



Ji'kaw

Mi'kmaq Ecological Knowledge: Striped Bass in Unama'ki

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(except photos where noted)

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We would like
to dedicate this
publication to
beloved family
members and
Elders of Unama'ki
who have carried
on the traditions
and shared their
knowledge and
passion for
the resource.

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Introduction

Aboriginal Traditional Knowledge (ATK) is a broad description of an integrated package of knowledge that includes the local knowledge of species, environmental practices and management systems, social institutions that provide the rules for management systems, and world views that form the basis for our beliefs. ATK comes from watching and listening, through direct experience of song and ceremonies, through the activities of hunting and daily life, from trees and animals, and in dreams and visions.

Knowledge, values, and identity are passed down to the next generation through practice, ceremonies, legends, dance, or song. ATK, and more specifically Mi'kmaq Ecological Knowledge (MEK), the Mi'kmaq way of life, is derived from centuries of interaction, observation, and adaptation to the natural environment. It is the Mi'kmaq science of survival intertwined with spirituality and culture unique to the people.

The collection and preservation of ATK is becoming more important. Initially used in land negotiations, ATK is increasingly recognized for use in scientific assessments, management plans, and recovery strategies for several species protected through Canadian legislation, known as the Species at Risk Act. Because of the potential use for MEK for culturally important species such as the American eel (katew), and Atlantic salmon (plamu), demand for specific ecological knowledge held by the Mi'kmaq is increasing. While there are protocols in place for the collection of MEK, little documentation has been produced for sharing this knowledge beyond the community's use and culture.

The Unama'ki Institute of Natural Resources (UINR) is an organization that represents the five Mi'kmaq communities of Unama'ki (Cape Breton Island, Nova Scotia) on natural resources issues. UINR contributes to an understanding and protection of the Bras d'Or Lakes' ecosystem through research, monitoring, education, management, and by integrating Mi'kmaq and conventional ways of understanding, known as Two-Eyed Seeing. UINR was identified as the lead organization to collect, interpret, and store MEK for this region.



Mi'kmaq World View

The Mi'kmaq are part of Wabanaki, the Algonquin-speaking confederacy that includes four other Nations; Maliseet, Passamaquoddy, Penobscot, and Abenaki. Mi'kma'ki (land of the Mi'kmaq) includes the five Atlantic provinces and northern Maine.

Mi'kma'ki was held in communal ownership.

Land and its resources were not commodities that could be bought and sold but were considered gifts from the Creator. This view is very different from the Western view of land.

Mi'kmaq were caretakers of the seven districts of Mi'kma'ki and we strived to live in harmony. This belief remains strong in our culture today.

We view the world and all that is in it as having spirit. We consider all life equal to our own and treat it with respect. We developed an intimate understanding of the relationships between the living and non-living so that each plant, animal, constellation, full moon, or red sky tells a story that guides our people so they can survive.

These beliefs affect the manner in which we treat the natural world for sustenance and survival. Animals and plants are not taken if they are not needed. All spirits are acknowledged and respected as relatives and are offered tobacco, prayer, or ceremony (or combination) when taken. No part of an animal is wasted. All parts that cannot be used are returned to the Creator.

This consciousness is described by the Mi'kmaq word, Netukulimk.

The Mi'kmaq right to fish for food, social and ceremonial needs, and for a moderate livelihood, is recognized by the Supreme Court of Canada and protected by the Constitution of Canada.



Bras d'Or Lakes



The Bras d'Or Lakes, situated in the center of Cape Breton Island, Nova Scotia, are a large estuarine body of interconnecting bays, barachois ponds, channels, and islands. The Bras d'Or Lakes formed approximately 10,000 years ago when the existing basin that was carved out of soft sandstone from the last glacial period became flooded by adjacent ocean water.

The term "Lakes" refers to two main components. The North Basin and the Bras d'Or Lake, connected by a 500 m wide opening (Barra Strait), are known collectively as the Bras d'Or Lakes.

The smaller component, the North Basin, branches into two channels that lead to separate small openings to the Atlantic Ocean.

The Great Bras d'Or Channel is 30 km long with an average depth of 19.5 m, average width of 1.3 km and is the source of the majority of saltwater exchange between the Lakes and Sydney Bight (Atlantic Ocean).

St. Andrew's Channel connects to Sydney Bight through a much more restrictive opening known as the Little Bras d'Or Channel. This channel, 8 km in length, less than 100 m wide, and approximately 5 m deep, does not contribute significantly to temperature and salinity distributions. At their southern-most point, the Bras d'Or Lakes connect to the Atlantic Ocean at St. Peters, a small, man-made canal that allows only an occasional exchange of water during vessel movements.

The Bras d'Or Lakes have been designated in the World Network of Biosphere Reserves by the UNESCO-Man and the Biosphere Programme.

The perimeter of the Bras d'Or Lakes measure approximately 1,000 km and have a total area of 1,080 km². Their average depth is 30 m but varies throughout. St. Andrew's Channel, for example, has a maximum depth of 280 m while small bays and coves have average depths of 10 m or less. Tidal range diminishes rapidly from the Great Bras d'Or Channel inward, with tidal ranges between 16 cm near the entrance to 4 cm at Iona.

Currents also follow the same pattern but are stronger in the channels and choke points. Salinity and temperature varies by area. Salinity ranges from 30 ppt in the Great Bras d'Or Channel to salinities lower than 18 ppt in semi-enclosed basins, but averages tend to fall around 22 ppt in most of the open regions. Winter temperatures fall to just below 0°C and the coves and ponds freeze over. However, in the past few years, some of these areas did not freeze. Summer temperatures exceed 16°C in July and surface and sub-surface temperatures are even higher (greater than 20°C) in shallow coves, especially in River Denys Basin. Substrata are primarily silt with smaller proportions of sand, gravel, and boulders.

The environmental quality of the Lakes is still considered to be very good. Sewage is the primary source of pollution. Sediments from land are becoming increasingly difficult to control and have the potential to alter important habitats.

Organic contamination and heavy metals in sediments, water, and biota are well below the federal sediment and water quality guidelines.

The Bras d'Or Lakes has been described as having a relatively low level of natural productivity.

The Bras d'Or Lakes are home to a variety of biota. Warm and cold water fish and invertebrates are present with several fish species, such as mackerel, herring, and salmon migrating to the Lakes annually to spawn. The primary commercial fisheries are for lobster, eel, and gaspereau. Invasive species, such as the green crab, the MSX oyster disease parasite, eel swimbladder parasite, and the golden star tunicate have found their way into the Bras d'Or Lakes. With their rare physical and chemical oceanography, range of temperate, arctic biota occurring in less than 10 km of water, and diversity of habitats, the Bras d'Or Lakes are truly a unique ecosystem.

The Bras d'Or Lakes are of great significance to Mi'kmaq heritage in this region. The Mi'kmaq word for Bras d'Or Lakes is Pitu'paq, meaning "to which all things flow." The Bras d'Or Lakes have provided a food source for Mi'kmaq. Numerous fish species, such as mackerel, trout, salmon, smelt, gaspereau, cod, hake, flounder, herring, eel, and others provide protein to our diet, as do resident invertebrates such as lobster, mussels, oysters, clam, scallops, whelks, and quahogs. Numerous bird species, such as geese and duck, have thrived here and were hunted. These gifts are important to communal health and are intertwined in our culture. The Lakes are also a means of transportation between hunting and fishing areas and those used for spiritual solidarity, like Malikewe'j (Malagawatch) or Mniku (Chapel Island).



Knowledge Gathering

Mi'kmaq ecological knowledge gathered for this report was collected from Mi'kmaq harvesters through a series of interviews and workshops.

For knowledge collection and sharing, UINR follows Mi'kmaq Ecological Knowledge protocols established by the Assembly of Nova Scotia Mi'kmaq Chiefs, Mi'kmaq Ethics Watch (Unama'ki College), Unama'ki Parks Canada sites (prepared for Parks Canada by UINR 2007), and advice of Elders and fishers.

In September 2011, the application for the collection of Mi'kmaq ecological knowledge on striped bass was submitted to the Mi'kmaq Ethics Watch for consideration for approval. Approval was obtained in December 2011.

A workshop was held March 5, 2012 in Membertou, Cape Breton, Nova Scotia. Selection of participants included a balance of Elders, current harvesters, Aboriginal Fishery Guardians, and knowledge holders. Knowledge holders were not randomly selected. Selection of Elders was based on a referral method from UINR's Elder Advisor. Current harvesters were selected from a pool of individuals who were representative of active harvesters.

Another workshop was held March 28 and March 31, 2012 to add to existing knowledge and to interpret and review the knowledge gathered.

Knowledge

The views in this report do not represent those of the entire Mi'kmaq nation. Participation by UINR and the Mi'kmaq in this workshop group is not, and should not, be construed as consultation. Any new areas being proposed by the Crown(s) to have expanded legal protection would require separate consultation under the Mi'kmaq-Nova Scotia-Canada Consultation process.

The knowledge contained in this report is strongly connected to Mi'kmaq tradition, the practice of striped bass harvesting in the Bras d'Or Lakes, and the transfer of knowledge between generations through stories and practice.





Ji'kaw/Striped Bass Harvesting

Striped bass is not harvested as often as other species due to its limited visits to the Bras d'Or Lakes and rivers, but harvesters are guaranteed to capture at least one striped bass per year if harvesting in the right location at the right time of year.

Striped bass is caught with rod and reel, spear, harpoon, and nets.

The lures used for bait include the red devil, artificial eels, shrimp, bloodworms, and surface baits. It has been baited with mice, smelt, herring, and gaspereau. Often, striped bass is caught incidentally when harvesting other species, such as salmon.

Most striped bass is captured in the evening, however it can be caught during the day as well.

Ji'kaw/Striped Bass in Unama'ki

Mi'kmaq harvesting spans many generations and is a reflection of local and intimate understanding of many of the fish species found in the Bras d'Or Lakes. Harvesting of striped bass and the practice and transfer of this knowledge are important and active components of Mi'kmaq culture in Unama'ki today.

Harvest Timing

Striped bass is observed in the Bras d'Or Lakes in late spring, remaining there until the end of October to November and, on some occasions, in winter. In the past, striped bass was caught during ice fishing and was too big to fit through the hole. A large part of the migration of striped bass to the Bras d'Or Lakes happens in spring and coincides with the gaspereau run. Striped bass can be observed jumping and travelling in schools at this time. Striped bass is commonly observed in areas where gaspereau are known to spawn, such as coastal lagoons (locally known as barachois ponds) around the Bras d'Or Lakes, and may be feeding on gaspereau eggs, larvae, or juveniles.

Another indication of the arrival of striped bass to the area is the presence of barn swallows. However, the majority of striped bass harvesting occurs mostly in late summer and fall.

Weather, and the presence of other fish for food, likely influences the movement of striped bass in the Bras d'Or Lakes.



Photo: MicMac News



Habitats

The harvesting location is important as striped bass is found in certain areas for a limited amount of time. Striped bass is found in fast-moving water and in areas where gaspereau are known to spawn, such as barachois ponds found along the Bras d'Or Lakes, and where there is an abundance of food. In general, areas where striped bass are found in the Lakes are those of higher freshwater input where there is shelter offered by sandbars, and where there is an abundance of aquatic vegetation. In these environments, striped bass resembles a log on the bottom. Striped bass is also observed in the pools of Margaree River, where it is found on rocky bottoms with overhanging banks.

Many feel that the Bras d'Or Lakes serve as a nursery area, especially barachois ponds. Barachois ponds are home, albeit temporarily, to all sizes of striped bass. The large barachois pond in East Bay was identified as an area of importance to striped bass of various sizes and was the site where the Canadian record for striped bass was landed at 26.8 kg (59 pounds). Until recently, small striped bass was not commonly observed in the Bras d'Or Lakes. Small striped bass is observed in the Judique area on the west coast of Cape Breton Island. Ten areas in the Bras d'Or Lakes were identified as striped bass harvesting locations, with as many identified outside the Lakes.

Many harvesters believe local rivers are spawning areas as striped bass is consistently present every year. Food availability is likely a factor in the movements of striped bass into the Bras d'Or Lakes. Striped bass may be following migrating schools of herring and gaspereau and feeding on juveniles.

Many harvesters clean striped bass on site and return unused parts back to the water to feed other fish. This on-site cleaning gives an opportunity to examine stomach contents of striped bass. Elvers, crabs, and small mussels have been observed in its stomach and harvesters comment that it will feed on anything that can fit its mouth.

Eels and gaspereau have been successfully used as bait. Striped bass also eat white perch. Many of these species are common to the Lakes and barachois ponds. Herring was also identified as another food source.

There are few predators of large striped bass. Seals, otters, porpoises, eagles, and bears are believed to be its primary predators.

In the past, several striped bass have been caught incidentally in August and September in Indian Bay, located in St. Patrick's Channel. Other areas where striped bass were observed were outside the Mi'kmaq communities of Eskasoni and Wagmatcook, and also in the area of West Bay.



Parasites

Parasites are not commonly observed in striped bass in the Bras d'Or Lakes. However, parasites were observed in striped bass in McNab's Cove in the southern part of the Bras d' Or Lakes. Harvesters report seeing holes on the side of the fish and were not sure whether they were puncture marks or infections.



Preparation and Uses

Striped bass is primarily harvested for food for personal consumption, and for feasts and events such as powwows.

Harvesters often speak of fish size in terms of small, medium, and large. Generally, for striped bass, small is under 20 inches (51 cm), medium corresponds to 24-30 inches (61 to 76 cm), and larger striped bass is described as greater than 30 inches (76 cm). These descriptions likely reflect the experience of the harvesters in observing a wide variety of sizes of striped bass in the Bras d'Or Lakes and rivers around Unama'ki.



Fish larger than 24 inches (61 cm) is commonly kept for food. If harvesters capture fish smaller than 20 inches (51 cm), it is carefully returned to the water. In general, harvesters will target medium to large fish, but prefer the taste of medium-sized fish. As encounters of striped bass in the Bras d'Or Lakes are seasonal, harvesters feel that they cannot afford to be choosy about fish size, but if small ones are caught, they are released. Smaller striped bass is not targeted for harvesting. It is viewed as the future striped bass fishery.

There are different ways to cook striped bass based on its size.

Many feel that sizes 24-28 inches (61-71 cm) are best for cooking. These fish are often filleted, then fried or baked. Fish larger than 30 inches (76.2 cm) is usually prepared as steaks.

The flavour of striped bass varies across habitats. River-captured striped bass has less flavour than that captured in estuarine waters. Striped bass has better flavour, a saltiness, when captured before entering freshwater. Striped bass has been described as having a mild flavour very similar to haddock.



Current Status

Generally, only a few select areas are known as striped bass harvesting sites. Striped bass is occasionally encountered in Whycocomagh and Nyanza Bays and Grand River, but are observed consistently every year in East Bay and the Mira River.

Harvesters feel that the population is at least stable with observations that it is increasing. This may be a reflection of the increased number of people engaged in striped bass harvesting. However, striped bass in the Eskasoni area was described as decreasing.

The time it takes to capture striped bass has not changed over time. It may take two to three days of checking to see if striped bass is present and when it is, it can be captured quickly, or may take a few hours. It can be caught every day when the run is coming in.





Netukulimk: Traditional Management

As striped bass is used as food by the Mi'kmaq, it is only harvested when needed. If there is no desire for a striped bass feed, then it will not be harvested, unless captured by accident.

Gear types also limit harvesting. Striped bass is seen as a fussy fish that does not bite every time. Certain bait, such as gaspereau and eels, seems to work better than others.

Season also restricts striped bass harvesting. There are only a few short months of the year when striped bass is available for local harvest.

Harvesters rotate harvesting areas to allow species to replenish.

Photo: MicMac News

The Value of Ji'kaw/ Striped Bass

Striped bass is food for the Mi'kmaq.

Many harvesters enjoy the sense of accomplishment of harvesting such a large and powerful fish that can feed many people.



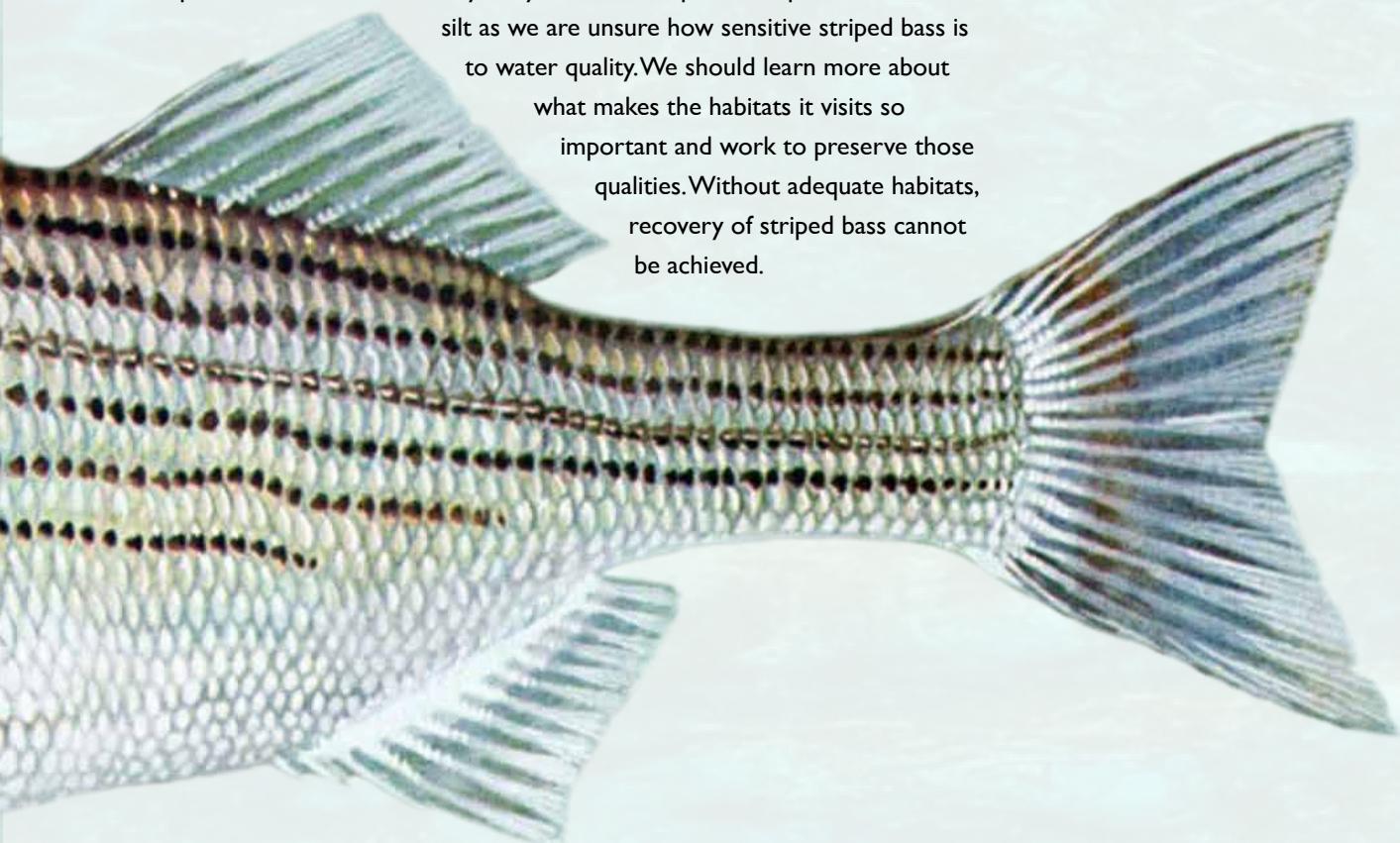
Mi'kmaq Concerns

Wasting striped bass is a concern. If people are not going to eat it, then it should not be harvested.

Striped bass is in the Bras d'Or Lakes and rivers in Unama'ki for some purpose, because it is here every year for a short time. Since it is not found throughout the Bras d'Or Lakes, special consideration should be given to preserving those habitats that striped bass returns to annually. They should be kept free of pollutants and

silt as we are unsure how sensitive striped bass is to water quality. We should learn more about what makes the habitats it visits so important and work to preserve those qualities. Without adequate habitats, recovery of striped bass cannot be achieved.

Freshwater habitats are affected by logging activities that destroy pools (for example, around McNab's Cove), and by pollution from agriculture.





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Photo: Brad Billett



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**UINR-Unama'ki Institute
of Natural Resources**

is Cape Breton's Mi'kmaq
voice on natural resources
and the environment.

UINR represents the five Mi'kmaq
communities of Unama'ki in
forestry, marine science research,
species management, traditional Mi'kmaq
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