

Climate Resiliency Plan (CRP)

for the Keweenaw Bay Indian Community

A Supplement to the Integrated Resource Management Plan (IRMP 2023)

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Acknowledgments

We first acknowledge that *Nayaano-nibiimaang Gichigamiin* (“The Five Freshwater Seas,” the Laurentian Great Lakes) bioregion is the ancestral, traditional, and contemporary lands and waters of numerous Indigenous nations, including the Anishinaabeg—the Three Fires Confederacy of Ojibwe, Odawa, and Potawatomi peoples. Indigenous peoples are the region’s original caretakers and knowledge keepers, and we recognize their centuries-long relationships as the foundation for governance of the world’s largest system of freshwater that continues into the present day. We acknowledge the more-than-human worlds who call this region home, and have done so since time immemorial.

We gratefully acknowledge the thoughtful contributions from KBIC community members and resource managers who were instrumental in the development and writing of the first Climate Resiliency Plan for the KBIC. The CRP Interdisciplinary Team included a Working Group, Reviewers, Collaborators and Contributors consisting of Natural Resource Department staff, KBIC government staff, KBIC community members, and WUPPDR and Michigan Tech researchers and writers. Funding for this work was provided by the Bureau of Indian Affairs. Miigwech.

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A. Overview

The Keweenaw Bay Indian Community (KBIC) is dedicated to the long-term protection of natural resources, healthy ecosystems, and the preservation of Ojibwa culture - this dedication has contributed to our people's resiliency for many generations. As part of our commitment, climate change is recognized as a priority in contemporary natural resource management and environmental protection planning initiatives for our Community. Following guidance from Tribal Council in Resolution KB-016-2015, the KBIC Natural Resources Department (NRD) secured funding from the Bureau of Indian Affairs (BIA) to support this initiative so that we may strengthen Community capacity to plan, prepare, and adapt within evolving climate change effects as identified as a priority in the KBIC Strategic Plan. **To address this priority, the KBIC Integrated Resource Management Plan (IRMP 2023) has been updated, integrating Climate Resiliency Planning as part of KBIC governance within and across the KBIC jurisdictional territories.**

Importantly, climate refers to the long-term pattern of weather for a particular area or region; weather refers to current or short-term changes in conditions (i.e. raining, snowing, sunny, cloudy). When climate related changes are discussed in this document, it specifically refers to a change, or shift, in the long-term pattern of particular weather conditions within the region (i.e. warmer, colder, wetter, drier).

In what follows, this Climate Resiliency Plan (CRP) for the KBIC serves as a guide to climate specific objectives and actions for many KBIC government offices, as more fully described in the 2023 KBIC Integrated Resource Management Plan (IRMP). The CRP underscores the value of climate resiliency planning and the importance of KBIC knowledge, practice, governance, and stewardship to anticipate, prepare for, and adapt to climate related changes in the 1842 ceded territory. As the CRP serves as a supplement to the IRMP, the ways these two documents can be used in tandem are described in this document. The CRP includes significant insights and reflections from all community offices of KBIC governance related to a) landscape changes and/or impacts in recent years within the KBIC ceded territory that may be related to climate change, b) the ways climate change is impacting all beings in our region, and c) priority areas of concern for future action and adaptation with respect to climate change. The CRP also highlights all recommended actions contributing to climate resiliency within the KBIC and its territorial jurisdictions as specified directly in the IRMP.

A.1. The Importance of Climate Resiliency Planning

Climate resilience planning has been a priority of the Anishinaabe Ojibwa since time immemorial - the Ojibwa have long remained an adaptive people to climate related changes. However, the rate of contemporary climatic change is unprecedented which requires a proactive planning approach by our Community. As a result, this CRP, as a supplement to the IRMP (2023), moves forward in KBIC climate resiliency planning as we have always done - by honoring our ancestors, knowledges, and teachings. In doing so, we remain committed to active long-term planning in consideration of the lives and livelihoods for seven generations to come, while simultaneously strengthening KBIC *mashkawendam*¹.

The current challenges KBIC faces are many, including changes in seasonal weather patterns, increase in extreme weather events, habitat degradation, pollution, and toxic contamination, and loss of our native plant, fish and animal relatives (species). These challenges are often exacerbated by limited capacity (e.g., funds, staff, and expertise), and in particular, the lack of knowledge by others that make decisions that affect our region. KBIC must address ongoing threats while simultaneously revitalizing obligations to land and life, and recovering and sharing

¹ *Mashkawizi*, “to be strong, resolute;” *endam* refers to what’s going on in the mind, meaning having strong resolution, taking heart and being determined.

the knowledge needed to do so. These challenges yield negative social, cultural, and economic consequences, particularly due to the loss of subsistence and commercial harvesting opportunities which also impedes transmission of knowledge to future generations. Importantly, the continuation of our people requires the ability to use and share its knowledge so that traditional knowledge and science can be integrated to strengthen community and ecosystem resilience for current and future generations.

The sustainability of Ojibwa Culture is, and always has been, a priority to the sovereignty of the Keweenaw Bay Indian Community (KBIC or “Community”) throughout the 1842 Treaty ceded-territory. Sustaining Ojibwa culture means to sustain our identity as Anishinaabe Ojibwa, dedicated to cultural practices that are, and always have been, changing and adapting with the seasons, generations, landscape and water ecologies, technologies, and also, by interacting with other cultures. In order to sustain Ojibwa culture, this fundamental priority remains: express gratitude and practice respect in our daily practices and relationships, and assert our sovereignty through the use and sharing of Ojibwa values between and across multiple generations.

A.2. KBIC Ojibwa Knowledge and Climate Resiliency Planning

KBIC retains an important role in protecting and restoring Great Lakes ecosystems, particularly because Ojibwa knowledge and practices have been sustained in the region for millennia. Traditional knowledge systems have been increasingly recognized for promoting resilient ecosystems and the health and safety of those who depend on them (Deloria et al. 2018; Finn et al. 2017; Seltnerich 2018). Traditional knowledge and practice calls for a broad accounting of and respect for relationships that compose a wholistic understanding of the world; in this view, all things are interrelated and interdependent (Kimmerer 2015; Whyte 2017). For Indigenous communities, health is deeply embedded in relations to place and comprises community, cultural, and spiritual relationships (Adelson 2000; Gagnon 2016; Geniusz 2009). Based on these understandings, governance, research and resource management are evolving to utilize the sciences as well as Indigenous knowledge systems to improve environmental and human health (Donatuto et al. 2011, 2014, 2016). Traditional ecological knowledge can guide, complement and supplement biological science and management of natural resources (Menzies and Butler 2014). Further, utilizing both western and Indigenous knowledge systems has also been shown to enhance cross-cultural and -scale efforts to better understand social-ecological systems (Berkes 2004) and to increase the relevance of research (Berkes 2012).

The KBIC is acutely aware of the current, ongoing harmful environmental trends due to climate change and the increased potential for negative impacts to tribal treaty and trust resources, economic wellbeing, local infrastructure, and the health and safety of the KBIC (Gagnon et al. 2013; KBIC 2002; Nankervis and Hindelang 2014). Treaty resources are a KBIC priority for protection and restoration because tribal members depend on healthy ecosystems for subsistence, commercial, and cultural purposes. Traditional foods and medicines such as fish, wild game,

manoomin (wild rice), berries, trees and plants are gathered within water and terrestrial landscapes in both the local and wider region (GLIFWC 2014). Thus, many stories and observations from KBIC tribal members and descendants inform management practices and implementation of KBIC strategic plans; their insights are also critical for KBIC governance and planning into the future. Harvesting practices are not only a means of Community wellbeing but also a vast source of traditional knowledge and community resiliency (Whyte 2018). Sharing knowledge strengthens cultural identity which also fosters resilience (Unger 2011; Wexler 2014). Fishers, hunters, and gatherers have shared their experiences and knowledge about changes related to climate change such as the disruption of seasonal phenology, the loss of hunting and gathering grounds, shifts in fish, wildlife, and plants' species, and changes in ice cover and access to ice fishing.

The following section outlines the KBIC knowledge and practices that guide climate resiliency planning, and its connections to integrated natural resource management, shared governance, and KBIC partnerships. These guiding frameworks are the result of an Integrated Assessment (IA) project (Michigan Sea Grant, 2023) between KBIC (including contributions by the Cultural Committee), Great Lakes Indian Fisheries and Wildlife Commission (GLIFWC), and Michigan Tech. This IA project is known as *Anishinaabe-Gikendaasowin* (translating to “knowledge” and “intelligence”), generously sponsored by the Michigan Sea Grant. The primary themes of the *Anishinaabe-Gikendaasowin* project include: 1) the overarching KBIC knowledge and practice framework, followed by and inclusive of, 2) KBIC Governance, Self-determination, and Autonomy, 3) KBIC Stewardship, 4) KBIC Relations & Relatives, and, 5) KBIC Resilience.

A.2.1. KBIC Knowledge and Practice

KBIC knowledge and practice includes teachings inherited from our ancestors and also gained from the everyday practices of our community. Essential components to KBIC knowledge and practice, as illustrated in Figure 1, are our governance, self-determination, and autonomy, our resilience as a people, our many relations and relatives across the landscape, and the stewardship ethic from which we live our daily lives.

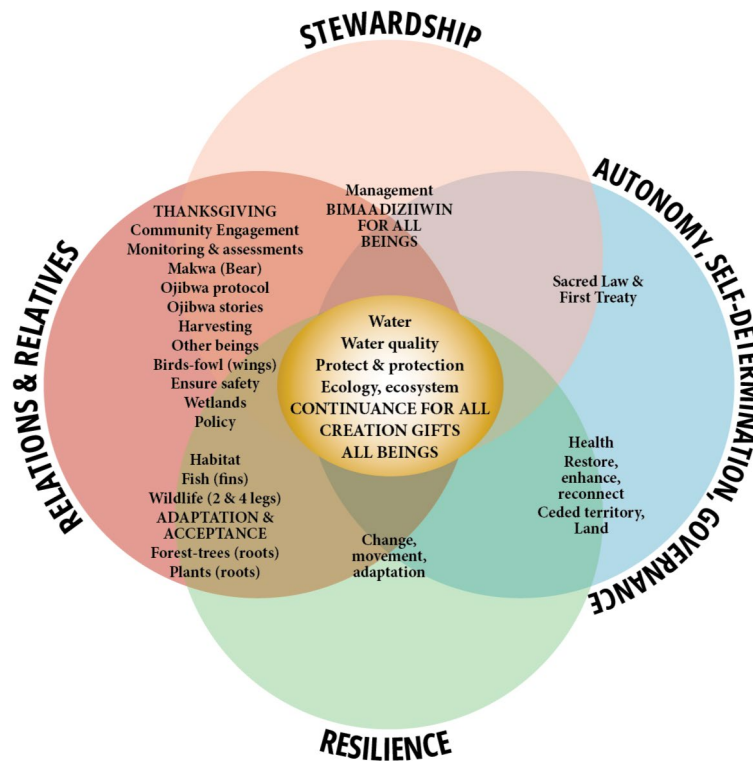


Figure 1: Knowledge and Practice of the Keweenaw Bay Indian Community Lake Superior Band of Ojibwa (2022). Credit: Anishinaabe-Gikendaasowin Integrated Assessment Research Team, funded by Michigan Sea Grant. Design by Todd Marsee, Michigan Sea Grant.

A.2.2. KBIC Governance, Self-determination, and Autonomy

KBIC governance, self-determination, and autonomy is foundational to KBIC climate resiliency planning. **KBIC governance** is the collective essence of our sovereign people, being flexible and adaptable, including our organizing principles and responsibilities for interacting with one another, other communities, and all our relations and relatives. And, **KBIC self-determination and autonomy** is our inherent ability, capacity, and knowledge to govern and take care of our people, homelands, and relations with others, and to self-determine the priorities and practices by which to govern, care for, and relate to others. As illustrated in the following graphic (Figure 2), our governance, self-determination, and autonomy aims for **balance and protection**, is informed by the **seven grandfather teachings**, asserts the **sovereignty** of our people, and ensures **our future** as an Ojibwa people remains.

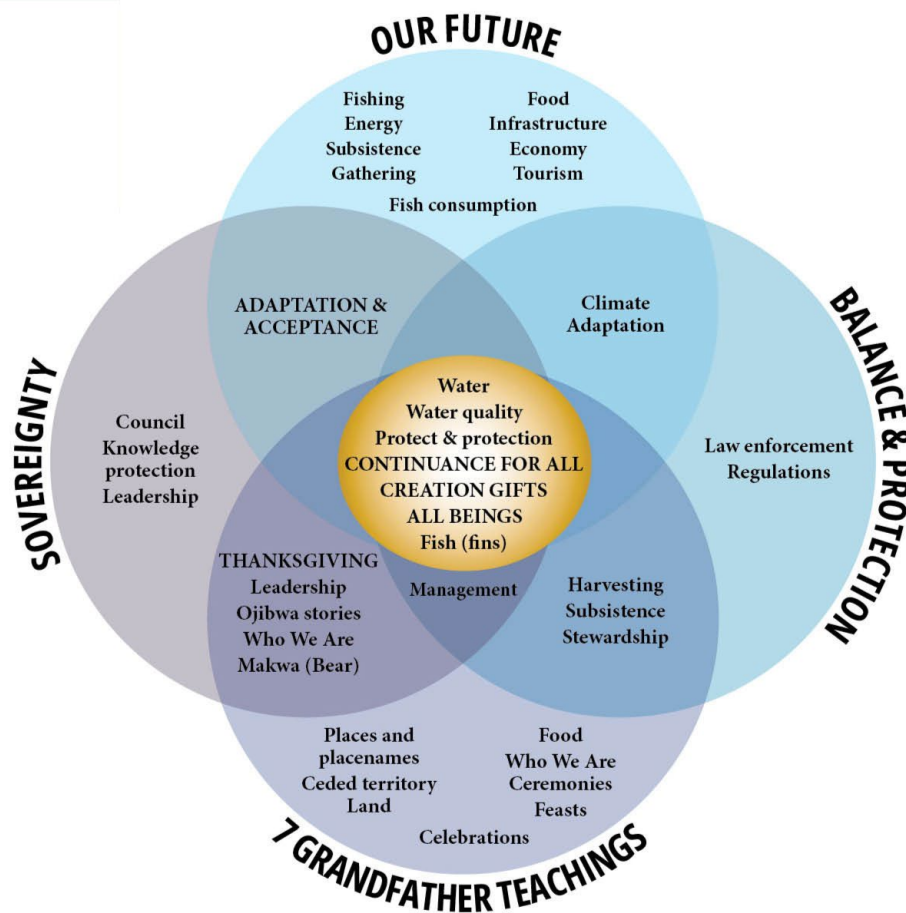


Figure 2: Governance, Self-determination, and Autonomy of the Keweenaw Bay Indian Community Lake Superior Band of Ojibwa (2022). Credit: Anishinaabe-Gikendaasowin Integrated Assessment Research Team, funded by Michigan Sea Grant. Design by Todd Marsee, Michigan Sea Grant.

A.2.3. KBIC Stewardship

KBIC stewardship is fundamental to KBIC climate resiliency planning. **KBIC stewardship** is being a good relative, which includes living in gratitude and humility, honoring and learning from our relatives--the four-legged and two-legged, swimmers, and winged ones, and sharing our gifts to strengthen and sustain relations with each other and all of creation for the next seven generations. As illustrated in the following graphic (Figure 3), our stewardship aims for the **continuance of all**, is informed by our philosophy of **bimaadiziiwin for all beings** and our commitment to the **thanksgiving** of our people, and acknowledges the reality of **interdependence** between all of earth's elements, lives, and livelihoods.

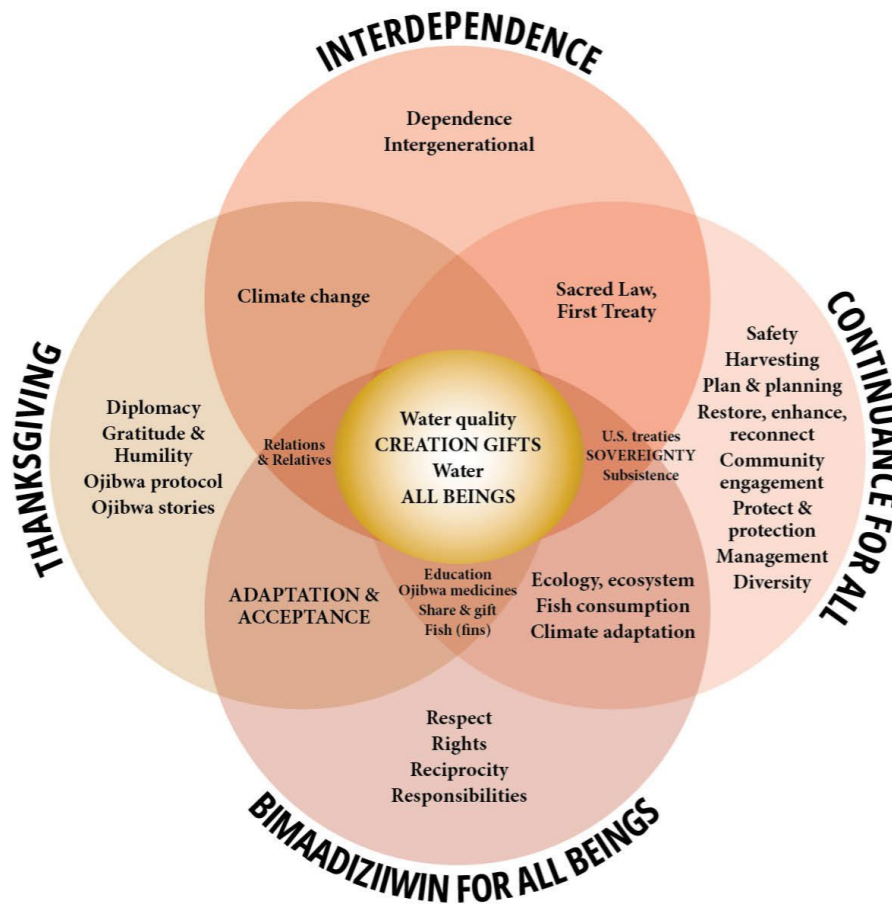


Figure 3: Stewardship of the Keweenaw Bay Indian Community Lake Superior Band of Ojibwa (2022). Credit: Anishinaabe-Gikendaasowin Integrated Assessment Research Team, funded by Michigan Sea Grant. Design by Todd Marsee, Michigan Sea Grant.

A.2.4. KBIC Relations & Relatives

KBIC relations and relatives sustain our lives and livelihoods, and as such, must be centered in KBIC climate resiliency planning. **KBIC relations and relatives** are our connections to *mino bimaadiziwin*², listening and learning in all directions, including the seasons and ceremonies, the woodlands, the waters, and the winds, medicines and foods, the fish, wildlife, and our ancestors - and all spirits - of the past, present, and future. As illustrated in the following graphic (Figure 4), our commitment to our relations and relatives recognizes the need for **adaptation and acceptance** for current changes and those yet to come, is inclusive of **all beings**, and importantly, seeks to strengthen our reverence for all the **creation gifts**, provided by the Creator since time immemorial.

² In Ojibwemowin, *mino bimaadiziwin* translates to “the good life.”

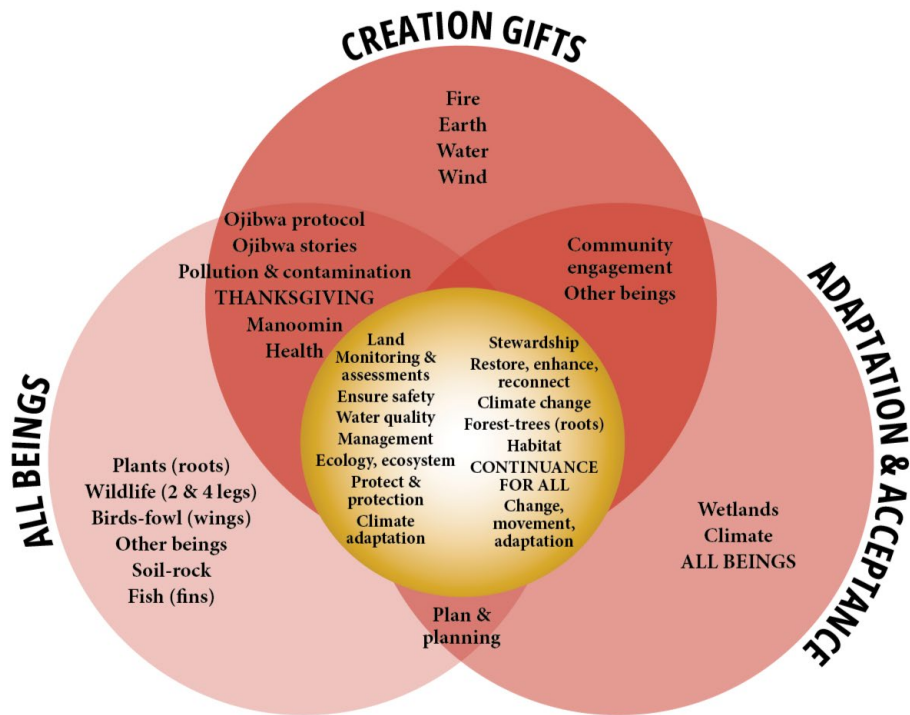


Figure 4: Relations & Relatives of the Keweenaw Bay Indian Community Lake Superior Band of Ojibwa(2022). Credit: Anishinaabe-Gikendaasowin Integrated Assessment Research Team, funded by Michigan Sea Grant. Design by Todd Marsee, Michigan Sea Grant.

A.2.5. KBIC Resilience

KBIC resilience remains foundational to our identity as an Ojibwa people; we are still here. **KBIC resilience** is living in balance with all others, honoring our ancestors and teachings, long-term planning in consideration of all others, and maintaining *mashkawendam* with and by all others. As illustrated in the following graphic (Figure 5), resilience requires ecosystem **balance and sustainability**, aims for the **health and wellbeing** of our people and all our relatives, **honors our ancestors and teachings**, and requires **long-term planning** for seven generations.

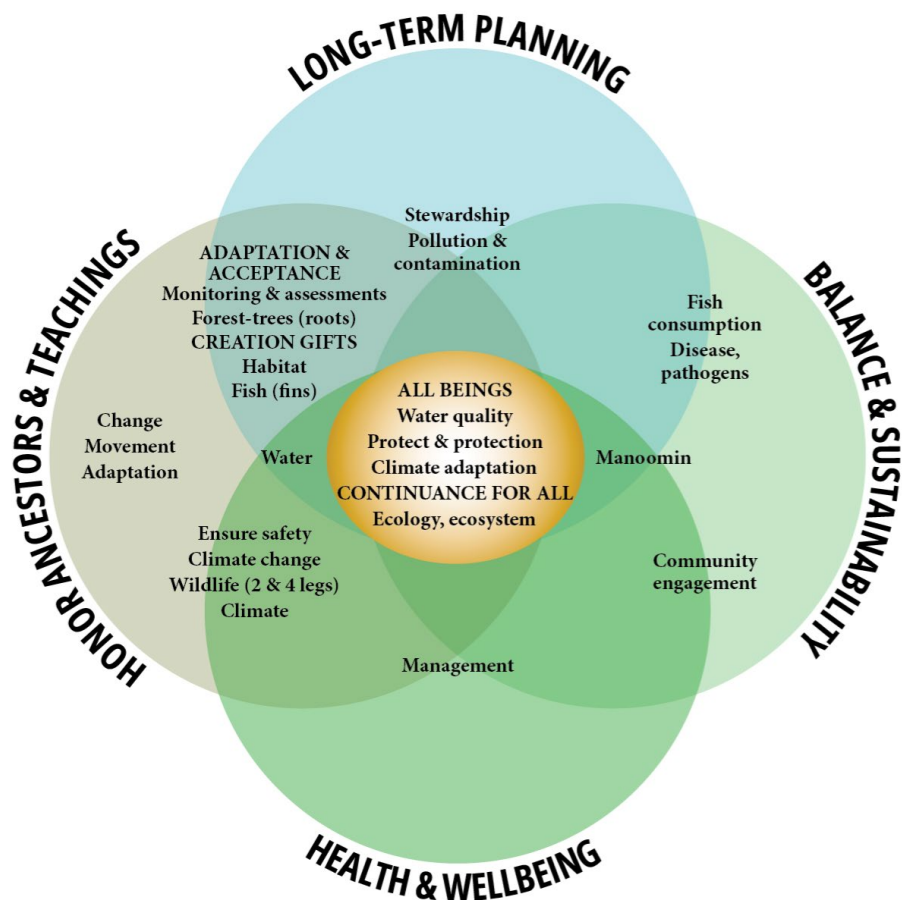


Figure 5: Resilience of the Keweenaw Bay Indian Community Lake Superior Band of Ojibwa (2022). Credit: Anishinaabe-Gikendaasowin Integrated Assessment Research Team, funded by Michigan Sea Grant. Design by Todd Marsee, Michigan Sea Grant.

A.3. Climate Resiliency Plan (CRP) and the KBIC IRMP

The CRP synthesizes the insights shared from government offices across KBIC governance areas. Specifically, these insights are organized as follows: **a) Climate Related Observations in the KBIC Ceded Territory**, **b) Climate Impacts to Others in the Ceded Territory**, and **c) Climate Priority Areas of Concern within the KBIC Ceded Territory**. Although briefly outlined in this CRP, each specific reference is connected to the detailed information included in the IRMP, further organized by KBIC governance areas and government offices. Then, this CRP lists the **recommended actions** that contribute to climate resiliency planning for the KBIC within its territorial jurisdictions, again, as specified in the KBIC IRMP (2023). Finally, this CRP provides concluding thoughts necessary for climate resilience for current and future generations.

B. KBIC Climate Observations, Impacts, & Priorities

The KBIC Climate Resiliency Plan (CRP) serves as a guide to climate specific objectives and actions for many KBIC government offices, as more fully described in the 2023 KBIC Integrated Resource Management Plan (IRMP). The following section of the CRP shares observations, impacts, and priorities related to climate change in the KBIC ceded territory; these insights coalesce around shared concerns for current, ongoing harmful environmental trends due to climate change and the increased potential for negative impacts to tribal treaty and trust resources. The insights described in the following section of the CRP were shared in informal discussions with members of leadership in offices of KBIC governance. These small group discussions prompted and inspired respondents to: a) share landscape changes and impacts in recent years that may be related to climate change within the KBIC ceded territory, b) describe how the Community and other beings/species have been, or may be, affected by climate change, and c) express concerns and reflections for what actions KBIC should prioritize with respect to climate change and climate adaptation.

A brief description is provided for each subset of the three overarching discussion themes: 1) **Climate Related Observations in the KBIC Ceded Territory**, 2) **Climate Impacts to Others in the KBIC Ceded Territory**, and 3) **Climate Priority Areas of Concern in the KBIC Ceded Territory**. As described above, each section also provides references that directly correspond to where more detailed information can be found within the IRMP document. The observations, concerns, and priorities shared by KBIC governance offices also align with specific KBIC climate actions described in the IRMP; these actions are also summarized in the *Recommended Actions for Climate Resiliency* section of the CRP.

B.1. Climate Related Observations in the KBIC Ceded Territory

Observations of changes and impacts that may be related to climate change were shared by respondents from community offices within KBIC governance. These insights highlight numerous changes observed over the last several years in the KBIC ceded territory including, but not limited to, a) greater storm severity and frequency, b) extreme variances in temperature and precipitation levels, c) rapid snow melts, d) drought and disturbances to growing and harvest seasons, e) an increase in wildfire severity and occurrence, f) fluctuations in river and lake levels, and g) impacts to air quality.

These observations spark concern for further confounding impacts such as: a) stronger storms creating greater erosion along shorelines and roads thus requiring more maintenance, b) damage to homes and KBIC facilities, c) damage to ecosystems and habitat, d) stamp sands migration, and e) increased risk of wildfire and poor air quality.

The following table provides a brief description of these observations as shared by offices within KBIC governance; the corresponding IRMP reference, found in [Annex 1](#), serves to ensure consistency and accessibility between the two plans. Key observations include: 1) **Increased Intensity & Frequency of Storms**, 2) **Extreme Heat & Wildfire**, 3) **Lake Level Fluctuations**, 4) **Damage to Infrastructure**, 5) **Shoreline Erosion**, 6) **Drought**, 7) **Air Quality**, and 8) **Flooding & Groundwater Levels**. These observations are listed in order of frequency of occurrence as shared in discussions with governance office respondents.

B.1.1. Increased Intensity & Frequency of Storms

Many have observed an increase in the severity, frequency, and length of storm events, also noting that this is causing significant changes to the landscape, infrastructure, and community - many of which have not been witnessed in the current generation's lifetimes. Wind storms are destroying tree landscapes and other habitat; storm surges are leading to increased infrastructure damage to coastal areas, erosion, and degradation of wetlands. Further concerns include the ways storm events may impact harvesting practices, both from a perspective of abundance and how these events may affect human safety while harvesting (e.g. fishing on both Keweenaw Bay and inland lakes).

B.1.2. Extreme Heat & Wildfire

Observations in the KBIC ceded territory include increased high humidity and heat index days with particular concerns on how this impacts the elderly, other vulnerable populations, and wildlife. The current and forecasted weather patterns and elevated temperatures also result in increased utility use and energy supply issues (e.g. air conditioning). Other observations include increased levels of smoke or hazy skies generating concerns regarding how negative impacts to air quality are affecting community members and wildlife. Further concerns include the adverse effects of wind storms and fuel sources in forests, even a few felled acres becomes more hazardous due to hotter, drier conditions further confounding the risk and reality of natural disturbance events such as wildfires.

B.1.3. Lake Level Fluctuations

High and low lake levels are not a new phenomenon for the Great Lakes, however, the frequency and intensity of storms are changing within the KBIC ceded territory. The high lake levels in tandem with intense storm surges are increasing the harmful impact of infrastructure damage to coastal communities, coastal erosion, and degradation of wetlands in the area. Many observe these fluctuating lake levels and have concerns regarding adverse impacts to ecosystems and fisheries on account of how these changes impact natural habitats (e.g. viability of areas to grow *manoomin* or fish migration in rivers). The potential for fluctuating water levels to affect historic underground storage tanks, water wells (households and institutions), and septic tanks on the Reservation is also a key concern.

B.1.4. Damage to Infrastructure

Climate change impacts of concern, experienced and expected, include the increase in rapidly changing seasonal temperatures and norms, and extreme storm events, both of which contribute to water level extremes in aquatic systems from drought to water excess conditions. Many express concerns for the capacities of roads, bridges, culverts, and the local wastewater treatment plant and other facilities. Other concerns for infrastructure include the risk of flooding on U.S. 41 on account of high water levels on Lake Superior. Flooding would limit evacuation routes and cut off the western Tribal community from the eastern community where critical and essential facilities are located. Other concerns include damage to houses and continued damage to recreational areas and trail systems.

B.1.5. Shoreline Erosion

More frequent and intense rain events are increasing erosion resulting in loss of beaches and greater amounts of sediment washing into rivers, lakes and streams. Community concerns include damage to infrastructure, such as the loss of shoreline increasing the risk of further gas leaks from the BP gas station in Baraga. Eroding shorelines near Sand Point are also contributing to migrating stamp sands and destruction of trails and recreation areas. The observed dramatic changes to the Lake Superior shoreline and beaches are of particular concern in the wake of the unprecedented Father's Day flood event of 2018.

B.1.6. Drought

Hotter and drier weather conditions have raised concerns for how climate change may be impacting plants and other relatives/species in the KBIC ceded territory. The increased stress on plants and trees is shifting growing seasons and creating a higher risk of wildfire danger. Many observe leaf color changing earlier and describe the need to water personal gardens more frequently and later into the growing season. This has implications for negative impacts to population densities, composition, and seasons of plants and animals affecting both the abundance and timing of harvest.

B.1.7. Air Quality

Observations of hazy skies, bright orange sunsets, and allergy-like symptoms related to wildfire smoke in the air have increased in the KBIC ceded territory. These recent changes in weather conditions, including increased temperature and precipitation, are impacting particulate matter such as windblown dust from droughts or smoke from wildfires thereby worsening air pollution. Many express concerns for how this impacts not only humans, but also wildlife relatives in the KBIC ceded territory.

B.1.8. Flooding & Groundwater Levels

The frequency and severity of storm events has increased and is described as something not previously experienced in the current generation's lifetimes. The combined effects of high lake levels, extreme weather events such as high winds and heavy precipitation, and saturated soils from rapid snow melt all contribute to increased flooding risk. Recently observed and impactful flooding events include the Father's Day Flood of 2018 and the destruction of trails at Sand Point on the Reservation. The trails were destroyed in a single storm event that inundated the KBIC

campground area with increased water levels. Flooding further impacts sediment and waste runoff into Lake Superior and other water bodies; there is also concern about the current capacities of local wastewater treatment plants and other infrastructure. Groundwater levels have risen over the past 20 years on the Reservation; the observed increase in precipitation raises further concerns for increased groundwater levels impacting septic tanks and other underground storage containers.

B.2. Climate Impacts to Others in the KBIC Ceded Territory

The impacts of climate change directly impact the health and wellbeing of the Community. This section of the CRP highlights significant observations and concerns shared by community offices within KBIC governance **related to how climate change may be impacting the wellbeing of all beings in the KBIC ceded territory**. These insights build upon the climate related observations shared in the section above. Shared impacts and concerns include the disruption of seasonal phenology, the loss of hunting and gathering grounds, shifts in fish, wildlife, and plants' species, increase in invasive species, changes in ice cover and access to ice fishing, and the ways that climate change influences Ojibwa culture, identity, and language. Other significant concerns focus on the impacts of toxics and poor air quality on all beings, and impacts specific to human safety related to observations of increased storm intensity and risks associated with harvesting practices (e.g. fishing on Keweenaw Bay). Other impacts include migrating human populations to the region creating a higher need for resources such as biomass and adding further demands on existing infrastructure.

The following table provides a brief description of these impacts as shared by offices within KBIC governance; the corresponding IRMP reference, found in [Annex 1](#), serves to ensure consistency and accessibility between the two plans. Key impacts of concern include: **1) Seasons of Harvest, 2) Language & Culture, 3) Fish, 4) Wildlife & Habitat, 5) Human Migration & Biomass Demands, 6) Invasive Species, 7) Plant Relatives, 8) Toxics, Pollution, and 9) Human Safety**. These observations are listed in order of frequency of occurrence as shared in discussions with governance office respondents.

B.2.1. Seasons of Harvest

Sustaining Ojibwa culture means to sustain our identity as Anishinaabe Ojibwa, dedicated to cultural practices that are, and always have been, changing and adapting with the seasons, generations, landscape and water ecologies, and technologies. Understanding how climate is impacting cultural practices today can help KBIC adapt to these changes - as we always have. Noted changes in the KBIC ceded territory related to the climate impacts include disruption of seasonal phenology; the growing season is longer into the fall, while the hunting and fishing season has shortened. Particular seasonal cycles and timing are noticeably different including rapid snow melts, fluctuating temperatures impacting sugaring practices, deer getting antlers later, the gathering of plants/medicines delayed, rapid fish spawnings, and fall color season

taking place earlier. Harvest practices are also impacted by the loss of habitat for plants and wildlife (e.g. deer moving into towns) and adverse impacts to the viability of areas to host culturally significant plant relatives (e.g. *manoomin* unable to thrive due to fluctuating lake levels).

B.2.2. Language & Culture

The KBIC ceded territory has been impacted in recent years by high lake levels, shoreline erosion, saturated soils from rapid snow melt, and extreme flooding events; these changes have impacts on the harvesting practices of treaty resources. Particular climate related concerns of KBIC subsistence practices includes the loss and/or movement of culturally significant relatives/species such as *manoomin* (wild rice), deer, cedar, and the cold water fisheries. Temperature changes are contributing to a shift in the timing of the harvesting of medicines, as well as the abundance of medicines. Shoreline changes and erosion also have resulted in the cancellation of ceremonies. These changes in climate are also impacting the Ojibwa lunar calendar and Ojibwemowin names for moons cycles; there may be a need to change the names as temperature and seasons of harvest shift. Adapting to these changes illustrates that KBIC are always evolving and that language is evolving - KBIC are an adaptive people.

B.2.3. Fish

Fishing is the strand of the KBIC cultural core that ties history to present day to future; it is a vital part of the foundation for cultural beliefs and values, traditional lifeways, and even individual identity. Elders have observed three decades of transformative changes in Lake Superior and other inland bodies impacting shifts in fish species, seasons of harvest, water quality and fishing methods. Some fish that used to be in certain rivers no longer are (e.g. chinook). Lake Superior and inland lakes are not freezing, the ice is delayed and does not form until February, and then only remains for a few weeks. The length of the spearing season has decreased and timing of when to harvest is inconsistent between years. The increased sediment delivery from winter storms and higher summer water temperatures is negatively impacting fish habitat; fish are particularly susceptible to changes to water quantity because they rely on freshwater rivers and streams as spawning and rearing habitat and as migration corridors.

B.2.4. Wildlife & Habitat

Our wildlife and plant relatives face many challenges including land use changes and habitat loss, habitat fragmentation, competition from invasive non-native species, altered ecological processes, and a rapidly changing climate. Specific wildlife-related concerns and observations related to climate change include:

- a) changes in migration timing and patterns of wildlife and shifts in distribution and geographic range of species (e.g. deer moving into town, getting antlers later),
- b) loss of species in the KBIC ceded territory not able to adapt to changes, more heat-related stress (e.g. moose, lynx, snowshoe hare),
- c) increased competition from invasive species degrading habitat (e.g. purple loosestrife, spotted knapweed, Phragmites),
- d) loss or change in habitat (e.g. wind storms and loss of tree species, smaller and drier wetlands, loss of vernal pools, lower lake levels, impacts of coastal erosion and migrating sand dunes on habitat),

e) change in parasites and diseases with increasing temperature and shifting geographic ranges (e.g. Chronic Wasting Disease in deer, Lyme disease, encephalitis, avian flu-virus, winter ticks, white-nose syndrome in bats).

B.2.5. Human Migration, Biomass Demands

Baraga and surrounding counties are experiencing an influx of new residents raising concerns for how this may result in an increase in demand for local services thereby creating burdens to longtime residents for housing demands and costs, as well as access to traditional hunting and harvesting grounds. Human populations migrating to the area are increasing pressures on the region's natural resources, habitats, infrastructure, and services. There has been a substantial increase in the demand for biomass at all scales; this demand has negative impacts on KBIC members who rely on wood for heating. Further, demand for land and development increases the risk of habitat fragmentation, a large threat to ecosystem biodiversity. Viewscapes and access are also under threat as new residents gate previously accessible tracts of land for hunting and gathering.

B.2.6. Invasive Species

Insect populations are observed to be undergoing changes in the KBIC ceded territory (e.g. increased numbers of grasshoppers, ticks, beetles, earwigs, black flies), some are causing increased damage to forests and gardens, and/or risks to health (e.g. Lyme disease). Climate change may provide an advantage for invasive species that are able to shift quickly into a new geographic range and/or tolerate a wider range of climatic conditions. The expansion of non-native plants, fish, and wildlife is a concern as this increases stress on native species populations within the KBIC ceded territory, particularly in shallow near-shore regions and coastal wetlands. Increased competition from invasive species also poses risks of degrading habitat (e.g. purple loosestrife, spotted knapweed, Phragmites).

B.2.7. Plant Relatives

Phenological observations are a key area of focus for KBIC's understanding of climate change study and contribute further to understanding these changes and their impacts. The current and expected changes due to climate are contributing to rapid seasonal and phenological shifts for many plants, insects, and habitat types which greatly affects fostering good relations between plants and people. Key concerns include the loss of habitat, wetlands, and plants and trees of cultural significance; there is a need to work towards reducing wildfires and their severity and adverse impacts, including fuel reduction in balance with prescribed fires for culturally important plants and medicines.

B.2.8. Toxics, Pollution

Climate change can increase threats related to disease migration, as well as exacerbate health effects resulting from increased temperatures and the subsequent release of toxic air pollutants. This is particularly concerning for vulnerable KBIC populations such as children, the elderly, and those with asthma or cardiovascular disease. The KBIC Department of Health and Human Services shares that chronic diseases such as heart disease, diabetes, and chronic respiratory disease are among the leading causes of death for our people. There are further community concerns related to continued contamination of lakes and fish, as well as in and around the KBIC

jurisdictional area. Increased shoreline erosion is a concern for many as the migration of stamp sands at Sand Point and Buffalo Reef have negative impacts on aquatic and terrestrial species habitat.

B.2.9. Human Safety

Critical safety concerns related to climate change include: a) extreme weather events such as prolonged drought and increased humidity (particularly for the elderly, other vulnerable populations, and wildlife), b) high winds and heavy precipitation events (contributing to fallen trees and widow makers), and c) the increased threat storms pose to fishers, their vessels, and their equipment. Other climate related health concerns include the impact of wildfires on local air quality affecting vulnerable populations with respiratory disorders. Increased temperature associated with climate change is exacerbating the number and geographic range of insect related diseases to both humans and wildlife (i.e., West Nile, Eastern equine encephalitis (EEE), Lyme, white-nosed syndrome for bats, and Chronic Wasting Disease for deer). These realities are further impacted by the extended warmer seasons and the shorter, warmer winter seasons. Other specific human health issues related to climate change include foodborne diseases and nutrition; safe water and food security; waterborne diseases; heat related illnesses and mortality (difficulties for elders to stay cool and an increase in heat stroke occurrences); mental health and stressors; vector borne diseases; weather related illnesses, injuries, and deaths; and the exacerbation of chronic diseases.

B.3. Climate Priority Areas of Concern in the KBIC Ceded Territory

The following section of the CRP highlights **priority areas of concern with respect to climate change in the KBIC ceded territory**. These insights were shared by community offices of KBIC governance and reflect the shared observations, impacts, and concerns related to climate change in our region. Specific climate actions for each of these priority areas of concern are described in the IRMP, they are also summarized in the *Recommended Actions for Climate Resiliency* section of the CRP. Actions in the CRP are organized by governance areas and the responsibilities associated with KBIC government offices are outlined to directly correspond with the IRMP numbering system to ensure consistency between the two plans.

The following table provides a brief description of these priorities as shared by offices within KBIC governance; the corresponding IRMP reference, found in [Annex 1](#), serves to ensure consistency and accessibility between the two plans. Key priorities of concern include: 1) **Planning For Increased Demand On Public Services, Infrastructure, Resources**, 2) **Green Energy, Sustainable Economy**, 3) **Capacity Building & Education; Perceptions on Climate Change**, 4) **Forest Conservation on Reservation**, 5) **Traditional Ecological Knowledge**, 6) **Food Sovereignty**, 7) **Fire Sovereignty & Fire Reduction**, and 8) **Protection of Natural**

Resources. These priorities are listed in order of frequency of occurrence as shared in discussions with governance office respondents.

B.3.1. Planning for Increased Demand on Public Services, Infrastructure, Resources

Protecting the health and wellbeing of the Community and infrastructure necessitates integrated resource management and planning for the comprehensive and holistic protection for the KBIC's current and future generations and traditional and contemporary homelands. The concern for the increase in climate refugees (all life forms), exacerbate issues associated with pressures on natural systems, fragile infrastructure, and services, as well as economic systems. Human populations migrating to the area are increasing pressures on the region's natural resources, habitats, and infrastructure and services. KBIC recognized the vital need to prepare for migrating human populations to the region that create a higher need for resources such as biomass and add further demands on existing infrastructure. An influx of new residents to Baraga and surrounding counties also increases demand for local services and contributes to burdens to longtime residents for housing demands and costs as well as access to traditional lands for hunting and gathering.

B.3.2. Green Energy, Sustainable Economy

KBIC passed a resolution for "green purchasing", and formed the Committee for Alternative and Renewable Energy (CARE) to explore options for renewable and sustainable energy on the Reservation, with the goal of ultimately reducing the emissions of greenhouse gas that contribute to climate change. In planning for and adapting to climate change, CARE centers on energy efficiency and conservation, and energy sovereignty for the KBIC. Specific concerns and priorities include the need for more efforts on resilient housing (energy conservation/ efficiency) and green infrastructure design considerations, as well as increasing propane storage in the Upper Peninsula and prioritizing fuel line repairs and updates in our region (i.e., Line 5). CARE is also primarily concerned about enhancing transitions to alternative energy uses (e.g., wind turbines, solar farms), and carbon credit programs more widely.

B.3.3. Capacity Building & Education

KBIC is creating, supporting, and implementing enhanced opportunities for K-12 education that promote and bridge Ojibwa livelihoods and ways of life, with climate change and climate adaptation as priorities. Encouraging place-based teaching and learning throughout the calendar year is paramount, particularly for vital cultural practices such as being good stewards, taking care of the land, soil, and waters, and learning more about significant KBIC livelihoods such as fishing. Informal learning opportunities are also offered connecting community members to issues related to food sovereignty, honorable harvests, and relationships with land and water. The Seven Grandfather teachings are foundational to our community's learning and continued good relationships with land and water. Capacity building also includes ongoing training and knowledge development of KBIC government offices to expand programs and enhanced collaboration across KBIC departments, as well as with external partners to leverage funding opportunities and advanced learning.

B.3.4. Forest Conservation on Reservation

Conservation of forest landscape and treaty resources is identified as a priority for KBIC. This includes ensuring that reservation lands are not sold, and that they are harvested in sustainable ways. This is prioritized through seasonal activities such as helping people locate and identify needed forest resources to harvest, inventorying tribal lands (e.g., collecting data on forest health and density primarily in winter season, updated every 5-10 years), permitting tree removals (e.g., trees that have blown down in recent storms), and setting up timber sales.

Further, internalizing the need for renewable, green energy sources such as a fuel wood project for biomass that involves tribal members and will ultimately benefit the KBIC.

B.3.5. Traditional Ecological Knowledge (TEK)

All identified priorities and recommended climate actions will require an increased reliance on sharing data, skills, and knowledges. This includes Traditional Ecological and Indigenous Knowledges (TEK, IK), across communities and the region. In an effort to protect the health, security, and general welfare of the Community, and recognizing that the effects of climate change will negatively impact the local environment, fish and wildlife, natural resources, and infrastructure on which the Community relies, the Tribal Council created Resolution KB-016-2015 acknowledging our responsibilities to the natural world, stating that “*through traditional knowledge, practice, experience, and relationships with nature, KBIC has an important role in defending and healing the natural environment.*”. Importantly, the continuation of our people requires the ability to use and share its knowledge so that traditional knowledge and science can be integrated to strengthen community and climate resilience for current and future generations.

B.3.6. Food Sovereignty

The KBIC prioritizes access to a safe, culturally acceptable and nutritionally adequate diet through a sustainable food system that promotes community self-reliance and social justice. The local ecosystem is a rich and vast garden where foods and medicines are found throughout the forests and waters. However, increases in temperatures, changes in precipitation patterns, and changes in extreme weather events are impacting seasons of harvest in the KBIC ceded territory. Food sovereignty education and outreach initiatives are critical to restoring and strengthening the KBIC. Practices to restore and protect local environments, economies, and cultures while adapting to climate impacts are just some activities that can help strengthen not only food sovereignty within the KBIC, but within local communities as well.

B.3.7. Fire Sovereignty, Fire Reduction

Key climate-related concerns in the KBIC ceded territory include wildfires, structural fires, and severe winds. Priorities are to direct more focus on fuel reduction and management, and find a balance with prescribed fires for culturally important plants and medicines (e.g. blueberries). As such KBIC is prioritizing forest and community health with the development of fire management plans that are customized to our landscape, cultural values, and needs of significant medicinal and cultural plants and other species/relatives.

B.3.8. Protection of Natural Resources

KBIC is dedicated to the long-term protection of natural resources, healthy ecosystems, and the preservation of Ojibwa culture - this dedication has contributed to our people's resiliency for many generations. Natural resources are also considered cultural resources and/or treaty resources; these resources are essential sources of life contributing to the livelihoods of our people and relatives, including the winged ones, and those with fins, the two-, four-, and many-legged, and our many relations with roots. KBIC landscape stewardship responsibilities are vast, working to protect and restore treaty resources and good relations within the changing environment, climate related changes, and priority community needs. Climate resiliency planning is acknowledged as essential to these obligations

C. Recommended Actions for Climate Resiliency

Recommended actions contributing to climate resiliency within the KBIC and its territorial jurisdictions are specified throughout the IRMP. Organized by governance areas, and the responsibilities associated with KBIC government offices, climate resiliency actions are synthesized here, outlined in **this CRP to directly correspond with the IRMP numbering system** to ensure consistency between the two plans.

Some actions include goals and/or general recommendations from the 2020-2025 [KBIC Hazard Mitigation Plan](#) (2020:142-156), which specify climate planning strategies and preparedness activities specific to KBIC. To reduce the community's vulnerability and risk to local hazards, some of which are due to climate related changes, the comprehensive set of Action Items vary from structural measures to educational initiatives. Identified action items are included below by number and action only; however, each Action Item is more fully described in the IRMP and the [KBIC Hazard Mitigation Plan](#).

C.3. Strengthening Ojibwa Culture

Ojibwa culture remains the foundation of contemporary KBIC governance, and as such, will remain a priority in climate resiliency planning. Responsibilities to KBIC cultural resources are strengthened when climate adaptation and preparedness remain in our forefront. To enhance climate resiliency, a number of interrelated actions are recommended by the Cultural Committee, Education department, and the Tribal Historic Preservation Office.

C.3.2. Cultural Committee

ACTIONS specifically recommended are the protection of diverse habitat areas and plant communities for harvesting foods and gathering medicines, and specifically, for these protections to be considered in the planning for various land use purposes (e.g., development, leasing). Other

actions related to climate change are: Controlled Burns, and to Amend/Change/Review priorities, objectives, and actions as climate changes and impacts are more well known. Additional actions contributing to strengthening Ojibwa culture are as follows:

- Conduct scientific research on specific areas that are suitable for planting wild rice to discover most suitable areas for wild rice production.
- Update the strategic timber harvesting plan.
- Update the Forest Management Plan.

C.3.3. Education Department

ACTIONS specifically recommended by the Educational Department are to create, support, and implement enhanced opportunities for KBIC K-12 education that promote and bridge Ojibwa livelihoods and ways of life, and climate change as a priority. Several opportunities require increased capacity, particularly for increased educational programming and teaching materials connecting K-12 curriculum and Ojibwa ways, and additional support for teachers, such as role models and student mentors, in our schools. The encouragement of teaching and learning engagement throughout the calendar year is especially important, particularly cultural practices of importance such as being good stewards, taking care of the land, soil, and waters, and learning more about significant KBIC livelihoods such as fishing.

C.3.4. Tribal Historic Preservation Office

ACTIONS specifically recommended include enhanced cultural education and an increase in cultural practices focused on relationships with and respect for *Aki*.

C.4. Leadership and Law Making

Informed by Ojibwa culture and directed by the priorities of our people, KBIC leadership and law making includes the everyday government planning, decision making, and implementation of the KBIC government, economic infrastructure, and judicial system. As such, climate resiliency planning is a priority, recognizing climate preparedness as essential to adaptive governance in service of our tribal community. To ensure climate resiliency, the goals and actions outlined below are recommended by the Attorney's Office as well as the KBIC Tribal Council.

C.4.2. Attorney's Office

ACTIONS specifically recommended are to continue implementing policy to decrease climate impacts such as the use of energy efficient lights, and support transitions to clean energy sources such as solar panels.

C.4.4. Tribal Council

ACTIONS specifically recommended by the KBIC Tribal Council are included in Resolution KB-016-2015. Additionally, Goal 1 from the 2020-2025 [KBIC Hazard Mitigation Plan](#) states the following action (2020:131): Work to improve existing local government policies and codes to reduce the impacts of natural hazards. Finally, in consideration of climate resiliency, Council is currently working on revisions to the KBIC Strategic Plan.

C.5. Land Stewardship

KBIC land stewardship responsibilities are vast, working to protect and restore treaty resources and good relations within the changing environment, climate related changes, and priority community needs. Climate resiliency planning is acknowledged as essential to these obligations. In support of climate preparedness and adaptive landscape stewardship, the Forestry, Natural Resources, and Real Estate/Transportation government offices support actions, as outlined below.

C.5.2. Forestry

ACTIONS specifically recommended for the Forestry Department are included in the Forest Stewardship Plan objectives ([FSP 2018:30](#)). As an ongoing priority action, the Department supports the continuation of cultural gratitude, reciprocity, and thanksgiving for good harvests. Additionally, Department actions aim to ensure the diversification, and/or increase in the resiliency of on the ground species, as well as natural regeneration while anticipating what will be and recognizing what was. In doing so, the Department will support the following actions:

- Pursue BIA funding for climate resiliency projects, specifically for red oak restoration projects, and the improvement of forest roads to ensure these roads can withstand high flow events.
- Prioritize and support culturally important trees and medicines such as cedar, white birch and sugar maple through restoration projects and promote workshops for knowledge and practice sharing.
- Continued ecology-based planning with the U.S. Forest Service.
- Secure long term outlets for forest conservation on the reservation.
- Promote long term and wide scale landscape planning (40+ years) including conservation easements and carbon credit programs.
- Ensure reservation lands are not sold and harvested only in sustainable ways.
- Internalize the need for renewable, green energy sources such as the fuel wood project for biomass which ultimately involves tribal members and benefits the KBIC.
- Update the Stand Exam/Inventory on KBIC Trust and Fee Lands to determine and communicate current conditions, which will also inform the Forest Stewardship Plan:
 - Timber resources

- Potential Forestry or NRD project areas
- Forest protection concerns including insect and disease, weather events and timber trespass
- Potential gathering areas (boughs, berries, leeks, etc)
- Firewood collection areas
- Potential sugar bush areas
- Improve and protect the forest landscape when conducting land management and timber sales:
 - Protect soil and water resources by following Michigan Department of Natural Resources and Michigan Department of Environmental Quality Sustainable Soil and Water Practices on Forest Land (MI DNR & DEQ, 2009)
 - Maintain and promote stand diversity, favoring minor tree species where feasible
 - Retain legacy trees and/or patches on the ground to improve the future forest, and wildlife habitat and connectivity (i.e., buffered stream corridors, large seed trees, wildlife den trees)
 - Retain long-lived conifers such as hemlock, northern white cedar, and white pine where feasible
 - Maintain and improve site productivity by retaining at least 25-33% of slash, tops, and limbs (MDNRE, 2010)
 - Maintain forest aesthetics
- Promote a healthy and resilient forest landscape by improving forest conditions using the above guidelines
- Monitor the forest for pest and disease infestations and communicate to NRD Invasives Management
- Obtain Forest Development funding to conduct Forest Development climate change projects. Monitor these projects and communicate results and lessons learned.
 - Use pre-commercial timber stand improvement (TSI) for weed-and-clean operations
 - Use Forest Development tree planting projects to establish refugia of better climate adapted tree species

C.5.3. Natural Resources

ACTIONS specifically recommended by Natural Resources for climate resiliency include, promoting the reinstatement of the KBIC Natural Resources Committee, increasing collaboration and partnerships between governments, communities, and educational partners at multiple scales, and supporting infrastructure needs of the community focused on *water* issues, enhanced *recycling* capacity, and local *farming* initiatives. From the 2020-2025 [KBIC Hazard Mitigation Plan](#) (2020), the department also recommends Action Items 1, 2, 4, 5, 18, 24, and 29 that specifically support climate preparedness, planning, and mitigation.

Action Item 1: Reduction of Human and Wildlife Impacts to Shoreline Erosion (2020:142) Areas of Lake Superior experience bank erosion problems due to human and wildlife impacts. Numerous mitigation efforts have corrected problems, but some areas have an ongoing need for stabilization.

Action Item 2: Wild Rice Restoration (2020:142-143) Wild rice is used in the daily lives of community members, as well as, ceremonies, and feasts. It is also recognized as a preferred source of food for migrating waterfowl and has high ecological value for both wildlife and fish habitat. It can also help to maintain water quality by securing loose soil, tying up nutrients, and slowing winds across shallow wetlands. The amount of wild rice throughout the Great Lakes region has declined from historic levels due mainly to water fluctuations from hydro dams and degradation of water quality from logging and shoreline development over the past century. The long-term goal is to develop harvestable self-sustaining wild rice populations on the reservation and within the ceded territory for future generations.

Action Item 4: Green Infrastructure Installation (2020:143-144) Green infrastructure is a cost-effective, resilient approach to managing wet weather impacts that provides many community benefits. While single-purpose gray stormwater infrastructure—conventional piped drainage and water treatment systems—is designed to move urban stormwater away from the built environment, green infrastructure reduces and treats stormwater at its source while delivering environmental, social, and economic benefits.

Action Item 5: Wildlife Diseases (2020:144-145) Wildlife inventory and monitoring plays a large role in KBIC's ability to assess environmental conditions, set management priorities, and to carry out ongoing management activities in an effective manner. The Wildlife Program collects data throughout the L'Anse Reservation and regionally on waterfowl, frogs and toads, sand hill cranes, songbirds, mammals, turtles and salamanders. The program has also monitored wildlife for health-related issues such as chronic wasting disease and avian influenza. Continued monitoring is important to calculate the impact due to a changing climate and other factors.

Action Item 18: Legacy Mining and Stamp Sand Remediation (2020:149-150) Stamp mills from legacy mining dumped stamp sand into Keweenaw Bay. This stamp sand was carried southward by the Keweenaw Current and deposited at Sand Point. Further north in Lake Superior, Buffalo Reef and Torch Lake is a natural spawning ground for lake trout and whitefish. Mine tailings from over 30 years of copper stamp mill production were deposited off the town of Gay, Michigan. The tailings are migrating towards Buffalo Reef and are threatening the spawning ground. These two sites have ongoing projects for restoration and remedial dredging operations, respectively.

Action Item 24: Disaster Debris Management (2020:152) Develop a plan for the management of debris from natural disasters.

Action Item 29: Identify and Inventory Datasets for Quantitative Hazard Analysis (2020:154)
Through the hazard mitigation planning process there were many data gaps identified including flood depth grids for rigorous hydrological modeling, structural and wild fire events, abandoned mine status, age and estimated value of all critical facilities, comprehensive asset inventory, dam inundation modeling for Baraga County’s high hazard dams, and updated flood erosion maps for current and rising lake levels.

Recommended actions for the specific natural resources programs are outlined below.

C.5.3.1 Central Support

ACTIONS specifically recommended by Central Support are to continue enhancing food sovereignty and community assistance initiatives within KBIC, including partnerships with others to focus on supporting KBIC food systems and assistance needs within our community.

C.5.3.2 Environmental Health

The Environmental Health section of the Natural Resources Department includes programs focused on 1) Air Quality, 2) Lands, 3) Sustainability, and 4) Water Quality, as organized below.

C.5.3.2.1. Air Quality

ACTIONS specifically recommended by the KBIC Air Quality program include, but are not limited to, continue working towards the development of a community partnership with the L’Anse Library on an R5 Air Sensor Loan Program, deploying additional local air sensors for attaining baseline air quality data at sites deemed as areas of concern on the L’Anse Reservation, and maintain collaborations with EJSG consultants responsible for creating a health risk assessment report for purposes of studying effects of airborne toxic contaminants that are reflective of KBIC priority concerns. Additional actions include producing the KBIC Level IV Emissions Inventory inclusive of a 50 miles radius of reservation, developing a public health alert plan for smoke and haze associated with wildfires, participating in the CEMP/Eagle Mine project, and providing energy assessment consulting as needed for the KBIC CARE.

C.5.3.2.2. Lands

ACTIONS specifically recommended by the Lands program are to continue emphasized actions towards current program priorities and objectives, and continue to enhance focus on climate related changes as opportunities and funding allows.

C.5.3.2.3. Sustainability

ACTIONS specifically recommended by the Sustainability program are to continue emphasized actions towards current program priorities and objectives, and continue to enhance focus on climate related changes as opportunities and funding allows.

C.5.3.2.4. Water Quality

ACTIONS specifically recommended by the Water program include the actions listed below, and additionally, from the 2020-2025 KBIC Hazard Mitigation Plan (2020:145), Action Item 8: Watershed Assessment for Stream Infrastructure. This project will assess the condition of the road/stream crossings for aquatic organism passage and watershed connectivity.

C.5.3.3. Fisheries and Aquaculture

ACTIONS specifically recommended by the Fisheries program support ongoing program objectives, including continued 1) habitat monitoring, restoration and rehabilitation efforts, 2) participation in Regional Workgroups and other intergovernmental planning engagement, 3) educational activities for all community age groups, and 4) monitoring activities, including the Aquatic Invasive Species Monitoring program. Additionally, Action Item 14 from the 2020-2025 [KBIC Hazard Mitigation Plan](#) (2020:148) recommends the relocation of the Pequaming Bay KBIC Fish Hatchery, identified as extremely vulnerable to rising lake levels.

C.5.3.4. Great Lakes

ACTIONS specifically recommended by the Great Lakes section are to continue working and expanding partnerships with others to focus on the protection of Treaty Resources and to continue Great Lakes ecosystem education in our community.

C.5.3.5. Wildlife and Habitat

C.5.3.5.1. Invasive Species

ACTIONS specifically recommended are included in the 2020-2025 [KBIC Hazard Mitigation Plan](#) (2020:137) for addressing and mitigating negative impacts from invasive species, many of which support climate change preparedness and mitigation actions. Climate resiliency actions recommended by the Invasive Species program, in partnership with internal and external government offices, specifically include, to 1) monitor priority lakes and streams for early detection of new populations, 2) implement a rapid response plan for newly discovered non-local species, 3) prevent the spread of existing invasive population to minimize impacts, 4) review ongoing research and participate in research as opportunities arise, and 5) conduct periodic review of local plans and their implementation, and complete an analysis of progress and areas where adaptations are warranted. Finally, Action Item 21 (2020:150-151) in the 2020-2025 [KBIC Hazard Mitigation Plan](#) recommends the installation of boat washing and fish cleaning stations at Buck's Marina.

C.5.3.5.2. Plants

ACTIONS specifically recommended by the Plants program are to work in partnership with others to focus on the adaptive stewardship needs in our community.

C.5.3.5.3. Pollinators

ACTIONS include the following: 1) hosting education/outreach programs for the community to share information on the vitality and significance of insects in our community; 2) continued collaboration with local road commission staff to assure that native wildflower plantings along roadsides are not mowed down until after bloom time and also advocate to curb the use of herbicides and pesticides on lands adjacent to the reservation; 3) more staff time dedicated to participating in and contributing to nation-wide programs, such as the Pollinator Partnership, Monarch Watch, and the Pollinator Protection workgroup associated with Tribal Pesticide Program Council (TPPC); 4) diversifying and increasing the number and variety of native plants that serve in our restoration sites, 5) facilitate partnerships with NRCS, USDA, DNR (Federal, State and Tribal entities) along with private landowners to install or enhance pollinator habitat; and 6) develop guidance materials on insect identification, highlighting the gifts they give and what we can do to expand and enhance habitat for them.

C.5.3.5.4. Wetlands

ACTIONS specifically recommended by the Wetlands program include the actions listed below.

- Delineate wetlands following ACOE protocols
- Monitor and assess the presence of vernal pools
- Conduct vegetation surveys and rapids assessments to monitor for change over time
- Research and incorporate methods to gauge the effects of climate change on local wetlands
- Research and incorporate methods to steward local wetlands and associated resources in regards to any potential climate change effects.
- Provide wetland focused education and outreach to the Community
- Monitor water quality in wetlands
- Inventory and monitor wetlands for invasive plant species

C.5.3.5.5. Wildlife

ACTIONS specifically recommended by the Wildlife program are to work together with partners, agencies, and landowners across ceded territory landscape. These collaborations work to protect and enhance biodiversity, advocate and support land uses (including bio-fuel collections) that minimize disruption and harm to wildlife and habitat communities, maintain healthy wildlife communities and responsiveness with harvesters, and continue diligent work for sensitive, threatened, and endangered species. Finally, program activities seek to increase engagement in climate change actions. All recommended actions require an increased reliance on sharing data, skills, and knowledges, including Traditional Ecological and Indigenous Knowledges (TEK, IK), across communities, agencies, and the region. More detailed information on these recommended actions can be found in the [Wildlife Stewardship Plan](#) (2014), and a select few are listed below.

- Continue to monitor for species and habitat diversity, and continue to expand population surveys for non-game and protected species.
- Coordinate with KBIC Forestry and Real Estate/Transportation offices to provide input on land purchases and protections based on cultural and native plant species, sensitive areas such as vernal pools and corridors, as well as older aged forests and conifer dominated habitat to maintain and/or increase habitat for species including but not limited to: waterfowl, frogs/toads, turtles, mammals, birds and bats.
- Coordinate with KBIC Forestry and BIA Foresters to encourage and plan for a diverse landscape of forest habitat types and ages that will enable the continued existence of a wide variety of wildlife (i.e. moose, wolf, pine marten, fisher, bear, bobcat, birds, amphibians, reptiles and bats).
- Continue to survey Tribal hunters and trappers about wildlife and harvesting practices.
- Verify presence/absence of threatened, endangered, or sensitive species on and around the KBIC reservations.
- Facilitate education and collaboration with community members and agency partners strengthening stewardship among all stakeholders.
- Monitor for wildlife diseases (i.e. chronic wasting disease, avian influenza, botulism, bovine tuberculosis, epizootic hemorrhagic disease, white nosed syndrome, etc.)
- Increase utilization of the [Tribal Climate Adaptation Menu](#) (TAM Team 2019).

C.5.4. Real Estate/Transportation

ACTIONS specifically recommended by the Real Estate/Transportation Department support the protection and acquisition of lands identified as culturally, historically, and/or environmentally significant. The Department recommends the development of a comprehensive land use plan consistent with the needs of the Community that takes into consideration the unique relationship the Community has with the natural world and its ever increasing susceptibility to the expanding human population as well as adverse impacts due to climate related changes.

From the 2020-2025 [KBIC Hazard Mitigation Plan](#) (2020), the department may also have a role in the following Action Items (3, 25-26).

- 3: Drainage Improvements and Maintenance (2020:143)
- 25: Purchase Land for Landscape Connectivity and Establishing Wildlife Corridors (2020:152)
- 26: Establish Conservation Easements (2020:153)

C.6. Protecting Health and Wellbeing, Safety, and Infrastructure

Protecting Health and Wellbeing, Safety, and Infrastructure requires continued mindfulness on climate resiliency planning for the comprehensive and holistic preparedness for the Keweenaw

Bay Indian Community lands, waters, and people of all ages. As a substantial component of the everyday lives and livelihoods of Community members within KBIC territorial jurisdictions, the following KBIC government offices aim to enhance partnerships with internal and external government offices. Climate resiliency obligations are vast, and our commitment to the empowerment and autonomy of individuals and the Community, for current and future generations, remains.

C.6.2. Child Support Services

ACTIONS specifically recommended by Child Support Services are to support climate resiliency programs provided across the KBIC and governmental offices to protect, restore, and sustain natural resources for future generations.

C.6.3. CARE

ACTIONS specifically recommended by the Committee for Alternative and Renewable Energy (CARE) from the 2020-2025 [KBIC Hazard Mitigation Plan](#) (2020) focus on KBIC energy audits/assessments within our community, detailed below in Action Item 16.

Action Item 16: Facility Assessments with Energy Audits (2020:148) Energy audits, or also known as an energy assessment, is a comprehensive analysis of a facility's energy use, its health, and the safety of its occupants. KBIC would work with a local energy auditor to complete a comprehensive analysis of Tribal facilities to identify and resolve energy use, cost, or efficiency concerns. Audits can also identify and eliminate health and safety problems, such as air leaks, moisture issues, and insufficient insulation. Energy audits provide recommendations towards reducing energy use and costs. Additionally, audit findings will also guide future renewable opportunities for KBIC.

C.6.4. Commodity Foods

ACTIONS specifically recommended for the Commodity Foods Program are continued enhancement of community member autonomy while participating in program services, and the increased planning, promotion, and integration with other departmental programs such as Health and Human Services and current Natural Resources education and outreach programs, including participation in community harvesting workshops and community garden initiatives.

C.6.5. Fire and Emergency Management

ACTIONS specifically recommended by the Fire and Emergency Management program align with our responsibilities for the preparedness, training, and coordination of emergency response and recovery efforts on the L'Anse Reservation. From the 2020-2025 [KBIC Hazard Mitigation](#)

[Plan](#) (2020), the program may have a role in the following recommended Action Items (13 and 30).

- **13:** Seiche Early Warning System (2020:147)
- **30:** Improved Emergency Response, Equipment, and GIS (2020:154) in the event of the following items below.
 - Snowstorms and Blizzards
 - Shoreline Flooding and Erosion
 - Riverine and Urban Flooding
 - Wildfires
 - Structural Fires
 - Severe Winds

C.6.6. Health and Human Services

ACTIONS specifically recommended by the Department of Health and Human Services, and included in the DHHS Agency Strategic Plan (2015), are listed below, followed by potential actions associated with climate change and Food Sovereignty, specifically from the 2020-2025 [KBIC Hazard Mitigation Plan](#) (2020).

- Develop a **Hazard Vulnerability Assessment** to determine the potential environmental hazards that may affect the KBIC and our ability to meet their medical needs, and to inform KBIC safety plans.
- Educate staff about **traditional practices and cultural sensitivity** to promote use in DHHS treatment practices and education programs. DHHS will continue to learn about and incorporate traditional practices in the delivery of health care services; we will enhance our knowledge of Ojibwa customs and traditions of the Keweenaw Bay Indian Community to inform our practices by utilizing language, traditional foods, and culturally acceptable behaviors so that we may demonstrate respect to the community we serve making them comfortable when receiving services.
- Anticipate the health effects of **climate change**, to assure that systems are in place to detect and track them, and to take steps to prepare for, respond to, and manage associated risks. This includes 1) identifying population groups at greatest risk for specific health threats, such as severe weather and heat waves that pose a particular risk to the young, the elderly, and the poor; and 2) communicating the health-related aspects of climate change, including risks and ways to reduce them, to the public, decision makers, and healthcare providers.
- Use **traditional, evidence based, and innovative strategies** that contribute to building a strong, healthy community interrelated with the health of the natural resources in this ecosystem.

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- Communicate the health-related aspects of climate change, including risks and ways to reduce them, to the public, decision makers, and healthcare providers.
- Use traditional, evidence based, and innovative strategies that contribute to building a strong, healthy community interrelated with the health of the natural resources in this ecosystem.

Action Item 33: Food Sovereignty (2020:156) Food sovereignty is the ability to feed the community and feed them well. It is a state of being in which a community can have a safe, culturally acceptable and nutritionally adequate diet through a sustainable food system that promotes community self-reliance and social justice. The local ecosystem is a rich and vast garden where foods and medicines are found throughout the forests and waters. Food sovereignty education and outreach initiatives are critical to restoring and strengthening the KBIC. Practices to restore and protect local environments, economies, and cultures are just some activities that can help strengthen not only food sovereignty within the KBIC, but within local communities as well.

C.6.7. Housing

The **OBJECTIVES** of the Housing Department include overseeing and guiding KBIC departments in a good way, climate education, and the continued focus on protecting present landscapes and resources for future generations. Specific 5- and 10-year objectives are included below.

5-year Objectives:

- Improve rental units by using Housing’s modernization program to implement energy saving appliances to help tenants reduce utility costs and to improve the indoor air quality
- Develop housing for low to moderate income families/individuals on the reservation with emphasis on energy efficient home designs

10-year Objectives:

- Infrastructure improvements -- improve existing drainages within housing area, reduce fuel buildup around homes, and invest in energy efficient street lighting
- Homeownership program – create program to transition low to moderate families/individuals from renters to home ownership into energy efficient designed homes

- Improve existing housing units by replacing windows, doors, insulation and roofing with Energy Star products and materials

In addition to these Objectives, **ACTIONS** specifically recommended by Housing are listed below.

- Provide emergency assistance to tribal member homeowners living within the KBIC service areas of Baraga, Ontonagon, and Marquette, for health and safety related issues such as furnace, hot water heaters, and handicap accessibility. Emergency situations can occur from severe storms, floods, fires, or prolonged cold/heat temperatures that may be an increasing impact of climate change.
- Consider issues of vulnerability and risk to inform housing land use planning and ensure that the community will be adaptable to the most likely effects of climate change.
- Collaborate with the Real Estate/Transportation Office to consider residential leasing on allotments and trust lands so that it includes language and space for renewable energy and recognition of the impacts of a changing climate

C.6.8. Public Works

ACTIONS specifically recommended by Public Works are to increase capacity and training of the department's staff. From the 2020-2025 KBIC Hazard Mitigation Plan (2020), Public Works also recommends the following Action Items (10-11, 27, 32).

Action Item 10: Backup generators for Critical Facilities (2020:146) Some critical facilities do not have backup power which could cause a cascade effect if a disaster were to occur. Stabilizing these systems is essential to community resilience. More information can be added here after the public comment period.

Action Item 11: Drainage Database, Infrastructure, and Maintenance Improvements (2020:146) As an ongoing project in the county, the County Road Commission has had an active role in upgrading roads and replacing inadequate culverts in response to previous problems and to mitigate future problems. Keweenaw Bay Indian Community is working closely with tribal and non-tribal government agencies to work on this ongoing need. The Natural Resources Dept will also continue to maintain and upgrade databases as needed while monitoring beaver dam problems.

Action Item 27: Build Relationships with Regional Recycling Facilities to Reduce Overlap and Establish Composting (2020:153) Develop a sustainable program within KBIC and coordinate with regional facilities to provide for the best protection of the environment.

Action Item 32: Equipment needs for KBIC Solid Waste Facility (2020:155) Replace worn equipment to keep up with increased demands of waste disposal, especially related to COVID situation and increased household waste.

C.6.9. Seniors and Elder Nutrition

ACTIONS specifically recommended by Seniors and Elder Nutrition are listed below.

- Enhance department food sovereignty and food systems knowledge
- Increase communications within and across departments for environmental protection and planning (i.e., department head meetings) and
- Implement more local and fresh fish, meats, and vegetables by developing a KBIC food code, restoring our community garden, and working with local farms, especially tribally owned ones. A food code allows our program to also accept donations from KBIC hunters and fishers.

C.6.10. Social Services

ACTIONS specifically recommended by Social Services are specified in Action Item 28 from the 2020-2025 [KBIC Hazard Mitigation Plan](#) (2020), **28: Public Information / Education Program** (2020:153-154) as public information and outreach initiatives are the key to mitigating many of the potential climate risks and hazards within Keweenaw Bay Indian Community.

C.6.11. Tribal Police: Public Safety and Tribal Conservation

ACTIONS specifically recommended by Tribal Police are focused on its department objectives noted below.

- Enforcing conservation/natural resource laws, codes, and ordinances, and developing new environmental protection codes as needed
- Expanding land use management ordinances in conjunction with Tribal Council and the Land Use Management Plan within the Real Estate/Transportation Department
- Expanding upon rules and regulations within the Conservation Enforcement Code in conjunction with the Natural Resources Department, Tribal Council, Tribal Attorneys, and Tribal Court
- Consideration and participation in planning for response to manmade and natural disasters to protect and conserve the natural resources, environment, people, and property of the KBIC reservation boundaries and home territory

Tribal Police will also continue to develop, implement, and enforce the codes listed below, many of which may be subject to impacts due to climate related changes.

- Environmental Health
- Pesticide Control
- Water Quality
- Wetland Protection
- Solid Waste
- Lakeshore Protection and Sediment Erosion Control
- Underground and Above-Ground Storage Tank Rules and Regulations
- Air Quality
- Water and Sewer
- Land Use Permitting
- Fish, Wildlife, and Plants Conservation and Enforcement

C.6.12. Youth Programs

The **OBJECTIVES** of, and **ACTIONS** specifically recommended by, Youth Programs are to continue growing the Program which strengthens KBIC youth as the future generations of KBIC leaders, decision makers, and community members.

In summary, recommended actions contributing to climate resiliency within the KBIC and its territorial jurisdictions are outlined above, and further described throughout the IRMP.

Government offices across KBIC retain responsibilities for climate resiliency planning, and many actions have been synthesized here. Climate resiliency planning remains crucial to KBIC governance, program strategies, and everyday community member activities. These strategies enhance KBIC climate preparedness to reduce the community's vulnerability and risk to local hazards, some of which are due to climate related changes.

D. Concluding Thoughts

The Keweenaw Bay Indian Community (KBIC) remains dedicated to the long-term protection of natural resources, healthy ecosystems, and the preservation of Ojibwa culture - this dedication will continue to contribute to our people's resiliency for many generations to come. From this day forward, this commitment is recognized as a priority in contemporary natural resource management and environmental protection planning initiatives. This CRP follows guidance from Tribal Council in Resolution KB-016-2015, and the KBIC Natural Resources Department (NRD), generously funded by the Bureau of Indian Affairs (BIA). This CRP's guidance contributes to our Community capacity to plan, prepare, and adapt within evolving climate change effects, as identified as a priority in the KBIC Strategic Plan. Because climate resiliency planning is a priority, the KBIC Integrated Resource Management Plan (IRMP 2023) has been updated to integrate Climate Resiliency Planning as part of KBIC governance within and across the KBIC jurisdictional territories. This KBIC Climate Resiliency Plan serves as a governance

guide to climate specific actions for government offices across the KBIC.

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