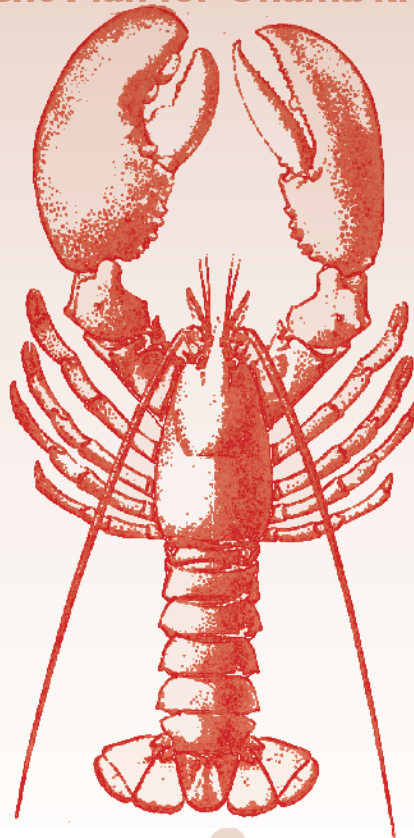


Unama'kik Jakejue'ka'timk
Food, Social, and Ceremonial Lobster Fishery
Management Plan for Unama'ki 2007-2008



September 2007

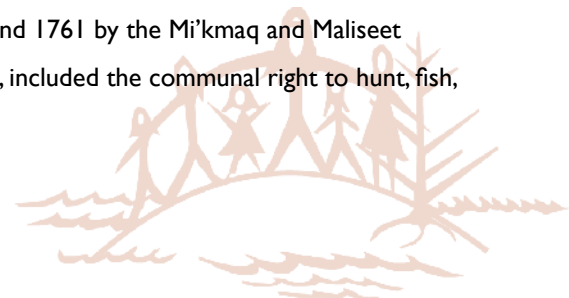


1.0 Introduction

The Mi'kmaq are one of the distinct Aboriginal Peoples of Canada and the traditional caretakers of Mi'kma'ki—the land that extends from the Gaspé Peninsula of Quebec, all of Nova Scotia, Prince Edward Island, the north shore to Saint John River of New Brunswick, to portions of Newfoundland and Maine. The Mi'kmaq governed through councils based on consensus and in accordance with the laws of nature. Traditionally, the Mi'kmaq Grand Council was the leader of the Mi'kmaq nation. In the Grand Council were the Grand Chief, Grand Captain, Captains, and seven District Chiefs. District Chiefs were responsible for confirming and reassigning hunting and harvesting territories under the guiding principle of Netukulimk—“the Mi'kmaq way of harvesting without jeopardizing the integrity, diversity, or productivity of our environment”. It is the Mi'kmaq way of resource management that includes a spiritual element that ties the people to the plants, animals, and the environment as a whole. It is the intent of this plan that all of nature's bounty, both land and sea, be harvested under this concept.

With the arrival of the Europeans to modern day North America, negotiations were initiated with the Mi'kmaq to develop relationships of peace, friendship, and understanding. Following the foundation of this relationship, formal agreements were established as nation-to-nation Treaties. Aboriginal and Treaty rights, and the right to self-governance are recognized and affirmed in the Constitution of Canada, giving the Mi'kmaq rights, freedoms, and liberties, which include (among other things), the right to fish, fowl, hunt, gather, and trade. These rights have Constitutional protection and prevail over all other laws and actions of the federal and provincial governments. Present day Mi'kmaq are the beneficiaries of these Treaties.

There are numerous court cases that confirmed the Aboriginal right to fish, whether on reserve or off. The Mi'kmaq of Nova Scotia possess an Aboriginal right to fish for food for themselves or their families, independent of any Treaty-based right (*R. v. Denny, Paul and Sylliboy*, 1990). This right takes priority over the interests of recreational and commercial fishermen. The Sparrow Decision in 1990 also reaffirmed the Aboriginal right to fish, but addressed the role of Aboriginal Peoples in the co-management of the fisheries resource. From this decision, it was determined that the Mi'kmaq have an important role in management decisions, and government must provide Aboriginal Peoples with meaningful participation in the development of conservation and management plans. The most recent court ruling, the Marshall decision (1999), confirmed that, the Treaties signed in 1760 and 1761 by the Mi'kmaq and Maliseet communities of present-day Atlantic Canada, included the communal right to hunt, fish, and gather for a “moderate livelihood”.



Today, many First Nation communities have entered into modern fishing agreements for food, social, and ceremonial (FSC) purposes through Aboriginal Fisheries Strategy (AFS) agreements, and for commercial access through Interim Fisheries Agreements (Marshall agreements). These agreements do not extinguish Mi'kmaq rights to hunt, fish, and gather for food, or to pursue a moderate livelihood, but provide access to resources under a defined management framework. Marshall agreements provide access to commercial fishing licenses with profits from the sale going back to the community. Licenses obtained through Marshall agreements follow the same regulatory conditions and conservation measures as the rest of the commercial industry. AFS agreements provide access for food, social, and ceremonial needs with the stipulation that catch cannot be sold, traded, or bartered. They also have provisions that restrict the amount of fish that may be caught, fishing methods, and seasons. Many different species are included under each communal AFS agreement and each community may have different provisions. The five First Nation communities of Unama'ki (Cape Breton Island)—Eskasoni, Membertou, Potlotek, Wagmatcook and We'koqma'q—have entered into these agreements with the Government of Canada, and renegotiate their AFS agreements annually. These AFS agreements have been signed every year since 1992.

While Mi'kmaq have Aboriginal and Treaty rights to harvest resources as usual, we also have the responsibility to ensure nature's gifts are not abused or wasted. We have an inherent responsibility to ensure the integrity, diversity, and productivity of these gifts is there for future generations. This responsibility is an equal and integral component, intertwined with our culture and way of harvesting. This management plan is a reflection of our concern for this gift and describes the ways in which we will work responsibly toward long-term ecological sustainability of the lobster resource.

The management plan is directed to the food, social, and ceremonial fishery for American lobster (jakej; *Homarus americanus*) that takes place along the eastern coast of Cape Breton and the inland waters of the Bras d'Or Lakes (Figure 1; LFAs 27-30 as defined in the 1985 Atlantic Fishery Regulations). These areas are currently identified as fishing locations within current AFS agreements signed by Unama'ki Mi'kmaq communities.



This plan was developed with FSC lobster fishers, elders, members of the Grand Council, and other knowledgeable community members to address concerns with current conservation provisions set out in the AFS agreements. This plan is **voluntary** and will be used to complement current conservation conditions outlined in the AFS agreements. In the absence of AFS agreements, this management plan will still apply to the Unama'ki food, social, and ceremonial lobster fishery.

The duration of the plan will cover the FSC fishing season of the fall of 2007 to the fall of 2008 (15 September 2007 to 14 September 2008).

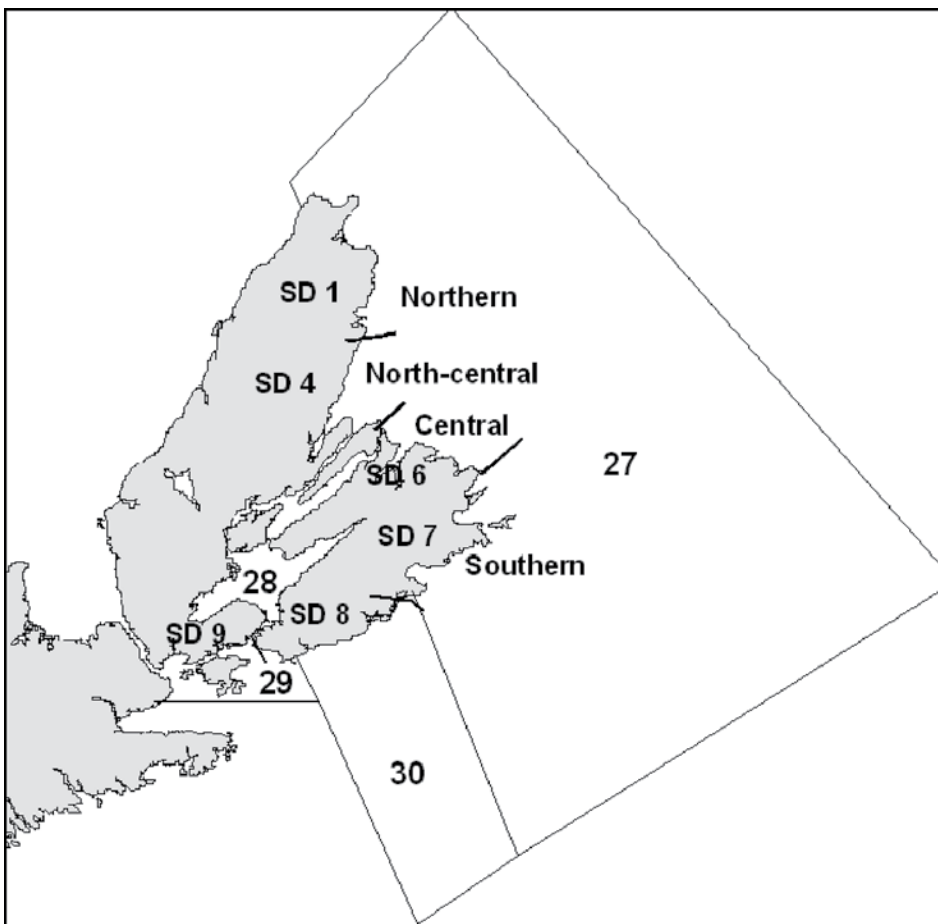
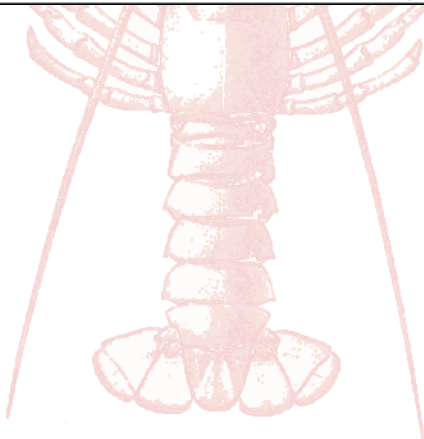


Figure 1.
Map of Eastern Cape Breton identifying
lobster fishing areas (LFAs) 27-30
(Tremblay and Reeves 2004)



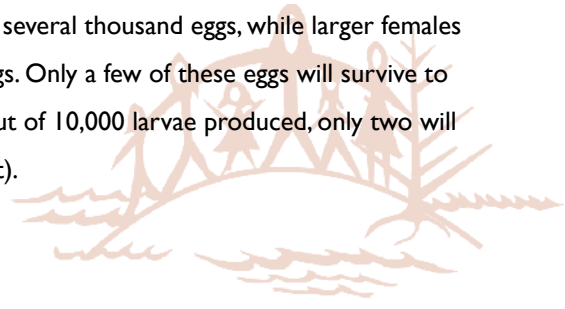
2.0 Biological Synopsis

Loosejaw (American lobster, *Homarus americanus*) are found along the coast and in the estuaries of North America from Labrador to North Carolina. They are commonly found in depths of less than 50 m, but have been observed in depths of up to 700 m. Some areas have greater abundance of lobster than others, such as the south shore of Nova Scotia and many areas of the Gulf of St. Lawrence. A lucrative fishery exists in Atlantic Canada for this species. In 2005, the fishery had a landed value of \$684 million.

In order to grow, lobsters must moult (shed their shells). When the lobster gets too large for its shell, the cephalothorax (carapace) splits in two and the lobster pulls its body through first, then its claws, legs, and finally its tail. Once the lobster is out of its shell, it is very soft and vulnerable to predation. The lobster takes in a large amount of water to increase its volume and a new shell begins to form. It takes about one month for the shell to become hard again. When the shell becomes hard, the lobster releases the excess water and has room to grow in its new shell. After moulting, lobsters are 15 to 20 % larger and 40 to 50 % heavier. Moulting occurs during the summer months when water temperatures are warmer. Lobsters will moult many times throughout their lives, but will moult less frequently as they get larger. After sexual maturity is reached, a female lobster may only moult once every two years, while the male may continue to moult annually. As a result the male may become larger in size than a female of the same age. A lobster may moult as many as 20 times before it reaches commercial size. This translates to roughly eight to 10 years of age. Currently, there are no techniques to determine the precise age of a lobster, so we don't know how long they can live. The largest recorded lobster landed off the coast of Nova Scotia (in 1977) was 20 kg (44 lbs) with an overall length of 1 m (3.3 ft).



The life cycle of lobster is complex (Figure 2). Lobsters mate after the female moults and her shell is still soft. A male lobster of similar or larger size will flip the female over on her back and transfers sperm cells into the female using his gonopods (Figure 3). After mating is over, she is flipped back onto her legs and is protected by the male for a few days until her shell hardens. After mating, the female can keep the male's sperm for one year and even longer, using it to fertilize her eggs when they are transferred under her tail. Most females lay their eggs the year after mating. Here they remain glued to her body another nine to 12 months. She protects her eggs by keeping her tail curled up under her, but she may lose up to 50% of her eggs from disease, parasites, predation, or handling from fishers. Small females produce several thousand eggs, while larger females can produce several tens of thousands of eggs. Only a few of these eggs will survive to become adult lobsters. It is estimated that out of 10,000 larvae produced, only two will survive to adulthood (0.02% survival to adult).



Hatching occurs in the summer when water temperatures increase to 10° C, usually during June through August. The female lifts her tail and thousands of larvae float to the surface and remain within the top metre of water for three to nine weeks, depending on local water temperature. At this time, larval lobsters look like tiny shrimp, and their movements are determined by currents and local wind action.

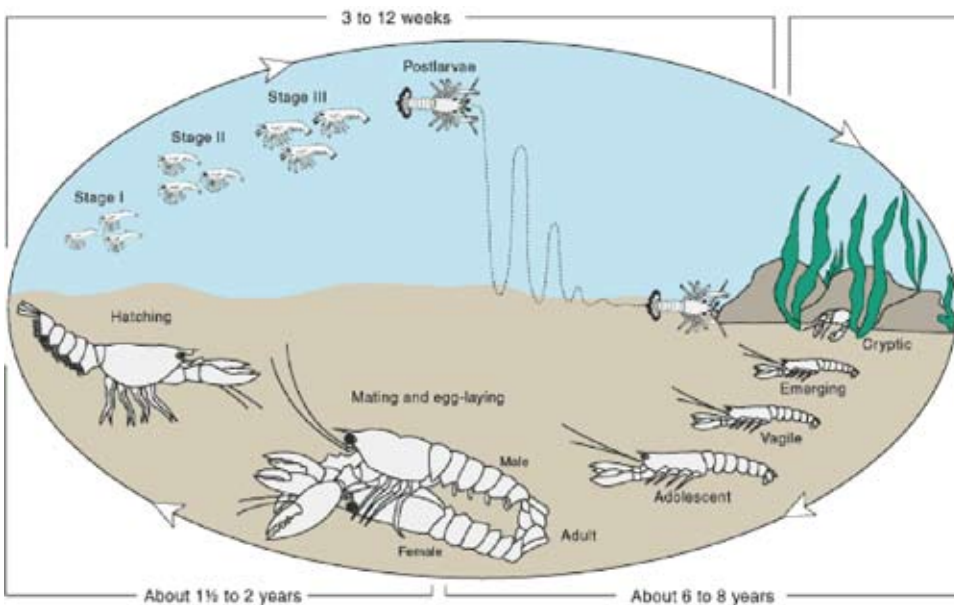
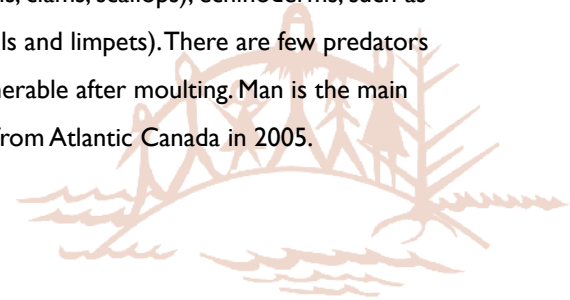


Figure 2.

Life cycle of the American lobster
(Taken from www.osl.gc.ca/homard/en/schema-cycle-de-vie.html).

At this stage they moult twice, to reach a size of about 11 mm (known as stage III larvae). At the third moult, they undergo metamorphosis from shrimp-like stage III larvae to post-larvae, where they resemble miniature lobsters. At this stage they are able to explore and actively search for places to settle. Once a place on bottom is found, usually within the crevices of gravel and cobble bottom, they moult quickly. They will remain benthic (i.e. on bottom) for the rest of their existence. After settling on bottom, they are cryptic and stay hidden for about a year to protect themselves from predators, such as cod, flounder, wolf fish, ocean pout, monkfish, dogfish, and smaller crabs. They come out at night to feed on copepods, gastropods, fish eggs, small sea urchins, and marine worms. As the lobsters increase in size, they will have to find new shelter. For the next six to eight years (from 15 mm to 55 mm carapace length and greater depending on local water temperatures), they will go through several stages that describe how they live and feed until they reach sexual maturity.

Adult lobsters feed on crab, shellfish (mussels, clams, scallops), echinoderms, such as urchins, marine worms, and gastropods (snails and limpets). There are few predators of adult lobsters, but they are especially vulnerable after moulting. Man is the main predator and removed over 50,721 tonnes from Atlantic Canada in 2005.



Maturity rates vary from area to area and are dependent on local water temperatures. The length at which 50% of the females are mature is used as the basis for maturity estimates. In northern Cape Breton, this length is estimated to be 73 mm carapace length (CL); 78 mm CL off the east coast of Cape Breton; and 84 mm CL off the southern and southeastern coast of Cape Breton (DFO 2004). There are no maturity estimates for the Bras d'Or Lakes, but females appear to bear eggs at sizes similar to those in the northern half of Cape Breton.



Figure 3.

Comparison of the first pleopods (swimmerets) in male (left) and female (right) lobsters. The first pair of pleopods in males are modified into hardened structures called gonopods.

(Photo: S.Denny)



3.0 Overview of the fishery

Prior to the establishment of a commercial fishery for jakej (lobster) in Atlantic Canada, lobsters were commonly harvested for food by the Mi'kmaq during our annual spring to fall fishing season using spears, traps, swimming, and diving. In the past, we harvested lobsters from all areas in Atlantic Canada. Currently, each of the five Mi'kmaq communities have access to the lobster resource in eastern Cape Breton (LFAs 27,29-30) and the Bras d'Or Lakes (LFAs 27-28) under our AFS agreements. As each community is responsible for negotiating its own agreements, there are differences in location of the fishery, seasons, catch method, and trap allocations among communities.

3.1 Location and time- frame or duration of the fishery

Table 1.

Trap allocation and areas fished as set out in the Community Aboriginal Fishery Agreements.

Community	Lobster Fishing Area (LFA)	Total # of Traps	Catch Method
Eskasoni	27,28,29,30	250	Traps
Membertou	27,28	250 in season one; 200 in season two (see Table 2)	Traps and/or diving
Membertou	29	50	Traps and/or diving
Potlotek	28, 29, 30	250	Traps
Wagmatcook	27,28,29	250	Traps
We'koqma'q	27,28,29	275	Traps



Table 2.

Seasons set out in AFS agreements according to areas fished.

Community	LFAs	Season one	Season two	Season three
Eskasoni	27	1 June to 20 July 2007	21 July to 31 May 2008	
	28	1 June to 20 July 2007	21 July to 31 May 2008	
	29	1 June to 20 July 2007	21 July to 31 May 2008	
	30	1 June to 20 July 2007	21 July to 31 May 2008	
Membertou	27	1 June to 15 July 2007	29 September 2007 to 31 May 2008	
	28	1 June to 9 July 2007	29 September 2007 to 31 May 2008	
	29	1 June to 10 July 2007	29 September 2007 to 31 May 2008	
Potlotek	28	1 June to 1 July 2007	1 October to 1 November 2007	9 May to 31 May 2008
	29	1 June to 20 July 2007	21 July to 14 November 2007	1 May to 31 May 2008
	30	1 June to 14 November 2007	21 July to 15 November 2007	2 May to 31 May 2008
Wagmatcook	27	1 June 2007 to 15 November 2007	15 May 2008 to 31 May 2008	
	28	1 June 2007 to 15 November 2007	1 May 2008 to 31 May 2008	
	29	1 June 2007 to November 2007	9 May 2008 to 31 May 2008	
We'koqma'q	27	1 June to 14 November 2007	1 May to 31 May 2008	
	28	1 June to 14 November 2007	9 May to 31 May 2008	
	29	1 June to 14 November 2007	10 May to 31 May 2008	



3.2 Landings

The FSC lobster fishery has been underutilized. While many communities have a maximum allocation of 250 to 275 tags, less than 15% are distributed each year, with the exception of Potlotek and Eskasoni in 2006 (250 tags issued). Reporting of catches are mandatory under AFS, however, like many other fisheries, reporting is poor and needs improvement. Potlotek estimated catches of 6,053 kg (13,345 lbs) harvested from LFA 29 in 2006. These may have included catches from other communities. Overall, catches remain relatively small. It is estimated that the FSC fishery takes less than 1% of the total landings of the commercial fishery in these lobster fishing areas.

3.3 Advisory process

Presently, the only reviewers of the FSC fishery are Fisheries and Oceans Canada. Mi'kmaq have little say in how we manage our food fishery and have less responsibility in reporting to our people. A Mi'kmaq advisory process would allow the community to review the management plan, landings, get updates of stock status, integrate traditional knowledge, and play a greater role in the co-management process. This process will link the inherent rights of the Mi'kmaq of Unama'ki to our inherent responsibility for the benefit of future generations. It will also serve as our link to traditional resource management.

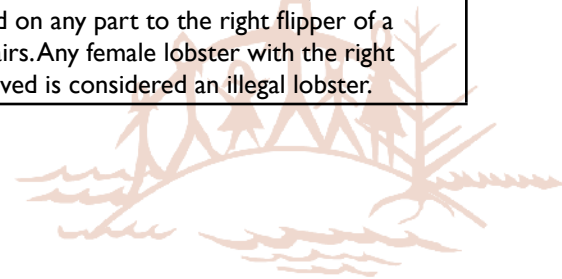
In general, an advisory committee will meet with the Grand Council members from Unama'ki to jointly review the management plan, annual landings, and make recommendations for the management of the FSC lobster fishery for the up-coming year. The advisory committee and Grand Council would also be informed of those individuals who have abused their rights and make referrals to healing circles to determine appropriate sanctions, if needed. The advisory committee will be made up of four individuals from each community. It was suggested (but communities may decide) that one elder, two fishers (one of which must be a youth), and one natural resource officer (or designated individual) be selected from each of the five Mi'kmaq communities. In addition, there will be a biologist from the Unama'ki Institute of Natural Resources (UINR). In total, this committee would have a maximum of 21 members that would meet annually with the Grand Council before the commencement of the fall fishing season (first meeting targeted for August 2008). Terms of reference are under development.



3.4 Management style

Management of the FSC lobster fishery is based on input controls, such as gear limits, and technical measures similar to the commercial lobster fishery for each LFA. Unlike seasons and trap limits, conservation measures set out in AFS agreements do not differ among the five Mi'kmaq communities. The conditions set out in the AFS agreements are as follows:

Gear, Methods, and Other Conditions	
1	All traps must be tagged with valid lobster trap tags issued by DFO (tag numbers specific to each community).
2	All lobster traps onboard a vessel must have in the exterior walls of each parlor in the trap, and not more than 250 mm from the floor of each trap, at least: <ul style="list-style-type: none"> (a) two unobstructed, circular openings, the diameter of each is not less than 57.2 mm; or (b) one unobstructed, rectangular opening the height and width of which is not less than 44 mm (height) by 127 mm (width). Note: In LFA 27: No person shall fish with, or have on board the vessel, a lobster trap unless the trap has, in the exterior walls of each parlor in the trap, and not more than 250 mm from the floor of each trap, at least <ul style="list-style-type: none"> (a) two unobstructed circular openings the diameter of each is not less than 50.8 mm; or (b) one unobstructed, rectangular opening the height and width of which is not less than 38.1 mm (height) by 127 mm (width).
3	No person shall fish with, or have on board a vessel, a lobster trap that exceeds: <ul style="list-style-type: none"> (a) 125 cm in its greatest length; (b) 90 cm in its greatest width; or (c) 50 cm in its greatest height.
4	No person shall fish with, or have on board a vessel, a lobster trap unless the trap: <ul style="list-style-type: none"> (a) has, in one exterior wall of each parlor, an escape panel that provides, when removed, an unobstructed opening not less than 89 mm in height and 152 mm in width, and that is fastened to the lobster trap with: <ul style="list-style-type: none"> (i) untreated cotton or sisal twine that does not exceed 4.8 mm in diameter; or (ii) uncoated ferrous metal wire, other than of stainless steel, that does not exceed 1.6 mm in diameter; or (b) is a wooden lobster trap that has, in one exterior wall of each parlor, two softwood laths that are adjacent to each other and that are not treated with a wood preservative.
5	No person shall possess any claw, tail, or meat that has been separated from the thorax or carapace of the lobster.
6	Possession of lobsters with eggs attached is prohibited.
7	No person shall catch and retain or possess, in Lobster Fishing Area 28, 29 or 30, any female lobster marked with any mutilation to the right flipper (uropod) next to the middle flipper (telson). The right flipper shall be determined when the underside of the lobster is lying underside down, and its tail is toward the person making the determination. For the purpose of this license condition, mutilation means any man-made or natural wound on any part to the right flipper of a female lobster, with or without setal hairs. Any female lobster with the right flipper next to the middle flipper removed is considered an illegal lobster.



8	The possession of lobsters of a size less than specified in this license is prohibited. In LFA 27, the minimum size is 76 mm. In LFA 28 and 29, the minimum size is 84 mm. In LFA 30, the minimum size is 82.5 mm.
9	The possession of lobster of a size greater than specified in the license is prohibited. In LFA 30, the maximum size is 135 mm.

3.5 Links with other activities and planning initiatives

Linkages with this plan, and other initiatives, are under development and are related to the mandate of the Unama'ki Institute of Natural Resources (UINR). UINR represents the five Mi'kmaq communities of Unama'ki. It is a non-profit organization that was formed to address First Nations' concerns regarding natural resources and their sustainability. Since 1999, UINR has represented Unama'ki First Nations' voice on environmental concerns and is actively involved in aquatic resources, oceans and fisheries management, habitat management, and species-at-risk issues, and research.

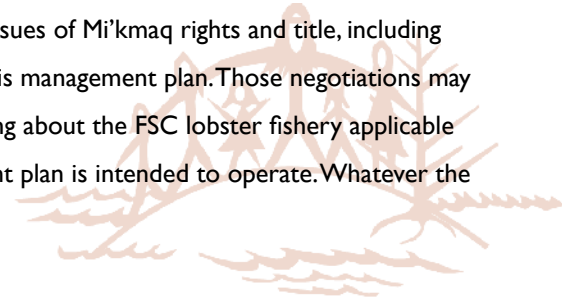
UINR's three goals are:

- To provide resources for First Nations' equal participation in natural resource management in Unama'ki and its traditional territory;
- To strengthen First Nations' research and natural resource management while maintaining our traditions and world views; and
- To partner with other groups sharing the same desire to protect and preserve our resources for future generations.

UINR is examining research initiatives for lobster resource enhancement, and improving marine environmental water quality and species habitats within the Bras d'Or Lakes. UINR is also working toward other natural resource management initiatives.

UINR is the secretariat for the Collaborative Environmental Planning Initiative (CEPI). CEPI is an initiative dealing with environmental challenges in the Bras d'Or Lakes and involves multiple partners (government and non-government) working to improve management of the Lakes.

Please note that the five Unama'ki First Nations are part of the "without prejudice" negotiations with Canada and Nova Scotia, set up under the Framework Agreement signed 23 February 2007, in what is known as the "Made-in-Nova Scotia Process". Those negotiations are aimed at resolving issues of Mi'kmaq rights and title, including rights respecting the fisheries included in this management plan. Those negotiations may reach an interim agreement or understanding about the FSC lobster fishery applicable to the time period in which this management plan is intended to operate. Whatever the



five Unama'ki First Nations agree to herein is subject to amendment by virtue of what they agree to, if anything, in the Made-in-Nova Scotia Process.

4.0 Stock Status

Lobsters are commonly found along the coast of North America in depths of less than 50 m, but can also occur at depths of 500 m. It is the largest and one of the most abundant members of the clawed lobster family (Homaridae). Lobsters are generally solitary, crevice dwellers that exhibit aggressive defensive behaviors toward other species and each other.

4.1 Biology, ecology and habitat

Lobster grow by moulting. They continue to grow throughout their lives, moulting less frequently. Adult males are larger than adult females. Besides differences in appearance and function of the first pair of pleopods (in males, they are modified into hardened, calcified gonopods; Figure 3), males tend to have larger claws than the female, while a sexually mature female will have a wider abdomen. Reputed to be scavengers, adult lobsters typically consume a fresh diet of marine worms, crabs, shellfish, and echinoderms.

The life cycle of lobsters is complex. Hatching occurs over several weeks in the summer months. Eggs are hatched as planktonic larvae and have a relatively short larval phase of three to about nine weeks, followed by a short benthic settling stage (also known as post-larvae). Higher water temperatures facilitate the development and moulting of all stages of development. At 22° C it takes about three weeks to go from egg to post-larvae; at 15° C, it takes about six weeks, and at 12° C, it takes about nine weeks. Below 12° C, survival to the settling stage in lab studies is low.

Lobsters exhibit complex courtship behaviors. Males compete for females by establishing a mating shelter. Larger and dominant males are more successful establishing a mating burrow and courting females. A female preparing to moult, approaches the male burrow and lives with the male for several days until she moults. After moulting, and while she is still soft, the male deposits sperm internally into the female where it remains for several months and possibly several years. The male offers her several days of protection until her shell hardens. After she leaves, he may mate with more females and she may occasionally mate with more than one male, particularly if she hasn't been inseminated.



After mating, eggs are fertilized externally in the summer or fall of the following year and are cemented to her pleopods for another nine to 12 months. This is a typical two-year reproduction cycle for the female lobster. Mortality is high for eggs, larvae and postlarvae. Only two in 10,000 larvae will survive to become adults.

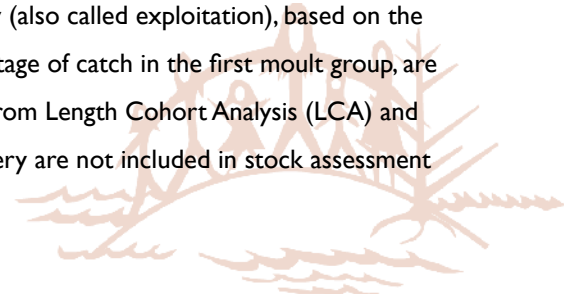
Shelter at all life stages is required for this species. Settling postlarvae actively search for favourable places to establish residency, preferring crevices in gravel and boulders for their first year of life. At this stage, they are prey for ground fish, such as cod and flounder, wolf fish, crab, and other invertebrates. As the lobster out-grows its shelter, it travels more widely, spending more time outside its shelter. Adult lobsters generally have few predators (seals and humans), but the impact of these predators can be significant.

4.2 Species interactions

Predation, temperature, currents, local wind action, and availability of food and habitat are known to impact the development, survival, and distribution of lobster larvae. When the lobster reaches the benthic stage and grows larger in size, it is less susceptible to changes in environmental conditions, but is still susceptible to predation. Lobster feed on a range of benthos, but rock crab (*Cancer irroratus*) is an important food source in coastal areas. Groundfish were thought to be major predators for lobster, but there is little evidence to support this. Other known predators include striped bass (*Morone saxatilis*), shortfin sculpin (*Myoxocephalus scorpius*), cunner (*Tautoglabrus adspersus*), and white hake (*Urophycis tenuis*). Lobster are found on a wide range of habitats, but most commonly on sand substrate with overlying rocks and boulders. As larvae are planktonic for up to 12 weeks of their life, currents and local wind conditions affect their distribution. Source-sink dynamics are not well understood for this species, but it is known that larvae from one management area can settle into another.

4.3 Assessment

Science Advisory Reports for Eastern Cape Breton are produced every four to five years following the Regional Assessment Process (RAP). The last assessment was completed in 2004. Indicators used to evaluate the commercial fishery are based on landings, kg of lobster caught per trap haul, numbers per trap haul of legal sizes, pre-recruits and spawners in Fishermen and Scientists Research Society (FSRS) traps, and at-sea samples. Estimates of fishing mortality (also called exploitation), based on the number of trap hauls, mean size, and percentage of catch in the first moult group, are also used. Exploitation rates are estimated from Length Cohort Analysis (LCA) and Change-in-ratio. Landings from the FSC fishery are not included in stock assessment



although they are provided to DFO annually. Historical landings for LFAs 28-30 were combined until 1991 making it difficult to determine long-term trends, especially for the Bras d'Or Lakes (LFA 28).

4.4 Research

Collaborative research activities between the industry and scientists take place through the Fishermen and Scientists Research Society (FSRS). Monitoring activities are conducted annually through DFO's Population Ecology Division. UINR is working with their FSC fishers to improve log book records and establish a record of catches. These records will provide information on catch composition, especially during the fall fishery.

4.5 Prospects for 2008

Overall, stock status for LFAs 27–30 has improved since 1997. The catch rate of spawners has declined in LFA 30 while other areas, such as LFA 27 show signs of increased catch rates of legal sizes, and evidence for increased reproduction. LFA 29 showed a substantial increase in catch rates of several size groups.

LFA 28 (Bras d'Or Lakes) does not have reliable indicators because of a lack of longer-term data, but studies completed on lobster abundance in relation to habitat indicate low lobster densities, ranging from 0.019 lobsters per m^2 off Cape Dauphin (LFA 27), to 0.0005 lobsters per m^2 in East Bay (LFA 28). Rock crab densities also follow a similar pattern with higher densities found in the Great Bras d'Or Channel (0.045 per m^2) and Cape Dauphin (0.023 per m^2) with fewer found in East Bay (0.002 per m^2). In areas of the Bras d'Or Lakes where there was good lobster habitat there were also much lower lobster densities than in comparable areas outside of the Bras d'Or Lakes. Traditional ecological knowledge indicates that lobsters are not as abundant as they were in the past.

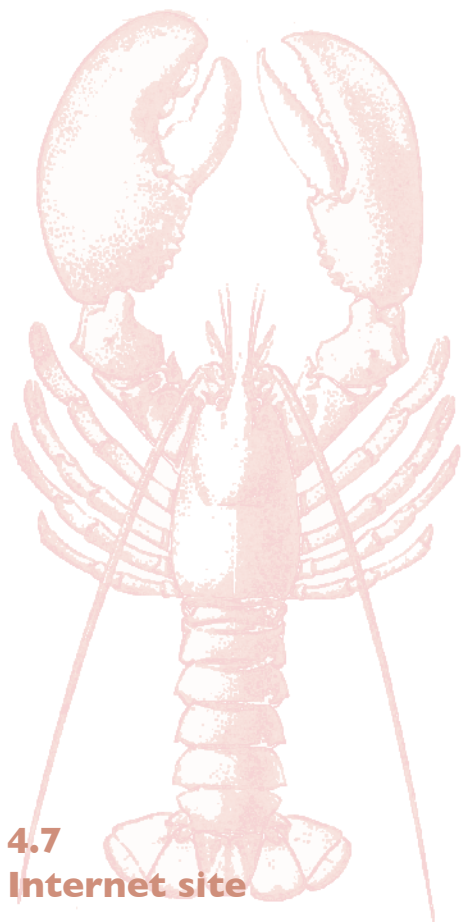


4.6 References

- Butler, M.J., Stenech, R.S., and Hernkind, W.F. 2006. Juvenile and Adult Ecology. In: *Lobsters: Biology, Management, Aquaculture and Fisheries*. Edited by B. Phillips. Blackwell Scientific, Ames, Iowa. Pp. 263-309.
- Cobb, S.J. and Castro, K.M. 2006. Homarus Species. In: *Lobsters: Biology, Management, Aquaculture and Fisheries*. Edited by B. Phillips. Blackwell Scientific, Ames, Iowa. Pp. 310-339.
- DFO. 2007a. *Commercial Landings Seafisheries*. [On-Line]. Available: www.dfo-mpo.gc.ca/communic/statistics/commercial/landings/seafisheries/s2005av_e.htm
- DFO. 2007b. *Commercial Landings Seafisheries* [On-line]. Available: www.dfo-mpo.gc.ca/communic/statistics/commercial/landings/seafisheries/s2005aq_e.htm
- DFO. 2004. *Eastern Cape Breton Lobster (LFAs 27-30)*. DFO Science Stock Status Report 2004/032.
- Ennis, G.P. 1995. Larval and postlarval ecology. In: *Biology of the Lobster Homarus americanus*. Edited by: J.R. Factor. Academic Press, San Diego. Pp. 23-46.
- OSL. 2007. *The American Lobster*. [On-line]. Available: www.osl.gc.ca/homard.html.
- Tremblay, M.J. Paul, K. and Lawton, P. 2005. *Lobsters and other invertebrates in relation to bottom habitat in the Bras d'Or Lakes: Application of video and SCUBA transects*. Can. Tech. Rep. Fish. Aquat. Sci. 2645:iV +49 p.
- Tremblay, M.J. and Reeves, A. *Eastern Cape Breton Lobster (LFAs 27-30): 2004. Stock status and biological effects of the increase in minimum legal size*. DFO Can. Science Advisory Sec. Res. Doc. 2004/21. 71 p.
- Wahle, R.A and Fogarty, M.J. 2006. Growth and Development: Understanding and Modeling Growth Variability in Lobsters. In: *Lobsters: Biology, Management, Aquaculture and Fisheries*. Edited by B. Phillips. Blackwell Scientific, Ames, Iowa. Pp. 1-44.

4.7 Internet site

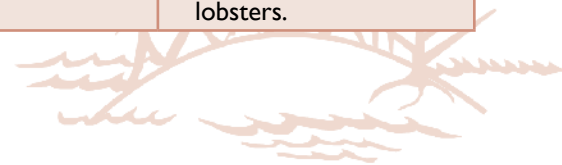
This plan is available to the general public and can be found at: www.uinr.ca/research .



5.0 Current Conservation and Management Issues



Current Problem	Issue	Approach
<p>Increased mortality during handling and in early fall</p>	<p>Handling of lobsters during and just after the moult increases the likelihood of damage to the shell, increased risk for predation, and possibly death.</p>	<p>Restrict fishing to times of non-moulting. A standardized no-fishing season will be adopted, but other seasons outlined in each AFS agreement will be respected.</p> <p>Develop a code of practice/handling so that fishers are educated on how to properly release soft lobster, ensure individuals will remain alive until cooking, and reduce the loss of eggs when putting them back into the water (Appendix A).</p>
<p>Limited protection for reproducing females</p>	<p>Several issues have been identified:</p> <ol style="list-style-type: none"> 1) Not all areas have a minimum legal CL at the level at which 50% of females are mature; 2) Large females are important as egg producers. Large females and the males to mate with them are not protected in any areas; 3) The fall fishery allows the opportunity to fish females that have moulted but are not yet showing their eggs. These females would be protected in the spring fishery the following year. 	<p>Continue with release of berried and v-notched females as stated in the AFS regulations. Also,</p> <ol style="list-style-type: none"> 1) Standardize a minimum legal CL for all areas using the most conservative estimate (i.e. the largest min CL will be used); 2) Implement a maximum size limit for both males and females; 3) Currently do not have adequate data on catch rates in the fall or on size or sex composition, but are applying minimum and maximum sizes throughout the duration of the spring and fall fisheries. Increased data collected through log books will be adopted. 4) A voluntary v-notch program will protect those lobster from the commercial industry. Proper v-notching training will be provided. 5) Code of handling practice will assist in reducing egg loss from improperly handled females and soft shelled lobsters.





<p>Effort</p>	<ol style="list-style-type: none"> 1) Differences in trap regulations make it difficult to deploy traps in different areas, or to spread traps around to distribute effort. 2) Lobsters are thought to be two to nine times more likely to trap in the fall than the spring because of increased temperatures and migration. 3) Traps tend to be concentrated in one area rather than spread out over many LFAs. 	<ol style="list-style-type: none"> 1) Standardize traps so that the largest escape vent and hoop sizes are used to allow the smaller lobster to escape and prevent the larger lobster from entering. 2) Implement conservation measures that currently exceed minimum industry standard as a way to compensate for harvesting in the fall. Before other conservation measures can be implemented, we need a better idea of how many and what is caught during the fall season, 3) Use of standardized traps for all areas will allow for greater movement between areas especially from LFA 27 to 29 or 30.
<p>Sale of product</p>	<p>Under current AFS agreements, each community or individual cannot sell, trade, or barter fish caught in the food fishery.</p>	<ol style="list-style-type: none"> 1) Message was relayed through Mi'kmaq food fishing rights information sessions in winter 2007. 2) Communication flyers also went to every First Nation household in Unama'ki. This message will be reinforced to the fishers when applying for tags.
<p>Habitat Protection</p>	<p>Other organizations and fisher groups have invested time and money in enhancement of lobster habitat.</p>	<ol style="list-style-type: none"> 1) Use these areas as a refuge and refrain from harvesting activities to protect a proportion of the population from exploitation. 2) Explore other means of funding for enhancement for habitat and resource. 3) Mi'kmaq will conduct themselves and the operation of vessels in a manner that does not compromise lobster habitat, nearshore, or offshore. Information contained in the Code of Practice (Appendix A).



<p>Reduction of Netukulimk in our thinking during harvesting</p>	<p>Mi'kmaq worked with Mother Nature to ensure our survival, always respecting the earth, air, and water. That concept is not in the non-native system of resource management. Our rights are important, but equally important is our responsibility to ensure that we fish using Netukulimk principles.</p>	<p>Approach must be holistic and cautious in order to manage this gift and must extend beyond seven generations so that our descendants are privy to this resource. In an unpredictable environment, we must think prudence and allow the resource to be able to thrive, even when environmental conditions are not favourable.</p>
<p>Reporting of landings</p>	<p>Reporting of actual landings is important for fishery scientists and managers for assessment purposes.</p> <ol style="list-style-type: none"> 1) Confidence in reported landings for the food, social, and ceremonial fisheries is low. 2) Lack of database to house this information. 3) Landings are estimated and reported to DFO on an annual basis. 4) Lack of sharing of catches and other information between communities. 	<ol style="list-style-type: none"> 1) Standardized log books with ability to record data on lobster numbers, size and sex categories, and those released rather than weight (difficult to estimate). 2) Data housed at UINR to maintain a database of historical catches. Each community remains responsible for submitting data to DFO. 3) Increased communication between communities through UINR. UINR will report landings back to the communities and prepare analysis for Mi'kmaq Lobster Advisory process.
<p>Enforcement</p>	<p>During the fall fishing season, enforcement of the Mi'kmaq food fishery is seen as excessive, but without enough enforcement on vandalism. Trap loss, vandalism, and risk of personal injury is more common than failing to follow fishing conditions set out in the AFS agreements during the food fishery.</p>	<p>Education on the ecology of the lobster gift and adoption of good practices are targeted as effective measures for resource conservation and practice of Netukulimk.</p>



<p>Lack of Advisory Process</p>	<p>Currently, the only reviewers of the food fishery are employees of DFO. Mi'kmaq have little say in how we manage the food fishery. A Mi'kmaq advisory process would allow the community to review catches and stock status and assist in the co-management process.</p>	<p>Establish an advisory body to work collaboratively with the Grand Council of Unama'ki to jointly review the management plan, annual landings, and make recommendations for the management of the FSC lobster fishery for the up-coming year. The advisory committee and Grand Council would also be informed of those individuals who have abused their rights and make referrals to healing circles to determine appropriate sanctions if needed.</p>
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6.0
Long-term
Objectives

The long-term objective of this management plan is to contribute to the overall sustainability of the lobster gift in Unama'ki while maintaining traditional ways of fishing and integrating traditional resource management through Netukulimk.



7.0 Specific Management Objectives

7.1 Conservation and Sustainable Fishing

This plan will provide feedback on conservation and sustainable fishing practices under the FSC fishery for lobster through education, improved reporting, and collaborative data collection.

7.2 International Considerations and Obligations

Because of the nature of Mi'kmaq food fishing rights and the migratory nature of the lobster, it is possible that a Nova Scotia or Atlantic-wide Mi'kmaq lobster fishing plan may be developed in the future.

7.3 Domestic Considerations

7.3.1 Aboriginal

The Aboriginal people of Nova Scotia are currently involved in the FSC fishery for lobster. The Mi'kmaq of Unama'ki are also involved in the commercial fishery, with each community owning at least one lobster license for LFAs 27-30. In total, there are five FSC lobster access licenses and 25 commercial licenses owned by First Nations in Unama'ki. This plan does not extinguish food-fishing rights, but provides a framework to enhance our conservation strategy for long-term sustainable fishing for the food, social, and ceremonial fishery.

7.3.2 Commercial

The lobster resource is a shared gift. The Mi'kmaq will share information with the commercial industry in a fair and transparent manner and respect industry conservation measures.

7.3.3 Exploratory/Experimental

There are no exploratory or experimental lobster licenses in LFAs 27-30.



8.0 Management Measures for 2007-2008

8.1 Fishing seasons

In addition to the gear, methods, and conditions outlined in section 3.4, the Mi'kmaq of Unama'ki will adopt the following management measures:

To respect individual AFS agreements, a standardized NO FISHING season will be adopted. Community fishing seasons stated in AFS agreements will be adhered to, with the exception of a no-fishing season. This will be in effect for LFAs 27-30, dependent on locations fished within individual community AFS agreements.

To respect the reproductive nature of the lobster, the Mi'kmaq of Unama'ki agreed not to fish during times of moulting and mating. **Lobster fishing for food, social, or ceremonial purposes will not take place between 1 July to 15 September 2007 in LFAs 29, 30, and the ocean side of LFA 27 (north of the entrances to the Bras d'Or Lakes).**

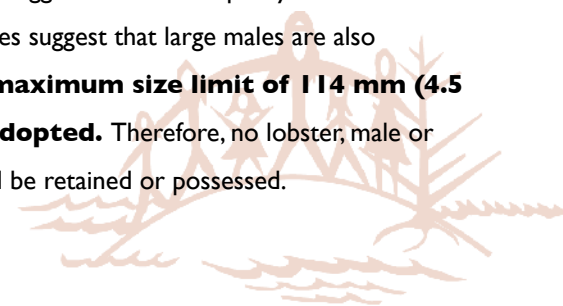
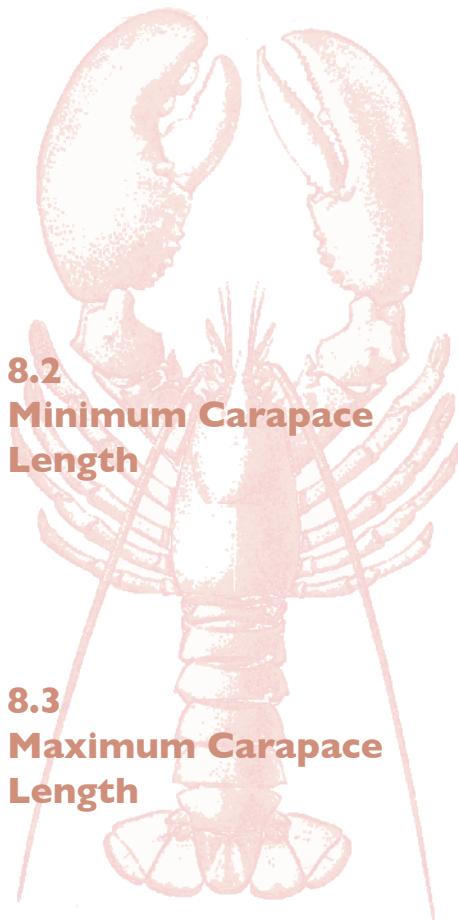
As the Bras d'Or Lakes are a unique ecosystem with warmer waters than the adjacent ocean, **a no-lobster fishing season for the Bras d'Or will be in effect between 29 June to 19 September 2008.** This includes LFA 28 and part of LFA 27 north of the Grand Narrows Bridge to the entrances of the Bras d'Or Lakes.

8.2 Minimum Carapace Length

A standard minimum carapace length will be used regardless of fishing location. The Mi'kmaq of Unama'ki will not possess any lobster below 84 mm (3.3 in) carapace length (CL). Therefore, **the minimum size of 84 mm (3.3 in) is adopted for LFAs 27-30.** This is minimum CL for LFAs 28 and 29, 6.5 mm (.25 in) greater than the current minimum size for LFA 27, and 1.5 mm (.06 in) greater than LFA 30.

8.3 Maximum Carapace Length

Large females can produce significantly more eggs and of better quality than their smaller counterparts. However, recent studies suggest that large males are also required for successful mating to occur. **A maximum size limit of 114 mm (4.5 in) CL for both sexes of lobster is adopted.** Therefore, no lobster, male or female, greater than 114 mm (4.5 in) CL will be retained or possessed.



8.4 V-Notching

A voluntary v-notch program will be implemented for females that exceed the maximum size limit [> 114 mm (4.5 in) CL]. Proper training will be provided to reduce the risk of unnecessary damage to the lobsters.

8.5 Code of Conduct/ Practices

In an effort to reduce loss of eggs, harm, and possibly death of lobsters not taken for food, the Mi'kmaq of Unama'ki have developed a code of handling practices to assist with the safe return of lobsters to the sea. The code of practice is based on the Mi'kmaq concept of Netukulimk and the DVD, *Quality Lobster from Ship to Shore*, produced by Nova Scotia Fisheries Sector Council. The code of practice can be found in Appendix A.

8.6 Reporting of Landings and Database of Catches

A standardized log book (Appendix B) will be used during the FSC fishery. Fishers are required to report the number of lobsters taken between the sizes of 84 mm (3.32 in) to 114 mm (4.5 in) carapace length and those that are returned to the sea. Returns include those that are below 84 mm (3.32 in), above 114 mm (4.5 in) carapace length, soft-shelled animals, or those with missing appendages. At the end of each season, community natural resource officers will collect the log books and submit copies to UINR. A database of lobster catches will be maintained at UINR. Reporting of landings to DFO will remain the responsibility of each community.

8.7 Standardized traps

This conservation measure will replace the current regulation for LFA 27 currently stated in AFS agreements and section 3.4 of this plan.

To encourage harvesting in more than one LFA, traps will be equipped with the larger-sized escape vents and the maximum entrance hoop size currently required for LFAs 28 and 29. All traps onboard a vessel must have in the exterior walls of each parlor in the trap and not more than 250 mm from the floor of each trap, at least:

- a. two unobstructed, circular openings the diameter of each is not less than 57.2 mm (6.4 mm greater than regulations for LFA 27); or
- b. one unobstructed, rectangular opening the height and width of which is not less than 44 mm (height) by 127 mm (width) (6 mm greater than regulations for LFA 27); or
- c. entrance hoops NOT greater than 153 mm (6 in).



8.8 Habitat Protection

Industry and First Nations have invested time and money in lobster habitat enhancement initiatives. These areas, although small, can serve as an important refuge for lobster and will be respected as areas for broodstock protection. No fishing will take place within 100 m of the perimeter of areas identified as enhancement sites. These include sites off Eskasoni (LFA 28), River Bourgeois (LFA 29), and New Campbellton (LFA 27). A map of the areas and buffer zones can be found in Appendix C.

9.0 Enforcement Measures

Current lobster fishing methods and conditions are enforceable through DFO's regulatory body (Conservation and Protection). **Proposed conservation measures for 2007–2008 are voluntary.**

10.0 Financial Responsibilities

UINR will be responsible for providing assistance to the communities to make the necessary equipment changes (entrance hoops and escape vents), provide stainless steel measures for minimum and maximum sizes, and log books for up to two years.

The advisory committee will be comprised of volunteers and Grand Council members whose travel expenses for the annual meeting will be paid through UINR.

Scientific monitoring will be provided through the collaborative efforts of UINR and volunteer fishers and/or natural resource officers in each community. UINR will continue to pursue research activities related to habitat protection, lobster resource, and habitat enhancement over the next five years.



11.0 *Literature Cited*

Berneshawi, S. 1997. *Resource management and the Mi'kmaq nation.*

Can. J. Native Studies. 17 (1): 115-148.

Native Council of Nova Scotia. 1993. *Mi'kmaq Fisheries Netukulimk Towards a Better Understanding.* Halifax: Atlantic Nova Print Co. Inc. 57 pp.

Tremblay, M.J. and A. Reeves. *Eastern Cape Breton Lobster (LFAs 27-30): 2004.*

Stock status and biological effects of the increase in minimum legal size. DFO Can. Science Advisory Sec. Res. Doc. 2004/21. 71 p.



Appendix A Code of Conduct and Handling for the FSC Lobster Fishery

Unama'kik Jakejue'ka'timk

Code of Practice and Handling of Lobster harvested during the Food, Social, and Ceremonial Fishery

The Code of Practice and Handling is voluntary. The Chiefs of Unama'ki encourage all FSC lobster fishers to adopt this Code as a commitment to Netukulimk, the safety of our people, and our responsibility to ensure the lobster gift is there for the benefit of all.

The following guiding principles were developed after meeting with five Mi'kmaq communities in Unama'ki:

1. Minimize waste

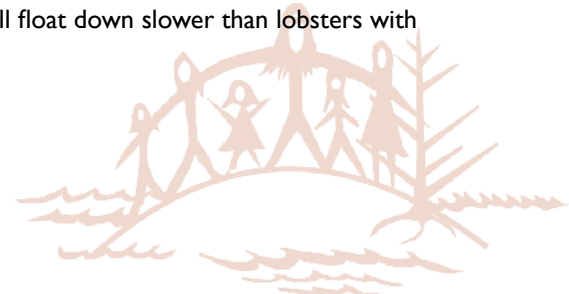
Care will be taken to ensure that the lobster harvested will survive until prepared for consumption. Specifically:

- Handle lobsters carefully. Throwing lobsters results in cracked or damaged shells that could result in water loss and death.
- Keep lobsters out of the wind and rain to prevent dehydration and exposure to fresh water.
- Band lobster claws so they don't have the opportunity to damage other lobsters.
- Refrain from using mackerel as bait if holding lobsters for ceremonial purposes. Mackerel is known to affect lobster vigour in holding tanks.
- Share your catch with Elders or other community members if you cannot store cooked lobsters.

2. Minimize damage to lobster returned to the sea

Lobsters returned to the sea today will become catches in the future.

- Do not throw lobsters with eggs back into the ocean. Instead, carefully cup the tail and gently put back into the water to prevent unnecessary loss of eggs.
- Put soft-shell lobsters back in the same manner. Their shells are not hard enough to provide weight and will float down slower than lobsters with hardened shells.



3. Minimize footprint on the environment

Lobsters live in the ocean and the Bras d'Or Lakes. Respect and care will be extended to the environment in which the lobster lives.

- Obey garbage dumping laws by not dumping any garbage into the ocean.
- Take care to secure items in your boat so they do not fly out when steaming or hauling.
- Prepare fuel on land.
- Take care not to destroy other ocean habitats by using slipways to put your boat into the water.
- If you are using a vessel with a sewage holding tank, obey sewage dumping laws in the Bras d'Or Lakes and use a sewage pump-out station to get rid of sewage.

4. Follow safe boating practices

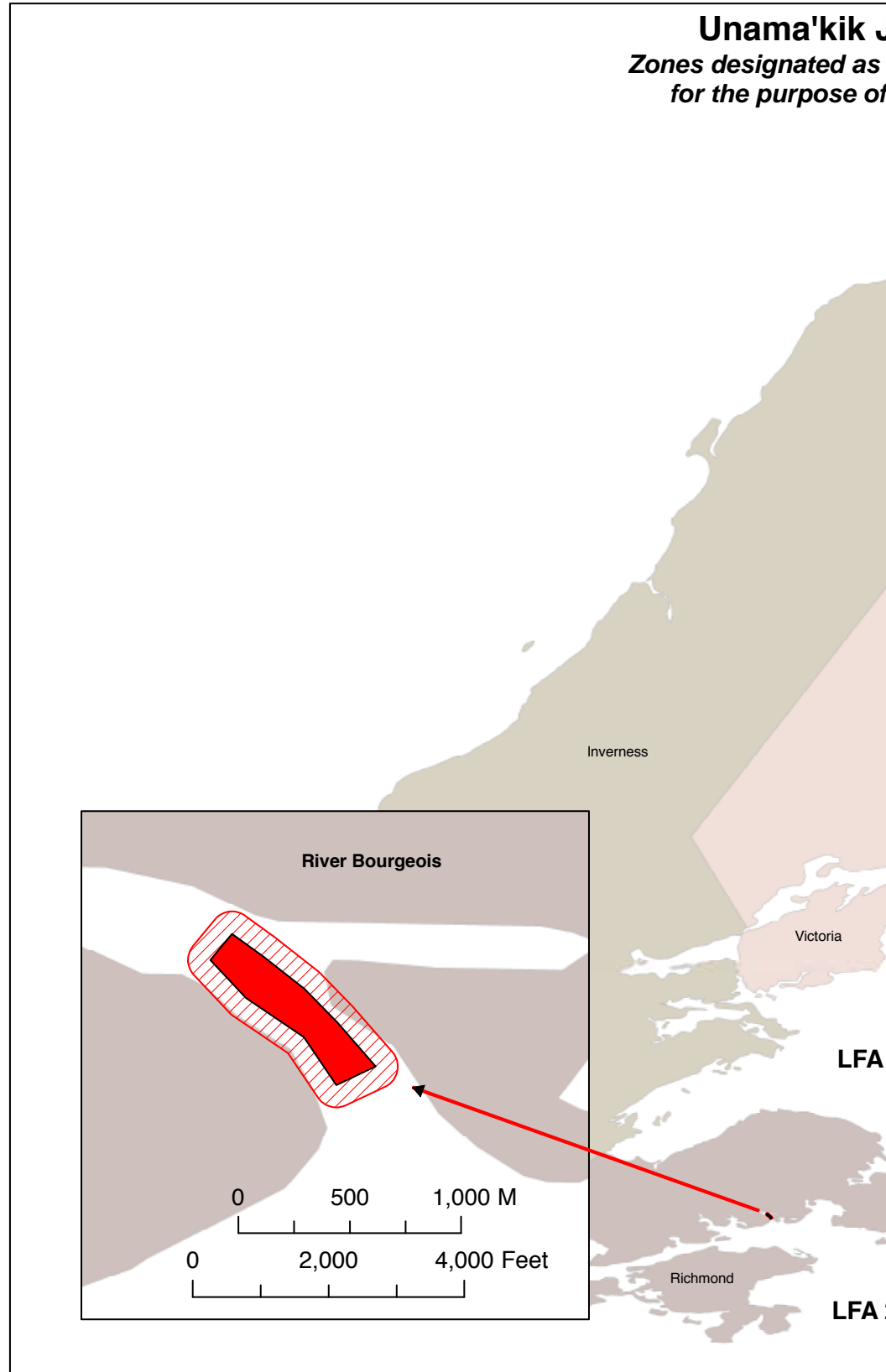
The ocean is powerful. Be prepared.

- Wear proper flotation devices.
- Carry a boat safety kit on board at all times.



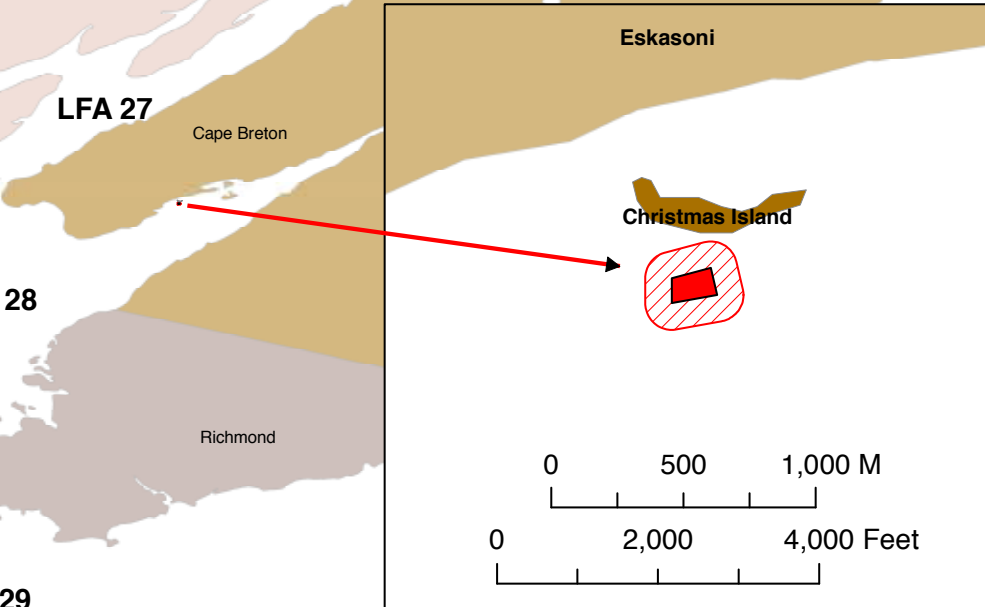
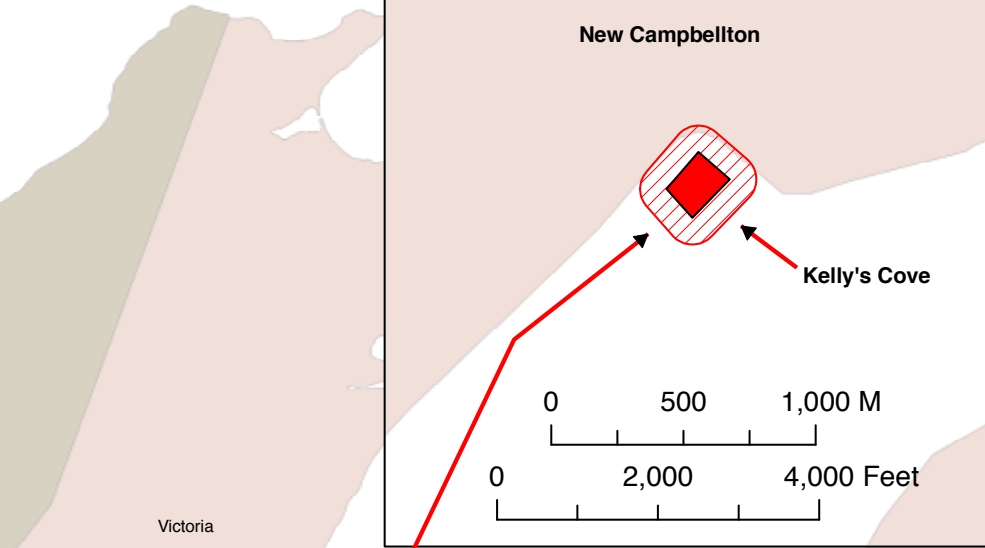
Appendix C

Areas identified as no-fishing zones for the purpose of protecting artificial lobster habitat enhancement sites.



Jakejue'ka'timk

"no lobster fishing areas"
of broodstock protection



Artificial Lobster Habitat Enhancement Sites

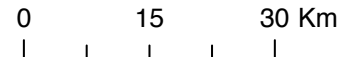


- No Fishing Zones -

Artificial Habitat Sites

Notes

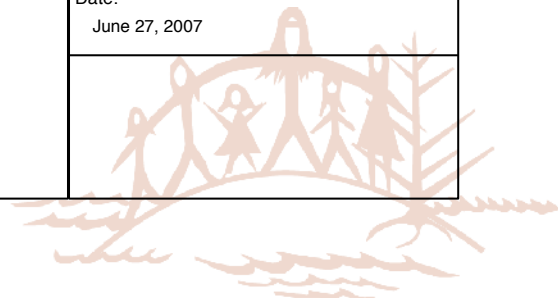
- Eskasoni
- New Campbellton
- River Bourgeois
- 100M Buffer Zone



Filename:
ArtificialLobsterHabitatEnhancementSites.pdf

Created By:
Membertou Geomatics Consultants

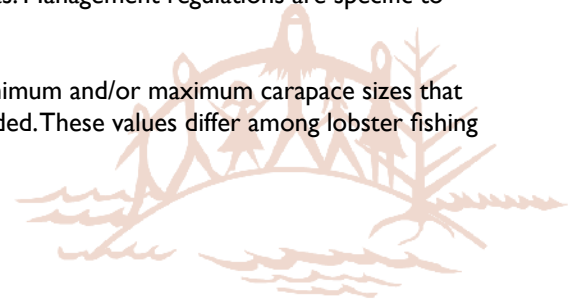
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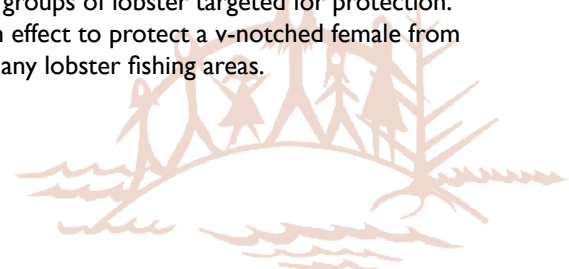
Glossary



Assessment	The process of determining the status of the stock. Usually takes into account fishing mortality, natural mortality, growth, and recruitment. Also referred to as stock assessment.
Benthic	Refers to animals and fish that live on the bottom of the seafloor.
Catch rate	Refers to the amount of catch per unit effort. An example is the catch per trap haul where catch can be measured as the number or weight of animals, and the unit of effort is one trap haul.
Catch composition	Refers to the size, condition, and sex of lobster captured during the fishery.
Carapace	Refers to the lobster's body, or back.
Carapace length (CL)	The length the carapace, or back. It is usually measured in millimeters (mm).
Change in Ratio	Another method used to estimate exploitation rates. The change in ratio uses the within-season ratio of exploited size classes to unexploited size classes.
Exploitation rate	The percentage of lobsters vulnerable to the fishery which are harvested in a given year.
First moult group	The size group of lobsters that have just moulted to sizes above the minimum legal size. For example, in an area where the minimum legal size is 84 mm, a lobster just below the minimum legal size (83 mm) would moult to about 95 mm CL. The smallest lobster moulting into the legal sizes would be 84 mm CL. Thus the first moult group would be 84-95 mm CL.
Landings	The weight of lobsters landed at a landing site. This value may be different from the catch, which includes the discards.
Inseminated	To introduce or inject semen into the female reproductive tract; impregnated.
Invertebrates	Animals that do not have a backbone. Common examples include crabs, lobsters, snails, sea urchins, insects, worms, etc.
Kg of lobster per trap haul	Refers to the weight of lobsters, in kilograms, caught after the trap has been hauled once; a measure of catch rate.
Lobster Fishing Areas (LFAs)	Fishing areas for lobster that have been defined as management areas. Management regulations are specific to each LFA.
Legal sizes	Refers to the minimum and/or maximum carapace sizes that can be legally landed. These values differ among lobster fishing areas.



Length Cohort Analysis (LCA)	Used to derive fishing mortality (F) from a combination of length frequency data and estimates of natural mortality and the length of time the average lobster spends within each length category. Estimates of F are then used to estimate exploitation rate.
Maximum Carapace Length	The maximum carapace length of lobster that can be legally landed. Not all LFAs have maximum carapace length regulations.
Minimum Legal Size (MLS)	The minimum carapace length of lobster that can be legally landed.
Number per trap haul	Refers to the number of lobsters caught after the trap has been hauled once; a measure of catch rate.
Pleopods	Also known as swimmerets. These are found on the underside of the lobster's tail. They are used for swimming, burrowing, ventilating, and carrying eggs in the female. The first pair is different between male and female lobsters and is used to identify its sex.
Planktonic	Drifting in water.
Pre-recruits	Recruits are the the new length or age group of the population entering the exploited component of the stock for the first time. Pre-recruits are those that are one moult group away from becoming those recruits. (See First Moul group).
Prey	An animal hunted or caught for food.
Predators	Animals that live by catching or hunting other animals.
Spawners	Refers to egg-bearing females in the population.
Source-sink dynamics	The theoretical model used in ecology to describe how differences in the quality of habitat may affect population growth or decline of certain species. Sources are generally areas of habitat that are high in quality and allow the population to increase on average. A sink is of low habitat quality that would not be able to support a population on its own. Sink populations could persist if there is an excess of individuals produced in source population that moves to the sink.
Substrate	Refers to the material covering the surface. For example, sand is a substrate covering parts of the ocean bottom; mud is another.
V-notch	Refers to the mark made in the tail fan on egg-bearing females, or other groups of lobster targeted for protection. Regulations are in effect to protect a v-notched female from being landed in many lobster fishing areas.



References

Barnes, R.D. 1987. *Invertebrate Zoology (5th Ed.)*. Saunders College Publishing, Toronto 893 pp.

FAO. 2007. *Fisheries Glossary*. [On-line]. www.fao.org/fi/glossary

Fisheries Resource Conservation Council. 2007. *Sustainability Framework for Atlantic Lobster 2007 Report to the Minister of Fisheries and Oceans*. Fisheries Resource Conservation Council, Ottawa. 53 pp.

Tremblay, T.J. 2007. (Department of Fisheries and Oceans). Personal communication.

Tremblay, M.J. and Reeves, A. *Eastern Cape Breton Lobster (LFAs 27-30): 2004. Stock status and biological effects of the increase in minimum legal size*. DFO Can. Science Advisory Sec. Res. Doc. 2004/21. 71 p.

Wikipedia. 2007. *Source-sink dynamics*. [On-line] [www.wikipedia.org/wiki/Source-sink dynamics](http://www.wikipedia.org/wiki/Source-sink_dynamics).



Notes

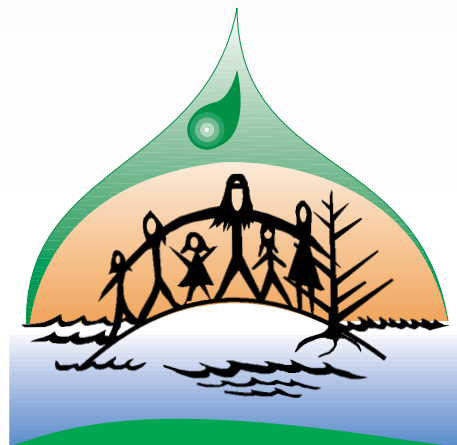




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