

**Integrated Fisheries Management Plan (IFMP) for Narwhal in the Nunavut  
Settlement Area**

***(Monodon monoceros)***

(Effective January 2013)



## Foreword

The purpose of this Integrated Fisheries Management Plan (IFMP) is to identify the main objectives and requirements for the narwhal fishery, as well as the management measures that will be used to achieve these objectives.

This document also serves to communicate the basic information on the fishery and its management to Fisheries and Oceans Canada (DFO) staff, Nunavut Wildlife Management Board (NWMB), Hunters and Trappers Organizations (HTOs), Regional Wildlife Boards (RWOs), Inuit, communities and other stakeholders.

This IFMP provides for more informed stakeholder input into management decisions, and promotes a common understanding of the “basic rules” for the sustainable management of the fisheries resource.

This IFMP is not a legally binding instrument which can form the basis of a legal challenge. The IFMP can be modified at any time and does not fetter the Minister's discretionary powers set out in the *Fisheries Act*. The Minister can, for reasons of conservation or for any other valid reasons, modify any provision of the IFMP in accordance with the powers granted pursuant to the *Fisheries Act*. Where DFO is responsible for implementing obligations under land claim agreements, the IFMP will be implemented in a manner consistent with these obligations. In the event that an IFMP is inconsistent with obligations under land claim agreements, the provisions of the land claim agreements will prevail to the extent of the inconsistency.

The Government of Canada recognizes the right of Inuit to harvest narwhal in accordance with the Nunavut Land Claims Agreement, and the importance of the narwhal fishery to the social, economic and cultural well being of Inuit.

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Signature and title of DFO approval authority

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Signature and title of other approval authority  
(i.e. authority established under land claims agreement)

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### **3.1 Overview of the Fishery**

#### **3.1.1 History**

Narwhal inhabit the marine waters of the northern third of the northern hemisphere (Reeves and Tracey 1980; Hay and Mansfield 1989). As such, its distribution area includes the open waters of the nation states of Canada (Nunavut), Denmark (Greenland), Iceland, Norway (Svalbard), the Russian Federation and the United States (Alaska). However, the vast majority of narwhal hunts occur in Canada and Greenland, where they are currently only hunted by Inuit.

Narwhal hunting has been, and still is, integral to Inuit. The annual harvest of narwhal by Inuit represents a unique historical relationship in terms of a continuous utilization of a local marine resource. As such, narwhal and their products have widespread economic, social and cultural importance for Inuit. Although the archaeological record is intermittent, it seems that narwhal have been hunted in this region for some two millennia (Savelle 1994). More specifically, it is clear that Inuit have possessed the technology, expertise and ecological knowledge to hunt this species since at least the early nineteenth century (Mary-Rousselière 1984). Inuit terms for narwhal include *tuugaalik* (with tusk), *qirniqtaq qilalugaq* (black whale) and *allanguaq* (with black and white dots).

Prior to 1971, hunting and trade of narwhal in Canada was unregulated by government. In 1971, the Government of Canada enacted the Narwhal Protection Regulations that established a narwhal annual catch quota for individual Inuit hunters. This was replaced in 1977 by quotas assigned to specific communities or settlements. Because of the limited biological information available to estimate sustainable harvest levels, quotas were based on historic local catch records. In 1993, the Narwhal Protection Regulations were revoked when the Marine Mammal Regulations were enacted.

In 1999, the NWMB instituted a trial community-based management initiative to more closely align narwhal management with the harvest management responsibilities assigned to the RWOs and HTOs under the Nunavut Land Claims Agreement (NLCA). Community-based management provided additional flexibility in how participating communities used their annual quotas and managed the narwhal fishery. In 2009, the NWMB discontinued community-based management as a stand alone program, but retained harvest limits and quota flexibilities for communities previously under community-based management. Additional information on this initiative is provided in Appendix 1.

The narwhal fishery is currently managed subject to provisions in the Nunavut Land Claims Agreement, and the Fisheries Act and its regulations.

#### **3.1.2 Type of Fishery and Participants**

Narwhal have been hunted by humans for thousands of years, for food, fuel, and other products. Narwhal are an important food source for Inuit; the *maktaa*q, or skin, is a highly valued traditional food. Narwhal tusks also provide an economic benefit to hunters. Currently, Inuit from the Nunavut Settlement Area are the only harvesters of narwhal in Canada.

#### **3.1.3 Location of the Fishery**

Narwhal are harvested throughout Nunavut (Figure 1); the majority of harvests occur in eastern Nunavut, but there have been recent sightings (and harvests) in western Nunavut.

### **3.1.4 Governance**

The narwhal fishery in the Nunavut Settlement Area is co-managed by the Department of Fisheries and Oceans (DFO), the Nunavut Wildlife Management Board (NWMB), Regional Wildlife Organizations (RWOs), and Hunter and Trapper Organizations (HTOs), in accordance with the Nunavut Land Claims Agreement, the Fisheries Act and its regulations and, in some communities, local hunting bylaws. The NWMB is the main instrument of wildlife management in the Nunavut Settlement Area, but the Minister retains ultimate authority and responsibility for wildlife management and conservation of fish, including marine mammals. Nunavut Tunngavik Incorporated (NTI) is the primary Designated Inuit Organization (DIO) under the NLCA and is responsible for ensuring that Inuit rights and obligations under the Agreement are implemented.

#### *Fisheries Act, regulations and policies*

The narwhal fishery is regulated by the *Fisheries Act* (R.S., 1985, c. F-14) and regulations made pursuant to it, including the *Fishery (General) Regulations* and the *Marine Mammal Regulations*. Where an inconsistency exists between these statutes and the Nunavut Land Claims Agreement, the Agreement shall prevail to the extent of the inconsistency.

These documents are available on the Internet at:

[www.dfo-mpo.gc.ca/acts-loi-eng.htm](http://www.dfo-mpo.gc.ca/acts-loi-eng.htm)

#### *An Integrated Aboriginal Policy Framework*

Fisheries and Oceans Canada, as the federal department with primary responsibility for oceans and the management and protection of aquatic resources, has had increasing involvement with Aboriginal communities since the 1990s, particularly in areas where DFO administers the aquatic resources and ocean spaces. Supreme Court of Canada (SCC) decisions have provided guidance on the nature and scope of Aboriginal and treaty rights and of governments' responsibility to manage natural resources in a manner consistent with the constitutional protection provided to Aboriginal and treaty rights.

The fundamental theme of DFO's Integrated Aboriginal Policy Framework is on fostering a respectful and mutually beneficial relationship with Aboriginal groups who are seeking a greater share of the fisheries resource, on contributing to the growth and well-being of their communities, and on providing them with a greater role in integrated aquatic resource and oceans management.

The Framework is available on the internet at:

<http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/iapf-cipa-eng.htm>



### Sustainable Fisheries Framework

DFO has adopted a Sustainable Fisheries Framework for all Canadian fisheries to ensure that objectives for long-term sustainability, economic prosperity, and improved governance for Canadian fisheries are met. The Sustainable Fisheries Framework contains policies for adopting an ecosystem based approach to fisheries management, including *A Fishery Decision-Making Framework Incorporating the Precautionary Approach*, and *Managing Impacts of Fishing on Benthic Habitat, Communities and Species*. This policy framework applies to the narwhal fishery in the Nunavut Settlement Area.

These documents are available on the Internet at:

[www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm](http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm)

### Nunavut Land Claims Agreement

In 1993, Canada settled a comprehensive land claim agreement with the Inuit of the Nunavut Settlement Area. The Nunavut Land Claims Agreement (or Agreement) created priority access and wildlife harvesting rights for Inuit and other Aboriginal groups who traditionally harvested within the Nunavut Settlement Area.

The Agreement also created an Institution of Public Government, the Nunavut Wildlife Management Board (NWMB or Board), to share decision making authority with the Federal Government. The NWMB and DFO Minister consider matters relating to the proper management and control of fisheries and the conservation of fish within the Nunavut Settlement Area. Under this co-management regime, the NWMB is the main instrument of wildlife management, but the Minister retains ultimate responsibility for wildlife management and may accept, reject or vary decisions made by the NWMB with respect to harvesting and other decisions related to management and protection of wildlife and wildlife habitat.

The Agreement establishes wildlife management authority for the NWMB including the responsibility to establish, modify or remove levels of Total Allowable Harvest (TAH) or harvesting, Basic Needs Levels (BNL) and non-quota limitations (NQLs) on harvesting in the Nunavut Settlement Area. Once established for a stock or population, the TAH replaces the existing regulatory quota.

The Nunavut Land Claims Agreement establishes wildlife management authority for RWOs and HTOs. The powers and functions of the RWOs (NLCA 5.7.6) include:

- Regulation of harvesting practices and techniques among the members of HTOs in the region, including the use of non-quota limitations.
- Allocation and enforcement of regional basic needs levels and adjusted basic needs levels among HTOs in the region.
- Assignment to any person or body other than an HTO, with or without valuable consideration and conditions, of any portion of regional basic needs levels and adjusted basic needs levels.
- Generally, the management of harvesting among the members of HTOs in the region.

The powers and functions of the HTOs (NLCA 5.7.3) include:

- Regulation of harvesting practices and techniques among the members, including the use of non-quota limitations.

- Allocation and enforcement of community basic needs levels and adjusted basic needs levels among members.
- Assignment to non-members, with or without valuable consideration and conditions, of any portion of community basic needs levels and adjusted basic needs levels.
- Generally, the management of harvesting among the members.

The Nunavut Land Claims Agreement establishes authority to Nunavut Tunngavik Incorporated (NTI) as the primary Designated Inuit Organization (DIO) under the Agreement (Article 39). It is responsible for ensuring that Inuit rights and obligations under the land claim are implemented, including the wildlife management provisions (Article 5) of the NLCA.

Under the Agreement, wildlife management and Inuit harvesting are guided by the principles of conservation (NLCA s.5.1.5).

The Nunavut Land Claims Agreement is available on the internet at:

<http://laws-lois.justice.gc.ca/eng/acts/N-28.7/>

#### Species at Risk Act

The Species at Risk Act (2002, c.29) (SARA) is a federal Act to prevent wildlife species from being extirpated or becoming extinct and to provide for their recovery. It provides the legal protection of wildlife species and the conservation of their biological diversity. Canadian species listed as extirpated, endangered, threatened or special concern are regulated by the *Species at Risk Act* (2002, c. 29) which has implications for the management of fisheries that impact listed species.

The SARA listing process for narwhal is pending an agreement on harmonization of the provisions of SARA with the Nunavik Inuit Land Claims Agreement.

The *Species at Risk Act* is available on the Internet at:

[www.dfo-mpo.gc.ca/acts-loi-eng.htm](http://www.dfo-mpo.gc.ca/acts-loi-eng.htm)

#### Canada/Greenland Joint Commission

In 1989, Canada and Greenland established the Canada/Greenland Joint Commission on the Management and Conservation of Beluga and Narwhal through a Memorandum of Understanding between DFO and the Greenlandic Ministry of Fisheries and Hunting. The Commission was established to coordinate management and conservation for shared beluga and narwhal stocks/populations.

The Commission meets every two years to consider new information about narwhal and beluga and recommends management actions, including information provided by its Scientific Working Group. Inuit resource users actively participate as Inuit commissioners and delegates.

### **3.1.5 Fisheries Characteristics**

Upon ratification of the Nunavut Land Claims Agreement in 1993, all existing restrictions or quotas on the amount of wildlife that could be harvested within the Nunavut Settlement Area were retained and deemed to have been established by the NWMB. These regulatory provisions

continue to be the basis for the regulation and management of narwhal harvest by Inuit communities in Nunavut, requiring among other things:

- possession of a Marine Mammal Tag is required to fish for narwhal. The Marine Mammal Tag is the licence authorizing hunting that must be affixed to the narwhal when landed under the Marine Mammal Regulations;
- gear restrictions to ensure humane harvesting and prevent wastage;
- harvest restrictions for calves and family groups for the conservation and protection of the stock;
- requirements to keep records and to report harvest information;
- a narwhal tusk requires a licence to be legally possessed;
- a permit is required to transport a narwhal tusk/product domestically and internationally.

Narwhal are hunted during the summer when they aggregate in summering areas, and during spring and fall migration to and from over-wintering areas. Hunting occurs during three phases of ice conditions: 1) at the floe edge while the landfast ice is still solid and where narwhal congregate awaiting access to summering areas, 2) in ice cracks as the ice conditions deteriorate and where narwhal travel along cracks and under ice from hole to hole, and 3) in the open water.

Narwhal are hunted with firearms, and are sometimes harpooned before shot to minimize losses. During the open water season, hunters in boats may cooperate, using several boats to herd narwhal or drive them inshore. Once in shallow water sinking losses are reduced since most sunk whales can be retrieved with a grappling hook and line.

By-catch of narwhal in other fisheries is low, as occasionally, narwhal are caught in seal or char fishing nets.

Fishery Officers (Department of Fisheries and Oceans) and Conservation Officers (Government of Nunavut) monitor narwhal hunting activities for compliance with the *Fisheries Act* and applicable regulations, but Fishery Officers cannot enforce local HTO bylaws. Fishery Officers work with resource managers to identify priority areas and activities for compliance monitoring. Compliance monitoring includes patrols of the fishery, inspections and monitoring of the trade of narwhal products throughout Canada. In addition, HTOs monitor hunting activities.

Harvest information is provided by hunters who self-report to the HTOs. HTOs then report to DFO annually. Appendix 2 provides information on annual quotas and harvest levels for all communities that harvested narwhal since 1998.

Domestic movement of narwhal products requires a DFO Marine Mammal Transportation Licence. International trade of narwhal products requires a CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) Export/Re-export Permit. Canadian CITES Export/Re-export Permits are issued only for narwhal products bearing a valid Marine Mammal Tag and that are from a sustainable harvest.

The NWMB is in the process of establishing TAH levels, BNLs and associated NQLs to manage the fishery, based on the defined stocks/populations. Until a TAH level is established for each stock or population, annual community quotas will remain in place.

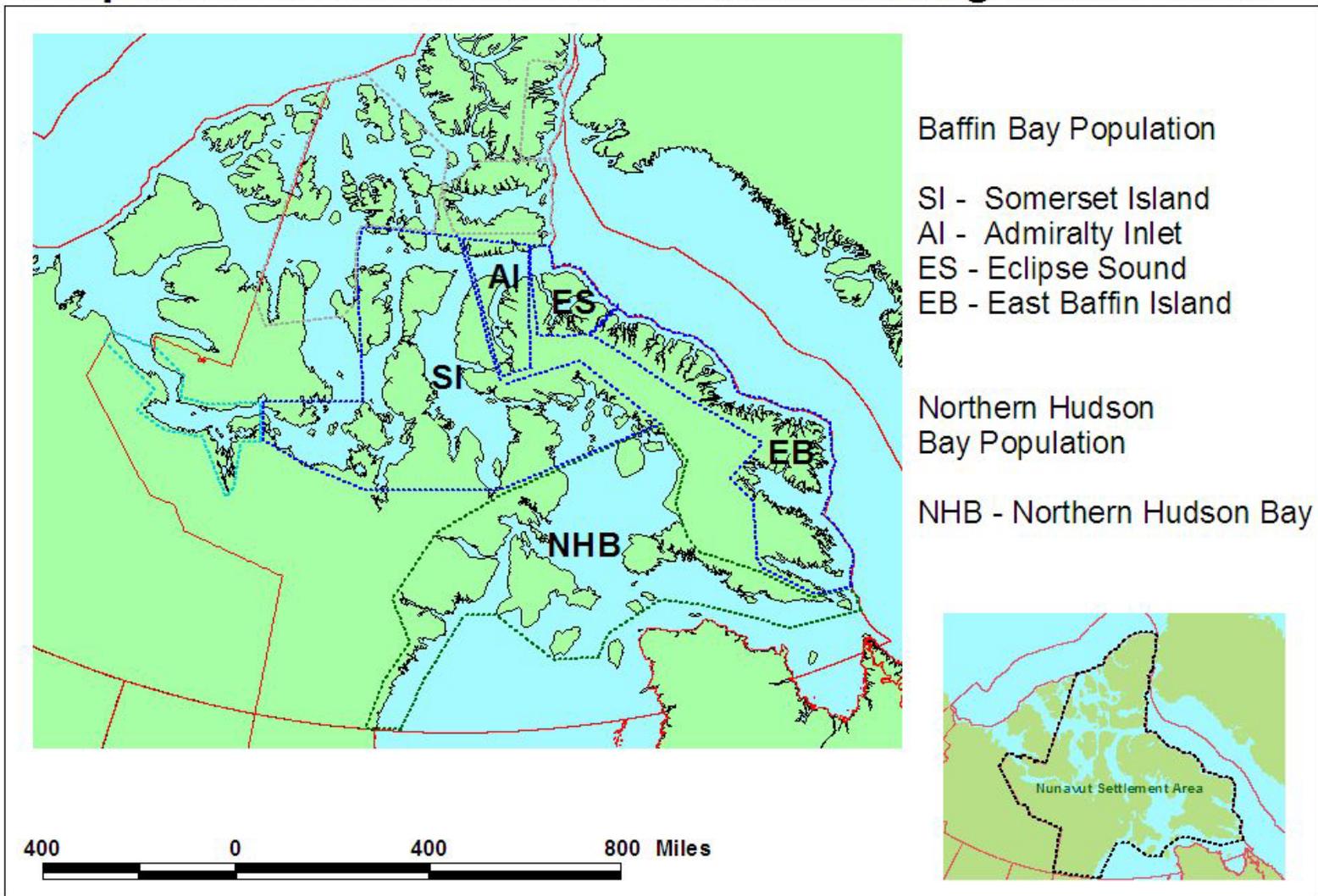
The Regional Wildlife Organizations will allocate and enforce the regional BNL, in the form of Community Harvest Limits (CHL), of narwhal once established and will regulate the harvesting

practices and techniques among the Hunter's and Trapper's organizations in the region. In addition, the local HTOs have the authority to regulate the harvesting practices and techniques of Inuit who are members of the HTO. The local HTOs will also allocate and enforce the local BNL (CHL) for narwhal, once established. Some communities have established local hunting by-laws (Appendix 3).

In 2008, DFO recommended that the narwhal fishery be managed based on known summering stock aggregations. Six management units have been identified. The Baffin Bay population has been separated into four management units (Somerset Island, Admiralty Inlet, Eclipse Sound, East Baffin Island) based on observed summering aggregations and satellite telemetry (DFO 2008). A fifth stock, in Parry Channel, Jones Sound and Smith Sound, has tentatively been identified as a separate management unit. The Northern Hudson Bay narwhal population remains a distinct management unit (Figure 2). Communities that harvest from each management unit are provisionally assigned and identified in Table 1 (subject to community input). Communities within the Admiralty Inlet, Eclipse Sound and East Baffin management units harvest narwhal from their respective management units during the summer aggregation period, and from mixtures comprised of narwhal from the Somerset Island, Admiralty Inlet, Eclipse Sound and East Baffin management units when narwhal migrate past Arctic Bay, Pond Inlet, Clyde River and Qikiqtarjuaq to their overwintering areas each spring and again when the narwhal return to the summering areas each fall.

**Figure 2:** Location of management units of Canadian narwhal populations. Dashed lines indicate management unit boundaries.

## Boundaries for Narwhal Management Units



**Table 1:** Harvesting communities in each narwhal management unit

Stock/Population	Management Unit	Harvesting Community(s)
Baffin Bay	Somerset Island (SI)	Resolute Bay Taloyoak Gjoa Haven Kugaaruk Cambridge Bay Igloolik Hall Beach Kugluktuk
	Admiralty Inlet (AI)	Arctic Bay
	Eclipse Sound (ES)	Pond Inlet
	East Baffin Island (EB)	Clyde River Qikiqtarjuaq Pangnirtung Iqaluit
Northern Hudson Bay	Northern Hudson Bay (NHB)	Repulse Bay Coral Harbour Chesterfield Inlet Rankin Inlet Cape Dorset Whale Cove Kimmirut Arviat Baker Lake Hall Beach
Unknown	Parry Channel, Jones Sound, Smith Sounds (PJS)	Grise Fiord

### 3.1.6 Approval Process

This IFMP will be approved by the Minister of Fisheries and Oceans and the Nunavut Wildlife Management Board (NWMB), pursuant to Nunavut Land Claims Agreement S. 5.2.34. It will be reviewed and amended as necessary.

This IFMP will be translated to Inuktitut and made available from DFO.

### 3.2 Stock Assessment, Science and Traditional Knowledge

### 3.2.1 Biological Synopsis

## 3.2 Stock Assessment, Science and Traditional Knowledge

### 3.2.1 Biological Synopsis

Narwhal, *Monodon monoceros*, are toothed whales that are distributed mainly north of 60°N in the waters of the Eastern Canadian and European Arctic (including west Greenland). Narwhal have also been observed as far west as Alaska (Allen and Angliss 2011) and as far south as Newfoundland-Labrador (Mercer 1973, Merdsoy et al. 1979). Adult narwhal have two teeth in their upper jaw. In males, the left front tooth protrudes to form a spiralled ivory tusk. Occasionally, tusks are also observed in females. Double tusked narwhal are uncommon (Mansfield et al. 1975).

Males can grow to 5.4m in length (excluding the tusk) and 1,800 kg (4000 lbs) in weight, females to about 5m and 1,000 kg (2200 lbs) (Mansfield et al. 1975). Recent advances in age determination suggest that narwhal live longer than was previously thought. Males become sexually mature at approximately 9 years, and can live to  $84 \pm 9$  years; females become sexually mature at approximately 6 years of age can live to  $115 \pm 10$  years. (Garde et al. 2007). Narwhal are thought to breed in spring (March to May); calves are born in July-August the following year (Best and Fisher 1974; Mansfield et al. 1975; Hay 1984). Calving intervals have been estimated at 3 years (Mansfield et al. 1975); however, some Inuit hunters believe calving occurs every 1-2 years (Remnant and Thomas 1992; Stewart et al. 1995). Calves are grey or bluish-grey at birth, and become almost completely white ventrally and mottled grey to black on their dorsal surface and sides (Mansfield et al. 1975).

Ice, water depth, and the presence of upwellings may all play key roles in habitat selection (Heide-Jørgensen et al. 2002; Laidre et al. 2004). Narwhal over winter in the deep water of Baffin Bay-Davis Strait, where they appear to feed intensely on Greenland Halibut (*Reinhardtius hippoglossoides*) (Laidre and Heide-Jørgensen 2005). Narwhal summer ranges, where most calves are born, are generally in coastal areas over deep bottoms that offer shelter from the wind (Mansfield et al. 1975; Richard et al. 1994). During fall migration and on their winter ranges, narwhal are found in deep water and on the continental slope, sometimes within pack ice in winter (Dietz et al. 2001; Laidre et al. 2002). Narwhal tend to return to the same locations each summer (Dietz and Heide-Jørgensen 1995; Heide-Jørgensen et al. 2003; Laidre et al. 2004; Dietz et al. 2008).

### Stock Delineation

There are two narwhal populations in the eastern Canadian Arctic: the Northern Hudson Bay (NHB) narwhal population and the Baffin Bay (BB) narwhal population. This separation is based on evidence from satellite telemetry, genetic, and contaminant data (de March and Stern 2003; de March et al. 2003; Richard 2010).

The NHB population is not thought to be shared internationally. Its summer range includes the area surrounding Southampton Island, with the largest aggregations in Repulse Bay, Frozen Strait, Lyon Inlet, and Foxe Channel. NHB narwhal typically arrive on their summer range in late July and then leave by mid to late August. Most NHB narwhal appear to winter in southeast Davis Strait and/or eastern Hudson Strait, with some occupying open leads and polynyas of NHB and western Hudson Strait (DFO 1998; Richard 2001; Westdal 2008).

The BB narwhal population is considered to be shared with Greenland since its distribution includes the Canadian Arctic Archipelago and northwest Greenland (Richard et al. 1994; DFO 1998). Narwhal from Canada and Greenland over winter together in Baffin Bay. A portion of the Baffin Bay narwhal population migrates seasonally from its wintering grounds in Baffin Bay to recurring summer aggregations in the Canadian High Arctic. Four stocks have been provisionally recognized that correspond to these recurring summer aggregations (Figure 1.2; DFO 2008). The relationship of narwhal summering in Parry Channel, Jones Sound and Smith Sound to other BB narwhal is not known. There are genetic differences between narwhal from Jones Sound and those from the Somerset Island summering stock (DFO 2011).

### 3.2.2 Ecosystem Interactions

Narwhal are an ice-associated species, and the potential effects of climate change are under study. Changes to habitat, prey availability, and increased natural mortality may lead to changes in abundance, distribution and stock structure (Laidre and Heide Jorgensen 2005, Laidre et al. 2008).

In Nunavut, local residents and scientists have observed killer whales feeding on marine mammals including narwhal (Steltner et al. 1984; Campbell et al. 1988; Stewart et al. 1995; Laidre et al. 2006; Higdon and Ferguson, 2009). Killer whales may be an important predator of narwhal, as indicated by their behavioural responses when killer whales are nearby (Campbell et al. 1988; Laidre et al. 2006). Narwhal attempting to seek protection near shorelines and in bays or inlets may be more available to hunters. DFO is working with Nunavut HTOs to gather information on killer whale abundance and distribution in Nunavut, to evaluate their impact on marine mammals (Ferguson et al. 2012, 2011, Higdon et al. 2011).

### 3.2.3 Traditional Knowledge

Traditional Ecological Knowledge (TEK) of local narwhal distribution and movements has been collected through workshops, interviews with elders and hunters chosen by the HTO, community consultations and questionnaires (Remnant and Thomas 1992; Stewart et al. 1995; summary in Stewart 2001, Gonzalez 2001; Westdal 2008).

Inuit recognize differences among narwhal, based on tusk characteristics and body size, in many communities. Inuit report that narwhal are numerous and are seen more frequently with changes in ice cover. Inuit have also observed fewer narwhal in traditional areas, and speculate that this is due to increased ship traffic, exploration and general noise. Seismic testing is also thought to have negative effects on the hearing and behaviour of narwhal (DFO ~~unpublished TEK report~~[2012/001 from 2011 tour](#)).

Richard (2010) used Inuit and scientific observations to delineate narwhal and beluga stocks in Nunavut. Inuit observations included local knowledge and reports of narwhal seasonal range and aggregation areas, hunter observations of narwhal appearance and behaviour in different areas of Nunavut and adjacent waters (see Appendix II, in Richard 2010).

### 3.2.4 Stock Assessment

A precautionary approach to fisheries management links harvest recommendations with stock assessment data. Lower harvest levels are recommended when stock assessments are uncertain, to avoid serious harm to fish or marine mammal stocks or their ecosystem. A lack of

stock assessment data should not be used as a reason to postpone (or fail to take) management actions. This approach is widely accepted as an essential part of sustainable fisheries management.

In accordance with the Fisheries Act and the NLCA, the best available information guides narwhal management decisions made on behalf of the Minister/NWMB. A management decision to restrict Inuit harvesting shall do so only to the extent necessary to effect a valid conservation purpose; give effect to the allocation system outlined in the NLCA; or to provide for public health or public safety (NLCA s.5.3.3).

DFO maintains an active scientific research program, aimed at an increased understanding of narwhal population processes (e.g. seasonal distribution, movements and diving behaviour, habitat use, diet analysis), environmental factors that influence narwhal distribution and numbers, and the role of narwhal in marine ecosystems.

The objective for narwhal stock assessment research is to support sustainable narwhal hunts and maintain narwhal population health and diversity. Objectives are achieved by developing methods to minimize the uncertainty associated with population abundance estimates, understanding the demographic effects of harvest and changing environmental conditions, and predict future trends in abundance under various scenarios.

Research and information needs have been identified to improve narwhal stock assessment:

- Conduct aerial surveys to estimate abundance for the Northern Hudson Bay and Baffin Bay management units to develop the time series necessary for risk analysis of various harvest scenarios
- Assess other methods of estimating narwhal stock abundance (e.g mark/recapture)
- Gather TEK regarding Parry Channel/Jones Sound/Smith Sound narwhal
- Use telemetry data to develop robust methods required to adjust counts for animals under water
- Gather biological samples from harvests in as many communities as possible to assess stock status.
- Conduct fishery independent monitoring to determine loss rates
- Continue satellite telemetry programs, genetic analysis and laboratory analyses of other bio-markers to further stock delineation

Narwhal abundance estimates are derived from aerial surveys flown over known summering aggregations, before narwhal begin their fall migration. Historic abundance estimates derived from aerial surveys of summering aggregations of Baffin Bay and Northern Hudson Bay narwhal are summarized in DFO (2011) and (Richard 1991, 2010) respectively. Historic surveys did not account for diving narwhals missed by observers during the survey.

The Baffin Bay population has recently been separated into four management units, based on observed summering aggregations. The most recent abundance estimates of Baffin Bay management units (Somerset Island, Admiralty Inlet, Eclipse Sound, and East Baffin Island) and of the Northern Hudson Bay population account for diving narwhals. These surveys have been used to recommend a harvest level (presented as Total Allowable Landed Catch, TALC) for each proposed management unit (Table 2.1).

**Table 2.1:** Narwhal abundance estimates, Potential Biological Removals (PBR) and Total Allowable Landed Catch (TALC) for five known management units (DFO 2008, DFO 2011\*).

Population	Management Unit	Survey Year	Abundance Estimate	CV	PBR	TALC
Baffin Bay	Somerset Island	1996	45,358	35%	681	532
	Admiralty Inlet*	2010	18,049	23%	299	233
	Eclipse Sound	2004	20,225	36%	301	236
	East Baffin Island	2003	10,073	31%	156	122
Northern Hudson Bay	Northern Hudson Bay	2000	5,053	40%	73	57

Stock assessment information (e.g. abundance estimates, hunting mortality and concurrent population dynamics parameters) is currently insufficient for all narwhal management units. As a result, the Fishery Decision Making Framework (see Section 3.1.4) cannot be implemented for narwhal. Instead, a Potential Biological Removal (PBR; Wade 1998) threshold was determined for each management unit, using the most recent abundance estimate. The PBR value was then adjusted to estimate mortality due to hunting losses, based on self-reporting by harvesters. DFO's sustainable harvest advice for each management unit is presented as a Total Allowable Landed Catch (TALC) recommendation.

### **The Harvest Allocation Model**

The recommended Total Allowable Landed Catch (TALC) applies throughout the year. For each management unit, narwhals killed locally on their summer range, and those killed elsewhere during spring and fall migration must be deducted from the appropriate TALC recommendation. As noted earlier, genetic differences within Baffin Bay narwhals are not yet evident (DFO 2011). A Harvest Allocation Model, based on the current understanding of narwhal seasonal distribution, was developed to ensure that the total catch on a stock or population does not exceed its TALC recommendation.

The Harvest Allocation Model (Richard 2011/056) was developed to assist co-management decisions about sub-allocating the Basic Needs Level (BNL) for each of the four known summering stocks within Baffin Bay (Somerset Island, Admiralty Inlet, Eclipse Sound and East Baffin Island). The model cannot be used to allocate narwhal catches to Grise Fiord, because the relationship of narwhal in Smith/Jones Sound to those elsewhere in Baffin Bay is not known. Similarly, the model cannot be used to assist decisions for the Northern Hudson Bay narwhal population, because it is independently managed at the population level.

The allocation model uses HTO decisions on seasonal catch proportions to provide a catch limit for each of Arctic Bay, Pond Inlet, Clyde River and Qikiqtarjuaq. It allows the maximum possible catch for each community, without exceeding the sustainable harvest recommendation for any of the four Baffin Bay summering stocks. As BNL levels are established, the appropriate Regional Wildlife Organization (RWO) will regulate the sub-allocation of the BNL within each stock.

**Figure 3:** Location of summering aggregations of Canadian narwhal populations. Baffin Bay narwhal summering aggregations are found in Areas A-H (A- Somerset, B- Admiralty Inlet, C- Eclipse Sound, D- East Baffin, and F-G-H - Parry Channel/Jones Sound/Smith Sound). Area E is the principle summer range of the Northern Hudson Bay stock. Source: DFO 2010.



### 3.3 Social, Cultural and Economic Importance of the Fishery

For centuries, narwhal have been used as a traditional food for Inuit and have supplied materials for day to day living. Narwhal are mostly hunted for their skin (maktaaq). In addition to its protein and caloric value, skin is highly valued food because of its richness in vitamin C, zinc, retinol and other essential nutrients (COSEWIC, 2004). Narwhal ivory is a valuable by-product of the food hunt. Narwhal meat is more commonly used as food for dogs but is also eaten by Inuit if other meat is not available. Narwhal also provide the material for numerous necessities required for arctic living such as narwhal bones used for carving, sinews used for sewing thread, skin for laces, tusks for making handicrafts, tent poles, walking sticks, and the manufacture of hunting equipment. Therefore, the hunt itself and the sharing of the proceeds are socially, culturally, and economically important to Inuit.

The narwhal hunt is considered significant as it provides both food and income, particularly in isolated Arctic communities, where employment opportunities are very scarce for families involved in hunting. With regard to tourism, Whitford (2006) estimated that there were approximately 7,000 whale watchers in northern Canada including northern Manitoba and the Arctic. In addition to commercial tourism, tours for special projects such as scientific studies, photography and television provides significant indirect benefits to society in terms of science exploration and education.

The ivory tusk of the narwhal is also a valuable commodity and an important source of cash income for some coastal communities (COSEWIC, 2004; Reeves, 1992). The value of narwhal tusks varies with their condition. The average value, to the hunter, of narwhal ivory with natural (unbroken) tips is calculated to be approximately \$150/ft (GN July 2011 meeting presentation materials). In 2009, the Inuit harvested 461 narwhal and of those, 365 (79%) were tusked. The average tusk length of narwhal killed in 2009 was 168.5cm (5.53ft). A tusk of that size, with an intact tip, has an estimated value of almost \$1000.00 (DFO unpublished data). The 2009 harvest would therefore generate income from tusks sales of approximately \$360,000.

The narwhal hunt, particularly for isolated communities where alternate employment opportunities are rare, remains economically important. As evidenced in a study on Arctic Bay hunters, the prices paid to hunters for both skin and ivory approximately doubled between 1975 and 1990 (COSEWIC, 2004).

There is a low level of international trade in narwhal parts from Canada. The most commonly exported narwhal product exported from Canada is the raw tusk. Between 1990 and 2007, an average of 102 tusks was exported annually compared to an average harvest of 422 narwhal the same period (DFO unpublished). The foreign demand for tusks is likely influenced by restrictions enacted by importing countries (e.g. the United States, and members of the European Economic Community).

### **3.4 Management Issues**

#### **3.4.1 Fisheries Issues**

IFMPs are required to cover all aspects of a fishery, in particular, those related to the sustainability of target species, ecosystem considerations and monitoring. There are a number of issues that co-management organizations continue to address in the management of the narwhal fishery.

#### **Long Term Sustainability-Abundance Estimates**

Comprehensive up-to-date abundance estimates and stock assessments are lacking for most management units. Abundance estimates for narwhal management units are based on aerial surveys. For Baffin Bay narwhal, the most recent abundance estimate available is for the Admiralty Inlet management unit, which was surveyed in 2010 (DFO 2011). The Eclipse Sound management unit was last surveyed in 2004; the East Baffin Island management unit in 2003, and the Somerset Island management unit in 1996. The High Arctic (Parry Channel, Jones Sound and Smith Sound) management unit has never been surveyed.

The population abundance estimate for Northern Hudson Bay narwhal was derived from surveys conducted in 2000. An aerial survey conducted in 2008 experienced technical difficulties, and could not provide an updated abundance estimate. The management unit was surveyed again in 2011, and results are expected in spring 2012. The Kivalliq Regional Wildlife Organization has expressed concerns with 2011 survey conditions (ice conditions, weather and the presence of killer whales in the general survey area) and requested the survey to be repeated in 2012.

Funding for surveys will be needed to obtain abundance estimates and advice of sustainable harvest levels of all management units.

Inuit knowledge plays an integral role in the development, implementation and analysis of narwhal surveys and stock assessment. A Working Group was established to review current practices for the inclusion of Inuit knowledge in narwhal stock assessment projects. The group's November 2011 report outlined DFO's current practices that include review of published Traditional Ecological Knowledge, community consultations, participation of Inuit in surveys, and reporting results to communities, HTO and other Inuit organizations. The report also suggested adding some enhanced practices such as;

- *Including Inuit observers in all narwhal surveys*
- *Formal observer training*
- *Incentives for participation in community consultations*
- *Alternate survey methodologies*
- *Community based monitoring*
- *Training Inuit technicians, biologists and scientists*

The co-management partners continue to be open these and other suggestions for enhancing the involvement of Inuit in research surveys.

### **Monitoring and Control of Removals**

Control of removals is based on issuance of Marine Mammal Tags to individual harvesters prior to narwhal being harvested. Overharvests of community quotas have occurred on occasion. In most cases, these have been accounted for through transfers of unused Marine Mammal Tags within the affected stock or through the use of the flexible quota system for those communities that participated in the community-based management initiative. Narwhal harvesting needs to remain within regulated harvest levels.

Timely, accurate reporting of community narwhal harvesting is essential. Without complete and accurate estimates of local harvesting activity, co-managers must exercise caution when recommending harvest limits, so that vital, healthy narwhal populations/stocks that are capable of sustaining harvesting needs of Inuit can be maintained. The timeliness of the reporting allows managers to assess the harvest as limits are approached.

A working group, including representatives from DFO, NTI, the NWMB and the GN was established in 2011 to develop recommendations on processes to improve harvest reporting. An Operational Process for Marine Mammal Tag Distribution, Harvest Reporting and Tusk Certification is under development. These processes will be reflected in an annual Community Information Booklet for hunters, as well as in the annual Marine Mammal Tag Information Package that will be provided to all HTOs.

### Reducing loss rates

It is understood that some hunting loss is inevitable when hunting marine mammals. However, loss rates need to be minimized as much as possible to demonstrate proper management and control of the fishery and to ensure conservation of narwhal. Some communities have developed local hunting rules to reduce harvest loss.

### 3.4.2 Oceans and habitat considerations

Under the *National Framework for Canada's Network of Marine Protected Areas*, networks of federal-provincial-territorial Marine Protected Areas will be developed based on thirteen bioregions in Canada. Five of these bioregions are in the Arctic. The primary goal of marine protected area networks is to provide long term protection of marine biodiversity, ecosystem function and special natural features. An action plan will be developed for each bioregional marine protected area network, that will identify priority gaps in protection to be filled through future federal-provincial-territorial marine protected areas and other conservation measures such as fisheries closures and *Species at Risk Act* critical habitat.

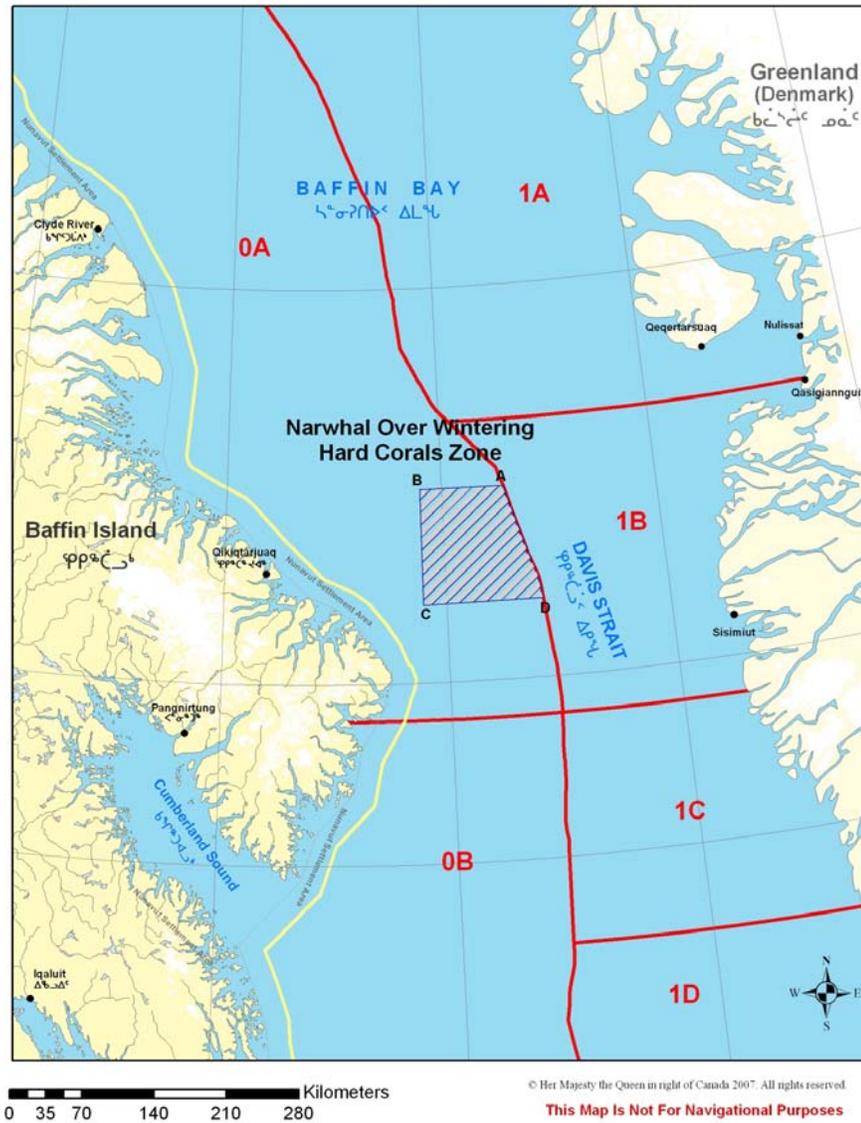
In 1998, DFO established a closed area for the Greenland Halibut fishery in the southeastern portion of NAFO Division 0A (Figure 4.1) to protect narwhal over-wintering habitat. The deep waters beyond the Greenland continental shelf and Davis Strait sill in Baffin Bay have been identified as an important narwhal over-wintering area (DFO 2007) (Laidre et al. 2003). The area is closed to Greenland Halibut fishing, as this fish species is a major food source for narwhal on their over-wintering grounds. This area is enclosed by straight lines joining the following points in the order in which they are listed:

Point	Latitude	Longitude
A.	68° 15'N	58° 33' 4.7" W
B.	68° 15'N	60° 30'W
C.	67° 15'N	60° 30'W
D.	67° 15'N	57° 50' 33" W

Points A and D are connected by the NAFO Division boundary.

This area covers some of the southern narwhal over-wintering ground and will remain closed to Greenland Halibut commercial fishing. For additional information, see the Greenland Halibut Integrated Fishery Management Plan.

**Figure 4:** Fishing closure in NAFO Subarea 0 to protect over-wintering narwhal and cold water corals.



### **3.4.4 National and International Issues**

#### **Committee on the Status of Endangered Wildlife in Canada**

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is a body of qualified experts from jurisdictional agencies and non-government organizations, independent scientists, and members of the academic community whose mandate is to identify and assign status to indigenous wildlife species at risk of extinction or extirpation across their range in Canada. The narwhal was assessed as not at risk in April 1986. In 2004, COSEWIC reassessed narwhal as a species of “special concern” (COSEWIC 2004).

#### **Species at Risk Act**

Since 2006, the SARA listing process has been deferred, pending completion of an agreement to harmonize provisions of SARA with the Nunavik Inuit Land Claims Agreement.

#### **Convention on International Trade in Endangered Species**

Narwhal are listed on Appendix II of the Convention on International Trade in Endangered Species (CITES), and a non-detrimental finding (NDF) decision from the Scientific Authority is required to obtain a CITES Export/Re-export permit to export narwhal products internationally. Currently, there is one Canadian stock and one population ineligible for international trade. Because there is no abundance estimate to make a decision on sustainability for the Parry Channel/Jones Sound/Smith Sound stock, communities harvesting from this stock cannot export narwhal products at this time; and because the harvest currently exceeds the Total Allowable Landed Catch recommendation for the Northern Hudson Bay population, communities harvesting from this population are also unable to export narwhal products internationally.

#### **Tusk traceability**

One of the management issues in recent years relates to compliance in the fishery. Improvements to the licensing process will facilitate increased tusk traceability. Improved controls over tusks are critical to protect the legal market and trade, from the hunter to the end buyer.

A working group, including representatives from DFO, GN, NTI, established in 2011, will provide recommendations on methods to improve tusk traceability. An Operational Process for Marine Mammal Tag Distribution, Harvest Reporting and Tusk Certification is under development. These processes will be reflected in an annual Community Information Booklet for hunters, as well as in the Marine Mammal Tag Information Package that will be provided annually to all HTOs.

### **3.5 Objectives for long term and short-term**

#### **3.5.1 Long-term Objectives**

1. Maintain vital, healthy narwhal populations capable of sustaining harvesting needs.
2. The protection of narwhal habitat.
3. To improve harvesting methods and equipment to reduce struck and lost.
4. Continue to document Inuit Traditional Ecological Knowledge of narwhal.

5. Maintain access to international markets for ivory export.
6. Manage narwhal consistent with the wildlife harvesting and management provisions under the Nunavut Land Claims Agreement.

### **3.5.2 Short-term Objectives**

1. Conduct surveys of each narwhal stock/population on a 5 year cycle. Secure funding for these surveys.
2. Incorporate community and hunter information into the design, and reporting of narwhal surveys.
3. Establish TAH, BNL and NQLs for each narwhal stock/population and complete necessary regulatory changes to implement management by summering stock.
4. Develop and implement processes for accurate and timely harvest reporting.
5. Develop/enhance monitoring program to reduce struck and lost, including an assessment harvesting methods and equipment, collection of data on rates of struck and loss and development of training materials for inexperienced hunters to reduce struck and loss.
6. Implement measures to improve tusk traceability.
7. Maintain narwhal over-wintering closure area in NAFO Subarea 0A.
8. Increase public awareness of the importance of narwhal subsistence to Inuit for community cohesion, nutrition, and well-being.
9. Identification and development of economic opportunities related to this activity.

## **3.6 Access and Allocation**

### **3.6.1 Harvest levels and allocation**

Current regulatory quotas are listed in Appendix 5. The NWMB is in process of establishing TAH and BNL for each stock/population. The BNL will be allocated by the RWOs to the HTOs based on the harvest allocation model (for the four Baffin Bay stocks) and the report of the previous year's harvest to ensure that harvest levels remain within established TAHs for each management unit. HTOs will allocate harvest to members.

Prior to setting TAH, the NWMB will need to consider harvesting rights of other Aboriginal groups adjacent to and within the Nunavut Settlement Area. For example, Inuit from the Nunavik Marine Region have expressed an interest in harvesting narwhal, and this will need to be addressed prior to setting the TAH for some management units.

DFO supports and facilitates scientific investigation and other uses of narwhal. Requests for licences to fish for scientific, educational, and public display purposes are considered. Existing

policies with respect to licences and the court decisions respecting the lack of authority of the Minister to use fish for financing purposes apply.

<http://www.dfo-mpo.gc.ca/science/newpoli-polinouv/guidance-conseils-eng.htm>

### **3.7 Management Measures for the Duration of the Plan**

#### **3.7.1 Marine Mammal Tag**

A Marine Mammal Tag (licence) is required to hunt (fish) for narwhal (*MMR* s. 5).

When a TAH is established for a specific management unit, narwhal can only be hunted from that management unit with the appropriate Marine Mammal Tag (e.g. summer season only Marine Mammal Tag, migratory season only Marine Mammal Tag, all season Marine Mammal Tag).

All narwhal tusks will require a Marine Mammal Tag to be considered legal.

#### **3.7.2 Quota/TAH**

Once the regulatory quota has been reached (ie. where a TAH for a stock/population has not been established), no further narwhal hunting is allowed (*MMR* s. 23). Narwhal harvesting will be closed by notice issued by a Fishery Officer.

Where a TAH has been established for a stock/population, harvests shall not exceed the TAH.

Once the Community Harvest Limit (summer, migratory, all season) has been reached in a Management Unit, no further hunting is allowed, unless approved by the RWO, under the Marine Mammal Tag Transfer Policy.

#### **When the fishery is closed in a management unit**

For communities that harvest without seasonal restrictions:

- i) Once the sum of the Community Harvest Limits in a management unit is reached, the all season fishery is closed.

For communities that harvest with seasonal restrictions:

- i) The summer fishery will be closed as either of the following conditions is reached:
  - a. Once the summer Community Harvest Limits are reached in each management unit
  - b. Once the summer season end date as set by the HTO for a community is reached.
- ii) The migratory fishery will be closed as either of the following conditions is reached:
  - a. Once the migratory Community Harvest Limits are reached in each management unit.
  - b. Once the migratory season end dates as set out by the HTO for a community are reached.

A Marine Mammal Tag Transfer Policy is under development. When finalized and approved, the policy will be applicable to all tag transfers for narwhal harvesting communities (Appendix 4).

### **3.7.3 Control and Monitoring of Removals**

The reporting of harvest information is required (*MMR s. 17 and 24, NLCA s. 5.7.43*).

The HTO will notify the RWO and DFO when the Community Harvest Limit has been reached.

The RWO will notify DFO when the summer, migratory and all season hunts are over.

After landing a narwhal, hunters shall return the completed portion of the Marine Mammal Tag containing the required harvest information, as soon as possible, to the person who issued the Marine Mammal Tag (*MMR s. 24*).

The HTO will provide DFO with completed narwhal tag return/harvest information form at the end of each month and the end of the hunting season.

### **3.7.4 Protection of Females with Calves**

A narwhal calf or an adult narwhal accompanied by a calf cannot be hunted (*MMR s. 18*).

### **3.7.5 Animal Welfare**

Hunters shall only kill a narwhal in a manner that is designed to kill it quickly (*MMR s. 8*).

### **3.7.6 Reducing Loss Rates**

Hunters that kill or wound a narwhal shall make reasonable efforts to retrieve it without delay, and shall not abandon or discard it (*MMR s. 10(1)*).

Hunters shall not waste any edible part of a narwhal (*MMR S. 10(2)*).

Hunters are required to have all necessary equipment on hand to retrieve a hunted narwhal (*MMR s. 9*).

Hunters to use a rifle or shotgun with the following restrictions (*MMR s. 19*):

- a) a rifle and non-full metal jacketed ammunition that produce a muzzle energy of not less than 1,500 foot pounds
- b) a shotgun and rifled slugs that produce a muzzle energy of not less than 1,500 foot pounds

### **3.7.7 Tusk Traceability**

Hunters shall attach the Marine Mammal Tag securely to the tusk of the narwhal, or where there is no tusk, to the carcass of the narwhal (*MMR. s. 24*).

All tusks need to be inspected and certified by a Conservation Officer or Fishery Officer, at which time, a permanent attachment device will affix the Marine Mammal Tag to the tusk.

Possession of untagged tusks is illegal (*MMR s. 14*).

A Marine Mammal Transportation licence is required to transport narwhal or narwhal parts from one province to another (*MMR s. 16(1)*).

A CITES Export Permit is required to transport narwhal products outside of Canada.

### **3.7.8 Habitat/Ecosystem Protection**

Greenland Halibut fishing is not allowed in the NAFO Division 0A closure area, as identified in the Greenland Halibut NAFO Subarea 0 Integrated Fishery Management Plan.

### **3.7.10 Other**

Reporting of all non-hunt related mortality is required (*NLCA s. 5.7.43*) e.g. narwhal caught in fishing nets or humanely harvested due to entrapments.

### **3.8 Shared Stewardship Arrangements**

Annual meetings will be held between DFO and RWOs to coordinate the sub-allocation of the BNL for the Baffin Bay management units. It is expected that once RWOs become familiar with the Harvest Allocation Model, DFO may not need to participate in these meetings.

### **3.9 Compliance Plan**

The Conservation and Protection program promotes and maintains compliance with legislation and regulations implemented to achieve the conservation and sustainable use of Canada's aquatic resources, and the protection of species at risk, fish habitat and oceans. Conservation and Protection works closely with internal partners to evaluate risks to fish and fish habitat to ensure program delivery meets Departmental objectives.

The program is delivered through a regulatory approach that incorporates consultation with internal and external partners and is delivered through:

- Promotion of compliance through education and shared stewardship;
- Monitoring, control and surveillance activities that range from basic patrols to major investigations;
- Evaluation of compliance and intelligence information that provides direction and improvements for program delivery.

Fishery Officers monitor fishing and activities in and around fish habitat to ensure compliance with the Fisheries Act and its regulations as well as several other federal statutes. Officers investigate violations of these acts and regulations and resolve them by applying various compliance options.

Fishery Officers in the Eastern Arctic Area monitor the narwhal fishery and the trade of narwhal products for compliance with the Marine Mammal Regulations which are made pursuant to the Fisheries Act. Conservation and Protection works closely with internal (e.g. Resource Management) and external (e.g. GN-Dept. Of Environment, CITES) partners to consult on and or resolve compliance issues.

Fishery Officers promote compliance with regulations by working with user groups (e.g. hunters and buyers) and other stakeholders to better understand the laws. Officers talk with hunters and people involved in marine mammal trade to provide information that increases awareness of, and helps resolve compliance and conservation concerns in the narwhal fishery and the narwhal tusk trade. Increased education and awareness will help protect the legal market and trade of narwhal tusks.

Compliance Strategy

Conservation and Protection collaborates with resource managers in the identification of compliance issues and works with them to address the issues.

Fishery Officers focus efforts on:

- narwhal conservation
- compliance with legislation
- tusk traceability / illegal trade of narwhal tusks
- licence inspections

Operational Activities include:

- Monitoring of narwhal hunts
- Education of user groups and stakeholders
- Inspections of narwhal products from harvest to export
- Cross reference of harvest data with trade data
- Liaison with Nunavut Wildlife Officers and other territorial or provincial police agencies.

COMPLIANCE FOCUS		
ISSUE	Regulation	Strategy
Monitor harvest and enforce regulations,	Sections 6, 7, 8, 9, 10, 18, 19, 23, and 24 of the MMR	hunt monitoring inspections licences
Harvest reporting and quota compliance	Sections 6, 14, 17, 23 and 24 of the MMR  Section 22 of the Fishery (General) Regulations (FGR)	Inspections Licences cross referencing and issuance Variation orders
Tusk traceability	Section 24, 14 and 16 of the MMR	Inspections

Compliance Performance

Compliance performance may be measured by a number of indicators, including:

- Number of narwhal hunt patrol days
- Number of hunters checked for compliance with the Marine Mammal Regulations
- Number of incidents of licence irregularities

- Number of violations / warnings / charges.
- Compliance with quota
- Compliance with regulations
- Number of inspections conducted

### **3.10 Performance Review**

This Narwhal IFMP was developed through an extensive consultative process including the NWMB, NTI, GN, RWOs, HTOs and narwhal hunters. DFO will continue to consult with these groups on a regular basis throughout the life of this Management Plan as circumstances require.

Post season review sessions will be conducted with co-management organizations. Progress on achieving the short term objectives and effective implementation of management measures identified in the Plan will be reviewed. Recommendations to improve management of the narwhal fishery will be developed to meet the long term objectives of maintaining a sustainable narwhal fishery.

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## Glossary of Terms

Abundance: Number of individuals in a stock or a population.

Basic Needs Level (BNL): means the level of harvesting by Inuit identified in Sections 5.6.19 to 5.6.25 of the Nunavut Land Claims Agreement

By-catch: The unintentional catch of non-targeted species while directing fishing for another species.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Committee of experts that assess and designate the conservation status of species that may be at risk in Canada

Convention on International Trade in Endangered Species (CITES): an international agreement to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

Convention on International Trade in Endangered Species (CITES) Export Permit: The permit required for the international export of species or products that are CITES listed. An export permit shall only be granted when the Scientific Authority of the State of Export has advised that such export will not be detrimental to the survival of the species in the wild.

Floe edge: where sea ice that is still attached to the land meets the open water and or moving sea-ice .

Harvest Limit: a maximum number of narwhal permitted to be harvested by a community or from a management unit in a given time period.

Landfast ice: sea ice that has frozen along the coastline, or to the sea floor over shallow parts of the continental shelf, and extends out from land into sea.

Marine Mammal Regulations (SOR/93-56): Federal regulations under the *Fisheries Act* that govern the management and control of fishing for marine mammals and related activities in Canada or in Canadian fisheries waters.

Management Unit: A geographic area identifying discrete aggregations of wildlife that are the target of specific management actions to facilitate their sustainable use and conservation.

Marine Mammal Tag (Licence): Licence required to fish for marine mammals under the Marine Mammal Regulations (s. 5).

Marine Mammal Transport Licence (MRTL): Licence required for transport of marine mammal parts and products from one province (or territory) to another.

Non-Detriment Finding (NDF): Under CITES, a determination by the DFO Scientific Authority indicating that trade in narwhal products will not be detrimental to the long term survival of the species in the wild.

Non-quota Limitation (NQL): means a limitation of any kind, except a total allowable harvest, and may include a limitation on season of harvest, sex of wildlife, size of wildlife, age of wildlife or method of harvest.

Population: a reproductively isolated group of animals, sharing a habitat.

Potential Biological Removal (PBR): A statistical method currently used by DFO Science to provide recommendations on sustainable harvest levels.

Precautionary Approach (PA): Applying caution to management actions when scientific knowledge is uncertain and not relying on the absence of adequate scientific information as a reason to postpone action to avoid serious harm to wildlife stocks or their ecosystems.

Quota: The number of narwhal that can be harvested by a community, as set out in Column 1, Section 23 of the Marine Mammal Regulations.

Species at Risk Act (SARA): The Canadian Act to prevent wildlife species from becoming extinct and secure the necessary actions for their protection and recovery in Canada.

Stock: refers to a resource management unit. For narwhal, it refers to a geographically segregated group of animals that are subject to hunting.

Telemetry: The measurement of movements of wild animals that have been tagged with radio or satellite transmitters.

Total Allowable Harvest (TAH): for a stock or population means an amount of wildlife able to be lawfully harvested as established by the NWMB pursuant to Sections 5.6.16 to 5.6.18 of the NLCA

Total Allowable Landed Catch (TALC): a sustainable harvest level recommendation for a stock or population developed by applying an estimate of harvest loss rates as a correction factor in the PBR calculation

Traditional Ecological Knowledge (TEK): A cumulative body of knowledge handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. Inuit hold traditional knowledge on narwhal.

## APPENDICES

### Appendix 1 – Community-Based Management

In 1999, the NWMB instituted a trial community-based management (CBM) initiative for narwhal. The first trial (1999-2001) involved three communities in 1999 and 2000; two additional communities participated in 2001. The first CBM trial was extended to include the 2002 hunting season, to permit a full assessment of the program. In 2003, the NWMB and DFO agreed to a second trial of the CBM initiative (2003-2007).

The CBM system was designed to align narwhal co-management with the harvest management responsibilities assigned to the HTOs by the Nunavut Land Claims Agreement. Participation in CBM was contingent on HTO agreement to establish and enforce local narwhal hunting rules, and to provide annual reports of narwhal landed and lost (struck and lost, wounded and escaped). In 1999, regulatory quotas in participating communities were lifted. In 2001, due to significant increases in harvest by some communities, the NWMB established revised harvest limits based on traditional knowledge and scientific advice from DFO. During the second CBM trial (2003-2007) participating communities could request NWMB approval to carry-over or borrow against their annual harvest limit “up to 50% of a community’s annual allocation or under undefined *special circumstances* up to 15% from the following years limit”. A formal policy was never enacted therefore each request was brought to the Board for decision.

In 2009, the NWMB decided to discontinue CBM as a stand alone program, but retained established harvest limits and the flexible quota privileges for communities previously under the CBM system until TAH levels are established and implemented. The Minister accepted this decision.

Working Draft (Revision #6) Narwhal IFMP – April 24<sup>th</sup>, 2012

**Appendix 2 – Landed catch of narwhal (*Monodon monoceros*) in Nunavut, 1999-2010. (Source: DFO, unpublished data.)**

	1996		1997		1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010	
	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch	Quota	Landed Catch
Arctic Bay	100	100	100	66	100	92	100	89	100	no record	100	132 <sup>OH</sup>	101 <sub>2</sub>	78	130	129	130	123	130	131 <sup>CO</sup>	130	130	130	124	130	132 <sup>OH</sup>	130	129	130	128
Arviat	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	3 <sub>6</sub>	3
Baker Lake	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	2 <sub>6</sub>	0
Cambridge Bay	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	NRQ	-	2 <sub>3</sub>	0	NRQ	-	NRQ	-
Cape Dorset	10	0	10	0	10	0	10	0	10	0	10	1	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10	2
Chesterfield In.	5	0	5	0	5	4	5	no record	5	3	5	2	5	4	5	1	5	4	5	4	5	4	5	3	5	2	5	4	4 <sub>6</sub>	2
Clyde River	50	10	50	15	50	17	50	0	50	52 <sup>*</sup>	50	41	50	44	50	50	50	50	50	39	50	43	50	42	50	17	50	13	50	50
Coral Harbour	10	no record	10	no record	10	no record	10	0	10	0	10	0	10	4	10	1	10	3	10	6	10	3	10	1	10	1	10	8	9 <sub>6</sub>	6
Gjoa Haven	10	0	10	0	10	0	10	0	10	0	10	no record	10	0	10	0	10	0	10	0	10 <sub>‡</sub>	0	10 <sub>‡</sub>	1	8 <sub>‡</sub>	0	10 <sub>‡</sub>	1	10 <sub>‡</sub>	1
Grise Fiord	20	2	20	1	20	9	20	16	20	17	20	24 <sup>*</sup>	20	2	20	8	20	9	20	1	20	21 <sup>OH</sup>	20	20	20	23 <sup>*</sup>	20	5	20	21 <sup>BA</sup>
Hall Beach	10	1	10	1	10	11 <sup>OH</sup>	10	0	10	1	10	7	10	9	10	2	10	11 <sup>OH</sup>	10	3	10	1	10	0	10	0	10	0	10	2
Igloolik **	25	4	25	0	25	25	25	4	25	5	25	10	25	0	25	1	25	25	25	24	25	25	25	1	25	0	25	1	25	0
Iqaluit	10	0	10	5	10	1	10	0	10	0	10	4	10	2	10	0	10	0	10	0	10	0	10	3	10	0	10	0	10	0
Kimirut	10	0	10	0	10	0	10	0	10	0	10	0	10	1	10	0	10	0	10	0	10	0	10	1	10	0	10	0	10	1
Kugaaruk	10	no record	10	15 <sup>*</sup>	10	8	10	0	10	25 <sup>*</sup>	10	37 <sup>OH</sup>	19 <sub>2</sub>	17	25	24	25	16	25	20	25 <sub>‡</sub>	48 <sub>3</sub>	25 <sub>‡</sub>	40	25 <sub>‡</sub>	35	25 <sub>‡</sub>	42	25 <sub>‡</sub>	45
Pangnirtung	40	33	40	2	40	no record	40	33	40	41 <sup>OH</sup>	40	16	40	28	40	29	40	25	40	5	40	1	40	1	40	21	40	41 <sup>OH</sup>	40	28
Pond Inlet	100	100	100	75	100	105 <sup>*</sup>	QR	132	QR	167	QR	65	108 <sub>2</sub>	63	130	67	130	65	130	62	130	88	130	65	130	697 <sub>5</sub>	130	44	130	62
Qikiqtarjuaq	50	no record	50	50	50	58 <sup>*</sup>	QR	81	QR	131	QR	87	81 <sub>2</sub>	82 <sup>*</sup>	90	90	90	95 <sup>OH</sup>	90	88	90	85	90	88	90	80	90	90	89	
Rankin Inlet	10	0	10	0	10	no record	10	no record	10	no record	10	5	10	2	10	3	10	7	10	3	10	10	10	9	10	1	10	8	9 <sub>6</sub>	9
Repulse Bay	25	16	25	35	25	18	QR	154	100 <sub>1</sub>	42	100 <sub>1</sub>	99	72 <sub>2</sub>	56	72	38	72	106 <sup>CO</sup>	72	72	72	75 <sup>*</sup>	72	74 <sup>*</sup>	72	25	72	97 <sup>CO</sup>	71 <sub>6</sub>	82 <sup>*</sup>
Resolute Bay & Creswell Bay	32	2	32	7	32	9	32	14	32	9	32	11	32	9	32	2	32	4	32	16	32	28	32	9	32	10	32	16	32	9
Taloyoak	10	0	10	0	10	0	10	0	10	0	10	10	10	10	10	no record	10	0	10	0	10 <sub>‡</sub>	34 <sup>*</sup>	10 <sub>‡</sub>	0	10 <sub>‡</sub>	3	10 <sub>‡</sub>	5	10 <sub>‡</sub>	2
Whale Cove	5	0	5	no record	5	0	5	0	5	0	5	no record	5	0	5	no record	5	0	5	1	5	2	5	0	5	0	5	2	4 <sub>6</sub>	1
<b>Total</b>	<b>542</b>	<b>268</b>	<b>542</b>	<b>272</b>	<b>542</b>	<b>357</b>	<b>367</b>	<b>523</b>	<b>467</b>	<b>493</b>	<b>467</b>	<b>551</b>	<b>638</b>	<b>411</b>	<b>704</b>	<b>445</b>	<b>704</b>	<b>543</b>	<b>704</b>	<b>475</b>	<b>704</b>	<b>598</b>	<b>704</b>	<b>482</b>	<b>704</b>	<b>1047</b>	<b>704</b>	<b>506</b>	<b>704</b>	<b>543</b>

The information in this table is taken from Marine Mammal Tag returns and any notes in the file that state otherwise. This information does not include found tusks or any struck and lost animals.

**NRQ - No Regulatory Quota**

**QR - Quota Removed**

**Grey shaded cells are Community Based Management approved harvest limits by the NWMB**

CO - Carrover of tag(s) from the previous year

OH - overharvest occurred

BA - NWMB decision to Borrow Against following year's quota to cover an overharvest, and was approved by the Minister of DFO

\* Overharvest was reconciled with a transfer/borrowing of tags from another community

\*\* Igloolik received an increase in quota in 1981 from 10 to 25

‡ Since 2006, the Gulf of Boothia communities (Gjoa Haven, Kugaaruk and Taloyoak), of the Kitikmeot Regional Wildlife Board (KRWB), have a combined harvest limit of 75 narwhals, 45 are community specific and 30 are additional NWMB harvest allocations for the region.

The KRWB sub-allocates the additional 30 tags annually.

1 - Community decision to limit the harvest to 100

2 - 2002- harvest limitations were re-established as per NWMB resolution to DFO minister

3 - KRWB allocation in addition to 3 tags carried over from 2005

4 - Cambridge acquired 2 tags from Gjoa Haven, the tags were unused and returned

5 - 73 narwhal were harvested prior to entrapment, 624 narwhal were humanely harvested with DFO's permission (ice entrapment)

6 - Arviat and Baker Lake were allocated tags from the other Kivalliq Wildlife Board communities in a 2010 decision, for one year only

### **Appendix 3 - Community Narwhal Hunting By-laws**

In addition to the co-management governance processes described earlier (S.3.1.4) some Hunter and Trapper Organizations (HTO) have enacted and enforce community hunting rules that reflect their stewardship of local narwhal stocks, and their powers and functions assigned under the NLCA (S.5.7.3).

Eight (8) narwhal hunting communities have developed written narwhal hunting by-laws, and three (3) communities follow verbal hunting by-laws.

Written local by-laws incorporate systems and rules designed to ensure that narwhal harvesting remains within the regulatory quota. Some communities have adopted individual limits on Marine Mammal Tag issuance or, if hunting is to be done cooperatively, limit Marine Mammal Tag issuance according to boat capacity and equipment. Harvest reporting is requested within specified times, including the reporting of stuck, wounded and escaped whales.

Community-specific hunting by-laws provide for the safety of hunters and the community, seasonal hunt closures based on conservation or environmental conditions, gear requirements to maximize hunting efficiency, and training for inexperienced hunters.

## **Appendix 4 – Marine Mammal Tag Transfer Policy**

### **Phase One<sup>1</sup>: Marine Mammal Tag transfers for narwhal harvesting when stocks are not mixed<sup>2</sup>.**

The purpose of Marine Mammal Tag transfers is to assist Regional Wildlife Organizations (RWOs) to:

1. Cover off over-harvest of a Community Harvest Limit (CHL) by allowing the exchange of unused Marine Mammal Tags between communities within the management unit, during the current narwhal harvesting year
2. Plan for, and allow, transfers of Marine Mammal Tags between communities within a management unit, during the current narwhal harvesting year, to maximize harvests in response to year to year variance in narwhal availability.
3. When there are not enough unused Marine Mammal Tags available for exchange, reconcile over-harvests within the management unit by reducing the following year's allocation and harvest from the community that over-harvested

### **General provisions of Phase One:**

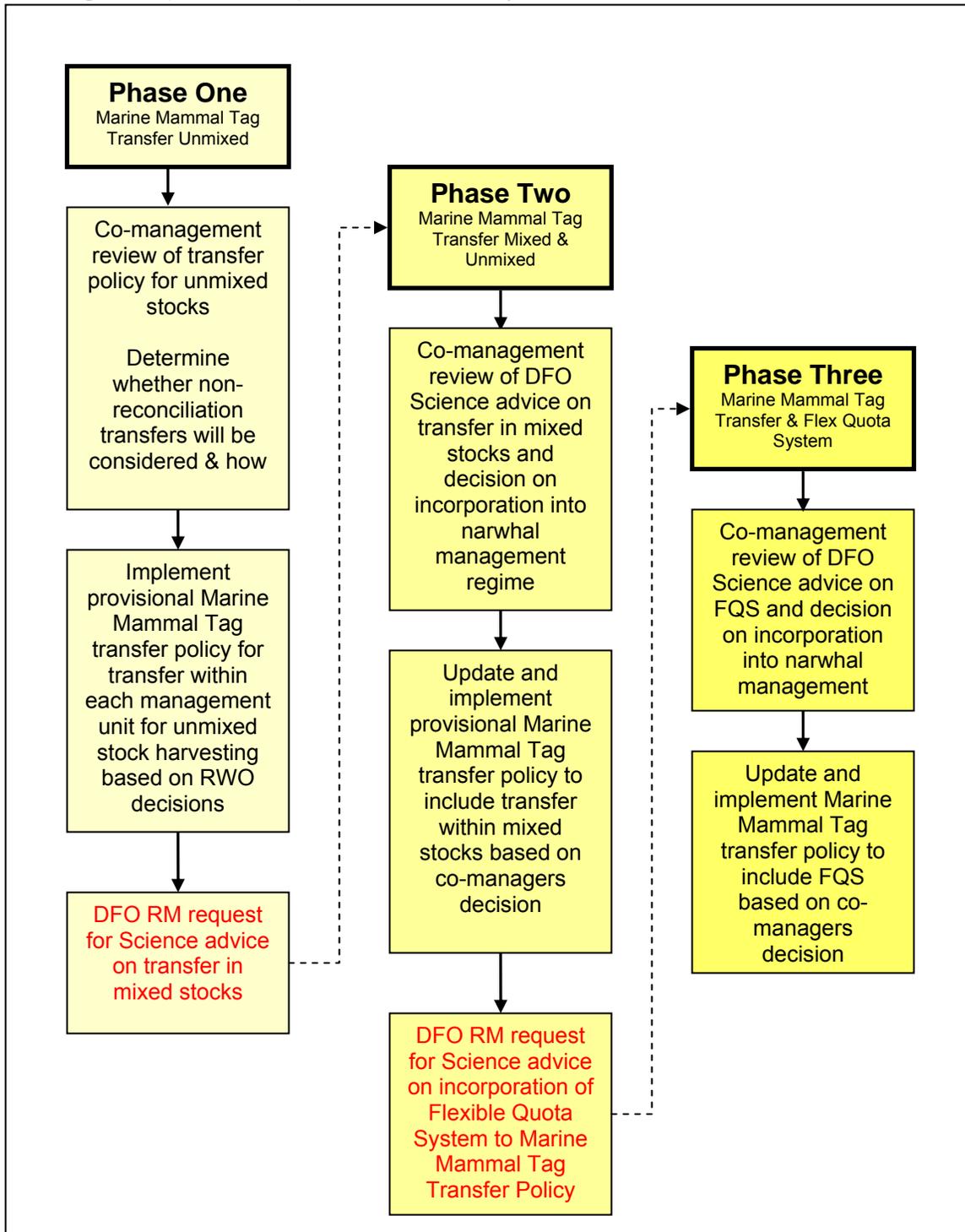
1. Following the establishment of a Total Allowable Harvest Level (TAH) and Basic Needs Level (BNL) for each narwhal stock/population and the establishment of corresponding management units based on known summering areas, the BNL for each stock/population will be allocated annually, by the RWO to the Hunter and Trappers Organizations (HTO), in each management unit. The allocation will be in the form of Community Harvest Limits. Depending on whether or not a community harvests from mixed migratory stocks, each community will receive either an All-Season Community Harvest Limit, or a Summer-Season and Migratory-Season Community Harvest Limit. The number of Marine Mammal Tags a community receives will correspond to its Community Harvest Limit(s) (All- Season, Summer-Season and Migratory-Season).
2. A valid Marine Mammal Tag is required to hunt a narwhal.
3. Individual Marine Mammal Tags may only be used to land one narwhal.
4. Marine Mammal Tags may only be used in the harvest season for which they were issued. At the end of the season, any unused tags expire and cannot be used in subsequent years.

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<sup>1</sup> These basic transfer provisions will be amended/expanded as required to reflect DFO Science advice on incorporation of mixed stock transfer in phase two and to reflect DFO Science advice on incorporation of a flexible quota system to the tag transfer policy in phase three (see figure 1).

<sup>2</sup> In the four Baffin Bay management units, stocks are not mixed when whales are in their summering areas. In the Northern Hudson Bay management unit, the stock is not mixed throughout the entire year

5. The transfer of Marine Mammal Tags is not permitted between management units.
6. Transfers of Marine Mammal Tags are subject to RWO(s) pre-approval.
7. Marine Mammal Tag transfers between communities in a management unit are allowed for harvesting when stocks are not mixed, for the purposes identified above (i.e. to cover off an individual community's over-harvest, to maximize harvests or to reconcile over-harvests within the management unit) subject to pre-approval by the RWO(s).
8. Marine Mammal Tag transfers cannot occur once the sum of the Community Harvest Limit(s) (All-Season, Summer-Season) for that management unit in any given harvest season is reached.
9. Marine Mammal Tag transfers cannot occur during the Migratory-Season in any management unit.
10. In the event that insufficient Marine Mammal Tags are available within a management unit for harvest reconciliation, community over-harvests will be reconciled with a compensatory reduction in that HTO's annual Community Harvest Limit (All-Season, Summer-Season) by the RWO for the next narwhal harvest season.
11. Requests for Marine Mammal Tag transfers for any other purposes (e.g. cross-species tag transfers or barter for wildlife products) will be forwarded to the NWMB by the RWO for the management unit for decision on a case-by-case basis as per their authority under NLCA s.5.2.33 (k). Such requests can only be considered if the transfer does not jeopardize the conservation status of the stocks or populations of wildlife in question and does not violate the terms of the management regimes governing the specific wildlife species in question.



**Figure 1.** Flow chart depicting steps in progressive, evidence based approach to development and implementation of a Marine Mammal Tag transfer policy for the 2013 narwhal fishery in the Nunavut Settlement Area. The chart delineates the steps required rather than the time sequence for the process.

**Appendix 5** – Current Canadian regulatory narwhal quotas. NRQ= no regulatory quota

Community	Quota	Community	Quota
Arviat	NRQ	Iqaluit	10
Arctic Bay	130	Kimmirut	10
Baker Lake	NRQ	Kugaaruk	25
Cambridge Bay	NRQ	Pangnirtung	40
Cape Dorset	10	Pond Inlet	130
Chesterfield In.	5	Qikiqtarjuaq	90
Clyde River	50	Rankin Inlet	10
Coral Harbour	10	Repulse Bay	72
Gjoa Haven	10	Resolute Bay & Cresswell Bay	32
Grise Fiord	20	Taloyoak	10
Hall Beach	10	Whale Cove	5
Igloolik	25	Total	704

**Appendix 6** - Basic Needs Levels and Total Allowable Harvests by stocks/populations as established by the NWMB

Stock/Population	Management Unit	Basic Needs Level (BNL)	Total Allowable Harvest (TAH)
Baffin Bay	Somerset Island (SI)		
	Admiralty Inlet (AI)		
	Eclipse Sound (ES)		
	East Baffin Island (EB)		
Northern Hudson Bay	Northern Hudson Bay (NHB)		

## **Appendix 7 - Safety at Sea**

For information on boating safety, please call the Office of Boating Safety toll-free at 1-800-230-3693 or visit the Office of Boating Safety website at [www.boatingsafety.gc.ca](http://www.boatingsafety.gc.ca).