

MCH-CRP Beneficiary Meeting #4 -- Priority Projects Preliminary Matrix

Priority Projects	Issues	Potential Options	Traditional Ecological Knowledge	Literature Review	Partnerships	Notes
<b>Mauka Restoration</b>	<ul style="list-style-type: none"> <li>Sediment and silt from mauka during floods;</li> <li>Flooding due to blocked streams, rivers, and culverts</li> <li>Invasive species</li> <li>Unmanaged lands increase wildland fire risk</li> </ul>	<ul style="list-style-type: none"> <li>Establish testing areas for native, drought-resistant, animal-proof, and economically viable plants</li> <li>Plant vegetation to stabilize sediment</li> <li>Create water retention planning, i.e. detention basins, etc.</li> <li>Regular cleanup of streams and gulches &amp; MOU/Agreements in place (see Makai)</li> <li>Control deer population &amp; planning</li> <li>Conduct controlled burns</li> </ul>	<ul style="list-style-type: none"> <li>Ahupuaa land management from mauka to makai, managed by konohiki</li> <li>Eight resource realms model traditionally guided decisions on resource use: 1) Moana-Nui-Ākea: Far offshore fisheries. 2) Kahakai Pepeiao: Coastal zones. 3) Ma Uka: Mountainous zones. 4) Nā Muliwai: Freshwater systems. 5) Ka Lewalani: The sky, including weather patterns. 6) Kanaka Honua: Natural resources needed for human sustenance. 7) Papahelōlona: The wisdom of experts in fields like agriculture, fisheries, and healing. 8) Ke 'Ihi'ihi: wahi pana (storied places) and wahi kapu (sacred places) and their attributes and elements.</li> <li>The use of social-ecological zones ("wao" and "kai") for resource management. Each zone had specific purposes like maintaining watershed health (wao kele) or maximizing biodiversity (wao lā'au), which can guide land management strategies to mitigate deforestation, habitat degradation, and invasive species problems in coastal and forest areas</li> <li>Loi kalo as a sediment basin</li> </ul>	<ul style="list-style-type: none"> <li>Support proper management of grazing domestic and wild ungulates, including fencing to exclude axis deer from watersheds rich in native habitat, and fencing to enclose axis deer within designated hunting areas</li> <li>Support the development of a "Subsistence Management Plan for Deer"</li> <li>Support sustainable agricultural and forestry management to protect Moloka'i's land, water, and marine resources.</li> <li>Support the goals, objectives and actions of the 2018 Molokai Community Wildfire Protection Plan.</li> </ul>	<ul style="list-style-type: none"> <li>CoM Public Works</li> <li>Nature Conservancy</li> <li>Molokai Land Trust</li> <li>Hawaii Wildfire Management Organization</li> <li>Butch Haase</li> <li>CWRM</li> <li>USACE</li> <li>Molokai Hunting Club</li> <li>Ka Honua Momona</li> <li>TNC Molokai</li> <li>Ka Ipu Makani</li> <li>'Aina Pulapula</li> <li>'Aina Momona</li> <li>Moloka'i Homestead Farmers Alliance</li> <li>Moloka'i Ranch</li> </ul>	
<b>Makai Restoration</b>	<ul style="list-style-type: none"> <li>Fishponds filled in with sediment</li> <li>Degradation of marine habitat</li> <li>Loss of beaches/shoreline (buffer for homes) from coastal erosion</li> <li>Shoreline armoring accelerates beach loss and hinders sand accumulation</li> <li>Invasive Species (Pests) threaten natural and cultural resources</li> <li>Invasive mangrove and kiawe trees disrupt shoreline processes and lead to sediment buildup</li> </ul>	<ul style="list-style-type: none"> <li>Create Makai Restoration Design Plan</li> <li>Plant native vegetation to prevent erosion</li> <li>Conduct marine life restoration</li> <li>Protect fishponds</li> <li>Deploy coir rolls to enhance beaches</li> <li>Remove invasive species and replace with appropriate natives</li> <li>Implement natural fencing to control Gorilla Ogo</li> <li>Limu restoration</li> <li>Uncover and restore springs</li> <li>Assess how the Kohea Wetland can capture floodwater</li> <li>Protect Kapuāiwa Coconut Grove from mites</li> <li>Maintain Kiorea Park</li> <li>Maintain Kalaniana'ole Hall</li> </ul>	<ul style="list-style-type: none"> <li>Rotating seasonal restrictions (kapu) on harvesting certain species, ensuring their populations remained sustainable. Applying these practices can help manage fish populations, prevent overharvesting, and ensure the sustainability of other key marine resources</li> <li>Regulate the harvesting of limu and protect freshwater sources that support limu growth.</li> <li>Harvest only what is needed from the land and sea and share resources with neighbors.</li> </ul>	<ul style="list-style-type: none"> <li>Remove and replace invasive plants and trees with climate-adapted, drought-tolerant native grasses, shrubs, and trees</li> <li>Remove man-made debris between the high and low water line, such as tires, appliances, and rubble</li> <li>Support the establishment of the island as a community-based subsistence fishing area (CBSFA)</li> <li>Support the preservation of fishponds, along with any parts of a fishpond system complex such as hatchery, pond, or trap characteristics.</li> <li>Support the protection and restoration of natural systems, such as wetlands and dunes, for flood mitigation and climate change adaptation.</li> </ul>	<ul style="list-style-type: none"> <li>Hawai'i Department of Aquatic Resources</li> <li>UH Sea Grant</li> <li>Jim Buika (CoM Disaster and Shoreline Planner)</li> <li>USACE</li> <li>NOAA</li> <li>ONHR-DOI</li> <li>Ka Honua Momona</li> <li>Molokai Wetland Partnership</li> <li>Ka Ipu Makani</li> <li>Sustainable Coastlines</li> <li>Goodfellow Brothers</li> </ul>	

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<b>Water Flow Maintenance and Flood Prevention</b>	<ul style="list-style-type: none"> <li>Sediment flow from watersheds into nearshore waters</li> <li>Lack of hydrological data</li> <li>Clogged culverts &amp; waterways lead to flooding</li> <li>Highways covered in sediment during flooding</li> <li>Poorly maintained drainage systems</li> <li>Cesspools pollute nearshore waters</li> <li>Kūlana 'Ō'iwi has caused flooding for neighbors</li> <li>Saltwater intrusion corroding 'Olo'olo water line</li> </ul>	<ul style="list-style-type: none"> <li>Restore water flow from mauka to makai, including uncovering covered up or filled springs and wetlands/‘Aina wai</li> <li>Immediate need for an MOU among the Homestead Associations, DHHL, DOT, and COM for maintaining culverts and planning drainage solutions</li> <li>Regular river and culvert cleanups with responsible party mapped &amp; documented &amp; filed with all agencies.</li> <li>Conduct Hydrological Studies</li> <li>Drainage Master Plan</li> <li>Regular infrastructure maintenance</li> <li>Reroute flood waters with drainage infrastructure</li> <li>Preserve cemetery</li> <li>Cesspool conversion</li> <li>Replace 'Olo'olo water line with new resilient line</li> </ul>	<ul style="list-style-type: none"> <li>The traditional system recognized the interconnectedness of freshwater sources (streams, springs) and the coastal environment. Ensuring that watershed areas are protected from development and that stream flow is maintained from mauka to makai can help mitigate flooding, reduce sedimentation in coastal areas, and preserve marine ecosystems</li> <li>Acknowledging the connection between freshwater springs (such as 'Olo'olo Spring) and coastal health. Ensuring these springs are maintained and clear of silt and invasive plants is crucial to supporting native fish populations such as mullet and crabs.</li> </ul>	<ul style="list-style-type: none"> <li>Support actions that restore native upland habitat and reduce sediment-laden stormwater from reaching the shoreline</li> <li>Reclamation and removal of soil runoff that has settled into the ocean, fishponds and streams will remove the soil from these areas and restore it to the land for agricultural use.</li> <li>Encourage and support research that studies water quality, invasive species, and circulation issues around the Kaunakakai Wharf Road and Small Boat Harbor.</li> <li>Manage surface water using green infrastructure and natural system drainage, retention, and filtration to reduce flooding and siltation of ocean waters.</li> <li>Encourage DHHL compliance with County regulations on drainage.</li> <li>Encourage development of an integrated, effective, and environmentally sensitive stormwater management system from Kalama'ula to Kamalo through a partnership of landowners mauka of Kamehameha V Highway.</li> <li>Encourage the Hawai'i Department of Transportation (HDOT) to reconstruct culverts to 100-year flood-design standards on all State roads.</li> <li>Support policies that encourage private landowners to decrease impervious surfaces on private property to reduce surface water runoff.</li> <li>Convert cesspools to septic systems wherever feasible to reduce the risk of contaminated water and protect beneficiary health</li> <li>Initiate a groundwater inundation program by regularly testing the pH, salinity, and water level relative to the tide at specific sites</li> <li>Complete a site selection study to identify a location for a new cemetery.</li> <li>Encourage the location or relocation of all critical infrastructure, facilities, and development out of the evacuation and inundation zones vulnerable to coastal hazards.</li> </ul>	<ul style="list-style-type: none"> <li>USACE</li> <li>DHHL</li> <li>DOT- Highways</li> <li>DOH - WWB</li> <li>CoM Water Supply</li> <li>CoM Public Works</li> </ul>	
<b>Restoration and Relocation of Residential Hale</b>	<ul style="list-style-type: none"> <li>Residential hales, yards &amp; wastewater systems (cesspools) have been threatened &amp; inundated due to sea level rise, king tides, flooding risks &amp; groundwater inundation</li> </ul>	<ul style="list-style-type: none"> <li>Explore relocation options with beneficiaries, explore which areas are viable for relocation options &amp; which ahupua'a have potential for relocation placement</li> <li>Assess implications for access and future impacts</li> <li>Elevate hales on stilts, in short term (Policy involved)</li> </ul>	<ul style="list-style-type: none"> <li>Hales were not typically built in areas where flooding occurred, wetlands/‘aina wai and was only used for fishing and cultural practices.</li> </ul>		<ul style="list-style-type: none"> <li>DHHL</li> </ul>	
<b>Emergency Evacuation and Public Safety</b>	<ul style="list-style-type: none"> <li>Lack of emergency roads for resident evacuation;</li> <li>Power outage risks in flood areas</li> <li>Poor cellphone coverage</li> </ul>	<ul style="list-style-type: none"> <li>Develop emergency evacuation plans</li> <li>Involve the community, especially kūpuna, in emergency planning. Door-to-door surveys have been effective</li> <li>Locate and/or Construct emergency evacuation roads from mauka to makai, Map and Identify evacuation routes and roadways</li> <li>Develop homestead resilience hubs/shelters</li> <li>Construct cell towers</li> <li>Develop water tanks &amp; system to provide emergency water and water for firefighting. MOU with CoM needed for emergencies, when DHHL system affected.</li> </ul>		<ul style="list-style-type: none"> <li>DHHL should host and facilitate Community Work Days to install hurricane clips, add continuous load path straps, and take other house-strengthening and storm-resilient measures</li> <li>There is a need for emergency shelters in Central Molokai.</li> <li>Promote public education about natural and human-induced hazards to improve preparedness and response and to reduce hazard risk and impacts.</li> <li>Support a more coordinated emergency response system that includes clearly defined and mapped evacuation routes and approved shelters located away from areas susceptible to natural hazards.</li> <li>Support and advocate for better preparedness capacity by improving inter-agency planning, coordination, and implementation.</li> </ul>	<ul style="list-style-type: none"> <li>Police Department</li> <li>Fire Department</li> <li>Maui Emergency Management Agency</li> <li>EMS</li> <li>Verizon</li> <li>Hawaiian Electric</li> <li>Hawaii Energy</li> </ul>	

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<b>Education and Awareness Campaign</b>	<ul style="list-style-type: none"> <li>• Need for stewardship of native species and understanding of water systems;</li> <li>• Loss of traditional cultural knowledge</li> <li>• Need for greater adaptive capacity to address risks</li> </ul>	<ul style="list-style-type: none"> <li>• Support education initiatives like Wao Akua and 'Ae 'Āina</li> <li>• Land Stewardship programs</li> <li>• Emergency response training</li> <li>• Identify and catalog community assets to leverage during disasters</li> <li>• Sustainable land management workshops</li> <li>• Catalog vulnerable members</li> <li>• Phone tree (check on your neighbor program)</li> </ul>	<ul style="list-style-type: none"> <li>• Honor and respect traditional 'ohana cultural values and customs to guide subsistence harvesting of natural resources.</li> <li>• Use the kaulana mahina (the Hawaiian lunar calendar) to understand when to plant which crops, good times for harvesting, fishing or mending gear, and establish kapu or sacred days for honoring the gods.</li> <li>• 'Aha councils traditionally governed resources through collective knowledge. Leaders were selected based on their mastery of resource management practices, including fisheries, hydrology, and agriculture. Reviving this collective approach can help inform decisions about fisheries restoration, invasive species control, and erosion management</li> </ul>	<ul style="list-style-type: none"> <li>• Educate beneficiaries on the causes and consequences of sea level rise and coastal erosion, including providing maps of flood zones and sea level rise exposure</li> <li>• Provide beneficiaries with FEMA resources like the "Homeowners Handbook to Prepare for Natural Hazards" and "Answers to Questions about Substantially Improved / Substantially Damaged Buildings"</li> <li>• Support a significant increase in public outreach, education, and involvement events to build community-based stewardship and implementation capacity.</li> <li>• Support education for residents and visitors for culturally appropriate subsistence-based hunting, fishing, gathering, and protocol for respecting cultural and historic sites.</li> </ul>	<ul style="list-style-type: none"> <li>• National Disaster Preparedness Training Center</li> <li>• Hawaii Green Growth</li> <li>• National Preservations Institute</li> <li>• Ka Honua Momona</li> <li>• Ka Ipu Makani</li> </ul>	