


Editorial

Hawai'i in Focus: Navigating Pathways in Global Biocultural Leadership

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Abstract: As an introduction to the special issue on “Biocultural Restoration in Hawai'i,” this manuscript provides background for term ‘biocultural restoration,’ and contextualizes it within the realms of scholarship and conservation. It explores two key themes related to the topic. First, “Earth as Island, Island as Earth,” scales up an island-borne concept of sustainability into a global context. Second, “Hawai'i as a Biocultural Leader,” examines the reasons behind the global trend of looking to the most isolated landmass on the planet for solutions to global sustainability issues. We conclude by summarizing the content of the special issue and pointing out the historic nature of its publication. It is the largest collection to date of scientific papers authored by Native Hawaiians and *kama'āina* (Hawai'i-grown) scholars, and more than 50% of both lead and total authorship are women. This Special Issue, therefore, represents a big step forward for under-represented demographics in science. It also solidifies, as embodied in many of the papers in this Special Issue, indigenous methodologies that prioritize working relationships and practical applications by directly involving those on the front lines of biocultural conservation and restoration.

Keywords: Native Hawaiian; social-ecological system; agro-ecology; *āina momona*

1. Introduction to the Special Issue

“It is seeing that establishes our place in the surrounding world; we explain that world with words but words can never undo the fact that we are surrounded by it. The relation between what we see and what we know is never settled The way we see things is affected by what we know or what we believe We never just look at one thing; we are always looking at the relation between things and ourselves.”

—John Berger, *Ways of Seeing* [1]

The term ‘biocultural’ recognizes humanity as part and parcel of the environment. We are not from another planet. In an esoteric manner that is true to some words, ‘biocultural’ is an etymological and epistemic step towards recognizing symbiotic relationships between societies and environment in the real world. As the late art critic John Berger mentions, it is an expansion of our perspective to how we relate. The term recognizes that even as humanity shapes the environment, the environment shapes us. It also helps us recognize that those who have developed a long-term experience of ‘relationship with place’ may help root us back to our home and guide us in living on this planet in a more just and sustainable way.

Biocultural diversity is the diversity of life in all its manifestations—biological and cultural. Biocultural approaches to conservation have been defined by Gavin et al. [2] (p. 140) as “conservation actions made in the service of sustaining the biophysical and sociocultural components of dynamic, interacting, and interdependent social-ecological systems”. It is a dynamic, integrative approach to understanding the links between nature and culture and the interrelationships between humans and the environment [3].

Biocultural heritage, as discussed in this Special Issue, encompasses indigenous and local community knowledge innovations, and practices that developed within their social-ecological context [4]. Biocultural approaches emphasize co-evolution of people with their biophysical environment [5], and the importance of language in symbolizing and cementing that relationship [6,7]. To speak of the biocultural is to recognize the existence of multiple worldviews as the foundation for different ways of seeing and different ways of knowing [8]. Such diversity can provide society with a greater adaptive capacity to deal with current and future changes [4,9,10].

The related nature of environment and society is captured in a variety of conceptual frameworks which assert that humans—and their behaviors—are integral elements of all environments and ecosystems. For example, Ingold’s “dwelling perspective” elaborates on the concept of humans-in-nature, as involving the “skills, sensitivities, and orientations that have developed through long experience of conducting one’s life in a particular environment” [11] (p. 25). Berkes and Folke [12] used the term “social-ecological system” to emphasize the integrative concept of humans-in-nature, and to stress that the delineation between social and ecological systems is artificial and arbitrary. Social-ecological systems are integrated complex systems that include social (human) and ecological (biophysical) subsystems in a two-way feedback relationship. The term emphasizes that the two parts (social subsystem and ecological subsystem) are equally important, and they are coupled, interdependent, and co-evolutionary.

The outcome of these frameworks ultimately is that all ecosystems are what Barton et al. [13] calls socioecosystems or contingent landscapes. These terms refer to “the intertwined social and natural landscapes that are the context of human societies and are contingent on the socioecological history as well as the physical conditions under which that history took place” [14]; they are landscapes that emphasize the interrelatedness of the social and the biophysical elements of the environment. The recognition of the dynamics and importance of the human role in ecosystems goes under a variety of names depending on the academic discipline—biocomplexity, new ecology, historical ecology, environmental history, human ecology, and as used in this Special Issue, biocultural relationships. Under any of these names, investigators are essentially concerned with how contingent landscapes interact with societies.

While the dominant academic perspective in the United States during the 20th century viewed humanity as not only separate from, but also inherently destructive to nature, the philosophy of viewing humanity and nature as intrinsically interconnected is not new. In the 5th century BC, the Greek philosopher Herodotus voiced his observation that events shape both people and nature, and that people and nature interact and evolve together through these events. Natural and social scientists re-discovered this unity of people and nature well known to indigenous societies through such concepts as *aski* of the Cree people in northeast Canada (the integrated concept of land, consisting of living landscape, humans, and spiritual beings), *vanua* in Fiji (a named area of land and sea, considered an integrated whole with its human occupants) [8], and *ahupua’a* in Hawai’i as discussed in several papers in this Special Issue.

In recent decades—out of the dialogue around environmental determinism, in which environmental constraints were thought to shape the evolution of human societies; and cultural ecology, which emphasized the influence of humans over their environments—the idea of the unity of people and nature, redeveloped and theorized over several iterations. A merger of these viewpoints led first to a recognition of two-way interactions between humans and the environment, and finally to an acceptance of co-evolution between people and their places. In the 21st century, this notion has

revived and is now a part of mainstream conversations embodied in indigenous and local community movements, scholarship, academia, and the professional spheres.

This co-evolutionary perspective addresses the temporal aspects of this two-way influence, in the words of Barton et al. [13], accepting that:

“... humans cannot be viewed either as passive consumers or rapacious exploiters of ecosystems; conversely ecosystems are more than a backdrop for human agency or a larder to fuel human economies. ‘Pristine’ ecosystems have not existed anywhere for millennia, and humans and cultural systems have played an integral role in the development and maintenance of ecosystems worldwide. Yet humans—even in the context of complex society—are still subject to a wide variety of ecological constraints. This means that human society is constantly reshaping the intertwined cultural and natural components of the socioecological landscape on which its members and their descendants must operate.”

This perspective is a common thread and a key part of the existential foundation of the people of Hawai‘i. Indeed, today our constitution and legal system recognize and have begun to re-invigorate the common law of our land, the indigenous public trust doctrine of *mālama ‘āina* (to care for that which feeds). Human–nature systems, indigenous knowledge, and biocultural heritage gain significance in this context.

2. Earth as Island, Island as Earth

As the earth moves into a new age—the Anthropocene—islands, like those in Hawai‘i, have much to offer our global society. When the first astronaut to orbit Earth returned home, it was not the wonders of space that struck him the most, but rather the view of the earth as an isolated sphere within that space. Subsequent photos of the earth, such as “Earthrise” and “Blue Marble”, arguably had a great impact on environmentalism. They hit home the indisputable fact that our earthly home is indeed a tiny island in the ocean of space, and that that our planet has clear boundaries and limits to its resources.

This is not a new concept for island cultures. Since time immemorial, island communities recognized the constraints of unfettered growth on natural resources. They not only adapted to live within what the environment could reasonably offer, but also discovered innovative and ingenious ways to manage their land and seascapes. Our Hawaiian ancestors sought to stabilize and expand key biomes and ecotones to enhance the provision of ecosystem services from natural systems. This strategy recognizes that the environment has its own *mana*—its own authority to make decisions, its own power to provide outputs, and its own spirit that enhances the world around it. To work with the environment, rather than in imposition to it, is a more efficient means to multiple ends. However, it requires that we adapt ourselves to the land as much as we adapt the land to ourselves. Health of the land and the health of community is inextricably linked.

Our Hawaiian ancestors developed a variety of ways to obtain higher returns from ecosystem services. This Special Issue documents the use of certain agro-ecological concepts that maximize returns. In particular, these systems tend to enhance ecosystems on the margins, the so-called edge effects of ecology that are often highly productive. Examples include:

- Flooded-field agro-ecosystems that demonstrate features of riparian areas and wetlands, and that were extensively developed. The expanded agro-ecological zone retains much of the ecosystem services of the natural areas—flood control, erosion mitigation, habitat for freshwater fauna and birds, groundwater recharge—while at the same time providing for greater cultural necessities such as preferred flora and fauna species for food, medicine, and ceremonies.
- Nearshore aquaculture that utilize walled fishponds to more efficiently provide marine resources and simultaneously maintain ecosystem services of estuaries, such as habitat protection and water filtration. These ponds also enhance nutrient efficiency that ultimately produces marine resources that can be obtained efficiently at a high catch per unit of effort.

- Agroforestry systems that maintain much of the ecosystem services of a natural forest such as nutrient cycling, biodiversity, soil creation, and erosion control, while increasing societal necessities such as resilience and abundance.

The island perspective is borne out of the necessity of limits. Here in Hawai'i, we can see the horizon just out beyond our shoreline. We are the most isolated land mass on the planet, more than 2,000 miles from anywhere else. Island communities are worlds in themselves, bounded by the vast ocean to a finite area of land and resource base. On a remarkably short time scale, many islands in Oceania reached their carrying capacity, forcing their societies to adapt. Survival within a paradigm of perceived limits requires humans to think in an entirely different framework, to make difficult decisions about what is truly needed and desirable. How many people are too many? What standard of living is appropriate? Every island has dealt with its given limits in different ways—some by choice and foresight, others by harsh social restrictions, and some by extreme environmental regulation. As our global island rushes towards its own limits there is much to learn from the Hawaiian experience.

One illustration of an island perspective is in the Hawaiian words for water—*wai*; and wealth, worth, or presiding—*waiwai*. The relationship between these two concepts, within a Hawaiian world view, implies that natural resources—particularly water—was of great importance to prosperity. To protect water resources, prohibitions on private ownership of land and water existed, and resources held in common as a public trust. Large-scale land divisions were generally based on watersheds. Spatial division and prioritization applied to the use of water for drinking, bathing, and irrigation. Agricultural water diversion designs directed flow back into the river to preserve the water flow downstream. As fresh water flowed into the ocean, managed areas inland helped maximize the productivity built on precious nutrients. The allocation of stream resources was very important to each *ahupua'a*, or social-ecological community [15,16]. The practicality of Hawaiians' relationships to nature was, and to a large extent still is, culturally reinforced. Concepts of conservation woven into religion, politics, the economy, and social structures, communicated a kinship with the natural environment. Deities assumed plant and animal forms; every aspect of the world was infused with *mana*—spiritual power to be appropriately respected.

Another illustration of the island perspective is the incorporation of the sacred into conservation practice [17]. In Hawai'i, this includes various kinds of sacred sites such as *wao akua* (sacred forests), *wahi pana* (storied places), and *wahi kapu* (holy places). An example of an area encompassing all three is Mauna Kea, the tallest mountain in the world as measured from its volcanic base on the seafloor. It is one of the holiest places in the Hawaiian archipelago with slopes covered in sacred forest, and its summit home to revered deities, a sacred lake, ancient shrines, the highest burial site in Polynesia, and a foundation for Native Hawaiians' creation story. Biocultural restoration encompasses the restoration of such sacred sites, as they combine both ecological and cultural values. The process of restoration in Hawai'i includes a re-examination of ourselves, our identity, our knowledge systems and our relationship to our place on the path toward re-invigorating a sense of community and righting the canoe.

Despite the onslaught on Hawaiian culture and state of the environment, the sentiment of nature as the provider, and humans as the protector, is still strong. Hawai'i is an island embedded in island earth. The importance of studying, understanding, and unpacking biocultural restoration here is important for conservation in the present, and for the evolving and climatically changing future.

3. Hawai'i as a Biocultural Leader

Hawai'i is an emerging leader and global touchstone in biocultural restoration, knowledge generation, development of both theory and philosophy, and action—partly as a consequence of a revitalization movement that started in the 1970s [6]. Hawai'i is home to many projects to restore the health and function of systems that exist in the confluence of nature and humanity. In this endeavor, multifaceted approaches to facilitate the return to a state of resource abundance—known in the Hawaiian language as *'āina momona*—emerge. Several of the more successful attempts in this

movement merged the ancestral and contemporary in the realms of science, technology, and philosophy to inform adaptive practices in multiple fields and initiatives that aim to restore biocultural resource abundance. More broadly, this is a movement to restore Native Hawaiian epistemologies, language, cultural practices, and connection to place. Part of this includes the restoration of cultural landscapes that encompass sacred sites, biocultural resources, and traditional practices—as documented in several papers in this Special Issue.

However, getting to this point has been an uphill battle, and there is a historical and political context for this struggle. The dominant view of nature and ecosystems for the past century and more—imposed on indigenous people in indigenous places—have often been through the eyes of Western European and North American travelers, settlers, nature enthusiasts, observers, activists, or conservation professionals. Towards the last half of the 20th century, ‘conservation’ had become the modern incarnation of colonization—providing a kinder and gentler, but no less condescending, vision of a foreign worldview imposed on indigenous people and ancestral places. Some contemporary reflections on the history of conservation show that the ‘fathers’ of the modern U.S. conservation movement might have articulated a very different, and perhaps better, vision of ecosystem management if they had consulted with the native people and advocated for their right to exist in their homelands. Instead, in many cases, they contributed to their displacement.

However, the past two or three decades ushered in a new paradigm. Many conservationists have moved closer to indigenous visions and world views, and some have developed strong collaborative partnerships with indigenous groups. At the forefront of biocultural restoration in Hawai‘i—and across the globe—are consultations with, and the participation and perspectives of, the native and local people who inhabit and/or have a deep and long-term relationship with their places. Hawai‘i’s revitalization movement also owes a great deal to Native Hawaiian scholars who documented indigenous knowledge before it was lost e.g., [18–20]; and to researchers who drew from multiple sources to unravel the cultural complexities of Hawaiian society e.g., [21–23]. Moving forward it will increasingly rely on multi-disciplinary approaches that reveal the landscape complexities of Hawai‘i, e.g., [5,24–26]. We have reached a maturation point in Hawai‘i where both *kūpuna* (respected elders) and senior scholars have mentored in a new generation of researchers and practitioners who work with both the people and the place. Instead of being expansive, this approach starts in situ with measurable units of place, and incorporates native and local perspectives and relationships.

As an example of the far-reaching depth of these perspectives and efforts, a friend, and young indigenous scientist, Dr. Kiana Frank recently informed us how her study and understanding of her Hawaiian culture and the community *mo‘olelo* (stories) helps her to see a nuanced Hawaiian eco-understanding all the way down to the microbial level. She can tie her community and her students directly to this knowledge as a part of their heritage and source of well-being.

On a macro-level, examples of environmental justice and social transformation grow and compound. Grassroots networks caring for Hawai‘i’s environment have burgeoned and pushed collective interest of a long tradition of community-based natural resource management. Growing and impactful networks include E Alu Pū (a statewide, community-based stewardship network), Hui Mālama Loko I‘a (a statewide, fishpond restoration network), Maui Nui Makai Network (focused on community nearshore management efforts in Maui County), Kai Kuleana (a community-based nearshore management network in Kona, Hawai‘i), and Hui Loko (a fishpond and anchialine-pond restoration network on the island of Hawai‘i). These networks, along with their membership organizations—both individually and collectively—have stoked long-glowing embers of Hawai‘i’s biocultural heritage, and the fire now burns on every island in the archipelago.

These networks create alliances, and the impacts of their collaboration and coordination culminated in 2015 when their collective support was a critical component in the State’s adoption of the first community-based subsistence fishery area (CBSFA) rules in Hā‘ena (Kaua‘i). This ground-breaking initiative—tantamount to a ‘first ever’ achievement in a global context—created the governance structure for an approach to fishery co-management that is inclusive and sustainability-oriented [7,27].

This effort was guided by teachings carried in the stories of elders, which helped a community understand the way their ancestors related to the environment, while contextualizing the role of researchers in community-based efforts. Support for this accomplishment was inspired by community-based natural resource management efforts and shared lessons learned that were borne out of efforts in Mo'omomi (Moloka'i). Hā'ena's CBSFA success was a touchstone event that has opened the door for a statewide movement to better care for nearshore resources in rural Hawaiian communities—such as those like Mo'omomi (Moloka'i), Kīpahulu (Maui), and Miloli'i (Hawai'i Island), among others—who have been navigating bureaucracy and politics towards this same goal for more than two decades.

Themes of community-based stewardship are being incorporated into the education system at the primary and secondary level inspired, in part, by the efforts described above. The notion that Hawai'i needs education programs that produce future elders as much as they produce future professionals has taken root. As such, curriculum development and community efforts are beginning to merge. In charter schools, Hawaiian language education and grassroots environmental stewardship efforts—to care for and nurture the relationship between people and their places—have been embedded in the curriculum. Educational networks are budding forth as well, such as Ko'olau 'Āina Aloha (a region education and environmental stewardship network in the Ko'olaupoko region of O'ahu) and others. These networks feed each other and continue to grow in size, strength, and influence as they stand on a firm foundation of biocultural heritage.

The networks described above are composed of people who use their culture, ecological knowledge, and ancestral practice to inform their relationships with, and care for, the environment. This is the approach that will ultimately transform the way Hawai'i is cared for in the future. Communities are stepping up to remind us that we have a *kuleana* (right and responsibility) to care for Hawai'i. This includes not just a right to benefit from Hawai'i's environment (food, recreation, tourism or otherwise), but a duty to both *mālama* (care for) Hawai'i, and to ensure the people's concomitant right to do as much to assure abundance and well-being for unborn generations.

4. This Special Issue

Our goal with this Special Issue was to produce a well-rounded collection of papers documenting the state of biocultural restoration in Hawai'i from a scholarly perspective. We very much view this as an opportunity to professionally raise up some of Hawai'i's thought leaders. The Issue highlights viable models of biocultural conservation in the larger effort to restore *'āina momona*, with some focus on the management of forests, streams, nearshore fisheries, traditional crop diversity, and traditional food systems. Although none of the papers directly address health and wellness, and issues related to legal and policy matters, restoring *'āina momona* builds a foundation that can facilitate change in these areas as well. We want to emphasize the biocultural foundation of both ecological and cultural restoration. Conserving biocultural diversity and restoring the health of social-ecological systems can, as illustrated herein, be founded on cultural values and aligned with community priorities.

A common theme amongst the efforts examined in this Special Issue is the re-creation of landscape mosaics that included agro-ecological systems designed and managed for cultural and social benefit in such a way that did not irreparably compromise the integrity of native ecosystems. This overarching management approach was at the foundation of indigenous adaptation to island resource scarcity and long-term sustainability. These lessons were not learned lightly—as several island failures can be seen across the Pacific; nor were these systems maintained lightly—many successful islands had strict systems of enforcement put in place to ensure that land use was prioritized in order to provide for the needs of the community above the individual. In our own humble way, we hope this issue helps to translate some of the knowledge accumulated by our island ancestors in a way to not only contribute to the growing momentum in Hawai'i, but also to provide viable solutions to global issues for our greater island earth as well.

This Special Issue is the largest collection to date of scientific papers authored by Native Hawaiian and *kama'āina* (Hawai'i-grown) scholars. Each of the more than one dozen papers is co-authored by at least one Native Hawaiian scholar, with collective contributions from nearly one hundred *kama'āina* scholars, which represents an ancestral multi-ethnic mosaic and experience of living in these islands. As expressed in the 'Acknowledgements' sections of each of the papers, this Special Issue embodies the perspectives and teachings of several dozen elders, cultural practitioners, and community leaders. It is no surprise these papers have all coalesced around the common theme of biocultural restoration in Hawai'i. In the legacy of *Papa-hānau-moku* (Earth mother), more than 50% of lead authors and co-authors are *wāhine* (female), a reflection of this Special Issue which is ultimately focused on how we better nurture and care for our island home.

Also significant is that many of the papers in this Issue employ indigenous methodologies that prioritize working relationships and practical applications by directly involving those on the front lines of biocultural conservation and restoration. Under a different research paradigm, many of these individuals may have served as 'informants' or human 'subjects' for information extraction, rather than as co-authors of the papers. This engaging approach allows those who are 'living' biocultural restoration to tell their own stories, coupled with scientific research that provides both experiential and experimental evidence. This approach to writing and documenting the biocultural restoration efforts in Hawai'i parallels efforts on the ground, efforts that critically rely on strong, multifaceted relationships between communities, organizations, scientists, and policy-makers to create successful collaborative partnerships.

You will find in this Issue an exploration of various themes of biocultural restoration in Hawai'i. Some touch on philosophical aspects, such as the value system at the foundation of Hawaiian biocultural resource management [28], as well as on theoretical aspects, such as examinations of the structure and function of the Hawaiian social-ecological system [5]. It also includes a comprehensive overview of the systems-based approach to Hawaiian biocultural resource management [15], a multi-faceted approach to rain-fed agro-ecological systems [29], and a case study on monitoring biocultural resources [30]. Historical ecology is utilized in two papers to provide insights into how the Hawaiian archipelago was transformed from an ecosystem into a social-ecological system with the first arrival of Polynesians, and how these social-ecological systems, in turn, underwent a regime shift once Europeans colonized these islands [5,31]. Traditional approaches to biocultural resource management in the 21st century are explored from two angles. One [27] looks at it from a community-based natural resource management perspective, whereas the other [32] looks at it from the perspective of an *ali'i* (royal) trust organization that is Hawai'i's largest private land owner and benefactor of the Native Hawaiian community. An important contribution by Kealiikanakaoleohaililani et al. [17] highlights the spiritual foundations and the role of ritual in biocultural restoration in indigenous places. The issue also includes papers that quantify ecosystem services and cultural services that are the products of biocultural restoration, including flooded field systems [33], agroforestry systems [34], and aquaculture systems [35].

In closing, it is important to ground this Special Issue in its historic and political context. Our effort is just one product of the long-term culmination of collective energies concerning biocultural survival and justice following the overthrow of the Hawaiian Kingdom by business interests and the United States in 1893. It is fueled by the spirit that gave birth to a cultural and civic revival, which ultimately ushered in the Hawaiian renaissance that began in the 1970s. It was then when the call to *mālama 'āina* began to gather strength. It is the same spirit that subsequently inspired occupations that led to repatriations of history, language, land, of *iwi* (bones), and cultural artifacts among others, as well as the development and growth in influence of semi-sovereign entities like the Office of Hawaiian Affairs, and the maturation of *ali'i* trusts that were originally developed by Hawaiian royal families.

Each of these progressive threads (language, culture, history, education, law and policy, etc.) became part of an ever-thickening and sturdy rope, which brought our island community into a new era. Our focus on biocultural restoration is just one common thread. On our shores, our home, our community, and our biocultural approach took the center stage at the 2016 World Conservation

Congress in Honolulu where the ‘culture-nature/nature-culture’ journey in conservation was launched, and then carried forward around the world. The context in which many of the authors in this Special Issue have grown up in the last two generations represent an era of increasing empowerment for a thoughtful, deliberate, and grounded restoration mindset. This mindset not only helps steward our home, but also creates new institutional approaches and practical rewards in the form of jobs and opportunities to allow for the culture and people of Hawai‘i to thrive.

Biocultural restoration in the long run will have to be in situ, at the confluence of people and place, and in reality where theory does not always stick and laboratory controls are not available. The process of scientifically documenting the state of biocultural restoration in Hawai‘i has provided valuable insight into the past as much as into the present. Restoration is an active term. In Hawai‘i it is about reviving the virtues of *aloha ‘āina* and the practice of *mālama ‘āina*, to love and care, respectively, for the ‘āina, that which feeds. This is the foundation upon which this Special Issue on “biocultural restoration in Hawai‘i” is built.

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