STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

November 17 – 18, 2025

TO: Chairman and Members, Hawaiian Homes Commission

THROUGH: Lilliane Makaila, Acting Planning Program Manager

FROM: Nancy M. McPherson, Planner *Nancy M. McPherson*

SUBJECT: For Information Only – Draft Molokaʻi Coastal Homesteads Community Resilience Plan

Recommended Action

None. For information only.

Background

This planning project originated from requests by homestead lessees in Kalamaʻula, Kapaʻakea and Kamiloloa-One Aliʻi, situated along Molokai's southern coastline, for DHHL to address increasingly frequent impacts they were experiencing due to shoreline erosion, inundation during extreme high tides, and flooding of low-lying coastal areas during heavy rain events. Site visits by Planning Office staff confirmed serious shoreline erosion, flooding and drainage issues in all three homestead areas, which then led to a now seven-year-long planning effort to document the issues and existing conditions, engage with beneficiaries, and develop implementable plans with measures to reduce risk, mitigate and adapt to coastal hazards, restore features of the landscape with nature-based solutions, and increase community resilience for close to 300 homestead lessees in these coastal communities.

In 2021 the Planning Office applied for a National Fish and Wildlife Foundation (NFWF) National Coastal Resilience Fund (NCRF) Community Capacity Building & Planning grant, which was approved. In 2022 the Planning Office was still in the process of preparing the South Molokai Shoreline Erosion Management Plan (SM-SEMP), so once that plan was approved in December 2022, DHHL contracted with the G70 planning firm to develop a Community Resilience Plan for the Kalamaʻula, Kapaʻakea and Kamiloloa-One Aliʻi coastal homestead communities on the island of Molokaʻi starting in June 2023. See Fig. 1, MCH-CRP Project Area, and Fig. 2, NCRF Focus Areas, below.

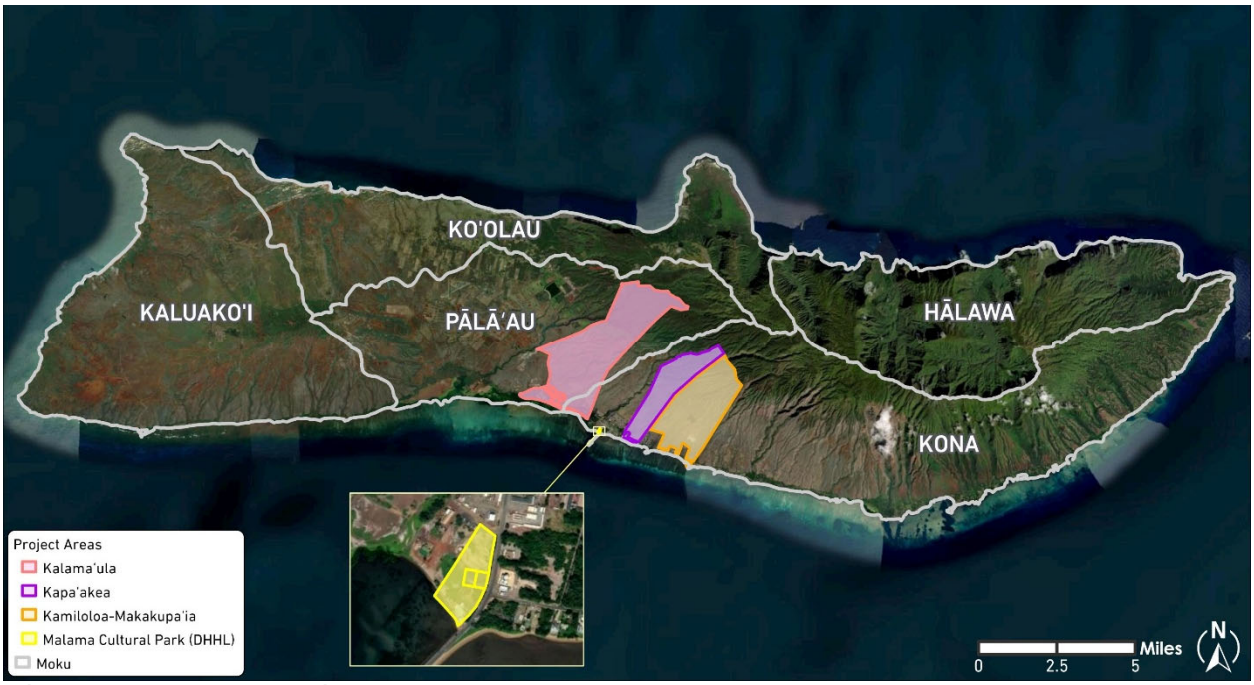

Fig. 1 MCH-CRP Project Area

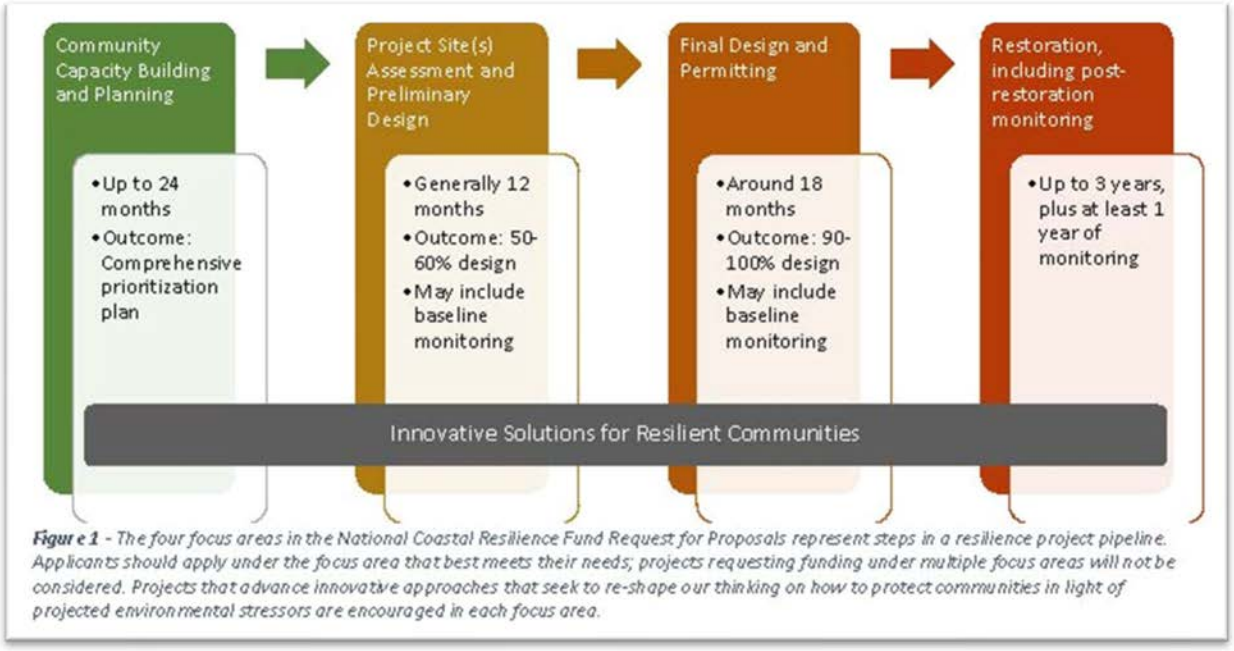

Figure 1 - The four focus areas in the National Coastal Resilience Fund Request for Proposals represent steps in a resilience project pipeline. Applicants should apply under the focus area that best meets their needs; projects requesting funding under multiple focus areas will not be considered. Projects that advance innovative approaches that seek to re-shape our thinking on how to protect communities in light of projected environmental stressors are encouraged in each focus area.

Fig. 2 NCRF Focus Areas

Progress updates on the Moloka‘i Coastal Homesteads Community Resilience Plan (MCH-CRP) have been provided to the Hawaiian Homes Commission (HHC) within the Planning Office Plan Implementation Update for Molokai at the April HHC Meetings since 2023. Building on a multi-year, multi-plan foundation, the project has arrived at

a stage where the Planning Office wishes to present a Review Draft to the Hawaiian Homes Commission (HHC) for information. See Exhibit A, MCH-CRP HHC Review Draft. Based on comments and feedback, revisions will be made to the Draft MCH-CRP, which will be brought back to the beneficiaries on Moloka‘i in December/January for review during a Draft Plan workshop and 30-day comment period. After final revisions based on beneficiary comments and feedback, a Final Draft will be brought back to the HHC for approval in early 2026.

Mutually Reinforcing Planning Efforts, 2018 to present

DHHL has been gradually developing a planning and policy framework to better address coastal and other natural hazards, mitigate vulnerabilities, and strengthen community resilience on Hawaiian Home Lands, starting with Molokai. The MCH-CRP’s consistency with the DHHL Planning System will be discussed in more detail later in the submittal.

South Molokai Shoreline Erosion Management Plan (2018 – 2022)

Known as the SM-SEMP, this plan responded to years of community concerns about shoreline loss and coastal flooding affecting the Molokai south shore homestead communities. By gathering beneficiary input through meetings, interviews, and workshops with homesteaders, lineal descendants, and local experts, their real-life 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 with modern science.

While studying the shoreline and coastal homesteads and formulating mitigation measures to address shoreline erosion impacts, the beneficiaries and planning team concluded that the environmental and coastal hazard issues the SM-SEMP identified could not be resolved without including the entire ahupua‘a, because conditions up mauka were impacting the makai areas. This awareness prompted the application for and award of the NFWF NCRF grant for the project NFWF titled “Developing Community Resilience for Molokai Coastal Homesteads.”

DHHL General Plan Update (2020 – 2022)

The DHHL General Plan comprises Tier 1 of the DHHL Planning System. The previous 2002 DHHL General Plan had only one objective that mentioned natural hazards and disaster mitigation, under *Land and Resource Management.* The 2022 update included discussion of climate change and natural hazard considerations in all seven major

chapters in 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 updating Island Plans, acquiring lands and doing master plans and environmental review. Projected sea level rise and natural hazards will play a significant role in land suitability analysis for the upcoming Molokai Island Plan update, as will the information in the SM-SEMP and the MCH-CRP.

Malama Park Special Area Plan (2020 – 2022)

Special Area Plans (SAP's) are on Tier 3 of the Planning System. This planning effort provided detailed goals and strategies required for implementation of the Special District land use designation given to DHHL's 4.58 acres of land at Malama Park in Kaunakakai ahupua'a via an Island Plan land use amendment. The SAP analyzed coastal hazards and issues such as sea level rise. Strategies include invasive species removal and restoration of native coastal plant species, creation of a vegetated berm along the shoreline, and monitoring, which reinforce the kinds of shoreline restoration and erosion mitigation measures that the MCH-CRP will be recommending for the eroding shorelines in the project area.

Discussion

The project design for *Developing Community Resilience for Moloka'i Coastal Homesteads* proposed preparing the *Molokai Coastal Homesteads Community Resilience Plan (MCH-CRP)* to develop a plan for improving resilience to multiple natural hazards for coastal homestead communities on the island of Moloka'i through scientific analyses and Geographic Information Systems (GIS) modeling of projected sea-level rise, flooding, groundwater upwelling and other increasing coastal hazards.

The data on existing and historical conditions would be verified and refined by participatory mapping workshops, interviews with kupuna, cultural practitioners and lifelong residents of each homestead area. Hazard and vulnerability assessments would also be verified by technical experts knowledgeable of Molokai conditions as well as other Molokai large landowners conducting ecosystem restoration and natural resource management activities.

This three-year project has analyzed entire tracts in the ahupua'a of Kalama'ula, Kapa'akea and Kamiloloa-Makakupa'ia, as well as the DHHL Malama Park lands in Kaunakakai, and has conducted extensive beneficiary participation to identify five (5) priority

projects for each ahupua‘a that will stabilize and restore shorelines, mitigate coastal flooding and sedimentation, mitigate upland erosion and emphasize culturally grounded, nature-based solutions. Multiple huaka‘i (site visits) have been conducted with beneficiaries, DHHL staff and consultants in order to validate the data gathered and refine the priority projects to improve implementation.

PLANNING APPROACH

The MCH-CRP seeks to ground the data on existing conditions and projected changes with the deep, long term beneficiary knowledge of place, culture and history, weaving traditional wisdom with modern science to guide how the community continues to thrive over time. The project team took almost a year to collect data, create base maps and build a knowledge base before starting beneficiary outreach. The team also met with a Planning Hui made up of representatives from all three homestead areas to refine the outreach approach.

The MCH-CRP was developed through a beneficiary-driven process guided by a resilience planning framework. The process followed four key steps:

1. Identification of assets – the natural, cultural, social, and infrastructural resources that strengthen the community
2. Identification of hazards – the environmental and climate-related threats facing the homesteads
3. Assessment of vulnerabilities – understanding where people, places, and systems are most at risk
4. Determining risks – prioritizing which issues require the most urgent attention.

BENEFICIARY OUTREACH AND PARTICIPATORY MAPPING

Developing an integrated, culturally grounded model of resilience started with asking beneficiaries for their understanding, definitions and experiences of resilience at the first beneficiary workshop held in May 2024 at Kūlana ‘Ōiwi. See Fig. 3 Workshop #1 Responses, below.

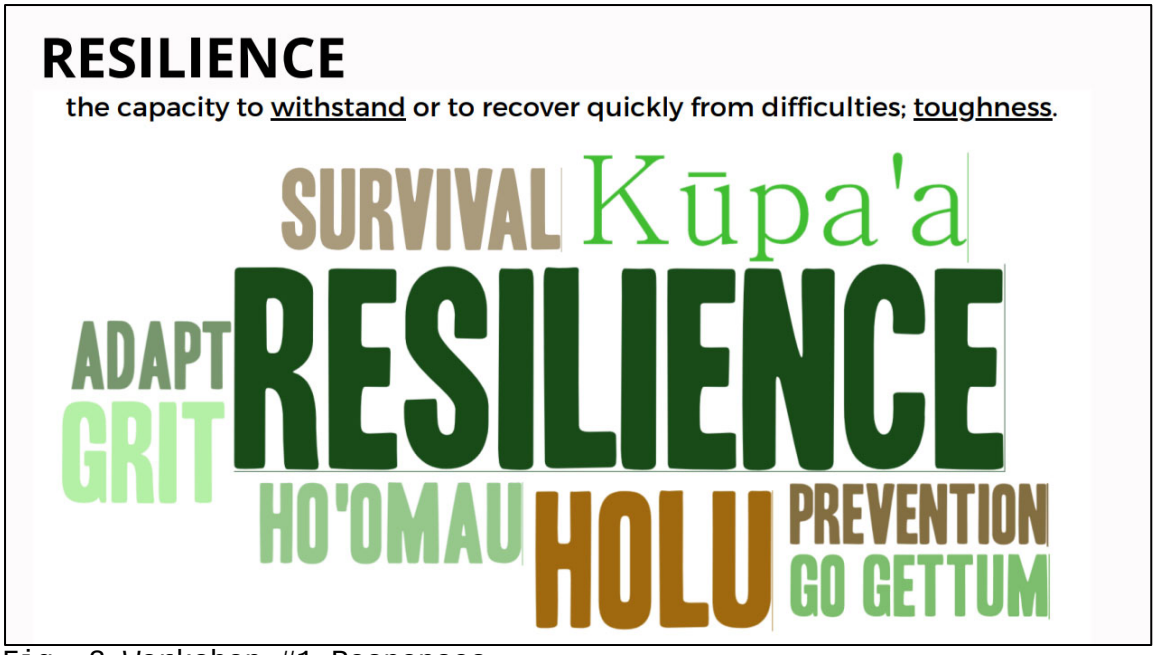

Fig. 3 Workshop #1 Responses

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.

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.*

These terms and concepts reflect the existing strengths and inherent resilience of Molokai homesteaders. This plan seeks to build on those strengths and find ways to support and empower the homesteaders' efforts to reduce vulnerabilities and increase their existing resilience. Planning Hui meetings and interviews and talk story sessions were then held from April to June of 2024.

Beneficiary Workshop #2 was held at Kūlana ʻŌiwi in June 2024 and was designed 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. Beneficiaries discussed three key themes:

- Pilikia/Hihia (hazards, problems, or risks)
- Manawa (opportunities and possibilities)
- Waiwai (benefits, strengths, and assets)

Through a participatory mapping activity, each group located these elements on maps of their community to visualize where vulnerabilities and opportunities exist. See Fig. 4, Hazard Exposure Base Map, below. Community assets are the valued places, resources, and systems that sustain daily life, identity, and well-being in the homestead communities.

Beneficiaries identified fifteen key assets:

1. Makai Homesteads
2. Mauka Homesteads
3. Kamehameha V / Maunaloa Highway
4. Reef and Marine Life
5. Gulches and Waterways
6. Wetlands
7. Fishponds
8. Beaches
9. Agricultural and Pastoral Land
10. Native Forests
11. Drainage Infrastructure
12. Parks
13. Community Centers
14. Roadways
15. Kapa‘akea Cemetery

Fourteen primary hazards were also identified by beneficiaries:

1. Rising Sea Levels
2. Coastal Erosion and Land Loss
3. Storm Surge, Wave Overtopping, and King Tide Flooding
4. Intense Rainfall Events and Flash Flooding
5. Blocked or Undersized Drainage Infrastructure
6. Sediment Buildup in Streams and Culverts
7. Extended Drought Periods
8. Wildfire Ignition and Spread
9. Overgrazing and Browsing by Invasive Deer
10. Erosion and Sediment Runoff from Mauka Areas
11. Contamination from Cesspools and Stormwater
12. Invasive Mangrove Encroachment
13. High Winds from Tropical Storms or Hurricane
14. Tsunami and Large Swell Events

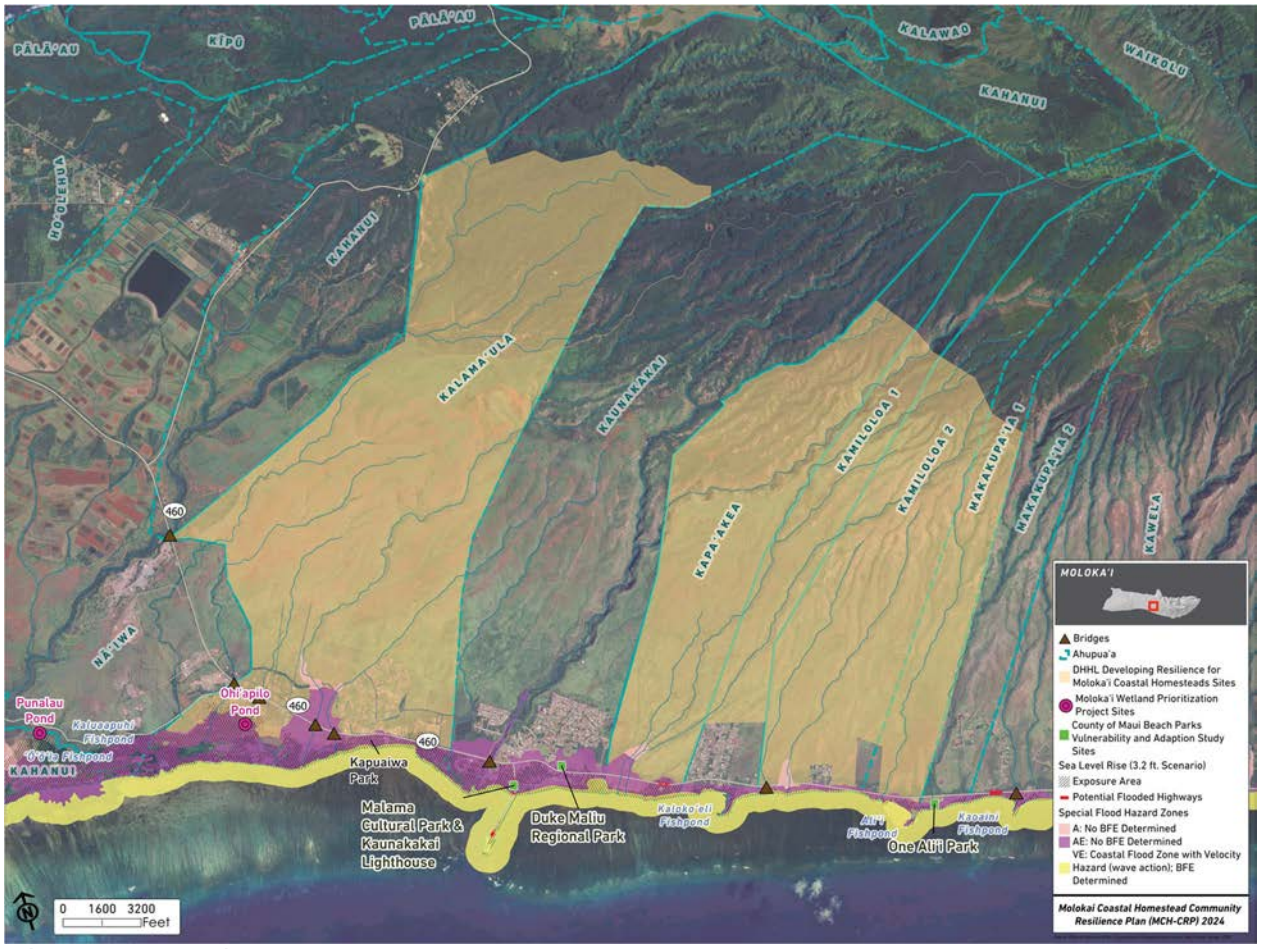

Fig. 4 Hazard Exposure Base Map

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. In the discussion for each challenge, the plan highlights the hazards facing the homestead communities, the vulnerabilities that increase their exposure, and the resulting risks to people, place, and resources:

1. Sea Level Rise, Coastal Erosion, and Coastal Flooding
2. Heavy Rainfall, Ravine Flooding, and Drainage Overflows
3. Drought, Wildfire, and Mauka Degradation
4. Sedimentation, Pollution, and Marine Ecosystem Decline
5. Severe Storms, Hurricanes, and Tsunami

Beneficiary Workshop #3, held at Kūlana ‘Ōiwi in August 2024, focused on developing and refining potential resilience strategies. These discussions also involved Molokai subject matter experts from various state and county agencies and representatives from

organizations such as the Molokai Island Burial Council and the Moloka‘i Homestead Livestock Association. Together, participants ranked and prioritized the most impactful and achievable strategies.

Beneficiary Meeting #4 was broken into two workshops at regular homestead association meetings held in April 2025 to review strategies and early actions, followed by an informational briefing to the Hawaiian Homes Commission at its annual meeting on Moloka‘i.

HUAKA‘I WITH BENEFICIARIES AND OTHER STAKEHOLDERS

Huaka‘i were conducted with interested beneficiaries and other stakeholders and technical experts from September 2024 to February 2025. The purpose of the Huaka‘i was to provide beneficiaries an opportunity to experience these upland areas firsthand, to reconnect with place, and to share stories, memories, and insights that could guide the planning process. The Huaka‘i also served as a working session to brainstorm restoration and management strategies that have helped shape the resilience strategies within the MCH-CRP. See Fig. 5, View of Lāna‘i from mauka lands, below.

Fig. 5 View of Lāna‘i from mauka lands

RESILIENCE GOALS AND STRATEGIES

Through this planning process, beneficiaries identified five primary planning goals to address the risks and vulnerabilities described previously. These five goals are:

1. Improve Emergency Evacuation and Public Safety
2. Mauka Restoration
3. Water Flow Maintenance and Flood Prevention
4. Restoration and Relocation of Residential Hale
5. Makai Restoration

A matrix of resilience strategies, which also identifies responsible entities, timelines, funding possibilities, workforce development opportunities, and preliminary cost estimates, was then developed, and cross-referenced to color-coded maps that identify potential locations for implementation of resilience strategies.

Potential resilience strategies and projects include pre-disaster emergency response and evacuation planning, evacuation routes and sites, fire breaks, a Drainage Master Plan, mauka and makai restoration plans, managing invasive species, and restoration of springs, fishponds and wetlands.

OBSERVATIONS

During the workshops, the beneficiaries raised multiple concerns regarding the need for disaster preparedness, evacuation planning, and flooding and erosion mitigation. They are acutely aware of the vulnerabilities of their communities, particularly in Kapa‘akea, and are concerned that DHHL and the Molokai District Office may not have the resources available to mount adequate responses to acute hazards and disasters such as flooding, which seem to be increasing in severity. There are serious concerns about the stability of the land and safety of the graves where the County’s Kapa’akea Cemetery is located, and the high amounts of soil present in flood waters that deposited a deep layer of mud during multiple flood events over the last several years.

Illegal activities such as dumping and stockpiling up mauka is a big concern, as is failing cesspools that are affected by high tides and elevated groundwater levels, and chronic and episodic shoreline erosion resulting in loss of lot area fronting the ocean. These are legitimate community health and safety concerns that DHHL, possibly in partnership with other state and county emergency management and hazard mitigation agencies, needs to address in the short term with strategic implementing actions.

RELATIONSHIP TO DHHL PLANNING SYSTEM

DHHL General Plan (2022)

As discussed earlier in the submittal, the 2022 DHHL General Plan has multiple goals, policies and metrics throughout the Plan that support the MCH-CRP resilience goals and strategies. A primary vehicle for reevaluating land suitability and developing new and better land use plans, including identifying areas for relocation of homesteaders affected by increasing coastal hazards due to rising sea levels, will be the update of the Molokaʻi Island Plan.

The land suitability phase will identify areas that are subject to current and future hazards and apply appropriate land use designations such as the Special District Coastal Hazard designation. The design phase should also ensure that any uses or development within vulnerable areas are designed to be resilient to anticipated hazards and incorporate mitigation measures to minimize risk to life and property.

DHHL Molokaʻi Island Plan (2005)

The purpose of each DHHL Island Plan is to (1) assign land use designations for land holdings on each island; (2) establish land use goals and objectives of the General Plan, specific to each island; and (3) identify island-wide needs, opportunities, and priorities. At a minimum, an island plan shall do the following:

(1) Apply the criteria from the general plan to identify suitable homestead lands, including areas for new development, infill, and redevelopment;
(2) Apply criteria to determine available lands not required for homesteading, including areas for revenue generation, community use, and other non-homesteading uses designated in the general plan;
(3) Prioritize the development or redevelopment of designated homestead lands based on defined criteria;
(4) Identify infrastructure requirements; and
(5) Analyze state and county plans to identify potential impacts on department land use and infrastructure.

The DHHL Molokaʻi Island Plan was approved by the HHC in June 2005, under the 2002 General Plan. DHHL lands on Molokaʻi are situated in five major areas: ʻUalapuʻe, Kapaʻakea-Kamiloloa-Makakupaʻia, Kalamaʻula, Kalaupapa-Pālāʻau (Apana 3) and Hoʻolehua-Pālāʻau (Apana 1 & 2). The MCH-CRP only covers the regions of Kapaʻakea-Kamiloloa-Makakupaʻia and Kalamaʻula, as well

as the Malama Park lands in Kaunakakai, which were not yet in the inventory in 2005. See further discussion of the Malama Park Land Use Amendment and Special Area Plan, below.

Molokai Island Plan Update (2026 – 2027)

The DHHL Planning Office has selected a consultant and is negotiating the scope of work to start the Island Plan update process in early 2026. Significant attention will be paid to addressing the policies in the General Plan regarding climate change and sea level rise, hazard mitigation, community resilience and emergency preparedness.

DHHL Moloka‘i Regional Plan (2020)

The DHHL Moloka‘i Regional Plan was updated in 2019 and approved by the HHC in February 2020. There was limited discussion during the planning process of the need for hazard mitigation, emergency preparedness or evacuation routes and sites. No Priority Projects related to these needs were developed. The subsequent preparation of the South Molokai Shoreline Erosion Management Plan (SM-SEMP) identified risks and vulnerabilities for the coastal homesteads along Molokai’s southern shoreline, such as coastal erosion, inundation and flooding from heavy rain events, and motivated PLO to apply for the NFWF NCRF grant to prepare the MCH_CRP in order to include the lands mauka of these coastal homesteads and evaluate resiliency at an ahupua‘a scale.

Malama Cultural Park Special Area Plan

In June 2011, the Department of Land and Natural Resources (DLNR) transferred to DHHL four parcels totaling 4.6 acres at Malama Park, near Kaunakakai Wharf. In January 2018, the HHC approved the recommended land use designation of “Special District” for the Malama Park lands. This land use designation requires additional planning prior to issuing dispositions for long term use of the land.

Also prepared by G70, the Malama Cultural Park Special Area Plan was approved by the HHC at its July 2022 meeting. The SAP’s Implementation Plan describes beneficiary desires for collaboration with the Molokai community to pursue a Community-Based Stewardship Management Model for the Park. Implementation of the SAP will play a key role in increasing resilience of the DHHL lands within the Kaunakakai ahupua‘a. See Fig. 6, Malama Park Management Zones, below.

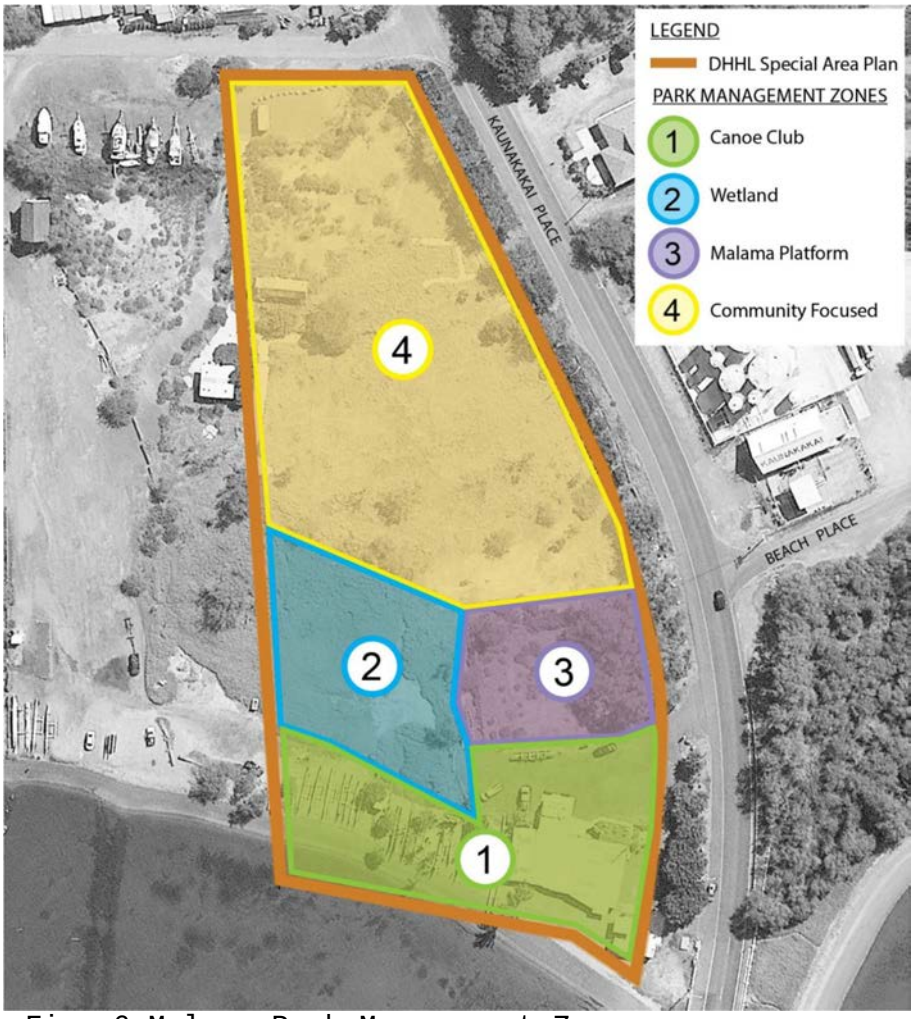

Fig. 6 Malama Park Management Zones

NEXT STEPS & IMPLEMENTATION

For the medium- and long-term, the intention is that having a comprehensive prioritization plan for community resilience will lead to eligibility for additional NFWF NCRF grants and/or grants from other sources, such as the Act 196 “Green Fees,” for project site assessments and preliminary design, final design and permitting, and implementation in partnership with beneficiaries, which is DHHL’s long-term implementation strategy.

In addition, in 2026 the Planning Office will be starting the planning process for the Moloka‘i 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 MCH-CRP process and by building a strong policy foundation and framework based on beneficiary input and participation, will strengthen DHHL’s ability to pursue implementation of the resilience strategies in the MCH-CRP.

Next Steps:

- Bring Draft Plan back to beneficiaries for a final workshop and circulate for a 30-day comment period (December/January 2025)
- Request HHC approval of Final Plan (February 2025)
- Identify funding sources and methods for implementation of resilience strategies.

Recommendation

None. For information only.

Moloka‘i Coastal Homesteads Community Resilience Plan

SUMMARY REPORT

ISLAND OF MOLOKA‘I, HAWAI‘I

DEPARTMENT OF HAWAIIAN HOME LANDS

HHC REVIEW DRAFT

PREPARED BY:

G70

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NOVEMBER 2025

ITEM G-2
EXHIBIT A

MOLOKAI COASTAL HOMESTEADS COMMUNITY RESILIENCE PLAN

Island of Molokaʻi, Hawaiʻi

SUMMARY REPORT

DEPARTMENT OF HAWAIIAN HOME LANDS

Prepared By:

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SUSTʻĀINABLE MOLOKAI

NOVEMBER 2025

Table of Contents

Executive Summary

The Molokaʻi Coastal Homestead 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 of Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi homesteads. Funded through the National Fish and Wildlife Foundation's National Coastal Resilience Fund, this plan represents the first stage (Community Capacity Building and Planning) of a multi-phase process to strengthen the resilience of Molokaʻi's south shore Hawaiian Home Lands communities.

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), mālama 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.

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
- Wildfire and drought due to invasive grasses and unmanaged mauka lands
- Erosion and sedimentation filling wetlands, springs, and fishponds, degrading reefs
- 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:

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

Mauka Restoration – restore upland forests and reduce erosion and wildfire risk.

Waterways and Drainage – maintain and restore natural drainageways, ravines, and wetlands.

Residential Hale Retrofits and Relocation – strengthen or relocate homes vulnerable to flooding and coastal hazards.

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

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

A Path Forward

Completion 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 Moloka‘i’s legacy as a rich, thriving, and abundant land where community resilience and cultural sovereignty are strengthened for generations to come.

Chapter 1: Introduction

Background

Rooted in extensive multigenerational history, intertwining both native Hawaiian makai fishing and mauka ranching lifestyles, the homestead communities of Kalamaʻula, Kapaʻakea, 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 1-2 **Aerial Image of South Molokaʻi**

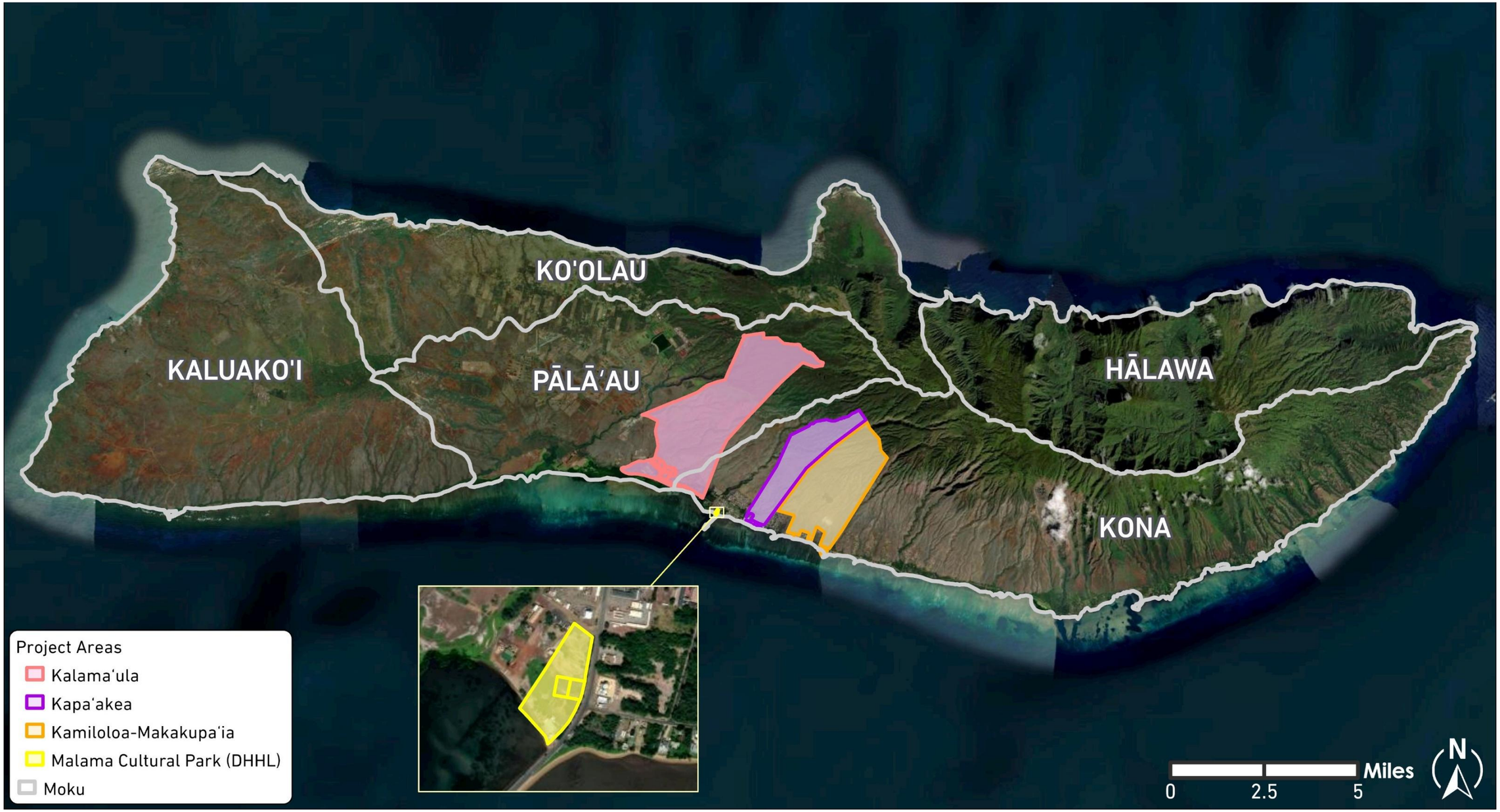


Figure 1-1 **Planning Areas**

In recent years, the south shore of Moloka‘i has experienced more frequent and intense natural events including flooding, erosion, and high surf. Hurricanes 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 deeply connected every part of the island is. When one system fails, many parts of the community are affected.

In response to these growing coastal challenges, DHHL prepared the South Moloka‘i Shoreline Erosion Management Plan (SM-SEMP) in 2022. The plan was developed by Planning Consultants Hawai‘i, LLC, and Coastal Planners, LLC. The SM-SEMP built upon years of community concerns about shoreline loss and coastal flooding affecting the Molokai 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 with modern science.

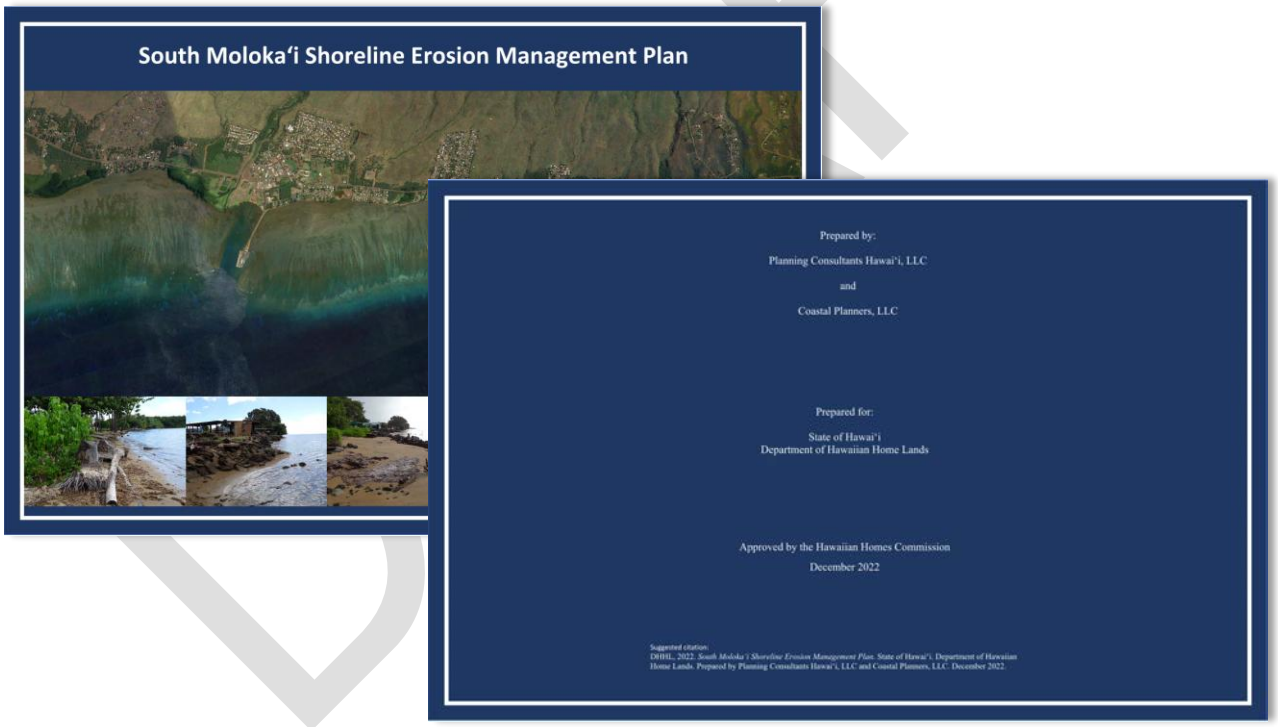


Figure 1-3 **South Moloka‘i Shore Erosion Management Plan (2022)**

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.

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. 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 the Moloka‘i Coastal Homestead Community Resilience Plan (MCH-CRP), which expands on the SM-SEMP 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 Moloka‘i 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 ‘āina 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 planning process followed the framework of the U.S. Climate Resilience Toolkit (2023), integrating local knowledge, Traditional Ecological Knowledge (TEK), anecdotal evidence, and scientific analysis. From the start, this plan was guided by beneficiaries through workshops, huaka‘i (site visits), and small group meetings. Participants shared mo‘olelo to identify climate threats and community assets. Through collaborative discussions, 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.

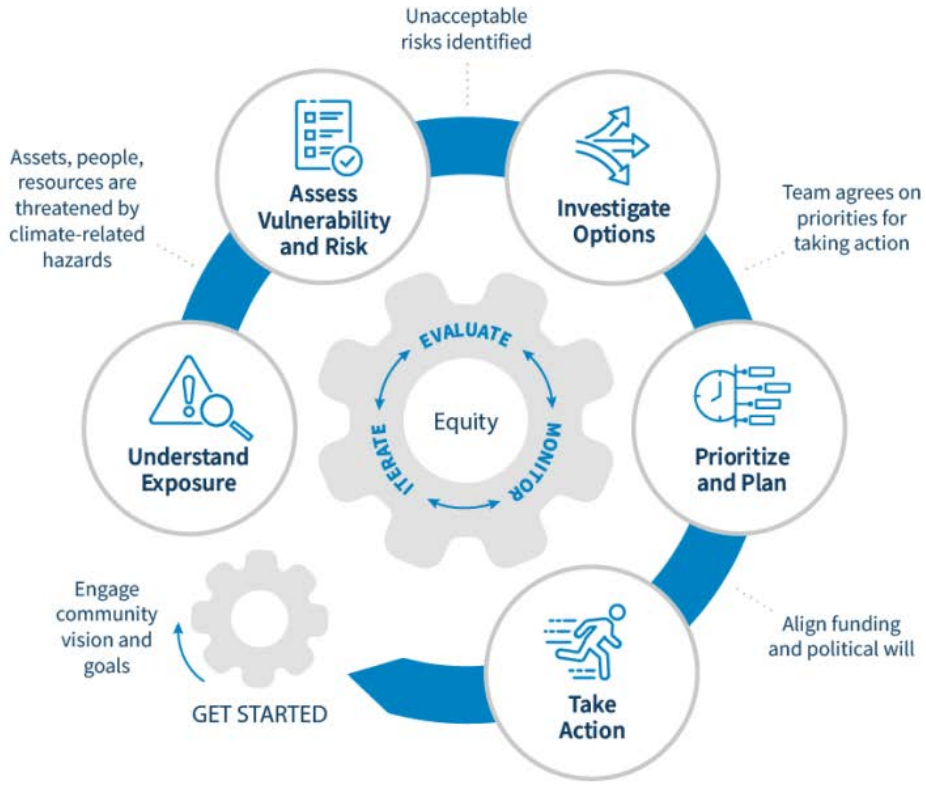


Figure 1-4 Steps for Developing a Climate Resilience Plan (*U.S. Climate Resilience Toolkit, NOAA*)

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 as well as by accessing other state 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 Molokaʻi supporting community engagement and Planning

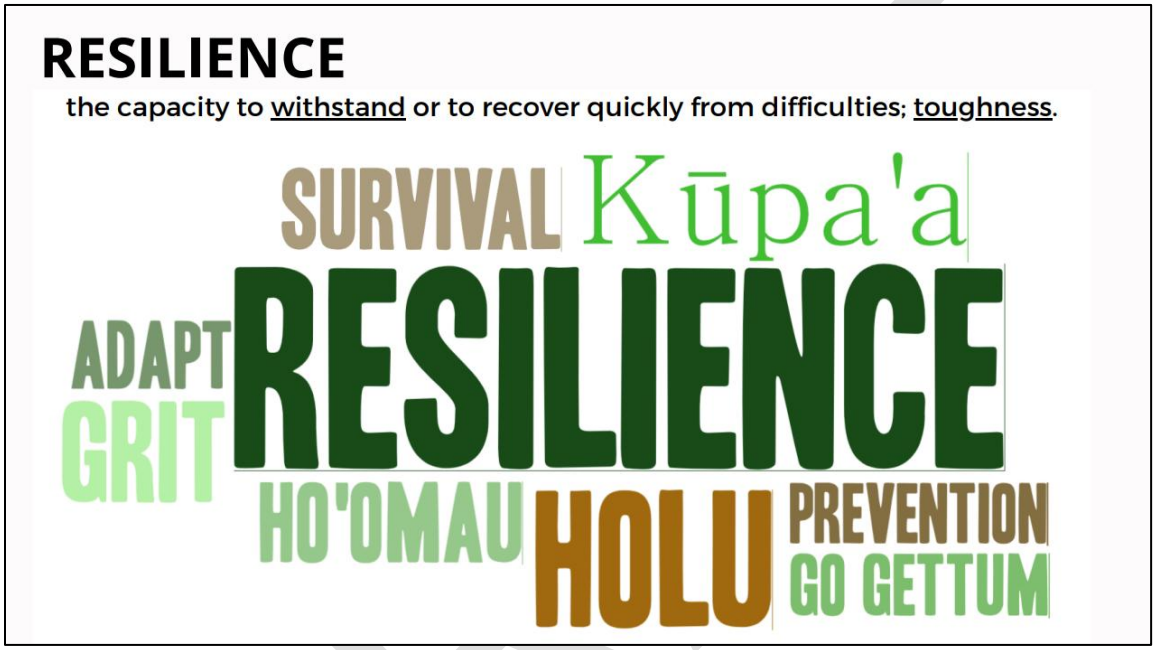
Consultants Hawaiʻi providing technical analysis. Background studies and hazard assessments were conducted in late 2023 to document existing conditions, community assets, and vulnerabilities. A series of meetings, huakaʻi, interviews, and workshops were held with homestead beneficiaries and technical 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 the south shore homestead communities.

MCH-CRP Planning Timeline

Date	Event / Milestone
2018–2022	DHHL completes the SM-SEMP
June 2023	DHHL initiates MCH-CRP planning process
June 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
May 2024	Beneficiary Meeting #1 to introduce MCH-CRP
April–June 2024	Series of Planning Hui meetings, beneficiary meetings, and talk story sessions to identify problems and opportunities
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;
September–December 2024	Technical expert consultations; ʻOhiʻapilo 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 – November 2025	Develop Draft MCH-CRP

Summary of Beneficiary Workshops and Huakaʻi

A total of four beneficiary workshops have been conducted to date. The first Workshop was held at Kūlana ʻŌiwi in May 2024. 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.



Workshop #1: Beneficiaries were asked "what does resilience mean to you"

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.*

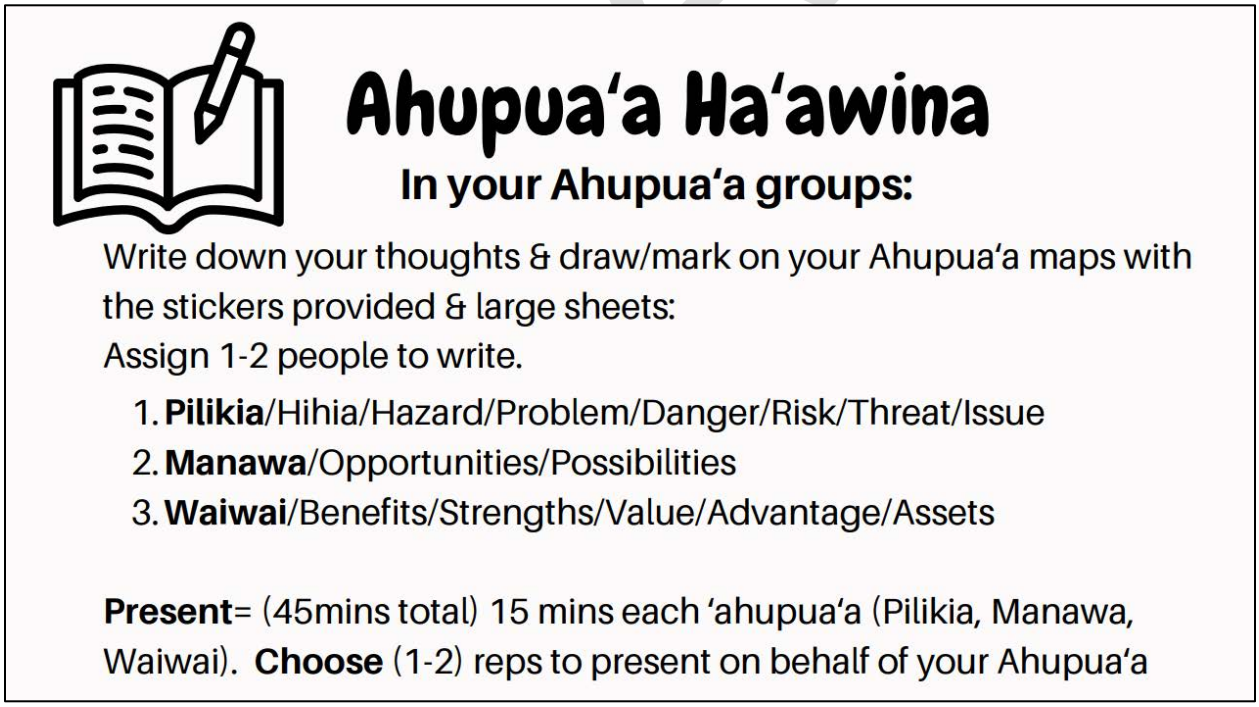
Hoʻomau*: Always, steady, constant, ever, unceasing, permanent, stationary, continual, perpetual; to continue, persevere, preserve, endure, last; preservation, continuation.*

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

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 Kūpa‘a and Ho‘omau reflect a collective understanding that resilience means standing firm through adversity and being unwavering in commitment to ‘āina, 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.

The second beneficiary workshop was held at Kulana ‘Ōiwi in June 2024. The purpose 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 ahupua‘a. Beneficiaries worked in small groups to discuss three key themes—Pilikia/Hihia (hazards, problems, or risks), Manawa (opportunities and possibilities), and Waiwai (benefits, strengths, and assets). Through a participatory mapping activity, each group located these elements on maps of their community to visualize where vulnerabilities and opportunities exist. 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 workshop helped to establish a clear picture of the communities’ assets and challenges, forming the foundation for developing resilience strategies. Key assets and hazards identified during this meeting are discussed in Chapter 4.



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

Workshop #2: Beneficiaries engaged in an interactive mapping activity

Workshop 3, held at Kūlana ʻŌiwi in August 2024, 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 State Department of Transportation (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 Police Department, UH Sea Grant, Ka Honua Momona, Molokaʻi Island Burial Council, and Molokaʻi Homestead Livestock Association joined the discussion to share technical insight, answer questions, and support the community in shaping informed strategies. Beneficiaries identified key projects, the resources needed for implementation, and the partnerships essential to success. Together, participants ranked and prioritized the most impactful and achievable strategies, which are further discussed in Chapter 5 of this plan.

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

Workshop #3: Beneficiaries ranked potential resilience strategies

Workshop 4, held in April 2024, 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 the preliminary draft of the 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 Draft Resilience Strategy Matrix, is presented in Chapter 5 of this plan.

In addition to the beneficiary consultation workshops, beneficiaries were invited to participate in a Huakaʻi, a site visit to DHHL lands in the mauka regions of the ahupuaʻa. The purpose of the Huakaʻi was to provide beneficiaries an opportunity to experience these upland 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 mauka lands, discussed historical and cultural connections, and reflected on how the health of these areas affects the homestead communities below. The Huakaʻi also served as a working session to brainstorm restoration 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.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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 Kalama‘ula, Kapa‘akea, and Kamiloloa One Ali‘i, resilience is not a new concept. It has been practiced for generations through self-reliance, cooperation, and the stewardship of ‘āina. 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.

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 ‘āina that sustains life.

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 Kalaniana‘ole (1922)

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. Coral reefs and 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. 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 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.

Figure 2-1 The Disaster Cycle

Hawaiian Models of Resource Management and Resilience

For native Hawaiians, resilience has always been rooted in the relationship between kānaka (people) and ‘āina. Long before the concept of resilience was used in planning or science, Hawaiian land and resource management systems were designed to sustain abundance, balance, and community wellbeing. These systems recognized that the health of people and the health of the environment are one and the same.

Figure 2-2 envisions a homestead community committed to the implementation of the United Nations (UN) Sustainable Development Goals, a set of 17 global goals it adopted in 2015 to improve health and education while also tackling climate change. In this figure, ola (individual well-being) and kaiāulu (community-level well-being) are seen as embedded parts of the ‘āina, or biosphere. This model moves away from the western sectorial approach to planning, where social, economic, and ecological development are seen as separate parts (adapted from the *Anahola: Innovation-oriented, Ag-centric, Sustainable Community Development* by Sustain Hawai‘i, 2019). The focus is shifting from the environment as externality, to a Hawaiian perspective where the ‘āina is a precondition and foundation for ola, kaiāulu, and sustainability.

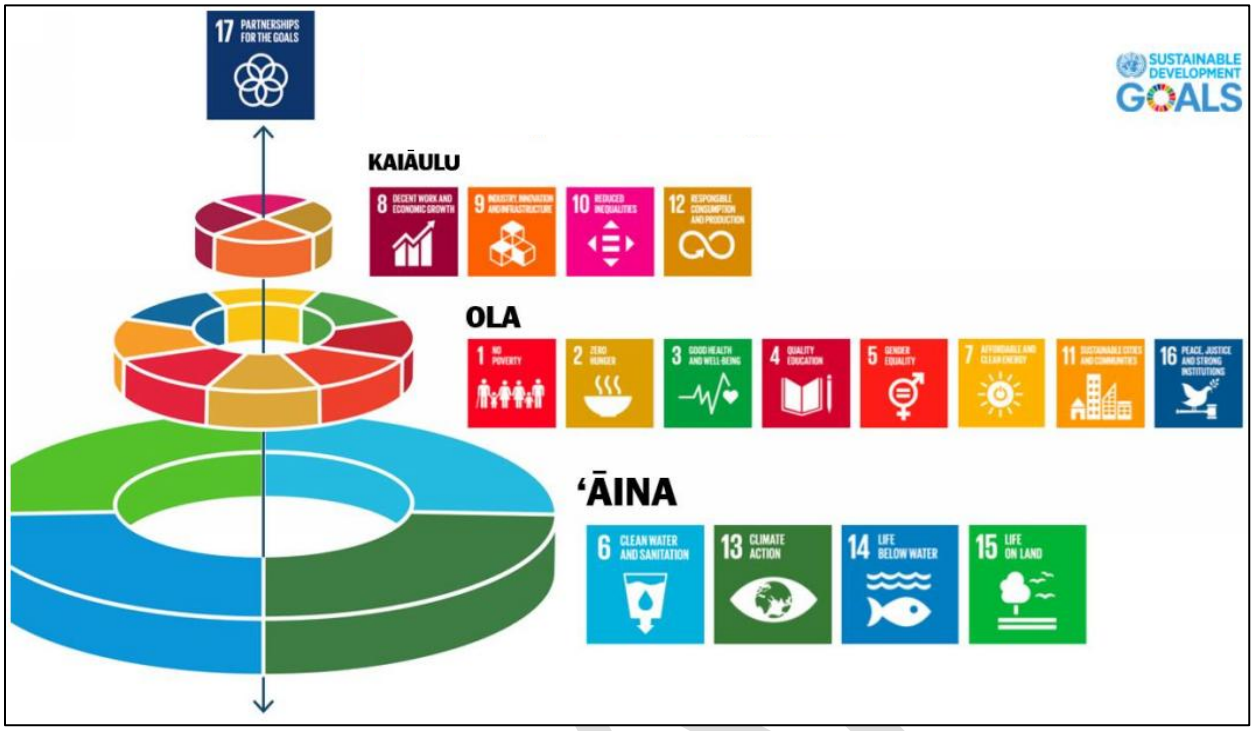


Figure 2-2 **Community-Scale Adaptation of UN Sustainable Development Goals**

Traditional Hawaiian land management divided each island into large regions called moku, which were then subdivided into smaller community-based land sections known as ahupua‘a. Each ahupua‘a typically extended from the mauka to makai, providing access to a full range of resources needed for food, water, and shelter (*Minerbi, 1999*). This structure reflected a deep understanding of how ecosystems function as connected systems rather than separate parts.

Management within each ahupua‘a was guided by the principle of kuleana (responsibility, ancestral obligation, jurisdiction, or authority). Everyone had a role in caring for the land, water, and ocean. Resource use was regulated through seasonal kapu, which allowed time for natural systems to replenish. This balanced approach maintained productivity while preventing depletion. The ahupua‘a system provided coordination across communities, recognizing that natural processes like water flow, fish migration, and forest growth cross human boundaries.

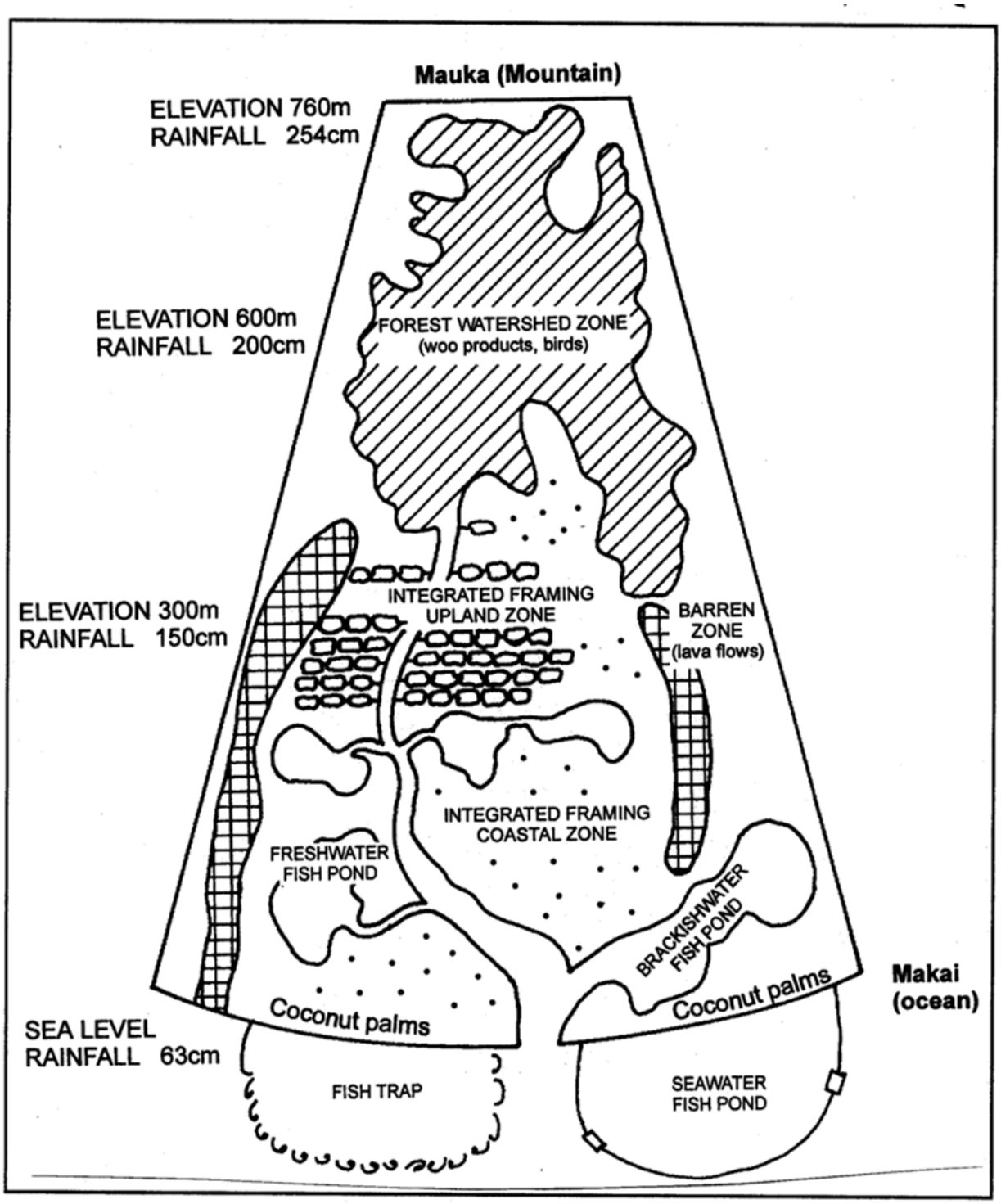


Figure 2-3 **Illustration of Ahupua‘a (Minerbi, 1999)**

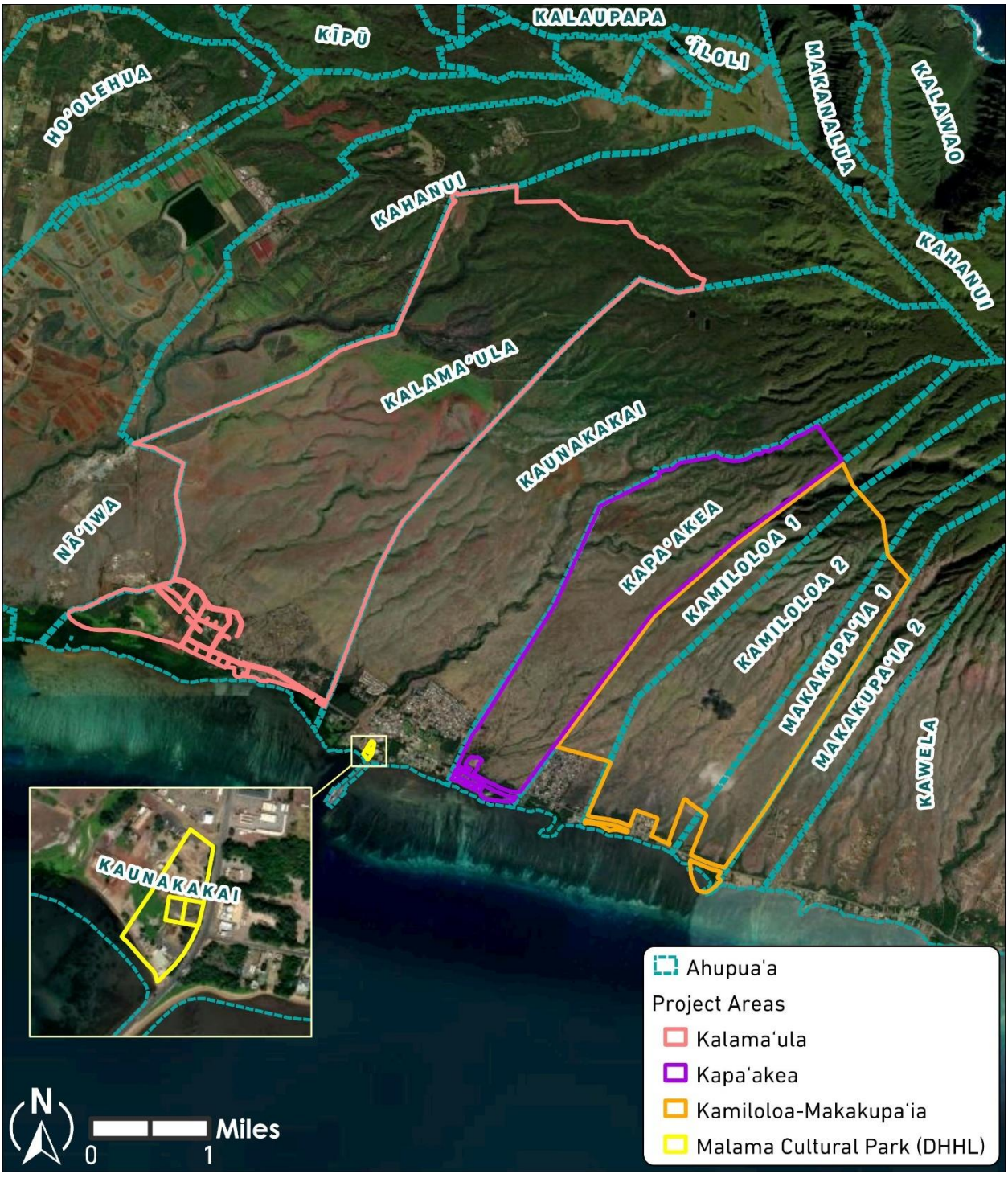


Figure 2-4 **Ahupua‘a Map**

Within the ahupua‘a are stratifications of elevation, called wao (realms). Wao are regions of elevation, similar vegetation, biodiversity levels, and growth patterns that exist in Hawai‘i’s natural environment. Wao are not uniform across islands, rather, they vary depending on the environment, vegetative density, and resource management practices on each island. Wao typically contain their own microclimates, have their own physical characteristics, and contain prominent plant and animal species. Each wao also provides resources for humans, each with specific functions and cultural protocols (*Figure 2-5*). When managed collectively, they supported clean water, fertile soil, and thriving marine life.

Generally, these regions are as follows: wao akua (a distant mountain region with a sacred forest, believed inhabited only by spirits (akua)), wao kele (rain belt, upland forest), wao nāhele (inland remote forest region, jungle), wao lā‘au (agro-forest), wao kānaka (an inland region where people may live or occasionally frequent), Ka Po‘ina Nalu (inner reefs), and kai koholā (outer reef frequented by humpback whales) (Winter et. al., 2018).

The lands above the wao kānaka (wao akua, wao kele, wao nāhele, and wao lā‘au) would have been held in common for use by the residents of the ahupua‘a, given their role in generating and maintaining cultural, biological, and spiritual balance. Wao kānaka lands in the interior were areas for cultivation, habitation, or direct management of natural resources.

Figures 2-6 and 2-7 provide an illustrative representation of the Socio-Ecological Zones of the MCH-CRP subject ahupua‘a.

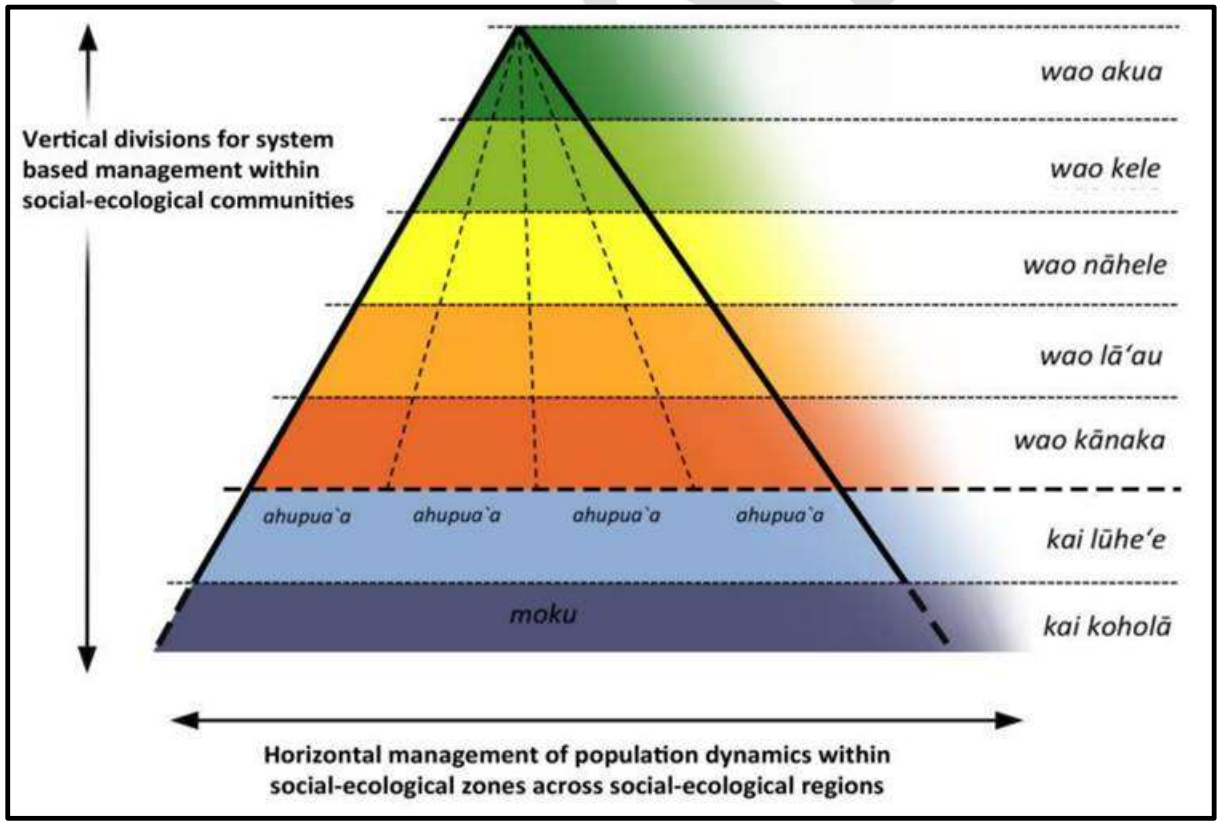


Figure 2-5 **Model of Single Social-Ecological Region**

Socio-Ecological Zone	Translation	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

Socio-Ecological Zone	Translation	Management Implications
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.
Ka Po‘ina Nalu	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)

Resilience from a native Hawaiian perspective is rooted in relationships. When people care for the land and the land cares for them, the foundation for social, cultural, ecological, and economic wellbeing is strengthened.

Effective watershed management brings these relationships together in practice. The mauka forests capture rainfall, filter water, and reduce flooding during heavy rains. Healthy gulches and wetlands slow and absorb runoff, protecting coastal homes and fishponds from sediment and pollution. When the forest, streams, wetlands, and reefs are managed as one connected system, they provide both ecological protection and community safety. This is where the moku and ahupua‘a systems remain powerful today. They organize land and water stewardship in a way that naturally builds resilience across every phase of the disaster cycle.

During the mitigation and preparedness phases, caring for watersheds and restoring natural systems reduce the risks of flooding, erosion, and drought. In times of response, strong community networks built through stewardship help neighbors mobilize quickly and care for one another. In recovery, cultural and ecological restoration bring healing to both people and place. Through this Indigenous model, resilience is not limited to reacting to disasters. It is a living process that connects environmental health with social strength and cultural continuity. By restoring and managing Moloka‘i’s watersheds using traditional knowledge and modern science, the homestead communities are continuing the legacy of resilient people caring for resilient lands and seas.

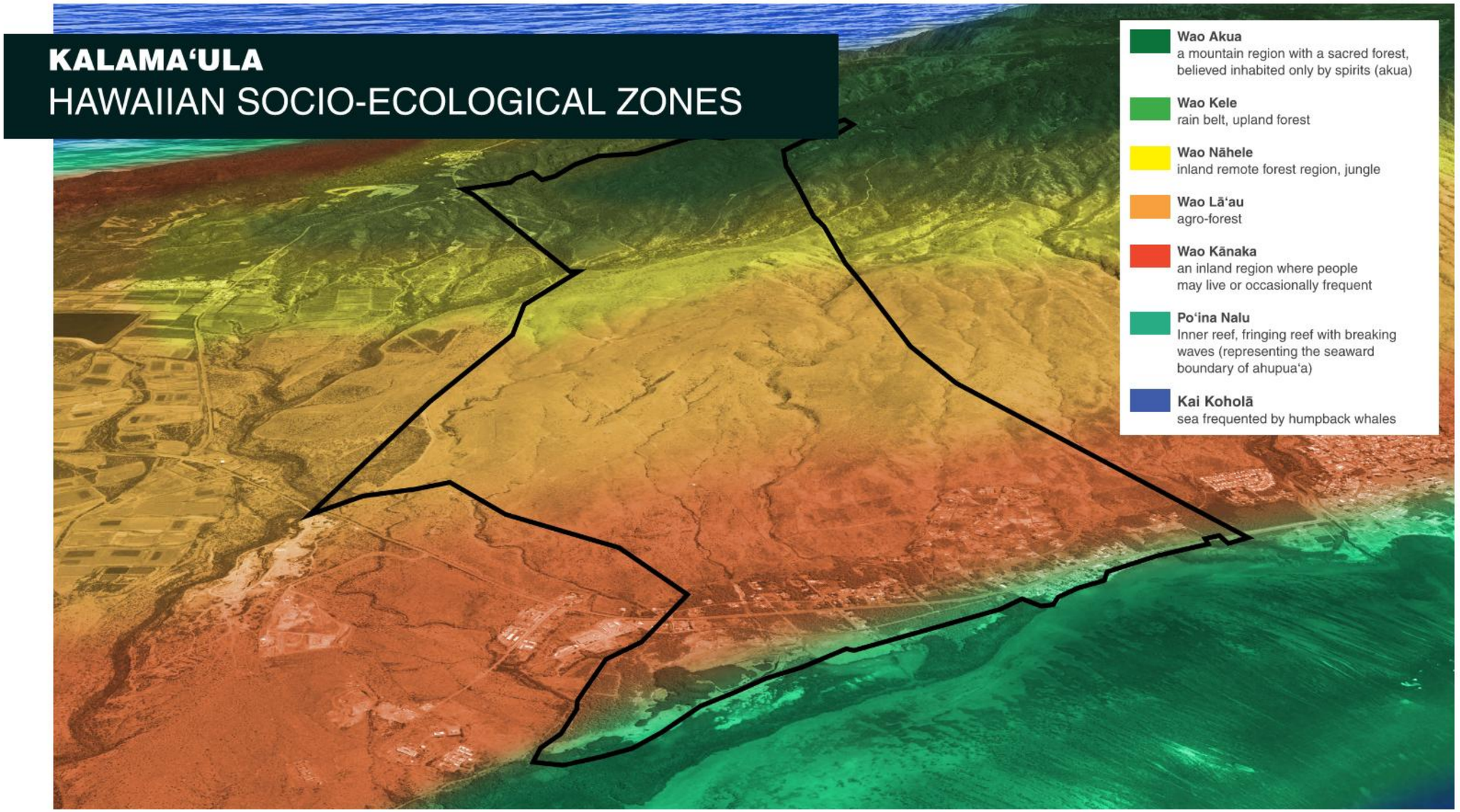


Figure 2-6 **Illustration of Socio-Ecological Zones of Kalama’ula Ahupua‘a**

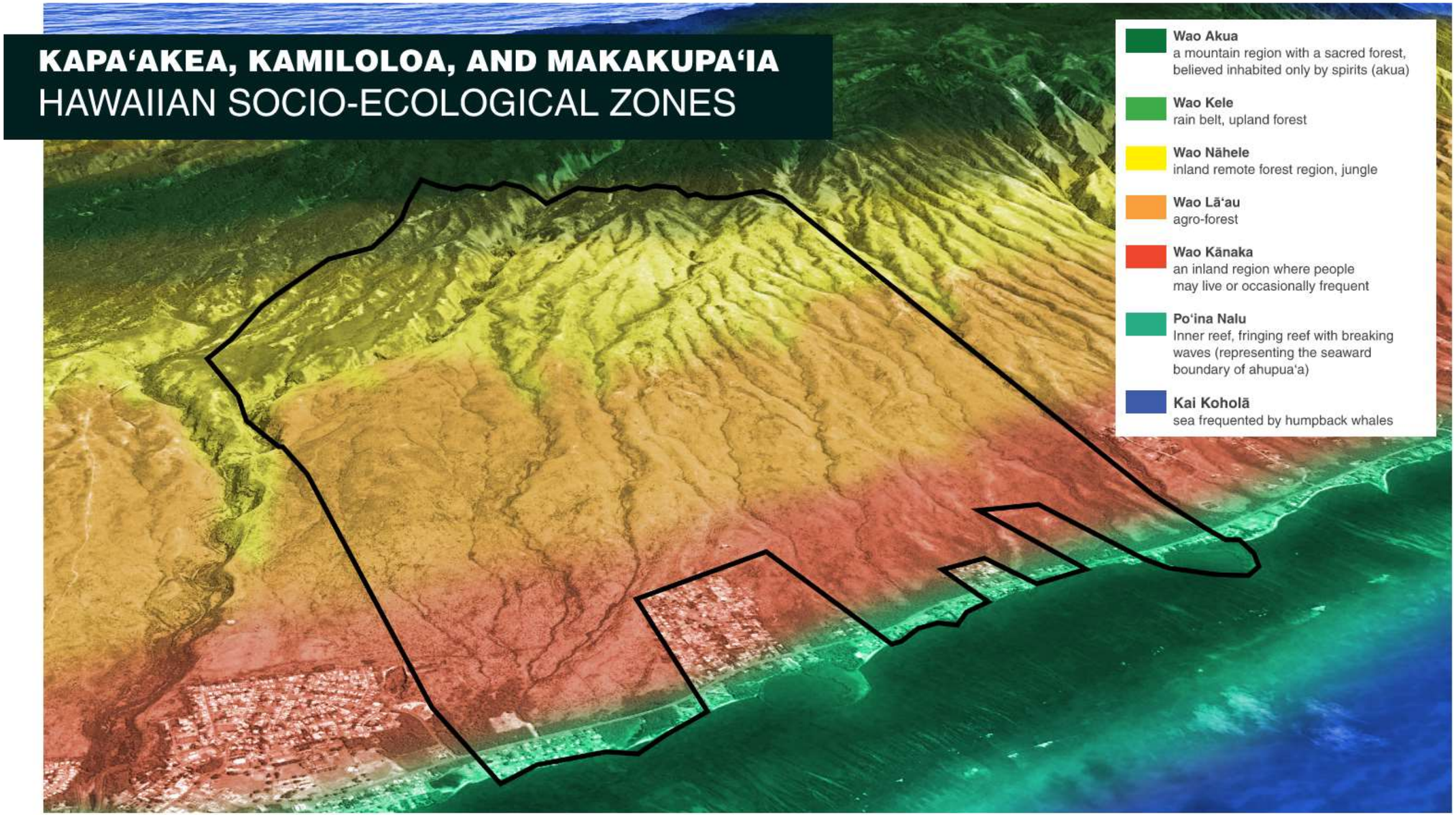


Figure 2-7 **Illustration of Socio-Ecological Zones of Kapa’akea and Kamiloloa Ahupua‘a**

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 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. 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 by the islands of Lānaʻi and Kahoʻolawe from waves, storms, and swells 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, 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, foreign colonization in the 1800s and the imposition of private land ownership systems drove Hawaiians out of their ancestral spaces. Many of these loʻi and fishponds were abandoned and either filled or now include mangroves and sediment.

Before the introduction of ranching and invasive ungulate populations, the Kalamaʻula, Kapaʻakea, 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 watershed. 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.

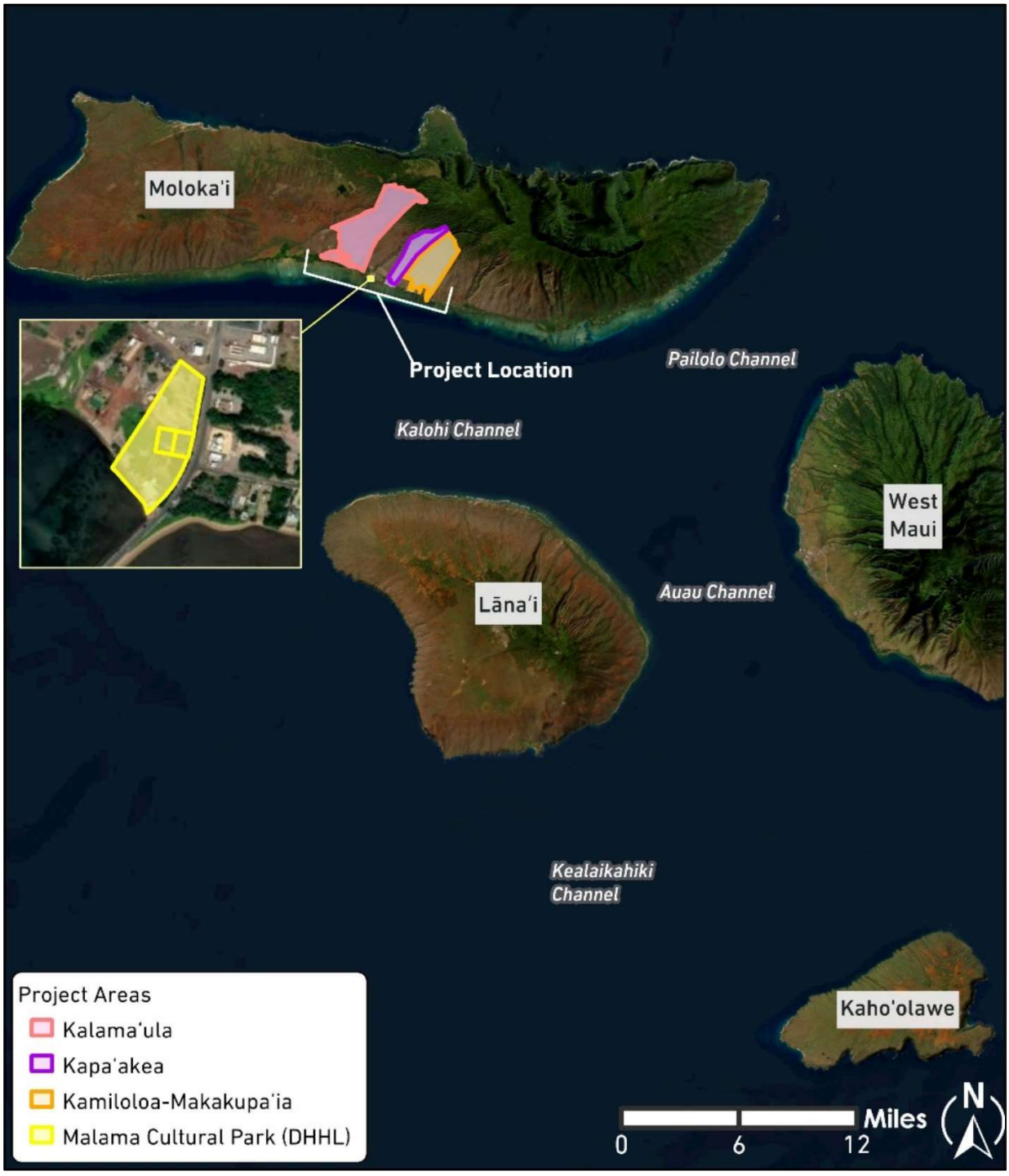


Figure 3-1 **Regional Setting**

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 sheep. 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.

The construction of Kaunakakai wharf in 1889 and its several extensions and improvements over the years disrupted along-shore currents, waves and sediment transport. Sand and mud tends 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.

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 reduces 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.

Figure 3-2 **Photo of Kaunakakai Wharf (1949)**

Non-native limu (algae) species, such as *Gracilaria salicornia* (gorilla ogo) and *Acanthophora spicifera*, have proliferated in Moloka‘i’s coastal waters. *Acanthophora spicifera* was unintentionally introduced to Hawai‘i in 1950, likely through hull fouling on a barge arriving in Pearl Harbor. From there, it spread rapidly across the main Hawaiian Islands, including Moloka‘i. *Gracilaria salicornia* was intentionally introduced to Hawai‘i in the 1970s for experimental aquaculture aimed at agar production. Initial plantings occurred on O‘ahu, and the species was later translocated to Moloka‘i’s Puko‘o Fishpond in the 1980s. 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 1800's, 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 plants 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 **Fire prone grasses burning in a 2020 fire near Kaunakakai (Photo Credit: Hawaii News Now)**

Fire prone grasses such as these burning in a fire near Kaunakakai in 2020, are both a cause and a result of wildfires on Molokaʻi. They desiccate easily, spread fire rapidly, and regenerate quickly after wildfire. This leads to what is known as the grass-fire cycle.

These ahupuaʻa are now facing additional threats 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 that are the focus of this plan: Kalama‘ula, Kapa‘akea, Kamiloloa, and Malama Cultural Park. The boundaries of each homestead community, the total land area, and their relationship to surrounding features such as Kamehameha V Highway, the shoreline, and DHHL’s Mālama Cultural Park is illustrated.

Information is also presented on the DHHL property designations and homestead land use patterns within these communities. Tables and maps summarize the existing uses of DHHL lands including residential, agricultural, community, and conservation areas. The data reflect conditions as of 2024 and include the number of active leases, total population, and the overall makeup of homestead lands.

Climate and Hydrology

The south shore of Moloka‘i has a warm and dry climate with limited rainfall and steady trade winds throughout most of the year. The figures that follow illustrate how rainfall and watershed processes shape the landscape of southern Moloka‘i. Rain falls most heavily in the mauka forest reserve, where it collects before flowing downslope through a network of gulches in intermittent streams. These streams carry freshwater and sediment toward the wetlands and low-lying areas along the coast, eventually reaching the nearshore ocean. The figures illustrate drainage channels and rainfall gradients, highlighting how the health of the mauka areas directly affects the coastal environment and the homestead communities below.

Average rainfall near the shoreline is about one to two inches per month, increasing to nine to ten inches in the mauka forest reserve. These sharp rainfall differences create strong contrasts across the landscape, with dry grasslands and shrublands along the coast and wetter forested areas upland.

Although the region often experiences drought, intense short-term rain events can cause flooding in the gulches and low-lying coastal areas. This combination of dry conditions, periodic heavy rains, and steady winds contributes to wildfire risk, erosion, and challenges for water supply and land management. Understanding these patterns is essential to addressing both drought and flooding concerns in the homestead communities.

Kalama’ula

Moku: Pālā‘au & Kona

Ahupua‘a: Kalama‘ula

Area: 5,042 Acres

Kapa’akea

Moku: Kona

Ahupua‘a: Kapa’akea

Area: 1,942 Acres

Kamiloloa

Moku: Kona

Ahupua‘a: Kamiloloa & Makakupa‘ia

Area: 3,249 Acres

Malama Cultural Park

Moku: Kona

Ahupua‘a: Kaunakakai

Area: 4.58 Acres

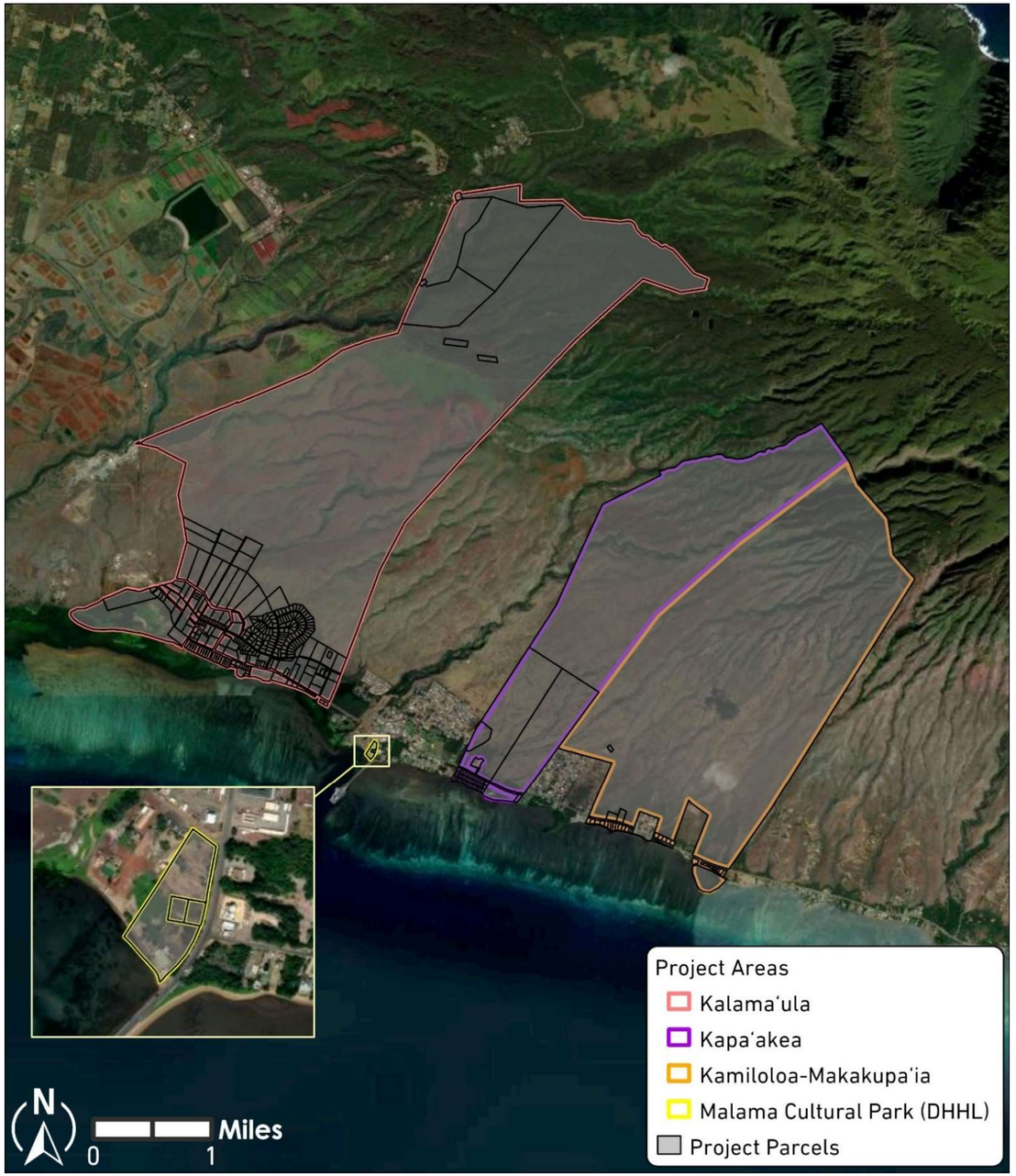


Figure 3-4 **Homestead TMK Map**

Kalama’ula

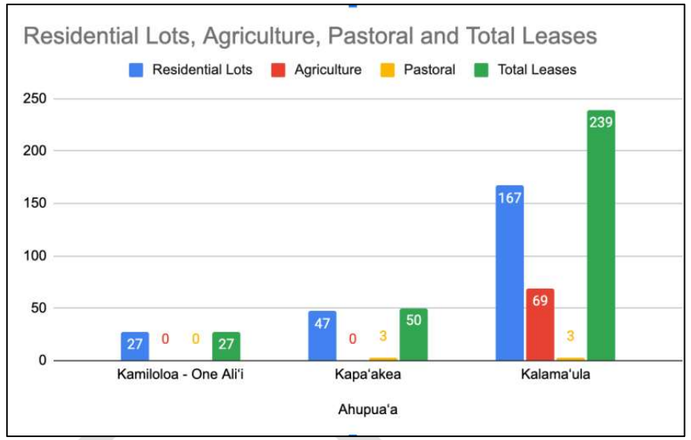
160 Residential Lots

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

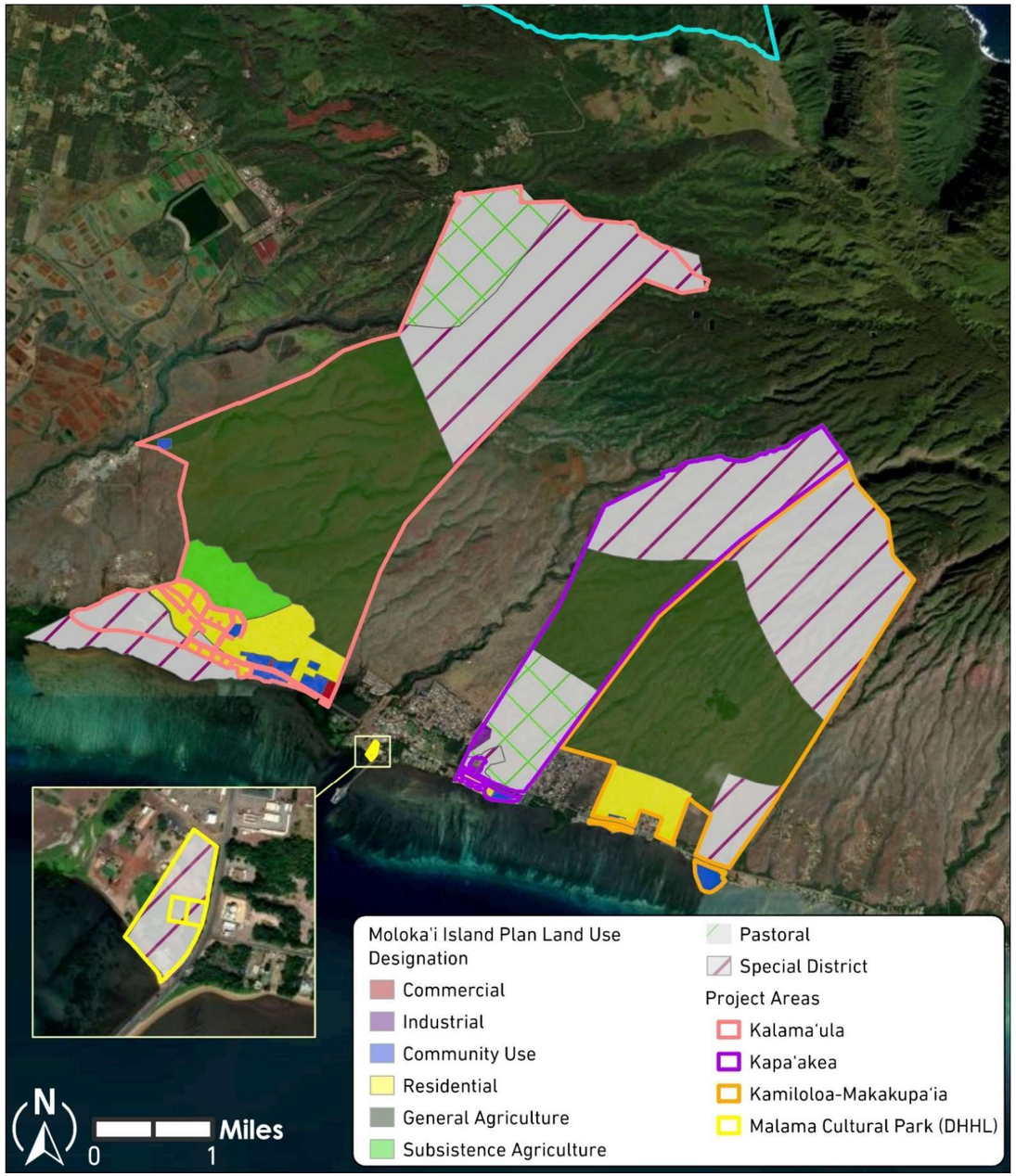


Figure 3-5 DHHL Land Use Designation Map

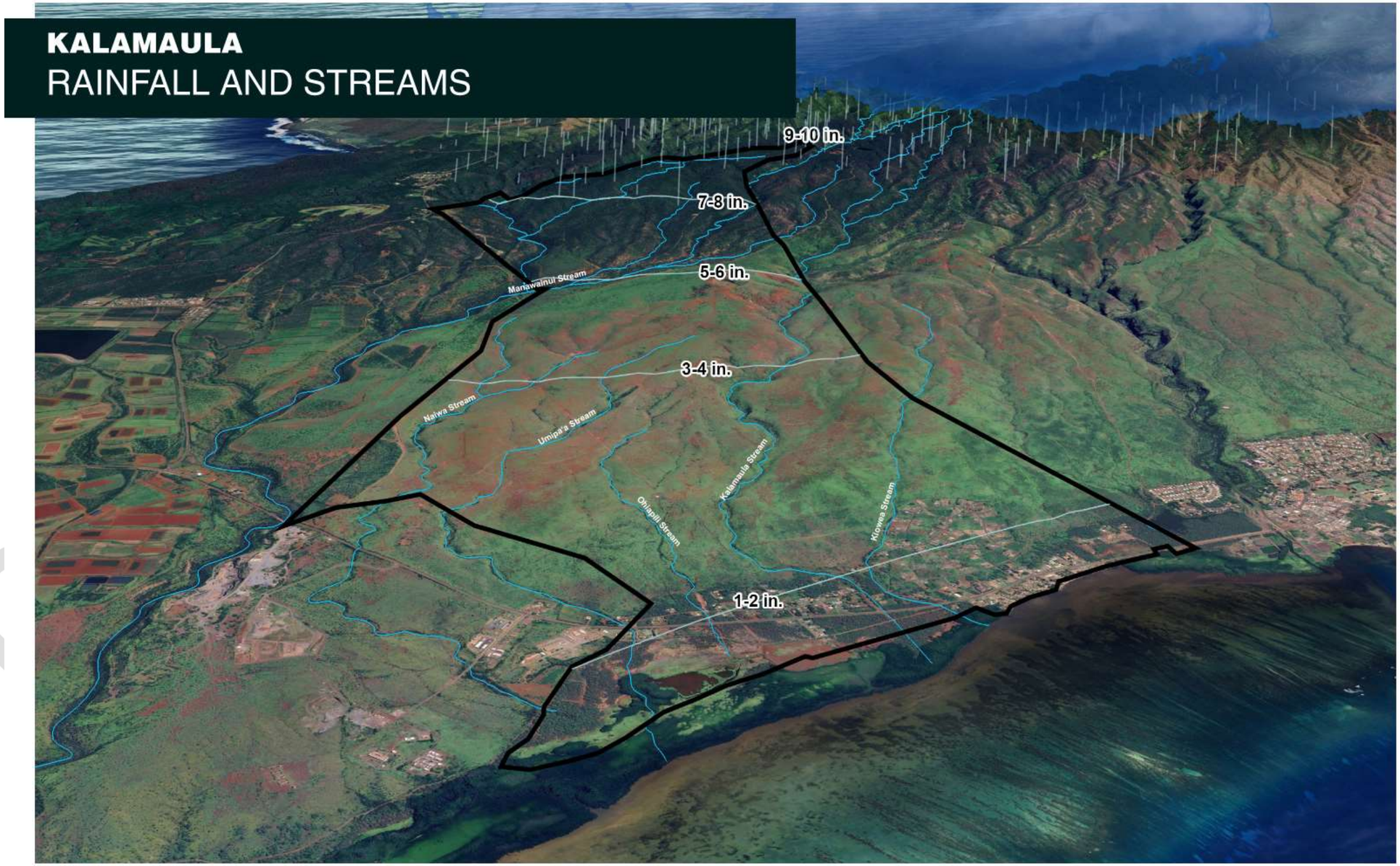


Figure 3-6 **Kalama‘ula Rainfall and Streams**

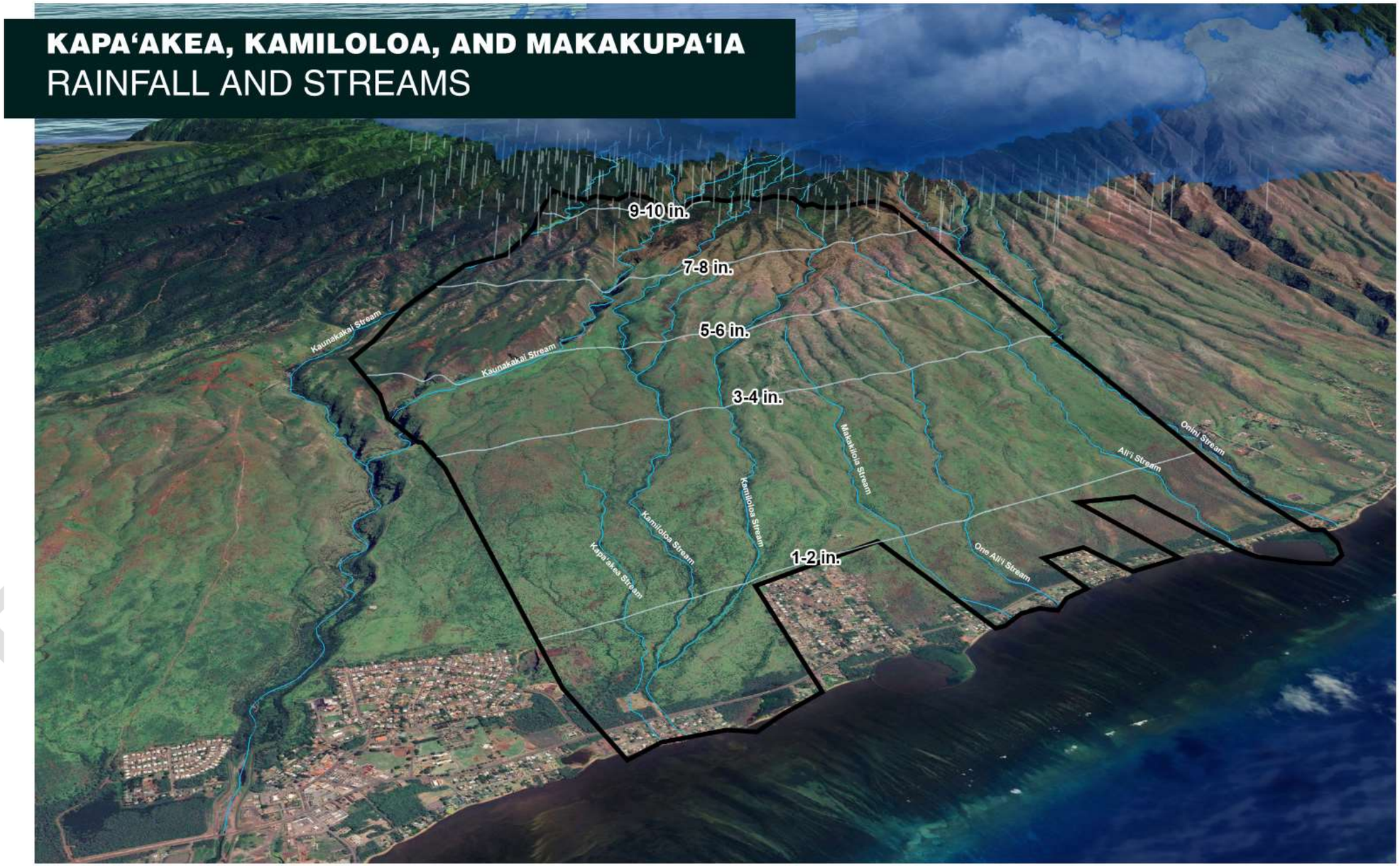


Figure 3-7 **Kapa‘akea and Kamiloloa Rainfall and Streams**

EXISTING CONDITIONS

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

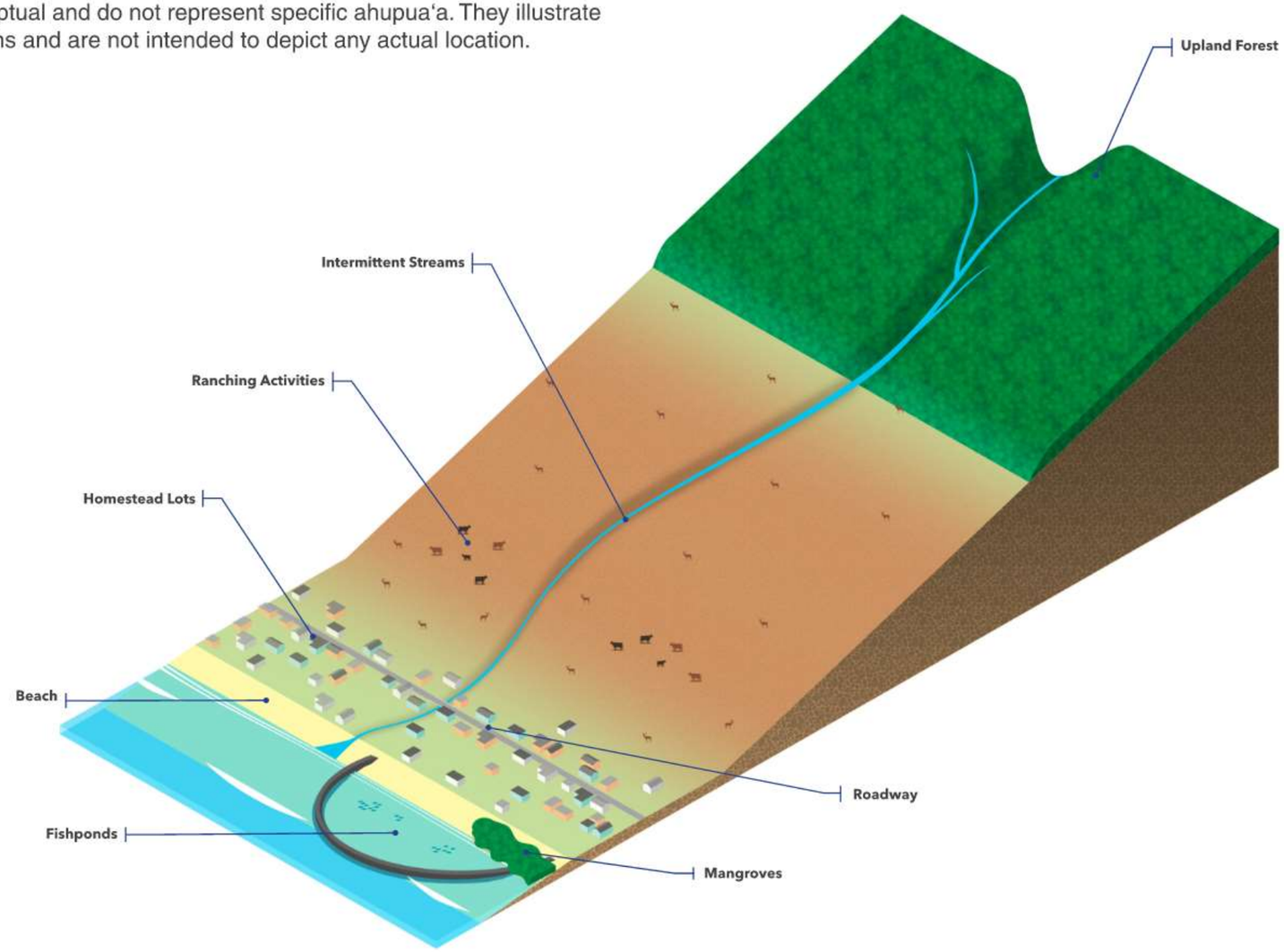


Figure 3-8 **Conceptual Existing Conditions of Homestead Ahupua‘a**

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 valued places, resources, and systems that sustain daily life, identity, and well-being in the homestead communities. These assets were identified by DHHL beneficiaries through community consultations, site visits, and small group discussions. They reflect the priorities and lived experiences of the homesteaders, ranging from residential areas, gathering places, and infrastructure to cultural and natural resources that support subsistence, heritage, and resilience.

The following describes the fifteen key assets that were identified.

1. Makai Homesteads
The makai homesteads are DHHL residential lots located on the coastal plain between Kamehameha V Highway and the shoreline. These small parcels house beneficiary families in modest homes that reflect the rural character of southern Moloka‘i. 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 Kalama‘ula 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 Highway
This highway is the main route that connects all of the southern Moloka‘i 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 ‘ohana. 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 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. Community groups continue restoration efforts that provide hands on learning and stewardship opportunities.

8. Beaches
The beaches 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 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
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.

2. Coastal Erosion and Land Loss
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.

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.

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 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.

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.

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.

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.

9. Overgrazing and Browsing by Invasive Deer
Axis deer populations have expanded across southern Moloka‘i. Their overgrazing removes vegetation that stabilizes soil, damages crops, and worsens erosion and sediment runoff into coastal waters.

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.

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.

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.

13. High Winds from Tropical Storms or Hurricane
Strong winds associated with tropical storms or hurricanes 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.

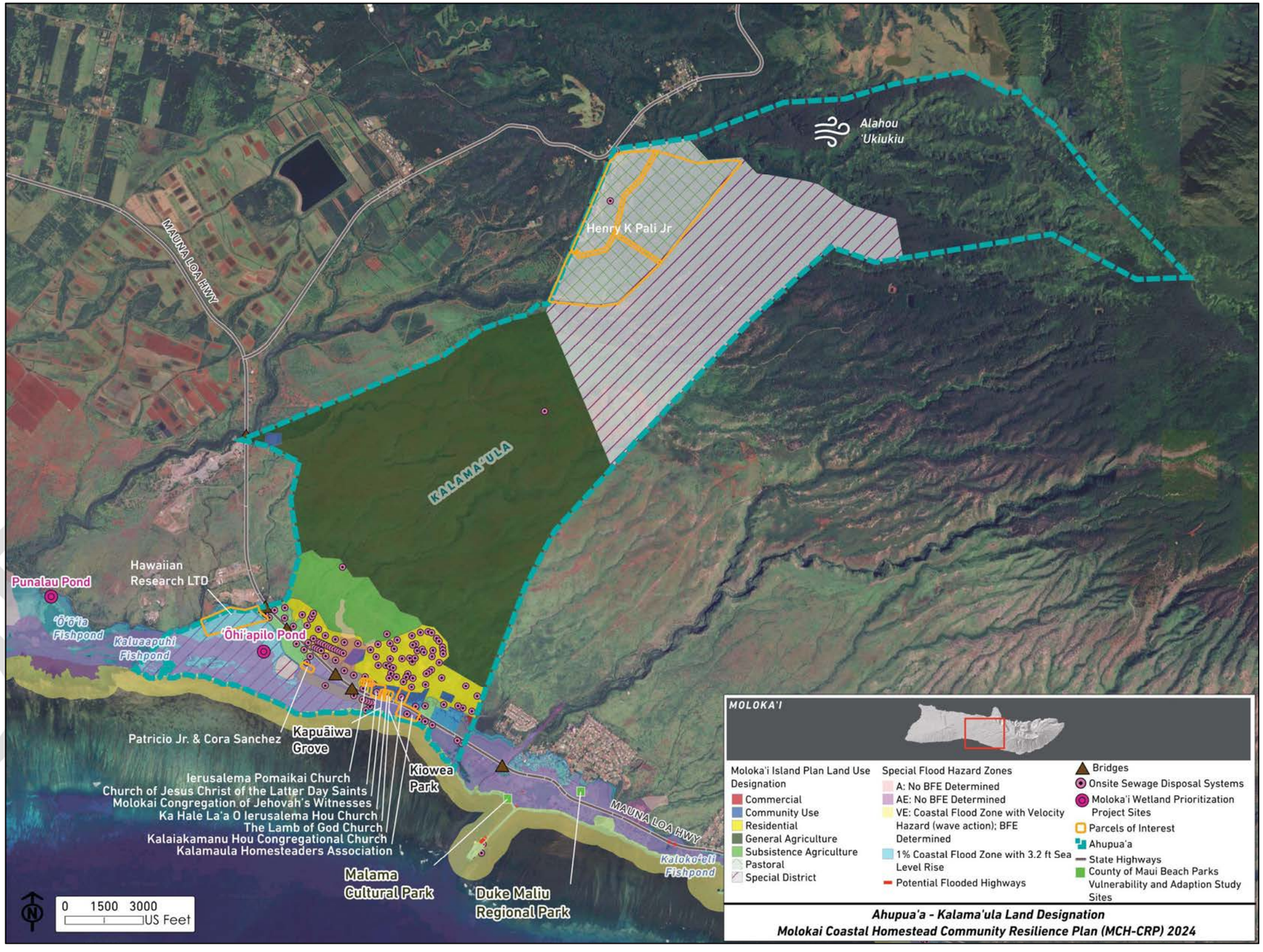


Figure 4-1 **Kalama’ula Ahupua‘a Hazard Exposure**

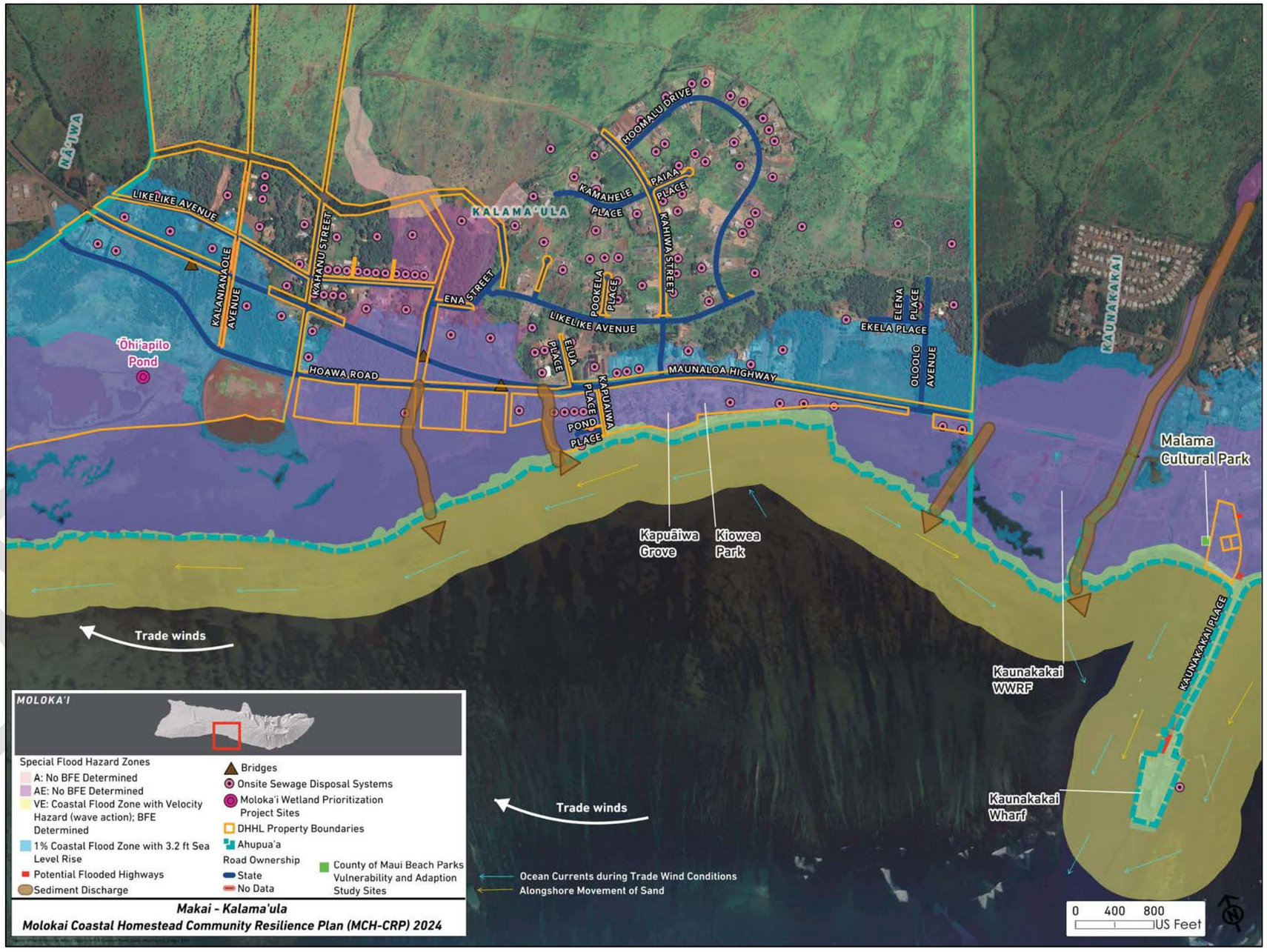


Figure 4-2 **Kalama’ula Makai Hazard Exposure**

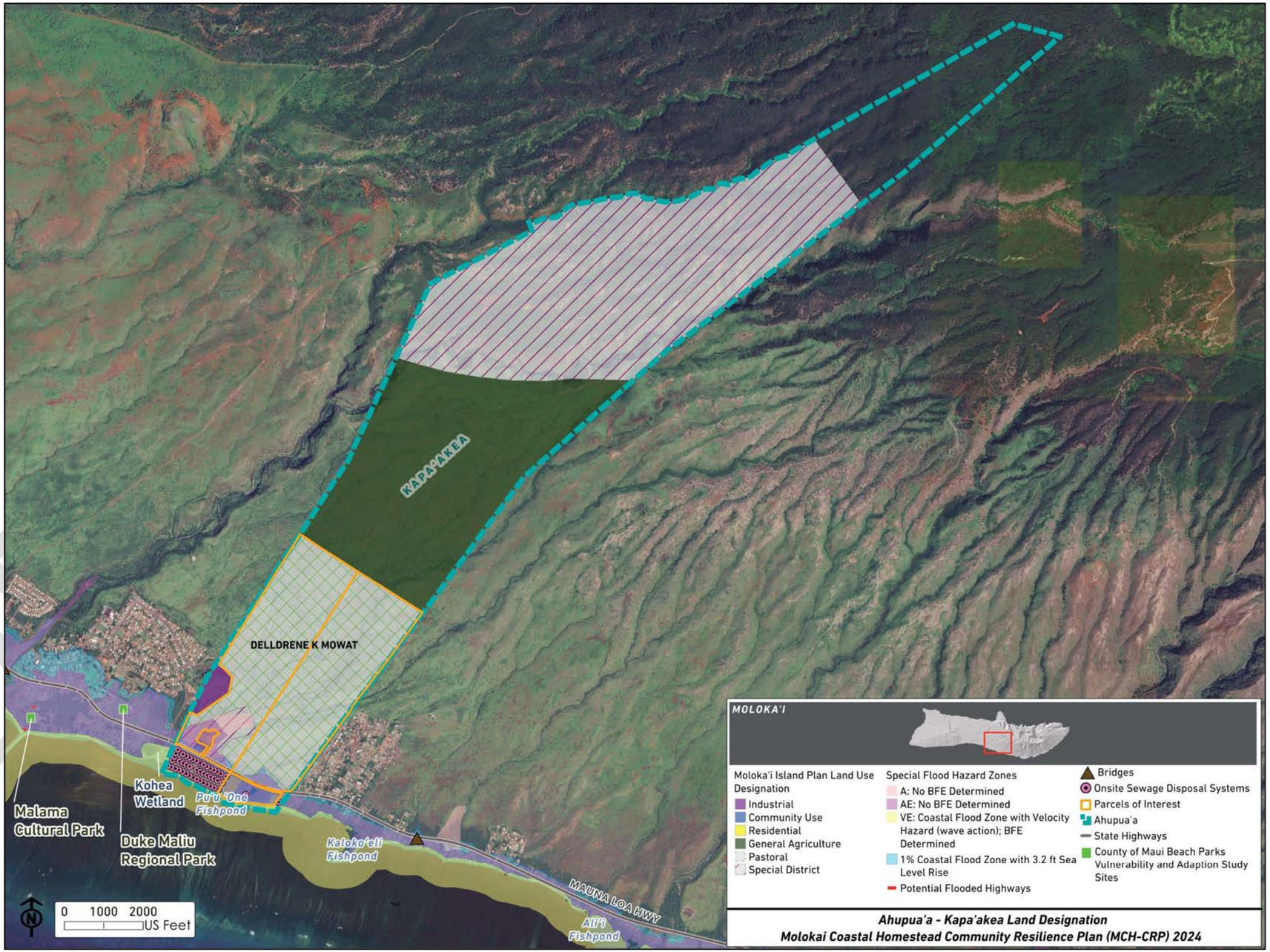


Figure 4-3 **Kapa‘akea Ahupua‘a Hazard Exposure**

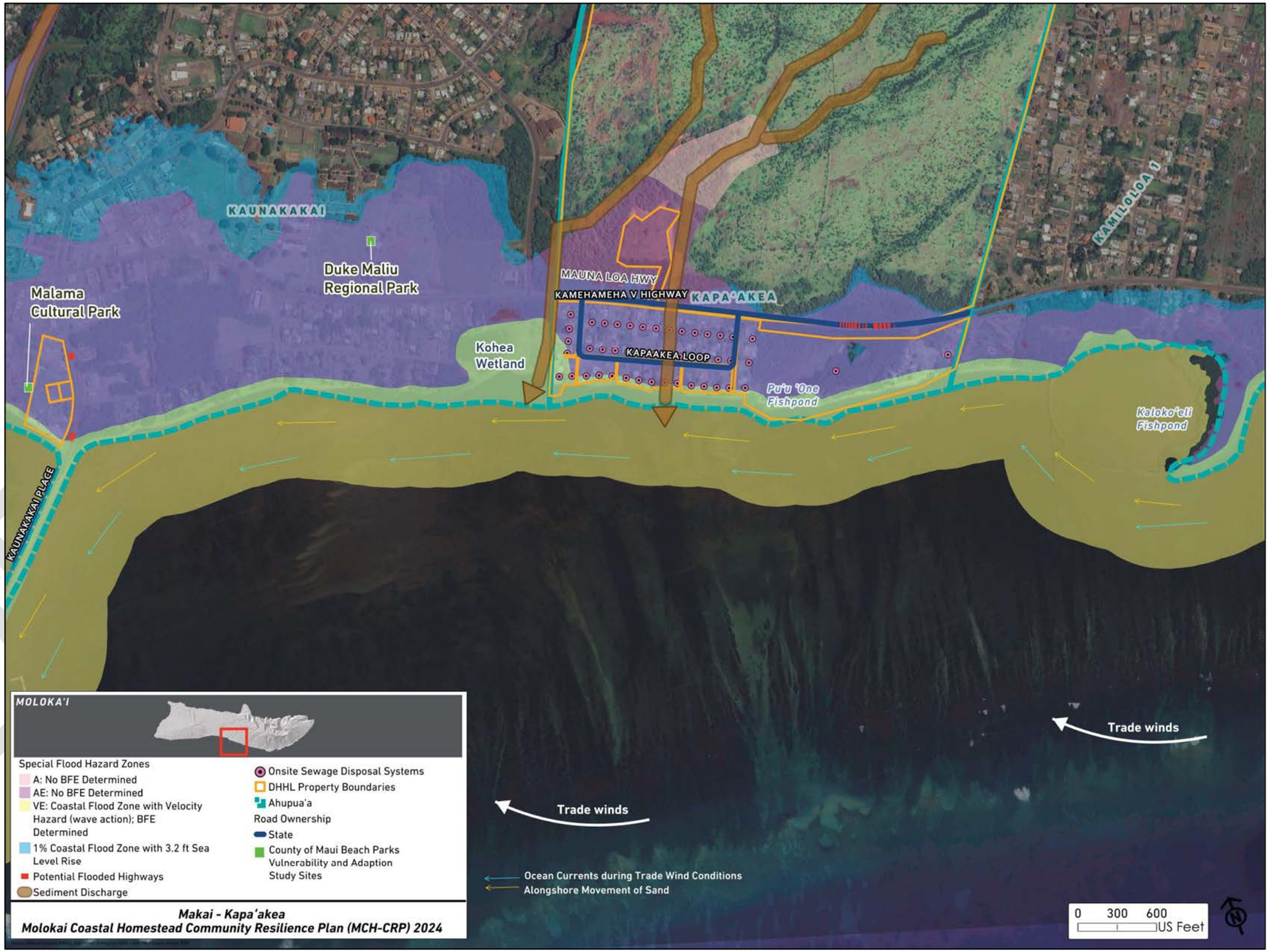


Figure 4-4 **Kapa‘akea Makai Hazard Exposure**

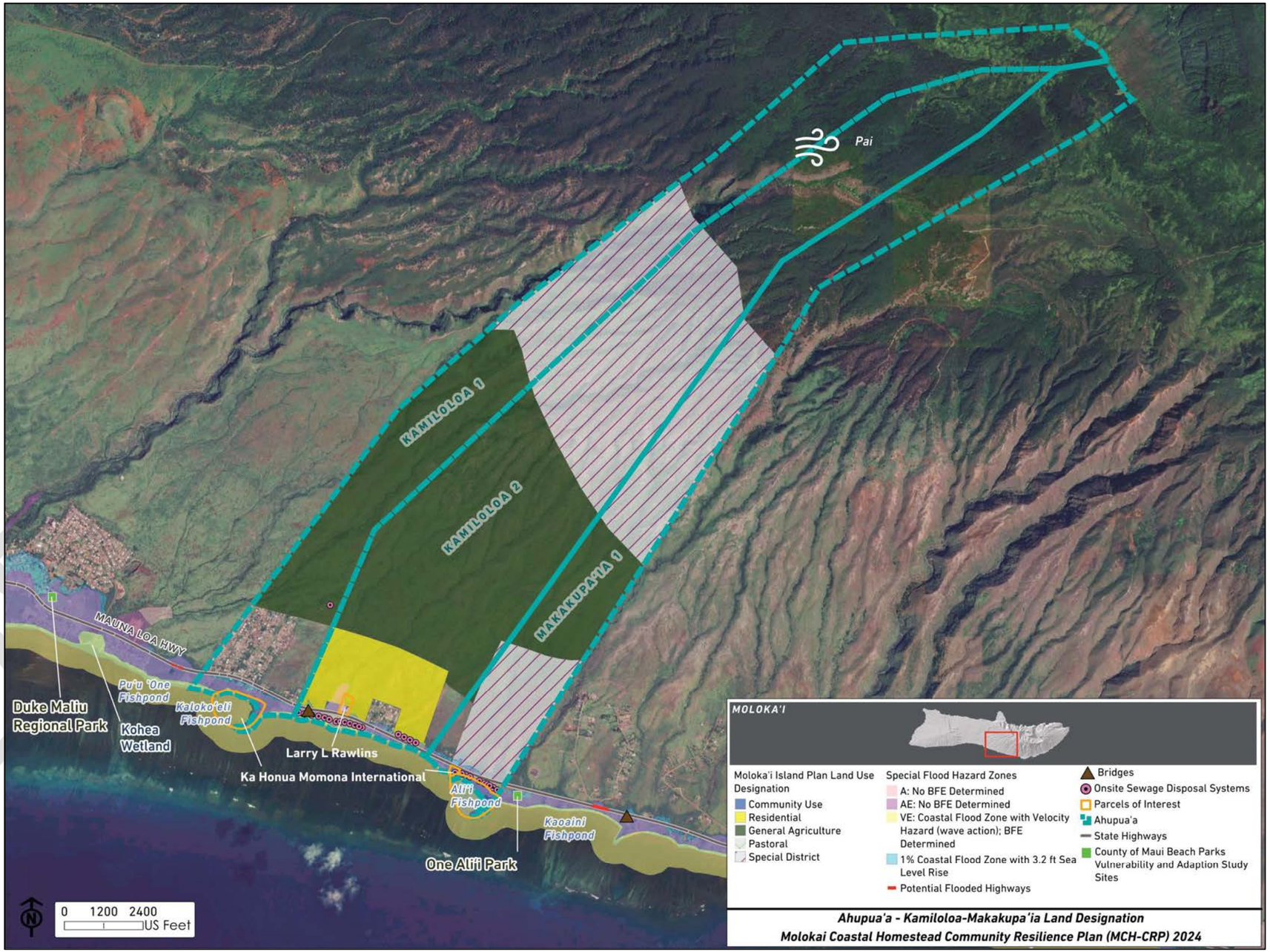


Figure 4-5 **Kamiloloa Ahupua‘a Hazard Exposure**

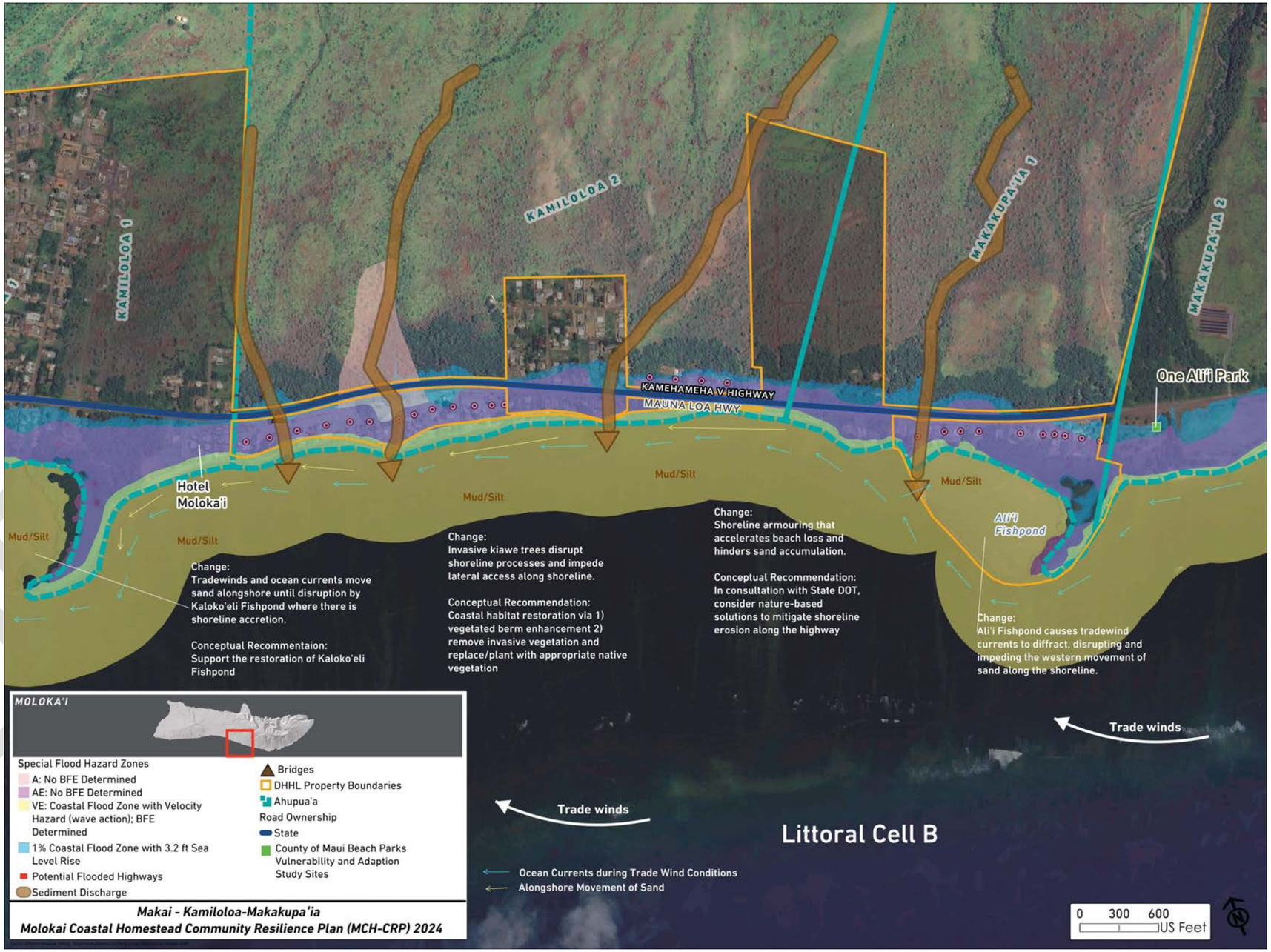


Figure 4-6 **Kamiloloa Makai Hazard Exposure**

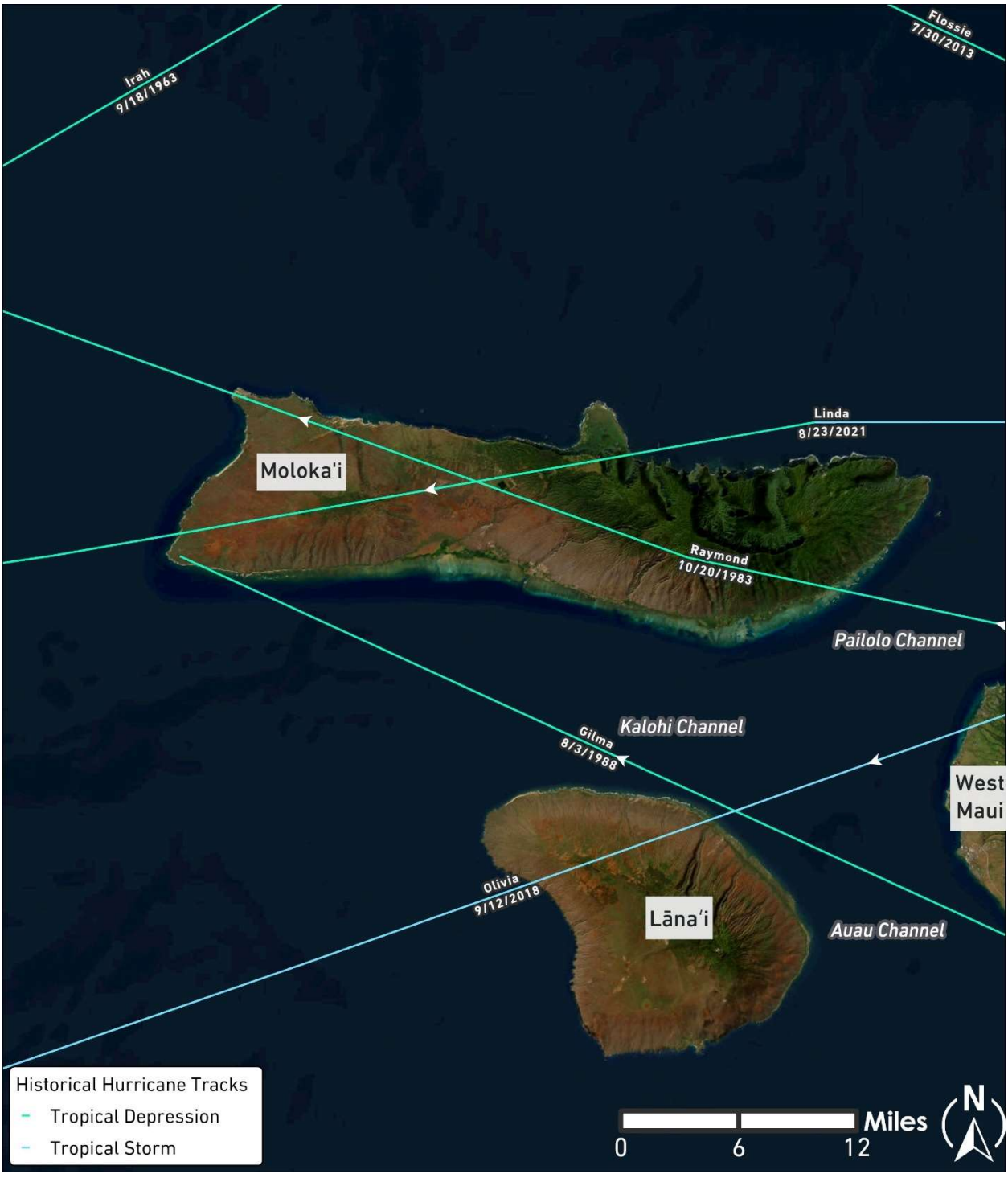


Figure 4-7 **Historical Hurricane Tracks Near Moloka‘i**

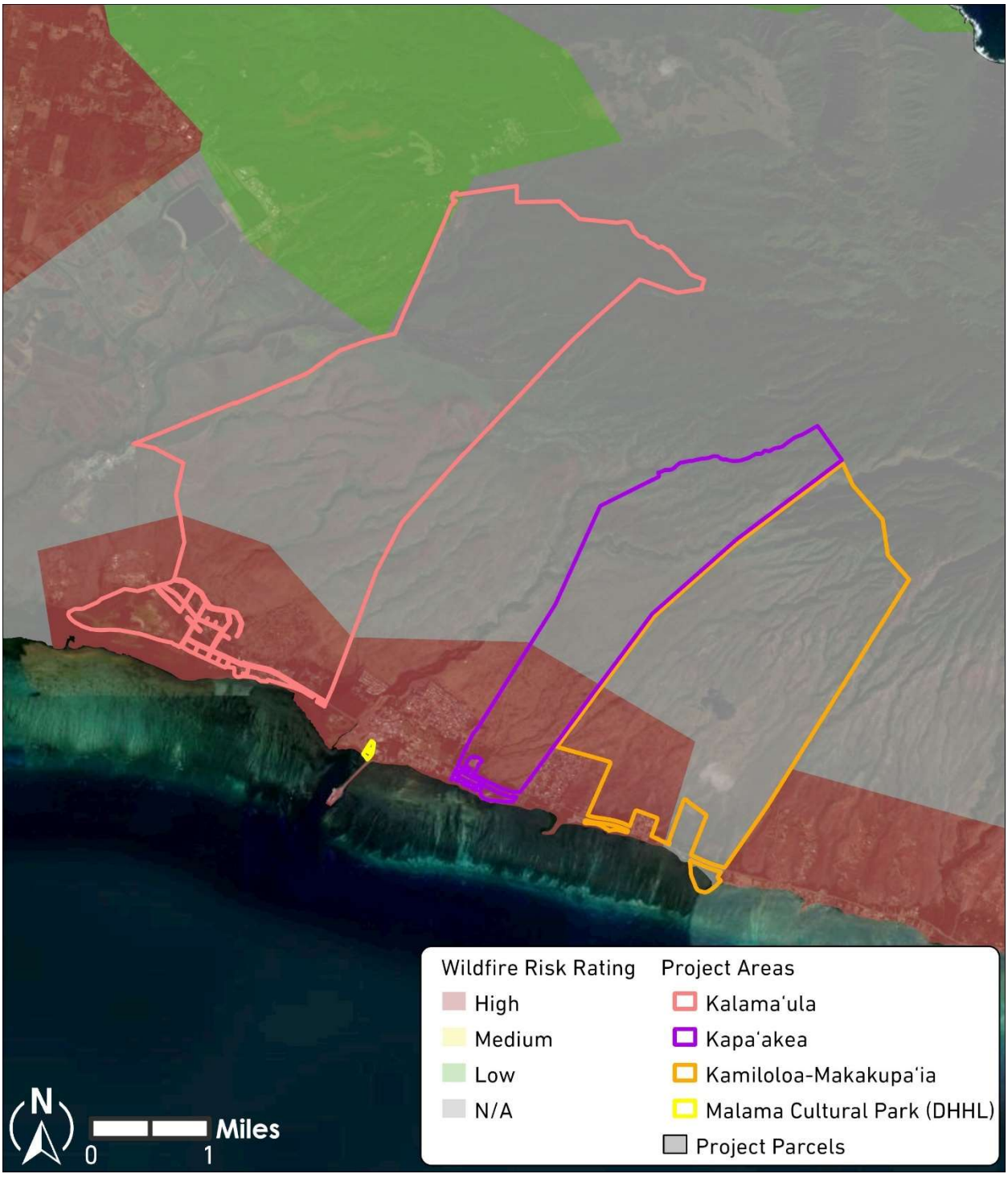


Figure 4-8 **Wildfire Risk Rating (HWMO 2024)i**

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

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 invasive deer	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														
Neighborhood and Mauka 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 3-7.

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 Kamehameha V Highway) built in flood and erosion zones
        - 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
        - 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 of 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:**
        - 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

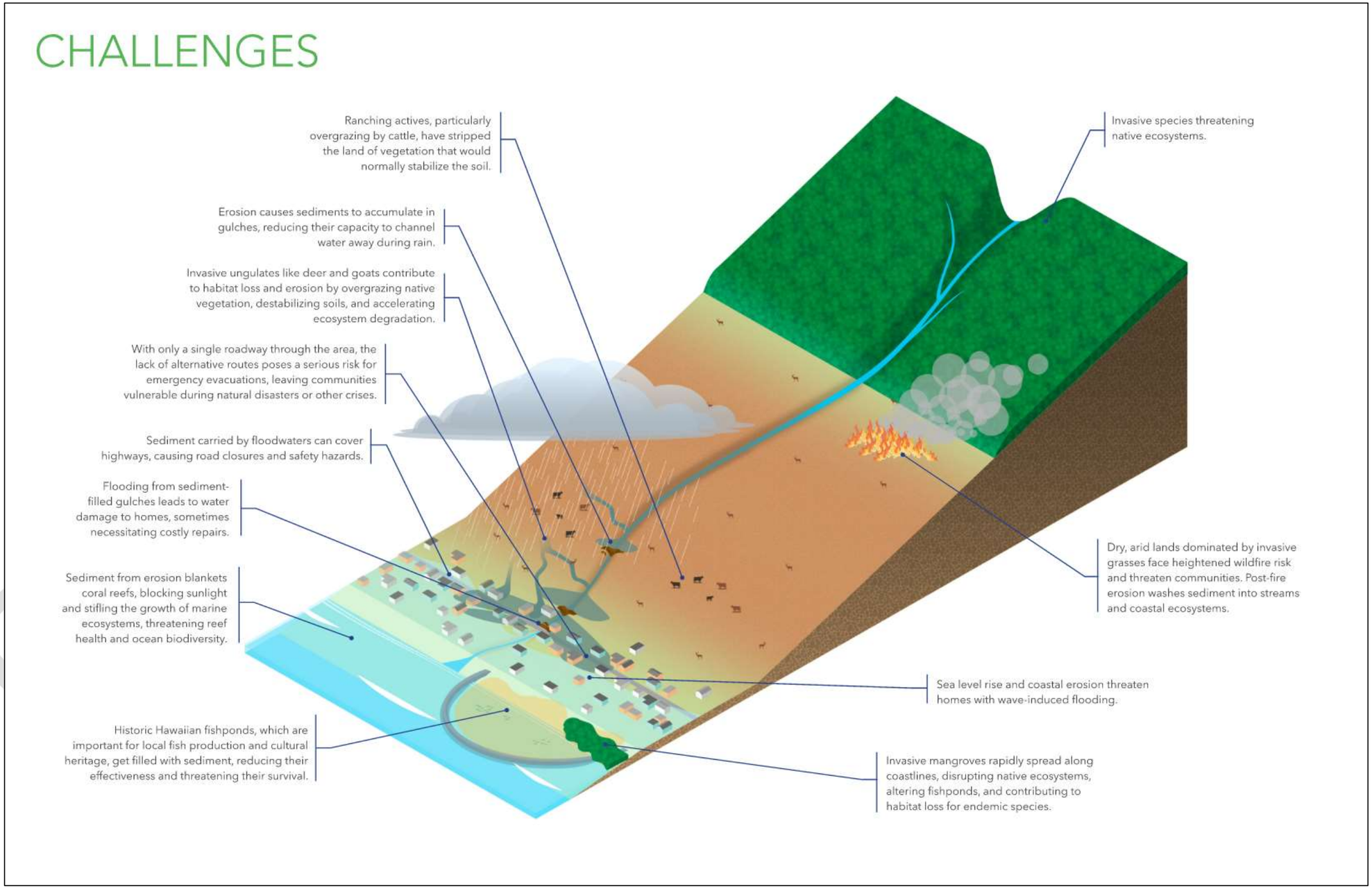


Figure 4-9 **Conceptual Illustration of Key Risks**

Chapter 5: Resilience Goals and Strategies

Through the community planning process, beneficiaries identified five primary planning goals 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:

(1) Improve Emergency Evacuation and Public Safety,
(2) Mauka Restoration,
(3) Water Flow Maintenance and Flood Prevention,
(4) Restoration and Relocation of Residential Hale, and
(5) Makai Restoration.

This chapter also identifies a series of resilience strategies designed to help achieve each goal through coordinated, community-led action. *Figure 5-1* provides a conceptual illustration of how the resilience strategies may be implemented.

Additionally, workforce development emerged as a key priority across all goals, 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.

The sections in this chapter explore each goal in detail, outlining community priorities, potential projects, key partnerships, and pathways for implementation.

EXAMPLES OF POTENTIAL PRIORITY PROJECTS

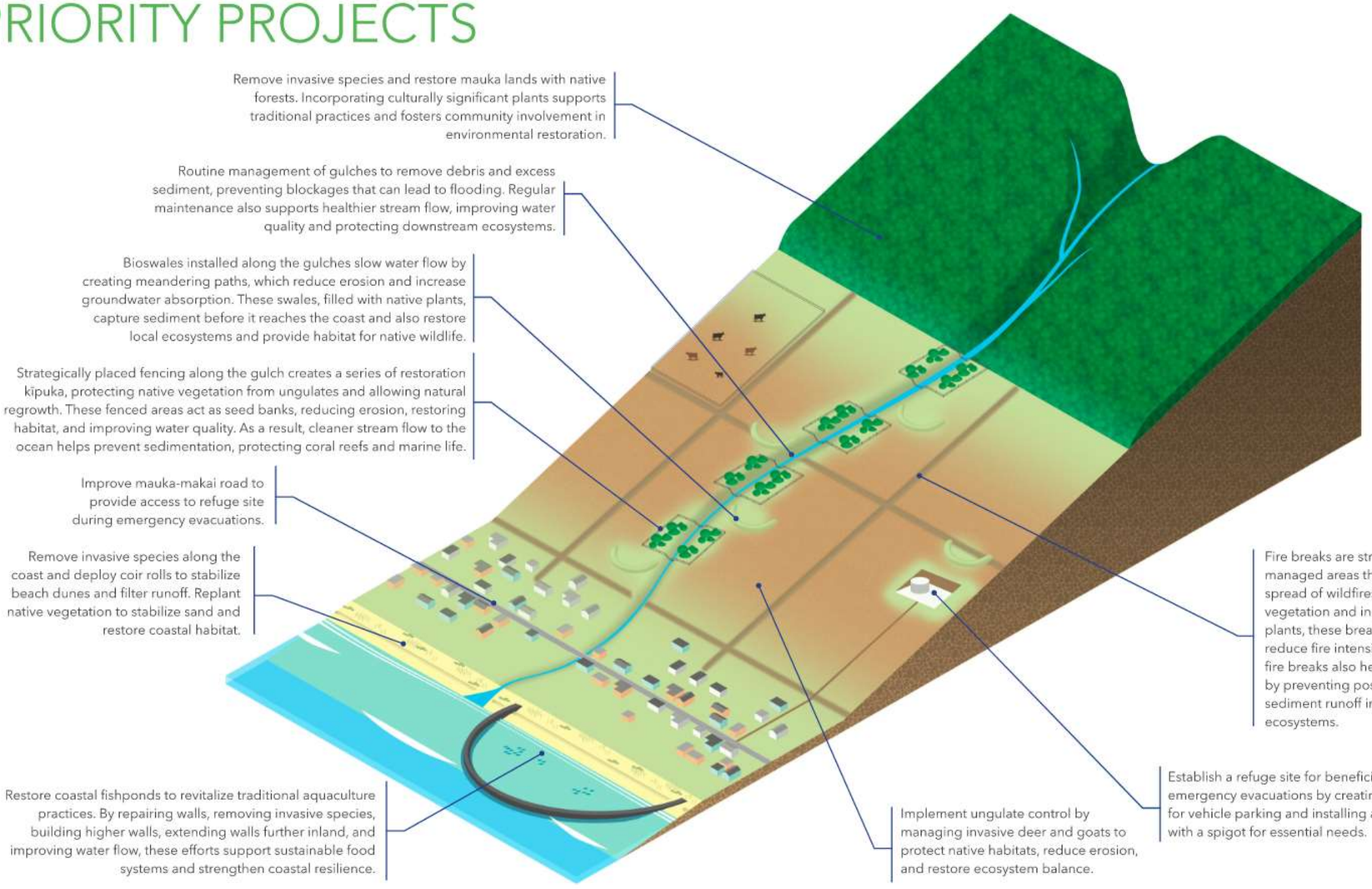


Figure 4-10 **Conceptual Rendering of Resilience Strategies**

Emergency Evacuation and Public Safety

Beneficiaries identified critical safety issues impacting Kalamaʻula, Kapaʻakea, and Kamiloloa communities, particularly during emergencies. Major concerns include the lack of sufficient emergency roads to facilitate resident evacuation, increased risks from power outages during floods, and poor cellphone coverage that limits communication during emergencies. To address these urgent needs, beneficiaries proposed the Emergency Evacuation and Public Safety project, including the establishment of resilience hubs.

The Emergency Evacuation and Public Safety project involves developing comprehensive evacuation plans in collaboration with community members, especially kūpuna, whose insights and needs are essential in emergency preparedness. Effective strategies, such as door-to-door surveys, will ensure all residents' concerns are addressed. Additionally, the project proposes identifying, mapping, and constructing emergency evacuation roads connecting mauka and makai areas, creating clear and reliable routes for residents during emergencies. The establishment of homestead resilience hubs or shelters will provide safe gathering points and access to essential resources when disasters occur. Improving communication infrastructure by constructing additional cell towers will significantly enhance cellphone coverage, ensuring reliable communication during crises. Furthermore, the project includes developing emergency water storage tanks and systems specifically designed to provide water for firefighting and general emergency use, supported by formal agreements (MOUs) with the County of Maui for emergency assistance.

Although no specific traditional ecological knowledge was noted for this project, community resilience will be strengthened through knowledge exchange, public education, and community-based preparedness practices.

Key partnerships critical for implementing the Emergency Evacuation and Public Safety project include:

- Police Department
- Fire Department
- Maui Emergency Management Agency
- Emergency Medical Services (EMS)
- Verizon
- Hawaiian Electric
- Hawaii Energy

Beneficiaries from Kalamaʻula, Kapaʻakea, and Kamiloloa identified Emergency Evacuation and Public Safety as a planning goal.

In Kalamaʻula, 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 Kalamaʻula 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

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 3rd river bridge and culvert, which currently lacks capacity and becomes obstructed with sediment. The community further proposed extending existing access roads mauka (inland), 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 agreements (MOUs) involving the Kapa‘akea 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.

Mauka Restoration

Beneficiaries identified multiple critical issues in the mauka areas above Kalamaʻula, Kapaʻakea, and Kamiloloa. These issues include sediment and silt flowing from the mauka regions during floods; flooding due to blocked streams, rivers, and culverts; invasive species impacting native vegetation; and unmanaged lands increasing wildland fire risks. To address these concerns, the Mauka Restoration project was proposed.

The Mauka Restoration project aims to restore and manage mauka lands to enhance community resilience. Potential options for implementation include establishing test areas for planting native, drought-resistant, animal-proof, and economically viable vegetation. This vegetation will help stabilize soils and reduce sediment runoff during heavy rains. Water retention planning, including the creation of detention basins and bioswales, will be developed to better manage flooding and stormwater. Regular cleaning of streams, gulches, and culverts, supported by formal agreements and memoranda of understanding (MOUs), will further address flooding risks. Additionally, the project will implement methods to control deer populations, manage invasive species, and conduct controlled burns to reduce the risk of wildfires.

Traditional ecological knowledge will inform the implementation of the Mauka Restoration project, particularly through the ahupuaʻa land management approach, which promotes resource stewardship from mauka to makai. Historically, konohiki (resource managers) carefully oversaw land use, guided by eight resource realms: Moana-Nui-Ākea (far offshore fisheries), Kahakai Pepeiao (coastal zones), Ma Uka (mountainous areas), Nā Muliwai (freshwater systems), Ka Lewalani (weather systems), Kanaka Honua (human sustenance resources), Papahelōlona (traditional expert knowledge), and Ke ʻIhiʻihi (storied and sacred places). Additionally, traditional social-ecological zoning systems ("wao" and "kai") will guide land management decisions, helping restore biodiversity, manage invasive species, and protect critical watershed areas. Traditional methods such as loi kalo (taro patches) can be reintroduced to serve as natural sediment basins, further reducing sediment runoff.

Partnerships will be essential to the successful implementation of Mauka Restoration. Key partners include:

- County of Maui (CoM) Public Works
- Molokai Land Trust
- Hawaii Wildfire Management Organization
- Butch Haase
- Commission on Water Resource Management (CWRM)
- U.S. Army Corps of Engineers (USACE)
- Molokai Hunting Club
- Ka Honua Momona
- The Nature Conservancy (TNC) Molokai
- Ka Ipu Makani
- ʻĀina Pulapula

- ʻĀina Momona
- Molokaʻi Homestead Farmers Alliance
- Molokaʻi Ranch

Beneficiaries from Kalamaʻula, Kapaʻakea, and Kamiloloa identified Mauka Restoration as a planning goal.

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, Molokai 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 memoranda of understanding (MOUs) among Kapaʻakea Association, DHHL, Department of Transportation (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 over Koa due to its 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 for Kamiloloa identified include The Nature Conservancy and Molokai Land Trust, both of which bring critical expertise in ecological restoration and native species propagation.

Water Flow Maintenance and Flood Prevention

Beneficiaries identified several key issues related to water flow maintenance and flood prevention that directly impact the communities of Kalamaʻula, Kapaʻakea, and Kamiloloa. These issues include clogged culverts and poorly maintained drainage systems, sediment buildup covering highways, pollution from cesspools affecting nearshore waters, flooding caused by infrastructure at Kūlana ʻŌʻiwi, and saltwater intrusion corroding the ʻOloʻolo water line. Additionally, sediment runoff from upland watersheds is negatively affecting coastal reefs and habitats, increasing flooding risks in agricultural and residential areas, and invasive species are exacerbating erosion and flooding problems.

The Water Flow Maintenance and Flood Prevention project addresses these issues by improving drainage and water management infrastructure. Proposed actions include regular maintenance of culverts and drainage systems to ensure clear pathways for water flow, implementing a comprehensive drainage maintenance plan, and constructing infrastructure that reroutes floodwaters away from vulnerable areas. To address pollution concerns, the project includes converting existing cesspools to modern septic systems, significantly reducing water contamination risks. Furthermore, replacing the deteriorating ʻOloʻolo water line with a more resilient pipeline will reduce corrosion issues caused by saltwater intrusion. To manage sediment runoff from mauka areas, the project will restore natural water flow by maintaining streams and gulches, installing check dams and vegetative barriers, replanting native trees, and effectively managing invasive species.

Although no specific traditional ecological knowledge was explicitly noted, historically, traditional systems recognized the interconnectedness of waterways from mauka to makai, using native vegetation to stabilize land and reduce erosion. These principles will help guide efforts to restore watershed health and manage water flow sustainably.

Key partnerships critical to implementing the Water Flow Maintenance and Flood Prevention project include:

- County of Maui Public Works
- Hawaiʻi Department of Transportation (DOT-Highways)
- U.S. Army Corps of Engineers (USACE)
- Department of Health–Wastewater Branch (DOH–WWB)
- County of Maui Water Supply
- Department of Hawaiian Home Lands (DHHL)

Beneficiaries from Kalamaʻula, Kapaʻakea, and Kamiloloa identified Water Flow Maintenance and Flood Prevention as a planning goal.

Beneficiaries from Kalamaʻula homestead strongly emphasized regular maintenance and improvements of culverts and drainage systems to prevent frequent flooding. Specific culverts, notably the 3rd river 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 Kalamaʻula residents was the need to replace the deteriorating ʻOloʻolo 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 Molokai 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, Department of Transportation (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 residential 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 uniquely 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.

Restoration and Relocation of Residential Hale

Beneficiaries identified critical concerns related to sea-level rise, coastal erosion, and flooding affecting residential areas. Rising sea levels and increased frequency and severity of flooding are placing homes, yards, and utilities at risk. Although land in mauka areas is available, it currently lacks suitable access routes and necessary infrastructure to support the relocation of homes and community facilities. To address these pressing issues, beneficiaries proposed the Restoration and Relocation of Residential Hale project.

This project will develop a comprehensive managed retreat plan in close collaboration with beneficiaries, clearly identifying options, incentives, and necessary steps for relocating vulnerable residences and critical infrastructure. The planning process will involve engaging beneficiaries to discuss and prioritize relocation options, identify appropriate lands for relocation, and determine infrastructure needs, such as roads, water systems, power, and wastewater facilities. Additionally, an incentive program will be explored to encourage voluntary inland relocation. As part of the 2025 Molokaʻi Island Plan Update, clear thresholds will be established such as specific

measurements of sea-level rise or erosion that will trigger relocation actions. This approach ensures that the decision-making process remains transparent, community-driven, and responsive to beneficiaries' concerns. Investment in land banking will secure suitable parcels for future relocation efforts, supporting a proactive approach to long-term community resilience. Regulatory compliance, such as the required conversion of cesspools by 2050, will also be incorporated into this planning process, ensuring alignment with broader environmental goals. The project would also explore near-term solutions to armor and protect hazard exposed homes such as elevating or raising foundations, installing flood barriers, and flood-proofing structures.

Traditional ecological knowledge will inform this project through historical practices that prioritized the location of residential hales away from high-risk coastal areas. Traditionally, Hawaiians managed coastal areas carefully, emphasizing resource and infrastructure protection from flooding and erosion, practices that offer valuable guidance for contemporary relocation efforts.

Key partnerships necessary for successful implementation include:

- Department of Hawaiian Home Lands (DHHL)
- County Planners
- Sea Grant Specialist
- Land Trusts

Beneficiaries from Kalamaʻula, Kapaʻakea, and Kamiloloa identified Homestead Managed Retreat, Restoration, and Relocation as a planning goal.

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 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 residential 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 to septic systems 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.

Makai Restoration

Beneficiaries identified several significant issues affecting the makai areas near Kalama‘ula, Kapa‘akea, and Kamiloloa. Primary concerns include fishponds filled with sediment, degraded nearshore water quality resulting from runoff, loss of wetlands due to agricultural activities or development, and invasive species overwhelming native habitats. To address these challenges, beneficiaries proposed the Makai Restoration project.

The Makai Restoration project involves creating a detailed restoration design plan to guide actions aimed at restoring and protecting coastal ecosystems. This includes removing invasive species and replanting with native coastal plants, restoring traditional fishponds to capture sediment runoff, and reconstructing coastal wetlands to enhance wildlife habitats and serve as buffers against flooding. Additionally, this project will coordinate closely with agricultural activities in the region to minimize runoff into the ocean, further improving nearshore water quality.

Implementation of the Makai Restoration project 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.

Key partnerships are critical to the success of the Makai Restoration project. Essential partners include:

- Hawai‘i Department of Aquatic Resources (DAR)
- University of Hawai‘i researchers
- Local community stewardship programs
- UH Sea Grant
- CoM Disaster and Shoreline Planner
- Sea Grant Specialist
- USACE

- NOAA
- ONHR-DOI
- Ka Honua Momona
- Molokai Wetland Partnership
- Ka Ipu Makani
- Sustainable Coastlines
- Goodfellow Brothers

Beneficiaries from Kalamaʻula, Kapaʻakea, and Kamiloloa identified Makai Restoration as a planning goal.

In Kalamaʻula, beneficiaries specifically 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 uniquely 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 wharf, to enhance water circulation and ecological function.

The Kapaʻakea community uniquely prioritized the restoration and management of fishpond and wetland ecosystems as central to makai restoration efforts. Beneficiaries discussed the historical significance of Kapaʻakea 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 Mālama, and Pūlama 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 Molokai Land Trust and bioengineering specialists to implement these restoration methods effectively.

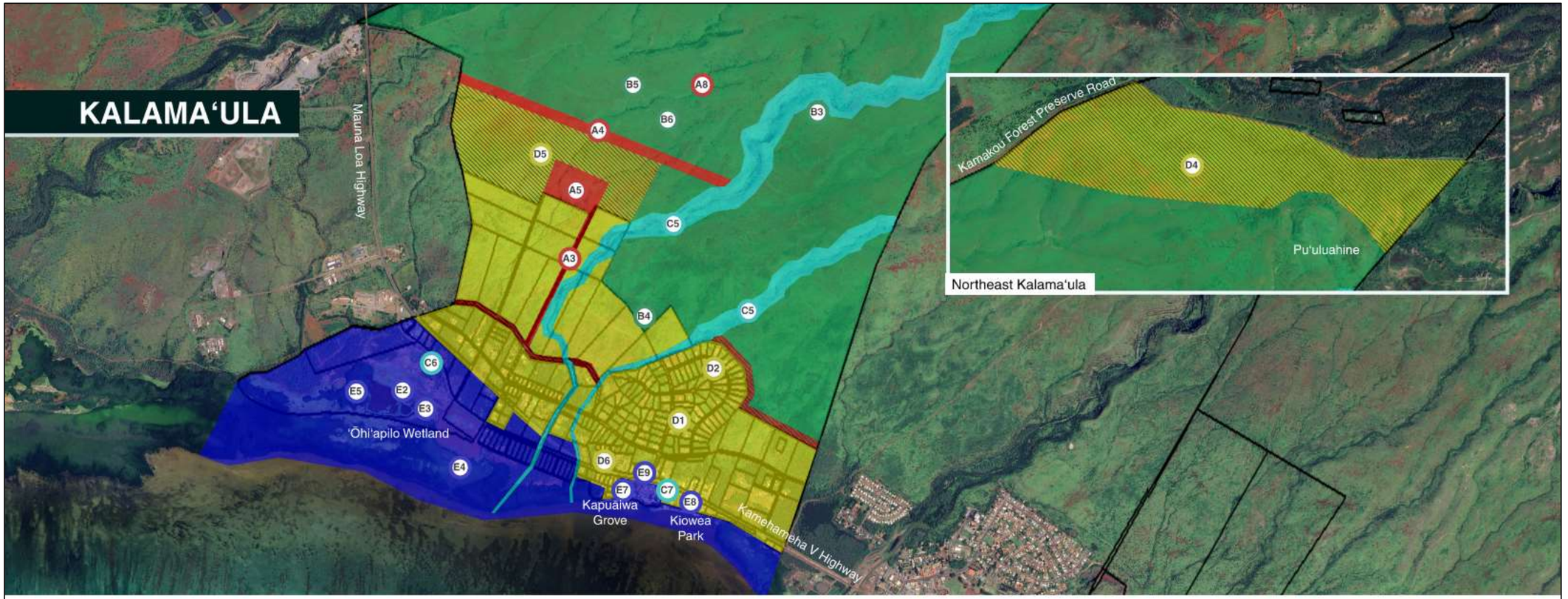
Workforce Development

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 consultation process for this plan, beneficiaries expressed a shared concern that too often, when projects are implemented on Moloka‘i, 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

The Resilience Strategy Matrix serves as the core framework for organizing and presenting the recommended actions of the MCH-CRP. The matrix is organized by the five planning goals and is color coded for clarity. Each goal includes a set of resilience strategies that address specific challenges and opportunities identified through the community planning process. For each strategy, the matrix provides a brief summary of the actions involved, identifies key partners and collaborators, and outlines potential funding sources and cost estimates to guide future implementation. The spatial distribution of these strategies is illustrated in Figures 5-1 (Kalama‘ula), 5-2 (Kapa‘akea), 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 ahupua‘a or community.



A Emergency Evacuation and Public Safety

- A1 Pre-Disaster Emergency Response and Evacuation Plan*
- A2 Update DHHL Plans on Moloka'i
- A3 Emergency Evacuation Routes
- A4 Fire Break Construction
- A5 Evacuation Sites
- A6 Event Reporting and Documentation System
- A7 Water Delivery Technical and Feasibility Study*
- A8 Wildfire Detection Cameras

B Mauka Restoration

- B1 Mauka Restoration and Maintenance Plan*
- B2 Archaeological Inventory Survey*
- B3 Ikipuka Waihona Concept
- B4 Expand Plant and Food Nursery
- B5 Reduce Fuel Loads
- B6 Feral Animal Management Program

C Waterways and Drainage

- C1 Historical Hydrological Study*
- C2 Drainage Master Plan*
- C3 MOU for Drainageway Maintenance and Improvements*
- C4 Drainage Maintenance Training and Participatory Mapping Workshop*
- C5 Conduct Routine Maintenance of Water and Drainageways
- C6 Restore Springs
- C7 Study of Kulana Ōiwi Flooding

D Residential Hale Retrofits and Relocation

- D1 Adapt Structures and Systems
- D2 Maintain Home Ignition Zones
- D3 Vulnerability Assessments Survey*
- D4 Residential Restoration and Relocation Plan
- D5 Develop Kalamaula Mauka Ag Lots
- D6 Convert Cesspools

E Makai Restoration

- E1 Makai Restoration & Management Plan*
- E2 Nature-Based Coastal Protection Projects
- E3 Manage Invasive Species
- E4 Marine Ecosystem Restoration
- E5 Restore Ohi'apilo Wetland
- E6 Implement Special Area Plan for Malama Cultural Park**
- E7 Protect Kapuāiwa Coconut Grove
- E8 Maintenance for Kiowea Park
- E9 Maintenance for Kalaniana'ole Hall
- E10 Evaluate Impacts of Kaunakakai

A Emergency Evacuation and Public Safety

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- A2 Update DHHL Plans on Moloka‘i
- A3 Emergency Evacuation Routes
- A4 Fire Break Construction
- A5 Evacuation Sites
- A6 Event Reporting and Documentation System
- A7 Water Delivery Technical and Feasibility Study*
- A8 Wildfire Detection Cameras

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- B4 Expand Plant and Food Nursery
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- E9 Maintenance for Kalaniana‘ole Hall
- E10 Evaluate Impacts of Kaunakakai Wharf

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B Mauka Restoration

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- B2 Archaeological Inventory Survey*
- B3 Ikipuka Waihona Concept
- B4 Expand Plant and Food Nursery
- B5 Reduce Fuel Loads
- B6 Feral Animal Management Program

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- C2 Drainage Master Plan*
- C3 MOU for Drainageway Maintenance and Improvements*
- C4 Drainage Maintenance Training and Participatory Mapping Workshop*
- C5 Conduct Routine Maintenance of Water and Drainageways
- C6 Restore Springs
- C7 Study of Kulana Ōiwi Flooding

D Residential Hale Retrofits and Relocation

- D1 Adapt Structures and Systems
- D2 Maintain Home Ignition Zones
- D3 Vulnerability Assessments Survey*
- D4 Residential Restoration and Relocation Plan
- D5 Develop Kalamaula Mauka Ag Lots
- D6 Convert Cesspools

E Makai Restoration

- E1 Makai Restoration & Management Plan*
- E2 Nature-Based Coastal Protection Projects
- E3 Manage Invasive Species
- E4 Marine Ecosystem Restoration
- E5 Restore Ohi‘apilo Wetland
- E6 Implement Special Area Plan for Malama Cultural Park
- E7 Protect Kapuāiwa Coconut Grove
- E8 Maintenance for Kiowea Park
- E9 Maintenance for Kalaniana‘ole Hall
- E10 Evaluate Impacts of Kaunakakai Wharf

#	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 Opperations Center (EOC) HWMO	Short Term	- State or County/MEMA & HIEMA, HazMit funding - Hawai‘i Community Foundation (HCF) - Climate Impact Fee (Act 96) - HWMO - Federal Funding for Community Wildfire Protection Projects	DHHL	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	Update DHHL Plans on Moloka‘I 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 Moloka‘i General Plan, Island Plan, Regional Plans 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.	Yes	$10,000
A3	Develop and Maintain Emergency Evacuation Routes	- DHHL PLO - DHHL Land Mananagement Division (LMD) - HWMO	- DHHL LMD - DHHL Molokai District Office (MDO) - DHHL Land Development Division (LDD) - HHAs - MEMA - Moloka‘i EOC	Short Term	- Wildfire Mitigation Funds - Firewise Community - Act 96 - Federal Emergency Management Administration (FEMA)	DHHL	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”).	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
							- Coordinate with DHHL, County agencies, and homestead associations for maintenance and access management.		
A4	Fire Break Construction & Maintenance	- DHHL - County of Maui (CoM) Department of Transportation (DOT) - HHAs	- Moloka‘i Livestock Association (MHLA) - DHHL LMD	Short Term	-Act 96	DHHL	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	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. - 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.	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
A6	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
A7	Water Delivery Technical and Feasibility Study	- DHHL Water Specialist - DHHL LDD - HHAs	State Department of Agriculture (DOA)	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
A8	Install Wildfire Dection 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 - 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. - Support wildfire prevention, rapid response, and public safety. - Use data to inform long-term fire management and landscape restoration planning. alerts accessible to fire agencies and trained community partners. - 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	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
B3	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
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
B5	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
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 Moloka‘i Hunting Club, State of Hawai‘i 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	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
C2	Develop a Drainage Master Plan	- HHAs - DHHL	- CoM - United States Army Corps of Engineers (USACE)	Short-Term	- HCF	DHHL	Prepare a comprehensive Drainage Master Plan for the entire ahupua‘a 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 ahupua‘a. - 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
C3	Develop MOU for Drainageway Maintenance and Improvements	- DHHL PLO - DHHL LMD	- CoM - Hawai‘I DOT - HHAs	Short-Term	- Act 96	DHHL PLO	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
C4	Drainageway Maintenance and Participatory Mapping Workshops	- HHAs	- DHHL - State DOT - CoM	Short-Term	- DHHL Grants	DHHL-PLO	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 Moloka‘i homestead ahupua‘a. 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
C5	Conduct Routine Maintenance of Water and Drainageways	- HHAs	- DHHL - COM - DOT - USACE - MHLA	Short Term	- NFWF		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	$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
C6	Restore Springs	HHAs	DHHL	Mid-Long Term	-Act 96 -NFWF-NCRF - OHA	HHAs	Restore and reactivate traditional and existing springs within the Moloka‘i coastal homestead ahupua‘a 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 ‘ohana mo‘olelo. - Remove overgrowth, sediment, kiawe, and mangroves that block or alter natural spring flow. - Reconnect springs to fishponds, wetlands, and traditional ‘auwai (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: • Hawai‘i 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
C7	Conduct a Study of Kūlana ‘Ōiwi Drainage and Flooding Impacts	- DHHL - HHAs	- CoM Public Works - MEMA	Mid-Term	- HCF - OHA - FEMA - USACE	DHHL	Undertake a focused hydrological study of Kūlana ‘Ōiwi 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 ‘Ōiwi. - Assess impacts to adjacent homestead properties, including flooding depth, duration, and flow direction. - Identify infrastructure or design factors at Kūlana ‘Ōiwi 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 Moloka‘i 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
D1	Adapt Structures and Systems to Better Withstand Coastal Hazards	HHAs	- DHHL - NDPTC - HWMO	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
D2	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
							- Educate residents on ongoing maintenance and wildfire preparedness.		
D3	Conduct Vulnerability Assessments Survey	- HHAs - DHHL	- NAHASDA	Short-term	-Act 96 - HWMO:	DHHL	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
D4	Create a Ahupua’a 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 ahupua’a 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
D5	Develop Kalama’ula Mauka Agriculture Lots	- DHHL	- Lot Awardees	Mid Term	-Act 96	DHHL	Plan and implement the development of new agricultural lots in Kalama‘ula 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 Kalama‘ula 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
D6	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
E1	Develop a Makai Restoration & Management Plan	- HHAs - DHHL	- Ka Honua Momona, - Molokai Land Trust - ‘Āina Momona - DAR - UH Sea Grant	Mid Term	- NWFW National Coastal Resilience Fund	DHHL	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 ‘aki‘aki. - 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 - ‘Āina 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	DHHL	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	Protect Kapuāiwa Coconut Grove	- DHHL - HHAs	- Ka Honua Momona - 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	HHAs	Preserve and restore the historic Kapuāiwa Coconut Grove by improving tree health, preventing pest infestations, and ensuring long-term cultural and environmental stewardship. This strategy emphasizes proactive pest management, soil and water care, and community involvement to safeguard one of Molokai’s most significant cultural landscapes. Key Components: - Monitor and treat coconut trees affected by mites, disease, or other health threats. - 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. - Develop a comprehensive pest prevention and management plan for coconut and other native trees. - Engage the community in cultural restoration, education, and stewardship activities. - Install fencing around the grove to manage access and address safety and liability concerns.	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
E8	Provide Long-Term Maintaince of Kiowea Park	- HHA	- DHHL MDO - HHA-Licensee	Short Term	- OHA Grants - DLNR Kaulunani Urban & Community Forestry Grants - HCF - HTA Kūkulu Ola or Aloha ‘Āina - National Park Service – Tribal Heritage or Historic Preservation Grants - DHHL Capital Improvements or Site Management Funding	HHAs	Enhance and sustain Kiowea Park through ongoing maintenance, habitat restoration, and community stewardship. This strategy supports cultural access, recreation, and environmental resilience by restoring native ecosystems, improving facilities, and ensuring the park remains a safe and welcoming community space. Key Components: - Restore native vegetation and stabilize the shoreline to prevent erosion. - Remove invasive species such as kiawe and manage overgrowth. - Improve park infrastructure, including bathrooms, benches, signage, and utilities. - Redesign and plan upgrades for the park’s bathroom facilities. - Install fencing to address safety and liability concerns. - Promote community-led maintenance, stewardship, and cultural education activities. - Utilize secured grant funding to complete the kitchen in the pavilion.	Yes	$2,000,000
E9	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,	DHHL	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.	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
E10	Evaluate Shoreline and Ecological Impacts of Kaunakakai Wharf	- DHHL - USACE - Hawai‘I DOT - CoM	- UH Sea Grant / UH WRRC	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

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.

Beneficiaries interested in actively participating in the projects and taking ownership of the designated lands may apply for a land disposition from the DHHL Land Division. This application process requires beneficiaries to articulate their commitment to the long-term care and preservation of the identified areas.

Within the application, beneficiaries are expected to outline their plans for funding and executing stewardship activities in perpetuity. This includes detailing the financial resources, skills, and strategies they intend to employ to ensure the sustained success of the projects.

Recognizing that not all projects can solely rely on volunteer efforts, DHHL actively encourages collaboration. To facilitate this, DHHL is committed to assisting beneficiaries in securing financial support. This support goes beyond traditional volunteerism, recognizing the need for beneficiaries to receive compensation for their significant contributions. Understanding the importance of providing a living wage to those engaged in stewardship activities, DHHL aims to make restoration and preservation efforts economically viable for the local community.

Ongoing collaboration is integral to the success of these initiatives, ensuring that the projects remain community-driven and aligned with the values and needs of the beneficiaries. Regular communication, feedback sessions, and collaborative decision-making will be fundamental components of the ongoing stewardship.

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