

3 COMMUNITY PROFILE



Rocky coastline near Lāwaʻi.

The Community Profile summarizes available information to describe the existing conditions of the South Kauaʻi Community Plan planning district (hereafter referred to as the “Planning District”). This information, which was gathered in the initial phase of the planning process, provided an objective foundation for subsequent phases of the planning process to analyze issues, develop a vision, and brainstorm alternative scenarios and policies. The following sections describe the rich history, natural resources, and the existing conditions of the Planning District.

3.1 CULTURAL AND HERITAGE RESOURCES

In her book *The Kauaʻi Album*, Carol Wilcox states that “the history of Kōloa is in many ways Hawaiʻi’s history in a microcosm” (1981). In fact, Wilcox’s statement can apply to all of South Kauaʻi, from Kalāheo to Lāwaʻi to Kōloa and Poʻipū. South Kauaʻi was home to a large pre-contact population that supported itself through a unique agricultural system. It is the birthplace of Prince Kūhiō and the home of eminent royalty. It was an important port for the whaling and sandalwood industries and hosted the first commercial sugar mill in Hawaiʻi. Today, it attracts thousands of tourists annually to its shores and world-class resorts. South Kauaʻi provides a rare opportunity to share the story of Hawaiʻi by experiencing the features of a single region.

3.1.1 Kauaʻi Nui Kuapapa

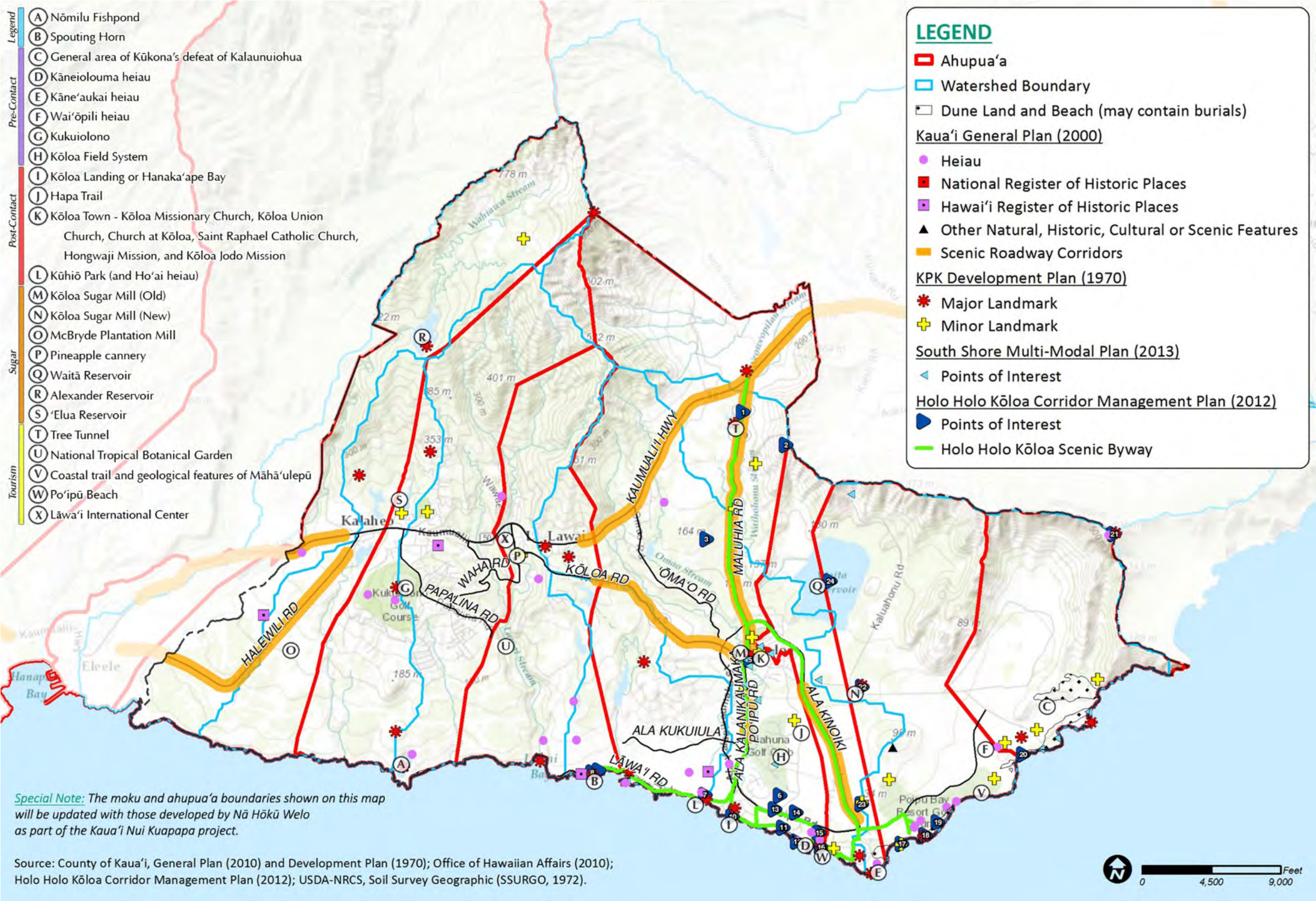
The County of Kauaʻi is currently engaged in a cultural and historical project called “Kauaʻi Nui Kuapapa: Talking about Our Island” to identify the borders of the original six moku of Kauaʻi and Niʻihau, as well as the estimated 54 ahupuaʻa land divisions. The South Kauaʻi Planning District is a portion of the Kona Moku. The moku and ahupuaʻa boundaries may differ considerably from the modern boundaries as they will be based on maps and information from the early 1800s to reflect King Kaumualiʻi’s era. The maps are expected to be finalized by November 2014 and will be used to update the boundaries mapped in this report at that time.

On Kauaʻi, signs have been placed along the state highways at the point of entry and exit of each of the moku. Historical and cultural information related to each will be integrated into public information displays. A curriculum will also be developed for three grade levels at Kauaʻi’s public schools as part of their project and a book will be published compiling the maps and historical information.

3.1.2 Moʻolelo

South Kauaʻi is the setting of numerous moʻolelo, or legendary stories, and a few examples are notable for their association with some of the region’s prominent geographic features. Figure 3-1 shows the richness of South Kauaʻi’s history and highlights the locations referenced below. A list of these sites is provided in Appendix B.

Figure 3-1: Heritage Resources Map



Nōmilu Fishpond is the focus of numerous traditional stories (Map Point A). One is related to the menehune’s fondness for the shrimp found in the spring called Ka-Kalua. Another has to do with the pond’s origin as a cinder cone – it was the hill Pele stopped at during her search for a home in the Hawaiian Islands. Pele’s sister Nāmakaokaha’i flooded the crater after Pele caused Nōmilu to erupt. Before Pele left, she turned two supernatural eels, Puhi-‘ula, “red eel,” and Puhi-pakapaka, “scaly eel,” into stone as guardians of the pond.

A legend about a giant mo’o (meaning serpent or water spirit) named Lehu provides an origin story for Spouting Horn, the blowhole in Lāwa’i (Map Point B). As the legend goes, Lehu became fascinated by the fountains of Spouting Horn, but when he went to explore the lava tube, he became stuck inside. Now, every time a wave rushes in, Lehu growls and hisses. (Burke and Hammatt 2013).

3.1.3 Pre-Western Contact

3.1.3.1 Center of Royal Activity

Prior to Western contact, South Kaua’i was a center of royal activity on the island. During their reigns, high chiefs of Kaua’i Kūkona (7th ali’i ‘aimoku, meaning sovereign ruler) and Mano’okalanipo (8th ali’i ‘aimoku) lived in Po’ipū when on the south shore. Kūkona was also born in Kōloa and defended Kaua’i from an overthrow attempt in the 1300s. (Burke and Hammatt 2013) Called the war of Ka-welewele-iwi, it began when the chief of Hawai’i, Kalaunuiohua, who had already conquered Maui, Moloka’i, and O’ahu, attempted to invade Kaua’i from the shores of Māhā’ulepū, Pāā, and Weliweli. Kūkona drew the invaders inland, causing the enemy forces to be thinly spread out from Māhā’ulepū to Lāwa’i (Map Point C). The Kaua’i forces, along with a flanking canoe division, easily defeated the invaders, resulting in the capture of Kalaunuiohua and the chiefs of O’ahu, Maui, and Moloka’i. Kūkona spared the chiefs’ lives in return for their promise to never again invade the island of Kaua’i (Wichman, 2003). Māhā’ulepū, which means “falling together,” likely received its name from this battle.

Another important area for royalty in South Kaua’i is the Heiau (meaning sacred place) of Kāneiolouma, which, as the primary assembly grounds in Po’ipū, likely hosted royal events and visitors (Map Point D).

3.1.3.2 Religious Importance

South Kaua’i is home to a large number of heiau. In 1885, a Lahainaluna student identified fourteen heiau in the district of Kōloa alone. The 2000 County of Kaua’i General Plan notes twenty-four heiau in the South Kaua’i Planning District. Some of the most significant remaining heiau include Kāneiolouma in the ahupua’a of Kōloa, Kāne’aukai in Weliweli, and Wai’ōpili in Māhā’ulepū (Map Points D, E, F). Although it is now destroyed, the Heiau of Kukuinolono (“Lono’s light”) in Kalāheo is notable for its association with the major pu’u (cinder cone) of Kukuinolono (Map Point G). Kukuinolono is the highest cinder cone in the Planning District and where bonfires used to be set to act as beacons for the fishermen of the area.

3.1.3.3 Pre-Contact Populations

A large population flourished in Kōloa prior to western contact as evidenced by the many archaeological habitation sites in the district. Supporting this population were a variety of lo’i terraces, dry-land agriculture, fish ponds, and salt pans scattered throughout the seven ahupua’a that make up the Planning District. A particularly impressive agricultural technique was the Kōloa Field System, which covered most of the coastal plain of the Kōloa ahupua’a (Map Point H). The Kōloa Field System was an extensive irrigated complex used to divert the waters of the Waikomo Stream for taro, native sugar, and fish (Burke and Hammatt 2013). An agricultural system of this size and magnitude is contemplated to have supported several thousand people pre-contact (Hammatt et al 1991).

The archaeology of the region also illustrates a well-organized society versed in religious, economic, social, and political life. Religion permeated through daily activity, secular affairs, and every significant event including birth, death, marriage, construction, fishing, agriculture, and war. These significant events were recognized and celebrated to ensure well-being and prosperity.



Kāneioloma Heiau encompasses approximately 13 acres and contains numerous habitation, cultivation, sporting or assembly, and religious structures dating back to the mid-1400s. (Photo Credit: Kaua’i Stories)

To sustain a large productive society, pre-contact Hawaiians depended upon an extremely ordered and equitable system of land management—one that considered the careful balance of resource use to support the chiefs, ensure sufficient use for the people, and sustain the resource. In this type of system, the ahupua’a was viewed as one single system where everything within it was interconnected. There was no private land ownership, instead everyone had a shared interest in caring for the land. For this reason, ahupua’a boundaries were carefully planned to provide inhabitants all that they needed to sustain themselves.

3.1.4 Post-Western Contact

Similar to the rest of Hawai’i, South Kaua’i experienced a number of major changes due to Western contact, including the advent of the sandalwood and whaling industries, increased immigration, and the influence of missionaries. In fact, Hawaiians from South Kaua’i may have been some of the first to experience the impacts of Western contact as residents of Kōloa were the first to greet Captain James Cook when he arrived in Hawai’i in 1778.

3.1.4.1 Industry

Sandalwood became a major export from Hawai'i in the early 1800s and fundamentally changed Hawai'i's economic structure from self-sufficient to commercial (Ho'okuleana, LLC, 2012). By 1830, the sandalwood trade had completely collapsed and was shortly replaced by the whaling industry. It was the whaling industry that brought Kōloa to prominence as the official port of entry for Kaua'i in the 1850s. Kōloa Village and Kōloa Landing (or Hanakā'ape Bay), at the mouth of the Waikomo Stream, became flourishing commercial centers as trade with Americans and Europeans grew (Map Point I). Hapa Trail, which runs from Weliweli Road in Kōloa town makai to Po'ipū Road, provided a transit corridor for goods arriving and leaving on ships (Map Point J) (Ho'okuleana, LLC, 2012). Much of the whaling ships' demand for firewood, bullocks, sweet potatoes, sugar, and molasses at Kōloa Landing was met by activities in the mauka areas of the South Kaua'i region.



Clockwise from top: 1) Kōloa Church; 2) View of fishpond at Kūhiō Park; 3) Prince Kūhiō commemorative statue in Kukui'ula.

3.1.4.2 Missionary Influence

Christian missionaries arrived in the nation of Hawai'i in 1820. The missionaries have had a lasting legacy, both positive and negative, on the island chain. In South Kaua'i, they had a particularly strong influence in Kōloa town, where they started the first public school on the island. Originally known as the Dole School, it later became Kōloa School. Although the main building burned down in 1973, the site is still used for an elementary school today. Several other historic buildings in Kōloa were a result of the missionaries' activities. These buildings include the Kōloa Missionary Church, Kōloa Union Church, Church at Kōloa, and Saint Raphael Catholic Church (Map Point K).

3.1.4.3 Prince Kūhiō

The last heir to the throne of the Kingdom of Hawai'i, Prince Jonah Kūhiō Kalaniana'ole was born in 1871 in Kukui'ula and grew up in Kōloa. Often called Ke Ali'i Maka'ainana ("Prince of the People"), Prince Kūhiō is best known for being the first congressional delegate for the Territory of Hawai'i. He also led the effort to pass the Hawaiian Homes Commission Act. Kūhiō is commemorated at Po'ipū's Kūhiō Park, which encompasses the foundation of his home and fishpond as well as the Ho'ai heiau (Map Point L) (Ho'okuleana, LLC, 2012).

3.1.4.4 Sugar

When the whaling industry ended in about 1861, the era of sugar began in the Hawaiian Islands and ultimately lasted for over a century. South Kaua'i played a special role in the birth of this new industry as it is home to the first commercially-viable sugar mill in the state at the Old Kōloa Sugar Mill (Map Point M).

Three large sugar companies dominated the nineteenth century story of South Kaua'i. The first sugar plantation company on Kaua'i, the Kōloa Sugar Company (originally Ladd and Company), owned lands in eastern Kōloa, Weliweli, Pā'ā, and Māhā'ulepū ahupua'a. The McBryde Sugar Company, owned by Walter McBryde, stretched from 'Ele'ele ahupua'a, through Wahiawa, Kalāheo, Lāwa'i, and western Kōloa ahupua'a. Grove Farm Company held upland lands from Kōloa to Lihu'e.

Although sugar cane had been grown and processed in small mills run by Chinese entrepreneurs in various areas, Ladd and Company developed the land at a new intensive scale and built modern mill equipment. The commercial activity initiated by Ladd and Company had widespread ramifications. Kōloa Town, where the first Kōloa Sugar Mill was located, and the landing at the mouth of Waikomo Stream became major commercial centers (Map Point I). Eventually, there were two large mills in South Kaua'i – a new Kōloa Sugar Mill in Pā'ā (Map Point N) and the McBryde Plantation Mill in Wahiawa (Map Point O), which replaced an older mill in 'Ele'ele. McBryde also built a pineapple cannery in Lāwa'i in 1907 (Map Point P), which was demolished in 2002 after being damaged by hurricanes 'Iwa and 'Iniki (Chang, 2002).

Supporting the sugar industry was a network of ditches, flumes, and reservoirs. In 1906, the 2.3-billion gallon Waitā Reservoir was built to serve the Kōloa Sugar Company's lands (Map Point Q). This reservoir continues to provide irrigation to local agricultural ventures and is also now a popular sport fishing location. Alexander and 'Elua Reservoirs were two of the major water sources for the McBryde Plantation (Map Points R and S, respectively) (Ho'okuleana, LLC, 2012).

As sugar demand increased, the plantations faced a shortage of laborers and began to import workers in the 1850s. With these immigrants, who were primarily from Japan, China, and the Philippines, came their religions and traditions. In particular, the two Buddhist missions in Kōloa reflect this legacy – the Kōloa Jodo Mission and Hongwanji Mission. The Hongwanji temple burned down in 1994, but the mission is still in use today (Map Point K) (Ho'okuleana, LLC, 2012).



Old Kōloa Sugar Mill.



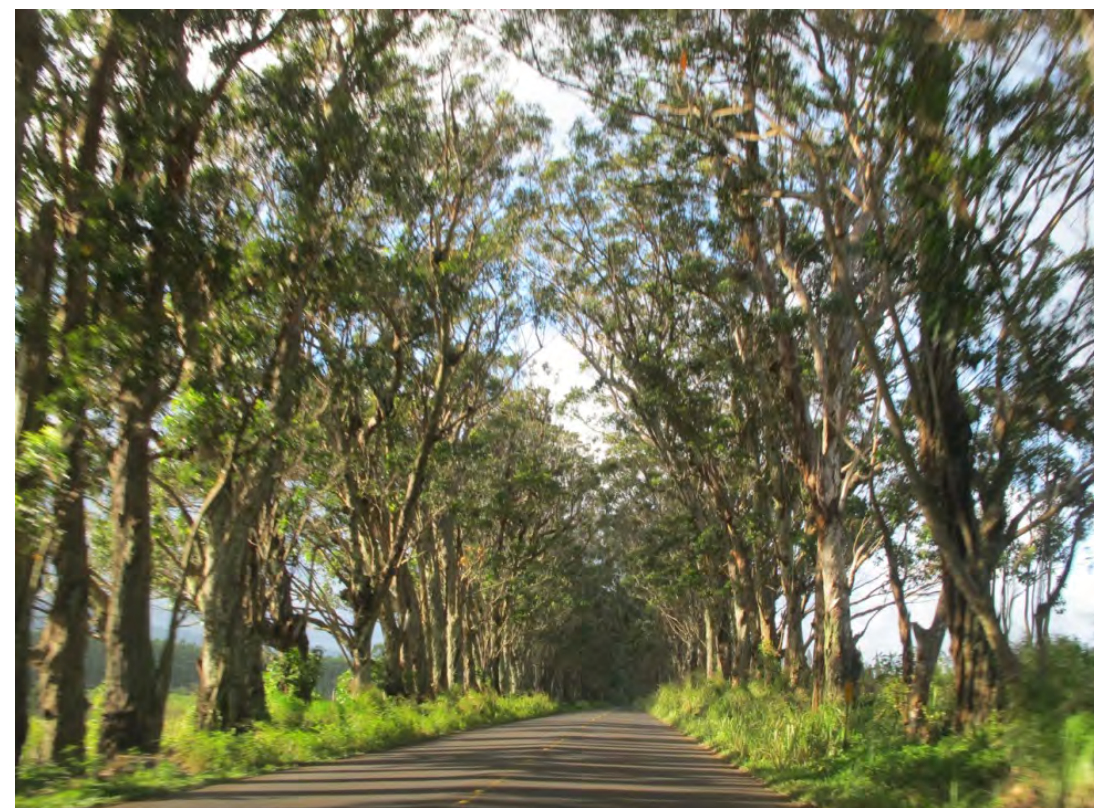
Po'ipū Beach Park

3.1.4.5 Tourism

Although tourists have been coming to Hawai'i since it became a U.S. territory and before, it was not until statehood in 1959 that tourism exploded and eventually overtook sugar as the primary driver of the state's economy. While drawing on the cultural and natural history of Hawai'i, tourism has also defined a new set of landmarks. Po'ipū, in particular, has become the most popular visitor location on Kaua'i. Attractions in the region include the Tree Tunnel on Maluhia Road which was planted in 1911 with swamp mahogany (*Eucalyptus robusta*) trees donated by Walter McBryde (Map Point T);

the headquarters of the National Tropical Botanical Garden at Lāwa'i (Map Point U); the coastal trail and geological features at Māhā'ulepū (Map Point V); and Po'ipū Beach (Map Point W); and the Lāwa'i International Center (Map Point X).

From legend to the abundance of pre-contact Hawai'i to the major economic changes wrought by whaling, sugar, and tourism, South Kaua'i provides a compact but comprehensive look into Hawai'i's past.



Tunnel of Trees along Maluhia Road.

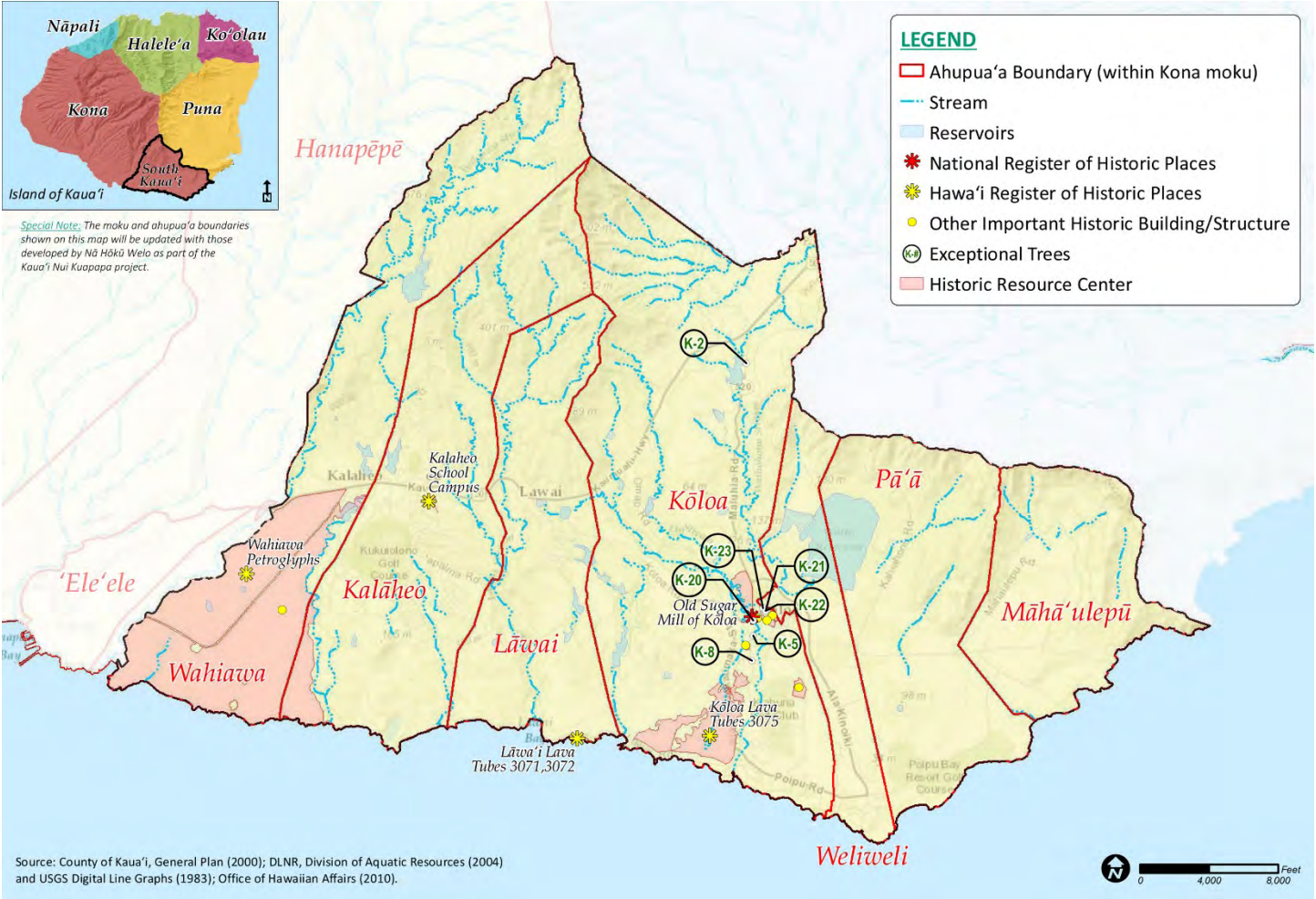


Spouting Horn along Po'ipū's coastline toward the west.

3.1.5 Archaeology

Cultural Surveys Hawai'i (CSH) prepared a review of the archaeological and cultural literature that has been written about the Planning District. More than one hundred previous archaeological studies and more than 1,000 archaeological sites have been documented within the Planning District. Seven of the eight ahupua'a of the Kōloa District are within the Planning District (see Figure 3-2). A summary of the history and archaeology of each ahupua'a are provided below.

Figure 3-2: South Kaua'i Ahupua'a and Registered Historic Places



3.1.5.1 Wahiawa Ahupua'a

Wahiawa (Wahi-awa), or “milkfish place,” was said to have been named after the tradition of the Pōhaku-awa, a stone with a carved bowl in its surface. In traditional Hawaiian times, fisherman transporting awa (milkfish) from Nōmilu Fishpond to a large pool in the Wahiawa Stream used this bowl to keep their catch alive. (Clark 2002)

From research of historic documents, cultural documentation, and previous archaeological studies, it is apparent that land use in Wahiawa Ahupua'a is long and varied, extending from pre-Contact times into the modern era. The presence of multiple heiau within the ahupua'a suggests the relative importance of Wahiawa in traditional times. Heiau were located in both the uplands and near the shore. Two heiau are listed within the ahupua'a: Huhukai Heiau, on Wahulua Bay (Bennett 1931), which was destroyed sometime before the twentieth century, and Waiopili (“water of Pili” (Soehren 2013)) Heiau (Bennett 1931) in Wahiawa Valley, close to and makai of the government road.

Cultural accounts, as well as Land Commission Award (LCA) documentation, indicated that settlement within the ahupua'a was focused on Wahiawa Valley and the immediate area. Abundant stream and spring water was available for the cultivation of wetland taro, as well as other traditional staple foods, within the fertile stream valley. Research indicated dense agricultural terracing throughout the interior of Wahiawa Valley from the uplands to the sea. Habitation areas were noted both within the valley, as well as on the kula land above. The sheltered waters and sandy shoreline of Wahiawa Bay would have allowed for harvesting of marine resources and provided an ideal landing site for canoes. Traditional burial interment practices included cave burials within the slopes of Wahiawa Valley, and burials in the sandy sediments on the banks of Wahiawa Stream and muliwai.

Land use in the early historic period came to be dominated by livestock ranching. Historic documentation suggested that cattle and horses were widespread in Wahiawa from the time of Kaumuali'i. Extensive commercial agriculture ventures, including ranching and sugar cane cultivation later came to dominate land use in Wahiawa Ahupua'a. McBryde Sugar Company cultivated Wahiawa for nearly a century, terminating operations in 1996. Major land disturbance by plantation agriculture was for the most part restricted to the upper plateau areas suitable for sugar cane cultivation, though several ditches were constructed to draw irrigation water from Wahiawa Stream. Plantation Camps were constructed to house the large number of plantation laborers. The camps were generally located within Wahiawa Valley, centered around the railroad crossing and at the shore of Wahiawa Bay. Modern land use included the conversion of the sugar cane fields to coffee and the excavation of the Kaua'i Aggregates Quarry.

Traditional Hawaiian activities in the area may have included agriculture, habitation, transportation/pathways, religious activities including burial interment, and resource gathering. Traditional sites may include agricultural terraces and associated 'auwai, and habitation terraces or platforms both within Wahiawa Valley, as well as in the immediate vicinity. Previously documented human burials are also known to exist closer to the coast.

Remnants of the ranching and sugar plantation era may also exist in the area. Historic sites related to commercial plantation irrigation, including historic ditches, flumes, pipelines, and other features may still exist. Plantation camp infrastructure may also be present. Historic homesteads and ranching may have also left physical remains. Barbed wire fences, stone walls, wooden or stacked stone enclosures, water troughs, and historic habitation deposits, including structure foundations, retaining walls, and refuse dumps could be observed.

3.1.5.2 Kalāheo Ahupua'a

Kalāheo means “the proud day” and its major geographic feature is Kukuilono, a large cinder cone. Kalāheo had only a small gulch, but it was known for its dryland cultivation of sweet potatoes in the early post-Contact period. Mid-nineteenth century land documents indicate that there were some irrigated taro lo'i along Kalāheo Stream.

The greatest pre-Contact resource for the ahupua'a was Nōmilu Fishpond, where the finest salt was made and traded. In the early post-Contact period, the land was used as pasture as part of McBryde's Wahiawa Ranch. In the late nineteenth century, the land was used for intensive sugar cultivation, which greatly modified the land and probably destroyed the majority of earlier habitation and agricultural features, except in inaccessible gulch areas. Modern residential and tourist development has increased this modification of the land.

Three heiau are mentioned in the literature. Kahaleki'i Heiau was on the western side of Kukuilono Hill, but it had been destroyed by 1931. Kapoho (“the depression”) Heiau was inland of the fishpond Nōmilu, but it was destroyed before the twentieth century. Kukuilono Heiau was once on Kukuilono peak, but it had been destroyed. (Bennett 1931)

3.1.5.3 Lāwa’i Ahupua’a

According to Kikuchi, the name “Lāwa’i” means “the day to end the fishing tapu” (Kikuchi 1963). Others believe the name Lāwa’i comes from “lawā a’i” which means “plenty to eat” or “valley of plenty” (Allerton 1972).

As in Kalāheo, only a few remnant taro terraces were found along the lower gulches, suggesting the agriculture in this area was mainly dryland agriculture of sweet potatoes and other crops (Handy 1940). This idea is reinforced by the small number of kuleana claims (five), most of which consisted of a house lot near the shore. Also like Kalāheo, Lāwa’i was associated with the McBryde family in the nineteenth century, first as part of the Wahiawa Ranch, then as part of the McBryde Sugar Company. It is likely that land modification from sugar cane cultivation has destroyed the majority of archaeological features, except in places not accessible to plowing, such as along steep gulches.

Three heiau are listed for the ahupua’a: Niukapukapu Heiau (Bennett Site 72) atop of Niukapukapu hill, Kalohiokapua Heiau (Bennett Site 69) in Lāwa’i Valley, destroyed before the 1930s, and Māmalu Heiau (Bennett Site 70) near the mouth of Lāwa’i Valley, destroyed before the 1930s.

3.1.5.4 Kōloa Ahupua’a

The name Kōloa has several derivations. Kōloa is the name for the large, soft Hawaiian sugar cane (*Saccharum officinarum*) once grown by the Hawaiians. Kōloa is also the name of a steep rock, called Paliokōloa, on the banks of Waikomo Stream, from where the ahupua’a got its name.

From previous archaeological studies and historic accounts it appears that habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa. Inhabitants developed an extensive and unique irrigated complex, the Kōloa Field System, which used elevated ‘auwai to divert the waters off of Waikomo Stream to cultivate taro, native sugar, and fish. The full extent of the Kōloa Field System is hard to estimate, however, because of the widespread historic land modifications (mainly for sugar cane). As Judd’s 1935 account asserts, it is likely that low inland areas were used for less intensive cultivation of patches of sweet potato, pia (arrowroot), and wauke and the gathering of hala (pandanus fiber), kukui nuts (oils having medicinal applications), and other resources. The coastal portion of the ahupua’a would have been a focus for permanent habitation, collection of marine resources, ceremonial activities, and burials. Evidence of intensive traditional Hawaiian use of lands well mauka of Kōloa Town is generally lacking. Remnants of dry-land agriculture or temporary field shelters associated with upland gardening or gathering and processing of forest resources are certainly possible.

In the early historic era (1795-1880), the Kōloa Field System continued in use for foreign trade and was probably further intensified. Sweet potatoes were a main crop for the whaling and merchant ships, and the purchase of pigs, salt, oranges, and other items are noted in many ship journals. The documents of the Great Māhele show that by the mid-1800s there were still several traditional farmers within Kōloa who both lived and worked within the area. The individual claims – for both lo’i (wetland) and kula (dryland) agriculture – suggest that while traditional farming of taro for subsistence was still taking place, in kula lands sugar cane production for sale to the nearby sugar mill had begun to dominate the landscape. Of the LCAs within Kōloa, several claimed a kula planted with cane or a cane field or sugar cane garden. Several also identified cane lands as boundaries for the LCAs. Clearly, kula lands were being converted into sugar lands at an increasing rate. Within three years of sugar cultivation by Ladd and Company in 1835, residents in and surrounding Kōloa were quickly moving to adapt to the new economy based on the production of sugar cane. Eventually, most of inland Kōloa was planted with sugar cane and only the rockiest areas, unsuitable for cultivation, survived the dramatic changes in the landscape brought about during the early twentieth century.

During the later historic period, the upper elevations of Kōloa became important collection areas of irrigation water. It is possible that historic ditches, flumes, pipelines, and other features related to collection of irrigation water exist in the ahupua’a today. A historic water ditch is documented in the 1935 Kōloa sugar map as “McBryde Ditch.” These ditches varied from tunnels, flumes, constructed ditches to earthen ditches. Ranching could have also left physical remains. Barbed wire fences, wooden or stacked stone enclosures, water troughs, and historic habitation deposits, including structure foundations and refuse dumps, could potentially be found, especially to the south of ‘Ōma’o Gulch.

Five heiau are listed in Kōloa: Hō’ai (Bennett Site 75) (probably “to feed” (Soehren 2013)) at Kūhiō Park on the west bank of Waikomo Stream, Kanehaule (Bennett Site 92) on the east branch of ‘Ōma’o Stream, destroyed before the 1930s, Kāneioulouma (Bennett Site 81) on the shore near Kihouna Heiau (Bennett Site 80), and Kūhāhāpō (“Kū feeling at night”) at Lae o Kahala. Additionally, in 1885, an informant named Makea was able to describe fourteen heiau within the Kōloa area (Lahainaluna Schools 1885: 165).

3.1.5.5 Weliweli Ahupua’a

The Weliweli ahupua’a was named after a gruff voiced man named Weliweli (“fearful”) who led one adventuresome group of menehune to explore Kaua’i. In the pre-Contact period, Weliweli was generally an arid area not suited for irrigated taro cultivation, probably a factor in that only one kuleana LCA was granted in this ahupua’a in the mid-nineteenth century. The lands of Weliweli were the first on Kaua’i to be extensively developed for sugar cane development. Ladd and Co. acquired rights to the land as early as 1835. As one of the areas longest modified for sugar cane cultivation, it is likely that many pre-Contact features were destroyed. However, plantation infrastructure (ditches and flumes), sugar transport infrastructure (road causeways, railroad berms, etc.), clearing mounds, and boundary walls should be still present within the ahupua’a.

One heiau is mentioned in Weliweli. The heiau is located on the shore, but it was not further described by Bennett, suggesting that it had been destroyed before the 1930s (Bennett 1931).

3.1.5.6 Pā’ā Ahupua’a

Pā’ā literally means “dry, or rocky.” Frederick Wichman defines it as “fence of lava rock” (Wichman 1998). Like Weliweli, Pā’ā was also an arid area, but it had more LCAs (15) granted. The documents mention dryland agriculture of sweet potatoes near the shore and irrigated taro cultivation in the gulches. Fishponds and salt making are also mentioned. In the early post-Contact period, the area was set aside for pasture. Pā’ā was leased by the Kōloa Sugar Co., who drained the large Pā’ā swamp, but found it was not suitable for sugar cane cultivation. Thus, the ahupua’a lands were extensively modified and many pre-Contact sites were modified or destroyed.

In legends, Pā’ā is the home of the heiau of Kāne’aukai, the fishing god, who aids two fisherman by turning into human form and teaching them ‘oli to catch more fish. The majority of the historic properties remaining in the ahupua’a today are probably related to ranching and sugar cane cultivation.

3.1.5.7 Māhā’ulepū Ahupua’a

Māhā’ulepū means “falling together,” a reference to a great battle in the 1300s, when the ruling chief, Kūkona, lured the invading army of the Hawaiian chief, Kalaunuiohua, into the inland area of Wahiawa, where all the Hawaiian warriors “fell together” (Wichman 1998). Hā’upu, the dominant geographic feature in Māhā’ulepū, was probably named for a demi-god.

Māhā’ulepū was a well-watered ahupua’a, as reflected in the large number (27) of kuleana lands awarded to commoners in the Māhele. Taro was cultivated along streams and in wetland areas. The land was acquired by the Kōloa Sugar Company in

1878 and used for large-scale sugar cultivation. This resulted in the modification and destruction of earlier habitation and agricultural features of the pre-Contact and early post-Contact historic periods. In these former sugar cane areas, it is likely that the majority of remnant features is associated with plantation infrastructure. On the coast, the sands of Māhā‘ulepū were used as an extensive burial ground, and it is likely that areas with undisturbed subsurface sand deposits contain additional burials. Keōlewa Heiau (Bennett Site 90, probably “the shifting sand”) is listed in the ahupua‘a, but it was destroyed before the 1930s.

3.1.6 State and National Registers of Historic Places

Significant historic sites may be nominated to the Hawai‘i and/or National Register of Historic Places. The State Historic Preservation Division is the official keeper of the Hawai‘i Register of Historic Places. The list formally recognizes districts, sites, structures, buildings and objects and their significance in Hawai‘i’s history, architecture, archaeology, engineering and culture. The National Register of Historic Places, kept by the National Park Service, encompasses significant properties nominated by State and Federal agencies, historic areas in the National Park System and all National Historic Landmarks. It is the official list of the country’s cultural resources.

Properties on the Hawai‘i Register are eligible for property tax discounts. For structures on the National Register, a range of tax credits as well as grants and other incentives are available. The property owner must follow certain guidelines when restoring or rehabilitating the structure.

Within the Planning District, there are five sites on the Hawai‘i Register:

- Wahiawa Petroglyphs (SHPD #30-09-3169)
- Lāwa‘i Lava Tubes (SHPD #30-10-3071, -3072)
- Kōloa Lava Tubes (SHPD #30-10-3075)
- Old Sugar Mill of Kōloa (SHPD #30-10-9302)
- Kalāheo School Campus (SHPD #30-10-9391).

The Old Sugar Mill of Kōloa is also listed on the National Register as a National Historic Landmark. See Figure 3-2.

3.2 PHYSICAL ENVIRONMENT

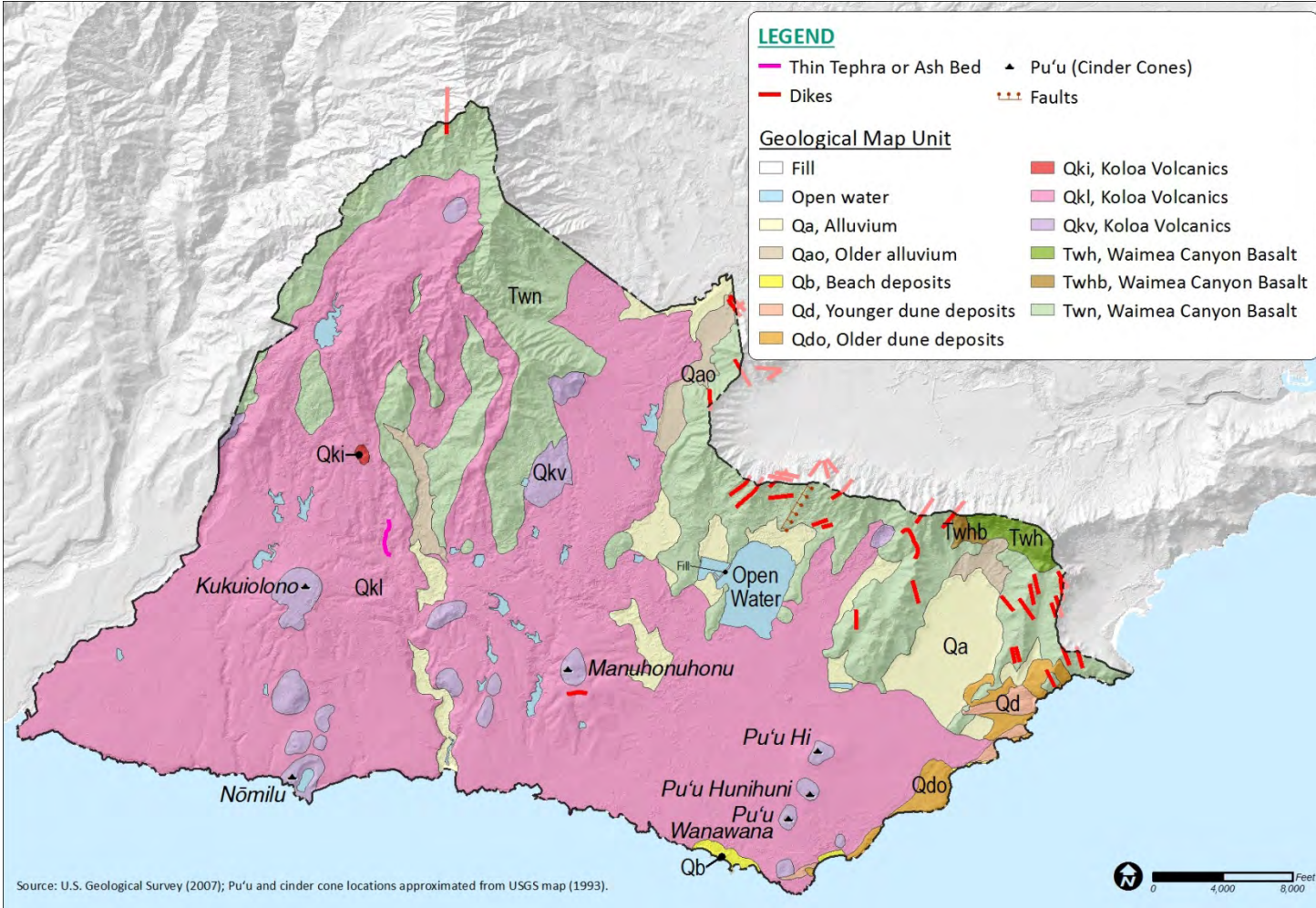
3.2.1 Geology

Kaua‘i is one of the oldest and most geologically complex of the Hawaiian Islands. The geology of the Planning District is dominated by cinder cones (pu‘u), ash beds, and olivine deposits resulting from the Kōloa Volcanic Series, which occurred 1.5 million years after the island’s main shield-building phase (see Figure 3-3). Notable cinder cones along coastal areas include, from east to west: Pu‘u Hi, Pu‘u Hunihuni, Pu‘u Wanawana, Manuhonohono, and Nōmilu. Further mauka, at 800 feet above mean sea level, Kukuinolono in Kalāheo is the tallest of the cinder cones in the Planning District.

Other areas of geological interest in the Planning District include the ahupua‘a of Māhā‘ulepū and Spouting Horn. Māhā‘ulepū’s border is comprised of an eroded remnant of a caldera (Mount Hā‘upu). This area also includes several unique geological features, including lithified calcareous sand dunes and limestone features. Of particular note is a large sinkhole that provides access to the Makauwahi Cave, which is the largest limestone cave in the state of Hawai‘i. Spouting Horn is a blowhole located just east of Kukuī‘ula Bay where vertical blasts of water occur when ocean waters are forced out

of a submerged lava tube. Its original Hawaiian name was Puhi, which means “blowhole” or “eel” for the mo‘o who got stuck in the lava tube here.

Figure 3-3: Geology



3.2.2 Topography

The topography within the Planning District slopes makai and south from Kapalaoa Summit (3,267 feet), its highest and northernmost point, down to the plains where it gently slopes out to the coastline. Elevations range from sea level to more than 3,000 feet above mean sea level over a distance of eight miles. Hā‘upu Ridge is the dominant topographical feature on the east side of the Planning District, rising approximately 2,300 feet above mean sea level.

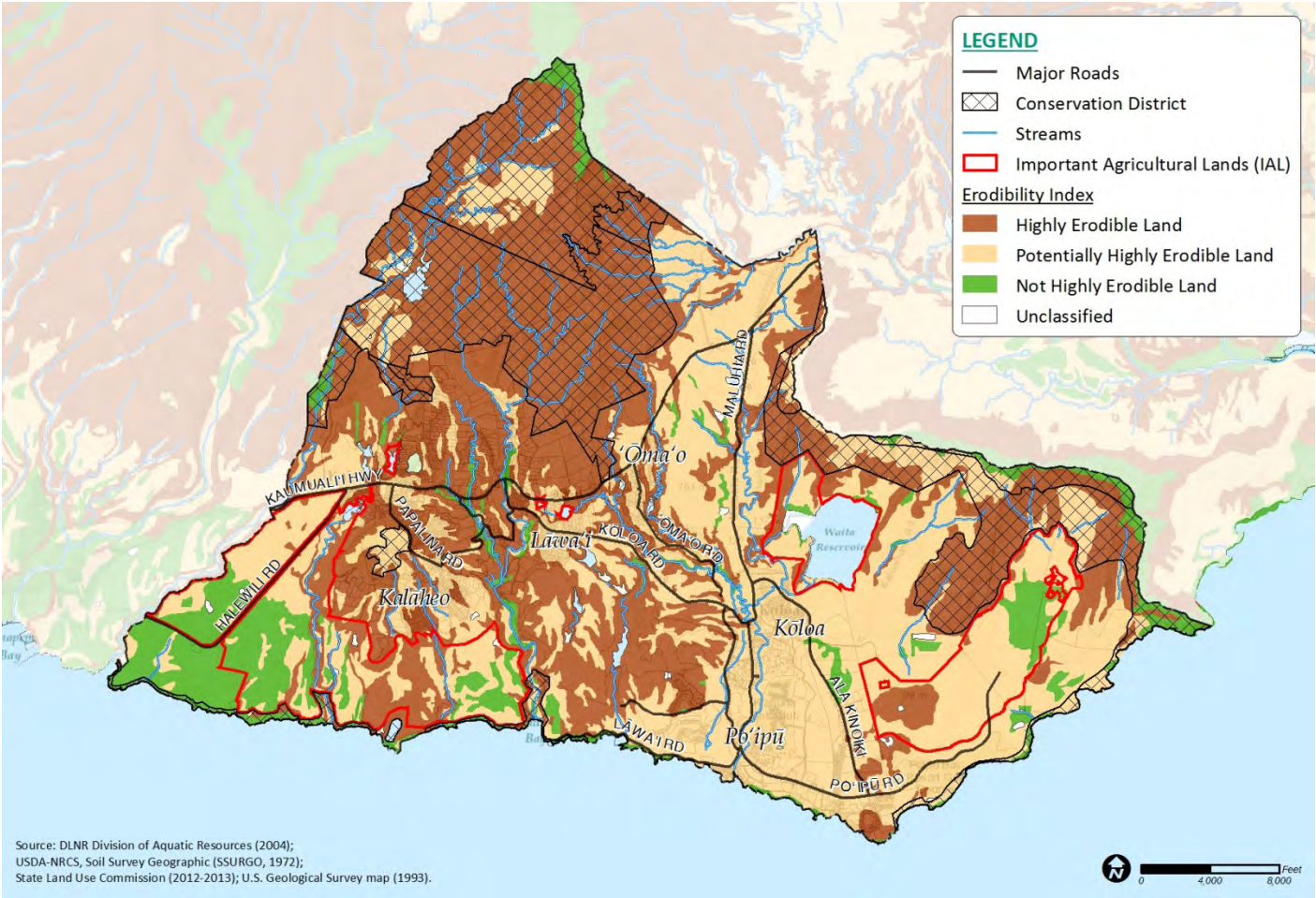
3.2.3 Soils

Three soil studies prepared for lands on Kaua‘i describe the physical attributes and relative productivity of different land types for agricultural production.

First, the United States Department of Agriculture (USDA) Soil Conservation Service’s survey defines the soil types of the Planning District as Oxisols, Inceptisols, and Mollisols. Oxisols, which are reddish in color, resistant to weathering, and have very low native fertility, are the primary soil type found in the Planning District. In general, the various other soil types that occur in the Planning District are stony, rocky soils that developed on uplands in material weathered from basic

volcanic rocks. The Soil Conservation Service also classified just over a quarter of the Planning District’s acreage as “highly erodible land” and much of the remaining land as “potentially highly erodible land” (see Figure 3-4).

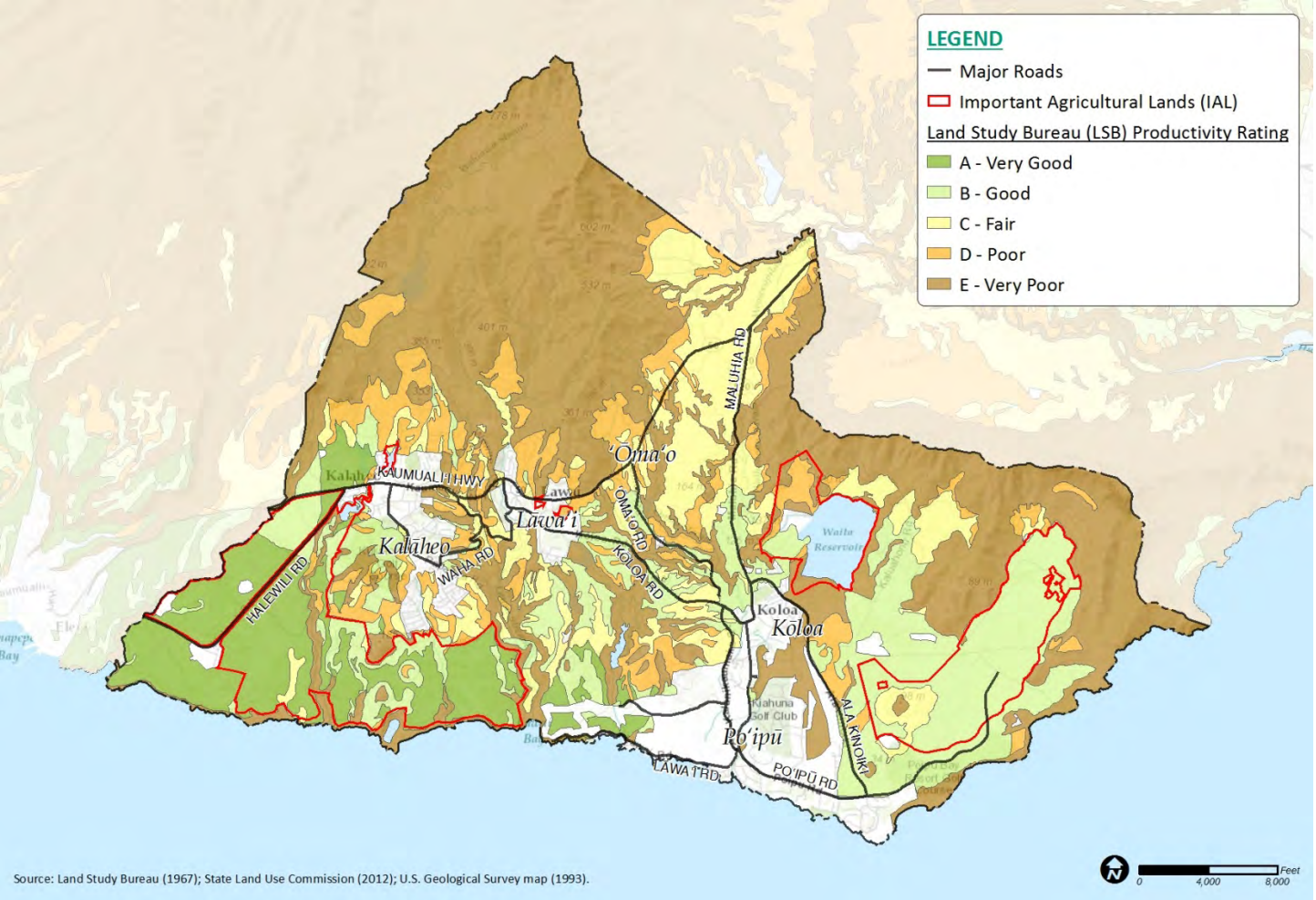
Figure 3-4: Soil Survey



According to the USDA Natural Resources Conservation Service (NRCS), “the Highly Erodible Land and Wetland Conservation Compliance Provisions were established by Congress in the 1985 Farm Bill, as amended... and provides disincentives for producers to produce commodities on converted wetlands or highly erodible land. ...To maintain certain USDA benefit and program eligibility, fields designated as highly erodible (HEL) must be protected from excessive soil erosion when used to produce agricultural commodities, by applying an approved conservation system” (NRCS 2002). Highly erodible lands are determined based on soil, climate, and topographic properties that when combined into a standardized “erodibility index” results in a value ≥ 8 . This evaluation is based on natural conditions and does not incorporate erosion management practices. (Brady 2005)

The second soil study is the University of Hawai’i Land Study Bureau’s (LSB) Detailed Land Classification productivity rating system which categorizes the majority of the land in the Planning District as having the lowest productivity (class “E”). Only 11.6% of the land is rated as “A,” or having the highest level of productivity, and most of it has been designated as Important Agricultural Lands (see Figure 3-5). The areas in white in Figure 3-5 are areas that have not been classified as the LSB did not classify lands within the Urban State Land Use District.

Figure 3-5: LSB Soil Productivity

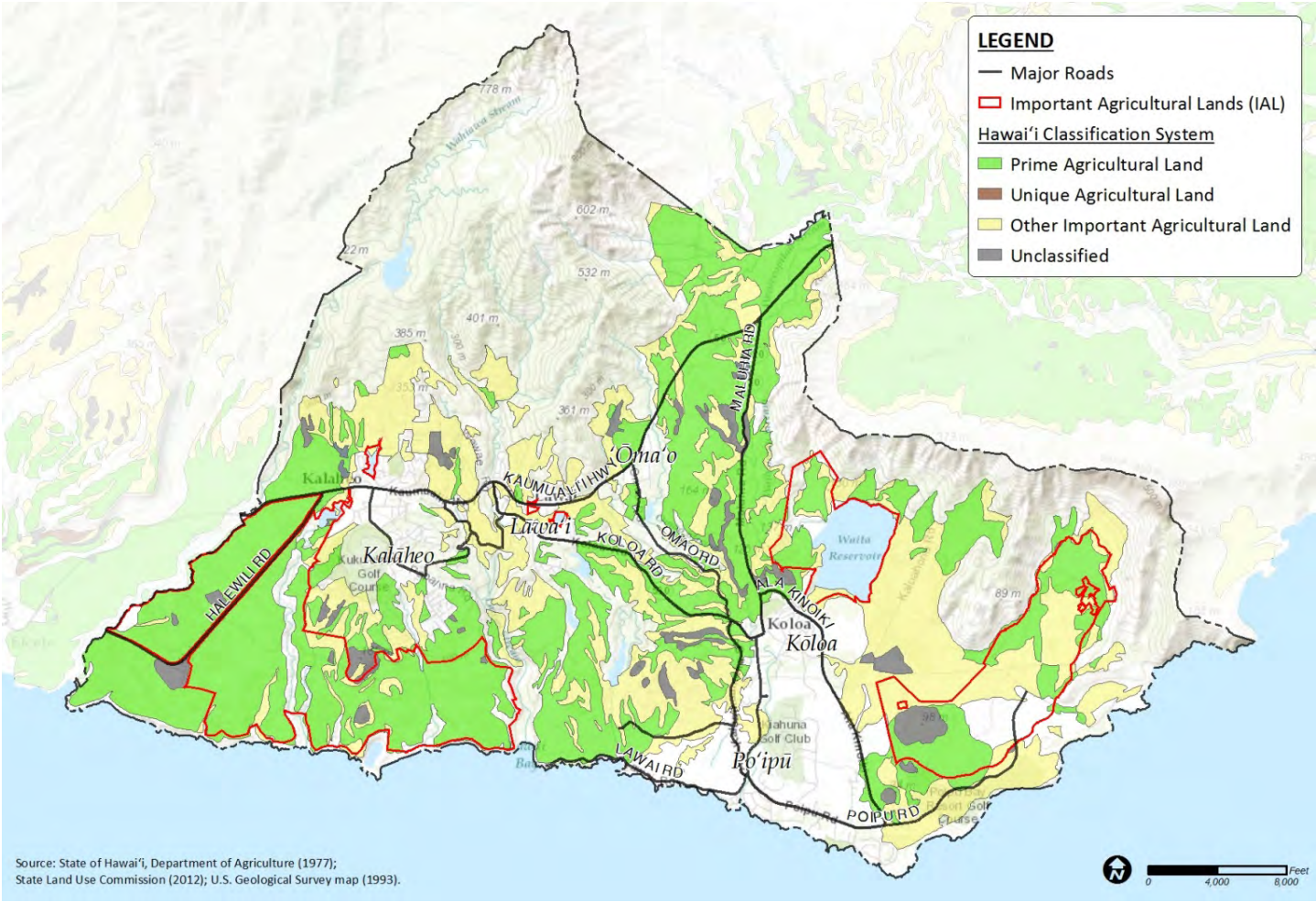


Finally, the 1977 Agricultural Lands of Importance to the State of Hawai’i (ALISH) classified about half (49.4%) of the lands of the Planning District (see Figure 3-6). Of that, the majority of the land is considered “Prime” agricultural land while the rest is “Other Lands of Importance” or “Unclassified.”

- Prime Agricultural Land is land best suited for the production of food, feed, forage, and fiber crops. The land has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to modern farming methods.
- Unique Agricultural Land is land other than Prime Agricultural Land that can be used for specific high-value food crops. The land has a special combination of soil quality, growing season, temperature, humidity, sunlight, air drainage, elevation, aspect, moisture supply, or other conditions that favor the production of a specific crop of high quality and/or high yield when the land is treated and managed according to modern farming methods. In Hawai’i, some examples of such crops are coffee, taro, rice, watercress and non-irrigated pineapple.
- Other Agricultural Land is land other than Prime or Unique Agricultural Land that is also of statewide or local importance for the production of food, feed, fiber, and forage crops. The lands in this classification are important to agriculture in Hawai’i yet they exhibit properties, such as seasonal wetness, erosion, limited rooting zone, slope, flooding, or drought, that exclude them from the Prime or Unique Agricultural classifications. These lands can be

farmed satisfactorily by applying greater inputs of fertilizer and other soil amendments, improving drainage, mitigating erosion, and providing flood protection. They can produce fair to good crop yields when managed properly.

Figure 3-6: Agricultural Lands of Importance to the State of Hawai‘i



3.2.4 Important Agricultural Lands

The Hawai‘i State Constitution established a policy to “conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands” (Hawai‘i State Constitution, Article 11, Section 3). Pursuant to the constitutional mandate, the State Legislature adopted standards, criteria, and procedures to designate Important Agricultural Lands (IAL) as Act 183 (Session Laws of Hawai‘i 2005) and incorporated as HRS Chapter 205, Part III. Once designated, owners of these lands qualify for incentives. Reclassification of Important Agricultural Lands requires a 2/3 supermajority and must meet certain standards and criteria specified in HRS §205-50. As of January 2014, the Land Use Commission (LUC) has approved four landowner petitions in the County of Kaua‘i for a total of 16,618 acres (Office of Planning 2014). Within the Planning District, roughly 6,000 acres have been designated as IAL (see Figure 3-48).

In addition, Act 183 (SLH 2005) required each county to designate potential IAL for the respective county councils to consider for decision-making. Similar to farmer or landowner-led petitions, the designations must be based on how well

the agricultural lands meet the eight specific standards and criteria itemized in HRS §205-44. In order to meet the county-specific directives of legislation, the County of Kaua‘i contracted with the UH Mānoa’s Department of Urban and Regional Planning to develop a methodology to rank and map agricultural lands using GIS based on how well they meet the eight criteria. The eight criteria are:

- 1. Land currently used for agricultural production;
- 2. Land with soil qualities and growing conditions that support agricultural production of food, fiber, or fuel and energy-producing crops;
- 3. Land identified under agricultural productivity rating systems, such as the agricultural lands of importance to the State of Hawai‘i (ALISH) system adopted by the board of agriculture on January 28, 1977;
- 4. Land types associated with traditional native Hawaiian agricultural uses, such as taro cultivation, or unique agricultural crops and uses, such as coffee, vineyards, aquaculture, and energy production;
- 5. Land with sufficient quantities of water to support viable agricultural production;
- 6. Land whose designation as important agricultural lands is consistent with general, development, and community plans of the county;
- 7. Land that contributes to maintaining a critical land mass important to agricultural operating activity; and
- 8. Land with or near support infrastructure conducive to agricultural productivity, such as transportation to markets, water, or power.

As of July 2011 the counties were permitted to recommend lands for IAL designation to the LUC. Recommended lands must exclude those already designated for urban use either by state land use boundary, county zoning, or community or general plan designations. Also, once a landowner has voluntarily designated the majority of its qualified holdings as important agricultural lands, the LUC cannot designate any other of its landholdings for IAL except by a petition pursuant to section 205-45 (HRS §205-49).

Extensive public participation and input from a 21-member stakeholder/technical advisory committee (STAC) over a period of two years were instrumental in developing the County’s February 2015 draft IAL study and its recommendations. The study is still undergoing review and revision. However, the key points and findings to date are:

- **Criteria:** Of the eight criteria required for identifying Important Agricultural Lands, water for agriculture was consistently noted as the most important factor by the STAC and members of the community. Other highly ranked criteria were soil quality and designation as Prime Agricultural Lands according to the ALISH rating system.
- **Methodology:** Agricultural lands on Kaua‘i were scored on a scale of 0 to 40 based on how well they meet the eight legislative criteria. None of the 136,908 acres of agricultural land scored a 0 (0 meaning it did not meet any of the criteria) or a 40 (40 meaning it met all the criteria at 100%). The minimum score was 1.76 and lands with a threshold score of 28 or more met all eight criteria at some level. Over a third (34.8%) of agricultural lands, or 47,740.15 acres, scored a 30 or higher.

Three goals were used to help benchmark how many acres should be placed in IAL by the County: 1) food self-sufficiency, 2) elimination of electricity produced from petroleum, and 3) supplying biofuel for highway fuel consumption.

- **Food Sustainability:** An estimated 21,158 acres of lands in food production alone would be needed to feed a population of 70,000, roughly the population of Kaua‘i, based on an average daily caloric intake of 2,500 calories.

This includes a variety of fruits, vegetables, starches (rice and potatoes), fish, chicken, pork, eggs, and dairy. If beef production is included, this number jumps by 98,183.81 acres to 119,342 acres. Based on this estimate, 1.70 acres per year per person on average is needed to be food self-sufficient on Kaua'i. This number drops to 0.30 acres per year if beef is imported. The estimate without beef production was used as a benchmark to help determine what level of threshold should be used for County-designated IAL on Kaua'i since beef production does not require the best soils or topography, while IAL would.

- **Electricity Production:** Based on Kaua'i's average daily electricity generation rate of 4.65 kWh/square meter/day from photovoltaics (PV), it would take 100 acres of PV to replace the daily electricity production from petroleum 1,200,000 kWh/day (based on 2008 data).
- **Biofuel Production:** Based on peak highway fuel consumption in 2009, the average fuel consumption per vehicle was estimated to be 685 gallons per year. Due to the lower efficiency of biofuel-based ethanol, 30% more biofuel would need to be added to provide the same usage, or 890.5 gallons of biofuel per vehicle. In 2009, there were 73,847 registered vehicles on Kaua'i. Different crops were identified based on their efficiency of producing ethanol per acre per year in order to estimate the amount of acreage needed for fuel production and how many vehicles could be fueled by the ethanol produced in different scenarios and at different thresholds.

Based on the feedback received on the alternative scenarios, increasing food self-sufficiency should take priority as the tool for deciding where County-led designations should be focused.

It is important to note that initial mapping of candidate lands did not exclude those agricultural lands protected from County-recommended IAL designation even though HRS §205-49(a)(3) states that “the [Land Use] commission shall not designate any additional lands of that landowner as important agricultural lands except by a petition pursuant to HRS §205-45... if the majority of landowners’ landholdings is already designated as important agricultural lands, excluding lands held in the conservation district, pursuant to HRS §205-45 or any other provision of this part.” At the time of this publication, the LUC is still determining how to interpret “landowners’ landholdings,” whether it should be based on statewide landholdings, or by island, or by business unit. For comparison, HRS §205-45 uses the “county” as a spatial frame of reference in determining how and where the 15 percent credits for reclassifying the “petitioner’s other land in the same county” to rural, urban, or conservation district are earned for designating lands as IAL. The County is in the process of revising its draft report.

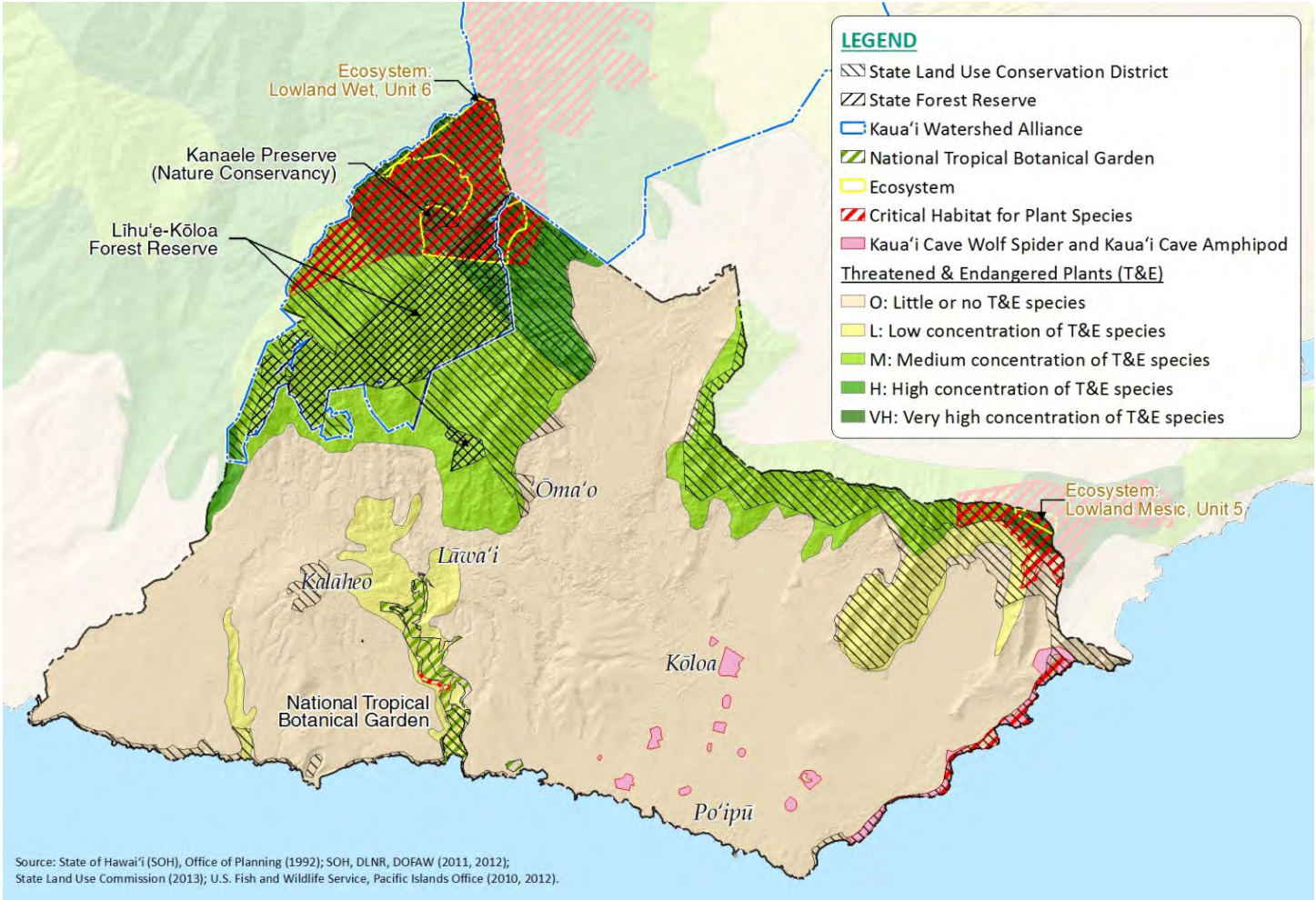
3.2.5 Vegetation & Wildlife Habitat

The Hawaiian Islands are geographically isolated. More than 2,000 miles separate Hawai'i from the nearest continent. Since the native flora and fauna could only have arrived by long-distance dispersal, the resulting biota lacks representatives of many of the plant and animal groups that populate the continents. It has also resulted in unique and endangered species that are found nowhere else on the planet.

There are two vegetation zones in the Planning District: wet forest above 300 feet elevation and lowland dry and mesic forest below 300 feet. Most of the dryland and mesic forest has been transformed by human activity, but a significant portion of the native wet forest and remnants of dry native forest and shrubland remain. The U.S. Fish and Wildlife Service (USFWS) defined the lowland mesic and lowland wet forest ecosystems as Plant Critical Habitats. In the Kōloa and Po'ipū area, the USFWS defined Invertebrate Critical Habitats for the Kaua'i Cave Wolf Spider and Kaua'i Cave Amphipod. Invasive alien species are prevalent throughout the Planning District, even in protected critical habitat areas, which continually threaten the integrity of native biodiversity.

Several designations and management systems provide various degrees of protection of the Planning District's natural resources. The Conservation District encompasses nearly all of the remaining native vegetation. Within the Conservation District, the Kanaele Preserve encompasses the Native Bog Vegetation, and the Lihū'e-Kōloa Forest Reserve encompasses some of the Native Wet Forest and Shrubland and Native Cliff Vegetation. Figure 3-7 overlays the critical habitats with the reserves, State Conservation District, and ecosystems to show the protected areas.

Figure 3-7: Critical Habitats, Reserves, State Conservation District, and Ecosystems



A portion of the lands within the Conservation District, owned by the State and Alexander and Baldwin, is part of the Kaua'i Watershed Alliance—a public-private partnership committed to the long-term protection of Kaua'i's upper watershed areas. The partnership works together to protect the region from invasive alien plants, animals, and other threats.

The National Tropical Botanical Garden (NTBG)—created by Congressional Charter as a not-for-profit institution dedicated to tropical plant research, conservation, and education—manages the Allerton and McBryde Gardens as well as Lāwā'i Kai. The gardens are home to various botanically important tropical plant species as well as NTBG's Conservation Program and a state-of-the-art horticulture and micropropagation facility. Lāwā'i Kai is a coastal area that is a documented

green sea turtle nesting site, a refuge for monk seals who haul out regularly, a seldom used fishery, a productive estuary, and a protected habitat for rare coastal plant species.

There are also several Exceptional Trees designated in South Kaua'i and protected by ordinance from any damage or removal (KCC §22-5). They are mapped on Figure 3-2.

Table 3-1: South Kaua'i's Exceptional Trees

No.	Tree	Location
K-2	Tree Tunnel (<i>Eucalyptus Robusta</i>)	Both sides of Maluhia Road (TMKs 2-7-02:01 and 2-8-01:05)
K-5	Baobab (<i>Adansonia digitata</i>)	Behind Kōloa Missionary Church, southeast corner (TMK: 2-8-10:01)
K-8	Earpod (<i>Enterlobium cyclocarpum</i>)	In front of Kaua'i Mortuary on Po'ipū Road (TMK: 2-8-10:45)
K-20	Monkey Pod (<i>Samanea saman</i>)	Behind old Yamamoto Store near river (TMK: 2-8-07:16)
K-21	Monkey Pod (<i>Samanea saman</i>)	Honpa Hongwanji Mission and Kōloa Early School (TMK: 2-8-04:56)
K-22	Monkey Pod (<i>Samanea saman</i>)	Honpa Hongwanji Mission and Kōloa Early School (TMK: 2-8-04:56)
K-23	Monkey Pod (<i>Samanea saman</i>)	Behind Kōloa Early School (straddles TMKs 2-8-04:03 and 53)



3.2.6 Climate, Hydrology, & Renewable Energy Potential

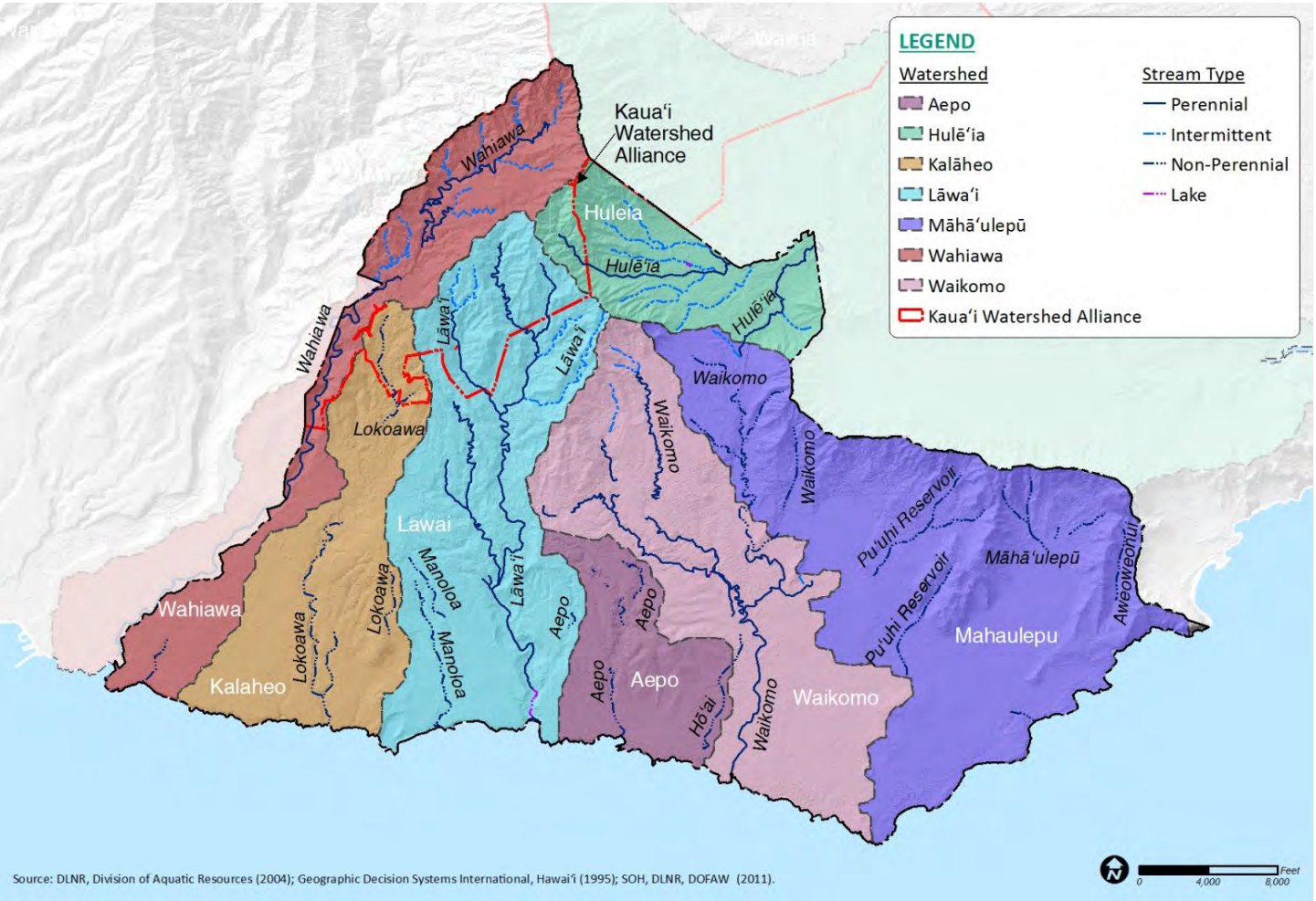
Located on the drier, leeward side of the island, the mean annual rainfall in the Planning District ranges from 35 inches at the coast to 160 inches at the highest mauka elevations. During the summer months (May-September), the sun is higher in the sky, temperatures are warmer, and the trade winds occur more steadily. The winter months (October-April) are cooler, trade winds are less frequent, and wide-spread storm rainfall is more common. Brief periods of intense rainfall can lead to flooding and soil erosion. The rainfall intensity for a 10-year storm in Kōloa is approximately 2.5 inches per hour.

The Planning District has six watersheds with eleven streams. See Figure 3-8. The perennial streams are Waikomo, Lāwa'i, and Wahiawa, originating in the rainy uplands with flows maintained by high level springs and seeps. All three of these streams are listed as impaired by the State Department of Health because they do not meet certain state water quality standards. For Lāwa'i Stream, turbidity standards were not attained throughout the year and total nitrogen and nitrate+nitrite nitrogen during the dry season (May-October). Waikomo and Wahiawa Streams were not in attainment for turbidity, total nitrogen, and nitrate+nitrite nitrogen year round. However, all were listed low on the priority list for developing total maximum daily load (TMDL) standards (DOH 2012).

There are two large reservoirs in the Planning District. Created by damming Wahiawa Stream above Kalāheo, the Alexander Reservoir is currently home to a 1,000 kilowatt hydroelectric power plant. Near Kōloa town, the Waitā Reservoir was once a marsh and is fed from Ku'ia Stream through a tunnel.

Groundwater occurs as basal, perched (water bodies “resting” or “settled” within rock), and most likely dike-impounded water. The Planning District is mostly encompassed by the Kōloa Aquifer System with a small portion of the northeastern corner in the Hanamā'ulu Aquifer System. The estimated sustainable yield of the Kōloa Aquifer System is 30 million gallons per day (MGD) and current pumpage is estimated at only 0.342 MGD.

Figure 3-8: Watersheds and Streams

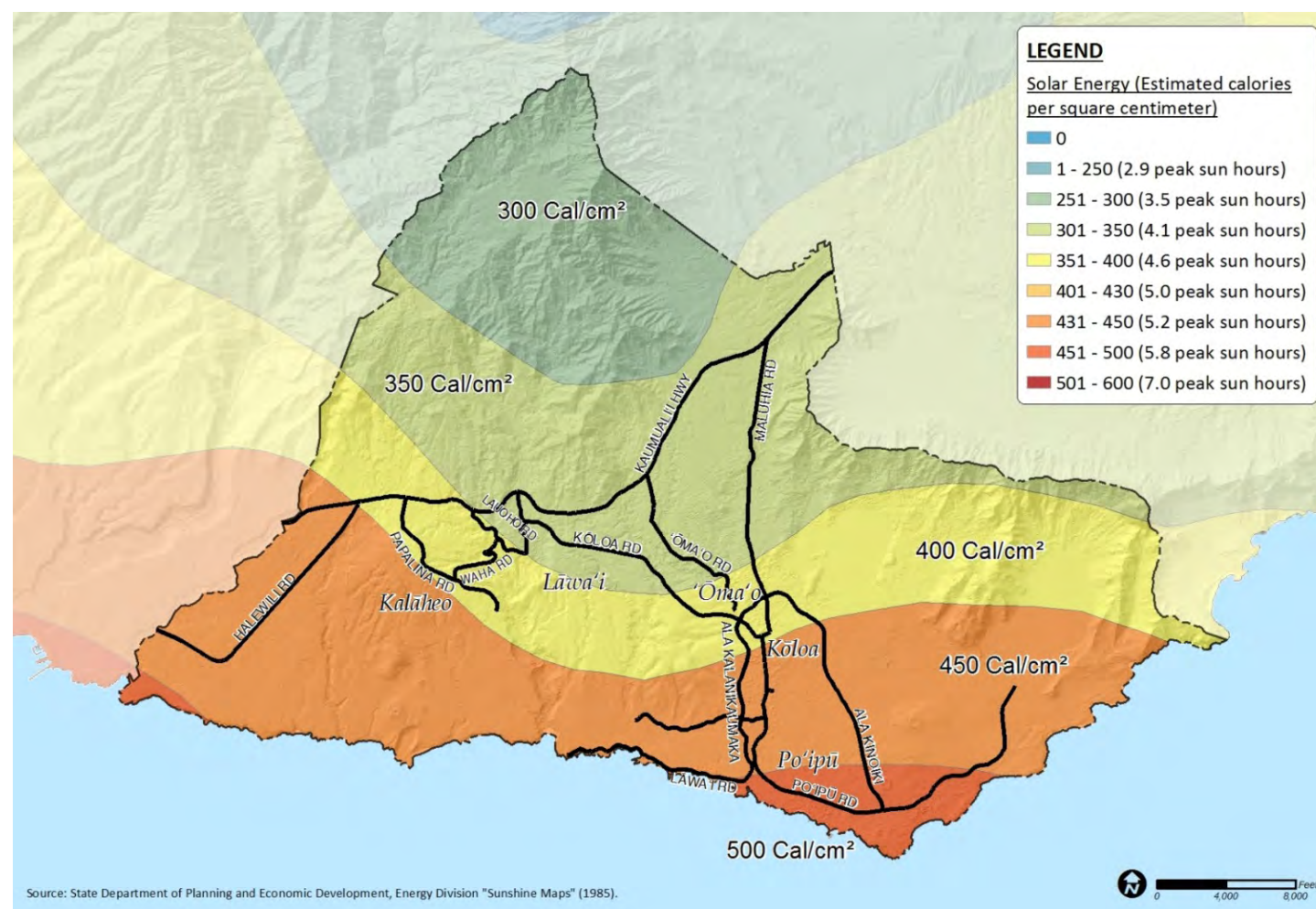


However, the State Commission on Water Resource Management (CWRM) warns that due to Kaua'i's geology, it can be difficult to generate a steady supply of water by pumping water from the aquifers. The Limtiaco Consulting Group (TLCG) recommends consultation with a qualified hydrogeologist for any future expansion of the water resource.

In the Planning District, the solar radiation ranges from 300 cal/cm2/day in the mauka regions to 450-500 cal/cm2/day along the coast. These are some of the highest solar radiation resources on the island. See Figure 3-9.

The trade winds would be the main source of wind energy, blowing 70% of the time. In the Planning District, the high-wind areas are at the crests of lower mountain ridges.

Figure 3-9: Solar Radiation



3.3 COASTAL ENVIRONMENT

The south-facing Planning District generally has higher surf during the summer months from South Pacific swells and occasionally during the winter months from Kona storms.

For most of the nearshore waters of the Planning District, the State Department of Health (DOH) water quality classification is Class A. Between Ho'ai Bay and Makahū'ena Point, the DOH classified the nearshore waters as Class AA, which are to "remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions." In Class A waters, the best degree of treatment is required and the discharge must be compatible with recreational uses and protection of fish, shellfish, and wildlife. Under the inland water classifications, Class I waters similarly have the goal of remaining as pristine.

Every two years, the State DOH prepares a "Water Quality Monitoring and Assessment Report," which provides an integrated submittal to the United States Environmental Protection Agency (EPA) in order to fulfill the requirements of the federal Clean Water Act (CWA) (Sections 303(d) and 305(b)). The latest draft prepared in April 2014 adds several marine environments within the Planning District to the CWA list of impaired waters for turbidity including Beach House Beach,

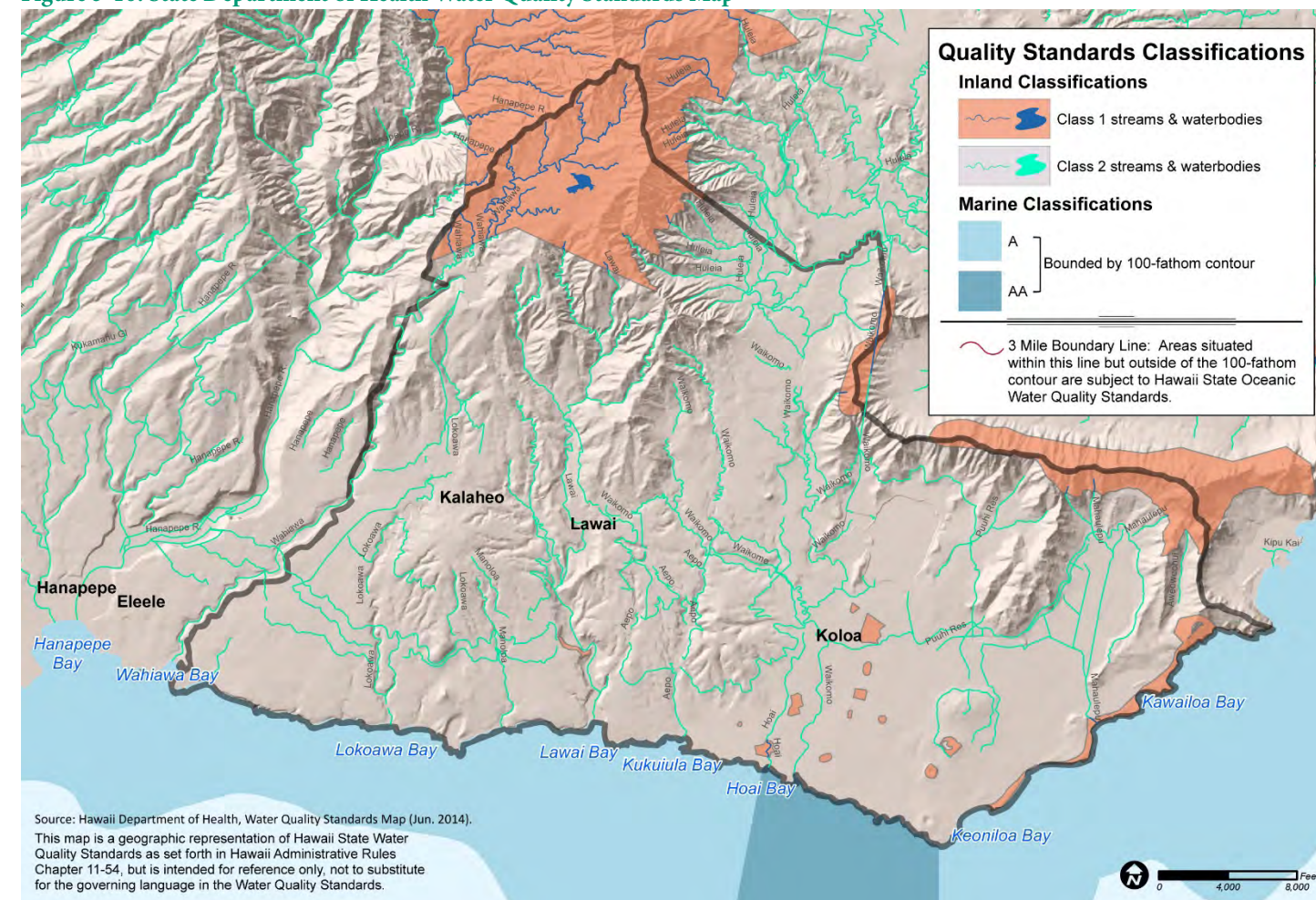
Brennecke Beach, and Sheraton Beach. The Surfrider Foundation also conducts informal water quality testing and often submits its findings to DOH. See Figure 3-10 and Table 3-2 for descriptions of each coastal area in the Planning District.

Place name information in Table 3-2 is kindly provided by Theodore Blake, a long-time resident of Kōloa whose family roots trace back generations to the area.

Annual shoreline accretion and erosion rates for the island of Kaua'i were estimated by the Coastal Geology Group from the UH School of Ocean and Earth Sciences and Technology (SOEST) in 2009 based on historical aerial photographs.

Shoreline change rates along South Kaua'i shorelines ranged from a small amount of accretion to erosion at 1-2 feet per year. Rocky shorelines and other stable shorelines were not included in the study. The findings from the study are summarized in the "Coastal Erosion Assessment" column of Table 3-2. Additional information on shoreline erosion in South Kaua'i is provided in Section 3.6.7.3.

Figure 3-10: State Department of Health Water Quality Standards Map



Existing shoreline public access points are shown in Figure 3-11. There are seventeen accesses with legal documents, which give the public the right to use the accesses, or easement documents, which are close to being recorded. This also includes accesses which have easement documents executed (or signed) but not recorded.

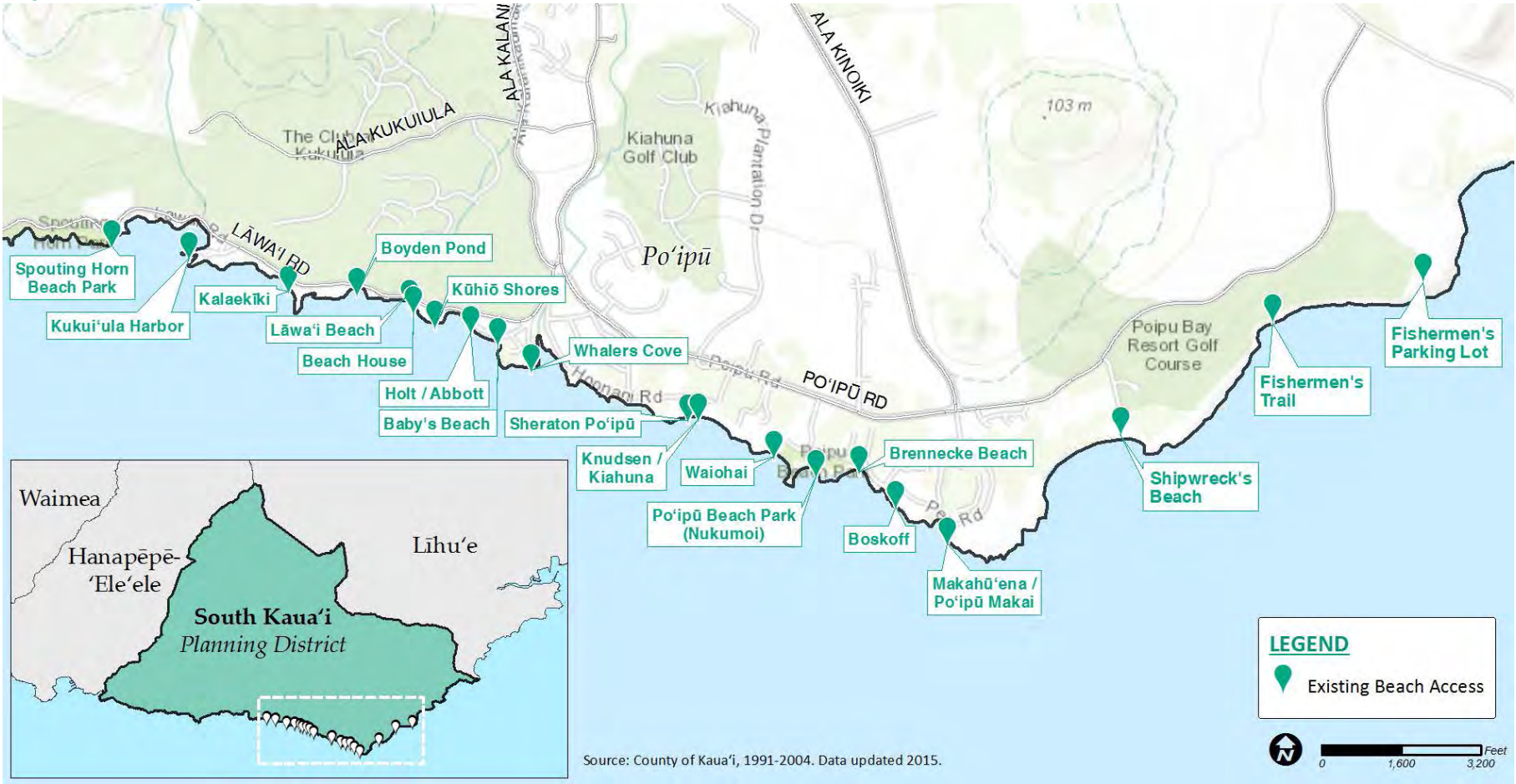
Table 3-2: Coastal Area Descriptions

Coastal Area	Description	Place Names	Access	CWA Listed Impaired Water Body Pollutant	Coastal Erosion Assessment
Wahiawa Bay	<ul style="list-style-type: none">Large, sand-bottomed bay with low sea cliffsProtected from winds and currentsSand mixed with silt from Wahiawa Stream runoff		Private road from Numila <i>Public access:</i> Desired		Accretional or steady state
Kalāheo	<ul style="list-style-type: none">Predominantly sea cliffsWest of Kōheo Point are remote, tiny beaches at base of cliffsEast of Kōheo Point are two pocket sand beaches at the heads of gulchesOne of the pocket beaches fronts Lokoawa Bay		Private cane road from Numila or Kalāheo <i>Public access:</i> Not a high priority		Coastal erosional study did not cover beaches in or near Lokoawa Bay
Nōmilu Fishpond & Pālama Beach	<ul style="list-style-type: none">Nōmilu Fishpond is brackish, spring-fed 20-acre pondPālama Beach is long, sandy beach to east of NōmiluSurfable waves break over shallow patch reefsSnorkeling and swimming are good when calmLanipū’ao Rock directly offshore from Pālama Beach is popular scuba destination		Private cane road <i>Public access:</i> Desired		Erosional at approximately 0.5 feet per year
Lāwa’i Kai	<ul style="list-style-type: none">Wide crescent beach bordered by two rocky pointsFronted by shallow sandbar that varies seasonallyExcellent for bodysurfing and occasionally surfingBeach and bay are part of the Lāwa’i Kai Special Subzone (LKSS) within the State Conservation District signed into law by the Governor on July 5, 2013.	<ul style="list-style-type: none">Manaloa – Border of Kalāheo and Lāwa’i Ahupua‘aKa Lae o Kaiho‘lali – west point of Lāwa’i BayKa‘ulala – name of middle of Lāwa’i BayKa Lae o Kaiwa (the point of the frigate bird) – east point of Lāwa’i BayPueo Point – Point east of Kalaeokaiwa	Rugged, rocky difficult shoreline access from both the east and west. The community process that was initiated in 2007 and which guided the creation of the LKSS determined that it was not desirable to improve access to this culturally and biologically sensitive area and that the difficult access would help to limit increased recreational use of this unique place.		Erosional at approximately 1-2 feet per year
Spouting Horn Beach Park	<ul style="list-style-type: none">Centers on Spouting Horn, a blowhole formed on the bench of a lava tubePark includes paved parking, restrooms, and curio vendorsPrimarily rock shorelineSmall pocket of sand to west of lookout provides limited swimming and sunbathing site during calm seasFishermen and commercial snorkeling tours frequent the shoreWedge-tailed shearwater colony lives in the area		Publicly accessible as County beach park		Rocky shoreline, no erosional assessment
Kukui‘ula Small Boat Harbor	<ul style="list-style-type: none">Boat ramp, mooring areas, boat-trailer parking lots, restrooms, showers, picnic pavilionsHeavily used for recreational and commercial activitiesShoreline fishermen, swimmers, surfers, and canoe clubs also use harbor	<ul style="list-style-type: none">Kukui‘ula BayKaūlala Point – east point of Kukui‘ula Bay	Publicly accessible as County beach park		Steady state
Beach House	<ul style="list-style-type: none">Beach House beach and those along Ho‘ai Bay almost completely disappear at high tide	<ul style="list-style-type: none">‘Ēkaha (birdnest fern) – point west Ka Lae KikiKai Halulu (To roar like thunder, or a legendary man-eating	Publicly accessible as County beach park	Turbidity (Dry Season,	Steady state to

Coastal Area	Description	Place Names	Access	CWA Listed Impaired Water Body Pollutant	Coastal Erosion Assessment
Beach & Ho’ai Bay	<ul style="list-style-type: none">Sunbathing at low tide and snorkelingPKs, Centers, and Acid Drops are popular surf sites near Beach House beachAlong margins of Ho’ai Bay are several small pockets of sand and one large, secluded pocket called Waterhouse Beach	<ul style="list-style-type: none">bird) – Halauakalena just after Boyden’s makai of public parking area surf spot by Weir’s former residence (Heroins)Waialeale Beach – from Kai Halulu to Kolopa (Acid Drop)Kolopa – Beach House point (PK’s)Hō’ai Bay (to feed) – Kūhiō ParkKunu (to broil) – RosenbergersKāheka (shallow pool)Nahumā’alo Point (to bite in passing) – Webers		Beach House Beach)	light accretional
Kōloa Landing	<ul style="list-style-type: none">Rocky shorelineAttracts fishermen while nearshore waters are popular with snorkelers and scuba divers	<ul style="list-style-type: none">Keawaloa (long channel or milkfish)Kaheka (Waterhouse/Baby Beach)Hanakā’ape Bay (headstrong)Keawaloa – River mouthLae of Nahumā’alo – point west of Whalers Cove CondominiumMa’ulili Kai – stretch between Hanakā’ape Bay to Lae o Kamilo (Sheraton Hotel)Lae o Kahala	Public access available from Ho’onani Road	Turbidity (Dry Season)	Rocky shoreline, no erosional assessment
Po’ipū Beach & Waiohai Beach	<p>Po’ipū Beach</p> <ul style="list-style-type: none">Pocket beach in small bay between two rocky pointsPopular windsurfing and surfing site, with range of conditions for different abilities <p>Waiohai Beach</p> <ul style="list-style-type: none">Narrow sand crescent that lines small bay in front of Waiohai ResortOffshore surf site called Waiohai	<ul style="list-style-type: none">Punahoa (companion spring)Lae o Ka’ōpua (point of the puffy cloud) – cow’s headLae o KamiloKaho’ōnāpua’a – Bay/Beach fronting Sheraton and Outrigger Kiahuna ResortHaleoi’a – Bay fronting Marriott Waiohai Beach (house of fish)Heiau Kihouna – MarriottNukumoe PointKaho’oleinakupua’a – Po’ipū Beach	Publicly accessible from Po’ipū	Turbidity (Dry Season, Sheraton Beach)	Erosional at approximately 0.8 feet per year
Po’ipū Beach Park & Brennecke Beach to Makahū’ena Point	<p>Po’ipū Beach Park</p> <ul style="list-style-type: none">Heavily used by residents and visitorsSafe swimming beachShowers, lifeguard tower, pavilions, restrooms, parking <p>Brennecke Beach</p> <ul style="list-style-type: none">One of most popular body surfing beaches on island due to nearshore sandbar	<ul style="list-style-type: none">Po’opoko – border of Kōloa and Weliweli ahupua’aMakahū’ena Point	Publicly accessible as County beach park	Turbidity (Dry Season)	Erosional at approximately 1 foot per year
Keonelo/Keoniloa (Shipwreck) Beach	<ul style="list-style-type: none">Body surfing and wind surfingVery high southwesterly winter surf occasionally exposes historic Hawaiian petroglyphs carved in soft beach rock shelvesEponymous shipwreck was unidentified wooden boat that lay on sand until Hurricane ‘Iwa cleared it away	<ul style="list-style-type: none">Kaneaukai Point – border of Weliweli and Pa’a ahupua’a (name of a fish god)Keonelo Bay	Public access is provided by the hotel		Erosional at approximately 1.2 feet per year

Coastal Area	Description	Place Names	Access	CWA Listed Impaired Water Body Pollutant	Coastal Erosion Assessment
Māhā‘ulepū Beach	<ul style="list-style-type: none">2-mile coast from Punahoa Point to Hā‘ula BeachThree distinct areas: Gillin’s Beach, Kawailoa Bay, and Hā‘ula BeachGillin’s Beach is long, narrow beach lined by patches of beach rockKawailoa Bay is sandy beachHā‘ula Beach is a pocket beach with a low, flat rock shelf fronting the beach, making it marginal for swimmingConcentration of volcanic vents (pu‘u cinder cones)Archaeologically dense as area was once well populatedSand dunes support native vegetationWedge-tailed shearwaters nest in the cliffs	<ul style="list-style-type: none">Waiopili Stream – boundary point of Pa‘a and Māhā‘ulepū near former quarry (west of stream)MakawehiBoundary point of Pā‘ā and Māhā‘ulepū near Quarry Ditch (west of ditch)PapalinakoaPu‘uleokoKāmala Point (the garden)Kawailoa Bay (meaning long water)Papamo‘i Bay (meaning platform of the chiefs)Pākamoi (meaning wobbling rock)Pā‘ōō Cape (named for the several varieties of o‘o‘pu)Hā‘ula (meaning reddish; a reference to limu hā‘ula)Nā‘ākea Cape (also called “Second Hā‘ula”; translation unknown, but area known for the battle of Kawelewele Iki)Lae Kawelikoa Point (border of Kipu and Māhā‘ulepū)	Access is by private road that is open to the public during daylight hours. At the Po‘ipū Bay Golf Course, public access is provided via two easements: one across and the other along the property. Permanent public access is desired by the community.		Erosional at approximately 0.6 feet per year. However, some areas are higher (e.g., north of Pāo‘o Point is erosional at 1.6 feet per year and South Gillian’s Beach is erosional at 1.1 feet per year)
Sources: US ACOE Coastal Resource Atlas (1984; GIS 1989); UH SOEST 2009; T. Blake (personal communication 2014, 2015); DOH (Draft 2014)					

Figure 3-11: Existing Public Shoreline Accesses



3.4 BUILT ENVIRONMENT

3.4.1 Place Types

South Kaua’i is comprised of five distinct towns—Kōloa, Po’ipū, Kalāheo, Lāwa’i, and ‘Ōma’o. New development in Kukui’ula extends Po’ipū to the west. Each town is characterized in Table 3-3.

Table 3-3: Place Types

	Walkability	Activity Mix	Character Assets	Streetscape	Parking	Development Potential
Kalāheo	The busy highway makes this area fairly unfriendly to pedestrians. Connectivity across the highway is problematic. Sidewalks and bicycle facilities are disconnected within the commercial core along the highway and do not extend into the neighborhoods.	The zoned commercial area extends several blocks makai of the highway, but the existing commercial uses are concentrated along the highway. The commercial mix consists of bakery, pharmacy, service uses, and food establishments, serving primarily local residents rather than tourists.	<ul style="list-style-type: none">Most urban portion of Kaumuali’i Highway.	<ul style="list-style-type: none">Lacks sidewalks.	Parallel on-street parking is available along the Kaumuali’i highway.	Land area along the highway immediately west of central Kalāheo remains undeveloped and is without limitations of steep slopes.
Kōloa	The commercial core is walkable, with a compact scale and lower speed streets. However, residential streets are less connected and compact for walkability.	The zoned commercial area extends several blocks along Kōloa Road between Po’ipū Road and Waikomo Road, but with most of the commercial uses on the makai side of Kōloa Road. The commercial mix consists of grocery markets, several snack shops and restaurants, and other tourist retail.	<ul style="list-style-type: none">Rural character of buildings and streets.A lively retail core and a mix of civic and institutional uses.	<ul style="list-style-type: none">Rural character, narrow roads.Retail buildings typically have a shopfront with a gallery frontage or awning.Residential buildings are detached and setback from the street with porch frontage.Limited locations with sidewalks.	Mix of on-street parking and off-street parking lots.	High potential for infill development. There are a number of infill parcels where development proposals have been made in the past.
Kukui’ula	The newly developing areas are spread over a large area, so distance and little connectivity of new streets largely discourages walkability.	The zoned commercial area is on the west side of Ala Kalanikaumaka St., at the intersection with Po’ipū Road. The commercial mix consists of restaurants, tourist-oriented shops, and a specialty food market.	<ul style="list-style-type: none">Extensive coast access with sandy beaches.Popular boat harbor, and botanical gardens.	<ul style="list-style-type: none">Rural character for most roads.Sidewalk on one side of Lāwa’i Road from boat harbor to Ala Kalanikaumaka St.	Generally off-street, with little to no on-street parking.	Most land on the mauka side of Lāwa’i Road is either available or already entitled for future development. Most “Open”-zoned land is slated for golf courses.
Lāwa’i	Streets are not highly connected given topography, making walking more difficult. Pedestrian crossings are difficult across Kaumuali’i Highway.	Along Kaumuali’i Highway at Aulima Road is a small commercial zoned area, consisting of a post office, food market, and catering business. “Project development” zoning encompasses the businesses along Kōloa Road. This commercial mix consists of a general store, and small services and offices.	<ul style="list-style-type: none">Rural character of neighborhoods and streets.Surrounding topography and natural features prevent potential for suburban sprawl.	<ul style="list-style-type: none">Highway designed with priority for regional, through travel.High vehicle speeds discourage shared use of main roads by pedestrians and/or cyclists.Off the highway, rural character with narrow local roads. No sidewalks.	Generally off-street, with little to no on-street parking.	Topography limits development opportunities mostly to small infill projects. Former cannery/mill site may also be opportunity for a larger future development project.
‘Ōma’o	‘Ōma’o is small and compact, helpful for walkability within the community. Walkability to a commercial center is difficult, with the nearest along Kaumuali’i Highway in Lāwa’i.	‘Ōma’o is exclusively zoned for residential uses (beyond surrounding lands zoned for preservation and open space).	<ul style="list-style-type: none">Rural character of neighborhoods and streets.Surrounding topography and natural features prevent potential for suburban sprawl.	<ul style="list-style-type: none">Highway designed with priority for regional, through vehicular travel.Off the highway, rural character with narrow local roads. No sidewalks.	Generally off-street, with little to no on-street parking.	Topography limits development opportunities mostly to small, individual infill projects.

	Walkability	Activity Mix	Character Assets	Streetscape	Parking	Development Potential
Po'ipū	Resorts and residential areas connect almost solely by Po'ipū Road, which lacks sidewalks along much of its length.	The zoned commercial area is concentrated on the northeast corner of Po'ipū Road and Kiahuna Plantation Drive. The commercial mix consists of tourist-oriented shops, restaurants, and snack shops. Land between Po'ipū Road and the coast is a mix of resort and residential zoning.	<ul style="list-style-type: none">• Extensive coast access with sandy beaches. Popular Po'ipū Beach Park.• Rural character of buildings and streets.• A lively retail core and a mix of civic and institutional uses.	<ul style="list-style-type: none">• Narrow roads, many with a sidewalk on one side of the street.• Large resort buildings often built along road, set around green open spaces.	Local streets are not currently designed for on-street parking, yet off-street facilities are insufficient to accommodate parking demands. Informal on-street parking is common along Po'ipū Road and local streets.	Most of the shoreline properties are developed. Community desire to preserve Māhā'ulepū as open space. Need for workforce housing close to resorts, which are major employment centers.

3.4.2 Roadways

The Planning District is served by Kaumuali'i Highway (Route 50), one of two major highways on Kaua'i. Kaumuali'i Highway, a two-lane state arterial, begins at its intersection with Kūhiō Highway (Route 56) in Lihu'e and ends at Mānā on the west side of Kaua'i. Between Puhī and Lihu'e, the highway has been widened to 4 lanes.

There are two traffic signals in the Planning District. One is located at the Kaumuali'i Highway and Papalina Road intersection adjacent to the Kalāheo Neighborhood Center. The other is located at the intersection of Kaumuali'i Highway and Kōloa Road. The only state or county roadway categorized as a National Highway System facility within the district is Route 50, Kaumuali'i Highway between Lihu'e and Maluhia Road. However, there are other public roads eligible for Federal Highway Administration (FHWA) funding, called federal-aid highways, and they include National Highway System facilities as well as all other public roads not federally classified as local or rural roads. In addition to Kaumuali'i Highway, the following road segments within the Planning District shown in Table 3-4 are classified under the federal functional categories.

Various plans and studies have proposed a number of improvements or additions to the road network in the Planning District. These recommendations are briefly described in Table 3-5. All but the Kōloa-Po'ipū Area Circulation Plan, Po'ipū Road Charrette, and to some extent the Federal-Aid Highways 2035 Plan prioritized traffic flow over different modes of transportation in their analyses. Those that are constructed or on the Statewide Transportation Improvement Program (STIP) are annotated as such.

Table 3-4: Federal-Aid Highways within South Kaua'i Planning District

Federal Roadway Classification	Street Name
Urban Minor Arterial	Kaumuali'i Highway-west of 'Ōma'o Road
Urban Major Collector	Papalina Road Kōloa Road Po'ipū Road Ala Kinoiki (Eastern Bypass) Waikomo Road
Urban Minor Collector	Pu'uwai Road Waha Road Lauoho Road-between Waha Road and Kōloa Road Piko Road 'Ōma'o Road Weliweli Road Māhā'ulepū Road-between Weliweli Road and Ala Kinoiki
Rural Principal Arterial – Other	Kaumuali'i Highway-east of Maluhia Road
Rural Minor Arterial	Kaumuali'i Highway-Maluhia Road to 'Ōma'o Road Maluhia Road
Rural Major Collector	Halewili Road Lāwa'i Road west of Kukui'ula Harbor
Rural Minor Collector	(None)
Committed/Under Construction	Northerly Leg of Western Bypass
Source: Exhibit 1-3 (CH2MHill 2014)	

Figure 3-12: Federal-Aid Highways

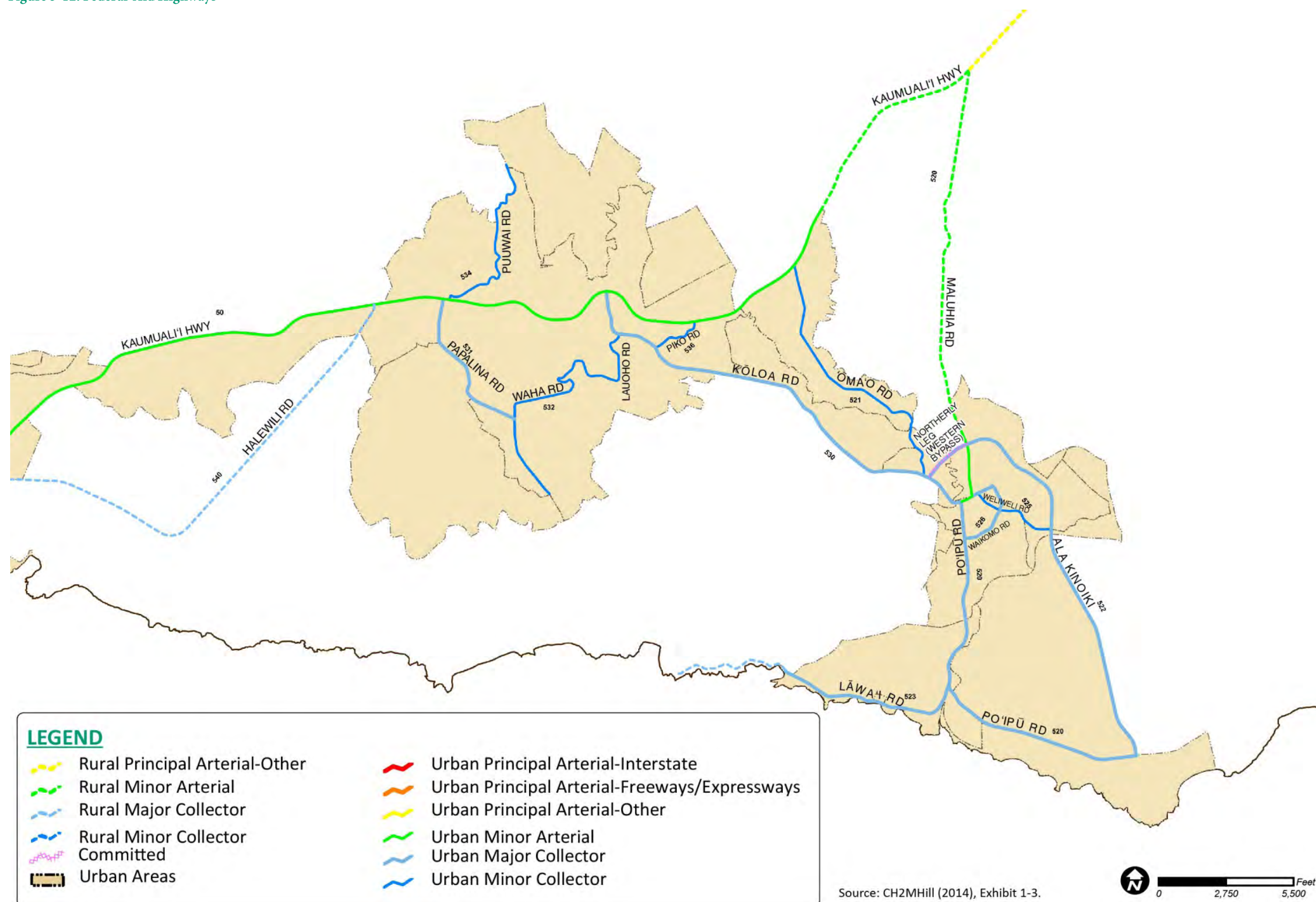


Table 3-5: Recommended Road Network Improvements from Previous Planning Efforts

Plan or Study	Summary of Major Recommendations from Prior Studies and Plans
Federal-Aid Highways 2035 Transportation Plan for the District of Kaua’i (2014)	<ul style="list-style-type: none">• Kaumuali’i Highway widening east of Kōloa Road (STIP).• Widen Kaumuali’i Highway to a divided 4-lane facility between Kōloa Road and Kalāheo Town.• Widen Po’ipū Road to include bike lanes, sidewalks, and intersection improvements between Lāwa’i Road and Ala Kinoiki (STIP).• Construct the northern leg of the Western Access Road as a 2-lane, signed shared roadway from Kōloa Road to Maluhia Road (planning complete).
Kōloa-Po’ipū Area Circulation Plan (2007) <i>Recommendations based on strategy to improve connectivity rather than widen existing roads.</i>	<ul style="list-style-type: none">• Kōloa traffic flow and safety improvements (including realigning the Kōloa Road/Po’ipū Road intersection).• Maluhia-Ala Kinoiki Realignment to favor traffic traveling between Maluhia Road and Ala Kinoiki.• Roundabouts at 1) the Maluhia Road/Ala Kinoiki/Western Bypass Northern Extension and 2) the intersection of Ala Kinoiki/Weliweli Road/Cane Haul Connector.• Four-way stop or roundabout at Kiahuna Plantation Drive/Po’ipū Road intersection.• Cane haul road connector between Po’ipū Road and Ala Kinoiki.• New mauka-makai “spine road” connection, i.e., a north-south connection between Po’ipū Road and Ala Kinoiki.• East-west connections to Ala Kinoiki – connecting Kiahuna Drive to Ala Kinoiki and connecting Ala Kinoiki to Spine Road.• New mauka-makai connection between Ho’onani Road and Po’ipū Road.• Two connections to Ala Kalanikaumaka, potentially in the vicinity of Pa’anau Road and Lopaka Paipa Boulevard.• Ala Kalanikaumaka northern extension from Kōloa Road to Maluhia Road at Ala Kinoiki (planning complete).
Po’ipū Road Charrette (2012)	<ul style="list-style-type: none">• Include bike lanes, intersection/crossing improvements, and bus pullouts and shelters along Po’ipū Road from Kōloa Road to the Grand Hyatt (STIP).• Provide sidewalks on the entire eastern side from Kōloa Road to the existing Po’ipū roundabout, and on the western side from Kōloa Road to Blake Lane. Provide sidewalks on both sides of Po’ipū Road from the existing Po’ipū roundabout to the Grand Hyatt on the makai side and from the existing Po’ipū roundabout to Kipuka Street (STIP).• Gateway signage at Po’ipū Road and Kōloa Road.• Improved pedestrian crossings at existing Po’ipū Road roundabout (STIP).• Potential on-street parking in some areas.• Install roundabouts on Po’ipū Road at the following intersections:<ul style="list-style-type: none">○ Cane Haul Road (future trail connection to Ala Kalanikaumaka)○ Kiahuna Plantation Drive○ Ala Kinoiki○ Ho’owili Road (if new road is connected mauka)
County of Kaua’i General Plan (2000)	<ul style="list-style-type: none">• Ala Kalanikaumaka (Completed between Kōloa Road and Po’ipū roundabout).• Proposed road widening projects:<ul style="list-style-type: none">○ Kaumuali’i Highway to a four-lane parkway between Lihu’e and Maluhia Road○ Po’ipū Road to a four-lane divided roadway between Lāwa’i Road and Ala Kinoiki○ Widen Ala Kinoiki to four lanes○ Expand Maluhia Road by adding a second 2-lane tree tunnel road (STIP).• Rather than widening highway through Kalāheo and Lāwa’i, consider developing a new road paralleling the south shore connecting Port Allen with Po’ipū across Lāwa’i Valley, then extend it to Nāwiliwili using existing cane haul roads and tunnel through Hā’upu.• Develop a network of pedestrian and bicycle trails connecting Kōloa, Po’ipū, and Kukui’ula.• Kōloa Road and other major roads in the district have landscaped shoulders with large canopy trees.
The 1978 Kōloa-Po’ipū-Kalāheo Development Plan	<ul style="list-style-type: none">• Increase parking, which will require a reorganization of land use and buildings in key areas.

3.4.2.1 Complete Streets & Living Streets Standards

The County of Kaua’i Department of Public Works is currently working on updating their street design standards to incorporate complete streets concepts. They have chosen the Los Angeles County’s *Model Design Manual for Living Streets* (“Living Streets Manual”) as their foundation to update the standards. The manual encourages communities to shift from vehicle-centered metrics such as level of service (LOS) for determining street design success to pedestrian safety and an improvement in the quality of life. The following is quoted from the Living Streets Manual (2011):

To meet the goals and tenets of living streets, communities should adopt the following benchmarks and performance measures.

Benchmarks

- Every street and neighborhood is comfortable to walk and bicycle in.
- Every child can walk or bike to school safely.
- Seniors, children, and disabled people can cross all streets safely and comfortably.
- An active way of life is available to all.
- There are zero traffic fatalities.
- No unfiltered street water flows into local waterways or the ocean.
- Retail streets become one of the most popular destinations for tourists in the country.

Performance Measures

- Street fatalities and injuries decrease for all age groups.
- The number of trips by walking, cycling, and transit increases.
- Vehicle travel is reduced.
- Prevailing speeds of vehicles on local streets decrease.
- Street water runoff is reduced.
- Water quality in rivers and the ocean improves.
- Retail sales and tourism increase.
- Resident satisfaction increases.

The Living Streets Manual also recognizes that liability is a major concern in revising street standards and holds to nationally-recognized design standards. It also states that street design should be context appropriate and has adopted Andres Duany’s transect which ranges from the natural zone (T-1) through urban core (T-6). The Living Streets Manual states that in the least intensive zones, T-1 and T-2 (Rural), a rural road or highway is appropriate, and suggests that sidewalks may not be necessary in the rural zone. However, in South Kaua’i, safe pedestrian and bicycle ways need to be developed even along the rural roads such as Ala Kionoiki, Ala Kalanikaumaka, and Maluhia, Kōloa, ‘Ōma’o, and Waha Roads as they are major connectors between South Kaua’i’s communities.

One of the main ways the Living Streets Manual increases safety is by setting the goal of reducing the design speed of all roadways to 20 – 35 mph. Where this cannot be achieved, it recommends installing measures to improve pedestrian safety. Design standards from the Living Streets Manual are shown in the following tables and are used in the conceptual street sections developed for the multimodal roadway network developed for South Kaua’i and discussed in Section 4.3.1.

Table 3-6: Travel Lane Widths and Associated Design Speeds

Movement Type	Design Speed	Travel Lane Width
Yield*	Less than 20 mph	N/A
Slow	20-25 mph	9** - 10 feet
Low	30-35 mph	10 - 11*** feet
Notes: *Yield streets are typically residential two-way streets with parking on one or both sides. When the street is parked on both sides, the remaining space between parked vehicles (12 feet minimum) is adequate for one vehicle to pass through. Minimum width for a yield street with parking on both sides should be 26 feet curb face to curb face. Minimum width for a yield street with parking on one side should be 20 feet curb face to curb face, which allows for two 10 foot lanes when the street is not parked. **9 feet requires a design exemption. ***Generally, 10 foot lanes are preferred. Where heavy bus or truck traffic exists, 11 foot lanes may be considered.		
Source: Los Angeles County 2011, Table 4.3		

Table 3-7: Parking Lane Widths

Movement Type	Design Speed	Parking Lane Width
Slow	20-25 mph	Angle: 16.5 feet (60°); 15 feet (45°)
Slow	20-25 mph	Parallel: 7 feet
Low	30-35 mph	Parallel: 7-8 feet
Source: Los Angeles County 2011, Table 4.2		

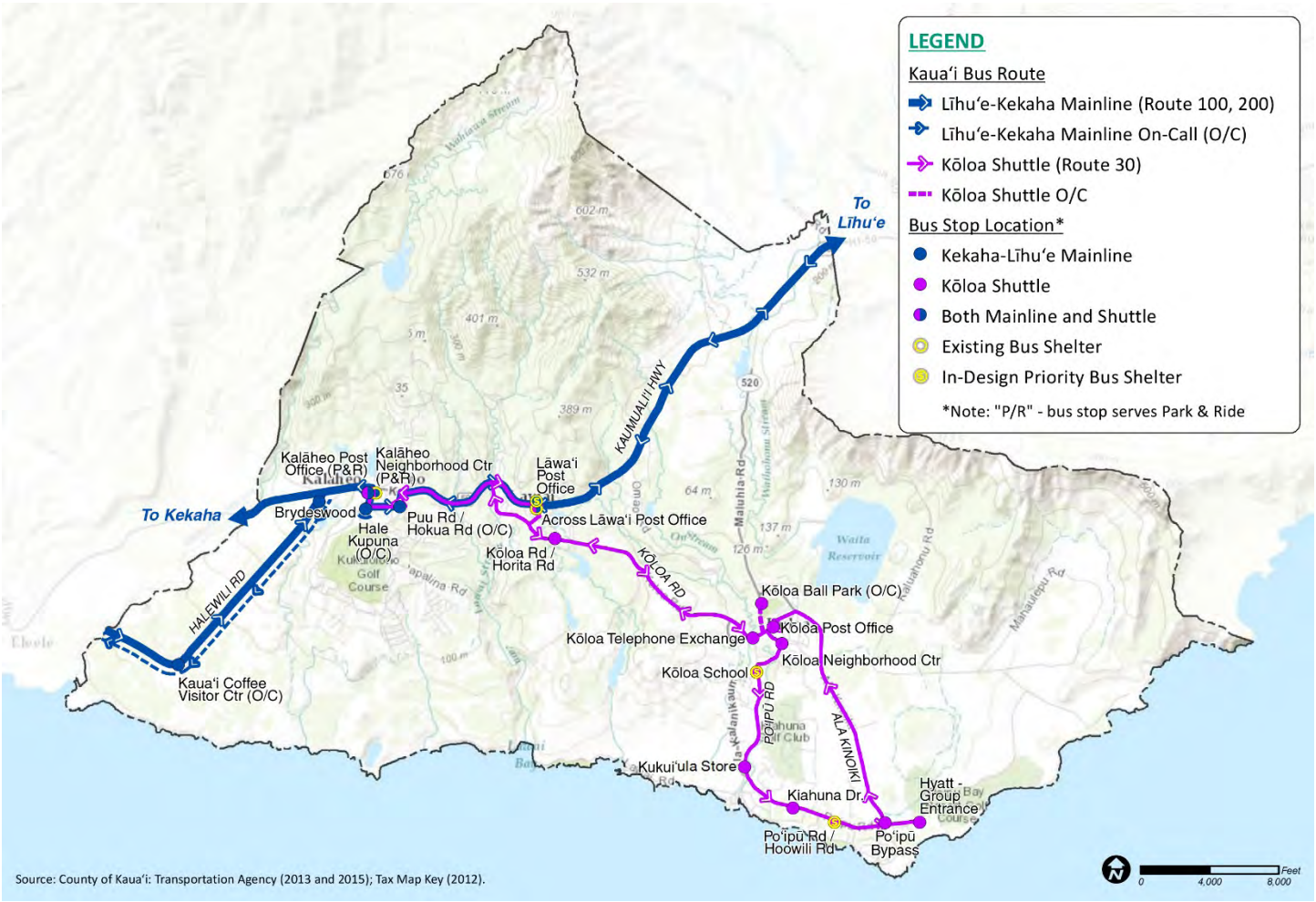
3.4.3 Public Transportation

The Kaua'i Bus is the only public transit system serving the island of Kaua'i and is managed by the County of Kaua'i Transportation Agency. Two of the agency's seven fixed route bus services operate within the South Kaua'i Planning Area—the Kekaha to Lihue mainline and the Kōloa Shuttle. The mainline route operates in two directions: an eastbound bus (Route 100) from Kekaha to Lihue and a westbound bus (Route 200) from Lihue to Kekaha. The Kōloa Shuttle (Route 30) is an hourly shuttle which circulates through the residential neighborhoods within Kalāheo, Kōloa, and Po'ipū. Public transit routes are shown in Figure 3-13.

As with the road networks, the Kōloa-Po'ipū Area Circulation Plan made recommendations to improve the current public transportation system in the Planning District. The primary recommendations included:

- *Employee Destination Shuttle Service* to provide work transportation for resort and other employees who live outside the Kōloa-Po'ipū area to major employment destinations within the area.
- *Kōloa Town-Po'ipū Beach Shuttle Service* to connect residents and visitors with local shops and attractions.
- In coordination with above recommendations, the mainline bus service could be modified to extend to downtown Kōloa before going back out to Kaumuali'i Highway.

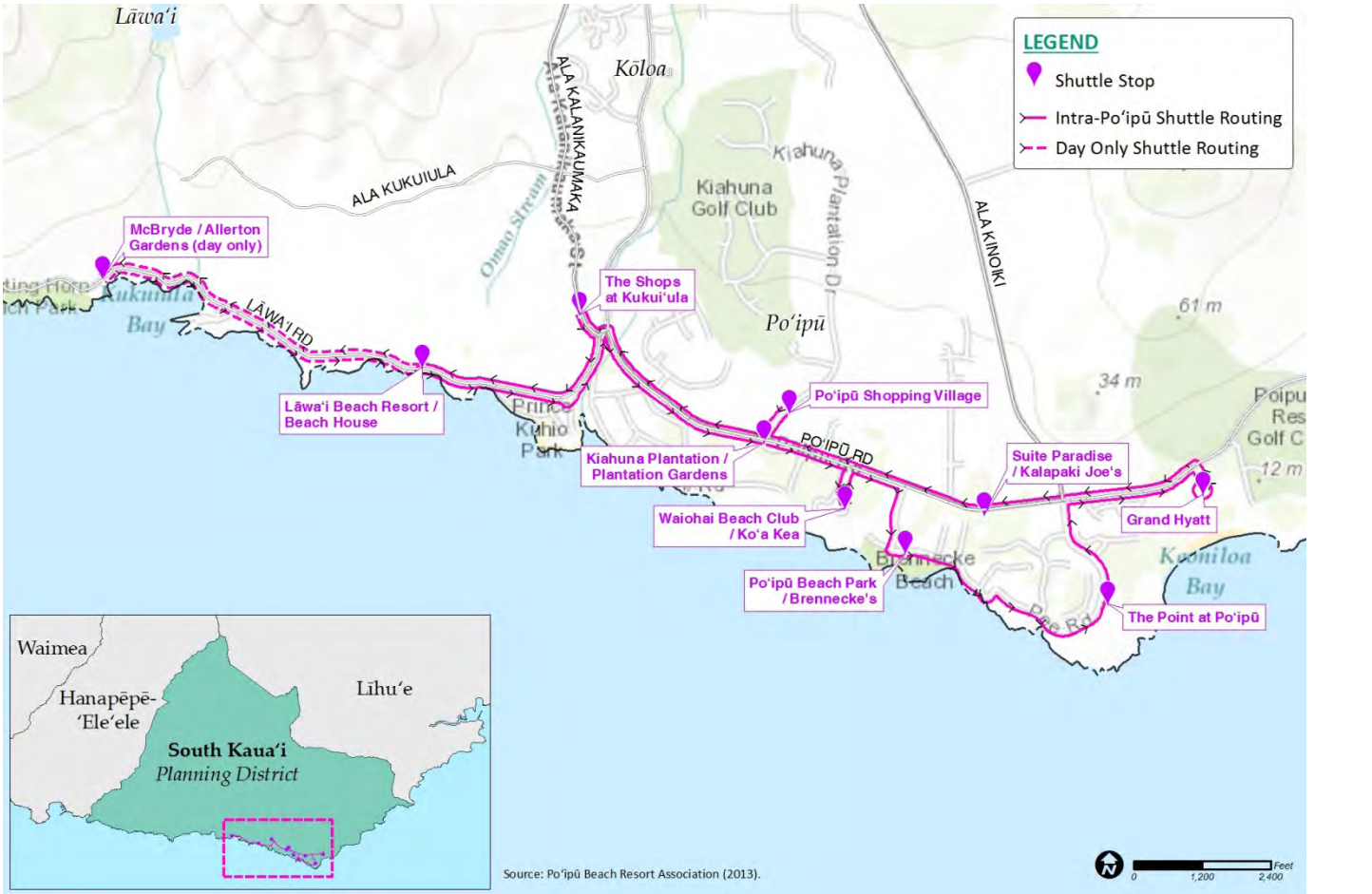
Figure 3-13: Existing Public Transit Routes



3.4.3.1 PBRA Intra-Po'ipū Shuttle (Beta Test)

The Po'ipū Beach Resort Association (PBRA) formed a committee in December of 2006 to study the potential shuttle system and initiated a beta shuttle with Roberts Hawai'i during the holiday season of 2013. The route circulated primarily along the coast serving the resorts, shopping centers, and beaches (see Figure 3-14). Two shuttles ran continuously between 10:00 AM and 10:00 PM Friday through Sunday, and stopped every half hour. The cost was \$2 per person per entry. The test run was funded by PBRA members along the route. Unfortunately, this initial test shuttle did not prove to be profitable as structured.

Figure 3-14: PBRA Intra-Po'ipū Beta Shuttle Route



3.4.4 Bicycle Facilities

The only districts on Kaua’i with any bicycle infrastructure are the Lihu’e and East Side Districts, and much of this infrastructure is disconnected. However, cyclists are allowed to use any of the island’s public roads; some of which are fairly safe for bicycling, while others can be hazardous. Within the Planning District, the Multimodal Land Transportation Plan noted the hazardous stretches include Maluhia and Po’ipū Roads where there are high traffic volumes and/or high traffic speeds with little to no shoulder space (Charlier 2012). A summary of the recommendations from the previous studies for improving the bicycle infrastructure within the Planning District is listed in Table 3-8.

Table 3-8: Recommended Bicycle Network Improvements from Previous Studies

Plan or Study	Summary of Major Recommendations from Prior Studies and Plans
Federal-Aid Highways 2035 Transportation Plan for the District of Kaua’i (2014)	<ul style="list-style-type: none">Widen Po’ipū Road to include bike lanes, sidewalks, and intersection improvements between Lāwa’i Road and Ala Kinoiki (STIP).
Po’ipū Road Charrette (2012)	<ul style="list-style-type: none">Include bike lanes, intersection/crossing improvements, and bus pullouts and shelters along Po’ipū Road from Kōloa Road to the Grand Hyatt (STIP).
Kōloa-Po’ipū Area Circulation Plan (2007)	<ul style="list-style-type: none"><i>Hapa Trail</i>: second highest priority; upgrade to lushly landscaped, paved multi-use path including a grade separation at the Cane Haul Connector.<i>Makai Promenade</i>: create a multi-use path paralleling the waterfront, connecting the currently fragmented sidewalks, paths, and trails.<i>Marked Bike Lanes</i>: add striped bicycle lanes along Po’ipū Road, Ala Kinoiki, and Ho’owili Road.<i>Other Multi-use Pathways</i>: extend Hapa Trail mauka along Weliweli Road and extend along the length of the recommended Cane Haul Connector.
Bike Plan Hawai’i (2003)	<ul style="list-style-type: none">Bike path on Maluhia and Hapa Roads and a new Po’ipū Bay Coastal Bike Path.Signed Shared Roadways on Kaumuali‘i Highway, Kōloa Road, ‘Ōma‘o Road, Ala Kinoiki (Kōloa-Po’ipū Bypass Road), Weliweli Road, Lāwa’i Road, Kukui‘ula internal roads, the east-west portion of Po’ipū Road, and Halewili Road. Signed Shared Roadways on planned Kaumuali‘i bypass roads.

3.4.5 Pedestrian Facilities and Safe Routes to Schools

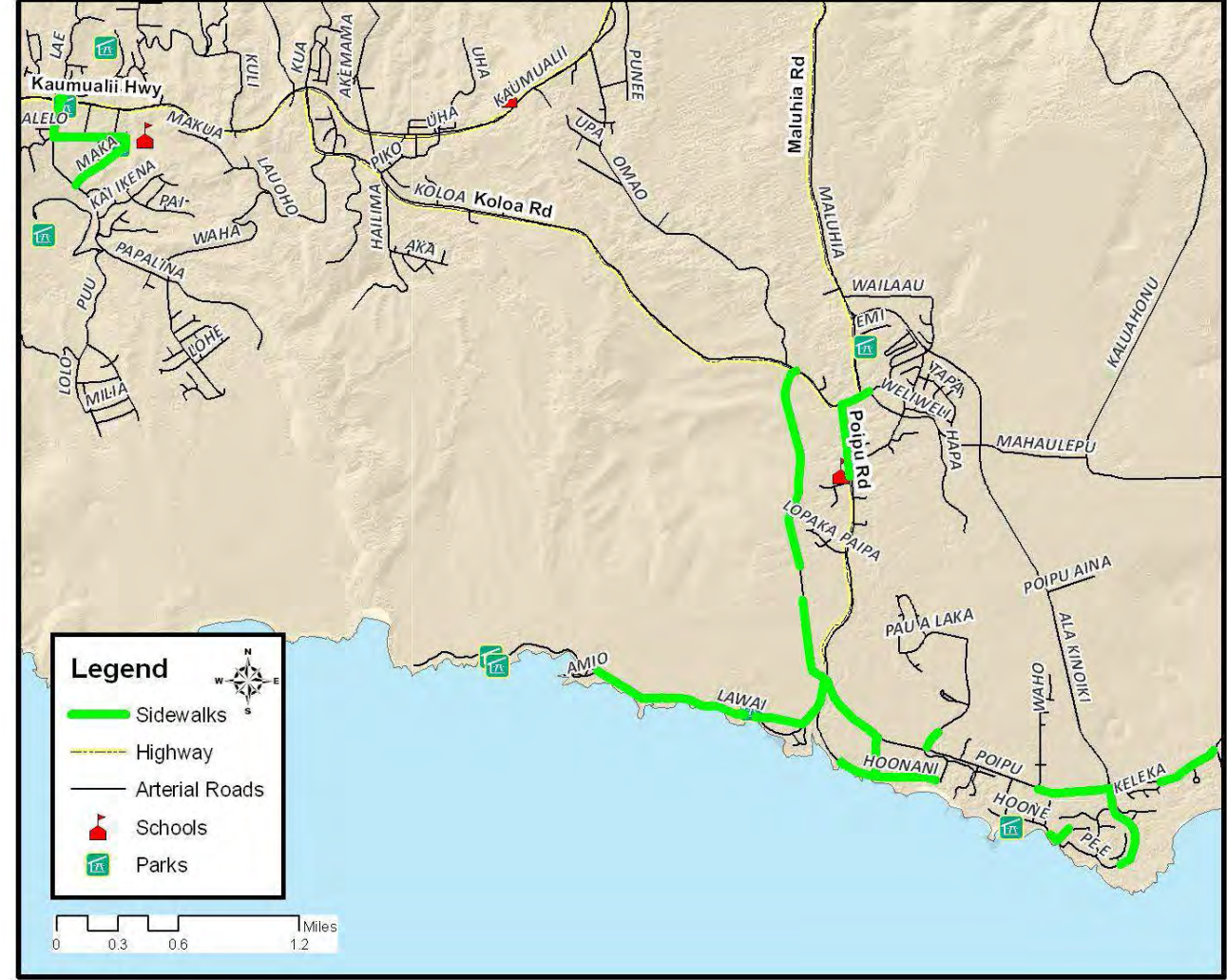
In 2007, the Kōloa-Po'ipū Area Circulation Plan analyzed existing pedestrian facilities and made recommendations on several pedestrian improvements (see Figure 3-15). It also identified Kōloa Town safety improvements as the highest priority, primarily to provide safe passage to students walking to and from Kōloa School. They recommended adding sidewalks along Waikomo Road and Po'ipū Road for Kōloa School students and improving sidewalks through the downtown core. It also recommended adding sidewalks along all of Po'ipū Road, most of Ala Kinoiki, and Ho'owili Road between Po'ipū Road and the Makai Promenade. The principal at Kalāheo Elementary has voiced a similar concern over pedestrian safety with the narrow sidewalk on Pu'u Road, which is often blocked by overgrown vegetation and no sidewalks on the lower part of Papalina Road leading up to town from Waha Road.

In 2010, Brockmyer prepared a sidewalk inventory of the Kōloa-Po'ipū District for the County of Kaua'i Planning Department and it included the towns of Kalāheo, Lāwa'i, Po'ipū, and Kōloa. It noted which side or sides of major roadways had sidewalks, the approximate length, and where there were issues like disconnected paths. A map of the inventoried sidewalks is provided in Figure 3-16.

Figure 3-15: Existing and Recommended Pedestrian Facilities (Charlier 2007)



Figure 3-16: Existing Sidewalk Inventory (Kaua'i Planning Department 2010)



The County of Kaua’i has since been successful in acquiring Safe Routes to Schools (SRTS) funds for pedestrian and bicycle improvements for South Kaua’i as well as other communities around the island. Within the Planning District, SRTS funding has been provided to install rectangular rapid flashing beacons at Kalāheo Elementary School at the intersection of Pu’u and Papalina Roads. SRTS funds have also been acquired for both phases of the Kōloa SRTS improvements. Phase I has been completed and included the installation of lighted crosswalk systems and the restriping of Po’ipū Road in front of Kōloa Elementary School to add a bike lane and paved shoulder. See Figure 3-17. Phase II will involve the construction of ADA accessible sidewalks on both sides of Po’ipū Road, converting the paved shoulder into a bike lane, extending sidewalks on Pa’anau Road, and extending bike lanes. Community support of existing and proposed SRTS infrastructure on Kaua’i has been very strong. Both Kalāheo and Kōloa Elementary Schools have active SRTS programs that aim to educate students and encourage both walking/biking to school and the installation of SRTS infrastructure. Both programs include walk-to-school days and annual evaluations through teacher tallies and parent surveys.

Figure 3-17: Safe Routes to Schools Po’ipū Road near Kōloa Elementary School



At both Kōloa and Kalāheo Elementary Schools, over 80% of the students live within one mile of the school. Parent surveys were completed for Kōloa in November 2012 and for Kalāheo in May 2013. According to these surveys, only about 10% of fourth and fifth graders walk or bike to/from Kalāheo School and only 21% walk to Kōloa School in the morning and 31% walk in the afternoon. Twelve percent of fourth and fifth graders bike to and from Kōloa School. For both schools, parents identified safety of sidewalks, pathways, and intersections as well as the speed and amount of traffic along the route as the primary reasons that they do not allow their children to walk or bike to school.

3.4.6 Infrastructure & Utilities

Civil engineers from The Limtiaco Consulting Group prepared much of the research on existing utilities and infrastructure within the Planning District. Their findings are presented below.

3.4.6.1 Potable & Non-Potable Water

3.4.6.1.1 Overview of Potable Water Systems

The Kaua’i Department of Water (DOW), Kaua’i County’s public water agency, provides potable water services to all five towns within South Kaua’i: Kalāheo, Lāwa’i, ‘Ōma’o, Kōloa, and Po’ipū.

Water in the Kalāheo-Kōloa area is supplied by twelve underground sources. It is pumped, treated, and stored in fifteen tanks dispersed throughout the towns. Through DOW’s Water Quality Report, information regarding the water sources and reservoirs are provided in Table 3-9.

Table 3-9: Water Sources and Reservoirs within the Planning District

KALĀHEO AREA		
Source	Reservoir	Reservoir Size (gallons)
Kalāheo Deepwell A Kalāheo Deepwell B	Kalāheo Nursery	100,000
	Kalāheo Clear Well Storage Tank	300,000
	Kukuilono #1	250,000
	Kukuilono #2	200,000
	Kakela Makai	200,000
	Kalāheo 908 Tank	500,000
LĀWA’I-’ŌMA’O AREA		
Source	Reservoir	Reservoir Size (gallons)
Lāwa’i Well Number 1	Andrade Tank	30,000
Lāwa’i Well Number 2	Lāwa’i	250,000
Pīwai Wells Number 2	Pīwai	100,000
Pīwai Wells Number 3		
KŌLOA-PO’IPŪ AREA*		
Source	Reservoir	Reservoir Size (gallons)
Kōloa Well 16-A	Kōloa	1,000,000
Kōloa Well 16-B	Kōloa (Pa’anau)	250,000
Kōloa Well C	Po’ipū	1,500,000 (2 tanks each)
Kōloa Well D	Pa’anau No. 2	500,000
Kōloa Well E	‘Ōma’o Tank	500,000
Kōloa Well F		
* The Water Plan 2020 recommends an additional 1,000,000 gallons of storage be added by the year 2020.		

The DOW is implementing “Water Plan 2020,” a project to provide “safe, affordable, and sufficient drinking water” for Kaua’i. It focuses on replacing aging infrastructure, but does not focus on growth or new development. In 2011, water consumption was roughly 3 MGD (Table 2). Water Plan 2020 forecasts South Kaua’i water usage to be approximately 5 MGD in 2020 and approximately 6.8 MGD in the year 2050. A hydraulic model of the South Kaua’i waster system has not been developed; therefore, DOW is unable to calculate hydraulic capacity at specific points within the water system, which is useful for the design of fire flow protection.

Several known projects in the South Kaua’i area, as published in Water Plan 2020 Progress Report for Fiscal Year 2011-2012 and the DOW Annual Report for Fiscal Year 2011-2012, include the following:

1. DOW is currently designing a new 0.5 MG Yamada Tank and Clear Well Storage System in the Kalāheo district.
2. The Kukuioolono 0.5 MG Tank is currently being designed for the Kalāheo water system.
3. A new 8-inch waterline is currently being designed to be constructed in Halewili Road for the Kalāheo water system.
4. A 0.5 MG tank with a spillway elevation around 1,111 feet is being designed for the Kalāheo water system.
5. Pīwai 677 feet 0.5 MG Storage Tank for the Lāwa’i-‘Ōma’o system was installed.
6. Plans and specifications for various pipelines are being designing for the ‘Ōma’o-Lāwa’i water system.
7. DOW is replacing the 6-inch and 8-inch water mains in Kōloa.

2011 consumption in gallons per day (GPD) within the Planning District is summarized by area in Table 3-10 along with projected use through 2050.

Table 3-10: Water Use 2011 Consumption and 2020/2050 Forecast

Location	Consumption (GPD)		
	2011	2020	2050
Kalāheo	511,000	746,000	902,000
Lāwa’i-‘Ōma’o	299,000	458,000	564,000
Kōloa	329,000	798,000	1430,000
Po’ipū	1,844,000	2,953,000	3,970,000
Total	2,983,000	4,955,000	6,866,000

The Planning District is served primarily by the Kōloa Aquifer System. The estimated sustainable yield of the Kōloa Aquifer System is 30 MGD. However, CWRM warns that due to Kaua’i’s geology, it can be difficult to generate a steady supply of water by pumping water from the aquifers. A qualified hydrogeologist would be required for any future expansion of the water resource (TLCG 2014).

The DOW also notes that although there are currently no restrictions on issuing water meters in the Planning District, the actual determination of available water service is done on a case-by-case basis based on available source, storage, and transmission in the project area at the time of development.

3.4.6.1.2 Overview of Non-Potable Water Systems

3.4.6.1.2.1 Surface Water

Perennial streams and man-made ditches channel water to various non-potable reservoirs in the South Kaua’i area. Table 3-11 lists the non-potable reservoirs found in five ahupua’a located in the South Kaua’i area. Although the Aepo ahupua’a is

not directly associated with a South Kaua’i town, the ahupua’a is surrounded by Lāwa’i, ‘Ōma’o, and Kōloa towns. These reservoirs provide non-potable for irrigation of surrounding areas.

3.4.6.1.2.2 Recycled Water

According to the 2013 Update of the Hawai’i Water Reuse Survey and Report, an estimated 0.47 MGD of wastewater was collected and treated at three privately-owned and operated treatment facilities in South Kaua’i, particularly in the Kōloa and Po’ipū areas. The R-1 and R-2 quality recycled water (produced at the respective treatment facilities) are typically blended with surface water prior to reuse for landscape irrigation and golf course water features.

Table 3-11: Open-Air Reservoirs by Ahupua’a

Kalāheo Ahupua’a	
Reservoir Name	Max Storage (MG)
‘Elima	41
Mau	26
Ipuolono	147
‘Elua	111
Lāwa’i Ahupua’a	
Reservoir Name	Max Storage (MG)
Ioleau	39
Luawai	Not available
Kumano	57
Kaupale	78
Kōloa Ahupua’a	
Reservoir Name	Max Storage (MG)
‘Ōma’o	63
Huinawai	64
Hanani	Not available
Pia Mill	26
Pu’u O Hewa	37
Piwai	85
Mauka	196
Aepo Ahupua’a	
Reservoir Name	Max Storage (MG)
Aepo’ehā	218
Aepo’ekolu	50
Aepoalua	43
Aepo	124
Manuhonuhonu	16
Weliweli Ahupua’a (Po’ipū)	
Reservoir Name	Max Storage (MG)
Waitā	3,226

3.4.6.2 Wastewater

The County of Kaua’i provides wastewater services to four communities on the island operated by the Division of Wastewater Management. These communities include Hanapēpē, ‘Ele‘ele, Līhu‘e, and Waimea. South Kaua’i is not serviced by the County of Kaua’i; therefore, all South Kaua’i wastewater is treated by individual and private systems.

There are numerous private small packaged wastewater treatment plants in the Kōloa-Po‘ipū area that services resorts, hotels, and apartments. Most of the treated wastewater is recycled and used for irrigation at golf courses or discharged to injection wells. Future development in the area will require added capacity through expansion or construction of a new facility. Table 3-12 lists wastewater treatment plants in the Kōloa-Po‘ipū area referenced from the Environmental Impact Statement (EIS), which was prepared for the company HOH Utilities, LLC in 2008. The EIS was prepared for the development of a private regional wastewater system in the Kōloa-Po‘ipū area.

Table 3-12: Private Sewage Treatment Plants in the Kōloa-Po‘ipū Area

District Name	Treatment Plant Name	Average Daily Flow (GPD)
Po‘ipū	Po‘ipū WRF	386,000
Po‘ipū	Brennecke/Misc.	5,000
Po‘ipū	Lāwa‘i Beach/Kūhiō Shores	61,500
Po‘ipū	Whalers Cove	8,000
Po‘ipū	Waikomo Stream	16,000
Po‘ipū	Alihilani	3,800
Po‘ipū	Grand Hyatt	144,200
Po‘ipū	Makahū‘ena	25,000
Po‘ipū	Po‘ipū Kai	103,000
Po‘ipū	Hale Kahanalu	1,450
Po‘ipū	Nihikai	10,000
Po‘ipū	Po‘ipū Shores	7,500
Po‘ipū	Sunset Kahili	6,000
Po‘ipū	Po‘ipū Palms	2,150
Po‘ipū	Po‘ipū Makai	3,500
Po‘ipū	Weliweli Tract	32,000
Kōloa	Old Kōloa Town	2,250
Kōloa	Sueoka Store	2,500
Kōloa	Big Save	2,500
Kōloa	Bendor Village/Po‘ipū Realty/Fish Market	1,840
Kōloa	DMB Employee Housing	5,520
Kōloa	Hale ‘Ohana	11,250
Kōloa	Kōloa Shops	800
Kōloa	Dr. Murray	1,600
Kōloa	Kōloa Early School	560

In addition to these small packaged wastewater treatment plants, large capacity cesspools, septic tanks, and cesspool systems are used for wastewater treatment and disposal throughout South Kaua’i, primarily in residential communities. The Environmental Protection Agency (EPA) recently mandated that all large-capacity cesspools be upgraded to septic systems. However, this mandate did not apply to single-family residences connected to individual cesspools or non-residential cesspools serving fewer than 20 people.

According to the 2000 Kaua’i General Plan, private systems are serviced by private contractors. Wastewater pumped from septic tanks or cesspools is hauled to a private treatment plant or the County’s wastewater treatment plant at ‘Ele‘ele.

3.4.6.2.1 Potential Wastewater Centralization Project in Kōloa and Po‘ipū

In 2008, HOH Utilities, LLC proposed the development of a privately-owned regional wastewater system in the Kōloa-Po‘ipū area that would connect three geographical areas: Kōloa, Po‘ipū, and Kukui‘ula. The development would include a collection system (including pump stations and force mains), wastewater treatment, and a reclamation facility to produce recycled water. The system would also be sized to accommodate future development. Septic system and cesspool users would have the option to connect to the proposed wastewater system. The cost for the project was estimated at \$28 million in the 2009 Final EIS for the project.

Unfortunately, development plans for this regional wastewater system were withdrawn in 2009 due to the economic downturn, which slowed development and constricted financing. The regional wastewater plan can be revisited when economic conditions improve.

3.4.6.3 Drainage

South Kaua’i’s terrain ranges from mountains to coastland. The Planning District is located within five watersheds and five ahupua’a spanning approximately 42 square miles. The Hawaiian Ahupua’a Land Use System describes an ahupua’a as landscape segments from the ocean to the mountain serving as a land use management system. The state defines a watershed unit to be a drainage basin (or basins) which include both stream and overland flow, where runoff enters the ocean or an internal landlocked drainage basin.

Although South Kaua’i has some of the driest parts on the island, the average annual rainfall in the Planning District ranges from 30 inches to 200 inches from the coast to the mountains respectively.

Developed areas throughout the South Kaua’i region have gutters and storm drain systems. However, the Planning District is for the most part rural with stormwater generally sheet flowing and percolating into the ground during smaller rainfall events or channeled via swales and culverts, either natural or manmade, to streams that ultimately discharge into the Pacific Ocean.

There is an existing flooding problem at the makai end of Mano‘okalanipo, near the corner of Ho‘one and Ho‘owili Roads, in Po‘ipū. The area is prone to flooding because it is in a low-lying area, and gravity flow to the downstream beach park is not accessible. Constructing a solution will be costly and will require permitting approvals with the Hawai‘i State Department of Health. A new storm drainage outfall could also impact beach park users and overall water quality of the shoreline. The County Department of Parks and Recreation has been in communication with the United States Army Corps of Engineers with regard to the problem and received some recommendations and possible solutions. Unfortunately, the cost estimates for the proposed solutions were extremely high and flooding continues to occur with heavy rainfall events.

3.4.6.4 Solid Waste

Kaua'i County collects all residential curbside solid waste once per week. Residential refuse is either collected manually (a two-person crew) or automatically (vehicle-loading) depending on location. In South Kaua'i, refuse is collected manually and residents are required to provide their own 32-gallon containers and are allowed up to three refuse receptacles. Starting Summer 2016, all residential refuse collection will be automated. Residents will be required to select one of two cart sizes: 96 gallons or 64 gallons.

Collection vehicles transport the solid waste to one of four transfer stations where it is compacted and taken to Kaua'i County's Kekaha Landfill. Waste Management, Inc. is contracted by Kaua'i County to operate and monitor the landfill.

Kaua'i County does not provide bulky item collection service. Bulky items are accepted at the Kekaha Landfill or several of the transfer stations. Depending on the material, bulky items can be brought to alternate locations. For example, appliances and scrap metal, can be brought to Puhi Metals Recycling in Lihu'e. There are no locations in the South Kaua'i area that accept bulky items.

Commercial establishments must contract independently with a private hauler, namely Garden Isle Disposal, to collect and haul solid waste. Garden Isle Disposal provides waste containers and charges commercial tenants for collection based upon the number of containers that they use and collection frequency. Businesses can transport solid waste directly to a refuse transfer station if they prefer not want to contract a private hauler.

3.4.6.4.1 Green Waste

There are no separate curb-side collections for residential green waste. Residents are allowed to mix their green waste with their solid waste that is collected curb-side, however, this practice is not encouraged and contributes to the diminishing life of the Kekaha Landfill. Residents can also haul their green waste to a transfer station, Kekaha Landfill, or other designated green waste locations. The County has plans to offer automated curb-side green waste collection island-wide in the coming years, to coincide with curb-side recycling collection. There are no locations in the South Kaua'i area that accept green waste.

Commercial establishments can haul their green waste to several designated locations and pay a tipping fee to dispose of their green waste.

3.4.6.4.2 Recycling

Garden Isle Disposal is contracted by Kaua'i County to operate and maintain the recycling program, which includes newspaper, plastic, glass, aluminum cans, and cardboard. Residents are not required to participate in the recycling program. The County does not provide curbside collection for residents, although in 2010-2011 the County implemented a pilot curbside recycling program. The County continues to investigate the feasibility of a curbside program; the timeline for a decision is unknown.

There are eight Residential Recycle Drop Bins throughout Kaua'i where residents can bring and dispose of their recyclables for free. Two of these drop bins are located in South Kaua'i in Lāwa'i and Po'ipū.

Beverage containers (aluminum cans and glass/plastic bottles) can be recycled for a 5-cent deposit refund, as part of the State's HI-5 beverage container redemption program. There are two beverage container centers in South Kaua'i; one in Lāwa'i and the other in Kōloa.

Commercial establishments can recycle materials such as cardboard, newspaper, office paper, plastic, HI-5 beverage containers, and tires. Commercial establishments can contract Garden Isle Disposal to collect and haul recyclable items. Alternatively, businesses can transport recyclables directly to the Kaua'i Resource Center located in Lihu'e. There are no locations in South Kaua'i that accept commercial recyclables.

In 2013, the South Kaua'i Planning District generated the most solid waste in tons per year compared to other planning districts. The high solid waste generation is due in part due to the high number of hotel and resort condominiums as well as large- and small-scale agricultural activities in the area.

3.4.6.5 Power and Communications

Kaua'i Island Utility Cooperative (KIUC) provides island-wide utility electric service through a combination of fossil fuel burning power plants, hydroelectric power plants and large scale solar energy systems. Currently, approximately 15% of the island's energy is generated by renewable energy sources. These renewable sources have been mostly limited to solar installations because protections for endangered birds make wind power difficult to implement on Kaua'i. KIUC's transmission lines and primary distribution circuits are primarily routed overhead on utility poles, with the exception of the infrastructure in newer developments such as Po'ipū where the utility infrastructure is installed underground.

Telecommunications services for the island of Kaua'i are provided by three utility companies. Hawaiian Telcom provides cable television, telephone, and high-speed communications services. Oceanic Time Warner Cable provides telephone, high-speed communications and cable television services. Sandwich Isles Communications provides telephone and high-speed communications services.

3.4.7 Parks & Recreation

The Planning District contains 110.66 acres of county parkland that includes one passive park, six neighborhood parks, two district parks, and three beach parks. See Table 3-13. The Planning District also has two Neighborhood Centers in Kōloa and Kalāheo, which include kitchen facilities and serve as venues for community meetings, classes, and large gatherings such as birthday and graduation parties. The Kalāheo Neighborhood Center includes a gym that is in constant use by community sports leagues, fitness classes, and community interest activities. Po'ipū Beach Park Mauka Preserve is a special use area for the restoration of Kāneiolouma Heiau.

Table 3-13: County Parks within the South Kaua'i Planning District

Park Name	Type	Acres
Anne Knudsen Park	District	11.28
'Ele'ele Nani Park	Neighborhood	7.05
'Ele'ele Park	Neighborhood	2.95
Kalāheo Neighborhood Center, Gym	Neighborhood Center	2.81
Kalāwa'i Park	District	21.13
Keoniloa Bay Park	Beach	1.00
Kōloa Neighborhood Center	Neighborhood Center	0.96
Kōloa-Po'ipū District Park	District (Undeveloped)	20.32
Kukui'ula Harbor Park	Beach	0.89
'Ōma'o Park	Neighborhood	1.50
Po'ipū Beach Park	Beach	10.51
Po'ipū Beach Park Mauka Preserve (Kāneiolouma)	Special Use Area	11.04
Spouting Horn Park	Passive	4.44
Waha Park	Neighborhood	2.04
Waikomo Park	Neighborhood	3.74
Weliweli Park	Neighborhood	9.00
	Total Acres	110.66
Source: County of Kaua'i Department of Parks & Recreation (2013)		

3.4.7.1 Major Parks and Recreational Facilities

According to the County Department of Parks and Recreation, some of the notable county-owned parks include Kōloa (Knudsen) Park, Kukui'ula Harbor Park, Spouting Horn Beach Park, Kalāwa'i Park, and Po'ipū Beach Park. Some of the non-county-owned parks and recreational resources include the Kōloa Heritage Trail, Māhā'ulepū Heritage Trail, Prince Kūhiō Park, and the Wahiawa Mauka State Park Reserve. Additionally, the National Tropical Botanical Garden (NTBG) — known for its stone walls, taro patches, and abundance of plants— is located in the Lāwa'i Valley and a portion of the Wahiawa Mauka State Park Reserve is located in the northern part of the Kōloa-Po'ipū region. Key recreational areas are highlighted below.

3.4.7.1.1 Po'ipū Beach Park

Po'ipū Beach is the premier South Shore beach destination for visitors and residents alike. The 10.5-acre County park has picnic tables and pavilions, a children's play structure, comfort stations, large grassy areas, and sheltered beaches. There is a unique stretch of sand called a tombolo, which extends from Nukumoi Point to a rocky outcrop about 300 feet from the shore. It periodically washes away and rebuilds, but is believed to be what creates the calm ocean conditions within the sheltered bays of Po'ipū Beach (Sea Engineering, Inc. 2013). Lifeguards are on guard seven days a week. Swimming, boogie boarding, surfing, snorkeling and scuba diving are popular activities along the one-mile stretch of coastline (PBRA 2014). The parking lot across the street from the beach park floods at times during heavy rains, reducing the available number of parking stalls.

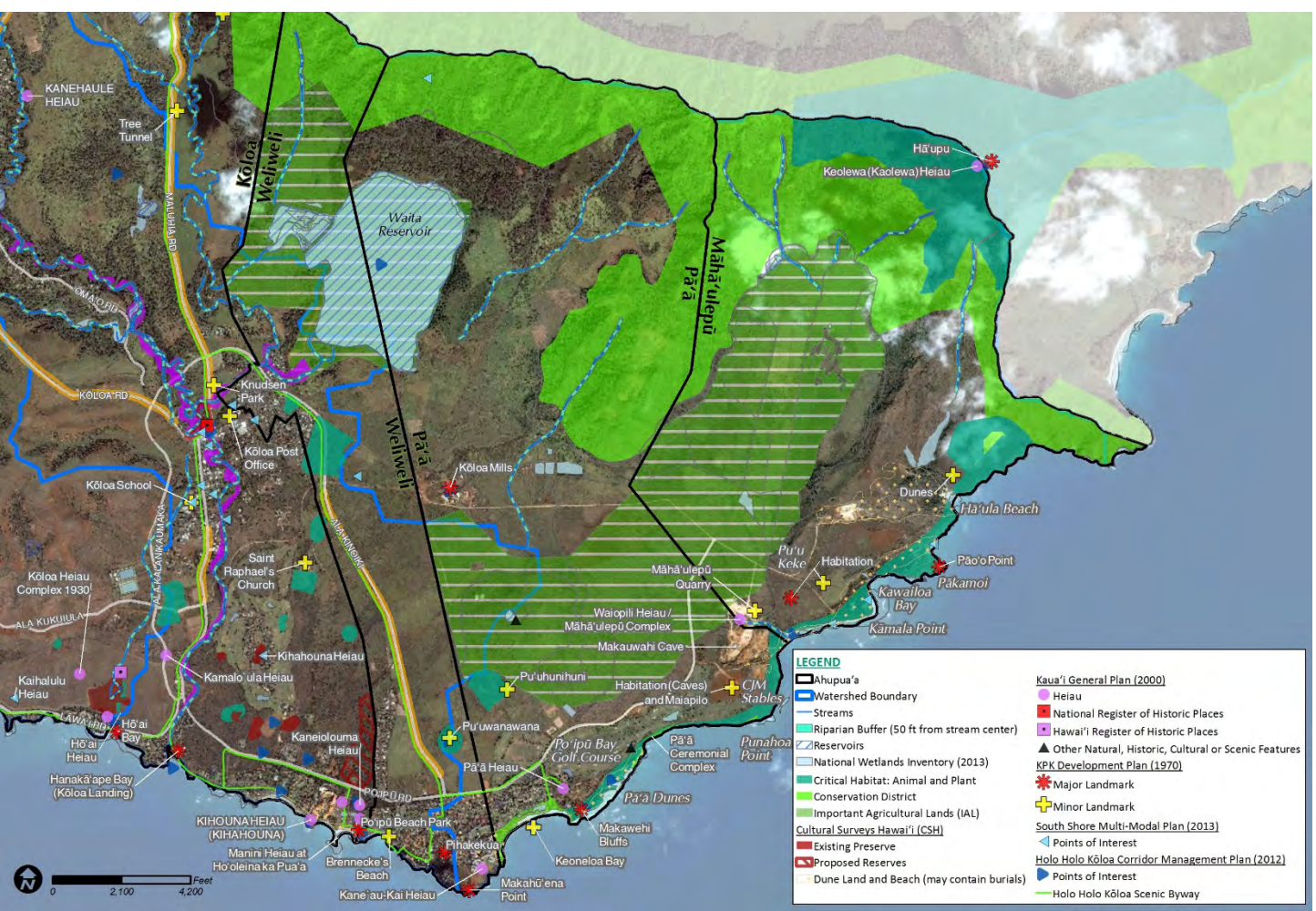
3.4.7.1.2 National Tropical Botanical Garden – Allerton/McBryde Gardens

The congressionally chartered National Tropical Botanical Garden has two of its five gardens within the Planning District—the Allerton Garden and the McBryde Garden. The Allerton Garden adjoins Lāwa'i Kai Beach and Bay and the McBryde Garden is mauka of the Allerton Garden. Combined, the two gardens welcome 50,000 visitors annually (NTBG 2012). Recently, the Lāwa'i Kai Special Subzone (LKSS) was established on the makai half of NTBG's property within the State Conservation District and includes the public resource areas of the beach, bay, and stream estuary. It was approved by the State Board of Land and Natural Resources (BLNR) on April 26, 2013 and signed into law by the Governor on July 5, 2013. The purpose of the LKSS is to provide a comprehensive ahupua'a-based land management system for Lāwa'i Kai with the focus on resource protection and maintaining recreational uses at 2009 levels due to increasing concern and pressure to access the bay. While Lāwa'i Kai Beach and Bay are not pristine ecosystems, they are rich in marine biodiversity and important green sea turtle nesting sites, refuge for monk seals, and protected habitat for rare coastal plant species. The area is also steeped in cultural traditions and history linked to Queen Emma (NTBG 2012). There are seven individual management plans that cover Historic Resources, Landscape Resources, Infrastructure, Archaeological Resources, Lāwa'i Kai Estuary and Stream, Coastal and Marine Resources, and Recreation and Commercial Activities. The BLNR approved NTBG's Conservation District Use Permit in May 2014 in order to implement the *LKSS Master Plan and Management Plan 2013-2033*.

3.4.7.1.3 Māhā'ulepū Coastline

The Māhā'ulepū coastal area functions as a de facto beach park and recreational area. Being informal, there are no lifeguards or public facilities in the area, such as restrooms or wayfinding features. Access is provided by the landowner during the day down a 2.5 mile long dirt road to an unpaved parking area. Many visitors and residents frequent the beach areas for swimming, snorkeling and fishing, with hikers taking advantage of a crisscrossing network of trails from Makawehi Point to Hā'ula Bay. The area is also rich with cultural sites, Po'ipū Bay Golf Course, the Makauwahi Sinkhole, and CJM Stables.

Figure 3-18: Māhā'ulepū Resources



3.4.7.2 Golf Courses

There are three golf courses within the Planning District, all of which are privately owned: Kukuiolono Park and Golf Course, the Kiahuna Golf Club, and the Po'ipū Bay Golf Course, which was home to the PGA Grand Slam of Golf from 1994-2006.

3.4.8 Public Safety

3.4.8.1 Police

The Planning District is under the jurisdiction of the 311-square mile Waimea District of the Kauai Police Department. The 28 officers employed by the Waimea District operate out of the Kōloa Sub-station, which is the only police station in the Planning District. Traffic violations and collision investigations are also covered by the Traffic and Safety Unit of the Police Department.

3.4.8.2 Fire

There are two County-operated fire stations in the Kōloa region: Kōloa and Kalāheo. Only the Kōloa Fire Station has an emergency medical response unit (ambulance), but both stations are responsible for responding to emergency calls.

3.4.8.3 Ocean Safety

The Kaua'i Fire Department also operates the Water Safety Operations Bureau, which provides lifeguard services and “promotes prevention and safety awareness to all persons who frequent...beaches and provides training for staff and public entities.” Po'ipū Beach Park is the only area that is lifeguarded within the Planning District.

3.4.8.4 Wildfire

Wildfire response mostly falls under the purview of the Kaua'i Fire Department. However, the northern, more mountainous areas of the Planning District are served by the state Division of Forestry and Wildlife.

3.4.9 Medical

The clinics that specialize in neighborhood medical care include Wilcox Health's Kōloa Medical Clinic and Hawai'i Health Systems Corporation's Kalāheo Clinic. Hawai'i Health Systems Corporation anticipates opening a new clinic location in the Kukui'ula area. For more advanced or immediate services, South Kaua'i residents may be forced to travel to either the West Kaua'i Medical Center in Kaua'i or Wilcox Memorial Hospital in Lihue. Both hospitals offer 24-hour emergency services, birth centers, imaging services, outpatient clinics, rehab facilities, and skilled nursing. According to a 2012 Department of Health study titled State of Hawai'i Primary Care Needs Assessment Data Book, Kaua'i County was designated a “Medically Underserved Population (MUP).”

3.4.10 Schools & Libraries

The State of Hawai'i Board of Education divides Kaua'i into three complexes, each of which contains a high school and all of its feeder intermediate and elementary schools. Except for Kalāheo Elementary, all of the schools in the Planning District fall under the Kaua'i Complex, headed by Kaua'i High School in Lihue. Most public school students in the region attend Kōloa Elementary School and then enroll in Chiefess Kamakahelei Middle School in Puhi and Kaua'i High School in Lihue. Only about 25-30 percent of Kalāheo Elementary school students stay within the Waimea Complex (Burkman, personal communication 2015).

Kalāheo Elementary School falls under the Waimea Complex, headed by Waimea High School. There are seven other public schools in this complex. In general, the facilities at both Kōloa and Kalāheo Elementary Schools significantly exceed state standards. The only other school in this region is the private K-12 Kahili Adventist School, but there are four other public schools in the Kaua'i Complex.

The Kōloa Public Library is the only library located in the Planning District.

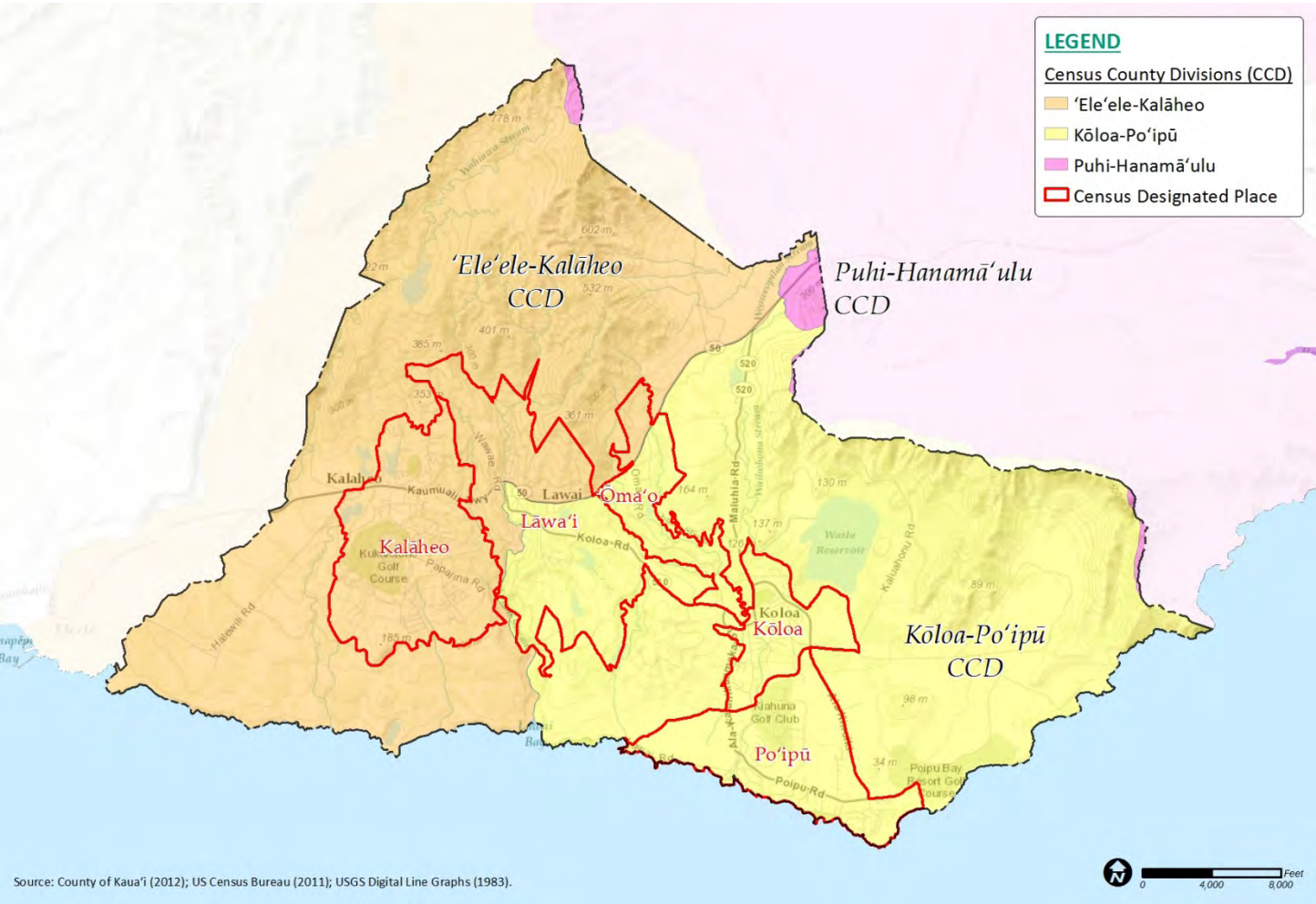
3.5 SOCIO-ECONOMIC CHARACTERISTICS

The following section includes data summarized from the 2010 U.S. Census Bureau and the 2035 projections drafted by SMS Research & Marketing Services, Inc. (SMS) in their 2014 “Kaua'i General Plan Update: Socioeconomic Analysis and Forecasts” report for the County Planning Department.

3.5.1 Population Size

The Planning District includes two census county divisions (CCD): 'Ele'ele-Kalāheo (407) and Kōloa-Po'ipū (406) (see Figure 3-19). Together these two census divisions correspond to the Kōloa judicial district except for the western boundary which runs parallel roughly 4,000 feet to the east along Wahiawa Stream and there are three small areas on the eastern boundary that fall into the Puhi-Hanamā'ulu CCD. The census designated places (CDP) in the Planning District include: Po'ipū, Kōloa, 'Ōma'o, Lāwa'i, and Kalāheo. In this section, “Kōloa District” refers to the combined census divisions ('Ele'ele-Kalāheo (407) and Kōloa-Po'ipū (406)) rather than the judicial district. CDP refers to the census designated places.

Figure 3-19: Census County Divisions and Census Designated Places



3.5.1.1 Kōloa District

In 2010, approximately 14,000 people resided in the Kōloa District. This number represents a doubling of the population during the fifty-year period since 1960. See Figure 3-20. The region experienced its highest growth rate during the twenty-year period from 1970 – 1990, but growth rates have declined since then and remained around 1% annually.

3.5.1.2 Census Designated Places

Kalāheo has been the district's most populous CDP since 1970. At 4,595 residents in 2010, Kalāheo's population is more than double the population of the next largest CDP, Kōloa. Kōloa and Lāwa'i each had nearly 2,000 residents and 'Ōma'o had 1,300 residents. Po'ipū contained the district's smallest town population at 979, declining from 1,075 in 2000. See Figure 3-21.

3.5.1.3 Population Growth

On a county level, population growth has been caused almost equally by net migration and by natural population increase (the rate of births minus deaths) since 1980. It is interesting to note that population growth in the Planning District has not exceeded the 20-year projection developed for the 1978 Kōloa-Po'ipū-Kalāheo Development Plan. The Plan estimated that population growth would occur at an annual average rate of four percent over a 20-year period, which is significantly more than actual average annual growth rate of two percent between 1980 and 2000 and the more recent one percent rate in the last two decades.

For the forecasted population growth for the island of Kaua'i, SMS used a 1.15 percent per annum as a high estimate and 0.8 percent per annum for the low forecast. The moderate or baseline estimate used 1.1 percent per annum, consistent with DBEDT's 2040 projections (SMS 2014). From there, they allocated the projected growth to each of the six community plan districts based on their historical share of the island's population. The Lihue Planning District received the largest portion of the projected growth with South Kaua'i receiving higher than average growth and the rest of the districts relatively little growth by comparison. For South Kaua'i, the population is estimated to reach 16,855. In 2010, South Kaua'i had roughly 17.4 percent of the county population and is projected to have 19.2 percent of the 88,013 populace in 2035 (SMS 2014).

3.5.2 Population Characteristics

3.5.2.1 Ethnic Composition

Since 1990, the largest racial group in the district has been White, followed by Asian. Prior to 1990, the largest racial group was Asian—with Japanese and Filipino populations comprising most of this group. The change may at least be partially due to a technicality, as the 2000 Census for the first time allowed respondents to choose multiple racial categories rather than just one. It is interesting to note that on a national level, Kaua'i has the second largest percentage of Asians of all 3,141 counties in the United States at 41 percent, second only to Honolulu County at 48 percent.

Kōloa CDP had the largest percentage of Asians within the Planning District in 1990, 2000, and 2010, while Po'ipū had the highest percentage of Whites. In 2010, the mixed race group, or those who identify themselves as two or more races, formed approximately 25 percent of the population in all CDPs with the exception of Po'ipū. People who considered themselves Native Hawaiian or part Native Hawaiian made up approximately 20 percent of the population in Kalāheo, Kōloa, Lāwa'i and 'Ōma'o. At 10 percent, the Native Hawaiian proportion of the Po'ipū population is significantly lower than the rest of the district. See Figure 3-22.

Figure 3-20: Kōloa District Resident Population, 1960-2010

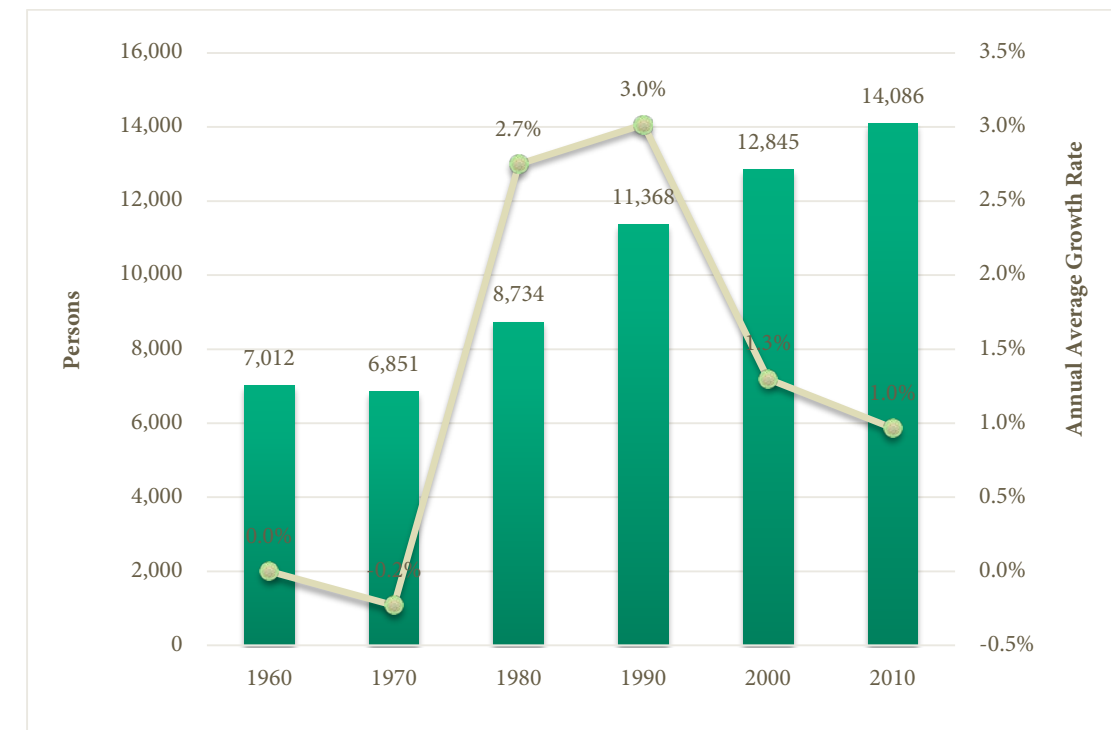


Figure 3-21: Population Growth by Town, 1960-2010

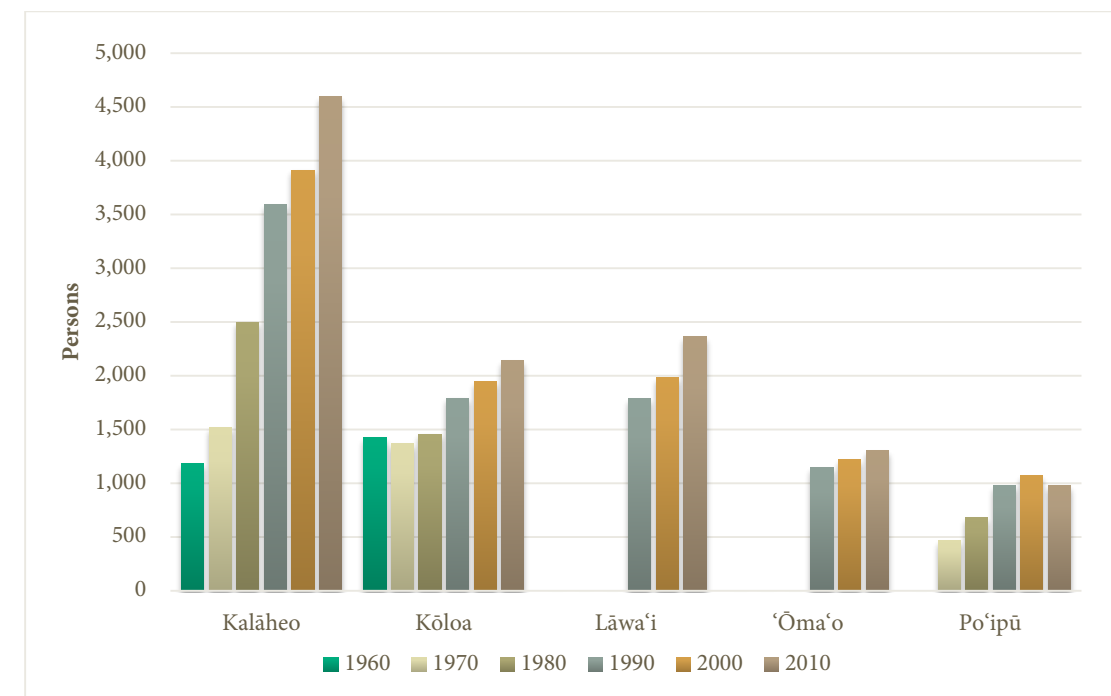
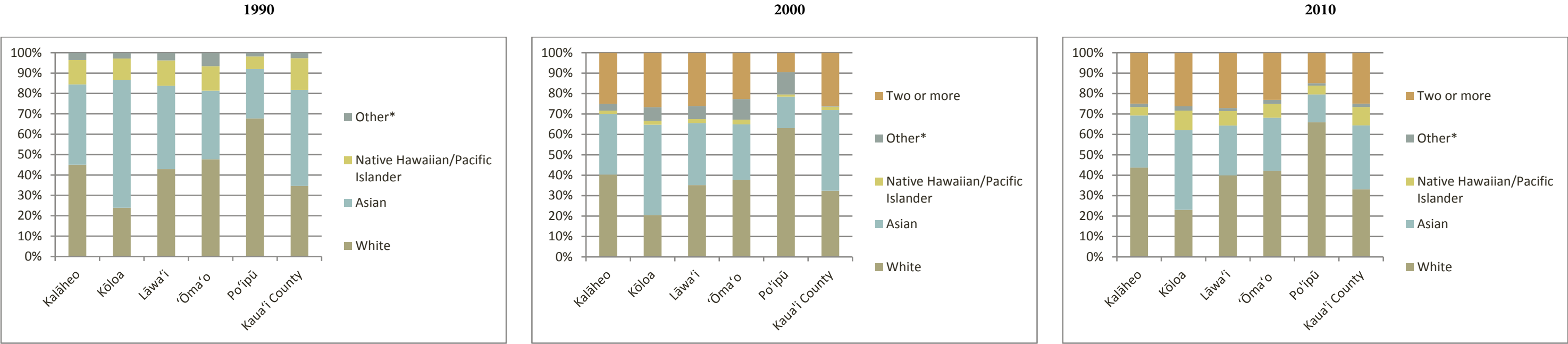


Figure 3-22: Racial Composition by CDP and for Kaua'i County, 1990-2010



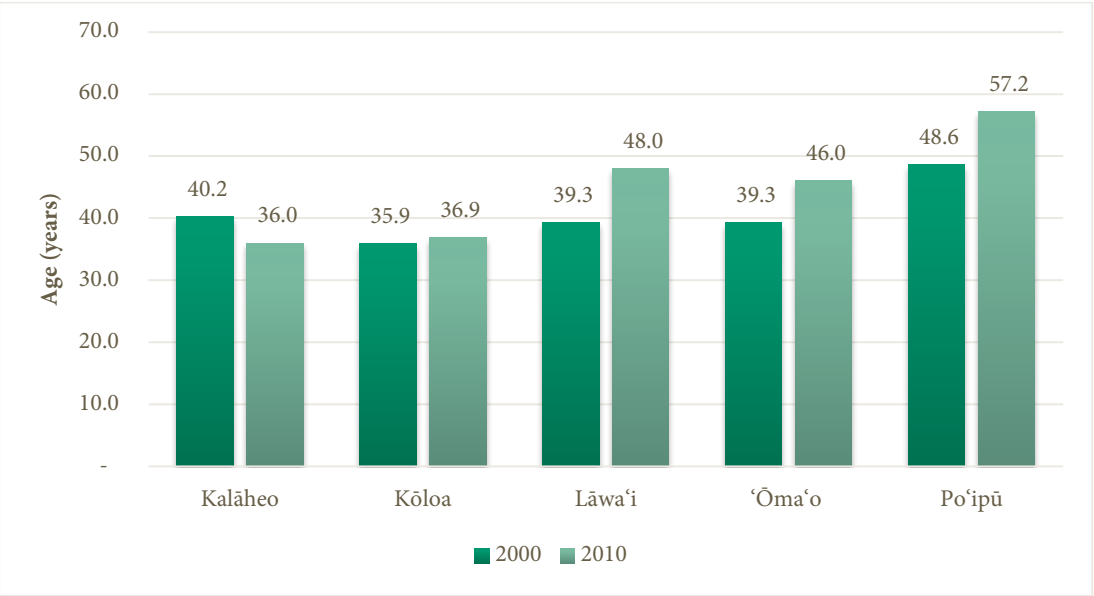
*Black Alone, Alaskan Native/Native American Alone, Other Alone

3.5.2.2 Age

Like the rest of the island, the Kōloa-Po'ipū CCD has an aging population. The median age for the CCD was 35 in 1970 and has steadily increased to 45 in 2010. In fact, the division is relatively older compared to the county as a whole which had a median age of 41.1 in 2010. Between 2000 and 2010, the median age of the Kalāheo-'Ele'ele CCD stayed nearly the same at 38.5 and did not follow the county-wide trend of getting older.

There are also some dramatic differences in median age in the CDPs. Between 2000 and 2010, Kalāheo's median age decreased, while all other towns increased. In 2010, Kalāheo and Kōloa had the district's youngest median age of 36.0 and 36.9, respectively, while Po'ipū had the oldest median age of 57.2 – revealing a difference of almost 20 years between the two CDPs. The median ages of Lāwa'i and 'Ōma'o were approximately 46-48 years in 2010. See Figure 3-23.

Figure 3-23: Median Age by CDP, 2000 & 2010



3.5.2.3 Households

Growth in the number of total households continued between 1990 and 2010, although the average household size decreased in all CDPs. See Figure 3-24 and Figure 3-25. SMS noted a similar trend in their report and estimates that the number of persons per household for the Planning District will remain relatively constant and will be the lowest on the island in 2035 at 2.76 (SMS 2014).

As a proportion of total households, family households decreased as the number of nonfamily households increased, including homes where the householder lives alone. Po'ipū has the lowest percentage of family households and the highest percentage of homes where the householder lives alone of all the towns in the district (Table 3-14). Approximately 73 to 76 percent of total households in Kalāheo, Kōloa, Lāwa'i and 'Ōma'o were family households in 2010.

Figure 3-24: Number & Types of Households by Town, 1990

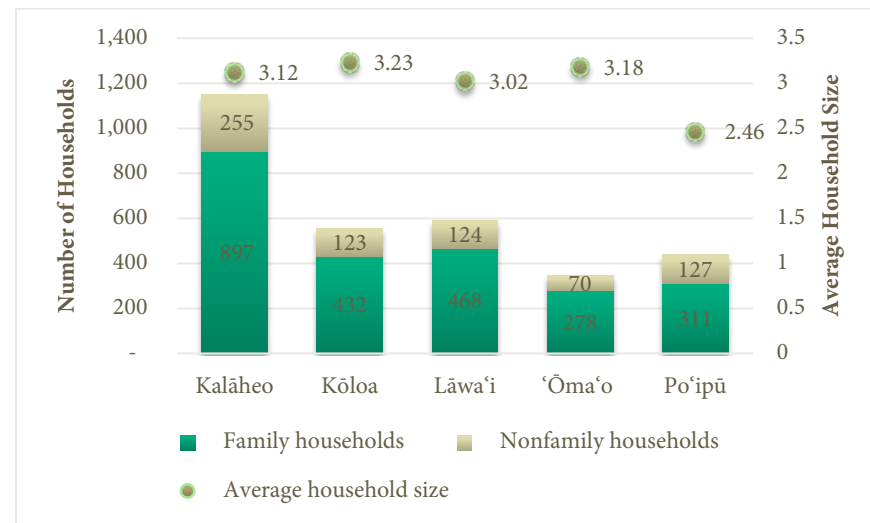
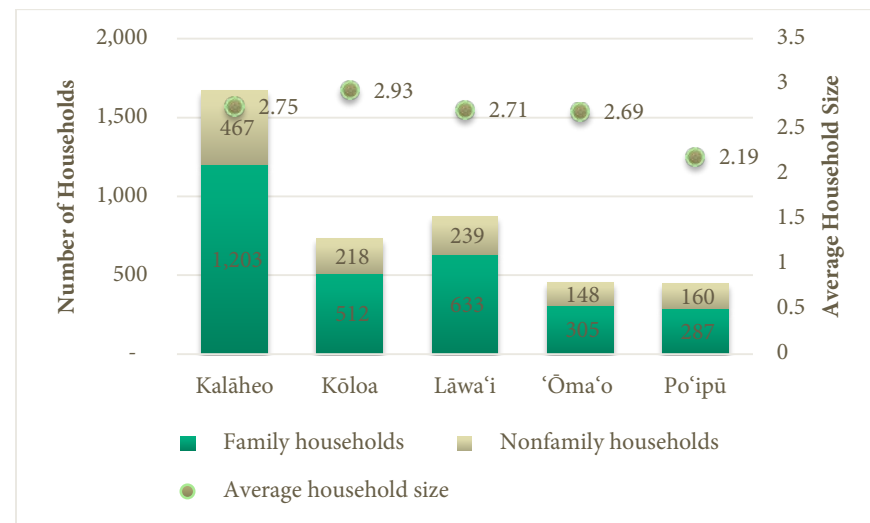


Figure 3-25: Number & Types of Households by Town, 2010



3.5.2.4 Income and Poverty

The U.S. Census Bureau defines median income as “the amount which divides the income distribution into two equal groups, half having incomes above the median, half having incomes below the median.” Median household income for all CDPs except Kalāheo increased between 1989 and 2011 according to the American Community Survey. Po'ipū has the highest median income (\$95,446) and the highest percentage of households earning over \$150,000. 'Ōma'o and Lāwa'i displayed similar income distributions over time, while Kōloa went from having the lowest median household income of the CDPs in 1989 and 1999 to one higher than Kalāheo CDP.

All of the CDPs except Kōloa were below the County of Kaua'i's average poverty rate of 7.2 percent. Lāwa'i had the lowest rate at only 1.9 percent. Kōloa's poverty rate was the highest at 10.2 percent as of 2011. See Figure 3-27.

Figure 3-26: Median Household Income by CDP, 1989-2011

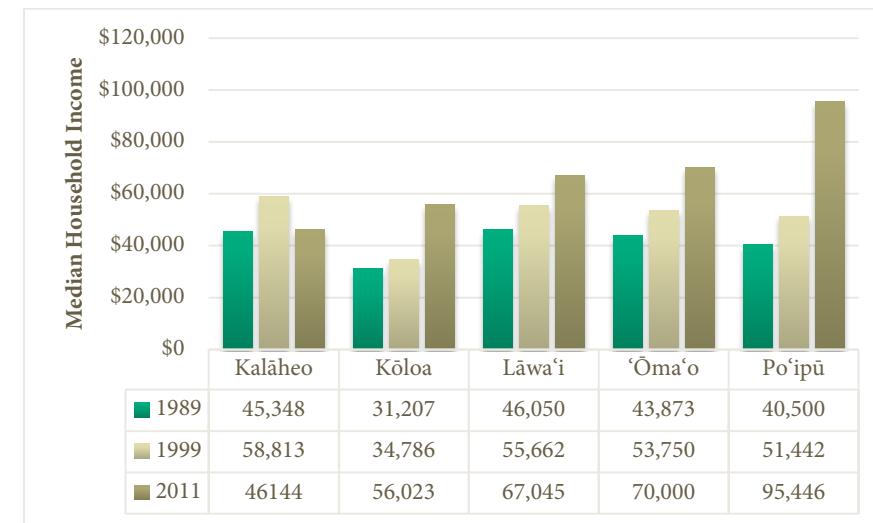


Figure 3-27: Percent of Families below Poverty Line by CDP and County-Wide, 2011

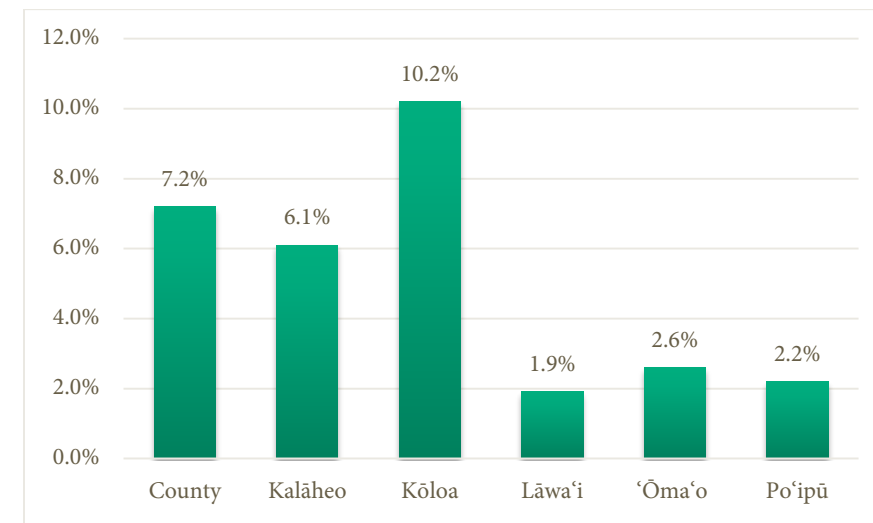


Table 3-14: Household Composition by CDP, 1990-2010

	Kalāheo			Kōloa			Lāwa‘i			‘Ōma‘o			Po‘ipū		
	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
Total Households	1,152	1,428	1,670	555	693	730	592	711	872	378	392	453	388	472	447
Population in Households	3,592	3,913	4,593	1,791	1,942	2,139	1,787	1,984	2,363	1,105	1,166	453	954	1,075	979
Average Household Size	3.12	2.74	2.75	3.23	2.8	2.93	3.02	2.79	2.71	3.18	2.97	2.69	2.46	2.28	2.19
Average Family Size	3.48	3.18	3.16	3.66	3.25	3.41	3.35	3.18	3.07	3.53	3.36	3.11	2.87	2.65	2.64
	Percent of Total Households														
Family Households	78%	73%	72%	78%	73%	70%	79%	75%	73%	74%	76%	67%	67%	66%	64%
w/ children under 18	36%	32%	23%	34%	35%	37%	35%	32%	31%	37%	38%	28%	21%	19%	20%
Married Couple Family	65%	58%	57%	61%	47%	44%	66%	61%	56%	61%	60%	49%	58%	57%	53%
w/ children under 18	36%	24%	31%	34%	21%	20%	35%	25%	22%	37%	29%	17%	21%	15%	14%
Female Householder	9%	11%	9%	11%	19%	18%	7%	9%	9%	8%	11%	10%	5%	5%	7%
w/ children under 18	6%	6%	6%	6%	10%	12%	4%	4%	5%	4%	7%	6%	3%	3%	4%
Nonfamily households	22%	27%	28%	22%	27%	30%	21%	25%	27%	19%	24%	33%	33%	25%	36%
Householder living alone	15%	20%	21%	17%	23%	22%	15%	19%	19%	13%	17%	25%	21%	25%	27%
Householder 65+	7%	9%		8%	9%		5%	6%		3%	7%		4%	7%	
Households w/ individuals 65+	25%	28%		40%	31%		26%	25%		18%	23%		22%	31%	

3.5.3 Housing Characteristics

Housing growth has significantly exceeded the 20-year growth projected in the 1978 Kōloa-Po‘ipū-Kalāheo Development Plan. The housing stock in the Kōloa District grew from 3,952 to 6,641 units between 1990 and 2010, an increase of 68 percent. Most of this growth occurred in Po‘ipū, which displayed the district’s most dramatic growth with nearly 1,000 new units between 1990 and 2010. However, in the 2010 census, 86 percent of Po‘ipū’s housing stock was categorized as “seasonal.” In 2010, Kalāheo had the largest housing stock with approximately 1,800 units, followed by Po‘ipū (1,588), Lāwa‘i (959), Kōloa (814), and ‘Ōma‘o (493). Po‘ipū aside, all the other towns had occupancy rates ranging from 93 to 95 percent. Kōloa is the only town where a greater number of housing units were occupied by renters than owners.

Over 80 percent of the housing units in Kalāheo, Lāwa‘i, and ‘Ōma‘o are single family residences. In Kōloa, less than 60 percent are single family residences, and in Po‘ipū, that number is approximately 30 percent. Po‘ipū has the greatest amount of multi-family housing with 50 percent of all units are located in structures containing 10 or more units.

3.5.3.1 Housing Costs and Affordability

Between 1990 and 2010, median housing prices increased in all the Planning District’s towns at a dramatically faster rate than the rest of the county. From 1990 to 2000, housing values increased 18 to 25 percent, and from 2000 to 2010, values increased 59 to 66 percent. In 2010 Po‘ipū had the district’s highest median housing price at \$928,600 while Kōloa had the lowest median price at \$528,000 – just half of the Po‘ipū price. Rental costs also increased in all towns between 1990 and 2010. As was the trend with median housing value, Po‘ipū also had the highest median rent in the district at \$912 in 2000 and doubling to \$1,802 in 2010, while Kōloa had the lowest median rent with \$442 also nearly doubling to \$861 in 2010.

3.5.4 Economy

According to the 2010 Census, Kaua‘i’s labor force totaled 34,981¹. Of that number, approximately 32,665 were employed and 2,316 were unemployed, resulting in an unemployment rate of 5 percent (Figure 3-31). The State’s Department of Labor and Industrial Relations (DLIR) also provides labor force and unemployment data on a more regular basis than the decennial census. The historical data for Kaua‘i County indicate an upward trend in labor force growth, equating to 1.1 percent per year since 1990. Hurricane ‘Iniki in 1992 impacted both the labor force, which decreased by 800 people in a single year, and unemployment, which jumped from 4.1 percent in 1991 to 9.6 percent in 1992, reaching a high of 13.1 percent in 1993. Since then, unemployment rates slowly declined to a low of 2.4 percent in 2006 but then soared to 9.3 percent in 2009 during the global recession. On the CDP level, in 2010, participation in the labor force ranged from 49 to 97 percent of the respective CDP population 16 years and older, compared to the County where 78 percent of the population 16 years and older participated in the labor force. Regarding class of worker, the majority of all workers in the CDPs are “private for-profit wage and salary workers.” Approximately 11 to 25 percent of the workforce in all towns is employed by the government, with the majority employed by the State (Figure 3-32). Po‘ipū and Kalāheo have the highest percentage of government workers at 25 and 22 percent, respectively. All towns except Kōloa have a comparable proportion of self-employed workers at 12 to 13 percent, with Kōloa at 8 percent. Po‘ipū and Kalāheo had the highest percentage of workers employed in managerial and professional jobs, while Kōloa has the smallest percentage.

¹ The labor force consists of people 16 years and older who are classified as “employed” or “unemployed” and includes both civilian workers and those in the Armed Forces.

Figure 3-28: Percent Owner-Occupied Units by Town, 1990-2010

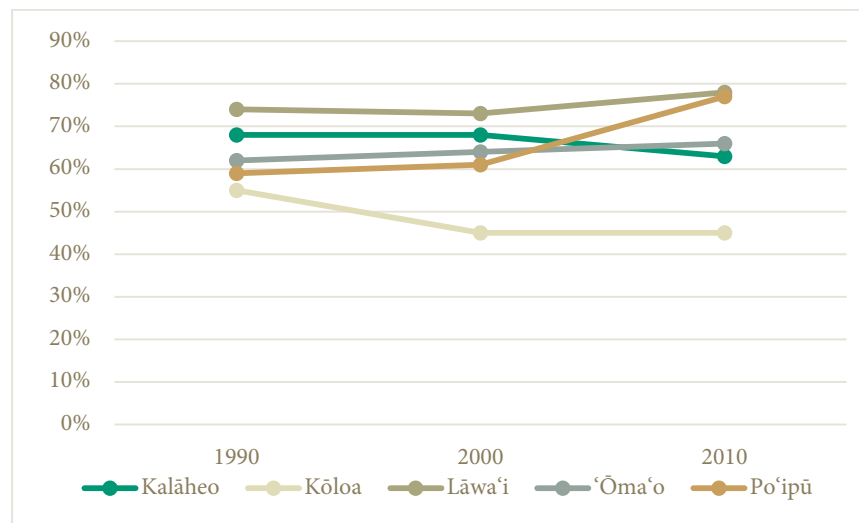


Figure 3-30: Median Rent by Town, 1990-2010

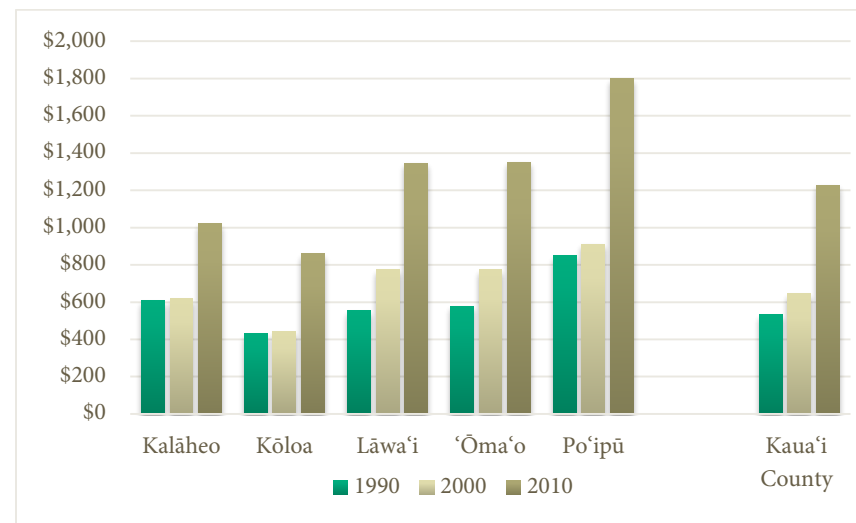


Figure 3-32: Class of Worker by CDP, 2010

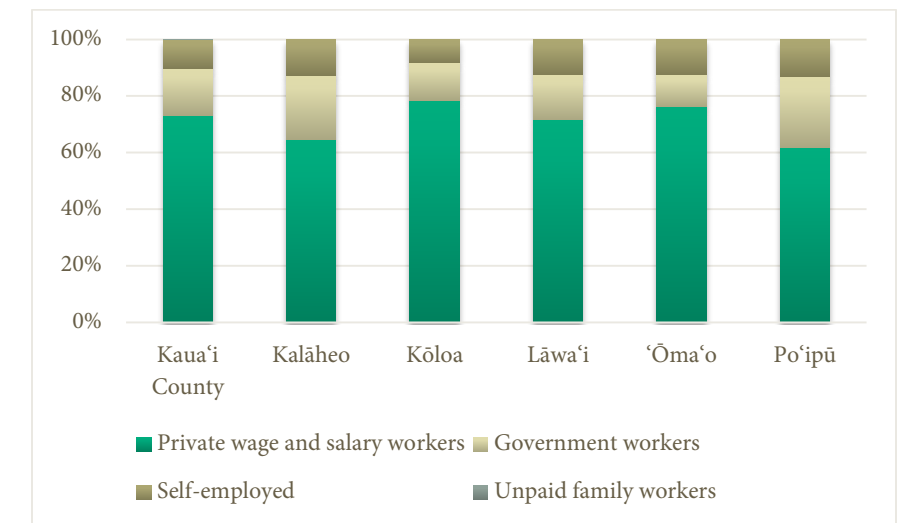


Figure 3-29: Median Value, Owner-Occupied Housing Units, 1990-2010

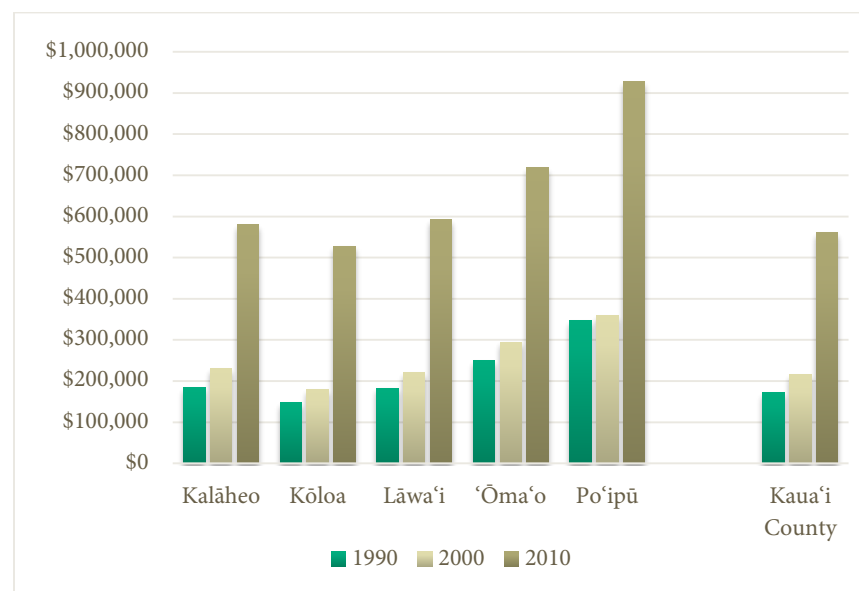


Figure 3-31: Annual Employment, Kaua'i County 1990-2012

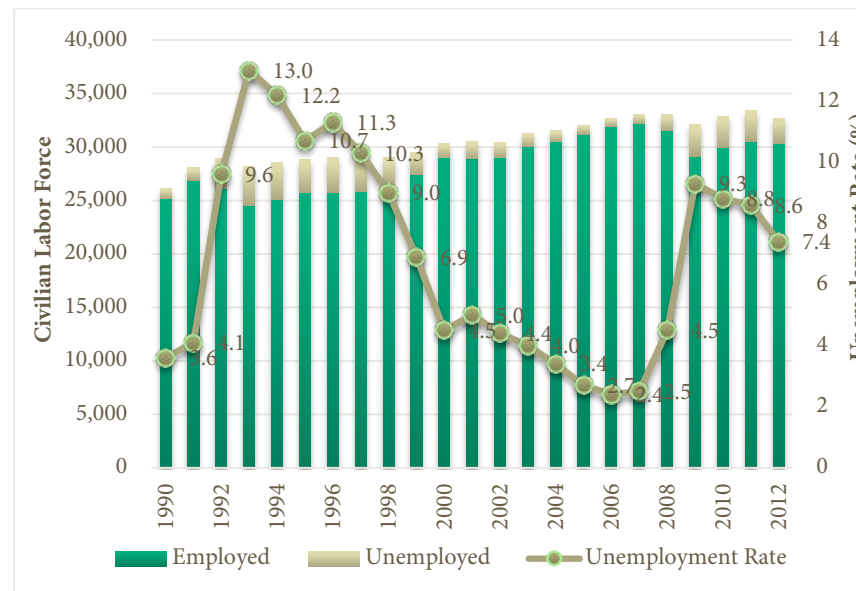
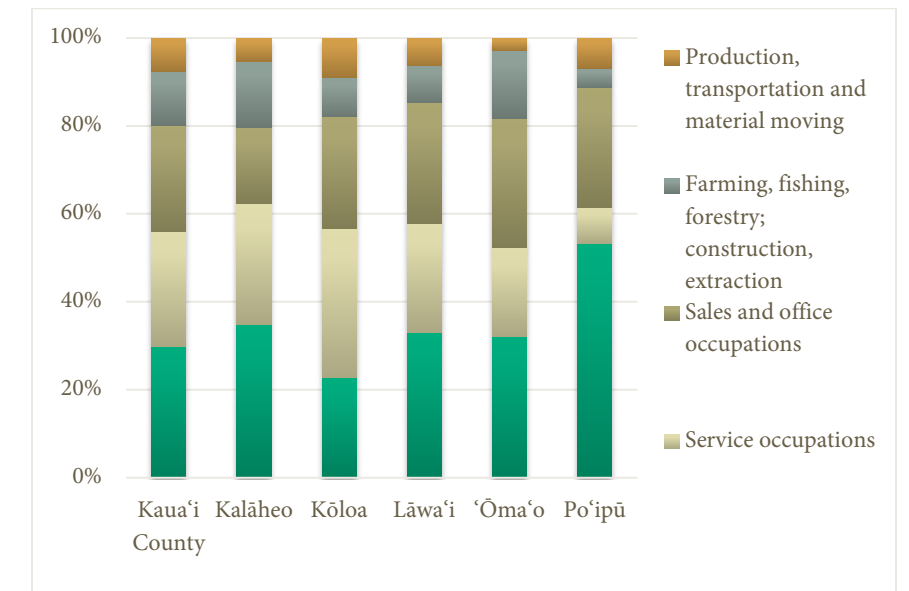


Figure 3-33: Occupation by CDP and County-Wide, 2010



Kōloa also had the highest percentage of labor force employed in service occupations. In all CDPs, about a quarter of the workforce was employed in sales and office occupations. With the exception of Po'ipū, approximately 14 to 20 percent of the workforce in each town was involved in fishing, farming, construction, extraction, maintenance, production, transportation and material-moving occupations (Figure 3-33).

In general, approximately 30 percent of the households of the Planning District towns received social security, but 40 percent of households in Po'ipū receive social security, reflecting its relatively older population.

In 2010, among the 189 establishments in the Kōloa zip code, the main industry is retail trade, followed by accommodation and food service. Kalāheo had fewer establishments at 82 and its largest industries were construction, retail trade, and accommodation and food services. Approximately 18 percent of all workers in the county's accommodation/food services/arts/entertainment industry work in the Planning District. Sixteen of the Kaua'i's Top 100 Employers are located in the district, according to a survey conducted by InfoUSA in 2008. The largest employers in the Planning District are the Grand Hyatt Kaua'i Resort and the Sheraton Kaua'i Resort.

3.5.4.1 Travel to Work

The Census also provides data on commuting and whether residents work and reside in the same town. In Kalāheo, 'Ōma'ō and Lāwa'i, 86 to 89 percent of residents worked outside of their town and had to commute to work. In Kōloa and Po'ipū, a higher percentage of residents were employed locally – 25 and 40 percent, respectively. See Figure 3-34.

Overwhelmingly, the primary means of commuting is automobile travel. With the exception of Po'ipū, at least 94 percent of the workforce traveled to work via car, truck or van (Figure 3-35). Po'ipū, which has the largest proportion of its workforce actually working in the same town, had a slightly lower automobile commute rate of 92 percent. The amount commuting via public transportation was negligible in all towns. Approximately 1 to 5 percent of the workforce in the Kōloa District walked to work, except in Kalāheo and Po'ipū where no one walked to work.

3.5.4.2 Tourism

During an average 24-hour period in 2012, 22,318 visitors were present on Kaua'i. Since 1983, Kaua'i's average daily visitor count (ADVC) has grown from approximately 8,000 visitors to nearly 22,000 visitors in 2007. This is an increase of 275 percent, or an average annual growth rate of 6 percent over a 25-year period. ADVC fell to 18,690 in 2009 – a decrease of over 3,200 daily visitors in a two-year period – but has since recovered.

It is projected that Kaua'i County's ADVC will steadily increase at a modest rate over the next twenty-five years according to the latest estimates from DBEDT. The estimated 2035 Kaua'i's ADVC is 27,000 – nearly 5,000 more visitors than the current high.

Figure 3-34: Work and Reside in the Same CDP, 2000

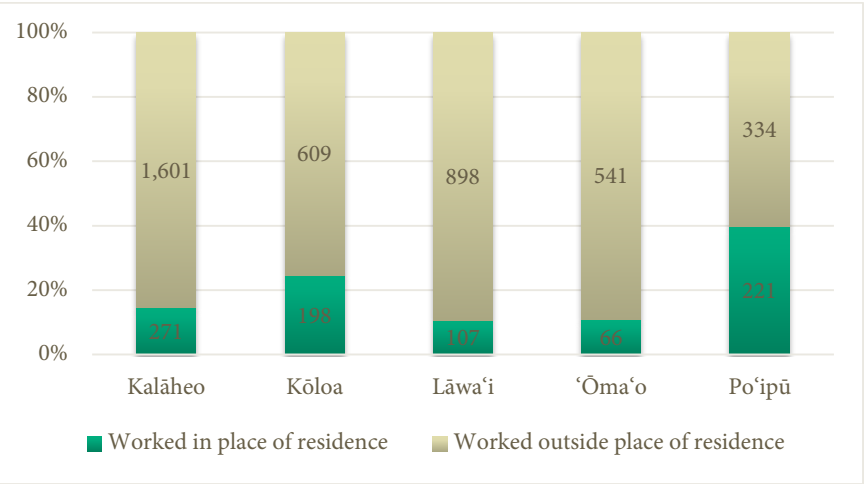


Figure 3-35: Commute to Work by CDP and County-Wide, 2010

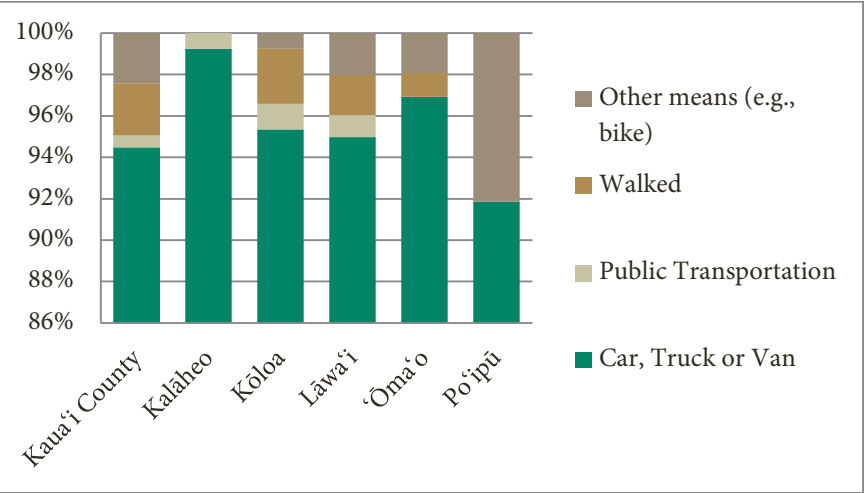
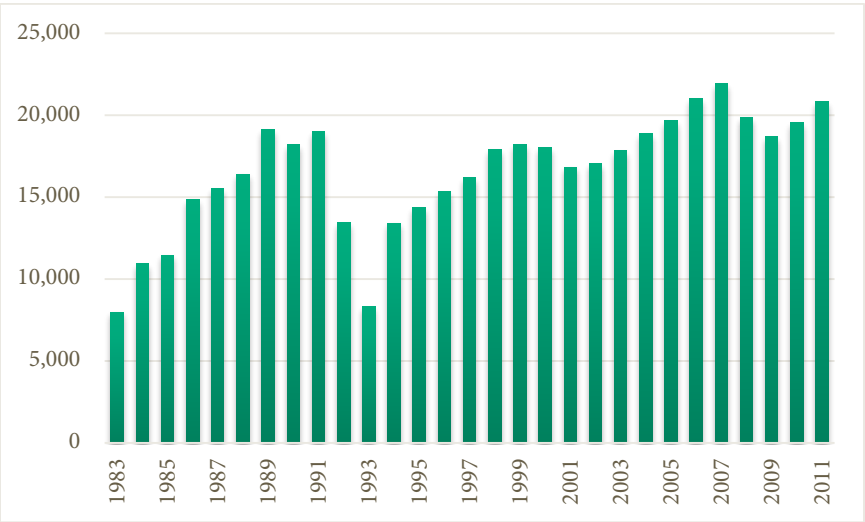


Figure 3-36: Average Daily Visitor Count, Kaua'i County



3.5.5 Visitor Units

The Hawai‘i Tourism Authority (HTA) inventories the number of visitor units in Hawai‘i on an annual basis in their Visitor Plant Inventory (VPI). Visitor units are distributed amongst five areas: Po‘ipū-Kukui‘ula, Princeville-Hanalei, Wailua-Kapa‘a, Lihu‘e, and Kalāheo-Waimea. The greatest number of visitor units on the island are located in the Po‘ipū-Kukui‘ula area. In 2014, there were a total of 3,065 visitor units in the area or roughly 36 percent of Kaua‘i’s total inventory (Figure 3-37). Kaua‘i lost 183 visitor units between 2013 and 2014, with 104 lost in the Po‘ipū-Kukui‘ula area alone. The majority of the loss was in the individual vacation unit (IVU) type.

In 2003, there were 2,371 visitor units in the Po‘ipū-Kukui‘ula area. With the advent of timeshare properties, that number jumped to 2,976 in 2004. Current trends since 2009 show hotel units and condo-hotel units leveling and timeshare units increasing slightly, but the number of IVUs are highly variable. In 2000, there were only 84 IVUs. Eleven years later there were over a thousand. A steep decline in IVUs between 2011 and 2012 occurred primarily due to the passage of Ordinance No. 904 passed in July 2010, which prohibited transient vacation rentals outside of the VDA boundary and subsequent permitting requirements instituted with the passage of Ordinance No. 912 in October 2011. The number of IVUs has remained relatively steady at 548 and 598 in the past two VPI reports but dropped again in 2014 to 518. There are seven anticipated resort projects in the district that are all located in the Po‘ipū-Kukui‘ula area, and a couple of undeveloped but residentially zoned properties within the VDA. If buildout of all projects occur, an additional 1,961 units could be added to the area. While this is unlikely to occur in the next few years, buildout is possible within the 20-year planning horizon of the Plan. Buildout represents an increase of 64% from the year 2014 visitor unit total in the region. See Table 3-15.

Figure 3-37: Existing Po‘ipū-Kukui‘ula Area Visitor Units, 2000-2014

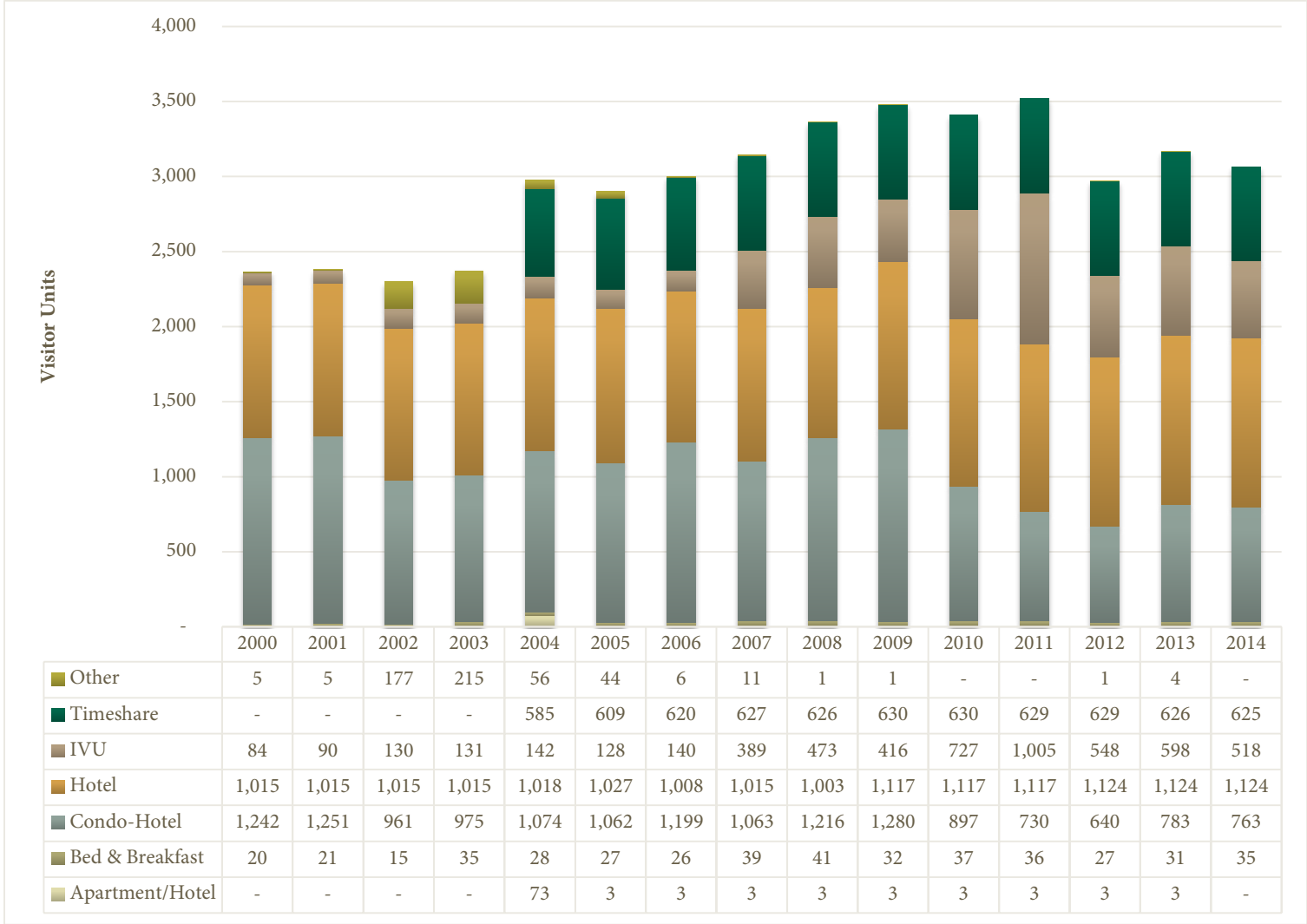


Table 3-15: Permitted and Potential Additions to the Visitor Unit Inventory, Po‘ipū Area

Name of Facility	Planned Type	Permitted and Potential Visitor Units 2015	Notes
Kukui‘ula Development Co., LLC	Resort, Single-Family, Multi-Family, Golf Course, Hotel, Condo/Timeshare	750	Unit count capped by ordinance.
Pilimai at Po‘ipū Golf Course	Resort Condominium	191	Construction is ongoing.
Po‘ipū Beach Estates	Resort Single-Family	110	Construction is ongoing.
Wainani at Po‘ipū	Single-Family	70	Construction is ongoing.
Village at Po‘ipū	Resort Single-Family	51	Construction is ongoing.
Royal Palms at Po‘ipū Beach	Resort Condominium	56	Final zoning permit entitlements received.
Kiahuna Po‘ipū Golf	Resort Condominium	282	Final zoning permit entitlements received.
Sheraton Kaua‘i Expansion	Multi-Family/Hotel	173	Final zoning permit entitlements received.
R-20 Parcel on Kiahuna Plantation Drive (Knudsen Trust)	Possible Multi-Family	152*	Vacant parcel (7.6 acres R-20).
R-10 Parcel on Po‘ipū Road (Knudsen Trust)	Possible Multi-Family	126*	Vacant parcel (12.6 acres R-10).
Total Units		1,961	
*The figures for full buildout on vacant parcels do not consider the percentage of the area covered by archeological resources and other limiting factors, such as lot coverage, parking, and height requirements.			

3.5.5.1 Visitor Unit Forecast and Projections

SMS forecasted the number of visitor units that will be needed for the island of Kaua'i by 2035 and distributed those projections to the six community plan planning districts. For South Kaua'i, they estimated between 3,877 and 4,406 visitor units will be required by 2035 (SMS model 2014). With an existing 3,065 visitor units in 2014, the difference between the forecasted and existing number of visitor units is between 812 and 1,341 units. By applying SMS's medium estimate of an average of 70 percent occupancy rate to the number of permitted and potential visitor units of 1,961, the net difference between the projected required number of units and permitted units is between 561 and 32 units. Depending on how many of the permitted units are actually built, especially at Kukui'ula and Pilimai at Po'ipū, and the two zoned but not permitted parcels, this figure could be relatively close to or fall short of the projected need on the high side of the projections and may still require additional permitting for visitor units should these developments stall or be lower than expected. On the low side of the projections, there is a potential excess of 561 units.

Table 3-16: South Kaua'i Visitor Units, Forecasted and Projected Comparison

Number of Visitor Units Needed to Meet Forecasted Visitor Unit Demand by 2035	Between 3,877 and 4,406
Existing Number of Visitor Units, 2014	3,065
Number of Permitted Visitor Units, 2015	1,961
Estimated Occupancy Rate (Based on SMS Length of Stay Medium Forecast of 7.1 days)	70%
Number of Additional Available Visitor Units (70% Occupancy Rate applied to Permitted Visitor Units)	1,373
Total Available Visitor Units Projected in 2035	4,438
Net Difference between Forecasted and Projected Units	Between +561 and +32

3.6 NATURAL HAZARDS & CLIMATE RISKS

The County of Kaua'i Multi-Hazard Mitigation Plan (2009 Update) provided an update to all sections of Kaua'i County's mitigation plan, including hazard identification, asset identification, risk and vulnerability assessments, current mitigation activities, and mitigation strategies. The following summarizes the relevant portions of the County of Kaua'i Multi-Hazard Mitigation Plan (2009 Update), the State Civil Defense (SCD) website, the FEMA website, and the State Department of Land and Natural Resources website as they might be related to the South Kaua'i Planning District.

3.6.1 Hurricanes

Hurricanes are relatively uncommon in Hawai'i as compared with other tropical locations such as the Caribbean. This is because the ocean around the islands is relatively cool and the wind patterns are more likely to create shear, which tears storms apart. However, Hawai'i has sustained significant damage from hurricanes and tropical storms historically and the frequency of these major storms can vary from year to year. Kaua'i has sustained two direct hits from hurricanes since reliable recordkeeping began in 1950 – 'Iwa in 1982 and 'Iniki in 1992. Causing an estimated \$2.3 billion in damages, Hurricane 'Iniki is the worst storm to have hit Hawai'i.

Both 'Iwa and 'Iniki caused extensive damage to the Planning District, particularly the Po'ipū area. However, as the County of Kaua'i Multi-Hazard Mitigation Plan (2009 Update) notes:

“Redevelopment following 'Iwa occurred in precisely the same location, only to be devastated 10 years later by Hurricane 'Iniki. Today, these same areas are once again densely developed, although decisions were made by some developers to put the golf courses closer to the shoreline and increase the setbacks for building development.”

3.6.2 Tsunamis

Tsunamis are a series of enormous waves created by an underwater disturbance such as an earthquake or landslide. The topography of the coastline and the ocean floor will influence the size of the waves when they approach the shore. All sides of the island of Kaua'i have observed tsunami run-ups (heights) of over ten feet, which caused significant damage and historically, loss of life. The tsunami evacuation zones were last updated in 2013 and are shown in Figure 3-38.

Figure 3-38: Tsunami Evacuation Zones



3.6.3 Earthquakes

According to historical records, the history of earthquakes impacting Kaua'i has been low. Kaua'i is considered the least vulnerable to earthquakes of all the major Hawaiian Islands. However, there is always a concern that an earthquake in Hawai'i or somewhere within the Pacific Rim could generate tsunamis or damage O'ahu such that the supply of goods and services to Kaua'i might be interrupted.

3.6.4 Landslides & Rockfalls

Landslides can be caused by a variety of factors including earthquakes, storms, volcanic eruptions, fire and by human modification of land. Most visible examples of landslides are where the construction of roads required cutting into hills, and portions of the graded lands have slid or resulted in rockfalls. In the Planning District, this occurred in an area on Kaumuali'i Highway past Kalāheo and Lāwa'i. Destruction of roads from landslides could result in cutting off vehicular access, which could present a major problem because Kaua'i's road system is small enough that there may be no alternative means of access.

3.6.5 Flooding

Flooding can occur from excess rainfall, storm surges, high tide wave action, unmanaged drainage systems, or sea level rise. Stream flooding on Kaua'i is characterized by numerous flash floods, as well as prolonged flooding associated with slowly passing rainstorms that saturate the soils. Flooding in the Planning District has mainly occurred at the Po'ipū Beach Park parking lot, in Kalāheo Stream, in Po'ipū and Kōloa due to overland flow, and along the coast due to tsunami run-up. The U.S. Federal Emergency Management Agency (FEMA) develops flood hazard rating maps called FIRMs (Flood Insurance Rate Maps) to help determine flood insurance rates. Figure 3-39 shows the FIRM for the Planning District. However, the flood risk has not been determined for all areas within the Planning District.

Figure 3-39: Flood Insurance Rate Map



3.6.6 Dam Failures

Dams and reservoirs in Hawai'i are used for agriculture, drinking water storage, flood control, recreation, and various other purposes. The Hawai'i Dam and Reservoir Safety Act of 2007 (HRS 176D) attempts to reduce the risk of dam failure by mandating inspection and regulation of any activity, including maintenance and operation, related to dams and reservoirs. This act applies to dams with artificial barriers of 25 feet or more in height or with an impounding capacity of 50 acre-feet or more. Dams less than 6 feet in height, regardless of storage capacity, or that have a storage capacity less than 15 acre-feet (5 million gallons) regardless of height, do not fall under the state's jurisdiction, unless specified. Approximately 23 regulated and 7 unregulated dams are located within the Planning District. The State DLNR Engineering Division's Dam Safety Program is charged with carrying out the requirements of the Hawai'i Dam and Reservoir Safety Act of 2007 including dam safety inspections of all state regulated dams, working with owners to develop or update their Emergency Action Plans for each facility, reviewing permit applications, providing training, and regulating and promoting dam safety statewide.

3.6.7 Coastal Hazards, Climate Change, & Sea Level Rise

3.6.7.1 Sea Level Rise

The UH Sea Grant Program has been contracted by the County of Kaua'i to prepare a technical study focusing on climate change and sea level rise (SLR) for the General Plan update. Sea level around the island of Kaua'i is currently rising at an average rate of 1.53±0.59mm/year, or about 6 inches/century. However, unlike global records, accelerated sea level rise has not yet been detected in the Hawai'i tide gage records (Sea Grant 2013).

Current National Oceanic and Atmospheric Administration (NOAA) recommendations for planning and policy making purposes suggest using a benchmark of one meter, or three feet, of sea level rise by the year 2100, although estimates have ranged anywhere from one to six feet. The variation can also be different along different shorelines depending on the specific landforms, subsidence, soils, hydrology, etc. of the area (Eversole 2014). Potential impacts of sea level rise include increased coastal erosion rates, flooding, and wave inundation, drainage issues and groundwater inundation, as well as increased vulnerability to hurricanes and tsunami (Sea Grant 2013).

Hawai'i Sea-Level Rise Maps are available through the NOAA Coastal Services Center Sea Level Rise and Coastal Impacts Viewer, an online interactive mapping and visualization tool intended to "provide coastal managers with a preliminary look at sea-level rise and coastal flooding impacts." Geographic Information Systems (GIS) layers for the Kaua'i NOAA Viewer flooding areas are also available. The maps depict inundation levels above Mean Higher High Water (MHHW) on 1 foot increments from 0 to 6 feet. A slider bar on the web-based graphical display is used to show how various levels of sea level rise will impact coastal communities. The online mapping tool allows the use to display five data layers:

1. Sea-level rise, from 1 to 6 feet, showing areas impacted.
2. Mapping confidence, differentiating between areas of high confidence of inundation and areas of uncertainty.
3. Marsh impacts and migration, indicating potential changes to wetland areas.
4. Vulnerability rating (high, medium, and low) developed by overlaying social and economic map layers on the sea-level rise inundation areas.
5. Flood frequency plots describing changes in frequency and duration of flood events with sea-level rise.

While the NOAA Sea Level Rise maps provide the best available information on coastal flooding hazards with sea-level rise, the maps have several limitations. For beach-front properties, this type of "bathtub" model does not account for or depict increased beach erosion (shoreline recession) that is expected with sea level rise. Research studies of shoreline

change related to sea-level rise suggest typical horizontal shoreline retreat of one to two orders-of-magnitude (10 to 100 times) the rate of vertical sea-level rise. As a result the maps may underrepresent the “true” hazard for many coastal properties. The maps depict only an incremental increase above high tide level. They do not account for additional inundation from high-wave setup, storm surge, extreme high tides, etc.

3.6.7.2 Coastal Hazards

According to the Kaua'i Climate Change and Coastal Hazards Assessment (KC3HA) prepared by the UH Sea Grant College Program, the four key coastal hazard impacts for Kaua'i are: 1) coastal flooding and wave inundation, 2) erosion, 3) inland (stream) flooding, and 4) wind. All of these impacts can be generated by a variety of hazard events or processes (e.g., hurricane, high surf, sediment budget deficit) and all are exacerbated by climate change and associated sea level rise (SLR). Scientific studies also indicate that climate change will potentially increase tropical cyclone frequency, result in unpredictable rainfall and weather patterns, and cause coastal ground saturation and migration and expansion of wetlands- all of which can compound the impacts (IPCC 2014; PIRCA 2012). Further, as a result of increased carbon dioxide in the atmosphere, the ocean is becoming more acidic. The consequences of these hazard impacts can be seen in increased runoff, landslides, beach loss, and slope failures, all of which can affect the community (see below). Mitigation programs, policies, and practices should be designed around these impacts and consequences, not just the event that causes them (Sea Grant 2014).

In light of these issues, to ensure South Kaua'i is resilient, policymakers should examine the potential consequences of coastal hazards and climate change for South Kaua'i, and design adaptation strategies to address those consequences:

- Infrastructure:
 - Roads: Roadways located along the shoreline may become inundated and block escape routes or access by emergency services.
 - Drainage: Drainage facilities may be inundated and fail during extreme weather events, causing inland flooding.
 - Wastewater: Currently there are no County-owned facilities within the 1, 3, and 6 foot inundation zones predicted by the NOAA SLR and Coastal Impacts Viewer. However there are private package plants and IWS that may be inundated, causing widespread failures due to SLR and other climate change hazards such as more extreme storm events, inland flooding, etc. The proposed centralized wastewater treatment plant planned at the Kōloa Mill Site is one solution that would close the coastal facilities and locate the plant away from coastal hazards.
 - Water: Changes in weather and rainfall patterns could affect available water resources and require different resource development.
- Agriculture: inundation could lead to a loss of coastal or low-lying agricultural systems such as lo'i, fisheries, and fishponds as well as changes in weather patterns and available water resources.
- Parks and Recreation: inundation could lead to loss of public access, trails, beach parks, swimming, diving, and surfing spots, and harbors.
- Cultural Resources: increased vulnerability and loss of coastal and low-lying sites and artifacts, traditional food sources and resources, burials, and traditional lifestyles.
- Natural Resources: changing water depths will further impact nearshore reefs and coastal ecosystems already stressed by increasing water temperatures, ocean acidification, and runoff. Species that depend on shallow water depths, inter-tidal or sub-tidal systems, or the interrelationship between the ocean and freshwater streams will be impacted. Coastal habitats will convert from one type to another. Other impacts to species and habitats include the

loss of wetlands in some areas and the creation of new ones in others, salt water intrusion into freshwater systems, and degradation of coastal and stream water quality. The loss of wetlands could also mean a loss of natural storm buffers for future weather hazards and natural filters for runoff.

Kaua'i's primary focus on mitigating impacts from climate change and coastal hazards has been adaptation and a reduction on dependence on fossil fuels.

- Increased renewable energy use by KIUC. Their strategic goal is to replace 50% of their electricity generation with renewable sources by 2023 in order to reduce their emissions to 1990 levels by the same year. By 2015, they expect to be at 40% renewable energy sources.
- Mode shifting ground transportation from single occupancy vehicles to transit, bicycles, and walking. Combined with alternative fuels, electric vehicles, and efficiency gains, net reductions in emissions from the ground transportation sector are within reach in the next decade.
- Revision of shoreline setback ordinance requires increased setbacks from certified shorelines based on coastal erosion rates to help minimize potential impacts from coastal hazards and flooding.
- Kaua'i also has a number of shoreline armoring structures (seawalls, revetments, etc.) to protect homes and infrastructure on the shoreline. Due to increasing knowledge on the impacts of these structures on beaches and stricter regulations at the State and County level, there has been shift away from building new permanent shoreline structures.
- The Kaua'i Planning Department commissioned a technical study to inform the General Plan and Community Plan process. The Kaua'i Climate Change and Coastal Hazards Assessment (KC3HA) incorporates a gap analysis report for Kaua'i by Dennis Hwang that develops a methodology to “assist in efficient implementation of hazard science into the community so that hazard risks are reduced.”

Based on current knowledge and the NOAA Digital Coast SLR inundation data for the Po'ipū area, general policies about how to interpret the available data and the future needs have been developed for Po'ipū:

- Po'ipū provides one example where the NOAA SLR Viewer may greatly underestimate SLR-related hazards because the model does not account for increased coastal erosion and wave-induced flooding with increasing SLR.
- SLR-Related Hazards:
 - The 1 foot SLR scenario shows limited potential for flooding in a few backshore areas at Po'ipū.
 - Flooding in the 3 and 6 foot scenarios is limited to isolated areas in the backshore. (Sea Grant 2014)

3.6.7.3 Shoreline Erosion

As noted in Section 3.3, UH SOEST estimated that changes along South Kaua'i's shorelines ranged from a small amount of accretion to erosion at 1-2 feet per year. However, erosion rates may increase with SLR as described in Section 3.6.7.1. Recently, sand erosion at Po'ipū Beach has been a major concern for residents and the visitor industry. The tombolo, or stretch of sand that reaches out from Nukumoi Point to a rocky outcrop about 300 feet from the shore, periodically washes away and rebuilds. However, it disappeared for several years during the 2000s before reappearing for a short time in 2010. The disappearance of the tombolo is partly responsible for the accelerated beach erosion at Po'ipū Beach and also contributes to stronger currents in nearshore areas frequented by the public. Another major event that has impacted the shoreline in recent years is Hurricane 'Iniki which transported much of the sand inland due to wave overwash from the storm. The sand was quickly bulldozed back to the shore. However, the vegetation line has greatly recessed and is over 100 feet inland of its pre-'Iniki location on the west end of the park (Sea Engineering, Inc. 2013).

Beach nourishment projects have occurred, the most recent being a small-scale beach nourishment of about 400 cubic yards in December 2013. The sand was obtained for free from the State when they dredged the Kawaiʻele Bird Sanctuary in Mānā and the remaining costs for sand washing, materials, and labor was roughly \$23,000 (Pap Personal Communication 2014). However, for longer term solutions to the problem, the County of Kauaʻi Department of Parks and Recreation commissioned a study completed by Sea Engineering, Inc. in March 2013 to understand the coastal processes at Poʻipū Beach and determine how to restore the beach to its 1975 location.

The study found that although there is a long-term erosion trend at the beach park, there are also periods of stability and accretion. The sand deposits within the Waiohai and Poʻipū embankments are relatively stable. However, the major stress to the system was triggered by Hurricane ʻIniki which contributed to a reduction in the stability of the tombolo. Maintenance of the tombolo is regarded as the first priority since it is critical to beach stability; it should be the first element restored in case of a blowout due to a major storm event. In addition, nourishing the beach with approximately 6,600 cubic yards of sand will restore the beach and tombolo to the 1975 footprint, allowing the beach to adjust to changing conditions and stabilize the tombolo and shoreline. Other supporting activities include restoring the vegetation line seaward to its pre-ʻIniki location and building a new rock rubblemound structure at the Keiki Pool. (Sea Engineering, Inc. 2013)

3.6.8 Droughts

Drought impacts vary in timing and severity, but can be generally categorized into three sectors: water supply; agriculture and commerce; and environment, public health, and safety. The water supply sector encompasses urban and rural drinking water systems that are affected when a drought depletes ground water supplies due to reduced recharge from rainfall. The agriculture and commerce sector includes the reduction of crop yield and livestock sizes due to insufficient water supply for crop irrigation and maintenance of ground cover for grazing. The environmental, public health, and safety sector focuses on wildfires that are both detrimental to the forest ecosystem and hazardous to the public. It also includes the impact of desiccating streams, such as the reduction of in-stream habitats for native species. According to a recent report from the U.S. Drought Monitor, the southern coastal areas of Kauaʻi were experiencing “Abnormally Dry” conditions as of May 13, 2014.

3.6.9 Wildfires

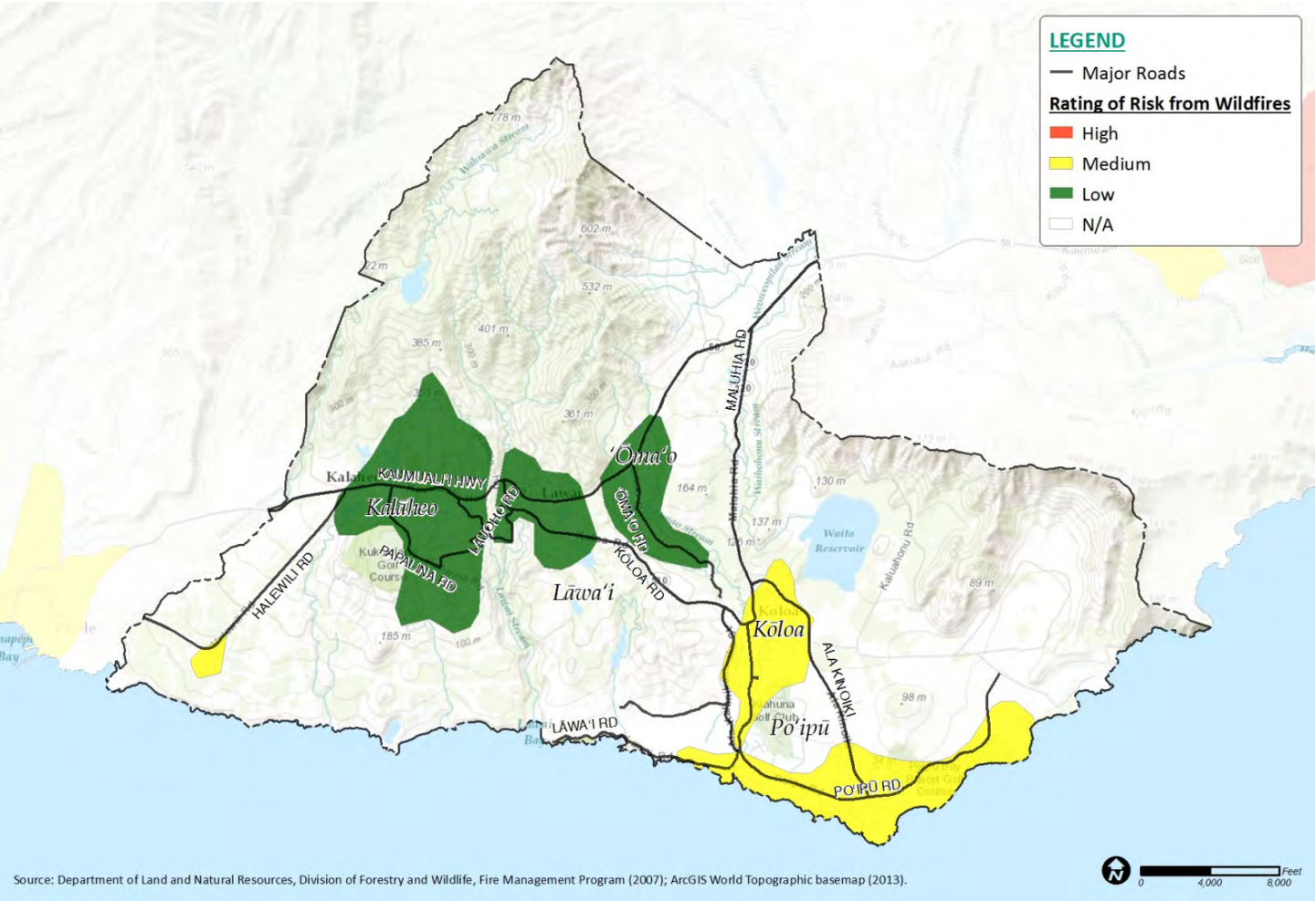
After Hurricane ʻIniki devastated Kauaʻi’s wild land areas in 1992, and the windblown debris increased fuel and potential for fires, the Kauaʻi Wildfire Prevention Analysis and Plan provided a wildfire risk assessment for the island in 1994 and 1995. Geographic areas were assessed according to the potential for wildfire prevention risk and vulnerability (Figure 3-40).

The following areas within the Planning District received the following assessments:

Area Name	Risk	Hazard	Value
Kōloa/Mauka	Low	Moderate	Moderate
Kōloa/Makai	High	High	High

Source: County of Kauaʻi (2008, 2012); DLNR, Division of Forestry and Wildlife, Fire Management Program (2007); ESRI, ArcGIS World Topographic basemap (2013).

Figure 3-40: Wildfire Risk Zones



3.6.10 Critical Facilities and Shelters

- State of Hawaiʻi Public Emergency Shelters in the Planning District listed on the State Civil Defense webpage include:
- ʻEleʻele Elementary School [Special Needs + Pet Friendly + General Population] (652 permissible occupants)
 - Kalāheo Elementary School [Special Needs + Pet Friendly + General Population] (964 permissible occupants)
 - Kōloa Elementary School [Special Needs + General Population] (884 permissible occupants)
- The County of Kauaʻi Multi-Hazard Mitigation Plan (2009 Update) notes the actions recommended in the 2003 plan that have been implemented are:
- “Developing Hotels as Shelters – Hotels have been consulted as partners to provide shelter spaces for visitors in addition to their guests, but currently discussions have occurred in facilities that have more than 500 rooms, such as the Kauaʻi Marriott, Grand Hyatt, and Princeville Resorts....
 - Additional discussions have been coordinated through the Poʻipū Beach Resort Association (PBRA) that works with hotels and resorts in the Poʻipū area....”

However, according to the PBRA, it has been a while since evacuation and safety plans have been updated at area resorts. Also, the added concern that many visitors now stay at IVUs, which may not have a way to broadcast emergency information or directions to their guests, poses a new problem should an emergency arise on the South Shore.

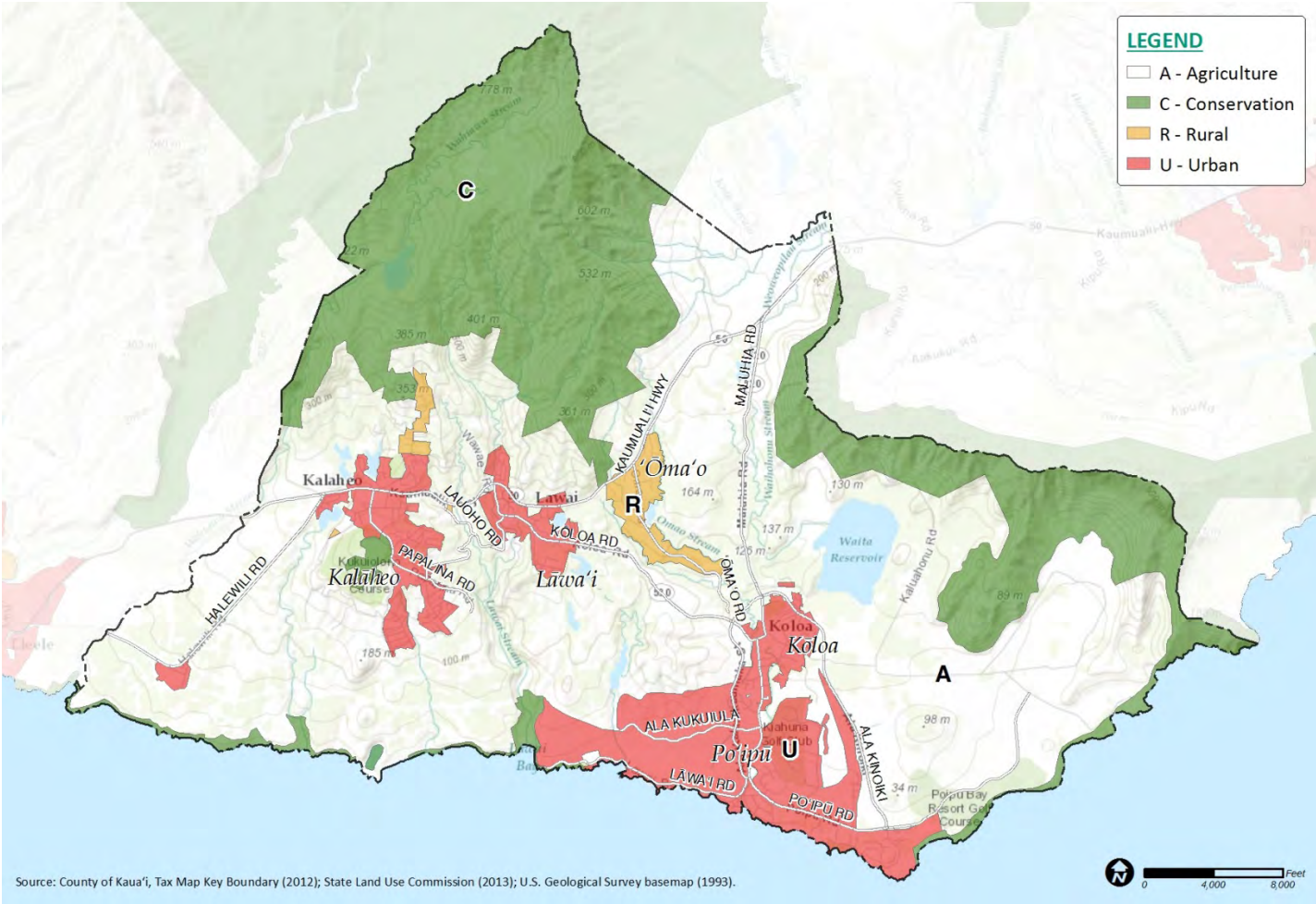
3.7 REGULATORY CONTEXT AND EXISTING LAND USE

3.7.1 Existing Regulatory Framework

3.7.1.1 State Land Use Districts

Approximately 70 percent of the Planning District’s land is in the Conservation District. Of the remaining approximately 30 percent, the Agricultural District covers 29 percent, the Rural District covers less than one percent, and the Urban District covers just over one percent. In the Planning District, the Urban District generally corresponds to the towns and resort area of Po’ipū-Kukui’ula, Kōloa, Lāwa’i, Kalāheo, and Numila. Of the six districts on Kaua’i, only Lihu’e has more land under the Urban District. ‘Ōma’o and the mauka portion of Kalāheo comprise the area under the Rural District. See Figure 3-41.

Figure 3-41: State Land Use Districts



3.7.1.2 County of Kaua'i General Plan

The County General Plan Land Use Map depicts policy for long-range land uses. The Land Use Map uses the following map designations: Urban Center, Resort, Residential Community, Transportation, Military, Agriculture, Major Parks, Town Centers, Planned Roads, and Public Facilities. While there are no *Urban Centers* in the Planning District, Kalāheo and Kōloa are designated as *Town Centers*. The Planning District’s *Residential Communities* correspond to the State Land Use

Urban district in Kalāheo, ‘Ōma’o, Lāwa’i, and Kōloa and to the State Land Use Rural district for ‘Ōma’o. Given the *Resort* designation, the Po’ipū-Kukui’ula area is one of Kaua’i’s three primary resort destinations and have the highest proportion of visitor units on the island. Princeville and Wailua-Kapa’a are the other two; secondary resort destinations include Nukoli’i and Lihu’e. See Figure 3-42.

3.7.1.3 1978 Kōloa-Po’ipū-Kalāheo Development Plan

The 1978 Kōloa-Po’ipū-Kalāheo Development Plan is one of six regional plans that establishes specific guidelines to carry out the long-range development goals and objectives expressed in the County General Plan. It was last updated in 1978, and thereafter adopted by the County Council in 1983 via Ordinance No. 447. This South Kaua’i Community Plan updates the maps and land use policies in that plan.

3.7.1.4 County Zoning

With 41 percent of all zoned lands within the Planning District, agriculturally zoned lands occupy the most land area. The next largest areas are zoned “Conservation” (28%) and “Open” (22%). These three zoning designations total 91% of the zoned lands in the Planning District. Approximately 2,500 acres, or eight percent of the district, is zoned Residential. Resort (123 acres), commercial (97 acres), and industrial (28 acres) zoned lands together make up less than one percent of the Planning District. See Figure 3-43.

Figure 3-42: General Plan Land Use Map

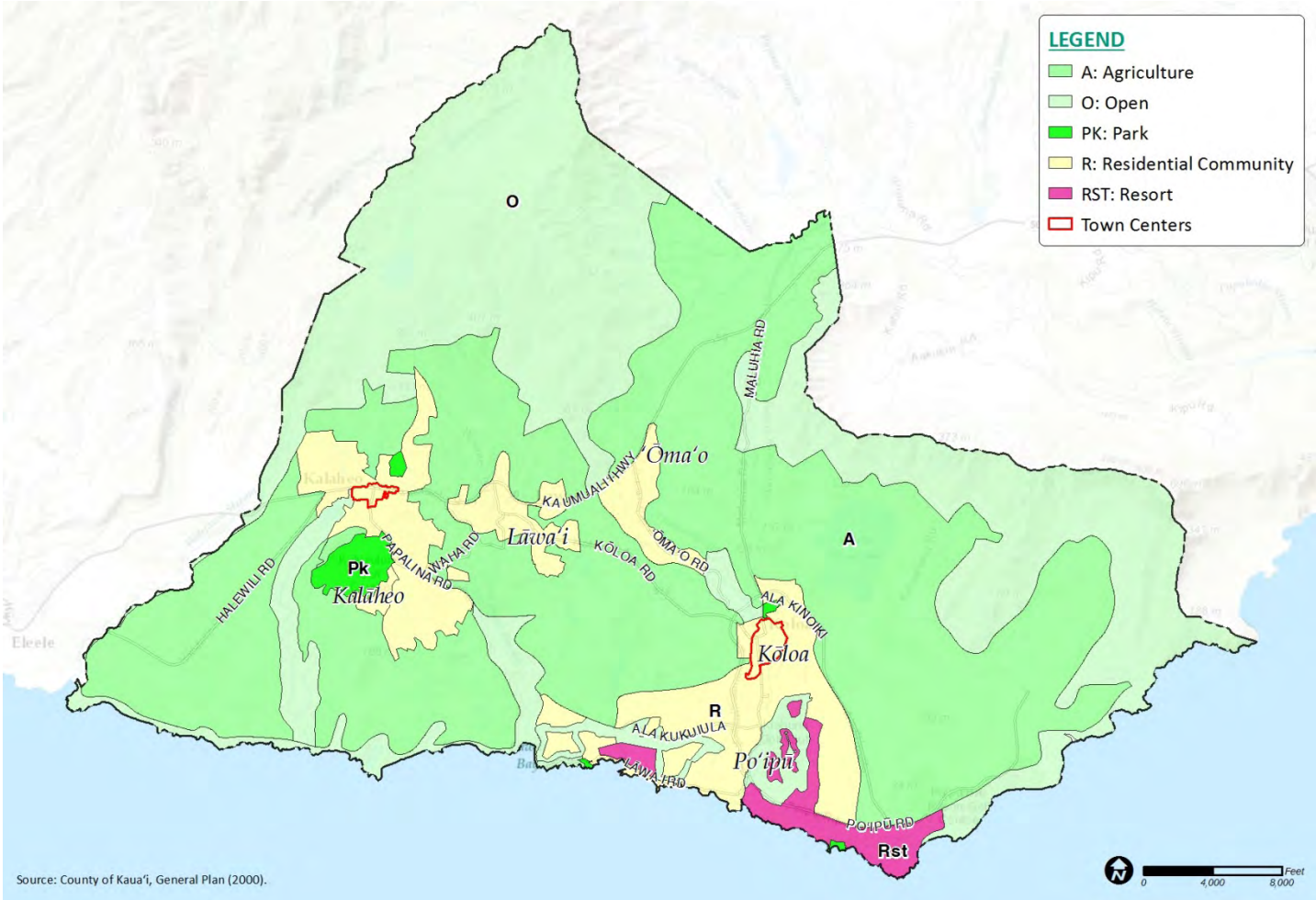
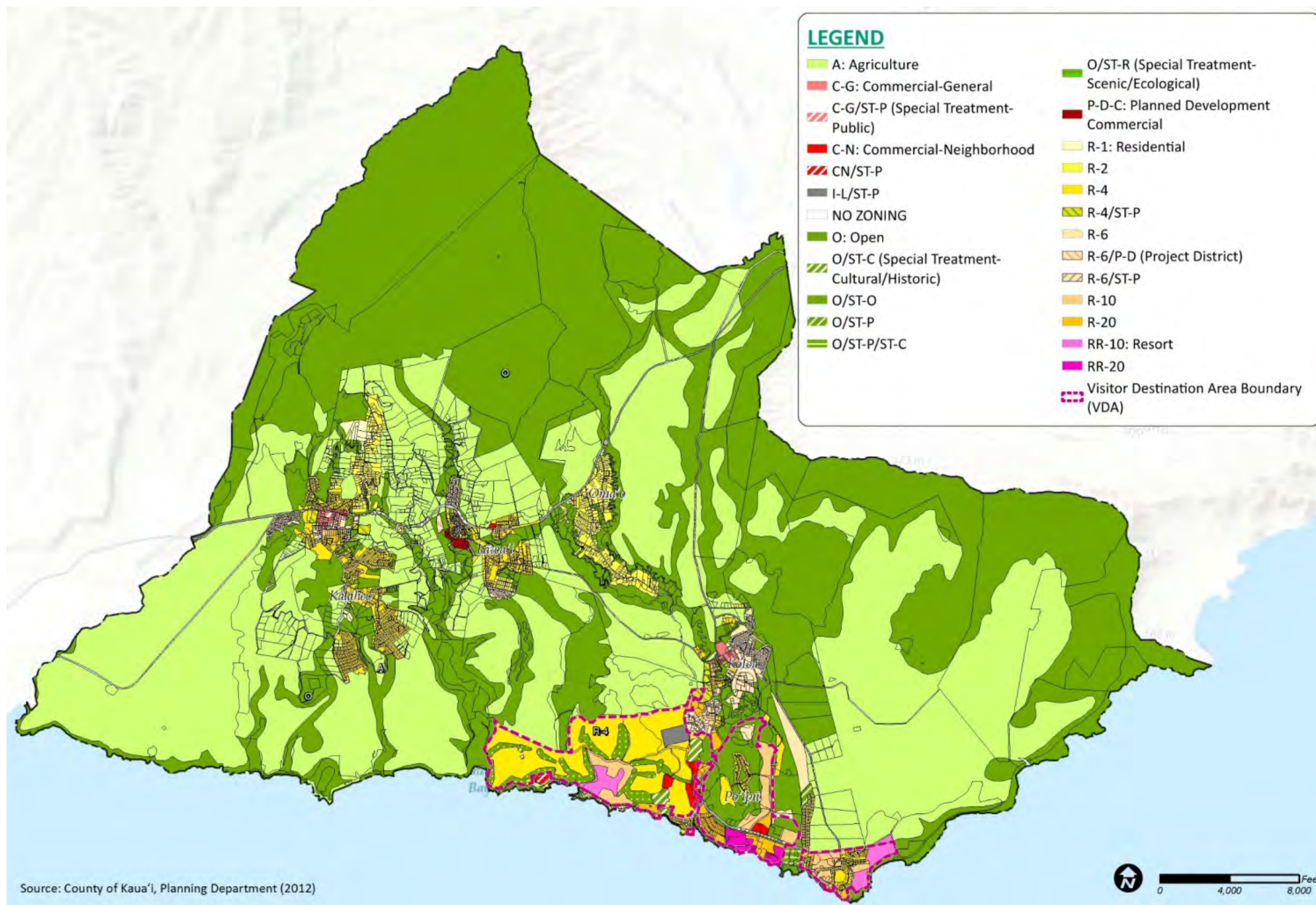


Figure 3-43: Existing Zoning



3.7.1.5 Special Management Area & Shoreline Setback Area

The Special Management Area (SMA) boundary generally follows the General Plan’s Open designation along the shoreline. In Po’ipū, the inland extent of the SMA boundary corresponds to the General Plan Resort, but this does not hold true for Kukui’ula where the Resort boundary is outside the SMA. See Figure 3-44.

The depth of the no-build shoreline setback is a minimum of 40 feet and can slide up to 100 feet based on average lot depth or 100 times the annual coastal erosion rate for structures with a building footprint greater than 5,000 square feet. The County is currently amending the shoreline setback ordinance so these requirements may change in the near future.

Figure 3-44: Special Management Area



3.7.2 Existing Land Use

3.7.2.1 Landownership

Three private landowners own approximately 61.5 percent of the land within the Planning District. Alexander & Baldwin owns 9,999 acres (31.9%) in the western portion of the Planning District. Grove Farm Company and its affiliated companies own 7,699 acres, or 24.5% of the Planning District. The Eric A. Knudsen Trust owns 1,603 acres (5.1%). State, county, and federal land comprises only about seven percent (7%) of the District’s land. The remaining 31.5 percent is a variety of smaller private or nonprofit landowners. See Figure 3-45.

3.7.2.2 Development Trends

On average, 75 lots are created through subdivision on an annual basis in the Planning District. In 2006, this number skyrocketed to over 400, but declined precipitously to below 50 in 2007. In 2009, no lots were approved to be subdivided.

The County zoning ordinance requires vacation units to be located within defined visitor destination areas (VDA) (CZO §8-17.2 & -17.8). The majority of vacation units on the island are in the Planning District, specifically the Kōloa/Po’ipū/Kukui’ula area. Time-share units and multi-family vacation units existing prior to September 22, 1982 and located outside a VDA are considered legally nonconforming uses (CZO §8-17.5); single-family vacation units existing prior to March 7, 2008 are legally nonconforming uses provided they are Holders of a Non-Conforming Use Certificate (CZO §8-17.10).

Projects proposed within the Planning District include resort, commercial, residential, and mixed-use (commercial and residential) totaling approximately 1,000 housing units, 2,100 transient accommodation units, and over 120,000 s.f. of commercial space. These projects are located in Kōloa, Po’ipū, and Kukui’ula, with one project in Kalāheo. See Figure 3-46.

The County of Kaua’i’s housing policy requires the private sector to provide affordable housing totaling 30% of residential projects (10 units or greater) or, for resort projects, a number of housing units based on an analysis of number of jobs, as workforce housing. State and county housing agencies as well as self-help housing programs, tax credits, and other programs also provide affordable housing for various income levels. Buyers of workforce housing are subject to a 10-year buyback restriction.

There are several housing units in the Planning District where the 10-year restriction has expired, priced in the open market, and no longer affordable to the 80%-140% workforce household (e.g., Weliweli Subdivision). Within the Planning District, affordable housing projects include 208 rental units in Kōloa, 28 elderly rental units in Kalāheo, 111 for-sale units in Kalāheo (13 for-sale units expired in Po’ipū), and 37 self-help units in ‘Ele’ele (which fall outside, but are in close proximity to the Planning District). See Figure 3-47.

With the median value of housing at \$416,200 in the Planning District, only about 50% of the properties could be affordable to a family earning 140% of the County’s median housing income.

Figure 3-45: Major Landowners

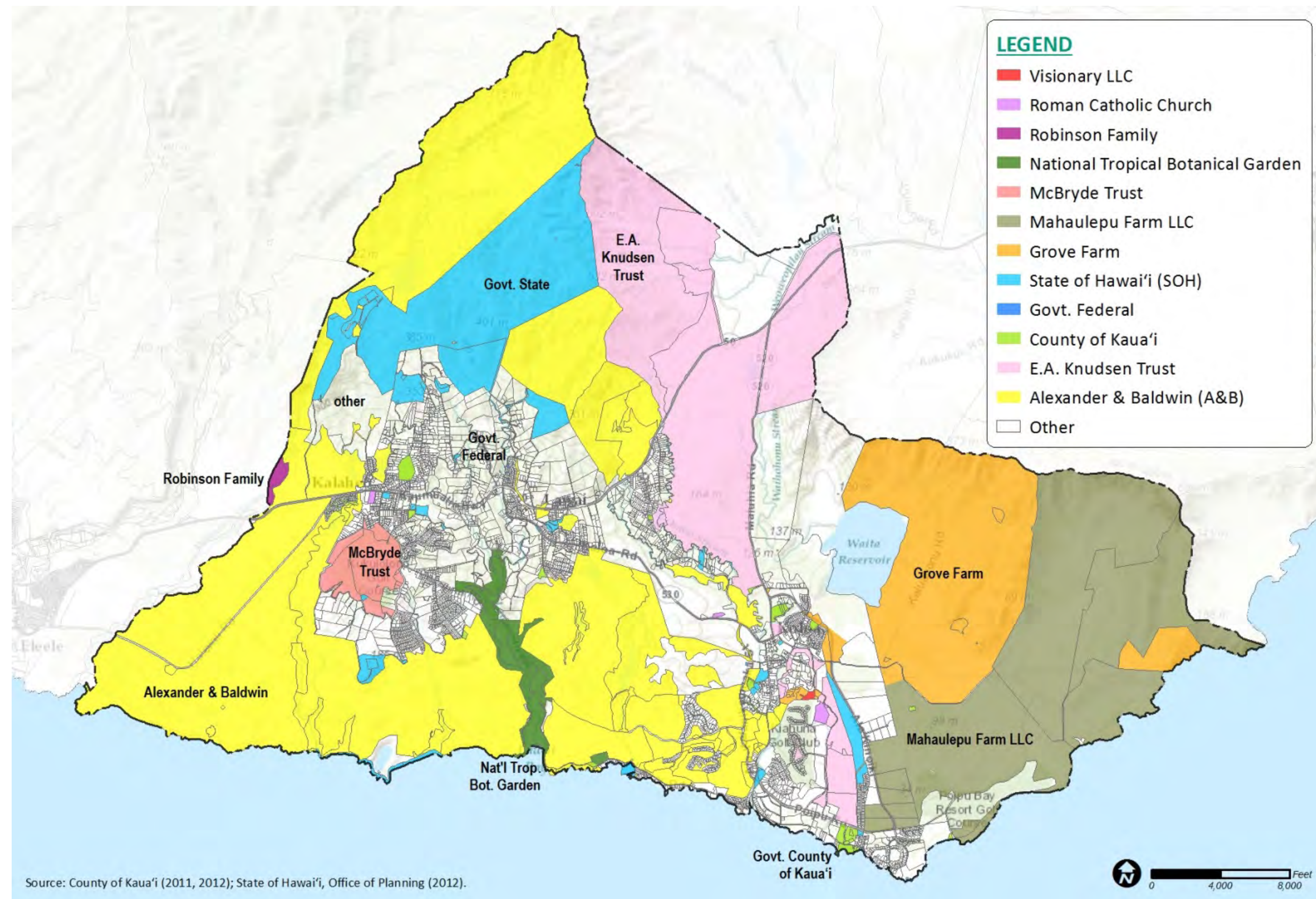


Figure 3-46: Major Projects In-Progress

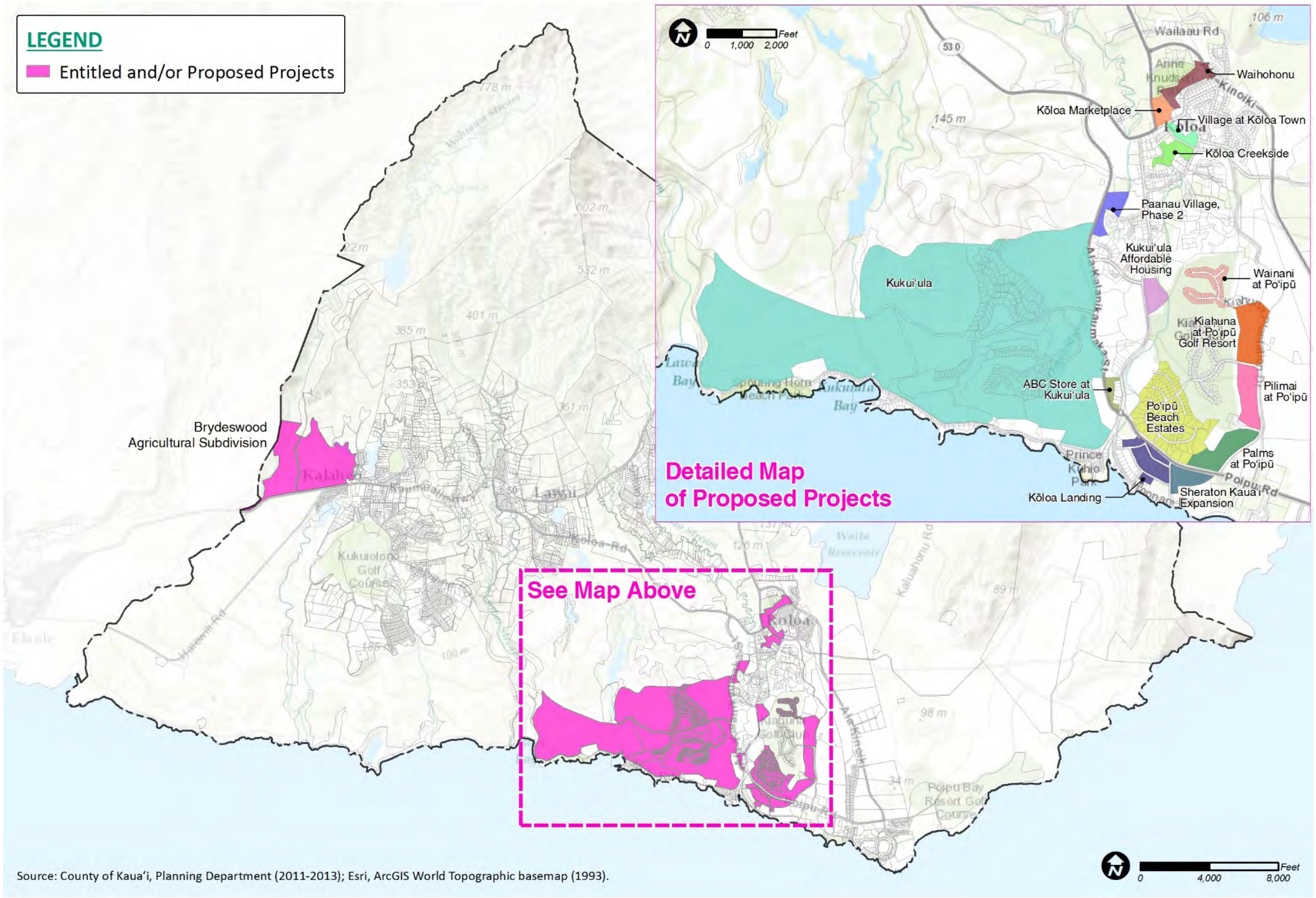
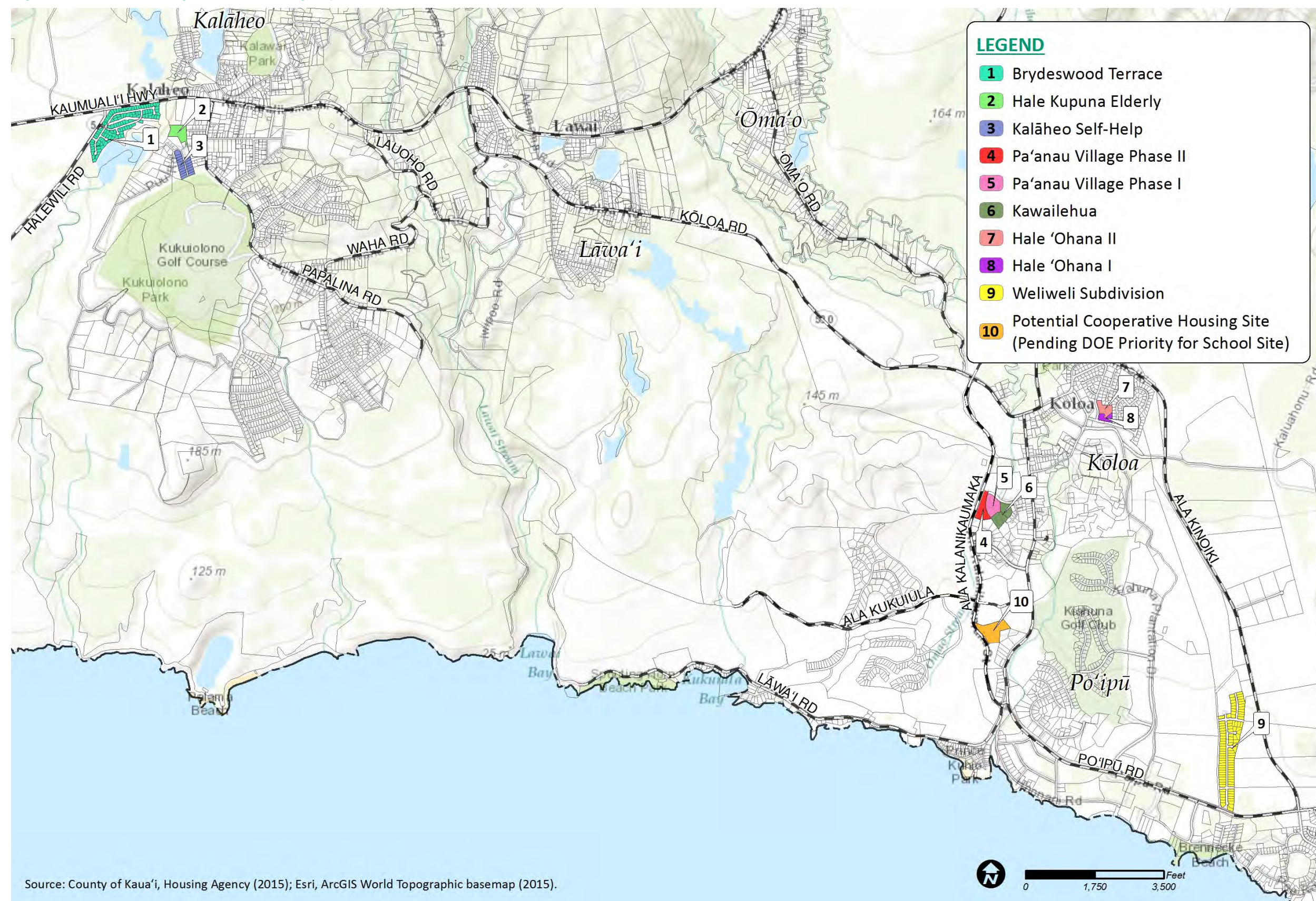


Figure 3-47: Past and Existing Affordable Housing Projects



3.7.2.3 Important Agricultural Land Designations

In the Planning District, the State Land Use Commission has approved petitions from Grove Farm and Alexander & Baldwin to voluntarily designate a total of approximately 6,000 acres as Important Agricultural Land. These lands are shown in Figure 3-48.

Figure 3-48: Important Agricultural Lands, 2013

