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‘Āina Kaumaha: The Maintenance of Ancestral Principles for 21st Century Indigenous Resource Management †

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† We choose not to italicize Hawaiian words, in recognition of the indigenous language and space that we write from within Hawai‘i. We refer to Hawaiian organisms by their Hawaiian names.

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Abstract: Globally, there is growing recognition of the essential role indigenous people have in biocultural conservation. However, there are few cases of applied indigenous resource management today, especially from the indigenous standpoint. In this paper, we provide an example of the maintenance and adaptation of an indigenous resource management system in Hawai‘i from the perspective of an instrumental ‘Ōiwi (Indigenous Hawaiian) social institution, Kamehameha Schools. Kamehameha Schools is not only the largest private landowner in Hawai‘i, but is uniquely tied to a lineage of traditional ali‘i (chiefs) resulting in present-day influence, decision-making authority, and wealth to fund a perpetual vision for its ancestral lands and communities. Notably, we share our journey from the perspective of indigenous resource managers, using the ‘Ōiwi methodology of mo‘okū‘auhau (genealogy and continuity) to guide our (re)discovery of what it means to steward in an indigenous way. First, we ground ourselves in ‘Ōiwi worldviews, recognizing our genealogical and reciprocal connections to ‘āina (land and sea). Then, we examine the functions of the traditional institution of the ali‘i and the chiefly principle of ‘āina kaumaha—a heavy obligation to steward the biocultural health of lands and seas in perpetuity. We detail how ‘āina kaumaha has manifested and transferred over generations, from traditional ali‘i to the royal Kamehameha line, to Kamehameha Schools as an ali‘i institution. Finally, we discuss how we endeavor to meet inherited obligations through Kamehameha Schools’ resource management approach today, which includes active stewardship of vast tracts of native ecosystems and Hawai‘i’s most important cultural sites, influencing biocultural well-being through representing ‘Ōiwi perspectives in diverse industries, and developing the next generation of ‘Ōiwi stewards. We provide a guide for indigenous organizations (re)defining their ancestral ways of stewardship, as well as for the many non-indigenous agencies with obligations to native lands and people today working to incorporate indigenous systems into their current management. Given that much of the world’s lands are indigenous spaces, we argue that the restoration of effective biocultural resource management systems worldwide requires the maintenance, and in some cases reestablishment, of indigenous institutions at multiple levels.

Keywords: indigenous resource management; Hawai‘i; biocultural conservation

1. Introduction

As indigenous people are increasingly recognized as critical to biocultural resource conservation globally [1–4], some indigenous communities and organizations are regaining management of their

ancestral lands and resources [5–9]. Yet, the question remains, how can the world manage biocultural land and seascapes in an indigenous way in the 21st century, given the immense environmental and social changes that indigenous systems have endured over the last several hundred years. Hawai'i exemplifies intense socio-ecological change. The archipelago has some of the highest rates of endemism on land [10] and in the sea [11] in the world, but is challenged with extreme threats of invasive species and habitat loss, leading to high degrees of extinction [12]. Kānaka 'Ōiwi (Indigenous Hawaiian people) who have stewarded the lands and seas of Hawai'i for a millennium, have been systematically dispossessed of sovereign governance, including loss of stewardship and access to ancestral lands as well as loss of traditional management and tenure of shoreline and ocean resources [13], and face disproportionately high rates of poverty, homelessness, health issues, abuse, and incarceration [14,15]. As the health and well-being of indigenous people are inextricably linked to the health of their ancestral places [16–18], it is critical to understand past and current systems of indigenous stewardship not only for potential resource management benefits, but for the plethora of interrelated social values which drive collective well-being.

We know that indigenous management systems are by their nature responsive, adaptive to social and ecological change, and transform over time [19], and therefore could be applicable to address today's sustainability challenges that fundamentally bridge disciplines, such as climate change adaptation [13]. Moreover, many indigenous resource management institutions and their governance have been shown to be especially sustainable and resilient over long periods of time [20]. Yet, there is a scarcity of examples of applied indigenous resource management [21–23]. Furthermore, existing models of application and integration of indigenous knowledge in resource management often focus on data-oriented knowledge that can easily fit into western science frameworks such as knowledge of weather and climate [24,25], animal ecology [26], phenology [27] or management practices like marine prohibitions [28], forest patch protection [29], agroecological practices [30], and watershed-based management [31]. Focusing on knowledge and management practices alone ignores the fact that indigenous knowledge is inextricably nested within systems of practice and belief [19], and successful application of indigenous knowledge systems for resource management depends on the conservation of these through the system's social institutions and worldviews [29,32,33].

Additionally, the socio-ecological literature championing indigenous systems of stewardship lacks cases from the perspective of indigenous authors, although there are a few examples [34–36]. When working to understand and bridge indigenous systems of resource management, it is critical to learn directly from the indigenous point of view. Beyond that, indigenous-led examples allow for a self-determined approach and expression grounded in ancestral ways of knowing [36–38]. In this paper, we provide an example of the maintenance and adaptation of an indigenous resource management system in Hawai'i from the perspective of an influential 'Ōiwi (Indigenous Hawaiian) social institution, Kamehameha Schools. Kamehameha Schools is not only the largest private landowner in Hawai'i, but as we explain below, is tied to a lineage of traditional chiefs resulting in unique influence and wealth today.

1.1. Brief History of Kamehameha Schools

Shortly after Western Contact in 1778, the famous ali'i (chief) Kamehameha I, united the Hawaiian Islands under his rule for the first time in Hawai'i history, forming the Hawaiian Kingdom [39]. This consolidation of power allowed for the hereditary passing of lands to his descendants, who would remain the dominant chiefs through the Hawai'i Kingdom era. Even throughout the process of Western-based land privatization in the mid-1840's, Kamehameha's descendants retained control of vast tracts of lands. These lands were passed down within the family until the last direct descendant of the Kamehameha line, Bernice Pauahi Bishop. During her lifetime (1831–1884), Pauahi witnessed a substantial 35% decline in the Native Hawaiian population mainly due to Western disease. With that decline came a loss of 'Ōiwi lifeways and tradition. Because Pauahi believed that education would offer

her people the best future, she left her entire estate, nine percent of the Hawaiian Islands, to establish the Kamehameha Schools. At her passing, Pauahi's estate totaled 375,500 acres of land assessed at about \$474,000. Today, Kamehameha Schools' estate includes nearly 365,800 acres or ten percent of Hawai'i's land (Figure 1), and combined with other assets, is valued at \$11.5 billion [40]. As a result of Pauahi's vision, Kamehameha Schools' mission focuses on the creation of educational opportunities in perpetuity to improve the capability and well-being of people of Kānaka 'Ōiwi ancestry.

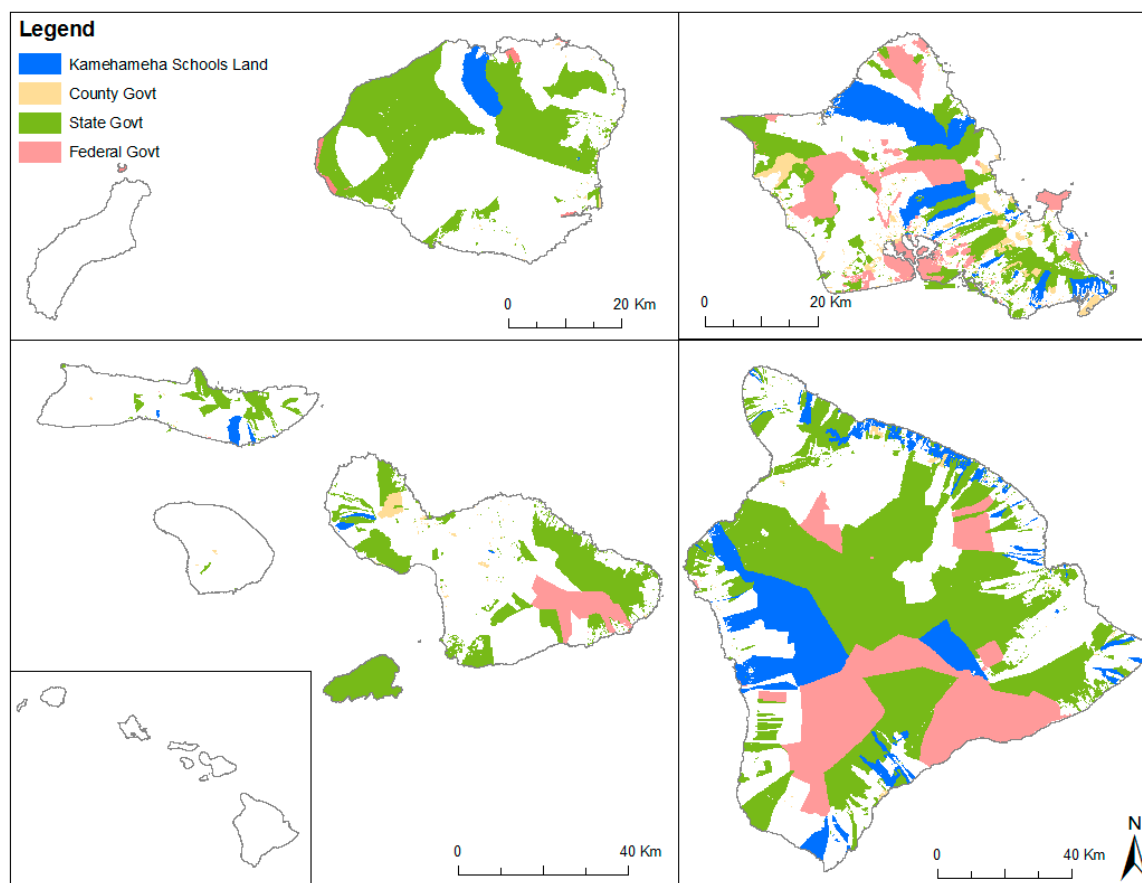


Figure 1. Map showing distribution of Kamehameha Schools lands (blue) along with lands managed by the Counties (orange), the State (green), and the Federal (pink) governments.

1.2. Development of Kamehameha Schools' Natural and Cultural Resource Management

In 2002, the department responsible for Natural and Cultural Resources stewardship was created. We, the authors of this paper, currently make up this team at Kamehameha Schools, which is responsible for the stewardship of all of the native ecosystems and cultural sites and landscapes within the institution's 365,800 acre landholdings. At its inception, our team was charged with the task of "mālama i ka 'āina", an 'Ōiwi concept literally translated as "care for the land", which the institution defines as "ethical, prudent, and culturally-appropriate stewardship of lands and resources" [41]. Those of us who were there at the time, along with our predecessors and former leaders (Neil Hannahs, Ulalia Woodside, and Kekuewa Kikilo'i), set out to understand and (re)discover what it means to steward Kamehameha Schools' land in an 'Ōiwi way, something that was customary in our history, but had been largely lost within the institution in the recent century. Since 2002, we have taken deep dives into resources, including within historical documents, 'Ōiwi scholarship, and our own institutional archives, so that we could understand why and how to do our work of appropriate 'Ōiwi stewardship of Kamehameha Schools land.

Of the authors, five of us are Kānaka 'Ōiwi and all of us are kama'āina (born and raised in Hawai'i; literally "land child" [42]) with collectively over 40 years of experience managing resources

at Kamehameha Schools from an indigenous institutional perspective. This figure is even more extraordinary when considering the fact that our team's average age is currently just 35 years old. Our backgrounds include training in both 'Ōiwi and Western knowledge systems in the fields of: Ritual, Oli (the practice of chant), 'Ōlelo Hawai'i (Hawaiian Language), Traditional Hawaiian Land Use, Biocultural Resource Management, Ethnoecology, Botany, Archaeology, Anthropology, Hawaiian Studies, Urban and Regional Planning, Agroecology. We consistently bridge these complementary systems and disciplines in our work directing the maintenance and restoration of biocultural integrity on Kamehameha Schools' lands. This paper is a result of our personal experience of years developing an indigenous way of stewardship through on-the-ground natural and cultural resource management.

As an indigenous organization, Kamehameha Schools is unique, in Hawai'i and within the broader global context, because it is (1) a large-scale owner and steward of ancestral lands with (2) substantial decision-making authority and (3) financial wealth to fund a perpetual vision for its lands and communities. Albeit, within a larger colonial hierarchy (U.S. state, federal, and international regulations and law). So, what does it look like, when an indigenous organization has the power to be in full control of resources for the betterment of their native communities in perpetuity? There are far-reaching implications of sharing our story, for other indigenous organizations around the world that are (re)discovering their own ways of stewardship. Moreover, there are state, federal, and other non-governmental organizations that do not have indigenous-focused missions in Hawai'i and around the world, but are now responsible for the management of former indigenously-stewarded lands and seas. In Hawai'i, those include some of the most bioculturally important lands that were originally bestowed to the Hawaiian Kingdom Government or to the Crown, including the summits of sacred mountains (e.g., Mauna Kea (see [43]), Mauna Loa, Kīlauea, Haleakalā, Ka'ala) as well as the majority of the watersheds, and all of the nearshore and marine seascapes across the archipelago (Figure 1). Because of the growing recognition of the value of biocultural resource management [44], many of these agencies are working towards incorporating 'Ōiwi ways of knowing into their current management [45,46]. Our case study can provide a potential roadmap for these non-indigenous agencies working to bridge multiple knowledge systems to manage or restore biocultural abundance in the lands and communities they are responsible for today.

In this case study of applied indigenous resource management, we have used 'Ōiwi methodologies to define for ourselves what it means to steward 'āina (land and seascapes) in an 'Ōiwi way. Therefore, this paper does not follow the standard Introduction, Methods, Results, and Discussion format of a scientific journal article, but rather is framed by the 'Ōiwi concept of mo'okūauhau (genealogy). First, we work to understand our mo'okūauhau, our continuity in our positions as 'āina stewards of an ali'i institution. We look to indigenous worldviews and traditional institutions particular to us as Kamehameha Schools land stewards through examining primary 'Ōiwi sources, such as mele (chants) and ka'ao (cosmologies), mo'olelo (life stories) and 'ōlelo no'eau (wise sayings of biocultural significance), as well as secondary source interpretations of traditional concepts from early Kānaka 'Ōiwi scholars. Second, we examine the transference of obligation genealogically and through landscapes. We look to chiefs of the Kamehameha lineage and how they related to their land holdings during their lifetime through chants written for them, mo'olelo in Hawaiian language newspaper articles of their time, as well as documentation of their land stewardship in their letters and land reports. The task is to figure out who we are, not in the sense of our name, or title, but *what is our function?* We do this by determining where we sit in the genealogical framework of the institution. Third, we discuss the ways in which our resource management predecessors took on the responsibility, to both our 'āina and our Kānaka 'Ōiwi communities, again examining internal land documents and letters of our institutional predecessors. Fourth, we consider our research and resource management experiences to discuss how we as an indigenous institution endeavor to meet these genealogical obligations through our resource management program today. We seek to answer the question, how do we serve to continue the function of those before us our institutional genealogy in today's socio-ecologic context?

2. 'Ōiwi Worldview: Mo'okū'auhau & Aloha (Genealogy & Reciprocity)

First we had to understand how and where we as humans sit in relation to the rest of our Hawaiian universe, including the natural and cultural resources we steward, through an 'Ōiwi worldview. From this perspective, kānaka (people) have a shared ancestry with 'āina (land and sea), inclusive of the earth, sky, the celestial bodies, all living things in the sea, on land and in the atmosphere, as well as the dynamic processes that sustain these systems [47–51]. In the Kumulipo cosmology, which details the creation of the Hawaiian universe, in the first wā (time) there is only darkness [48]. The chant states that all life originates from the primordial slime. First is born Kumulipo, a male, and Po'ele a female, then the 'ukuko'ako'a (coral polyp), the many creatures and algae of the ocean and their counterpart plants on land. The two thousand line chant recognizes the birth of all our fish and invertebrates and their plant counterparts, the insects, forest and seabirds, turtles, lobsters, those that cling, the pig, the rat, and the dog. In the eighth wā, the female La'ila'i and the male Ki'i were born and the gods Kāne and Kanaloa were born. It is from La'ila'i and Ki'i that generations of ali'i and then commoners were born. The Kumulipo also recognizes the genealogy of Hāloa—the first kalo and elder brother of the Hawaiian people, who came from Wākea (expansive sky), Papa (earth foundation), and Ho'ohōkūkalanī (star establisher). In this single chant, one can see the intimate kinship that the people of Hawai'i share with the Hawaiian universe, from the tiny coral polyp to every fish or plant or animal, each is foundational to our genealogy as kānaka.

"I ola 'oe, i ola mākou nei."

When you live, so do we.

—Hi'iakaikapolioplele to an 'Ōhi'a (*Metrosideros polymorpha*) forest [52]

In genealogies such as the Kumulipo, we recognize that 'āina—inclusive of all the native lifeforms and ecological processes, came before us as kānaka, and have created the foundations upon which we live and thrive. Thus, we all have inherited the responsibility through our genealogy as Kānaka 'Ōiwi to ensure the continuation of such foundations. The health of 'āina is inherently and reciprocally related to the health and well-being of its people [18,53]. For example, our existence depends on the health and existence of the forest, all lifeforms and ecological processes therein, which provides us with fresh water, climate regulation, materials for construction, and medicine, as well as our ancestral plants like the endemic and bioculturally foundational 'ōhi'a (*Metrosideros polymorpha*), which also provides cultural inspiration, reminding us how to adapt and flourish in harsh conditions, while also nourishing those around us. The opposite is true as well—that the forest's health depends on our health. We must ensure that our human activities do not adversely affect the forest, not overharvest any of its elements, protect it from weeds and invasive animals, and continue to chant, sing, and dance to honor its existence. Within this worldview, we participate in a reciprocal relationship with the natural world—to take and give in kind, as a sound and necessary means to ensure our collective well-being inclusive of 'āina.

3. The Ali'i Institution

In order to understand where we sit in Kamehameha Schools' continuity as an ali'i institution stewarding lands, we must first understand the basic traditional systems of how ali'i related to and were responsible for 'āina. It is outside of the scope of this paper to give a comprehensive summary of the ali'i institution. Here, we provide our understanding of the ali'i particularly in regards to stewardship of 'āina in the past, so that we can think about application of these concepts today.

3.1. Reciprocal Relationships between 'āina, ali'i, and maka'āinana

“Ili'i o Hāloa.”

Pebbles of Hāloa.

Descendants of chiefs of Hāloa, grandson of Wākea and Papa, or any chiefs descended from the gods. [54] #1227.

In this section we discuss the social institution of the ali'i class in traditional Hawai'i, describing the reciprocal relationships between (1) the 'āina, (2) the ali'i, and (3) the maka'āinana (commoners) (Figure 2). In the 'Ōiwi worldview, the ali'i were recognized as close descendants of the akua (elemental deities or natural phenomena often translated as gods) because they came before maka'āinana genealogically [48,55]. The high ali'i were considered to be direct descendants of akua [56], with some accounts calling highest ni'aupi'o chiefs “gods among men” [48]. Akua are natural forces and elements that sustain life. For example the major akua Kāne and his many forms include fresh water, the sun, air currents, as well as the associated forces such as the gathering of clouds, the red-hued setting sun, or the dark density within a storm [47] (p. 104–105). Akua are also the lifeforms on earth, including the animals, rocks, and plants, such as the 'ie'ie (*Freycinetia arborea*), the climbing monocot in the forest also associated with Kāne due to the ways in which it intercepts and distributes rain into the forest understory [57]. One can see that akua are 'āina, as they make up the land and seas and all of the processes therein [33,44]. 'āina, the term we use for land and seascapes, is translated as “that which feeds” physically, spiritually, mentally. Akua, and 'Ōiwi spirituality more generally, cannot be separated from 'āina.

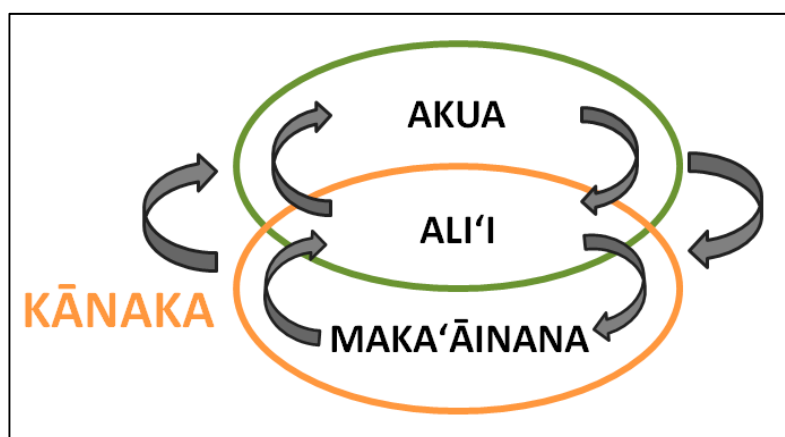


Figure 2. Hierarchical and reciprocal relationships between akua, ali'i, and maka'āinana.

Akua were described by Pukui, Haertig, and Lee as “the impersonal gods of Hawaii, powerful, distant deities whose origins were lost in dim corridors of time” [56] (p. 23). However, because of their close genealogical relationship, the ali'i could maintain an intimate connection with higher level akua, that maka'āinana could not. Although, there were other less significant personal gods that maka'āinana had access to [56].

“Hānau ka 'āina, hānau ke ali'i, hānau ke kanaka.”

Born was the land, born were the chiefs, born were the commoners.

The land, the chiefs, and the commoners belong together [54] #466.

Unlike Western feudal relationships between chiefs and commoners, in traditional Hawai'i, ali'i had a close kinship with the maka'āinana. The maka'āinana considered the ali'i, an elder sibling [53]. They needed one another, while the maka'āinana cultivated abundance on both land and sea with expert skills spanning realms of engineering, botany, medicine, navigation, psychology, sport, fishing, farming, architecture, etc. [58], and the ali'i provided access to akua, protection from war, enforcement

of social norms, as well as the maintenance of land and seascape integrity. Because of the genealogical relationship to akua (who came before) and makaʻainana (who came after), the aliʻi had a duty to care for both akua/ʻāina and their people. There were many types of aliʻi situated within a hierarchical structure, correlating to various scales of resource management. The highest aliʻi (e.g., Aliʻi Nui) was entrusted with the coordination of the largest scale of resource management at the scale of the island. While the aliʻi below him were in charge of the stewardship according to various smaller socio-ecological divisions [50] (Figure 3).

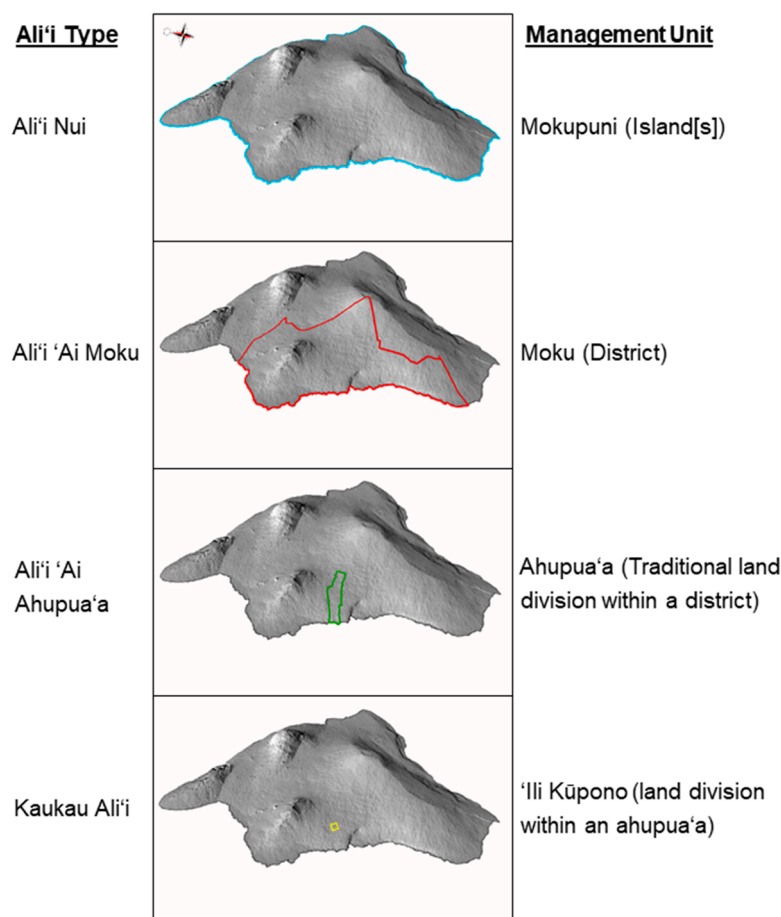


Figure 3. The various scales of socio-ecological management by aliʻi in traditional Hawaiʻi [50].

3.2. Kaumaha-Chiefly Obligation to Steward in Perpetuity

As we (re)understood the relationship aliʻi had with ʻāina and makaʻāinana, we thought more about the vast responsibility that the aliʻi shouldered to ensure the functioning of the socio-ecological system. We enlisted Kānaka ʻŌiwi scholars at the indigenous organization, the Edith Kanakaʻole Foundation (EKF) to assist us in understanding these profound concepts. We describe the weighty or heavy burden of aliʻi to safeguard and perpetuate resources in perpetuity for his or her people as kaumaha [47,57]. We use kaumaha to describe a deep, imperative responsibility that one cannot easily relinquish, such as that of landscape-level ʻāina stewardship.

The word kaumaha is colloquially most often understood as the feeling of sadness, grief and sorrow, and contemporarily, students often learn this word early in ʻōlelo Hawaiʻi classroom training as an example stative verb in sentences like: “Kaumaha au, I am sad.” However, connotations of grief and sadness are not what we wish to convey in this context of ʻāina stewardship. Pukui, Haertig and Lee (2002) explain that kaumaha as grief and sorrow is derived from the “original use of kaumaha meaning weight or heavy weight and from use of the separate syllables, kau (place, put, set) and maha (relief or rest). From the most literal connotation, that holding a physical weight is followed with relief when it is set down,

came the abstract idea that grief is a heavy weight followed by relief.” [56] (p. 132). The literal and figurative *kaumaha* is somewhat like the English word *burden*, which refers to a heavy load that one carries, but figuratively and colloquially is understood as misfortune or hardship. In our context describing the perpetual duty to maintain and steward ‘āina, we refer to the original meanings of *kaumaha*: heavy, weighty, profound, deep and significant, and not its subsequent often cited figurative definitions.

Furthermore, we contrast the concept of *kaumaha*—an ali‘i obligation of stewardship, with the more familiar term *kuleana*, meaning right, privilege, responsibility [42]. Traditionally, when a new Ali‘i Nui ascended to power, all of the lands of the Island would be redistributed to the various ali‘i allies under him or her. The rights and responsibilities (or *kuleana*) that *maka‘āinana* had on those lands would not change through these conversions. On the other hand, the rights and obligations (or *kaumaha*) that individual ali‘i had to steward lands given to him or her could change drastically [59]. We view the right and responsibility *maka‘āinana* had to live on and care for their lands and seas as a *kuleana*, and indeed this is the name given to the lands that *maka‘āinana* claimed during the land privatization process of the 1840’s [45]. Both *kaumaha* and *kuleana* are inherited responsibilities through land and *mo‘okū‘auhau*, however, we argue that because of the intimate interdependence that ali‘i had with *akua* and *maka‘āinana* across various landscape scales, they carried a different obligation to maintain critical ‘āina functions for all (i.e., water cycling—discussed below).

‘O ke akua ke komo, ‘a‘oe komo kānaka

The gods may enter, man cannot enter

‘O ke kāne huawai, he akua kēnā

Man with the water gourd, he is the god

Kumulipo, Lines 111–112 [48]

In the Kumulipo lines above, the man with the *kāne huawai* (water gourd) is referred to as an *akua*. Why does this *kāne huawai* elevate this man to *akua* status? We understand this passage to be about the maintenance of the water cycle, and that the man who perpetuates the sources and driving forces of water is not a merely a man but is an ali‘i and god-like [57]. The ali‘i as the principle land steward had the *kaumaha* or imperative duty to maintain the water cycle that sustains all life—the streams, the groundwater, the forested watershed, evaporation, condensation, precipitation [57]. The maintenance of the function of the watershed ensured that all lifeforms in the Hawaiian realm would be supported, including people. This involved the protection of the geologic formations that drive weather systems, the large trees that interact with the atmosphere to produce rain and cloudfall, the multi-layered forest that slows the force of descending raindrops, the groundcovers that absorb moisture and prevent erosion, as well as the aquifers and conduits that hold and distribute fresh water throughout the landscape.

In order to fulfill the *kaumaha* to ensure maintenance of ‘āina in perpetuity, the ali‘i imposed rules for resource interaction, which included *kānāwai* (laws, rules, or protocols) and *kapu* (sacred, prohibitions, taboos) at different scales [42,60,61]. *Kānāwai* and *kapu* are both essential elements of ‘Ōiwi religion more broadly. *Kānāwai* and *kapu* indicate the relationship between natural phenomenon and natural phenomenon, *Kānaka* and natural phenomenon, and *Kānaka* to *Kānaka*”, [47] (p. 45), meaning these concepts tell us (1) how different elements of the environment will interact, (2) how we as people and the environment should interact, and (3) how we as people should interact with one another. All three relationships are vital for biocultural resource health. The ali‘i, as the institutors of *kapu* and *kānāwai* in traditional Hawai‘i, governed through these relationships. First, they understood environmental element interactions and cycles through careful observation over generations. Second, using this expert scientific understanding of their environments, they understood resources had specific *kapu* or a sacredness which prohibited *kānaka* to access those resources at specific times. Ali‘i enacted *kānāwai* of how *kānaka* should access those *kapu* resources. For example, seasonal *kānāwai* were put upon many *kapu* fish according to observations of their spawning times, knowledge of their maturity rates, food abundance and availability, and other information [49,50,62]. And third, ali‘i created and

enforce rules of how people should interact with one another, an example being Kamehameha I’s famous Kānāwai Māmalahoe, or Law of the Splintered Paddle, which declared protections for all people, young and old, from violent assault [63].

3.3. Kaumaha Inherited Throughout the Kamehameha Line

As we began to understand kaumaha as a foundational concept of traditional ali’i stewardship, we wanted to determine how the ali’i who came before us demonstrated kaumaha in their ‘āina management and how kaumaha was transferred. At the start of this journey to (re)discover our function, the genealogy of Kamehameha Schools’ lands was forgotten. We knew that lands originally were consolidated under Kamehameha I and eventually were bequeathed to Bernice Pauahi, yet we did not know which other ali’i had kaumaha for these lands, and thus how they stewarded. One of the first tasks taken on by our predecessors was to determine which ali’i are connected to lands in the over 70 ahupua‘a we have tenure for today. This was done by looking through the institutions property title archives, historic maps, as well as Māhele records (documents from land privatization in the 1840’s), most of which are now electronically available online (see kipukadatabase.com, papakilodatabase.com, Avakonohiki.org). The results of this research are shown in Figure 4.

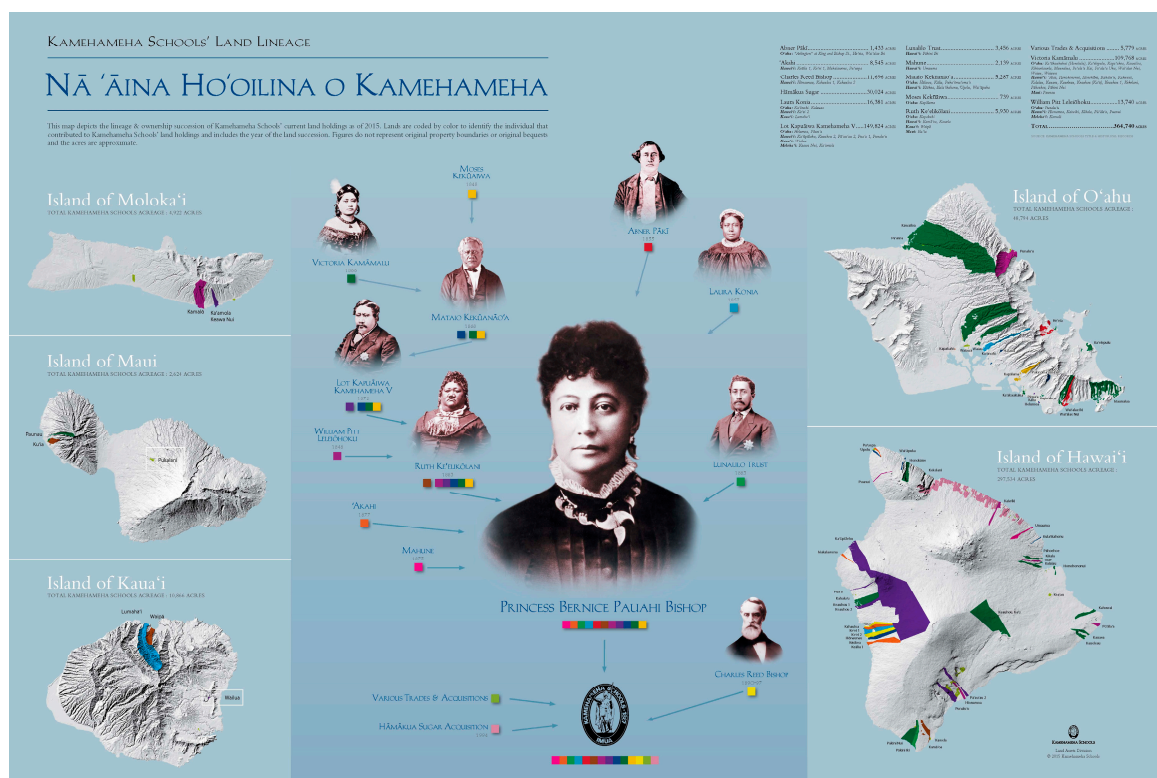


Figure 4. Map depicting ‘āina ho’oilina or inherited lands from Bernice Pauahi Bishop’s ali’i. ancestors.

More recently, we have looked to specific ali’i predecessors to understand how they carried kaumaha to steward the same lands we manage today. We found that the kaumaha that the ali’i held to ensure the persistence and prosperity of ‘āina, including its flora, fauna, and human communities for generations to come are illustrated throughout the Kamehameha line of chiefs, starting with Kamehameha I. We found the principle of kaumaha evident even through Western contact and colonization, and the vast socio-ecological changes in Hawai’i. Stories of Kamehameha’s life originally printed in Hawaiian language newspapers in the 19th and 20th centuries, often layout his accomplishments in stewardship and restoration of biocultural integrity [64–67]. One mo’olelo found in multiple accounts showed us how he managed resources during his rule, at a time just after first Western contact. When seeing his people harvesting small sandalwood (*Santalum* spp.; ‘iliahi)

trees from upland forests in the early 1800’s at the behest of other lower-ranking ali’i who were taking advantage of new capitalistic economies, Kamehameha said to them:

“No ke aha la oukou i mana’o ai e kua i kēia lā’au’ala li’ili’i, ‘oiai e nui aku ana ‘o ia ma kēia mua aku? Ua pane mai la nā kākau ali’i me nā kānaka. Ua elemakule ‘oe a ua kokoke mai nā lā hope o kou ola ‘ana, a na wai la ia mau lā’au’ala, ‘a’ole mākou i ‘ike i ka mea nāna ia lā’au’ala ma kēia mua aku. Ia wā pane aku ‘o Kamehameha iā lākou penei: ‘A’ole anei ‘oukou i ‘ike i ka’u po’e keiki? ‘O lākou auane’i ka po’e nāna ia mau lā’au’ala, a o lākou nō auane’i ko’u po’e kaulana ‘āina ma kēia hope aku, ke huli a’e nā lā o ko’u ola ‘ana ma kēia ao.”

Why did you folks think to cut these small sandalwood when it still has yet to grow? The royal scribe and the people replied, You are getting old and the end of your life is getting near, and for who are these sandalwoods? We don’t see the ones who these sandalwoods belong to from here on out. Kamehameha responded to them: You folks don’t see my future descendants? From this time, they are the ones these sandalwoods belong to, and they are indeed my land stewards hereafter, my living days are turning over in this realm.

(Rev. J.F. Pokuea in Ke Aloha Aina 1896 [64]; Translated and diacriticals added by author)

This account suggests that Kamehameha may have instituted a kapu on sandalwood harvest during this time, as would be custom for an ali’i of his status. The story alludes to Kamehameha’s (1) responsibility to manage of the forest resources at a landscape scale, larger than areas that are the responsibility of lesser ali’i; (2) recognition of the mutual dependence of kānaka and the sandalwood tree, (3) and that he is considering this mutla dependence not only in the current generation but for the numerous of generations of kānaka ‘ōiwi, even those still unseen to us today.

Because ali’i, including Kamehameha maintained a close relationship with the akua, they were often called upon by their maka’āinana to serve as an intermediary in times of need [47]. Kamehameha exhibits his relationship during the 1801 lava flow in the Kekaha region of Kona, Hawai’i Island where he is asked by his maka’āinana to intercede with Pele (the Hawaiian deity of volcanism, fire, lava, eruption) as a lava flow was threatening the lands in the region. Even a century after Western contact, the people still looked to the ali’i as the social institution that communicated with natural phenomena, the akua. For example, the kaumaha to communicate with akua continues on to Kamehameha’s great-granddaughter Ruth Ke’elikōlani (Figure 5). In 1881, Ke’elikōlani is also called upon by the people of Hilo to intercede with Pele in upper Hilo, where she successfully entreats with Pele to stop a lava flow heading towards Hilo [68].

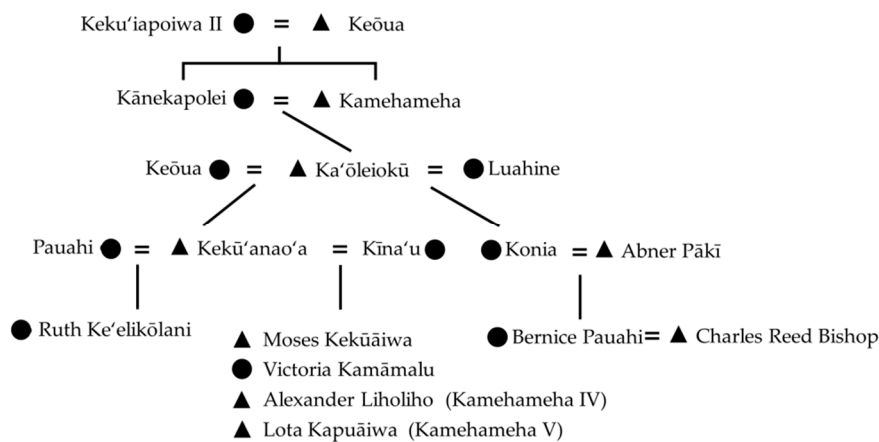


Figure 5. Mo’okū’auhau showing the ancestry of kaumaha from Kamehameha to his great-granddaughters Ruth Ke’elikōlani and Bernice Pauahi.

In this same era of the 1800's, we see the kaumaha of the ali'i being passed down from chief to their heirs not just genealogically, but also through the land tenure. When Ke'elikōlani, the largest landowner in Hawai'i, passes away in 1883, her land lineage from the Kamehameha line as well as the responsibility of the ali'i to be the link to akua is passed down to our organization's founder, Bernice Pauahi Bishop. Pauahi's name, inherited from her aunt (Ke'elikōlani's mother) translated as "destroyed by fire" [69], suggests a relationship between her kaumaha as a Kamehameha ali'i and the fire or Pele [47]. In Hawai'i tradition, mele inoa (name chants) were created to honor a newborn's genealogy from the baby's human family to the ancestral deities that came before them [55,68] Pauahi's name chant (a portion below) provides information codifying her connection with the akua Pele as well as her kaumaha to protect and maintain the water, and her connection as an ali'i to the akua [47].

He kapu he moe wai no ka uka

The taboo is the taboo of "water storage" for the uplands

Kahu ka 'ena, kai mu i kai ko'o, o Nauahi loa

Steward the heat, from silent seas to billowing seas, longevity of all manner of uahi (smoke)

(He Inoa No Pauahi -Birth Chant of Bernice Pauahi Bishop), Lines 12 and 81 [68]; Translated in [47])

3.4. Kamehameha Schools Inherits Kaumaha

Throughout her life, Pauahi inherited lands from her ali'i family members (Figure 4), with the largest set of lands from Ruth Ke'elikōlani at her death in 1883. At that time, Pauahi was the last remaining heir of the Kamehameha line, and her estate of over 370,000 acres of land represented the lands once controlled by Kamehameha. In the same year, Bernice Pauahi completed her will, which bequeathed all of her estate to create and maintain the Kamehameha Schools. She died just one year later [68]. This relationship and responsibility of the ali'i is passed on even after the biological end of the Kamehameha line at Pauahi's death, through the creation of the Kamehameha Schools. In this establishment of the Kamehameha Schools as an "ali'i institution", as the steward and keeper of the Kamehameha line's ali'i lands, Kamehameha Schools serves the ali'i function, with the kaumaha to care for its resources and people in perpetuity.

In the late 19th and early 20th century, extractive land use practices were widespread across Hawai'i, and included largescale clearing of lands for pasture, sugar, and pineapple. Despite this, early Kamehameha Schools Trustees instead made decisions to ensure the protection of resources on the estate's landholdings. The quote below from Charles Reed Bishop, Pauahi's husband and one of the first Trustees of Kamehameha Schools, demonstrates his understanding of the ali'i kaumaha to maintain the natural resources, not only for the short-term utilitarian benefits to the institution, but more importantly also for the maintenance of climate regulation, erosion control, water supply and quality into the future.

So much is already known regarding the great value of forests, not only for furnishing fuel, building material and furniture woods, but in preserving the rainfall, restraining the violence of freshets, perpetuating the springs and rivulets of water, tempering the atmosphere and preventing the waste of the soil... It would be well for large landowners to reserve suitable localities—hilltops . . . for tree planting. The results, if not directly profitable in a pecuniary point of view, would be advantageous in the local effects upon the climate, and protection against landslides and storms. It has come to be a necessity.

—Charles Reed Bishop, 1883 [69]

The actions of Kamehameha Schools' early Trustees recognize the ali'i responsibility of maintaining the water cycle, as explained earlier. Agents of the ali'i institution at that time voluntarily set aside vast tracts of native forest lands for the express purpose of watershed and forest resource protection. They chose not to convert lands to pasture by clearcutting, as many other large landowners were doing, and instead chose to maintain these forested uplands for generations to come. Beginning in the 1890's, they allocated resources to fencing, removal of livestock, establishment of nurseries,

and replanting of trees, years before the creation of the United States Forest Service (1905) or the territory of Hawai'i's Board of Commissioners of Agriculture and Forestry (1903) [70]. The forethinking by these early Trustees has resulted in many native forested landscapes that serve as primary watersheds for many communities today. For example, in the leeward district of Kona, Hawai'i Island, we currently actively steward much of the remaining mesic and wet native-dominated forest in the region (Figure 6), which continue to serve as vital sources for much of the community's drinking water.



Figure 6. Results of early KS decisions to manage forests. An aerial view of KS forested lands in Hōnaunau, Kona, Hawai'i Island on the left, and neighboring lands that were converted to pasture use.

In the same era, Charles Reed Bishop, as an agent of the ali'i institution, recognized that the lands held by Kamehameha's lineage hold arguably some of the most sacred and spiritual sites in all of Hawai'i. Yet, as culture, language and practices, were being extinguished across Hawai'i, and whole cultural landscapes erased by practices such as plantation agriculture and logging, he identified the ali'i Trust's responsibility to protect cultural resources. He wrote,

There is a matter that should not be lost sight of. I mean the acquisition and control of the Heiaus [religious temples] and Puuhonuas [religious complex; place of refuge], say those of Mookini in Kahala [Kohala], of Puukohola at Kawaihae, of Pakaalana in Waipio, of Honaunau in Kona, and perhaps one of the Islets of Mokuola in Hilo Bay, and any others of interest and worth preserving . . . once in the control of the Museum they should be protected perpetually . . .

—Charles Reed Bishop to Henry Holmes, 1897 [71]

The “museum” referenced here is the Bishop Museum, Hawai'i's largest museum today. Founded by Bishop at the request of his wife Pauahi as a perpetual place to house the many cultural items of her family, and as this quote suggests, maintain the wahi kūpuna (ancestral spaces) that are critical to Ōiwi identity. It is important to note is that Charles Reed Bishop was an American as well as a Hawaiian Kingdom citizen, however not Kānaka Ōiwi by ancestry. Yet, as a representative of the ali'i institution, he inherits and carries the kaumaha to maintain the biocultural health of Kamehameha Schools' resources in perpetuity. This idea is powerful. We are not biological descendants of the ali'i who originally held and cared for the lands we are responsible for today, but, we have inherited the kaumaha held in the mo'okū'auhau of the 'āina. We carry the kaumaha of our predecessors irrelevant of our biological ancestry or cultural background. Our team has personally come to these realizations through our research and through our physical, mental, and spiritual work within these lands day in and day out, year in and year out.

4. The 21st Century: Returning to Ancestral Principles

4.1. Remembering our Foundations

Though we found references and examples of prudent management of natural and cultural resources and perpetual vision by early leaders at Kamehameha Schools, these concepts were not widespread within the institution for much of the 20th century. In fact, one of the main reasons we undertook this exercise to understand our function through genealogy is because there are even more cases in the recent memory of the institution's damaging decisions [72]. For example, long-term leases to vast sugar plantations (i.e., Kawaihoa, O'ahu); transformation of biodiverse forests to pasture and agriculture (i.e., Keauhou-Ka'u, Hawai'i Island); residential developments in traditionally abundant agroecosystems and aquaculture areas (i.e., Ka'elepulu and He'eia, O'ahu), commercial and resort development in areas with widespread and important cultural sites (i.e., Ka'upulehu, Kahalu'u, and Keauhou, Hawai'i Island); legacy land sold then subsequently bulldozed (i.e., Kapu'a, Hawai'i Island which held one of the most diverse mesic forests in the area). Kamehameha Schools was "land rich, and cash poor", and at that time, and its 'āina was viewed solely as an economic resource to fund the educational mission. Yet, this approach completely ignored the 'Ōiwi worldview that kānaka and 'āina are ancestrally and reciprocally connected and disregarded the mo'okū'auhau of Kamehameha Schools' ali'i lands including the kaumaha transferred within. There were many other Kamehameha Schools proposals to monetize ali'i lands for marinas, resorts, golf courses, gentlemen estates, and even an amusement park in the late 1900's, however, these were met with opposition from kānaka 'ōiwi communities around the Islands. These communities are analogous to maka'āinana, as they continued to care for and live on their ancestral lands. Ultimately, it was the voices of the community that compelled Kamehameha Schools into transformative realignment evident in its 2000 Strategic Plan centered around Kānaka 'Ōiwi community discussions and concerns [41].

Goal 6: Kamehameha Schools will mālama i ka 'āina: practice ethical, prudent and culturally appropriate stewardship of lands and resources.

6.1—*Manage lands and other resources to optimize their support of the educational mission.*

- *Manage the portfolio of resources to derive an overall balance of economic, educational, cultural, environmental and community returns.*
- *Develop and incorporate educational programs and curricula into resource stewardship programs.*
- *Develop and incorporate resource stewardship into educational programs and curricula.*
- *Inventory and manage Kamehameha Schools' nonfinancial resources (e.g., historic, cultural, human, and intellectual).*

6.2—*Manage lands to protect and enhance ecosystems and the wahi kūpuna (ancestral sites inclusive of all cultural resources and iwi [burials]) they contain.*

- *Integrate Hawaiian cultural values and knowledge into resource stewardship practices.*
- *Incorporate ahupua'a—land division—management principles which recognize the interdependencies of ecosystems and create a synergy of uses in land use decisions.*
- *Promote a broad understanding of stewardship efforts and, as appropriate, cultural resource management programs. (Kamehameha Schools Strategic Plan 2000–2015)*

In this new era, decisions around lands and resources returned, for the first time in a generation, to the ancestral principle that kānaka are part of a larger "ohana (family) that includes the rest of the universe: land; sky; fresh water; salt water; plants and animals" [73]. Around this time, the Kamehameha Schools leadership made successful financial investments, resulting in a shift from a land rich and cash poor entity, to a Trust that was "land rich" and growing a diverse endowment of real estate and financial assets. This wealth allowed Kamehameha Schools the opportunity to once again make strategic investments into the stewardship of its landholdings.

Today, Kamehameha Schools is an \$11.5 billion trust, and the organization as a whole recognizes that our institutional genealogy is deeply tied to our 'āina, which we can directly attribute our current economic, educational, and biocultural wealth to [41]. We recognize that because of its inheritance from our ali'i (Pauahi, Ke'elikōlani, to Kamehameha I and beyond), our landbase (ten percent of Hawai'i), and now our financial wealth, our kaumaha or profound responsibility to both steward 'āina and reciprocally support community is even greater. Kamehameha Schools continues to be looked at by many beneficiaries to be the ali'i that provides for community in a modern context beyond just education, but for community and social programming, agricultural opportunities, natural and cultural resource management, publishing, political advocacy, and commercial real estate development.

4.2. The Manifestation of 'Ōiwi Principles in Stewardship Today

I Hawai'i nō nā Hawai'i i ka 'āina

Hawaiians are Hawaiians because of the land [74]

How do we continue the function of the ali'i and leaders of our institutional genealogy in today's socio-ecological context? In 2008, our department composed the adage above. The saying recognizes (1) the shared ancestry that kānaka have with all of the elements of 'āina and (2) our reciprocal relationship and interdependence. Just as the 'Ōiwi lifeforms evolved over many years to create the unique native ecosystems and landscapes of Hawai'i, so too have those ecosystems shaped the cultural identity, traditions and practices of Kānaka 'Ōiwi as a people. These concepts of mo'okū'auhau and aloha are at the foundation of our stewardship—which includes natural and cultural resource management, advocacy, community engagement, and beyond.

Additionally, we hold kaumaha as a programmatic principle and basis for many of our decisions, as we strive to meet our obligation as an ali'i land steward by contributing to biocultural resource stewardship across Hawai'i. Twelve percent of Hawai'i's remaining native ecosystems are on Kamehameha Schools' lands and over half of all of Hawai'i's threatened and endangered species depend on increasingly rare native habitats within these landholdings. Like our predecessors, we recognize that healthy, functioning native ecosystems provide critical ecosystem services that sustain life and quality of life in our islands, for native plants and animals, and all those who drink our water, breathe our air, and are inspired by our landscapes. Though we are not mandated to do so by any governmental authority, we know our function is to maintain the summits, headwaters, forests, coastal zones, hills, as sources of our ancestral identity for the benefit of our 'Ōiwi communities forever. An entire one fifth of the watershed forests that sustain Hawai'i's aquifers are on Kamehameha Schools lands. We manage these vital watershed resources in association with regional watershed partnerships, voluntary alliances of private landowners and governmental agencies, who agree to work together to steward resources across landownership boundaries. Due to our extensive landholdings, we belong to 7 of Hawai'i's 10 watershed partnerships and are one of the very few private landowners that provide financial resources to support the critical watershed conservation work of these partnerships.

Over the past generation, we've shifted over 100,000 acres of land from pasture back into management for ecosystem health. Our approach is to protect intact native communities; enable natural regeneration, where possible, by suppressing priority threats; and, where necessary, reintroduce biocultural diversity. For example, at Keauhou, Ka'ū, we are restoring native forests and shrublands on 30,000 acres of former cattle pasture. We have installed protective fencing and removed cattle, goats, sheep, and pigs. Native canopy is being restored through replanting. Our communities participate in stewardship through 'āina-based education and community engagement programs that are strengthening and reestablishing ancestral connections to forested landscapes. Most recently, we've formalized our commitment to stewardship in this area through a Safe Harbor Agreement with the State of Hawai'i Department of Land and Natural Resources and the U.S. Fish and Wildlife Service. The agreement is a cooperative effort that supports recovery of threatened and endangered species. It is the first of its kind in Hawai'i, the longest term in the United States, and the first to cover 7 species of native birds, the 'ōpe'ape'a (*Lasiurus cinereus semotus*; Hawaiian hoary bat), and 25 species of

native plants. The Safe Harbor Agreement is a commitment to mālama Kamehameha Schools 'āina at Keauhou, Ka'ū, inclusive of rare species recovery, through landscape-scale restoration of native forests and protection of native species, while preserving Kamehameha Schools ability for beneficiaries to interact with these landscapes and resources.

The landscapes we steward are also inclusive of critical cultural resources, comprised of wahi kūpuna which include heiau, agricultural and aquacultural systems, trails, habitations areas, as well as koehana (artifacts), and iwi kūpuna (ancestral burials). Like our predecessors, we recognize our obligation to the perpetuation of our cultural resources for future generations, as they are embodiments of our ancestors' presence, existence, and sustainability. We acknowledge that these wahi kūpuna and koehana are repositories of ancestral knowledge and energy [75]. Thus, we are committed to stewarding our cultural resources in perpetuity. In order to understand the mo'okū'auhau, history, and ancestral knowledge of our lands, we have completed ethnohistoric studies for all of our landholdings. We have also inventoried close to four thousand cultural sites through various archaeological studies have to inform our stewardship of these places into the future.

We are entrusted not only to know where these sites are, but to also protect, maintain, and restore Kānaka 'Ōiwi connections with these significant wahi kūpuna. Though often challenging, we work to maintain the conditions of the many heiau in different conditions across our lands, often in remote areas and heavily impacted by natural and man-made threats. We conduct consistent management of these sacred sites and places to ensure the integrity of the wahi kūpuna, but also to maintain access to these sites for community use. We have pioneered cultural resource community engagement strategies, first providing opportunities to access to 'ike vāina (knowledge of lands) through the development of online resources including a website of 3D models of select cultural sites and artifacts. Community engagement strategies also involve improving physical access to wahi kūpuna with the intention of rekindling pilina or the ancestral bond between kānaka and 'āina. This strategy can take many forms, and includes the development of interpretive trails at sites, hosting community workdays, supporting field schools, and facilitating restoration of traditional agriculture and loko i'a (aquaculture systems). It is through both the knowledge and physical interaction with these cultural resources that our communities access and reestablish their connection to place and identity.

4.3. Influencing Stewardship Beyond Kamehameha Schools 'āina

Like our ali'i predecessors, we work across large landscapes, and are sometimes looked to by our communities as well as government agencies to be the representative voice of Kānaka 'Ōiwi in 'āina stewardship. Consequently, beyond our direct resource management functions, we have taken on the significant duty to drive 'Ōiwi perspectives in statewide consortiums and alliances. We participate in leadership roles and provide support, especially in topics concerning cultural perspectives, community-based management, and biocultural stewardship, in influential groups such as the Hawai'i Conservation Alliance, Pacific Islands Climate Change Cooperative, Environmental Funders Group, International Union for the Conservation of Nature—Indigenous Peoples Organizations and others. Such organizations and their members influence the agenda for research, funding, and policy at state, regional, and international levels. By actively participating in these groups, we uplift 'Ōiwi perspectives across scales of stewardship industries.

Furthermore, we also serve to represent our Kānaka 'Ōiwi communities with state agencies, such as those that regulate cultural sites (State of Historic Preservation), the Division of Forestry and Wildlife, and Department of Aquatic Resources. For example Kamehameha Schools supports an effort which created the first community-based marine 10-year rest area in Hawai'i in the ocean off Ka'ūpūlehu, a Kamehameha Schools landholding. We provided support in the decade of social and ecological research of the fishery, and provided testimony in favor of the initiative which required a change to the Hawai'i State Administrative Rules. Today, with the marine rest area in place, we are actively engaged in the community's planning and management of the natural and cultural resources in the near-shore and coastal areas as a partner. We have served as the lead communicator

with regulatory expertise with state agencies which have jurisdiction over some of the community's stewardship activities. The Ka'ūpūlehu marine rest area embodies the duty we feel to support our communities in their capacity to manage their ancestral biocultural abundance. Additionally, Kamehameha Schools directly partners with community individuals and organizations through 'āina-based education programming, stewardship or resource management agreements, as well as community-based management of 'āina across all of the islands we own land.

Finally, in recognition of the overall lack of Kānaka 'Ōiwi and 'Ōiwi perspectives in 'āina stewardship industries across the archipelago, our team has developed internship and other professional training opportunities to foster the development of future Kānaka 'Ōiwi resource managers in Hawai'i. These internships focus on training participants in culturally-grounded approaches to research, science, and 'āina stewardship, while also simultaneously contributing to Kamehameha Schools' on-the-ground resource management in a variety of forms. For example, due to historically little to no 'Ōiwi representation in the cultural resource management field in Hawai'i, including in the field of contractors that Kamehameha Schools looks for its own work, Kamehameha Schools supports the Wahi Kūpuna Internship Program (WKIP), developed by the Kānaka 'Ōiwi organization Huliauapa'a. The WKIP is an immersive summer internship training undergraduate Kānaka 'Ōiwi students in 'Ōiwi cultural resource management, including appropriate cultural protocol, technical skill building in ethnographic and archival research, geographic information systems (GIS), community interviews, archaeological field methods, research writing, and presentations. In addition, each student chooses a management-aligned topic to research throughout the summer tailored to questions from Kamehameha Schools resource managers or community stewards, in order to ground their newly learned skills in applied management issues. Similarly, Kamehameha Schools supports a summer Ecosystem Monitoring Internship Program focused on training undergraduate and senior level high school Kānaka 'Ōiwi students in biological survey and forest management strategies, while also providing a solid grounding in 'Ōiwi perspectives on 'āina. Many alumni of this program have gone on to seek advanced degrees in natural resources fields, and most are now employed in 'āina stewardship careers, working as kahu 'āina (land stewards), foresters, researchers, and educators. Through the half-dozen 'āina stewardship training opportunities we directly manage, and numerous others we support financially, we are working to uplift the next generation of vŌiwi thought leaders in the 'āina space. This is indeed our kaumaha, to not only care for Hawai'i's lands for our communities today, but that we ensure there are capable stewards for every aspect of aloha 'āina (love for the land)—from those who will manage the lands at Kamehameha Schools, or those who will steward from the community, to those who will do the research on our lands and seas, to those who are entrusted to teach 'Ōiwi resource management to future generations of stewards.

5. Discussion

There is increasing consensus that indigenous people worldwide are essential to biocultural conservation, because of their widespread tenure, resilient and persistent management systems, sustainable practices, and innovative conservation techniques [3]. Yet, there is a lack of examples of applied indigenous resource management in the systems context, especially from the indigenous perspective. Our case study provides an example of the maintenance of an indigenous resource management system over hundreds of years fixed within traditional worldviews, social institutions, and principles. We have shown that this resource management system was not, and is not static, but instead like other socio-ecological governance systems, has transformed and adapted overtime [19,76,77]. We provide an important case of how an organization defines itself using ancestral concepts and methodologies to execute leadership in indigenous stewardship today.

Our process is replicable, and could serve as a guide for both indigenous organizations determining for themselves how to steward in a way that is appropriate to their ancestral ways of knowing, as well as for non-indigenous agencies which have obligations to indigenous lands and people. First, we let 'Ōiwi methodologies guide us in the process of (re)discovery. Second,

we looked to the foundation, our 'Ōiwi worldviews (mo'okū'auhau and aloha). It should be noted that genealogical and reciprocal connections to landscapes are inherent in many other indigenous cultures [38], and could potentially also be a foundation for other organizations. Third, we worked to understand the institution we sit, from traditional functions, to the transference of responsibility (in our case kaumaha) through time, actors, and lands. It was through the self-determined indigenous process that we were able to answer the questions: what is our function and how do we continue that function today? It is important to note that the process is continual and iterative, as with 'Ōiwi ways of knowing, adapting, and stewarding. We continue to hold team discussions dedicated to better understanding our position in the continuity of ali'i function, and consequently, we consistently have new realizations, both personal and collective, about why and how we manage 'āina.

There are challenges and limitations beyond our individual and institutional control in maintaining an indigenous system of resource management. This continues to be an issue globally, where the structures of governance and community that indigenous institutions sit within have changed quite drastically. Even within our own indigenous institution, we face cycles of changing leadership and vision. Beyond that, as a private landowner we have limited control over what ali'i traditionally regulated (i.e., fresh water allocation, public access, nearshore and marine tenure, etc.) because these are now under the control of county, state, and federal agencies. Furthermore, traditional relationships between ali'i and community have been radically altered, with traditional social structures of community centered on 'āina, reciprocally connected to a hierarchical system of social regulation, greatly damaged through generations of American colonization, though examples of persistence exist [78,79]. Therefore, it is critical for our 'Ōiwi stewardship in this contemporary social context to look beyond our conservation and management practices alone, but to consider our greater kaumaha, our chiefly obligation to steward biocultural systems in perpetuity. We have found that one way we can fulfill our kaumaha in today's governance context, is to collaborate with governance agencies that now also carry a responsibility and heaviness once only granted to ali'i, as well as to restore our mutually benefitting relationships with community through supporting their own stewardship of their ancestral resources.

Indigenous institutions are among the world's most durable and enduring for governance, offering inspiration for the development of sustainable systems, while others, acting on vested interests, opt for short-term gains at substantial social and environmental cost. [80] (p. 340)

Like in traditional indigenous societies, effective indigenous resource management systems require social institutions that as we have shown, coordinate resource management at different scales, take on roles of governance of resources, and plan for stewardship in perpetuity [19]. For all of us working towards biocultural abundance on indigenous lands (in Hawai'i those are all landowners), it is essential to restore the institutional functions and continuity for today's context. We provide one roadmap of an institution refinding our continuity and purpose. The restoration of indigenous knowledge for resource management today necessitates the maintenance, and in some cases reestablishment, of indigenous institutions at the regional, county, state, or national level.

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