2 | LĀNA`I'S FUTURE

2.1 VISION AND GUIDING PRINCIPLES

We are Lāna`i – people who care. Lāna`i was and is the Pineapple Island. While the plantation is gone, the pineapple remains the symbol of hospitality and warmth. We cherish our sense of `ohana, in which people know each other, share, sacrifice, and take care of each other. We deeply value our rural lifestyle of being close to the land and a life spent outdoors. It is the history of our land and people that makes Lāna`i different from other places. "We honor and take care of our kūpuna and nurture our children in a safe and peaceful place, and we value, cherish, and protect our environment and natural resources."[1] We honor our unique heritage by preserving many of our archaeological and cultural sites, and by maintaining Lāna`i City's special sense of place as the last intact plantation town in Hawai`i.

We recognize that Lāna`i faces many challenges in order to achieve a sustainable future. We must seek ways to expand our economy, provide better healthcare, improve education, become energy independent, and encourage self-sufficiency. As we strive to meet these challenges, we realize we must work to preserve some things and accept those changes that do not fundamentally alter Lāna`i's unique character.

We offer the following as guiding principles and goals for the future of the island:

- Diversify the economy to provide opportunities and resiliency.
- Provide opportunities for the island's keiki to live and work on Lāna`i.
- Diversifying the economy and creating more job opportunities require our population to grow; we commit to finding constructive ways to assimilate the growing population into the community.
- Mālama `āina: protect and restore the environment.
- Protect our water and provide efficient, effective, and environmentally sound infrastructure and services.
- Preserve the historic character of Lāna`i City and honor the Hawaiian culture through preservation of cultural sites.
- Maintain the rural lifestyle with its slower pace, open space, and connection to the natural environment.
- Ensure a healthy community that is supported by a full array of healthcare services for all members of the community.
- Expand educational opportunities to nurture children and inspire adults.

[1] Castle & Cooke Hawai`i (December 2010). *Lāna`i Community Listening Workshops Report*. Prepared by Hawaii Alliance for Community-Based Economic Development.

- Provide a variety of social and recreational facilities and opportunities for all ages.
- Preserve the subsistence lifestyle through traditional access for gathering, hunting, and fishing.
- Establish trust to create a collaborative and respectful relationship between the community and Pūlama Lāna`i.
- Establish Lāna`i as a model sustainable island to be known for its bold integration of innovative green technologies into a traditional rural island community.

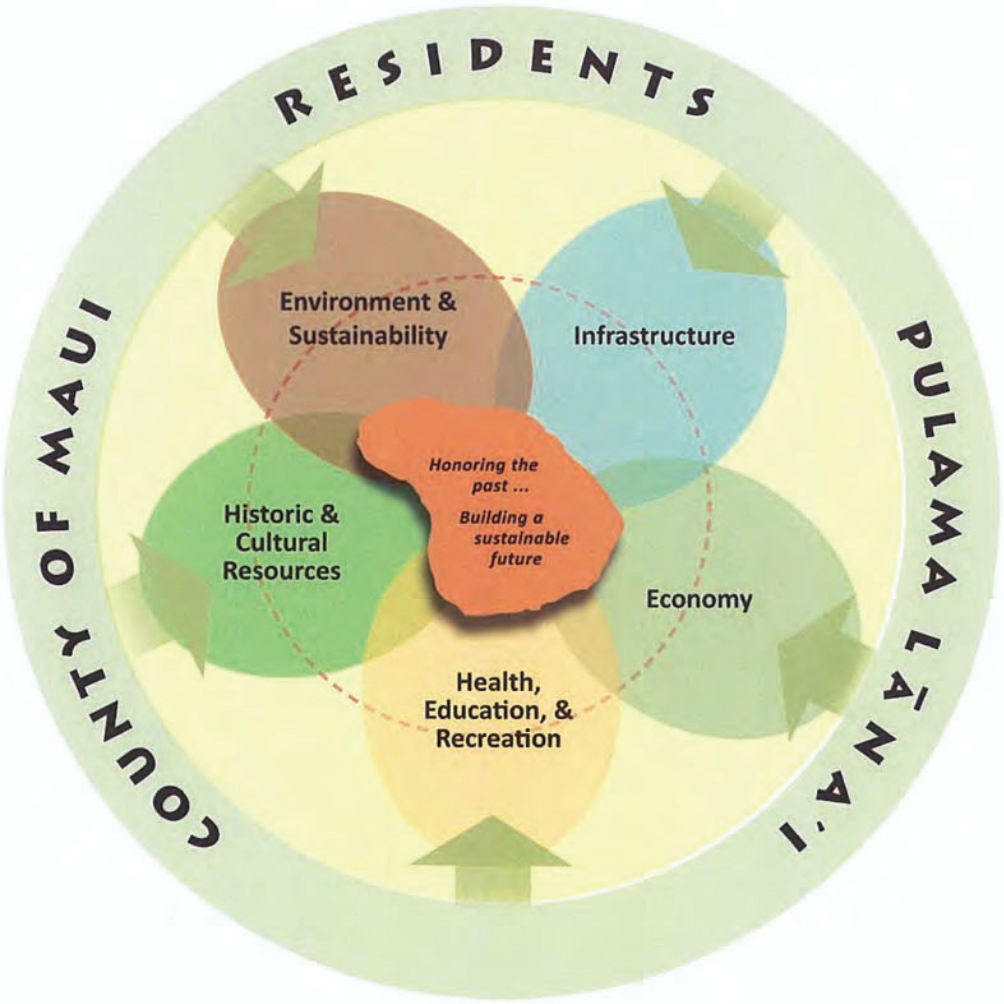

Figure 2.1 Vision for Lāna`i's Future

2 | LĀNA`I'S FUTURE

2.2 PROBLEMS AND OPPORTUNITIES

INTRODUCTION

The identification of major problems and opportunities is required by Chapter 2.80B, MCC. This outline of the problems and opportunities facing the island is a record of the community's top concerns and issues that need to be addressed.

PROBLEMS

A. LIMITED WATER RESOURCES

The capacity of existing water resources may be insufficient to support new growth. Projects that already have entitlements could consume most of the remaining capacity of Lāna`i's single aquifer. It may be necessary to increase the capacity of water resources for new development.

B. DECLINING FOREST ECOSYSTEMS

***Much of Lāna`i's forest ecosystems have been declining over the last century.*** Water and other natural resources on the island are vulnerable because of historical declines in forest ecosystem functions and the anticipated effects of climate change. Lāna`i's forest systems are vitally important because the island's main aquifer relies, in part, on the "cloud forest" (clouds retained by barrier of tree tops) for water recharge. Over the past 150 years, ungulates (sheep, goats, and deer) have decimated and denuded the forests, allowing invasive species to proliferate and crowd out native species. The planting of Cook Pines in the early 20th century helped to restore the cloud forest, but the cloud forest trees on Lāna`ihale need replanting.

C. LIMITED RECREATION, HEALTH CARE, AND SOCIAL SERVICES

There is a need for increased health care and social services. There is a shortage of in-home care, hospice services, and nursing facilities. This problem will likely grow as the population increases. The Lāna`i community is greatly concerned about addressing social issues, such as alcohol and drug abuse, and domestic violence. There is limited access to organized recreational and social activities, especially for Lāna`i's teenagers (ages 11-17) and young adults (ages 18-30). In addition, support services in cultural education are needed to help new and future residents integrate into Lāna`i's community.

D. LIMITED ECONOMIC DIVERSITY

A narrow economic base provides limited economic opportunities for the island's residents. Since the end of the pineapple plantation, Lāna`i's economy has depended mainly on luxury tourism and resort home construction. This reliance on a single industry causes the island to be vulnerable to the fragility of the luxury tourism and resort housing markets. Limited employment opportunities are a constraint to the residents' ability to achieve a higher standard of living. The economic recession of 2007 – 2009 significantly increased the resorts' vacancy rates and curtailed resort home construction, resulting in lower employment and the out-migration of residents seeking employment outside of Lāna`i. The particularities of luxury resort employment and the boom-and-bust cycles of home construction provide little incentive for the youth of the community to remain on or return to the island.

E. HISTORIC CHARACTER THREATENED

***Lāna`i's historic and cultural resources are truly unique in the State and the Nation, but many of these resources are threatened by incremental demolition and demolition by neglect.*** Lāna`i City is the State's last intact plantation town, filled with houses and other structures that are part of the personal histories of many families. These structures represent a significant chapter in Hawai`i's social history. Demolition of buildings and structures that contribute to the island's history are eroding the town's historic integrity. Furthermore, the island's cultural resources and landscapes, such as Keahiakawelo (Garden of the Gods) at the north end of the island, could be significantly altered and transformed by development.

F. LIMITED HOUSING OPTIONS

The availability and variety of housing types on the island are limited. While housing demand on Lāna`i eased somewhat during the economic recession of 2007 – 2009, recent increases in economic activity have increased the demand for affordable housing. The lack of new housing developments and the limited variety of existing housing prevent working families and short-term contract workers from fulfilling their housing needs. New housing choices are needed for singles, the elderly, renters, and first-time home buyers. However, there is concern that new development may be inappropriate or insensitive, and could negatively alter Lāna`i's unique rural character.

G. TRANSPORTATION LIMITATIONS AND COST

The island suffers from an extremely limited number of options for freight shipments and personal transportation. As one of the smallest and least populated islands in the most isolated island chain in the world, Lāna`i suffers from expensive transportation costs for freight, goods, and people. Limited sea barge and air freight transportation to the island contributes to higher costs for groceries, fuel, and other goods when compared to Maui or other Hawaiian Islands. Limited airline seats and flights restrict opportunities for tourists to

visit the island and for residents to travel off island. Improving transportation services is essential for economic development.

H. AGING INFRASTRUCTURE

***Many of Lāna`i's infrastructure systems are old, inadequate, and require extensive renovation or redevelopment to meet existing and future needs.*** As Lāna`i City nears the centennial since its founding in 1922, many of its infrastructure systems are in need of repair, replacement, or expansion. For example, the water transmission system has leakage rates above industry standards and the landfill is projected to reach capacity by 2020. A new landfill site is needed or the island will have to start shipping solid waste off island. A drainage master plan was prepared for Lāna`i City and the Kō`ele Project District (PD) in 2006 but has not been fully implemented. Electric power is more expensive on Lāna`i than on other Hawaiian Islands and the facility is outdated and vulnerable due to dependence on petroleum supplies.

I. RELATIONSHIP WITH MAJOR LANDOWNERS

The relationship between previous major landowners and the community was historically difficult. Issues identified through workshops and interviews were the poor working relationship, strained communications, and an eroded sense of trust between residents and the company. This may be caused by the unusual nature of Lāna`i being a plantation or company town, with one individual owning approximately 98 percent of the land and the majority of job opportunities being within a single industry. However, with a new landowner and management company there is an opportunity to establish a more positive relationship.

J. GOVERNANCE ON OTHER ISLANDS

Access to many government services and functions is difficult for Lāna`i residents because most government agencies are based on Maui and O`ahu. It is also difficult for residents to participate in meetings and hearings on issues that directly affect Lāna`i when they are held on Maui. Recent improvements in telecommunications do allow web-based testimony by residents.

OPPORTUNITIES

A. MĀLAMA `ĀINA: COMMUNITY ENVIRONMENTAL RESTORATION

***There are ongoing programs to restore Lāna`i's watershed, which is essential to maintaining the island's water supply and natural resources.*** All residents and visitors may share in the common goal of restoring the environment by preserving and protecting Lāna`i's natural resources. The community recognizes and values the benefits provided by conserving and restoring the forest ecosystem. Residents, the company, State agencies, and nonprofit groups have begun forest restoration projects and are continuing these efforts. Engaging more groups, such as youth, hunters, fishermen, and eco-tourists to expand community stewardship of forest resources will accelerate environmental restoration and build collaboration between different groups in the community.

B. WATER USE AND DEVELOPMENT PLAN

The County's Water Use and Development Plan provides a guide to improving the island's water system. Water conservation actions identified in the Lāna`i Island Water Use & Development Plan (WUDP)[2] provide specific measures that individual citizens, the company, other landowners, and government agencies can use to reduce water consumption and overpumping of the aquifer, prevent pollution, and reduce operational costs.

C. DESALINATION AND WATER CONSERVATION

The new landowner is exploring the option of developing desalination plants that would create potable water out of saltwater. Producing potable water through desalination would greatly decrease the potential of overpumping the aquifer. Increased production of potable water for human consumption means there could be adequate water supply for the re-introduction of agricultural operations. Potable water can be saved by using brackish and treated water for the irrigation of the golf courses and resort landscaping.

D. INTACT HISTORIC CHARACTER OF LĀNA`I CITY AND THE ISLAND

***The historic character of Lāna`i City and the island is relatively intact and provides a solid foundation for the future.*** The intact historic character of Lāna`i City is an asset for both residents and visitors. The town's unique character can be enhanced by additional restoration and adaptive reuse of historic buildings and careful integration of new development. The urban design of Lāna`i City centralizes housing and commercial services and can be easily replicated and adapted to include additional forms of housing. Lāna`i City's rural character and sense of place can be maintained through the implementation of design guidelines. Historic resources and landscapes in other parts of the island, such as Keomuku, Keahiakawelo, and Maunalei, are also assets that add to the special character and sense of place that is unique to Lāna`i.

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[2] *Ordinance 3885 (2011).*

E. SMALL-TOWN LIFESTYLE AND `OHANA

***Lāna`i City is an idyllic small town in a beautiful setting that is a safe, calm, and friendly place to live.*** The small-town lifestyle and sense of `ohana draw former residents and visitors back to Lāna`i time and again. The `ohana lifestyle creates a supportive network of neighbors, families, and friends who help sustain a healthier and happier community. This not only makes Lāna`i a very desirable place to live, work, and raise a family, but also fosters a more resilient community.

F. NEW MAJOR LANDOWNER

Having a new landowner provides new opportunities to create a stronger relationship between the community and the company, and to initiate a clear program for economic development. In 2012, Larry Ellison purchased David Murdock's holdings on the island. Ellison created a new management entity, Pūlama Lāna`i, that is pursuing new projects, enterprises, and investments on the island. Pūlama Lāna`i managers have expressed their vision to the community and are interested in involving the community in these changes, while working to protect the island's historic, cultural, and natural resources. This is a timely opportunity that could help to diversify the island's economy and implement a new vision for the future of Lāna`i.

G. HUNTING

Subsistence hunting by residents and hunting tourism are important economic and environmental activities on the island. Hunters come to the island to hunt axis deer and mouflon (European big horn) sheep. Hunting can be part of the game management strategy to control the feral ungulates on the island. Hunting is an economic engine for the island as hunters bring money into the economy and provide the livelihood for numerous residents and businesses. The Hunting Advisory Council, composed of local operators, believes hunting tourism could grow if there were more accommodations available to serve the needs of hunter-tourists.

2.3 POPULATION

A. POPULATION FORECAST

The 2010 Census counted 3,135 residents living on Lāna`i. According to the County's Land Use Forecast produced in December 2012, an additional 885 residents are forecast to live on the island by the year 2030, for a total population of 4,020. However, the forecast was completed prior to Pūlama Lāna`i's future growth estimate and future development plans that are described in Chapter 9. Pūlama Lāna`i estimates the island's resident population could reach approximately 6,000 if its development plans are realized.

In 2010, Lāna`i's average visitor census was estimated at 673 visitors per day. The Maui County Socio-Economic Forecast projects the average visitor census for Lāna`i will reach 912 visitors per day by the end of 2035.[3]

B. WHAT IS A SUSTAINABLE POPULATION SIZE FOR LĀNA`I?

Lāna`i's population is expected to grow beyond the estimates suggested by census data because of increased economic activity from Pūlama Lāna`i's development plans. However, Pūlama Lāna`i has committed to ensuring over the next 20 years, the island's population does not expand beyond the estimate of 6,000 people.

Given the community's vision and goal of maintaining its rural, small town sense of community and `ohana, the anticipated growth provides an opportunity to evaluate what population size is desirable for the island. In addition, the community must continuously ask how many people the island can support without adversely affecting its ecosystems, natural resources, and water resources. Evaluating these questions will require consistent dialogue between the community, the County, and Pūlama Lāna`i while future growth occurs.

[3] County of Maui (September 2014). *Socio-Economic Forecast Report: Final Draft 9/15/2014.*

2.4 SUSTAINABILITY AND CLIMATE CHANGE ADAPTATION

A. INTRODUCTION

One intent of this community plan update is to help establish a sustainable and resilient future for Lāna`i. This section provides an introduction and brief guide to how sustainability and climate change adaptation are incorporated into the policies and actions of this plan.

B. SUSTAINABILITY

Over the past decade, sustainability has become a fundamental concept of comprehensive community planning. It refers to the ability to address the needs of the present without compromising the ability to meet future needs. It requires consideration of the long-term environmental, social, cultural, and economic costs of present-day actions. Sustainability is a process, rather than an end-state, whereby a community acknowledges that environmental, economic, and social systems are linked and must be balanced.

Sustainability is important in a region as fragile and remote as the Hawaiian Islands. In 2011, the Hawai`i State Legislature adopted Act 181, establishing sustainability as a priority of the State by incorporating definitions, guiding principles, and goals of the Hawai`i 2050 Sustainability Plan into the Hawai`i State Planning Act, Chapter 226, Hawai`i Revised Statutes (HRS). Updates to the County's general plan will integrate these sustainability guidelines and principles (see Appendix 2.1 Definition of Sustainability in Hawai`i and Appendix 2.2 Guiding Principles of Sustainability).

C. CLIMATE CHANGE ADAPTATION

In July 2012, the Hawai`i State Legislature adopted Act 286, amending the Hawai`i State Planning Act by adding climate change adaptation priority guidelines (see Appendix 2.3 – Climate Change Adaptation Priority Guidelines).

Climate change will become increasingly serious before the middle of the 21st century and will have profound impacts upon societies all over the world, especially to island communities such as the Hawaiian Islands.

Climate change will profoundly affect not only Hawai`i's natural environment, but also its communities. The anticipated effects of climate change on Hawai`i include: 1) warmer temperatures; 2) increased heat-related deaths and illnesses; 3) sea-level rise with resultant flooding, beach erosion, and damage to coastal property; 4) warmer sea-surface temperatures and ocean acidification with negative impacts to coastal and marine ecosystems; 5) increased frequency and severity of storms with increased vulnerability to storm damage; and 6) increased drought with variable effects on aquifer recharge, stream flows, and freshwater resources. These

effects will adversely impact communities and sectors throughout Hawai`i, including the economy (agriculture, tourism, fisheries, and trade), the built environment, historic and cultural resources, infrastructure systems, ecosystems, and natural resources.[4] Climate change mitigation measures, such as lessening our dependence on fossil fuels, reducing emissions, and changing the way we design and build communities, are needed to help lessen the impacts of human activity on the climate.

Climate change adaptation seeks to reduce the vulnerability of biological systems to climate change effects, such as sea-level rise, increased severity of storms, increased drought conditions, and flooding. Climate change adaptation requires strategies and actions to reduce the adverse consequences of climate change while harnessing any beneficial opportunities. While the precise timing cannot be predicted, it is clear that significant climate change adaptation and mitigation measures will be needed by mid-century. Taking action now will help to mitigate the impacts of climate change and reduce potential damage in the future.

D. WORKING TOGETHER TOWARDS A SUSTAINABLE AND RESILIENT LĀNA`I

For Lāna`i, this is a pivotal time when the ambitions and visions of its community, the island's major landowner, the County, and the State are considerably aligned to face the intertwined challenges of sustainability and climate change. In recognizing the links between society, the environment, and the economy, sustainability acknowledges the ecological limits of natural systems and affirms the well-being of humanity is fundamentally dependent on the health of our environment. Lāna`i can become resilient and ready for change by strengthening its society and natural and built environments, and diversifying its economy. The elements needed to achieve this are identified in the individual chapters of this community plan. How these elements work together is described below.

**SOCIETY – LĀNA`I'S PEOPLE AND CULTURE:** Caring for the people is a key component of ensuring a sustainable and resilient Lāna`i. This involves providing educational opportunities and a full spectrum of social services for residents of all ages. Critical actions include expanding primary emergency services, in-home care, hospice facilities and services for families in crisis, and improving the quality of schools and the availability of college-level education. It is also important to foster participation and collaboration between the community, government, Pūlama Lāna`i, nonprofit groups, and private businesses in the stewardship of natural, historical, and cultural resources to build collaboration. Lāna`i's culture and sense of place can be honored by protecting Lāna`i City's historic plantation-town character and all of its archaeological and cultural sites.

Ensuring a resilient and sustainable society also requires a variety of housing types that are affordable to residents of all ages and increasing food security. Expanding community gardens and local food production, and introducing the youth to agriculture through programs, such as Future Farmers of America and 4-H, support food security. Climate change adaptation will be

[4] Hawaii State Legislature (2012). *Climate Change Adaptation Priority Guidelines* (Act 286).

necessary for the health and safety of people and the environment. It calls for new ways of designing communities and infrastructure by building upon existing hazard mitigation principles, such as relocating critical infrastructure out of tsunami inundation zones, incremental adaptation of harbors, increasing water conservation and reuse, and managing aquifer recharge areas.

THE NATURAL AND BUILT ENVIRONMENT: How the built environment is designed greatly influences the protection and sustainability of the natural environment, and the sustainability of society and culture. A well-designed community is characterized by a compact and pedestrian-oriented mix of land uses, multi-modal transportation networks, diversity of housing, strong sense of place and culture, and preservation of open space, agricultural land, and natural resources. Lāna`i can create a sustainable community by building upon its historic development patterns, integrating land use and transportation planning, and making development decisions predictable, fair, and cost-effective.

Natural landscape features and environment, such as dryland and cloud forests, gulches, wetlands, and coral reefs, will be protected and restored. Feral ungulates and invasive species will be managed and principles of native Hawaiian land management, including ahupua`a, will be integrated to help guide resource management. Green technology, building practices, and infrastructure solutions will also be used.

THE ECONOMY: Fostering a robust and diversified economy is the third component to working toward a sustainable and resilient Lāna`i. This requires diversifying the tourism industry, supporting agriculture, encouraging new industries, expanding education and support services for small businesses, and providing necessary infrastructure, land, and affordable sea and air transportation options. Lowering energy costs by reducing dependence on fossil fuels and increasing renewable energy is also key to providing stronger economic opportunities and becoming more sustainable. This will be achieved by increasing the generation and use of renewable energy sources, promoting the use of electric vehicles, and exploring options for biofuels, biodiesel, and waste-to-energy technology. Water resources will be used in a sustainable and economic manner by recycling one hundred percent of wastewater for irrigation and exploring options for reuse of household graywater for lawn and garden irrigation.

3 | ENVIRONMENT AND NATURAL RESOURCES

A. INTRODUCTION

The clearing and degradation of once extensive wet and dryland areas have significantly changed Lāna`i's native ecosystems. Damage to forest understory and tree roots by hoofed animals, initially free-range and later feral, has led to the destruction of large forest areas. Bare forest lands enabled invasive plants to become established, resulting in increased erosion, the loss of native species, and reduced aquifer recharge. Invasive plants, animals, and insects have decimated native species, such as forest birds, and weakened the biodiversity and resiliency of the forest ecosystem.

Protecting and restoring Lāna`i's forest ecosystems help to reduce erosion, surface water runoff, flooding, and siltation of the reefs and ocean waters, and ensures a sustainable water supply. The forest ecosystem benefits natural and cultural resources, recreation, agriculture, tourism, infrastructure, and economic viability. Recent studies have calculated financial values for services provided by forest ecosystems[5] (see Appendix 3.1).

> A University of Hawai`i (UH) study examined the various services provided by O`ahu's Ko`olau forests - including water recharge, water quality, climate control, biodiversity, and cultural, aesthetic, recreational, and commercial values. These services were calculated to have a net present value of between $7.4 and $14 billion. Approximately half of that amount is attributed to the forest's contribution to ground and surface water quality and quantity. Other watersheds across the state were estimated to be comparable in value.[6]

Background

Feral ungulates had caused notable damage to Lāna`i's forests by the mid-1800s. In the early 1900s, State agencies, conservationists, and agricultural lobbyists called for the eradication of feral goats to protect the wet forest and Lāna`i's limited water supply. Goats were eventually eradicated, but axis deer and mouflon sheep were introduced for hunting in the 1920s and mid-1950s, respectively.

Lāna`i is one of the driest of the inhabited main Hawaiian Islands. The island relies on the native wet forest and the thick fern understory to capture fog drip, or moisture from passing clouds, to recharge the aquifer. In 1995, the State Commission on Water Resource Management (CWRM) modeled Lāna`i's groundwater system and predicted the loss of forest cover would drastically affect groundwater levels. The model indicated that fog drip generates approximately fifty percent of the fresh water found in the central aquifer region.[7] These findings are supported by recent studies by the County Department of Water Supply (DWS) and others.[8]

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[5] State of Hawai`i, Department of Land and Natural Resources (2011). *The Rain Follows the Forest.*
[6] *Ibid,* p. 4.
[7] Stokes, Darrell (2000). *Final Environmental Assessment for the State of Hawai`i Forest Stewardship Program Lāna`ihale Forest Stewardship Plan* (prepared for Lāna`i Company Inc.).
[8] *WUDP, Ordinance 3885 (2011).*

3 | ENVIRONMENT AND NATURAL RESOURCES

Existing Conditions

Two forest conservation areas protect the Lāna`ihale cloud forest (wet forest) and the Kānepu`u dryland forest. Most vegetation outside of these areas is non-native. A healthy native forest is beneficial in providing habitat for the survival of endangered and endemic native plant and animal species. Lāna`i's forests are currently home to 64 native plant species that are listed as endangered, candidate, or species of concern. The forests have loss seventy native plant species, in addition to seven of eight native forest bird species.[9]

The Lāna`ihale conservation area covers 3,588 acres, with 2,300 acres fenced. Attracted to Lāna`i's dark night sky, Hawai`i's second largest colony of `ua`u (Hawaiian petrel) nest in the fern understory of Lāna`ihale. Since 2006, efforts to protect Lāna`i's `ua`u colony, including controlling invasive predators and strawberry guava, have been underway. The highly invasive strawberry guava plant displaces the `ua`u nesting grounds and also impacts watershed and aquifer health by disrupting the native forest ecosystem. Forest health is further compromised by axis deer and mouflon sheep that denude land within the conservation area. Soil erosion from the denuded land around Lāna`ihale is estimated at upwards of 2,200 tons of soil loss per year.[10]

The Kānepu`u Preserve, a Pūlama Lāna`i, State Department of Land and Natural Resources (DLNR), and Nature Conservancy natural area partnership, consists of 590 acres of dryland forest that contains 48 rare native plant species, including culturally important tree species such as olopua and lama. Early fencing in 1911 saved this forest from destruction by goats. Recently, the Nature Conservancy replaced the preserve's fencing and developed a management plan for its native plant species. Many of these plants are being outplanted to establish new restoration areas. Pūlama Lāna`i oversees 20,000 acres of lowland mesic (moderate) and dry communities, including the Kānepu`u Preserve and the Lāna`ihale conservation area. Preservation plans call for additional fencing, feral animal removal, and native plant restoration, as well as continuing conservation actions through the support of programs and volunteer groups. The Lāna`i Native Species Recovery Program performs invasive weed control and fence upgrading and maintenance.

The entire island is within the Hawaiian Islands Humpback Whale National Marine Sanctuary. Created by Congress in 1992, the sanctuary protects humpback whales and their habitat. The National Oceanic and Atmospheric Administration (NOAA) and the DLNR jointly manage the sanctuary, which constitutes one of the world's most important humpback whale habitats.

In 1976, the Mānele-Hulopo`e Marine Life Conservation District was established on Lāna`i's south shore to protect 1) species associated with shallow coral reef, sandy beach, and rocky habitats; and 2) Hawaiian monk seals, green sea turtles, spinner dolphins, and other marine mammals. The DLNR's Division of Aquatic Resources (DAR) manages this three hundred nine-acre protection area, which is affected by excessive sediment and other water quality pollutants, recreational

[9] Stokes, *supra* note 8.
[10] *Ibid.*

overuse, and overfishing. To address over-fishing, the Mānele Harbor Fishery Management Area sets limits on fish harvests and defines the fishing season and fishing areas.

B. ISSUES AND STRATEGIES

Issue 1: **Increasing numbers of invasive animal and plant species are contributing to erosion, loss of native species, and declines in the forest ecosystems.**

Strategy 1A: Increase public understanding of the importance of forest ecosystems to the environment and the economy. Support increased collaboration and stewardship among community groups, schools, and individuals by building upon existing stewardship efforts and programs.

Strategy 1B: Increase efforts to prevent, control, and eradicate invasive species. Evaluate existing prevention policies to close loopholes. Build support for adequate funding of inspectors, research, and control or eradication programs by increasing public outreach.

Issue 2: **Erosion impacts water quality by causing excessive sediment to enter surface and ocean waters. In addition, discharges of chemicals and fertilizers from golf courses, households, businesses, and farms may increase the amount of pollutants found in the soil and water.**

Strategy 2: Conduct community workshops to educate landowners and businesses on best management practices (BMPs) for intercepting and reducing sediment and other pollutants from entering surface and ocean waters. Develop a toolbox of BMPs that includes green infrastructure and other techniques utilizing natural or constructed soil, rock, and plant-based systems to manage surface water.

C. GOAL, POLICIES, AND ACTIONS

GOAL **Lāna`i's environment and natural resources will be protected, restored, and preserved for future generations.**

Policies

1. Protect, preserve, restore, and enhance Lāna`i's native forest ecosystems, including the Lāna`ihale cloud forest, Maunalei Gulch, and Kānepu`u Preserve.
2. Protect fog drip, aquifer recharge areas, and water quality.
3. Protect and restore biodiversity, native habitats, and native plant and animal species through conservation, land management, education, and control of invasive species.
4. Recognize and support agricultural, forestry, and game BMPs as key elements to maintain, preserve and protect Lāna`i's land, water, and marine resources.
5. Protect and restore, where appropriate, Lāna`i's coastal resources and water quality by implementing BMPs for surface water and sediment management, including the use of green infrastructure.
6. Support the Mānele-Hulopo`e Marine Life Conservation District.
7. Recognize the existing boundaries of the Kānepu`u Preserve and support expansion of those boundaries.
8. Support the use of adaptable protection areas, such as a system of floating preserves, as a means of managing nearshore coastal resources.
9. Support the protection and expansion of native plants by encouraging the use of appropriate practices and techniques for native plant propagation, planting, and distribution.
10. Native plant species which are found on Lāna`i shall be utilized for landscape purposes wherever feasible and appropriate.
11. Encourage and support public stewardship of natural resources.
12. Encourage the State to adequately fund quarantine and inspection programs.
13. Protect and enhance the island's native plant and animal species by prohibiting the importation of alien species.

Actions

Table 3.1 Environment and Natural Resources Actions

No.	Action	Policy No.	Lead County Agency	Partners
3.01	Compile data to create maps of primary water recharge areas requiring the highest protection and restoration efforts, and maps of secondary water recharge areas that may be susceptible to pollutant infiltration.	2	Department of Planning	CWRM Pūlama Lāna`i* United States Geological Survey (USGS)
3.02	Assist in the protection and restoration of wet and dryland forests. • Develop specific actions, baseline survey maps, and key messages. • Increase implementation capacity and ongoing stewardship. • Continue efforts to control feral animals. • Conduct or coordinate public education and involvement events to increase community stewardship. • Install interpretive signage. • Educate shipping companies on invasive species. • Develop a native tree planting program and establish a nursery. • Re-establish a Forest and Watershed Partnership. • Explore permaculture methods.	1, 3	Mayor's Office (Environmental Coordinator)	DLNR Pūlama Lāna`i Office of Economic Development (OED) Maui Nui Seabird Recovery Project Lāna`i Native Species Recovery Program Non-governmental organizations (NGOs) State Department of Education (DOE) Lāna`i Forest and Watershed Partnership (LFWP) Community groups
3.03	Develop a toolbox of BMPs to mitigate sediment and pollutant runoff, such as the use of green infrastructure.	5	Department of Public Works (DPW)	Department of Planning NGOs State Greenway Program

* Hereafter, references to Pūlama Lāna`i in the Action tables will include Lāna`i Resorts, LLC, assigns or relevant successors.

Table 3.1 Environment and Natural Resources Actions

No.	Action	Policy No.	Lead County Agency	Partners
3.04	Assist State agencies in developing a toolbox of BMPs for use by citizens and businesses to improve ecosystems and water quality in urban areas. Assist in providing public education, through workshops or other means, on water quality, pollution prevention, and BMPs to encourage changes in business and household practices.	3, 4, 5	Mayor's Office (Environmental Coordinator)	State Department of Health (DOH) (Clean Water Branch) DPW Department of Planning DLNR Lāna`i Water Advisory Committee (LWAC)** Lāna`i Water Company, Inc. (LWC)
3.05	In consultation with landowners, use the existing system of roads and trails as firebreaks and construct small water storage reservoirs for fire suppression.	1, 3	Maui Fire Department (MFD)	Pūlama Lāna`i DLNR
3.06	Hold educational forums on the protection of coastal waters to discuss current activities, programs, or issues, such as Hawaiian Islands Humpback Whale National Marine Sanctuary, water quality, or fish farms issues.	6, 8	Mayor's Office (Environmental Coordinator)	DAR NGOs NOAA
3.07	Reduce sediment and nutrient loads from entering coastal waters by assisting landowners, upon request, to construct small-scale water retention, or bioretention, projects that control surface flows and increase aquifer recharge.	2, 5	DPW	Pūlama Lāna`i DLNR NGOs Natural Resources Conservation Service (NRCS) USGS

** For an explanation of the authority and scope of LWAC, *see* Chapter 7, Section 7.1 Water, Subsection B - Lāna`i Water Advisory Committee.

Table 3.1 Environment and Natural Resources Actions

No.	Action	Policy No.	Lead County Agency	Partners
3.08	Assist in conducting outreach to agricultural, ranching, and development interests on implementing BMPs to reduce herbicides and pesticides.	4, 5	OED	Mayor's Office (Environmental Coordinator) DOH (Clean Water Branch) Pūlama Lāna`i UH College of Tropical Agriculture and Human Resources (CTAHR) NRCS
3.09	Review the Special Management Area (SMA) boundary and make changes as necessary to comply with the objectives and policies defined in Section 205A-2, HRS.	3	Department of Planning	Pūlama Lāna`i Lāna`i Planning Commission
3.10	Work with federal, state, and county agencies to initiate a program that provides education and community involvement in the stewardship of coastal areas, including conducting baseline studies on coastal water quality.	6, 8	Mayor's Office (Environmental Coordinator)	DLNR DOH (Clean Water Branch)
3.11	Work with the State to develop a quarantine and inspection process for imported plant species.	1, 3, 4	Mayor's Office (Environmental Coordinator)	State Department of Agriculture (DOA) Pūlama Lāna`i
3.12	Work with Pūlama Lāna`i to establish a feral animal control program.	1, 3, 4, 7	Mayor's Office (Environmental Coordinator)	DLNR Pūlama Lāna`i Lāna`i Hunting Advisory Group