> <p>Confirm DHHL needs and discuss strategy with them.</p> <p>Abide by Honokohau IIFS.</p> | Maximize reliability of water service | Need data on costs | MDWS | 2 |
| A10 #33 | Develop wells for increased reliable source Upcountry and | Maximize reliability of water service | Need date on costs | MDWS | 2 |

| | | | | | |
|----------------|---|---------------------------------------|--|--|--|
| | <p>reduce surface water transport to mitigate low supply during drought, equipment failure, chlorides or other source and supply problems and avoid use restrictions and reduce stream use in dry season.</p> <p>Well locations to be discussed as part of ongoing communications with stakeholders, including Hawaiian groups.</p> | | | | |
| A10 #40 | Expand R-2 Kahului Wastewater Treatment facility distribution and/or upgrade to R-1 | Maximize reliability of water service | | | |
| A10 #41 | Expand R-1 system from Kihei Wastewater facility (Committed service connections in dry season use leaves 0.7 mgd unused capacity. Restricted nonpotable uses. | Maximize reliability of water service | | | |
| A10 #42 | Implement R-1 expansion from Mahinahina Wastewater Treatment facility | Maximize reliability of water service | | | |