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Chapter 2

He ali‘i nō ka ‘āina, ke kauwā wale ke kanaka

“The land is the chief, the people merely servants”

History of the Land

Approximately 1,500 years ago voyagers in large double-hulled canoes set sail from the Marquesas Islands, crossing more than 2,400 miles of unforgiving open-ocean. The reward for these explorers was an isolated homeland of fertile islands in the trackless waters of the North Pacific. Once here, the Hawaiian culture developed and flourished as the inhabitants were compelled to adapt to the environmental challenges of this now legendary and lonely archipelago.

One key to the early success of *kānaka maoli* was their creation of the ahupua‘a system, a land management design based on geographic principles taken from the natural boundaries of their environment.¹ Paying close attention to the language of land and ocean, and by studying the effects of their actions, the Hawaiian population grew exponentially.

The navigational prowess of the Hawaiian ancestors led them to the discovery and settlement of an island paradise, but this Eden had another face. Daily life for the first Hawaiian settlers was carried out under the constant threat of volcanic eruptions, earthquakes, storms, unpredictable seas, and flash floods. Hawaiian deities, or *‘aumākua*, embody this fragile yet intricate relationship of people with their environment. Reflecting the broad spectrum of natural elements,

‘aumākua take on the personalities of land (‘āina), sea (kai) and sky (lani). Their actions are the forces that shaped and often threatened daily life.²

Hawaiian oral history tells of *Haumea*, Earth Mother, and *Wakea*, Sky Father, and their large family of five sons and eight daughters. Two of the daughters were *Pele*, fire goddess of volcanoes, and *Na-maka-o-kaha‘i*, her jealous older sister and goddess of the sea. The waves of the sea goddess scour the lava, Pele’s home, eroding it and crushing it to sand as she chases Pele from island to island. As these two clash along the shores of Hawai‘i, mortals at times seem caught in between. Pele, known both as a creator and destroyer, now makes her home deep in *Hale ma‘uma‘u* at *Kilauea*, the most active volcano on Earth.³

Today, the people of Hawai‘i face the same challenges as our predecessors of perpetuating a healthy natural environment and managing the hazards of the land, sky, and ocean. However, the problems are becoming increasingly complex as a growing population, now 1.25 million and projected to increase to 1.6 million by 2030, expand within the hazardous coastal zone, creating a greater demand on limited resources such as fresh water, and increasing the need for careful husbandry of island ecosystems.⁴

Shaped by Natural Forces

Situated almost in the center of the Pacific, Hawai‘i is one of the most isolated places on Earth with Los Angeles 2,400 miles to the east and Japan 3,800 miles to the west. Hawai‘i is also the southernmost state in the U.S., resting on the same general latitude as Hong Kong and Mexico City. Totalling 6,425 square miles of land, the 47th smallest state consists of eight large islands including Hawai‘i, Maui, Lana‘i, Moloka‘i, O‘ahu, Kaho‘olawe, Kaua‘i and Ni‘ihau, as well as 124 uninhabited small islands, emerged reefs, and shoals.

Vast contrasts in climate combined with dramatic physical forces such as weathering and erosion, flooding, volcanic eruptions, and massive landslides enabled the growth of tropical rainforests, freshwater streams, grasslands, deserts, and even tundra in the relatively compact area of the Hawaiian chain. Variations in temperature and landscape are striking: temperatures can drop below freezing or soar to 90°F, all within a few miles. On the island of Kaua‘i, barren, dry deserts lie mere miles from the summit of Mt. Wai‘ale‘ale, one of the wettest places on Earth.⁵

Since no point on any of the Hawaiian Islands is far from the sea, however, the buffering effect of the Pacific Ocean’s prodigious heat engine limits annual temperature variation in any one location. Absorbing heat during the day and releasing it against the chill of night, the ocean moderates daily, seasonal, and inter-annual temperature fluctuations. As a result, the climate in any one spot is more regulated and uniform than climates in similar continental latitudes such as Spain and Florida. In Honolulu, there is an approximately 11° temperature range between summer and winter.⁶ These balmy conditions continue to entice new residents to Hawai‘i every year.

The Appearance of Life

The Hawaiian Islands’ extreme isolation led to the magnificent community of plants and animals found at the time of the Polynesians’ first landing. Amazingly, of all the island life that

existed then, over 90% of the species were unique to these islands.⁷ The strange, lush, volcanic pinnacles were unparalleled and alone; a secluded outback adrift in the Pacific. This authentic natural paradise allowed each growing thing the opportunity to develop adhering only to the dictates and limitations of the laws of evolution.

Hawai‘i’s capacity to support this diversity, both on land and in the sea, was as great as anywhere on Earth. As the sunken seamounts of the aging islands moved inexorably northwest on the great Pacific Plate, the spores of marine plants and the larvae of corals, fishes, and other marine animals drifted back to colonize the waters of the younger islands. This process fostered the evolution of hundreds of marine species over millions of years. In the struggle to adapt or vanish from existence, more than 25% of the marine species in the Hawaiian chain evolved into endemics, organisms found nowhere else in the world.⁸

Along the shores, seeds of plants washed up to colonize the virgin soils. With time, a process of adaptation and natural selection produced new species. About 90% of the 1,000 or so native flowering plants and 70% of the 150 species of fern are endemic success stories. About 25% of these are dune-loving shoreline plants.⁹ Birds, also responsible for dispersing seeds of some species, surreptitiously made their way to the islands as well. The islands’ amazing avifauna once consisted of more than 140 species of native birds.¹⁰ A complex pattern of life unfolded as pollinators and dispersers refined their skills in order to adapt to the varying microclimates and isolated topography of the high volcanic islands. Today, well over half of Hawai‘i’s original bird species are extinct, due in part to the introduction of ground-nesting predators such as the rat, the mongoose, and now the feral cat.

Much of the mountainous interior of the islands is uninhabitable, which has led to settlement primarily on the coast of most islands and along the ridgelines of O‘ahu around Honolulu. Trapped between the mountains and the sea, the Honolulu metropolitan area has one of the highest population densities in America, in company with Boston, Chicago, and Oakland.¹¹ Add the growing number of tourists every year (from close to 300,000 in 1960 to over seven million now¹²), and the pressure on our natural environment and resources becomes severe.

Hawai‘i’s Introduction to Western Culture

The arrival of European mariners to the remote Pacific in the late 1700’s set in motion many of the confounding dilemmas that Hawai‘i faces today. Captain James Cook’s sighting of O‘ahu on January 18, 1778, opened the Oceanic culture to global influences and European diseases: missionaries, whalers, traders, and naturalists flocked to Hawai‘i in search of adventure, riches, and religious converts. Muskets and cannonballs introduced by Europeans transformed island warfare and contributed to the violent unification of Hawai‘i by King Kamehameha I in 1795.¹³

Following Kamehameha’s conquest, agricultural and aquacultural production intensified, radically altering the coastal region and lower valleys from marginal hinterlands to a system of irrigated pond-fields and permanent residential sites. On April 14, 1820, the brig Thaddeus arrived from Boston with the first Christian missionaries. Accompanying the missionaries to their new post were numerous diseases never encountered before by native people, including mumps, cholera, and measles. As a result, the native Hawaiian population was decimated from over 300,000 people in 1778 to only 50,000 people by the end of the 19th century.¹⁴

In the course of this near extinction, western trade flourished. Hawai‘i’s international reputation grew as a stopover point between whaling voyages from the Arctic to Japan. Between 1829 and 1843, more than 1,700 whaling ships visited the waters around Hawai‘i and their crews fueled the contagion consuming the Hawaiian people.¹⁵

Whaling commerce in Hawai‘i was rivaled by a vigorous lumber trade. Tracts of Hawaiian forest were burned to identify sandalwood by its scent. This coveted wood was cut and traded for silk and porcelain from Canton. The Chinese called Hawai‘i “Than Heung Sahn,” the Sandalwood Mountains. Aware of the costs of deforestation, Kamehameha I imposed a *kapu* (restriction) on extraction of this sought-after wood, but following his death frantic trade resulted in the eradication of forest tracts and left the *ali‘i* (ruling chiefs) indebted to foreign traders as they borrowed on the promise of future lumber. In December 1826, the Kingdom of Hawai‘i enacted its first written law, a tax that required each man to supply approximately sixty-seven pounds of sandalwood annually to the *ali‘i* in order to decrease the mounting debt.¹⁶

Two major famines occurred at this time as able-bodied men took to the forests to find sandalwood. Agricultural and fishing duties were abandoned as the need to pay the heavy tax dictated daily life. The Hawaiian people suffered exposure, disease, malnutrition, and exhaustion as the last natural sandalwood forests were wiped out. As island food production suffered from neglect, reliance on imported goods dominated and Hawai‘i lost the need for sustainable use of resources as it shifted to an economy based on trade.¹⁷ This trend has continued to present day as islanders have largely lost the ability to feed ourselves, relying instead on the daily lifeline of commercial shipping from distant ports to provide basic goods.

But foreign abuses to the land were not the first among these islands. Even ancient land use produced significant and long-lasting changes to the environment. Rats brought by Polynesian canoes flourished in the hills and plains and feasted on endemic plants, insects, snails, birds and their eggs, significantly aiding in many extinctions. Wildfires were purposefully set to clear lands; and alien “canoe plants” (brought with the discoverers) exploited available niches. Evidence suggests that some species of reef fishes and other marine edibles were depleted by the native Hawaiian population during the last centuries before the arrival of Captain Cook. But by far the most extensive destruction was the near extinction of a major ecosystem, the lowland forests. Localized impacts among windward and leeward valleys “pale” beside the island wide destruction of lowland native forests that took place in the middle period of Polynesian settlement of the islands¹⁸. However, up until the western conquest and eastern arrivals, the consumptive impact on Hawaiian ecosystems was relegated largely to low elevations and at comparatively slow rates. This all changed with the arrival of foreigners whose appetite for expansion and subjugation, coupled with powerful engineering and agricultural tools, admitted of no limitation.

The relationship between the Hawaiian people and their natural environment changed with the influx of new settlers and traders, who viewed the islands as an infinite resource ripe for the picking. Soon agriculture, particularly *kō* (sugar), linked the Hawaiian economy directly to the U.S. market. Pineapples emerged as Hawai‘i’s second major export crop and the modest island of Lanai became the world’s largest pineapple plantation.¹⁹ In response to this land-use shift, thousands of imported workers came to the islands: Chinese, Japanese, Portuguese, Russians, Puerto Ricans, Filipinos, and Americans. The new land use and development methods accelerated the pattern of deforestation and soil erosion, permanently altering numerous tracts of land at increasingly higher elevations. At first barely noticeable but steadily growing throughout

the 20th century, sewage, pesticides, and other pollutants flowed into streams and through the porous volcanic soil, draining into coastal waters and aquifers. In many bays and estuaries with restricted circulation, reefs and wetlands were changed forever.

By the 1900's, the seeds that would drive future human development had been planted. Settlers adopted a philosophy of confronting, rather than bending with, nature. When Sanford Dole was appointed governor in 1900, just after Hawai'i had become a new territory of the United States in 1898, the young (and illegal²⁰) government was ill prepared to make the tough decisions necessary for the long-term perpetuation of island resources.²¹ Entrepreneurs from around the world were busy exploiting Hawai'i's natural commodities for economic gain, while large-scale engineering projects sought to divert freshwater to quench the thirst of agriculture. The spoils of dredging the Ala Wai Canal replaced the wetlands of Waikīkī as a short-sighted, profit-only land use ethic solidified.



From space, the islands of Hawai'i appear adrift in an endless sea. [2 p spread]

From http://en.wikipedia.org/wiki/Image:NASA_Hawaiian_Islands_full_quality.png

Statehood and Its Consequences

Events of the early 1900's placed Hawai'i in a precarious situation. During the Spanish American War and World War I, the islands became strategic to the U.S. military. Following the attack on Pearl Harbor in World War II, vast tracts of land were turned over to the U.S. armed forces and converted into military bases. Over 200,000 acres of the land on O'ahu was permanently converted into military warehouses, airstrips, housing, and marine facilities.²²

The war effort brought a generation of service men and women through the islands; a new wave of residents who would fuel post-war growth. Hawai'i joined the national trend of post-war affluence and increased leisure time, which led to America's rush to the shore on all of its coasts. Farmlands in middle America emptied as soldiers and sailors who had seen the world established new families along the shorelines of the nation. As with development in the low-lying barrier

islands of the Atlantic and Gulf Coasts and the urbanization of active-fault zones in California, development patterns in Hawai‘i ignored nature’s warning signs as people settled in areas vulnerable to hazards and tested the carrying capacity of most environments.

Statehood arrived in 1959 generating more immigration and investment in the islands. The consequences of post-war prosperity, immigration, and agricultural mechanization, without respect for the islands’ natural boundaries, are clearly visible today: 25% of the total length of beaches on O‘ahu have been lost;²³ over 30% of wetlands on O‘ahu have disappeared;²⁴ once meandering streambeds now flow between straight, concrete walls; and impermeable surfaces flush torrents of run-off into coastal waters with every season of rain.

Lured by the simplicity of sun, sea, and sand, mainland tourists and immigrants flocked to the islands via jet plane. From 1960 to 2000, the population doubled as many visitors stayed and joined the islands’ cosmopolitan blend of eastern and western culture, dramatically changing the ethnic makeup of Hawai‘i.²⁵ In 1853, nearly 96% of the population was Hawaiian but by 1990 that had plunged to only 12.52 percent.²⁶ There is a sharp parallel between the shift in political control away from the native population and the islands’ environmental decline. Losses of wetlands, forests, streams, beaches, dunes, and the reef fishery are akin to cultural losses for the Hawaiian people, whose customs and ethnicity are intimately connected to the land.

Just as the early Hawaiians relied heavily on the sea for their sustenance and leisure, the people of Hawai‘i today still depend on the beaches, reefs, and nearshore waters for their livelihood and pleasure. The marine tourism industry alone generates over \$800 million dollars to state revenues, and in 2002, Hawai‘i’s coral reefs were valued at nearly \$10 billion when combining recreational, amenity, fishery, and biodiversity values.²⁷ Unfortunately, managers have yet to find the right mix of access and protection to ensure a healthy resource base along the coast²⁸.

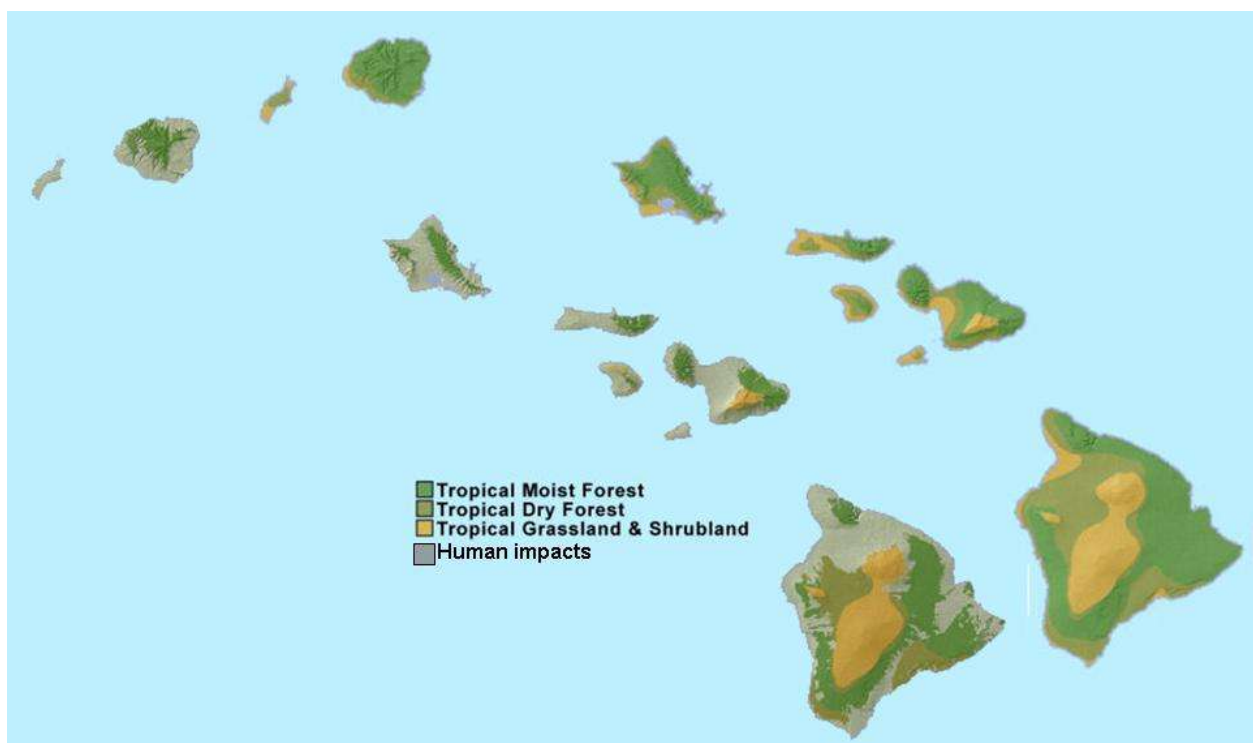
Relearning the Lessons of the Ahupua‘a

Polynesians brought with them a “transported landscape”²⁹. That is, the plants and animals arriving with early Hawaiians resulted in large-scale changes to ecosystems on all the islands. But, while the Polynesians certainly exerted pressure on the natural resources, a conservation ethic was transported with their Oceanic culture as well, and this helped to maintain the integrity of their relationship with the land. As a result, after more than one thousand years of impact, the Polynesians at the time of western contact were still able to feast on the resources offered by their surroundings. Hawaiian traditions define a reciprocal relationship between people and the land³⁰ and the native culture evolved in the embrace of endemic ecosystems, both on the land and in the sea. As a result, Hawaiians developed an intimate relationship with their natural setting, marked by deep love, knowledge, and respect of these places. Exploring the Hawaiian connection to the land reveals a service bond; not land serving people, but people serving the land. One Hawaiian proverb states: *He ali‘i nō ka ‘āina, ke kauwā wale ke kanaka* (The land is the chief, the people merely servants)³¹.

For instance, the traditional methods of capture and a system of kapu placed strict rules on the timing and the amount of fish captured, ensuring the availability of precious seafood. The *konohiki* and ali‘i decided when to impose kapu by watching daily and seasonal marine patterns, and observing how the fish responded to harvest pressure. The moon was watched, and both fishing and planting times defined by its phases. This early form of adaptive management was

based on a complex knowledge of the rhythms of the ocean and land, the physical and biological aspects of resources, and the sustainable pressure exerted by taking. Today's system of marine protected areas could mine the ancient knowledge and re-establish the kapu pattern of use and regulation based on an informed definition of sustainable taking.

The island landscape was divided into a system of *moku*, or districts, each containing one or more ahupua'a.³² These topographically-designed commons ran across the watersheds to the sea, and jointly provided each moku with access to a full range of island resources. This management system carries a powerful embedded message: the islands' natural processes and resources are connected to the physical geography of the landscape. Knowledge of water quality, soil productivity, cultivation, fishing, and navigation were continually refined and were woven into the fabric of daily life.



Impacts to the natural ecosystem have been severe on every island³³.

From <http://www.hawaiiicoreregionplan.info/MHT.html>

In the time of Kamehameha III, the ahupua'a system was abandoned as tempting sums of money, disease, and death caused many Hawaiians to relinquish their land. Strict religious rules became increasingly violent as the commoners and ruling elite struggled for power. In the mid-1800's, land holdings of the elite were broken up and a new land tenure system, the *Mahele*, redistributed property and imposed new taxes.³⁴ Instead of securing land for Hawaiians, as the missionaries had professed it would do, the Mahele alienated Hawaiians from their land and the ahupua'a system was lost. Today, highway systems, water and utility lines, and government jurisdictional boundaries all run parallel to the shore and contrary to the mauka-makai (ridge-line

to reef) flow of natural energy and resources. Western attempts to tame the land have severed the bounds of the ahupua‘a system.

Long after abandoning traditional stewardship, modern residents are rediscovering the wisdom of the past and revitalizing the notion of the ahupua‘a resource management system. Today, Hawaiian communities have revived the ahupua‘a model as a means of addressing crucial resource management problems. Community-driven *ahu moku* councils blend the best in conservation values and knowledge from western and Hawaiian cultures.³⁵ On an island with strict boundaries imposed by Mother Nature, the ahupua‘a, and moku within which they lie, requires all Hawaiian citizens to consider the consequences of their actions and to frame the future by becoming stewards of this archipelago. An updated and refined ahupua‘a system within a 21st Century setting can provide a template, not only for living on the shores of paradise, but for living with the entire island system.

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² For more information, see Herb Kawainui Kāne, The ‘Aumakua – Hawaiian Ancestral Spirits, Dept. of Land & Natural Resources, Dept. of Aquatic Resources, <http://hawaii.gov/dlnr/dar/sharks/aumakua.html>.

³ U.S. Geological Survey, Hawaiian Volcano Observatory, Kilauea – Perhaps the World's Most Active Volcano, <http://hvo.wr.usgs.gov/kilauea/>.

⁴ Hawai‘i 2050 Sustainability Plan, p 19, http://hawaii2050.org/index.php/site/sp_goals/P18/.

⁵ Encyclopedia Britannica, <http://www.britannica.com/EBchecked/topic/634095/Mount-Waialeale>.

⁶ NOAA National Weather Service, Daily Climatic Normals for Hawai‘i from 1961 to 1990, <http://www.prh.noaa.gov/hnl/pages/climnormals.php>.

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¹⁰ Department of Land and Natural Resources, Division of Forestry, The Hawai‘i Endangered Bird Conservation Program, <http://www.state.hi.us/dlnr/dofaw/captiveprop/consprog.htm>.

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¹³ Gavan Daws, Shoal of Time: A History of the Hawaiian Islands, p 32-44 (UH Press 1968).

¹⁴ C. Schmitt, Demographic Statistics of Hawai‘i: 1778-1965, (Honolulu 1968).

¹⁵ Noel J. Kent, Hawai‘i: Islands Under the Influence, p 22 (UH Press 1993).

¹⁶ Thomas Kemper Hitch, Islands in Transition: The Past, Present and Future of Hawai‘i’s Economy, p 39 (UH Press 1993).

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- ¹⁷ Thomas Kemper Hitch, Islands in Transition: The Past, Present and Future of Hawai'i's Economy, p 37 (UH Press 1993).
- ¹⁸ John L. Culliney, Islands in a Far Sea: The Fate of Nature in Hawai'i, p 92-93 (UH Press 2006).
- ¹⁹ Glenda Bendure and Ned Friary, O'ahu, p 21 (Lonely Planet 2003).
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- ²¹ See, e.g., Gavan Daws, Shoal of Time: A History of the Hawaiian Islands, p 294-5 (UH Press 1968).
- ²² Haunani-Kay Trask, Stealing Hawai'i: The War Machine at Work, Honolulu Weekly, July 17, 2002.
- ²³ Charles H. Fletcher et al, Beach Loss Along Armored Shorelines on O'ahu, Hawaiian Islands, Journal of Coastal Research, 13(1), 209-215 (Winter 1997).
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- ³³ The Nature conservancy, Hawaiian High Islands Ecoregion project, Major Habitat Types, see: <http://www.hawaiiecoregionplan.info/MHT.html>
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