DRAFT MOLOKA‘I COASTAL HOMESTEADS COMMUNITY RESILIENCE PLAN

JANUARY 2026

HAWAIIAN HOME LANDS

HAWAIIAN HOMES COMMISSION · DEPARTMENT OF HAWAIIAN HOME LANDS

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PREPARED BY:

G70

Executive Summary

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The Molokaʻi Coastal Homesteads Community Resilience Plan (MCH-CRP) is a community-driven planning effort prepared by the Department of Hawaiian Home Lands (DHHL) in partnership with the beneficiaries that live within the Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi homesteads, as well as those that have an interest in Malama Cultural Park. Funded through the National Fish and Wildlife Foundation's (NFWF) National Coastal Resilience Fund (NCRF), this plan represents the first stage (Community Capacity Building and Planning) of a multi-phase process to strengthen the resilience of Hawaiian Home Lands communities located along Molokaʻi's southern shoreline.

Purpose

The MCH-CRP provides a roadmap for adapting to and preparing for climate change impacts such as sea level rise, flooding, erosion, wildfire, drought, and invasive species. Building upon prior planning efforts and technical studies, the plan integrates both Traditional Ecological Knowledge (TEK) and modern science to identify threats, assess community and natural assets, and develop nature-based solutions that enhance community, cultural, and ecological resilience.

The plan views resilience through a Hawaiian lens, grounded in values of aloha ʻāina (love for the land), Malama ʻāina (care for the land), and self-determination. The planning approach follows the traditional moku and ahupuaʻa system of managing land and sea as one connected whole.

Planning Area

The MCH-CRP planning area includes four DHHL areas on the south shore of Molokaʻi: the homestead communities of Kalamaʻula, Kapaʻakea, and Kamiloloa, as well as the Malama Cultural Park. Together, the planning area covers approximately 10,238 acres. Collectively, these lands extend from mauka areas through residential homesteads to makai coastal environments, encompassing dry and upland landscapes, drainage corridors, shoreline areas, and important cultural and community resources.

Beneficiary-Driven Process

Guided by DHHL beneficiaries, the MCH-CRP was shaped through workshops, site visits, and interviews that drew upon community knowledge and the lived experience of homesteaders. Kūpuna, lineal descendants, and practitioners shared moʻolelo (stories), historical observations, and cultural practices that informed strategies for future stewardship. Technical experts contributed data and analysis on hazards, drainage, ecosystems, and infrastructure.

Key Findings

The plan identifies numerous interconnected threats to the homestead communities and coastal ecosystems, including:

- Sea level rise and coastal flooding threatening homes, roadways, and fishponds
- Ravine and stormwater flooding from poorly maintained drainage channels and erosion
- Wildfire and drought due to invasive grasses and unmanaged mauka lands
- Erosion and sedimentation filling wetlands, springs, and fishponds, degrading reefs and coastal residential homesteads
- Invasive species such as deer, kiawe, and mangroves altering native habitats
- Aging infrastructure and limited evacuation access along the single coastal highway

These hazards compromise the health of both people and ecosystems, from mauka forests to nearshore reefs.

Framework for Action

The MCH-CRP establishes five Resilience Goals supported by specific, community-based strategies:

A. Emergency Evacuation and Public Safety – Improve access and coordination for disaster preparedness.

B. Mauka Restoration – Restore upland forests and reduce erosion and wildfire risk.

C. Water Flow Maintenance and Flood Prevention – Maintain and restore natural drainageways, ravines, and wetlands.

D. Residential Hale Retrofits and/or Relocation – Strengthen and/or relocate homes vulnerable to flooding and coastal hazards.

E. Makai Restoration – Restore fishponds, wetlands, and coastal ecosystems to support fisheries, cultural practices, and natural buffers.

Each goal includes conventional and nature-based solutions that provide dual benefits of protecting communities while restoring ecosystems vital to fish and wildlife.

A total of 25 resilience strategies were identified across the planning area. These strategies reflect priorities raised by beneficiaries and are intended to be carried forward by the Homestead Associations over time as capacity, funding, and partnerships allow. While all 25 strategies remain viable for future implementation, the planning process focused on helping each homestead community identify a small set of near-term priorities that respond to their most urgent risks.

Each of the three homestead areas was asked to identify five priority projects that are critical to advance in the near term. These priority projects are organized in the table below, followed by a description of each.

A1. Create a Pre-Disaster Emergency Response and Evacuation Plan

Develops a community specific emergency plan that identifies risks, roles, responsibilities, evacuation routes, and communication systems. Supports shared coordination between DHHL, Homestead Associations, and emergency partners.

A3. Develop Resilience Hubs or Evacuation Sites

Establishes safe mauka gathering sites equipped with backup power, water, emergency supplies, and communications. These hubs serve as community centers during normal times and evacuation sites during emergencies.

A4. Fire Break Construction and Maintenance

Creates and maintains fire breaks around communities to reduce wildfire risk and improve access for firefighting and emergency crews. Includes community training and stewardship.

B1. Develop a Mauka Restoration and Maintenance Plan

Creates a comprehensive plan to restore mauka lands using mapping, LiDAR, ecological studies, and traditional knowledge. Identifies priority restoration zones, fencing needs, fire management strategies, and long term stewardship plans.

C1. Develop a Drainage Master Plan

Creates a comprehensive plan to guide drainage improvements across the homestead ahupuaʻa. Includes mapping, hydrologic modeling, inventory of canals and culverts, TEK integration, and engineered alternatives for long term water management.

C2. Green–Grey Drainage Improvements and Maintenance Program

Implements both natural and engineered drainage solutions, including sediment removal, canal clearing, erosion control, and native planting. Establishes a coordinated maintenance program across agencies and the Homestead Associations.

D1. Conduct Vulnerability Assessments Survey

Completes parcel-level assessments of home conditions, structural risks, and exposure to hazards such as flooding, wildfire, and coastal erosion. Includes interviews, mapping, and documentation needed to guide future retrofit or relocation decisions.

Priority Project	Kalamaʻula	Kapaʻakea	Kamiloloa
1	D1: Conduct Vulnerability Assessment Survey	A1: Create a Pre-Disaster Emergency Response and Evacuation Plan	A1: Create a Pre-Disaster Emergency Response and Evacuation Plan
2	A3: Develop Resilience Hubs or Evacuation Sites	A3: Develop Resilience Hubs or Evacuation Sites	B1: Develop Mauka Restoration & Maintenance Plan
3	B1: Develop Mauka Restoration & Maintenance Plan	B1: Develop Mauka Restoration & Maintenance Plan	C1: Develop a Drainage Master Plan
4	A4: Fire Break Construction & Maintenance	C1: Develop a Drainage Master Plan	C2: Green-Grey Drainage Improvements & Maintenance Program
5	E7: Maintain Kupuāiwa Coconut Grove and Kiowea Park	D2: Adapt Structures and Systems to Better Withstand Coastal Hazards	E1: Develop Makai Restoration & Maintenance Plan

D2. Adapt Structures and Systems to Better Withstand Coastal Hazards

Supports home retrofits such as elevation, hardening, hurricane resilience, utility protection, and floodproofing. Builds partnerships with experts for Firewise assessments and homeowner training on hazard preparedness.

E1. Develop a Makai Restoration and Management Plan

Creates a comprehensive plan to guide restoration of shoreline areas, integrate traditional ecological knowledge, identify priority projects, and build long term stewardship partnerships. Serves as the foundation for future coastal restoration work.

In addition to the Homestead Association-led strategies, the MCH-CRP identified 11 resilience strategies that fall under the responsibility of DHHL. These DHHL-led strategies address system-level needs that individual homesteads cannot advance on their own. They focus on improving coordination across agencies, filling technical and planning gaps, and advancing foundational studies, policies, and land management actions that support long term resilience. Some of these strategies may occur before homestead-led projects, while others may move forward in parallel. Together, the homestead-led and DHHL-led strategies create the conditions needed for coordinated, effective, and culturally grounded implementation across the Molokaʻi homestead communities.

A Path Forward

Upon completion, the Final MCH-CRP will be presented to the Hawaiian Homes Commission for consideration and adoption. Adoption of the MCH-CRP positions DHHL and the homestead communities to pursue future NFWF and other community resilience-related funding for design, permitting, and implementation. The plan sets the foundation for continued collaboration, workforce development, and education that empowers beneficiaries to lead the stewardship of their lands.

Through this plan, DHHL and its beneficiaries reaffirm Molokaʻi's legacy as a rich, thriving, and abundant land where community resilience and cultural sovereignty are strengthened for generations to come.

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Introduction

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Background

Rooted in extensive multi-generational history, intertwining both native Hawaiian makai (seaward) fishing and mauka (inland) ranching lifestyles, the homestead communities of Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi (Kamiloloa) make up the DHHL lands on the south shore of Molokaʻi *(Figure 1-2)*. For generations, native Hawaiians in these communities have shared a symbiotic relationship with both the land and ocean, using them as food and medicinal resources while also practicing responsible stewardship to preserve their natural functions over the long term. This reciprocal relationship allowed for the residents of south Molokaʻi to fuel and drive a strong, stable, and long-lasting population.

The south shore of Molokaʻi remains a uniquely rural and culturally intact place, characterized by its fringing reef (the longest continuous reef in the United States), rich marine life, sandy beaches, wetlands, ancient loko iʻa (fishponds), native forests, and homestead communities nestled between the mauka hillsides and the ocean plain *(Figure 1-1)*. Churches, gathering halls, and parks serve as anchors of community life, while the rolling mauka lands used for ranching now face challenges of erosion, wildfire, and invasive species. The strength of these communities lies in their connection to place and in the persistence of a lifestyle grounded in aloha ʻāina. Yet these low-lying lands with limited evacuation routes and aging infrastructure make the homesteads particularly vulnerable to natural and climate-related hazards.

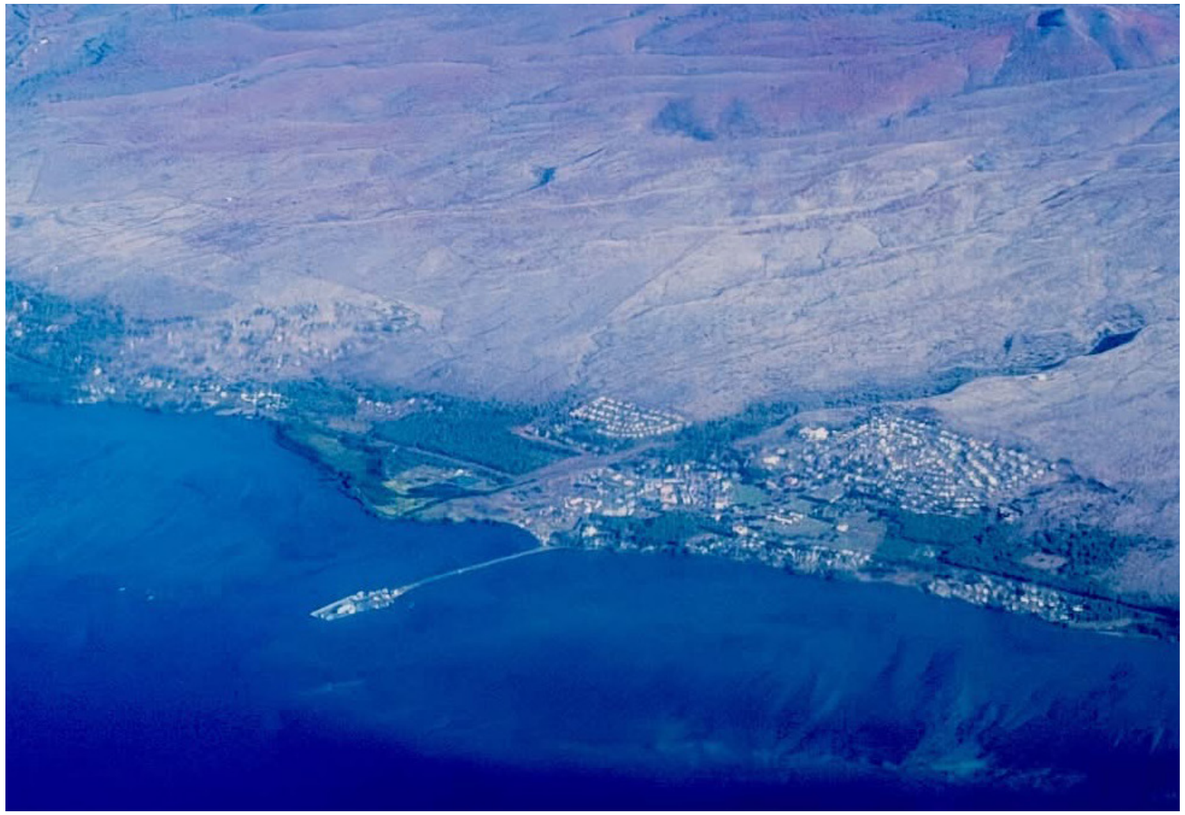


Figure 1-1 Aerial Image of South Molokaʻi

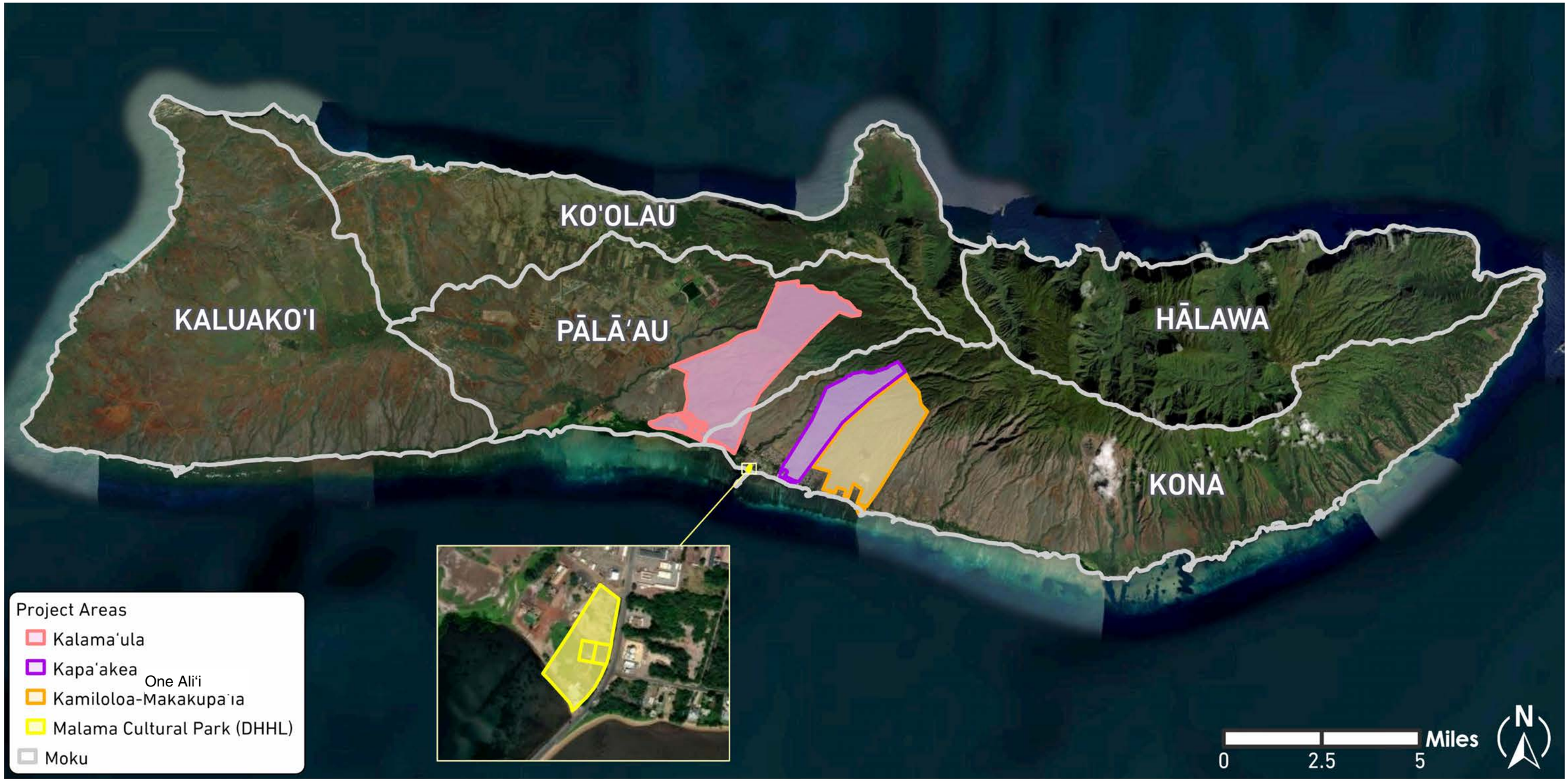


Figure 1-2 Planning Areas

In recent years, the south shore homestead communities of Molokaʻi have experienced more frequent and intense natural events including flooding, erosion, and high surf. Hurricanes, tropical storms, and heavy rain have damaged roads, filled drainage ditches, and flooded homes. When Kamehameha V Highway is blocked or eroded, it cuts off access to schools, medical care, and essential services. These events show how every part of the island is deeply connected. When one system fails, many parts of the community are affected. These communities can be flooded for days and cut off from normal transportation and evacuation routes.

Traditional Ecological Knowledge (TEK)
is the deep understanding of the environment passed down through generations of Indigenous peoples through observation, experience, and practice. It reflects how communities live with and care for the land, water, and resources in ways that maintain balance and cultural connection.

In response to these growing coastal challenges, DHHL prepared the South Molokaʻi Shoreline Erosion Management Plan (SM-SEMP) in 2022 *(Figure 1-3)*. The plan was developed by Planning Consultants Hawaiʻi, LLC, and Coastal Planners, LLC. The SM-SEMP built upon years of community concerns about shoreline loss and coastal flooding affecting the Molokaʻi south shore homestead communities. Beneficiary input was gathered through meetings, interviews, and workshops with homesteaders, lineal descendants, and local experts. Their knowledge and experiences helped identify erosion hotspots, flood-prone areas, and culturally significant shoreline resources. Technical studies of shoreline change, wave energy, and sea level rise were also completed to guide strategies that balance Traditional Ecological Knowledge (TEK) with modern science.

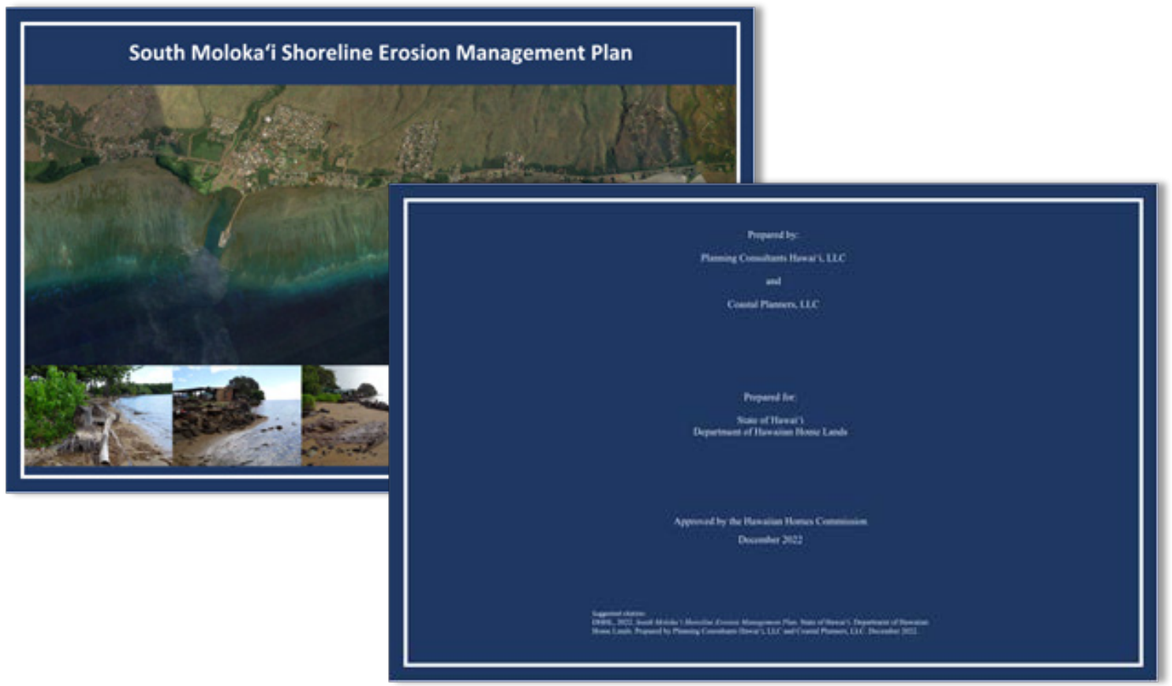


Figure 1-3 South Molokaʻi Shore Erosion Management Plan (2022)

Several beneficiaries who participated in the SM-SEMP process emphasized that shoreline management alone would not be enough to address the broader impacts of climate change affecting their communities. They called for a comprehensive and coordinated effort to strengthen resilience from mauka to makai inclusive of the entire ahupuaʻa. In response, DHHL partnered with beneficiaries to develop resilience strategies that apply nature-based solutions to reduce risk, restore ecosystems, and protect community assets. This effort led to the creation of this report, the Molokaʻi Coastal Homestead Community Resilience Plan (MCH-CRP), which expands on the SM-SEMP and several other ongoing or proposed initiatives *(see Appendix A)* by addressing multiple climate-related hazards through an integrated, beneficiary-driven, and culturally grounded approach.

Nature-Based Solutions
are actions that use natural processes and ecosystems to address environmental and community challenges.

Planning Approach

The MCH-CRP is the first plan of its kind for the DHHL homesteads on Molokaʻi and represents a bold step toward an integrated, culturally grounded model of resilience. Building on the foundation laid by the SM-SEMP, the MCH-CRP expands the focus beyond the shoreline to address a full range of stressors through nature-based and community-led solutions. The plan also responds to chronic, interconnected challenges such as housing, food security, and economic opportunity, acknowledging that true resilience requires both ecological and social stability.

Rooted in the community's deep knowledge of place, the plan honors the enduring relationship between people and ʻāina shaped through generations of lived experience. It recognizes that resilience is not new to these homesteads but a continuation of adapting to changing conditions while applying ancestral knowledge to meet today's challenges. This plan weaves traditional wisdom with modern science to guide how the community continues to thrive over time.

The 2022 DHHL General Plan comprises Tier 1 of the DHHL Planning System, and includes discussion of climate change and natural hazard considerations throughout the plan, as well as a Climate Change White Paper in the appendix. The General Plan directs DHHL to include climate change and natural hazards in land suitability analyses when creating or updating its plans. Significant attention is given to addressing the policies in the General Plan regarding climate change and sea level rise, hazard mitigation, natural & cultural resources, water & drought resilience, community resilience, built-environment resilience and emergency preparedness. Within the DHHL Planning System, the MCH-CRP is a type of Strategic Program Plan, located on Tier 2 *(See Figure 1-4)*, which informs or carries out General Plan policies and priorities for specific functional areas; in this case, the MCH-CRP includes native Hawaiian development, disaster preparedness, community resiliency and water resources, albeit for a localized area.

In 2026, the DHHL Planning Office will be starting the planning process for the DHHL Molokaʻi Island Plan update and the statewide DHHL Disaster & Climate Risk Reduction Plan. Both of these planning processes will incorporate what has been learned through the Tier 2 MCH-CRP process; and by building a strong policy foundation and framework based on beneficiary input and participation, incorporating it by reference, will strengthen DHHL's ability to pursue implementation of the resilience strategies in the MCH-CRP.

The planning process followed the framework of the U.S. Climate Resilience Toolkit (2023), integrating local knowledge, anecdotal evidence, and scientific analysis *(Figure 1-5)*. From the start, this plan was guided by beneficiaries through workshops, huakaʻi (site visits), and small group meetings *(see Appendix B for notes)*. Participants shared moʻolelo to identify climate threats and community assets. Through collaborative discussions and lived experiences, they helped assess vulnerabilities, explore possible solutions, and prioritize resilience actions. Beneficiary guidance informed each step of the planning process, from defining issues to developing strategies and identifying near term actions for implementation. Collaboration and partnerships were emphasized throughout the planning process.

The following table *(Table 1-1)* outlines the partnerships and their roles in the process. A detailed table of partnership roles, jurisdiction and responsibilities is located in *Appendix C*.

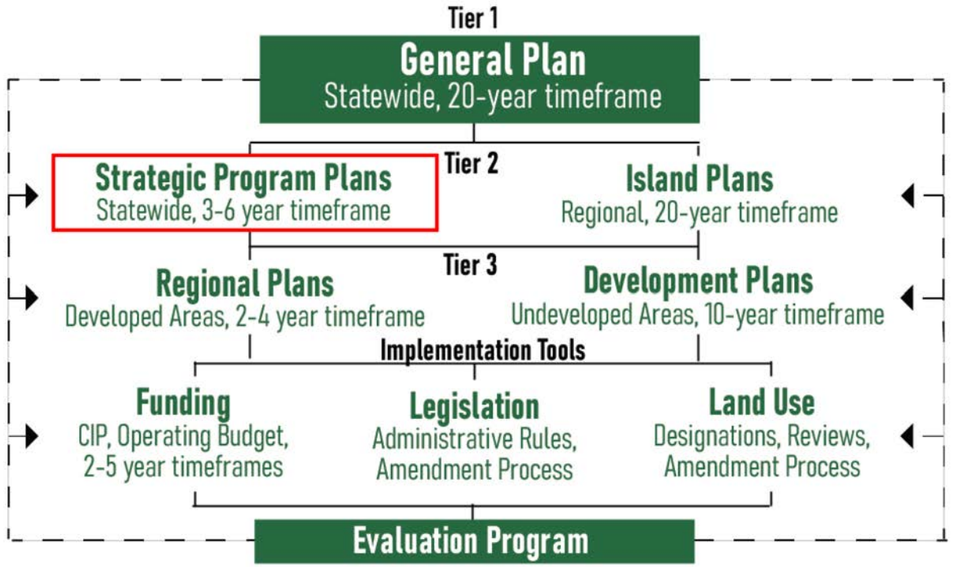


Figure 1-4 DHHL Planning System

Table 1-1: Partnerships

Term	Who It Refers To	Activities
Beneficiaries	Homestead lessees & associations	Cultural and community knowledge, identifying needs, prioritization
Experts	Non-profit, Private, County, State, and Federal organizations	Technical expertise, jurisdictional roles
Sustʻāinable Molokai	Subcontractor	Community engagement support and facilitation
Keliʻa Design	Subcontractor	Community engagement support and facilitation
G70	Consultants	Technical analysis, mapping, report writing
DHHL	DHHL Planning Office staff	Grant writing, coordination, consultant oversight

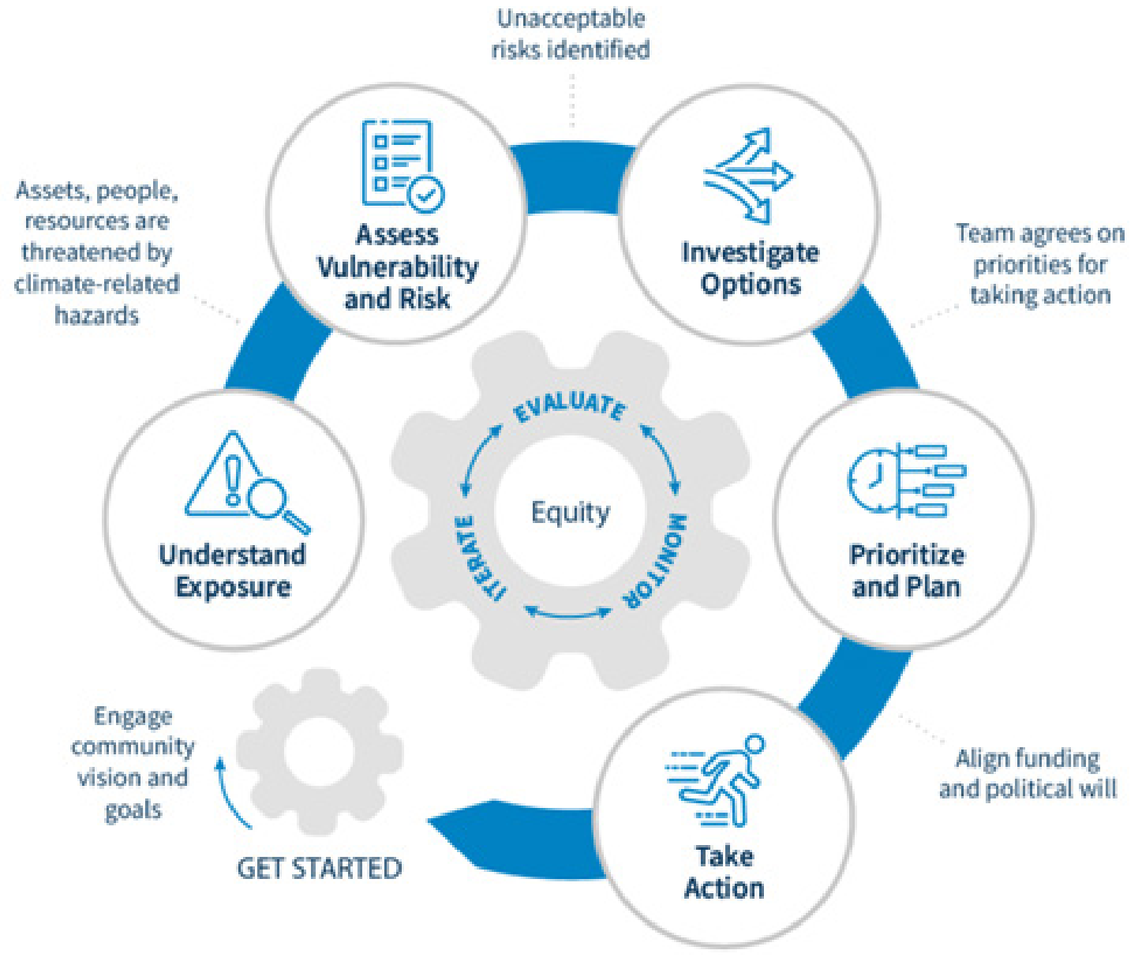


Figure 1-5 Steps for Developing a Climate Resilience Plan *(U.S. Climate Resilience Toolkit, NOAA)*

Project Funding

The MCH-CRP is funded through the National Fish and Wildlife Foundation (NFWF) National Coastal Resilience Fund (NCRF). The NCRF has multiple stages of funding. DHHL is currently in the first stage, which is focused on Community Capacity Building & Planning.

Funding in this stage was granted for DHHL to develop a resilience plan with nature-based solutions that provide both a community resilience benefit and a fish and wildlife benefit. Upon completion of this stage with the adoption of this MCH-CRP by the Hawaiian Homes Commission, additional funding opportunities can be accessed to implement the solutions. Future funding stages include Site Assessment & Preliminary Design, Final Design & Permitting, and Implementation. To progress the project forward to these stages, it is anticipated that grant applications will be submitted to NFWF through the NCRF program as well as by accessing other state governmental and non-governmental, and federal funding mechanisms.

Planning Process

Planning for the MCH-CRP began in June 2023 when DHHL contracted with G70 to lead the process, with Sustʻāinable Molokai and Keliʻa Design supporting community engagement and Planning Consultants Hawaiʻi providing technical analysis. Background studies and hazard assessments were conducted in late 2023 to document existing conditions, community assets, and vulnerabilities. A series of meetings, huakaʻi, interviews, and workshops were held with homestead beneficiaries and technical experts to identify issues, explore resilience strategies, and prioritize nature-based solutions. Beneficiary guidance has been central at every stage, shaping the plan's goals, strategies, and early actions toward a more resilient future for Molokaʻi's south shore homestead communities.

Table 1-2: MCH-CRP Planning Timeline

Date	Event / Milestone
2018 - 2022	DHHL completes the SM-SEMP
May 2022	NFWF NCRF Grant Agreement executed
June 2023	DHHL initiates MCH-CRP planning process
December 2023 - March 2024	Background research, geospatial analysis, and technical analysis of community assets, hazards, and vulnerabilities
March 2024	Initial meeting with Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi Association leaders
April - June 2024	Series of Planning Hui meetings, beneficiary meetings, and talk story sessions to identify problems and opportunities. The initial Hui meetings helped to shape the All beneficiary meetings structures, process & pilina which would span throughout the whole project's outreach process
May 2024	Beneficiary Meeting #1 to introduce MCH-CRP
June 2024	Beneficiary Meeting #2 to identify Issues and Opportunities
August 2024	Beneficiary Meeting #3 to explore resilience strategies; Huakaʻi with beneficiaries to observe mauka conditions; voting and ranking for top 5 potential resilience strategies
September - December 2024	Technical expert consultations; ʻŌhiʻapilo Wetland huakaʻi with beneficiaries
January - February 2025	Continued coordination with homestead associations and mauka to makai huakaʻi
April 2025	Beneficiary Meeting #4 to review strategies and early actions; Informational briefing to the Hawaiian Homes Commission on Molokaʻi
May - December 2025	Develop Draft MCH-CRP
December 2025	Homestead Board Meetings to confirm priority projects and review current matrix

Summary of Beneficiary Workshops and Huakaʻi

For the MCH-CRP, "beneficiaries" refers to DHHL homestead lessees and their households and associations *(see Table 1-1)* within the Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi homestead communities. These are the communities living within the project area and experiencing the hazards—erosion, flooding, king tides, drought, wildfire, and shoreline change—that led to the request for DHHL to initiate the planning effort. Participation included homestead association leadership, board representatives, kūpuna, long time residents, cultural practitioners, lineal descendants who remain engaged with their ʻāina, and other homestead lessees who attended open beneficiary meetings. In addition, residents directly affected by coastal hazards participated through one-on-one interviews and talk story sessions. These groups collectively provided the manaʻo that shaped the plan.

Initial meetings with Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi Hawaiian Homestead Association (HHA) Presidents and Representatives in March 2024 *(Table 1-2)* grounded the planning team in the demographic scale of each homestead community, association leadership structure, and the need to involve two to four representatives per association in a Planning Hui. The Planning Hui provided input that helped to shape both process and content for the beneficiary workshops. These early sessions emphasized the need for the planning process to "come from the beneficiaries from the beginning," with repeated communication loops. The pilina building (connection to place) with the HHA Presidents and Representatives was an essential part of the foundation of this plan, and led to a collaborative approach throughout the whole process.

The Planning Hui meetings were held prior to the initial beneficiary workshops, and identified the following:

- The need for access road maps, mauka to makai water restoration focus areas, jurisdiction clarification, and evacuation planning details.
- Land use questions connecting mauka and makai, including restoration, cattle management, fire breaks, and housing/resilience hub considerations.
- Recommendations for how project options should be organized in maps, presentations, and workshop materials.
- Topics requiring expert consultation (e.g., drainage jurisdiction, water system constraints, invasive species, wildfire prevention, fishpond and wetland management, shoreline strategies).

These meetings clarified that resilience could not be addressed solely at the shoreline, and that mauka conditions, including water flow, vegetation management, invasive species, and ungulate pressure, were integral to solutions.

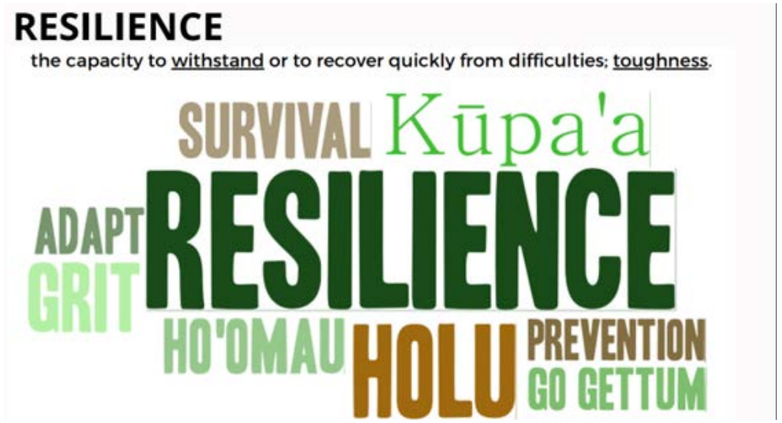
A total of four beneficiary workshops have been conducted to date.

Beneficiary Workshop #1

The first workshop, held at the DHHL Kūlana ʻŌiwi Hālau in May 2024, was attended by 14 beneficiaries from all three homesteads. The workshop served as an introduction to the MCH-CRP and the planning process. Its purpose was to bring beneficiaries together to learn about the intent of the plan, the stages of work, and how their knowledge and guidance would shape the outcomes.

The beneficiary responses to "What does resilience mean to you?" reveal a deep sense of strength, adaptability, and perseverance rooted in both Hawaiian values and lived experience. Words like Kūpaʻa and Hoʻomau reflect a collective understanding that resilience means standing firm through adversity and being unwavering in commitment to ʻāina, culture, and one another. These words express that resilience is not just about surviving challenges but doing so with purpose and loyalty to community and place.

Holu brings in the idea that strength also comes from flexibility, and the ability to bend, move, and adapt without breaking. Combined with words like Adapt, Grit, and Go Gettum, it shows that beneficiaries see resilience as both mental toughness and the ability to evolve in response to change. Survival and Prevention highlight a pragmatic awareness of the risks faced by their communities and a desire to act proactively to protect lives, homes, and resources.



Holu: Springy, pliable, resilient, as a mattress; to sway, as palm fronds; to ripple, as waves; to play back and forth; bumpy, as an airplane ride.

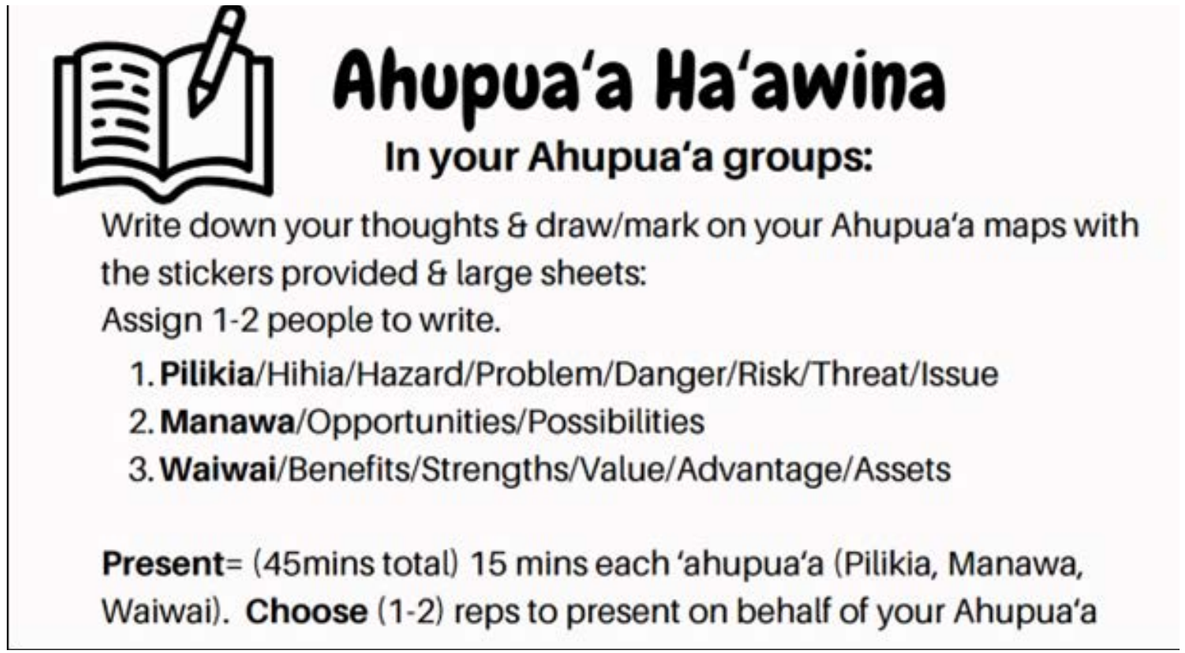
Hoʻomau: Always, steady, constant, ever, unceasing, permanent, stationary, continual, perpetual; to continue, persevere, preserve, endure, last; preservation, continuation.

Kūpaʻa: Steadfast, firm, constant, immovable; loyal, faithful; determined; loyalty, allegiance, firmness.

Workshop 1: Beneficiaries were asked "What does resilience mean to you?"

Beneficiaries worked in ahupuaʻa-based groups to identify Pilikia (hazards, challenges), Manawa (opportunities), Waiwai (community assets), as defined and facilitated by Sustʻāinable Molokai. The Pilikia identified during Workshop #1 centered on long-standing issues with flooding, drainage failures, shoreline erosion, invasive species, and the degradation of both mauka and makai ecosystems. Beneficiaries described recurring flooding caused by the elevated Kūlana ʻŌiwi campus and chronic blockage at Third River, tying these problems to sediment moving from the uplands, unmanaged gulches, and inadequate culvert maintenance. They also emphasized how mauka conditions, including overgrazing by deer, wildfire risk, and poor land stewardship, directly affect coastal homesteads through increased runoff and sedimentation. Traditional ecological knowledge appeared throughout these discussions: kupuna and long-time residents explained that vegetation stabilizes land and shoreline features, illustrating this with examples such as the punawai (freshwater springs) where the shrimp live; areas planted with native vegetation remained intact while unplanted areas eroded, affecting shrimp habitat. They also shared observations of how mangrove expansion, gorilla ogo accumulation, and disease in historic niu groves are altering coastal processes and cultural landscapes. Together, these insights revealed interconnected vulnerabilities spanning hydrology, ecology, and cultural resources, which became foundational to the plan's understanding of community risk.

From these discussions also emerged a clear sense of Manawa—opportunities rooted in traditional practice, community cooperation, and local environmental knowledge. Beneficiaries described how planting native vegetation, restoring fishpond and punawai function, managing invasive species, and reestablishing mauka to makai health could strengthen both ecological and cultural resilience. They also identified Waiwai, or enduring assets, such as generational knowledge of the land, practices of sharing and mutual aid, significant cultural sites like Aliʻi Pond, and the community's strong sense of place and responsibility for ʻāina. Practical solutions grounded in this traditional knowledge, such as fencing revegetation areas, selecting deer-resistant plants, creating detention basins, and adapting food cultivation to increasingly saline soils, demonstrated how cultural and ecological understanding could be applied to modern hazards. Taken together, the Pilikia, Manawa, and Waiwai expressed in Beneficiary Meeting #1 reflected beneficiaries' deep relationship to their environment and provided the conceptual and practical framework upon which subsequent resilience strategies were built.



Beneficiaries were notified of consultation meetings through multiple outreach methods designed to reach as many homestead residents as possible. Prior to each meeting, the project team met with homestead leaders to share information and request their support in spreading the word throughout their communities. Postcards were mailed directly to beneficiaries living within each homestead, and project team members went door to door to personally invite residents and answer questions.

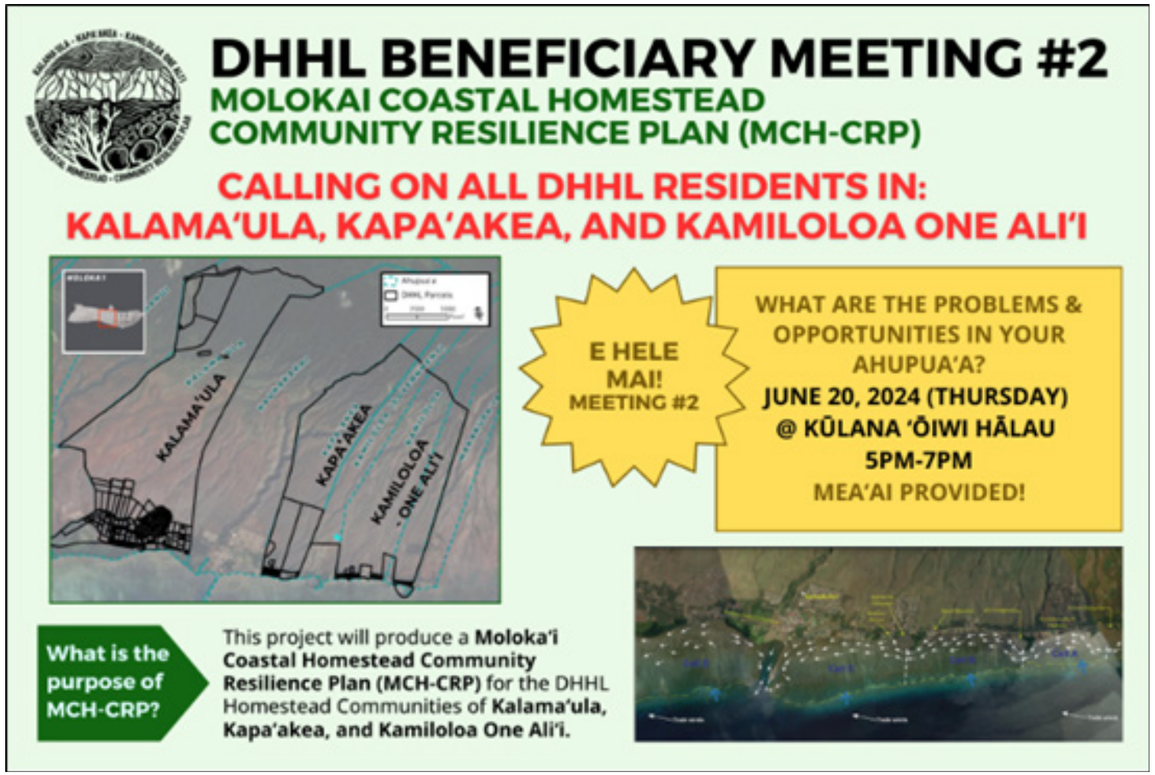
Beneficiary Workshop #2

The second beneficiary workshop was held at Kulana ʻŌiwi Hālau in June 2024. This workshop was attended by 30 self-identified beneficiaries from all three Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi homesteads. The purpose of this workshop was to build on the foundation of the first meeting by identifying what is most important to the homestead communities and understanding the specific challenges they face within their ahupuaʻa. Through a participatory mapping activity, each group located Pilikia, Manawa, and Waiwai on maps of their community to visualize where vulnerabilities and opportunities exist. The documentation of this interactive mapping was central to shaping how vulnerabilities and opportunities were spatially understood and later incorporated into the plan's technical analyses and project lists. This process encouraged open discussion, sharing of lived experiences, and collective problem solving. Each group selected a representative to present their findings on behalf of the group.

The group representatives presented detailed problem statements—flooding, drainage failures, sedimentation, invasive species pressures, shoreline erosion, cesspools, wildfire risks, and loss of cultural sites—which closely aligned with and expanded upon Workshop #1 findings. These inputs added to the plan in several ways.

First, the mapping exercise revealed patterns of watershed-driven hazards that beneficiaries consistently identified across ahupuaʻa, reinforcing the shift to a mauka to makai framework rather than a shoreline-only focus. This connection appears repeatedly, such as the identification of mauka erosion, gulch sediment flows, and the need to restore water pathways and diversions.

Second, beneficiaries elevated jurisdictional confusion—especially regarding culverts, stream maintenance, and road rights-of-way—which led to the



Workshop #3: Beneficiaries met with subject matter experts and prioritized resilience strategies

Workshop #3: Beneficiaries ranked potential resilience strategies/projects

plan including explicit next steps such as a meeting with State of Hawai'i Department of Transportation (DOT) and County of Maui about culvert and stream maintenance responsibilities.

Third, multiple traditional and practical insights shared during Workshop #2 shaped early resilience solutions, such as the importance of revegetating dunes and gulches to hold sand and soil, selecting deer-resistant native species, fencing restoration areas, and recognizing the stabilizing role of restoring fishpond walls which help to reduce sedimentation into the ocean as well as provide nutrients for the fishpond. Beneficiaries also highlighted cultural assets—Kapuāiwa Grove, punawai, fishponds, cemeteries, mo'olelo of place—which reinforced the plan's emphasis on protecting sites of cultural significance. Through these contributions, Workshop #2 served as a pivotal moment where beneficiary reasoning, cultural knowledge, and spatial insight materially shaped both the technical and values-based direction of the MCH-CRP. A compilation of key assets and hazards identified during these meetings are discussed in Chapter 4 Assets, Hazards, and Vulnerabilities.

Beneficiary Workshop #3

Beneficiary Workshop #3, held at the Office of Hawaiian Affairs conference room at Kūlana 'Ōiwi in August 2024, included nine beneficiaries from all homesteads. This workshop focused on developing and refining potential resilience strategies. Building on the priorities identified in earlier workshops, beneficiaries worked together to explore practical projects and actions that address community vulnerabilities and strengthen resilience. Subject-matter experts from the DOT, State Department of Land and Natural Resources (DLNR) Division of Aquatic Resources (DAR), County of Maui Emergency Operations Center, Maui Department of Water Supply, Maui Public Works, Maui Police Department, University of Hawai'i (UH) Sea Grant, Ka Honua Momona, Moloka'i Island Burial Council, and Moloka'i Homestead Livestock Association joined the discussion to share technical insight, answer questions, and support the community in shaping informed strategies.

Although this workshop was smaller in number than Workshop #2, the presence of subject-matter experts (of whom some are also beneficiaries) created a setting where beneficiaries could directly question agency representatives, verify the feasibility of ideas raised in earlier workshops, and refine project concepts in real time. This structure gave beneficiaries significant decision-making authority: they were not simply reacting to a presentation, but actively shaping which resilience strategies would be carried forward.

The process of participation for workshop #3 differed from earlier meetings by focusing on strategy development and project refinement, rather than hazard identification. See *Chapter 5* to this discussion of matrix evolution. During the meeting, beneficiaries were briefly advised on the purpose of the session—to "rank and choose priority sites/options available"—and were provided with maps, aerials, and draft project lists developed from Workshops #1 and #2. After this short orientation, the workshop shifted into a beneficiary-led working session. Each participant evaluated proposed projects, asked technical experts targeted questions about feasibility and jurisdiction, and discussed trade-offs and priorities across themes such as mauka restoration, emergency access, shoreline management, cultural site protection, and housing and land use. This meeting format gave beneficiaries both the information and the authority needed to advance or eliminate project options.

This workshop clarified that mauka restoration would require specific tools—such as historic aerial photos, detailed maps, and coordinated data collection—to guide gulch stabilization and revegetation efforts, elevating these from general concepts in earlier workshops into actionable next steps. Beneficiaries also gained clearer understanding of jurisdictional boundaries for roads, culverts, and drainage features, which confirmed the need for inter-agency coordination first raised in Workshop #2 and solidified it as a priority action. The session further introduced practical considerations for emergency access, including evacuation staging areas, communication gaps, and site-specific safety constraints that had not surfaced in earlier discussions. Expert dialogue also validated community observations about how fishpond, wetland, and dune systems respond to vegetation and hydrology, strengthening support for nature-based shoreline strategies.

Workshop #2: Beneficiaries worked in groups to map out identified Pilikia (Challenges) and Manawa (Opportunities)

Workshop #2: Beneficiaries engaged in an interactive mapping activity

Beneficiaries emphasized the historical mauka-to-makai flow paths with greater specificity, identifying where water once traveled, where springs historically fed the wetlands and fishponds, and how modern blockages have altered these dynamics. Cultural practitioners described changes in water clarity, fish behavior, and sediment patterns that serve as traditional indicators of ecosystem health, offering observational tools to guide future monitoring and restoration. The workshop also confirmed that restored areas will require continued protection through fencing and coordinated grazing management, linking cultural stewardship practices with practical land management needs that experts affirmed as feasible.

Projects that tended to be advanced addressed mauka-to-makai restoration, drainage and culvert maintenance, shoreline and fishpond ecosystem repair, emergency access and evacuation improvements, and housing and land-use strategies—particularly those involving potential mauka relocation and resilience hubs. Beneficiaries, supported by expert input, elevated solutions that focused on restoring natural water flow, stabilizing gulches and dunes with native vegetation, improving road and access safety, reducing sediment and flooding impacts, and strengthening culturally grounded shoreline stewardship. At the same time, projects involving extensive coastal armoring, interventions that did not address upstream watershed issues, and highly regulated, high-cost structural fixes that lacked community support were not carried forward. This workshop refined the project list substantially, emphasizing feasible, culturally aligned, and community-driven strategies that align with beneficiary priorities and that can be supported by strong partnerships with key agencies and organizations. The most impactful and achievable strategies are further discussed in Chapter 5 Resilience Goals and Strategies.

Beneficiary Workshop #4

Beneficiary Workshop #4, held in April 2025, consisted of two separate meetings where the project team joined the regularly scheduled homestead association meetings in Kalamaʻula and Kapaʻakea. The purpose of these meetings was to review and refine a draft Detailed Resilience Strategy Matrix, which summarized proposed projects, potential partners, project details, and preliminary cost estimates. Beneficiaries provided thoughtful feedback on each strategy, offering local insight on priorities, feasibility, and community needs. The outcome of this review, the Detailed Resilience Strategy Matrix and DHHL Resilience Strategy Matrix, are presented in *Appendix E and Appendix F*, respectively, of this plan.

Expert Meetings

By request, an additional meeting with beneficiaries and experts from various fields was held in September 2024. This was a hybrid meeting, held online for those that were unable to attend the in-person meeting being held at the Sustʻāinable Molokai office. This allowed for a broader reach of experts across the State, as well as another chance for beneficiaries to attend that were unable to attend Beneficiary Workshop #3. Prior to the workshop, both experts and beneficiaries were emailed a Preliminary Goals Matrix categorizing previously identified projects. This was to help provide a framework and allow the experts to better understand how their technical background could assist those projects.

After technical difficulties were settled, a presentation of the project status and outreach was given by Sustʻāinable Molokai. Breakout groups were created based on topics in the Preliminary Goals Matrix and fields of expertise in attendance (Mauka–Makai Hydrology, Mangrove & Wetland Management, Drainage & Infrastructure, Conservation & Marine Monitoring). Beneficiaries moved through these breakout groups to ask questions and gather technical insight and cross-validation for priority projects drafted by each homestead community. The attendees re-grouped at the end and shared their takeaways for each homestead community.

For Kalamaʻula, beneficiaries described recurring flooding and sedimentation tied to mauka erosion, blocked culverts, and stream management challenges; experts reinforced the importance of mauka restoration, clarified jurisdictional complexities around drainage maintenance, and discussed tools such as aerial surveys and targeted monitoring to better understand sediment movement. In Kapaʻakea, beneficiaries highlighted persistent flooding in wetland areas, limited drainage capacity, and concerns around evacuation and wastewater infrastructure, while experts emphasized the need for coordinated inter-agency agreements and hydrologic studies to support fishpond and wetland restoration. For Kamiloloa One Aliʻi, beneficiaries reported severe makai flooding, shoreline instability, and sediment impacts, and expert input helped frame these issues within a mauka-to-makai hydrologic context, including the use of soft shoreline stabilization approaches and consideration of longer-term adaptation options such as improved evacuation routes and managed retreat.

Individual meetings also held between DHHL, the consultants, and experts from County of Maui, DOT, DLNR/DOFAW, DAR, TNC, UH, OHA, NRCS, and others provided technical explanations and feasibility insights in response to beneficiary questions. Topics included: jurisdiction over culverts, water system pressures, mauka restoration, mangrove management, deer and ungulate impacts, sediment basins, wildfire mitigation, reef and estuary restoration, cesspool conversion, and hydrologic data collection. Experts confirmed the need for mauka interventions, informed potential engineering and ecological solutions, and validated community observed hazards.

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Additional Outreach

Talk story sessions with two residents from Kapa‘akea provided detailed, place-based knowledge of flooding patterns, sediment movement, drainage blockages, shoreline change, and cultural site impacts. These interviews helped verify problems documented in earlier planning stages, while adding household-level stories, specific hazard experiences, and community-held historical knowledge. This information influenced the framing of priority problems and validated the need for mauka-makai analysis.

A meeting held on August 26, 2024, with large landowners and Right-of-Entry (ROE)/Licensed Lessees (including Kalaiakamanu Hou, Hou Congregational Church, Molokai Church of God, and Molokai Nazarene) revealed parallel issues faced by churches and other land users in the area, including flooding, shoreline erosion, septic failure, and the need to plan for relocation mauka. These groups echoed beneficiary calls for mauka restoration, vegetation management, and equipment/resources to support drainage and wildfire mitigation. Their perspectives confirmed the wider geographic relevance of challenges experienced by homestead communities. The churches and ROE/lessees present at the meeting expressed a strong interest in collaborating with beneficiaries on resilience projects. There was repeated emphasis on shared stewardship—such as their ongoing efforts to revegetate rocky hillsides, maintain drainage paths, and respond directly to flood events—as well as recognition that solutions require coordinated action across homestead and non-homestead lands.

In addition to the beneficiary consultation workshops, beneficiaries were invited to participate in a Huaka‘i, a site visit to DHHL lands in the mauka and makai regions of the ahupua‘a. The purpose of the Huaka‘i was to provide beneficiaries an opportunity to experience these areas firsthand, to reconnect with place, and to share stories, memories, and insights that could guide the planning process. Participants observed the current conditions of the lands, discussed historical and cultural connections, and reflected on how the health of these areas affects the adjacent homestead communities.

At Kalama‘ula, participants viewed mauka water systems, cattle operations, wildfire history, and land suitability for future residential or resilience hub areas. At Kamiloloa, participants examined roadway access, drainage paths, and shoreline conditions. At ‘Ōhi‘apilo Wetland, participants observed flooding dynamics, native plant restoration areas, historical shoreline changes, and cultural significance. The Huaka‘i also served as a working session to brainstorm restoration, evacuation and management strategies for inclusion in the plan. Through this collective experience, beneficiaries contributed valuable traditional knowledge and practical ideas that helped shape the resilience strategies within the MCH-CRP.

Huaka‘i - Potential Evacuation Site in Kalama‘ula

Huaka‘i - DHHL water reservoir in Kalama‘ula

Huaka‘i to mauka lands in Kamiloloa

Huakaʻi to mauka grazing lands in Kalamaʻula

Huakaʻi to mauka lands in Kalamaʻula

How Beneficiary Input Shaped the Plan

The pilina building with the HHA Presidents and Representatives was an essential part of the foundation of this plan and led to a collaborative approach throughout the whole process. They helped shape the process by guiding the team on how to explain and translate technical language and goals into cultural, place-based concepts.

Building pilina with the board members helped both the beneficiaries and the consultants strategize together to adjust the process as they went. Some of the more technical and detailed meetings were held within the standing Homestead Association Member meetings, where beneficiaries typically had good turn outs and went to the homesteads places instead, which helped maintain consistency of attendance and knowledge throughout the planning process along with deep, historical and cultural knowledge of the issues & history within their spaces.

Beneficiary input has shaped the plan by redefining its scope, priorities, and implementation pathways. Early workshops made it clear that coastal hazards could not be addressed in isolation; beneficiaries consistently traced flooding, erosion, and sedimentation to upland conditions such as degraded gulches, overgrazing, altered water pathways, and wildfire-driven landscape changes. This repeated emphasis reinforced the necessity for the plan to be a comprehensive mauka-to-makai resilience strategy, integrating watershed restoration, hydrologic reconnection, invasive species control, and upland vegetation management as essential components of coastal protection. Input from the workshops also clarified that drainage failures and unclear jurisdiction over culverts and roadways were central barriers to resilience. These concerns led to the inclusion of drainage system assessments, inter-agency coordination steps, and the development of jurisdiction maps and maintenance responsibilities as concrete next actions.

Beneficiaries also played a definitive role in shaping project priorities, feasibility considerations, and the sequencing of resilience actions. Through mapping exercises, ranking activities, and dialogue with experts, they advanced projects that aligned with cultural values, practical experience, and community safety needs—such as shoreline revegetation, fishpond and wetland restoration, emergency access and evacuation improvements, and resilience hubs. Workshop #3, in particular, helped refine these priorities by converting broad concepts into actionable measures, including the need for historic aerial data to guide mauka restoration, protective fencing for revegetated areas, detailed evacuation planning, and partnerships for managing gulch and shoreline systems.

Additionally, traditional knowledge shared throughout the process shaped both the technical direction and cultural grounding of the plan. Beneficiaries identified environmental indicators such as changes in water clarity, sediment behavior, fish activity, storm-driven debris movement, and vegetation health, that provide ongoing monitoring tools rooted in long-standing observation. These insights reinforced the need for nature-based solutions, culturally informed stewardship, and ongoing engagement with homestead associations, practitioners, and local organizations. Together, these contributions lend to resilience strategies that reflect the lived experience, priorities, and cultural relationships of the communities they are designed to serve.

Chapter 2

Foundations of Resilience

Chapter 2

Foundations of Resilience

Community Resilience

Resilience is the ability of a community to adapt, recover, and grow stronger when faced with challenges. For the homestead communities of Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi, resilience is not a new concept. It has been practiced for generations through self-reliance, cooperation, and the stewardship of ʻāina. In the context of this plan, community resilience refers to the collective capacity of people, place, and culture to anticipate, absorb, and recover from disruptions such as flooding, erosion, drought, wildfire, and other climate-related hazards while maintaining the well-being and identity of the community. A list of key terminology used throughout this plan is provided in *Table 2-1* below.

Table 2-1: Key Terminology

Term	Definition
Hihia	Entangled, interwoven, involved, perplexed, hampered, rank, snarled, obscure and difficult to understand (Kep. 167); snarl, entanglement, kink, thicket, difficulty, problem, trouble
Pilikia	Trouble of any kind, great or small; problem, nuisance, bother, distress, adversity, affliction, accident, difficulty, inconvenience, perturbation, tragedy, lack; in trouble, troubled, bothered, cramped, crowded
Waiwai	Goods, property, assets, valuables, value, worth, wealth, importance, benefit, estate, use; useful, valuable, rich, costly, financial
Impact	Adverse consequences caused by a hazard or threat
Risk	Likelihood of a hazard or threat occurring and the magnitude of the impact
Vulnerability	Degree of susceptibility to adverse effects of hazards and threats
Adaptation	Actions taken to adjust to conditions so that risk to assets is reduced
Mitigation	Actions taken to prevent or reduce the likelihood or magnitude of a hazard and consequently, the risk associated with a hazard

"Stick together and try to agree to the best of your ability to meet the most important problem: the rehabilitation of our race."

- Prince Jonah Kūhiō Kalanianaʻole (1922)

Resilience is more than a response to emergencies. It is an ongoing process that strengthens social connections, supports cultural practices, and promotes sustainable management of land and water. For homesteaders, resilience reflects the Hawaiian value of kuleana, a shared responsibility to care for one another and for the ʻāina that sustains life.

Community resilience relies on the interconnection of four main systems: social, cultural, ecological, and economic.

- Social resilience grows from strong relationships and collective action. Families, neighbors, and community organizations form networks of support that are essential before, during, and after a disaster.
- Cultural resilience comes from maintaining Native Hawaiian identity, values, and traditional knowledge. Cultural practices such as caring for fishponds, gathering limu, or planting kalo strengthen both community pride and the health of the land and sea.
- Ecological resilience depends on restoring and protecting natural systems that buffer against hazards. Healthy mauka forests absorb rainfall and reduce flooding. Wetlands filter runoff. Healthy coral reefs and vegetated sand dunes protect shorelines from storm surge and erosion.
- Economic resilience is built by supporting local livelihoods, small businesses, and food security that can withstand disruptions in supply chains. Economic diversity and local production create stability during emergencies.

When these systems work together, the community becomes more adaptable and self-reliant, able to recover faster and more sustainably after a disturbance.

Disaster Cycle

The disaster cycle is a continuous process that illustrates how communities prepare for, respond to, and recover from hazardous events *(Figure 2-1)*. The cycle is made up of four connected phases: mitigation, preparedness, response, and recovery. Mitigation includes the actions taken before a disaster to lessen its impacts. Preparedness focuses on building the knowledge, skills, and systems needed to respond quickly and effectively. The response phase begins when a hazard strikes and the community must act to protect life, property, and essential services. It depends on coordination, clear communication, and the ability to adapt under pressure. Recovery follows, as the community repairs damage, restores services, and begins to rebuild. It is both a physical and social process that provides an opportunity to reflect, improve, and strengthen what was damaged or lost.

Resilience planning requires the consideration of

Figure 2-1 The Disaster Cycle

the entire disaster cycle, not just reacting after an event occurs. Each phase is connected, and decisions made before a disaster directly affect how well a community can respond and recover. By integrating resilience into every stage of the cycle, homestead communities can adapt to changing conditions while protecting their people, lands, and way of life for future generations.

Hawaiian Models of Resource Management and Resilience

For Kānaka ʻŌiwi (Native Hawaiian), resilience is rooted in the reciprocal relationship between kānaka (people) and ʻāina (land, that which feeds). Long before "resilience" entered planning and scientific vocabularies, Hawaiian land and resource governance systems were deliberately designed to sustain abundance, balance, and community wellbeing. These systems affirm that the health of people and the health of ʻāina are indivisible.

Figure 2-2 envisions a homestead community committed to advancing the United Nations (UN) Sustainable Development Goals (particularly SDG 3 – Health and Well-being, SDG 6 – Clean Water and Sanitation, SDG 11 – Sustainable Cities and Communities, SDG 13 – Climate Action, SDG 14 – Life Below Water, and SDG 15 – Life on Land) through a Hawaiian worldview.

In this adapted model, ola (individual well-being) and kaiāulu (community-level well-being) are seen as embedded parts of the ʻāina, or biosphere. Contemporary research with Native Hawaiian communities affirms that connection to ʻāina is directly linked to physical, mental, and community health, and that ʻāina-based practices can buffer stress and trauma, including climate-related stressors. For Molokaʻi homesteads, resilience planning must therefore protect and expand opportunities for ʻāina-based living and practice, not only reduce exposure to hazards.

Traditional Hawaiian land management organized each mokupuni (island) into large regions called moku, which were further subdivided into community-managed land sections known as ahupuaʻa. Typically extending from mauka to makai *(Figure 2-3)*, each ahupuaʻa encompassed the full range of resources needed for food, water, materials, and shelter (Minerbi, 1999). This mauka to makai design was not simply geographic; it expressed an understanding of islands as integrated social–ecological systems, where water, nutrients, species, and people are connected across elevation and habitat. Governance extended down to ʻili and other

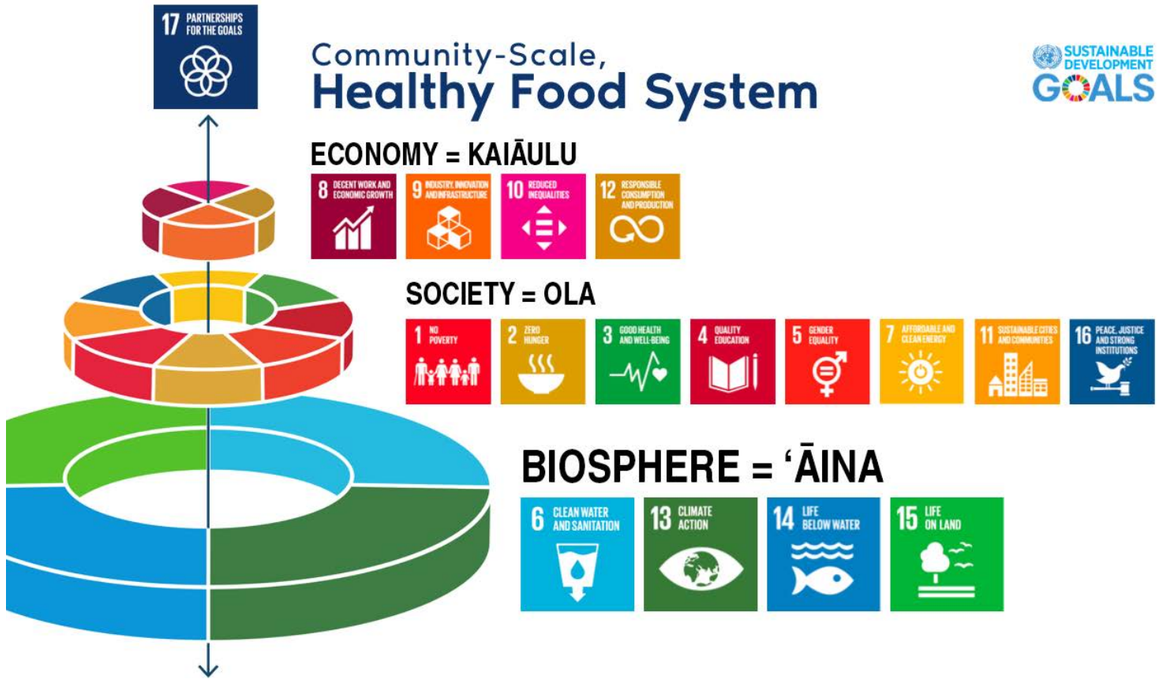

Figure 2-2 Community-Scale Adaptation of UN Sustainable Development Goals

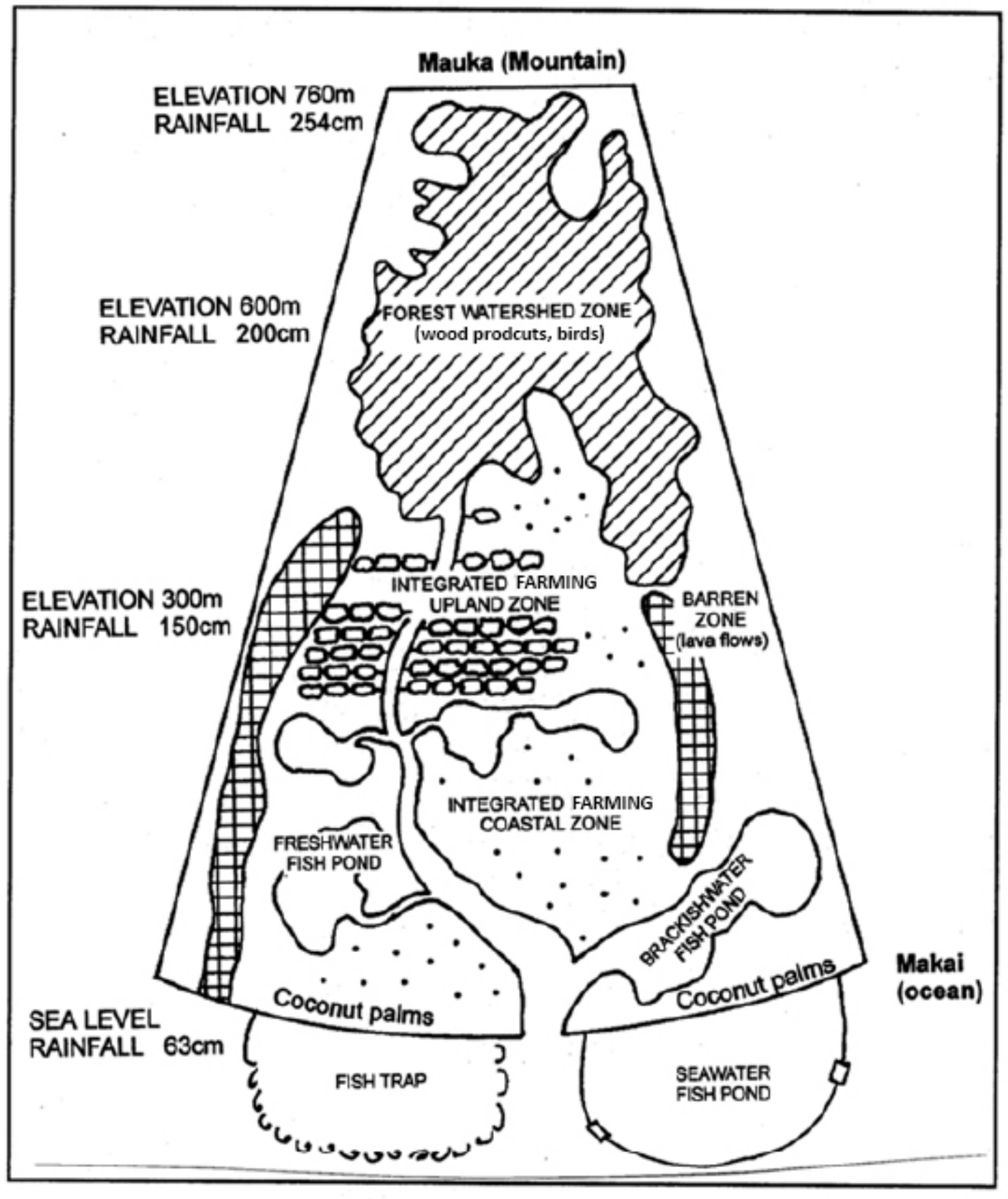

Figure 2-3 Illustration of Ahupuaʻa Concept (Minerbi after Apple, 1999)

nested units, enabling management at multiple scales while maintaining coherence across the whole moku.

The ahupuaʻa of Kalamaʻula ("the red rays" or "red torch/red lama tree") was historically recognized for its freshwater springs, wetlands, and fishponds—including Kapuāiwa's springs and multiple loko iʻa—that once supported abundant native fish, limu, and agriculture *(Figure 2-4)*. These resources made Kalamaʻula an important center for freshwater access and coastal food production, reflected today in the remaining springs and cultural sites documented in this plan.

Kapaʻakea ("coral/limestone surface") was historically a landscape of wetlands, fishponds, and estuarine resources, famous for its loko puʻuone and coastal fisheries, while Kamiloloa ("the long/tall milo tree") and its partner ahupuaʻa, Makakupaʻia, were known for extensive coastal fisheries, multiple large fishpond complexes such as Kalokoʻeli and Aliʻi, and inland agricultural terraces that formed a significant habitation and farming complex. Oral histories and archival notes describe rich nearshore limu, octopus grounds reserved for aliʻi, and productive ʻauwai-fed agriculture, illustrating these ahupuaʻa as places of integrated mauka to makai food systems that supported thriving populations.

These Indigenous governance systems are not just historical context; they function as a proven, place-based resilience framework. Because moku and ahupuaʻa boundaries follow watershed, reef, and resource patterns, they align closely with contemporary priorities in hazard mitigation, climate adaptation, and land-use planning. For Molokaʻi homestead communities, building on this foundation can strengthen existing efforts to reduce flood risk, protect water supplies, secure food systems, and safeguard coastal resources.

Management within each ahupuaʻa was guided by kuleana (responsibility, ancestral obligation, jurisdiction, and authority). Aliʻi (chiefs) and konohiki (land managers) exercised kuleana to set kapu, manage access to key resources, and ensure that the needs of the community and the health of the ʻāina were balanced, while ʻohana and individual residents fulfilled kuleana for the specific lands and waters they used. Resource use was regulated through seasonal kapu and customary protocols that allowed time for natural systems to replenish, linking daily practices such as when to fish, plant, or harvest to the long-term abundance and security of the community. Today, kuleana is expressed through homestead associations, ʻohana-based stewardship groups, kiaʻi loko iʻa and kiaʻi wai, and other community institutions that are central partners in resilience planning.

Within each ahupuaʻa, Kānaka ʻŌiwi also recognized horizontal bands of elevation and associated ecosystems called wao (realms) *(Figure 2-5)*. Wao are social–ecological zones that share climate, vegetation, biodiversity, and patterns of use *(Table 2-1)*. These realms are not uniform across the islands; their boundaries and functions reflect local environmental conditions and management practices. Generally, these realms include the following zones: wao akua (remote, sacred cloud-forest associated with akua), wao kele (rain belt, wet upland forest), wao nāhele (inland remote forest region), wao lāʻau (managed agro-forest), and wao kānaka (zones where people live, cultivate, and directly manage resources). In the kai (seaward) direction, zones such as ka poʻina nalu (inner reefs) and kai koholā (outer reef frequented by humpback whales) connect coastal communities to nearshore and offshore resources (Winter et al., 2018).

The lands above the wao kānaka, specifically wao akua, wao kele, wao nāhele, and wao lāʻau, were commonly held and managed for the benefit of the ahupuaʻa. These upper wao functioned as critical recharge and biodiversity zones, generating and maintaining cultural, biological, and spiritual balance. Wao kānaka zones in the interior supported loʻi kalo, māla, habitation areas, and other forms of intensive management. When stewarded together, the wao and kai zones supported clean and abundant freshwater, fertile soils, healthy fisheries, and ʻāina momona (a state of thriving ecological and community abundance) *(Figure 2-5)*.

Figures 2-6 and 2-7 illustrate how the ahupuaʻa of Kalamʻula, Kapaʻakea, Kamiloloa, and Makakupaʻia are organized across distinct socio-ecological zones that extend from the upland wao akua and wao kele through the wao kānaka and into the nearshore kai lūheʻe and kai koholā. These figures visually demonstrate that each ahupuaʻa contains a full suite of interconnected ecological functions, with upland forest and recharge areas positioned directly upslope of inhabited and cultivated lands, and coastal ecosystems forming the terminal receiving environments for freshwater, sediment, and nutrients moving downslope.

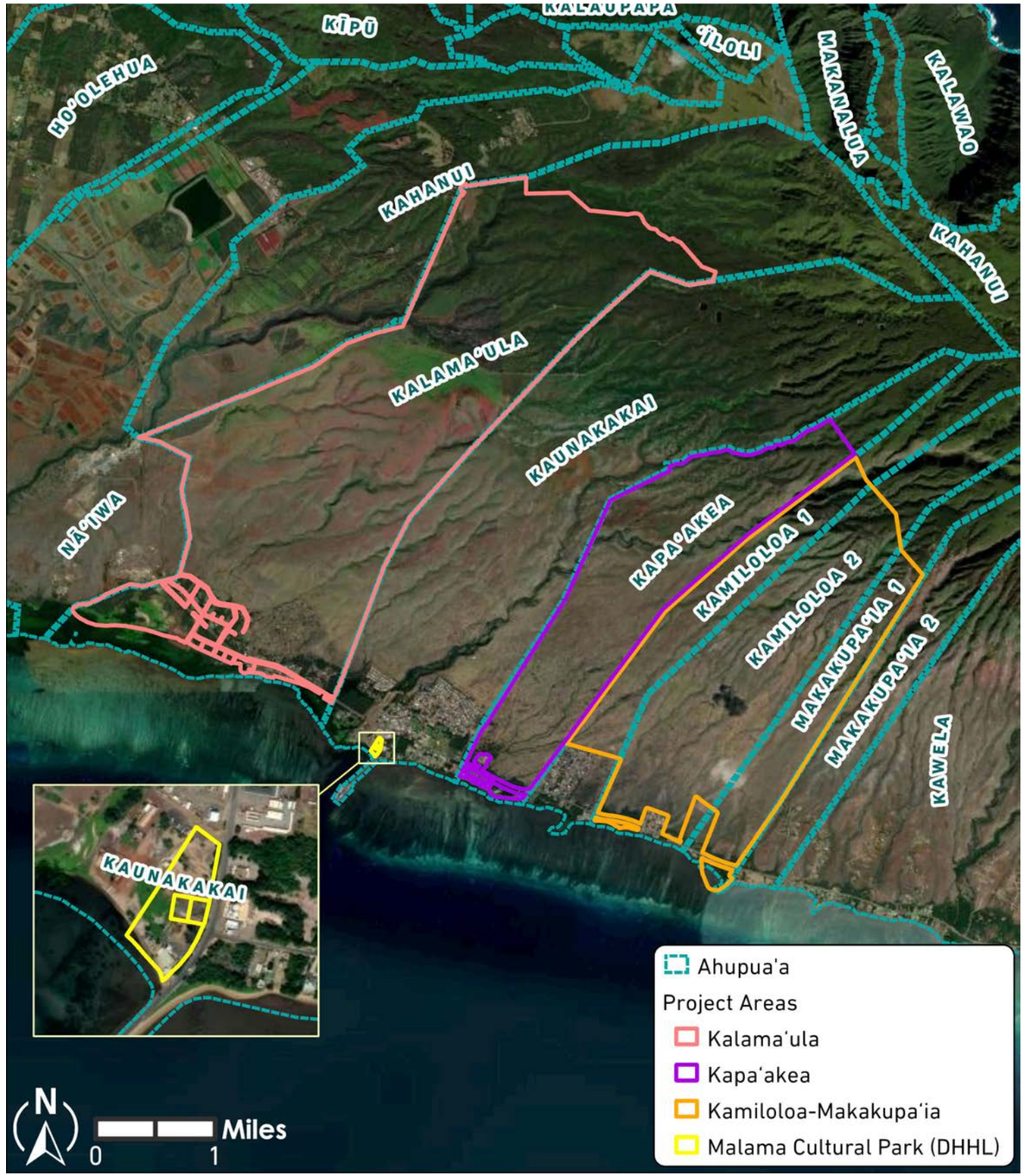

Figure 2-4 Moloka'i Coastal Homestead Ahupua'a Map

Table 2-1: Social Ecological Regions

Socio-Ecological Zone	Translation	Land and Water Management Implications
Wao Akua	Sacred Forest	Primary function: Perpetual source population for endemic biodiversity. Designated as "sacred forest", making it a restricted forest zone for a native-only plant community, accessed only under strict protocols. Associated with montane cloud forest, elfin forest.
Wao Kele	Wet Forest	Primary function: Maximize aquifer recharge. An untended forest zone associated with core watershed areas (remote upland, wet forest below the clouds) which was left as a native-dominant plant community. Impractical for access except for transit through via trails.
Wao Nāhele	Remote Forest	Primary function: Maximize habitat for native birds. A forest zone that was minimally-tended (generally remote upland, mesic forest) and left as a native-dominant plant community. Impractical for access except by bird catchers and feather gatherers.
Wao Lā'au	Agro-Forest	Primary function: Maximize the availability of timber and non-timber forest products. A zone allowing for the management of a highly-tended forest via an integrated agroforestry (native and introduced plants) regime: Native and introduced hardwood timber, Introduced food trees, Native and introduced biofuel sources, Maximization of native biodiversity for non-timber forest products, Cordage and weaving material, Medicine and dyes, Ceremonial and adornment plants
Wao Kānaka	Habitation Zone	Primary function: landscape-scale augmentation to maximize the availability of food, medicine, and housing. A zone allowing for (but not mandating) the conversion of forest to field agriculture, aquaculture, habitation, recreation, and/or temple worship. Native and introduced trees tended, individually or in groves, for regular and specific cultural services.
Kai Lūhe'e	Inner Reef	Fringing reef with breaking waves (representing the seaward boundary of ahupua'a)
Kai Koholā	Outer Reef	Sea frequented by humpback whales (Megaptera novaeangliae) (submerged volcanic shelves)

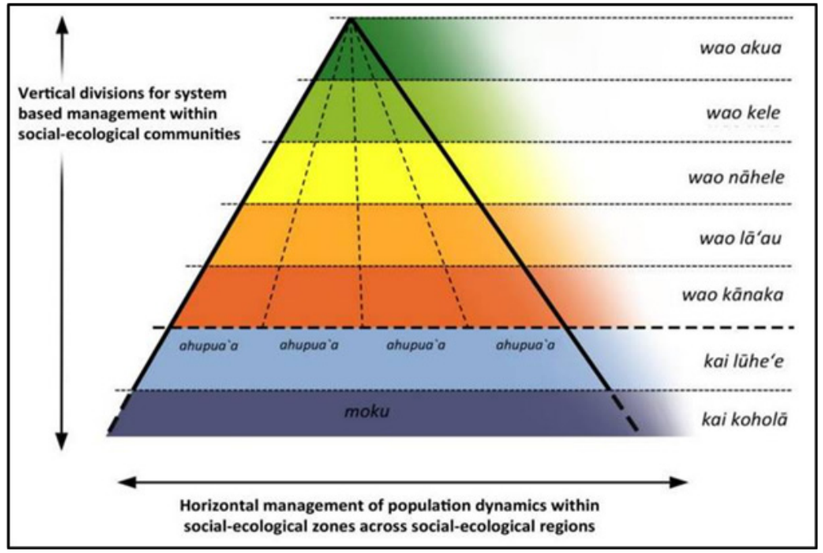

Figure 2-5 Model of Single Social-Ecological Region (Source: Winter, 2018)

KALAMA‘ULA HAWAIIAN SOCIO-ECOLOGICAL ZONES

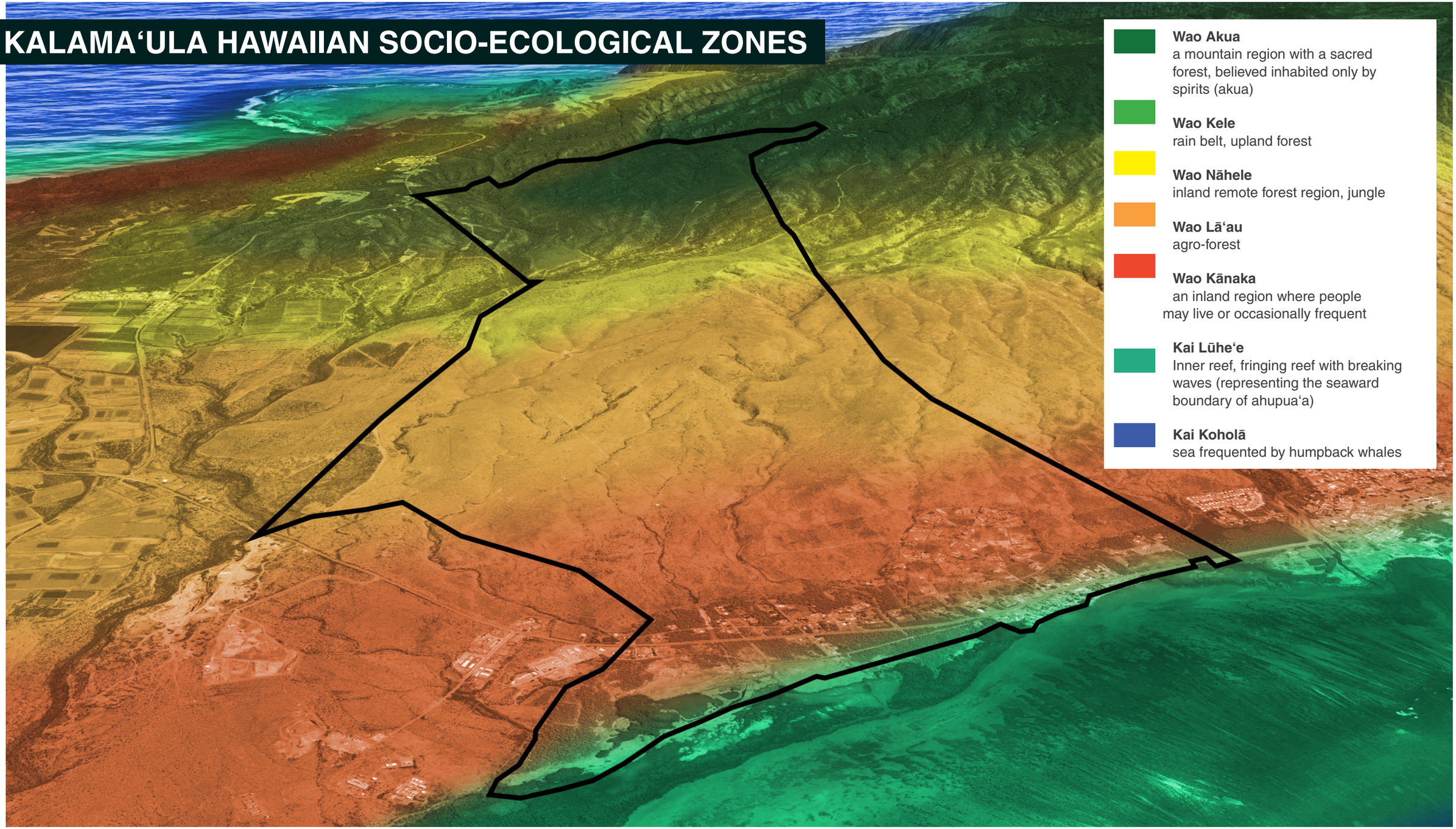

Figure 2-6 Illustration of Socio-Ecological Zones of Kalama’ula Ahupua‘a

KAPA‘AKEA, KAMILOLOA, AND MAKAKUPA‘IA HAWAIIAN SOCIO-ECOLOGICAL ZONES

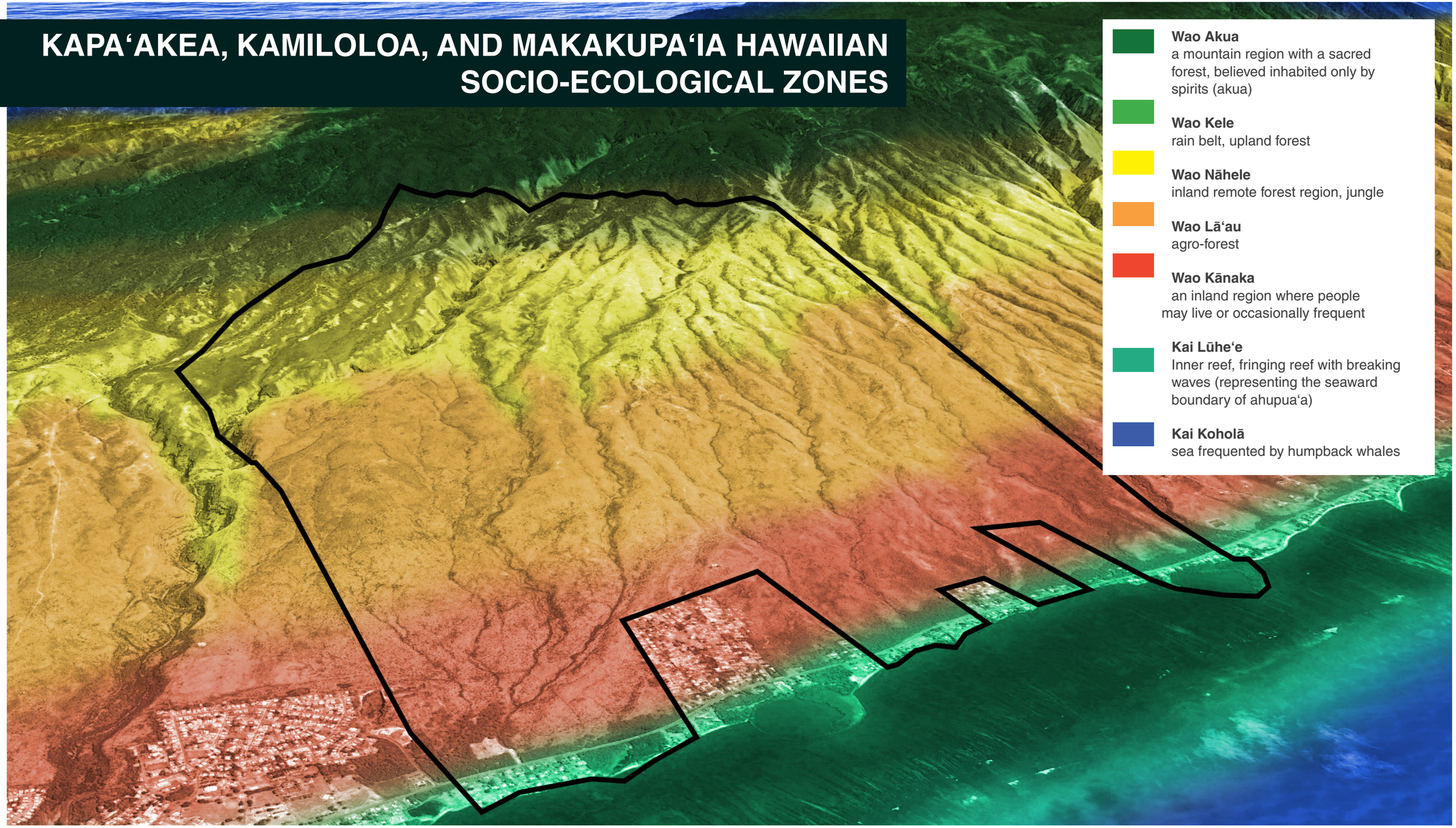

Figure 2-7 Illustration of Socio-Ecological Zones of Kapa’akea and Kamiloloa Ahupua‘a

In both figures, the steep mauka gradients transition rapidly into broad mid-slope and coastal zones, reflecting the physical reality of south Molokaʻi where water moves quickly through gulches during storm events. The spatial arrangement of the wao lāʻau and wao kānaka zones highlights where historical agroforestry, loʻi kalo, habitation, and contemporary homestead development are concentrated, often directly within drainage pathways that connect upland watersheds to fishponds, wetlands, and reefs. This configuration helps explain why changes in mauka vegetation cover, grazing pressure, and wildfire impacts have immediate consequences for flooding, erosion, and sedimentation in coastal homesteads and nearshore waters. The figures also show that the kai lūheʻe zone, where fringing reefs and fishponds are located, functions as a critical buffer and indicator of upstream conditions, reinforcing the ahupuaʻa principle that coastal resilience depends on the health and management of upland zones as much as shoreline conditions.

From a Native Hawaiian perspective, resilience is relational: when people fulfill their kuleana to care for ʻāina, ʻāina in turn sustains social, cultural, ecological, and economic wellbeing.

Effective watershed management brings these relationships into practice. Mauka forests capture and store rainfall, filter and slowly release water, and reduce the intensity of flooding during heavy rains. Healthy gulches, floodplains, and wetlands slow and absorb runoff, reducing sediment and pollutants that would otherwise impact coastal homes, fishponds, and reefs. When forests, streams, wetlands, and reefs are managed as a single connected system, they reduce disaster risk while sustaining fisheries, nearshore ecosystems, and community safety. The moku and ahupuaʻa frameworks remain powerful because they align with the natural movement of water, sediment, species, and people, and therefore provide a culturally grounded basis for resilience planning across the entire disaster cycle.

During mitigation and preparedness, restoring native forests, restoring and maintaining loʻi and wetlands, and protecting coastal ecosystems reduces risks of flooding, erosion, drought, and saltwater intrusion. In response, the strong social networks and governance structures built through Malama ʻāina (care for the land) enable neighbors to mobilize quickly, share knowledge, and care for one another. In recovery, cultural practices, ʻāina-based workdays, and the restoration of damaged ecosystems support healing for both people and place.

Over the last two centuries, these integrated systems of kuleana and ʻāina-based governance were significantly disrupted by land privatization, plantation and ranching economies, military activities, and centralized state and county regulations. These shifts fragmented social–ecological relationships, weakened community decision-making over ʻāina and kai, and contributed to present-day vulnerabilities such as flooding, erosion, and food insecurity. At the same time, homestead communities and other Native Hawaiian organizations are actively revitalizing ʻāina-based governance through community-driven watershed initiatives, restoration of loʻi kalo and loko iʻa, and co-management of nearshore resources. Resilience planning in this context must therefore address not only ecological conditions but also questions of jurisdiction, authority, and community control over land and water.

Through this Indigenous model, resilience is not confined to reacting to hazards; it is a living, intergenerational practice that weaves environmental health, social cohesion, cultural continuity, and self-determination, by restoring and managing Molokaʻi's watersheds through the integrated lens of the moku system, combining ancestral knowledge with appropriate contemporary science. Accordingly, the homestead communities are continuing a legacy of resilient people caring for resilient lands and seas, while advancing locally grounded contributions to global resilience and sustainability goals.

For Molokaʻi homesteads, the long-term goal is ʻāina momona—a condition in which land, waters, and people are thriving together. In this context, resilience is measured not only by reduced losses from disasters, but also by community-defined indicators such as the level of ʻohana access to ʻāina and kai, the abundance of native species and productive loko iʻa, the continuity of cultural practices, and the strength of ʻohana and kaiāulu networks in times of stress. These measures can complement agency metrics and guide implementation and monitoring of this plan.

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Chapter 3

South Shore Community Profiles

Chapter 3

South Shore Community Profiles

Regional Setting and Land Use History

Molokaʻi is the fifth largest of the six developed islands in the southern Hawaiian Island chain, measuring about ten miles wide and thirty-eight miles long. The island has roughly eighty-eight miles of shoreline surrounding its 260 square miles of land. Sections of these shorelines are dynamic and can shift quickly in response to natural forces such as storms, strong winds, and large surf events.

Molokaʻi's south shore is protected from waves, storms, and swells by the neighboring islands of Lānaʻi and Kahoʻolawe and is not exposed to the prevailing northwest ocean swells and storms like the northern cliffs *(Figure 3-1)*. These conditions led to the formation of a coastal plain and the longest continuous fringing reef in the United States, with some of best coral coverage sites in the developed Hawaiian Islands. However, both manmade and climate driven shoreline processes and sea level rise have led to erosion and sedimentation challenges in southern Molokaʻi.

The construction of fishponds along Molokaʻi's southern coast by early Hawaiian settlers, starting around 1,000 A.D., originally led to the altering and disruption of the natural flow of southern Molokaʻi's ocean waves and currents. The terrestrial environment also saw significant change as settlers constructed extensive ʻauwai (irrigation ditches), taro loʻi (ponded terraces) and habitat sites to sustain the growing population. These human interventions began to alter the natural flow of stream water from the mauka reaches to the shoreline and marine environment. However, this system not only helped feed people but supported a wide array of wildlife as well. Both the loʻi and fishponds offered prime habitat for native waterbirds, freshwater fish and invertebrates. The water would drain back into the stream from the loʻi and continue to the sea, delivering nutrients to the estuaries and fishponds, where juvenile marine species flourished.

Besides providing the nutrient-rich staples of the Hawaiian diet, taro loʻi and fishponds also functioned as filtration systems, absorbing floodwater during storms and mitigating the impact of runoff into the ocean. Although the ahupuaʻa system sustained the Hawaiian people for generations, many converging factors, including the sandalwood trade and foreign colonization in the 1800s with the imposition of private land ownership systems and diversion of water, drove Hawaiians out of their ancestral spaces. Many of these loʻi and fishponds were abandoned and either filled or now include mangroves and sediment.

In the early 19th century, Molokaʻi's native ʻiliahi became central to the burgeoning sandalwood trade between Hawaiʻi and China. The Chinese highly prized sandalwood for its aromatic qualities, using it in incense, medicine, and fine woodworking. Hawaiian chiefs, recognizing its value, directed commoners to harvest vast quantities of ʻiliahi, often at the expense of tending to their own crops. This intensive exploitation led to the rapid depletion of sandalwood forests across the Hawaiian Islands, including Molokaʻi, resulting in significant ecological and economic impacts.

In 1859, Kamehameha IV (Alexander Liholiho) established a sheep ranch on the west end of Molokaʻi at Kaluakoʻi. His brother Kamehameha V (Lot Kapuāiwa) expanded the ranch by acquiring additional lands, and augmented them with other types of livestock, including cattle and deer. This was the founding of Molokaʻi Ranch, later purchased in 1897 by the American Sugar Company. The sugar enterprise did not last long as their wells, with the sustained pumping required, produced saline water, which soon killed the cane in the fields. The ranch again reverted to a livestock venture.

Foot trails in Molokaʻi transporting goods and people, windward to kona, were gradually turned to horse paths, then later widened to accommodate animal-drawn wagons or buggies. Eventually when the automobile was introduced to Molokaʻi, the trails became western-style roads. This new mode of transportation required not only better roads, but supplies of oil and gasoline for fuel, which were transported by ship. The harbors on Molokaʻi were shallow and vulnerable to shifts in the gusty winds. As larger ships with deep drafts came to the islands, they required wider openings in the reefs and deeper, well-protected waters for anchorage. Several wharves were constructed during the 1880s at Kaunakakai, Pukoʻo, Kamaloʻo, Kalaupapa and Pelekunu. Of the five original wharves, only Kaunakakai remains, having been rebuilt several times as a pier.

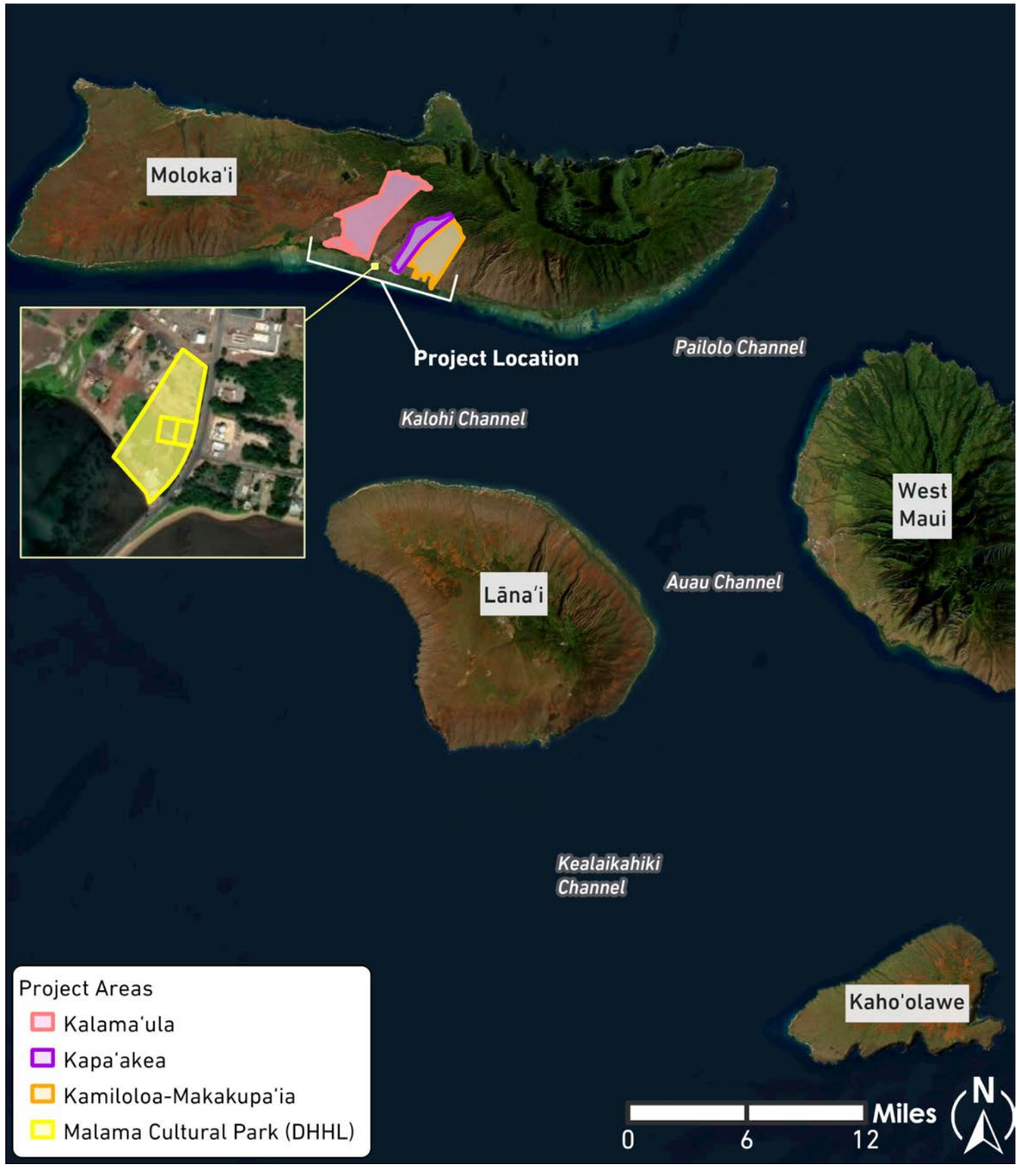


Figure 3-1 Regional Setting

The construction of Kaunakakai wharf in 1889 and its several extensions and improvements over the years (particularly when the wharf road culverts were removed), disrupted along-shore currents, waves and sediment transport *(Figure 3-2)*, robbing the shoreline bordering Malama Cultural Park of its sandy beach. Sand and mud tend to build up in the harbor, resulting in high spots. Shallow areas are a safety concern for vessels. The increased build-up of sand and mud is also kicked up and carried to the surrounding marine ecosystems, such as the coral reef. Maintenance dredging by the U.S. Army Corps of Engineers was completed in 1973 and 2024.Before the introduction of ranching and invasive ungulate populations, the Kalamaʻula, Kapaʻakea, and Kamiloloa areas were dominated by native dryland forests, woodlands, and shrublands, which played a crucial role in stabilizing the soil and supporting the island's watersheds. The region was covered with native species such as lama *(Diospyros sandwicensis)*, ʻiliahi *(Santalum spp.)*, naio *(Myoporum sandwicense)*, ʻaʻaliʻi *(Dodonaea viscosa)*, and milo *(Thespesia populnea)*, along with ground-covering species like ʻuhaloa *(Waltheria indica)* and pua kala *(Argemone glauca)*. These plants were deeply adapted to Molokaʻi's dry, leeward environment, helping to retain soil moisture, prevent erosion, and sustain biodiversity.

The American Sugar Company introduced red mangroves *(Rhizophora mangle)* in 1902, to stabilize the coastal mudflats of Pālāʻau in south central Molokaʻi from eroding. Mangroves have since become an invasive problem, spreading eastward and taking over much of the coastline. The invasive nature of the mangroves causes them to reduce the wetland habitat important for endemic water birds, and encroach onto reef flats, coastal beaches, and fishponds, disrupting traditional fisheries and reducing biodiversity. However, mangroves have also reduced the amount of sediment transport from the watershed to coastal waters and the reef, and reduced the erosion caused by coastal wind and wave energy.

Non-native limu (algae) species, such as *Gracilaria salicornia* (gorilla ogo) and *Acanthophora spicifera* (spiny prickly seaweed), have proliferated in Molokaʻi's coastal waters. *Acanthophora spicifera* was unintentionally introduced to Hawaiʻi in 1950, likely through hull fouling on a barge arriving in Pearl Harbor. From there, it spread rapidly across the main Hawaiian Islands, including Molokaʻi. *Gracilaria salicornia* was intentionally introduced to Hawaiʻi in the 1970s for experimental aquaculture aimed at agar production. Initial plantings occurred on Oʻahu, and the species was later translocated to Molokaʻi's Pukoʻo Fishpond in the 1980s to see if it could support fishpond restoration efforts on Molokaʻi. These aquaculture projects were eventually abandoned, but the algae had already established themselves in the local marine environments. The ability of both species to reproduce vegetatively through fragmentation, and the absence of natural herbivores that specifically target these non-native algae, allowed them to grow unchecked in their new environments. These invasive limu species outcompete native limu and corals, leading to declines in reef health and associated marine life.

Although land management and the control of grazing animal populations have been in effect since the late 1800s, overgrazing by feral animals and cattle still causes much of the present soil erosion problems on Molokaʻi. Extended periods of drought and recurring wildfires have also contributed to the loss of native ecosystems and further accelerated erosion. The widespread loss of vegetation has altered the island's rainfall patterns, leading to reduced precipitation and the conversion of many perennial streams into intermittent flows.

The combination of overgrazing and low annual rainfall limits the ability of grazed lands to recover naturally. Open and disturbed areas are often invaded by non-native grasses that create dense fuel loads, increasing the frequency and severity of wildfires. After fire, the absence of vegetation leaves the ground exposed, reducing soil formation and water retention across the watershed. When short and intense rain events occur, flash flooding can rapidly erode these bare slopes, carrying sediment downslope, clogging streams and drainageways, and causing flooding in the coastal communities below.

Figure 3-3 provides a conceptual illustration of the existing mauka-to-makai conditions described in above. The figure depicts upland forest areas draining through intermittent streams and gulches into lands historically used for agriculture and ranching, before reaching low-lying homestead areas, wetlands, fishponds, and nearshore reef systems. It also shows how roadways, grazing activities, and shoreline modifications intersect with natural drainage pathways, influencing the movement of freshwater and sediment across the ahupuaʻa.

These ahupuaʻa are now facing additional threats

Figure 3-2 Photo of Kaunakakai Wharf (1949)

from the increasing frequency and intensity of climate-driven natural hazards. More powerful storms are producing severe and dangerous floods, placing greater stress on mauka watersheds and increasing the amount of sediment that flows into coastal waters. The continuing changes in climate patterns and hazardous events pose a serious threat not only to the lives and homes of multigenerational families, but also to private property, businesses, critical infrastructure, cultural sites and practices, and essential ecosystem resources and services.

Homestead Profiles

The following pages provide an overview of the homestead communities and areas that are the focus of this plan: Kalamaʻula, Kapaʻakea, Kamiloloa, One Aliʻi, and Malama Cultural Park. These areas are located along the south shore of Molokaʻi within the moku of Kona and Pālāʻau and span several ahupuaʻa, including Kalamaʻula, Kapaʻakea, Kamiloloa, Makakupaʻia, and Kaunakakai. As shown in *Figure 3-4*, the homestead areas vary considerably in size, ranging from approximately 4.6 acres at Malama Cultural Park to more than 5,000 acres at Kalamaʻula, and together form a continuous coastal planning area linked by the coastal highway and shared shoreline and watershed systems.

Information is also presented on the DHHL land use designations and existing homestead land use patterns within each community. As illustrated in *Figure 3-5*, Kalamaʻula is the largest and most diverse homestead area, containing 160 residential lots, 69 agricultural lots, and 3 pastoral lots, supporting an estimated 322 residents across 232 active leases. Kapaʻakea includes 47 residential lots and 3 pastoral lots, with approximately 166 residents and 50 total leases, while Kamiloloa contains 27 residential lots, approximately 75 residents, and 27 active leases. Mālama Cultural Park is designated as a Special District and does not contain residential homesteads, but plays an important role as a community, cultural, and shoreline resource within the planning area. Together, these figures illustrate differences in population density, land use mix, and development patterns that influence how climate impacts, flooding, coastal change, and access to resources are experienced across the homestead communities.

Climate and Hydrology

The south shore of Molokaʻi is characterized by a warm, dry climate shaped by limited rainfall and persistent trade winds for most of the year. Rainfall patterns exhibit a strong mauka–makai gradient, with the highest precipitation occurring in the upland forest reserve and sharply decreasing toward the coast. Average rainfall near the shoreline is approximately one to two inches per month, increasing to nine to ten inches per month in the mauka forested areas. These contrasts create a landscape of dry coastal grasslands and shrublands transitioning to wetter upland forests, with water moving downslope through a network of gulches and intermittent streams. As illustrated in *Figures 3-6 and 3-7*, these drainage systems transport freshwater, sediment, and nutrients from the uplands to coastal wetlands, fishponds, and nearshore waters, directly linking mauka watershed health to coastal conditions and community wellbeing.

Despite overall arid conditions, short-duration, high-intensity rain events periodically generate flooding in gulches and low-lying coastal areas. This combination of prolonged dry periods punctuated by heavy rainfall contributes to erosion, sediment transport, wildfire risk, and stress on water resources. Wind exposure further exacerbates evapotranspiration and vegetation loss in the coastal plain. Together, these climatic and hydrologic dynamics create a system that is highly sensitive to changes in land cover, drainage obstruction, and watershed degradation—conditions that are increasingly influenced by climate change and land use pressures.

Freshwater availability along the south shore has historically depended not only on surface runoff, but also on punawai (springs) fed by the shallow coastal groundwater lens. Groundwater flowing from the uplands emerges naturally near the shoreline where impermeable layers and gentle topography force freshwater to the surface. These springs historically sustained coastal vegetation, wetlands, loʻi, and loko iʻa, even during dry periods. Nearshore plant communities such as kiawe, milo, and wetland vegetation are closely tied to this shallow water table, which continues to influence coastal ecology today.

Historical accounts and planning documents identify multiple freshwater discharge zones and spring-fed systems associated with Kalamaʻula, Kapaʻakea, Kamiloloa, and Kaunakakai. Springs and groundwater seepage supported extensive fishpond complexes (including Aliʻi, Kalokoʻeli, and other loko iʻa) by providing a steady source of cool, low-salinity water essential for fish growth and productivity. These systems relied on careful management of water exchange between freshwater inputs, brackish ponds, and the nearshore ocean. Disruptions to groundwater flow, whether through fill, road construction, blocked culverts, or altered drainage, have reduced spring expression and impaired fishpond function over time.

Loko iʻa along the south shore were engineered to function as integrated hydrologic systems, capturing freshwater from streams and punawai while allowing controlled exchange with ocean waters. Fishpond walls, sluice gates, and channels were designed to regulate water depth, salinity, and sediment movement. Healthy mauka watersheds were essential to these systems: upland vegetation reduced erosion, moderated runoff, and ensured consistent groundwater recharge. When upland areas were degraded, increased sediment loads and altered flow patterns directly affected fishpond productivity and coastal water quality—a relationship that remains evident today.

Sea level rise adds an additional layer of complexity to this hydrologic system. Rising ocean levels elevate the coastal water table, increasing groundwater emergence in some areas while causing chronic flooding and saltwater intrusion in others. This phenomenon is already observable in low-lying coastal zones between Kalamaʻula and Kamiloloa, where groundwater upwelling, ponding, and reduced drainage capacity are becoming more frequent. These changes have implications not only for infrastructure and housing, but also for wetlands, fishpond restoration potential, and nearshore ecosystems.

EXISTING CONDITIONS

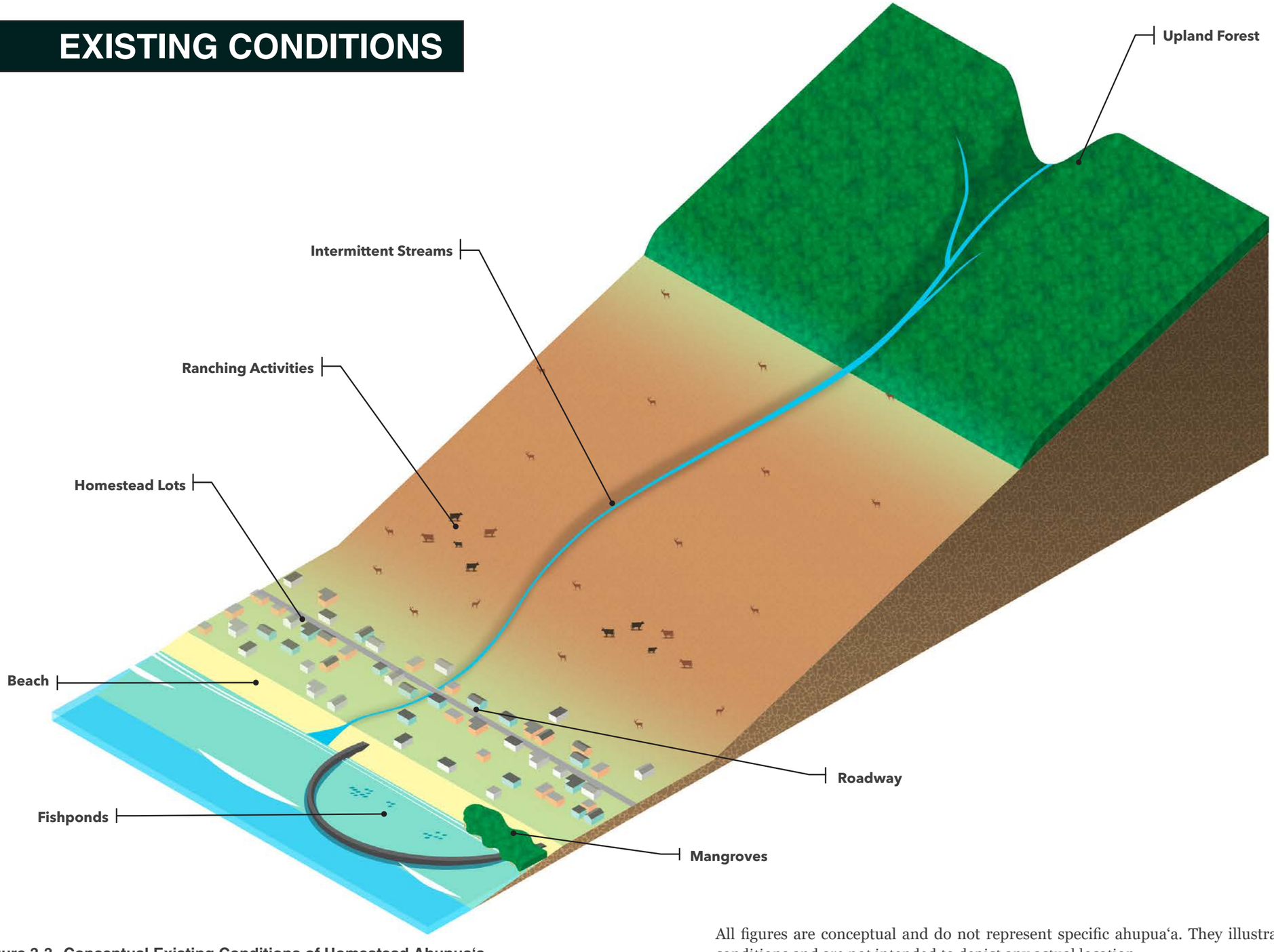


Figure 3-3 Conceptual Existing Conditions of Homestead Ahupua‘a

All figures are conceptual and do not represent specific ahupua‘a. They illustrate generalized conditions and are not intended to depict any actual location.

Kalamaʻula

Moku: Pālāʻau & Kona

Ahupuaʻa: Kalamaʻula

Area: 5,042 Acres

Kapaʻakea

Moku: Kona

Ahupuaʻa: Kapaʻakea

Area: 1,942 Acres

Kamiloloa

Moku: Kona

Ahupuaʻa: Kamiloloa & Makakupaʻia I

Area: 3,249 Acres

Malama Cultural Park

Moku: Kona

Ahupuaʻa: Kaunakakai

Area: 4.58 Acres

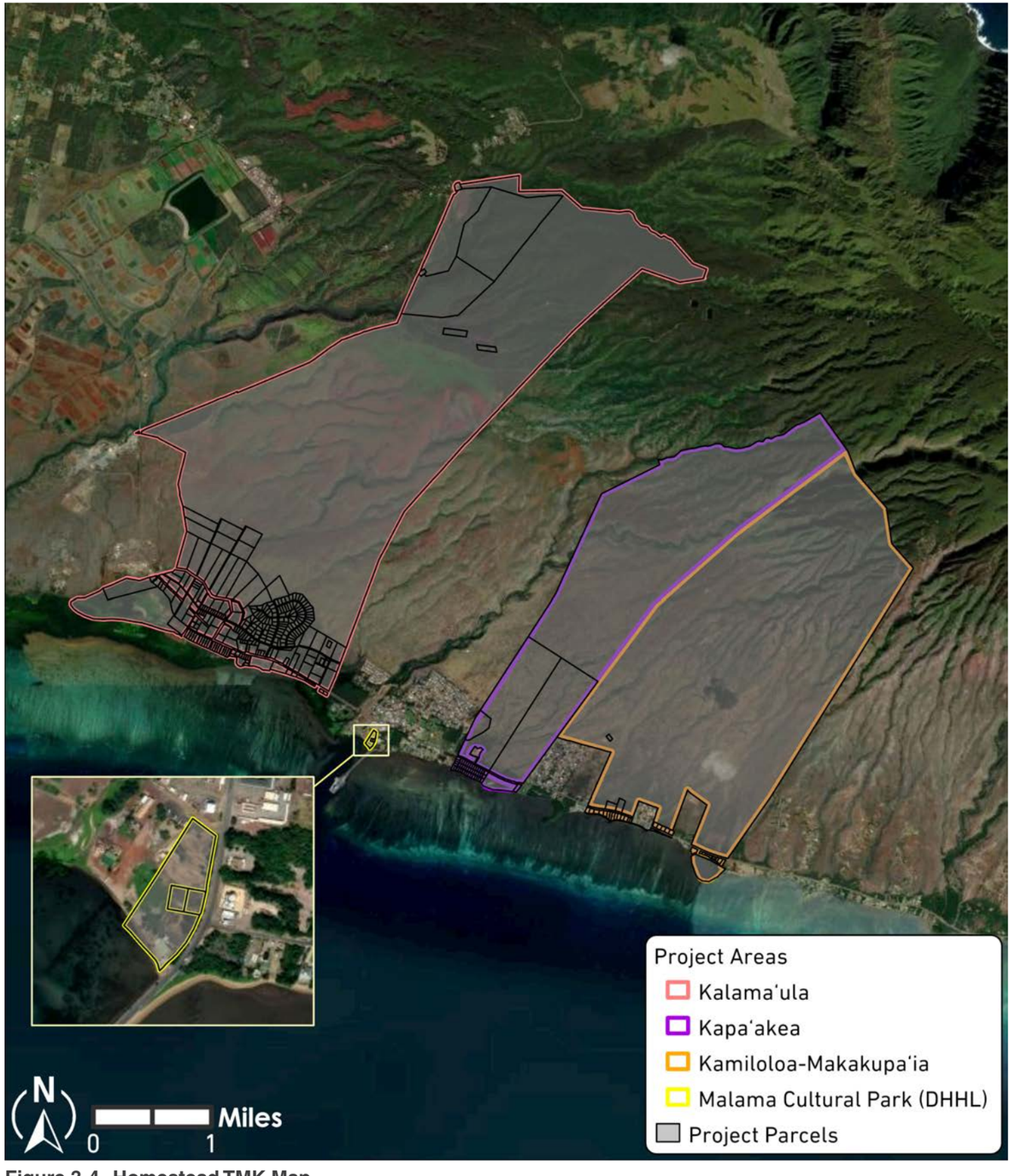


Figure 3-4 Homestead TMK Map

Kalama‘ula

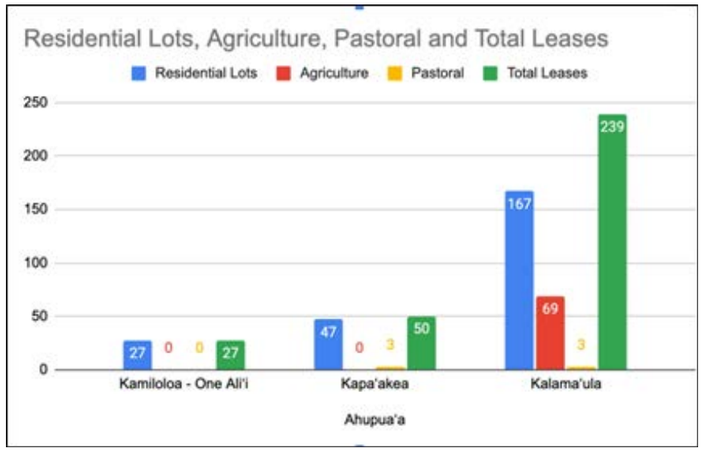
160 Residential Lots

69 Agriculture Lots

3 Pastoral Lots

322 Residents

232 Total Leases



Kapa‘akea

47 Residential Lots

3 Pastoral Lots

166 Residents

50 Total Leases

Kamiloloa

27 Residential Lots

75 Residents

27 Total Leases

Malama Cultural Park

Special District

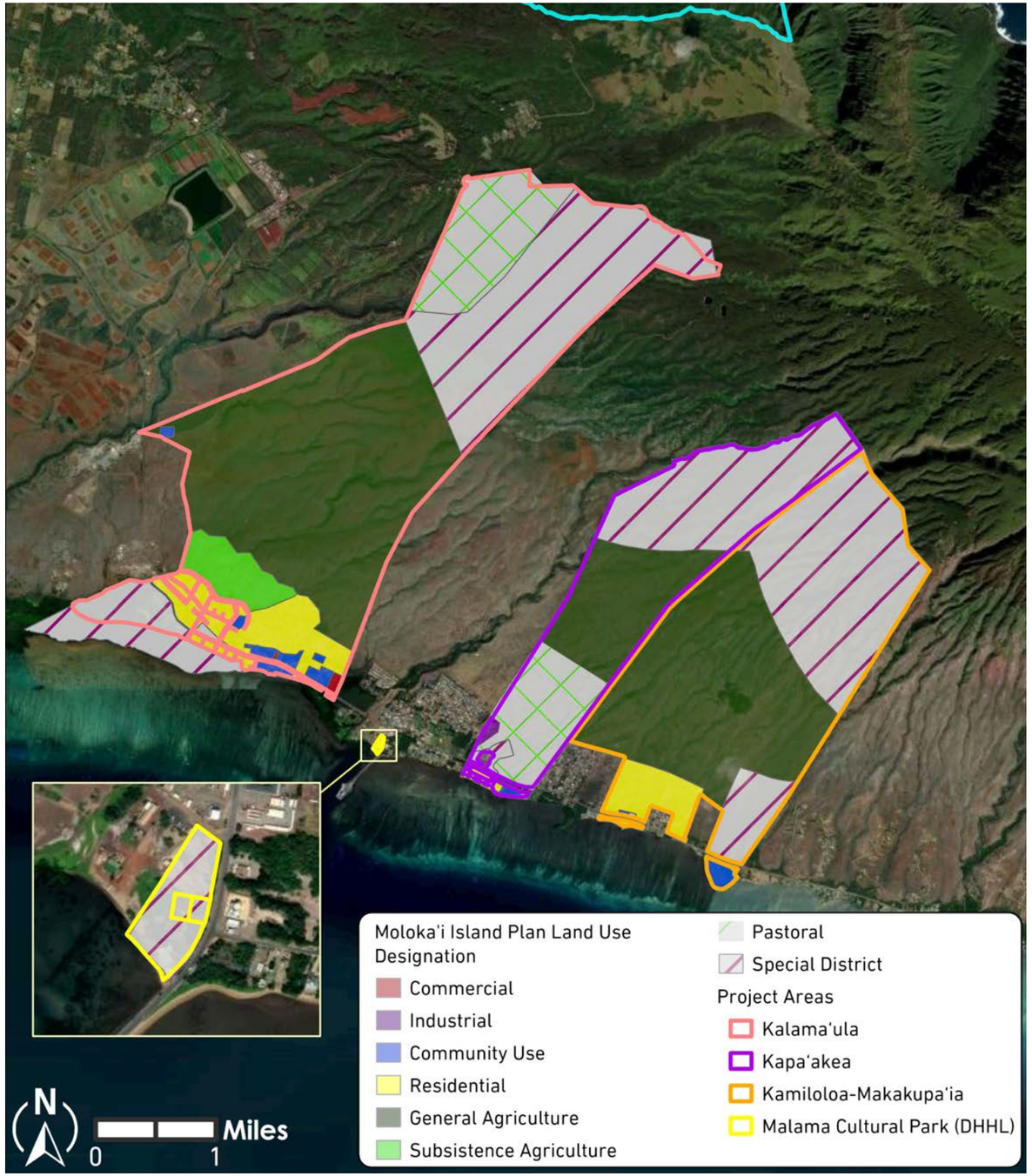


Figure 3-5 DHHL Land Use Designation Map

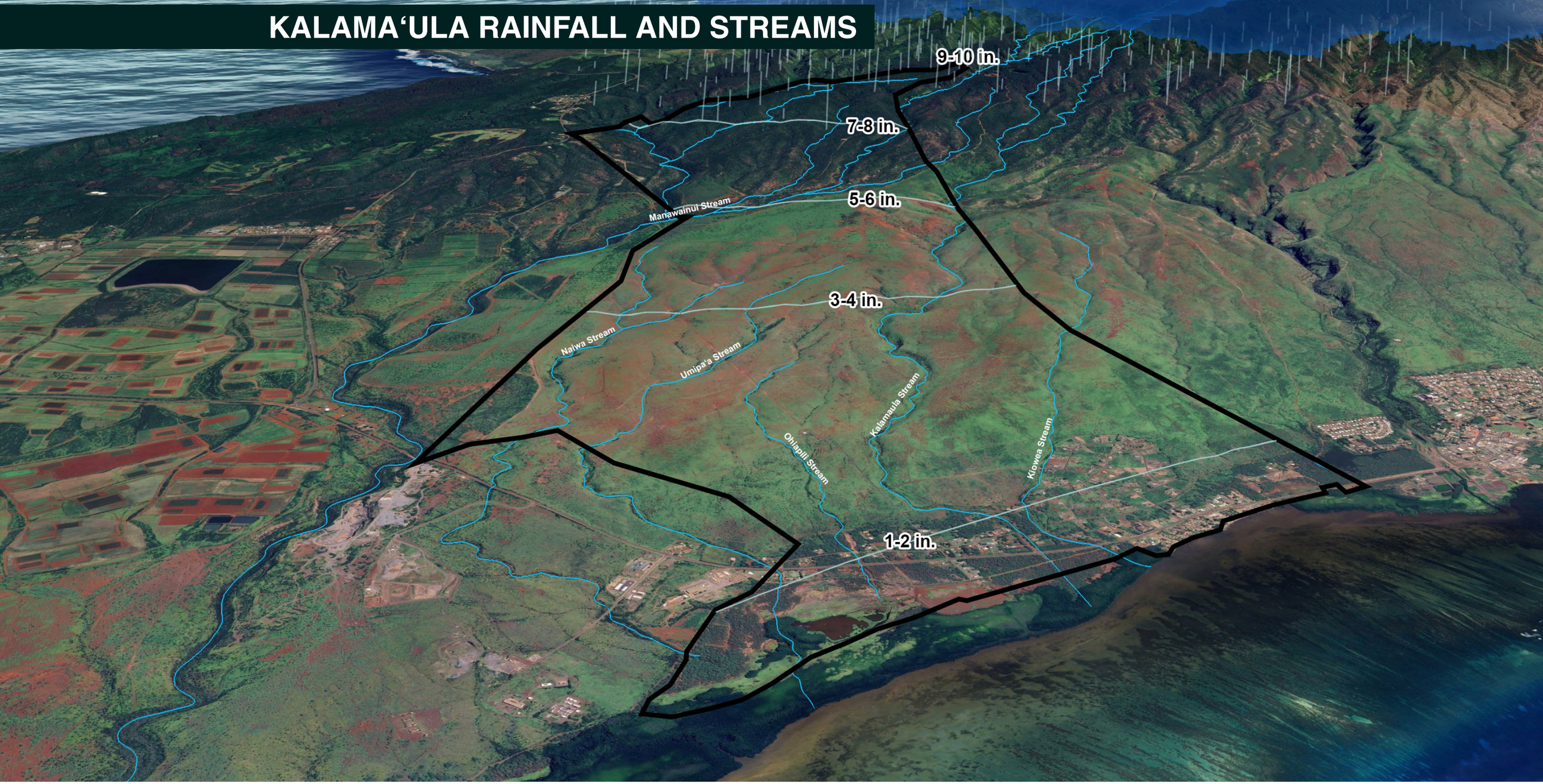


Figure 3-6 Kalamaula Rainfall and Streams

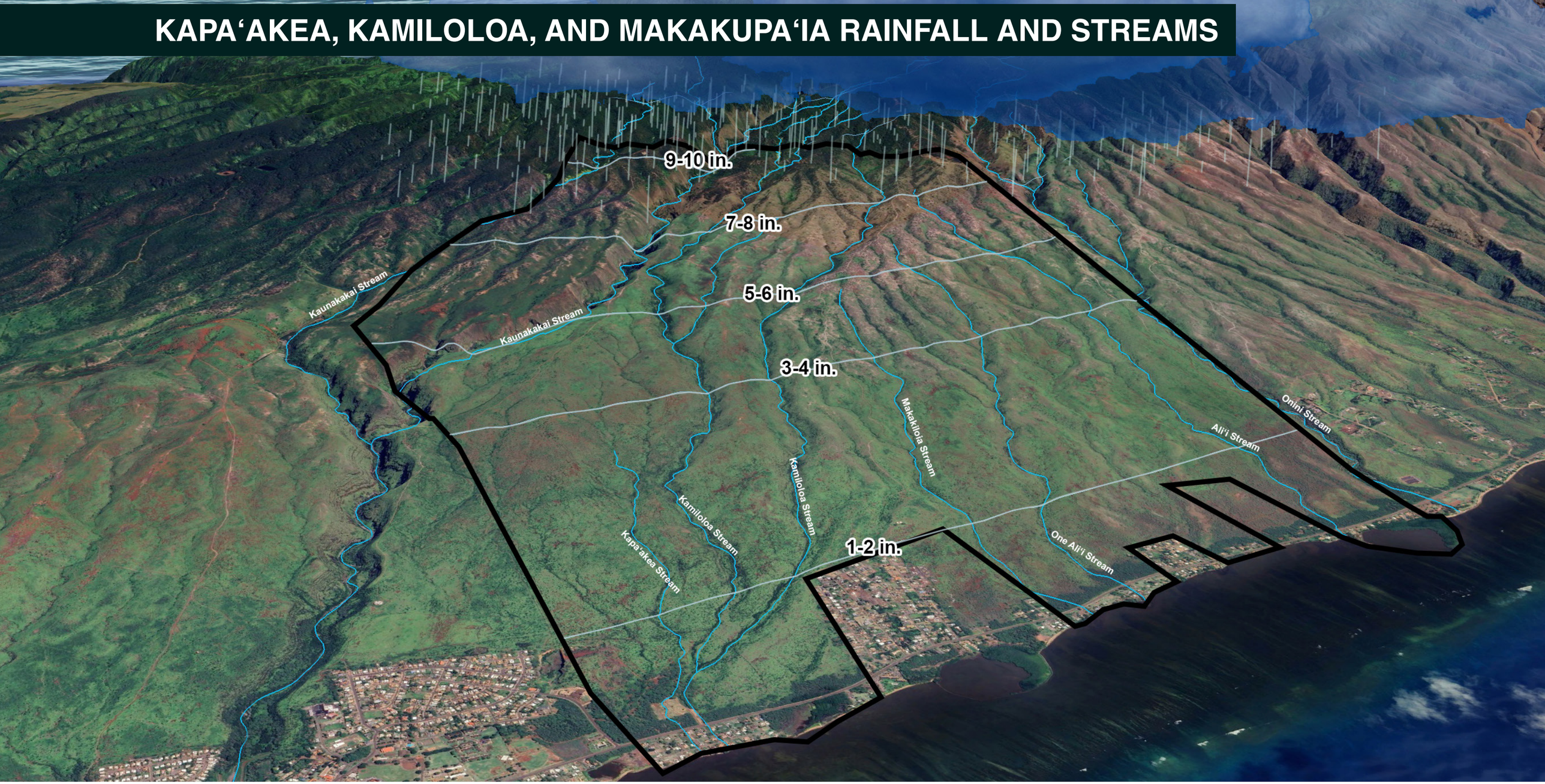


Figure 3-7 Kapa‘akea, Kamiloloa, and Makakupa‘ia Rainfall and Streams

Chapter 4

Assets, Hazards, Vulnerabilities and Risks

Chapter 4

Assets, Hazards, Vulnerabilities and Risks

The MCH-CRP was developed through a beneficiary-driven process guided by a resilience planning framework. The process followed four key steps: first, the identification of assets—the natural, cultural, social, and infrastructural resources that strengthen the community; second, the identification of hazards—the environmental and climate-related threats facing the homesteads; third, an assessment of vulnerabilities—understanding where people, places, and systems are most at risk; and fourth, determining risks—prioritizing which issues require the most urgent attention.

Community Assets

Community assets are the places, resources, and systems that sustain daily life, identity, and well-being in the homestead communities. They include both physical infrastructure and the cultural and natural landscapes that support subsistence, ʻohana connections, and ʻāina based practices. These assets were identified by DHHL beneficiaries through community consultations, site visits, and small group discussions, and they reflect the priorities and lived experiences of homesteaders.

Together, these fifteen assets form the foundation of community safety, food and water security, cultural continuity, and resilience. They are the starting point for understanding how hazards affect the homesteads and where investments in protection, restoration, and adaptation will have the greatest impact.

The following describes the fifteen key assets that were identified.

1. Makai Homesteads

The makai homesteads are the approximately 90 DHHL residential lots located on the coastal plain between Kamehameha V Highway and the shoreline, between the Kalamaʻula bridge and the eastern edge of Kamiloloa One Aliʻi. These small parcels house beneficiary families in modest homes that reflect the rural character of southern Molokaʻi. Ground elevations range from about 1.5 ft to 6 ft, and no lot is more than about 590 ft from the annual high-water line. The area is shaped by open views of the ocean, relatively flat elevation, and proximity to sandy shorelines and traditional fishing and gathering grounds. Beneficiaries value these homesteads for their close relationship to the sea and for the sense of community that comes from generations of families living along the coast.

2. Mauka Homesteads

The mauka homesteads are medium-sized (approximately 1-acre) DHHL residential lots located in the Kalamaʻula Homestead on gently sloping land above Kamehameha V Highway. The area has a small-town rural character with modest homes, open yards, ocean views, and family gardens. Beneficiaries described these lots as peaceful and community oriented, with easy access to Kaunakakai and nearby facilities.

3. Kamehameha V / Maunaloa Highway

The two highways going east and west from Kaunakakai are the main routes is the main route that connects all of the southern Molokaʻi communities. Beneficiaries described it as their lifeline for daily access to schools, health care, and Kaunakakai town. It is also the only corridor for emergency evacuation and delivery of goods and services.

4. Reef and Marine Life

The nearshore reef system provides food, cultural identity, and education for keiki and ʻohana. It supports subsistence fishing, limu gathering, and canoe practice. Beneficiaries described the reef as a source of nourishment and pride that connects them to their ancestors and traditional practices.

5. Gulches and Waterways

Natural gulches carry fresh water from the mountains to the sea. They are vital to agriculture and help recharge wetlands and fishponds. Beneficiaries noted that these gulches once supported kalo and sweet potato cultivation and remain important pathways for the health of the entire ahupuaʻa.

6. Wetlands

Wetlands along the shoreline, including ʻŌhiʻapilo, support native birds, filter runoff, and store floodwaters. They were once abundant food gathering areas and remain important for education, habitat, and restoration. Beneficiaries recognize their role in both ecological balance and flood protection.

7. Fishponds

Loko iʻa such as Aliʻi and Kalokoʻeli are living examples of ancestral knowledge and sustainable food systems. Beneficiaries value these loko iʻa for their cultural, educational, and food producing importance. There are smaller loko iʻa and loko puʻuone that are in various stages of restoration and are cared for by lessees. Community groups continue restoration efforts that provide hands on learning and stewardship opportunities.

8. Beaches

The beaches and shoreline areas are cherished for recreation, canoe launching, fishing, limu gathering, and community gatherings. They are open spaces that bring people together and provide a sense of peace, belonging, and connection to the ocean.

9. Agricultural and Pastoral Land

The mauka lands were once areas of sweet potato and agroforest cultivation and are now used for ranching and hunting. Beneficiaries see them as essential for food security and the renewal of traditional land management practices.

10. Native Forests

The upper forested areas provide habitat, water, and cultural materials such as plants for medicine, hula, and weaving. Beneficiaries identified these forests as a source of life that supports hunting, resource gathering, and watershed protection.

11. Drainage Infrastructure

Ditches, culverts, and outfalls help move stormwater through the communities. Beneficiaries view them as essential for protecting homes, roads, and property from flooding. Regular maintenance and coordination among agencies were identified as community priorities.

12. Parks

Places such as Malama Cultural Park, Kapuāiwa Coconut Grove, and Kiowea Park serve as community gathering spaces and cultural sites. They are used for events, recreation, canoe paddling, and small business activities. Beneficiaries emphasized their historical and cultural significance as well as their role in bringing people together.

13. Community Centers

Facilities such as Kalanianaʻole Hall, Kūlana ʻŌiwi Multi Service Center, and the churches along Church Row are essential meeting and service spaces. They support cultural education, celebrations, funerals, and access to programs and resources that strengthen the community.

14. Roadways

Neighborhood streets, shoreline access paths, and rural mauka roads connect residents to homes, gardens, cultural sites, and hunting areas. Beneficiaries identified the need to maintain these routes for daily travel, community connection, and emergency access.

15. Kapaʻakea Cemetery

This cemetery, owned and managed by County of Maui, is the resting place of many kūpuna and is regarded as a sacred and historical site. Beneficiaries expressed strong commitment to its care, noting its importance as a space for remembrance, reflection, and continuity of family and community heritage.

Hazards

Hazards are natural or human-caused events that have the potential to harm people, property, cultural resources, or ecosystems. In the context of the MCH-CRP, hazards include both long-term environmental changes and short-term events that threaten the safety, health, and livelihoods of DHHL beneficiaries. These hazards are intensified by climate change, which is increasing sea levels, extreme rainfall, drought, and coastal flooding. Understanding these hazards is essential to identifying where the homestead communities are most vulnerable and to guide strategies that strengthen community resilience from mauka to makai.

The MCH-CRP conducted a spatial analysis of these hazards to better understand exposure within the DHHL homestead areas. *Figures 4-1 and 4-2* illustrate hazard conditions in Kalamaʻula, *Figures 4-3 and 4-4* illustrate Kapaʻakea, and *Figures 4-5 and 4-6* illustrate Kamiloloa. Each map identifies key community assets and overlays multiple hazard layers using GIS data, including FEMA Special Flood Hazard Zones, projected 1 percent coastal flood zones with 3.2 feet of sea level rise, and known cesspool locations. This mapping approach allows the community to visualize where assets intersect with overlapping hazards.

Fourteen primary hazards were identified by beneficiaries as described below:

1. Rising Sea Levels

Flooding in January 2023 compromising Maunaloa Highway (Sustʻāinable Molokaʻi)

Sea levels along Molokaʻi's south shore are projected to increase by more than three feet this century, resulting in chronic coastal flooding and permanent inundation of low-lying areas. Rising seas threaten coastal homes, roads, and cultural sites, and allow saltwater to intrude into wetlands and groundwater systems. The SM-SEMP 2022 study estimates 2,590 acres of southern Molokaʻi will be flooded at 3.2 ft SLR, including 780 structures—54 of them are makai homestead lots located between the Kalamaʻula bridge and the western edge of Kamiloloa One Aliʻi.

2. Coastal Erosion and Land Loss

Looking east along an eroding shoreline fronting Kamiloloa (DHHL)

Erosion is steadily eating away at the shoreline area along Molokaʻi coasts. Loss of beach sand and scouring around seawalls and informal armoring expose properties to flooding and remove habitat for coastal plants and nesting birds.

Alluvial layers of red clay can pollute nearshore waters with fine silt and sediment that smothers coral reefs (SM-SEMP, 2022)

3. Storm Surge, Wave Overtopping, and King Tide Flooding

High-energy wave events and seasonal king tides regularly push seawater inland, flooding yards, roads, and septic systems. These events are becoming more frequent as sea level rises and reef conditions decline.

Kaunakakai Gulch Flooding, January 2023 (Sustʻāinable Molokaʻi)

Flooding in January 2023 compromising Maunaloa Highway (Katy Mokuau)

4. Intense Rainfall Events and Flash Flooding

Heavy downpours overwhelm natural and built drainage systems. When rainfall is concentrated over short periods, runoff from mauka slopes moves rapidly through gulches, flooding residential areas and depositing sediment into wetlands and fishponds.

5. Blocked or Undersized Drainage Infrastructure

Many drainage ditches and culverts in the homestead areas are filled with debris, are too close to sea level, or are too small to handle large storm flows. This leads to ponding in streets and yards, backflow through outfalls, and flooding of nearby homes.

Kapaʻakea Channel 2 During and After Rainstorm

6. Sediment Buildup in Streams and Culverts

Eroded soil from mauka lands and gulch slopes settles in channels and culverts, reducing their capacity and causing them to overflow during heavy rains. Sediment carried to the coast smothers fishponds and coral reef habitats.

Kapaʻakea Channel 1 During and After Rainstorm

7. Extended Drought Periods

Periods of drought stress crops, native plants, and water supplies. Dry vegetation increases the risk of wildfire and limits opportunities for reforestation and agriculture on mauka lands *(Figure 4-7)*.

Drought exposed soil showing deep surface cracking after extended dry conditions (Heather Place)

8. Wildfire Ignition and Spread

Dry grasslands and unmanaged deer browse create continuous fuel loads that allow fires to spread rapidly across slopes. Wildfire threatens homes, forests, and utilities, and accelerates erosion when rains follow burned areas.

Brush Fire Burns 50-Acres Near Kaunakakai (Hawaii News Now, 2020)

9. Overgrazing and Browsing by Invasive Deer

Axis deer populations have expanded across southern Molokaʻi. Their overgrazing removes vegetation that stabilizes soil, damages crops, and worsens erosion and sediment runoff into coastal waters.

Axis deer grazing in open grassland, contributing to vegetation loss and increased erosion risk (Molokai Dispatch, 2025)

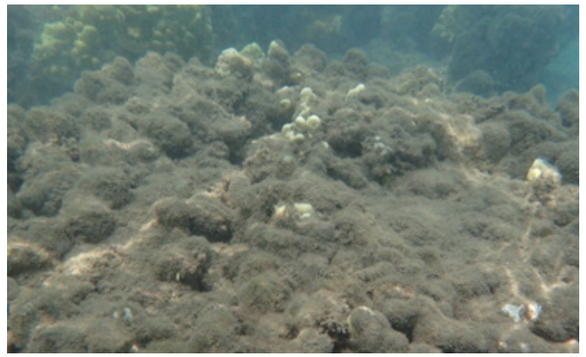
10. Erosion and Sediment Runoff from Mauka Areas

Unmanaged mauka lands with bare or degraded soils release large volumes of sediment during storms. This sediment clogs waterways, fills fishponds, and degrades coral reefs that protect the shoreline.

Sediment laden coastal waters off Molokaʻi, reducing water clarity and stressing reefs and marine life (Civil Beat, 2022)

11. Contamination from Cesspools and Stormwater

Untreated wastewater from cesspools and runoff from roads carry bacteria and nutrients into streams and the ocean. This degrades water quality, harms marine life, and poses health risks for residents and beach users.



Runoff an smother coral reefs and prevent sunlight from reaching corals (Maui Nui Marine Resource Council)

12. Invasive Mangrove Encroachment

Non-native mangroves have colonized sections of the coast, trapping sediment and altering natural water flow. Their spread threatens fishpond walls, overwhelms native habitats, and changes the character of historic shoreline areas.

Invasive mangrove between Kalamaʻula and Kaunakakai Wharf (SM-SEMP)

In invasive Kiawe impeding access along the shoreline (SM-SEMP, 2022)

13. High Winds from Tropical Storms or Hurricane

Strong winds associated with tropical storms or hurricanes *(Figure 4-8)* can damage roofs, topple trees, and disrupt electrical utilities and communication systems.

14. Tsunami and Large Swell Events

Although infrequent, tsunamis and large south swells can inundate the low-lying shoreline, damaging infrastructure and endangering lives. Coastal residents are particularly exposed due to limited elevation and evacuation routes.

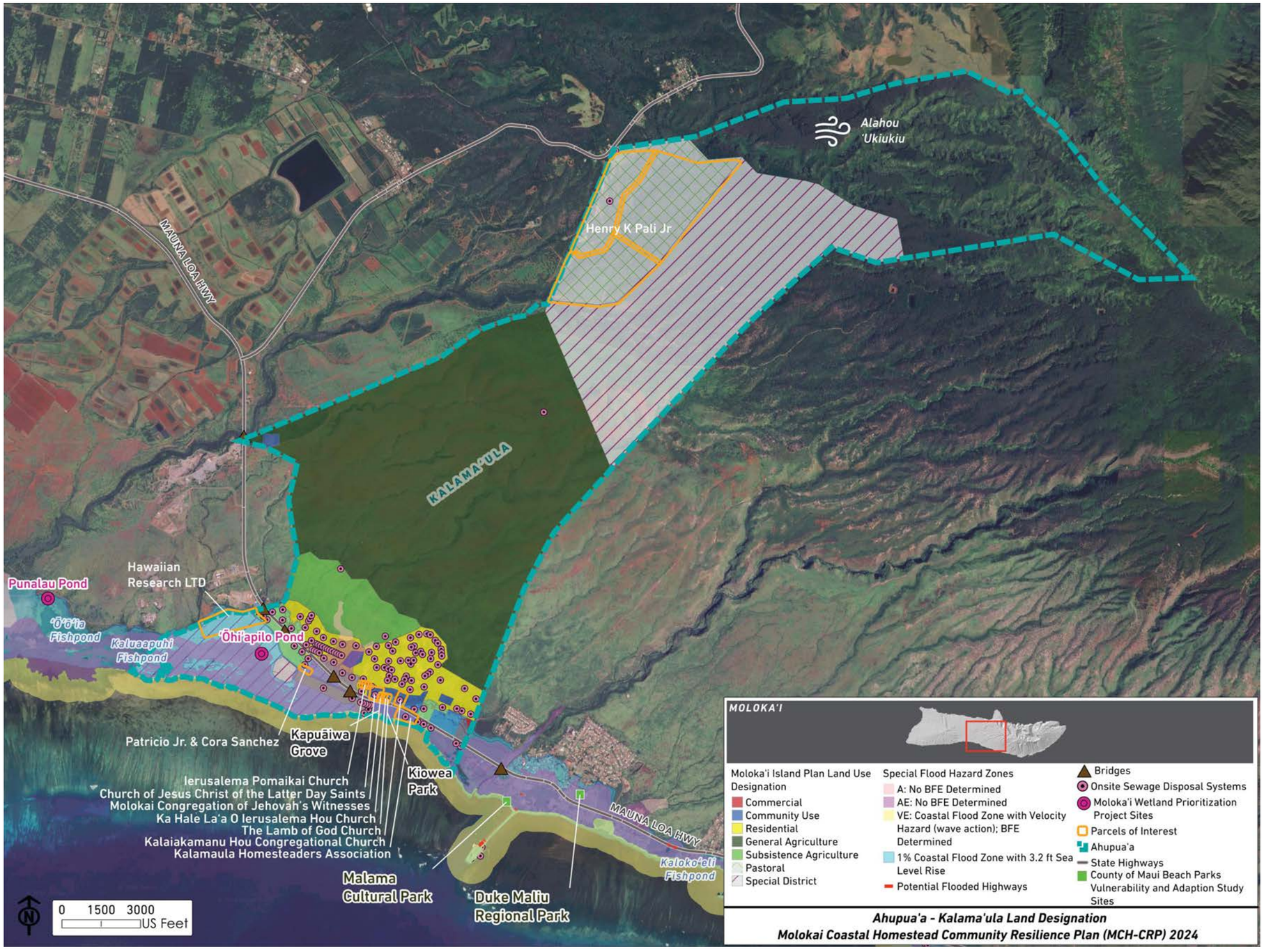


Figure 4-1 Kalama'ula Ahupua'a Hazard Exposure

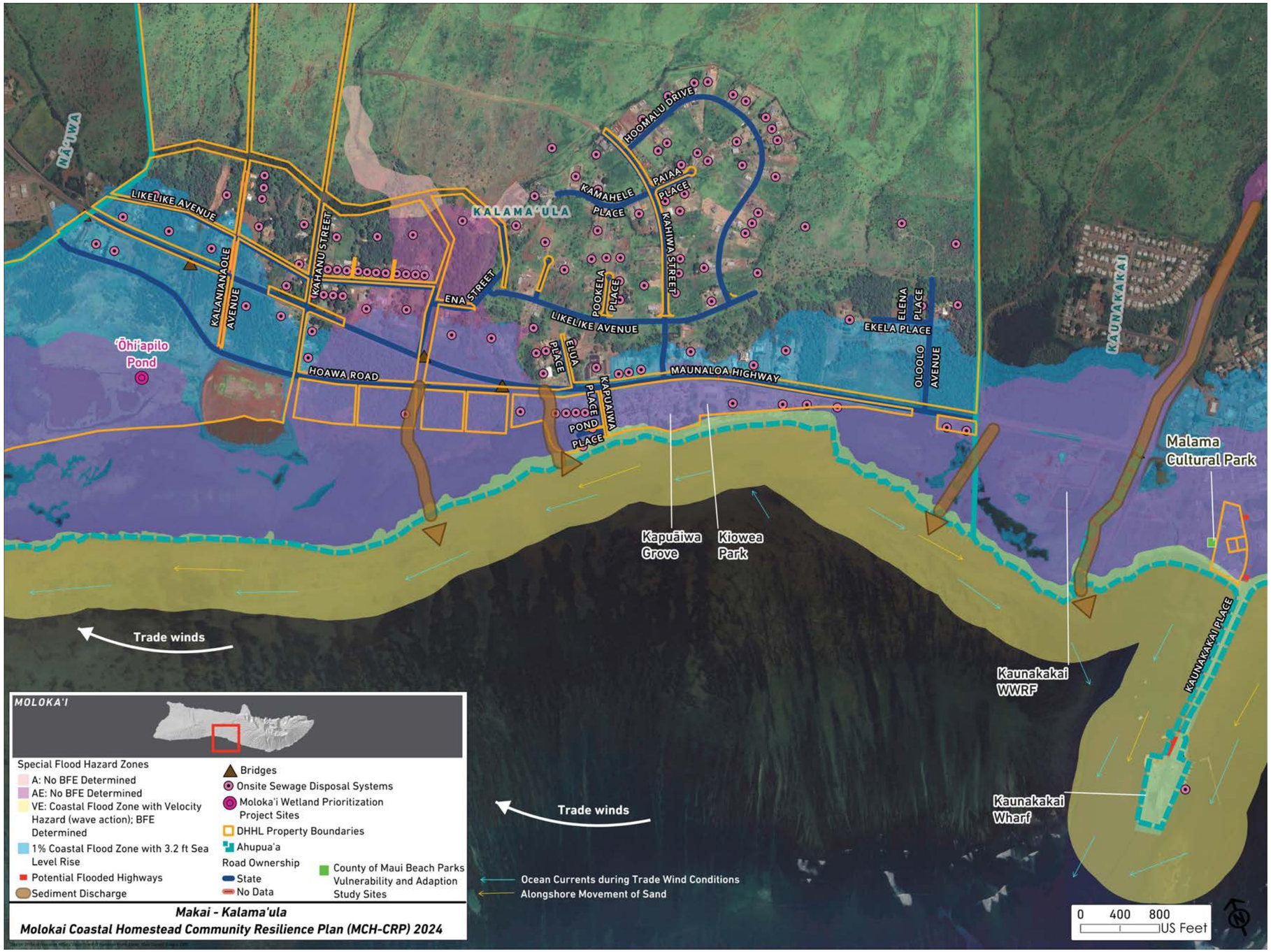


Figure 4-2 Kalama'ula Makai Hazard Exposure

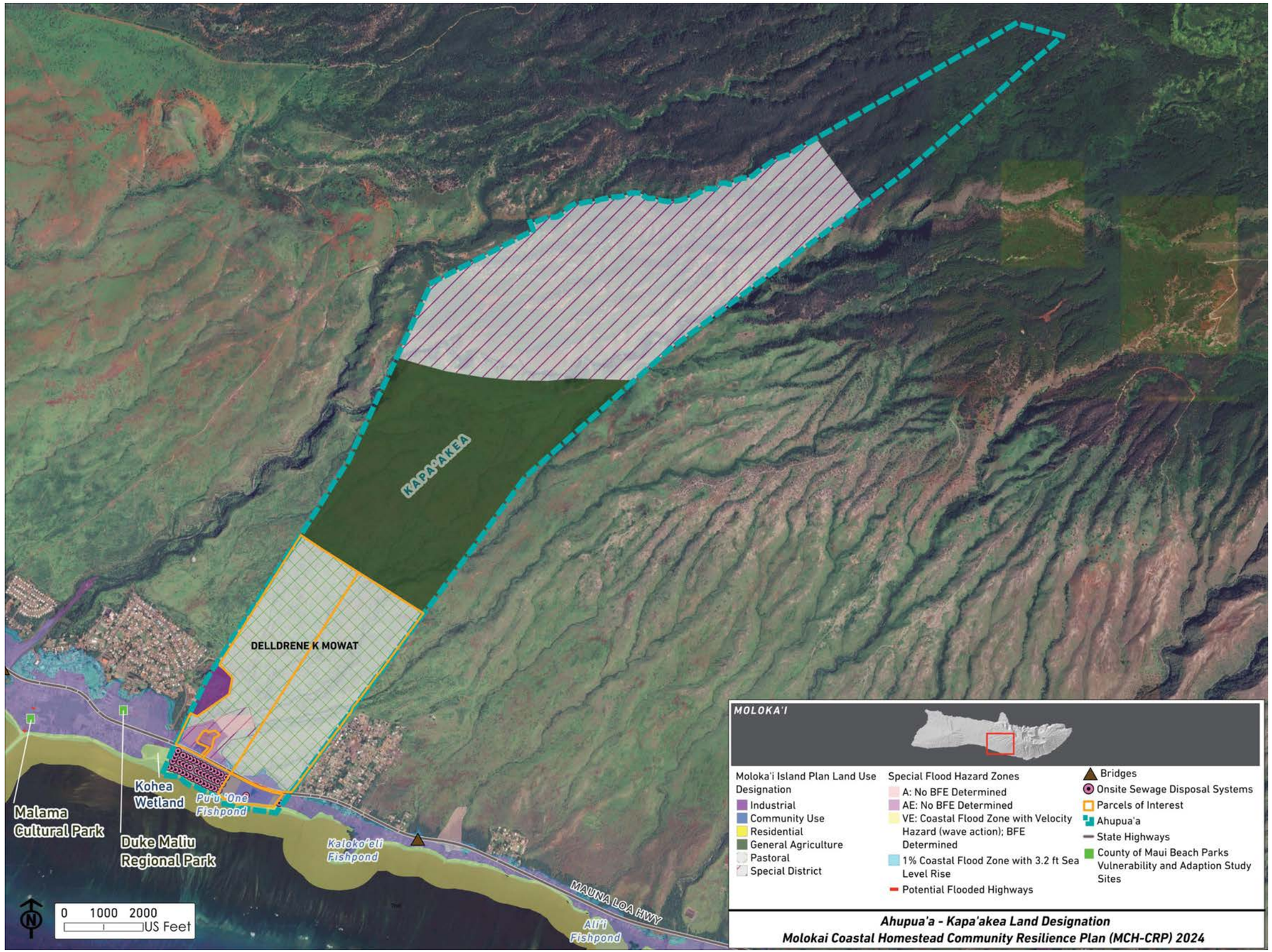


Figure 4-3 Kapa‘akea Ahupua‘a Hazard Exposure

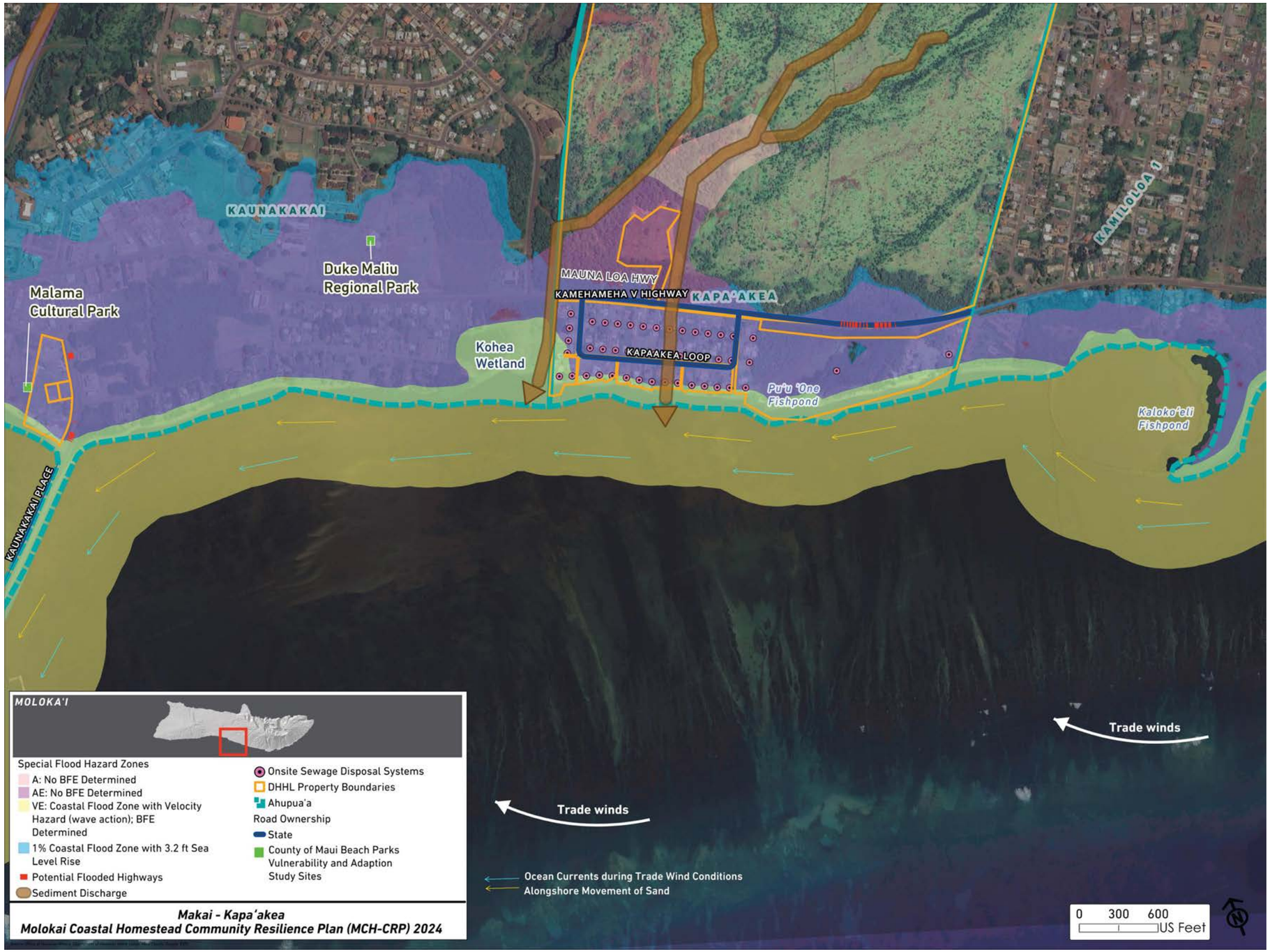


Figure 4-4 Kapa‘akea Makai Hazard Exposure

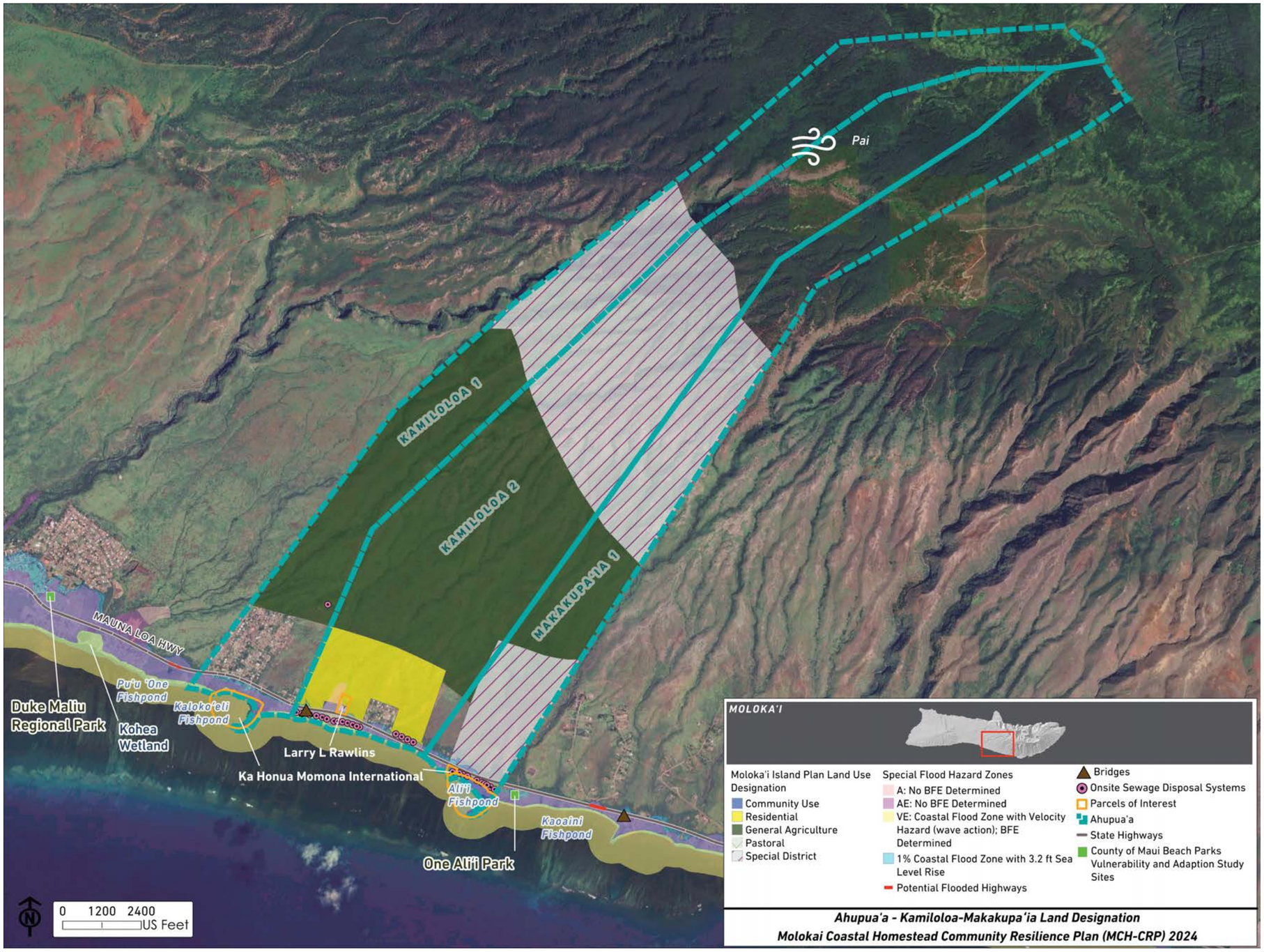


Figure 4-5 Kamiloloa Ahupua‘a Hazard Exposure

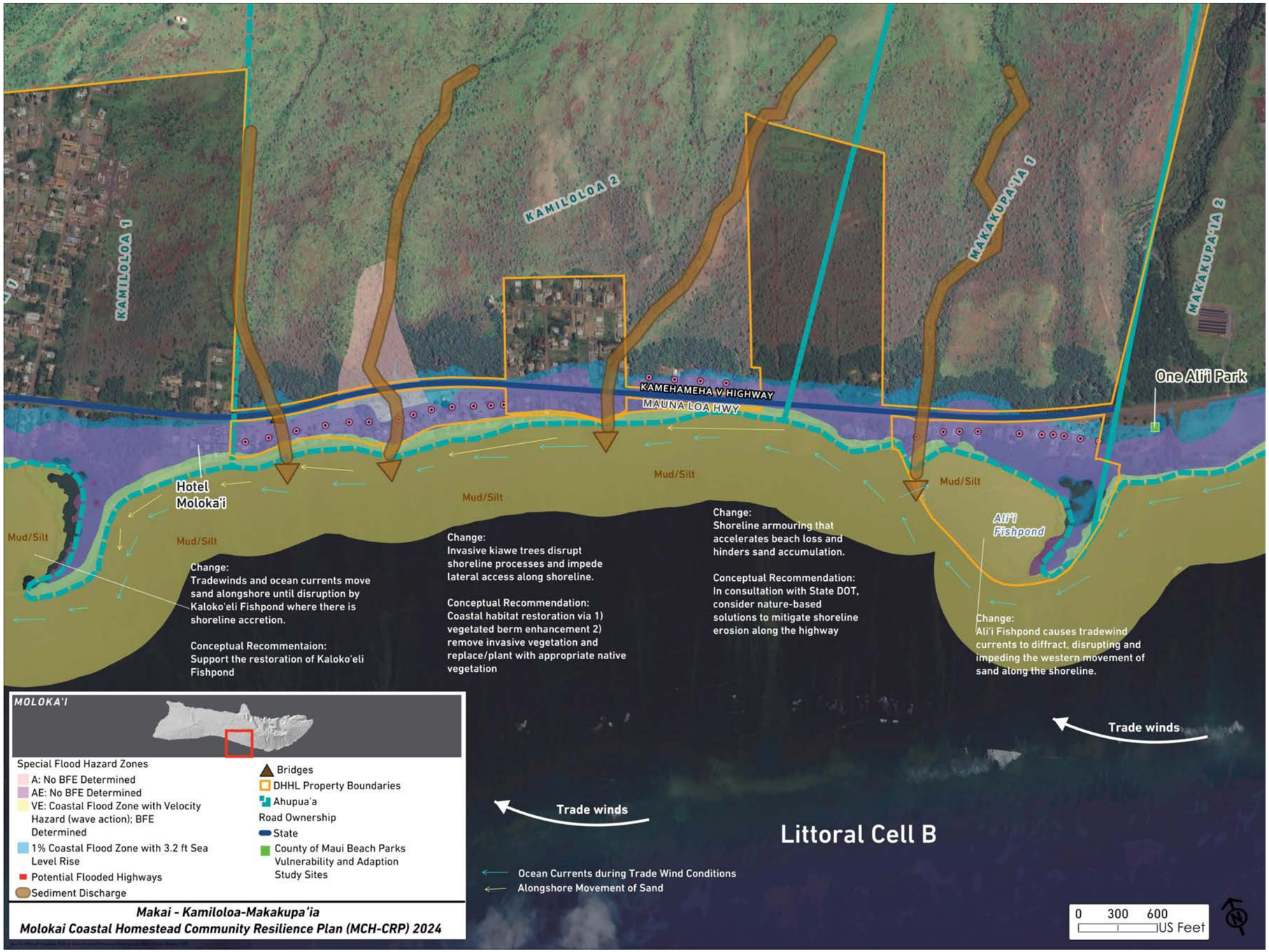


Figure 4-6 Kamiloloa Makai Hazard Exposure

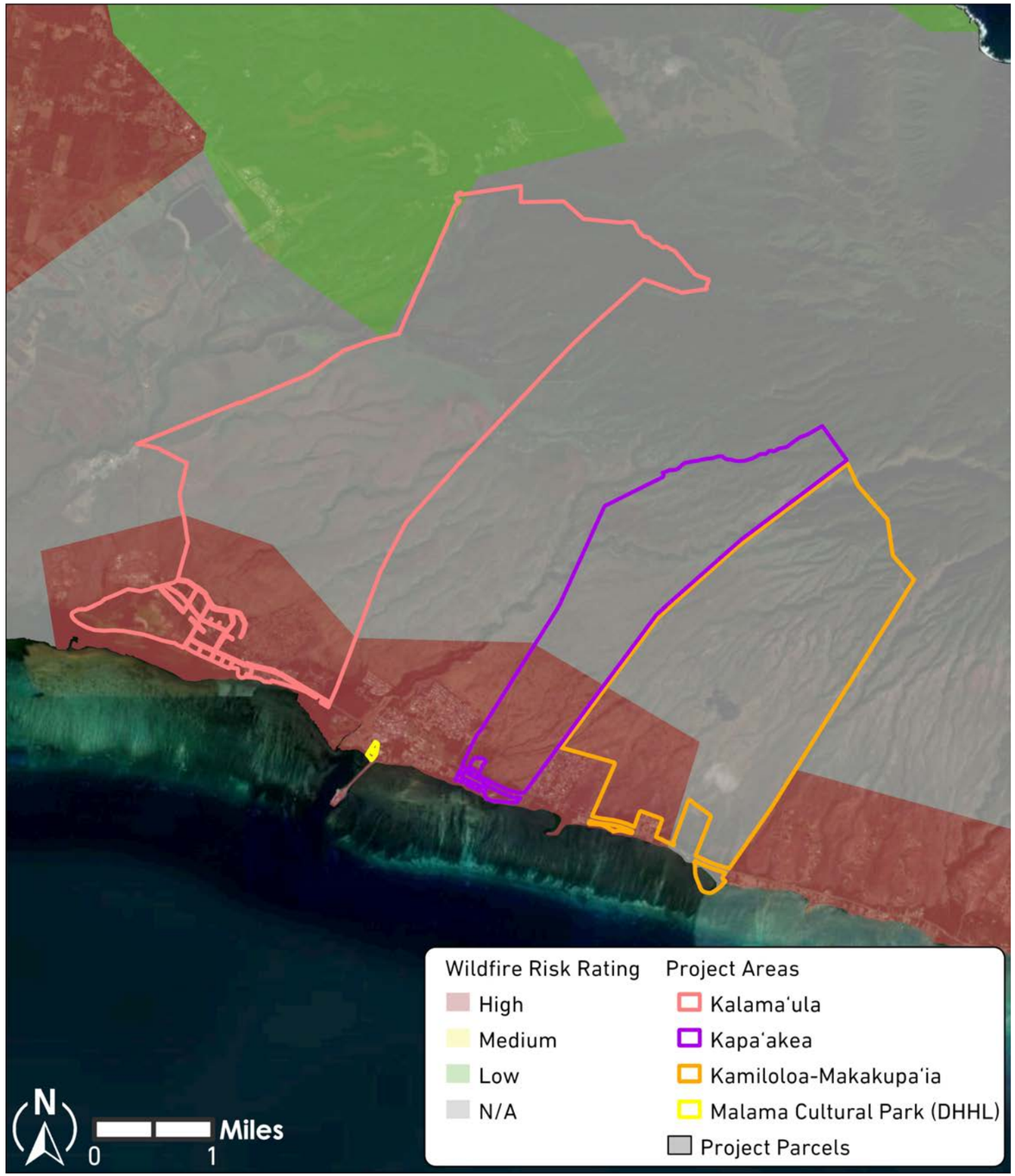


Figure 4-7 Wildfire Risk Rating (HWMO 2024)i

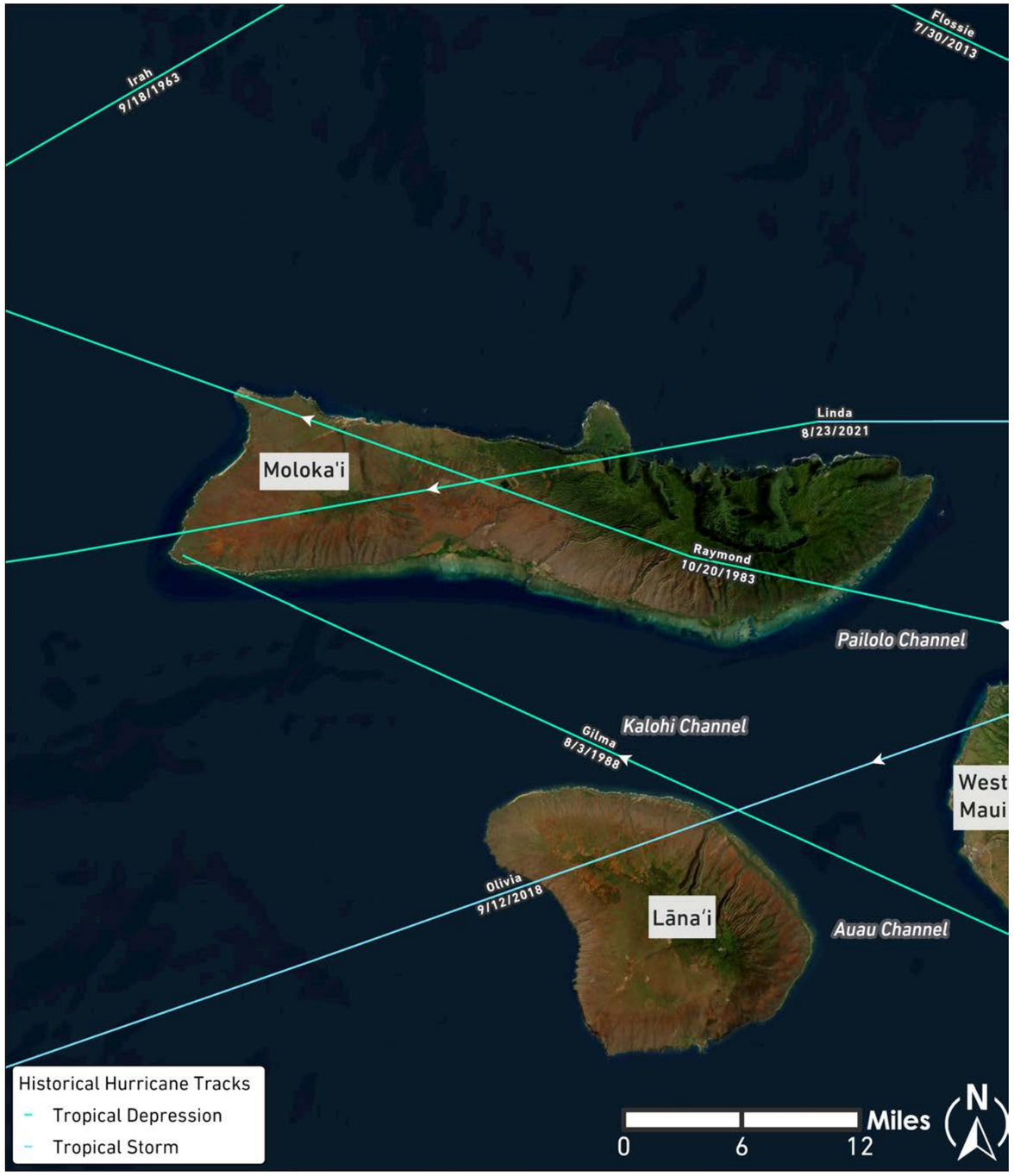


Figure 4-8 Historical Hurricane Tracks Near Moloka'i

Vulnerabilities and Risks

Vulnerability describes how likely a person, place, or system is to be harmed by a hazard. It reflects three main factors: exposure (the degree of contact with a hazard), sensitivity (how strongly the hazard affects the asset), and adaptive capacity (how well a community or system can respond and recover). Within the MCH-CRP, vulnerability represents how susceptible community assets such as homes, roads, or natural systems are to the range of coastal and climate related hazards identified by beneficiaries.

Risk refers to the potential consequence that occurs when a vulnerable asset is exposed to a hazard. It combines both the likelihood of the hazard and the severity of its impact. Understanding risk helps beneficiaries decide where to focus adaptation, restoration, and emergency preparedness actions.

For the MCH-CRP, vulnerability was assessed for each of the fifteen identified assets in relation to the fourteen hazards described in the previous section. This evaluation used a five-tier scale ranging from Very High (red) to Very Low (blue), summarized in *Table 4-1* below . Each category reflects a combination of exposure, sensitivity, and adaptive capacity. *Table 4-2* presents the vulnerability measurement of each community asset to the identified hazards using this color-coded scale.

Table 4-1: Vulnerability Ratings

Vulnerability Level	Description	Color Code
Very High	Directly exposed and highly sensitive with limited capacity to respond or adapt	Red
High	Exposed to hazard with some protective measures but still significant sensitivity	Orange
Moderate	Some exposure and sensitivity with partial ability to mitigate or recover	Yellow
Low	Limited exposure with effective protection or adaptive capacity	Green
Very Low	Minimal exposure with strong adaptive capacity	Blue

Table 4-2: Vulnerability of Community Assets

Hazard / Asset	Rising sea levels	Coastal erosion and land loss	Storm surge, wave overtopping, and king tide flooding	Intense rainfall events and flash flooding	Blocked or undersized drainage infra-structure	Sediment buildup in streams and culverts	Extended drought periods	Wildfire ignition and spread	Overgrazing and browsing by ungulates	Erosion and sediment runoff from mauka areas	Contamination from cesspools and stormwater	Invasive mangrove encroachment	High winds from tropical storms or hurricane	Tsunami and large swell events
Makai Homesteads														
Mauka Homesteads														
Kamehameha V Hwy														
Reef / Marine Life														
Gulches														
Wetlands														
Fishponds														
Beach														
Agricultural / Pastoral Land														
Native Forests														
Drainage Infrastructure														
Parks														
Community Centers														
Mauka Roads														
Neighborhood Roads														
Cemetery														

Based on the vulnerability assessment, the MCH-CRP identified five key challenges that represent the most significant and overlapping risks for the South Moloka'i homestead communities. Each challenge highlights the hazards facing the homestead communities, the vulnerabilities that increase their exposure, and the resulting risks to people, place, and resources. Identified risks are illustrated conceptually on *Figure 4-9*.

1 Sea Level Rise, Coastal Erosion, and Coastal Flooding

HAZARDS
- Rising sea levels
- Coastal erosion and land loss
- Storm surge, wave overtopping, and king tide flooding

+ VULNERABILITIES
- Homes and infrastructure (including coastal highways) built in flood and erosion zones
- Sea level rise reduces drainage capacity in systems designed for lower sea levels
- Limited coastal protection and failing seawalls
- Loss of natural buffers (dunes, wetlands, and vegetation)
- Cesspools and septic systems near shoreline
- Lack of alternate evacuation routes inland

= RISKS
- Permanent inundation and displacement of homesteads
- Damage or loss of property, utilities, and roads
- Contamination of nearshore waters from flooded cesspools
- Threats to public safety and isolation during floods
- Cultural site loss (e.g., fishponds, Kapuāiwa Coconut Grove, springs)

2 Heavy Rainfall, Ravine Flooding, and Drainage Overflows

HAZARDS
- Intense rainfall events and flash flooding
- Blocked or undersized drainage infrastructure
- Sediment buildup in streams and culverts

+ VULNERABILITIES
- Poorly maintained drainage canals and culverts
- Ravines and drainageways filled with sediment and vegetation
- Sea level rise causes coastal inundation by limiting where stormwater can drain
- Homes and roads constructed within floodplains
- Filled wetlands reducing flood storage capacity

= RISKS
- Flood damage to homes, roads, and property
- Isolation of communities due to impassable roads
- Erosion and debris flows damaging nearshore ecosystems
- Increased maintenance and repair costs for DHHL and residents

3 Drought, Wildfire, and Mauka Degradation

HAZARDS
- Extended drought periods
- Wildfire ignition and spread
- Overgrazing and browsing by invasive deer leading to native vegetation and soil exposure

+ VULNERABILITIES
- Deforested mauka lands caused by decades of overgrazing from cattle and invasive deer populations
- Invasive grasses and shrubs increasing fire fuel loads
- Lack of active land management or fire breaks
- Reduced watershed recharge capacity

= RISKS
- Wildfire threats to mauka homes and critical infrastructure
- Post-fire erosion and sediment runoff into coastal waters
- Long-term decline in native forest regeneration
- Increased flooding and sedimentation risk downslope

4 Sedimentation, Pollution, and Marine Ecosystem Decline

HAZARDS
- Erosion and sediment runoff from mauka areas
- Contamination from cesspools and stormwater
- Invasive mangrove encroachment

+ VULNERABILITIES
- Degraded mauka slopes and unmaintained ravines
- Filled wetlands and fishponds losing filtering capacity
- Outdated wastewater systems
- Limited environmental monitoring or enforcement

= RISKS
- Decline in coral reef health and fish populations
- Sediment filling historic fishponds (loko i'a)
- Poor water quality affecting gathering and fishing practices
- Loss of traditional food sources and cultural identity

5 Severe Storms, Hurricanes, and Tsunami

HAZARDS
- High winds and wave surge from tropical storms
- Tsunami and large swell events

+ VULNERABILITIES
- Aging Housing Stock
- Coastal homes not designed to modern wind/flood standards
- Critical infrastructure (roads, utilities) located in low-lying areas
- Lack of formal emergency evacuation routes and shelters
- Limited communication and coordination during emergencies

= RISKS
- Damage to homes and community facilities
- Injury or loss of life during major storm events
- Extended loss of utilities and access to essential services
- Economic and emotional stress for residents

CHALLENGES

Ranching activities, particularly overgrazing by cattle, have stripped the land of vegetation that would normally stabilize the soil.

Erosion causes sediments to accumulate in gulches, reducing their capacity to channel water away during rain.

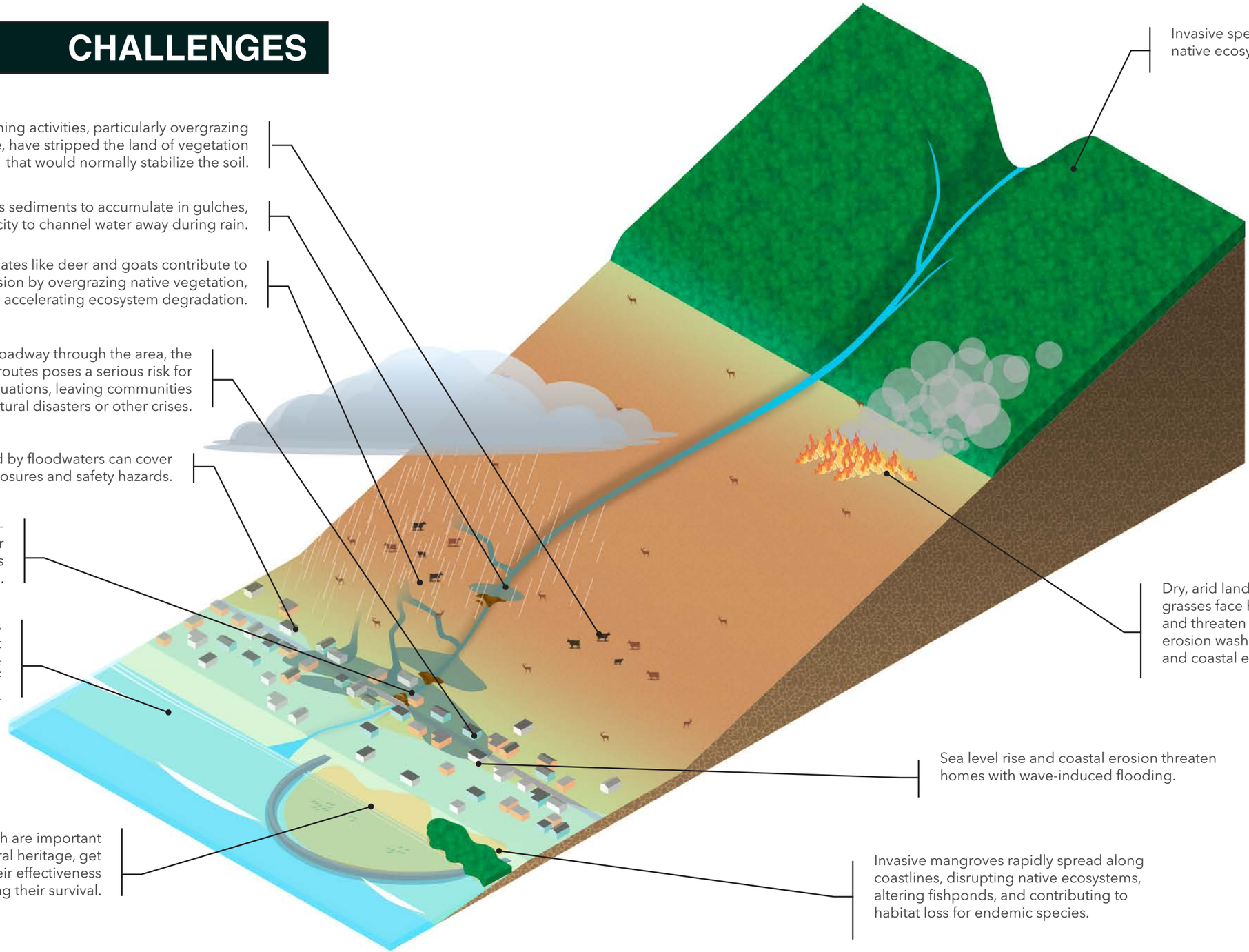
Invasive ungulates like deer and goats contribute to habitat loss and erosion by overgrazing native vegetation, destabilizing soils, and accelerating ecosystem degradation.

With only a single roadway through the area, the lack of alternative routes poses a serious risk for emergency evacuations, leaving communities vulnerable during natural disasters or other crises.

Sediment carried by floodwaters can cover highways, causing road closures and safety hazards.

Flooding from sediment-filled gulches leads to water damage to homes, sometimes necessitating costly repairs.

Sediment from erosion blankets coral reefs, blocking sunlight and stifling the growth of marine ecosystems, threatening reef health and ocean biodiversity.



Historic Hawaiian fishponds, which are important for local fish production and cultural heritage, get filled with sediment, reducing their effectiveness and threatening their survival.

Invasive species threaten native ecosystems.

Dry, arid lands dominated by invasive grasses face heightened wildfire risk and threaten communities. Post-fire erosion washes sediment into streams and coastal ecosystems.

Sea level rise and coastal erosion threaten homes with wave-induced flooding.

Invasive mangroves rapidly spread along coastlines, disrupting native ecosystems, altering fishponds, and contributing to habitat loss for endemic species.

Social Vulnerability

Social vulnerability refers to the characteristics of a person or community that influence their ability to anticipate, respond to, and recover from hazards. Social vulnerability is shaped by social, economic, cultural, and health conditions (Cutter et al., 2003).

Common SVI factors that influence risk include:

- Household income
- Crowded or multigenerational housing
- Reliance on a single transportation route
- Limited access to medical care
- Percentage of households with elders or young children
- Language barriers
- Housing located in flood prone or coastal areas

While detailed Social Vulnerability Index (SVI) mapping for Molokaʻi is conducted through state and federal sources, census based indicators show that the DHHL homestead communities experience several vulnerability stressors associated with lower income, limited transportation options, and coastal exposure. Key social vulnerability factors in the homestead communities include lower household incomes, a higher number of kupuna and residents with health challenges, and reliance on a single coastal highway that is easily disrupted by flooding or erosion. Limited resources make housing maintenance and retrofits difficult. Households with lower incomes may delay roof repair, foundation elevation, or replacement of old infrastructure.

Social Capital

Strengthening resilience for DHHL homestead communities requires understanding both the challenges that increase vulnerability and the strengths that support community response and recovery. These communities hold deep ancestral connections to the land, long standing relationships among families, and cultural practices passed down for generations. These qualities reduce risk and support resilience even when material resources may be limited.

Social capital refers to the relationships, trust, shared values, and cooperation within a community. These connections influence how people support one another, share information, and recover after disasters. Communities with strong social capital often respond more quickly in emergencies, experience fewer losses, and recover faster than communities that rely mostly on external assistance.

Social capital is one of the greatest strengths of Molokaʻi's homestead communities. Hawaiian approaches to kuleana, reciprocity, and cooperation create a strong foundation for collective action during emergencies. When hazards occur, community relationships support the rapid sharing of supplies, caregiving, transportation, and reliable information, often reducing the need for outside intervention.

Adaptive Capacity

Adaptive capacity refers to the ability of a community to adjust to hazards, lessen harm, and recover after a disruptive event. The Molokaʻi homestead communities hold deep adaptive capacity grounded in cultural identity, generational knowledge, and strong place-based stewardship that guides daily living and resource management. Tight social networks and a long history of self-reliance allow families to mobilize quickly, share what they have, and support one another through difficult times. Subsistence practices strengthen food security, while spiritual and genealogical ties to land and sea provide grounding, purpose, and a clear sense of kuleana during recovery. These strengths help the community bounce back even when financial resources are limited.

Factors Contributing to Adaptive Capacity of Homestead Communities

Tough and Rugged Community Identity
Homesteaders describe themselves as tough, self-reliant, and accustomed to limited external support. Many families prepare by storing food, maintaining tools, and knowing how to respond without waiting for county, state or federal aid.

Strong Family Networks
Many large families live close to one another, which creates an immediate support system during storms and other emergencies. These networks allow households to share childcare, food, and other essential resources, while also providing regular help for kupuna and individuals with limited mobility. This everyday interdependence becomes especially important during crises, allowing families to respond quickly and recover together.

Subsistence Knowledge and Food Production
Many homestead families rely on local fishing, gathering, hunting, and food cultivation, which reduces dependence on imported food and provides a stable source of nourishment during emergencies. These subsistence practices also strengthen cultural identity and pass intergenerational knowledge from kūpuna to keiki. Community interviews highlight deep traditional ecological knowledge about seasonal patterns, storm behavior, nearshore ecology, and the relationships between land and water. This lived understanding supports daily decision making and enhances the community's ability to adapt and respond to changing conditions.

Community Organized Response
Molokaʻi residents often mobilize quickly and independently during emergencies. People check on neighbors, clear debris, relay information, and volunteer for community safety.

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Chapter 5

Resilience Goals and Strategies

Chapter 5

Resilience Goals and Strategies

Through the planning process, five primary planning goals were identified to address the risks and vulnerabilities described in Chapter 4. These goals reflect a comprehensive, place-based approach to building resilience across the ahupuaʻa. The five goals include:

A. Improve Emergency Evacuation and Public Safety,
B. Mauka Restoration,
C. Water Flow Maintenance and Flood Prevention,
D. Restoration and Relocation of Residential Hale, and
E. Makai Restoration.

Each goal is discussed in detail in this chapter. Additionally, workforce development emerged as a key priority across all strategies, emphasizing the importance of empowering DHHL beneficiaries to lead and carry out the work of resilience. By investing in local training, skills development, and employment opportunities, the plan aims to strengthen community capacity, build economic stability, and reinforce self-determination.

This chapter also presents a series of resilience strategies designed to achieve each goal through coordinated, community-led action. The plan includes twenty-seven resilience strategies that homestead associations and beneficiary-led organizations may pursue, along with ten resilience strategies for DHHL to implement. Every strategy represents a planning effort, project, or program that could be developed and supported through future funding.

Among the twenty-seven homestead association strategies, each homestead community identified five "priority projects" to pursue in the near term. These priority projects highlight actions that beneficiaries see as most urgent and most likely to strengthen community resilience.

The following sections describe the planning process that supported the identification of the planning goals, resilience strategies, and the sets of five priority projects for each homestead community. Next, each of the five resilience goals is explored in detail. The chapter concludes with a Priority Project Implementation Matrix

The resulting matrix is a simple tool that shows the strategies the community and DHHL can take to strengthen resilience in the homestead areas. For decision makers, the matrix serves as the main roadmap for what happens next. It highlights the short list of near-term pilot projects that DHHL and the homestead associations are ready to pursue, along with the longer-term investments needed to support the communities over time.

Process for Identifying the Resilience Strategies and Priority Projects

The identification of resilience strategies and the selection of the top five priority projects for each homestead community came through an extended, community guided planning process grounded in both technical analysis and traditional ecological knowledge.

Beneficiary Workshop #3 marked a major step in this process. Beneficiaries and technical experts participated in a hands-on mapping exercise that focused on identifying practical, resilience-building strategies for each homestead ahupuaʻa. Participants worked together to highlight actions that address vulnerabilities and strengthen community resilience from mauka to makai directly on maps of their ahupuaʻa. Following the workshop, the planning consultants organized all ideas into a Preliminary Goals Matrix *(see Appendix D)*.

The Homestead Associations reviewed the Preliminary Goals Matrix in several phases, causing it to grow and evolve. At this early stage, the matrix was organized by the five overarching planning goals and did not yet assign strategies or priority projects to individual ahupuaʻa. Its purpose was to group related concepts so both beneficiaries and technical experts could more easily review and refine them. The Preliminary Goals Matrix included planning goals, key issues, options, traditional ecological knowledge, literature references, and potential partnerships. This version was shared with technical experts during a series of Expert and Resource Meetings held in September 2024. Their review helped validate concepts and led to updates based on lessons learned from prior efforts on Molokaʻi and across the pae ʻāina.

In April 2025, the engagement consultants met with the Kalamaʻula and Kapaʻakea Homestead Associations during their regularly scheduled meetings to share an updated matrix as part of Beneficiary Workshop #4. Because Kamiloloa does not hold regular association meetings, its leaders were invited to participate in the

Kapa‘akea session. These meetings served as working discussions where beneficiaries further refined the matrix. Many community members continued to send written updates afterward. This version of the matrix grew to include information on funding opportunities, workforce development, roles and responsibilities, scopes of work, and community priorities.

From late 2024 through mid-2025, DHHL and the consultant team continued to refine the Preliminary Goals Matrix. Edits focused on organizing beneficiary's ideas into clear resilience strategies and aligning the matrix with state funding criteria such as Act 96, which supports climate resilience and natural resource recovery.

In Fall 2025, the project team reorganized, reformatted, and relabeled the matrix while preparing for an informational briefing to the Hawaiian Homes Commission (HHC) and the beneficiaries, forming the Detailed Resilience Strategy Matrix. Strategy descriptions were expanded, and new columns were added for implementation partners, funding sources, approximate costs, and timelines *(Appendix E)*. *Figure 5-1* was generated to provide a conceptual illustration of how the strategies may be implemented to restore ‘āina and improve resilience. Additionally, within each ahupua‘a *(pages 5-9 to 5-11)*. Map figures were also created for commissioners and beneficiaries to visualize where each strategy would occur.

In December 2025, the updated Detailed Resilience Strategy Matrix was reviewed with each Homestead Association board to confirm their selections for the top five priority projects. Beneficiaries also determined that the matrix should be reorganized to clearly distinguish strategies for DHHL implementation from those intended for homestead associations. This separation strengthened transparency, clarified roles, and supported more realistic implementation planning for both DHHL and community partners.

To further support decision making, new columns were added to show each association's top five priority projects. Within each strategy, actions were also grouped into three tiers that align with prescribed NFWF funding stages:

- Tier 1 includes site assessment and preliminary design work.
- Tier 2 includes detailed design and permitting.
- Tier 3 includes implementation activities.

This tiered structure provides a clear pathway for project development and helps identify which efforts may be eligible for near term funding.

The final Priority Project Implementation Matrix *(Table 5-1)* also highlights where strategies are linked or dependent on one another, which helps identify opportunities to streamline efforts, reduce redundancy, and improve coordination across the homestead communities.

The Detailed Resilience Strategy Matrix, and the Detailed DHHL-Led Resilience Strategy Matrix are included in *Appendix E and Appendix F*, respectively. The Priority Project Implementation Matrix appears later in this chapter, along with a separate summary of strategies that fall under DHHL responsibility.

Five Resilience Goals

A: Emergency Evacuation and Public Safety

Emergency Evacuation and Public Safety was identified by beneficiaries as one of the most urgent resilience needs across Kalama‘ula, Kapa‘akea, and Kamiloloa. Homestead beneficiaries consistently voiced concerns about their ability to safely respond during emergencies such as wildfire, coastal flooding, king tides, heavy rain events, and roadway blockages. These hazards threaten lives, limit access to essential services, and place vulnerable residents at risk.

This goal focuses on improving community readiness, strengthening emergency communication, and creating safe and reliable routes for evacuation. It supports a coordinated approach between beneficiaries, DHHL, and emergency agencies so the homestead communities are better prepared before a hazard occurs and better able to respond when conditions change quickly.

Together, the strategies under this goal strengthen protection for people, homes, infrastructure, and natural resources. They also build leadership and capacity within the homesteads to guide emergency response in a culturally grounded and community driven way.

Key Beneficiary Mana‘o Informing Goal A

In Kalama‘ula, beneficiaries emphasized the vulnerability of existing main roads located near shorelines and flood-prone areas, calling for alternative inland evacuation routes that are elevated above flood zones, especially for rapid evacuation during tsunami warnings. Unique to Kalama‘ula was the proposal to establish helicopter landing areas specifically for emergencies such as fires and floods, accompanied by clearly defined water access points for firefighting. Beneficiaries recommended upgrading and regularly maintaining roads and culverts, particularly mentioning the need for improving the Third River bridge and culvert, which currently lacks capacity and becomes obstructed with sediment. The community further proposed extending existing access roads mauka beyond Kūlana ‘Ōiwi, to enhance escape routes and reduce wildfire risks. Kalama‘ula residents strongly advocated for including kūpuna and other vulnerable groups in planning efforts, utilizing door-to-door surveys to ensure preparedness measures accurately reflect their specific needs. Lastly, Kalama‘ula beneficiaries recommended installing additional street lighting along critical routes, enhancing nighttime visibility and safety during evacuations.

Kapa‘akea beneficiaries uniquely highlighted the need for comprehensive drainage management as essential for public safety and effective evacuation. Beneficiaries recommended a coordinated approach to redesign culverts and manage wetlands to reduce flood risks that currently threaten evacuation routes. They suggested formal memorandum of understanding (MOUs) involving the Kapa‘akea Homestead Association, DHHL, County of Maui, and DOT to plan and maintain critical drainage infrastructure. Another unique emphasis was placed on establishing an emergency proclamation to directly address drainage and flooding risks. Beneficiaries also proposed establishing an emergency fund within the Homestead Association, supported by DHHL, specifically to manage community preparedness and resilience efforts. Additionally, Kapa‘akea community members prioritized conducting detailed water quality and geological assessments to identify the safest evacuation routes and resilience hub locations. Emphasis was also placed on educating residents, particularly youth, through an ‘Opio task force, engaging local schools and UH programs in developing community resilience certification programs to prepare and empower residents for emergency response.

Beneficiaries from Kamiloloa prioritized identifying and possibly paving existing roads to serve as reliable emergency evacuation routes. Unique to this community was the recommendation to establish gravel parking lots and designated "resiliency areas," strategically equipped with water tanks, spigots, and staging areas for firefighting equipment, including portable dipping ponds. Beneficiaries proposed that signage clearly mark these roads and staging areas for "Emergency Use Only," managed directly by the Homestead Association. Additionally, Kamiloloa emphasized maintaining updated inventories of vulnerable community members, medical providers, and available first-aid equipment, ensuring regular updates and management through local associations. The community specifically recommended biannual emergency preparedness workshops and drills, in collaboration with local high schools, to build human capacity and foster proactive resilience planning. Another distinctive recommendation from Kamiloloa beneficiaries was conducting an evacuation study addressing traffic flow, contraflow management, shuttle services for homebound residents, and integrating solar-powered resilience hubs with battery storage for power during disasters. Improving communication by installing broadband or Starlink substations/antennae was also uniquely emphasized for reliable emergency communication in partnership with DHHL.

Nature based and TEK-grounded approaches are woven into this goal so that emergency infrastructure supports the broader mauka to makai restoration ethic of the plan. Vegetated firebreaks, green drainage features, and water storage systems designed to serve both emergency needs and ecological restoration should be incorporated wherever possible. These design choices help reduce hazards while also healing the landscape.

Governance is also central to this goal. A Pre-disaster Emergency Plan must be convened and regularly updated by Homestead Associations in partnership with DHHL, with clear roles for emergency agencies and community volunteers. Homestead Associations and DHHL will share responsibility for maintaining evacuation routes, hubs, and communication systems, while making the hard land use and investment decisions needed over time as conditions change.

EXAMPLES OF POTENTIAL PRIORITY PROJECTS

Remove invasive species and restore mauka lands with native forests. Incorporating culturally significant plants supports traditional practices and fosters community involvement in environmental restoration.

Ungulate control.

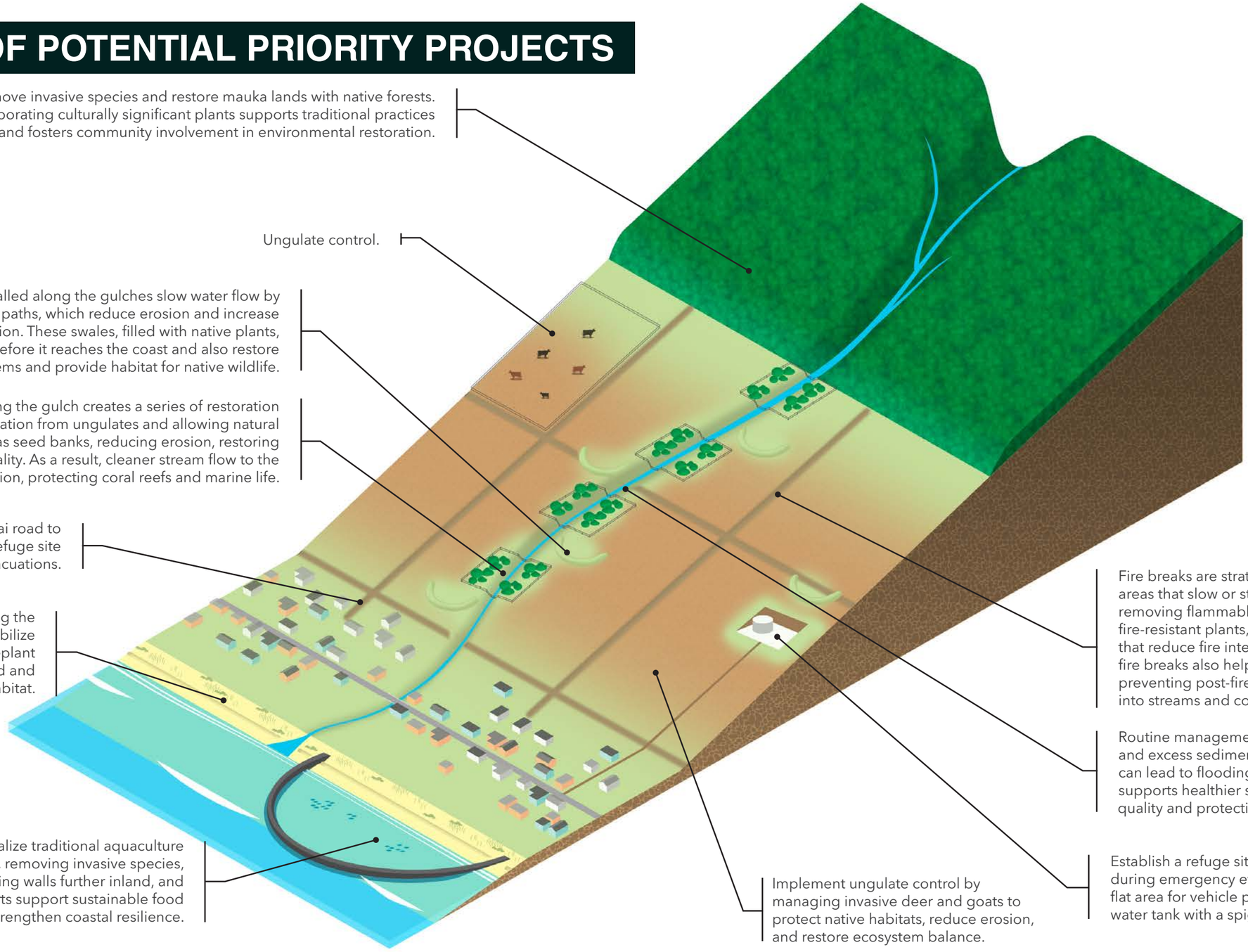
Bioswales installed along the gulches slow water flow by creating meandering paths, which reduce erosion and increase groundwater absorption. These swales, filled with native plants, capture sediment before it reaches the coast and also restore local ecosystems and provide habitat for native wildlife.

Strategically placed fencing along the gulch creates a series of restoration kīpuka, protecting native vegetation from ungulates and allowing natural regrowth. These fenced areas act as seed banks, reducing erosion, restoring habitat, and improving water quality. As a result, cleaner stream flow to the ocean helps prevent sedimentation, protecting coral reefs and marine life.

Improve mauka-makai road to provide access to refuge site during emergency evacuations.

Remove invasive species along the coast and deploy coir rolls to stabilize beach dunes and filter runoff. Replant native vegetation to stabilize sand and restore coastal habitat.

Restore coastal fishponds to revitalize traditional aquaculture practices. By repairing walls, removing invasive species, building higher walls, extending walls further inland, and improving water flow, these efforts support sustainable food systems and strengthen coastal resilience.



Fire breaks are strategically cleared and managed areas that slow or stop the spread of wildfires. By removing flammable vegetation and incorporating fire-resistant plants, these breaks create buffers that reduce fire intensity. Properly maintained fire breaks also help safeguard watersheds by preventing post-fire erosion and sediment runoff into streams and coastal ecosystems.

Routine management of gulches to remove debris and excess sediment, preventing blockages that can lead to flooding. Regular maintenance also supports healthier stream flow, improving water quality and protecting downstream ecosystems.

Establish a refuge site for beneficiaries during emergency evacuations by creating a flat area for vehicle parking and installing a water tank with a spigot for essential needs.

Implement ungulate control by managing invasive deer and goats to protect native habitats, reduce erosion, and restore ecosystem balance.

Figure 5-1 Conceptual Rendering of Resilience Strategies

Goal A Resilience Strategies

The resilience strategies supporting Goal A are described below.

A1. Create a Pre-Disaster Emergency Response and Evacuation Plan

Develops a community specific emergency plan that identifies risks, roles, responsibilities, evacuation routes, and communication systems. Supports shared coordination between DHHL, Homestead Associations, and emergency partners.

A2. Develop and Maintain Emergency Evacuation Routes

Improves and maintains mauka access routes, staging areas, and safe evacuation paths. Supports wildfire response and emergency access for all homestead areas.

A3. Develop Resilience Hubs or Evacuation Sites

Establishes safe mauka gathering sites equipped with backup power, water, emergency supplies, and communications. These hubs serve as community centers during normal times and evacuation sites during emergencies.

A4. Fire Break Construction and Maintenance

Creates and maintains fire breaks around communities to reduce wildfire risk and improve access for firefighting and emergency crews. Includes community training and stewardship.

A5. Event Reporting and Documentation System

Creates an easy to use system for residents to report flooding, fire, erosion, and other hazard events. Helps track problem areas and improves maintenance and emergency response planning.

A6. Install Wildfire Detection Cameras

Adds early detection cameras across mauka and makai areas to identify wildfires quickly and support rapid response. Integrates with county and state emergency systems.

Key Partners Involved in Achieving Goal A

Partners who help advance this goal include:

- Homestead Associations
- DHHL Planning Office
- DHHL Land Management
- DHHL Land Development Divisions
- DHHL Molokaʻi District Office
- Hawaiʻi Wildfire Management Organization
- Hawaiʻi Emergency Management Agency
- Maui Emergency Management Agency
- Molokaʻi Emergency Operations Center
- County of Maui Department of Fire and Public Safety, and Fire Prevention Bureau
- Molokaʻi Livestock Cooperative
- Maui Electric Company (MECO)

B: Mauka Restoration

Mauka Restoration was identified by beneficiaries as a critical resilience goal due to the upper slopes above the homestead communities having experienced decades of damage from overgrazing, wildfire, drought, invasive species, and uncontrolled erosion. These mauka lands once played an essential role in supporting healthy forests, springs, ravines, and coastal ecosystems. Today, erosion from mauka areas sends sediment downslope into homesteads, fills drainageways, harms fishponds, and affects nearshore marine life.

Beneficiaries emphasized that restoring mauka areas is not only an environmental responsibility but also a cultural one. Healthy mauka forests and upland areas (Wao Akua, Wao Kele, Wao Nāhele, and Wao Lāʻau) support habitat, recharge water, reduce fire risk, stabilize soils, and strengthen the entire ahupuaʻa. This goal addresses the need to rebuild the natural systems that protect the homesteads and restore relationships with the land through stewardship, training, and traditional ecological knowledge.

Key Beneficiary Manaʻo Informing Goal A

In Kalamaʻula, beneficiaries expressed concerns primarily about sediment buildup and flooding, which are exacerbated by degraded mauka lands. Unique strategies suggested include rebuilding watersheds with native vegetation, creating vegetated firebreaks or green breaks, and establishing buffer zones around vulnerable culverts and stream areas to improve soil stability and reduce sediment runoff. Kalamaʻula residents specifically pointed to the detrimental effects cattle and deer populations have on mauka vegetation, thus prioritizing invasive species control alongside native plant restoration. Regular maintenance activities, such as scheduled cleanups of culverts, gulches, and streams, were emphasized. Beneficiaries called for collaboration with ʻĀina Momona, Molokaʻi Land Trust, and the University of Hawaiʻi at Mānoa for expertise in watershed management and restoration projects. Kalamaʻula beneficiaries further proposed developing educational programs for residents, incorporating cultural perspectives on land management, and creating opportunities for community members to actively engage in stewardship activities.

Kapaʻakea beneficiaries emphasized managing drainage across the entire ahupuaʻa to mitigate flooding, particularly during heavy rains and king tides. Unique to this homestead is a strategic focus on revising culvert designs and improving mauka drainage infrastructure, calling for formal agreements (MOUs) among Kapaʻakea Association, DHHL, DOT, and County of Maui. Restoring the mauka watershed and maintaining culverts and drainage ditches were highlighted as critical steps to prevent flooding impacts. Further, Kapaʻakea beneficiaries emphasized the importance of community education and stewardship, suggesting an ʻŌpio task force involving local schools for youth training in environmental and cultural resource management. Partnerships unique to Kapaʻakea include coordination with agencies such as DLNR, FEMA, UH Water Resource Center, and private environmental testing labs to provide comprehensive hydrological and environmental assessments.

Beneficiaries from Kamiloloa emphasized the importance of mauka restoration efforts, specifically highlighting the need for detailed aerial and map reviews to strategically identify restoration sites. Unique to Kamiloloa is a strong interest in employing native vegetation species, with a clear preference for milo trees over kou trees due to their lower water requirements. Beneficiaries suggested establishing test plots, setting up protective fencing, and creating drip irrigation systems alongside developing a dedicated plant nursery and supply storage container. Additionally, there was discussion around exploring opportunities for coastal homesteaders to participate economically in restoration by cultivating economically beneficial plants like blue agave. Engaging local lessees as members of restoration crews was specifically recommended to create economic and employment opportunities within the community. Key partners identified for Kamiloloa include The Nature Conservancy and Molokaʻi Land Trust, both of which bring critical expertise in ecological restoration and native species propagation.

Traditional ecological knowledge will inform the implementation of the Mauka Restoration strategies, particularly through the ahupuaʻa land management approach, which promotes resource stewardship. For example, traditional methods such as loʻi kalo (taro patches) can be reintroduced to serve as natural sediment basins, further reducing sediment runoff.

Goal B Resilience Strategies

The resilience strategies supporting Goal B are described below.

B1. Develop a Mauka Restoration and Maintenance Plan

Creates a comprehensive plan to restore mauka lands using mapping, LiDAR, ecological studies, and traditional knowledge. Identifies priority restoration zones, fencing needs, fire management strategies, and long term stewardship plans.

B2. Implement Kipuka Waihona Concept

This concept draws inspiration from the Hawaiian idea of kīpuka, meaning a variation or opening, such as a calm place in a high sea, an opening in a forest or clouds, or an oasis of vegetation within a lava bed. Small fenced restoration sites are established along eroded ravines as these islands of renewal, where native species are replanted to stabilize soils, slow stormwater, reduce erosion, and form a growing network of restored areas that can expand over time.

B3. Reduce Fuel Loads

Removes invasive grasses, shrubs, and kiawe in high risk areas. Supports cultural and scientific fire management practices, including controlled burns, to reduce wildfire hazards and allow native ecosystems to recover.

B4. Expand Plant and Food Nursery

Expands the existing Kalamaʻula nursery to increase capacity for native plant propagation, food production, cultural plants, and community education. Provides plants needed for mauka and makai restoration projects.

B5. Feral Animal Management Program

Develops a coordinated program with hunters and agencies to manage deer, pigs, and other animals that damage vegetation, destabilize soils, and undermine restoration efforts. Integrates modern wildlife science with cultural practices.

Key Partners Involved in Achieving Goal B

Partners who help advance this goal include:

- Homestead Associations
- DHHL Planning Office
- DHHL Land Management Division
- DHHL Land Development Division
- County of Maui Department of Fire and Public Safety, and Fire Prevention Bureau
- Molokaʻi Hunting Club
- Department of Land and Natural Resources Division of Forestry and Wildlife
- DLNR Commission on Water Resource Management
- Molokaʻi Homestead Livestock Association
- Natural Resources Conservation Service
- Hawaiʻi Wildfire Management Organization
- Hawaiʻi Community Foundation

C: Water Flow Maintenance and Flood Prevention

Water Flow Maintenance and Flood Prevention was identified by beneficiaries as a major resilience priority across all three homestead communities. Residents consistently described chronic flooding during heavy rain events, blocked drainage canals, overflowing ravines, clogged culverts, and sediment buildup that damages homes, roads, and coastal environments. These issues are worsened by eroded mauka slopes, invasive vegetation, poor drainage maintenance, and loss of traditional waterways.

This goal responds to the community's call for safer and more reliable water flow from mauka to makai. Flooding affects public safety, home health, road access, cesspools and septic systems, cultural sites, and fishponds. Restoring natural and engineered drainage systems strengthens the ahupuaʻa and protects both people and ecosystems. Beneficiaries noted that earlier wetland areas were filled for development, canals and drainage ditches were never designed for today's storm events, and maintenance responsibilities have long been unclear. This goal helps clarify roles, strengthen partnerships, and bring both modern engineering and traditional water knowledge back into practice.

Key Beneficiary Manaʻo Informing Goal C

Beneficiaries from Kalamaʻula homestead strongly emphasized regular maintenance and improvements of culverts and drainage systems to prevent frequent flooding. Specific culverts, notably the bridge and adjacent culverts, were highlighted as having insufficient capacity and chronic sediment buildup. Kalamaʻula uniquely recommended regularly scheduled cleanups of debris and sediment from culverts, streams, and gulches, alongside establishing vegetated buffer zones around drainage infrastructure to reduce sediment accumulation and flooding. Beneficiaries also proposed replacing existing degraded cesspools with modern septic systems to reduce water contamination risks. Another significant concern raised by the DHHL Molokaʻi District Office was the need to replace the Maunaloa Highway water line, which is vulnerable to saltwater corrosion, with a more resilient pipeline. Beneficiaries further emphasized the importance of replanting native vegetation mauka to stabilize soils and reduce sediment runoff. Collaborative partnerships were recommended with organizations like ʻĀina Momona and Molokaʻi Land Trust to support reforestation and ecological restoration efforts, as well as addressing invasive species that exacerbate soil erosion.

The Kapaʻakea homestead community prioritized developing a coordinated drainage management plan to comprehensively address flooding across the entire ahupuaʻa. Beneficiaries uniquely recommended redesigning and upgrading undersized culverts, which frequently overflow, causing flood hazards in residential areas. They proposed formalizing maintenance agreements (MOUs) involving DHHL, County of Maui, DOT, and Army Corps of Engineers (USACE) to ensure regular and funded maintenance of drainage infrastructure. Beneficiaries specifically requested comprehensive surveys to assess water quality and hydrology in historically wetland areas, emphasizing the importance of testing stagnant water and groundwater contamination under existing homes. Another unique strategy for Kapaʻakea included exploring leases designed for pastoral or non-structural uses in areas prone to severe flooding, as an adaptive measure. Beneficiaries further recommended educational programs on traditional water management practices, involving community youth and local schools, to promote resilience and effective flood prevention management.

Beneficiaries in Kamiloloa highlighted the need for improving mauka drainage systems to better manage floodwaters. They specifically proposed installing bioswales, detention basins, and crescent shaped absorption beds filled with native vegetation along streams and gulches. These features would slow water flow, allow greater absorption into groundwater, and reduce flooding impacts during heavy rainfalls and king tide events. Kamiloloa residents also emphasized the importance of regularly maintaining and clearing channels and drainage ditches, specifically mentioning past instances where significant sediment buildup required immediate excavation. Establishing formal agreements (MOUs) with local stakeholders, including DHHL and the County of Maui, was recommended for ongoing channel maintenance. Kamiloloa residents further recommended conducting detailed hydrological studies, specifically for the south shore, to address groundwater contamination issues and guide future water flow restoration efforts.

Goal C Resilience Strategies

The resilience strategies supporting Goal C are described below.

C1. Develop a Drainage Master Plan

Creates a comprehensive plan to guide drainage improvements across the homestead ahupuaʻa. Includes mapping, hydrologic modeling, inventory of canals and culverts, TEK integration, and engineered alternatives for long term water management.

C2. Green–Grey Drainage Improvements and Maintenance Program

Implements both natural and engineered drainage solutions, including sediment removal, canal clearing, erosion control, and native planting. Establishes a coordinated maintenance program across agencies and the Homestead Associations.

C3. Watershed Participatory Mapping Workshops

Engages beneficiaries in hands-on learning about drainage maintenance, flooding risks, and nature-based solutions. Community members document problem areas, support data collection, and build stewardship skills.

C4. Restore Springs

Identifies and restores traditional and existing springs to improve water flow, cultural connection, and ecosystem health. Reopens blocked springs, reconnects waterways, and supports educational uses and stewardship within the community.

Key Partners Involved in Achieving Goal C

Partners who help advance this goal include:

- Homestead Associations
- DHHL Planning Office
- DHHL Land Management Division
- DHHL Land Development Division
- DHHL Molokaʻi District Office
- County of Maui Planning and Public Works Departments
- United States Army Corps of Engineers
- State Department of Transportation
- Hawaiʻi Community Foundation
- Molokaʻi Livestock Cooperative

D: Residential Hale Retrofits and/or Relocation

Restoration and Relocation of Residential Hale was identified by beneficiaries as an essential resilience goal because many homes in the homestead communities face long standing hazards that are becoming more severe with climate change. Beneficiaries described frequent flooding around homes, drainage issues caused by past grading and development, wildfire exposure, coastal erosion, and aging home structures that were not built for the conditions experienced today. Some homes are located in floodways or near the shoreline where water levels are already rising.

This goal focuses on making homestead homes safer by identifying which structures are most vulnerable, supporting retrofits that reduce risk, and planning for potential relocation if conditions worsen over time. It also helps improve awareness among homeowners and supports educational workshops on building safety and hazard readiness.

Addressing these challenges is essential for protecting homestead families, safeguarding investments, and supporting long term community stability. Beneficiaries emphasized that protecting homes is protecting the next generation, and that any resilience work must begin with the places where people live.

Key Beneficiary Manaʻo Informing Goal D

Beneficiaries in Kalamaʻula emphasized the importance of long-term residential planning with particular consideration for the aging population, noting a significant number of elderly residents currently living in flood-prone zones, such as makai of Kūlana ʻŌiwi. They recommended proactive engagement of kūpuna through door-to-door surveys to ensure relocation plans fully address their specific needs. Kalamaʻula uniquely proposed establishing buffer zones and green breaks around residential areas to reduce immediate hazards from wildfires and flooding while relocation strategies are developed. Residents also highlighted the need for careful integration of cultural and historical preservation into relocation plans, ensuring that future residential developments inland maintain strong connections to cultural sites and traditional practices. Beneficiaries specifically recommended long-term (50-year) planning horizons, ensuring relocation actions align with anticipated climate change impacts and community demographics. Collaborative partnerships with organizations such as ʻĀina Momona were suggested to leverage resources for land banking, identifying suitable mauka lands for future residential development, and securing necessary funding for infrastructure development.

Beneficiaries from Kapaʻakea uniquely highlighted the need for comprehensive water quality and geological surveys to accurately assess current risks to existing residential structures and determine suitable, safer areas for relocation. The community specifically discussed implementing interim solutions for vulnerable homes, such as floating-floor houses or leases without permanent structures (pastoral uses), to immediately reduce flood risks. Beneficiaries also emphasized the need for clear decommissioning plans for properties vacated due to relocation, ensuring safe and sustainable transitions. Additionally, Kapaʻakea residents recommended integrating regulatory compliance into relocation planning, specifically referencing the mandated conversion of existing cesspools by 2050. Education on relocation options and incorporating cultural knowledge into planning processes were emphasized as important steps in creating community acceptance and engagement in managed retreat planning.

Beneficiaries in Kamiloloa specifically expressed a strong interest in exploring inland (mauka) relocation options for residential lots currently situated in vulnerable coastal areas. They suggested that developing emergency evacuation roads could serve as an initial step toward broader managed retreat, eventually followed by the addition of critical infrastructure such as water and wastewater systems to support new residential lots. A distinctive recommendation from Kamiloloa was to consider innovative, resilient housing designs, such as dome-shaped houses that are fireproof and hurricane-resistant, as part of relocation planning. Beneficiaries emphasized the importance of creating clear incentives and economic opportunities, potentially involving coastal residents in restoration projects—such as planting economically viable species like blue agave—to encourage participation in the relocation process.

Goal D Resilience Strategies

The resilience strategies supporting Goal D are described below.

D1. Conduct Vulnerability Assessments Survey

Completes parcel-level assessments of home conditions, structural risks, and exposure to hazards such as flooding, wildfire, and coastal erosion. Includes interviews, mapping, and documentation needed to guide future retrofit or relocation decisions.

D2. Adapt Structures and Systems to Better Withstand Coastal Hazards

Supports home retrofits such as elevation, hardening, hurricane resilience, utility protection, and floodproofing. Builds partnerships with experts for Firewise assessments and homeowner training on hazard preparedness.

D3. Maintain Home Ignition Zones

Reduces wildfire risk by clearing vegetation, creating defensible space around homes, and supporting fire safe landscaping. Includes workshops and demonstrations for residents.

Key Partners Involved in Achieving Goal D

Partners who help advance this goal include:

- Homestead Associations
- DHHL Planning Office
- DHHL Land Management Division
- DHHL Land Development Division
- Hawaiʻi Wildfire Management Organization
- National Disaster Preparedness Training Center
- Hawaiʻi Sea Grant
- County and State Hazard Mitigation Programs

E: Makai Restoration

Makai Restoration was identified by beneficiaries as an essential resilience goal because the coastal zone is central to the identity, health, and livelihood of the homestead communities. Beneficiaries emphasized that the shoreline, wetlands, fishponds, and reef system have been suffering from sedimentation, invasive species, reduced water quality, coastal erosion, and long-term impacts from historic land use. These issues are worsened by climate change, stronger storms, rising sea levels, and continued mauka erosion.

The makai landscape is a place of cultural practice, gathering, education, fishing, and family connection. When coastal systems decline, the entire ahupuaʻa

suffers. Restoring makai areas strengthens food systems, protects cultural sites, improves water quality, and supports healthy marine ecosystems.

This goal focuses on restoring shoreline processes, enhancing native ecosystems, managing invasive species, and building community stewardship. Beneficiaries also stressed the importance of caring for fishponds, wetlands, and coastal springs that feed nearshore waters and support traditional practices.

Key Beneficiary Manaʻo Informing Goal E

In Kalamaʻula, beneficiaries addressed the restoration of coastal ecosystems by focusing on mangrove removal, which is intended to reveal freshwater springs that historically fed local fishponds. Techniques such as strategic weed-whacking of mangrove roots were suggested to prevent further spreading. Kalamaʻula beneficiaries highlighted the importance of removing invasive marine algae (gorilla ogo) from shoreline areas and fishponds. They recommended partnerships with organizations like ʻĀina Momona and DLNR's Division of Aquatic Resources (DAR) to implement effective algae management strategies, including the use of seine nets or hiring specialized contractors. Beneficiaries also discussed restoring historical sites, including reconstructing or improving features like historic fishpond walls and the Kaunakakai wharf, to enhance water circulation and ecological function.

The Kapaʻakea community recognized the restoration and management of fishpond and wetland ecosystems as central to makai restoration efforts. Beneficiaries discussed the historical significance of Kapaʻakea Puʻuone (inland fishpond) and highlighted its potential to support community food security through sustainable aquaculture practices. Removal and management of invasive mangroves were strongly recommended, with replacement by native coastal plants that effectively stabilize soil and prevent erosion. Beneficiaries identified the need for comprehensive water quality and hydrological surveys, emphasizing collaboration with Ka Honua Momona, Hui Malama, and Ka Ipu Makani for managing culturally significant wetland areas. Additionally, Kapaʻakea residents recommended formalizing agreements among local organizations, DHHL, DOT, and the County of Maui to implement effective drainage solutions to protect restored coastal and wetland habitats from flooding and contamination.

Beneficiaries from Kamiloloa homestead highlighted the importance of shoreline mitigation through vegetation restoration. They specifically recommended utilizing grass and coir rolls ("mesh bag rolls of seed starters") to stabilize shorelines, facilitate sediment movement, and provide natural protection against tsunami and wave events. A clear preference was given to native vegetation such as Milo, despite acknowledgment of its shedding seeds and pods. Beneficiaries also emphasized collaboration with Molokaʻi Land Trust and coastal restoration specialists to implement these restoration methods effectively.

Implementation of the Makai Restoration goal will be significantly informed by traditional ecological knowledge. Historically, Native Hawaiian practices included rotating seasonal restrictions (kapu) on harvesting fish and other marine resources, ensuring sustainable use and ecological balance. Fishpond restoration, an integral part of traditional Hawaiian land management, will also help filter sediment and nutrients from runoff, improving water quality. Wetland ecosystems were traditionally maintained and protected as vital components of the landscape, acting as natural buffers that protected nearshore ocean environments and habitats.

Goal E Resilience Strategies

The resilience strategies supporting Goal E are described below.

E1. Develop a Makai Restoration and Management Plan

Creates a comprehensive plan to guide restoration of shoreline areas, integrate traditional ecological knowledge, identify priority projects, and build long term stewardship partnerships. Serves as the foundation for future coastal restoration work.

E2. Implement Nature Based Coastal Protection Projects

Uses native vegetation, dune restoration, wetland enhancement, and traditional shoreline practices to reduce erosion and strengthen coastal resilience. Implements recommendations from the South Molokaʻi Shoreline Erosion Management Plan.

E3. Invasive Species Removal and Management

Removes invasive plants and marine species such as mangrove, kiawe, and gorilla ogo that disrupt ecosystems. Restores native coastal vegetation and supports community stewardship activities.

E4. Marine Ecosystem Restoration

Restores coral, limu, and marine habitats through science based and culturally grounded practices. Supports native species, improves water quality, and strengthens sustainable harvesting traditions.

E5. Restore ʻŌhiʻapilo Wetland

Improves water quality, habitat health, and cultural access through hydrologic restoration and invasive species removal. Builds on past studies and supports long term stewardship.

E6. Implement Special Area Plan for Malama Cultural Park

Restores habitat, improves trails and facilities, and enhances cultural and educational features at Malama Cultural Park through the Special Area Plan adopted in 2022.

E7. Maintain Kapuāiwa Coconut Grove and Kiowea Park

Supports long-term stewardship of Kapuāiwa Coconut Grove and Kiowea Park through coordinated pest management, soil and vegetation restoration, and routine maintenance. This integrated project protects culturally significant coconut trees, restores native coastal vegetation, stabilizes the shoreline, and improves park facilities while supporting cultural practices, public access, and ongoing community care of these important places.

Key Partners Involved in Achieving Goal D

Partners who help advance this goal include:

- Homestead Associations
- DHHL Planning Office
- DHHL Land Management Division
- DHHL Land Development Division
- Ka Honua Momona
- Molokaʻi Land Trust
- ʻĀina Momona
- Molokaʻi Wetland Partnership
- Molokaʻi Limu Hui
- University of Hawaiʻi Sea Grant
- Department of Land and Natural Resources
- United States Army Corps of Engineers
- Hawaiʻi Invasive Species Council
- Hawaiʻi Community Foundation

Workforce Development

Workforce development is a core component of the MCH-CRP and central to the long-term success of building community resilience. The plan envisions DHHL beneficiaries as the primary stakeholders and implementers of the resilience strategies identified, reflecting a commitment to self-determination and community-led action. Through this approach, beneficiaries are not only participants in planning but also leaders in carrying the work forward. The plan emphasizes creating opportunities for beneficiaries to gain training, develop technical and cultural skills, and carry out the work themselves.

During the consultation process for this plan, beneficiaries expressed a shared concern that too often, when projects are implemented on Molokaʻi, contracts and employment go to off-island companies, leaving limited benefits for local families. The MCH-CRP responds to this by prioritizing investment in local capacity building and workforce training that generates income within the community, creates stable jobs, and strengthens the local economy. By empowering beneficiaries to do the work, the plan helps to build community capital, sustain livelihoods, and reinforce a culture of stewardship.

Summary Matrix of Hawaiian Homestead Association-Led Resilience Strategies and Priority Projects

The Priority Project Implementation Matrix serves as the central framework for organizing and presenting the recommended actions of the MCH-CRP. It brings together the work of beneficiaries, technical experts, and DHHL into one clear structure that reflects the five planning goals of this plan. The matrix is color coded for ease of use and is organized so readers can see how each goal is advanced through a set of resilience strategies. Each strategy responds to the challenges and opportunities identified throughout the community planning process.

Three versions of the matrix are included in this plan. The Preliminary Goals Matrix captured actions that address vulnerabilities identified by beneficiaries in Beneficiary Workshop #3, and appears in *Appendix D*. The Detailed Resilience Strategy Matrix follows the and provides a complete overview of each strategy. It includes a short description of actions, primary and secondary responsibility for implementation, key partners and collaborators, potential funding sources, and rough order of magnitude cost estimates.

The Priority Project Implementation Matrix is presented in *Table 5-1* below. This summary highlights the specific actions associated with each of the three NCRF funding tiers. It also identifies the top five priority projects selected by each homestead area as the most urgent for near-term implementation.

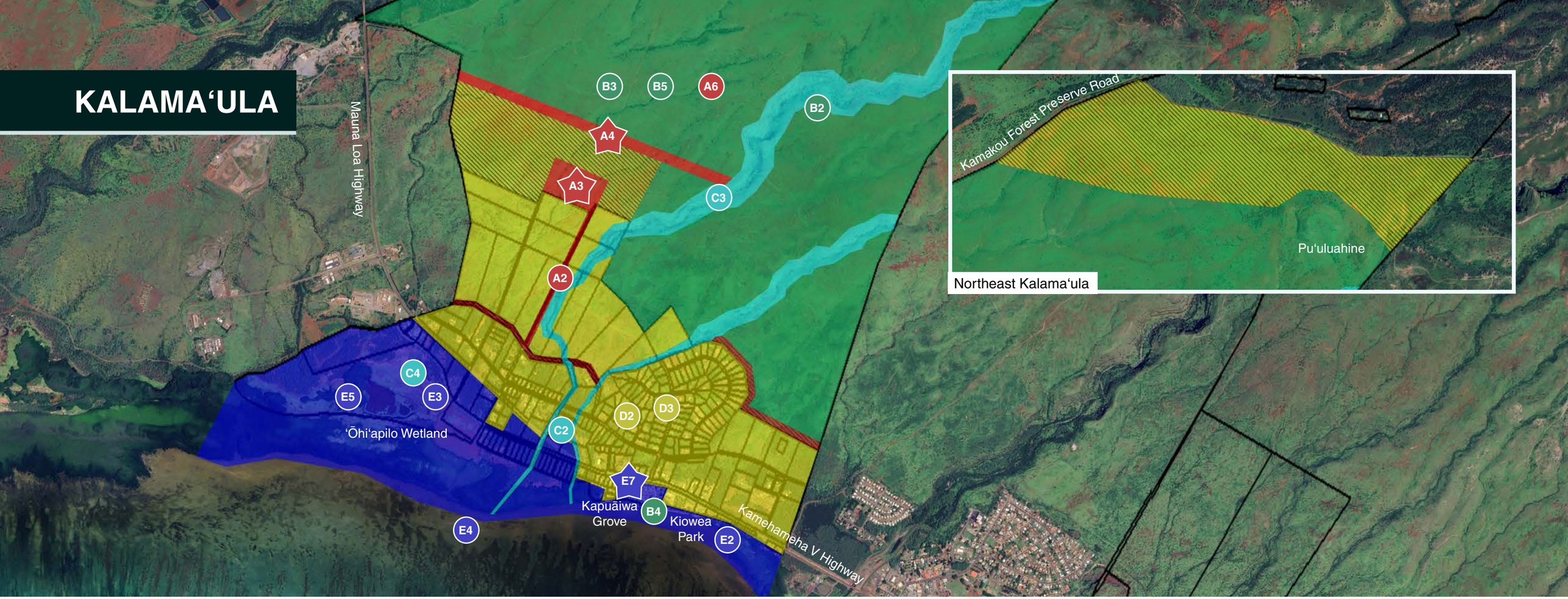
The spatial distribution of these strategies is illustrated in *Figures 5-1 (Kalamaʻula), 5-2 (Kapaʻakea), and 5-3 (Kamiloloa)*, showing where projects are generally located within each homestead area. Strategies marked with an asterisk (*) are non-spatial in nature and represent actions that apply broadly across the entire ahupuaʻa or community. The top five Priority Projects for each homestead are also summarized in *Table 5-2* below.

Given the number of studies, pilots, and restoration actions proposed in the MCH-CRP, this matrix is intended to function as a living implementation roadmap rather than a one-time project list. DHHL and its partners will establish simple monitoring frameworks that track ecological change, hazard reduction, job creation, and training delivered. These indicators will provide a clear picture of progress and help guide future decisions. Periodic reviews of the matrix with homestead associations and technical partners will update priorities, incorporate lessons learned, and keep the roadmap aligned with community needs and changing conditions across the ahupuaʻa.

Table 5-2: Priority Project Summary Table

Priority Project	Kalamaʻula	Kapaʻakea	Kamiloloa
1	D1: Conduct Vulnerability Assessment Survey	A1: Create a Pre-Disaster Emergency Response and Evacuation Plan	A1: Create a Pre-Disaster Emergency Response and Evacuation Plan
2	A3: Develop Resilience Hubs or Evacuation Sites	A3: Develop Resilience Hubs or Evacuation Sites	B1: Develop Mauka Restoration & Maintenance Plan
3	B1: Develop Mauka Restoration & Maintenance Plan	B1: Develop Mauka Restoration & Maintenance Plan	C1: Develop a Drainage Master Plan
4	A4: Fire Break Construction & Maintenance	C1: Develop a Drainage Master Plan	C2: Green-Grey Drainage Improvements & Maintenance Program
5	E7: Maintain Kupuāiwa Coconut Grove and Kiowea Park	D2: Adapt Structures and Systems to Better Withstand Coastal Hazards	E1: Develop Makai Restoration & Maintenance Plan

KALAMA‘ULA



A Emergency Evacuation and Public Safety

- A1 Create a Pre-Disaster Emergency Response and Evacuation Plan*
- A2 Develop and Maintain Emergency Evacuation Routes
- A3 Develop Resilience Hubs or Evacuation Sites
- A4 Fire Break Construction and Maintenance
- A5 Event Reporting and Documentation System*
- A6 Install Wildfire Detection Cameras

B Mauka Restoration

- B1 Develop Mauka Restoration and Maintenance Plan*
- B2 Implement Kipuka Waihona Concept
- B3 Reduce Fuel Loads
- B4 Expand Plant and Food Nursery
- B5 Feral Animal Management Program

C Water Flow Maintenance and Flood Prevention

- C1 Develop a Drainage Master Plan*
- C2 Green–Grey Drainage Improvements and Maintenance Program
- C3 Watershed Participatory Mapping Workshops
- C4 Restore Springs

D Residential Hale Retrofits and Relocation

- D1 Conduct Vulnerability Assessments Survey*
- D2 Adapt Structures and Systems to Better Withstand Coastal Hazards
- D3 Maintain Home Ignition Zones

E Makai Restoration

- E1 Develop a Makai Restoration and Management Plan*
- E2 Implement Nature-Based Coastal Protection Projects
- E3 Invasive Species Removal and Management
- E4 Marine Ecosystem Restoration
- E5 Restore Ohi‘apilo Wetland
- E7 Maintain Kapuāiwa Coconut Grove and Kiowea Park

* A1, B1, plans, etc. are not located on the map because they are full ahupua‘a focused plans

* Strategies are non-spatial in nature and represent actions that apply broadly across the entire ahupua‘a or community.

KAPA‘AKEA

A — Emergency Evacuation and Public Safety

- A1 Create a Pre-Disaster Emergency Response and Evacuation Plan*
- A2 Develop and Maintain Emergency Evacuation Routes
- A3 Develop Resilience Hubs or Evacuation Sites
- A4 Fire Break Construction and Maintenance
- A5 Event Reporting and Documentation System*
- A6 Install Wildfire Detection Cameras

B — Mauka Restoration

- B1 Develop Mauka Restoration and Maintenance Plan*
- B2 Implement Kipuka Waihona Concept
- B3 Reduce Fuel Loads
- B4 Expand Plant and Food Nursery
- B5 Feral Animal Management Program

C — Water Flow Maintenance and Flood Prevention

- C1 Develop a Drainage Master Plan*
- C2 Green–Grey Drainage Improvements and Maintenance Program
- C3 Watershed Participatory Mapping Workshops
- C4 Restore Springs

D — Residential Hale Retrofits and Relocation

- D1 Conduct Vulnerability Assessments Survey*
- D2 Adapt Structures and Systems to Better Withstand Coastal Hazards
- D3 Maintain Home Ignition Zones

E — Makai Restoration

- E1 Develop a Makai Restoration and Management Plan*
- E2 Implement Nature-Based Coastal Protection Projects
- E3 Invasive Species Removal and Management
- E4 Marine Ecosystem Restoration
- E5 Restore Ohi‘apilo Wetland
- E7 Maintain Kapuāiwa Coconut Grove and Kiowea Park

* A1, B1, plans, etc. are not located on the map because they are full ahupua‘a focused plans

* Strategies are non-spatial in nature and represent actions that apply broadly across the entire ahupua‘a or community.

KAMILOLOA - MAKAKUPA‘IA

A Emergency Evacuation and Public Safety

- A1 Create a Pre-Disaster Emergency Response and Evacuation Plan*
- A2 Develop and Maintain Emergency Evacuation Routes
- A3 Develop Resilience Hubs or Evacuation Sites
- A4 Fire Break Construction and Maintenance
- A5 Event Reporting and Documentation System*
- A6 Install Wildfire Detection Cameras

B Mauka Restoration

- B1 Develop Mauka Restoration and Maintenance Plan*
- B2 Implement Kipuka Waihona Concept
- B3 Reduce Fuel Loads
- B4 Expand Plant and Food Nursery
- B5 Feral Animal Management Program

C Water Flow Maintenance and Flood Prevention

- C1 Develop a Drainage Master Plan*
- C2 Green–Grey Drainage Improvements and Maintenance Program
- C3 Watershed Participatory Mapping Workshops
- C4 Restore Springs

D Residential Hale Retrofits and Relocation

- D1 Conduct Vulnerability Assessments Survey*
- D2 Adapt Structures and Systems to Better Withstand Coastal Hazards
- D3 Maintain Home Ignition Zones

E Makai Restoration

- E1 Develop a Makai Restoration and Management Plan*
- E2 Implement Nature-Based Coastal Protection Projects
- E3 Invasive Species Removal and Management
- E4 Marine Ecosystem Restoration
- E5 Restore Ohi‘apilo Wetland
- E1 Maintain Kapuāiwa Coconut Grove and Kiowea Park

* A1, B1, plans, etc. are not located on the map because they are full ahupua‘a focused plans

* Strategies are non-spatial in nature and represent actions that apply broadly across the entire ahupua‘a or community.

Table 5-1: Hawaiian Homestead Communities Priority Projects Implementation Matrix

Resilience Goals	Resilience Strategy/ Project Name	Tier 1: Site Assessment and Preliminary Design	Tier 2: Detailed Design and Permitting	Tier 3: Implementation	Kalamaʻula Priority Project	Kapaʻakea Priority Project	Kamiloloa Priority Project	Notes
A: Emergency Evacuation and Public Safety	A1: Create a Pre-Disaster Emergency Response and Evacuation Plan	Risk assessment; traffic studies; evacuation modeling; stakeholder coordination; preliminary evacuation framework; community engagement	Final plan drafting, detailed route design, MOUs, training program development, compliance review	A2, A3, A4, A5, and A6		1	1	
	A2: Develop and Maintain Emergency Evacuation Routes	A1*	Engineering design; environmental review; historic preservation / biological reviews; signage design; maintenance MOUs; construction documentation; permits and approvals; workforce development	Procure equipment and materials; road upgrades; staging area construction; signage installation; community drills; long-term maintenance operations		2**		* A1 fulfills A2 Tier 1 ** Kapaʻakea requested combining A2 and A3, but due to their different design and permitting requirements, they must remain separate. Although A3 is not listed as a priority project, it is still a high community priority. Funding can be sought to implement A3 separately or concurrently with A2.
	A3: Develop Resilience Hubs or Evacuation Sites	A1*	Land dispositions, architectural / engineering design; environmental review; historic preservation & biological reviews; utilities planning; O&M plan; emergency operations protocols; permits and approvals; workforce development	Construction; equipping hub; community training; drills; maintenance; adaptive management	2			*A1 fulfills A3 Tier 1
	A4: Fire Break Construction & Maintenance	A1*	Land dispositions, engineering design; environmental review; historic preservation / biological reviews; maintenance plan; MOUs; cost estimating; permits and approvals; workforce development	Procure equipment and materials; fire break construction; vegetation removal; erosion control; community training; routine maintenance	4			*A1 fulfills A4 Tier 1
	A5: Event Reporting & Documentation System*	A1*	System architecture; GIS integration; dashboard design; SOPs; pilot testing; training materials	System launch; community training; integration with DHHL operations; real-time monitoring; long-term maintenance				*A1 fulfills A5 Tier 1
	A6: Install Wildfire Detection Cameras	A1*	Land dispositions, technical system design; communications / power engineering; environmental review; procurement; emergency integration; workforce training; detailed budget & phasing; permits or approvals	Camera installation; system testing; monitoring activation; maintenance; community education; inter-project integration; long-term operations and upgrades				*A1 fulfills A6 Tier 1

Table 5-1: Hawaiian Homestead Communities Priority Projects Implementation Matrix

Resilience Goals	Resilience Strategy/ Project Name	Tier 1: Site Assessment and Preliminary Design	Tier 2: Detailed Design and Permitting	Tier 3: Implementation	Kalama‘ula Priority Project	Kapa‘akea Priority Project	Kamiloloa Priority Project	Notes
B: Mauka Restoration	B1: Develop Mauka Restoration & Maintenance Plan	LiDAR and aerial mapping; TEK integration; AIS/biological studies; erosion and vegetation assessment; preliminary zone mapping; early fire management concepts; engineering studies	Draft and final mauka restoration master plan, Engineering for fencing/ irrigation; species prescriptions; fire suppression design; phasing plan; historic preservation / biological reviews; workforce plan; cost estimates; monitoring protocols	B2 and B3	3	3	2	
	B2: Implement Kipuka Waihona Concept	B1*	Land dispositions, permits and approvals; workforce development	Procure equipment and materials; invasive species removal; fencing installation; native planting; erosion control; micro-reservoirs; workforce employment; monitoring; education				*B1 fulfills B2 Tier 1
	B3: Reduce Fuel Loads	B1*	Land dispositions, permits and approvals; workforce development	Procure equipment and materials; mechanical clearing; cultural/ prescribed burns; native replanting; erosion control; workforce deployment; monitoring & adaptive management				*B1 fulfills B3 Tier 1
	B4: Expand Plant and Food Nursery	Assess existing Kalama‘ula nursery; identify species needs; conceptual layout; site evaluation; workforce and training needs	Update land disposition; develop engineered expansion plans; finalize propagation program; environmental review; design training program; prepare construction documents; permits and approvals; workforce development	Construct nursery upgrades; increase plant production; launch training programs; run community workshops; maintain and adapt operations; support B2, C4, D3, E2, and E3 actions				
	B5: Feral Animal Management Program	Population mapping; impact assessment; TEK integration; conceptual strategies; access/safety assessment; community outreach; regulatory and workforce planning	Land dispositions, develop management plan; identify partners and incentives; fencing designs; environmental/cultural review; safety protocols; training curriculum; monitoring plan; detailed budget & phasing	Procure equipment and materials, selective culling / controlled hunting; fence construction; ongoing monitoring; workforce deployment				

Table 5-1: Hawaiian Homestead Communities Priority Projects Implementation Matrix

Resilience Goals	Resilience Strategy/ Project Name	Tier 1: Site Assessment and Preliminary Design	Tier 2: Detailed Design and Permitting	Tier 3: Implementation	Kalama'ula Priority Project	Kapa'akea Priority Project	Kamiloloa Priority Project	Notes
C: Water Flow Maintenance and Flood Prevention	C1: Develop a Drainage Master Plan	Watershed mapping; hydrologic/ hydraulic modeling; inventory springs; infrastructure inventory and assessment; early hazard assessments; preliminary drainage concepts; community input; TEK integration	Engineered alternatives; phasing plans; cost estimates; environmental review; sediment control design; draft & final Drainage Master Plan; MOU's and policy setup	C2, C3, and C4		4	3	
	C2: Green–Grey Drainage Improvements & Maintenance Program	C1*	Land dispositions, detail design; historic preservation / biological reviews; USACE coordination; permits and approvals; workforce development; formal maintenance plan	Install drainage upgrades; green/ grey solutions; sediment & erosion controls; procure equipment and materials; routine maintenance; monitoring; adaptive management			4	*C1 fulfills C2 Tier 1
	C3: Watershed Participatory Mapping Workshops	C1*	Land dispositions, identify education partners, curriculum development; MOUs; workforce development	Procure equipment and materials; community stewardship that supports C2; interactive GIS mapping; citizen science and education; integration with A5				*C1 fulfills C2 Tier 1
	C4: Restore Springs	C1*	Land dispositions, detailed surveys; engineering & ecological designs; maintenance plans; fencing & access design; workforce development; cost estimating, historic preservation / biological reviews; USACE coordination; permits and approvals	Procure equipment and materials; clearing blockages; hydrologic restoration; native planting; fencing; monitoring; community stewardship; adaptive management				*C1 fulfills C2 Tier 1
D: Residential Hale Retrofits and Relocation	D1: Conduct Vulnerability Assessments Survey	Hazard modeling; parcel-level assessments; structural inspections; homesteader interviews; utility vulnerability surveys; preliminary retrofit concepts; regulatory screening; prioritization	Integrate with A1; vulnerability profiles; engineering designs; utility adaptation design; mitigation concepts; detailed cost estimates	D1 and D2	1			
	D2: Adapt Structures and Systems to Better Withstand Coastal Hazards	D1*	Detail design; material specifications; permits and approvals; workforce development	Procure equipment and materials; structural retrofits; utility protection; floodproofing; corrosion-resistant upgrades; monitoring; homeowner training		5		*D1 fulfills D2 Tier 1
	D3: Maintain Home Ignition Zones	D1*	Coordination with HWMO / Firewise for home assessments; develop training programs; landscape plans; workforce development	Procure equipment and materials; vegetation clearing; landscaping; ember-hardening upkeep; community workdays; monitoring; reporting; ongoing training; adaptive management				*D1 fulfills D3 Tier 1

Table 5-1: Hawaiian Homestead Communities Priority Projects Implementation Matrix

Resilience Goals	Resilience Strategy/ Project Name	Tier 1: Site Assessment and Preliminary Design	Tier 2: Detailed Design and Permitting	Tier 3: Implementation	Kalamaʻula Priority Project	Kapaʻakea Priority Project	Kamiloloa Priority Project	Notes
E: Makai Restoration	E1: Develop a Makai Restoration & Management Plan	Ecosystem assessments; hydrology; water quality; invasive mapping; marine habitat surveys; modeling; cultural consultation; threat identification; preliminary design concepts; prioritization	Draft and final makai restoration master plan; environmental reviews; USACE coordination; cost estimates, phasing plan	E2, E3, E4, E5, and E6			5	
	E2: Implement Nature-Based Coastal Protection Projects	E1*	Land dispositions, detailed engineered ecological designs; detailed management/ monitoring plans; historical preservation and biological reviews; USACE coordination; permitting and approvals	Procure equipment and materials; dune restoration; coir rolls, shoreline stabilization; landscaping; wetland enhancement; community stewardship programs; monitoring; adaptive management; long-term maintenance				*E1 fulfills E2 Tier 1
	E3: Invasive Species Removal & Management	E1*	Land dispositions, detailed management plans; compliance reviews; training design; integration with E2; detailed cost & phasing; USACE coordination; permitting and approvals;	Procure equipment and materials; removal operations; native planting; habitat enhancement; monitoring; community workforce deployment; cultural access support; long-term maintenance				*E1 fulfills E3 Tier 1
	E4: Marine Ecosystem Restoration	E1*	Land dispositions, detailed restoration plan; coral/limu protocols; environmental review, historic preservation / biological reviews; USACE coordination; permitting; workforce development	Procure equipment and materials; in-water invasive removal; limu restoration; coral/habitat enhancement; sediment reduction actions; community stewardship; monitoring and adaptive management				*E1 fulfills E4 Tier 1

Table 5-1: Hawaiian Homestead Communities Priority Projects Implementation Matrix

Resilience Goals	Resilience Strategy/ Project Name	Tier 1: Site Assessment and Preliminary Design	Tier 2: Detailed Design and Permitting	Tier 3: Implementation	Kalamaʻula Priority Project	Kapaʻakea Priority Project	Kamiloloa Priority Project	Notes
E: Makai Restoration	E5: Restore ʻŌhiʻapilo Wetland	E1*	Land dispositions, detailed ecological design; historic preservation / biological reviews, USACE coordination; permitting; access planning; monitoring framework; workforce development	Procure equipment and materials; invasive removal; hydrologic reconnection; native planting; habitat enhancement; fencing/ exclusion; monitoring; community stewardship; long-term maintenance				*E1 fulfills E5 Tier 1
	E6: Implement Special Area Plan for Malama Cultural Park	E1*	Capacity building, detailed design, of SAP management strategies and facilities, shoreline stabilization design; permitting, workforce development	Procure equipment and materials; invasive species removal; native planting; facility / infrastructure upgrades; coastal protection; cultural programming; ecological restoration; shoreline stabilization; workforce deployment; monitoring & adaptive management				*E1 fulfills E6 Tier 1
	E7: Maintain Kupuāiwa Coconut Grove and Kiowea Park	Condition assessment; cultural/ecological surveys; invasive population mapping; infrastructure & safety review; preliminary restoration concepts prioritization; early costs	Update / renew dispositions; maintenance & stewardship plan; landscape & drainage design; shoreline stabilization design; cultural protocol integration; infrastructure design; permitting; detailed cost & phasing; workforce development	Procure equipment and materials; invasive removal; coconut planting & maintenance; facility / infrastructure upgrades; access improvements; cultural stewardship; monitoring & long-term maintenance	5			

DHHL-Led Resilience Strategies

DHHL's trust responsibilities are established in the Hawaiian Homes Commission Act of 1920, as amended, and reaffirmed in the Hawai'i State Constitution. These legal foundations require DHHL to manage Hawaiian Home Lands and related resources for the exclusive benefit of native Hawaiian beneficiaries. As trustee, DHHL has a duty to protect the trust lands, support their productive use, administer homesteading programs, and steward revenues and resources in ways that advance beneficiary well-being now and for future generations.

In carrying out these obligations, DHHL also retains important decision-making authorities. These include land use approvals, leasing authority, infrastructure planning, compliance with state and federal regulations, and the responsibility to review, approve, and oversee projects that affect the trust corpus. These authorities cannot be delegated or transferred. They are central to DHHL's kuleana as trustee and will remain in place throughout implementation of this plan.

The MCH-CRP emphasizes beneficiary-led action, but this does not replace or diminish DHHL's legal responsibilities. Instead, it strengthens the partnership between DHHL and homestead communities by creating clear pathways for beneficiaries to propose, co-design, and carry out projects while DHHL continues to lead on trust stewardship, regulatory compliance, long-term planning, and protection of the land base. Beneficiary leadership operates within the framework of DHHL's trust duties, not outside of them.

In addition to the Homestead Association-led strategies, the MCH-CRP also identifies a set of actions that must be carried out directly by DHHL. That being said, partnership with and stewardship by beneficiaries is central to the concept of 'aina ho'opulapula and crucial for successfully addressing climate change adaptation and community resilience by and for DHHL's homestead communities. These DHHL-led strategies address system-level needs, fill gaps in agency coordination, and provide foundational studies, plans, and land management actions that support long-term community resilience. These strategies may occur before or at the same time as Homestead Association-led strategies. Together, they create the conditions needed for safe, effective, and well-coordinated implementation across the homestead ahupua'a.

The DHHL strategies use the same five planning goal codes (A through E) to show how each action supports the broader resilience goals. A complete version of the DHHL Matrix is included as *Appendix F*. The summary below highlights each DHHL strategy and provides a short description based on the Matrix.

Goal A: Emergency Evacuation and Public Safety

DHHL A1. Update DHHL Plans to Incorporate Hazard Mitigation and Resilience Strategies

Updates the Moloka'i Island Plan, Regional Plan, and Native Hawaiian Development Program Plan to include hazard mitigation and resilience actions. This allows future resilience projects to qualify for DHHL grants and creates pathways to leverage federal hazard mitigation funding.

DHHL A2. Water Delivery Technical and Feasibility Study

Evaluates engineering options to improve water access for fire protection, mauka restoration, agriculture, and homestead needs. The study explores possible expansion of the Moloka'i Irrigation System and assesses new pumping and storage alternatives to strengthen wildfire response and land management.

Goal B: Mauka Restoration

DHHL B1. Conduct Archaeological Inventory Survey for Ahupua'a

Completes an archaeological survey of DHHL mauka lands to identify historic and cultural sites. The results support cultural protection and help streamline future permitting for restoration and infrastructure projects.

Goal C: Water Flow Maintenance and Flood Prevention

DHHL C1. Conduct Historical Hydrological Study

Documents past and present water flow patterns, historic springs, stream networks, and water diversions. This hydrological baseline will guide future mauka restoration, water management, and spring restoration actions, combining traditional knowledge with scientific data.

DHHL C2. Develop MOU for Drainageway Maintenance and Improvements

Creates a multi-agency agreement between DHHL, the County of Maui, and the State Department of Transportation to clarify responsibilities and coordinate maintenance of streams, culverts, and drainage channels. This partnership strengthens flood prevention across the homestead communities.

DHHL C3. Conduct a Study of Kūlana 'Ōiwi Drainage and Flooding Impacts

Assesses how stormwater flows around the Kūlana 'Ōiwi complex and identifies factors contributing to flooding on adjacent homestead lots. The study provides recommendations to improve drainage and align solutions with the broader Drainage Master Plan.

Goal D: Residential Hale Retrofits and/or Relocation

DHHL D1. Create an Ahupua'a Residential Hale Restoration and Relocation Study

Evaluates which residential areas face long term hazards such as flooding, sea level rise and erosion, and identifies options for retrofitting or relocating homes. The study will inform the Moloka'i Island Plan Update and help guide future homestead development to safer locations.

DHHL D2. Develop Kalama'ula Mauka Agriculture Lots

Plans and develops improvements for Accelerated agricultural lots in Kalamaula Mauka, including subdivision design, environmental review, and required infrastructure. These lots support local food production, provide additional access routes, and provide long-awaited homesteading opportunities.

DHHL D3. Convert Cesspools

Reduces contamination and improves water quality by converting cesspools in high risk areas to approved wastewater systems. This strategy aligns with state and county programs and prioritizes areas identified through the Hawai'i Cesspool Prioritization Tool.

Goal E: Makai Restoration

DHHL E1. Evaluate Shoreline and Ecological Impacts of Kaunakakai Wharf

Assesses how the wharf has altered currents, alongshore sediment flow, springs, and marine habitat conditions. The study integrates traditional knowledge and scientific research to support future shoreline restoration and fishpond recovery.

DHHL E2. Provide Long-Term Maintenance for Kalaniana'ole Hall

Develop plans for stabilizing, assessing, and planning for the long-term stewardship of Kalaniana'ole Hall. DHHL will evaluate the future of the hall, with near-term efforts focused on preventing further deterioration and longer-term plans considering construction of a new facility that incorporates elements of the original building as part of historic preservation. Long-term management and maintenance would transition through a disposition with a homestead association or beneficiary-led organization.

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Chapter 6

Community-Based Implementation Strategy

Chapter 6

Community-Based Implementation Strategy

The Homestead Associations and beneficiary organizations will play a crucial role in implementing the identified priority projects. By involving the community in decision-making and execution, the projects become a collective effort, strengthening community bonds and fostering a sense of pride and responsibility.

Beneficiary organizations interested in actively participating in the projects and taking on stewardship of the designated lands may apply for a land disposition from the DHHL Land Division. Rather than a single, "one size fits all" approach, DHHL will co-design disposition types and terms (such as licenses, stewardship agreements, and limited term dispositions) so they are appropriately scaled to the project type, community capacity, and the level of management required.

Applications will describe the applicant's commitment to long-term care of the area, along with their initial plans for funding, staffing, liability, and carrying out stewardship activities. However, DHHL recognizes that long term stewardship cannot rely solely on volunteer labor or unrealistic expectations placed on community organizations. To support successful implementation, Native Hawaiian Development Program Plan (NHDPP) programs and DHHL technical assistance will support these dispositions, helping organizations strengthen management plans, prepare competitive grant applications, and navigate environmental review, permitting and compliance.

Because many resilience strategies require ongoing investment, DHHL will actively support beneficiaries in pursuing external funding. This may include grants, contracts, and other resources that allow community members to receive fair compensation for stewardship work. Restoration and management responsibilities should contribute to local economic opportunity and workforce development, not create financial strain.

Ongoing collaboration between DHHL and the beneficiary community will remain essential. Regular communication, joint planning, and feedback sessions will help maintain alignment between community priorities and project needs over time. Sufficient staff time will need to be allocated to support co-management and project implementation.

In essence, DHHL envisions beneficiaries not merely as participants but as leaders in the long-term stewardship of their land trust and legacy. The goal is to empower the community to take charge of these initiatives, creating a sustainable and resilient future for Molokaʻi where the people actively contribute to the restoration and preservation of their island.

Beneficiary Roles and Leadership in Implementing the MCH-CRP

Beneficiaries and their homestead associations will play a leadership role in carrying the MCH-CRP from planning into action. Because the plan is rooted in self-determination, implementation must follow a process where beneficiaries guide decisions at every stage: planning, design, implementation, and long-term monitoring. Within this framework, a "beneficiary-led project" is defined as a project where beneficiaries set the project goals, identify preferred designs, select or advise on project partners, participate in monitoring, and hold a primary voice in how the work moves forward. These projects strengthen community ownership, elevate traditional ecological knowledge, and reinforce the principle that resilience begins with the beneficiaries.

DHHL-led projects will prioritize beneficiary awareness and involvement by conducting timely outreach in a spirit of transparency, collaboration and mutual respect. Clear protocols will also guide how DHHL and homestead associations work through disagreements. If concerns arise, the parties will enter a facilitated discussion built on transparency, cultural grounding, and respectful communication. The goal is to identify points of alignment, surface community concerns, and adjust project direction in a way that honors both the mission of DHHL and the lived experience of beneficiaries.

Beneficiary-Led Organizations Participation

In addition to Homestead Associations, several native Hawaiian beneficiary-led organizations on Molokaʻi hold deep place-based knowledge and have demonstrated success in planning, resource management, cultural restoration, and community action projects. Under the Hawaiian Homes Commission Act, Sections 204(a)(2) and 207(c)(1)(a), DHHL has the authority to issue land dispositions for non-homesteading uses. The MCH-CRP uses this authority to support beneficiary-led management models, recognizing that beneficiaries who live, learn, and cultivate relationships in a specific place hold the knowledge needed to steward it responsibly. As such, Beneficiary-led organizations will be recognized as priority partners for design and implementation throughout the MCH-CRP. Their participation strengthens the plan's commitment to Indigenous governance, community stewardship, and long-term resilience.

Priority partnership opportunities include:

- Co-applicant status on grant applications
- Eligibility to receive technical assistance
- Opportunities for direct funding for implementation
- Clear communication of expectations, timelines, and responsibilities

As an example, Strategy E6 (Implement special area plan for Malama Cultural Park) demonstrates how beneficiary-led organizations can guide and carry out resilience actions. The Malama Cultural Park Special Area Plan was developed to shift day-to-day stewardship of the park's coastal cultural landscape to a community-based entity.

Beneficiary-led organizations may apply to become implementation partners through a competitive DHHL solicitation process. After the HHC adopts the MCH-CRP, DHHL may open a call for applications from interested organizations. Applicants submit proposals describing their qualifications, capacity, and pilina (connection to the place). DHHL evaluates each application based on the organization's ability to meet the goals of the specific resilience strategy and to manage the related lands and resources responsibly. The strongest applicant may be nominated for a land disposition. Before the disposition is issued, DHHL will conduct a consultation meeting to gather beneficiary feedback and seek final beneficiary approval of the nominated organization.

Native Hawaiian Development Program Plan Update

The NHDPP is one of DHHL's primary tools for supporting beneficiary advancement. The plan guides programs that expand economic self-sufficiency, cultural practice, health, and education. DHHL is currently updating the NHDPP. Resilience Strategy DHHL A1 of the MCH-CRP calls for DHHL plans to be updated to incorporate hazard mitigation, emergency preparedness, and community resilience strategies. The revised NHDPP will play a major role in preparing beneficiaries for successful implementation of the MCH-CRP by expanding island-specific training and support.

As part of this update, DHHL will seek to integrate a suite of resilience-related capacity building programs into the NHDPP. These programs include workforce development, project management and leadership training, cultural and ecological stewardship training, disaster preparedness and mitigation training, nonprofit strengthening, and hands-on volunteer and paid apprenticeship programs. Grant writing and project management support will also be offered to help homesteaders pursue future funding and lead their own restoration and resilience projects.

Technical Assistance Framework

DHHL commits to assisting beneficiaries in securing comprehensive technical assistance during the design, permitting, and implementation phases of priority projects. Technical assistance will be built directly into all future grant applications and funding sources. This assistance may include:

- Grant writing, budgeting, procurement, and reporting
- Environmental review and permitting support
- Hydrologic, ecological, cultural, and engineering expertise
- Project and construction management
- Community monitoring, maintenance, and stewardship protocols
- Long-term data collection and adaptive management

Technical assistance will be available to Homestead Associations and native Hawaiian beneficiary-led organizations, ensuring they can serve as primary implementers or co-implementers of resilience actions.

Partnership Roles, Jurisdiction, and Responsibilities

Successful implementation of the MCH-CRP requires clear coordination across federal, state, county, nonprofit, and beneficiary-led partners. Beneficiaries expressed a strong need to understand who holds jurisdiction over specific lands, hazards, systems, and regulatory processes, and how each partner's authority relates to the priorities expressed by homesteaders. See Appendix C which defines the roles and responsibilities of each group of partners involved in implementation.

MCH-CRP Implementation Hui

Successful resilience planning requires long term coordination, clear communication, and shared accountability. To support this, the MCH-CRP recommends creating a standing Implementation Hui that brings together homestead association boards and key representatives, beneficiary-led organizations, DHHL divisions, and key partner agencies referred to in the Detailed Resilience Strategy Matrix *(Appendix E)*. This hui will serve as the central coordinating body responsible for tracking progress, advancing priority actions, and maintaining alignment with beneficiary priorities over time.

The Implementation Hui will:

- Coordinate implementation across mauka, makai, drainage, housing, and emergency related strategies
- Maintain an organized schedule of project milestones and funding opportunities
- Identify cross agency needs and resolve barriers that require multi-jurisdictional action
- Create a regular forum for beneficiaries, DHHL, and partners to check in, share updates, and adjust course as conditions change
- Support beneficiary-led organizations as they build capacity, apply for funding, and take on stewardship kuleana

It is recommended for the Hui to meet on a set schedule (for example, quarterly), with additional working sessions convened as needed for technical topics such as permitting, wildfire planning, or coastal restoration design.

To support transparency and measurable progress, the Hui should maintain a simple tracking system that shows the status of each project by tier, such as "ready for implementation," "needing design and funding," or "requiring further planning." A small set of indicators could be used to monitor progress over time. These indicators may include number of projects being advanced, amount of training delivered, number of jobs created or supported, acres restored or under active stewardship, drainage or flooding issues addressed, partnerships formed, and funding secured. Together, these measures will help the community see where progress is being made and where additional support is needed.

DHHL will prepare and share regular public updates, such as annual summaries, that report on these indicators, describe milestones achieved, and outline next steps. Updates may be delivered at community and homestead association meetings, annual Hawaiian Homes Commission meetings on Molokaʻi, and through digital platforms, helping beneficiaries stay informed and actively engaged in shaping implementation over time.

This Implementation Hui becomes the backbone of a real implementation system. By meeting consistently, tracking measurable progress, and allowing for collaborative decision making, the Hui helps all parties remain accountable to the resilience goals identified by beneficiaries. This structure provides the support needed to move projects forward in a coordinated way, ensuring that the MCH-CRP remains an active, adaptive, and community-driven plan.

Chapter 7

References

Chapter 7

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Cesspools: State of Hawaii Department of Health 2010

Topo: USGS 1983

Biome: USGS 2016

Summaries of Plans, Documents, and Initiatives Informing the MCH-CRP

Summaries of Plans, Documents and Initiatives Informing the Molokaʻi Coastal Homestead – Community Resilience Plan

Department of Hawaiian Home Lands (DHHL) Plans and Initiatives

- (2005) Molokai Island Plan
- (2014) HHC Water Policy Plan
- (2018) DHHL Molokai Potable/Non-Potable Water Management Plan
- (2019) Molokai Regional Plan
- (2022) South Molokaʻi Shoreline Erosion Management Plan (SM-SEMP)
- (2022) Malama Cultural Park - Special Area Plan
- (2022) DHHL General Plan Update
- (2023) DHHL Molokaʻi Cesspools Conversion Study
- (2025) DHHL Molokai Dry Stream Beds H&H Studies

Island-Specific Plans & Assessments

- (2023) Molokai Clean Energy Resiliency Action Plan (Molokai Clean Energy Hui)
- (2023) A Prioritization Plan for Coastal Wetland Restoration on Molokai (USGS)
- (2024) Strategic Plan for Hawaii Wetlands (PBHJV)
- (2024) Molokaʻi Community Wildfire Protection Plan (CWPP)

County of Maui Plans

- (2018) Molokai Community Plan (COM)
- (2020) County of Maui Hazard Mitigation Plan Update
- (2021) COM Wastewater Infrastructure Inundation Study-MKK: KWRF
- (2021) Beach Parks Vulnerability and Adaptation Study (COM-DPR)
- (2022) Mitigate Maui Nui
- (2022) Molokai Water Plan Preliminary Draft (Maui County DWS)
- (2022) COM Climate Action & Resiliency Plan (CARP)
- (2024) Molokai Climate Change and Sea-Level Rise Adaptation and Resiliency Plan (CCSLAR)
- (2024) Hazard Mitigation Grant Program (HMGP) Projects for Maui County. Potential Molokai Projects are:
    - Molokai Pipeline Protection
    - Planning for Relocation of Kaunakakai Wastewater Facility
    - Re-establishment of Molokai Emergency Response Working Group
    - Molokai Disaster Response and Recovery Plan, including Resilience Hubs
    - FEMA Technical Assistance to Evaluate the CDRZ Program on Molokai as a Case Study for Underserved and Indigenous Communities

Federal Plans and Initiatives

- Hawaii Coastal Resilience Assessment (NFWF/NOAA)
- Resilience & Recovery Planning and Management (NPI)
- FEMA Policy: Tribal Mitigation Plan Review Guide (FEMA Policy #306-112-1)

Department of Hawaiian Home Lands (DHHL) Plans and Initiatives

- **(2005) Molokai Island Plan**

The "2005 Island Plan Molokai" document outlines various development plans and community concerns related to several DHHL communities on Molokai.

Kalamaula

- Location and Description: Kalamaula lands are located mauka of Kamehameha Highway, featuring gentle slopes from sea level up to 1,800 feet. The area includes 161 residential, 76 agricultural, and three pastoral homestead leases.

- Land Use Plan: The plan proposes 57 new one-acre residential lots, community parks, kupuna (elderly) housing, and special districts for natural resource management and flood control. There is also a focus on general agriculture and commercial development.

- Infrastructure and Services: The community is supported by the Hoolehua Water System, but there are concerns about the water supply meeting future demand. Road improvements are also needed.

- Cultural Sites: Significant cultural sites in the area include Kapuaiwa Grove, Ohiapili Fishpond, and several heiau (temples).

- Community Use: The area includes Church Row, Kulana Oiwi Multi-Services Center, and plans for additional community park space and services for elders.

Kapaakea

- Location and Description: Kapaakea is situated along the southern portion of Molokai, about one mile east of Kaunakakai town. It includes 286 new residential lots and designated areas for community parks, cultural centers, and fishponds .

- Land Use Plan: The plan includes significant infrastructure improvements, such as new storage and transmission facilities for potable water, a new wastewater treatment facility, and road improvements.

- Community Concerns: Key concerns include drainage issues, the expansion of the cemetery, and the need for adequate water supply .

Kamiloloa One Alii

- Location and Description: The Kamiloloa One Alii area is part of a larger tract that includes Makakupaia. This region is characterized by mild slopes and significant drainage channels.

- Land Use Plan: It includes 286 new residential lots, proposed community uses for parks, cultural centers, and fishpond restoration. Special district areas are designated for natural resource management and flood control.

- Community Concerns: Similar to Kapaakea, concerns include the need for new water sources, drainage, and flood control .

Malama Cultural Park

- Description and Use: While the document does not explicitly detail Malama Cultural Park separately, it highlights the importance of cultural resource preservation and community-based initiatives. The focus is on maintaining areas for community events, cultural activities, and educational uses.

- Community Initiatives: Emphasis is placed on the involvement of local residents in managing and restoring cultural and natural resources, such as fishponds and traditional sites.

Overall, the document stresses the importance of infrastructure improvements, water management, cultural site preservation, and community engagement across all these areas. The focus is on sustainable development that meets the needs of the community while preserving cultural and natural resources.

- **(2014) HHC Water Policy Plan**

The HHC Water Policy Plan establishes policies and priorities for the development, management, and protection of water resources serving Hawaiian Home Lands statewide. The plan emphasizes the importance of securing adequate and reliable water supplies for homestead communities, protecting Native Hawaiian water rights, and promoting conservation and efficient water use. For Moloka‘i, the plan provides policy support for DHHL’s pursuit of groundwater reservations, surface water applications, and infrastructure investments needed to support existing and future homesteads while accounting for drought conditions and climate variability.

- **(2018) DHHL Molokai Potable/Non-Potable Water Management Plan**

This plan evaluates potable and non-potable water systems serving DHHL lands on Moloka‘i, including system capacity, infrastructure condition, and future demand. It identifies challenges related to limited source capacity, aging infrastructure, and drought vulnerability, and recommends improvements to water storage, transmission, and alternative non-potable supplies for irrigation and other uses. The plan supports integrated water management strategies to improve long-term water security for homestead communities such as Kalama‘ula, Kapa‘akea, and Kamiloloa One Ali‘i.

- **(2019) Molokai Regional Plan**

The "2019 Molokai Regional Plan Update" provides detailed insights into various DHHL (Department of Hawaiian Home Lands) communities on Molokai, specifically addressing the areas of Kalamaula, Kapaakea, Kamiloloa One Alii, and Malama Cultural Park. Here is a summary of how the document relates to these communities:

<u>Kalamaula</u>

- Location and Description: Kalamaula is located west of Kaunakakai and includes a mix of residential, agricultural, and pastoral uses. It is known for its significant cultural and historical sites, including Kapuaiwa Grove and Church Row.

- Infrastructure and Services: The Kalamaula homestead area is served by the DHHL Ho'olehua Water System. Efforts are made to maintain the infrastructure, with water from the 200,000-gallon Kalamaula concrete tank serving the community.

- Community Use: The area includes the Kulana Oiwi Multi-Services Center, which houses offices for various organizations, reflecting the community’s role as a central hub for services.

- Land Use Designations: Kalamaula's land use includes residential homesteads, agricultural lands, and areas designated for community use and conservation.

<u>Kapaakea</u>

- Location and Description: Kapaakea is situated along the southern section of Molokai, approximately one mile east of Kaunakakai. The area is characterized by its coastal community setting and varying slopes and drainage channels.

- Land Use Designations: Kapaakea includes residential, agricultural, and special district lands. It also faces issues related to flood hazards and sea level rise, necessitating careful planning and management.

- Priority Projects: The community has prioritized projects that address infrastructure needs and environmental concerns, such as erosion management plans for coastal areas to mitigate the impacts of sea level rise.

<u>Kamiloloa One Alii</u>

- Location and Description: Kamiloloa One Alii, part of the southern section near Kapaakea, features a combination of residential and agricultural land uses. The area is known for its wetlands and drainage channels.

- Land Use Designations: Similar to Kapaakea, Kamiloloa includes residential and special district lands. It also faces significant flood risks and challenges related to climate change.

- Infrastructure Projects: Community meetings have highlighted the need for road improvements and other infrastructure projects to enhance safety and accessibility in the area.

<u>Malama Cultural Park</u>

- Description and Use: Malama Cultural Park is designated as a special district, reflecting its importance for cultural and community activities. The park is used for various cultural events and as a space for community gatherings.

- Community Initiatives: The park is part of broader efforts to preserve and promote Hawaiian cultural traditions and values. The community is actively involved in managing and utilizing this space for cultural education and activities.

- Environmental Considerations: The area is also subject to environmental assessments to ensure its sustainability and resilience against climate change impacts.

- **(2022) South Moloka‘i Shoreline Erosion Management Plan (SM-SEMP)**

The "South Moloka‘i Shoreline Erosion Management Plan" (SM-SEMP) document is that it provides a comprehensive strategy for managing and mitigating shoreline erosion along the south shore of Moloka‘i, particularly in areas inhabited by Department of Hawaiian Home Lands (DHHL) beneficiaries. The plan is designed to address the impacts of climate change, including sea level rise and increased storm frequency, which exacerbate coastal erosion and threaten communities, infrastructure, and cultural sites.

For Kalamaula, the emphasis is on removing invasive mangrove and replacing it with native vegetation to restore coastal habitats. The project includes community-based efforts to reclaim land lost to mangrove infestation, which has hindered access to the ocean and along the shoreline. The preservation of historical sites such as heiau (temples), house sites, and springs is also highlighted, ensuring these cultural landmarks are protected and integrated into the restoration plans.

In Kapaakea, the restoration focuses on managing coastal resources and reclaiming neglected ponds. The Kapaakea Pond, once a significant feature, is now filled with silt and overgrown with mangrove and kiawe. Efforts to restore this pond and other special places, like the Ka La'i o Ke Kioea Bird Sanctuary, are crucial for maintaining the area's historical and ecological significance. Additionally, Kapaakea Cemetery and Pu'umaninikolo hill are noted for their historical value and need for conservation.

For Kamiloloa and One Alii, the restoration projects include enhancing Kaloko'eli Pond and other coastal features. This area was historically significant for its fishery, particularly for he'e (octopus), which was a protected resource. The projects aim to repair pond walls and remove invasive species like mangrove to restore these habitats. The site known as Ka Lua Na Moku 'Iliahi, a trench used historically for sandalwood storage, is also part of the conservation efforts .

At Malama Cultural Park, the focus is on improving wetlands and restoring the coastal environment through the removal of invasive species and the creation of vegetated sand berms to protect against erosion. The park, rich in Hawaiian history, serves as a hub for recreational activities and water sports. Enhancing these natural features will improve water quality and aesthetic appeal, supporting both ecological resilience and community use.

- **(2022) Malama Cultural Park - Special Area Plan**

The "Malama Cultural Park Special Area Plan" focuses on the management and preservation of Malama Cultural Park, emphasizing the values of the DHHL beneficiaries and Molokai residents. The park holds historical and cultural significance as an ancestral land where King Kamehameha V built a vacation home and traditional Hawaiian activities took place. The plan sets goals to maintain the park as a community treasure, protect native species habitats, perpetuate cultural practices, and support community economic development through educational programs. Developed with extensive community consultation, the plan highlights the desire for community-led management and proposes actions such as managing vehicular access, improving water delivery, developing areas for elders and memorial gardens, controlling invasive species, and constructing facilities like a pavilion and bathrooms.

The plan also engages DHHL communities, including Kalamaula, Kapaakea, and Kamiloloa One Alii, in the park's stewardship and management. Kalamaula residents, particularly the Kalamaula Homesteaders Association, have been active in the consultation process, reflecting their vested interest in the park. Kapaakea community members, consulted during the planning process, envision using the park for cultural and educational programs. Similarly, representatives from the Kamiloloa-One Alii Homestead Association participated in stakeholder consultations, indicating their involvement in the park's planning and management. The plan's strategies for resource management and addressing environmental concerns are particularly relevant to these communities, ensuring that the park serves as a vibrant, educational, and culturally significant space for current and future generations.

- **(2022) DHHL General Plan Update**

The 2022 Department of Hawaiian Home Lands (DHHL) General Plan Update establishes the highest-level policy framework for DHHL statewide and formally integrates climate change, natural hazards, and resilience considerations into land use and development decision-making. The plan directs DHHL to evaluate climate risks—including sea level rise, flooding, wildfire, drought, and erosion—when planning new homesteads, infrastructure, and land uses. It also emphasizes water security, protection

of natural and cultural resources, community resilience, and emergency preparedness. Within the DHHL Planning System, the Moloka'i Coastal Homestead – Community Resilience Plan (MCH-CRP) functions as a Tier 2 Strategic Program Plan that advances and implements General Plan policies at the local level, providing a pathway for beneficiary-driven resilience actions to inform future DHHL planning efforts, including the upcoming Moloka'i Island Plan update and statewide Disaster and Climate Risk Reduction Plan.

- **(2023) DHHL Moloka'i Cesspools Conversion Study**

The Moloka'i Cesspools Conversion Study was conducted to document wastewater conditions on DHHL lands, identify where cesspools remain in use, and recommend safe, modern replacement systems. It was undertaken to comply with Hawai'i Act 125, which requires all cesspools statewide to be upgraded by 2050, and to protect coastal waters, groundwater, and community health on Moloka'i. **Kapa'akea, One Ali'i, and the coastal portions of Kalama'ula are the highest-priority sites** for cesspool replacement due to shoreline proximity, flooding, and environmental sensitivity. **Upland Kalama'ula** parcels can often utilize **septic systems**, assuming adequate space and groundwater separation.

<u>Kapaakea</u>

Kapa'akea is a **shoreline homestead with small lot sizes**, located within **100 yards of the coast**. According to the study, it is highly vulnerable to **flooding during rain events**, which leads to saturated soils and compromised cesspool function. Because of its **low elevation**, **shallow groundwater**, and **proximity to sensitive marine waters**, Kapa'akea is classified as a **Priority 1** area for cesspool conversion.

The report recommends **advanced treatment solutions**: replacing cesspools with **Aerobic Treatment Units (ATUs)** capable of meeting **NSF 245 nitrogen-reduction standards**, paired with a site-specific subsurface disposal system. These systems are recommended because they provide higher water-quality effluent, reducing impacts to nearshore ecosystems, coral reefs, and groundwater.

Summary: Kapa'akea is a small, low-lying shoreline community where homes sit very close to the ocean and frequently experience flooding. Because shallow groundwater and stormwater runoff increase the chance that cesspool wastewater reaches the coast, it is classified as a **Priority 1** area. The report recommends replacing cesspools with **advanced Aerobic Treatment Units (ATUs)** that reduce nitrogen and produce cleaner effluent, paired with disposal systems suited to each lot's limited space and wet conditions.

<u>Kamiloloa One Alii</u>

The One Ali'i (Kamiloloa) homestead area, like Kapa'akea, lies **directly on the southern shoreline** with **many homes under 100 yards from the ocean**. The area experiences **regular flooding**, substantial stormwater runoff from higher elevations, and constrained lot sizes. These conditions result in greater risk of untreated wastewater reaching coastal waters.

The report therefore places One Ali'i into **Priority 1**, identical to Kapa'akea. For this area, the study strongly recommends **ATUs with advanced treatment** (NSF 245), because rising groundwater and sea level conditions will continue to reduce soil absorption capacity over time. Disposal system type is to be chosen during design based on soil, groundwater depth, and available space.

Summary: Like Kapa'akea, One Ali'i is directly on the south shoreline and highly susceptible to rain-related flooding and poor drainage. With many lots within 100 yards of the ocean, existing cesspools

pose elevated risk to nearshore waters. This area is also designated **Priority 1**, and the study recommends **ATU-based systems** with advanced treatment, since rising groundwater and small lot sizes make traditional septic systems less reliable and potentially unsafe for long-term use.

Kalamaula

Kalamaʻula differs from the first two shoreline communities because its parcels are generally **larger**, and the majority are set back **more than 100 yards from the coastline**, though some lower-lying parcels closer to the shore do experience **periodic flooding**.

Because conditions vary across the homestead, Kalamaʻula is split in practice:

- **Coastal/low-lying portions** behave similarly to Kapaʻakea and One Aliʻi, warranting **Priority 1** classification, concern for flooding, and the need for **ATUs**.
- **Upland/larger parcels** have better elevation, deeper groundwater separation, and more space, allowing the use of **conventional septic systems** where appropriate.

The study recommends choosing between septic systems and ATUs **based on proximity to the shoreline, groundwater depth, and soil type**. Some existing cesspools on larger lots may be replaced with septic + absorption fields or converted to seepage pits where conditions are safe.

Summary: Kalamaʻula contains a mix of larger upland lots and some lower-elevation parcels closer to the shore. The coastal portions experience occasional flooding and are treated similarly to Kapaʻakea and One Aliʻi, requiring **ATUs**. However, most of Kalamaʻula sits farther from the shoreline, with deeper groundwater and more space, making **septic systems** generally feasible in these upland areas. System choice depends on each lot's elevation, soil conditions, and proximity to sensitive waters.

Malama Cultural Park

Although the report does **not** identify the Malama Cultural Park as one of the four DHHL homestead areas evaluated, it is **adjacent to** the southern shoreline zone that includes **Kamiloloa and Kapaʻakea**. Therefore, the environmental findings that apply to coastal homestead lands—**flooding vulnerability, shallow groundwater, proximity to marine resources, and high environmental sensitivity**—are directly relevant to the broader area surrounding the park.

Because the park sits within the same **low-elevation coastal band** as the Priority 1 homestead areas, the report's conclusions indicate that **any wastewater systems in or near the Malama Cultural Park area would require advanced treatment**, similar to One Aliʻi and Kapaʻakea, to protect nearby ocean waters, cultural resources, and recreation areas.

Summary: While not one of the four homesteads studied, the Malama Cultural Park area lies within the same low-elevation coastal zone as Kapaʻakea and One Aliʻi. Because it shares similar flooding vulnerability, shallow groundwater, and proximity to marine resources, the report's findings imply that wastewater systems near the park would need **advanced treatment similar to Priority 1 shoreline areas** to protect surrounding cultural and coastal environments.

- **(2025) DHHL Molokai Dry Stream Beds H&H Studies**

The *2025 Molokaʻi Hydrology & Hydraulics Dry Stream Beds Study* was conducted to understand how stormwater moves through the dry gulches that drain the south shore DHHL communities and to determine where flooding risks threaten homestead lands. Because these gulches normally remain dry, sediment buildup, vegetation, erosion, and undersized culverts have gone largely unaddressed,

leaving the channels unable to convey large storm events. The study finds that nearly all major gulches running from Kalamaʻula through Kapaʻakea to One Aliʻi lack the capacity to safely pass 100-year storm flows, creating overtopping hazards, backwater flooding, and sheet flow toward homes, roads, and coastal areas. The overall drainage health of the region is therefore rated poor, with clear needs for channel improvements, culvert upgrades, and better stormwater conveyance across multiple watersheds.

Kalamaʻula

Kalamaʻula contains the largest cluster of dry stream beds (Helms Stream, Paleka Stream, Lehua Stream, Poepoe Stream, and Kahinu Stream), all of which funnel stormwater rapidly downslope during heavy rain. The study shows that these channels are narrow, partially obstructed, and hydraulically limited, meaning they cannot reliably contain 100-year storm flows. As runoff concentrates from multiple ridges, floodwater can spread laterally toward homestead lots if channels overflow or culverts back up. Recommended actions include: clearing and reshaping portions of the channels; increasing capacity at road crossings; addressing erosion and sedimentation; and coordinating regional drainage so flows remain contained within defined corridors rather than spilling onto residential parcels.

Kapaʻakea

Kapaʻakea lies in a low-elevation coastal band with limited drainage pathways. The Kapaʻakea Cemetery Stream channel is shallow and constrained, and the study identifies culverts that may act as bottlenecks during major storms. Because the area is already vulnerable to ponding and coastal flooding, overtopping presents a direct risk to nearby homes. Recommended actions are: upsizing or improving culvert crossings; removing blockages; and regrading the channel to ensure peak storm flows can move efficiently toward the shoreline without diverting onto residential lands.

Kamiloloa One Aliʻi

The One Aliʻi Stream system (east and west channels) is the most analyzed in the study and exhibits some of the highest modeled flows in the region. Peak 100-year discharges exceed the capacity of both the east and west channels, especially near culverts and narrow sections. This creates a significant risk of overtopping that can send sheet flow toward homestead properties and public areas near One Aliʻi Beach Park. Recommended actions include: widening or deepening key segments of the channels; upgrading culverts to eliminate backwater effects; and providing additional conveyance or energy dissipation features to reduce flood impacts on the homestead.

Island-Specific Plans & Assessments

- **(2023) Molokai Clean Energy Resiliency Action Plan (CERAP - Molokai Clean Energy Hui)**

The Molokaʻi CERAP emphasizes that “Molokaʻi’s renewable energy system should improve access to reliable clean electricity island-wide at all times, so residents are secure during and after an emergency or disaster. The critical connection between energy self-sufficiency and emergency preparedness should be reinforced by all organizations responsible for these life-saving services. Residents should not bear the burdens of brown-outs, black-outs, and damage to property caused by an insufficient system.

- **(2023) A Prioritization Plan for Coastal Wetland Restoration on Molokai (USGS)**

This plan identifies and prioritizes coastal wetlands across Molokaʻi for restoration based on ecological value, cultural importance, vulnerability to sea level rise, and potential benefits to community resilience. The assessment highlights south shore wetlands as high-priority areas due to their historic role in flood attenuation, water quality improvement, and habitat for native waterbirds. The plan provides a science-based framework for targeting wetland restoration projects that align closely with DHHL homestead resilience goals.

- **(2024) Strategic Plan for Hawaii Wetlands**

The Strategic Plan for Hawaiʻi Wetlands establishes statewide priorities for wetland conservation, restoration, and management, with an emphasis on protecting native waterbird habitat, improving hydrologic function, and increasing climate resilience. The plan identifies coastal wetlands on Molokaʻi as critical opportunities for nature-based solutions that reduce flooding and enhance ecosystem services, while also supporting cultural practices and community stewardship.

- **(2024) Molokaʻi Community Wildfire Protection Plan (CWPP)**

The Molokaʻi Community Wildfire Protection Plan (CWPP) identifies wildfire risks across the island and establishes priorities for fuel reduction, vegetation management, emergency access, and community preparedness. The plan highlights Molokaʻi’s heightened wildfire vulnerability due to prolonged drought, strong winds, invasive fire-prone grasses, and extensive grazing lands, particularly in central, west, and south Molokaʻi. It emphasizes the importance of coordinated action among state, county, landowners, and community organizations to reduce wildfire threats to watersheds, homestead communities, infrastructure, and coastal ecosystems. The CWPP directly informs the MCH-CRP by supporting mauka restoration, grazing management, firebreak planning, improved emergency access, and cross-agency coordination as essential components of climate resilience and hazard mitigation for DHHL homestead communities.

County of Maui Plans

- **(2018) Molokai Community Plan (County of Maui)**

The 2018 Molokai Community Plan addresses issues related to the Hawaiian homestead settlements in areas such as Kapa'akea, Kamiloloa, One Ali'i, Makakupa'ia, and Kalama'ula. It highlights the need for an integrated and environmentally sensitive stormwater management system due to flooding concerns near the Kaunakakai Fire Station, Education Center, and the nearly full Kapa'akea Cemetery. The plan suggests involving the Department of Hawaiian Home Lands (DHHL) as a key partner in various initiatives, including developing a cultural archive, cooperative agricultural programs, coordinated land use planning, establishing building codes, and housing rehabilitation programs. Additionally, it stresses the importance of protecting water rights and resources, and encourages the creation of a Molokai Water Use and Development Plan, re-establishing the Molokai Water Working Group, and improving water transmission and storage systems for better fire protection.

Furthermore, the plan outlines actions to improve stormwater management, such as developing a comprehensive plan using natural systems where possible, building dispersion and retention facilities, maintaining drainage infrastructure, and evaluating older swales and drains. It also proposes partnerships to restore historic wetlands, remove and recycle junk cars, resolve issues at Malama Park, and enforce proper property identification and address posting. The plan acknowledges that DHHL is not bound by Maui County regulations for housing development but currently requires lessees to obtain county building permit approvals, which has led to some confusion. Additionally, DHHL homesteads are served by individual septic tanks and cesspools, highlighting a need for improved waste management solutions.

- **(2020) County of Maui Hazard Mitigation Plan Update**

The County of Maui Hazard Mitigation Plan identifies natural hazards affecting Maui County, including flooding, coastal erosion, sea level rise, wildfire, and drought, and outlines mitigation actions to reduce risk to life, property, and infrastructure. The plan includes Molokaʻi-specific hazard profiles and mitigation priorities and serves as the basis for eligibility for FEMA Hazard Mitigation Assistance funding. Many of the hazards and vulnerabilities identified for Molokaʻi directly affect DHHL homestead communities.

- **(2021) COM Wastewater Infrastructure Inundation Study-MKK: KWRF**

This study evaluates the vulnerability of the Kaunakakai Wastewater Reclamation Facility to flooding and sea level rise. It identifies existing and future risks associated with groundwater rise, coastal flooding, and system capacity constraints, and provides adaptation recommendations including protective measures, alternative treatment approaches, and long-term relocation planning. The findings are particularly relevant for downstream DHHL homestead communities that rely on the facility and are exposed to similar coastal hazards.

- **(2021) Beach Parks Vulnerability and Adaptation Study**

This study assesses the vulnerability of Maui County beach parks to sea level rise, coastal erosion, and flooding, including parks along Molokaʻi’s south shore. It evaluates exposure of park infrastructure and recreational resources and recommends adaptation strategies such as managed retreat, nature-based shoreline protection, and redesign of facilities. The findings inform broader shoreline management and resilience planning efforts that affect nearby homestead communities.

- **(2022) Mitigate Maui Nui**

Mitigate Maui Nui is a regional initiative to identify and prioritize hazard mitigation projects across Maui, Molokaʻi, Lānaʻi, and Kahoʻolawe. The program focuses on reducing risk from flooding, wildfire, coastal hazards, and other climate-driven threats. It supports project identification, interagency coordination, and pursuit of federal funding, including FEMA Hazard Mitigation Grant Program resources applicable to Molokaʻi homestead communities.

- **(2022) Molokai Water Plan Preliminary Draft**

The document titled "Molokai Water Plan Preliminary Draft" addresses water resources affecting the DHHL communities of Kalamaula, Kapaakea, Kamiloloa One Alii in the following ways:

1. Kalamaula: The Kalamaula community receives water from the DHHL-owned and operated Ho'olehua Water System (HWS), which also services the Ho'olehua homestead area, the airport, Moloka'i High School, and Kualapu'u Elementary School. However, the current water system cannot meet the existing maximum daily demand due to a source capacity shortfall.

DHHL has a legally guaranteed reservation of 2.9 million gallons per day (MGD) from the Kualapu'u aquifer, but the system's sustainable yield and existing withdrawals indicate that water supply challenges persist.

DHHL has also applied for a surface water reservation from the Waikolu Stream, which could potentially provide additional non-potable water, including 150,000 gallons per day that could be delivered to DHHL's Kalamaula tract.

2. Kapaakea: The Maui County Department of Water Supply (DWS) system provides potable water to Kapaakea from the Kualapu'u well, with water lines running along Kamehameha V Highway and connecting to local loops within the community.

3. Kamiloloa One Alii: Similar to Kapaakea, the Kamiloloa community receives its potable water from the Maui County DWS system, which sources water from the Kualapu'u well.

Overall, the water resources for these communities are tightly linked to the Kualapu'u Aquifer and the DHHL's reservations and applications for both ground and surface water. There are ongoing concerns about sustainable yields, water quality, and the ability of current infrastructure to meet growing demands. Additionally, the challenges of water transport, conservation, and future development needs are central themes in managing water resources for these DHHL communities.

- **(2022) COM Climate Action & Resiliency Plan (CARP)**

Molokaʻi, with a population of 7,345 residents, has maintained a culture that does not primarily depend on tourism for its economy. However, climate change poses significant threats to this traditional way of life. The island's landscape suffers from the effects of overgrazing, deforestation, drought, and contemporary agricultural practices, particularly in the lower elevations of west and south Molokaʻi, which are extremely dry and at high risk for fires. The feral ungulate population exacerbates erosion, landslides, and damages to farming, ranching, and coastal resources. Additionally, increased heat and drought create financial stress on households, while storms and flooding disrupt community connectivity and threaten critical infrastructure. Community collaboration with large landowners is essential for fire prevention and controlling the feral ungulate population.

Economic challenges are also present due to the loss of major employers and ongoing climate impacts. Sustʼāinable Molokai, a nonprofit organization, is addressing these issues by restoring ʻāina momona (abundance) and developing plans to increase renewable energy and adapt to climate change. They aim to rebuild the local food system through a Food Sovereignty Program, supporting local farmers and improving food distribution. The community has identified needs such as relocating the main town Kaunakakai to higher ground, improving import methods, relocating sewage treatment facilities, addressing cesspools, and implementing water pollution and erosion control measures. High-priority actions include securing funding for wastewater reuse infrastructure and updating the wastewater management plan to mitigate climate change impacts.

- **(2024) Molokai Climate Change and Sea-Level Rise Adaptation and Resiliency Plan (CCSLAR)**

The Molokaʻi Climate Change and Sea-Level Rise Adaptation and Resiliency Plan (CCSLAR) provides a comprehensive island-wide assessment of climate change impacts, including sea level rise, coastal flooding, groundwater rise, erosion, drought, and increasing storm intensity. The plan evaluates vulnerabilities of critical infrastructure, natural resources, and communities, with particular attention to low-lying coastal areas such as Kaunakakai and surrounding south shore regions. It identifies adaptation strategies ranging from short-term protective measures to long-term planning for infrastructure relocation, decentralized wastewater systems, and nature-based solutions. The CCSLAR informs the MCH-CRP by providing island-scale climate projections, vulnerability analyses, and adaptation pathways that align with beneficiary-identified priorities for flood reduction, water quality protection, emergency preparedness, and long-term community resilience in DHHL homestead areas.

- **(2024) Hazard Mitigation Grant Program (HMGP) Projects for Maui County**

Molokai Pipeline Protection
  - The Molokai pipeline along the Kaunakakai Pier is fully exposed to natural and human hazards. The pipeline provides all fuel for the island, and therefore is critical infrastructure for life and safety. A proposed project would build out protection of the pipeline through some kind of casing.

Planning for Relocation of Kaunakakai Wastewater Facility
  - The KWRF is already showing evidence of risk to SLR with saltwater infiltrating the groundwater causing salt to seep up and create a salt flat west of the facility. Projections show that most of the facility will be flooded with 3.2 feet of passive flooding. The KWRF is also already near treatment capacity. This is a critical infrastructure facility that serves the town of Kaunakakai, the largest population on Molokai and an underserved community. Given the age and vulnerability of the site, the recent Molokai Climate Change and SLR Adaptation and Resiliency Master Plan (CCSLR) recommends identifying alternative treatment systems as a short term adaptation, as well as long-term plan for decommissioning of the facility that might involve relocation and/or decentralized treatment facilities.

Re-establishment of Molokai Emergency Response Working Group
  - A previous working group has recently been re-established to organize responses after emergencies such as flooding events. The informal working group has included Public Works, HDOT, Planning Department and Fire. An 89-Day hired position to formulate, organize, and re-establish the working group, and HMGP funding would be requested to support longer term planning and organization.

Molokai Disaster Response and Recovery Plan, including Resilience Hubs

- HMGP funds would be requested for professional services to develop a locally informed and community specific Disaster Response and Recovery Plan. The Plan would include a Molokai specific strategy for creating Resilience hubs and safe zones.

FEMA Technical Assistance to Evaluate the CDRZ Program on Molokai as a Case Study for Underserved and Indigenous Communities

- The FEMA Community Disaster Resilience Zones (CDRZ) program is intended to build disaster resilience in communities by driving federal resources to the most at-risk and underserved communities. However, the methodology for the zone designations does not achieve this desired outcome in Hawaii communities due to limitations of the underlying census tract data. The Molokai community would like to request support from FEMA to use Molokai as a case study to evaluate improved options for identifying zones in Hawaii and other indigenous communities.

<u>Federal Plans and Initiatives</u>

- **Hawaii Coastal Resilience Assessment (NFWF/NOAA)**

The "Hawaii Coastal Resilience Assessment" report addresses the growing threats to Hawaii's coastal communities from natural events such as coastal erosion, storm surge flooding, and sea level rise. The assessment combines Geographic Information System (GIS)-based data on land use, protected areas, human community assets, flooding threats, and fish and wildlife resources to identify and prioritize areas, termed Resilience Hubs, that could benefit from conservation and restoration efforts. This report defines Resilience Hubs as large areas of natural, open space or habitat where, if investments are made in conservation or restoration,
there is potential for improved human community resilience and benefits to fish and wildlife habitats and species. These efforts aim to improve human community resilience and provide benefits to fish and wildlife habitats. The Coastal Resilience Evaluation and Siting Tool (CREST) accompanies the assessment, providing an interactive online interface for users to explore and utilize the data for informed decision-making.

The southern coast of Molokai, near Kaunakakai, is highlighted as an area with medium to high values in both the Terrestrial and Marine indices. This region's high values are due to the combination of important marine and coastal habitats used by various marine and terrestrial species. Molokai's southern coast features the longest and among the healthiest coral reefs in Hawaii, contributing to very high coral cover. The Marine Index values here are driven by moderate reef fish biomass and the presence of Essential Fish Habitat (EFH), critical habitat for the Hawaiian monk seal, and the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS).

Furthermore, the wetlands on Molokai's southern coast, though highly degraded by invasive mangroves, were once vital habitats for threatened waterbird populations, indicating potential benefits from habitat restoration efforts in this area. The island's resilience hubs, formed through the Green and Blue Infrastructure analysis, show significant potential for implementing nature-based solutions to achieve benefits for fish and wildlife while reducing flooding risk to important human community assets. This makes Molokai a prime candidate for conservation and restoration projects aimed at building human community resilience and supporting biodiversity.

- **Resilience & Recovery Planning and Management (NPI)**

The presentation titled "Resilience & Recovery Planning and Management" focuses on strategies for disaster and climate resilience planning specifically tailored for historic properties and cultural resources. It outlines the importance of organizing, assessing, planning, and implementing measures to enhance resilience against disasters and climate-related events. Key topics covered include definitions of climate and disaster resilience, disaster planning terminology, and the significance of integrating various planning efforts such as local preservation plans, hazard mitigation plans, and comprehensive planning.

The presentation emphasizes a multi-level approach to resilience planning, involving federal, state, and local frameworks. It highlights the role of federal agencies like FEMA in coordinating disaster response and the importance of local jurisdictions in managing incidents. Case studies from various cities such as St. Augustine, Annapolis, and Pensacola illustrate practical applications of resilience planning, showcasing efforts to protect cultural heritage from hazards through regulatory tools, comprehensive planning, and community engagement. The overarching message is that resilience planning requires collaboration across all levels of government and community stakeholders to effectively mitigate risks and ensure swift recovery from disasters.

- **FEMA Policy: Tribal Mitigation Plan Review Guide (FEMA Policy #306-112-1)**

The "Tribal Mitigation Plan Review Guide" from FEMA outlines essential guidelines for Indian tribal governments to develop, update, maintain, and implement hazard mitigation plans. These plans are a prerequisite for eligibility for certain non-emergency disaster assistance programs and must be updated every five years. The guide emphasizes fair and constructive reviews, recognizing tribal sovereignty and fostering partnerships to reduce disaster vulnerabilities. It details requirements for the planning process, hazard identification, risk assessment, mitigation strategy, plan updates, and formal adoption, ensuring plans are comprehensive and culturally relevant.

Enhanced tribal mitigation plans, demonstrating a comprehensive approach and effective resource utilization, are eligible for increased HMGP funding. FEMA commits to ongoing technical assistance and regular policy review, ensuring plans reflect current conditions and regulatory updates. The guide integrates other tribal planning efforts and FEMA programs, aiming to build resilient tribal communities through consistent and equitable implementation of hazard mitigation strategies.

Consultation Summary

MCH-CRP Beneficiary Outreach

Timeline:

- **3.25.24** - Introduce project to Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi Homestead Association Presidents and Representatives to introduce the MCH-CRP plan @ SM OFFICE 6pm-7pm
- **4.22.24** - DHHL Hawaiian Homestead Commission Meeting - Introduce project to HHC
- **4.25.24** - 1 on 1 interview/Talk story session with Kapaʻakea Oceanside Resident
- **4.25.24** - MCH-CRP Planning Hui Meeting #1
- **4.26.24** - 1 on 1 interview talk story session with Kapaʻakea Oceanside resident
- **5.08.24** - MCH-CRP Planning Hui Meeting #2
- **5.13.24 - MCH-CRP Beneficiary Meeting #1 : Intro to plan & project**
- **6.12.24** - Kapaʻakea Homestead Assoc. Meeting:
  - Sm Group-Intro Project, Discussion & Collected manaʻo
- **6.17.24** - MCH-CRP Planning Hui Meeting #3
- **6.18.24** - Kalamaʻula Homestead Assoc. Meeting:
  - Sm Group-Intro Project, Discussion & Collected manaʻo
- **6.20.24 - MCH-CRP Beneficiary Meeting #2: What are the problems & opportunities?**
- **7.20.24** - MCH-CRP Planning Hui Meeting #4
- **8.08.24** - Kalamaʻula & Kamiloloa Huakaʻi
- **8.08.24 - MCH-CRP Beneficiary Meeting #3**
- **8.26.24** - MCH-CRP Large Landowners & ROE/Lease Meeting
- **8.27.24** - MCH-CRP meet with Molokai District -DHHL Team
- **9.26.24** - MCH-CRP Resource/Expert Technical Advisor Meeting??
- **10.18.24**-MCH-CRP meet with Molokai District DHHL Team
- **10.19.24** - MCH-CRP Kalamaʻula & Kamiloloa Huakaʻi
- 11.13.24 - Resource/Expert Meeting with DOT
- **12.02.24** - MCH-CRP Resource/Expert Meeting (Debra Kelly NRCS)
- **12.05.24** - Kalamaʻula Talk story session with Beneficiaries
- **12.11.24** - MCH-CRP Resource/Expert Meeting (TNC)
- **12.18.24** - MCH-CRP Resource/Expert Meeting (DLNR Lance DeSilva)
- **01.14.25** - Attend/Present at Kalamaʻula Homestead Association Meeting
- **02.14.25** - MCH-CRP Huakaʻi Mauka & Makai Kalamaʻula
- **04.08.25 - MCH-CRP Beneficiary Meeting #4: Kapaʻakea & Kamiloloa**
- **04.16.25 - MCH-CRP Beneficiary Meeting #4: Kalamaʻula**
- **04.21.25** - Hawaiian Homes Commission Meeting on Molokai
- 11 2025 - Hawaiian Homes Commission Meeting: Review Summary Report of Preliminary Draft
- **12.03.25** - Attend/Present at Kapaʻakea Homestead Association Meeting
- **12.09.25** - Attend/Present at Kalamaʻula Homestead Association Meeting
- **01.07.26 - MCH-CRP Beneficiary Meeting #5: Presentation of Draft Plan**
- **01.05-23.26- Beneficiary Review Period-Submit Comments!**
- **02.17.2026-HHC Final Review and Approval of MCH-CRP: PHASE 1 PAU!**

KEY:

- BROWN: HHC Meetings
- PURPLE: 1 on 1 or Talk Story Sessions
- ORANGE: Planning Hui Meetings
- RED: Beneficiary Meetings #1-#5
- GREEN: Huakaʻi
- PINK: Technical or Resource/Expert Meetings

MCH-CRP **Core Team**: The MCH-CRP Core Team consists of three entities: DHHL serves as the overarching head of the team with G70 and Sustainable Molokai providing the leg work to support the beneficiaries. Sustainable Molokaiʻs role as contracted by G70, is to be the beneficiary community outreach.
Nancy McPherson (DHHL), Cody Winchester & Barbara Natale (G70), Heather Place & Katy Mokuau (SM).

MCH-CRP **Planning Hui**: The MCH-CRP Planning Hui was designed to collaborate with the Homestead associations to prepare for Beneficiary Workshops and Huakaʻi. This beneficiary-based process insured active participation and engagement. Involves Core Team along with Homestead Association Presidents and Representatives from each ahupuaʻa.

Kalamaʻula Homestead Association: Lehua Kauka (President), Brent Nakihei (VP), Hamau Howe (Sec), Stacey Crivello (Rep), Kalani Johnston (Rep), Kaleo Crivello (Rep), Kekama Helm/Ane Bakutis (Rep), Mike & Nani Kahinu (Rep).

Kapaʻakea Homestead Association: Kahekili Pa-Kala (President), Enoka Naho'opi'i(VP), Tina Schonely (Treasurer), Marissa Poaipuni (Secretary), Sumu Asano (Sgt of Arms), Bridgett Mowat (Rep),

Kamiloloa Homestead Association: Hala Pa-Kala (President), Todd Ragsdale (Rep)

1 on 1 Interview Talk Story Session with Residents: 1 on 1 interviews were conducted throughout this planning process and have provided valuable and much needed information regarding the struggles, needs, and concerns of these beneficiaries.

- *Kapaʻakea Residents:*
  - Interviewees (for dates please see timeline above): Pinky Gaspar, Bridgett Mowat,

Expert/Technical Meeting:

Meetings with Experts and Technical Resources were held to allow beneficiaries the opportunity to ask questions, hear ideas, and solutions that might be feasible in their specific ahupuaʻa. An example could be mitigation strategies regarding flooding, mauka restoration, and shoreline management.

Experts ranged from County of Maui (Water:Rodger Apuna road, County Council - Keani Rawlins-Fernandez, Keʻomailani Hirata, First Response MPD - Jamie Winfrey, Parks & Recs - Darin Kimoto, Emergency Management - Zhantell Lindo, etc.), State (DOT - Lee Marquez & Pomai Simms, DAR - Edward Kekoa/Kristy Stone/Petrisha Alvarez, DHHL - David Bush, Myron Poepoe, Elroy Mollena, Andrew Choy, DOE - Daniel Espaniola, Will Carlson, Kim Kaai, Shona Pineda, DLNR - Justin Luafalemana, Lance DeSilva, DOFAW-James Espaniola,), Debra Kelly(NCRS), Harrison Togia (UH SOEST & CoM and State DoT Roads Assessments), Butch Haase (MLT), Helen Raine (Pacific Birds/Molokai Wetland Partnership), Thorne Abbott (SM SEMP Planner), Maile Naehu (Kumimi Fishpond Restoration), Juanita Colon(Rural Water), OHA, Ka Ipu Makani, The Nature Conservency,, State Representative Mahina Poepoe, UH Sea Grant-Chip Fletcher, Rosie Alegado, Kua Hawaii, Tara Owens.

3.25 & 4.25.24 - MCH-CRP Intro & Planning Hui Meeting #1

- **Who:** Which includes reps from all 3 ahupuaʻa
  - Lehua Kauka, Jordan Poaipuni, Sumu Asano, Bridget Mowat, Mango Stephens, Sybil Lopez, Hala Pa Kala, Liko Wallace
- **What:** DHHL, SM, and G70 invited Association Presidents and Representatives to introduce plan and get information on planning approaches that would be best for beneficiaries
- **Where/When:** SM Office 4-6PM
- **Food:** what and by who: Maka's Korner (Korean Chicken, Green Salad, Rice)
- **Purpose:** To build a relationship with associations & their representatives throughout this planning process.
- To gather input on better processes that fit the Molokai beneficiaries' concerns.
- **Materials Shared:** Powerpoint presentation slide deck, MCH-CRP Tri-fold brochure, Maps, Comment Cards,
- **Format:**
  - Introduction to MCH-CRP Plan, recap for those who missed last meeting
  - Confirmed all Associations meeting dates for May & June and collected contact information for additional Planning Hui reps
  - Ongoing list of Stakeholder Interviews (see below)
  - Discussed **Workshop #1 Intro** slide edits & info to produce and edit for meeting (see below)
  - Brainstormed for **Workshop #2 & Expert Hui** (see below). Brainstorming/Planning to be continued at next few Planning hui meetings
  - Brainstormed for **Workshop #3 (see below)**. Brainstorming/Planning to be continued at next few Planning hui meetings

- **Outcome/Next Steps:** (Suggestions made)
  - Confirm all associations meeting dates for May & June and collected contact information for additional planning hui reps
  - Created an ongoing Stakeholder/Expert Interview list (suggested by Sybil Lopez)
  - Discussed Workshop #1 Intro slide edits & info to produce and edit for meeting
    - **Sign-ins**
      - Add Kūpuna / ʻopiʻo, # per ʻohana/households
      - Medical req, emergency services, needed per household, etc.
    - ez)
      - Island map
      - 3 Ahupuaʻa Maps (add land designation, erosion, streams, lessees, and large land use lessees
    - Use common terms to introduce series of Workshops ideas- Show examples of eachWhat are the Problems & Hazards? What are the Opportunities? What are the Assets? (Suggested by Sybil Lopez & Lehua Kauka)
  - Brainstormed for Workshop #2
    - **Start with an icebreaker/activity to engage audience**
      - What does Climate Resiliency or Resiliency mean to you?
    - **Background information**
      - Planning hui

      - Ahupuaʻa Primers: Make 1 pager, easy to read, maybe the last page of draft primer and other overall info for project.
    - **Overall Timeline:**
      - Add to show: Breakdown of each workshop & goals and total timeline through EO project, not just beneficiary engagement portion
      - NFWF Funding Pathway slide - specify that it's POSSIBLE funding for future NCRF priorities, and make it clearly different than overall Project timeline
    - **Maps** (Printed Large) (suggested by Sybil Lop
  - Brainstormed for Expert/Resource Hui
  - Brainstormed for Workshop #3
  - Agreed to continue this planning hui meetings throughout this planning process
  - Use CCSLAR as a resource only (suggested by Sybil Lopez)

Action Items:

1. Update Calendar, Association Reps, Meeting Dates,
   a. SCHHA - 3rd Wed | Kalamaʻula - 3rd Tuesday | Kapaʻakea - (quarterly 2nd Tuesday) | Kamiloloa One Aliʻi-as needed
2. **MCH-CRP Planning Meeting #2** scheduled for **WEDNESDAY, MAY 08, 2024 @ SM Office @ 4-6PM**
3. Start building your resources: Contact Ka Honua Momona, MHLA, etc. and other entities we did not contact yet
4. Build your list for Subject Matter Experts.
5. **Schedule Workshop #2 Date: June 20, 5p-7p @ Kūlana Ōʻiwi Halau-**confirmed
6. Add to list below of Kupuna and leaders your Ahupuaʻa
7. Look at date options for Workshop #3 & #4 in August 2024
8. Look at date options for Huakaʻi in August 2024 for all ahupuaʻa.
9. Look at schedules with Homestead Associations for times on their meeting agenda

List of Stakeholder Interviews: (Ongoing)

Kalamaʻula

1. Henry Paleka & Aunty Rose
2. Penny Martin
3. Brian Naeole
4. Helm ʻOhana
5. Crivello ʻOhana

Kapaʻakea

1. Ron & Lucy Davis
2. Squeaky Greenleaf
3. Aunty Leilani Wallace
4. Aunty Pinky Gaspar & Oceanfront Kapaʻakea residents*
5. Manitin Ohana
6. John Ocampo (Ocean Front)*
7. Aea ʻOhana (Ocean Front)*

8. Pelekane ‘Ohana *
9. Asano ‘ ‘Ohana*

Kamilola-One Ali‘i

1. Mervin Dudoit
2. Aunty Vanny
3. Dennis & Haunani Kamakana
4. Elano Naki
5. Alberta Napoleon
6. Herbert Ho
7.

5.08.24 - MCH-CRP Planning Hui Meeting #2

Workshop #2 Planning - Jun 20, 2024 @ Kulana Oiwi Halau 5-7pm

- **Sign-ins**
  - Add Kūpuna / ‘opi‘o
  - # per ‘ohana/households
  - Medical, emergency services, plan, etc.
- **Association Leaders & Reps host tables by Ahupua‘a (Tables)**
- **Ice Breaker/Intro Activity**
  - What are the PROBLEMS & HAZARD?
    1. Def: Technical meaning & common terms
    2. Share by Ahupua‘a‘s (Kapa‘akea: what‘s yours?)
    3. Show examples with pictures by ‘Ahupua‘a
  - What are the OPPORTUNITIES?
    1. Def: Technical meaning & common terms
    2. Share by Ahupua‘a‘s (Kapa‘akea: what‘s yours?)
    3. Show examples with pictures by ‘Ahupua‘a
  - What are the ASSETS?
    1. Def: Technical meaning & common terms
       a. Benefits, Strengths, People
       b. i.e. Food Security, Resiliency, Water Access/Boats, Knowledge of all i.d. of households/kupuna‘s/medical,transportation,etc.
    2. Share by Ahupua‘a‘s (Kapa‘akea: what‘s yours?)
    3. Show examples with pictures by ‘Ahupua‘a
- **Hazard Historical Timeline**
- **What are the problems, opportunities, and assets?**
  - Define Hazards and Vulnerabilities
  - Assets: Benefits, Strengths, people
    1. What does that mean?
       a. Kupuna (resource), emergency prep,
- **Common terms to describe:**
  - Wastewater, king tides, SLR, floods, fire, hurricane, drought, tsunami, infrastructure, roads/evacuation routes.
  - Infrastructure and hazards need to be identified as different categories
    Per sybil: (For example, wastewater-cesspools should be identified as infrastructure vs. drought as a hazard). In the introduction phase, this may need to be defined so people will understand the differences so when solutions arise, it will be easier to target.
- **Resources/Plans to be available:**
  - DHHL Molokai Island Plan
  - DHHL Molokai Regional Plan
  - DHHL Malama Cultural Park Special Area Plan
  - COM Hazard Mitigation Action Plan (Mitigate Maui Nui)
- **MAPS**

- Printed Large scale (whole table sizes 2‘x6‘ or so), multiples per ‘ahupua‘a for each table
- Base layers of:
    1. Historical maps (show original uses)
    2. Water (river, paths, streams)
    3. Coastal homesteads (residences inc indiv. wastewater layer)
        a. Check into DHHL status of MKK Cesspool Assessment (inc. ground truthing)
    4. Land-Use Designations
    5. Historical hazards maps per ahupua‘a/over time
    6. Ocean Currents (historical & current)
    7. Winds (historical & current)
    8. Roads/Infrastructure
    9. CZM
    10. Resiliency Hub/Emergency Shelters/Reference maps
    11. Crest map layer
    12. ROEs

MCH-CRP Meeting #1: May 13, 2024 @ Kūlana ‘Ō‘iwi Hālau 5:30-8PM

- Attendees: Beneficiaries from Kalamaula, Kapaakea, and Kamiloloa One Alii: Kaleo Crivello; Carla DeAngelo, Adeline Isamura, Kalani Johnston Sr., Michael Kahinu; Raymond Kalilikane; Lehua Kauka; Bridget Mowat, Malia Nishihira, Jordan Poaipuni; Todd Ragsdale, Cora P Sanchez; Nancy McPherson (DHHL), Katy Mokuau and Heather Place (SM), Barbara Natale (G70)
- Purpose: Discussing resilience and addressing current hazards in the DHHL homestead communities of Kalamaula, Kapa‘akea, and Kamiloloa One Alii.
- Groups were formed by ahupua‘a (Kalama‘ula, Kapa‘akea, Kamiloloa One Ali‘i)
- Dinner: Ulu Chowder (Na ‘Ike)

- Activity:
    - Problems (Pilikia)
        - Kalam‘ula: Erosions, Flooding, Deer Population (Overgrazing), WIldfires, Water Diversion, Tides, Invasives Species
        - Kapa‘akea: Flooding causes damage to homes, Mauka restoration, mud & sediment flow straight to ocean, 1 road for community, evacuation areas are now in flood zone
        - Kamiloloa: Shoreline erosion, Flooding,
    - Opportunities (Manawa)
        - Kalama‘ula: Planting native vegetation to mitigate flooding and erosion, culvert maintenance, controlled burns, evacuation plans, Maintenance of Kalanianaole Hall, Coconut Planting projects, Shoreline coastal management
        - Kapa‘akea: Keeping streams open, Evacuation planning, protection of Kapa‘akea Cemetery from flooding and erosion
        - Kamiloloa: Soft/medium erosion controls, installation of temp inshore/offshore groins or jetties to manage water flow, creation of potable and non-potable water tank programs for residential farm uses, Evacuation plans and routes,
    - Assets (Waiwai)
        - Kalama‘ula: Sacred lands, ‘ōhi‘apilo wetland, [Knowledge, history, mo‘olelo, & being raised in Kalam‘ula]
        - Kapa‘akea: Mauka Restoration, Punawai restoration
        - Kamiloloa: Long time residents (over 70 years), Ali‘i pond has historical and cultural significance, Limu farming
- **Materials Shared:**Powerpoint presentation slide deck, MCH-CRP Tri-fold brochure, Maps, Comment Cards,
- **Outcome/Next Steps: (Suggestions made)**
    - Future Workshops: Scheduled workshops to further discuss resilience, options, and actionable plans. (suggested by Sybil Lopez and Kalama‘ula Association)
    - Community Involvement: Continued engagement with community members to refine and prioritize projects.
    - Schedule future Huaka‘i for Mauka and Makai

Format:

1. Introduction and Activity
- Heather and Katy facilitated an activity, asking “What does Resiliency mean to you?” Answers included prevention, ability to bounce back and adapt after stress, survival.

2. Presentation
- Heather and Katy reviewed previous DHHL plans that are being used and built upon, as well as other island-specific and applicable County of Maui plans.
- Funding for this project through National Fish and Wildlife Foundation (NFWF) National Coastal Resilience Fund (NCRF) was explained.
- The Project Team was introduced and discussed their roles in the project.
- The purpose of the Molokai Coastal Homestead Community Resilience Plan (MCH-CRP) was described.
- Heather provided additional information about each homestead community.
- The meeting process and timeline were presented.
- Workshop #2 scheduled for June 20, 2024.

3. Community Input on Hazards and Resilience
- Community members worked in ahupua‘a groups to discuss specific challenges/issues and potential solutions.
- Identification of hazards (pilikia), opportunities (manawa), and assets (waiwai).

4. Next Steps
- Plan for future workshops and the creation of priority projects for each ahupua‘a.

Takeaways for Each Homestead Community:

Kalamaula

Pilikia:
· Kulana Oiwi and its original engineering (built 6-12 inches higher than surrounding) have caused flooding for nearby residents.
o Third River gets plugged up on makai side.
o This has been brought up time and time again without resolution.
· Erosion, deer population issues, overgrazing, wildfires, water diversion, tides, sediment.
· Invasive species:
    ○ Gorilla Ogo: plugging up the punawai
    ○ Mites and disease are attacking historical niu (coconut) in Kapuaiwa Grove / Kiowea Park. Lots of rats, helath issue
    ○ Mangrove: out of control, piling up all the sand, all lepo. Kamalo used to have flow, could walk the beaches there. Salt marshes were not there.
· A lot of druggies - safety light should be placed on the power pole at the end of Kapuaiwa Road.
· Homesteads need to know who has jurisdiction so they know who to call and be empowered to take action. It is not clear – what county laws and what DHHL laws are in effect on my property?

Manawa:
· Planting native vegetation to mitigate flooding and erosion.
· Culvert maintenance needed for both mauka and makai sides of the highway.
· Controlled burns at Kapuaiwa.
· Development of evacuation plans and resilience hubs.
    ○ Townside vs. west side: plans on ETA, transportation (Spencer busses), river cutoffs
    ○ One staging area near Ranch Camp.

    ○ Resilience hub with shower, storage, tie this in with the programs you have now, like educational. Could be a community center to use for hula, cultural programs.
· Maintenance of Kalanianaole Hall for educational and historical purposes.
· Coconut planting projects.
· Shoreline coastal management to restore wildlife
o Looking at alternative plans to control the population of gorilla ogo - need to clear the punawai and create a hatchery for the ‘ōpae.
· Look at other resilience plans in Hawaii – Kauai has done some, doing wetland restoration, bioswales to capture and hold water. Creates jobs.

Waiwai:
- Kapuaiwa is sacred.
- ‘Ōhi‘apilo Wetland.
- Knowledge, History, Mo‘olelo, & being raised in Kalama‘ula.
- They know where the punawai are, where breeding grounds, migration areas, and current cycles.
- Growing up with their kupuna and being raised by their elders first hand. They hold the knowledge!
- “Our people make us resilient”
- Just point us in the right direction. We want to be part of the solution.

Key Points:
· Importance of knowledge and history from kupuna.
· Need for better culvert and stream maintenance, particularly in the Kulana Oiwi area.
· Evacuation routes and plans, especially considering limited access points.
· Emphasis on preventive measures for resilience.
· Determine best course of action to save the niu at Kapuaiwa Grove.
· Restore punawai so that ‘ōpae can reproduce.

Kapa‘akea

Pilikia:
· Flooding from overflowing streams, causing damage to homes and the environment.
· Biggest concern is mauka.
· Mud and sediment flow affecting the ocean and subsistence living.
· Only have one road in and out for the community.
· Evacuation areas are now in the flood zone.

Manawa:
· Keeping streams open and taking care of the mauka areas (need to plant).
· Disaster and evacuation planning, including helping kupuna.
· Protection of Kapa‘akea Cemetery from flooding and erosion.

Waiwai:
· Mauka restoration

Key Points:
· Importance of mauka restoration to prevent downstream flooding.
· Emphasis on resilience through preventive measures and preparation.
· Historical and cultural significance of the area, necessitating preservation efforts.
· Requirement for alternative access and evacuation routes.

Kamiloloa One Alii

Pilikia:
· Used to be coconut grove all along that shoreline - should have kept the trees.
· Fee simple lots on shoreline - new people came, cleared out the kiawe - caused erosion.
· Continued and escalating shoreline erosion and projected sea-level rise.

6.17.24 - MCH-CRP Planning Hui Meeting #3

Workshop #3 Planning

- Date options: August 1, 5-8, 2024
  - FEMA
    - Identify who/where
    - Community homestead areas (info + study site poss.)
  - Experts: Round robin throughout
    - MEMA (Gina Albanese)
    - HIEMA (Kelsey Yamanaka)
    - FEMA-identify which divisions
  - Training and Educations
  - Resilience Hubs + partnerships (COM Office, Melani Swicke)
    - Baja
    - Keʻeaumoku w/ FEMA, Red Cross & Army Corp of Engineers
    - Napili-Noho Hub (moved from Kahana to Napili)
    - Implementation
    - Look @ County Assessment

    - **Experts Hui:** (Ongoing) To go around to Ahupuaʻa tables to answer questions & give advice per hazards/problems

Expert Speciality	**Names**	**Contact Information**
UH SOEST Climate and Resilience **Expertise:** Building a Climate Resilient Community: Let's End the Age of Destruction and Forge a Just and Sustainable Future	Chip Fletcher, Interim Dean (Kammie Tavares)	SM has
Office of Planning & Sustainable Development - Coastal Zone Mgmt (OPSD-CZM) **Expertise:** CZM and establishing DHHL jurisdiction	CZM Project Analyst- Sarah Chang (Sofia Luczac)	(sarah.m.chang@hawaii.gov), (sofia.a.luczac@hawaii.gov)
Department of Health, EPA **Expertise:** Cesspool Conversions/Assessment	(Nancy will get the contact)	
DLNR - DAR **Expertise:** Work with the people of Hawaii to manage, conserve, and restore the state's unique aquatic resources and ecosystems for present and future generations	Kristy Stone & Luna Kekoa (Edward L) & (Patricia-MKK Rep)	SM has
CWRM/USGS **Expertise:** Water Reservations, In-stream flow standards:protecting our estuaries and establishing "Cultural Sustainable Yield."	Ayron Strauch or Rebecca Alakai - CWRM	
Expertise: Water as a Public Trust and the link to the Water Use and	Dr. Jonathan Likeke Scheuer	

Development Plan (WUDP)		
COM Public Works **Expertise: Water works system on Molokai**	Rodger Apuna	SM has
Rural Water & Cesspools	Juanita Colon	SM has
DHHL-Cesspools Assessments	(Nancy will ask?-Kehaulani Quartaro)	Nancy will ask
MIS-DOA?	Ask Zhan/Keani	Ask Leilani
Expertise: Ka Huli Ao and the Water law training; meaning to Ka Pa'akai Analysis and Kauai Springs Test	Dr. Kapuaʻala Sproat	
DOT Highways	Lee Marquez	SM has
Hawaii Green Growth	Erin Derrington, Global Energy & Water Communities of Practice Coordinator	
UH (Professors)	Dr. Rosie Alegado (Shows how mauka to makai systematic events affect others) Dr. Oceana Francis (CoM Roads Assessment) Harrison Togia(DOT Assess)	SM has
UH Sea Grant	Wesley Crile (Dunes and Wetlands) Shellie Habel (Coastal Geologist-Cesspool Specialist)	
CoM Planners	Jim Buika (Disaster & Shoreline Planner)-Nancy ask Tara Owens (Sea Grant & CoM Planning)	taram@hawaii.edu
CoM-Molokai Planner	Sybil Lopez	
CoM Parks & Recs	Darin Kimura	Katy has
NOAA **Expertise:** Co-stewardship	Becky Lizama	
Maui Nui Climate Change and Community Specialist	Melanie Swick, Geologist	Melanie.Swick.contractor@ha

		waii.gov
National Disaster Preparedness Training Center (NDPTC)	Kirsten Turner Dr. Karl Kim	kirsten.b.turner@hawaii.gov
HI Wildlife Management Org	Elizabeth Pickett-ED	
Director Office of Indigenous Innovation for the Office of the Vice President for Research and Innovation for UH System	Kamuela Enos	
National Preservations Institute (NPI) **Expertise:** Continuing education and profession training in historic preservation and cultural resource management	Jere Gibber	
ONHR-DOI **Expertise:** Kapapahuliau Climate Resilience Program	Cedric Duarte, Communications Officer	
Expertise: WIldlife/Land Management	Dr. Craig Harper, Extension Wildlife Specialist	
Hawaii Office of Homeland Security	Jimmie Collins	
Ka Honua Momona	Tiana Puaa	
MHLA	MP Kamakana (used to be Uncle Ron)-Katy ask Troy	
TNC Molokai **Expertise: Land management and native species restoration on Molokai**	Russell Kallstrom	rkallstrom@tnc.org
Molokai Land Trust **Expertise:** Land Management/Native species (Punalau, Kainalu, Mokio)	Butch Haase / Wailana Moses Lopez	butch@molokailandtrust.org butch.haase@gmail.com
Molokai Hunting Club **Expertise: Animal Management / Fencing as a tool**	Justin Luafalemana (background in fencing)	molokaihuntingclub@gmail.com
Soil Water Conservation District	Aunty Debbie Kelley	
NRCS-	Ask Aunty Debbie	
Maui Emergency Management Agency	Eric Neuhart Emergency.Management@mauicounty.gov	
Molokai EOC	Hanale & Zhantell Lindo, First Responders, etc.	

First Responders	Jamie Winfrey (Police) Kaina Alcon (kalamaʻula) or Noa Horner (Hoʻolehua) (Fire Captains) Tabby Ching or Tita Maliu (Hoʻolehua) (EMS)	(808)553-5355 (police Station)
ʻAha Kiole-Moku o Palaʻau	Kanoe Davis, Keani Rawlins-Fernandez, Lorilei Rawlins-Crivello, Kawika Crivello	SM to look–Uncle Merv Dudoit (Kamiloloa/One Aliʻi) & his son, used to be involved in KIM?–Heather go talk to him & ʻohana
ʻAha Kiole-Moku o Kawela	Hanohano Naehu, Laʻa Poepoe, Mahina Poepoe, Malia Waits, Bronson Kalipi	
OHA	Gayla Haliniak	
Molokai Wetland Partnership	Kristen Helen Raine	
Ka ipu Makani (KIM)	Pulama & Nahulu	

Huakaʻi Options

- August 03-04, 10-11

Homestead Association Meetings

- Update calendar, association reps, meeting dates

To begin the MCH-CRP Process, after the Beneficiary Meeting #1-Intro, part of the Core Team attended the Homestead Association Meetings for Kapaʻakea and Kalamaʻula to recap the introduction to the project and let the beneficiaries know about the next steps and what was to come for Beneficiary Meeting #2 that will be happening soon. By

attending the Homestead Association Meetings, additional Beneficiaries who don't like to attend the big DHH/Plan meetings were reached. Also, by bringing the outreach to their 'ahupua'a and their homestead communities,a more relaxed setting allowed for open discussion and dialogue between local Moloka'i facilitators and the homestead beneficiaries.

MCH-CRP: Kapa'akea Homestead Meeting
June 12, 2024-6pm

Katy Mokuau & Heather Place (SM) facilitated
Attendees: KHA Board and Beneficiaries

- Handouts: Workshop #1 Presentation Print-out
- Talked through Workshop #1 Presentation print-out, this projects planning process, SM-SEMP plan that came before, and next meeting-Beneficiary Meeting #2 to come in next week.
- Lots of questions from beneficiaries were expressed for the disdain for long drawn out planning processes & discussion of the NFWF funding and future funding tiers were shared by facilitators. Funding, Implementation and future steps were also of concern of beneficiaries. As the process was talked through as a whole and outcomes of the plan and 5 Priority Projects per ahupu'a, understanding started.
    - The beneficiaries were very grateful that the facilitators came to their association meeting and community to explain more in depth in a smaller, more intimate and relaxed setting just within their ahupu'a to allow for lots of open dialogue and question/answers.
    - Outcome: Many were going to plan to attend Beneficiary Meeting #2 now that they understood what the heck this plan was and why and invited the facilitators to come back throughout the process to association meetings.

MCH-CRP: Kalama'ula Homestead Meeting
June 18, 2024-6pm

Katy Mokuau & Heather Place (SM) facilitated
Attendees: KHA Board and Beneficiaries

- Handouts: Workshop #1 Presentation Print-out
- Talked through Workshop #1 Presentation print-out, this projects planning process, SM-SEMP plan that came before, and next meeting-Beneficiary Meeting #2 to come in next week.
- This meeting was more concise as Kalama'ula HA has many items on its agenda and lots of projects currently going on within their ahupua'a. They are also very organized and knowledgeable with processes and planning. There were questions from beneficiaries & discussion of the NFWF funding and future funding tiers were shared by facilitators.
- Outcome: Those who did not attend the Beneficiary Meeting #1 were glad facilitators came and recapped them and they felt like they had a good understanding going into Beneficiary Meeting #2 and already started discussing and sharing about some of the pilikia shared by their ahupua'a. They were glad to put these issues to paper and that there would be a step taken in the forward direction by DHHL.

MCH-CRP Meeting #2: June 20, 2024 5-7PM Kūlana 'Ō'iwi Hālau

- Attendees: Community members from Kalamaula, Kapaakea, and Kamiloloa One Alii: Pinky Gaspar, Lehua Kauka, Kaleo Crivello, Sybil Lopez, Michael Kahinu, Nani Kahinu, Bridget Mowat, Maverick Kaulia, Lawrence Lasua, Kapua Lauifi, Henry Paleka, Jessie

Leilani Wallace, Irene Kaahanui, Judi Caparida, Monique Ocampo, Gayla Haliniak, Kazan Dela Cruz, Winnifred Lopez, Miriam Kikukawa, Todd Ragsdale, Phil Stephens, Lorena Atchinson, Kawika Domingo, Hala Pa Kala, Keani Rawlins, Dwayne Kala, Carla DeAngelo, Kalani Johnston, Marina Lafaele; Nancy McPherson (DHHL), Katy Mokuau and Heather Place (SM), Cody Winchester(G70)

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- Purpose: Discussing Problems in their Ahupua'a that could be potential priority projects for MCH-CRP plan.
- Dinner: Na Ike provided

    - Kalama'ula:
        - Erosion/Flooding: Shoreline erosion, wind erosion, swales up Mauka
        - Drought: Animal Management, Land Management (swales), Vegetation management (native, invasive, intentional vegetation)
        - Maintenance: Streams/Culverts (DOT/COM), Kapuaiwa, Kalanianaole
        - Engineering: Kūlana 'Ō'iwi, Kaunakakai Wharf
    - Kapa'akea:
        - King Tides (High high tides), Drainage: mauka→Makai (sedimentation), Erosion, Cesspools, Pu'u One Fishpond, Culvert/River Maintenance, Invasive Species(kiawe), Flooding, Water Diversions, Relocation,
    - Kamiloloa:
        - Flooding, erosion, King tides, Emergency evacuation, Diversion of rivers
        - Revegetate beach dunes to hold sand in place, revegetate mauka area to reduce erosion and runoff, Study waterflow of springs, Poor absorption and drainage
        - Revegetate the maukalands to reduce erosion, need mauka to makai solutions, Invasive species (limu, deer), Need a hydrologic data for Molokai south shore, restore water in ahupua'a→restore stream diversions
- **Materials Shared:**Powerpoint presentation slide deck, MCH-CRP Tri-fold brochure, Maps, Comment Cards,
- Outcome/Next Steps: (Suggestions made)
    - Compile problems, opportunities, and assets into priority projects
    - Compile projects into maps
    - Future Workshops: Scheduled workshops to further discuss resilience, options, and actionable plans.
    - Schedule Huaka'i for mauka for 3 ahupua'a
    - Schedule a meeting with DOT and COM about jurisdiction on Culvert/stream maintenance (suggested by Lehua Kauka)

Format:

1. Recap of Introduction of MCH-CRP Plan (Project Slides from Workshop #1 May 13, 2024)
2. Ahupuaʻa Haʻawina:
    a. Pilikia
    b. Manawa
    c. Waiwai
3. Next Steps

Kalamaʻula Group:

Setting and Issues:

- Kapuaiwa Grove (Coconut Grove) is a historical and cultural place on Molokai
    - Mites are killing the coconut trees from the top→down
- Need to know jurisdiction of area for workforce or funding to do cleaning of mites of remaining coconuts, area maintenance, etc.
- Erosion(mauka, shoreline, wind, etc) in areas cause major flooding in low lying areas
- Culvert, stream, and river maintenance need to be considered to lessen the amount of water damage
- Throughout the years drought has been a big issue.
    - Axis Deer have been eating our crops, native plants, etc causing less vegetation holding the sediment.
- Kahinu ʻOhana has dealt with major flooding since the construction of Kūlana ʻŌiwi leaving all water to flow into the Kahinuʻs yard.
- Education is a big talk: Animal Management, Land Management, Native/Invasive Species,
- King Tides have been higher levels at a more frequent rate → causing shoreline erosion to increase
- Kaunakakai Wharf - Since the covering of culverts, the ocean/shoreline currents have altered drastically

Mitigation Strategies:

1. Kapuaiwa Grove: Mites are killing coconut trees
    a. Potential Solutions: Controlled burns or cutting
    b. WORKFORCE: Off-island contracts are getting these cleaning jobs. Need to keep the jobs local.
    c. JURISDICTION: County, State, Fire: for funding, workforce.
        i. Keeping work/funds in community
2. EROSION
    a. Shoreline erosion
    b. Wind Erosion
    c. Swales up Mauka
3. FLOOD
    a. Mauka to Makai
    b. Culvert Maintenance
4. DROUGHT
    a. Deer
        i. Animal Management
        ii. Land management
            1. Swales
        iii. Vegetation management
            1. Native species
            2. Invasive species
            3. Vegetation that deer like to eat so they wont eat crops, etc
5. MAINTENANCE
    a. Streams/Culverts: Jurisdiction?
    b. Kapuaiwa
    c. Kalanianaole
6. BAD ENGINEERING
    a. Kūlana ʻŌʻiwi
        i. engineering has caused many flooding for neighbors.
    b. Kaunakakai Wharf
        i. Causes ocean currents to build up sand/mud/silt and decreases the population of native limu. This causes the increase population of invasive limu such as Gorilla Ogo.

What are some Manawa in your ʻAhupuaʻa?

8 Realms of Decision Making

1. MAINTENANCE:
    a. Kapuaiwa
    b. Kalanianaole
    c. Kiowea
    d. Including Rivers, streams, culverts, and parks.
2. RESTORATION
    a. Mauka
        i. Regenerate Management
        ii. Animal Management
            1. Education
        iii. Erosion
        iv. Native Planting
            1. Ohiʻa
        v. Kumu Laʻau Wao
    b. Makai
        i. Shoreline Erosion
        ii. Springs → Limu
        iii. Marine Life/Reef
    c. Moʻolelo
        i. Punawai
        ii.
    d. EDUCATION
        i. Wao Aku
        ii. Ae ʻĀina
        iii. Stewardship of the ʻĀina - Kumu Lipo
        iv. Management
            1. Animal Management
            2. Land Management
            3. Vegetation Management for Invasive and Native species

Kapaʻakea:
What is the pilikia?

- King Tides
- Drainage: Mauka to Makai-Floods, Sedimentation
- Erosion: itʻs different from east to west
- Cesspools
- Puʻuone Fishpond

    - walls need repair
    - Culverts blocked from feeding Puʻuone
- Culvert/River Maintenance
- Kiawe Trees soak up ground water for discharge, our native trees are gone
- Flooding and moving out of kapaʻakea
- Mauka Water Diversions: how do we fix and how do we fix?

Themes:
-**Hoʻopulapula:**
Working for all the people

-**ʻAi Aina:** Practice was that we have food from mauka to makai
-**Working on this together**
-Prompt: **Trust for the process** and start the projects
choices:-

What are some Waiwai in your ʻAhupuaʻa?

- Fishing, Crabbing, and acts as buffer for Mangroves
- Fishponds to be restored
- Spring water/By culverts that may have blocked for this

Aunty Leilani (Shared):
- Relocation due to flooding conditions:
    - Homestead Relocation: She doesnʻt want her moʻopuna to deal with this so she requested a relocation to Kalamaʻula homestead at the last Hawaiian Homes Commission meeting
    - Concerns:
        - who would be responsible for the new house costs and construction and what, She wants DHHL to build her a new house
        - What happens to the houses when they are left after move out from Kapaʻakea
        - Wonders how many of the others want to move and need to work on a plan and options available.
    - The rest of Aunty Leilaniʻs comments were noted on the maps

Aunty Bridgett-(Shared):
From Aunty Gaylaʻs side all the way to Rawlins side the erosion is different and may not be the same processes
-Our trees are gone
-Mangroves holds in the land
& until we find out more then restore fishpond then removal

King tides come through the process and live in the middle row, middle stream
Water process:
-Backfill cemetary and fire dept to fill and water that comes will
Didnʻt want to wait and the water diversion has affected everyone and flooding
-County & DHHL:
Processes of removal or readjusting after flood then that affected more areas and leasees also and some of it my make it worse.
-Greenleaf beach areas king tides inundation
-Makai:

Manawa:
-Brackish water and need for mauka resilience:

-We can know what is the historical problems and diversions & opportunity to apply for grants and mālama,

Kapaʻakea Resident (shared)--

The process: others in Kapaʻakea will speak when they have no idea and thatʻs not fair, otherʻs shouldnʻt be talking to you about oceanside issues

-Feedback: That it felt we(facilitators) decided for us before we came here

-Look at reports that Aunty Pinky has put into DHHL, all records and she doesnʻt want us to look at it.

Main concern: rights, livelihood,

-When asked how can we remedy what she is feeling about others speaking from Kapaʻakea her suggestion was to: Have Separate Meetings, donʻt put all of Kapaʻakea together: three rows of residential and have different issues, we all hold individual leases

-When asked for an issues or manawa? “I Donʻt need anything from this plan or the process, I took care of myself”

-My other neighbors want to come

-She was Homestead Association President during this time, Nancy got this project off of Uncle Pinky and community based and driven so she got this project

-Have no issues with this so she doesnʻt have that concern for her property, etc.

-MOC: Kūpuna asked her for help & they camped out in her office.

-Roadway: DOT-There was a hump that Aunty Leilani fought against and that hump

would have pushed water down and she wouldnʻt flood.

Humps, were installed in Kapaʻakea, etc.

-Talk story with other ahupuaʻa

Kamiloloa Group:

Todd

Setting and Issues:
- Todd has a lease for the property furthest west along the coast.
- Home experiences flooding during heavy rain events. Flooding is typically caused by overflowing of the ravine.
    - Silt, branches, and detritus flow into the gulch, raising water levels and impeding stream flow
    - The mouth of the stream becomes obstructed branches and sediment, preventing the water from flowing out to the ocean. As a result, the gulch channels backs up and overflows
    - Floodwaters from Mauka inundate the highway with sediment and debris, obstructing access and complicating emergency evacuation efforts.

    - Residents are uncertain about jurisdiction and whether they are permitted to clear the gulches themselves. They are also unsure of whom to contact when the ravine channels become blocked or the roads are covered in sediment.
- Flooding does not occur during normal rains. Only during heavy rains and when the ravines are full of sediment and overflow.
- Wave induced flooding is less of a concern.
- King tides have been observed but water does not reach his house.
- 2011 Tsunami brought waves up to the makai edge of his home. The waves were very shallow, only one or two inches deep
- The direction of water flowing through the gulch adjacent to his home was diverted when the highway bridge was constructed. The water used to flow between the neighboring houses. Now when it overflows the flood water threatens his home.

Proposed Mitigations:

- Beach nourishment and berm enhancement in front of vulnerable houses. Use a geotextile mattress and overlay with sand to build up dunes. This could be a “soft solution” to protect homes.
- Revegetate the beach dunes to hold the sand in place
    - Do not use naupaka. It erodes faster and catches rubbish
    - Use grasses instead.
- Revegetate mauka area to reduce erosion and runoff. Use animal-proof plants that are drought tolerant
    - Todd is growing mezcal blue agave on his property, and they are doing great. This could be an option that would also provide economic benefits as a marketable product. Agave is a regenerate plant like kalo. Molokai could become known as the next big Tequila region - “molokai Moonshine”
- Study the waterflow of springs. Understand the mauka to makai connection
- Construct vertical evacuation area to a location out of flood zone
- A high point could be bulldozed to create a flat area for cars to park
- A simple building or pavilion could be constructed at the evacuation point to provide shelter and refuge for beneficiaries
- The evacuation road doesn‘t need to be paved. It can be just a simple unimproved road.
- Deployable solar-powered signs could be placed along highway before emergency events to inform residents of the evacuation route
- The mauka roads could serve as a first step for future managed retreat. Having the roads in place now would make it easier to relocate people when needed.

Kawika Domingo

Setting and Issues:

- Kawika has a lease for a property along the coast. Has experienced flooding first hand
- He has had to use sandbags to protect his property from encroaching flood waters. He has needed sandbags stacked up to 3 ft high on occasions
- Very familiar and knowledgeable about the lands mauka Kamiloloa - Makakupa‘ia. He has hunting in the ares for many years
- He has observed the gulches getting worse over time. Chronic erosion has filled them with sediment, making them significantly shallower than they used to be
- Springs have been observed in the mauka area. Concern over springs getting clogged with sediment and pollution getting to ocean through groundwater

Proposed Mitigations

- Dredge out the gulches to get the rubbish out
- Install silt fencing to reduce sediment from entering the gulch
- COnstruct vertical evacuation roads. He knows areas that would be safe gathering areas

Dwayne & Hala Pa Kala

Setting and Issues

- Dwayne and Hala have a house along the coast

- General concern of poor absorption and drainage. Rainwater can‘t percolate into the ground. Concern for king tides causing coastal flooding of home
- The mauka lands experience chronic erosions
    - There are no trees or shrubs to hold the soil in place
    - Toxins are present in the soils from past ranching and agricultural use of the lands
- The highway regularly gets inundated with sediment. DOT comes to clear the road but it takes a long time and causes disruption

Proposed Mitigations

- Revegetate the mauka lands to reduce erosions
    - Plant vegetation in the gulches to filter the water and retain soils. Create testing areas along the gulch with different kinds of plants to see what works best “Living Laboratory”
    - Hemp can remove toxins from the ground. Economic VALUE
- Leave the pickleweed in place along the shoreline. The pickleweed does a good job of holding sand in place and filtering water
- Need mauka to makai solutions
- A better process to clear covered roadways is needed. Community volunteers could be deployed to assist

What are the 2 issues that affect all of us? Don‘t Divide us.

- Gorilla Ogo
    - Smothering reef, fishponds, and shoreline
- Solutions: Dune Fences→catches ogo to keep out of fishponds and shoreline→ restore Punawai
- Need Hydrologic data for Molokai South Shore - UH Study
    - Figure out why it‘s so dry
- Restore Water in Ahupua‘a → Restore stream diversions(70‘s+80‘s)
- DHHL dropped boulders in “spring” which is actually a lavatube.
- Bill Puleloa-told to plug it. Boy Puaoi - Compromised the flow → anaerobic smells bad
- Kamiloloa‘s sand is going down coast, building up at Kaloko‘eli
- Need placed to go Mauka - Box Power - get small goals going.
- Plants are holding the sand and land. Look at Steve Chakins‘s shrimp ponds– the ones with vegetation are okay, the ones without are getting eroded.
- Revegetating the gulches and land.
- Accretion - Deer Poop after the Big Rain-Rubbish, Tires all washed down, carcasses.
- Papa covered with mud + debris
- State DOT - Hwys Pushed that soil down makai 15-20ft deep.
- Mauka Lands not Being taken cared of
- Need more detention basins (Retain storm water)
- CLean up land, control deer, Select Plants deer don‘t eat (Tiare, taro all over)
- Just fence the area you‘re revegetating
- DOFAW/TNC bring to next workshop - Pepe‘opae Plants
- Drainage - Saltrate upwelling yards will get salties -
- 1 acre lots - fruit trees can‘t grow in salty soil
- Irrigation water trucked in - above raised bed, deep irrigation
- County water

ASSET/BENEFIT: DHHL have LV + Zoning authority can cut red tape in half, don‘t have to go through county SMA permitting.
Todd is a KS grad - asset
Larry Rawlin‘s ROE - that‘s where the water comes out

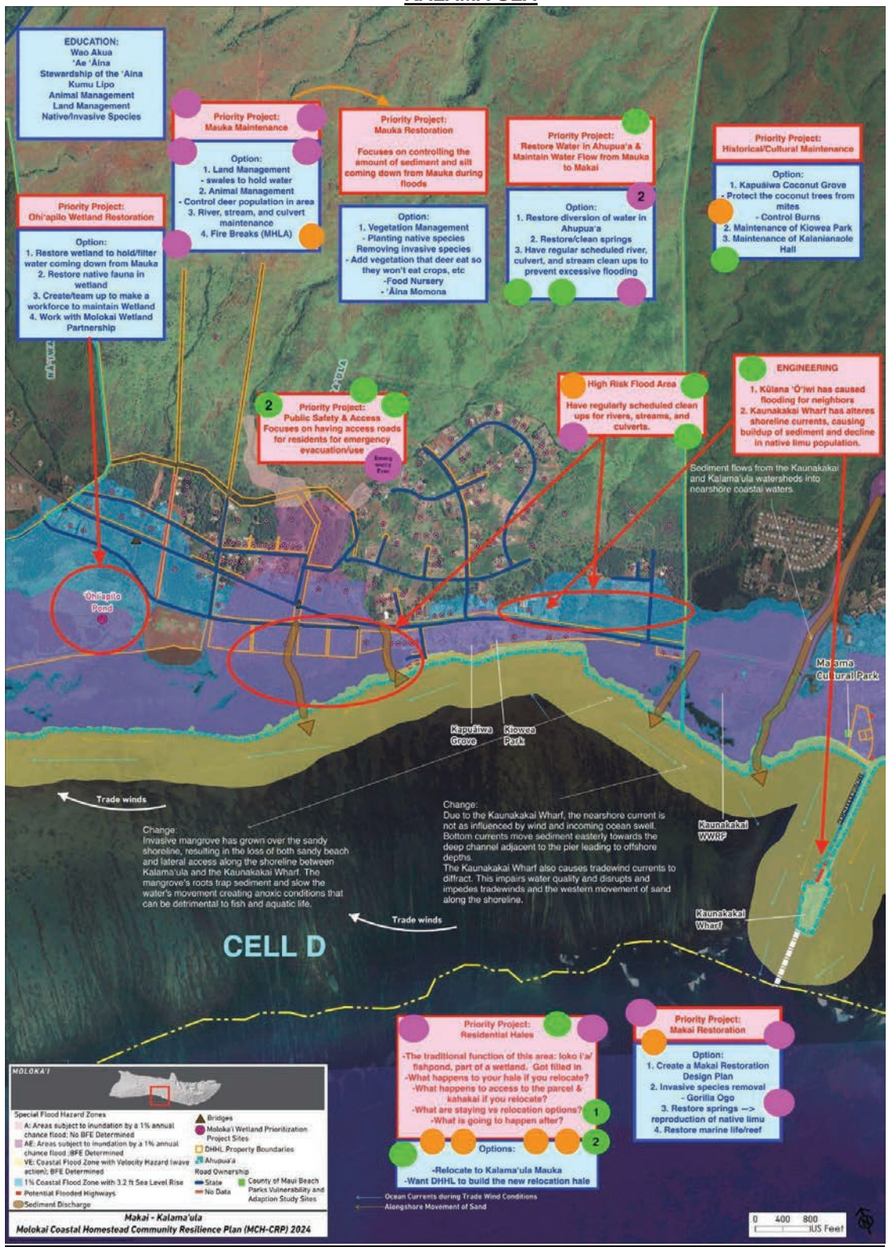
MCH-CRP Meeting #3: Rank and Choose Priority Sites/Options Available
8.08.24 OHA Conference Room Kūlana ʻŌʻiwi

- Attendees: Community members from Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi: Kalani Johnston, Mike Kahinu, Nani Kahinu, Lehua Kauka, Vana Naehu, Todd Ragsdale, Tina Schonely, Pelekane Tamashiro.
- Resource/Experts in their field: Zhantell Dudoit Lindo (COM Emergency Operations Center), Roger Apuna (COM Water), Keo Hirata (COM, MIBC),Petrisha Alvarez and Maria Angst (DAR), Lee Marquez and Pomai Simms (DOT), Shae Lauifi, Vana Naehu and Tiana Puaa (KHM), Edrian Apo and MP Kamakana (MHLA), Lani Caparida (MPD), Tara Owens (UH Sea Grant); MCH-CRP Team members: Nancy McPherson (DHHL), Katy Mokuau and Heather Place (SM), Barbara Natale and Cody Winchester (G70).
- Purpose: Discussing resilience and addressing current hazards in the DHHL homestead communities of Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi, with the attendance of the Resource/Experts on Molokai to attend per the discussion at the last Planning Hui Meeting
- Dinner: Na Ike
- Agenda:
- Intro: (20 mins) Pule & Get Food
- Intro (5 minutes)-
- Small 5 pages Printout Handout
    - Agenda
    - Brochure/Timeline
    - Next steps
- Priority Sites: (1 hr 10 mins)–(Have Maps with Priority Site Options on them numbered)
- 20 mins: SM/G70 Lead: Per Ahupuaʻa Priority Site Review and get any new ones missed or changes/edits?
- 20 mins: Association Members lead
    - What is your top 5?
        - Then Board Association Members will lead
        - Put 5 stickers on your choices on the priority sites on the maps
- 15mins: Final Priority Sites per each ahupuaʻa
    - Each ahupuaʻa shares (5 mins each)
- 15 mins: Priority Sites-Which overlap? Combo some?
- 1 hr: Options: What are the options?
- Experts around to visit each ahupuaʻa to give input
- Zoom: Experts in Break out rooms

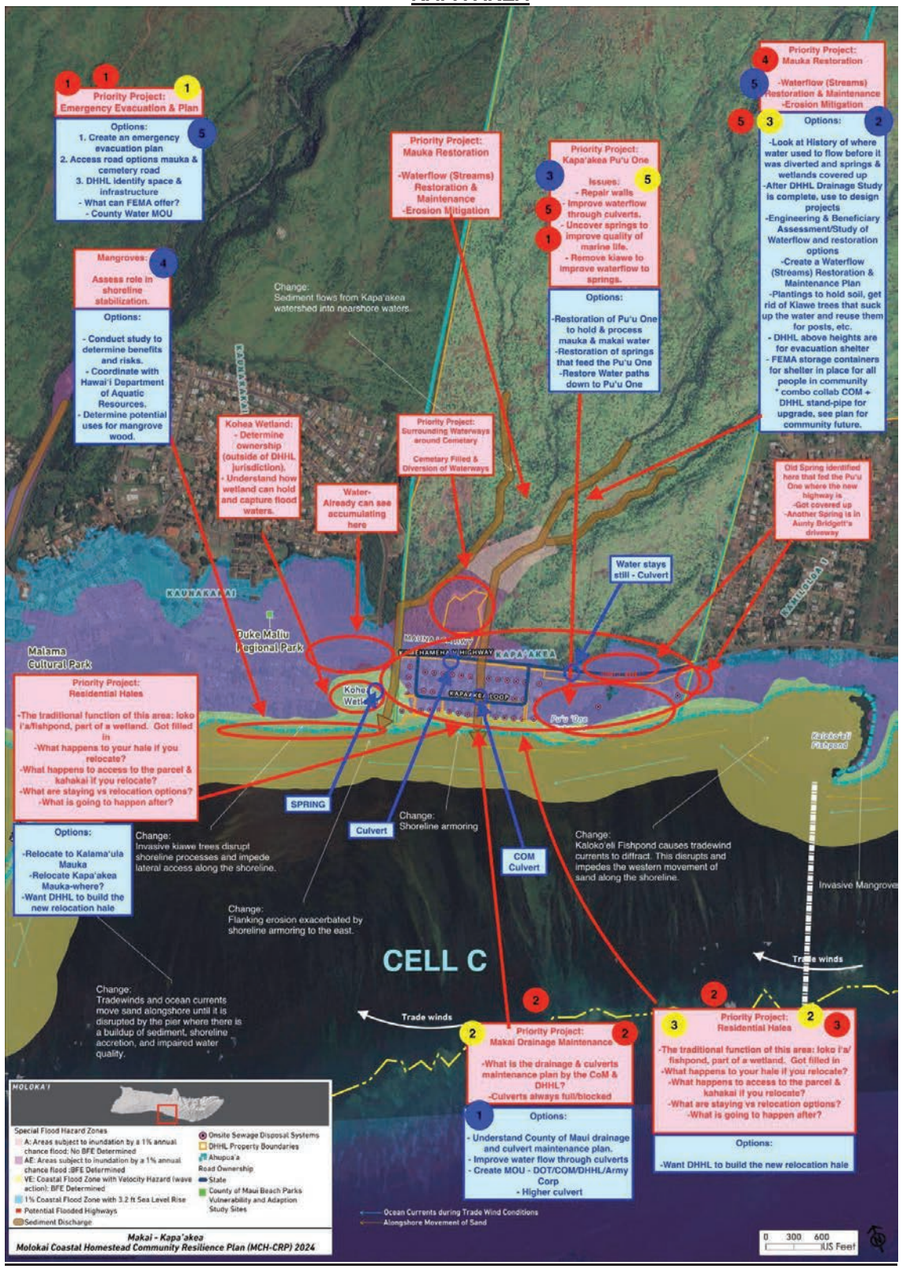
- **Kamiloloa**
    - Mauka Restoration: Aerials & maps (Gather & review old aerials and maps to focus on mauka restoration
        - Restoration efforts, Plant selection, partnerships and resources
    - Public Safety and Access
        - Evacuation roads, road management, signage and management, inventory needs, education and drills, evacuation study, resilience hubs, communication improvement

    - Economic and Community Development
        - Housing and Land Use (Interest in Mauka Lots, Innovative Housing), Economic Aspects (Resilient Economic Models), Partnerships and Resources (Homestead Associations),
    - Shoreline and Ocean/Makai Restoration
        - Aliʻi Fishpond and Walls,Mangrove Management/Replacement (Discussion on Removal Possibilities, Shoreline Vegetation, Resources and Techniques)
    - Partnerships and Resources
        - Molokai Land Trust, Consultants and Data
    - Drainage and Channel Maintenance
        - Drainage Management, Flooding, Channel Maintenance
- **Kapaʻakea**
    - Jurisdiction and Site Management (Agencies and Jurisdiction)
    - Fishpond and Wetland Management
        - Kapaʻakea Fishpond, Wetland and Loko Iʻa
    - Flooding and Drainage
        - Makai Drainage
        - Mauka Drainage
    - Residential and Infrastructure
    - Emergency Preparedness and Resilience
        - Emergency Proclamation and Planning, Educational Component
    - Partnership and Collaborations (Key Collaboration)
    - Prioritized Objectives
        - Identifying priorities such as protecting life, improving the area, and determining whether to protect the shoreline or relocate inland (mauka).
        - Bringing information back to the board for decision-making on immediate and long-term objectives.
        - Enhancing the community's understanding and involvement in managing their environment, with an emphasis on self-reliance and cultural integration.
- **Kalamaʻula**
    - Public Safety and Access
        - Street Lighting and Safety Concerns, Emergency Services and Evacuation, Community Involvement in Planning
    - Infrastructure and Maintenance (Roads and Culvert)
    - Environmental Concerns
        - Mangrove and Invasive Species Management, Flooding and Vegetation
    - Cultural and Historical Preservation
        - Historical Sites and Environmental Projects, Collaborations for Restoration
    - Community Resilience and Education (Building Community Capacity, Long-Term Planning)
    - Future Planning and Funding (Priority Projects, Funding and Resources)
- **Materials Shared:**Powerpoint presentation slide deck, MCH-CRP Tri-fold brochure, Maps, Comment Cards,
- Outcome/Next Steps: (Suggestions made)

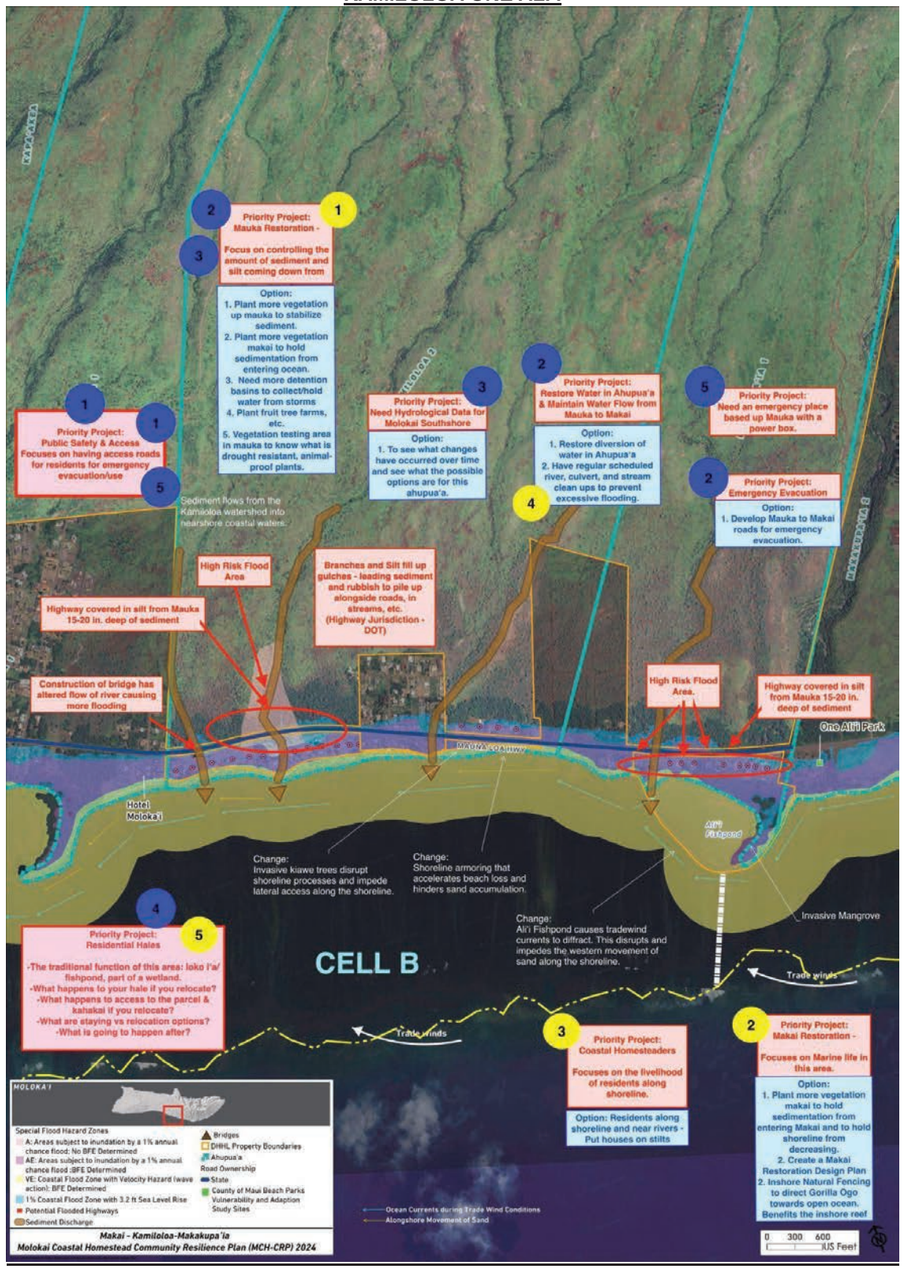
KALAMA‘ULA



KAPA‘AKEA



KAMILOLOA ONE ALI'I



7.20.24 - MCH-CRP Planning Hui Meeting #4

SM Office-4pm-6pm

- Recap of Workshop #3, outcomes and next steps
  - Extremely good discussion that was had within the small ahupua'a groups with the resource/experts rotating to each table for 30min or so slots each. Lots of good feedback from beneficiaries liking the format and collaboration with the resource/experts, as was really helpful for formulating details for priority projects, next steps, plan details, etc.

- Reviewed potential Workshop #4 Date Options & reviewed dates and planned for next big meetings such as Large landowner/leasees/ROE meeting, and Resource/Experts Meeting, etc.

MCH-CRP x Leasees, ROE, License, Large Landowners
Aug 26, 2024 @ DHHL/OHA Conference Room

Attendees:, Bridget Mowat (Kapa'akea Representative), Lehua Kauka & Mike Kahinu (Kalama'ula HA Board), Janice Ogoshi (Kalaiakamanu Hou Congregational Church), Shirley Nanod (Molokai Church of God), Hau'oli & Jamie Kalama (The Nazarene Church-Molokai), Nancy McPherson (DHHL), Heather Place & Katy Mokuau (SM)

Churches in Kalamaula (Church Row)
What have they been experiencing throughout the years?

Flooding -

- When Kalama'ula floods, the water comes up to the stairs of the church.
- Molokai Naz, On the hill so flooding does not affect them as much, But because the church is on a hill, this hill is full of rocks. They are working with the rock terrain they have, and with whatever water that they have to revegetate the land surrounding the church. Water is needed.
- Wildfire prevention may need to take action. Big heart behind restoring native plants, restoring mauka , keeping the sediment at a low for erosion. There have been conversations where members of the congregation have fear or worry about flooding.
- Mike Kahinu, Flooding is the main issue. The shoreline eroding away. Feel for their community that lives right on the shoreline.
- Church of God - Their church is lower, they live at the church. The area where the church is is like a bowl where it collects water and floods. The water comes up to the stairs. There is a spring underneath the church or in the area. The plants in that area are thriving, A group is coming to restore the church because of termites. Septic for Church of the God. But there is a septic between Church of God and Pomaika'i church.
- King tides have flooded Aunty Bridget's Septic
- Looking at the water pipeline from oloolo to kalamaula needs to replaced because it is corroding.

Plant Restoration:

  - Lehua Kauka, as president of Kalamaula Homestead Association. Writing grants for Kalama'ula Nursery - growing native plants, and restoring the ahupua'a. They know that everything that affects mauka will
  - SLR and change of currents have altered shorelines of all the islands not just MKK.

Mauka Restoration

- Go Mauka. When you relocate to mauka, they need to MALAMA. Let God and Nature do its course, buffer the land and sea, and move mauka. The aina cannot breathe. Move Mauka, maintain , malama, If people want to stay,
- To grow up mauka, What is still here that can be used. Have the studies done for mauka now.
- In 10 years from now, The churches are looking to eventually move mauka because there is no area or location that can have them be safe
- One time the parking lot was a lake. Now starting to think about relocating Mauka.
- Majority is saying that we need to spend our time and money wisely. Move mauka and stop spending so much time on shoreline whereas we can go up mauka, move residents mauka, and start malamaing the land up there. Let the shoreline go back to wetlands and be a buffer for land/sea.
- We need the funds to fund backhoes, tractors, etc. because we have the manpower just NOT the equipment.
- Ho'olehua Water system, where they only have potable water. Whereas they can use ag water for Ag purposes.

DHHL Meeting, DHHL Molokai District Office
Wednesday August 27th & Friday, October 18, 2024

Attendees: David Bush & Elroy Mollena & Myron (DHHL-Water), Katy Mokuau & Heather Place (SM), Nancy McPherson (DHHL Planner)

1st meeting: 8/27/2024: Go over basics of MCH-CRP with DHHL Water Operations Team and share maps, Beneficiary Meeting #2 priorities and discuss water/flooding/hazards and current emergency planning. All shared upcoming timeline of Beneficiary Meetings and collaboration meetings.

Water

DHHL Lines:

- West: Did change the laterals going west way to HDPE (High Density) copper is easier to maintain and repair.
- East: Not able to maintain and repair going to east which is the last house before the wastewater plant.
- DHHL is the only line in the purveyors system: that can provide for all the 3–CoM & Kawela & MKK Ranch
- CoM interconnection above Kalama'ula
- Every year, CoM needs assistance fr DHHL
  - Red hill is where the line splits goes for the water for town to Kawela.
  - Need to expand for the expansion of homestead.
- Well is 1500ft whereas Kawela's well is only 250 ft
  - Kawela has been testing with more salinity in wter. Need to move heigher for well
- Emergency Preparedness with EOC: DHHL avail to work w/ CoM in terms of emergency
  - ASK ZHAN!
  - Haven't run through scenarios-should start with Zhan/EOC
- Every 5 years to do the copper testing
- Every Year-By product testing

Water by
'Ahupua'a

- Kalama'ula
  - By Aunty Kauila Reyes was in the water. It was in water and manhole was in water where the land used to be
    - Moved the pipeline up 20 ft away from the shoreline
  - Kalani's property is right by the shoreline and fishpond.
  - Likelike: Drainage that comes from Brent Nakihei - 12in main line going through river bed, then a 6-8in higher up over river bed by Kalapana's hale.
  - Kalawe resident in Kalamaula Mauka - small river right there there is a water line going through that river

- Kamiloloa:
  - CoM meter on DHHL Parcel up top lot
  - County was supposed to drill a well up here years ago- nothing yet

Needs Going Forward:

- Extra Storage tank built up above Kalama'ula so it's above people, not above in Kalae
  - In terms of emergency, the extra tank can be used for emergency distribution of water to the residents in that area.
  - Need larger pump from 200-500 pump
- In terms of evacuation, the paved road to the tank above Kalama'ula would be the best bet and it connects with Kalama'ula Mauka road (kalaw's)

- MIS- DHHL
    - Need more manpower
    - Kalamaʻula-Potential to connect at blow out sections MIS
- Wells: Solar/PV project scratched, because MECO wouldnʻt allow
    - Solar/PV/ needed for the pumps
    - Have- Back Up Generators: 10-12 days generator
        - both pumps and both boosters running, 15 days generator ran, but refuel
        - MKK Ranch has generator so they can
        - DHHL has stub out for interconnection with CoM to help push that water to DHHL
    - MOU- with CoM & DHHL helps them all the time
        - CoM-35 gal/min & DHHL
        - CoM Pays Diesel and Water use-get billed
- Meyerʻs-DHHL Provides Meyerʻs lands

Wildfire:

- Kamiloloa: Myron has been going up and cutting back 30 ft on backside of the fenceline
- Kalamaʻula: County approached to do a back burn. Did one back 2014/2015 with Maui FD, and did firebreaks with controlled burn to train
    - MOU/Access needed.
    - There is the a road up to the water tanks and that will be the access for the Upper Kalamaʻula lot

Drainage/Flooding:

Equipment:

-Back Hoe
-Mini Excavator
-Mini Mini Ex.

Needs: -Big Excavator needed
-2 Polaris (Water system access & monitoring)

-Need more Staffing and Heavy Equipment to do this: especially Big Excavator, 2 Polaris-Water Resiliency
-Need to build capacity for Resiliency (fire breaks, drainage, water access)

Dec/Jan 2023-Flooding

Kapaʻakea:

- Myron and David was able to go to Kapaʻakea the next morning after the flood. Took them the whole day to clean.
- The loop road was cleared. Went into the driveways
- Pushed debris and sediment on the side, and waited until it cleared up to clear debris

DOT and CoM were responding down in Manaʻe, so only DHHL responded

- **Kalamaʻula**
    - Kekama/Helms had to respond
        - The only one that Myron cleans on a regular

All Areas:

- Water System
    - only water service on-island with back up electricity generation! CoM has no back up generators for their water supply/pump
    - NEED: Agreement/MOU with CoM/EoC/ for water use & aid
    - Alternative water sources are needed
        - More storage tanks

        - Water Catchment
        - Water/Air Generators, etc.
- Flood/Drainage Study
    - Update: H& H Hydraulics, contractor
    - CWORM- Water specialist with and Stream Diversions and History diversions need to be looked into for future flood planning
    - ʻAina Momona is working on water diversions and should go look at their project for reference
    - Projectile/ʻOpala Removal will be helpful to clear obstructions & hazards-contact CoM EP&S to schedule pickups/haul aways
- Mauka Restoration
    - Restore watershed Mauka Portion-in between Mauka restoration would be necessary. Nothing is being done outside of the fenceline for the watershed and extended restoration where animals/ungulates food sources are needed where all are in collaboration.
    - Lowland: Kipukaʻs at water sources needed also
- Emergency/Evacuation:
    - Coastal Homesteads could have options for portable boat ramps between designated house
    - HIEMA/MEMA: Emergency plan was submitted by Halealoha, need to request and probably update
    - Emergency Routes: Access Points & Gate access needed to be mapped and coordinated with HHAʻs.
    - Safety Zones/Evacuation sites with CoM & DHHL Partnership needed, as necessary for water use/access in some areas
        - Partnership/Designation/Perimeter for Wildfire & Defense space

Kalamaʻula:

- Water System/Emergency/Evacuation
    - Kalamaʻula: Water Tank, Can tap into for Emergency Service, has reserve, has paved emergency access road & has back up generators
    - DHHL/CoM Agreement in process for mutual aid
- Wildfire:
    - Firebreaks work in process, hold up was with machines CoM Molokai was waiting for

Kamiloloa/Kahinani:

- Water System/Emergency/Evacuation
    - Kamiloloa: CoM Water Tank, off dirt road that needs 4wheel drive. No backup generator power source, has makai booster.
        - This is the water storage for the heights.
        - NEED:
            - Access-Need better access to the Water Tank
            - Backup Energy source needed for use of tank/pump
            - DHHL/CoM Agreement in process for mutual aid & access to gate & water use at tank, may need to be installed
    - Ableve Kamiloloa & Makakupaʻia and One Aliʻi there is no water source/storage tank for DHHL or CoM. There are old wells up there but no need for them to pump more
    - Evacuation Site
        - Kamiloloa had been identified by Kapaʻakea & Kamiloloa One Aliʻi as Emergency site above 4th Heights/Kahinani where there could be access to the CoM Water Tank.
            - Needs identified above
            - Need Emergency Plan for Kapaʻakea & Kamiloloa One Aliʻi homesteads and what that means for

Next Huakaʻi scheduled for: October 19 & November options for David/Elroy requested to attend

9.26.24 - Resource/Experts Meeting 12-2PM @ SM Office

- Attendees: Tina Schonely & Jordan Poaipuni (Kapaʻakea Board), Kalani Johnston (Kalamaʻula Board), Todd Ragsdale (Kamiloloa One Aliʻi Representative), Sybil Lopez (SCHHA Molokai Mokupuni Rep), Mango Stephens (Kalamaʻula Beneficiary), Zhantell Lindo (CoM EOC), Keʻo Hirata (Molokai Burial Council), Councilmember Rawlins-Fernandez, Juanita Colon (Rural Water), David Bush & Elroy Mollena (DHHL-Molokai District Office-Water Operators), Harrison Togia (UH Seas, CoM County & State Roads Assessments Team)), Tara Owens(CoM & UH SeaGrant-Coastal Process/Hazards Specialist), Butch Haase (Molokai Land Trust), Kristen Harmon & Helen Raine (Molokai Land Trust), Henry Lindo (CoM Fire), Thorne Abbott (DHHL SM-SEMP Planner), Nancy McPherson (DHHL), Katy Mokuau and Heather Place (SM), Barbara Natale (G70).
- Purpose: Discussing resilience and brainstorming together to address current hazards in the DHHL homestead communities of Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi as presented by the Beneficiary Representatives by each ahupuaʻa
- Lunch: Makaʻs Korner: Korean Chicken, Green Salad, Rice

- **Kalamaula (Kalani report):**
  - Kalani highlighted issues with flooding, where sediment is carried down during heavy rains.
  - The state manages cleaning on the mauka (mountain) side of the culvert but not the makai (ocean) side, creating uncertainty about jurisdiction.
  - The insufficient management leads to water flowing to the sides, resulting in flooding of homes, and relief measures are needed.

- **Kapaakea (Tina):**
  - Jordan discussed the impact of continuous heavy rains and flooding in Kapaakea, emphasizing the need for an evacuation plan for events like tsunamis.
  - The region lacks adequate drainage, especially within the ahupuaʻa (land division), contributing to flooding in this wetland area.
  - There is a need for assistance or grants for families to cover costs of renovations or potential relocation due to the flooding.
  - Restoration efforts should start from the mauka side to manage sedimentation effectively.

- **Kamiloloa One Alii (Uncle Todd):**
  - Todd noted that most homes are on the makai side of the road, where flooding is highly concentrated.
  - Emphasis was placed on understanding the relationship between mauka (mountain) and makai (ocean) areas for proper restoration of stormwater flow.
  - The plan should focus on mitigating shoreline damage and balancing the brackish water nursery crucial for fish.
  - Suggestions include using water storage tanks to reduce water costs and support agricultural activities.
  - Restoration efforts need to consider past changes in shoreline boundaries and sedimentation, as well as the impact of changing tides and currents on the environment.
  - Coir rolls were proposed as a solution to manage sand and wind, helping maintain natural slopes and stabilize the shoreline.
- **Materials Shared:**Powerpoint presentation slide deck, MCH-CRP Tri-fold brochure, Maps, Comment Cards,
- **Outcomes/Suggestions per Breakout Groups by Priority Areas**

- **Water Group:**
  - **Water Supply**: There is a need to bring in treated water. Water sources include wells that went down in 2009, relied upon by both the county and Molokai Ranch. There is a backup generator, but progress on using available funding for water issues is slow. Discussions include backup plans for water catchment systems and natural alternatives to conventional water infrastructure.
  - **Flooding and Stream Maintenance**: Flooding affects all ahupuaʻa, particularly Kalamaula. Stream maintenance involves working with land management and development to address stream elevation issues, supported by engineering studies and drone surveys.
  -
  - **Stream Path and Drainage**: DHHL (Department of Hawaiian Home Lands) has equipment for stream maintenance but is cautious not to disrupt natural water flow without engineering expertise.
  - **Ololo Laterals**: High salinity is corroding pipes near coastal areas, necessitating replacement of main water lines.
  - **Water Agreements**: A water agreement with the county has expired, requiring renewal.
- **Conservation Group – Kalamaula:**
  - **Community Initiatives**: Efforts include plans for a community park and nursery aimed at multi-generational benefits for food security, education, and conservation.
  - **Deer Management**: A proposal is in place to manage deer populations, which could contribute to food security.
  - **Flooding Challenges**: Kalamaula faces significant flooding from two main rivers. Blocked culverts and debris accumulation near mangrove areas worsen the situation, spreading water and causing damage.
  - **Historical Waterways**: Restoration efforts could involve studying old water channels (auwai) used by ancestors, which could guide current water management.
  - **Land Access Issues**: Access to certain homestead lots in Kalamaula remains a challenge, with locked gates preventing residents from managing their lands. This is tied to unresolved jurisdictional issues with DHHL and the county.
  - **Limu (Seaweed) and Water Quality**: Community members have learned about limu, noting that freshwater flow is essential for healthy marine ecosystems, including fish habitats.
  - **Firebreaks and Planting**: Planting native species in strategic areas acts as a firebreak and helps prevent erosion.
  - **Reforestation**: Efforts include reforestation above Kalamaula, with plans to use water sources from Kalai down to support these activities.
- **Infrastructure Group – Kalamaʻula:**
  - **Road Management**:
  - **Deer Management:** is necessary for Holistic approach/planning

- **Conservation Group -General(Kalamaula, Kapaakea, Kamiloloa One Alii)**
  - **Fish and Coral Monitoring**: Ongoing efforts by DAR focus on monitoring fish and coral health in areas like Kamalo, Kamiloloa, and Palaau, with priority on marine areas from Kalamaula to Palaau.

- **Erosion Management**: Community members, along with organizations like Molokai Land Trust and the Molokai Watershed Partnership, are addressing erosion concerns.
- **Wetland and Mangrove Management**: The aim is to manage rather than remove mangroves as part of wetland restoration, focusing on stream restoration with community collaboration.
- **Stream Team**: The Division of Aquatic Resources (DAR) has a team focusing on streams, seeking to work with homestead associations for data collection and community engagement in stream management.
- **Community Engagement**: Efforts are being made to include residents in conservation plans, emphasizing the importance of community knowledge and permissions for conservation activities along streams.

Summary/Recap by each Ahupuaʻa:

Kalamaula (Kalani):

- **Mauka Restoration**: Focus on restoration efforts in the upland areas (mauka) to support water flow and conservation.
- **Mangrove Management**: Emphasizing managing mangroves rather than eradicating them to maintain balance in the ecosystem.
- **Jurisdiction Clarification**: Working to determine the appropriate jurisdiction for cleaning out a blocked culvert.
- **Auwai and Aerial Surveys**: Plans to utilize drones for aerial surveys of original water channels (auwai) to aid in restoration and land management.
- **Land Access**: Efforts to assist Wailana in regaining access to her land in Kalamaula, potentially aiding in local restoration and conservation efforts.

Kapaakea (Tina):

- **Emergency Planning**: Plan to communicate with Nancy about developing an emergency plan.
- **Memorandum of Understanding (MOU)**: Working on an MOU involving the water department and landowners to secure agreements.
- **FEMA Funding**: Aiming to secure FEMA funding to support emergency management and mitigation efforts.
- **Cesspool Options**: Preparing for an upcoming meeting about cesspool management and exploring alternative solutions.

Kamiloloa One Alii (Uncle Todd):

- No specific next steps or actions were mentioned specifically for only Kamiloloa, but lots of the above summary/recap are related to Kamiloloa as well.

Huakaʻi's
Saturday, October 19, 2024
Kalamaʻula & Kamiloloa locations only
Not Kapaʻakea location but Kapaʻakea board attended
(awaiting access through leasee area)

- Attendees: Nancy McPherson, Katy Mokuau, Heather Place, Cody Winchester, Sumu Asano, Enoka Nahoʻopiʻi, Wailana Moses (MLT), Dennis Kamakana (MHLA)
- Purpose: To bring and show beneficiaries a different perspective of their Ahupuaʻa and visualize future projects.

- **NOTES:**
  - Water is a big issue in this area. MIS line runs right through this Ahupuaʻa. (Cattle drink from Potable Water lines whereas they could be drinking Ag Water.)
  - 200K Tank would be a perfect area used for an Emergency and Evacuation Area.
    - Water can be used in this area in times of emergency.
  - Land Use
    - Some parts of land are flat and hillsides, could be perfect for residential lands and maybe a resilience center for this community.
    - MHLA is above cattle gate→ Homelani Cemetery→ Puʻu Luahine
      - From 192, has 9 paddocks (rotate animals)
        - Usually had 700 head, but due to recent drought for the last 10 years herd has decreased → 200-300 head now
    - DHHL/COM in process for mutual aid
  - **Suggestions**:
    - Land use: Ag Lands closer to Road should be changed to Residential. Land is too rocky to produce any type of farming. Whereas more mauka can be used for Ag Land.

Location: Kalamaʻula Huakaʻi Attendees: Nancy McPherson (DHHL), Katy Mokuau (SM), Heather Place (SM), Cody Winchester (G70), Sumu Asano & Enoka Nahoʻopiʻi (Kapaʻakea Board), Wailana Moses (MLT), Dennis Kamakana (MHLA)

- Water Tank
  - Tap in for service 200,000 gallon has reserve
    - DHHL Has 2 pumps and generators
    - COM - no generators / 1 pump
    - MIS Line
      - Extension needed
- SM x MHLA: AG lot for cattle feed– fiscal sponsor
- Kalaeloa: Ship to container of cattle
- Wildfires
  - 80ʻs Fire burned all the way up to Kalamaʻula (Red Hill)
  - 2009 Last fire
  - DHHL Options
  - Floating for portable boat ramps between designated houses
- Wildfire prevention (MHLA)
  - Firebreaks
  - USDA had continuous funds for firebreak
- Wildfire land task force
  - Hanalei Lindo, lessened
  - Lance DeSilva, DLNR
  - DOFAW
  - Zhan (Emergency)
- Roads
  - MHLA above cattle gate
- Molokai Homestead Livestock Association (MHLA
  - From 1992, has 9 paddocks (rotate animals)
  - Usually 700 head
  - With drought for the last 10 years, ranchers have to rotate animals and use all pastures
  - Only 200-300 head now
  - Cow/Calf operation until 500lbs ship out
    - No TB, TB-free only @ this location
    - Need high fencing in areas to protect from deer
  - If drought continues, the amount in their herd will have to be cut down.
  - Dohna Bicoy, USDA
  - Potable Water is feeding to cattle
- For Big/Rain Events: Huge Catchment Systems: Bioswales, Tanks, to hold to grow crops in swales
  - MLT has done this in Kawela and itʻs working and can start with fencing small area in the
  - swales or bottom of the gulches where rain typically collects

Location: Kamiloloa Huakaʻi Attendees: MCH-CRP Team (list names), Sumu Asano & Enoka Nahoʻopiʻi (Kapaʻakea Board), Hala Pa Kala (Kamiloloa Board), Kahekili Pa Kala (Kapaʻakea Board), Wailana Moses (MLT)

- Kahekili has background in Mauka Restoration with ʻĀina Momonaʻs efforts in Keawanui.
  - He believes filters in bigger rivers will help the amount of debris that reaches our south shore and residents.
    - Filters include big trees laying down perpendicular in river
  - Land looks promising due full coverage of grasses and low count of invasive tree species, i.e. Haole Koa and Kiawe.
  - Suggestion: Have a separate Huakaʻi to look at Keawanuiʻs Mauka Restoration Efforts. Compare the Keawanui to Kamiloloa and Kalamaʻula to see if viable in these areas.
- Water is the issue in this area. COM Water Tank above Kamiloloa- IF/WHEN DHHL moves residents in this area, will DHHL Beneficiaries pay County rates? Will the water come fr CoM?
- Kamiloloa (Above Kahinani Place) would be a viable area for Evacuation and Emergency Area.
  - Suggestion: To open up access gates from 1st, 2nd, and 3rd Heights for emergency access to Mauka.
- Aerial droning for 4WD Road Mapping, River Bed Studies, Erosion Studies, etc.
  - Makai Booster station for height
  - COM - no generator, 1 pump, no backup
  - CWORM: Water specialist with and stream diversions + history diversions
  - Access Points and Gates
    - Only 1 access at Kahinani. Option of opening up access and gates throughout Kamiloloa.
  - Create safety cones with COM & DHHL partnership and designation and perimeter wildfire/defensive space
  - Create Evacuation Site with Emergency
- Projectile/ʻOpala Removal
  - COM - Michell McLinden
- Mauka Restoration:
  - Restore watershed mauka portion (in between mauka restoration)
  - Elroy: Nobody is doing anything out of the fenceline watershed extended restoration where animal/deer/food sources are all in collaboration
  - Low land Kipukas by water sources
  - Game Management
    - Molokai Hunting Club MHC
      - Data from clubs
      - YR 2 of BY/MHC Collaboration
      - Education for hunting target management
- Water
  - No DHHL Water, COUNTY ONLY @ Kamiloloa & Makakupaiʻa One Aliʻi
  - Has old wells up there that no need for them to pump more
  - COM/EOC/Zhan needed agreement for water use
  - Alternative Water Source Needed
  - More storage tanks
  - Water catchments
  - water/air capturers
- Kamiloloa / MHLA
  - Roads/Access needed for Kamiloloa for cattle, for restoration, etc.
  - Land designation

11.13.24 - Resource/Expert Meeting with DOT

Department of Transportation State Highways Division : Lee Marquez - Molokai Base

Where is DOT jurisdiction?
Of All State Highways both sides until electric line, or private Above and below culverts 15 -20ft varying on area.

What is your process when it comes to road maintenance and culvert maintenance?
1 - Regularly highway cleanup Monitor regular and yearly cleaning, contractors on call if need to address.
The culvert is little in size (undersized), they have been trying to figure how to get the flow of water with dealing with CC and SLR. Especially with restrictions. Cannot divert water.
Kalama'ula Mauka cleaned DHHL paid private contractors to widen and removal of debris Palekas in the old Kalam'ula troy, paleka, lauifi, poepoe, kahinu

Do you have a set schedule when preparing for flooding or future flood events?
Kalama'ula - 20ft both side head clearance 7' under bridge. Inlet and outlet
Buffers in easements or culverts varies on road.
Boundary marker
Water meter, utility poles by water than it is in jurisdiction, if not it is out.

Kapa'akea state jurisdiction

Is there a way for DOT to get a permit to do more clearing outside of their jurisdiction to help the island and community with maintenance?
They have the equipment, and the manpower and is willing to help.

Graveyward - state that has regualr maintenance
Whatever passes DOT
- Uncle Lee has a database for State highways

Restrictions leave DOT to do less, COM can do more.
3rd river 75total ft.
Willinging to work with and for private lease or property owners to work higher up.
Send DHHL database to uncle Lee

12.02.24 - MCH-CRP Resource/Expert Meeting

Debra Kelly NRCS

Attendees: Debra Kelly (NRCS), Nancy McPherson (DHHL) Barbara Natale (G70), Heather Place (SM)

Soil Conservation -
EPA grant - identify hazards and vulnerabilities
Work completed to date - technical experts
Work with County

- Kapaakea - went with homesteaders to identify culverts that trash was being thrown in. Gardens being planted in. asked them to keep them clean. Educate on importance of water ways. Not to be used as personal use. Old slaughter house. Sediment basins. National programs to help build sediment basins. 100 ft easement owned by county. No drainage across highway. Want water to flow to wetland. Goodfellow did not want to assist

- Cleaning waterways. Identify conversation practices that could be implemented. Filter strips, sediment basins,
  - She has maps and reports - 2 year study. Land restoration. Inland pond east of kapaakea wanted to restore. Clear out the pond. Inland fishponds were for - reduce sediment going to ocean.
  - Dumping of junk cars / trash
- Put in firebreaks. People using fire breaks for personal use / dumping trash. Easy to throw over the fence.
- Homestead pasture project - did fenceline. Overgrazed. Lots of erosion coming from here. Grass plantings.
- Projects identified previously - on the right track
- Debbie will pull records and send - hopefully this week.
- No final report - only quarterly reports and meeting notes. Lost staff before the final report could be made.
- Cultural resources study, talked to land owners. Entire south shore.
- DHHL looking to EPA and femA - good to document past efforts. Revive information and take to the next level.
- **Slow down stormwater and retain it mauka before ever reaching the highway. Sediment basins. Identified best places to do sediment basins.**
- **How to get ag water**
  - Historical records - who did what and when.
  - All reports went thru DOH - clean water act
- 2017 portrait of sediment …. Fringing reef
  - Reef is dying. Another level of protection that could be lost. Need to stop the sediment.
  - Takes a lot of partners
  - Malama Park - Wharf - not as bad as what people think. She has a study on it.
- Mimicking work happening at Lahaina - sediment control. Spent millions to construct structures. Maintenance will fall on landowner. Would fall on DhhL. Community groups / assoc will be able to assist. Need equipment. Need place to put the sediment.
  - Landowner issues in the past.
- Kapaakea - divert water around both sides. Clear mangroves. Direct water to wetland.
  - Mowat family - cinder pit
- Kaunakakai master drainage plan
  - Where to put floodwater - need outlet.

- Property for sale - with house in front.

MCH-CRP x Russell Kallstrom
December 11, 2024 Via Zoom

Attendees:
Russell Kallstrom (TNC), Katy Mokuau, Cody Winchester, Nancy McPherson, Heather Place

Kewelo intakes no longer operational.
Noted that streams used to feed the fishponds. No longer do.

Native Plants:
Deer do not like to eat Pohinahina and Akia

- **Talk with aunty Lori about Invasive species planning/MoMisc: dangers, threats etc, ask to A Lori to come to Workshop #4 for educational**
  MoMISC will be focusing 50% of their time on CRB threats for Molokai, starts in Jan
  - Invite one of KHHA board members to it Aunty lehua, Uncle Lawrence, Uncle Kalani or Uncle Kaleo that were the point ppl for Kapūaiwa Grove
  - Short Term Results:
    - Team help facilitate this educational
      - Workshop #4: Coconut Rhinoceros Beetle (CRB):
        Inter -island Transport is a danger, something to advertise and do education to the beneficiaries on, comes through soil & fertilizer, etc. with Gorilla Ogo additives
      - DAR Patricia

Gulches:
2023 -Fencing steep gulches in
-Need to get feedback from beneficiaries for what can be managed with community hunting & also, etc.
-Game Management
-MHLA has been really helpful in the past to keeping fuel down traditionally
-In recent years 2015 to present that
-Axis Deer Study through 2015-2020, drought and redistribution of animals, many went more mauka and away from west end &
-Collaborative work with MHC, Community hunters, etc.
-18% is maintaining population, and increase in happening
-Game Management: Need to do data collection &
-DHHL: has been doing drone flights and topo and can do infrared scan
** Do a separate combo

Deer/Ungulate Mitigation:
-Do a separate meeting
Community reluctance about fencing. Need education.
Food nurseries and provide feed for deer.
-Kawela area, multi prong approach of such
-following rim of gulch and coming back up and really steep and not really huntable
-flat lands can still be used for hunting
-Contour fencing hasn't been tried w/ TNC yet

FIRE
-Interviewing David & Zhan, etc. Fire task force
-DoFaw is supposed to get a new bulldozer, can that be helpful with fire breaks, etc? & is working on passable & driven

Key roads:
All areas are prone to burn. Things getting drier and hotter with higher winds. Witnessed unprecedented winds this year. 2009 fire started in the heights and burned west to Kalamaula and then turned back around. What would be helpful is to have fire break roads around the homestead areas to protect houses and create network that firefighters can work with and stop movement of fire.
-2nd Heights/Schafer roads
-Makakupaia
Build road system around areas where directing new development for managed retreat. Critical to stopping fire.
Road planning is critical - evacuation, redundant engross, fire breaks, emergency vehicles.
Condition of roads can be a factor to runoff. Design roads correct way - repairing, maintaining, and designing new roads is a mitigation.
-Fire breaks and Fire mitigation: David Hope @ DHHL

Reef & Makai restoration:
Sedimentation basins worth exploring.
Kipuka style restoration - fenced area that naturally collects water. Plantings.
Fencing gulches may be a good way to go. That is what TNC is trying in Kawelo. Fence gulch where large amounts of water are going. Allow them to revegetate on their own or supplement with plantings. Act as sieve to catch overland sediment. Prevent it from all flowing sediment on to the reef and causing flooding.
Have decreased the amount of sediment being dumped into stream by 4 fold in Kawelo. Response on reef hasn't been as hoped. Starting to see baby corals come back closer to land. 8% reduction to sediment on reef.
Animal control fencing does work. Area in Kawelo is too steep to hunt.
Annual Report to the 25th Legislature
https://www.nature.org/en-us/newsroom/makolelau-acquisition/

Criteria / configuration for fence design. What does community feel it can manage.
For Kawelo - fence followed rim of gulch. Flat lands can still be used for hunting. Could explore more contour planting. In that case divert from straight edge along rim. Gulch fencing can be more expensive and complicated. Get feedback from beneficiaries on how they see the network of fencing working and what they think can be managed by community / org (like hunting club).
-Need to have a separate meeting for this
-Speak to Uncle Mac
-Kim Salensky: TNC Estuaries & Wetland expert
-Cultural sites in water also, not just on land, like Kalokoloa
-Kamiloloa used to be a fishery and so the historical bounds go down into the water, get that ahupua‘a bounds into water, to outer edge of the reef
-Go to traditional boundaries of ahupua‘a
-Russel & Pūlama for traditional boundaries
-Ask for flyer for Jan video
Advertise for this with Homestead Associations:
Screening on Sedimentation Video: Jan 13th Matt video

MCH-CRP x Lance De Silva
December 18, 2024 Via Zoom

Attendees: Lance DeSilva (DLNR-DOFAW), Katy Mokuau & Heather Place (SM), Nancy McPherson (DHHL), Cody Winchester (G70)

Mauka to makai restoration

Funding: NOAA–Maui 10M

- restoration mauka to makai
- Sediment basins, remove deer from the top
- Mirror project, design process rn
- Working with TNC Maui with sediment basins easier to clean and restore
- Lance will send links for this type of work they are working on

Need to do animal removal and fencing-seeing a big difference of the removal of deer

Animal Maintenance, collecting water on the bottom, and seeing a way to utilize

- Sediment basins
- Animal control - by helicopter (on maui area is not accessible and landlocked so no public access)
- Fencing gulches to help plants regrow and create buffers
- DLNR faced challenge on Molokai before. Residents only wanted molokai hunters to hunt lands. No DLNR workers.
- DHHL cannot hunt own land. Only DLNR can hunt land.
- Tradeoff / Concessions have to be made to allow state to hunt DHHL lands on Molokai.
- Julie Cachola working on fencing project at Kahikinui. It is a DLNR fence.

Address Impacts to reef from sedimentation-Utilize nature based solutions

Designing sediment basins so that they can be accessed and cleaned out after each storm

Lance will share information about project

Replanting erosion scars with low stature plants - not fire fuel

Paid positions for beneficiaries to do the work- partnership with other agencies that can help kokua the effort (hunting club, Molokai land trust, wetland partnership, ,etc.)

Fix the roads

Kahikinui Project on Maui - people against removing animals. Controversy and infighting between beneficiaries. Paralyzed project. One group wanted to restore area and other group was against removal of animals. Cattle, goat, deer, and pig (the big 4). Project didn't go anywhere because community couldn't make consensus on direction.

Plan to meet with Lance again in January after reviewing the information he shares.

Fire a big issue when restoring areas. Fuel breaks, grazing breaks in the right places.

Requesting Lance speak to beneficiaries at Molokai. Need clear agenda.

Waiohuli Project

Millions of dollars and years of conservation work can go up in smoke in one day. - Lance

Must consider fire. Powerline along highway beneath the project area. Fire started along highway from powerline. Whole area burned up.

Molokai did control burning in the past. Nancy has records.

Attend/Present at Kalamaʻula Homestead Association Meeting
January 14, 2025-6 PM

Katy Mokuau & Heather Place (KD) facilitated

Attendees: KHA Board and Beneficiaries

- Talked through recapping where we were in, this projects planning process, the next steps and the rescheduling for a makeup Huakaʻi for KHA only.
- Details for the huakaʻi logistics were discussed and planning for the next steps of project.
  - Outcome: The board was going to ensure the other representatives from their association would be able to come and Commissioner Lasua was confirmed also. The agenda and locations and access were discussed also.

Kalamaʻula only Huakaʻi–
Saturday, February 15, 2025

Repeat because the board members had to cancel last minute for 10/19/24 Huakaʻi due to emergencies/family etc.

Invitees: Since it was a repeat Huakaʻi, because the board members had to cancel last minute for 10/19/24 Huakaʻi due to emergencies/family etc., Kalamaʻula Board President Aunty Lehua was in charge of inviting board members and reps for their ahupuaʻa to join as there were limited 4 wheel drive vehicles to provide transportation on dirt roads up.

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Attendees: Lehua Kauka (Board president)**, Lawrence Lasua** (Commissioner)**, Mike Kahinu** (Board Member)**, Brent Nakihei** (Board Member), **Nani Kahinu, Shanna Willing & husband, Nancy McPherson** (DHHL) **, Katy Mokuau** (SM)**, Heather Place** (SM)**, Hina Hirata**(SM-Photos), **Tehani Kaalekahi** (SM), **David Bush**(DHHL)

Agenda:

8:30 am	Everyone Meet at Kūlana ʻŌʻiwi Parking lot.
9:00 am	Head over to DHHL gate in Kalamaʻula - top of Kahanu Street.
10:00 am	Head down from Mauka in Kalamaʻula (Kahanu Street) and head to Forest Road by Puʻu Luahine
11:30 am	Head down from Forest Road to Kalamaʻula Shoreline by Boat Ramp (Walk the shoreline at minus tide)
12:30pm	Lunch Break at Sustainable Molokaiʻs Office
1:30 pm	Pau

Areas to go to:

Kalamaʻula Mauka (Water Tank Road-DHHL) → Puʻu Luahine

Kalamaʻula Makai (Kapuaiwa)

- Mauka: Emergency Planning: Water Tank-Evacuation Site & Emergency Water:
    - Identified by Kalamaʻula throughout project as an evacuation site, confirmed by District Supervisor that would be a great place for that.
    - Pressure Relief Valve Procedures & Policies need to be created btwnn DO & KHA Board.
        - Spigot accessible inside gate
        - Emergency Preparedness Plan Needed:
            - Access: could have combo lockbox/ or key access potentially, etc. District Office would regulate permission, etc.
            - Shelter: Could have something up here for emergencies- i.e. shed, storage container with supplies, etc.
                - Best to locate across road from water tank
        - Fire:

          Firebreaks:
            - DHHL working with 100ʻ Firebreak–Tancayo to Linkeeʻs to maintain
            - Havenʻt done anything yet
            - Timeline: Limited ROE 30 days pau Jan 1-31, so needs reapplication ”
            - Fire Hydrant accessible outside gate: best location of better flow and new relief valve.
                - Fire Hydrant comes from Kalae source
                - Not Tested, A. Lehua will notify the Fire Dept. for consult
                - Lines to hydrant are now 12” line, and need to text if hydrants can be run at the same time
                - CoM Fire: drops hoses for homesteaders and homesteaders fight fires because they donʻt put firefighters at risk for brush fires
            - Recommendations
                - Hook up regulator on back tap on fire hydrant
                - Firewise training for Residents, Kalamaʻula HA has worked on Firewise projects, but arenʻt a registered community yet

- **Makai:**
    - Erosion obvious at shoreline and uprooted trees along makai spring, getting worse
    - Invasives: like Gorilla ʻOgo has been coming in with tides
        - Workshops by KHA want to be done periodically for Spring Clean-Ups
            - Aunty Lehua will reach out to Limu Hui and DAR Molokai
        - Mitigation Shoreline Measures:
            - Clearing park-David/DHHL will look into Contract w/ MoC and terms, etc.
                - Park was really bad, with green waste everywhere, buckets of water with coconuts breaking plastic near springs, etc.
                - On-Site controlled burning is allowed in very small sfʻs
                - Priorities:
                    - 1. Manage Green Waste
                    - 2. Clear out springs
                    - Remove Invasive Species
                    - 4. Shoreline: Gorilla ʻogo partnership/cleanups
                - Grants/Funding Sources:
                    - Needed for DHHL Office or DO of Writer for Grants
            - Levels of Water/Filtration levels naturally should be used
                - Level 1- Swale above in mauka as first system
                - Level 2-Kalo/ʻUala terraces

- Level 3-Mala that can withstand brackish/tidal waters

MCH-CRP Beneficiary Meetings #4: What can be done?
What are possible implementation options?

04.08.25 - Kapaʻakea & Kamiloloa -Held after Kapaʻakea Homestead Association Annual Membership Meeting
At Kapaʻakea Homestead-Greenleafʻs Residence: 6-8PM
Nancy McPherson (DHHL) & Heather Place (SM) facilitate
Attendees: Kapaʻakea Board and Beneficiaries

- Handouts: Priority Projects Matrix & prelim Potential Ahupuaʻa figure/map
- Quick Recap of process & progress up until now
- Work all together: Go through Priority Projects Matrix of strategies and projects that pertain to Kalamaʻula one by one. Nancy/Heather facilitated and the board and beneficiaries went through each area in terms of details, funding, responsible parties, etc.
- Lots of questions and discussion on DHHLʻs role for implementation strategies, next steps, DHHL history and pilikia and talked through issues.
- Outcome: Clarity gained in the discussions and questions together. Asked the Board and reps to comb through the Priority Projects Matrix together in their next meeting to see what needed to be refined/added/etc. Gave beneficiaries all copies and time to review in more detail for additions/changes to come.

04.16.25 - Held as part of Kalamaʻula Homestead Association Meeting
At Kulana ʻOiwi-OHA/DHHL Conference Room 6-8PM
Katy Mokuau & Heather Place facilitate (SM)
Attendees: Kalamaʻula Board and Beneficiaries

- Handouts: Priority Projects Matrix & prelim Potential Ahupuaʻa figure/map
- Quick Recap of process & progress up until now
- Work all together: Go through Priority Projects Matrix of strategies and projects that pertain to Kalamaʻula one by one. Katy/Heather facilitate and board and beneficiaries made changes, comments, additions to each area in terms of details, funding, responsible parties, etc.
- Outcome: Very thorough review and additions and changes gained in the 2 hours work put in together to comb through the Priority Projects Matrix. Very collaborative meeting by all and very productive to get to more specificity for the Priority Projects and fleshing it all out

MCH-CRP: Kapa‘akea Homestead Board Meeting
December 3, 2025-5:30pm
Katy Mokuau (KD) facilitated
Attendees: KHA Board and Beneficiaries

- Handouts: Priority Strategies & Projects and Ahupua‘a Map & Table: 11x17 Print-outs
- Talked through recapping where we were in, this projects planning process, the summer pause/gap per contract/personnel changes, the Act 96 incorporations, confirming the top Strategies and the first 5 specific Priority Projects, and next and last meeting-Beneficiary Meeting #5 potential dates for January. The Jan 5 release date of the Draft Plan was also shared.
- The revised ahupu‘a map with the updated table for their area was shared and the previously voted on Priority Projects and Strategies were highlighted. Review of some of the projects that were broken out into multiple smaller projects & planning processes and the board confirmed the top 5 specific Priority Projects, based on the previous voting by their beneficiaries and other projects & initiatives that were coordinated with during this process or are happening simultaneously that could cover some of the priorities.
    - Outcome: Many were going to plan to attend Beneficiary Meeting #5 and would review their 5 Priority Projects Matrix details as they could prior to the Comment Period opening. Great discussion was had through the added details and shaping of the Priority Projects and requests were made by the board to ask other members of the Planning Dept to attend, as the Planning Director did attend for the 1st Beneficiary Meeting and they thought they should attend for the last meeting as well to close.

MCH-CRP: Kalama‘ula Homestead Board Meeting
December 9, 2025-6pm
Katy Mokuau (KD) facilitated
Attendees: KHA Board and Beneficiaries

- Handouts: Workshop #1 Presentation Print-out
- Talked through recapping where we were in, this projects planning process, the summer pause/gap per contract/personnel changes, the Act 96 incorporations, confirming the top Strategies and the first 5 specific Priority Projects, and next and last meeting-Beneficiary Meeting #5 potential dates for January. The release date of the Draft Plan was also shared.
- There was discussions about the revised map showing the projects very well and appreciating seeing them all on the revised map within their area.
    - Outcome: The board was all going to plan to attend Beneficiary Meeting #5 and would review their 5 Priority Projects Matrix details as they could prior to the Comment Period opening. Great discussion was had about the other ongoing projects pertaining to their top Priority Projects, which they would mark up to include as comments for January‘s comment period. Updates for Kalaniana‘ole Hall and Kiowea Park pavillion was shared as well as the request to combine some of the Historical/Cultural areas into one project. Also discussion was had that confirmed the projects that were switched to the DHHL List for their priorities.

Table of Partnerships, Roles, Jurisdiction and Responsibilities

Partnership Roles, Jurisdiction, and Responsibilities

Federal Partners

Partner	Jurisdiction & Authority	Role in MCH-CRP
Federal Emergency Management Agency (FEMA)	Hazard mitigation, disaster assistance, resilience grants	Emergency preparedness, mitigation funding, relocation guidance
National Fish and Wildlife Foundation (NFWF)	National Coastal Resilience Fund	Funding for nature-based resilience projects
U.S. Army Corps of Engineers (USACE)	Flood risk management, dredging, shoreline protection	Technical review, flood modeling, permitting guidance
National Oceanic and Atmospheric Administration (NOAA)	Climate science and coastal management	Sea-level rise modeling, coastal restoration support
Natural Resources Conservation Service – U.S. Department of Agriculture (NRCS-USDA)	Soil health, erosion control, agricultural conservation	Mauka restoration, erosion mitigation, conservation practices

State of Hawai‘i Agencies

Partner	Jurisdiction & Authority	Role in MCH-CRP
Department of Land and Natural Resources – Division of Forestry and Wildlife (DLNR–DOFAW)	Forest management, wildfire prevention	Mauka restoration, wildfire mitigation, invasive species control
Department of Land and Natural Resources – Office of Conservation and Coastal Lands / Coastal Zone Management Program (DLNR–OCCL & CZM)	Coastal permitting and shoreline regulation	Review and permit shoreline and makai restoration projects
Department of Land and Natural Resources – Division of Aquatic Resources (DLNR–DAR)	Marine resources, fisheries, fishponds	Loko i‘a restoration guidance, limu and reef management
Hawai‘i Department of Transportation – Highways Division	State highways including Kamehameha V Highway	Evacuation route safety and access improvements
Hawai‘i Emergency Management Agency (HI-EMA)	Statewide disaster planning and coordination	Preparedness and mitigation planning alignment

County of Maui

Partner	Jurisdiction & Authority	Role in MCH-CRP
Maui County Department of Public Works (DPW)	Drainage infrastructure, stormwater systems	Culvert maintenance, ravine clearing, stormwater management
Maui Fire Department	Fire suppression, wildfire risk reduction	Community risk reduction and wildfire mitigation
Maui County Department of Water Supply (DWS)	Potable water systems and drought response	Water security planning and infrastructure coordination
Maui Emergency Management Agency (MEMA)	Local disaster preparedness and response	Evacuation planning and emergency coordination

Beneficiary-Led Partners

Partner	Jurisdiction & Authority	Role in MCH-CRP
Hawaiian Home Lands Homestead Associations	Community representation and stewardship	Lead prioritization, cultural guidance, and on-the-ground monitoring
Native Hawaiian Beneficiary-Led Organizations	Project implementation and stewardship	Eligible co-applicants; community-led resilience delivery

Nonprofit and Community Partners

Partner	Jurisdiction & Authority	Role in MCH-CRP
Sustʻāinable Molokaʻi	Community engagement and facilitation	Project coordination and outreach
Ka Honua Momona	Fishpond restoration and cultural stewardship	Loko iʻa and nearshore restoration
Molokaʻi Land Trust	Land conservation and coastal stewardship	Makai restoration and habitat protection
University of Hawaiʻi (including Sea Grant and affiliated researchers)	Applied research and monitoring	Climate analysis and TEK-integrated science
Hoʻāhu Energy Cooperative Molokaʻi	Renewable energy development	Community-scale energy resilience
National Disaster Preparedness Training Center (NDPTC)	Disaster preparedness training	Community capacity building
Hawaiʻi Wildfire Management Organization (HWMO)	Wildfire mitigation and education	Firewise programs and risk reduction
Molokaʻi Homestead Livestock Association	Livestock and grazing management	Fire risk reduction and erosion control

Utilities

Partner	Jurisdiction & Authority	Role in MCH-CRP
Molokaʻi Irrigation System	Agricultural water delivery infrastructure	Water system coordination and resilience
Department of Hawaiian Home Lands Water System (DHHL Water System)	Potable water for homesteads	Drought planning and infrastructure upgrades
Maui Electric Company (MECO)	Electric power generation and distribution	Grid resilience and backup power
Hawaiʻi Telecom	Telecommunications infrastructure	Emergency communications reliability

Appendix D

Preliminary Goals Matrix

Priority Projects	Issues	Potential Options	Traditional Ecological Knowledge	Literature Review	Partnerships	Notes
Mauka Restoration	• Sediment and silt from mauka during floods; • Flooding due to blocked streams, rivers, and culverts • Invasive species • Unmanaged lands increase wildland fire risk	• Establish testing areas for native, drought-resistent, animal-proof, and economically viable plants • Plant vegetation to stabilize sediment • Create water retention planning, i.e. detention basins, etc. • Regular cleanup of streams and gulches & MOU/Agreements in place (see Makai) • Control deer population & planning • Conduct controlled burns	• Ahupuaa land management from mauka to makai, managed by konohiki • 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 ʻIhiʻihi: wahi pana (storied places) and wahi kapu (sacred places) and their attributes and elements. • 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 lāʻau), which can guide land management strategies to mitigate deforestation, habitat degradation, and invasive species problems in coastal	• 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 • Support the development of a "Subsistence Management Plan for Deer" • Support sustainable agricultural and forestry management to protect Molokaʻi's land, water, and marine resources. • Support the goals, objectives and actions of the 2018 Molokai Community Wildfire Protection Plan.	• CoM Public Works • Nature Conservancy • Molokai Land Trust • Hawaii Wildfire Management Organization • Butch Haase • CWRM • USACE • Molokai Hunting Club • Ka Honua Momona • TNC Molokai • Ka Ipu Makani • ʻAina Pulapula • ʻAina Momona • Molokaʻi Homestead Farmers Alliance • Molokaʻi Ranch	
Makai Restoration	• Fishponds filled in with sediment • Degradation of marine habitat • Loss of beaches/shoreline (buffer for homes) from coastal erosion • Shoreline armoring accelerates beach loss and hinders sand accumulation • Invasive Species (Pests) threaten natural and cultural resources • Invasive mangrove and kiawe trees disrupt shoreline processes and lead to sediment buildup	• Create Makai Restoration Design Plan • Plant native vegetation to prevent erosion • Conduct marine life restoration • Protect fishponds • Deploy coir rolls to enhance beaches • Remove invasive species and replace with appropriate natives • Implement natural fencing to control Gorilla Ogo • Limu restoration • Uncover and restore springs • Assess how the Kohea Wetland can capture floodwater • Protect Kapuāiwa Coconut Grove from mites • Maintain Kiowea Park • Maintain Kalanianaʻole Hall	• 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 • Regulate the harvesting of limu and protect freshwater sources that support limu growth. • Harvest only what is needed from the land and sea and share resources with neighbors.	• Remove and replace invasive plants and trees with climate-adapted, drought-tolerant native grasses, shrubs, and trees • Remove man-made debris between the high and low water line, such as tires, appliances, and rubble • Support the establishment of the island as a community-based subsistence fishing area (CBSFA) • Support the preservation of fishponds, along with any parts of a fishpond system complex such as hatcheiy, pond, or trap characteristics. • Support the protection and restoration of natured systems, such as wetlands and dunes, for flood mitigation and climate change adaptation.	• Hawai'i Department of Aquatic Resources • UH Sea Grant • Jim Buika (CoM Disaster and Shoreline Planner) • USACE • NOAA • ONHR-DOI • Ka Honua Momona • Molokai Wetland Partnership • Ka Ipu Makani • Sustainable Coastlines • Goodfellow Brothers	

Water Flow Maintenance and Flood Prevention	• Sediment flow from watersheds into nearshore waters • Lack of hydrological data • Clogged culverts & waterways lead to flooding	• Restore water flow from mauka to makai, including uncovering covered up or filled springs and wetlands/‘Aina wai • Immediate need for an MOU among the Homestead Associations, DHHL, DOT, and COM for maintaining culverts and planning drainage solutions • Regular river and culvert cleanups with responsible party mapped & documented & filed with all agencies. • Conduct Hydrological Studies • Drainage Master Plan	• 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 • 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.	• Support actions that restore native upland habitat and reduce sediment-laden stormwater from reaching the shoreline • 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. • Encourage and support research that studies water quality, invasive species, and circulation issues around the Kaunakakai Wharf Road and Small Boat Harbor. • Manage surface water using green infrastructure and natural system drainage, retention, and filtration to reduce flooding and siltation of ocean waters. • Encourage DHHL compliance with County regulations on drainage. • 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. • Encourage the Hawai i Department of Transportation (HDOT) to reconstruct culverts to 100-year flood-design stemdards on all State roads. • Support policies that encourage private	• USACE • CoM Public Works • DOT • DHHL	
Managed Retreat	• Residential hales, yards & wastewater systems (cesspools) have been threatened & inundated due to sea level rise, king tides, flooding risks & groundwater inundation	• Explore relocation options with beneficiaries, explore which areas are viable for relocation options & which ahupua‘a have potential for relocation placement • Assess implications for access and future impacts • Elevate hales on stilts, in short term (Policy involved)	• Hales were not typically built in areas where flooding occurred, wetlands/‘aina wai and was only used for fishing and cultural practies.	• Prepare a community-based plan for the relocation of vulnerable buildings, infrastructure, and public facilities away from areas threatened by sea level rise and/or coastal erosion • Prioritize mitigation efforts that will provide potential funding opportunities to flood proof or retrofit vulnerable critical facilities and infrastructure.	• DHHL	

Emergency Evacuation and Public Safety	• Lack of emergency roads for resident evacuation; • Power outage risks in flood areas • Poor cellphone coverage	• Develop emergency evacuation plans • Involve the coImmunity, especially kūpuna, in emergency planning. Door-to-door surveys have been effective • Locate and/or Construct emergency evacuation roads from mauka to makai, Map and Identify evacuation routes and roadways • Develop homestead resilience hubs/shelters • Construct cell towers • Develop water tanks & system to provide emergency water and water for firefighting. MOU with CoM needed for emergencies, when DHHL system affected.		• 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 • There is a need for emergency shelters in Central Molokai. • Promote public education about natural and human-induced hazards to improve preparedness and response and to reduce hazard risk and impacts. • 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. • Support and advocate for better preparedness capacity by improving inter-agency planning, coordination, and implementation	• Police Department • Fire Depatment • Maui Emerency Management Agency • EMS • Verizon • Hawaiian Electric • Hawaii Energy	
Education and Awareness Campaign	• Need for stewardship of native species and understanding of water systems; • Loss of traditional cultural knowledge • Need for greater adaptive capacity to address risks	• Support education initiatives like Wao Akua and ʻAe ʻĀina • Land Stewardship programs • Emergency response training • Identify and catelog community assets to leverage during disasters • Sustainable land management workshops • Cataglog vulnerable members • Phone tree (check on your neighbor program)	• Honor and respect traditional ʻohana cultural values and customs to guide subsistence harvesting of natural resources. • 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. • ʻAha 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	• 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 • Provide beneficiaries with FEMA resources like the “Homeowners Handbook to Prepare for Natural Hazards” and “Answers to Questions about Substantially Improved / Substantially Damaged Buildings” • Support a significant increase in public outreach, education, and involvement events to build community-based stewardship and implementation capacity. • Support education for residents and visitors for culturally appropriate subsistence-based hunting, fishing, gathering, and protocol for respecting cultural and historic sites	• National Disaster Preparedness Training Center • Hawaii Green Growth • National Preservations Institute • Ka Honua Momona • Ka Ipu Makani	
Infrastructure and Public Facility Upgrades	• Clogged culverts • Highways covered in sediment • Poorly maintained drainage systems • Cesspools pollute nearshore waters • Kūlana ʻŌʻiwi has caused flooding for neighbors • Saltwater intrustion corroding ʻOloʻolo water line	• Improve water flow through culverts • Regular infrastructure maintenance • Implement a drainage maintenance plan • Reroute flood waters with drainage infrastructure • Preserve cemetery • Cesspool conversion • Replace ʻOloʻolo water line with new resilient line		• Convert cesspools to septic systems wherever feasible to reduce the risk of contaminated water and protect beneficiary health • Initiate a groundwater inundation program by regularly testing the pH, salinity, and water level relative to the tide at specific sites • Complete a site selection study to identify a location for a new cemetery. • Encourage the location or relocation of all critical infrastructure, facilities, and development out of the evacuation and inundation zones vulnerable to coasted hazards	• CoM Public Works • DOT- Highways • USACE • DOH - WWB • CoM Water Supply	

Appendix E

Detailed Resilience Strategy Matrix

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
A1	Create a Pre-Disaster Emergency Response and Evacuation Plan*	-Department of Hawaiian Home Lands Planning Office (DHHL PLO) -Hawaiian Homestead Associations (HHAs) - Hawai‘i Wildfire Management Organization (HWMO)	-HHAs - DHHL Moloka‘i District Office (MDO) - DHHL Land Management Division (LMD) - DHHL Land Development Division (LDD) - Hawai‘i Emergency Management Agency (HIEMA) - Maui Emergency Management Agency (MEMA) - Molokai Emergency Operations Center (EOC) HWMO	Short Term	- State or County/MEMA & HIEMA, Hazard Mitigation funding - Hawai‘i Community Foundation (HCF) - Climate Impact Fee (Act 96) - HWMO - Federal Funding for Community Wildfire Protection Projects	HHAs	A Pre-Disaster Emergency Management Plan will identify risks, vulnerable populations, and emergency routes within each ahupua‘a. The plan will coordinate roles and responsibilities among DHHL, homestead associations, emergency services, and community volunteers. It will also incorporate culturally grounded approaches to preparedness, training, and communication. Key Components: - Assess population size, household needs, and vulnerable groups (kupuna, keiki, people with disabilities). - Include pets, vehicles, and transportation needs in evacuation planning. - Use GIS data from DHHL’s Kalama‘ula Road Assessment and other mapping resources. - Incorporate the plan into State and County Hazard Mitigation Plans for consistency. - Coordinate with Fire Department and HWMO Firewise Support Specialists serving Moloka‘i. - Clarify responsibilities and communication between agencies and homestead communities. - Encourage participation in CERT (Community Emergency Response Team) and NDPTC (National Disaster Preparedness Training Center) programs for homestead boards and volunteers. - Conduct regular workshops and exercises to strengthen preparedness and build leadership capacity.	Yes	$800,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
A2	Develop and Maintain Emergency Evacuation Routes	- DHHL PLO - DHHL Land Management Division (LMD) - HWMO	- DHHL LMD - DHHL Molokai District Office (MDO) - DHHL Land Development Division (LDD) - HHAs - MEMA - Molokaʻi EOC	Short Term	- Wildfire Mitigation Funds - Firewise Community - Act 96 - Federal Emergency Management Administration (FEMA)	HHAs	Plan, improve, and maintain safe emergency evacuation routes connecting homestead communities to designated mauka evacuation areas. This strategy focuses on preparedness, wildfire mitigation, and maintenance of rural and undeveloped roads to improve emergency access. Key Components: - Assess existing road conditions within homestead areas to identify gaps in emergency access. - Designate and plan for a safe evacuation area, including next steps for preparedness and response. - Improve mauka access routes for wildfire mitigation and emergency response. - Clear and maintain parking and staging areas for residents during evacuation events. - Maintain and upgrade rural and undeveloped roads using context-sensitive methods that protect the landscape (e.g., “A Good Road Lies Easy on the Land – Water Harvesting from Low-Standard Rural Roads”(Zeedyk,2006)). - Coordinate with DHHL, County agencies, and homestead associations for maintenance and access management.	Yes	$100,000
A3	Develop Resilience Hubs or Evacuation Sites	- DHHL - HHAs	- MEMA	Mid Term	- FEMA - Act 96	HHAs	Establish new resilience hubs and evacuation sites in mauka areas, safely outside of flood and coastal hazard zones. These hubs will serve as community gathering centers year-round and become activated during disasters to provide emergency support and resources for homesteads. Key Components: - Update DHHL land use designation to “Community Use” to allow development - Identify and develop a mauka site for a resilience hub and evacuation area.	Yes	$3,500,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
							- Equip hubs with back-up power, water, food storage, communication systems, and emergency supplies. - Serve dual purpose: community center during normal operations; evacuation and recovery site during disasters. - Host preparedness training, workshops, and community coordination meetings. - Incorporate community gardens or greenhouses to strengthen local food security. - Design facilities to be energy-efficient, climate-adapted, and culturally grounded.		
A4	Fire Break Construction & Maintenance	- DHHL - County of Maui (CoM) Department of Transportation (DOT) - HHAs	- Molokaʻi Livestock Association (MHLA) - DHHL LMD	Short Term	-Act 96	HHAs	Establish and maintain fire breaks around residential lots and along the wildland–urban interface to protect homes and community infrastructure from wildfire. Regular clearing and maintenance will improve safety, access, and long-term fire resilience. Key Components: - Identify and map fire break locations around homestead communities and along mauka boundaries. - Clear and maintain vegetation to reduce wildfire fuel loads. - Create and maintain access routes for firefighting and emergency vehicles. - Implement a schedule for routine inspection and upkeep to keep fire breaks functional over time. - Coordinate with land managers and agencies for shared maintenance across adjoining lands. - Provide community training and stewardship opportunities for fire prevention and land management.	Yes	$2,500,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
A5	Event Reporting & Documentation System*	- HHAs	- DHHL - MEMA - HIEMA	Short-term	- Act 96	HHAs	Develop an easy-to-use event reporting and documentation system for residents and homestead associations to record flooding, erosion, fire, or other hazard events. The system will help DHHL track recurring issues, improve maintenance and design, and strengthen community preparedness through education and data sharing. Key Components: - Create a simple reporting tool that records event details such as date, time, lot number, location, and description. - Develop an online dashboard to visualize data and metrics—showing reported events, maintenance responses, and trends over time. - Coordinate with DHHL's PLO staff to manage data and track follow-up actions. - Establish clear procedures for residents and association boards to collect and submit reports. - Use aggregated data to identify priority areas for infrastructure maintenance, design improvements, and resilience planning. - Provide education on hazard awareness, response, and flood insurance options for older homestead communities. - Support transparent communication and collaboration between residents, association boards, and DHHL.	Yes	$100,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
A6	Install Wildfire Detection Cameras	- DHHL - HHAs	MECO	Short Term	- FEMA - HWMO	HHAs	Install and expand a network of wildfire detection cameras to provide full visual coverage of the Molokaʻi south shore ahupuaʻa. These cameras will support early fire detection, real-time monitoring, and rapid response to protect homesteads and natural resources. Key Components: - Install cameras at key mauka and makai locations to achieve full coverage across DHHL lands to support wildfire prevention, rapid response, and public safety. - Integrate cameras with machine learning and thermal imaging systems for automatic wildfire detection and alerting. - Connect to County, State, and DHHL emergency management systems for coordinated response. - Provide live feeds and alerts accessible to fire agencies and trained community partners. - Incorporate renewable power sources (e.g., solar with battery backup) for remote sites. - Use data to inform long-term fire management and landscape restoration planning. - Incorporate renewable power sources (e.g., solar with battery backup) for remote sites. - Support wildfire prevention, rapid response, and public safety. - Use data to inform long-term fire management and landscape restoration planning.	No	$800,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
B1	Develop Mauka Restoration & Maintenance Plan*	-HHAs	- DHHL	Mid Term	-Act 96 - NFWF	- HHAs	Prepare a comprehensive Mauka Restoration and Maintenance Plan to restore degraded upper slopes, reduce erosion, and improve watershed health within the Molokaʻi coastal homestead ahupuaʻa. The plan will use aerial imagery, LiDAR, and field assessments to identify high-priority areas for restoration, fencing, and long-term land management that supports fire prevention, drainage, and native ecosystem recovery. Key Components: - Use aerial imagery and LiDAR analysis to map erosion hotspots, drainage corridors, and sediment pathways. - Develop a land management plan by ahupuaʻa for fire suppression, prevention, and fuels management. - Identify and design riparian buffer strips and restoration zones using native and drought-tolerant plants. - Plan for irrigation systems and fencing to protect reforestation and agroforestry areas. - Conduct biological and soil assessments to guide site-specific restoration design. - Provide workforce opportunities and define community employment needs for plan implementation: - Strengthen collaboration between homesteaders, DHHL, and partner agencies for long-term stewardship. - Integrate TEK with scientific monitoring for adaptive management.	Yes	$800,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
B2	Implement Kipuka Waihona Concept	- HHAs	- DHHL	Mid-Term	- NWFW - HCF	HHAs	The Kīpuka Waihona Concept combines Hawaiian ecological knowledge with practical land management. The word kīpuka refers to an “island” of life that remains within a lava flow. In this plan, it symbolizes small, fenced “islands of renewal” established along eroded ravines to restore native ecosystems, reduce erosion, and build long-term resilience. Key Components: - Construct small, fenced kīpuka restoration nodes at strategic mauka locations rather than fencing entire ravines. - Replant each site with native dryland and riparian species to stabilize soils, slow runoff, and restore forest structure. - Integrate vegetated swales and small reservoirs to slow and capture stormwater, recharge soil moisture, and support reforestation. - Test and cultivate native, drought-tolerant, and animal-resistant species that can withstand Moloka‘i’s dry conditions and ungulate pressure. - Remove kiawe and other invasive plants and replace them with resilient native vegetation. - Use each kīpuka as a seed source, wildlife refuge, and outdoor learning site for stewardship and education. - Create a network of restored sites that can be expand over time as funding becomes available. - Employ homesteaders in restoration work to build community capacity and local economic opportunity.	Yes	$1,500,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
B3	Reduce Fuel Loads	- HHAs	- DHHL - Molokai Fire Department - Maui County Fire Prevention Office - MHLA - DLNR DOFAW	Short Term	- USDA – Natural Resources Conservation Service (NRCS) - Environmental Quality Incentives Program (EQIP) - HWMO) - FEMA) – Pre-Disaster Mitigation Grants US Forest Service – Community Wildfire Defense Grant (CWDG)	- HHAs	Implement active, long-term land management to remove invasive species and reduce wildfire fuel loads across mauka and coastal areas. This strategy may include controlled or prescribed burns conducted in partnership with cultural practitioners and fire experts to restore native ecosystems, protect homes, and reduce the risk of catastrophic wildfires. Key Components: - Develop and implement a fuel management plan for high-risk mauka and wildland–urban interface areas. - Conduct controlled burns in coordination with fire professionals and cultural practitioners to safely reduce hazardous vegetation. - Integrate Native Hawaiian cultural fire management practices rooted in traditional ecological knowledge. - Remove invasive grasses, shrubs, and kiawe that increase fire intensity and spread. - Promote regrowth of native vegetation to improve soil health, watershed function, and habitat quality. - Establish ongoing maintenance schedules and monitoring to sustain reduced fuel loads over time. - Build local workforce capacity in fire management, land restoration, and monitoring.	Yes	$500,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
B4	Expand Plant and Food Nursery	- HHAs	- DHHL LMD - DHHL PLO	Short Term	-Act 96	HHAs	Expand the existing Kalama‘ula Nursery into a larger hub for native plant cultivation, food security, and community education. The nursery will support native ecosystem restoration, provide plants for reforestation and landscaping, and promote sustainable agriculture and cultural practices. Over time, the facility can evolve into a Resilience Food Hub, integrating plant propagation with food production and training programs. Key Components: - Expand the Kalama‘ula Native Plant Nursery to increase capacity for propagation of native, drought-tolerant, and culturally significant species. - Support mauka and makai restoration projects by supplying native plant materials. - Develop partnerships with schools, farmers, and conservation groups to expand education, workforce training, and community involvement. - Grow plants that support habitat restoration, food security, and traditional practices such as weaving, medicine, and ceremony. - Integrate food crops, greenhouses, and composting systems to build a self-sustaining Resilience Food Hub. - Offer hands-on education programs in native plant care, nursery management, and agroforestry. - Provide seedlings for community gardens and homestead landscaping to enhance biodiversity and reduce wildfire risk.	Yes	$25,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
B6	Feral Animal Management Program	- HHAs - DHHL	- Molokai Hunting Club (MHD)	Short-Term	- EQIP - HCF	- HHAs	Develop and implement a coordinated program to manage populations of feral deer, pigs, and other ungulates that threaten forest health, agriculture, and community safety. The program will be built on collaboration between DHHL, hunters, and local agencies to create a balanced, culturally grounded approach to land stewardship and resource management. Key Components: - Conduct a planning and assessment process within DHHL lands to define management zones and population targets. - Review and integrate existing data from the Molokaʻi Hunting Club, State of Hawaiʻi DLNR–Division of Forestry and Wildlife (DoFAW), and other partners. - Develop a comprehensive management plan that includes population control, fencing priorities, and restoration linkages. - Coordinate with local hunters and beneficiaries to establish designated hunting areas and sustainable harvest protocols. - Implement monitoring systems to track population trends and ecosystem impacts. - Reduce damage to native vegetation, restoration sites, and agricultural areas caused by overgrazing and rooting. - Support community participation and training in wildlife management, monitoring, and safety practices. - Promote holistic, culturally informed stewardship integrating modern wildlife science and traditional knowledge.	Yes	$200,000-$500,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
C1	Develop a Drainage Master Plan	- HHAs - DHHL	- CoM - United States Army Corps of Engineers (USACE)	Short-Term	- HCF	HHAs	Prepare a comprehensive Drainage Master Plan for the entire ahupuaʻa to address chronic flooding, erosion, and sedimentation issues. The plan will integrate traditional and modern watershed management approaches to improve drainage infrastructure, protect homes and roads, and restore natural water flow from mauka to makai. Key Components: - Assess existing drainage systems, including canals, culverts, and ravines, to identify maintenance and capacity issues. - Map natural drainage pathways and areas of sediment buildup or flood risk. - Incorporate nature-based solutions such as vegetated swales, sediment traps, and restored wetlands. - Coordinate drainage planning across all three homestead communities to manage stormwater collectively by ahupuaʻa. - Develop design standards and maintenance schedules for long-term performance and resilience. - Align with County and DHHL infrastructure planning, integrating recommendations into future capital projects. - Include community education and workforce opportunities for maintaining and monitoring drainage systems. - Reduce flooding risks to residential areas, roads, and nearshore ecosystems while improving water quality and aquifer recharge.	Yes	$800,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
C2	Green–Grey Drainage Improvements & Maintenance Program	- HHAs	- DHHL - COM - DOT - USACE - MHLA	Short Term	- NFWF	HHAs	Program to focus on keeping drainage canals, ravines, culverts, and natural waterways functioning properly to reduce flooding, erosion, and sediment impacts on homes, roads, and nearshore ecosystems. Combine regular, coordinated maintenance with targeted upgrades that blend green infrastructure and grey infrastructure approaches. Nature-based solutions such as native vegetation, bioengineering, and erosion control measures to be used alongside conventional drainage improvements to slow water, stabilize banks, and reduce sediment before it reaches the ocean. Regular maintenance of drainage canals, ravines, culverts, and waterways helps reduce flooding and sediment buildup that threaten homes, roads, and coastal ecosystems. This strategy strengthens community resilience by restoring natural water flow, reducing blockages, and protecting downstream areas and nearshore waters from erosion and pollution. Key Components: - Establish coordinated maintenance schedules for all drainage systems. - Remove sediment, debris, and invasive vegetation from canals and culverts. - Stabilize eroding banks with native vegetation and nature-based methods. - Train community members in safe maintenance practices and monitoring.	Yes	$1,200,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
C3	Watershed Participatory Mapping Workshops	- HHAs	- DHHL - State DOT - CoM	Short-Term	- DHHL Grants	HHAs	Host a series of community workshops to educate beneficiaries about drainageway maintenance, flooding risks, and nature-based solutions. These participatory mapping sessions will empower residents to identify problem areas, collect data, and take part in ongoing drainage management and restoration efforts across the Molokaʻi homestead ahupuaʻa. Key Components: - Conduct hands-on workshops to teach beneficiaries about proper drainageway maintenance, sediment removal, and vegetation management. - Facilitate participatory mapping to document flooding areas, clogged culverts, and potential sites for nature-based drainage improvements. - Integrate citizen science approaches for data collection and monitoring of stormwater and erosion conditions. - Encourage community stewardship through regular clean-up events and shared maintenance efforts. - Explore and design nature-based solutions such as vegetated swales, bioswales, and sediment traps in appropriate areas. - Collaborate with DHHL, County of Maui, and partner organizations to support training, materials, and data integration. - Build community capacity and awareness for long-term stormwater and watershed management.	Yes	

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
C4	Restore Springs	HHAs	DHHL	Mid-Long Term	-Act 96 -NFWF-NCRF - OHA	HHAs	Restore and reactivate traditional and existing springs within the Molokaʻi coastal homestead ahupuaʻa to improve water flow, cultural connection, and ecosystem health. Pending necessary permits and approvals, this work will reopen blocked springs, reconnect them to traditional waterways, and revitalize them as cultural and educational sites for the community. Key Components: - Identify and map traditional and existing spring sites using aerial imagery, archival research, and ʻohana moʻolelo. - Remove overgrowth, sediment, kiawe, and mangroves that block or alter natural spring flow. - Reconnect springs to fishponds, wetlands, and traditional ʻauwai (irrigation ditches) to restore natural hydrology. - Reestablish springs as cultural and educational spaces for intergenerational learning and community stewardship. - Monitor water quality, flow, and ecological response over time. - Collaborate with the County of Maui Planning Department and regulatory agencies for compliance with: • Hawaiʻi State Water Code • USACE Section 401 & 404 Clean Water Act permitting. - Support native habitat restoration and groundwater recharge while honoring traditional water management practices.	Yes	$1,200,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
D1	Conduct Vulnerability Assessments Survey	- HHAs - DHHL	- NAHASDA	Short-term	-Act 96 - HWMO:	HHAs	Assess the vulnerability of homes and properties to coastal, flood, and wildfire hazards by conducting comprehensive surveys within each ahupua'a. Gather data on structural conditions, environmental risks, and household characteristics to guide future resilience investments and hazard mitigation planning. Key Components: - Survey home conditions including age, building materials, construction type, and location. - Evaluate exposure to hazards such as wildfire, Special Flood Hazard Areas (SFHA), and shoreline erosion. - Document socioeconomic factors such as demographics and household income. - Identify cesspool locations and conditions, noting overflow risk during king tides or proximity to water sources. - Secure funding for Homestead Association Coordinator positions per ahupua'a to manage and oversee survey efforts. - Employ two beneficiary contractors per ahupua'a to conduct the Vulnerability Assessment Survey.	Yes	$60,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
D2	Adapt Structures and Systems to Better Withstand Coastal Hazards	HHAs	- DHHL - NDPTC - HWMO / Firewise	Short-Term	- DHHL - OHA - Act 96 - HWMO	HHAs	Improve the physical resilience of homes and infrastructure in coastal areas to reduce vulnerability to flooding, erosion, fire, and storm impacts. Efforts include retrofitting and hardening existing structures, promoting community awareness through assessments and workshops, and leveraging partnerships with expert organizations. Key Components: - Retrofit Homes. Elevate, harden, and protect residential structures to withstand coastal and storm-related hazards. - Partnership with HWMO for Firewise Home Assessment Program. Conduct home assessments to identify vulnerabilities and provide recommendations for fire and hazard resilience. - Host sessions for lessees using Hwang's "Homeowner's Handbook to Prepare for Natural Hazards" to build knowledge of hazard mitigation techniques. - Request a Molokai-based workshop by UH Sea Grant to share best practices for coastal resilience and hazard adaptation.	Yes	$1,000,000
D3	Maintain Home Ignition Zones	- HHAs	- HWMO	Short-Term	- HWMO	HHAs	Reduce wildfire risk to residential homesteads by actively maintaining Home Ignition Zones through vegetation management, fuel reduction, and fire-safe landscaping. Encourage residents to create defensible space around homes and practice regular upkeep to prevent ignition and fire spread. Key Components: - Partner with HWMO to hold workshops and demonstrations. - Maintain buffer zones around homes to create defensible space. - Manage and reduce fire fuels near residential structures. - Use appropriate, fire-resistant plants and landscaping techniques.	Yes	$500,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
E1	Develop a Makai Restoration & Management Plan	- HHAs - DHHL	- Ka Honua Momona, - Molokai Land Trust - ʻĀina Momona - DAR - UH Sea Grant	Mid Term	- NWFW National Coastal Resilience Fund	HHAs	Create a comprehensive plan to restore and manage shoreline areas through culturally grounded and ecologically sound practices. The plan will identify priority restoration sites, integrate traditional ecological knowledge with modern coastal science, and strengthen stewardship partnerships to protect and enhance coastal ecosystems. It will also serve as a foundation for future implementation, funding, permit approvals, and community engagement efforts. Key Components: - Identify priority shoreline areas for restoration and management. - Provide education on native and cultural-based shoreline restoration methods (e.g., dry stack walls, native planting). - Establish and maintain Makai Community Use Areas through coordinated planning and upkeep. - Partner with Homestead Associations and beneficiary-led businesses for stewardship activities. - Assess shoreline erosion, sedimentation, and invasive species impacts. - Plan for the removal of invasive species (e.g., mangrove, gorilla ogo). - Restore native coastal vegetation such as pōhuehue and ʻakiʻaki. - Reconnect and enhance fishponds, wetlands, and freshwater springs. - Include culturally appropriate access paths, interpretive signage, and stewardship zones. - Use the plan as a foundation for future restoration projects, funding applications, and volunteer engagement..	Yes	$800,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
E2	Implement Nature-Based Coastal Protection Projects	- HHAs	- DHHL	Mid-Term	- NOAA Habitat Conservation or Coral Reef Conservation Program -Act 96 - OHA - HCF	HHA's	Protect and enhance coastal areas by implementing nature-based solutions identified in the Makai Restoration and Management Plan (E1) and the South Molokai Shoreline Erosion Management Plan. These projects will use natural systems and culturally grounded practices to reduce erosion, buffer storm impacts, and restore coastal resilience. Key Components: - Carry out restoration and protection actions identified in the Makai Restoration and Management Plan (E1). - Implement priority projects from the SM-SEMP - Utilize nature-based solutions such as native vegetation restoration, dune stabilization, and wetland enhancement. - Incorporate TEK and community stewardship in project design and implementation. - Monitor project effectiveness to inform adaptive management and long-term coastal resilience.	Yes	$2,200,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
E3	Invasive Species Removal & Management	- HHAs - DHHL	- Molokai Limu Hui, - KHM, - Molokai Land Trust - UH Sea Grant, Molokai Wetland Partnership	Short Term	- OHA - Hawai‘i Invasive Species Council (HISC) - National Fish and Wildlife Foundation (NFWF) - HCF - NOAA Coral Reef Conservation Program - Molokai Limu Hui	HHAs	Remove and manage invasive plant and marine species that threaten Moloka‘i’s coastal and terrestrial ecosystems. This strategy emphasizes collaborative, community-driven efforts to restore native habitats, reduce wildfire risks, and promote the return of native vegetation and limu along the shoreline. Key Components: - Collaborate with Moloka‘i Limu Hui and other local partners on coordinated invasive species removal. - Conduct site surveys to map infestation levels of invasive species such as gorilla ogo, mangrove, and kiawe. - Develop a community-friendly removal plan detailing tools, tides, timing, and safety practices. - Coordinate with local and state experts to apply effective, environmentally sound removal techniques. - Reintroduce native coastal plants (e.g., pōhuehue, ‘aki‘aki) in restored areas. - Engage community volunteers in hands-on removal, education, and stewardship activities. - Monitor shoreline and ecosystem recovery, including native limu population health. - Prioritize kiawe removal in both coastal and wildfire-prone zones to reduce hazards and restore native vegetation.	Yes	$160,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
E4	Marine Ecosystem Restoration	- HHAs - DHHL	- Ka Honua Momona - ʻĀina Momona - UH Sea Grant / Coral Resilience Lab - KIM	Short to Long	- NOAA Coral Reef Conservation Program - NFWF - OHA - HCF	HHA's	Restore and protect Molokai's nearshore marine ecosystems through community-led, culturally informed, and science-based actions. This strategy focuses on improving reef health, supporting native marine species, and integrating traditional stewardship practices to ensure long-term ecosystem resilience and sustainable use. Key Components: - Assess current reef health, including coral, fish, and limu populations, to identify key restoration zones. - Remove invasive marine species (e.g., gorilla ogo) that threaten native habitats. - Restore native limu beds and promote sustainable limu harvesting practices. - Reintroduce and protect native coral, urchins, fish, and limu species. - Incorporate traditional management practices such as kapu seasons and kilo (observation) to guide stewardship. - Conduct community-led snorkel surveys, water quality testing, and marine education programs. - Include Kilo i Moana (KIM) assessment of coastal springs as part of the Molokai Island Plan to link freshwater and marine ecosystem health.	Yes	$350,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
E5	Restore Ohi‘apilo Wetland	DHHL	HHAs	Mid-Term	- Act 96 - PI-CASC - NFWF	HHAs	Restore and enhance the ‘Ohi‘apilo Wetland to improve ecosystem health, water quality, and habitat for native species. This strategy builds on prior hydrological research and partnerships to guide restoration efforts, promote long-term stewardship, and strengthen community connection to this important cultural and ecological site. Key Components: - Review hydrological studies conducted by the Molokai Wetland Partnership under PI-CASC funding (2025). - Improve water quality through natural filtration, hydrological restoration, and invasive species management. - Remove invasive plants and animals to restore native wetland habitat. - Enhance public access and install educational and cultural signage. - Establish long-term stewardship programs involving local organizations and beneficiaries. - Create funded positions for maintenance and ongoing monitoring of wetland health.	Yes	$500,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
E6	Implement Special Area Plan for Malama Cultural Park	- Park Stewards	- DHHL	Mid-Term	- OHA Grants - DLNR Kaulunani Urban & Community Forestry Grants - Hawai‘i Community Foundation (HCF) - HTA (Hawai‘i Tourism Authority) – Kūkulu Ola or Aloha ‘Āina - National Park Service – Tribal Heritage or Historic Preservation Grants - DHHL Capital Improvements or Site Management Funding	Park Stewards	Carry out the restoration and improvement projects outlined in the Mālama Cultural Park Special Area Plan (MCP-SAP), adopted by the Hawaiian Homes Commission on July 18, 2022. This strategy focuses on enhancing the park's cultural, ecological, and community value through environmental restoration, infrastructure upgrades, and public engagement features. Key Components: - Restore the coastal environment and wetland areas within the park. - Enhance the vegetated berm to strengthen natural buffers and improve aesthetics. - Install fencing, welcome signage, and interpretive exhibits to support visitor safety and education. - Construct an elevated walkway or boardwalk with wayside exhibits highlighting cultural and natural features. - Maintain and improve the Mālama platform for community and cultural use. - Demolish the dilapidated jailhouse and replace it with a new comfort station. - Develop a covered pavilion or visitor center for gatherings, education, and stewardship activities. - Implement native landscaping and remove invasive species (e.g., mangrove, pickleweed, gorilla ogo). - Upgrade utilities, improve parking areas, and conduct soil remediation where needed. - Support ongoing maintenance and stewardship to ensure the park remains safe, accessible, and culturally vibrant.	Yes	$5,000,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
E7	Maintain Kapuāiwa Coconut Grove and Kiowea Park	- DHHL - HHAs	- Ka Honua Momona - Kualapuʻu Kaiapuni - Molokai Land Trust - MoMISC, - DLNR / DOFAW - UH CTAHR / UH Extension - MWP	Short-term	- HISC - OHA - USDA Forest Service HCF - DLNR – Kaulunani Urban and Community Forestry Program - National Park Service – Tribal Heritage or Historic Preservation Grants - DHHL Capital Improvements or Site Management Funding	HHAs	Restore, enhance, and sustain the historic Kapuāiwa Coconut Grove and Kiowea Park through ongoing maintenance, habitat restoration, and community stewardship. Improve tree health, prevent pest infestations, and ensure long-term cultural and environmental stewardship. This strategy supports cultural access, recreation, and environmental resilience by restoring native ecosystems, improving facilities, pest management, and ensuring the park remains a safe and welcoming community space while safeguarding one of Molokaʻi's most significant cultural landscapes. Key Components: - Develop a comprehensive pest prevention and management plan for coconut and other native trees. - Monitor and treat coconut trees affected by mites, disease, or other health threats. - Remove invasive species such as kiawe and manage overgrowth. - Establish early detection and response protocols for Coconut Rhinoceros Beetle (CRB) prevention. - Improve soil quality and irrigation to support the long-term vitality of the grove. - Engage the community in cultural restoration, education, and stewardship activities. - Install fencing to manage access and address safety and liability concerns. - Restore native vegetation and stabilize the shoreline to prevent erosion. - Improve park infrastructure, including bathrooms, benches, signage, and utilities. - Promote community-led maintenance, stewardship, and cultural education activities. - Utilize secured grant funding to complete the kitchen in the pavilion.	Yes	$2,000,000

Appendix F

Detailed DHHL Resilience Strategy Matrix

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
DHHL A1	Update DHHL Plans on Molokaʻi to incorporate Hazard Mitigation, Emergency Preparedness and Community Resilience Strategies*	- DHHL-PLO - Homestead Planning Liaison - Grants Specialist	- HHAs	Short Term	- Hazard Mitigation grants - DHHL grants	DHHL	Update existing DHHL planning documents, including Molokaʻi General Plan, Island Plan, Regional Plans, and the Native Hawaiian Development Program Plan (NHDPP), to integrate hazard mitigation, emergency preparedness, and community resilience projects. This update will make resilience initiatives eligible for DHHL grants and provide local match funding opportunities for federal programs. Key Components: - Make resilience projects eligible for DHHL grant funding. - Position DHHL and homesteaders to leverage funds for implementation and future resilience stages. - Coordinate with service providers to identify suitable sites for a new cell tower to expand coverage and strengthen communications during emergencies.	Yes	$20,000
DHHL A2	Water Delivery Technical and Feasibility Study	- DHHL Water Specialist - DHHL LDD - HHAs	- State Department of Agriculture (DOA) - HHAs	Mid Term	- HCF	DHHL	Conduct a technical and feasibility study to evaluate options for improving water delivery systems that support wildfire protection, agriculture, and residential needs in fire-prone ahupuaʻa. The study will assess the potential for a Molokaʻi Irrigation System (MIS) interconnection and new pump infrastructure above Kalamaʻula to supply ag water for fire mitigation and homestead lots. Key Components: - Complete a technical and engineering feasibility study to evaluate MIS interconnection and pumping alternatives. - Identify potential water sources and conveyance routes to supply mauka areas along fire breaks. - Support wildfire mitigation, residential fire protection, and mauka restoration through improved water access. - Assess costs, maintenance, energy requirements, and environmental impacts of system upgrades. - Coordinate with DHHL, DOA, Maui County, and community associations to align with existing water infrastructure plans. - Develop conceptual designs and funding pathways for future implementation.	Yes	$100,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
DHHL B1	Conduct Archaeological Inventory Survey for Ahupua‘a*	- DHHL	- HHAs	Mid-Term	- OHA	DHHL	Complete an archaeological reconnaissance survey of DHHL mauka lands to identify and document historic and cultural sites. This proactive survey will support cultural resource protection and help streamline future restoration or infrastructure projects that may require State (HRS 6E) or Federal (Section 106) Historic Preservation review. Key Components: - Conduct field surveys to identify and map historic properties and cultural sites. - Evaluate each site’s integrity and significance. - Prepare documentation to register eligible sites with the State or National Register of Historic Places. - Develop management recommendations to protect and steward identified sites. - Use findings to streamline environmental review and permitting for future resilience projects. - Collaborate with cultural practitioners, lineal descendants, and the State Historic Preservation Division (SHPD).	Yes	$200,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
DHHL C1	Conduct Historical Hydrological Study	- DHHL - USGS	- HHAs - DLNR Commission on Water Resource Management (CWRM) - University of Hawai‘I (UH) Richardson School of Law, - OHA - Cultural Practitioners & Kupuna Council	Short-term	-USGS	DHHL	Undertake a comprehensive Historical Hydrological Study to document past and present water flow patterns, including historic diversions, springs, and stream networks across the ahupua‘a. This study will establish a scientific and cultural baseline for future watershed restoration, groundwater management, and climate resilience planning. Key Components: - Conduct research on historical and current water flow systems, including streams, springs, diversions, and irrigation channels. - Map and assess historic and existing springs and waterways to understand hydrologic change over time. - Develop a baseline dataset to guide mauka restoration, reforestation, and water management strategies. - Collaborate with DLNR, CoM, and other agencies in coordination with CoM’s Moloka‘i Water Use Development Plan. - Request USGS partnership to conduct hydrologic modeling and monitoring. - Reference existing studies such as the USGS Assessment from Kawela and the USGS 3D Model of the Kualapu‘u Aquifer. - Engage DHHL’s Water Resource Management Specialist to lead coordination, data management, and integration with DHHL planning. - Incorporate both traditional knowledge and scientific data to identify opportunities for spring restoration and sustainable water use.	Yes	N/A, defer to USGS

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
DHHL C2	Develop MOU for Drainageway Maintenance and Improvements	- DHHL PLO - DHHL LMD	- CoM - Hawai‘I DOT - HHAs	Short-Term	- Act 96	DHHL	Establish a Multi-Agency Memorandum of Understanding (MOU) between DHHL, the County of Maui (CoM), and the Hawai‘i Department of Transportation (DoT) to coordinate drainageway maintenance and improvements. This partnership will create consistent protocols for cleaning and maintaining streams, culverts, and ravines to reduce flooding risks and protect homestead communities. Key Components: - Develop a formal MOU between DHHL, CoM, and DoT to clarify responsibilities and maintenance schedules for shared drainage systems. - Coordinate routine inspection, cleaning, and repair of streams, culverts, and drainage channels to prevent sediment buildup and overflow. - Conduct GIS mapping to document drainageway locations, easements, and right-of-way ownership across agencies. Align drainage management activities with DHHL leases and parcels for coordinated access and maintenance. - Establish clear communication procedures and contact lists for emergency and non-emergency maintenance needs. - Integrate Homestead Associations into the coordination process for reporting, monitoring, and local oversight. - Improve flood prevention, protect infrastructure, and strengthen agency-community collaboration.	No	$90,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
DHHL C3	Conduct a Study of Kūlana ʻŌiwi Drainage and Flooding Impacts	- DHHL - HHAs	- CoM Public Works - MEMA	Mid-Term	- HCF - OHA - FEMA - USACE	DHHL	Undertake a focused hydrological study of Kūlana ʻŌiwi to understand how stormwater runoff and drainage patterns affect neighboring homestead lots. The study will identify causes of localized flooding, model water flow during storm events, and recommend solutions that integrate with island-wide flood prevention and drainage improvement strategies. Key Components: - Conduct hydrological flow mapping during major rain and storm events to understand drainage dynamics around Kūlana ʻŌiwi. - Assess impacts to adjacent homestead properties, including flooding depth, duration, and flow direction. - Identify infrastructure or design factors at Kūlana ʻŌiwi that may exacerbate flooding in surrounding areas. - Develop recommendations for drainage improvements or redesign, such as grading adjustments, stormwater detention, or green infrastructure. - Integrate findings with the broader Drainage Master Plan and flood prevention strategies for the Molokaʻi coastal homestead region. - Collaborate with DHHL, County of Maui, and local residents to share data and identify community-led solutions. - Support long-term planning for resilient land use and infrastructure design that reduces flood risk to homestead communities.	Yes	$600,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
DHHL D1	Create an Ahupuaʻa Residential Hale Restoration/Relocation Study	- DHHL	- HHAs	Short-term	-Act 96	DHHL	Conduct a coordinated study to guide the restoration, retrofitting, or relocation of homes within each ahupuaʻa to reduce exposure to chronic flooding, sea level rise, and coastal erosion. Use findings to inform the Molokai Island Plan Update (2026) and direct future homestead growth toward safer, less hazard-prone areas. Key Components: - Identify residential areas vulnerable to flooding, sea level rise, and erosion. - Consult beneficiaries to guide planning, identify culturally and environmentally appropriate relocation sites, and prioritize community needs. - Explore managed retreat options and relocation opportunities for at-risk homes. - Develop assistance programs for beneficiaries to retrofit and protect existing homes. - Align recommendations with the 2026 Molokai Island Plan Update to support resilient land use and housing decisions.	Yes	$800,000
DHHL D2	Develop Kalamaʻula Mauka Agriculture Lots	- DHHL	- Lot Awardees	Mid Term	-Act 96	DHHL	Plan and implement the development of new agricultural lots in Kalamaʻula Mauka to expand homestead opportunities and support local food production. Complete all planning, design, and compliance steps necessary to ensure sustainable and legally compliant development with essential infrastructure in place. Key Components: - Prepare a Master Plan and subdivision design for the Kalamaʻula Mauka Agriculture Lots. - Complete an Environmental Assessment in compliance with HRS Chapter 343. - Obtain County subdivision approval and necessary permits. - Provide essential infrastructure including roads, drainage systems, and water service to support agricultural use and homestead development.	Yes	$5,500,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
DHHL D3	Convert Cesspools	- DHHL - HHAs	- Lessees	Mid Term	EPA Closing America's Wastewater Access Gap (CAWAG) - technical assistance. Clean Water State Revolving Fund (CWSFR) - funding for conversion. -Act 96/DHHL-CAT Projects Pg. 2, Project #2 Strengthen Hawai'i Homes Program, Statewide -SRF Clean Water State Revolving funds– DHHL working on with EPA (Timeline: Mid 2026 ETA-Waianae Valley as Priority Pilot Project, MCH-CRP can used to advocate for future priority project)	DHHL	Reduce water contamination and improve public and environmental health by converting existing cesspools to approved septic or alternative individual wastewater systems. Prioritize conversions in high-risk areas identified by the Hawai'i Cesspool Prioritization Tool and ensure alignment with county and state standards. Key Components: - Convert cesspools to septic systems or other approved alternative wastewater systems. - Prioritize Southshore Molokai, designated as a Priority 1 area in the Hawai'i Cesspool Prioritization Tool. - Reference the list of approved wastewater systems in the Maui County Code for compliance. - Align implementation with the Molokai Cesspools Conversion Study (2023) to ensure consistency with existing plans and data.	No	$5,000,000

#	Mitigation Strategies	Primary Responsible Entity/ies	Secondary Responsible Entity/ies	Timeline	Funding possibilities/Co-benefits (*)/Costing	Funding Main Applicant	Details	Workforce Development	Cost Estimates
DHHL E1	Evaluate Shoreline and Ecological Impacts of Kaunakakai Wharf	- DHHL - USACE - Hawai‘I DOT - CoM	- UH Sea Grant / UH WRRC - HHAs	Mid-Term	- OHA - HCF - Pacific Islands Climate Adaptation Science Center (PI-CASC)	DHHL	Conduct a comprehensive assessment of the Kaunakakai Wharf to understand its long-term ecological and hydrodynamic impacts on the surrounding shoreline and marine environment. This strategy will combine scientific study with traditional knowledge to evaluate changes to currents, sediment flow, and habitat conditions, informing future restoration and management decisions. Key Components: - Examine how the wharf has altered shoreline currents, sediment transport, and erosion/sedimentation patterns. - Assess impacts on fishpond functionality, freshwater spring flow, and overall marine habitat health. - Evaluate effects on limu and fish populations, as well as water quality and turbidity. - Conduct site observations of areas west of the wharf, including clean sand zones and mangrove-influenced areas, to understand current dynamics. - Perform historical reviews and document traditional knowledge sources (e.g., Henry Paleka and other community historians). - Engage with kūpuna, shoreline residents, and local fishermen to incorporate community observations and cultural perspectives.	Yes	$1,200,000
DHHL E2.	Provide Long-Term Maintenance for Kalaniana‘ole Hall	- DHHL	- HHAs - Licensee - Contractor	Short Term	- Act 88, SLH 2021, as amended by Act 248, SLH 2022	Licensee	Stabilize and maintain Kalaniana‘ole Hall to preserve its structural integrity and cultural value while long-term plans are developed collaboratively with the community. This strategy ensures the building remains safe and secure until future restoration or reuse decisions are made through beneficiary consultation. Key Components: - Stabilize the existing structure to prevent further deterioration. - Install fencing around the site to ensure safety and manage liability. - Conduct regular maintenance and monitoring of the building’s condition. - Hold community meetings with beneficiaries to determine long-term plans for restoration, use, or redevelopment. - Long-term management / maintenance of the facility would be determined through a disposition with Homestead Association or Beneficiary-Led Organization.	Yes	$1,500,000