

Blockchains and Environmental Self-Determination for the Native Hawaiian People: Toward Restorative Stewardship of Indigenous Lands

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I utilize diacritical marks (‘okina and kahakō) in Hawaiian words, except where they were originally omitted in quoted material, titles, and case names. In a purposeful departure from Bluebook Rule 7(b), I do not italicize Hawaiian words to afford ‘ōlelo Hawai‘i (the Hawaiian language) the same status as English. All translation mistakes are my own.

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INTRODUCTION

There is a map of Ka Pae ‘Āina o Hawai‘i—the Hawaiian archipelago—unrecognizable to colonial eyes. There are no telescopes on Haleakalā or Mauna a Wākea. No unexploded ordnance are lodged deep in Kaho‘olawe and Waikāne, and no bombs drop on Pōhakuloa. Mākua is a place of refuge once more under the sovereign nation of Hawai‘i.

My hands cannot hold this map that I love.¹ Hawai‘i, like other insular possessions of the United States, is not sovereign.² Astronomical observatories defile Haleakalā and Maunakea.³ Kaho‘olawe is uninhabitable,⁴ and the federal government condemned land in Waikāne rather than pay for restoration.⁵ Mākua is a minefield,⁶ and the U.S. military obliterates Pōhakuloa for live-fire training.⁷ Since the United States backed the illegal overthrow of

¹ This is a reference to Indigenous international human rights scholar Julian Aguon’s article *On Loving the Maps Our Hands Cannot Hold*. See Julian Aguon, *On Loving the Maps Our Hands Cannot Hold: Self-Determination of Colonized and Indigenous Peoples in International Law*, 16 UCLA ASIAN PAC. AM. L.J. 47, 68 (2010–11).

² See, e.g., Ediberto Román & Theron Simmons, *Membership Denied: Subordination and Subjugation Under United States Expansionism*, 39 SAN DIEGO L. REV. 437, 487–514 (2002); see also Melody Kapilialoha MacKenzie, *Ke Ala Loa - The Long Road: Native Hawaiian Sovereignty and the State of Hawai‘i*, 47 TULSA L. REV. 621, 657 (2012) [hereinafter MacKenzie, *Ke Ala Loa*].

³ See, e.g., Terina Kamailelalui ‘i Fa‘agau, *Reclaiming the Past for Mauna a Wākea’s Future: The Battle Over Collective Memory and Hawai‘i’s Most Sacred Mountain*, 22 ASIAN-PAC. L. & POL’Y J. 1, 22–28 (2021); see also *infra* Part II.E.3.

⁴ See, e.g., Jordan Kealaikalani Inafuku, Comment, *E Kūkulu ke Ea: Hawai‘i’s Duty to Fund Kaho‘olawe’s Restoration Following the Navy’s Incomplete Cleanup*, 16 ASIAN-PAC. L. & POL’Y J. 22, 24 (2015); see *infra* note 240.

⁵ See, e.g., Teresa Dawson, *Marines’ Plan for Jungle Training in Waikane Valley Reopens Old Wounds*, ENV’T HAW. (Env’t Hawai‘i, Inc., Hilo, H.I.), May 2013, <https://www.environment-hawaii.org/?p=3057>, archived at <https://perma.cc/BC9Y-K39Q>.

⁶ Kalamaoka‘āina Niheu, *Pu‘uhonua: Sanctuary and Struggle at Mākua*, in A NATION RISING: HAWAIIAN MOVEMENTS FOR LIFE, LAND, AND SOVEREIGNTY 161, 171–73 (Noelani Goodyear-Ka‘ōpua, Ikaika Hussey, & Erin Kahunawaika‘ala Wright eds., 2014) [hereinafter A NATION RISING].

⁷ See, e.g., Jun Shin, *Hawaii Has Failed to Take Care of Pohakuloa*, HONOLULU CIV. BEAT (Aug. 13, 2019), <https://www.civilbeat.org/2019/08/hawaii-has-failed-to-take-care-of-pohakuloa/>, archived at <https://perma.cc/Q6BV-SLEV>; see also *infra* Part II.E.4.

the Hawaiian Kingdom in 1893, Kānaka ‘Ōiwi—Native Hawaiians⁸—have fought legal and political battles to ensure survival.⁹ Some have given their lives in pursuit of sovereignty.¹⁰

The people of Hawai‘i are deeply committed to restorative justice for Kānaka. They amended the state constitution in 1978 to protect traditional and customary Native Hawaiian rights,¹¹ safeguard natural resources under the Public Trust Doctrine,¹² and hold over one million acres in the Public Land Trust,¹³ and later pledged to repair enduring harms to ‘Ōiwi communities.¹⁴

In the 1993 Apology Resolution, the U.S. Congress also committed to reconciliation with Kānaka and apologized for America’s involvement in the illegal overthrow.¹⁵ But na‘au pono—a deep sense of justice—has not flowed from these formalized commitments.¹⁶ Agencies lack the resources to adequately monitor trust lands, and officials often either do not value ‘Ōiwi lifeways or decide that development interests outweigh Native Hawaiian communities’ concerns.¹⁷ Moreover, U.S. forces continue to annihilate land throughout Hawai‘i.¹⁸ The obliteration of our biocultural resources results in cultural, and sometimes physical, devastation because Kānaka are inextricably intertwined with our ‘āina (land and literally “that which feeds”).¹⁹

⁸ Kānaka ‘Ōiwi are the Indigenous Peoples of Hawai‘i. This Note uses “Kānaka ‘Ōiwi” interchangeably with “Native Hawaiians” and “Kānaka” with no reference to blood quantum.

⁹ See generally A NATION RISING, *supra* note 6 (detailing Native Hawaiians’ successive political and legal struggles for our culture, land, and sovereignty).

¹⁰ For example, George Helm and Kimo Mitchell, ‘Ōiwi activists and members of the Protect Kaho‘olawe ‘Ōhana, disappeared after landing on Kaho‘olawe to protest the U.S. Navy’s bombing. Jonathan Kamakawiwo‘ole Osorio, *Hawaiian Souls: The Movement to Stop the U.S. Military Bombing of Kaho‘olawe*, in A NATION RISING, *supra* note 6, at 152.

¹¹ See HAW. CONST. art. XII, § 7. For a discussion of traditional and customary Native Hawaiian rights, see DAVID M. FORMAN & SUSAN K. SERRANO, KA HULI AO CTR. FOR EXCELLENCE IN NATIVE HAWAIIAN LAW, HO‘OHANA AKU, A HO‘OLA AKU: A LEGAL PRIMER FOR TRADITIONAL AND CUSTOMARY RIGHTS IN HAWAI‘I (2012).

¹² See HAW. CONST. art. XI, § 1. For a discussion of the Public Trust Doctrine in Hawai‘i, see D. Kapua‘ala Sproat & MJ McDonald, *The Duty to Aloha ‘Āina: Indigenous Values As a Legal Foundation for Hawai‘i’s Public Trust Doctrine*, HARV. C.R.-C.L. L. REV. (forthcoming 2022) (on file with author).

¹³ See HAW. CONST. art. XII, § 4.

¹⁴ See, e.g., H.R. 1627, 26th Leg., Reg. Sess. (Haw. 2011); Eric K. Yamamoto & Sara D. Ayabe, *Courts in the “Age of Reconciliation”*: Office of Hawaiian Affairs v. HCDCH, 33 U. HAW. L. REV. 503, 528 (2011).

¹⁵ Apology Resolution, Pub. L. No. 103-150, 107 Stat. 1510 (1993).

¹⁶ See D. Kapua‘ala Sproat, *An Indigenous People’s Right to Environmental Self-Determination: Native Hawaiians and the Struggle Against Climate Change Devastation*, 35 STAN. ENVTL. L.J. 157, 216 (2016) [hereinafter Sproat, *Environmental Self-Determination*].

¹⁷ The Commission on Water Resource Management’s struggle to fulfill its legal obligations is illustrative. See D. Kapua‘ala Sproat, *From Wai to Kānāwai: Water Law in Hawai‘i*, in NATIVE HAWAIIAN LAW: A TREATISE 522, 550–76 (Melody Kapilialoha MacKenzie, Susan K. Serrano & D. Kapua‘ala Sproat eds., 2015).

¹⁸ See *infra* Part II.E.4.

¹⁹ See *infra* Part II.A.

Blockchain, a type of distributed ledger technology,²⁰ could be a valuable tool for Kānaka in the restoration of our cultural and political autonomy as part of the Indigenous right to environmental self-determination.²¹ Blockchain's potential to aid in environmental self-determination lies in the technology's ability to facilitate systems of polycentric governance rooted in Native values that coexist alongside or replace centralized institutions and state-based governance.²² Given the United States' unwillingness to pursue decolonization as a remedy for the historical and ongoing subjugation of Indigenous Peoples, blockchain could be utilized to facilitate polycentric stewardship of the Public Land Trust—1,200,000 acres across Hawai'i held in trust by the State for Kānaka and the general public.²³ This Note seeks to demonstrate that blockchain can be a potent tool for Native Hawaiians' pursuit of environmental self-determination and advocates for the implementation of a blockchain-based polycentric management program for trust lands.

Part I sets forth the Four Values of Restorative Justice for Native Peoples, a framework of contextual legal analysis for adjudications impacting Indigenous communities deployed throughout this Comment. Part II provides a contextual history of the formation, governance, and mismanagement of the Public Land Trust to demonstrate why polycentric stewardship is necessary. Part III explains the right to environmental self-determination and the aspects of blockchain technology that make it especially relevant to Native Peoples seeking increased control over biocultural resources. To illustrate blockchain's potential, Part IV proposes a polycentric stewardship program for Pōhakuloa Training Area, a U.S. military training complex on Hawai'i Island that sits on Public Land Trust acreage. This Comment ultimately seeks to examine how blockchain can help Kānaka exercise our right to environmental self-determination while holding the state and federal governments accountable for exploiting Hawai'i nei (beloved Hawai'i).

²⁰ A distributed ledger is “a database that exists and is replicated across several locations or among multiple participants” and does not rely on a centralized authority to reach consensus about the current state of the ledger. EUR. COMM'N, SMART 2018/003, STUDY ON BLOCKCHAINS: LEGAL GOVERNANCE AND INTEROPERABILITY ASPECTS 136 (2020).

²¹ See *infra* Part III.A.

²² Polycentricity describes a complex form of governance with multiple, semi-autonomous units of decision-making nested at multiple jurisdictional levels. Keith Carlisle & Rebecca L. Gruby, *Polycentric Systems of Governance: A Theoretical Model for the Commons*, 47 POL'Y STUD. J. 927, 928 (2019); see *infra* Part III.B.1.

²³ JON M. VAN DYKE, WHO OWNS THE CROWN LANDS OF HAWAII' I 9, 237 (2009) (explaining that 1,400,000 acres were transferred from the United States to the State of Hawai'i, but 203,500 acres were set aside for the Department of Hawaiian Home Lands (“DHHL”) pursuant to the Hawaiian Homes Commission Act (“HHCA”), ch. 42, 42 Stat. 108 (1921) (formerly codified as amended at 48 U.S.C. §§ 691–718 (1958)) (omitted from codification in 1959)). DHHL acreage is excluded from the Public Land Trust. HAW. CONST. art. XII, § 4. The Public Land Trust is thus about 1,200,000 acres.

I. FOUR VALUES OF RESTORATIVE JUSTICE FOR NATIVE PEOPLES

Histories constructed about Indigenous Peoples are often inaccurate and are deployed time and time again to justify the exploitation of biocultural resources and cultural identities.²⁴ The Four Values of Restorative Justice for Native Peoples, an analytic framework for contextual legal analysis, uproots these settler colonial fictions.²⁵ Grounded in the New Legal Realism's insights,²⁶ contextual legal inquiry "starts with the premise (verified by socio-legal studies) that even though decision-makers may feel constrained to follow the legal rules to appear legitimate, they do not actually do so in a 'neutral' or 'objective' manner, especially in controversial cases."²⁷ This is especially true for Native Peoples' claims, which often encompass complex environmental and cultural abuses.²⁸ Contextual inquiry thus "focuses on the actual dynamics of decision-making, paying special attention to the value choices and interests implicated in adjudicatory decisions."²⁹ It engages a multi-level analysis to examine: "Who crafts the laws? Who interprets the laws? Who benefits from the laws? Who is hurt by the laws? What is at stake when the laws are 'blindly' applied? And what institutional and public constraints limit judges in their decisionmaking?"³⁰ The Four Values centers distinct harms of colonization, including land dispossession, loss of sovereignty, and cultural destruction, and, in turn, it prioritizes self-determination.³¹

The framework analyzes four realms, or values, of restorative justice for Native Peoples embodied in the international human rights principle of self-determination: mo'omeheu (cultural integrity), 'āina (land and natural

²⁴ Wallace Coffey & Rebecca Tsosie, *Rethinking the Tribal Sovereignty Doctrine: Cultural Sovereignty and the Collective Future of Indian Nations*, 12 STAN. L. & POL'Y REV. 191, 200 (2001); D. Kapua'ala Sproat, *Wai Through Kānāwai: Water for Hawai'i's Streams and Justice For Hawaiian Communities*, 95 MARQ. L. REV. 127, 155–56 (2011) [hereinafter Sproat, *Wai Through Kānāwai*].

²⁵ For an explanation of the framework, see Sproat, *Wai Through Kānāwai*, *supra* note 24, at 166–85; Sproat, *Environmental Self-Determination*, *supra* note 16, at 197–99; Sproat & McDonald, *supra* note 12.

²⁶ See, e.g., Thomas J. Miles & Cass R. Sunstein, *The New Legal Realism*, 75 U. CHI. L. REV. 831, 837–41 (2008); Lee Epstein & Tonja Jacobi, *The Strategic Analysis of Judicial Decisions*, 6 ANN. REV. L. SOC. SCI. 341, 342–43 (2010); Howard Erlanger, Bryant Garth, Jane Larson, Elizabeth Mertz, Victoria Nourse & David Wilkins, *Is It Time for a New Legal Realism?*, 2005 WIS. L. REV. 335, 335–63 (2005).

²⁷ Sproat, *Wai Through Kānāwai*, *supra* note 24, at 135.

²⁸ See Melody Kapilialoha MacKenzie, Susan K. Serrano & Koalani Laura Kaulukukui, *Environmental Justice for Indigenous Hawaiians: Reclaiming Land and Resources*, 21 NAT. RESOURCES & ENV'T 37, 79 (2007); Eric K. Yamamoto & Jen-L W. Lyman, *Racializing Environmental Justice*, 72 U. COLO. L. REV. 311, 355 (2001).

²⁹ Sproat, *Wai Through Kānāwai*, *supra* note 24, at 135.

³⁰ *Id.* at 161 (citing JUAN PEREA, RICHARD DELGADO, ANGELA HARRIS, JEAN STEFANCIC & STEPHANIE M. WILDMAN, RACE AND RACES: CASES AND RESOURCES FOR A DIVERSE AMERICA 3–4 (2000)).

³¹ See MacKenzie et al., *supra* note 28, at 38–42, 79; Sproat & McDonald, *supra* note 12; Yamamoto & Lyman, *supra* note 28, at 344.

resources), maui ola (social determinants of health and well-being), and ea (self-government).³² Individually, “[e]ach value is a salient dimension of restorative justice” for Indigenous Peoples.³³ The values are also tools of contextual inquiry to shift past formalist narratives that often justify subordination to get at “what is really going on” and “what is really at stake” in complex cases implicating dual cultural and environmental injustices.³⁴

Though each value requires a separate analysis, they are inextricably intertwined: “Culture cannot exist in a vacuum and its integrity is linked to land and other natural and cultural resources upon which Indigenous Peoples depend for physical and spiritual survival.”³⁵ “Native communities’ social welfare is defined by cultural veracity and access to, and the health of, natural resources” and, in turn, “cultural and political sovereignty determine who will control Indigenous Peoples’ destinies (including the resources that define their cultural integrity and social welfare) and whether that fate will be shaped internally or by outside forces (including colonial powers).”³⁶ Together, the values form an analytic framework for decisionmakers to both assess proposed actions impacting Native Peoples and biocultural resources and also develop reconciliatory initiatives to address settler colonialism’s enduring harms.³⁷

A. *Mo‘omeheu: Cultural Integrity*

The first value, mo‘omeheu, examines whether an action “support[s] and restore[s] cultural integrity as a partial remedy for past harms, or perpetuate[s] conditions that continue to undermine cultural survival.”³⁸ It is crucial to assess an action’s impact on cultural integrity because Native Peoples are “in a constant struggle to maintain culture and traditional lifestyles due to a myriad of factors, including colonization and other pressures of a quickly changing world.”³⁹

B. *‘Āina: Land and Natural Resources*

The second value, ‘āina, means land or “that which feeds” in ‘ōlelo Hawai‘i (the Hawaiian language), but the term here refers to all land and natural resources that sustain Kānaka, as well as the reciprocal relationship between Kānaka and our biocultural resources, embodied in the concepts of kuleana (responsibility and privilege) and aloha ‘āina (a profound love for

³² Sproat, *Wai Through Kānāwai*, *supra* note 24, at 173.

³³ Sproat, *Environmental Self-Determination*, *supra* note 16, at 197.

³⁴ Sproat, *Wai Through Kānāwai*, *supra* note 24, at 171, 207.

³⁵ *Id.* at 173 (citations omitted).

³⁶ *Id.*

³⁷ Sproat, *Environmental Self-Determination*, *supra* note 16, at 197.

³⁸ Sproat, *Wai Through Kānāwai*, *supra* note 24, at 179.

³⁹ *Id.*

the land).⁴⁰ The ancestral connection between Kānaka and ‘āina is the foundation of ‘Ōiwi identity.⁴¹ ‘Āina is also intertwined with “self-determination because a land base allows Indigenous Peoples to live and develop freely in order to pursue their cultural and political sovereignty.”⁴² Analysis of this realm analyzes whether an action “perpetuates the subjugation of ancestral lands, resources, and rights, or attempts to redress historical injustices in a significant way.”⁴³

C. *Mauli Ola: Social Determinants of Health and Well-Being*

The third value, mauii ola, analyzes a decision’s “potential to improve health, education, and living standards” of Kānaka.⁴⁴ Analysis of a proposed action’s impact on health and well-being is crucial because Native Hawaiians were decimated by newly-introduced diseases as Americans and Europeans plundered biocultural resources for profit.⁴⁵ Kānaka continue to “comprise the most economically disadvantaged” population in Hawai‘i and are “over-represented among the ranks of welfare recipients and prison inmates” and “underrepresented among high school and college graduates, professionals, and political officials.”⁴⁶ This value thus examines whether a “decision improves social welfare conditions or perpetuates the status quo of Natives bringing up the bottom of most, if not all, socio-economic indicators.”⁴⁷

D. *Ea: Self-Governance*

The final value, ea, examines whether an action “perpetuates historical conditions imposed by colonizers or will attempt to redress the loss of self-governance.”⁴⁸ Ea “upholds the accommodation of spheres of governmental or administrative autonomy for indigenous communities, while at the same time upholding measures to ensure their effective participation in all decisions affecting them left to the larger institutions of government.”⁴⁹ Restoration of self-governance is crucial to remedying land dispossession, which, in turn, deprives Kānaka of cultural and political sovereignty and self-determination.⁵⁰

⁴⁰ N. Mahina Tuteur, *Reframing Kānāwai: Towards A Restorative Justice Framework for Indigenous Peoples* INDIGENOUS PEOPLES’ J.L. CULTURE & RESISTANCE 59, 76 (2022).

⁴¹ *Id.* at 17.

⁴² *Id.*

⁴³ Sproat, *Wai Through Kānāwai*, *supra* note 24, at 181.

⁴⁴ *Id.* at 183.

⁴⁵ S. James Anaya, *The Native Hawaiian People and International Human Rights Law: Towards a Remedy for Past and Continuing Wrongs*, 28 GA. L. REV. 309, 315–16 (1994).

⁴⁶ *Id.* at 317.

⁴⁷ Sproat, *Wai Through Kānāwai*, *supra* note 24, at 182–83.

⁴⁸ *Id.* at 185.

⁴⁹ Anaya, *supra* note 45, at 355.

⁵⁰ See Sproat, *Environmental Self-Determination*, *supra* note 16, at 198.

II. CONTEXTUAL HISTORY OF HAWAI‘I’S PUBLIC LAND TRUST

Vested with customary,⁵¹ constitutional,⁵² statutory,⁵³ and common law⁵⁴ duties and obligations, the State holds 1,200,000 acres in the Public Land Trust for the benefit of Kānaka and the general public.⁵⁵ Public Land Trust acreage is also a protected resource under Hawai‘i’s Public Trust Doctrine.⁵⁶ Many Kānaka want the state and federal governments to return Public Land Trust acreage, so it may serve as a land base for a sovereign Native Hawaiian nation.⁵⁷

The State’s trust duties stem from ‘Ōiwi customs, values, and traditions, as well as Hawaiian Kingdom laws.⁵⁸ However, the Hawai‘i Department of Land and Natural Resources (“DLNR”), the agency responsible for managing the Public Land Trust, does not have the capacity to monitor all trust acreage or ‘Ōiwi practitioners’ ability to exercise constitutionally-protected traditional and customary rights in real time.⁵⁹ This Part seeks to make a case for enhanced ‘Ōiwi authority over trust acreage by examining the federal and state governments’ abuse of Hawai‘i, which is crucial to understanding disputes over the use and alienation of trust acreage today.⁶⁰ I deploy the Four Values of Restorative Justice⁶¹ to get at “what is really going on” and “what is really at stake” for Kānaka when trust acreage is mismanaged.⁶²

Section A roots the origins of the State’s constitutional trust obligations in ‘Ōiwi values and laws.⁶³ Sections B, C, and D then trace the status of the trust lands from 1898 to the present, while paying special attention to the dispossession of Kānaka from our land and our loss of autonomy as a result of American colonization.⁶⁴ Section E examines judicial opinions that

⁵¹ Traditional ‘Ōiwi law, customs, and principles are integrated into Hawai‘i’s Constitution, statutes, and common law. See HAW. REV. STAT. § 1-1 (2009).

⁵² HAW. CONST. art. XII, § 4.

⁵³ See, e.g., HAW. REV. STAT. § 171-64.7 (Supp. 2019).

⁵⁴ See, e.g., Ching v. Case, 449 P.3d 1146, 1150 (Haw. 2019); Pele Def. Fund v. Paty, 837 P.2d 1247, 1262 (Haw. 1992).

⁵⁵ DHHL holds another 200,000 acres in trust pursuant to the HHCA. See *supra* note 23.

⁵⁶ Ching, 449 P.3d at 1150.

⁵⁷ See Melody Kapilialoha MacKenzie, *Public Land Trust*, in NATIVE HAWAIIAN LAW: A TREATISE, *supra* note 17, at 76, 123 [hereinafter MacKenzie, *Public Land Trust*]. The State will transfer Kaho‘olawe, one of the Hawaiian islands and part of the Public Land Trust, to a sovereign ‘Ōiwi entity upon its recognition by the United States and the State. HAW. REV. STAT. § 6K-9 (2009).

⁵⁸ Sproat & McDonald, *supra* note 12; Melody Kapilialoha MacKenzie & D. Kapua‘ala Sproat, *A Collective Memory of Injustice: Reclaiming Hawai‘i’s Crown Lands Trust in Response to Judge James S. Burns*, 39 U. HAW. L. REV. 481, 519 (2017).

⁵⁹ See *Law Review Spring 2021 Symposium – 25 Years of PASH*, 43 U. HAW. L. REV. (2021), VIMEO at 53:11–2:00:00, <https://vimeo.com/519658393/7233498d4b>, archived at <https://perma.cc/45AZ-W4CJ> (last visited Apr. 24, 2021) (discussing DLNR’s ability to adequately safeguard ‘Ōiwi rights and natural resources).

⁶⁰ See generally MacKenzie, *Ke Ala Loa*, *supra* note 2.

⁶¹ For an explanation of the Four Values of Restorative Justice framework, see *infra* Part I.

⁶² Sproat, *Wai Through Kānāwai*, *supra* note 24, at 171, 207.

⁶³ See *infra* notes 66–111 and accompanying text.

⁶⁴ See *infra* notes 112–25, 126–36, and 137–60 and accompanying text.

shaped the State's evolving trust obligations and strengthened and weakened Native Hawaiians' self-determination claims.⁶⁵ This context reveals that the state and federal governments often fall far short of their commitments to reconcile with Kānaka. Enhanced 'Ōiwi authority over the Public Land Trust is thus a necessary step towards restorative justice for our communities.

A. *Native Hawaiian Values, Customs, and Traditions*

Like many Indigenous Peoples, Kānaka have a genealogical connection to our biocultural resources.⁶⁶ Understanding the reciprocal relationship between Kānaka and 'āina (land, and, literally, "that which feeds") is crucial for effective decision-making because this kinship underpinned Hawaiian Kingdom laws and is the foundation of Hawai'i's Public Trust Doctrine.⁶⁷ The Kumulipo, an 'Ōiwi cosmogonic genealogy, describes these familial ties and establishes 'āina as the basis of Native Hawaiian culture, health, and self-governance.⁶⁸ The Kumulipo explains that all life and knowledge sprang forth from Pō, the primordial darkness.⁶⁹ Pō's children, Kumulipo and Pō'ele, created our natural world, first birthing the coral polyp and then all of the flora and fauna in Hawai'i.⁷⁰ These plants and animals are 'aumakua (guardians) that protect Kānaka.⁷¹ Ho'ohokukalani, the daughter of Papa (Earth Mother) and Wākea (Sky Father), birthed a stillborn child, Hāloanakalaukapalili. She buried his body outside, and a kalo plant grew from his grave.⁷² Soon thereafter, Ho'ohokukalani had another child whom she named Hāloa after his elder sibling. Hāloa is the progenitor of our Native Hawaiian people.⁷³

Kānaka are thus genealogically connected to—and intimately a part of—our biocultural resources, engendering a kuleana (responsibility and privilege) to care for Hawai'i's landscapes, oceanscapes, and heavenscapes

⁶⁵ See *infra* notes 161–269 and accompanying text.

⁶⁶ MacKenzie, *Ke Ala Loa*, *supra* note 25, at 624; HAUNANI-KAY TRASK, FROM A NATIVE DAUGHTER: COLONIALISM AND SOVEREIGNTY IN HAWAII 59 (Univ. Haw. Press rev. ed. 1999). The distinctive relationship between Native Peoples and their lands is recognized in the U.N. Declaration on the Rights of Indigenous Peoples. G.A. Res. 61/295, Declaration on the Rights of Indigenous Peoples (Sept. 13, 2007) [hereinafter UNDRIP].

⁶⁷ Sproat & McDonald, *supra* note 12 (examining 'Ōiwi customs that form the base of Hawai'i's Public Trust); see also MacKenzie & Sproat, *supra* note 58, at 519.

⁶⁸ See, e.g., Sproat, *Environmental Self-Determination*, *supra* note 16, at 167–68. The kinship between Kānaka and our archipelago is encapsulated in an 'ōlelo no'eau (Hawaiian proverb): Hānau ka 'āina, hānau ke ali'i, hānau ke kānaka (Born was the land, born were the chiefs, born were the common people). MARY KAWENA PUKUI, 'ŌLELO NO'EAU: HAWAIIAN PROVERBS AND POETICAL SAYINGS 56 (1983).

⁶⁹ Sproat, *Environmental Self-Determination*, *supra* note 16, at 167 n.36 (citing MARTHA WARREN BECKWITH, THE KUMULIPO: A HAWAIIAN CREATION CHANT (1972)).

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.*

as a family member.⁷⁴ This reciprocal relationship is encapsulated in the foundational ‘Ōiwi value of aloha ‘āina (profound love for the land),⁷⁵ and, more recently, the concept of mālama ‘āina (to care for, protect, and preserve the land).⁷⁶ Prior to western contact in 1778, Kānaka manifested their kuleana in part by managing all biocultural resources “as a public trust for present and future generations”⁷⁷ and harnessing tidal power and natural hydrology to create regenerative communal agriculture and aquaculture systems that supported a population close to present-day size.⁷⁸ Aloha ‘āina is the foundation of—and inherent in—Hawai‘i’s constitutional Public Trust today⁷⁹ and has inspired generations of Kānaka to challenge colonial subordination.⁸⁰

The arrival of westerners on ‘Ōiwi shores radically altered Native Hawaiians’ cultural and political systems,⁸¹ ultimately resulting in the loss of land and self-governance, which in turn devastated culture, health, and welfare. Kānaka were decimated by successive pandemics, declining from about 1,000,000 people in 1778 to 40,000 by the end of the nineteenth century.⁸² American Calvinist missionaries arrived in 1820 promising reprieve from mass death,⁸³ but the missionaries, joined by foreign business and military

⁷⁴ E.g., NOENOE K. SILVA, *THE POWER OF THE STEEL-TIPPED PEN: RECONSTRUCTING NATIVE HAWAIIAN INTELLECTUAL HISTORY* 4 (2015); Kawika B. Winter et al., *Empowering Indigenous Agency Through Community-Driven Collaborative Management to Achieve Effective Conservation: Hawai‘i As an Example*, PAC. CONSERVATION BIOLOGY, Jan. 2021, at A, E.

⁷⁵ Though a possible literal translation of aloha ‘āina is “profound love for the land,” in reality, the phrase “escapes translation.” JAMAICA HEOLIMELEIKALANI OSORIO, *REMEMBERING OUR INTIMACIES: MO‘OLELO, ALOHA ‘ĀINA, AND EA* 12 (2021). Aloha ‘āina has been more fully described as “an internal love for place and community so strong that it cannot be overcome,” as well as “a natural and imbedded Kanaka Maoli practice of relation to one’s home.” *Id.* at 13. It “is a complex concept that includes recognizing that we are an integral part of the ‘āina and the ‘āina is an integral part of us.” SILVA, *supra* note 74, at 4. Aloha ‘āina has been described as a magnetic force that pulls Kānaka to Hawai‘i like compass needles pointing true north. *Ke Aloha Aina: Heaha la?*, KE ALOHA AINA, May 25, 1895 (Devin Kamealoha Forest trans.) (on file with author).

⁷⁶ See, e.g., LILIKALĀ KAME‘ELEIHIWA, *NATIVE LAND AND FOREIGN DESIRES: PEHEA LĀ E PONO AI?* 25 (1992) (explaining mālama ‘āina).

⁷⁷ Sproat, *Environmental Self-Determination*, *supra* note 16, at 168.

⁷⁸ Melody Kapilialoha MacKenzie, *Historical Background*, in *NATIVE HAWAIIAN LAW: A TREATISE*, *supra* note 17, at 2, 8 [hereinafter MacKenzie, *Historical Background*]; Kamanamaikalani Beamer, *An Aloha ‘Āina Economy—Give, Take, Regenerate*, in *THE VALUE OF HAWAI‘I 3: HULIHA, THE TURNING* 83, 84 (Noelani Goodyear-Ka‘ōpua, Craig Howes, Jonathan Kay Kamakawiwo‘ole Osorio & Aiko Yamashiro eds., 2020) (describing ‘Ōiwi agricultural ingenuity).

⁷⁹ Traditional “Hawaiian usage” is incorporated into Hawai‘i law. See HAW. REV. STAT. § 1-1 (2009); Sproat & McDonald, *supra* note 12, at 13–14.

⁸⁰ See, e.g., NOELANI GOODYEAR-KA‘ŌPUA, *THE SEEDS WE PLANTED: PORTRAITS OF A NATIVE HAWAIIAN CHARTER SCHOOL* 123–24 (2003); Osorio, *supra* note 10, at 155–57; Puuhonua Puuhuluhulu, *Like a Mighty Wave: A Maunakea Film*, YOUTUBE (Dec. 9, 2019), <https://youtu.be/4J3ZCzHMMPQ>, archived at <https://perma.cc/5P3S-V5JM>.

⁸¹ See MacKenzie, *Historical Background*, *supra* note 78, at 10.

⁸² Sproat, *Wai Through Kānāwai*, *supra* note 24, at 174 (citations omitted); see also KAME‘ELEIHIWA, *supra* note 76, at 81 (explaining that there was at least an 80% decline in the ‘Ōiwi population in the first 45 years after western contact).

⁸³ See KAME‘ELEIHIWA, *supra* note 76, at 140.

interests, sought to exploit Hawai‘i’s resources.⁸⁴ To safeguard ‘Ōiwi sovereignty and lifeways, ali‘i (chiefs) created a constitutional monarchy to stave off American and European colonialism.⁸⁵ The Constitution of 1840 codified trust concepts embedded in Native Hawaiians’ communal land tenure system by recognizing the mō‘ī (sovereign) as a trustee of all of the lands in the nation held in common by the mō‘ī, ali‘i, and maka‘āinana (common people).⁸⁶

Western interests, however, grew increasingly hostile to the communal land tenure system, preferring a private property regime instead.⁸⁷ Faced with interrelated pressures from missionaries-turned-capitalists,⁸⁸ imperialism in the Pacific,⁸⁹ and the rapid decline of the ‘Ōiwi population,⁹⁰ Kamehameha III (Kamehameha III) transitioned the nation to a private property regime through a process known as the Māhele (division or share)⁹¹ to “preserve a land base for all Hawaiian people, regardless of social or political status.”⁹² The transition began in 1845 when Kamehameha III established a Land Commission to grant individuals private property in a claims process guided by existing laws and ‘Ōiwi customs,⁹³ reinforcing that all Kānaka had rights in the land.⁹⁴

Kingdom law, however, required that the common interests of the sovereign, chiefs, and people be divided prior to adjudicating land claims.⁹⁵ Kamehameha III, his Western advisors, and the chiefs adopted a plan to divide—

⁸⁴ See *id.*; MacKenzie, *Historical Background*, *supra* note 78, at 21, 31–32.

⁸⁵ KAMANAMAICALANI BEAMER, *NO MĀKOU KA MANA: LIBERATING THE NATION* 104–05 (2014).

⁸⁶ See HAW. CONST. OF 1840, *translated in* TRANSLATION OF THE CONSTITUTION AND LAWS OF THE HAWAIIAN ISLANDS, ESTABLISHED IN THE REIGN OF KAMEHAMEHA III, 11–12 (photo. reprt. 1934) (1842) (recognizing that the land in the Kingdom belonged to Kamehameha I, but it “was not his own private property. It belonged to the chiefs and people in common, of whom Kamehameha I was the head, and had the management of the landed property.”) [hereinafter 1842 CONSTITUTION AND LAWS OF THE HAWAIIAN ISLANDS]; MacKenzie, *Historical Background*, *supra* note 78, at 11.

⁸⁷ MacKenzie, *Historical Background*, *supra* note 78, at 11.

⁸⁸ Within 100 years of the missionaries’ arrival, 5 companies—4 of which were founded by American missionary families—took control of Hawai‘i’s economy and politics, eventually helping to illegally overthrow the Kingdom. See generally CAROL A. MACLENNAN, *SOVEREIGN SUGAR* 52–102 (2014).

⁸⁹ Kamehameha III’s paramount concern in the mid-nineteenth century was western imperialism and its impact on ‘Ōiwi lifeways. MacKenzie & Sproat, *supra* note 58, at 503.

⁹⁰ VAN DYKE, *supra* note 23, at 31 (explaining the correlation between population decline and privatization of property).

⁹¹ See *id.* at 40.

⁹² MacKenzie & Sproat, *supra* note 58, at 510; see also BEAMER, *supra* note 84, at 143 (explaining that the Māhele was a tool of ‘Ōiwi agency meant to secure Native land rights).

⁹³ MacKenzie & Sproat, *supra* note 58, at 503.

⁹⁴ *Id.* at 504.

⁹⁵ *Id.* at 502–04; Declaration of Rights, Both of the People and Chiefs, *translated in* 1842 CONSTITUTION AND LAWS OF THE HAWAIIAN ISLANDS, *supra* note 86, at 9, 10–12 (“[p]rotection is hereby secured to the persons of all the people, together with their lands, their building lots, and all their property, while they conform to the laws of the kingdom, and nothing whatever shall be taken from any individual except by express provision of the laws.”).

and thus privatize—land interests, so that one-third of the ‘āina would remain in Kauikeaouli’s care, one-third would go to the chiefs and konohiki (land managers), and the final third would go to the people.⁹⁶ First, Kauikeaouli identified the lands he personally wished to reserve,⁹⁷ and then he and the chiefs divided out their interests in the remaining lands.⁹⁸ Kauikeaouli soon thereafter deeded 1,500,000 acres of his personal lands to the government “forever . . . unto his Chiefs and People.”⁹⁹ At the end of the Māhele, Kauikeaouli personally held 984,000 acres (23.8% of land in the nation), the government held 1,523,000 acres (37%), and the chiefs held 1,619,000 acres (39.2%).¹⁰⁰ The acres Kauikeaouli retained are now known as the Crown Lands,¹⁰¹ and the ‘āina he gave to the government are the Government Lands.¹⁰²

The Māhele did not sever the people’s undivided land interests.¹⁰³ The Kuleana Act of 1850 was meant to award the maka‘āinana allodial title to some acreage and divest their still-undivided interests in the rest.¹⁰⁴ The Act, however, was largely ineffective because only a small number of Kānaka were awarded Kuleana parcels,¹⁰⁵ and, for those that did receive an award, the acreage was often not large enough to cultivate sufficient crops.¹⁰⁶ Americans and Europeans, however, amassed large amounts of land for planta-

⁹⁶ VAN DYKE, *supra* note 23, at 40–41.

⁹⁷ *Id.*

⁹⁸ *Id.* at 41.

⁹⁹ MacKenzie & Sproat, *supra* note 25, at 505.

¹⁰⁰ VAN DYKE, *supra* note 23, at 42.

¹⁰¹ *Id.* The Crown Lands were initially known as the King’s Lands because they belonged to Kauikeaouli personally. MacKenzie, *Historical Background*, *supra* note 78, at 14. After Alexander Liholiho (Kamehameha IV) died intestate, however, his widow Queen Emma claimed her share of one-half of the King’s Lands and dower rights in the other half. *Id.* at 18. In response, the Hawai‘i Supreme Court declared that the King’s Lands were supposed to pass to the successors of the throne rather than to the mō‘ī’s heirs. *In re Estate of His Majesty Kamehameha IV*, 2 Haw. 715, 725 (1864). This directly contradicted Kauikeaouli’s intentions recorded in the Buke Māhele. BEAMER, *supra* note 84, at 145. Nevertheless, the legislature changed the name of the King’s Lands to the Crown Lands in 1865 and declared that they were inalienable and belonged to the successors of the Hawaiian monarchy. An Act to Relieve the Royal Domain from Encumbrances, and to Render the Same Inalienable (1865), *reprinted in LAWS OF HIS MAJESTY KAMEHAMEHA V, KING OF THE HAWAIIAN ISLANDS* 69 (1864–65). For clarity, this Comment begrudgingly refers only to the Crown Lands.

¹⁰² VAN DYKE, *supra* note 23, at 42.

¹⁰³ See MacKenzie, *Historical Background*, *supra* note 78, at 14 (explaining that the lands retained by the mō‘ī and ali‘i were encumbered by the maka‘āinana’s rights).

¹⁰⁴ An Act Confirming Certain Resolutions of the King and Privy Council Passed on the 21st Day of December, A.D. 1849, Granting to the Common People Allodial Titles for Their Own Lands and House Lots, and Certain Other Privileges (1850), *reprinted in PENAL CODE OF THE HAWAIIAN ISLANDS* 202–04 (1850). One section of the Kuleana Act allowed people to claim title to parcels they were actively cultivating plus a quarter-acre lot to build a home, while another section allowed people to purchase acreage from the Government Lands. *Id.*

¹⁰⁵ In total, about 8,421 Kuleana awards were given out to 29% of the adult male Native Hawaiian population at the time, though over 41,000 acres were awarded to only 23 missionary families. VAN DYKE, *supra* note 23, at 48.

¹⁰⁶ The average Kuleana parcel was 2.57 acres—far too small to steward regenerative agriculture and aquaculture systems requiring communal cooperation. *Id.* at 48–49.

tions,¹⁰⁷ holding title to three of every four privately-owned acres by the end of the nineteenth century.¹⁰⁸

Though Kauikeaouli's explicit goal was to protect 'Ōiwi lifeways,¹⁰⁹ the Māhele ultimately resulted in dispossession of Kānaka from their ancestral land, which in turn facilitated environmental destruction, loss of culture, and declining welfare at the hands of western capitalists and the U.S. Department of Defense ("DoD"). The Māhele, however, did not divest the common people's undivided interests in the Crown and Government Lands,¹¹⁰ implicitly preserving the trust concept and promise of a land base for Kānaka in that acreage.¹¹¹

B. *Illegal Overthrow of the Kingdom of Hawai'i*

Western sugar planters increasingly opposed 'Ōiwi sovereignty as they consolidated control over natural resources and political power.¹¹² In 1893, a small group of Americans and Europeans—aided by U.S. Marines—overthrew the Kingdom of Hawai'i¹¹³ and appropriated the Government Lands.¹¹⁴ They then declared that their Provisional Government was in control until the United States could annex Hawai'i.¹¹⁵ Alarmed by the overthrow and the push for annexation, President Grover Cleveland sent Commissioner James Blount to investigate the situation.¹¹⁶ Blount found that "Americans, with the support of the U.S. minister to Hawai'i and U.S. military troops, were responsible for overthrowing the monarchy."¹¹⁷ In turn, President Cleveland urged the U.S. Congress "to make all possible reparation" and restore the monarchy that had been "robbed of its independence and its sovereignty by a misuse of the name and power of the United States."¹¹⁸

Despite President Cleveland's directive and Native Hawaiians' vigorous advocacy,¹¹⁹ sovereignty was not restored. When the U.S. Senate did not

¹⁰⁷ MacKenzie, *Historical Background*, *supra* note 78, at 16.

¹⁰⁸ *Id.* at 18.

¹⁰⁹ MacKenzie & Sproat, *supra* note 25, at 510.

¹¹⁰ *E.g.*, Kamanamaikalani Beamer & N. Wahine'aipohaku Tong, *The Māhele Did What? Native Interest Remains*, 10 HŪLILI 125, 130 (2016); Maivān Clech Lām, *The Kuleana Act Revisited: The Survival of Traditional Hawaiian Commoner Rights in Land*, 64 WASH. L. REV. 233, 237 (1989).

¹¹¹ MacKenzie, *Ke Ala Loa*, *supra* note 2, at 627; *see* VAN DYKE, *supra* note 23, at 50.

¹¹² MacKenzie, *Historical Background*, *supra* note 78, at 21.

¹¹³ *Id.* at 18–22.

¹¹⁴ *Id.* at 24.

¹¹⁵ *Id.*

¹¹⁶ *Id.* at 27.

¹¹⁷ MacKenzie & Sproat, *supra* note 58, at 515.

¹¹⁸ *See* H.R. EXEC. DOC. NO. 47, 53D CONG., RELATING TO THE HAWAIIAN ISLANDS (GROVER CLEVELAND, Dec. 18, 1893) (2d sess. 1893), *reprinted in* H.R. EXEC. DOC. NO. 1, 53D CONG., APPENDIX II, FOREIGN RELATIONS OF THE UNITED STATES, 1894, AFFAIRS IN HAWAII 455–62 (3D SESS. 1895).

¹¹⁹ *See* NOENOE K. SILVA, ALOHA BETRAYED: NATIVE HAWAIIAN RESISTANCE TO AMERICAN COLONIALISM 123–63 (2004).

pursue annexation in 1894, the insurrectionists declared the creation of the Republic of Hawai‘i¹²⁰ and seized the Crown Lands from Queen Lili‘uokalani, the mō‘ī to whom they personally belonged.¹²¹ Soon thereafter, the Republic merged the Government and Crown Lands into “Public Lands” and made them alienable.¹²² Sugar plantations snatched up acreage. About 1,400,000 of the 1,800,000 acres of Crown and Government Lands were leased to 65 corporations and individuals by 1898.¹²³

Attempting to eradicate ‘Ōiwi culture, American decisionmakers closed Hawaiian schools and banned ‘ōlelo Hawai‘i (the Hawaiian language) and myriad cultural practices.¹²⁴ Without access to land, many Kānaka became part of a “floating population” crowded in tenements, enduring “conditions which many believed would inevitably result in the extermination” of the Native Hawaiian people.¹²⁵

C. *United States’ Control of the “Public Lands”*

The pro-annexation movement regained momentum when the United States entered the Spanish-American War.¹²⁶ An ‘Ōiwi delegation was initially successful in stopping a two-thirds majority of the U.S. Senate from

¹²⁰ See MacKenzie, *Historical Background*, *supra* note 78, at 24.

¹²¹ *Id.* Article 95 of the Republic’s 1894 Constitution declared that the Crown Lands were not encumbered by any trust and were the property of the government. REPUBLIC OF HAW. CONST. of 1894, art. 95, reprinted in FUNDAMENTAL LAW OF HAWAII 201, 237 (Lorin Thurston ed., 1904). This constitution “manufactured a legal history for the Crown and Government lands” to legitimize the seizure of ‘Ōiwi land. R. Hōkūlei Lindsey, *Native Hawaiians and the Ceded Lands Trust: Applying Self-Determination as an Alternative to the Equal Protection Analysis*, 34 AM. INDIAN L. REV. 223, 251 (2009). Queen Lili‘uokalani sued the United States, arguing that she had a vested equitable life interest in the Crown Lands and therefore was entitled to recover the value of that interest. *Liliuokalani v. United States*, 45 Ct. Cl. 418, 428 (1910). Relying on *In re Estate of His Majesty Kamehameha IV*, 2 Haw. 715 (1864), wherein the Hawai‘i Supreme Court directly contradicted ‘Ōiwi leaders’ intentions for the Māhele process, the U.S. federal claims court declared that the Crown Lands “belonged to the office and not to the individual.” *Liliuokalani*, 45 Ct. Cl. at 427; see *supra* note 101 for a discussion of *In re Estate of His Majesty Kamehameha IV*. In other words, the court held that the Crown Lands were *not* Queen Lili‘uokalani’s private property; rather, the acreage actually belonged to the Republic of Hawai‘i, which was controlled by haole (foreign) businessmen, many of whom helped to illegally overthrow the Kingdom. The court’s opinion contradicted Land Commission records distinguishing Kauikeaouli’s Crown Lands from the Government Lands. VAN DYKE, *supra* note 23, at 40 n.83 (quoting 3A *Privy Council Records*, Series 421, at 47–56). The court nevertheless upheld the seizure and cession of the Crown Lands to the United States. *Liliuokalani*, 45 Ct. Cl. at 428.

¹²² See Act of Aug. 14, 1895, No. 26, § 2, Haw. Laws Spec. Sess. 49. The Land Act of 1895 also created a homesteading program that disproportionately benefited Americans and Europeans. MacKenzie, *Historical Background*, *supra* note 78, at 24–25 (citation omitted).

¹²³ VAN DYKE, *supra* note 23, at 216.

¹²⁴ Eric K. Yamamoto, Carrie Ann Y. Shiota & Jayna Kanani Kim, *Indigenous Peoples’ Human Rights in U.S. Courts*, in RACE AND RACES: CASES AND RESOURCES FOR A DIVERSE AMERICA 246, 247 (Juan F. Perea, Richard Delgado, Angela Harris, Jean Stefancic & Stephanie Wildman eds., 3rd ed. 2015).

¹²⁵ Anaya, *supra* note 45, at 315 (citation omitted).

¹²⁶ MacKenzie, *Historical Background*, *supra* note 78, at 26, 31.

voting in favor of a treaty of annexation, but eventually both the Senate and House of Representatives voted to annex Hawai‘i via a joint resolution, which required only a simple majority.¹²⁷ The Joint Resolution of Annexation purportedly transferred 1,800,000 acres of Crown and Government Lands to the United States.¹²⁸

Both the Joint Resolution and Hawai‘i’s Organic Act, which established a territorial government, recognized the special trust status of the Crown and Government Lands.¹²⁹ The Joint Resolution directed Congress to enact “special laws for [the] management and disposition” of the Crown and Government Lands instead of applying federal public land laws,¹³⁰ and both pieces of legislation stipulated that revenue from the lands must be used to benefit island residents.¹³¹ The Joint Resolution and Organic Act, however, also provided that the federal government had a right to appropriate land for its own use.¹³² Under these provisions, the federal government set aside 432,725.91 acres of Crown and Government Lands by 1959,¹³³ including the entirety of Kaho‘olawe, one of the Hawaiian islands, for use as a U.S. military bombing range.¹³⁴ ‘Ōiwi legal scholars Melody Kapilialoha MacKenzie and D. Kapua‘ala Sproat point out a painful irony: “Although U.S. law acknowledged the trust nature of the Crown and Government Lands, it could not acknowledge the actual beneficiaries of that trust—the Native Hawaiian people—from whom those lands were taken.”¹³⁵ Instead, the “colonizer’s laws . . . were specifically crafted to legitimize the theft of Native Hawaiian land and sovereignty.”¹³⁶

D. State Control of the Public Land Trust

When Hawai‘i entered the Union in 1959, Section 5(b) of its Admission Act transferred title to about 1,400,000 of the 1,800,000 acres of the Crown and Government Lands from the United States to the newly-formed State of

¹²⁷ Joint Resolution to Provide for Annexing the Hawaiian Islands to the United States, July 7, 1898, 30 Stat. 750; see also MacKenzie, *Historical Background*, *supra* note 78, at 26.

¹²⁸ MacKenzie & Sproat, *supra* note 58, at 515 n.177; see also MacKenzie, *Historical Background*, *supra* note 77, at 27; Williamson B. C. Chang, *Darkness Over Hawaii: The Annexation Myth is the Greatest Obstacle to Progress*, 16 ASIAN-PAC. L. & POL’Y J. 70, 72 (2015) (arguing that the United States did not properly annex Hawai‘i and, therefore, has no jurisdiction over Hawai‘i today).

¹²⁹ MacKenzie, *Ke Ala Loa*, *supra* note 2, at 628.

¹³⁰ Joint Resolution to Provide for Annexing the Hawaiian Islands to the United States, July 7, 1898, 30 Stat. 750.

¹³¹ *Id.*; Hawaiian Organic Act, Pub. L. No. 56-339, § 91, ch. 339, 31 Stat. 141 (1900).

¹³² MacKenzie, *Historical Background*, *supra* note 78, at 28.

¹³³ ROBERT H. HORWITZ ET AL., PUBLIC LAND POLICY IN HAWAII: AN HISTORICAL ANALYSIS, LEGISLATIVE REFERENCE BUREAU REPORT NO. 5, at 68 (1969) (providing that the federal government set aside 287,078.44 acres, obtained permits and licenses to use 117,412.74 acres, and either condemned or purchased 28,234.73 acres).

¹³⁴ Exec. Order No. 10,436, 18 Fed. Reg. 1051 (Feb. 25, 1953); see *infra* note 240.

¹³⁵ MacKenzie & Sproat, *supra* note 25, at 515–16.

¹³⁶ *Id.* at 518.

Hawai‘i.¹³⁷ The Admission Act explicitly recognized the trust status of the acreage and partially acknowledged the special relationship between Kānaka and ‘āina.¹³⁸ Section 5(f) of the Admission Act required the State to hold the land in a public trust and use funds generated from trust acreage for one or more of five enumerated purposes, including “for the betterment of the conditions of” Kānaka.¹³⁹ Significantly, the “carefully crafted provisions” of Section 5(b) and 5(f) of the Admission Act “were based on the clear recognition that Native Hawaiians had continuing claims to these lands and that they must be held in trust until those claims are finally resolved.”¹⁴⁰

Through Section 5(d) and other provisions, however, the federal government retained 373,719.58 acres for national parks and military bases, including land for the Mākua Military Reservation on O‘ahu and Pōhakuloa Training Area on Hawai‘i Island.¹⁴¹ Section 5(d) also allowed Congress or the President to take any of the returned acreage for federal use within five years of admission.¹⁴² Hawai‘i’s admission to the Union may thus be understood as a tool used to legalize the theft and exploitation of biocultural resources to “perpetuate[] historical conditions imposed by colonizers.”¹⁴³

Though the Admission Act’s trust concepts were enshrined into Hawai‘i’s Constitution,¹⁴⁴ Kānaka did not benefit from the trust for almost twenty years.¹⁴⁵ This changed in 1978 when Kānaka successfully crafted constitutional amendments that sought to redress ongoing harms of colonization, including land dispossession, cultural annihilation, loss of sovereignty, and denial of self-determination. One amendment provided that acreage granted to the State by Section 5(b) of the Admission Act was to be held in a public trust for Kānaka and the general public.¹⁴⁶ This trust, now known as the Public Land Trust, sustains the Crown and Government Lands and is meant to be the foundation of reconciliation efforts between the State and Kānaka.¹⁴⁷ Many Kānaka want the trust acreage to be a land base for a future

¹³⁷ Admission Act of March 18, 1959, Pub. L. No. 86-3, § 5(b), 73 Stat 4.; *see also* VAN DYKE, *supra* note 23, at 257.

¹³⁸ *See* MacKenzie, *Ke Ala Loa*, *supra* note 59, at 630.

¹³⁹ Admission Act of March 18, 1959, Pub. L. No. 86-3, § 5(f), 73 Stat 4. The other four purposes are supporting public schools and educational institutions, development of a farm and home ownership program, making public improvements, and public use. *Id.*

¹⁴⁰ VAN DYKE, *supra* note 23, at 258.

¹⁴¹ U.S. DEP’T OF THE INTERIOR & U.S. DEP’T OF JUSTICE, FROM MAUKA TO MAKAI: THE RIVER OF JUSTICE MUST FLOW FREELY, REPORT ON THE RECONCILIATION PROCESS BETWEEN THE FEDERAL GOVERNMENT AND NATIVE HAWAIIANS 37–38 (2000) [hereinafter FROM MAUKA TO MAKAI]; HORWITZ ET AL., *supra* note 131, at 76 tbl.9. The federal government also continued to lease an additional 30,176.18 acres. FROM MAUKA TO MAKAI, *supra*, at 37.

¹⁴² Admission Act of March 18, 1959, Pub. L. No. 86-3, § 5(f), 73 Stat 4.

¹⁴³ Sproat, *Wai Through Kānāwai*, *supra* note 24, at 185; *see also* DEAN ITSUJI SARANILIO, UNSUSTAINABLE EMPIRE: ALTERNATIVE HISTORIES OF HAWAII STATEHOOD 5–6 (2018).

¹⁴⁴ *See* HAW. CONST. art. XII, § 4.

¹⁴⁵ MacKenzie, *Historical Background*, *supra* note 78, at 33.

¹⁴⁶ HAW. CONST. art. XII, § 4.

¹⁴⁷ *Off. of Hawaiian Affs. v. Hous. & Cmty. Dev. Corp. (HCDCH I)*, 177 P.3d 884, 901–02 (Haw. 2008), *rev’d and remanded sub nom. Hawaii v. Off. of Hawaiian Affs.*, 556 U.S. 163 (2009); *see also* MacKenzie, *supra* note 64, at 635.

sovereign Native Hawaiian nation,¹⁴⁸ consistent with Kauikeaouli's intent for the Crown and Government lands to secure sovereignty, and in turn physical, cultural, and spiritual health for our people.

Another constitutional amendment aimed at redressing the loss of self-governance established the Office of Hawaiian Affairs ("OHA"),¹⁴⁹ a semi-autonomous entity separate from the executive branch empowered "to accept the transfer of reparations money and land" for Kānaka to "provide for accountability, self-determination, [and] methods for self-sufficiency through assets and a land base."¹⁵⁰ Legislation requires that OHA receive a 20% pro rata share of the revenues from the Public Land Trust to be used for the betterment of Kānaka.¹⁵¹ In recognition of the importance of self-governance, OHA's original governing board was composed of Native Hawaiian trustees elected by those of 'Ōiwi ancestry.¹⁵² For the first twenty years after its establishment, OHA enabled Kānaka to "exercise[] a limited form of self-governance,"¹⁵³ "gradually bec[oming] a strong and respected voice for" Kānaka "at both the state and federal levels."¹⁵⁴ OHA's restorative power, however, has been undercut by denials of the pro rata share of trust revenues¹⁵⁵ and *Rice v. Cayetano*, a U.S. Supreme Court decision that deployed an ahistorical, formalist lens to invalidate OHA's ancestry-based voting qualifications.¹⁵⁶

Other 1978 constitutional amendments were aimed at remedying the loss of culture and decimation of 'Ōiwi health,¹⁵⁷ including an amendment that provided protections for traditional and customary Native Hawaiian

¹⁴⁸ See MacKenzie, *Public Land Trust*, *supra* note 57, at 123. As part of its commitments to reconciliation, the State agreed to transfer Kaho'olawe to an 'Ōiwi governing entity upon recognition by the federal and state governments. HAW. REV. STAT. § 6K-9 (2009).

¹⁴⁹ HAW. CONST. art. XII, § 5.

¹⁵⁰ Standing Comm. Rep. No. 59, 1 PROCEEDINGS OF THE CONSTITUTIONAL CONVENTION OF 1978, at 645-46 (1980).

¹⁵¹ HAW. REV. STAT. § 10-13.5 (2009).

¹⁵² Melody Kapilialoha MacKenzie, *Native Hawaiians and U.S. Law*, in NATIVE HAWAIIAN LAW: A TREATISE, *supra* note 17, at 265, 284.

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ The State profits from trust acreage but refuses to pay OHA the 20% pro rata share it is statutorily owed. For a discussion of the denials of funding see *Fulfilling the State's Public Land Trust Revenue Obligations*, OFF. HAWAIIAN AFFS., <https://www.oha.org/plt>, archived at <https://perma.cc/F35A-UGU3> (last visited Apr. 14, 2021); see also MacKenzie, *Ke Ala Loa*, *supra* note 2, at 640-44.

¹⁵⁶ See *Rice v. Cayetano*, 528 U.S. 495, 499 (2000). Because the *Rice* majority's sanitization of history and perversion of the Fifteenth Amendment cannot be summarized in one footnote, see Sproat, *Wai Through Kānāwai*, *supra* note 24, at 158-60; Susan K. Serrano, *A Reparative Justice Approach to Assessing Ancestral Classifications Aimed at Colonization's Harms*, 27 WM. & MARY BILL RTS. J. 501, 510-14 (2018); Chris K. Iijima, *Race Over Rice: Binary Analytical Boxes and Twenty-First Century Endorsement of Nineteenth Century Imperialism in Rice v. Cayetano*, 53 RUTGERS L. REV. 91, 95-98 (2000).

¹⁵⁷ Other restorative amendments include Article XV, Section 4, which made 'Ōlelo Hawai'i (the Hawaiian language) an official language, and Article X, Section 4 which requires a Hawaiian education program encompassing language, culture, and history in all public schools.

practices.¹⁵⁸ Relatedly, another amendment placed Hawai‘i’s natural resources under an evolving Public Trust Doctrine.¹⁵⁹ Though the ratification of these amendments showed the people of Hawai‘i’s commitment to restorative justice for Kānaka, wounds inflicted by American colonization have yet to be redressed.¹⁶⁰

E. Judicially-Imposed Trust Obligations

Kānaka have repeatedly turned to the courts to force the State to uphold its trust obligations.¹⁶¹ This section examines four seminal cases—*Pele Defense Fund v. Paty*,¹⁶² *Hawaii v. Office of Hawaiian Affairs*,¹⁶³ *In re TMT*,¹⁶⁴ and *Ching v. Case*¹⁶⁵—that have developed the State’s Public Land Trust duties.¹⁶⁶ In articulating these obligations, the Hawai‘i Supreme Court and U.S. Supreme Court have both strengthened and weakened protections for trust lands and, in turn, the availability of the acreage as a base for reconciliation.

1. *Pele Defense Fund v. Paty*

The Hawai‘i Supreme Court strengthened protections for trust acreage in *Pele Defense Fund v. Paty* by declaring that the State’s duties are analogous to those of private trustees.¹⁶⁷ Pele Defense Fund (“PDF”), a nonprofit composed of ‘Ōiwi practitioners and descendants of the goddess Pelehonuamea, partnered with local residents as well as Native Hawaiian and environmental organizations to oppose the Hawai‘i Geothermal Project (“HGP”), a large-scale energy plant in the Wao Kele O Puna rainforest on Hawai‘i Island that would have desecrated Pelehonuamea’s realm and, in turn, harmed ‘Ōiwi culture and wreaked ecological havoc.¹⁶⁸ PDF brought suit after the State exchanged Public Land Trust acreage on Hawai‘i Island

¹⁵⁸ HAW. CONST. art. XII, § 7.

¹⁵⁹ HAW. CONST. art. XI, § 1. Hawai‘i’s Public Trust doctrine is rooted in ‘Ōiwi values and Hawaiian Kingdom laws. Sproat & McDonald, *supra* note 12.

¹⁶⁰ Sproat, *Environmental Self-Determination*, *supra* note 16, at 216.

¹⁶¹ OHA’s constitutionally-contemplated and statutorily-owed share of trust revenues is another heavily-litigated issue. *See supra* note 163.

¹⁶² *Pele Def. Fund v. Paty*, 837 P.2d 1247 (Haw. 1992).

¹⁶³ *Hawaii v. Off. of Hawaiian Affs.*, 556 U.S. 163 (2009).

¹⁶⁴ *In re Contested Case Hearing re Conservation Dist. Use Application HA-3568 for the Thirty Meter Telescope at the Mauna Kea Sci. Reserve (In Re TMT)*, 431 P.3d 752 (Haw. 2018).

¹⁶⁵ *Ching v. Case*, 449 P.3d 1146 (Haw. 2019).

¹⁶⁶ Though beyond the scope of this Comment, the Public Trust Doctrine of Article XI, Sections 1 and 7 and protections for traditional and customary Native Hawaiian practices in Article XII, Section 7 vest the State with additional obligations towards Article XII, Section 4 Public Land Trust acreage.

¹⁶⁷ *Pele Def. Fund*, 837 P.2d at 1263 n.18.

¹⁶⁸ Davianna Pōmaika‘i McGregor & Noa Emmett Aluli, *Wao Kele O Puna and the Pele Defense Fund*, in *A NATION RISING*, *supra* note 6, at 180, 185–86, 189–91.

for land from a private owner for HGP development.¹⁶⁹ PDF argued that the land exchange constituted a breach of trust under Section 5(f) of Hawai‘i’s Admission Act in violation of Article XII, Section 4 of Hawai‘i’s Constitution.¹⁷⁰ Though *res judicata* barred PDF’s suit,¹⁷¹ the court declared that the State has a fiduciary duty under the Hawai‘i’s Constitution and must administer the Public Land Trust “solely in the interest of the beneficiaries,” use “reasonable skill and care to make trust property productive,” and act “impartially” in situations involving more than one beneficiary.¹⁷²

2. *Hawaii v. Office of Hawaiian Affairs*

Two years after *Pele Defense Fund*, OHA and four Kānaka sought to enjoin the State from selling or transferring Crown and Government Lands because of its trustee duties.¹⁷³ A state entity, the Housing and Community Development Corporation of Hawai‘i, sought to transfer trust acreage on Maui and Hawai‘i Island to a private developer.¹⁷⁴ In a groundbreaking opinion, the Hawai‘i Supreme Court in *Office of Hawaiian Affairs v. Housing and Community Development Corporation of Hawai‘i (HCDCH I)* sided with the plaintiffs and permanently enjoined the sale or transfer of Public Land Trust acreage until Native Hawaiians’ claims to the land were resolved.¹⁷⁵

In reaching this decision, the court partially relied on the Apology Resolution, a joint resolution passed by the U.S. Congress in 1993.¹⁷⁶ In the Apology Resolution, Congress recognized that Kānaka “never directly relinquished their claims . . . over their national lands”¹⁷⁷ and admitted that land was taken “without the consent of or compensation to the Native Hawaiian people . . . or their sovereign government.”¹⁷⁸ Congress also apologized to Kānaka for U.S. agents’ participation in the illegal overthrow of the Hawaiian Kingdom,¹⁷⁹ and committed to “reconciliation between the United States and the Native Hawaiian people.”¹⁸⁰ The court found that the Apology Resolution had the force of law and “serve[d] as the *foundation* (or starting point) for reconciliation, including the future settlement of the plaintiffs’ un-

¹⁶⁹ *Pele Def. Fund*, 837 P.2d at 1253.

¹⁷⁰ *Id.* at 1256.

¹⁷¹ The plaintiffs litigated similar claims in federal court two years earlier in *Ulaleo v. Paty*, 902 F.2d 1395, 1397 (9th Cir. 1990).

¹⁷² *Pele Def. Fund*, 837 P.2d at 1263 n.18 (quoting *Ahuna v. Dep’t of Hawaiian Homes Lands*, 640 P.2d 1161, 1169–70 (Haw. 1982)).

¹⁷³ *HCDCH I*, 177 P.3d 884, 898 (Haw. 2008), *rev’d and remanded sub nom. Hawaii v. Off. of Hawaiian Affs.*, 556 U.S. 163 (2009); *see also* MacKenzie, *Ke Ala Loa*, *supra* note 2, at 636.

¹⁷⁴ *HCDCH I*, 177 P.3d at 896–98.

¹⁷⁵ *See id.* at 927.

¹⁷⁶ *Id.* at 922–23; Apology Resolution, Pub. L. No. 103-150, 107 Stat. 1510 (1993).

¹⁷⁷ Apology Resolution, para. 29, Pub. L. No. 103-150, 107 Stat. 1512 (1993).

¹⁷⁸ *Id.* at 1510.

¹⁷⁹ *Id.* § 1(3).

¹⁸⁰ *Id.* § 1(4).

relinquished claims” to trust acreage.¹⁸¹ The court also recognized that alienated trust land is permanently lost and thus cannot be the foundation of restorative efforts.¹⁸² The court then declared that the Apology Resolution, similar state legislation,¹⁸³ and prior cases¹⁸⁴ imposed a fiduciary duty on the State “to preserve trust lands until the claims of the Native Hawaiian community are resolved through the political process.”¹⁸⁵

The State controversially sought review from the U.S. Supreme Court, arguing that the Joint Resolution of Annexation, Organic Act, and Admission Act extinguished Ōiwi claims to trust lands.¹⁸⁶ The Court did not legitimize the State’s ahistorical argument in *Hawaii v. Office of Hawaiian Affairs*, but it gutted the Apology Resolution and reversed the Hawai’i Supreme Court’s injunction barring the sale of trust lands.¹⁸⁷ To reach this conclusion, the Court first examined the Apology Resolution’s two substantive provisions, finding that the first did not create substantive rights and the second was misinterpreted.¹⁸⁸ The Court then declared that the thirty-seven preambulatory clauses had no operative effect.¹⁸⁹ Aside from these findings, the Court acknowledged that it had “no authority to decide questions of Hawaiian law or to provide redress for past wrongs except as provided for by federal law” and remanded the case.¹⁹⁰

Despite its sanitization of history, the Court “did not refute the findings of the U.S. Congress or the Hawai’i Supreme Court.”¹⁹¹ While the decision weakened the Apology Resolution’s restorative power, it revealed the Court’s hypocrisy regarding control of Hawai’i’s resources. The Court declared the Apology Resolution—a joint resolution—had no substantive power.¹⁹² As MacKenzie and Sproat point out, “[s]hould not then the 1898 Joint Resolu-

¹⁸¹ HCDCH I, 177 P.3d at 902.

¹⁸² *Id.* at 924.

¹⁸³ *See, e.g.*, Act 354, 1993 Haw. Sess. Laws 999–1000 (acknowledging that “the actions by the United States” in overthrowing the Hawaiian Kingdom “were illegal and immoral” and pledging “continued support” to Kānaka “by taking steps to promote the restoration of” Ōiwi “rights and dignity”); Act 359, 1993 Haw. Sess. Laws 1009–10 (“acknowledg[ing] and recogniz[ing] the unique status” of Kānaka to the State and United States and “facilitat[ing]” Ōiwi self-governance efforts).

¹⁸⁴ *See generally* Pele Def. Fund v. Paty, 837 P.2d 1247 (Haw. 1992); Ahuna v. Dep’t of Hawaiian Homes Lands, 640 P.2d 1161 (Haw. 1982).

¹⁸⁵ MacKenzie, *Ke Ala Loa*, *supra* note 2, at 636 (citing HCDCH I, 177 P.3d at 905, 923).

¹⁸⁶ Brief for Petitioner at 19, *Hawaii v. Off. of Hawaiian Affs.*, 556 U.S. 163 (2009) (No. 07-1372), 2008 WL 5150171.

¹⁸⁷ *See* Off. of Hawaiian Affs., 556 U.S. at 166.

¹⁸⁸ *See id.* at 173–74.

¹⁸⁹ *See id.* at 175–76.

¹⁹⁰ *Id.* at 177. OHA and three individual plaintiffs agreed to dismiss the lawsuit in return for legislation requiring a two-thirds majority vote in the state legislature for the transfer of any trust lands. *See* Act of July 13, 2009, No. 176, § 2, 2009 Haw. Sess. Laws 705, 706–07 (codified at HAW. REV. STAT. §171-64.7) (2010)). One plaintiff did not settle, but the Hawai’i Supreme Court found that his claims were not ripe because there had not yet been a final action by the legislature on Act 176 regarding trust acreage. *Off. of Hawaiian Affs. v. Hous. & Cmty. Dev. Corp.* (HCDCH II), 219 P.3d 1111, 1126 (Haw. 2009).

¹⁹¹ MacKenzie & Sproat, *supra* note 26, at 521.

¹⁹² Off. of Hawaiian Affs., 556 U.S. at 173–76.

tion of Annexation also be viewed with similar suspicion?"¹⁹³ The Court's answer is no, ironically, as five justices sanctioned the use of a joint resolution to unilaterally annex Hawai'i in *De Lima v. Bidwell*, one of the *Insular Cases*.¹⁹⁴

3. *In re TMT*

In 2018, the Hawai'i Supreme Court in *In re TMT* undercut protections for Public Land Trust acreage on Mauna a Wākea,¹⁹⁵ the tallest mountain in the world and a revered kupuna (elder) and akua (ancestor, god, elemental form) on Hawai'i Island.¹⁹⁶ Maunakea, as the mountain is colloquially known, was born from Papa (Earth Mother) and Wākea (Sky Father) and is the elder sibling of all Kānaka.¹⁹⁷ The genealogical connection between Kānaka and Maunakea engenders a reciprocal kuleana (responsibility and privilege) that "requires continual maintenance in order to remain pono, or balanced."¹⁹⁸ Maunakea's summit is part of the wao akua (the godly realm).¹⁹⁹ For many Kānaka, it is the most sacred place in the world.²⁰⁰ The Mauna's hau (snow) and lilinoe (mist) nourish an aquifer that provides freshwater for Hawai'i Island residents.²⁰¹ In these ways, Maunakea is a source of cultural integrity and wellbeing, sustaining Kānaka both culturally and physically.

Kauikeaouli retained part of Maunakea as his Crown Lands during the Māhele process, and the whole region eventually became part of the Public Land Trust.²⁰² Today, Maunakea is zoned as conservation land,²⁰³ the most restrictive state classification meant to protect and preserve natural resources.²⁰⁴ Despite this protective classification, the University of Hawai'i assumed the State's trust duties in 1968 in order to build an astronomical observatory on Maunakea²⁰⁵ and subsequently applied for special permits to

¹⁹³ MacKenzie & Sproat, *supra* note 58, at 522.

¹⁹⁴ *De Lima v. Bidwell*, 182 U.S. 1, 196 (1901).

¹⁹⁵ *In re TMT*, 431 P.3d 752, 782 (Haw. 2018).

¹⁹⁶ Leon No'eau Peralto, *Mauna a Wākea: Hānau Ka Mauna, the Piko of Our Ea*, in A NATION RISING, *supra* note 6, at 233.

¹⁹⁷ See *Mele Hānau nō Kau-i-ke-ao-uli*, in THE ECHO OF OUR SONG: CHANTS & POEMS OF THE HAWAIIANS 17, 23 (Mary Kawena Pukui & Alfons L. Korn trans. & eds., 1973) (explaining that Hāloa, the first Kanaka, and Maunakea are both descended from Papa and Wākea).

¹⁹⁸ Peralto, *supra* note 196, at 234.

¹⁹⁹ Devin Kamealoha Forrest, Wao Akua 1 (June 24, 2021) (unpublished manuscript) (on file with author).

²⁰⁰ See, e.g., Puuhonua Puuhuluhulu, *supra* note 80.

²⁰¹ Candace Fujikane, *Mapping Abundance on Mauna a Wākea as a Practice of Ea*, 11 HŪLILI 23, 25 (2019).

²⁰² Peralto, *supra* note 196, at 235–36.

²⁰³ See *In re TMT*, 431 P.3d 752, 757 (Haw. 2018).

²⁰⁴ See HAW. CODE R. §§ 13-5-1; 13-5-11 to 13-5-15 (2021).

²⁰⁵ William N. K. Crowell, Comment, *Chipping Away at the Public Trust Doctrine: Mauna Kea and the Degradation Principle*, 21 ASIAN-PAC. L. & POL'Y J. 1, 4 (2020) (citation omitted).

build at least forty-one new telescopes, including the Thirty Meter Telescope (“TMT”) on Maunakea’s summit.²⁰⁶

‘Ōiwi-led protests and strategic litigation²⁰⁷ halted TMT’s construction until 2018 when the Hawai‘i Supreme Court declared that the project could proceed in *In re TMT*.²⁰⁸ Overlooking precedent,²⁰⁹ the court held that because the construction of thirteen telescopes already caused “substantial, significant, and adverse impacts” on the summit, the impacts on natural resources “would be substantially the same even in the absence of the TMT Project.”²¹⁰

The dissent accused the Hawai‘i Board of Land and Natural Resources (“BLNR”)²¹¹ of creating a “new principle of natural resource law” that allows “one of the most sacred resources of the Hawaiian culture [to] lose[] its protection because it ha[d] previously undergone substantial adverse impact[s]. . . .”²¹² This “degradation principle” seemingly allows the State to justify degrading trust land because of the State’s own prior abuse and mismanagement,²¹³ contradicting Hawai‘i’s Constitution,²¹⁴ caselaw, administrative rules, and foundational environmental law principles.²¹⁵ The dissent charged the majority with “perpetuate[ing] the concept that the passage of time and the degradation of natural resources can justify unacceptable environmental and cultural damage.”²¹⁶

4. *Ching v. Case*

One year after *In re TMT*, the Hawai‘i Supreme Court reversed course and strengthened protections for Public Land Trust acreage and Public Trust resources in *Ching v. Case*.²¹⁷ Pōhakuloa, the land at issue in *Ching*, is the saddle region between Maunakea, Maunaloa, and Hualālai in the center of

²⁰⁶ *Id.* at 4.

²⁰⁷ *See, e.g.*, *Flores v. Bd. of Land & Nat. Res.*, 424 P.3d 469, 483 (Haw. 2018); *Mauna Kea Anaina Hou v. Bd. of Land & Nat. Res.*, 363 P.3d 224, 247 (Haw. 2015).

²⁰⁸ *In re TMT*, 431 P.3d at 782.

²⁰⁹ *Kilakila ‘O Haleakala v. Bd. of Land & Nat. Res.*, 382 P.3d 195, 216 (Haw. 2016) (declaring in relation to the construction of another telescope on Haleakalā on Maui that the Hawai‘i Board of Land and Natural Resources “does not have license to endlessly approve permits for construction in conservation districts, based purely on the rationale that every additional facility is purely incremental. It cannot be the case that the presence of one facility necessarily renders all additional facilities as an ‘incremental’ addition.”).

²¹⁰ *In re TMT*, 431 P.3d at 776.

²¹¹ BLNR is a seven-member board within the DLNR and is responsible for land leases (like the lease at issue in *Ching v. Case*, 449 P.3d 1146, 152 (Haw. 2019)) and conservation district use permit applications (as in *In Re TMT*, 431 P.3d at 757). *See generally Boards & Commissions*, HAW. DEP’T OF LAND & NAT. RES., <https://dlnr.hawaii.gov/boards-commissions/>, archived at <https://perma.cc/JBC3-YNRG>.

²¹² *In re TMT*, 431 P.3d at 795 (Wilson, J., dissenting).

²¹³ *Id.* at 794–96.

²¹⁴ *Id.* at 800–01.

²¹⁵ *Id.* at 795–96.

²¹⁶ *Id.* at 795.

²¹⁷ *Ching v. Case*, 449 P.3d 1146 (Haw. 2019).

Hawai‘i Island.²¹⁸ This area is of great historical and biocultural significance.²¹⁹ There are a multitude of cultural sites within the region,²²⁰ including large heiau (religious complexes), such as Ahu-a-Umi, Pu‘u Ke‘eke‘e, and Mauna Hale Pohaku, and smaller heiau, like cairns and standing stones.²²¹ ‘Auwai akua, (waterways of the gods) channel upland waters through Pōhakuloa down to the sea.²²² Kānaka engage in traditional cultural practices in Pōhakuloa,²²³ and at least three endangered species—the ‘akç‘akç (Hawaiian storm petrel),²²⁴ ‘ōpe‘ape‘a (Hawaiian hoary bat),²²⁵ and nçç (Hawaiian goose)²²⁶—populate the area.²²⁷

Pōhakuloa is also home to the Pōhakuloa Training Area (“PTA”), a 134,000 acre military complex touted as the “cornerstone of the U.S. Pacific Command.”²²⁸ PTA was officially established as an military training area in 1956,²²⁹ though U.S. forces began to occupy the area over twenty years prior.²³⁰ In 1964, President Lyndon B. Johnson set aside over 84,000 acres of Crown and Government Lands at Pōhakuloa pursuant to Section 5(d) of the Admission Act.²³¹ Shortly thereafter, the federal government forced the State to lease over 22,900 Public Land Trust acres to the United States for sixty-five years for a total of \$1.00.²³² The federal government bought another

²¹⁸ Uncle Ku Ching, *The Mālama ‘Āina Case*, MĀLAMA I KA HONUA: Q. J. SIERRA CLUB, 2 (Apr.–June 2020).

²¹⁹ *Id.*

²²⁰ See, e.g., CHRISTOPHER M. MONAHAN, SWCA ENV’T CONSULTANTS, SWCA PROJECT NO. 15131, CULTURAL RESOURCE EVALUATIONS OF STRYKER TRANSFORMATION AREAS IN HAWAI‘I 288–97 (2009) (describing cultural sites within PTA).

²²¹ CULTURAL SURVEYS HAWAI‘I, INC., ARCHAEOLOGICAL AND CULTURAL MONITORING REPORT FOR ACTIVITIES RELATED TO CONSTRUCTION OF THE PROPOSED BATTLE AREA COMPLEX (BAX) FOR THE STRYKER BRIGADE COMBAT TEAM (SBCT), U.S. ARMY PŌHAKULOA TRAINING AREA (PTA), ISLAND OF HAWAI‘I, HAWAI‘I 59 (2014).

²²² *Id.* at 69–71.

²²³ See Ching v. Case, No. 14-1-1085-04 GWBC, 2018 WL 11225507, at *1 (Haw. Cir. Ct. Apr. 3, 2018).

²²⁴ 32 Fed. Reg. 4001 (Mar. 11, 1967).

²²⁵ 35 Fed. Reg. 16,047 (Oct. 13, 1970) (codified at 50 C.F.R. § 17.11(h)).

²²⁶ The nçç was first listed as an endangered species in 1967. 32 Fed. Reg. 4001 (Mar. 11, 1967). In 2019, the nçç was reclassified as threatened. 84 Fed. Reg. 69,918 (Dec. 19, 2019) (codified at 50 C.F.R. § 17.41(d)).

²²⁷ Uncle Ku Ching, *supra* note 218, at 2–3.

²²⁸ HHF PLANNERS, REAL PROPERTY MASTER PLAN: PŌHAKULOA TRAINING AREA DRAFT FINAL 2 (2020) [hereinafter PTA REAL PROPERTY MASTER PLAN].

²²⁹ PROGRAMMATIC AGREEMENT AMONG THE U.S. ARMY GARRISON, PŌHAKULOA TRAINING AREA, THE U.S. ARMY GARRISON, HAWAII, AND THE HAWAII STATE HISTORIC PRESERVATION OFFICER REGARDING ROUTINE MILITARY TRAINING ACTIONS AND RELATED ACTIVITIES AT UNITED STATES ARMY INSTALLATIONS ON THE ISLAND OF HAWAI‘I, HAWAI‘I 1-2 (2018).

²³⁰ *Id.* at 23.

²³¹ Exec. Order No. 11,167, 29 Fed. Reg. 11,805 (Aug. 15, 1964); Exec. Order No. 11,166, 29 Fed. Reg. 11,803 (Aug. 15, 1964); see also HORWITZ ET AL., *supra* note 133, at 76 tbl.9A. In all, the federal government set aside 87,236.557 acres via executive order under Section 5(d) of Hawai‘i’s Admission Act. See HORWITZ ET AL., *supra* note 133, at 76 tbl.9A.

²³² HORWITZ ET AL., *supra* note 133, at 75, 76 tbl.9A–B.

parcel from Parker Ranch, a private landowner, under threat of condemnation in 2006.²³³

Though the 1964 lease gives the United States “unrestricted control and use” of the leased acreage, it also vests the federal and state governments with duties meant to protect Pōhakuloa.²³⁴ Significantly, the lease obligates the military to make reasonable efforts to remove ammunition and debris,²³⁵ and prevent unnecessary damage to natural resources.²³⁶ The military also agreed to return the acreage when the lease expires in 2029 and remove shells if economically and technically feasible.²³⁷ The State has the right to enter the leased acreage at any reasonable time approved by the military²³⁸ and is supposed to remove any trash left by the public.²³⁹ These duties, however, should be understood alongside the United States’ refusal to restore other land used for live-fire training, including Kaho‘olawe,²⁴⁰ Waikāne Valley,²⁴¹ and Mākua,²⁴² despite contractual obligations to do so.

Given this history, in 2014 Uncle Kū Ching, an ‘Ōiwi practitioner, attorney, and former OHA trustee,²⁴³ requested state records of the military’s

²³³ Chris Kanazawa, *Parker Ranch to Sell Tract to Army*, PAC. BUS. NEWS (July 21, 2006) <https://www.bizjournals.com/pacific/stories/2006/07/17/daily62.html>.

²³⁴ Ching v. Case, 449 P.3d 1146, 1150–51 (Haw. 2019).

²³⁵ *Id.* at 1150 n.3.

²³⁶ *Id.* at 1151 n.4.

²³⁷ *Id.* at 1151 n.5.

²³⁸ *Id.* at 1151 n.7.

²³⁹ *Id.* at 1151 n.6.

²⁴⁰ Kaho‘olawe, one of the Hawaiian islands, is a wahi pana (storied place) traditionally dedicated to Kanaloa, the god of the ocean, currents, and navigation, and a pu‘uhonua (place of refuge) for Kānaka. Davianna Pomaika‘i McGregor & Noa Emmet Aluli, *Mai Ke Kai Mai Ke Ola, From the Ocean Comes Life: Hawaiian Customs, Uses, and Practices on Kaho‘olawe Relating to the Surrounding Ocean*, 26 HAWAIIAN J. HIST. 231, 235–240 (1992). The U.S. Navy, however, used Kaho‘olawe as a bombing range, devastating Native biota, cracking the freshwater lens, and rendering the island uninhabitable. Though the Navy retains responsibility in perpetuity for removing all unexploded ordnance from the island and surrounding waters, the Kaho‘olawe Island Reserve Commission, Protect Kaho‘olawe ‘Ohana, and teams of volunteers continue to restore Kaho‘olawe. *See generally History*, PROTECT KAHO‘OLAWE ‘OHANA, <http://www.protectkahoolaweohana.org/history.html>, archived at <https://perma.cc/UW8R-77L5>.

²⁴¹ Waikāne Valley on O‘ahu is of vast historical and cultural significance. *See, e.g., He Moolelo Kaako No Hiiakaikapoliopole*, KA HOKU O HAWAII, Jan. 12, 1926, at 1 (Devin Kamealoha Forrest trans.). The U.S. Marine Corps, however, obliterated land in Waikāne leased from the Kamaka ‘ohana and have refused to restore it, as contractually obligated. Dawson, *supra* note 5.

²⁴² Mākua is a pu‘uhonua and home to many communities. *See generally* MĀKUA—TO HEAL A NATION (NĀ MAKA O KA ‘ĀINA 1996). The U.S. military, however, began to use Mākua for live-fire training during the 1920s. Niheu, *supra* note 6, at 164. After a protracted legal battle, Mālama Mākua, a ‘Ōiwi nonprofit, was successful in securing an injunction barring U.S. armed forces from conducting live-fire training in the valley. Joint Stipulation to Settle Pl.’s Compl. at 2–3, *Mālama Mākua v. Mattis*, Civil No. 16-00597 SOM-KJM (D. Haw. Aug. 3, 2018). Unexploded ordnance and other military debris have yet to be removed. *See generally Restoring Makua Valley*, EARTHJUSTICE, https://earthjustice.org/our_work/cases/1998/makua-environmental-impact-statement, archived at <https://perma.cc/F3YW-4K6W>.

²⁴³ Lauren Muneoka, *Meet the Mauna Kea Hui—Kukauakahi (Clarence Ching)*, KAHEA (Aug. 14, 2011), <http://kahea.org/blog/mk-vignette-kukauakahi-clarence-ching>, archived at <https://perma.cc/6TWT-7NZ7>.

compliance with the lease, as well as records documenting DLNR's efforts to ensure that the military followed the clean-up provisions.²⁴⁴ The State had no records.²⁴⁵ Three months later, Uncle Kū and Aunty Maxine Kahā'ulelio, an 'Ōiwi practitioner, community organizer, and member of the Protect Kaho'olawe 'Ohana,²⁴⁶ filed a lawsuit alleging that the State breached its trust duties by failing to monitor the military's compliance.²⁴⁷ The State argued that three recently-discovered inspection reports, as well as a few third-party monitoring reports, showed that DLNR fulfilled its trust obligations.²⁴⁸ The inspection reports, however, were "grossly inadequate."²⁴⁹ The first inspection was done entirely on foot by one person over the course of a single day in 1984.²⁵⁰ The second report was not signed and contained no findings.²⁵¹ The final report was initiated after the lawsuit was filed and found the land was in "unsatisfactory" condition.²⁵² The ancillary reports noted that unexploded ordnance, junk cars, and trash were littered all over PTA, indicating that the military was not in compliance.²⁵³ The State, however, never followed up with the military about Pōhakuloa's condition.²⁵⁴

In a path-forging opinion, the Hawai'i Supreme Court rejected the State's argument that it had no duty to monitor leased Public Land Trust acreage²⁵⁵ and vested the State with affirmative monitoring duties.²⁵⁶ The court declared that Hawai'i's Admission Act, the state constitution, common law of trusts, and caselaw imposed a duty to preserve trust property.²⁵⁷ "As a trustee, the State must take an active role in preserving trust property and may not passively allow it to fall into ruin."²⁵⁸ The court reasoned that the State's fiduciary duty imposed in *Pele Defense Fund* necessarily includes obligations to reasonably monitor trust property to ensure that it is not harmed and to investigate once the State is made aware of possible harm.²⁵⁹ This duty to investigate obligates the State to make reasonable efforts to monitor lessee compliance with terms meant to protect trust property.²⁶⁰ The

²⁴⁴ Ching, 449 P.3d 1146, 1152 (Haw. 2019).

²⁴⁵ *Id.*

²⁴⁶ For an autobiographical account of Aunty Maxine's aloha 'āina advocacy, see MOANIKE'ALA AKAKA, MAXINE KAHAULELIO, TERRILEE KEKO'OLANI-RAYMOND & LORETTA RITTE, NĀ WĀHINE KOA: HAWAIIAN WOMEN FOR SOVEREIGNTY AND DEMILITARIZATION 93–121 (Noelani Goodyear-Ka'ōpua ed., 2018).

²⁴⁷ First Am. Compl. for Decl. J. and Inj. Relief ¶ 1, Ching, 449 P.3d at 1146.

²⁴⁸ Ching, 449 P.3d at 1178–79.

²⁴⁹ *Id.* at 1178.

²⁵⁰ *Id.* at 1158.

²⁵¹ *Id.*

²⁵² *Id.* at 1159.

²⁵³ Ching, 449 P.3d at 1180.

²⁵⁴ *Id.*

²⁵⁵ *Id.* at 1176–77.

²⁵⁶ *Id.* at 1180, 1184.

²⁵⁷ *Id.* at 1175. By tying trust duties to Third Restatement of Trusts, the court ensured that the trust duties continue to adapt into the future.

²⁵⁸ *Id.*

²⁵⁹ Ching, 449 P.3d at 1175.

²⁶⁰ *Id.* at 1175–76.

court ultimately found that the State breached all of these duties by failing to (1) regularly monitor, (2) ensure the military was complying with lease provisions, and (3) appropriately follow-up with the military when the State became aware of potential violations.²⁶¹

The court then took the extraordinary step of ordering the State to promptly undertake affirmative activities to mālama ‘āina (care for, protect, and preserve) the leased land.²⁶² The trial court described the duty to mālama ‘āina as “the highest duty to preserve and maintain trust lands,”²⁶³ obligating the State “to use [its] best reasonable efforts to discharge [its] duties and obligations” under Hawai‘i’s Public Trust Doctrine and Public Land Trust.²⁶⁴ To begin the process of discharging the duty to mālama ‘āina Pōhakuloa, the court ordered the State to develop and execute a court-approved plan to conduct regular, periodic monitoring and inspections.²⁶⁵

Shortly after the court’s ruling, the military announced its intention to retain the leased acreage indefinitely.²⁶⁶ Given PTA’s strategic value, the federal government may use its eminent domain powers if the State refuses to renew the lease.²⁶⁷ But Kānaka are mobilizing to challenge the military’s retention of Pōhakuloa,²⁶⁸ just as our kūpuna have fought to protect Wao Kele O Puna, Maunakea, Kaho‘olawe, Mākua, and other beloved ‘āina across our archipelago. These movements are just a few iterations of nearly one hundred and thirty years of our lāhui (Hawaiian nation, people) rising to reclaim stolen land and restore our culture, well-being, and self-determination.²⁶⁹

III. BLOCKCHAINS FOR ENVIRONMENTAL SELF-DETERMINATION

For Kānaka, na‘au pono—a deep sense of justice—may only be achieved through self-determination and return of our ‘āina (land and liter-

²⁶¹ *Id.* at 1180.

²⁶² *See id.* at 1180, 1182, 1184. Specifically, the trial court vested the State with the duty to mālama ‘āina, *id.* at 1180, and the Hawai‘i Supreme Court affirmed this order, *id.* at 1184. For clarity, this Comment states that the Hawai‘i Supreme Court ordered the State to mālama ‘āina PTA.

²⁶³ *Ching v. Case*, No. 14-1-1085-04 GWBC, 2018 WL 11225507, at *3 (Haw. Cir. Ct. Apr. 3, 2018).

²⁶⁴ *Id.* at *11.

²⁶⁵ *See Ching*, 449 P.3d at 1180, 1182, 1184.

²⁶⁶ Timothy Hurley, *New Secretary of Army, Christine Wormuth, Supports Renewal of Training Ground Leases*, HONOLULU STAR ADVERTISER (Aug. 10, 2021), <https://www.staradvertiser.com/2021/08/10/hawaii-news/new-secretary-of-army-supports-renewal-of-training-ground-leases/>, archived at <https://perma.cc/QDJ2-LMMA>.

²⁶⁷ *See* U.S. ARMY CORPS OF ENGINEERS, ARMY TRAINING LAND RETENTION AT PŌHAKULOA TRAINING AREA: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE 2–10 (2020).

²⁶⁸ *See, e.g.*, Cancel RIMPAC Coalition (@CancelRIMPAC), *Protect Pōhakuloa with Jon Osorio and David Frankel*, FACEBOOK (Oct. 2, 2021, 12:00 PM), <https://www.facebook.com/CancelRIMPAC/videos/755922598318947>, archived at <https://perma.cc/KFN6-TPDE>.

²⁶⁹ *See generally* A NATION RISING, *supra* note 6.

ally “that which feeds”).²⁷⁰ Given the United States’ present unwillingness to decolonize, Kānaka may be amenable to the intermediary step of collaboratively managing our biocultural resources alongside the state and federal governments.²⁷¹ This Part seeks to demonstrate that blockchain technology can help Kānaka create a polycentric management program for Public Land Trust acreage as part of the Indigenous right to environmental self-determination. Section A describes the development of this right under international law.²⁷² Section B reviews the basics of blockchain and then examines how the technology can facilitate polycentric management of the Public Land Trust as an intermediary step towards restorative justice.²⁷³

A. Native Peoples’ Right to Environmental Self-Determination

Self-determination, legal scholar Susan Serrano explains, “entails repairing the harms suffered by those who have experienced systemic oppression according to their self-shaped notions” of restorative justice.²⁷⁴ Under international law, the right to self-determination enables Native Peoples to “freely determine their political status and freely pursue their economic, social, and cultural development.”²⁷⁵ Rooted in the notion “that all are equally entitled to be in control of their own destinies,”²⁷⁶ self-determination as a substantive norm requires that Indigenous Peoples be able to create their own governing institutions.²⁷⁷ It also “gives rise to remedies that tear at the legacies of empire, discrimination, suppression of democratic participation, and cultural suffocation.”²⁷⁸ Today, self-determination is “widely acknowledged to be a principle of customary international law and even *jus cogens*, a peremptory norm.”²⁷⁹ The right is recognized in the U.N. Charter,²⁸⁰ major international human rights instruments,²⁸¹ and most recently in the U.N. Declaration on the Rights of Indigenous Peoples.²⁸² Significantly, the Declara-

²⁷⁰ See Rebecca Tsosie, *The Conflict Between the “Public Trust” and the “Indian Trust” Doctrines: Federal Public Land Policy and Native Nations*, 39 TULSA L. REV. 271, 308 (2003).

²⁷¹ See *id.*

²⁷² See *infra* notes 274–293 and accompanying text.

²⁷³ See *infra* notes 294–361 and accompanying text.

²⁷⁴ Susan K. Serrano, *Elevating the Perspectives of U.S. Territorial Peoples: Why the Insular Cases Should Be Taught in Law School*, 21 J. GENDER, RACE & JUST. 395, 400 (2018).

²⁷⁵ UNDRIP, *supra* note 66, art. 3. See also Aguon, *supra* note 1, at 48–52, 57–59 (discussing the development of the right to self-determination); Anaya, *supra* note 45, at 320–36 (discussing Native Hawaiians’ right to self-determination).

²⁷⁶ Anaya, *supra* note 45, at 320.

²⁷⁷ *Id.*

²⁷⁸ *Id.*

²⁷⁹ *Id.* at 322.

²⁸⁰ U.N. Charter art. 1, ¶ 2.

²⁸¹ See, e.g., International Covenant on Civil and Political Rights, Mar. 23, 1976, 999 U.N.T.S. 171; International Covenant on Economic, Social, and Cultural Rights, Jan. 3, 1976, 993 U.N.T.S. 3.

²⁸² See UNDRIP, *supra* note 66; Rebecca Tsosie, *Indigenous People and Environmental Justice: The Impact of Climate Change*, 78 U. COLO. L. REV. 1625, 1665 (2007).

tion provides a robust set of cultural and political rights to protect biocultural resources, including recognition of Native Peoples' right to revitalize their cultural customs²⁸³ and strengthen their distinctive relationship with their ancestral lands.²⁸⁴ Though the United States resists recognizing the right to self-determination for Indigenous Peoples,²⁸⁵ the Declaration has normative power.²⁸⁶ It also provides a basis for recognizing a right to environmental self-determination.²⁸⁷

The right to environmental self-determination "preserves the relationship between indigenous peoples and their traditional lands for cultural and moral reasons."²⁸⁸ Native identities are inextricably linked to ancestral lands and resources such that environmental destruction inevitably also results in cultural annihilation.²⁸⁹ The right to environmental self-determination arises from Indigenous Peoples' "unique cultural and political status as dispossessed, colonized people now seeking restorative justice."²⁹⁰ The right's restorative justice foundation enables Native communities to "invoke a human rights-based set of norms rather than a domestic sovereignty model to engage local legal regimes to (1) protect traditional resource-based cultural practices regardless of whether they also possess the sovereign right to govern lands and (2) prevent practices that jeopardize cultural resources."²⁹¹

Operationalizing the right to environmental self-determination is crucial for Kānaka because our "resources and practices remain under siege" while decisionmakers struggle to actualize Hawai'i's restorative justice commitments in practice.²⁹² Blockchain may be a tool to operationalize environmental self-determination's affirmative grant of power to "protect traditional resource-based cultural practices" and "prevent practices that jeopardize cultural resources."²⁹³

B. *Blockchain Technology*

Blockchain is a type of distributed ledger technology.²⁹⁴ It "blend[s] together several existing technologies, including peer-to-peer networks, public-private key cryptography,²⁹⁵ and consensus mechanisms,"²⁹⁶ creating "a

²⁸³ UNDRIP, *supra* note 66, art. 11.

²⁸⁴ *Id.* art. 25.

²⁸⁵ Coffey & Tsosie, *supra* note 24, at 198.

²⁸⁶ *See, e.g.*, Aguon, *supra* note 1, at 59.

²⁸⁷ Tsosie, *supra* note 282, at 1665.

²⁸⁸ *Id.*

²⁸⁹ *See id.*

²⁹⁰ Sproat, *Environmental Self-Determination*, *supra* note 16, at 196.

²⁹¹ *Id.* at 196–97.

²⁹² *Id.* at 216.

²⁹³ *Id.* at 196–97.

²⁹⁴ EUR. COMM'N, *supra* note 20, at 136. For an explanation of distributed ledger technology, see *supra* note 20.

²⁹⁵ Each network participant has mathematically related public and private keys. DYLAN YAGA, PETER MELL, NIK ROBY & KAREN SCARFONE, NAT'L INST. OF STANDARDS & TECH.,

highly resilient and tamper-resistant database” that enables “transparent and nonrepudiable” data storage.²⁹⁷ Blockchain works by packaging “sets of data into cryptographic hash-linked blocks in a sequential chain,” stored on a decentralized network of computers.²⁹⁸ A consensus protocol synchronizes the addition of new blocks to each computer’s copy of the ledger, allowing the distributed network to reach agreement on the ledger’s current state without relying on a centralized authority.²⁹⁹

While there are multiple ways Indigenous Peoples can use blockchain to further environmental self-determination,³⁰⁰ this Note focuses on how Kānaka could deploy the technology to facilitate polycentric governance of the Public Land Trust.³⁰¹ Specifically, this section focuses on three aspects of blockchain that may increase ‘Ōiwi control over trust acreage, regardless of who owns the land: polycentricity,³⁰² mathematical certainty,³⁰³ and automation.³⁰⁴ With increased authority in decisions impacting biocultural resources, Kānaka can more effectively operationalize the right of environmental self-determination to protect place-based practices and prevent actions that threaten cultural survival. Together, polycentric governance, mathematical certainty, and automation could create a new model for

NISTIR 8202, BLOCKCHAIN TECHNOLOGY OVERVIEW 11 (2018). Users digitally encrypt data incorporated into the blockchain with their private keys, and anyone can verify the signature using the corresponding public key. *Id.* at 49. Public-private key cryptography enhances network privacy.

²⁹⁶ Consensus mechanisms are software protocols that facilitate agreement on the current state of the ledger. Each time a new block is published, all nodes in the network must agree that the block is authentic and append it to their existing copies of the ledger. *Id.* For a discussion of consensus mechanisms, see Jean Bacon, Johan David Michels, Christopher Millard & Jatinder Singh, *Blockchain Demystified: A Technical and Legal Introduction to Distributed and Centralized Ledgers*, 25 RICH. J. L. & TECH. 1, 22–25 (2018); Georgios Dimitripoulos, *The Law of Blockchain*, 95 WASH. L. REV. 1117, 1155 (2020).

²⁹⁷ PRIMAVERA DE FILIPPI & AARON WRIGHT, BLOCKCHAIN & THE LAW: THE RULE OF CODE 2 (2018).

²⁹⁸ EUR. COMM’N, *supra* note 20, at 136. There are three general types of network participants in blockchain-based systems: users, miners, and nodes. Users propose new transactions (i.e. sets of data) for addition to the blockchain. Bacon et al., *supra* note 296, at 18. “[S]oftware broadcasts the users’ required transactions onto the network, to be incorporated into blocks by the miners.” *Id.* Miners (individuals running specialized software) bundle users’ transactions into new blocks and then broadcast blocks to nodes (individual computers that maintain up-to-date copies of the ledger). Nodes receive and verify newly mined blocks and append them to their ledgers. *Id.* at 18–20.

²⁹⁹ Bacon et al., *supra* note 296, at 21.

³⁰⁰ Though beyond the scope of this Note, blockchain may also help Indigenous Peoples create governance systems that coexist alongside or replace state governance, ultimately reducing or eliminating reliance on nation-states. See, e.g., DE FILIPPI & WRIGHT, *supra* note 297, at 55; Helen Eenmaa, *Sovereignty and Autonomy Via Mathematics*, 4 STAN. J. BLOCKCHAIN L & POL’Y 79, 95 (2020). Native Peoples could also consider decentralized value systems. See generally Christopher Alcantara & Caroline Dick, *Decolonization in a Digital Age: Cryptocurrencies and Indigenous Self-Determination in Canada*, 32 CANADIAN J. L. & SOC’Y. 19 (2017).

³⁰¹ For a discussion of Hawai‘i’s Public Land Trust, see *supra* Part II.

³⁰² See *infra* notes 305–37 and accompanying text.

³⁰³ See *infra* notes 338–52 and accompanying text.

³⁰⁴ See *infra* notes 353–61 and accompanying text.

biocultural resource management rooted in ‘Ōiwi values and restorative justice principles.

1. *Polycentricity: From Centralized to Distributed Control*

Blockchains may help actualize environmental self-determination by facilitating polycentric land stewardship, regardless of whether Kānaka own the land. At present, the State manages the Public Land Trust in a centralized manner, relying on DLNR to administer the 1,200,000 acres, as well as a multitude of other public resources.³⁰⁵ Scholars have called for a shift from centralized, state-based resource governance to community-level management because of global climate change’s disparate impacts on island nations.³⁰⁶ Co-management, which provides for shared authority between resource users and governments,³⁰⁷ has been advanced as an appropriate decentralized structure to increase socio-ecological resilience and equity in management.³⁰⁸ Indigenous scholars have also proposed co-management as an intermediary solution to the dispossession of Native communities from their ancestral lands.³⁰⁹ Though progress has been slow, the State of Hawai‘i has implemented legislation for a variety of co-management initiatives to strengthen ‘Ōiwi lifeways and, interrelatedly, steward biocultural resources throughout Hawai‘i.³¹⁰ Among many benefits, co-management is thought to engender innovative solutions, integrate local knowledge in decision-making, lessen mistrust among resource users and agencies, and help alleviate economic stressors on local governments.³¹¹ But these benefits do not always accrue. Oftentimes local resource users—in Hawai‘i, ‘Ōiwi communities sustained by their biocultural resources—are left out of decision-making processes,³¹² and power imbalances remain intact.³¹³

Polycentricity, a form of governance that is distinct from but related to co-management, offers an alternative structure.³¹⁴ Polycentricity is a complex form of place-based governance whereby multiple decision-making groups

³⁰⁵ See *supra* note 59 and accompanying text.

³⁰⁶ See, e.g., Sarah A. Ebel, *Moving Beyond Co-Management: Opportunities and Limitations for Enabling Transitions to Polycentric Governance in Chile’s Territorial User Rights in Fisheries Policy*, 14 INT’L J. COMMONS 278, 278 (2020); Winter et al., *supra* note 74, at G.

³⁰⁷ Mehana Blaich Vaughan & Margaret R. Caldwell, *Hana Pa’a: Challenges and Lessons for Early Phases of Co-Management*, 62 MARINE POL’Y 51, 51 (2015).

³⁰⁸ Ebel, *supra* note 306, at 279.

³⁰⁹ E.g., Tsosie, *supra* note 270, at 308–10; David Treuer, *Who Owns America’s Wilderness?: Return the National Parks to the Tribes*, ATLANTIC (Apr. 12, 2021), <https://www.theatlantic.com/magazine/archive/2021/05/return-the-national-parks-to-the-tribes/618395/>, archived at <https://perma.cc/FQZ2-RWHT>.

³¹⁰ HAW. REV. STAT. § 188-22.6 (2011) (co-managed communal fisheries); HAW. REV. STAT. § 171-4.5 (2019) (‘Aha Moku Advisory Committee and ‘Aha Moku Island Councils); Winter et al., *supra* note 74, at B (describing other co-management initiatives in Hawai‘i).

³¹¹ Vaughan & Caldwell, *supra* note 307, at 52; Winter et al., *supra* note 74, at E.

³¹² E.g., Vaughan & Caldwell, *supra* note 307, at 51.

³¹³ See Winter et al., *supra* note 74, at A, B, F.

³¹⁴ Ebel, *supra* note 306, at 279 (citations omitted).

collaboratively steward a resource.³¹⁵ Polycentricity goes beyond co-management because it incorporates stakeholders as semi-autonomous and overlapping decisionmakers (rather than binary units), eliminating one centralized authority.³¹⁶ Because polycentric systems are necessarily interdependent, “a common set of rules, norms and strategies emerge to guide the behavior of a large majority of actors within the system” regardless of whether units cooperate with each other.³¹⁷ To illustrate how polycentricity can work on the ground, subsection a examines Papahānaumokuākea Marine National Monument’s polycentric management framework.³¹⁸ Subsection b then explains the evolution of polycentric theory from natural resources to blockchains.³¹⁹

a) *Polycentricity in Action at Papahānaumokuākea*

Papahānaumokuākea Marine National Monument’s management framework is polycentric.³²⁰ Due to overlapping state and federal laws, several governmental entities—OHA, the State through DLNR, the U.S. Department of Commerce through the National Oceanic and Atmospheric Administration (“NOAA”), and the U.S. Department of the Interior through the U.S. Fish and Wildlife Service (“FWS”)—use a polycentric structure to collaboratively manage Pāpahanauumokuākea (the Northwest Hawaiian Islands) as co-trustees.³²¹ Within the framework, each agency stewards specific resources, but their jurisdictions overlap.³²² For example, NOAA manages the

³¹⁵ Carlisle & Gruby, *supra* note 22, at 928. Though different in many respects, traditional Hawaiian society employed basic tenets of polycentric governance to steward biocultural resources. Compare ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION 101–02 (Canto Classics ed. 2015) (identifying nested jurisdictions as a hallmark of common-pool resource governance), with Alan M. Friedlander, Janna M. Shackeroff & John N. Kittinger, *Customary Marine Resource Knowledge and Use in Contemporary Hawai‘i*, 67 PAC. SCI. 441, 442–43 (2013) (describing nested governance in traditional fisheries management), and Kawika B. Winter, Kamanamaikalani Beamer, Mehana Blaich Vaughan, Alan M. Friedlander, Mike H. Kido, A. Nāmaka Whitehead, Malia K.H. Akutagawa, Natali Kurashima, Matthew Paul Lucas & Ben Nyberg, *The Moku System: Managing Biocultural Resources for Abundance within Social-Ecological Regions in Hawai‘i*, SUSTAINABILITY, 2018, at 1, 3–5 (describing nested land divisions used to manage biocultural resources).

³¹⁶ Ebel, *supra* note 306, at 279.

³¹⁷ Primavera De Filippi, Morshed Mannan & Wessel Reijers, *Blockchain as a Confidence Machine: The Problem of Trust & Challenges of Governance*, 62 TECH. SOC’Y, June 2020, at 1, 10 (citations omitted).

³¹⁸ See *infra* notes 320–28 and accompanying text.

³¹⁹ See *infra* notes 329–37 and accompanying text.

³²⁰ John N. Kittinger, Anne Dowling, Andrew R. Purves, Nicole A Milne & Per Olsson, *Marine Protected Areas, Multiple Agency Management, and Monumental Surprise in the Northwestern Hawaiian Islands*, J. MARINE BIOLOGY, 1, 4 fig. 2 (2011).

³²¹ *Id.* OHA was elevated to co-trustee status in 2017. See MEMORANDUM OF AGREEMENT FOR PROMOTING COORDINATED MANAGEMENT OF THE PAPAHAANAUMOKUĀKEA MARINE NATIONAL MONUMENT AND EXPANSION (2017).

³²² *Management*, PAPAHAANAUMOKUĀKEA MARINE NAT’L MONUMENT, <https://www.papahānaumokuākea.gov/new-about/management/>, archived at <https://perma.cc/CR9S-RLV6>.

marine areas, but DLNR is responsible for the Northwestern Hawaiian Islands Marine Refuge.³²³

A permitting requirement ensures that each co-trustee participates in all decision-making.³²⁴ Agencies must obtain a permit for every action within Papahānaumokuākea, and each agency must sign off on every permit.³²⁵ As part of the permitting process, OHA, which is responsible for representing Ōiwi interests but has no physical jurisdiction, gives cultural briefings prior to every action.³²⁶ OHA Kūkulu Papahānaumokuākea Specialist Brad Ka‘aleleo Wong explains that, because “Hawaiian culture is a big part of Papahānaumokuākea as reflected in its Mission, vision, and even the proclamation and regulations of the monument,” agencies must “look at ways to include ancestral knowledge and Hawaiian perspectives to help inform research, conservation, and management.”³²⁷ Polycentricity helps OHA ensure that “management decisions and activities include Hawaiian perspectives, and are in a way, pono.”³²⁸

b) *From Natural Resources to Blockchains: Evolution of Polycentricity*

From its origins in resource management, polycentric theory has evolved over the last three decades to include technocratic systems. Early research focused on common-pool resources—resources that are limited, and thus easily exploitable, but difficult to stop people from using, like forests and fisheries.³²⁹ This “Commons 1.0”³³⁰ work empirically demonstrated

³²³ *Id.*

³²⁴ See Kittinger et al., *supra* note 320, at 3–4.

³²⁵ See 1 PAPAHAUNAUMOKUĀKEA MARINE NAT’L MONUMENT, MANAGEMENT PLAN 233 (2008).

³²⁶ Interview with Brad Ka‘aleleo Wong, Office of Hawaiian Affairs Kūkulu Papahānaumokuākea Specialist (Apr. 1, 2021); OFF. OF HAWAIIAN AFFS., NOAA, U.S. FISH & WILDLIFE SERV. & STATE OF HAW., MAI KA PŌ MAI: A NATIVE HAWAIIAN GUIDANCE DOCUMENT FOR THE MANAGEMENT OF PAPAHAUNAUMOKUĀKEA MARINE NATIONAL MONUMENT 29 (2021).

³²⁷ Wong, *supra* note 326.

³²⁸ OFF. OF HAWAIIAN AFFS. ET AL., *supra* note 328, at 24.

³²⁹ See, e.g., OSTROM, *supra* note 315, at 3; Elinor Ostrom, *The Call to the Commons: Decline and Recommitment in Asturias, Spain*, in THE QUESTION OF THE COMMONS: THE CULTURE AND ECOLOGY OF COMMUNAL RESOURCES 250, 313 (Bonnie J. McCay & James M. Acheson eds., 1987); Elinor Ostrom, James Walker & Roy Gardner, *Covenants with and without a Sword: Self-Governance is Possible*, 86 AM. POL. SCI. REV. 404 (1992).

³³⁰ Legal engineers have called the early research on natural resource governance “Commons 1.0” because it gave rise to commons theory. Sinclair Davidson, Primavera De Filippi & Jason Potts, *Economics of Blockchain* (forthcoming) (manuscript at 13) (on file with author). Commons can be “defined as paradigms that combine a distinct community with a set of social practices, values, and norms that are used to manage a resource.” DAVID BOLLIER, THINK LIKE A COMMONER: A SHORT INTRODUCTION TO LIFE OF THE COMMONS 15 (2014). A central part of European and American colonialism was enclosing and obliterating commons for capitalist gain. E.g., PETER LINEBAUGH & MARCUS REDIKER, THE MANY-HEADED HYDRA: SAILORS, SLAVES, COMMONERS, AND THE HIDDEN HISTORY OF THE REVOLUTIONARY ATLANTIC 43–49 (2000).

“that centralized governance was not always necessary, and in fact, was frequently insufficient in responding to local needs.”³³¹ In turn, “assumptions that resources needed to be managed by the state or be privatized were debunked by scholars who illustrated that local resource users often develop and enforce rules which facilitate resource conservation.”³³² Building on these insights, “Commons 2.0” research applied polycentricity to digital commons, like open source software and peer production.³³³ Blockchain is emerging as “Commons 3.0” because the technology enables collaboration among disparate groups “while still maintaining the benefits of commons-type (i.e. polycentric) institutional governance.”³³⁴

In on-chain systems, each decision-making unit must account for the others and abide by *lex cryptographica* (cryptographically secured rules governing the technocratic system).³³⁵ The design of *lex cryptographica* is important because these protocols determine every aspect of the system’s functioning, ultimately constraining behavior and choices.³³⁶ In this way, blockchain-enabled polycentric governance may eliminate the need for co-management agreements to require collaboration among resource stewards and governments because *lex cryptographica* forces participants to collaborate through cryptographic mechanisms. In other words, blockchains are “trustless commons.”³³⁷

2. *Mathematical Certainty*

Co-management initiatives involving communities and governments must be rooted in trust.³³⁸ Trust among Kānaka and government agencies is often tenuous in light of the U.S.-backed illegal overthrow of the Hawaiian Kingdom,³³⁹ ongoing harms of colonization, attacks on restorative initiatives for Kānaka,³⁴⁰ and continued exploitation of Hawai‘i.³⁴¹ Blockchain may be able to help bridge the lack of trust among Kānaka and agencies because it can build confidence in technocratic systems, taking the place of trust among resource stewards.³⁴²

³³¹ Ebel, *supra* note 306, at 279.

³³² *Id.* (citations omitted).

³³³ Davidson et al., *supra* note 330, at 13 (citations omitted).

³³⁴ *Id.*; see also De Filippi et al., *supra* note 317, at 10.

³³⁵ DE FILIPPI & WRIGHT, *supra* note 297, at 55.

³³⁶ *Id.*

³³⁷ *Id.*

³³⁸ See, e.g., Vaughan & Caldwell, *supra* note 307, at 52; MALIA AKUTAGAWA & WINSTON WONG, A FRAMEWORK FOR THE ‘AHA MOKU SYSTEM AND COLLABORATIVE GOVERNANCE 6 (2020).

³³⁹ See *infra* Part II.B.

³⁴⁰ See *supra* notes 155–56 and accompanying text.

³⁴¹ See *supra* Part II.C–E.

³⁴² De Filippi et al., *supra* note 317, at 1.

Research suggests that blockchain builds confidence through mathematical certainty.³⁴³ Trust and confidence are separate phenomena.³⁴⁴ “[T]rust presupposes awareness of a certain element of risk,” in part, because trust can be broken.³⁴⁵ Confidence, on the other hand, “does not presuppose an acknowledgement of risk, but rather an attitude of assurance.”³⁴⁶ Confidence involves predictability, which can “reduc[e] the feeling of risk and uncertainty” that arises when beginning relationships with people, institutions, or systems.³⁴⁷ Legal engineer Primavera De Filippi explains that “blockchain-based systems are intended to produce ‘confidence’ in a particular system—not by eliminating trust altogether, but rather by maximizing the degree of confidence in the system as a means to indirectly reduce the need for trust.”³⁴⁸ Confidence in blockchain-based systems stems in part from participants’ confidence in the mathematical certainty of the algorithms underlying the system.³⁴⁹

Mathematical certainty can bridge a lack of personal trust³⁵⁰ because users need only trust the algorithms underpinning the network’s architecture to be confident in the system and trust that others are not taking advantage of them.³⁵¹ While the ultimate goal is cultivating trust among the people, establishing confidence in the system may be a crucial first step.³⁵²

3. *Smart Contracts & Automated Sanctions*

Blockchain may also help hold agencies accountable for faltering financial commitments through the creation of multi-layered, decentralized platforms that execute smart contracts.³⁵³ A smart contract is computer code stored on a blockchain.³⁵⁴ Though distinct from legal contracts, smart contracts enable the automated execution of all or part of legal agreements.³⁵⁵ Smart contracts are thus uniquely suited to both ensure payment upon the occurrence of triggering events and impose penalties upon the nonoccurrence of objective conditions.³⁵⁶ For example, a smart contract could auto-

³⁴³ *Id.* at 6–7; Eenmaa, *supra* note 300, at 96–97.

³⁴⁴ De Filippi et al., *supra* note 317, at 2; *see* Eenmaa, *supra* note 300, at 86.

³⁴⁵ De Filippi et al., *supra* note 317, at 4.

³⁴⁶ *Id.*

³⁴⁷ *Id.*

³⁴⁸ *Id.* at 6.

³⁴⁹ Eenmaa, *supra* note 300, at 96 (describing how blockchains generate certainty, and in turn, trust).

³⁵⁰ *Id.* at 86.

³⁵¹ De Filippi et al., *supra* note 317, at 6–7.

³⁵² *Id.* at 5.

³⁵³ EUR. COMM’N, *supra* note 20, at 27–28.

³⁵⁴ Stuart D. Levi & Alex B. Lipton, *An Introduction to Smart Contracts and Their Potential and Inherent Limitations*, HARV. L. SCH. F. ON CORP. GOVERNANCE (May 26, 2018), <https://corp.gov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations/>, archived at <https://perma.cc/FR8G-SHA2>.

³⁵⁵ *Id.*

³⁵⁶ *Id.*

mate the transfer of funds from an escrow account if an agriculture corporation did not replenish enough freshwater to a stream. Assume the State ordered the corporation to leave at least thirty million gallons per day (“mgd”) in the stream, but multiple gauges reported that only twenty-five mgd were left on any given day. With the help of an oracle (a person or program that feeds information onto the chain),³⁵⁷ a smart contract could release a pre-specified amount of funds from an escrow account to downstream farmers as compensation for the loss of five mgd for that day. In this scenario, the State, corporation, and farmers would have entered into a legally binding agreement and coded the fund transfer provisions on a smart contract, and the corporation would have placed funds in the escrow account prior to any violations.

Automated execution of contractual provisions gives parties the ability to establish *ex ante* penalties, removing the need for judicial adjudication in some cases.³⁵⁸ This in turn “enables transactions in situations devoid of human or institutional trust” and reduces the costs of enforcement,³⁵⁹ allowing economically or socially marginalized parties to hold more powerful actors accountable. For decades, corporations and DoD have pillaged biocultural resources without penalty. This is not to say that financial payments could ameliorate the annihilation of Native Hawaiian lifeways; money alone cannot heal enduring wounds of colonization.³⁶⁰ Smart contracts, however, may help ‘Ōiwi communities hold private and public actors accountable for their destruction before resources are harmed to such an extent that the harm becomes judicially cognizable and litigation is financially feasible. Early enforcement is also crucial in light of the degradation principle seemingly announced in *In re TMT*.³⁶¹

IV. TOWARD RESTORATIVE STEWARDSHIP OF THE PUBLIC LAND TRUST

Blockchain technology has the potential to facilitate polycentric stewardship of the Public Land Trust as part of the Native Hawaiian people’s right to environmental self-determination. This Part seeks to illustrate blockchains’ potential through a proposal for a stewardship program guided by the Four Values of Restorative Justice for a specific place: Pōhakuloa Training Area on Hawai‘i Island.³⁶² As discussed in Part I,³⁶³ the Four Val-

³⁵⁷ At present, smart contracts cannot autonomously retrieve data from off-chain resources, like remote IoT sensors, and push the data onto the chain. *Id.* Instead, parties rely on an oracle. EUR. COMM’N, *supra* note 20, at 29 n.36.

³⁵⁸ Levi & Lipton, *supra* note 354.

³⁵⁹ EUR. COMM’N, *supra* note 20, at 28.

³⁶⁰ Eric K. Yamamoto & Brian Mackintosh, *Redress and the Salience of Economic Justice*, F. ON PUB. POL’Y, Dec. 2010, at 3–4 (identifying economic justice as one aspect of redress initiatives).

³⁶¹ See *supra* notes 212–17 and accompanying text.

³⁶² For a discussion of the developing framework, see *supra* Part I.

³⁶³ See *supra* notes 24–50 and accompanying text.

ues—mo‘omeheu (cultural integrity), ‘āina (land and natural resources), maui ola (social determinants of health and well-being), and ea (self-governance)—are foundational principles of restorative justice embodied in the international human rights principle of self-determination.³⁶⁴ The Four Values can guide decisionmakers “in partnering with native communities to both better discharge” legal obligations “while also preserving the resources necessary” for Kānaka and our culture “to thrive.”³⁶⁵

Ideally, the military would respect the 1964 lease terms and return the trust acres when the lease expires. This response seems unlikely, however, because the military has made investments in the leased acreage and believes it is vital to training.³⁶⁶ Thus, if the federal government threatens to condemn the land, the State should renew the lease with contractual terms providing for the creation of a polycentric management program that knits together data collected by overlapping teams of resource stewards, stored on a secured blockchain maintained by an oversight commission and enforced with automated sanctions. A series of consensus protocols that seek to build trust among Kānaka, the military, and the State would guide the program. *Lex cryptographica*³⁶⁷ would root PTA management in the Four Values.³⁶⁸ Though development of a blockchain-based management program will require ongoing collaboration among stakeholders, legal engineers, and technologists, this Comment seeks to begin the conversation by discussing three key aspects of the program: polycentric management, cryptographically secured rules, and a commission.³⁶⁹

A. Polycentric Management of Pōhakuloa

Polycentricity is a crucial aspect of the proposed program because it elevates Native Hawaiian practitioners, communities, and organizations to the status of independent decision-making units. In this way, on-chain polycentric governance operationalizes ea because it enables Kānaka to have their own spheres of autonomy in the system, while consensus protocols require meaningful participation in decisions.³⁷⁰

Under the program, stakeholders would form stewardship teams. Cultural practitioners, OHA, and representatives from various Native Hawaiian organizations could represent ‘Ōiwi interests.³⁷¹ Officials from U.S. Army Garrison Pōhakuloa (“USAG-Pōhakuloa”) could provide the military’s per-

³⁶⁴ Sproat, *Environmental Self-Determination*, *supra* note 16, at 200.

³⁶⁵ *Id.*

³⁶⁶ See U.S. ARMY CORPS OF ENGINEERS, *supra* note 267, at 2-1, 2-7.

³⁶⁷ See *supra* note 335–37 and accompanying text.

³⁶⁸ For a discussion of the Four Values of Restorative Justice framework, see Part I.

³⁶⁹ See *infra* Parts IV.A, IV.B, IV.C.

³⁷⁰ See Anaya, *supra* note 45, at 355.

³⁷¹ See U.S. ARMY GARRISON-PŌHAKULOĀ, AN INTEGRATED CULTURAL RESOURCES MANAGEMENT PLAN 11–13 (2018) [hereinafter ICRMP] (listing ‘Ōiwi organizations USAG-Pōhakuloa consults with). ‘Ōiwi cultural practitioners also monitor PTA. See *Ching v. Case*,

spective. As the trustee, the State would also form a team of officials from relevant agencies, like DLNR. Each team would represent one decision-making unit. Team members would regularly collect overlapping sets of data on the condition of biocultural resources and log them on a secured, permissioned blockchain stored on each individual steward's computer.³⁷²

There are myriad cultural and environmental data sets that could be collected. One example is a data set tracking the condition of some of the nearly 1,200 identified archeological sites within PTA.³⁷³ The vast majority of these sites are of 'Ōiwi origin,³⁷⁴ including pu'u (cinder cones) that contain iwi kūpuna (Native Hawaiian ancestral remains).³⁷⁵ At present, the military uses pu'u as aerial targets,³⁷⁶ and troops purposefully deconstruct smaller heiau.³⁷⁷ Moreover, even when cultural resources meet the federal definition for an "archeological site," the military does not commit to protecting them.³⁷⁸ The obliteration of 'āina and iwi kūpuna degrades 'Ōiwi culture. Environmental impacts of live-fire training—including air pollution, unexploded ordnance, and radioactive contamination—threaten the health of 'Ōiwi practitioners and nearby communities, as well as the safety of the thousands of troops cycling through PTA annually.³⁷⁹ As autonomous decisionmakers, Kānaka could have increased authority over proposed actions at PTA.

The most beneficial impact, however, may be real-time knowledge of the condition of biocultural resources. Because the state and federal governments keep siloed, often inaccessible records, Kānaka can only turn to the judiciary after destruction has already occurred. Given the Hawai'i Supreme

449 P.3d 1146, 1158 (Haw. 2019) (describing testimony of Pōhakuoa Cultural Advisory Committee members).

³⁷² In other words, the stewards would be nodes and miners. *See supra* note 298.

³⁷³ Though USAG-Pōhakuoa has only surveyed about 51,000 acres of PTA's 132,820 acres, the military has already identified 1,198 archaeological sites within the complex. ICRMP, *supra* note 371, at 47. As of 2018, USAG-Pōhakuoa has only surveyed 20% of the ordnance impact area and 50% of the rest of PTA. *Id.* The impact area is about 51,000 acres, and the remaining complex is about 81,820 acres. *See* PTA REAL PROPERTY MASTER PLAN, *supra* note 228, at 2. Thus, only 51,110 acres, or 38.5% of PTA was surveyed as of 2018 (10,200 acres of the impact area, and 40,910 acres of the rest of PTA).

³⁷⁴ ICRMP, *supra* note 371, at 47.

³⁷⁵ Iwi kūpuna were re-interred at a number of sites within PTA after troops disturbed them. ICRMP, *supra* note 371, at 49.

³⁷⁶ CULTURAL SURVEYS HAWAI'I, *supra* note 221, at 75.

³⁷⁷ USAG-Pōhakuoa admits that sites may be damaged by various training actions and also notes that soldiers purposefully remove elements from cultural sites thereby "destroy[ing] their integrity and . . . mak[ing] them unrecognizable." ICRMP, *supra* note 371, at 50.

³⁷⁸ 16 U.S.C. § 470bb(1) (defining "archeological site," as a place where "any material remains of past human life or activities which are of archaeological interest" and are at least one hundred years old are found). The military affords some protections from arbitrary removal for sites that meet this definition, but sites are not protected when found within proposed construction areas unless they come under the purview of other preservation laws. ICRMP, *supra* note 371, at 42.

³⁷⁹ *See, e.g.,* Ching v. Case, No. 14-1-1085-04 GWBC, 2018 WL 11225507, ¶¶ 42–43 (Haw. Cir. Ct. Apr. 3, 2018).

Court's apparent willingness to sanction further destruction of land based on prior degradation,³⁸⁰ retroactive enforcement strips trust beneficiaries' power away, leaving Kānaka powerless to stop incremental degradation that will be used to justify future exploitation.³⁸¹ This knowledge can help Kānaka better advocate for Pōhakuoa, and, if successful, the entirety of the Public Land Trust. In sum, polycentric management would help Kānaka prevent practices that jeopardize biocultural resources as part of the right to environmental self-determination by increasing 'Ōiwi control over actions at PTA and making information accessible to trusted stewards.³⁸²

B. Cryptographically Secured Rules

Lex cryptographica will dictate the data collected, fines assessed, projects undertaken, and stewards' behavior.³⁸³ Stewardship team members must be the primary parties developing the *lex cryptographica* because the content of these rules may determine whether the system is restorative or merely perpetuates the status quo.³⁸⁴ Moreover, research shows that individuals are more likely to comply with rules if they can create and modify them.³⁸⁵ Allowing Kānaka, military officials, and state agents to be the primary rule-makers promotes compliance.³⁸⁶ Team members are also best suited to create rules because they can adapt to on-the-ground needs,³⁸⁷ tailor rules to local conditions,³⁸⁸ and create enforceable limits on resource use.³⁸⁹

Governance with place-based, adaptive rules created by resource users is consistent with traditional 'Ōiwi stewardship practices informed by resource-specific 'ike kūpuna (ancestral knowledge) accumulated over generations of data collection and close observation.³⁹⁰ For example, fishing families in the moku (social-ecological region) of Kona Hema on Hawai'i Island used a complex system of alternating regulations backed by specific penalties to manage populations of two fish species that were crucial protein sources for Kānaka in that area.³⁹¹ By adhering to the system's rules, ancient Kānaka stewarded resources that reciprocally sustained their families and, in turn, strengthened communal health and perpetuated culture. Similarly, the

³⁸⁰ See *supra* notes 212–17 and accompanying text.

³⁸¹ See *Ching v. Case*, 449 P.3d 1146, 1150 (Haw. 2019) (explaining that independent, reasonable monitoring is “an essential component” of the State’s trustee duties because “hold[ing] otherwise would permit the State to ignore the risk of impending damage to the land, leaving trust beneficiaries powerless to prevent irreparable harm before it occurs.”).

³⁸² See Sproat, *Environmental Self-Determination*, *supra* note 16, at 196–97.

³⁸³ See DE FILIPPI & WRIGHT, *supra* note 297, at 55.

³⁸⁴ See Vaughan & Caldwell, *supra* note 307, at 51.

³⁸⁵ See OSTROM, *supra* note 315, at 93.

³⁸⁶ See *id.*

³⁸⁷ See *id.* at 96; see also Vaughan & Caldwell, *supra* note 307, at 51.

³⁸⁸ See OSTROM, *supra* note 315, at 92.

³⁸⁹ See BOLLIER, *supra* note 330, at 29.

³⁹⁰ See, e.g., AKUTAGAWA & WONG, *supra* note 338, at 2.

³⁹¹ See Winter et al., *supra* note 315, at 10.

cryptographically secured rules governing PTA's management should adaptively account for short- and long-term restoration goals and be formed by cultural practitioners, military officials, and DLNR.

Designing *lex cryptographica* entails difficult conversations among Kānaka, agencies, and military officials because each group has a divergent vision for Pōhakuloa and competing legal claims to the land. The least contentious place to begin may be to create protocols enforcing already-existing agreements,³⁹² federal and state cultural and environmental laws,³⁹³ and the original lease provisions.³⁹⁴ Photographs of trash and shell casings,³⁹⁵ confirmation of access to cultural sites,³⁹⁶ and sightings of endangered species³⁹⁷ are examples of data that could be required under the existing contracts and laws. Zero-knowledge proofs (“ZKPs”), a type of cryptographic tool, could be used to secure sensitive data, such as the location of iwi kūpuna or chemicals used in training exercises.³⁹⁸ ZKPs enable the verification of data without revealing the content or source of the data.³⁹⁹ For PTA's management, this means that the network of stewards' computers supporting the system could reach consensus and verify that a data item was logged and whether it reflects compliance without revealing the data itself or identifying who uploaded the information.

Though the military may be resistant to anything but unilateral control, international norms provide that “respecting native peoples' sacred relationship to natural resources” is a necessary response to colonization.⁴⁰⁰ Even if the military disregards international norms, DoD requires installations to

³⁹² See, e.g., ICRMP, *supra* note 371.

³⁹³ See, e.g., Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451–66 ; Native American Graves Protection and Repatriation Act of 1990, 25 U.S.C. §§ 3001–13 ; HAW. REV. STAT. § 6E-43.6 (2009); see also ICRMP, *supra* note 371, at 13–26 (listing the various federal and state statutes and regulations applicable to the military's activities with respect to cultural resources).

³⁹⁴ See *supra* notes 234–39 and accompanying text.

³⁹⁵ One of the main issues in *Ching v. Case*, 449 P.3d 1146, 1158–62 (Haw. 2019), was the amount of trash, military debris, and unexploded ordnance littered around PTA.

³⁹⁶ One heavily-litigated issue regarding live-fire training in Mākuia is access to the many cultural sites within the Mākuia Military Reservation. See, e.g., Blaze Lovell, *Army Agrees to Restore Access to Makua Valley Cultural Sites*, HONOLULU CIV. BEAT (Aug. 7, 2018), <https://www.civilbeat.org/2018/08/army-agrees-to-restore-access-to-makua-valley-cultural-sites/>. In a 2018 settlement agreement, the Army agreed to investigate whether it could clean up stockpiles of unexploded ordnance around two cultural sites. Joint Stipulation to Settle Plaintiff's Complaint at 2–3, *Mālama Mākuia v. Mattis*, Civil No. 16-00597 SOM-KJM (D. Haw. Aug. 3, 2018).

³⁹⁷ See *supra* notes 224–27.

³⁹⁸ For the military, advanced cryptographic techniques may ameliorate security concerns. The DoD is already researching ZKPs for defense uses. See *Generating Zero-Knowledge Proofs for Defense Capabilities*, DEF. ADVANCED RSCH. PROJECTS AGENCY (July 18, 2019), <https://www.darpa.mil/news-events/2019-07-18>, archived at <https://perma.cc/GU9G-S2Y4>.

³⁹⁹ In other words, ZKPs “allow one party (the prover) to prove to another (the verifier) that a statement is true, without revealing any information beyond the validity of the statement itself.” *What are zk-SNARKS?*, ZCASH, <https://z.cash/technology/zksnarks/>, archived at <https://perma.cc/9WFV-J2RE> (last visited Mar. 1, 2021).

⁴⁰⁰ Sproat, *Environmental Self-Determination*, *supra* note 16, at 209.

consult with ‘Ōiwi organizations,⁴⁰¹ and federal and state laws mandate cultural and environmental preservation.⁴⁰² Enforcing these preexisting legal obligations and the original lease is a necessary starting place.

Ultimately, however, to be truly restorative, *lex cryptographica* should be shaped by the Four Values and require practices that fulfill the duty to mālama ‘āina.⁴⁰³ For example, given the long history of nuclear colonialism in the Pacific,⁴⁰⁴ the rules could operationalize mo‘omeheu (cultural integrity), which grants affirmative measures to redress historical and continuing threats to cultural survival.⁴⁰⁵ Munitions with depleted uranium could be banned and regular testing could be done to confirm that no weapons with depleted uranium are in use.⁴⁰⁶ Aligned with the value of ‘āina (land and natural resources), *lex cryptographica* could require that troops clean up a quantifiable amount of debris before each training to begin the process of redressing the military’s decades-long abuse of Pōhakuloa. A smart contract would only unlock weapons storage facilities once troops proved that enough trash was collected by weighing the debris on an IoT-enabled scale and logging photographic evidence. As the technology progresses, the program could require the military to use IoT-enabled weapons that charge a small fee each time they are fired. The funds could go to ‘Ōiwi entities that work to better various aspects of social determinants of well-being, like healthcare access, houselessness, and public education. Code-based rules like these could ensure that the military internalizes the costs of redressing the harm it causes to Pōhakuloa and Kānaka.

C. Oversight Commission

An oversight commission, comprised of representatives from each of the stewardship teams, would oversee the system and periodically audit on-chain data to determine whether the state and federal governments were in

⁴⁰¹ DoDI 4710.03 *Consultation with Native Hawaiian Organizations (NHOs)*, DEP’T DEF. (Aug. 31, 2018).

⁴⁰² See, e.g., *Army Regulation 200-1: Environmental Protection and Enhancement*, DEP’T ARMY (Dec. 13, 2007); see also ICRMP, *supra* note 371, at 13–26 (listing statutes and regulations guiding cultural preservation at PTA).

⁴⁰³ See *supra* notes 262–64 and accompanying text.

⁴⁰⁴ Between 1946 and 1958, the United States conducted sixty-seven nuclear tests in the Marshall Islands, poisoning many Marshallese and obliterating ecosystems. Today, U.S. forces continue to conduct missile tests in the Marshall Islands and store radioactive waste in a leaking container partially buried in an atoll. See generally JULIAN AGUON, *WHAT WE BURY AT NIGHT: DISPOSABLE HUMANITY* (2008); Comment, *A Reckoning for “Rational” Discrimination: Rethinking Federal Welfare Benefits in United States-Occupied Islands*, 43 U. HAW. L. REV. 265, 287–88 (2020).

⁴⁰⁵ Anaya, *supra* note 45, at 345.

⁴⁰⁶ See *Ching v. Case*, No. 14-1-1085-04 GWBC, 2018 WL 11225507, ¶¶ 40, 42 (Haw. Cir. Ct. Apr. 3, 2018) (noting the military’s use of ammunition containing depleted uranium). Hawai‘i’s Constitution bans all radioactive material, except as approved by a two-thirds majority of the legislature. HAW. CONST. art. XI, § 8.

compliance.⁴⁰⁷ If either party breached its obligations, the commission would trigger a smart contract to release funds from an escrow account to an ‘Ōiwi entity for restoration costs.⁴⁰⁸ For example, the military could be required to clean up a specific number of unexploded ordnance each month. Each removal would be logged with documentary evidence. If the military failed to remove the ordnance by the end of the month, the commission would trigger a smart contract to release a prespecified amount from the military’s escrow account to an ‘Ōiwi organization responsible for ordnance clean up.⁴⁰⁹ The amount of each sanction would have been established during the rule-making phase to prevent discretionary decisions.

When discretion is required for unforeseen violations, however, blockchain facilitates inclusive voting mechanisms,⁴¹⁰ like quadratic voting, which allows people to express degrees of preferences, rather than simply voting for or against something.⁴¹¹ In quadratic voting, each voter has a finite number of credits for voting, and each additional vote costs more than the previous one.⁴¹² Credits do not necessarily have to be fungible; there can be different credits for different types of decisions. Consistent with traditional ‘Ōiwi biocultural resource management practices,⁴¹³ every team member could be given credits to vote on discretionary decisions, but for decisions impacting specific resources, ‘Ōiwi stewards with resource-specific ‘ike could be allocated more credits.

In sum, this stewardship program would seek to balance both Native Hawaiians’ right to environmental self-determination with the reality of eminent domain,⁴¹⁴ as well as the need to redress the harms of American colonization with a federal judiciary often unmoved by—and at times hostile towards—Indigenous Peoples’ restorative justice claims.⁴¹⁵ Blockchain helps strike these balances by operationalizing the right to environmental self-determination on the ground to help Kānaka protect and restore biocultural

⁴⁰⁷ The Commission would also act as an oracle if IoT sensors were used to gather data. For a description of an oracle, see *supra* note 357 and accompanying text.

⁴⁰⁸ At least one Native Hawaiian Organization, DAWSON, does munitions removal and environmental restoration work in Hawai‘i and has worked with federal agencies in the past. See *Environmental*, DAWSON, <https://www.dawsonohana.com/solutions/environmental/#remediation>, archived at <https://perma.cc/9L6R-W8WC>.

⁴⁰⁹ See *id.*

⁴¹⁰ Steven Young, *Changing Governance Models by Applying Blockchain Computing*, 26 CATH. U. J. L. & TECH. 53, 61–63 (2018).

⁴¹¹ Shaan Ray, *What Is Quadratic Voting?*, TOWARDS DATA SCI. (Sept. 23, 2019), <https://towardsdatascience.com/what-is-quadratic-voting-4f81805d5a06>, archived at <https://perma.cc/4EWC-S4DF>.

⁴¹² *Id.*

⁴¹³ See AKUTAGAWA & WONG, *supra* note 338, at 1.

⁴¹⁴ U.S. CONST. amend. V (enabling the federal government to take land for public use upon payment of just compensation). For a discussion on the taking of Indigenous land via eminent domain and other doctrines, see Stacy L. Leeds, *By Eminent Domain or Some Other Name: A Tribal Perspective on Taking Land*, 41 TULSA L. REV. 51 (2005).

⁴¹⁵ See *supra* notes 156, 186–94 and accompanying text.

resources through polycentric management guided by the Four Values.⁴¹⁶ Blockchain-enabled polycentricity advances *ea* (self-governance) because consensus protocols elevate the status of Kānaka to that of independent decision-making entities with the same authority as government agencies. *Ea* is also cultivated through individual participation in the stewardship teams, development of *lex cryptographica*, the oversight commission, and quadratic voting.

In regard to *‘āina* (land and natural resources), *lex cryptographica* ensures that destructive practices that subjugate Pōhakuloa are prohibited, mitigated, or redressed. In turn, protecting *‘āina* preserves *mo‘omeheu* (cultural integrity), which is inextricably intertwined with the health of Hawai‘i. The cryptographically secured rules seek to instill an obligation in service members to care for their training ground as if it were their ancestor, cultural identity, and self-determination. While they need not feel—or even comprehend—Native Hawaiians’ reciprocal relationship with our land, indigeneity is not a prerequisite for soldiers to care for places that inspire, shelter, and train them to advance the name and power of the United States.⁴¹⁷

Financial sanctions for noncompliance with *lex cryptographica* ensure that the military internalizes the costs of continued environmental degradation by paying for restoration costs as damage occurs, thereby safeguarding Pōhakuloa from incremental destruction that could be used to justify future exploitation.⁴¹⁸ This helps preserve Kauikeaouli’s promise of a land base for a sovereign Hawaiian nation in the Crown and Government Lands. In regard to *mauli ola* (social determinants of health and well-being), place-based rules that provide strict limits on toxic substances seek to prevent adverse health consequences for Native Hawaiian practitioners and members of the armed forces. More broadly, financial sanctions could fund initiatives that target key aspects of *mauli ola*, like healthcare, education, and affordable housing for *‘Ōiwi* communities. If the program is successful, the open-source technology could be easily replicated and tailored to steward other trust acreage. In this way, blockchain can facilitate a new model for polycentric Public Land Trust management rooted in the Four Values framework as part of the Native Hawaiian people’s right to environmental self-determination.

⁴¹⁶ Sproat, *Environmental Self-Determination*, *supra* note 16, at 196–97.

⁴¹⁷ Non-Indigenous people can, and often do, cultivate reverence for place. See Winter et al., *supra* note 74, at D fig.1.

⁴¹⁸ Safeguarding *‘āina* is even more important in light of the Hawai‘i Supreme Court’s apparent willingness to sanction future destruction based on preexisting degradation. See *supra* Part II.E.3.

CONCLUSION

I ka wā ma mua, ka wā ma hope.
The future is found in the past.⁴¹⁹

In ‘ōlelo Hawai‘i (the Hawaiian language), “the past is referred to as Ka wā mamua, or ‘the time in front or before.’”⁴²⁰ With this orientation, Kānaka “acknowledge[] all that has come before ourselves, extending beyond the human realm to include the earth, sky, ocean, riverways, plants, animals, stars, [and] moon,” extending back to Pō, the inner darkness from which all knowledge and life springs forth and eventually returns, and through Ao, the emergence of light.⁴²¹ The future, however, “when thought of at all, is Ka wā ma hope, or ‘the time which comes after or behind.’”⁴²² Kānaka “stand[] firmly in the present, with [our] back[s] to the future, and [our] eyes fixed upon the past, seeking historical answers for present-day dilemmas.”⁴²³

Today, the dilemmas are manifold. Without self-determination, all that which feeds and sustains Kānaka is pillaged and commodified. Ironically, ‘āina and mo‘omeheu are degraded, while Native Hawaiian land and culture are fetishized to sell an escape to millions of tourists each year.⁴²⁴ With our culture under attack, self-governance toppled, and the theft of land legitimized in the colonizer’s highest court,⁴²⁵ ‘Ōiwi health and well-being continue to suffer as Kānaka are disproportionately represented among houseless, incarcerated, and chronically ill populations in our ancestral lands.⁴²⁶

Kānaka continue to look to ancestral knowledge for solutions that will lead to self-determination rooted in Native Hawaiian worldviews.⁴²⁷ ‘Ōiwi “perspectives transcend time” though “the tools we use to mālama our resources change and adapt.”⁴²⁸ Blockchain may be a new tool to record the past to help protect ‘Ōiwi culture and resources, restore self-determination, and improve social determinants of health and well-being, as part of the right to environmental self-determination. Just as our kūpuna relied on place-based, resource-specific knowledge to inform stewardship practices, we too can compile intricate records of management practices on blockchains to

⁴¹⁹ ‘Ōlelo No‘eau, ALOHA ‘ĀINA PROJECT, <https://blogs.ksbe.edu/alohaainaproject/%CA%BBolelo-no%CA%BBeau/>, archived at <https://perma.cc/AQG6-FEPL>.

⁴²⁰ KAME‘ELEIHIWA, *supra* note 76, at 22 (emphasis omitted).

⁴²¹ Nālani Wilson-Hokowhitu & Manulani Aluli Meyer, *I Ka Wā Mamua, The Past Before Us*, in *THE PAST BEFORE US: MO‘OKŪ‘AUHAU AS METHODOLOGY 2* (Nālani Wilson-Hokowhitu ed., 2019).

⁴²² KAME‘ELEIHIWA, *supra* note 76, at 22 (emphasis omitted).

⁴²³ *Id.*

⁴²⁴ See TRASK, *supra* note 66, at 136–46.

⁴²⁵ De Lima v. Bidwell, 182 U.S. 1, 196 (1901).

⁴²⁶ See, e.g., Anaya, *supra* note 45, at 206; Beamer & Tong, *supra* note 110, at 126.

⁴²⁷ GOODYEAR-KA‘ŌPUA, *supra* note 80, at 123–24.

⁴²⁸ Wong, *supra* note 326.

steward biocultural resources. On-chain polycentric governance of trust acreage guided by *lex cryptographica* rooted in the Four Values that incorporates Kānaka as independent decision-makers with equal, or greater authority would be a first step towards environmental self-determination. Polycentricity may also help the State fulfill its evolving constitutional trust obligations.⁴²⁹ The ability to compile a tamper-resistant record of past and present environmental and cultural concerns, stewardship successes and failures, as well as agreements and disagreements among Kānaka and other stakeholders would provide a starting point for a new form of distributed, adaptive management of ‘āina meant to be the foundation of reconciliation between the State and the Native Hawaiian people.⁴³⁰

GLOSSARY

This glossary provides translations for ‘ōlelo Hawai‘i words used more than once throughout this Note. “Often, when translating from ‘ōlelo Hawai‘i to English, or vice versa, a word does not have a direct translation, but rather there may be several interpretations that differ slightly,” layered meanings, or nuances that are beyond the scope of this Note.⁴³¹ This glossary thus provides only rough translations that are not authoritative beyond the pages of this Note. I am solely responsible for all mistakes and errors in translation.

⁴²⁹ See *supra* Part II.E.

⁴³⁰ HCDCH I, 177 P.3d 884, 901–02 (Haw. 2008), *rev’d and remanded sub nom.* Hawaii v. Off. of Hawaiian Affs., 556 U.S. 163 (2009); see *supra* note 181 and accompanying text.

⁴³¹ A. U‘ILANI TANIGAWA LUM, TERINA FA‘AGAU, DEVIN KAMEALOA FORREST & GLORIA LEILANI PALMA, WAI‘OLI VALLEY TARO HUI LONG-TERM WATER LEASE FOR TRADITIONAL LO‘I KALO CULTIVATION: DRAFT ENVIRONMENTAL ASSESSMENT 4 (2021).

‘Ōlelo Hawai‘i Word	Non-Authoritative English Translation
Akua	Ancestors, gods, elemental forms
Ali‘i	Chief(s) with no reference to gender
‘Āina	Land, earth, and literally “that which feeds”
Ea	Life, breath, sovereignty, and self-governance
Hawai‘i nei	Beloved Hawai‘i
Heiau	Religious complex
Iwi kūpuna	Native Hawaiian ancestral remains
Kānaka	Native Hawaiians
Kānaka ‘Ōiwi	Native Hawaiians
Kuleana	Responsibility and privilege
Kūpuna	Elders, ancestors
Maka‘āinana	Common people
Mauna	Mountain
Mauli Ola	Social determinants of health and well-being
Mō‘ī	Sovereign
Mo‘omeheu	Cultural integrity
‘Ōlelo Hawai‘i	Hawaiian language
Pu‘u	Cinder cone, hill

