Beings *on the* Move

Climate Change Vulnerability of Culturally Important Beings

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Adapted with permission by Gina Smith, WCEE

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Source of Climate Information for Eagle/Sturgeon: The Lac Du Flambeau Climate Resilience Initiative, Natural Resources http://ldfclimateresilience.org/naturalresources

Activity Overview

Estimated completion time

30 - 45 minutes

Grade Level

4th – 12th grade

Supplies

- **Being Cards** with a picture of an animal/plant, plus its English, Ojibwe, and Menominee names and preferred habitat on the front, and a list of climate change impacts to that animal/plant on the back
- **Instructor Climate Impacts Card** with a list of climate impacts we might see in the region
- (Optional) A **Spinner** for choosing climate impacts

Learning objectives

Participants should gain an understanding of

- What climate change effects we might expect in the region
- How climate change may affect culturally important beings
- How treaty rights and the lifeways of Ojibwe people may be impacted by climate change; How culture of the Menominee may be impacted by climate change

Instructions

Introduction

- Brainstorm list of climate impacts we will experience and share one way these climate impacts might affect our lives.
- How will climate change impact plants and animals?
- What are some ways humans depend on plants and animals?
- Think about the Ojibwe and Menominee people who maintain treaty rights related to harvesting and hunting that only extend to their reservations and/or ceded territories. How might climate change impact their ability to harvest/hunt the beings important to their way of life?

Activity

- Hand out **Beings Cards** to individual students or student pairs
- Without looking at the back of the card, have students brainstorm how their beings might be affected by climate change (think about where it lives, what it eats, what it needs to survive).
- Have all students line up facing the same direction
- Decide whether you will choose climate impacts by spinning the **Spinner**, reading them in order, or choosing randomly
- To begin a round, read the climate impact and explanation from the **Instructor Climate Impacts Card**; have students find that impact on their **Being Card** and take the listed number of steps forward
- After each round, ask students to explain what being they are and why they moved
- At the end, have everyone observe where they ended up relative to everyone else

Wrap-up

- Who was most vulnerable? Who was least vulnerable? Was anyone surprised by how far they did or did not move?
- Were there any beings that may benefit from climate change in some ways?
- What does this mean for people who have treaty rights to harvest these plants/animals and depend on them for so many things? (use your sheets for clues)
- What can we do to help these beings?

Instructor Climate Impacts Card

If your plant or animal being will be affected by any of the following, take the number of steps listed on your sheet. Note: When beings are mentioned in Climate Impacts, they are referred to by their Ojibwe name.

Increasing temperatures

Air temperatures are expected to increase in all seasons, but particularly in the winter. Water temperatures will increase too, in many cases more than air temperatures.

Drought

We can expect longer dry periods, particularly in the summer

Increases in predators

Some beings are expected to be favored by climate change and those beings may predate more heavily on other beings

Pathogens/diseases/parasites

Warmer temperatures may favor certain diseases or pathogens that can affect native beings

Extreme precipitation events

We can expect more rain to come in the form of large rain events, with inches of rain that may cause flooding

Decreases in snowfall

More winter precipitation will fall as rain as the temperatures warm

Low genetic variation

Some beings may not be able to respond as easily to climate change because of low genetic variation

Competing beings

Some beings may be favored by climate change and may outcompete others

Changes in diet

Some beings might have fewer food sources available

Limited dispersal

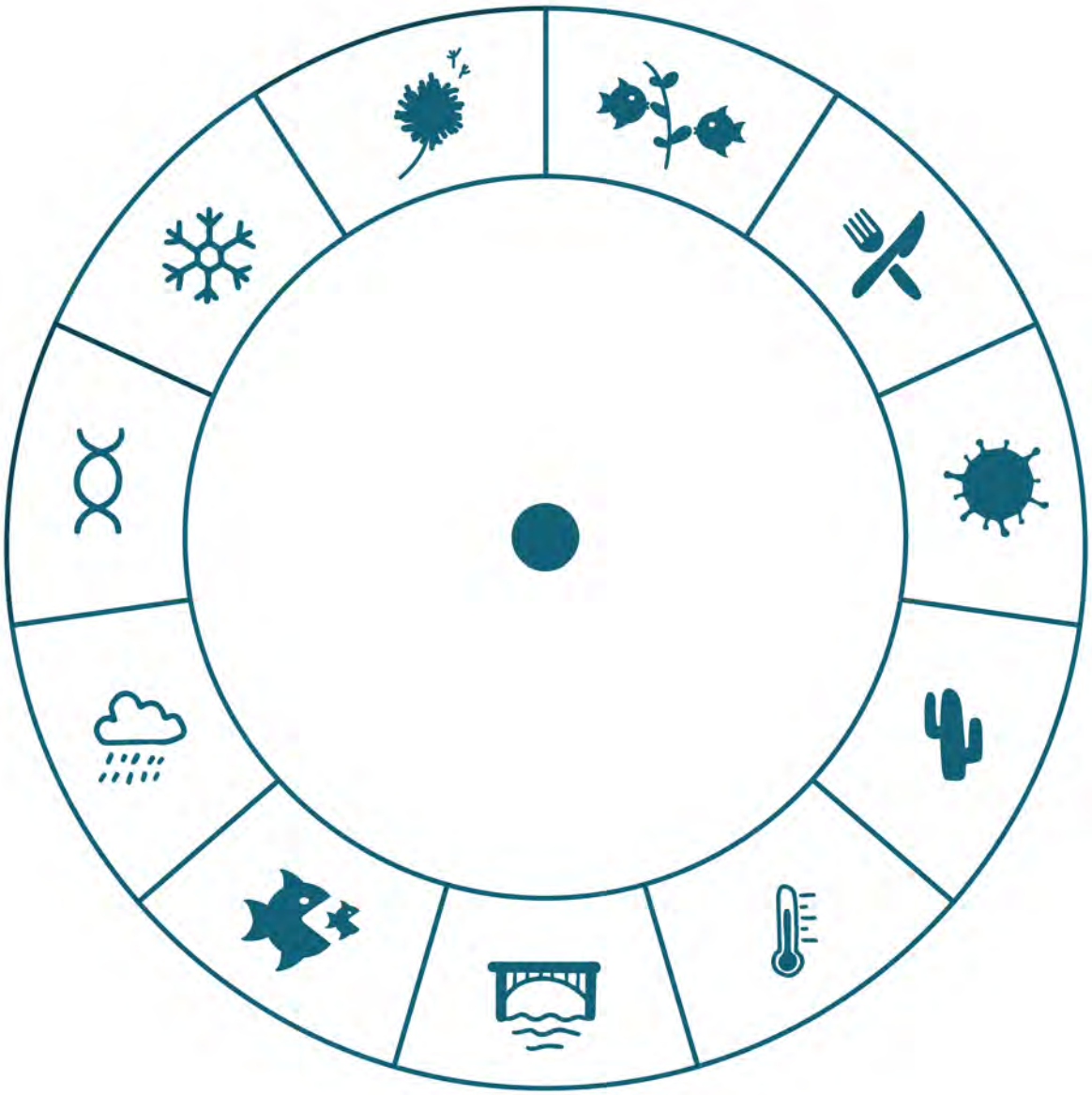
Some beings cannot travel very far or across barriers, and may not be able to move north as climate change continues

Human development

Development of towns and cities may disrupt habitat for some beings

Spinner Template

Resize and print to build a spinner to use with this activity.



Walleye

Ogaa
Ojibwe Name

Namāēqs
Menominee Name

Importance to the Ojibwe

Ogaa is an important source of food and highly respected by the Ojibwe people.

Importance to the Menominee

Namāēqs is a food source for Menominee people. Thier teeth are used in rattles.

Preferred Habitat
Cool water lakes

Walleye • Ogaa • Namāēqs

Climate Impacts

Warmer temperatures

Lake water temperatures are predicted to increase, reducing habitat for ogaa by 10-40%. This will affect the survival of this being in some lakes. (Take 2 steps)

Drought

Drought is not likely to affect ogaa. (0 steps)

Predators

No predators expected to increase because of climate change. (0 steps)

Parasites/pathogens

No parasites or pathogens of ogaa expected to increase because of climate change. (0 steps)

Extreme precipitation

An increase in the intensity and frequency of extreme precipitation events might decrease the ability of ogaa to breed in some lakes and rivers. (Take 1 step)

Decrease in snowfall

Decrease in snowfall not likely to affect ogaa. (0 steps)

Genetic variation

Genetic variation is likely average or high. (0 steps)

Competing beings

Ogaa are likely to experience competition from largemouth bass and smallmouth bass because these fish can survive better in warmer water. (Take 2 steps)

Changes in diet

Baby ogaa eat tiny animals found in lakes called zooplankton. It's possible that zooplankton populations will decrease as the climate changes. (Take 1 step)

Ability to disperse (move)

Dams, culverts, and road crossings can limit water connections between lakes and reduce the ability of ogaa to find more suitable habitat as the climate changes. (Take 3 steps)

Human development

Development of shorelines around lakes can affect ogaa habitat. (Take 1 step)

Moose

Mooz
Ojibwe Name

Mōs
Menominee Name

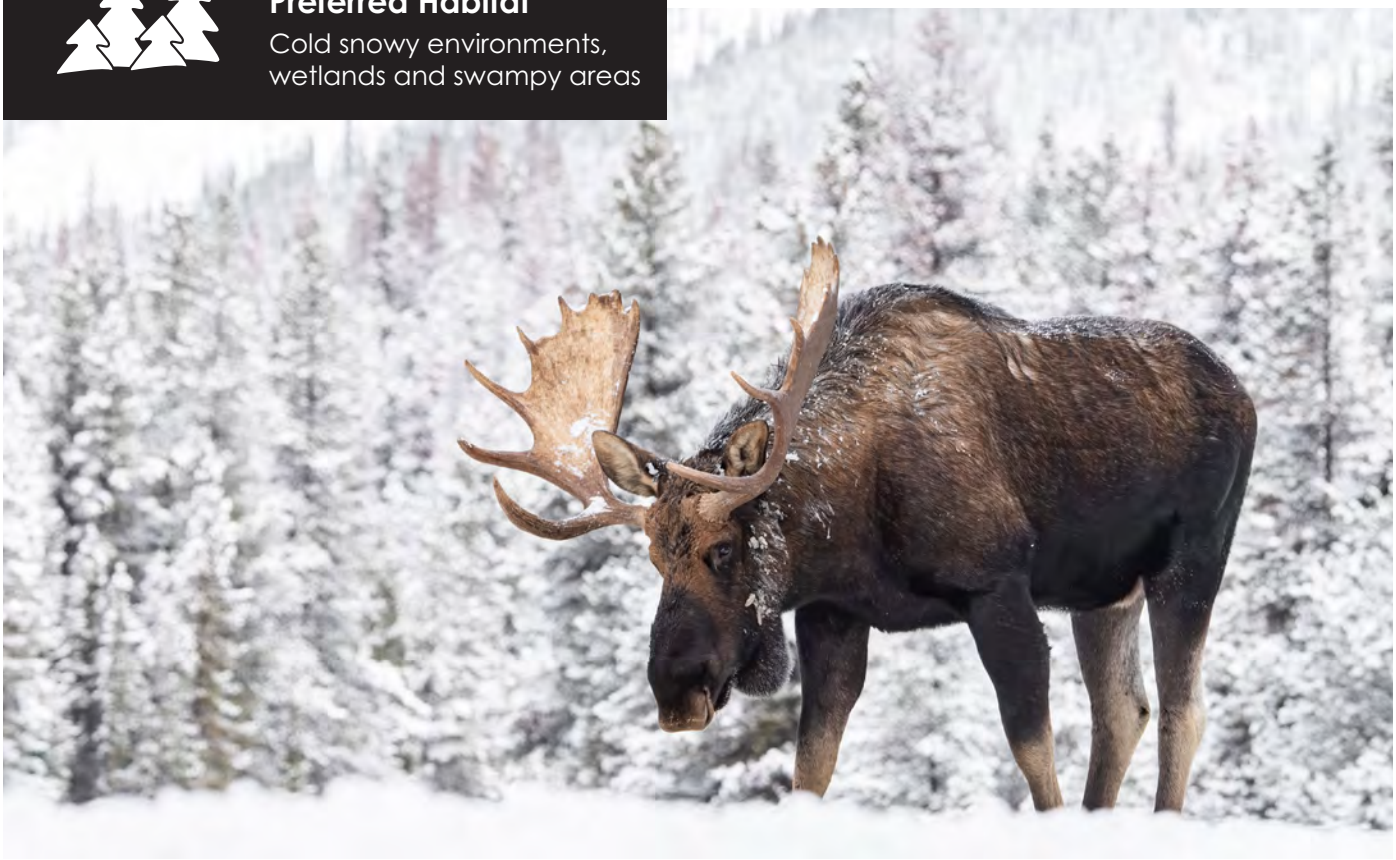
Importance to the Ojibwe

Mooz is hunted for food. Their hides are used for clothing and moccasins. All parts of mooz are used.

Importance to the Menominee

Mōs is a Principal Clan of the Menominee - the People of the Wild Rice. Mōs protects the wild rice beds during the growing season, supervises the harvest of the grain, and makes certain the crop is equitably distributed amongst the members.

Preferred Habitat
Cold snowy environments, wetlands and swampy areas



Moose • Mooz • Mōs

Moose • Mooz • Mōs

Climate Impacts

Warmer temperatures

Mooz experiences heat stress when temperatures are above 23°F in the winter and 59°F in the summer. (Take 3 steps)

Drought

Mooz eats aquatic plants and finds food in late spring, summer, and fall in wetland areas. Drought can dry out wetlands, decreasing food sources for mooz. (Take 1 step)

Predators

Predators of mooz include the wolf and bear. Populations of both may increase as climate warms. Predators cause 80% of the deaths of young mooz calves. (Take 3 steps)

Parasites/pathogens

Winter ticks are parasites that feed on mooz, causing skin irritations and blood loss. One mooz was found with over 100,000 ticks embedded in its body. (Take 3 steps)

Extreme precipitation

Extreme precipitation events not known to impact mooz. (0 steps)

Decrease in snowfall

Mooz are adapted to habitats with longer winters and lots of snow. (Take 3 steps)

Genetic variation

Mooz genetic variation is low making it less adaptable to a changing climate. (Take 2 steps)

Competing beings

White-tailed deer carry a disease called "brainworm," which is deadly to mooz. Deer populations are predicted to increase as the climate warms and therefore could spread more diseases to mooz. (Take 2 steps)

Changes in diet

The mooz diet is fairly flexible. (0 steps)

Ability to disperse (move)

Mooz can move long distances. (0 steps)

Human development

Human development has a minimal impact on mooz. (0 steps)

White-Tailed Deer

Waawaashkeshi

Ojibwe Name

Apāēhsos

Menominee Name

Importance to the Ojibwe

Waawaashkeshi are highly respected and an Ojibwe clan animal. They are an important source of food. Their hides are used for clothing and moccasins. All parts of Waawaashkeshi are used.

Importance to the Menominee

Apāēhsos is part of the Deer Clan who provide Provisions for the Hunt. To the Menominee, game animals like the Apāēhsos are brothers so they take only enough meat to fill their needs. They know that when their time to die comes, their bodies will return to the earth and provide grass for apāēhsos' children to eat. Menominee affirm these relationships through ceremony.

Preferred Habitat

Deer can adapt to live in many habitats including forests, farm fields, and in most rural and city environments.

White-Tailed Deer • Waawaashkeshi • Apāēhsos

Climate Impacts

Warmer temperatures

Waawaashkeshi is adaptable to warming temperatures and their populations are increasing. (0 steps)

Drought

Because they can move to other areas, waawaashkeshi is not as affected by drought as other beings. (0 steps)

Predators

No predators favored by climate change that are expected to impact the waawaashkeshi population. (0 steps)

Parasites/pathogens

A biting midge (insect) carries a deer disease called "EHD." Warming temperatures have allowed this insect to move further north and bring the disease with it. Chronic Wasting Disease is also a major threat to waawaashkeshi. (Take 1 step)

Extreme precipitation

Extreme precipitation will not impact waawaashkeshi. (0 steps)

Decrease in snowfall

Less snowfall and warmer winter temperatures will make it easier for waawaashkeshi to survive. (0 steps)

Genetic variation

Genetic variation is high and therefore they will be better able to adapt to climate change. (0 steps)

Competing beings

Waawaashkeshi is not negatively impacted by competition. (0 steps)

Changes in diet

Waawaashkeshi can adapt to a variety of foods. (0 steps)

Ability to disperse (move)

Waawaashkeshi is very mobile and can move to habitats that favor it. (0 steps)

Human development

Waawaashkeshi is able to adapt to living close to humans. (0 steps)

Wild Turkey

Giche-bine
Ojibwe Name

Mēseqnāēw
Menominee Name

Importance to the Ojibwe
Giche-bine are hunted for food. Their beautiful feathers are sometimes used in arts and crafts.

Importance to the Menominee
Mēsenāēwq is hunted by the Menominee. In the Menominee tribe, hunting is a process with dignity, respect, and ceremony. Feathers from Mēsenāēwq are also used by the Menominee.

Preferred Habitat
Turkeys are adapted to living in many habitats including forests, farm fields, and most rural and city environments.

Wild Turkey • Giche-bine • Mēseqnāēw

Climate Impacts

Warmer temperatures

Giche-bine are adaptable to warming temperatures and their populations are increasing. (0 steps)

Drought

Because they can fly or travel over land to move to other areas, gichi-bine is not as affected by drought as other beings. (0 steps)

Predators

Although giche-bine has predators that may increase, higher populations numbers of giche-bine can offset losses. (0 steps)

Parasites/pathogens

With increasing populations, giche-bine has more contact with humans and domestic farm-raised poultry which makes them more capable of transmitting diseases. These diseases are not common, but are expected to increase as climate change continues. (Take 1 step)

Extreme precipitation

Not expected to affect giche-bine. (0 steps)

Decrease in snowfall

Less snowfall and warmer winter temperatures will make it easier for giche-bine to find food during the winter and survive. (0 Steps)

Genetic variation

Genetic variation of giche-bine is high and therefore will help it adapt to climate change. (0 steps)

Competing beings

Giche-bine does not have many competing beings. (0 steps)

Changes in diet

Giche-bine likes acorns, but can adapt to a variety of foods including agricultural crops. (0 steps)

Ability to disperse (move)

Giche-bine is very mobile and can move to favorable habitats. (0 steps)

Human development

Giche-bine can adapt to living close to humans. (0 steps)

Painted Turtle

Miskwaadesi

Ojibwe Name

Māēhkāēnāh

Menominee Name (mud turtle)

Importance to the Ojibwe

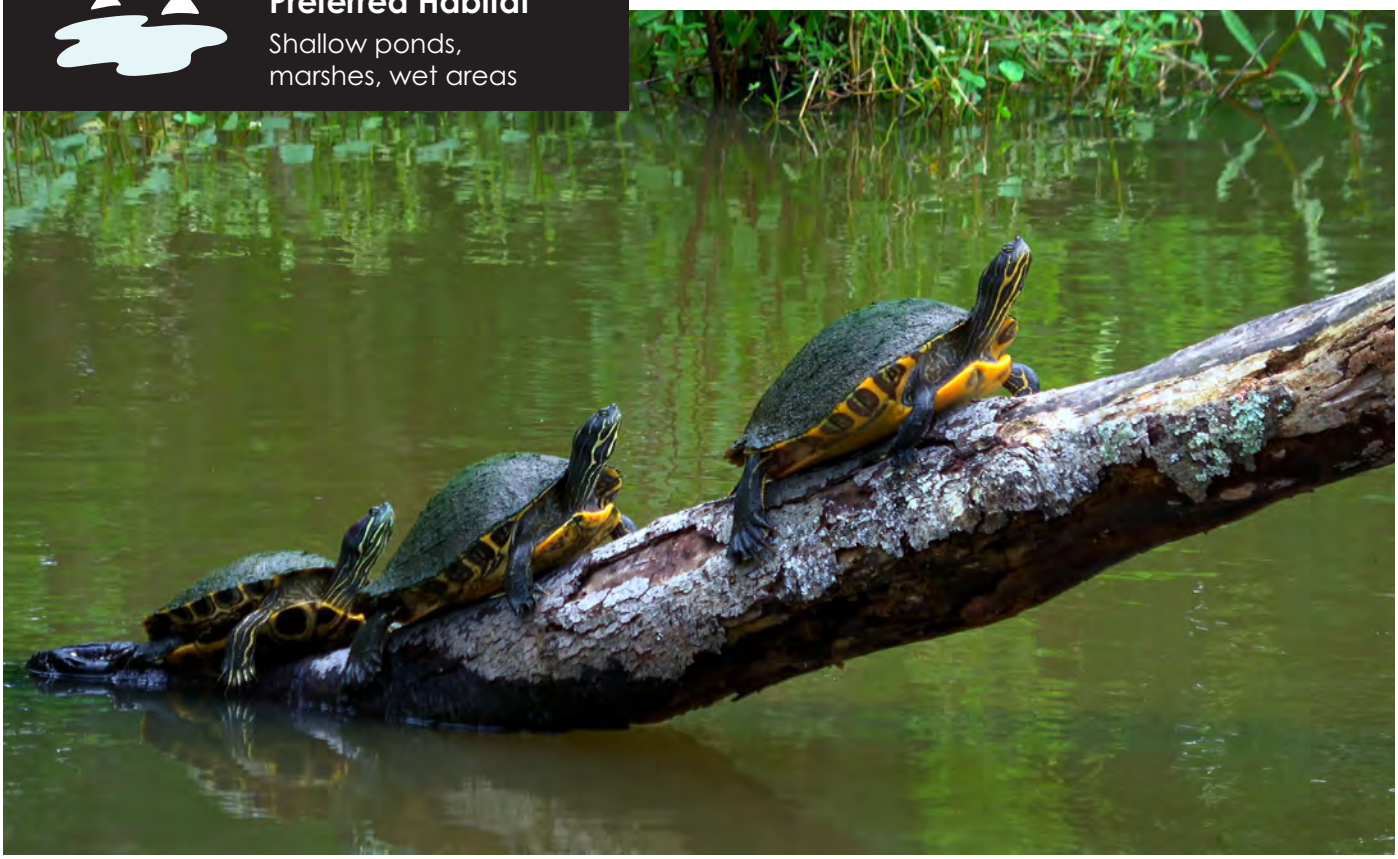
Miskwaadesi is important because of its role in the Ojibwe story of Creation. Its shell is used to make ceremonial rattles.

Importance to the Menominee

Māēhkāēnāh, the mud turtle, is significant to the Menominee Nation. Māēhkāēnāh, the Mud Turtle Clan, renders the Maple Sugar.

Preferred Habitat

Shallow ponds, marshes, wet areas



Painted Turtle • Miskwaadesi • Māēhkāēnāh

Climate Impacts

Warmer temperatures

Miskwaadesi are adapted to warming temperatures. (0 steps)

Drought

Miskwaadesi can survive temporary drought conditions. (0 steps)

Predators

No predators expected to increase with a warming climate. (0 steps)

Parasites/pathogens

Viruses affecting miskwaadesi are increasing as the climate warms. Viruses weaken their immune system which decreases populations. (Take 2 steps)

Extreme precipitation

Miskwaadesi nests and baby miskwaadesi can be washed away by extreme rain and storm events. (Take 1 step)

Decrease in snowfall

Not known to be affected by a decrease in snowfall. (0 steps)

Genetic variation

Genetic variation of miskwaadesi is unknown. (0 steps)

Competing beings

Miskwaadesi doesn't have many competing beings currently, but may in the future. (0 steps)

Changes in diet

Miskwaadesi eats a lot of things and has a flexible diet. (0 steps)

Ability to disperse (move)

Miskwaadesi are not very mobile. If habitat conditions change due to climate change, they are slow to move. (2 steps)

Human development

Roads created barriers for Miskwaadesi to cross. Many Miskwaadesi are killed crossing roads while they are looking for nesting areas. (Take 1 step)

Blueberry

Miin

Ojibwe Name

Importance to the Ojibwe

Miin are a source of food and used in ceremonies.

Mēn

Menominee Name

Importance to the Menominee

Mēn are a source of food for the Menominee. Mēn often thrive after the use of fire in the forests; something the Menominee have understood for many generations.

Preferred Habitat

Forests, clearings, and bogs. Blueberries especially like areas that have been recently burned.

Blueberry • Miin • Mēn

Climate Impacts

Warmer temperatures

Miin is a northern being limited to growing in cool environments. Increasing temperatures, especially warm winter or spring temperatures, could cause the plants to bloom out of season. Hot summer temperatures can reduce the quality and quantity of the fruit crop. (Take 1 step)

Drought

Miin, like most plants, is dependent on a consistent source of water and would be affected by drying. Severe drought can limit fruit production and weaken plants. (Take 1 step)

Predators

No predators of miin that will increase significantly with climate change. (0 steps)

Parasites/pathogens

No known pathogens that will increase due to climate change. (0 steps)

Extreme precipitation

Extreme precipitation unlikely to affect miin. (0 steps)

Decrease in snowfall

Miin benefits from a snowpack in the winter to provide protection from cold. Snowpack also prevents other beings from browsing on their branches. (Take 2 steps)

Genetic variation

Little is known about miin genetic variation. (0 steps)

Competing beings

Not affected by competing beings. (0 steps)

Changes in diet

Not applicable to miin. (0 steps)

Ability to disperse (move)

Most of the dispersers of miin, such as small mammals, travel small distances. However, seeds can also be spread by birds, which travel longer distances. (Take 1 step)

Human development

Miin needs fire to maintain its habitat. Humans often limit fire on the landscape. This prevents miin's habitat from being maintained. (Take 2 steps)

Common Loon

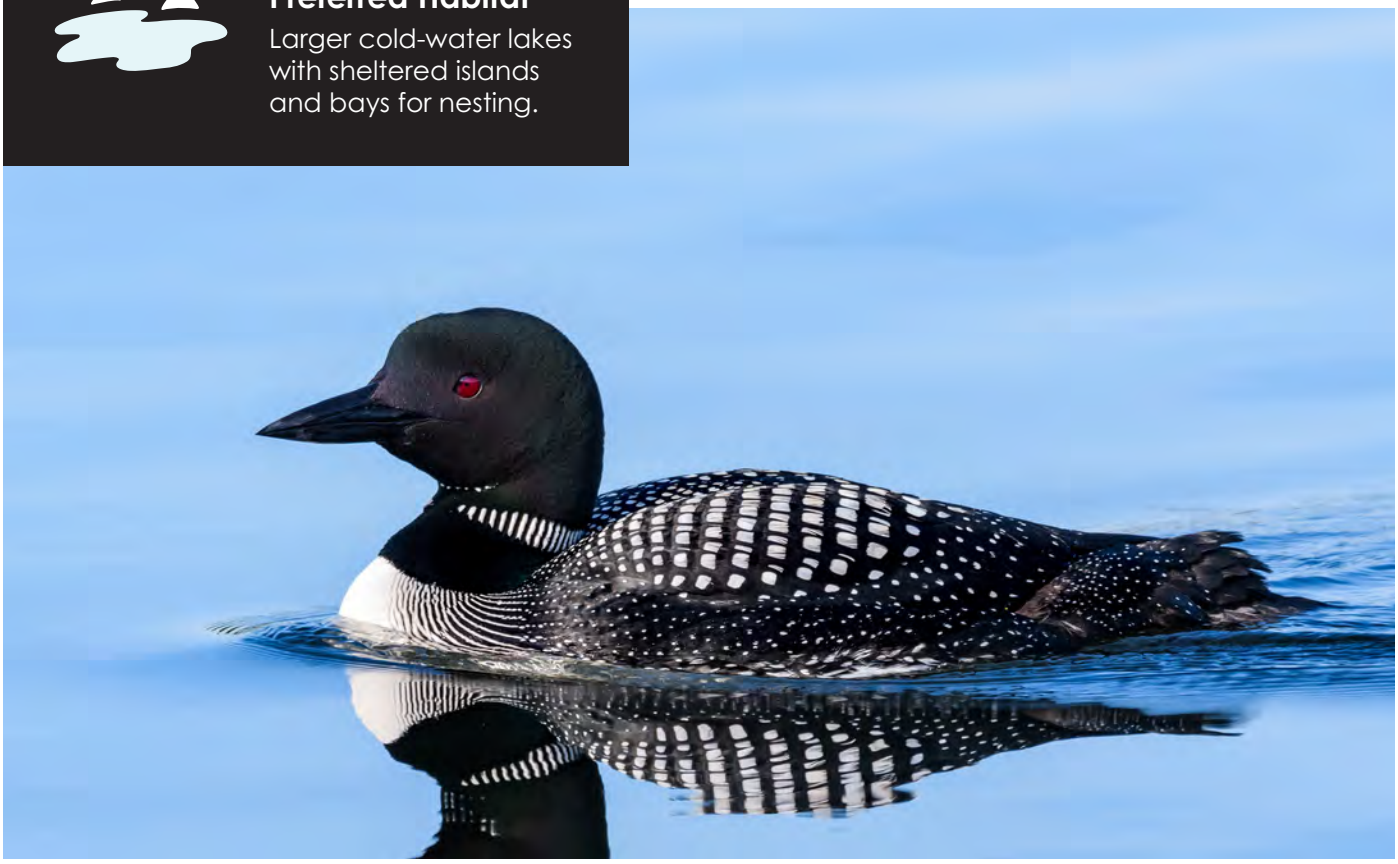
Maang
Ojibwe Name

Importance to the Ojibwe
Maang is an Ojibwe clan animal and highly respected.

Muak
Menominee Name

Importance to the Menominee
Muak, the Loon Clan, are the dugout canoe makers. Muak is given great respect by the Menominee as the most superb waterfowl and is often represented on the legs of drums.

Preferred Habitat
Larger cold-water lakes with sheltered islands and bays for nesting.



Common Loon • Maang • Muak

Climate Impacts

Warmer temperatures

Maang is extremely vulnerable to increasing temperatures which are pushing them farther north. (Take 4 steps)

Drought

Drought not likely to impact maang. (0 steps)

Predators

No predators expected to increase and affect maang in the future. (0 steps)

Parasites/pathogens

With warming temperatures, outbreaks of bird diseases, parasites, and biting insects that can cause maang to abandon nests are increasing and becoming more severe. (Take 1 step)

Extreme precipitation

Extreme storms and flooding can cause wash away maang nests and baby maang, and decrease water clarity which makes it hard for them to hunt. (Take 3 steps)

Decrease in snowfall

Maang migrates south in the winter and is not affected by decreases in snowfall. (0 steps)

Genetic variation

Little known about maang genetic variation. (0 steps)

Competing beings

Maang does not compete with many other beings. (0 steps)

Changes in diet

Maang's diet is fairly flexible and eats a variety of fish. (0 steps)

Ability to disperse (move)

Maang can travel large distances. (0 steps)

Human development

Dams, irrigation, and development of shoreline areas are affecting maang's habitat and the ability to nest successfully. (Take 2 steps)

Bear

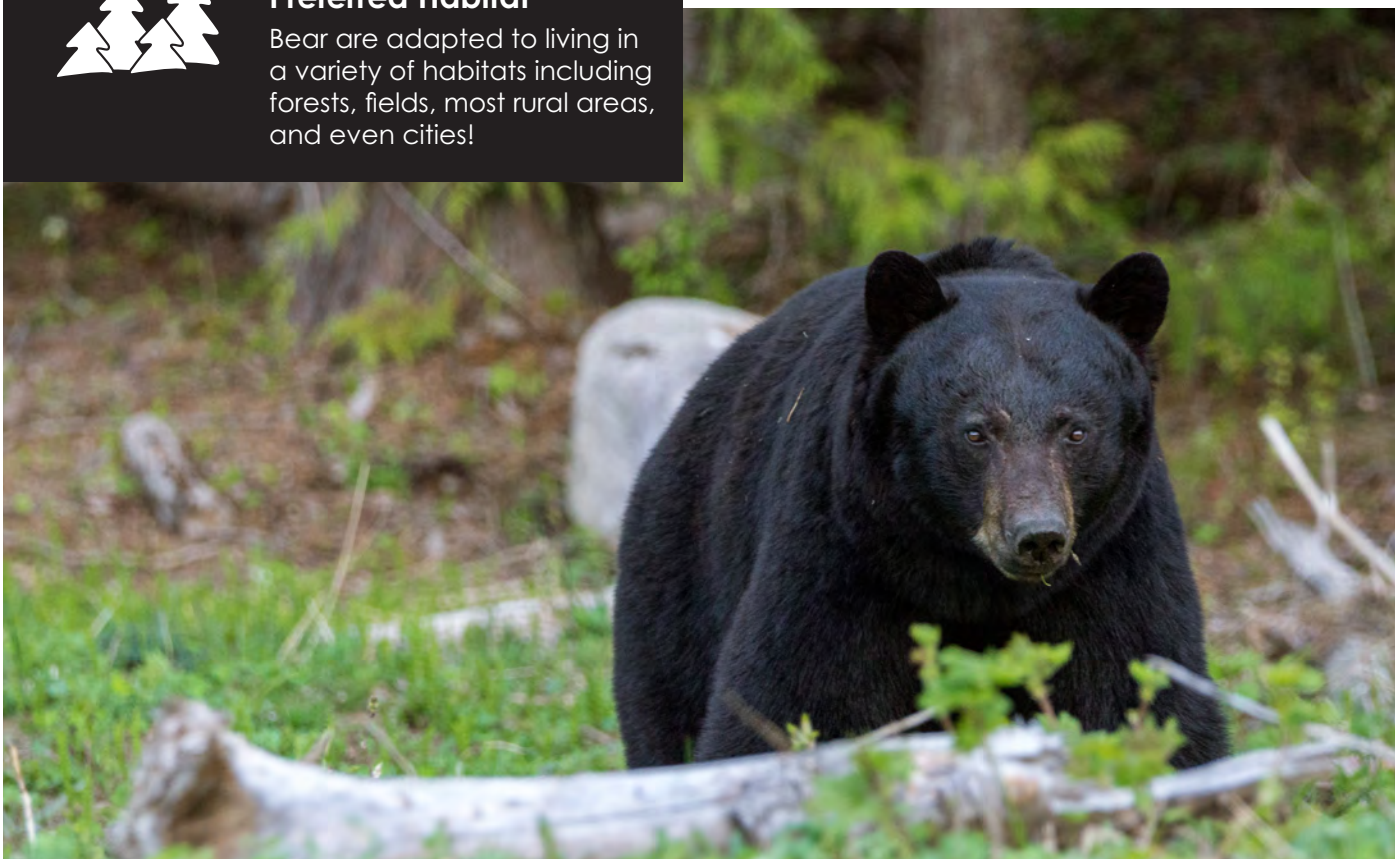
Makwa
Ojibwe Name (Black Bear)

Importance to the Ojibwe
Makwa is an Ojibwe clan animal and highly respected.

Awāēhsāēh
Menominee Name

Importance to the Menominee
Awāēhsāēh is one of the Menominee Principal Clans - the Speakers. The Bear Clan regulates civil affairs of the Menominee maintaining peace and order.

Preferred Habitat
Bear are adapted to living in a variety of habitats including forests, fields, most rural areas, and even cities!



Bear • Makwa • Awāēhsāēh

Climate Impacts

Warmer temperatures

Makwa is more adaptable to warming temperatures than many other beings. (0 steps)

Drought

Makwa is not affected by drought. (0 steps)

Predators

Makwa has few predators. (0 steps)

Parasites/pathogens

No evidence of pathogens affecting makwa increasing because of climate change. (0 steps)

Extreme precipitation

Makwa is not affected by extreme precipitation events. (0 steps)

Decrease in snowfall

Makwa is not dependent on snow, but can be affected by it. With climate change, snow and ice can thaw out and flood winter makwa dens. This can lead to makwa leaving their dens early when food isn't available yet. This can lead to weight loss or death of their cubs. (Take 1 Step)

Genetic variation

Genetic variation is high and therefore might help makwa adapt to climate change. (0 steps)

Competing beings

Makwa does not compete with many beings. (0 steps)

Changes in diet

Makwa's diet is very adaptable. It is not expected to be negatively affected by climate change. (0 steps)

Ability to disperse (move)

Makwa can move long distances. (0 steps)

Human development

Major highways are a major barrier and threat to makwa. Any lack in food caused by climate change will cause makwa to move more and have a greater chance of being hit by a car. Highways account for around 100 road deaths of makwa each year in the Upper Great Lakes region. (Take 1 Step)

White / Paper Birch

Wiigwaas
Ojibwe Name

Importance to the Ojibwe
The bark of wiigwaas is used to make birchbark canoes, shelters, containers, and craft items.

Wīkīhsāhtek
Menominee Name

Importance to the Menominee
Wīkīhsāhtek is used by the Menominee to build wigwams, make birch bark baskets, containers and crafts.

Preferred Habitat
Cool to cold areas with well-drained soils.

White / Paper Birch • Wiigwaas • Wīkīhsāhtek

Climate Impacts

Warmer temperatures

Wiigwaas is adapted to colder temperatures and won't be able to grow as well with increased temperatures. (Take 3 steps)

Drought

Wiigwaas seedlings have a hard time growing during drought. (Take 3 steps)

Predators

Wiigwaas can be killed by an insect pest called the bronze birch borer. White-tailed deer also eat its leaves. Both beings are likely to increase with climate change. (Take 3 steps)

Parasites/pathogens

No known wiigwaas pathogens that will increase with climate change. (0 steps)

Extreme precipitation

Not affected by extreme precipitation. (0 steps)

Decrease in snowfall

Wiigwaas needs snow in the winter to protect its roots. (Take 1 step)

Genetic variation

Genetic diversity of wiigwaas is high and may help it adapt to climate change. (0 steps)

Competing beings

Wiigwaas seedlings are often out competed and taken over by raspberry plants. Raspberries are expected to increase with climate change. (Take 2 steps)

Changes in diet

Not applicable to wiigwaas. (0 steps)

Ability to disperse (move)

Wiigwaas seeds can't disperse or move very far. Wiigwaas will have a hard time spreading to new habitats as the climate changes. (Take 2 steps)

Human development

Logging and development can impact wiigwaas but wiigwaas also like to grow in disturbed areas. (0 steps)

Snowshoe Hare

Waabooz
Ojibwe Name

Importance to the Ojibwe
Waabooz is a source of food for the Ojibwe and their fur is used as lining in clothing and in crafts.

Wāpos
Menominee Name

Importance to the Menominee
In the Menominee tribe, hunting is a process with dignity, respect, and ceremony. The fur of Wāpos is also used by the Menominee.

Preferred Habitat
Cold forested areas with deep winter snow.

Snowshoe Hare • Waabooz • Wāpos

Snowshoe Hare • Waabooz • Wāpos

Climate Impacts

Warmer temperatures

Waabooz only lives in cold environments. Increases in temperature, especially in the winter, will negatively affect waabooz. (Take 3 steps)

Drought

Drought is not likely to affect waabooz. (0 steps)

Predators

The populations of predators that eat waabooz are expected to increase with climate change. These include bobcat, coyote, and fisher. (Take 2 steps)

Parasites/pathogens

There are some diseases that affect waabooz that may increase with climate change. (Take 1 step)

Extreme precipitation

Waabooz will not be impacted by extreme precipitation. (0 steps)

Decrease in snowfall

Snow cover is critical to waabooz. If snow cover declines or snow comes later in the year and the ground is bare, waabooz's white color will not give it camouflage. It will be even more visible to hungry predators. (Take 5 steps)

Genetic variation

The genetic variation of waabooz is lower than in some other beings, making it harder for it to adapt to climate change (Take 1 step).

Competing beings

No competing beings favored by climate change that will increase in population. (0 steps)

Changes in diet

Waabooz's diet is flexible. (0 steps)

Ability to disperse (move)

The ability of waabooz to disperse (or move) in fragmented landscapes or areas with agriculture, roads and urban development is limited. (Take 3 steps)

Human development

Development is not a major threat to waabooz. (0 steps)

Sugar Maple

Ziinzibaakwadwaatig

Ojibwe Name

Importance to the Ojibwe

Ziinzibaakwadwaatig is tapped for sap which is used to make maple syrup.

Sōpomāhtek

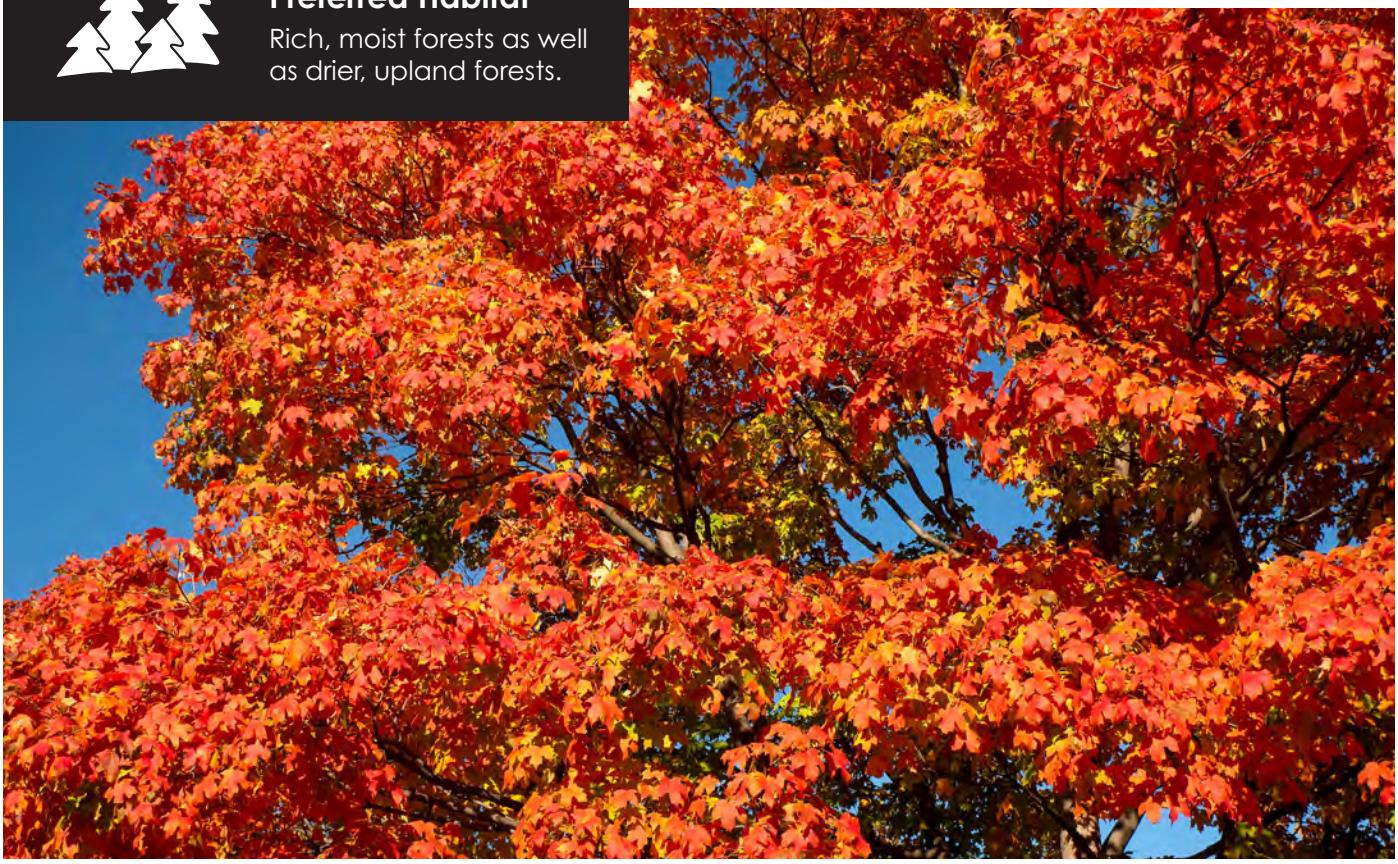
Menominee Name

Importance to the Menominee

Sōpomāhtek is a great gift from the Creator to the Menominee. It is a major food of the Menominee that must be processed and prepared each spring. The first run of the sap has the most medicinal value.

Preferred Habitat

Rich, moist forests as well as drier, upland forests.



Sugar Maple • Ziinzibaakwadwaatig • Sōpomāhtek

Sugar Maple • Ziinzibaakwadwaatig • Sōpomāhtek

Climate Impacts

Warmer temperatures

Warmer temperatures will make it harder for ziinzibaakwadwaatig to grow, particularly hotter and drier summers. (Take 3 steps)

Drought

Drought will impact ziinzibaakwadwaatig, particularly when there are multiple years of drought, and make it harder for them to grow. (Take 2 steps)

Predators

There are many insects that eat ziinzibaakwadwaatig leaves that will likely increase. Also, white-tailed deer eat ziinzibaakwadwaatig leaves and will likely increase due to climate change. (Take 1 step)

Parasites/pathogens

There may be pathogens that will increase but not much is known. (0 steps)

Extreme precipitation

Heavy rains and flooding can impact ziinzibaakwadwaatig roots. (Take 1 step)

Decrease in snowfall

Ziinzibaakwadwaatig depends on snow to protect its roots from frost damage. Less snow in the winter could damage their roots. (Take 3 steps)

Genetic variation

Genetic variation of ziinzibaakwadwaatig is high and may help it adapt to climate change. (0 steps)

Competing beings

Earthworms compete with ziinzibaakwadwaatig for nutrients and are increasing due to climate change. (Take 2 steps)

Changes in diet

Not applicable to ziinzibaakwadwaatig. (0 steps)

Ability to disperse (move)

Ziinzibaakwadwaatig's seeds are moved by small mammals and the wind, but cannot move too far. (0 steps)

Human development

Ziinzibaakwadwaatig is not very tolerant of compacted soil, pollution, and road salt. Development could harm this being. (Take 1 step)

Raspberry

Miskomin
Ojibwe Name

Importance to the Ojibwe
Miskomin are used as a food source.

Anōhkan
Menominee Name

Importance to the Menominee
Anōhkan are a source of food for the Menominee and the leaves have medicinal value. Anōhkan often thrive after the use of fire in the forests; something the Menominee have understood for many generations.

Preferred Habitat
A variety of habitats, including the edges of swamps and bogs, in the understory of forests, and in openings in the forest canopy.

Raspberry • Miskomin • Anōhkan

Climate Impacts

Warmer temperatures

Not affected by warmer temperatures. (0 steps)

Drought

Not affected by drought. (0 steps)

Predators

Not affected by predators. (0 steps)

Parasites/pathogens

Not affected by pathogens. (0 steps)

Extreme precipitation

Not affected by extreme precipitation. (0 steps)

Decrease in snowfall

Not affected by a decrease in snowfall. (0 steps)

Genetic variation

Genetic variation is high, which may help it adapt to climate change. (0 steps)

Competing beings

Not affected by any competing beings. (0 steps)

Changes in diet

Not applicable to miskomin. (0 steps)

Ability to disperse (move)

Miskomin seeds are dispersed by birds and animals. (0 steps)

Human development

Miskomin grows in disturbed areas and can live near humans. (0 steps)

Beaver

Amik
Ojibwe Name

Namāēh
Menominee Name

Importance to the Ojibwe

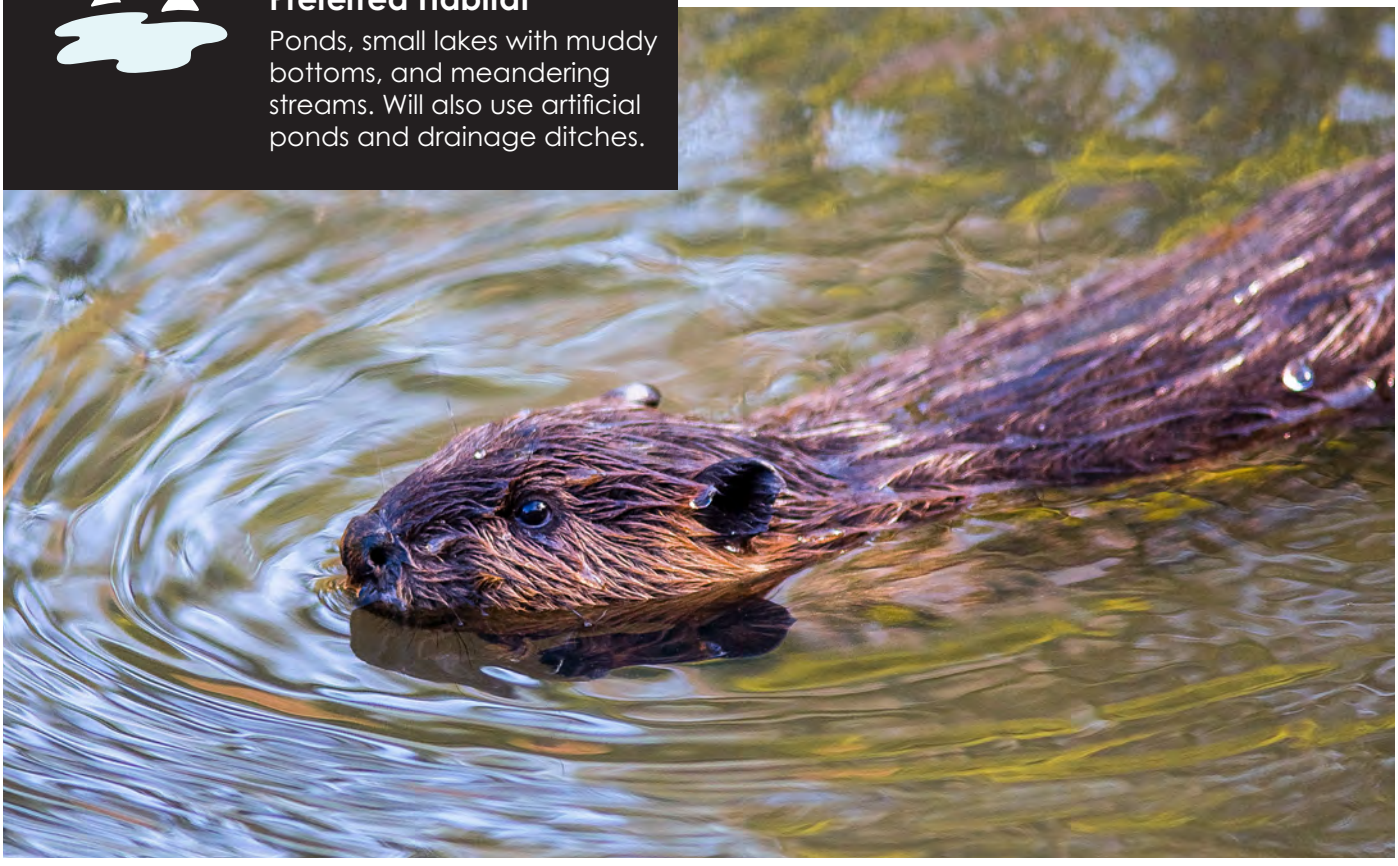
Amik is a clan animal and are eaten for food. The entire body of amik is used.

Importance to the Menominee

Namāēh is a clan within the Bear Clan - the Speakers. The Beaver Clan is related to the anticipation of spring.

Preferred Habitat

Ponds, small lakes with muddy bottoms, and meandering streams. Will also use artificial ponds and drainage ditches.



Beaver • Amik • Namāēh

Beaver • Amik • Namāēh

Climate Impacts

Warmer temperatures

Amik tolerates a wide range of temperatures. (0 steps)

Drought

Droughts may make some habitats unsuitable for amik, increase its vulnerability to predators, and decrease access to food. (Take 1 step)

Predators

No major predators whose populations will increase dramatically with climate change. (0 steps)

Parasites/pathogens

Tularemia is a disease that amik is susceptible to that may increase with climate change. (Take 1 step)

Extreme precipitation

Extreme storm events may cause flooding, soil erosion, and sediment transport, which could negatively alter amik habitat. Flooding could also destroy dams and lodges. (Take 1 step)

Decrease in snowfall

Not dependent on snow. (0 steps)

Genetic variation

Genetic variation may be low, as the amik population was reduced to around 500 individuals in 1900 due to hunting. (Take 1 step)

Competing beings

Little competition between amik and other beings. (0 steps)

Changes in diet

Amik's diet is flexible. (0 steps)

Ability to disperse (move)

Amik can travel long distances. (0 steps)

Human development

Amik is not negatively impacted by human development in general. (0 steps)

Wild Rice

Manoomin
Ojibwe Name

Manōmaeh
Menominee Name

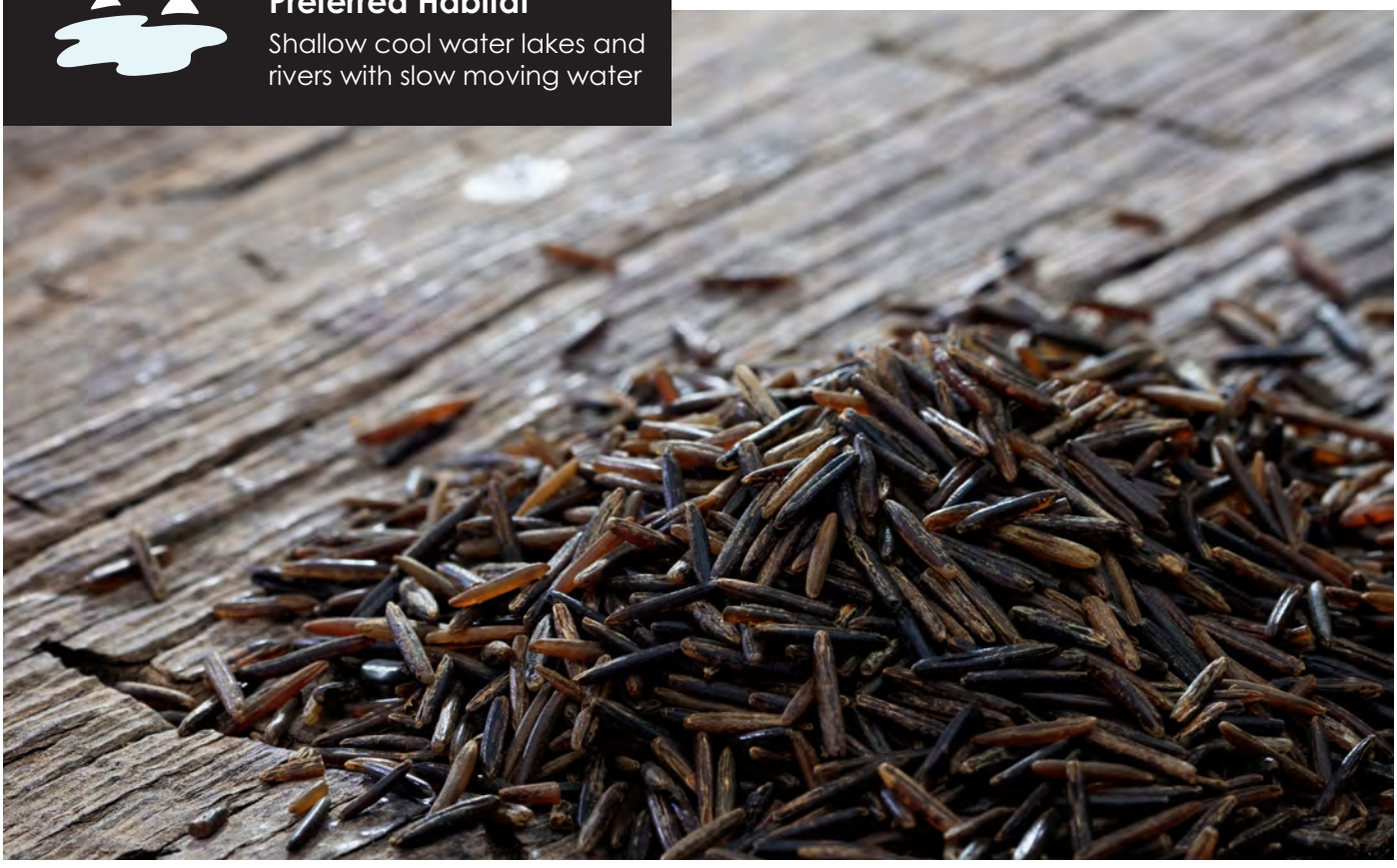
Importance to the Ojibwe

In the Ojibwe language "manoomin" means the "good berry." Manoomin is a sacred food harvested by the Ojibwe people. It is also an important food for birds and wildlife.

Importance to the Menominee

The Ojibwe gave the Menominee people the name, Manomini, from their word "manoomin" (wild rice). Neighboring tribes considered the Menominee "the people of the wild rice". Manōmaeh possesses a spirit similar to that of the Menominee people and other beings. Ceremonies and traditions emerge around the harvest of the rice to show appreciation for the generous bounty it provides.

Preferred Habitat
Shallow cool water lakes and rivers with slow moving water



Wild Rice • Manoomin • Manōmaeh

Climate Impacts

Warmer temperatures

Warmer air and water temperatures will decrease manoomin seed production and may make it difficult for it to grow well. (Take 3 steps)

Drought

Manoomin likes fluctuating water levels year-to-year and multiple years of low water levels may prevent it from growing. (Take 3 steps)

Predators

Canada geese have been known to decimate manoomin beds. (Take 1 step)

Parasites/pathogens

Climate change will favor rice worms, which can decrease manoomin seed production. Warm humid nights can allow brown spot disease to spread which hurts manoomin's growth. (Take 2 steps)

Extreme precipitation

Changes in water level from extreme storm events and flooding can drown this plant during certain points of its life (Take 3 steps)

Decrease in snowfall

Manoomin depends on snow and ice in the winter for seeds to germinate and to keep populations of other beings that compete with it low. (Take 3 steps)

Genetic variation

Manoomin's genetic variation is likely low, making it harder for it to adapt to climate change. (Take 1 step)

Competing beings

There are many competing beings that are likely to be favored by climate change such as pondweeds, water lilies, cattail, and flowering rush. (Take 2 steps)

Changes in diet

Not applicable (0 steps)

Ability to disperse (move)

Manoomin has limited ability to spread its seeds and move to other areas. This is because its seeds are heavy and fall straight down into the water. (Take 3 steps)

Human development

Boat traffic, dams, and shoreline development can all negatively impact manoomin. (Take 2 steps)

Largemouth Bass

Ashigan
Ojibwe Name

Importance to the Ojibwe

Ashigan are a source of food for the Ojibwe.

Aqsekan
Menominee Name

Importance to the Menominee

Aqsekan is a source of food for the Menominee.

Preferred Habitat
Cool to warm water lakes

Largemouth Bass • Ashigan • Aqsekan

Climate Impacts

Warmer temperatures

Ashigan likes cool to warm waters. Increasing temperatures in some lakes may favor ashigan. (0 steps)

Drought

Droughts can reduce habitat or cause ashigan to leave their spawning nests. (1 step)

Predators

No predators expected to increase with climate change. (0 steps)

Parasites/pathogens

Tapeworms, parasitic worms and largemouth bass virus are some of the few parasites and pathogens common in ashigan. Higher water temperatures will result in higher death rates for infected fish. (Take 2 steps)

Extreme precipitation

No known effects of extreme precipitation on ashigan. (0 steps)

Decrease in snowfall

Ashigan is not known to be affected by decreases in snowfall. (0 steps)

Genetic variation

Genetic variation of ashigan is high. (0 steps)

Competing beings

As temperatures get warmer ashigan is expected to outcompete other fish, such as walleye, because it is adapted to warmer water. (0 Steps)

Changes in diet

Climate change is not expected to affect ashigan's diet. (0 Steps)

Ability to disperse (move)

Ashigan can move large distances. (0 steps)

Human development

Development is not known to negatively impact ashigan in a major way. (0 steps)

Bald Eagle

Migizi
Ojibwe Name

Kēnew
Menominee Name

Importance to the Ojibwe

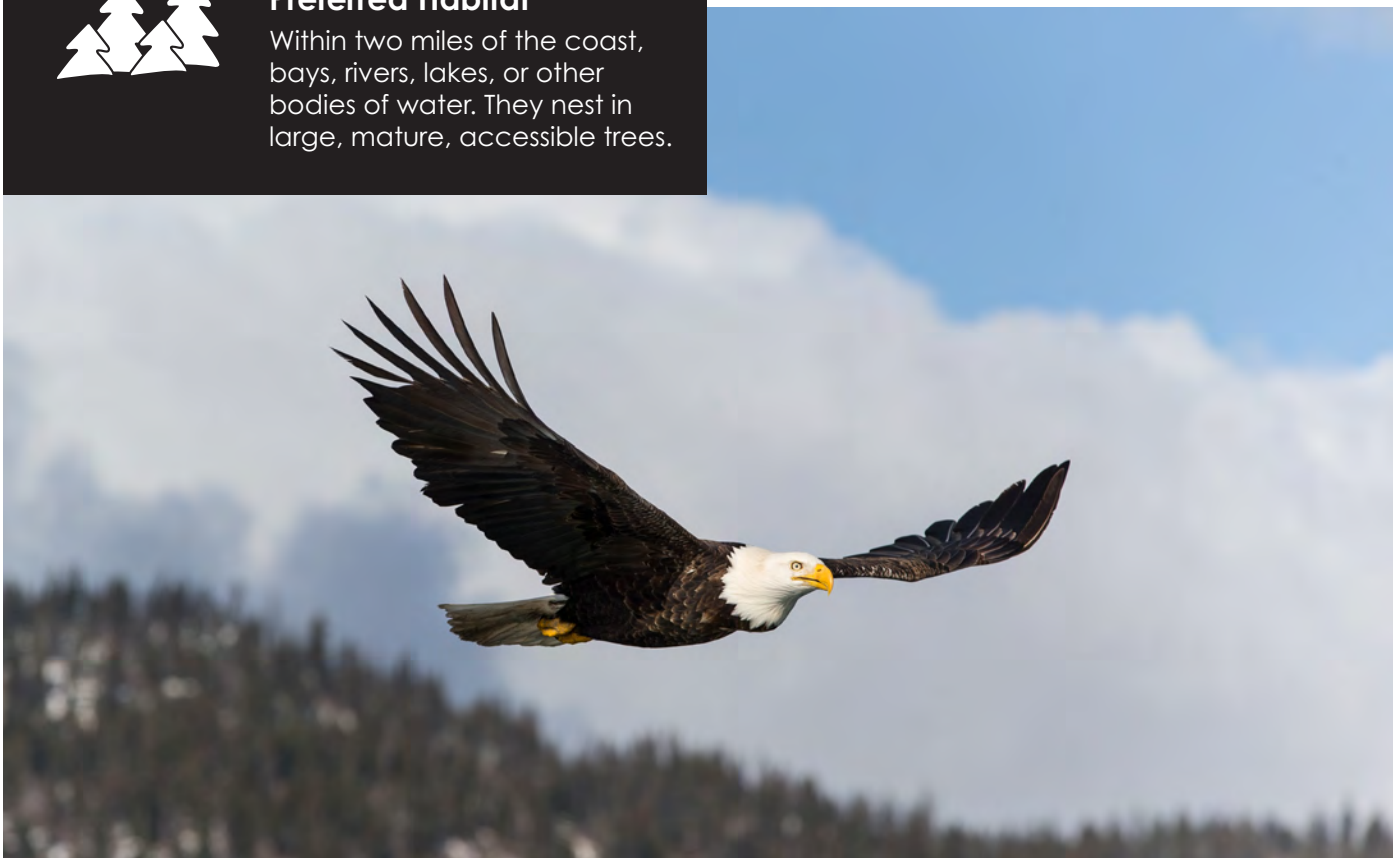
Migizi is one of the most revered and respected beings of the Ojibwe. They represent the spiritual connection to the Creator.

Importance to the Menominee

Kēnew (Golden Eagle) is a Principal Clan of the Menominee, the Thunderers. The Bald Eagle is a member clan that represents the careful reasoning that is required of all Menominee warriors.

Preferred Habitat

Within two miles of the coast, bays, rivers, lakes, or other bodies of water. They nest in large, mature, accessible trees.



Bald Eagle • Migizi • Kēnew

Climate Impacts

Warmer Temperatures

Migizi are adapted to a broad range of temperature regimes and are therefore unlikely to be negatively affected directly by warming temperatures. (0 steps)

Drought

While migizi are somewhat dependent on water bodies for food, it is unlikely that drought will alter the hydrologic suitability of migizi habitat. (0 steps)

Predators

No predators expected to increase with climate change. (0 steps)

Pathogens

Avian pathogens will generally increase with a warming climate. It is unknown how this might impact migizi. Much of the migizi's diet is fish or aquatic-based and may be at higher risk from pathogens. A potential issue caused by climate change may be West Nile Virus. (2 steps)

Extreme precipitation

No known effects of extreme precipitation on migizi. (0 steps)

Decrease in Snowfall

Migizi are not known to be impacted by decreases in snowfall. (0 steps)

Genetic variation

Information not available. (0 steps)

Competing Beings

Migizi are not expected to be outcompeted by other beings. (0 steps)

Changes in Diet

Migizi are foragers and have a fairly wide diet but generally prefer fish. Climate change could lead to increased mercury contamination in some fish species which could adversely affect migizi. (1 step)

Ability to Disperse (move)

Migizi have a long dispersal distance (>100km). (0 steps)

Human Development

Migizi are sensitive to pollution and pesticides. (1 step)

Lake Sturgeon

Namé

Ojibwe Name

Importance to the Ojibwe

Namé is a Clan animal, the teachers, and are an important food source for the tribe.

Namāēw

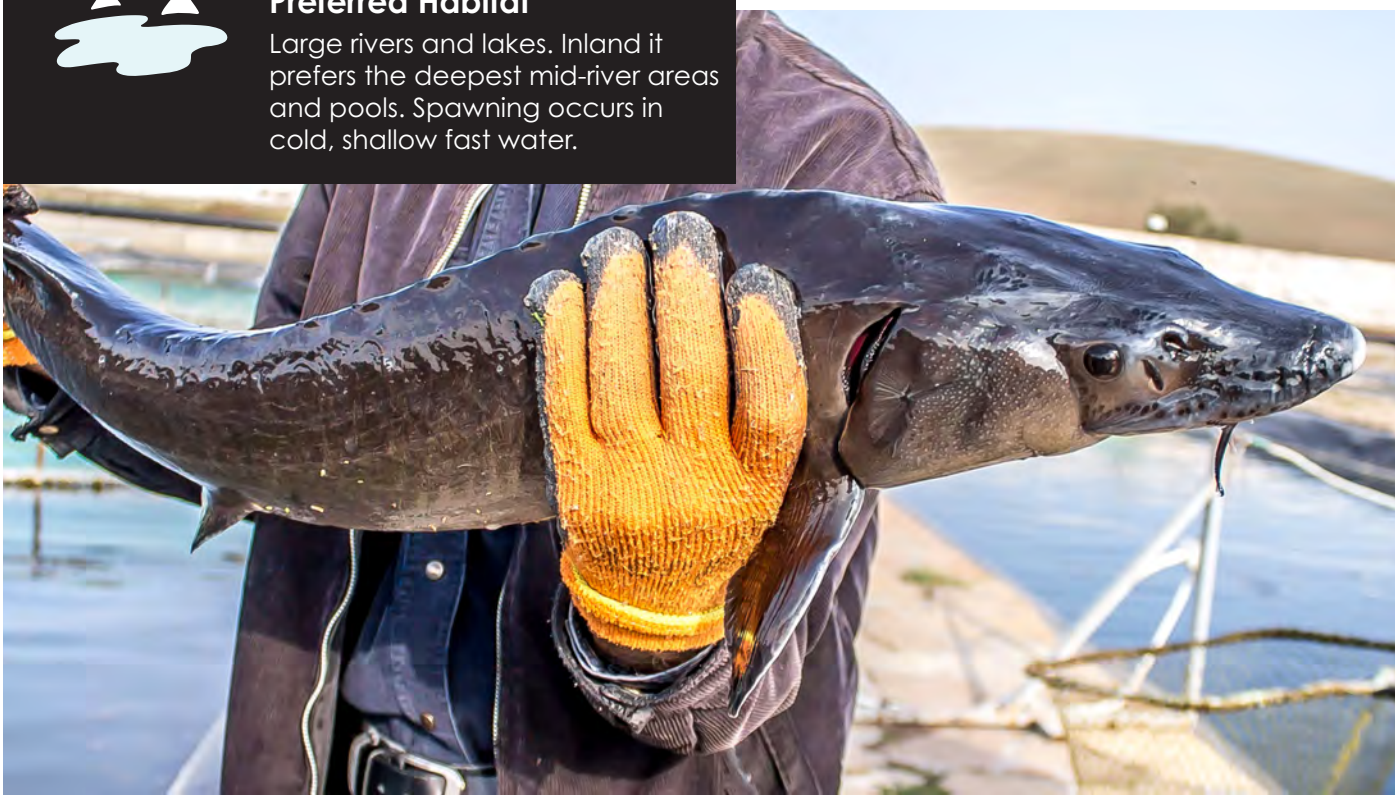
Menominee Name

Importance to the Menominee

Namāēw is a clan within the Bear Clan. The Sturgeon Clan are the Gift of Mä'näbus. Namāēw provide the Menominee with sustenance and medicine and are celebrated each spring. It is the duty of Namāēw to watch over the rice beds.

Preferred Habitat

Large rivers and lakes. Inland it prefers the deepest mid-river areas and pools. Spawning occurs in cold, shallow fast water.



Lake Sturgeon • Namé • Namāēw

Climate Impacts

Warmer Temperatures

Spawning dates are dependent on water temperatures and can vary widely year to year. Hatching of eggs also depends on water temperature. Projected increases in stream and lake temperatures may reduce the time stream temperatures are ideal for spawning. (3 steps)

Drought

It is unlikely that drought will alter the hydrologic suitability of namé habitat. (0 steps)

Predators

No predators expected to increase with climate change. (0 steps)

Pathogens

Namé may be vulnerable to an increase in pathogens. Egg mortality can be attributed to bacterial and fungal diseases. Namé are also susceptible to parasitism by other organisms. (2 steps)

Extreme Precipitation

Namé may be negatively impacted by increased sedimentation and deteriorated habitat from extreme precipitation, Egg mortality can be attributed to sediment deposition and water level fluctuations. (2 steps)

Decrease in Snowfall

Namé are not known to be impacted by decreases in snowfall. (0 steps)

Genetic variation

Information not available. (0 steps)

Competing Beings

Namé are not expected to be outcompeted by other beings. (0 steps)

Changes in Diet

Climate change is not expected to affect the diet of namé. (0 step)

Ability to Disperse (move)

There are some natural barriers like disconnected rivers, isolated lakes, etc. that may increase namé's vulnerability to climate change. Dams, spillways, and their impoundments also impact dispersal. (2 steps)

Human Development

Dams, spillways and their impoundments decrease the ability of namé to disperse in response to changing climate conditions. (2 steps)