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Restoring human and more-than-human relations in toxic riskscapes: “in perpetuity” within Lake Superior's Keweenaw Bay Indian Community, Sand Point

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ABSTRACT

Lake Superior’s Keweenaw Bay is the ancestral and contemporary homeland of the Anishinaabe Ojibwa and their relatives. It is also a toxic riskscape: Its waters, shorelines, and fish beings are polluted by an unknown tonnage of legacy mining waste rock called “stamp sands,” which contain unsafe levels of toxic compounds. This paper describes Ojibwa stewardship principles and reciprocal obligations, illustrating First Treaty With Gichi-Manitou practices of restoring relations within a toxic riskscape. Defined here, riskscapes are places and spaces where pollution/toxicity relations are continually reconfigured in literal, symbolic, and systemic ways. We share a story from Keweenaw Bay’s Sand Point restoration project (2002–present) to elucidate distinctly different approaches and challenges to restoring ecological relationships, including those between human and more-than-human beings. The restoration of 35 acres of barren shoreline into a thriving landscape concurrently created space for reclaiming Ojibwa stewardship obligations to land, water, and life. The goal was to restore Sand Point as a self-sustaining plant community, but maintenance remains demanding and costly. Lake Superior forces continually mobilize stamp sands, and recent extreme storm events have done so with even greater force. Thus measures of “success” are reconsidered annually, a reminder that “in perpetuity” toxic governance regimes are as unstable as riskscapes themselves. Yet Sand Point is a story of hope. Substantial transformations atop the surface reflect the restoration of many relationships between communities, institutional partners, and more-than-human beings. It is our Sand Point plant relatives who share the most valuable lessons of restoring sustainable livelihoods: resilience is inter-dependent communities caring for one another.

Keywords: ecological restoration, Lake Superior, stewardship, toxic risk

INTRODUCTION

Positionality

The authors of this manuscript are colleagues and research partners situated at the Keweenaw Bay Indian Community (KBIC) Natural Resources Department and at Michigan Technological University. One of us is a Keweenaw Bay Indian Community tribal member and the KBIC Natural Resources Director; the other is a naturalized U.S. citizen and Korean adoptee, and the Director for University-Indigenous Community Partnerships at Michigan Technological University. We have worked together as learners for more than a decade in different roles at KBIC and the university. Our relationship has served as a bridge to different ways of knowing and being, and has enhanced our understanding of human communities and all other beings. Our research relationship has also been strengthened by many at KBIC and Michigan Technological University who work in partnership with us to protect and restore land and life in the Great Lakes region and beyond.

Background and purpose

> *And I was just thinking to myself, "Lady, do you know what we were doing in the eighties? We were fighting for our treaty rights! After all that our Community has had to do, the work we do every day, you want to tell me about our tribe's missed opportunity to contribute to 'public comments' in the 1980s?! Yeah, no."*

When dealing with federal agencies we sometimes just have to laugh. It has become the best way to deal with yet another story of a federal employee exposing their ignorance of tribal communities, their history and treaty rights, and especially their political status as governing nations.

Although these stories can be common, our story highlights ignorance so you can also see the hope. Through many years of hard work between tribal and federal governments, some programs are improving and becoming more inclusive of tribal priorities and values. In our story about Sand Point (our community's area of concern) we share the ways we have worked to restore relations to food, medicines, and seven generations. It is important to keep in mind that what is visible on the landscape is also reflective of restoring relationships between tribal and federal governments. One cannot take place without the other.

The brief story shared above was about a phone conversation between federal and tribal partners. The call was focused on the Great Lakes Restoration Initiative (GLRI) Action Plan III scheduled to be implemented from 2020 to 2024. Representatives from Great Lakes tribes, the Environmental Protection Agency (EPA), and the Bureau of Indian Affairs (BIA) were discussing the priority Focus Areas and funding mechanisms organized by GLRI Action Plans. (For more information about Great Lakes Restoration, see GLRI Action Plan and Major Focus Areas, https://www.glri.us/action-plan.) In prior Action Plans, GLRI funding had been divided and allocated to federal and state entities, which would then, on the basis of their own priorities, solicit requests for proposals from other entities. Since the beginning of GLRI, tribes have been limited by the priorities decided by others. Prior to 2020, no GLRI funds had been directly dispersed to tribes. Instead, tribes competed with other entities, including other tribes, for a share of restoration funds. Importantly, many priorities held by the tribes did not fit precisely within the Focus Areas set by others.

In the conference call, one person, voicing the concern of many tribes, had inquired into the possibility of having Tribal Areas of Concern. Tribal lands, water, and food ways are indeed some of the most contaminated sites in the region (Bienkowski 2018, Gagnon et al. 2018, Whyte 2018a, McGregor

2020). Recognizing the current GLRI support afforded to Areas of Concern (AOC), many were interested in attaining resources to ameliorate consequences left by extraction on and/or near Great Lakes Indian reservations. Specifically for Keweenaw Bay, they were interested in Sand Point being designated a Great Lakes AOC. Results from recent Sand Point sampling had shown the severity and extent of contamination from historical copper mining and milling. Sand Point shares the related history of its Lake Superior neighbors (extraction, contamination, and waste-rock accumulation) but lacks an official AOC designation.

An EPA official responded to her request by explaining that most people do not ask to have an AOC in their community, especially given the stigma attached to such a designation, and that the government has not designated additional AOC sites since 1987. They proceeded to clarify that EPA had solicited for "public comments" in the early 1980s, and if she (or other tribal representatives) had been interested, they would have needed to submit comments during that period.

Although we laughed, we were also uncomfortably reminded of the contentious nature of relations between the federal government and Tribal Nations. Tribes have endured immense struggles to have a seat at the official environmental protection table. Tribes are engaged as nations, specifically, the government-to-government relationship stipulated by federal law (United States Senate 1987). This status means that tribes do not fit neatly into "public comment" categories. Many tribes are indeed struggling to do "environmental protection" within today's institutions, their tightly framed and named procedures and, sometimes, their lack of capacity and resources. At the same time, we should remember that tribes are the original caretakers and knowledge keepers of the place we now call North America. For thousands of years prior to settler colonialism (i.e., prior to the BIA and EPA), different governance regimes were a part of the landscape. Thus it makes sense that some tribes would seek to reclaim traditional stewardship obligations to land, water, and life in the name of Great Lakes restoration.

In this paper, we center on Sand Point as an example of restoration (of the landscape and also within governmental relations) to emphasize the different work of "in perpetuity" governance regimes. Sand Point lies within Lake Superior's Keweenaw Bay, the ancestral and contemporary homeland of the Anishinaabe Ojibwa and their relatives. Sand Point is also a toxic riskscape; its waters, shorelines, and fish beings are polluted by unknown tons of legacy mining waste rock called "stamp sands," which contain unsafe levels of toxic compounds. Although it is understood that many forms of toxic waste are likely to be managed in perpetuity, it is less clear what "in perpetuity" means in terms of governance.

Importantly, "in perpetuity" means "forever," "for all time," and "indefinitely." For the Ojibwa, its meaning is unchanged in the context of governance whereby perpetual care is an agreement with the past and the future; perpetual care is an engagement of reciprocity and is considered a gift of being in good relationship with, and in kinship to, all others (Johnston 2003). In the context of the federal governance regime, "in perpetuity" is understood to have these general meanings; however, it is flexible and adaptable to specific circumstances and types of toxicity. The perpetual management of toxic waste usually pertains to the engineered storage and technological maintenance of industrial byproducts in situ. Managing municipal landfills, metal mine operations, and coal and nuclear energy production facilities is a complex, costly, and evolving governance structure less than a century old (see Coil et al. 2012 for an overview of perpetual waste storage; see Washington State Department of Ecology 2017 for a specific, detailed example, including different definitions of "indefinitely"). Thus, toxic riskscapes produced and abandoned by industries prior to federal regulations (such as Sand Point and the Keweenaw Peninsula more broadly) are the social-ecological and economic burdens of current and future generations. Governance addressing legacy riskscapes is largely insufficient and piecemeal, and is equally a complex, costly, and evolving regime (i.e., Superfund, AOC, and brownfields).

In what follows, we begin by sharing who we are in Keweenaw Bay, including the context of Ojibwa stewardship principles and reciprocal obligations outlined in the First Treaty between the people and Gichi-Manitou (the Creator). Then we share the story of restoring Sand Point, a Keweenaw Bay Indian Community restoration project (2002–present) that elucidates distinct approaches and challenges to restoring ecological relationships. In the discussion, we focus on the annual reconsideration of "success" in the context of the "in perpetuity" toxic governance regime, and also outline four valuable lessons for restoring sustainable livelihoods shared by our plant relatives. The conclusion reaffirms Sand Point as an example of social-ecological restoration as an ongoing process and practice on the landscape, and also, for human and more-than-human relationships of many kinds.

CONTEXT

Who we are

The Keweenaw Bay Indian Community (KBIC or "Community") is the successor in interest of the L'Anse and Ontonagon Bands of Lake Superior Chippewa Indians (KBIC 2010). Lake Superior Chippewa are part of a larger Native American group known as the Anishinaabe, meaning "original person" (Benton-Benai 2010). Anishinaabe are one of the largest Indigenous groups in North America with nearly 150 bands living throughout their original homeland in present-day United States (U.S.) and Canada. Currently, Anishinaabe are known by various names: Chippewa, Ojibway, Ojibwe, or Ojibwa, as well as Ottawa or Odawa and Potawatomi. All of these names refer to the Anishinaabe people, the larger group who migrated from the Atlantic shores of North America and began settling in the Great Lakes region before 1000 AD.

Through a series of 18th- and 19th-century treaties with the U.S. government, Great Lakes Indigenous groups successfully negotiated agreements to retain the basis of their identity: the land in which they originally lived and the waters in which they traditionally fished (Doherty 1990). Lake Superior Bands are signatories to two treaties of peace with the United States (Treaty with the Chippewa 1842, 1854). In the 1842 Treaty with the Chippewa, the Bands reserved their existing rights of hunting, fishing, and gathering within more than 10 million acres of ceded land and water territory for their people. The 1854 Treaty with the Chippewa addressed these rights and also established the L'Anse Indian Reservation, approximately 59,000 acres of land in Michigan's Upper Peninsula. The region comprises large areas of forested land, diverse aquatic and terrestrial plants and wildlife, and vast lake and river systems with more than 160 tributaries and 70 miles of southern Lake Superior shoreline (Sweat and Rheaume 1998). In December 1936, the KBIC achieved federal recognition upon adoption of their Constitution and By-laws, making KBIC both the oldest and largest federally-recognized Indian tribe in the State of Michigan (KBIC 2010). It was at this time that the Community was established as a legal and political entity, organized in accordance with the provisions of the Indian Reorganization Act of 1934.

Since the treaty-making era, Great Lakes tribes have endured dire consequences of federal assimilation policies, state regulatory control over their harvesting, and environmental degradation and contamination caused by extractive industries (Wilkinson 2005). For much of this history, the intention was to thwart Indigenous knowledge and harvesting practices. The extraction of resources such as furs, timber, fish, and minerals substantially altered the region's land and water, all of its habitat, and the many species who depended on it, including the region's original people. Further, treaty rights were criminalized for more than a century. In Keweenaw Bay, 1842 treaty rights would not be reaffirmed until the 1971 People v. Jondreau decision ruled in the tribe's favor (Supreme Court of Michigan 1971), setting a national precedent for legal recognition for federally-recognized tribes in the United States (Wilkinson 2005).

The Jondreau decision served as the basis for asserting KBIC authority for restoring Lake Superior (Gagnon 2011). The urgency was real: In the name of conservation, the State of Michigan was discussing the termination of tribal fishing rights in order to reverse the declining Lake Superior fishery. Thus, immediately following the Jondreau decision, the KBIC sought to further understand 1842 treaty rights within the context of existing policy and management frameworks by state and federal governments. In the late 1980s, the Community hired its first biologist and constructed a fish hatchery facility that remains in operation today. In 1989, the KBIC became the 11th member tribe of the Great Lakes Indian Fish and Wildlife Commission (GLIFWC), whose work ensures the exercise of treaty rights within Michigan-, Wisconsin-, and Minnesota-ceded territories (GLIFWC 2010). Since that time, hatchery operations greatly expanded into fisheries and water quality programs, and in 1999 the KBIC Tribal Council established the KBIC Natural Resources Department (NRD or "Department"), to which it delegated primary responsibility for environmental and natural resources programs (Environmental Protection Agency 2020). Today, Department programs, staff, and partnerships have expanded to include air quality and brownfield programs, wildlife and wetland management, a plants program, and remediation and restoration projects across the region.

It is imperative to understand this history in order to appreciate the context of how official designations such as AOCs create and perpetuate injustices for "unofficial" contaminated sites. It also reflects the magnitude of both loss and resiliency of Great Lakes tribes, including the KBIC. The historical timeline is particularly telling because it underscores pertinent governance action by the Community as well as the U.S. and Canada. The Community engaged with the legal system for the reaffirmation of treaty rights and later established institutional structures to protect those rights and build systems and strategies for natural resources governance. At the same time, the U.S. and Canada were engaged in negotiation, construction, and implementation of the 1972 Great Lakes Water Quality Agreement (GLWQA), an agreement that would be amended in 1983, 1987, and 2012. Following an almost decade-long plan to identify and manage the most concerning and problematic toxic localities in the region, GLWQA amendments in 1987 were composed of 10 priority annexes. Annex one was, and remains, dedicated to Great Lakes AOCs.

Riskscapes and Ojibwa relations

Increased risks due to toxic contamination contribute to numerous burdens in particular places and lives. The dynamic and intersectional processes characterized by Kelly Alley (2002:18) as "wastescapes" and "flows that impact culture, ecology, and spirituality," and also described by other scholars in anthropology, sociology, and political ecology, contribute to an unequal burden of risks for marginalized populations (Paulson and Gezon 2005, Whiteford and Whiteford 2005, Johnson 2007, Kojola 2018, Malin et al. 2019). Within risk and disaster studies, scholars assert pre-existing vulnerability as foundational to the materialization of risk (Hoffman and Oliver-Smith 2002). Anthropology of policy scholars have drawn our attention to the contemporary power of policy, arguing that policies do not merely control but are also controlled by the conflicting narratives actively disputing particular policies (Shore et al. 2011). However, social and/or ecological studies are rarely informed by the unique legal and political status of Indigenous peoples or the socio-cultural and biophysical context within which toxicity arises (Watts 2013, Vinyeta et al. 2015), despite the prevalence of contamination in Indigenous communities. This is especially problematic because toxic contamination is woven into daily lives through environmental accumulations in Indigenous homelands, and more specifically, the primary animated habitats for food and medicines (e.g., O'Neill 2007, Donatuto et al. 2011, Hoover 2017, Hoover and Mihesuah 2019).

The creation of riskscapes, toxic or otherwise, often share a common history: exploitation, dispossession, and extraction of Indigenous lands and livelihoods as a result of processes and practices inherent in/to colonialism and settler colonialism, capitalism, and industrialization (Simpson 2017, Whyte 2018b). Riskscapes also maintain a fragile present and unsustainable future. This is due

in large part to the continuation of settler colonial frameworks, particularly in law and policy (Gilio-Whitaker 2019) as well as in the sciences (Liboiron 2021), which continue to shape Indigenous lands and experiences (Hoover 2017). However, as many scholars have shown, the fragility and unsustainability of the status quo is simultaneously being shaped by Indigenous peoples and their priorities.

The Keweenaw Peninsula is one part of the larger riskscape story for Indigenous peoples. Known as "Copper Country," it was home to 140 extractive copper mines and 40 mills from 1850 to 1929, each of which left behind contamination and degradation in one form or another. It is estimated that more than 64 million metric tonnes of tailings were disposed into Lake Superior by Keweenaw Peninsula mining and milling (Kerfoot et al. 2020). Approximately 35 miles north of Sand Point, the Torch Lake Area of Concern boundaries lie within a wider area inundated with legacy mining waste, most of which are also influenced by Lake Superior's wind and water currents. In addition to Sand Point and Torch Lake, other areas (and communities) in the region remain burdened by legacy contamination, a consequence of the industrialized extraction and processing of the Keweenaw's rich copper deposits more than a century ago.

Indigenous communities are inundated with extra-territorial impacts, health disparities, and struggles for political recognition, and simultaneously are actively reclaiming knowledge systems, traditional practices, and languages (i.e., identity). It has been well established that Indigenous peoples and knowledge systems are rooted in and exist as dynamic land-based relationships. Like the land, Ojibwa knowledge is interconnected to all beings, the climate and seasons, and the practices of the people who inhabit them and have done so since time immemorial (Johnston 1982, 2003). Specifically, the knowledge of the people is connected across a specific land base and a peoples' history to it (Johnston 1976, Basso 1996, Geniusz 2009, Coulthard and Alfred 2014). Knowledge is lived and experienced, and as such, new knowledge is being continuously generated and applied (Berkes 1999). Knowledge is flexible and adaptive to place and the people's relationships to all that exists in place, and because it is lived, it becomes shared across generations, creating a community's story that is passed inter-generationally (e.g., Harangody et al. 2022).

Within the Keweenaw Bay Indian Community, Ojibwa stewardship principles and reciprocal obligations directly inform practices of restoring relations within the Sand Point toxic riskscape. It may also be accurate to say that for some of us involved in the restoration, the toxic riskscape was a teacher and/or a reminder of Ojibwa stewardship principles and reciprocal obligations. Defined here, riskscapes are places and spaces where pollution/toxicity relations are continually reconfigured in literal, symbolic, and systemic ways. In addition to the continuous physical reconfigurations caused by Lake Superior's water and wind energies, practicing restoration informed by the First Treaty With Gichi-Manitou centers efforts on restoring good relations between and among humans and other beings, including the two- and four-legged beings, the swimmers and the winged ones, and also, our relatives with roots.

The Ojibwa people have a long-term, reciprocal obligation with plant and animal communities rooted in the people's First Treaty with Gichi Manidoo (the Creator; Johnston 1976, Kimmerer 2015). Also known as Sacred Law or Original Instructions, the First Treaty obligates all of creation to care for one another and support one another's autonomy. An illustrative example comes from Drs Martin Reinhardt and Traci Maday in *Interdisciplinary Manual for American Indian Inclusion* (2005:7): "[F]rom an Anishinaabe Ojibway perspective on education, Mother Earth is the original and primary teacher and classroom." They explain that the English word "education" is most closely related to the Ojibwa term *kinomaage*, which literally translates to "the Earth, it shows us the way." Anishinaabe and Haudenosaunee scholar Vanessa Watts (2013) emphasizes the intentionality of all beings, not simply human beings, and that the intentions of each being facilitates intimate relationships rooted in specific lands and waters and winds. Humans, through interactions with the land, careful observation, and

deep listening, can learn from plants and animals as they share their teachings, their gifts, with humans and other beings (Kimmerer 2010). *In As We Have Always Done*, Anishinaabe scholar Leanne Simpson (2017) describes these relations as *Nishinaabeg* internationalism, emphasizing the diplomacy to be practiced in relations with nations of many kinds, including plant and tree nations, fish nations, and other wildlife nations as well. Potawatomi scholar Kyle Powys Whyte in "What Do Indigenous Knowledges Do for Indigenous Peoples?" explains that Indigenous knowledge systems comprise the governance and identity of Indigenous peoples that contribute to the continuance of Indigenous nations and the resurgence of their members (2018c). Additionally, Anishinaabe Ojibwa must consider the implications of their decisions and actions across seven generations. These agreements are not only for human nations but also for more-than-human communities: fish nations, plant nations, and the many other wildlife nations. In other words, human actions must be considered within the context of caring for relatives of every kind. "Seven generations" is not meant to be symbolic but has literal meaning. In a time frame, we have learned that our current generation is centered within seven generations, three before us and three afterward. Our decisions honor our ancestors, and all of their teachings, and our actions do not burden our future relatives. Thus the KBIC are honoring the First Treaty in the renewed commitment to Sand Point restoration, the original "in perpetuity" governance regime.

RESTORING SAND POINT

Sand Point relations

Many Community members remember the barren, charcoal-gray beaches that lined Sand Point shores for decades (Fig. 1). Known locally in the Keweenaw as "stamp sands," waste rock creates desolate landscapes. Stamp sands are remnants of the region's copper mining past. Operating from 1902 to 1919 approximately four miles north of Sand Point, Mass Mill disposed approximately six billion pounds of crushed waste rock into Lake Superior's Keweenaw Bay (Kerfoot et al. 2020). With time, lake currents moved (and continue to move) stamp sands southward onto Sand Point beaches.

Stamp sands cannot support life. In the early 2000s, it was estimated that approximately 500,000 cubic yards of stamp sands covered a total of 71 acres at Sand Point (Nankervis 2013; Fig. 2). The low nutrient content, coarse texture, and heavy metal composition combine to construct a human-created wasteland. Although the precise mixture of toxicities that emerges in industrialized landscapes varies, the resulting riskscapes and prolonged disaster (un)recoveries are endemic to the settler colonial system (Hoover 2017, Whyte 2018b; see also Gagnon 2015). At Sand Point, the waste rock contains measurable, harmful levels of copper, iron, mercury, and arsenic in the soils, groundwater, surface waters, and fish. One of the most immediate dangers for people is breathing the air when sands are mobilized by disturbances such as wind.

Prior to its designation as a restoration site, the Sand Point shoreline was informally known as "squaw beach." Community members today share countless memories of long summer days at Sand Point. They reminisce about swimming with brothers and sisters and aunties. Elders smile when they remember. They felt fortunate to have the added warmth provided by dark sands and sunshine. They laugh about burying friends until only their heads were visible amid the sands. They remember that sometimes they would have to run full speed to the water to keep from burning their feet. Sand Point was also a popular year-round off-road vehicle location. Its flat, uninterrupted shoreline made for ideal 2.5-mile races (four-wheeling in summer and snowmobiles in winter). No one knew, or at least no one in the Community knew, that their beach was a toxic wasteland.

The Sand Point beach lies within an area known as the Ojibwa Public Recreation Area, purchased from the State of Michigan in the 1990s. Sand Point is the name used for the general area between U.S.

Highway 41 to the west and Lake Superior to the east, totaling several hundred acres in size with approximately 2.5 miles of Lake Superior shoreline (Fig. 2). Sand Point is KBIC Trust property, wholly owned by the Community and located entirely within the L'Anse Indian Reservation.

Sand Point has been peopled and storied since time immemorial. As part of a larger area considered sacred by the Ojibwa, its lands and waters are abundantly diverse and thriving with living beings. It consists of 197 acres of coastal wetland in addition to small meadows, a pine forest, two ponds, and the Sand Point Sloughs that support wild rice beds and cranberry bogs. There are also two tribal campgrounds, one among the pines and another on the waterfront, and a tribal marina, a historic lighthouse, walking trails, beach areas, and the Community Powwow grounds. Significantly, Sand Point is a historic Ojibwa village with historic Ojibwa burial mounds. Sand Point continues to be an important area for medicinal plant collection for the Community's Traditional Healing Clinic, which is also located on site beside the Powwow arena.

In an area inundated with stories, memories, and lifeways for the people in Keweenaw Bay, the contaminated shoreline appears almost out of place. As the sands neared the wetlands, however, urgency set in for the Community. For the Ojibwa, wetlands are often referred to as "living medicine cabinets." Wetlands are highly productive ecosystems that provide a number of gifts for both human and more-than-human communities, including pollution filtration, nursery habitat for fish and other wildlife, and flood control during storm events or spring snow melt. Wetlands also provide habitat for culturally significant plant species for the Ojibwe people. Importantly, in the Ojibwa language, the words for bog (*mashkiig*), swamp (*waabashkiki*), and medicine (*mashkiki*) are similar in origin, revealing the connection between different types of wetland ecosystems and the importance of wetlands for medicinal plants (KBIC 2019). More than 60 different culturally important plant species have been identified at Sand Point, many of which cannot thrive apart from their larger plant community.

The Sand Point restoration project (2002–present)

Sand Point can be an incredibly harsh environment because of Lake Superior's northern forces. Open-water waves and winds mobilize stamp sands onto the shores and also farther through the air. Even on a calm and sunny day, Sand Point has its challenges. The several acres of dark gray sands cause considerably higher temperatures than the immediate area at its perimeter.

From 2000 to 2005, intensive site assessment took place in partnership with the U.S. Army Corps of Engineers. The KBIC applied for a Brownfield Pilot Project Assessment Grant that offered one-time "clean-up" funding. The Community formed a Sand Point Task Force to determine needs of community members. The Department hosted numerous public meetings attended by KBIC Elders, Tribal Council, and the general public. There were several desires articulated through these meetings: quiet areas for meditation and wildlife viewing, preservation of burial mounds, lighthouse restoration, walking trails, interpretive signs to share Sand Point history, limited vehicular access, more picnic areas with restrooms, and, overall, low impact for ceremonial use.

On the basis of environmental and community assessments, three options were on the table for KBIC. Each alternative was analyzed for its potential effectiveness, implementability, initial and ongoing costs and efforts, and administrative burden: (1) shore armoring (determined to be cost prohibitive because of the extensive size of the shoreline site); (2) dredging stamp sands from the bay (too much material: disposal costs would be cost prohibitive); and (3) capping stamp sand (soil cap vegetated with grasses and shrubs would reduce leaching of contaminants and reduce wind-blown transport).

The KBIC Natural Resources Department secured the Pilot Project Assessment funding for Sand Point in 2005. With growing concern for stamp sands' encroachment to adjacent wetlands at Sand Point, the Community decided to cap a portion of the stamp sands to prevent further inland intrusion.

In 2006, and in partnership with the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NCRS), Fish and Wildlife Service, and the EPA, a six-to-ten inch cap of sandy-loam soil was placed atop 33.6 acres of stamp sands and seeded with a short grass mixture (Nankervis 2013; Fig. 3). Although the cap stabilized existing stamp sand deposits and decelerated the impact to coastal wetlands, the Sand Point habitat did not support a biodiversity of native plants and wildlife (Fig. 4). The Community began discussions on a long-term goal: restoring Sand Point to be a diverse, self-sustaining community of plants, trees, and other wildlife. At the same time, the KBIC Natural Resources Department continued to seek additional funding sources to focus on restoring native wildlife habitat, including *manoomin* (wild rice, *Zizania palustris*).

The GLRI request for proposals offered such an opportunity. In 2010, GLRI awarded project funds to the Keweenaw Bay Indian Community to restore landscape habitat at Sand Point. In partnership with the Forest Service, EPA, BIA, Army Corps, USDA-NRCS, and the Cedar Tree Institute, intensive planning work took place. First, the KBIC Natural Resources Department constructed a greenhouse biodome to focus on propagating native species plants, medicines, and pollinators for Sand Point. At the same time, strategic planning for topography, mounds, and boulders as wind-breakers, and placement of various plant and tree communities was also taking place.

Intensive restorative stewardship for Lake Superior's Sand Point began in the field seasons of 2011 and 2012. Significant landscape transformations took place over these next two years: 45 species of flowering plants, grasses, shrubs, and trees as well as exercise stations, wind-breaking boulders and elevated mound topography, an irrigation system, walking trails, and, on any given day, a number of people from the KBIC "plants crew" Youth Program and volunteers (Nankervis 2013; Figs. 5 and 6). Although the entire 2.5 acres were transformed, there was great focus on the smaller Native Species Demonstration Garden within the site.

Daily work brought on many questions about site "management." How much and for how long do we manage the transformed landscape? These questions pertained to specific seasons as well as across seasons. There was no precedent for a restoration initiative of this kind. How many days do we water newly planted species? Which species do we plant, continue to plant, and where? To address these questions, a number of formal and informal discussions took place with KBIC leadership and the Cultural Committee, community members, and contractors from Superior Tree Farm, as well as between staff in the hallway of the Natural Resources Department. Primarily, however, decisions were made with our hands in the Sand Point dirt: we did what we thought was best (for being Ojibwa) and learned from our mistakes. We decided that new plants would get two weeks of daily watering. Species that do not do well would not be planted in the same area the next season. Some species were not replanted at the site at all. At the end of the 2012 summer, Sand Point was thriving with life, and the one-acre Demonstration Garden transformed into a native species pollinator garden (Fig. 7).

In 2013, KBIC continued Sand Point stewardship specifically to monitor and maintain plant communities' growth and survey wildlife usage at the site. With the transition from spring into summer there were issues right away. A few plant species did not return, whereas at the same time newcomers spread across the site. There were tireless efforts to remove invasive species and bring in native plant relatives to take their places. Although the hope was to expand planting into new areas, the Biodome's plants that year were primarily used for original site maintenance. The plants crew could barely keep up. It was also incredibly hot and dry that season and so watering new arrivals and young trees was a tremendous task every day, and sometimes twice a day.

The extreme heat revealed the not-so-great quality of the cap's soil; the hard, clay-like ground surface created extremely difficult conditions for removing invasive species, planting newcomers, and keeping the site adequately moist. Our one-a-day watering strategy turned into two- and sometimes three-a-day drinks for our young ones. However, one species in particular did not seem troubled by

the dense cap: countless ants were able to make thousands of homes all over the site, ant beds comprised of stamp sands they diligently worked to the surface.

DISCUSSION

What is "success?"

The next several years would bring similar challenges and also new ones. An important question became how to define and measure success for Sand Point restoration. Year after year, we ponder it. Once envisioned as a self-sustaining system, the plants program has a ballooning budget, now accounting for a substantial portion of Department funds, approximately $200,000 each year. Shrub and tree growth is stunted as their roots reach near and beyond the cap into the sands below it. Many geese families have made the site ponds an annual nursery, residing in and around the site, but have not seen as many pollinators or other insects as we had hoped, at least not initially. As more plants expanded farther north and south in 2018–2021, it has become more common to see a diversity of pollinators, including bees of many kinds and the beloved monarch butterfly (*Danaus plexippus*; Figs. 8 and 9).

What about the KBIC goal that Sand Point would become a self-sustaining community without continuous human management and immense funds in perpetuity? We have realized that Sand Point is likely to be a restoration project for generations to come, the reality of too many legacy mining sites as well as current and future ones. Despite the fact that "in perpetuity" remains in policy for some of the most dangerous industrial processes on earth (e.g., mines, power plants, and nuclear reactors; Coil et al. 2012), its interpretations are as diverse as the sets of actions intended to mitigate harm (see Washington State Department of Ecology 2017, and case studies in Edelstein 2004, Brown 2007). Regulatory funding mechanisms (i.e., Superfund, AOC, and brownfields) cannot sustain costly remediation for long-term problems associated with legacy mines precisely because costs cannot be realistically determined. More often than not, these sites are abandoned or become the long-term liability of communities and governments (i.e., taxpayers).

In short, Ojibwa stewardship at Sand Point, and across the greater landscape, must be in perpetuity. KBIC is committed to restoration time, effort, and resources. We have found many ways to define success. Today, it is extremely rare to see invasive plant species at Sand Point. And unlike other beaches, it is even more rare to see litter. Many plant communities continue to return each spring and some have shown their colors hundreds of yards from their original planting sites. Most importantly, plants and people have gotten to know each other again (Fig. 10). Relationships of many kinds have become reestablished and reciprocity has returned as a seasonal engagement within Keweenaw Bay at Sand Point.

Teachers and lessons

Plant beings are wise teachers, and at Sand Point our plant teachers have shared many lessons. The wisdom of plants precedes human existence and they have many teachings to share with us if only we approach them and listen as learners. In what follows, we outline the primary lesson reminders shared by our wise relatives, the plants.

Lesson one: well-being is dependent on place

For many beings, well-being is dependent on place, and sometimes, place can be very precise and exact. Through the first few seasons at Sand Point, it became evident that a select few plants could not withstand the site's conditions, no matter where they were. For most plants, however, their well-

being was dependent on their specific location within the site: their distance from the harsh shoreline, their placement near the ponds, and their distance from the north end's open water and winds.

Lesson two: livelihood is dependent on your neighbors

One's livelihood can be highly dependent on one's neighbors, and in particular one's immediate neighbors. As the wind mobilizes stamp sands at Sand Point, the coarse, sharp sands can cause severe damage to plants, cutting into their flesh like tiny knives. In response, the Department plants crew began a "clump planting" strategy. The outer plants protect the inner, ensuring the species will go to seed and become the next generation community.

Lesson three: survival is community dependent

One's survival is dependent on the whole community, with each community member having different roles that ensure the community's survival. Some plants at Sand Point earned their status as "warrior species." Coreopsis, pearly everlasting, oxeye daisy, and goldenrod, to name a few, are able to thrive near shore and far north in the harshest physical conditions. Warrior species serve as the first line of defense for their communities.

Lesson four: resilience is interdependent communities caring for one another

Resilience needs to be recognized as a feature of interdependence and cooperation between and among diverse communities of many species. The plant needs the pollinators just as the pollinator needs the plants. As humans, we need other humans but we also cannot thrive without other more-than-human living communities. Humans reflect the resilience of their social-ecological systems. Landscapes give us life, and we must all learn from and care for each other.

All of these lessons are a lesson in humility. According to the Ojibwa Seven Grandfather Teachings, humans are equal to all other beings, no better and no less. Perhaps the goal of self-sustaining and/or sustainability is short-sighted, or rather short-minded, and interdependency is the desirable aim. These are the lessons that our Sand Point teachers are sharing with us.

(In)Justice knows no boundaries

Sand Point is the central focus of our story but it is not a bounded one. More-than-human phenomena continue their attempts to teach us in human communities. For example, in the summer of 2017 and fall of 2018, extreme storm events pummeled our region (and others). Each storm caused irreparable damage to the Sand Point landscape. Debris, including hundreds of pounds of stamp sands, pushed inland and inundated several hundred yards (Figs. 11 and 12). Lake Superior also reclaimed large masses of shoreline, including cap and plant cover, for herself. Some shoreline alterations actually increased the land area available for future stamp sand deposits. After the worst of the storms, in October 2018, a small inlet allowing stamp sands' passage into an adjacent wetland was discovered. The extreme storms are predicted to continue and intensify for years to come. In fact, the KBIC's geospatial specialist warns that the entire Sand Point area may be reclaimed by Lake Superior in about 100 years. Again, we must ask ourselves, how much management is needed, and what is success? Most recently, in 2021, extreme heat and drought conditions returned. The disparate seasonal conditions and annual cycles encourage us to continually reflect on what Sand Point is trying to teach us.

Clearly the Sand Point story is changing each year. Official or unofficial is irrelevant; Sand Point is an area of concern for the Keweenaw Bay Indian Community. The contaminated legacy site will likely be stewarded in perpetuity. Contamination is a clear injustice for Sand Point, its aquatic and terrestrial beings, and the Ojibwa people. But as previously mentioned, it is not an isolated case. Just north of

Sand Point, the Keweenaw Peninsula's Torch Lake Area of Concern and its legacy contamination refuses to be contained by the artificial boundaries created by the Great Lakes Areas of Concern program. Other legacy waste sites and stamp sands throughout the Keweenaw also exist as unofficial areas of concern; they remain contaminated and mobile, and will continue to create consequences in perpetuity. Moreover, a recent study modeled the potential for further north stamp sands to migrate south to Sand Point (Chiriboga 2018). Although the amount of contaminated sands that will migrate cannot be determined, it is certain that they are moving toward Sand Point and will distribute farther south into the bay. The sands, and Lake Superior's waters and waves, remind us that these stories have always been connected. We must look beyond boundaries in order to do justice.

The spatial and temporal boundaries created by naming and claiming a category such as "Area of Concern" can perpetuate injustice. Too often, policy designations minimize alternative meanings and places of community concern. Throughout the Keweenaw Peninsula, and in the Great Lakes region as a whole, there are additional areas impacted by toxicity that garner no less community concern, and are no less problematic because of toxic risk, than official "Areas of Concern." Further, as indicated by the EPA staff person, Areas of Concern is a closed list. This remains true even though toxic contamination has been discovered, and literally travels elsewhere, outside the boundaries of official AOCs. It serves as a reminder of how official categories erect boundaries of many kinds. Boundaries, physical or conceptual, include some and exclude others. In the case of GLRI Action Plans I and II, specifying AOCs and other Focus Areas created barriers for restoration opportunities. The Focus Areas delineate the issues of priority concern and frame specific areas for restoration attention. In doing so, it restricts whose priorities are addressed and determines who benefits from funding allocations.

Even so, GLRI has funded tribal restoration work across the region for almost a decade. Great Lakes Tribal Nations effectively (and creatively) aligned their priorities to specific Focus Areas. (For more information about Great Lakes Restoration and initiative progress, see GLRI Action Plan and Major Focus Areas, https://www.glri.us/action-plan.) However, the 2020 Action Plan III and Focus Areas more directly reflect tribal priorities. Some of the most substantial changes were influenced by the long-term engagement by tribal nations alongside federal partners. Over the course of several years, tribal government representatives participated in conference calls and in-person sessions to co-create each of the five Focus Area's primary objectives and commitments to better reflect shared priorities. Additionally, GLRI Action Plan III has a stronger emphasis on "protection" than Plans I and II. Finally, to ensure the Action Plan measures are determined and implemented by tribal nations, GLRI now allocates funds directly to Great Lakes tribes alongside federal and state government agencies.

Remember that what is visible on the landscape is also reflective of relationships (Fig. 13). Changes to GLRI Action Plan III are a direct result of dialogue between Great Lakes tribes and the BIA and EPA. Federal and tribal government partners worked together over many years to ensure a more equitable future for Great Lakes restoration, protection, and community resilience.

CONCLUSION

In thinking more about toxic riskscapes and care in perpetuity, an important question can center our everyday intentions: What will be our current generation's legacy? This kind of inquiry can guide our practices with Sand Point as well as restoration work with other areas of concern in different communities. In Keweenaw Bay, we seek a legacy that reflects our understanding that perpetual care is an agreement with past and future generations. Within Anishinaabe Ojibwa partnerships, we are remembering how to engage in reciprocity as a gift of being in good relationship with many others. These are the teachings from our Sand Point relatives. Healing lands and waters and future generations cannot be accomplished within one community or governing nation. We must restore relationships between our nations, of the human and the more-than-human kinds, across generations in perpetuity.

RESPONSES TO THIS ARTICLE

Responses to this article are invited. If accepted for publication, your response will be hyperlinked to the article. To submit a response, follow this link. To read responses already accepted, follow this link.

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DATA AVAILABILITY

Data/code sharing is not applicable to this article because no data/code were analyzed in this study.

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FIGURES