



# **BREAKING THE ICE:**

International Trade in  
Narwhals, in the Context  
of a Changing Arctic

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**A TRAFFIC & WWF-CANADA  
REPORT**

**TRAFFIC**<sup>®</sup>  
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- Definitions of the Arctic. Map by Philippe Rekacewicz, UNEP/GRID-Arendal. 2015. Available at [www.grida.no/graphicslib/detail/definitions-of-the-arctic\\_12ba](http://www.grida.no/graphicslib/detail/definitions-of-the-arctic_12ba). Data sources: AMAP, 1998. AMAP Assessment Report: Arctic Pollution Issues; AMAP, 1997. Arctic Pollution Issues: A State of the Arctic Environment Report; CAFF, 2001. Arctic Flora and Fauna: Status and Conservation.

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# ACRONYMS

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<b>APNA</b>	Agency for Fisheries, Hunting, and Agriculture (Greenland)
<b>CAFF</b>	Conservation of Arctic Flora and Fauna
<b>CSAS</b>	Canadian Scientific Advisory Secretariat (for DFO)
<b>CoP</b>	Conference of the Parties
<b>CITES</b>	<i>Convention on International Trade in Endangered Species of Wild Fauna and Flora</i>
<b>CITES MA</b>	CITES Management Authority
<b>CITES SA</b>	CITES Scientific Authority
<b>COSEWIC</b>	Committee on the Status of Endangered Wildlife in Canada
<b>DFO</b>	Fisheries and Oceans Canada
<b>EU</b>	European Union
<b>EEC</b>	European Economic Community
<b>EU-TWIX</b>	European Union Trade in Wildlife Information eXchange
<b>EU-WTR</b>	European Union Wildlife Trade Regulations
<b>GINR</b>	Greenland Institute of Natural Resources
<b>HTA</b>	Hunters and Trappers' Association (Canada)
<b>HTO</b>	Hunters and Trappers' Organization (Canada)
<b>IFMP</b>	Integrated Fisheries Management Plan (Canada)
<b>IGO</b>	Intergovernmental Organizations
<b>IUCN</b>	International Union for Conservation of Nature
<b>JCNB</b>	Canada-Greenland Joint Commission on Narwhal and Beluga
<b>JWG</b>	Joint Working Group (of JCNB SWG and NAMMCO)
<b>LEMIS</b>	Law Enforcement Management Information System (US)
<b>MMT</b>	Marine Mammal Tag
<b>MMTL</b>	Marine Mammal Transportation Licence (Canada)
<b>MMPA</b>	<i>Marine Mammal Protection Act</i> (US)
<b>MOU</b>	Memorandum of Understanding
<b>NDF</b>	Non-Detriment Finding (for CITES)
<b>NGO</b>	Non-governmental Organization
<b>NLCA</b>	<i>Nunavut Land Claims Agreement</i> (Canada)
<b>NTI</b>	Nunavut Tunngavik Incorporated (Canada)
<b>NAMMCO</b>	North Atlantic Marine Mammal Commission
<b>NMRWB</b>	Nunavik Marine Region Wildlife Board (Canada)
<b>NWMB</b>	Nunavut Wildlife Management Board (Canada)
<b>RWO</b>	Regional Wildlife Organization (Canada)
<b>SRG</b>	Scientific Review Group (EU WTR)
<b>SWG</b>	Scientific Working Group (JCNB)



<b>SARA</b>	<i>Species At Risk Act</i> (Canada)
<b>TAH</b>	Total Allowable Harvest (Canada)
<b>TALC</b>	Total Allowable Landed Catch (Canada)
<b>US</b>	United States
<b>USSR</b>	Union of Soviet Socialist Republics
<b>UNEP-WCMC</b>	United Nations Environment Programme-World Conservation Monitoring Centre
<b>WTR</b>	Wildlife Trade Regulations (EU)
<b>WAPTR</b>	<i>Wild Animal and Plant Trade Regulations</i> (Canada)
<b>WAPPRIITA</b>	<i>Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act</i> (Canada)



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# EXECUTIVE SUMMARY

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*Accelerating reductions in sea ice thickness, extent and persistence are a concern for many marine species associated with sea ice, including narwhal (*Monodon monoceros*). However, changes will likely favour more temperate marine species that are already moving northward. As sea ice melts, human development and activity will likely increase, possibly causing disturbances to narwhals and altering hunting pressures (making them easier or harder to reach by hunters).*

**R**apid changes to Arctic ecosystems will not only affect narwhals and their habitat, but also the livelihoods of Arctic communities that coexist with (and in some cases still depend upon) them. Given the potential impacts of climate change, it will be important to ensure that international trade does not pose a threat to the species.

This report focuses primarily on the international trade in narwhal parts. The purpose is to provide insight into current international trade, the limitations in available information and the potential impacts international trade might be having on the

conservation of the species in a rapidly changing Arctic marine environment.

Narwhals are a migratory species consisting of three populations in Arctic waters, predominately in Canada and Greenland. In 2008, the International Union for Conservation of Nature (IUCN) assessed the species as near-threatened with an unknown global population trend. The most recent global population estimates for narwhals is in excess of 100,000 animals, including at least 90,000 in the Baffin Bay population, 12,500 in the Northern Hudson Bay population and 6,400 in the East

Greenland population. Although scientific estimates have been limited for some narwhal populations, updated estimates are vital for informing satisfactory management decisions.

The impacts climate change will have on narwhals are not well understood, but are likely to have a negative effect on some stocks. In recent years, concerns over loss of sea ice and its effects on narwhals have been of increased interest and narwhals have been identified as one of the marine mammals most vulnerable to climate changes. Narwhals have high site fidelity, in winter they are associated with consolidated pack ice and they are dependent on open water via limited cracks and leads (cracks in the ice). Although they occupy a large geographic area, they have a very restricted and specialized diet. Given their association with sea ice, it is speculated that climate change may negatively impact narwhals through changes to prey abundance and availability, and changes in sea ice conditions. The type and extent of sea ice varies throughout the Arctic. Thus, the effects of global climate change on the Arctic ecosystem are likely to vary regionally. Consequently, the responses of narwhals will differ between regions and populations, and will likely be influenced by ice conditions, availability of prey and hunting pressure.

For many Arctic communities, hunting activities satisfy not only cultural, social, and nutritional needs, but also contribute to the financial needs of families and households. Money earned from the sale of animal products is used to meet household living expenses and to purchase equipment for harvest activities. The global economic value of narwhal is not known. However, the estimated economic value of narwhal hunts from two communities in Hudson Bay (Canada) for the 2007 season was calculated to

range from CAD81,267 to 1,413,947 with a mean of CAD529,928; which include replacement cost of meat and value of tusks and carvings.

The most valuable part of a narwhal for international trade is the tusk, which is generally sourced from male specimens<sup>1</sup>. On average, the revenue generated per male narwhal was estimated at approximately CAD6,542. The value of narwhal products varies depending on the country, the type of item, the item's artistic value and where and how it is sold. The value of tusks also varies depending on the size and quality and whether they are raw or carved. On average, an unbroken, uncarved narwhal tusk will sell from USD2,765 to USD12,500. An uncarved narwhal tusk with a broken tip will sell for USD925 to USD2,900. The most profitable item is a double-tusked skull which can sell from USD19,000 to USD25,000.

Narwhal hunting has occurred for centuries; however, Canada and Greenland are the only countries that currently allow hunting of narwhals by Canadian Inuit and Greenland hunters for subsistence purposes. According to the available data, on average 979 narwhal were landed globally per year from 2007 to 2011 (less than one percent of global population). Broken down by range State, this is an average of 621 narwhals landed by Canada per year and an average of 358 narwhals landed by Greenland per year. However, this estimate does not include animals that were struck and lost. Although the number of struck and lost animals is a concern, it is factored into management decisions using data from known studies.

Overharvest and illegal hunting always has the potential to become a concern. Information on illegal hunting and illegal trade is not always publically available or is anecdotal in nature making it difficult

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<sup>1</sup> All narwhals have two embedded teeth in their upper jaw. In males, the left tooth grows outward to form the tusk that projects from the upper jaw. In females, the two teeth normally remain embedded within the skull as unerupted teeth, as does a normal male's right tooth. However, a very small percentage of females can grow a tusk, and some males can have a double tusk.



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to verify. However, in instances where they may occur or are reported, management actions are taken by authorities. Although illegal hunting and/or illegal trade do not appear to be a widespread concern for most narwhal range States, there have been some instances of infractions. The most recent case, “Operation Longtooth”, involved approximately 250 narwhal tusks that were legally purchased in Canada and then smuggled to the United States over a number of years.

International trade in narwhal parts and derivatives is regulated by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The narwhal has been listed on Appendix II since 1979; therefore, CITES export permits are required for exports of narwhal parts and derivatives. Issuance of such documents requires that a non-detriment finding (NDF) (indicating that the trade is not detrimental to conservation of the species) be made prior to the export of narwhal parts and derivatives.

Some countries, including the United States and the European Union, have additional restrictions on imports in addition to what is required by CITES. The European Union Wildlife Trade Regulations

(EU WTR) treat narwhals from Canada as an Annex A species, and the United States Marine Mammal Protection Act (US MMPA) has prohibited the import of narwhal parts since 1972. However, imports may be allowed into both the EU and United States under very specific circumstances and with issuance of permits.

Analysis of CITES trade data from 1987 to 2009 could not provide a precise estimate of number of narwhals represented in international trade. Items described as bones, carvings or ivory represented the highest number of items in international trade but they cannot be correlated to numbers of animals. However, the numbers of tusks (which can correlate to number of animals) was used to provide a minimum estimate of the number of narwhals represented in international trade. Over a 23-year period (1987 to 2009), a total of 4,923 tusks were legally exported, for an average of 214 per year. Over a five-year period (2005 to 2009), a total of 892 tusks were legally exported, for an average of 178 per year. If the 250 smuggled tusks identified in the Operation Longtooth investigation were included in these numbers, then a minimum total of 1,142 tusks could have been in

international trade from 2005 to 2009, for an average of 228 per year. The international trade in tusks per year has been relatively consistent. This is well under the average combined reported total of 979 narwhals landed in Canada and Greenland each year.

According to these available data, there is no indication that international trade is currently a threat to the conservation of narwhals. However, these numbers should be considered an underestimate given that they do not take into account the animals represented by narwhal ivory carvings. Plus, products exported as personal effects may not be included in the United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC) CITES trade data. Positive NDFs have been determined for the majority of narwhal stocks, indicating that range States are taking the necessary steps to ensure international trade does not pose a threat to the conservation of the species. Therefore, international trade resulting from stocks with positive NDFs will be of little concern from a conservation point of view. Development of NDFs is an ongoing activity, which should be revised or updated as new information becomes available. The challenge will be to adapt management activities as appropriate in an Arctic environment that is expected to continue changing considerably in the near future.

## Trade recommendations

In an effort to obtain a more accurate assessment of the impact of international trade, a first step is to direct efforts at greater resolution and better collection of trade data (e.g., improve description of carvings, such as size or weight) and monitoring the trade. This is needed before costly and significant changes to current management practices, which may not be realistic, practical or financially possible in the short term. Since some Arctic people and communities are dependent on the income generated from selling products from hunting activities, any solutions considered should also

bear in mind local needs in an effort to prevent any unnecessary hardships to local communities. If new information suggests that more extensive solutions are needed, they should then be explored and management practices adapted where necessary.

Cooperation, communication and commitment are needed by all involved to help fill the gaps in our current knowledge. Successful management will result in populations and stocks that remain healthy, stable, resilient to threats and a resource to local communities. The trade recommendations of this report are as follows:

- More consistent reporting of CITES trade data would allow for better analysis and monitoring of trade in narwhals. Inconsistencies in CITES trade reporting are not specific to narwhals; they apply to all taxa listed under the Convention. Therefore, any changes and improvements to the reporting of data would require the agreement, participation and commitment of the signatory Parties. This could be facilitated by development and agreement on definitions for the purpose of transaction codes, reporting trade data for the actual items traded rather than on permits issued (as recommended by CITES Res. Con. 11.17), reporting seizure data and by following the guidelines for the preparations and submission of CITES annual reports. If lack of consensus among Parties impedes such changes, then those countries that trade in narwhal parts could take a proactive stance as a signal to the CITES Parties by improving their monitoring and reporting of trade data.
- Countries that trade in narwhal parts and derivatives need to be explicit when reporting information in their CITES annual reports. Precise reporting of trade in narwhal parts and derivatives will help to facilitate better analysis of trade activities. This could include the following:
  - ▶ Proper use of terminology codes. For example the term “teeth” should be used for

un-erupted teeth and the term “tusks” for erupted teeth; the term “carvings” should not be used for any ivory or bone-related product as there are existing codes for “ivory carvings”, “ivory pieces”, “ivory scraps” and “bone carvings”.

- ▶ More precise recording of units of measurement. It would be easier to approximate the numbers of animals represented in international trade if smaller items such as carvings and ivory pieces were recorded by weight.
- ▶ Creation of new codes to better define the products in trade. Possible examples include “raw tusks”, “carved tusks” and “ivory jewellery”.
- ▶ Recording information on the region and year of harvest. This would require a separate code for supplementary information, which could be included in the online database query option. This would allow tracking of products coming from individual narwhal stocks.
- Range States should consider the development of a permanent tagging method to facilitate tracking of high-value narwhal parts such as tusks, skulls and carvings. Potential options include pit tags, microchips, or metal tags similar to those used in reptile skins. Carvings and other smaller items could be marked with unique tagging numbers or traded with a certificate or holographic stickers that could associate carvings with hunting tag numbers.
- The data collected via implementation of a permanent tagging program would allow authorities to ensure the enforcement of sub-national NDFs, and would generally assist authorities in validation of legal trade. Alternatively, Canada and Greenland could consider developing a joint documentation scheme to help identify and track the source of narwhal ivory in international trade.
- The reporting of items exported as personal and household effects (including tourist souvenirs) would greatly improve the understanding of trade dynamics. It would provide a better, more accurate estimate of the number of narwhal represented in international trade and better allow the use of trade data to assess whether international trade poses a threat to the conservation of the species. One way to facilitate such reporting could be through completion of wildlife declaration forms like those used by the United States.
- An updated and circumpolar socioeconomic study on the importance of trade in Arctic species (including narwhals) would provide useful information to facilitate dialogue and insight into the potential effects of restricting hunting and trade. This study could involve a review of:
  - ▶ the impact of the export bans resulting from negative NDFs;
  - ▶ the impact of the stricter-than CITES measures for narwhals.
- A study on domestic trade patterns and trade dynamics in narwhals could help to provide insight into market dynamics and international trade. A centralized system for recording and monitoring domestic trade could provide useful information to assist in such a study.
- Stakeholders and/or range States should consider developing a study on the supply chain and consumer demand dynamics for narwhal parts. Analysis of import data, export data and re-export data can help determine patterns of trade and countries (or regions) of interest. Such a study could help determine market drivers, whether items stay in initial country of import, or whether they are a hub for additional international trade. If markets are better understood and monitored, then range States would be better informed for making sound management decisions.





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# INTRODUCTION

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*Increasing international attention has been placed on the Arctic in recent years, most notably due to concerns over rapid climate change. Accelerating reductions in sea ice thickness, extent and persistence are a concern for many marine species associated with sea ice, including narwhals (*Monodon monoceros*), but will likely favour more temperate marine species that are already moving northward.*

**P**ublic, governmental and industrial interest in the Arctic continues to escalate. Rapid changes to Arctic ecosystems will not only affect narwhals and their habitat, but also the livelihoods of Arctic communities that coexist with (and in some cases still depend upon) them.

## 1.1 Purpose of the report

This report focuses primarily on the international trade<sup>2</sup> in narwhal parts and derivatives. The

report's purpose is to provide insight into current international trade, limitations in available information and the potential impacts this trade might be having on the conservation of the species. A centralized system to track and record trade within a country does not exist for all range States. No attempt was made to analyse domestic trade (i.e. trade within the national borders of a country): the intention is to provide insight into dynamics of international trade. However, in some instances, this report discusses domestic trade in more general terms (e.g.

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<sup>2</sup>International trade is defined as "The exchange of goods and services across international borders" (First National Bank-International Trade Services, 2006), while domestic trade is defined as "Any commercial activity, including, but not limited to, sale and purchase, within the territory under the jurisdiction of a CITES Party" (CITES, 2008a).

types of items in trade). Since narwhals are listed in Appendix II of the *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES), analysis of international trade data is possible; however, it is not possible to isolate and analyze data from specific regions within a country, nor can the age of items in international trade be distinguished (i.e. only whether an item is recorded as pre- or post-CITES listing can be distinguished). The report only utilizes available scientific information on harvest and international trade. It does not attempt to incorporate the substantial and varied traditional knowledge held by indigenous peoples from around the Arctic regarding the biology, status, or population trends of this species.

To provide context to the review and assessment of international trade in narwhal parts and derivatives, the report includes background material on narwhals, the status of the species and the importance of wildlife and wildlife trade in the Arctic. Climate change is a growing concern for many Arctic marine mammals associated with sea ice; it could, and in some regions already is, affect hunting activities (and the resulting trade in Arctic species). As such, the potential threat climate change poses to narwhals and their habitat is briefly discussed. Although there is a wealth of available literature on these topics, background material is included in this report for the reader's convenience because this information is helpful for understanding various management structures and the basis for management decisions within narwhal range States and at international fora (e.g. CITES meetings and conferences).

Narwhals range into waters of four main nations, so management and conservation of the species is ultimately the responsibility of those individual

range States and is subject to their respective legislation, regulations and policies. The vast majority of narwhals occur in Canada and Greenland<sup>3</sup> (an autonomous territory of the Kingdom of Denmark); these are the main two range States. However, other range States include Norway and Russia, and narwhal are occasionally sighted in the United States (Alaska) and Iceland. Since the majority of narwhals occur in Canada and Greenland, a summary of the current management regimes for these two range States is provided. Management and trade are closely linked, so a comprehensive understanding of international trade dynamics for the species requires familiarity with how narwhals are managed in Canada and Greenland (i.e. management decisions can determine what can or cannot enter into trade). A summary of relevant agreements, legislation and regulations (both domestic and international) is provided in the appendices of the report.

## 1.2 Background

The narwhal (*Monodon monoceros*) is the only cetacean with a long spiralled tusk (COSEWIC, 2004; Richard and Kingsley, 2007; Rosing 1999). Generally, a female narwhal will have two teeth and a male will have one tooth and one long tusk, although a very small number of females may grow a tusk and occasionally a male will have two tusks. Pods tend to segregate by sexes and age, with larger males usually further offshore in open water and in deeper water than the groups of females with calves and juveniles (P. Ewins *in litt.* to E. Cooper March 11, 2014).

Narwhals are one of only three ice-associated cetaceans endemic to Arctic waters (Dietz and Heide-Jørgensen, 1995; Reeves *et al.*, 2014). They are a migratory species, spending over half of each year in ice-dominated

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<sup>3</sup> Although Greenland is not considered a sovereign nation (it is part of the Kingdom of Denmark), in the international forum Greenland/Denmark has been recognized as a range State for narwhal. For the purposes of this report the authors will reference Greenland as a range State, but it is implied that the report refers to Greenland/Denmark.



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wintering areas which can be so densely packed with sea ice that less than five per cent of open water is available (COSEWIC, 2004; Laidre and Heide-Jørgensen, 2005a; Heide-Jørgensen and Laidre, 2006). However, they also spend up to three months in coastal ice-free summering areas in the fjords and archipelagos of northern Canada and north Greenland (Koski and Davis, 1994; Heide-Jørgensen *et al.*, 2003; Laidre and Heide-Jørgensen, 2005a). Although they occupy a large geographic area, they have a very restricted and specialized diet (Laidre and Heide-Jørgensen, 2005b; Heide-Jørgensen and Laidre, 2006; Watt *et al.*, 2013). Depending on the time of year, narwhals eat Greenland halibut (*Reinhardtius hippoglossoides*), polar cod (*Arctogadus glacialis*), Arctic cod (*Boreogadus saida*), squid (*Gonatus* sp.) and other species of pelagic fish and benthos prey (Laidre and Heide-Jørgensen, 2005b; Heide-Jørgensen and Laidre, 2006; Watt *et al.*, 2013). Throughout their annual migration cycle, narwhals use various habitats which appear to be linked to the seasonal changes in Arctic

waters (Laidre *et al.*, 2004a; Laidre and Heide-Jørgensen, 2005a). Habitat selection may be influenced by the quality of ice habitat, density of pack ice and presence of leads in fast ice (COSEWIC, 2004). Patterns of habitat preference may also be determined by behavioural selection that is controlled by migration patterns, seasonal access and life history traits (Laidre *et al.*, 2004a).

Estimates of life history parameters and vital rates of narwhals have been hindered partly due to lack of reliable techniques to estimate their ages (Garde *et al.*, 2012). This has made it difficult to parameterize rates of body growth, age of sexual maturity, longevity, and rates of survival (Garde *et al.*, 2012). However, a technique using aspartic acid racemization has been identified to help estimate the age of narwhals (Garde *et al.*, 2007; 2012). Using this technique, Garde *et al.*, (2007) suggest that narwhal have a long life span (up to at least 115 years). Age of sexual maturity is thought to be approximately nine years for males and six to seven

years for females, which give birth to their first young at six to nine years (Garde *et al.*, 2007). Although more frequent reproduction is possible, mature females reproduce every three years and give birth to a single calf (although two calves may be possible) 14 to 15 months after conception (DFO, 2012d; COSEWIC, 2004). Generation times and net recruitment rates for narwhals are poorly understood (COSEWIC, 2004).

Narwhals are well adapted to living in Arctic waters. They have a thick (up to 10 cm) layer of blubber important for storing energy and insulating them from freezing waters. The absence of a dorsal fin is thought to be an evolutionary adaptation to aid in swimming under ice. They have specialized adaptations which aid in deep diving, to depths where water pressure is intense and little oxygen is present (the deepest recorded dive is approximately 1,750 m) (Richard and Kingsley, 2007; Laidre *et al.*, 2003). Their rib cages can compress under water pressure as they go deeper, their muscles are capable of carrying extra oxygen (i.e. they have a high concentration of myoglobin in their muscles) and they can shut off blood flow to select organs and non-critical body parts to save oxygen (Laidre and Heide-Jørgensen, 2006). Depending on depth, dives can last up to 25 minutes (Laidre *et al.*, 2003). All of these characteristics and adaptations help narwhals survive in Arctic waters.

### 1.2.1 Narwhal population and conservation status

The vast majority of narwhals are found in the Atlantic Arctic region in waters near the eastern Canadian High Arctic and east and west Greenland (Denmark) (Culik, 2010; CAFF, 2013). However, they are occasionally observed in waters near Svalbard (Norway) and Franz Josef Land (Russia); and rarely observed in waters from the Barents Sea, and also in the Chukchi Sea (Alaska, United States and Russia) (CAFF, 2013;

Culik, 2010; CITES, 2004; Reeves *et al.*, 2003; Jefferson *et al.*, 2012). Narwhals are a migratory species with distinct summering and wintering distributions. Three narwhal populations are currently recognized which is distinguished by their summer distribution (see Figure 1.1) (CITES, 2005; COSEWIC, 2004; Reeves *et al.*, 2003). This includes the Northern Hudson Bay population (Canada), the Baffin Bay population (Canada/Greenland) and the East Greenland population (Greenland) (Annex A and Figure 1.1). For harvest management purposes, the Baffin Bay population is further broken into management units/stocks based on their specific summering areas (DFO, 2010a; 2010c) (Annex A).

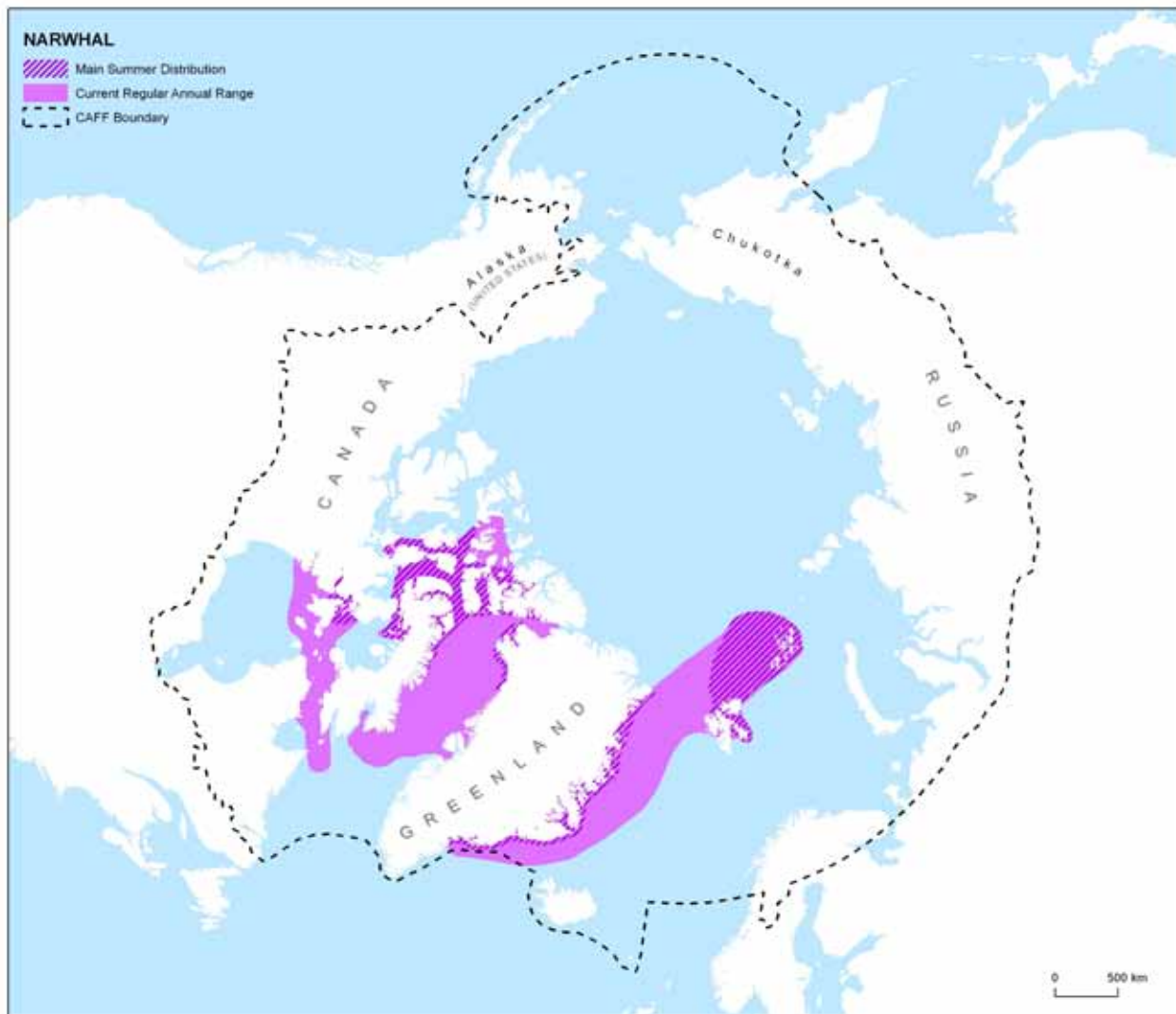
The global conservation status for narwhals was last assessed in 2008 by the International Union for Conservation of Nature (IUCN). The species was designated as Near Threatened<sup>4</sup> in the Red List of Threatened Species, which estimated the global population to be “probably in excess of 80,000 animals”, with an unknown population trend (Jefferson *et al.*, 2012). Although there are some historical data from several stocks, the global population size has never been known with certainty (COSEWIC, 2004). It is currently estimated to be in excess of 100,000 animals, including at least 90,000 in the Baffin Bay population, 12,500 in the Northern Hudson Bay population and 6,400 in the East Greenland population (Asselin *et al.*, 2012; Asselin and Richard, 2011; CAFF, 2013; Heide-Jørgensen *et al.*, 2010; 2013b; Innes *et al.*, 2002; Reeves *et al.*, 2014; Richard *et al.*, 2010). These estimates are based on the cumulative sum of available population estimates for the various stocks (see Table in Appendix A for details on estimates, confidence intervals, year and season of study). Recent studies for the Canadian Baffin Bay population suggest there may be more animals than once thought; however, this could be a result of improved surveying methods, not necessarily an indication that the population is increasing.

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<sup>4</sup> “A taxon is Near Threatened when it has been evaluated against the criteria for but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future” (IUCN, 2008).

# Figure 1.1

Global distribution of narwhals



Source: Reeves *et al.*, 2014.

Note: The Hudson Bay population is depicted by the distribution in the left of the map, the Baffin Bay population in the center and the East Greenland-Svalbard population of the map. CAFF is the biodiversity working group of the Arctic Council.

Population estimates are very difficult to establish since narwhals have a large distribution and range into areas that are not always accessible to humans. Aerial surveying methods are most often used, but these can be time-consuming, expensive and inaccurate, because an unknown proportion of a population may be hidden underwater at any given time (P. Richard, DFO Marine Mammal Research Program, *pers. comm.* to T. Shadbolt, December 23, 2008; Richard *et al.*, 2010; Heide-Jørgensen *et al.*, 2010). This can result in availability bias (animals are hidden underwater) and perception bias (animals are missed by observers) (Heide-Jørgensen *et al.*, 2010). However, most scientific estimates are adjusted to account for such biases. Since the historic population size is unknown, trends are difficult to determine. Despite availability of some good population estimates, changes in survey methods or lack of long-term monitoring make these estimates incomparable, which mean they cannot be used to determine trends in abundance (CAFF, 2013).

Some of the main anthropogenic threats to narwhals, beyond the effects of rapid climate change on sea-ice dynamics, include hunting, shipping, commercial fisheries, industrial development (i.e. oil and gas), tourism, and noise disturbance from these activities. The Northwest Passage is close to narwhal summering grounds and corridors, and increased traffic in these areas (due to reduced sea ice) could disturb narwhals as a result of more underwater noise from seismic activities and ships (Elliott and Simmonds, 2007). An offshore Greenland halibut (the primary prey of narwhals) fishery in central Baffin Bay is already active during the open water season in narwhals wintering areas (Heide-Jørgensen and Laidre, 2006; Laidre *et al.*, 2004b; Laidre and Heide-Jørgensen, 2005a). As new areas become accessible, new fisheries may open in areas near narwhal habitat. Increased fishing activities in primary wintering areas may affect prey availability and foraging success of narwhals in Baffin Bay (Laidre *et al.*, 2004b; Laidre and Heide-Jørgensen, 2005a). Other threats include disease and predation,

changes to prey sources, alteration and destruction of habitat and ice entrapments. The threat of large-scale mortality due to ice entrapment events or to disease is unpredictable. Threats affecting habitat are primarily caused by changes in sea ice, which could potentially impact hunters' access to narwhal hunting. The rise in temperature and the disappearance of seasonal and perennial sea ice could create new hunting areas that were previously inaccessible to hunters (Elliott and Simmonds, 2007; Hovelsrud *et al.*, 2008). The potential impacts of climate change on narwhals are subject to debate and are discussed in more detail below.

## 1.2.2 Climate change in the Arctic ecosystem

Global climate change is considered by many to be the leading environmental concern the world faces today. Within this century, our world is expected to change dramatically, and how its natural systems will respond, or to what extent these changes will affect biodiversity and the way in which people currently live, is uncertain.

Life in the Arctic is both vulnerable and resilient, surviving in some of the most extreme conditions on the planet (ACIA, 2004). The short growing season contributes to the Arctic's vulnerability and the highly variable climate also affects Arctic life (ACIA, 2004; McBean *et al.*, 2005). The Arctic climate is driven to a large extent by seasonal variations in the amount of solar radiation, with long summer days and very little sunlight during winter months. Regional characteristics of the Arctic climate are influenced by the physical properties of ice and snow, including low thermal conductivity, high reflectivity and high latent heat required to convert ice to water. Therefore, the Arctic climate comprises a variety of regional climates with different physical and ecological climate characteristics (McBean *et al.*, 2005). Future climate change will impact Arctic regions in different ways, both spatially and temporally. These characteristics and features make the Arctic a complex ecosystem that has significant inputs to the global climate system (McBean *et al.*, 2005).

As sea ice melts, areas which were previously inaccessible may see increases in these activities; for example, the Northwest Passage may be navigable for longer periods of time (Elliott and Simmonds, 2007; Hovelsrud *et al.*, 2008). Increased activity may also increase the risk of oil spills and other pollutants.

The population ecology of some Arctic marine mammals is affected by factors that influence the annual duration and distribution of sea ice and snow (Loeng *et al.*, 2005). Changes in the quality of sea ice, timing of seasonal sea ice formation, disappearance of seasonal sea ice, and the extent of cover for multi-year (i.e. perennial) and seasonal sea ice could affect ice-dependent species in the Arctic (Loeng *et al.*, 2005). Melting of sea ice will result in a loss of habitat for many Arctic species. This loss of habitat and related changes in phenology across the Arctic could affect survival rates, reproductive rates, and changes in prey abundance and distribution, and could result in decreased fitness (e.g. poor body condition or exhaustion) and increased risk of disease (Burek *et al.*, 2008; Laidre *et al.*, 2008).

## Narwhals and climate change

In general, the movements and life histories of many Arctic marine predators, including narwhals, can be linked to the cycles of sea ice (Laidre and Heide-Jørgensen, 2005a, 2005b). Therefore, shifts in the pattern or timing of ice formation and break-up and changes in concentration of sea ice could affect timing of migrations, length of feeding, fecundity, and survivorship of the species (Tynan and Demaster, 1997; Laidre and Heide-Jørgensen, 2005a; Laidre *et al.*, 2008).

CAFF, (2013) identified narwhals as one of seven marine mammals endemic to the Arctic which are highly associated with or dependent on sea ice for all or parts of the year. Narwhals have a restricted habitat preference and high site fidelity. In winter, they are associated with consolidated pack ice and dependent on open water via limited cracks and leads (Laidre and Heide-Jørgensen, 2005a; Laidre *et al.*, 2008; Heide-Jørgensen *et al.*, 2002a; 2003). In a comparative study, Laidre *et al.*, (2008) ranked narwhals as one of



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the marine mammal species most sensitive to climate induced habitat change. The distribution, type and extent of sea ice varies throughout the Arctic, and climate trends and patterns of change are not uniform and are highly complex (Tynan and Demaster, 1997). Therefore, the effects on marine mammals are expected to vary geographically (Tynan and Demaster, 1997). Consequently, the responses of narwhals to climate change may differ between regions and populations. Changes in habitat, availability of prey, and increases in natural mortality may result in changes to narwhal distribution, abundance and stock structure (Heide-Jørgensen and Laidre, 2006; DFO, 2012d).

The factors that influence narwhal movements and distribution are not well understood. However, feeding, calving, tidal cycles, ice conditions and hunting are suggested as possible influences (Kingsley *et al.*, 1994). Narwhal movements and site fidelity could reflect behavioural traits that have evolved for centuries or could reflect inherent traits for subpopulations (Laidre *et al.*, 2004a). Narwhals return to the same summering localities and wintering grounds every year (Laidre and

Heide-Jørgensen, 2005a; Heide-Jørgensen *et al.*, 2003). During their annual migration, narwhals appear to follow specific routes between focal areas that coincide with the timing of the succession of sea ice conditions (Heide-Jørgensen *et al.*, 2003). Narwhal migrations among stocks may vary, but a general migration pattern has been observed (see Appendix A). However, over a 31-year period, Laidre *et al.* (2012) found that autumn freeze-up (i.e. when fast ice begins to form) is now occurring two to four weeks later in some areas, which has also resulted in fall migrations occurring later.

It is unclear why narwhals utilize areas with heavy dense pack ice, although prey abundance may be a factor, and pack ice provides a refuge from predatory killer whales (*Orcinus orca*) (Heide-Jørgensen and Laidre, 2006; Laidre and Heide-Jørgensen, 2005b; COSEWIC, 2004). When killer whales are present, narwhals have been observed to hide in broken ice, cease vocalizations, reduce movement, breathe quietly to avoid detection, use shallow water, form tight groups near the water surface and go close to shore regardless of human presence (COSEWIC,



2004; Laidre *et al.*, 2006). When killer whales leave, narwhals slowly resume their natural behaviours (Laidre *et al.*, 2006). Inuit in Repulse Bay (Canada) have observed increasing numbers of killer whales (presumably due to reduced sea ice) and are concerned about their predation on narwhals (COSEWIC, 2004). A reduction of sea ice could allow for increased predation by killer whales and increased human exploitation if narwhals move closer to shore (COSEWIC, 2004; Laidre *et al.*, 2006). The presence of killer whales allegedly contributed to a large harvest of narwhals in Repulse Bay (Canada) in 1999 and made hunting easier in areas near Lyon Inlet (Canada) in 1998 and 2000 (COSEWIC, 2004).

Depending on the season, narwhals feed mainly on Greenland halibut, polar cod, Arctic cod and squid (Heide-Jørgensen and Laidre, 2006; Laidre and Heide-Jørgensen, 2005b). Recent studies in stable isotope analysis of narwhal skin collected from summer harvests provided further information on foraging. Watt *et al.* (2013) suggested that foraging patterns among the three narwhal populations (see Figure 1.1) may differ from one another and that narwhals may be more adaptable in terms of foraging behaviour than previously thought (Watt *et al.*, 2013). Unlike other sub-Arctic whales that feed intensely in their summering grounds, narwhals appear to feed more intensely in their wintering grounds which are densely packed with sea ice (see section 1.2). These are believed to be important areas for acquiring a major portion of their annual food intake (Heide-Jørgensen and Laidre, 2006; Laidre and Heide-Jørgensen, 2005a; 2005b). The intense feeding period that takes place while in wintering grounds could be a behavioural trait to avoid competition with lower-latitude whales feeding in the summer or a response to relatively low productivity in the high Arctic summering areas (Heide-Jørgensen and Laidre, 2006; Laidre and Heide-Jørgensen, 2005b).

Changes in the quality, extent and duration of sea ice could influence the density of prey species for marine mammals (COSEWIC, 2004; Tynan and

DeMaster 1997). As water temperatures increase and ice recedes, new commercial fisheries could open up in the Arctic. Since narwhals have a restricted winter dispersal which limits areas where they can find adequate food, narwhals' foraging success could be affected by commercial fisheries (Laidre and Heide-Jørgensen, 2005a). Changes in sea ice conditions could trigger a redistribution of prey abundance or alter prey migration patterns and polar specialists like narwhals could arrive in feeding areas after their prey have left (COSEWIC, 2004; Elliott and Simmonds, 2007; Laidre *et al.*, 2010). Changes in the predator-prey cycle could result in nutritional stress or changes in narwhal survivorship and fecundity (Laidre and Heide-Jørgensen, 2005a). Altered timing of migration, shifts in seasonal distribution, and changes in the timing of life history events may also occur (Laidre and Heide-Jørgensen, 2005a).

## *Narwhals and ice entrapments*

Among the most important physical features for Arctic species are polynyas (Elliott and Simmonds, 2007; Tynan and Demaster, 1997; Stirling, 1997). These are areas of open water in the pack ice, varying in shape, size, and location and caused by changes in winds, currents, upwellings, tidal fluctuations or a combination of these factors (Elliott and Simmonds, 2007; Tynan and Demaster, 1997; Stirling, 1997). The location and timing of the formation of known polynyas are becoming unpredictable, such as the polynyas in eastern Hudson Bay, areas which are important for some narwhals (Elliott and Simmonds, 2007). Polynyas or leads are extremely important for narwhals because they provide openings in the ice to breathe (Elliott and Simmonds, 2007; Heide-Jørgensen *et al.*, 2003; Laidre and Heide-Jørgensen, 2005a). Narwhals are not capable of pushing through metre-thick pack ice and failure to maintain breathing holes or to find open water can make them vulnerable to ice entrapments (also known as sassats) (Heide-Jørgensen *et al.*, 2003; Laidre and Heide-Jørgensen, 2005a).

Ice entrapments occur when drastic changes in the weather (i.e. sudden drops in temperature, shifting winds, changes in build-up of heavy pack ice) cause the polynyas and leads in the ice to freeze shut, thus trapping the animals (Laidre and Heide-Jørgensen, 2005a; Heide-Jørgensen and Laidre, 2006). Since open water in an ice-covered area is created by ice fracturing events, the absence of strong winds combined with cold temperatures can reduce the availability of open water areas (Laidre *et al.*, 2011). During an ice entrapment, hundreds of narwhals can be stranded with only a small opening in the ice through which they can breathe. They often die from exhaustion, famine or predation and these are considered natural mortality events (Heide-Jørgensen *et al.*, 2002b; P. Richard, Fisheries and Oceans Canada, *pers. comm.*, to T. Shadbolt, December 23, 2008). Laidre *et al.* (2011) examined four recent ice entrapments and the long-term trends in autumn freeze-ups in summering areas over a 31-year period (1979 to 2009). A significant trend to later autumn freeze-up was found (two to four weeks later over 31-year period), suggesting ice conditions are rapidly changing (Laidre *et al.*, 2011). During these ice entrapments, narwhals delayed departure from summering areas until late fall and winter. It is uncertain whether they were adapting to the changes in freeze-up by occupying their summering areas longer (waiting for ice to form) and thus becoming entrapped by ice or whether the ice entrapment events in summering areas were a result of random variation in narwhal residence—i.e. narwhals just happened to be in the area when the ice closed and were trapped (Laidre *et al.*, 2011).

### 1.2.3 Importance of wildlife and wildlife trade in the Arctic

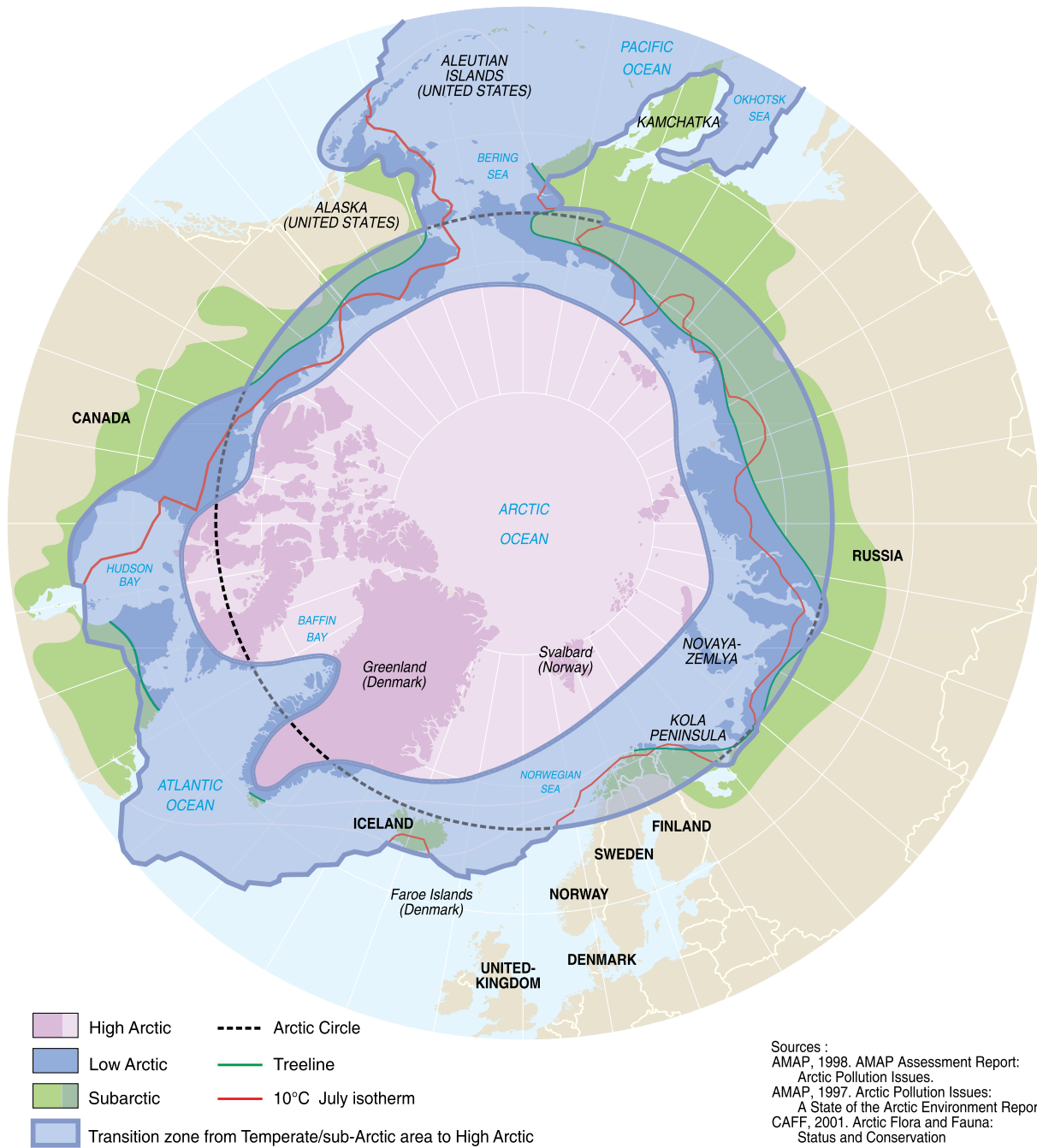
The Arctic is the northernmost region of the Earth and generally bounded in the south by the tree lines of Eurasia and North America (see Figure 1.2). It is a highly

complex and integrated system which encompasses an ice-covered ocean that spans approximately 14 million km<sup>2</sup>. Surrounding landmasses comprise a variety of landscapes such as mountains and glaciers, flat plains and plateaus, polar deserts, rugged uplands, wetlands, rivers and ponds (Huntington *et al.*, 2005b). Since the last Ice Age, many parts of the Arctic have been inhabited by humans who have evolved, adapted and altered their distribution in relation to changes in climate, resource availability, landscape, and hunting and fishing technologies (Huntington *et al.*, 2005a). Immigration to the Arctic increased substantially during the 20th century, when people relocated there in search of opportunities such as exploiting natural resources (e.g. oil, gold and fish) (Huntington *et al.*, 2005b). Today close to four million people live in the Arctic, including hunters and herders living on the land, and city dwellers (Huntington *et al.*, 2005b). Indigenous people have traditionally maintained a very close connection to their surrounding environment (Huntington *et al.*, 2005b; Nuttall *et al.*, 2005).

Wildlife has provided a critical foundation for the development of many Arctic cultures. Wildlife is often portrayed in mythologies, festivals, oral histories and sacred places (Klein *et al.*, 2005; Nuttall *et al.*, 2005). Many Arctic communities still rely on hunting, fishing, herding and gathering renewable resources as an important part of their livelihood and to satisfy nutritional needs (Huntington *et al.*, 2005b; Nuttall *et al.*, 2005). These activities provide strong links to the environment and continue to be of great importance for maintaining social relationships and cultural identity (Nuttall *et al.*, 2005). Many traditions have been maintained largely due to the cultural importance of wildlife and the economic incentive that wildlife provides, such as cheaper and relatively accessible local foods (e.g. fish, meat from terrestrial and marine mammals, edible plants, berries, etc.) compared to more expensive imported foods (Nuttall *et al.*, 2005).

# Figure 1.2

Definitions of the Arctic



Source: © PHILIPPE REKACEWICZ, UNEP/GRID-ARENDAL, 2005.

Trade<sup>5</sup> in animal parts has existed for many years, but during the past few centuries, the income acquired from selling animal parts such as meat, skins, ivory and handicrafts has become important for many Arctic communities (Klein *et al.*, 2005). This income is used to help cover basic living costs (e.g. heating homes, goods and services, travel) and to help cover costs for subsistence activities (Klein *et al.*, 2005). This is particularly important in regions such as the Arctic, where there are limited economic opportunities and the cost of living is very high<sup>6</sup>.

## Importance of narwhal to people in the Arctic

Narwhal hunting has occurred for centuries and has been important to the traditional subsistence economy (COSEWIC, 2004; DFO, 2012d). Narwhal hunts are of social and cultural importance to indigenous communities in the Arctic (CITES, 2006; COSEWIC, 2004; DFO, 2012d; Ford, 2006). Historically, the hunt provided a variety of subsistence goods for the community: narwhal sinews (tendons) were used for sewing thread, skins were used for laces, muktuk (see Box 1.1) was eaten, meat was used for dog food, oil from blubber was used for heating and lighting purposes, and tusks were used for walking sticks, tent poles and hunting weapons (COSEWIC, 2004; DFO, 2012d; Ford, 2006; Jensen and Christensen, 2003; Reeves, 1992). Canada and Greenland are the only range States that currently permit narwhal hunting, which is restricted to indigenous peoples; commercial hunting is prohibited (Anon., 1993a; 2011; COSEWIC, 2004).

Today, narwhal hunting still contributes to the subsistence economy by providing food and income, particularly in communities with limited employment

opportunities (DFO, 2012d). Narwhal meat is more commonly used as dog food, but Canadian Inuit will eat it if no other meat is available (though not all communities use the meat), while in Greenland, meat has been sold in stores, but at lower prices than muktuk (CITES, 2006; COSEWIC, 2004; DFO, 2012d; Reeves, 1993a; 1993b). Muktuk is still highly valued in Arctic communities and demand often exceeds supply (COSEWIC, 2004; Jensen and Christensen, 2003) (Box 1.1). Muktuk may be used by the community,

### Box 1.1 Edible whale skin (Muktuk, mattak)

Edible whale skin is the layer of skin and outermost blubber from narwhal (and other Arctic whales), which is rich in protein, zinc, vitamin C and other nutrients (COSEWIC, 2004; Reeves, 1992). It is considered a delicacy in Greenland and the Canadian Arctic, where large quantities are eaten by the hunters and shared with their communities or traded to other communities (COSEWIC, 2004; Jensen and Christensen, 2003).

The term used for edible whale skin varies regionally. In Canada, numerous terms are used depending on Inuit dialect and the type of whale: muktuk, mattaq, maktaq, maqtaq and muktaaq (COSEWIC, 2004; Reeves, 1992). In Greenland the term mattak is used, while the term maktak is used in Alaska.

For simplicity, this report uses the term “muktuk” throughout when referring to edible narwhal skin.

<sup>5</sup> For the purposes of this report, the term “trade” does not distinguish the type of trade (e.g. domestic, international, personal, or commercial). The type of trade being discussed will be specified in the text when relevant. Some cited literature only refers to trade in general terms.

<sup>6</sup> Due to factors such as a limited consumer market resulting from a low population density and the very high costs of transporting food, fuel and other necessities of life into the Arctic and to remote communities.



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traded or sold domestically, while other products of the hunt including tusks, skulls and handicrafts may be retained or sold domestically or internationally (CITES, 2006; DFO, 2012d; Reeves, 1992, 1993b). The income from the sale of tusks is a part of a subsistence<sup>7</sup> economy. The extra financial benefit of selling tusks could also influence the hunt; with a bias towards landing males for their tusks. However, the bias towards males could also be attributed to behavioral

differences between the sexes; the presence of females with calves<sup>8</sup>, and/or hunter preference for larger animals which yield more muktuk (although the muktuk of smaller animals is apparently more tasty). For the bulk of the summer hunting period in Canada, narwhal pods closest to shore tend to be groups of groups of females with calves and juveniles. Since only males have a tusks, Inuit hunters may seek to hunt large tusked males whenever they can, but they often

<sup>7</sup> Subsistence is defined as “The patterned acquisition and use of local resources in such a way as to enhance the social relationships existing among a community of people. Subsistence, so defined, allows the community to reproduce itself and its enabling cultural traditions over time” (Freeman *et al.*, 1992).

<sup>8</sup> In Canada under section 18 of the Marine Mammal Regulations (SOR /93-56), narwhal calves, or an adult narwhal that is accompanied by a calf, cannot be hunted. So hunting from a pod that has many females with calves would likely be biased towards males.



are not accessible (P. Ewins *in litt.* to E. Cooper March 11, 2014). Authorities in both Canada and Greenland have stated that, in most cases, trade in tusks does not appear to be the primary incentive for the hunt, but rather a by-product of it (CITES, 2006).

### 1.2.4 Regulating international trade of wildlife

International trade in narwhal parts is monitored through CITES, which is an international agreement between governments created to ensure that the international trade<sup>9</sup> in wild animals and plants does not threaten the survival of those species (Anon., 1973; Cooper and Chalifour, 2004). Species covered

by CITES are listed in one of three Appendices depending on the level of protection needed. Species can be added to or removed from Appendices I or II or moved between them only by a vote by the Conference of the Parties (CoP) which is held once every three years. However, species can be added to or removed from Appendix III at any time (Anon., 1973; Cooper and Chalifour, 2004). An important component of the Convention is the requirement for Parties to complete non-detriment findings (NDFs) to ensure that international trade in species in Appendices I and II is not detrimental to the conservation of the species in the wild. Completion of scientifically-based NDFs is critical to securing the conservation goals and objectives of CITES. Generally, international trade in species listed under CITES requires the issuance

<sup>9</sup> Article I(c) of CITES defines trade as “export, re-export, import and introduction from the sea.” Article I(d) defines re-export as the “export of any specimen that has previously been imported” and Article I(e) defines introduction from the sea as “transportation into a State of specimens of any species which were taken in the marine environment not under the jurisdiction of any State” (Anon., 1973a).

of permits or certificates, as required under Articles III, IV, and V of the Convention. However, there are several exemptions to the provisions of Articles III, IV, and V. The most commonly used are the exemptions for reservations, pre-Convention<sup>10</sup> specimens and personal and household effects, including tourist souvenirs (Anon., 1973; Cooper and Chalifour, 2004).

Species listed in Appendix I are those threatened with extinction and international trade in those species must be accompanied with import and export permits (or re-export certificates) which can only be issued under specific conditions (Anon., 1973). Species listed in Appendix II are those not currently threatened with extinction but could become so if their trade is not regulated<sup>11</sup> and international trade in those species must be accompanied with export permits (or re-export certificates) which can only be issued under specific conditions (Anon., 1973). Species listed in Appendix III are those identified by individual countries that wish to regulate the export of certain native species; international trade must be accompanied with export permits (from the country listing the species) or certificates of origin (from all other countries) which can only be issued under specific conditions (Anon., 1973). Narwhals are currently listed on Appendix II. A summary on narwhals with respect to the CITES is provided in section 4.2.1.

Although CITES is an international agreement, it is the responsibility of signatory countries to implement provisions of the Convention within their country through their national legislation. Prior to 1984, only a handful of European (EU) member states were signatories to CITES and the absence of systematic

border controls in the EU made implementation of CITES difficult. As such, two regulations came into force to implement CITES in all EU member states, including those countries which were not signatories to CITES. All taxa listed in CITES were made subject to these regulations, and additional restrictions were placed on trade in certain taxa listed under the Annexes of these regulations. Together, these regulations (known as the EU Wildlife Trade Regulations [EU WTR]) form the legal basis for CITES implementation in the EU regulating internal and international trade, and provide additional provisions for the import, export and re-export of specimens listed in Annexes A, B, C, and D of the regulations. The Annexes correspond to the CITES Appendices, although they may provide stricter provisions than the CITES Appendices and may also include non-CITES-listed species (European Commission and TRAFFIC Europe, 2013). Trade in species under the Annexes requires documentation (permits or certificates) which vary according to the level of protection. There are more lenient permit requirements for trade in items which are considered personal and household effects (European Commission and TRAFFIC Europe, 2013). The regulations also provided the EU with the legal authority to suspend imports of certain species from certain countries into the EU. Narwhals are listed on Annex A (with exception of non-edible parts of Greenland narwhals which is listed on Annex B). A summary on narwhals with respect to the EU WTR is provided in sections 4.2.2.

Additional information on the general provisions of CITES and the EU WTR is provided in Appendix B.

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<sup>10</sup> Pre-Convention specimens are any specimens of a CITES-listed species acquired prior to the date when the provisions of CITES applied to that species. If a CITES pre-Convention certificate is issued by an MA for such specimens then no other certificate or permit is required by CITES to authorize the export, import or re-export of such items (CITES, 2008a).

<sup>11</sup> Species may also be listed in Appendix II because they cannot easily be distinguished from other species listed in Appendix I or II.





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# METHODS

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*The information in this report was compiled via literature review, review of Internet resources, and analysis of available international trade data and correspondence with relevant authorities familiar with the trade and management of narwhal.*

Currency in this report is written as provided in the cited works and references. However, the USD currency is provided in parentheses using the conversion rate of the year in which the cited work was published. All currency conversions used the historical exchange rates provided from [www.oanda.com](http://www.oanda.com). Values were not adjusted for inflation.

## *Harvest management and wildlife trade agreements and regulations*

Information on harvest management regimes, harvest statistics, wildlife trade regulations and restrictions were all compiled from published reports, personal correspondence and information provided by government agencies.

Many publications and reports are inconsistent with the use of the terms “population”, “stock” or “sub-population” with regard to narwhals and their geographical boundaries without clarification on the basis of delineation (genetic or management). The biological definition of a “population” generally refers to a “reproductively isolated group of animals”, whereas a “stock” is a concept often used in fisheries management which refers to resource units that are subject to hunting removals (Outridge *et al.*, 2003). For the purposes of this report, the term “stock” refers to resource units or management units keeping in mind that some of these stocks may or may not be populations in the biological sense.

## Narwhal trade data

International trade data from CITES annual reports are entered into the United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC) CITES Trade Database. Narwhal range State export data from the UNEP-WCMC CITES Trade Database were analyzed for this report, using the option for comparative tabulation reports. The data are displayed as either a comparative tabulations report, or a gross/net trade report. Both reports provide the wildlife term (type of item), the quantity traded and the species name. However, comparative tabulation provides a report with more detailed information (including country of import and export, country of origin, CITES Appendix listing, source of trade, purpose of trade and unit of trade). As such, comparative tabulation allows for more specific analysis of data. In contrast, the gross/net trade report is less detailed because it only provides the quantity of items, the species chosen, the wildlife term and country of import or export. The gross/net trade report can be used to determine the volume of trade in a particular species or by a particular country where information on purpose or source is not required. However, gross/net trade reports often overestimate the volume of trade because when the reported quantities reported between import country and export country, the higher value is automatically selected (UNEP-WCMC, 2010).

In the early years of CITES, reports of international trade in specimens provided less detail than in later years. For instance, prior to 1987 the purpose of export was not consistently defined and items were most often recorded as traded for an “unknown” purpose. From 1987 onward, the purpose of export was recorded more consistently with defined specific purposes (though improved standardization is still needed). Therefore, this analysis only used data from 1987 to 2009. When this analysis was completed, data for 2010 and 2011 were not available

for all narwhal range States, and 2007 Greenland export data were not available for analysis.

The authors considered entries for data recorded as “sets” to be items (i.e. one set = one item). Data recorded with units as units of volume were excluded as they were not comparable with the entries for the majority of the data, which consisted of quantity of items. Data recorded with units as units of weight were summarized and reported separately, as they were not comparable with the entries for the majority of the data, which consisted of quantity of items.

Export data from narwhal range States (excluding re-export data) were used for the analysis as these data can provide some indication of the impact of international trade (i.e. export from a range State) on narwhal conservation. Import data were not analyzed mainly because not all Parties report imports adequately or consistently. Importing and exporting countries do not always record the same information (e.g. purpose of trade, product descriptions) about the same item. Furthermore, the year of import and export may not match for the same item if the export permit is issued late in the calendar year. Re-export data<sup>12</sup> were not analyzed mainly because it is difficult to determine how many times items were re-exported to and from various countries. These data are also less relevant to conservation because a re-exported specimen has already been removed from its environment. Therefore, data that included information for country of origin indicated that the items had been re-exported, and as such they were excluded. There were some instances of non-range States reporting export data, which were likely errors in reporting (because narwhals never ranged into these countries). In some instances the source country was not indicated, thus inadvertently recorded as export data when it should have been recorded as re-export data. As such, only narwhal range States’ export data were included in the analysis.

The analysis included all sources, except for items recorded as confiscated or seized specimens (source code “I”).

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<sup>12</sup> CITES defines re-export as the export of “any specimen that has previously been imported” (Anon., 1973a).

Specimens recorded as seized or confiscated are relatively incomplete and do not represent all CITES seizures internationally. Illegal trade data are very difficult to obtain. The United States Law Enforcement Management Information System (LEMIS) and the European Union Trade in Wildlife Information eXchange (EU-TWIX) record information on seizures and/or illegal trade, but are focused on trade to and/or from the United States and within the EU respectively. LEMIS or EU-TWIX data would not show seizures or illegal trade between Canada and a non-United States/ non-EU country. Although the UNEP-WCMC CITES Trade Database provides some information on seizures, a limited number of cases are reported to CITES in their annual reports. Most seizures are reported to customs in insufficient detail and the database either does not provide an explanation of why an item was seized (J. Caldwell, UNEP-WCMC CITES Trade Database Manager, in litt. to E. Cooper, September 21, 2006) or does not report the information at all (UNEP-WCMC, 2010). Furthermore, some items that are not illegal in nature (e.g. movement of previously seized or confiscated specimens between governments) may be recorded as seized specimens. This means the available data reported to CITES on illegal trade could reflect simple regulatory errors, gross attempts to smuggle, or anything in between (J. Caldwell, UNEP-WCMC CITES Trade Database Manager, in litt. to E. Cooper, September 21, 2006). As a result, the authors did not analyze CITES data that was reported as seized because they do not indicate levels of illegal trade.

It is important to note that one item traded is not necessarily equivalent to one animal traded. There can be multiple items in trade which can all be sourced to an individual animal (i.e. one skull, many bones, many carvings, many teeth, meat). Therefore, determining an exact number of animals represented by these data is not possible. However, minimum estimates of animals in trade can be made by looking at specific items which are known to represent a single animal (e.g. a tusk). In this report, the minimum number of narwhals represented in international trade was calculated by examining the numbers of tusks in the export data. Although teeth are also recorded in international

trade, it is impossible to know whether tusks and teeth recorded originate from the same animal or from different animals. Likewise, although a skull clearly represents a single animal, in some instances the skull and tusk from the same individual may be reported separately on permits (Environment Canada CITES Scientific Authority *in litt.* to E. Cooper, February 13, 2014).

The export data for 2006 to 2009 were tabulated to summarize the type of items (with purpose of export) according to range State, and the data were also depicted in info graphics. The authors did not provide an analysis on this multi-year trade; instead, the authors provided a more in-depth analysis on trends in international trade data over a 23-year period (1987 to 2009). These 23 years of data were tabulated to provide a summary of the quantity and type of commodity per year as a means to detect trends in international trade. Only trends in the international trade in tusks (which can be attributed to individual animals) were analyzed in more detail (annually from 2005 to 2009 inclusive) and tabulated to provide a summary of:

- the quantity of tusks exported by each range State according to purpose of export, by year;
- the quantity of tusks, with their destination according to purpose of export, by year;

Information on the value of narwhal parts and derivatives was compiled from published reports, personal correspondence, information provided by government agencies and from Internet stores. The authors viewed Internet stores to determine the range in advertised prices of narwhal products from 2008 to 2012 with the aid of The Wayback Machine (Internet Archive, 2012) a service that enables users to view and search archived versions of Web pages over time.

Some text from *Icon on Ice: International Trade and Management of Polar Bears* has been directly placed into this report since it is general information that is also applicable to this report (e.g. parts of sections 1.2 *Background*, 5.2 *Accuracy of CITES trade data*, and *Appendices B and C*).



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# SUMMARY OF HARVEST MANAGEMENT

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*Narwhals are managed in the range States under each country's domestic legislation and regulations, and are subject to multinational agreements (see Appendices B and C). Canada and Greenland are the only range States that allow narwhal hunting, which is limited to indigenous peoples.*

**A**lthough Russia, Norway, the United States and Iceland are also considered range States, there is no active harvest and the majority of the global narwhal population is found in Canadian and Greenlandic waters.

It is impossible to provide a precise number of narwhal harvested globally in a given year because the harvest

data for each range State are compiled using different time scales. Canadian harvest data are currently reported based on the management year (April 1 to March 31), while Greenland data are based on the calendar year (January 1 to December 31). In addition, numbers of struck and lost animals<sup>13</sup> are not included in the harvest data as they are not always known and vary depending on the region and conditions of the hunt, the

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<sup>13</sup> Struck and lost refers to animals which are struck (by a bullet or harpoon) but are not retrieved. A struck and lost animal may or may not die from its wound(s).

### Box 3.1 Precautionary approach

If insufficient information is available to determine whether an action or policy will harm a species and its functioning in the ecosystem, managers will often use the precautionary approach. Although there are various definitions of this approach, one of the most widely cited definitions is Principle 15 of the Rio Declaration (1999 Earth Summit in Rio de Janeiro) which states: “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”

### Box 3.2 Adaptive Management

It is not always possible to know all aspects of biological systems or the social and economic factors that can affect the sustainable use of resources. Therefore, monitoring the effects of use and allowing for adjustments as needed (by using all sources of information available) is preferable when deciding how to manage a resource. The Convention on Biological Diversity provides a definition for Adaptive Management in the Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity. Specifically, Principle 4 states: “Adaptive management should be practiced, based on:

- science and traditional and local knowledge;
- iterative, timely and transparent feedback derived from monitoring the use, environmental, socio-economic impacts, and the status of the resource being used; and
- Adjusting management based on timely feedback from the monitoring procedures.”

season, the year, hunters’ experience, weather during the hunt and type of hunt (open water vs. ice floe) (COSEWIC, 2004; Roberge and Dunn, 1990). Although the number of struck and lost animals is a concern, it is factored into management decisions using data from known communities (P. Richard, Fisheries and Oceans Canada, *pers. comm.* to T. Shadbolt, December 23, 2008). Canada currently uses a correction factor of 1.28 (an average 22% struck and lost rate) which is based on the available stuck and lost data from studies in Canada (DFO, 2012a; 2012b; Richard, 2008; Roberge and Dunn, 1990). We recognise that there is significant variability in the narwhal struck-and-lost rate based on the few available studies, and that this important aspect deserves thorough quantification and documenting.

Despite differences in timescale of compiled harvest data and the lack of stuck and lost data, it is possible to provide a *minimum* rough estimate on the number of narwhals landed globally. According to available data, from 2007 to 2011, on average 979 narwhals (621 from Canada and 358 from Greenland) were landed globally per year (see Table 3.1, Appendix A). However, this estimate includes 624 animals harvested in the 2008 ice entrapment in Canada (see Table 3.1), thus the estimate is inflated.

It is unclear to what extent international trade in tusks influences the hunting of narwhals. Inuit hunt narwhal for a number of reasons including cultural traditions and nutritional needs (e.g. for muktuk). Males may be targeted by hunters because they wish to generate

# Table 3.1

Narwhals landings by range State, harvest season 2007 to 2011

RANGE STATE	HARVEST YEAR					AVERAGE
	2007	2008	2009	2010	2011	
Reported landings in Canada	490	1047* (624 from ice entrapment)	506	543	520	621* (inflated as it includes 2008 ice entrapment)
Reported landings in Greenland	348	450	304	214	294	358
<b>Total</b>	<b>838</b>	<b>1497</b>	<b>810</b>	<b>757</b>	<b>814</b>	<b>979</b>

Source: Abraham, (2013); DFO, (2012d); DFO, (2011a); Kingsley *et al.*, (2013); Department of Fisheries, Hunting and Agriculture, 2013

The harvest data for Canada are reported based on the fiscal year April 1 to March 31. Some of the Canadian estimates differed slightly among the sourced materials (see Appendix D). The harvest data for Greenland are currently reported based on the calendar year January 1 to December 31. Prior to the change of regulations, the quotas and data were reported from June 1 to July 31. As such, the average estimate is 4.5 years rather than five years.

Note: The reported harvest data does not include losses associated with the hunt (i.e. animals struck and lost).

\* Narwhals landed from ice entrapments are included, such as occurred in 2008 when 624 narwhals were harvested from an ice entrapment in Canada. For Canada, narwhals harvested in ice entrapments do not count toward to community quotas because these are considered natural mortality events (P. Richard, Fisheries and Oceans Canada, pers. comms. to T. Shadbolt, December 23, 2008).

revenue to purchase household items and hunting equipment and fuel — although the muktuk from males is eaten too (P. Ewins *in litt.* to E. Cooper April 29, 2014).. However, muktuk remains a very important product from (and reason for) hunting narwhal. Hunting would likely continue at historic levels in Canada even if tusks could not be exported. Narwhal hunting continues in Greenland despite the export ban on ivory and continued in Canadian stocks that were subject to export prohibitions (due to negative CITES NDFs).

Netting and shooting narwhals from the shore or ice edge is clearly gender biased because the larger males tend to frequent the centre of the summering fiord, so shooting and netting from shore tends to target females and younger animals more heavily (P. Ewins *in litt.* to E. Cooper April 29, 2014). Not all narwhal tusks enter into international trade and significant numbers are in long-term storage (P. Ewins *in litt.* to E. Cooper April 29, 2014). Even if males are especially targeted by hunters, it is unlikely to have a detrimental impact on the conservation

of the species in the long term given the small proportion of animals hunted (in comparison to the total population) and in consideration that wild populations generally show resilience to male-selective harvesting (McLeod *et al.*, 2004, Milner *et al.*, 2007, Snyder *et al.*, 2014). However, a highly male biased harvest could potentially cause population decline (Milner *et al.*, 2007). Further studies into narwhal population dynamics would shed more light on this issue.

## 3.1 Canada

Two of the world’s three narwhal populations occur in Canada: the Northern Hudson Bay population is found only in Canada and the Baffin Bay population is shared with Greenland (see Appendix A for additional details). Narwhals are managed in accordance with various legislation, regulations and policies, and are subject to land claims agreements (see Appendices B and C). However the main regulations regarding hunting are facilitated through the *Marine Mammal Regulations*

(SOR/93-56) under the enabling statute, the *Fisheries Act* of Canada (R.S., 1985, c. F-14), as amended (Anon, 1985; 1993a). An Integrated Fisheries Management Plan (IFMP) for narwhals has recently been developed by DFO in consultation with co-management boards, which took effect in January 2013 (NTI, 2013).

The management and conservation of narwhals in Canada falls under the jurisdiction of Fisheries and Oceans Canada (DFO), a department of the federal government (Anon 1993a). However, the 1993 *Nunavut Land Claims Agreement* (NLCA) gave Nunavut Inuit the right to harvest narwhals in the Nunavut Settlement Area (as Nunavut was known prior to its formation) and the Nunavut Wildlife Management Board (NWMB) was subsequently created in 1994 (Anon, 1993b; NWMB, 2008b).

Although the federal government retains ultimate responsibility for wildlife management, the NWMB is the main instrument for wildlife management in Nunavut and is charged with making decisions and recommendations to the appropriate cabinet minister regarding the management of wildlife in Nunavut (Anon 1993b; NWMB, 2008b). However, NWMB decisions are subject to approval by the Nunavut Minister of Fisheries and Oceans (Anon., 1993b). Within the boundary areas of Nunavut (i.e. Areas of Equal Use and Occupancy), wildlife resources are also shared with Inuit from Nunavik (northern Québec), who participate in wildlife management through membership on the NWMB (NLCA, S.40.2.14) (Anon., 1993b). The main instrument for wildlife management for the offshore areas of Nunavik is the Nunavik Marine Region Wildlife Board (NMRWB) (Anon., 2006; NMRWB, 2010). Regional Wildlife Organizations (RWO) and the Hunters and Trappers' Organizations (HTO) are co-managing partners who play an important role in the management of narwhals. They enforce community quotas or harvest limits, regulate harvesting practices, techniques and management among

its members, prepare general hunting guidelines, and manage and monitor hunting in communities (Anon., 1993b; CITES, 2006; DFO, 2012d). Thus, narwhals in Canada are co-managed by DFO, regional wildlife management boards and resource user groups.

The DFO Science section is responsible for providing scientific information and advice on aquatic issues, including species at risk and environmental impact assessments (DFO, 2013b). In addition, DFO researchers conduct studies on narwhal biology and ecology, the results of which are considered in decision-making processes related to sustainable management of the species. The DFO Science Sector provides information on the risks of policy decisions and the likelihood of achieving policy objectives under alternative management tactics and strategies. DFO's science advisory processes are conducted by the Canadian Science Advisory Secretariat (CSAS) which coordinates all scientific peer review processes for DFO (DFO, 2013b).

Canada participates in the Canada-Greenland Joint Commission on Narwhal and Beluga (JCNB) which was created as per the 1989 Memorandum of Understanding (MOU) *On the Cooperation and Management of Narwhal and Beluga*; to facilitate the sharing of information and to address management and conservation issues regarding these joint stocks (Anon., 1989; CITES, 2006). Although Canada is not a signatory to the North Atlantic Marine Mammal Commission (NAMMCO), which provides advice on harvest sustainability of narwhals, Canada does participate as an official observer nation at NAMMCO meetings. See Appendix B for more information on the JCNB and NAMMCO.

## Hunting regulations

Narwhal hunting in Canada is currently regulated through a quota system, as established in the *Marine Mammal Regulations*<sup>14</sup>, through the allocation

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<sup>14</sup> She full provisions on the narwhal hunt are detailed in the *Marine Mammal Regulations* (Anon., 1993a) and the IFMP for narwhal.



of community quotas or through a harvest limit system (Anon., 1993a; CITES, 2006). Only Inuit are permitted to hunt narwhals, with community quotas ranging from five to 50 animals (Anon., 1993a; COSEWIC, 2004; Reeves, 1992) and harvest limits ranging from 25 to 130 animals (see Appendix D). Community quotas and harvest limits currently allow for a total of 704 narwhals to be harvested per year in Canada<sup>15</sup>. A Total Allowable Harvest (TAH) has been developed and is currently pending acceptance and approval (DFO, 2008; 2010c; 2012a; 2012b; 2013a; 2012d). Once established, the TAH will replace the existing regulatory quotas (DFO, 2012d).

The current regulatory quotas and harvest limits are administered using Marine Mammal Tags (MMT) (CITES, 2006). DFO distributes MMTs according to the community annual quotas and harvest limits (NAMMCO Annual Report, 2012). MMTs for each community are issued to a local organization—in most cases the Hunters and Trappers Organizations (HTOs) or Regional Wildlife Organizations (RWOs)—which then distribute tags to hunters (NAMMCO Annual Report, 2012; Reeves, 1992). Hunters are required to attach an MMT to narwhal tusks or carcasses and return the detachable portion of the tag with information about the hunt to the local HTO (DFO, 2012d; NAMMCO Annual Report, 2012). The purpose of attaching an MMT to a carcass is unclear because carcasses, if fresh and the local demand for muktuk is not yet saturated, are quickly skinned and left at the hunting site to be scavenged (R. Reeves, IUCN Cetacean Specialist Group chairman, *in litt.* to E. Cooper, January 7, 2014).

Once all the community tags are used, the narwhal hunting season ends for the year (COSEWIC, 2004; NAMMCO Annual Report, 2012; Reeves, 1992). When the hunting season ends, local HTOs return any unused MMTs and completed tags from narwhals landed to DFO along with a harvest summary. Catch



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summaries from information completed via the MMTs and HTO harvest summaries are then compiled by DFO (NAMMCO Annual Report, 2012). The tagging system allows for information to be collected from narwhals landed and ensures the regulatory quotas (or harvest limits) are monitored (CITES, 2006). However, the tagging system may be more effective for the reporting of male landings given that the tusk must be accompanied by an MMT (Roberge and Dunn, 1990). Reportedly, the tagging system also helps to ensure the legality of the trade in tusks, since permits are required for the national transportation and international trade of tusks (CITES, 2006; DFO, 2012d). However, the level of compliance with the tagging system is not readily apparent, and it is difficult to assess whether the system is achieving its purpose. Narwhal hunting activities are monitored by DFO fisheries officers and Nunavut territorial conservation officers for compliance with the *Fisheries Act* and its applicable regulations. However, those officers cannot enforce local HTO bylaws (DFO, 2012d; NAMMCO Annual Report, 2012). The quantity, frequency and proportion of hunts observed and reported on by enforcement officers is not publicly available.

According to the most recent five-year data obtained from hunting tags, (2007 to 2011), an average of 621 narwhals were landed per year, ranging from 490 to 1,047 (includes 624 from ice entrapment)

<sup>15</sup> The community quotas have not changed since introduced years ago. The harvest limits were changed in late 1999 but have been stable since 2003.



narwhals (Appendix D provides a breakdown of harvest data by community). This indicates that 88% of the quotas were used and 12% were unused. However, this estimate includes the abnormally high number of narwhals (624 animals) which were harvested from an ice entrapment near Pond Inlet in 2008. If the 2008 annual harvest data is excluded, the average number of narwhals harvested per year would be 515 over a four year period, suggesting that 73% of the quotas were used and 27% were unused.

DFO reports that there are few known examples of overharvest or illegal harvesting in Canada and that all such events are investigated (P. Hall, Fisheries and Oceans Canada, *pers. comm.* to T. Shadbolt, April 15, 2009). In instances where there is potential for overharvest by a community, the NWMB may approve a transfer of unused tags to that community from another nearby (DFO, 2012d; NWMB, 2000). Therefore, although it may appear that in some years the harvests for some communities were in excess of the allocated quota, in many instances communities have requested NWMB approval for a carry-over of unused tags from the previous season, to borrow tags

from another community, or to receive an advance on tags from the next season's hunt (DFO, 2012d; NWMB, 2000, 2004a, 2004b).

## 3.2 Greenland

Two of the world's three narwhal populations occur in Greenland: the East Greenland population is found only in Greenland and the Baffin Bay population is shared with Canada (see Appendix A for additional details). Narwhals are managed in accordance with various pieces of legislation, regulations and policies. A summary of those is provided in greater detail in Appendices B and C. However, the main regulations regarding hunting are facilitated through the *Self-Government Executive Order No. 7 of 29 March 2011 on the protection and hunting of belugas and narwhals* (Anon., 2011).

The Department of Fisheries, Hunting and Agriculture is responsible for the management of narwhals in Greenland (CITES, 2006), while local municipal authorities play an important role by assisting with monitoring quotas and hunts in the municipalities (Witting *et al.*, 2008). Within the department, the Agency for Fisheries, Hunting, and Agriculture (APNA) has administrative authority for day-to-day activities in terms of harvesting management decisions (JCNB, 2009). Management recommendations for the harvest are provided by the Canada-Greenland Joint Commission on Narwhal and Beluga (JCNB) for stocks shared with Canada and by NAMMCO<sup>16</sup> for all other stocks (CITES, 2006).

Biological advice on harvest management is provided by the Greenland Institute of Natural Resources via their participation in the scientific committees of relevant organizations (NAMMCO and JCNB). Scientific advice on harvest sustainability is provided by JCNB and NAMMCO via the meeting known as the Joint Working

<sup>16</sup> Greenland is a signatory to NAMMCO and is present at most meetings (NAMMCO, 2006).

Group (JWG) (meeting of JCNB Scientific Working Group (SWG) and the Scientific Committee Working Group of NAMMCO); however, the NAMMCO Scientific Committee reviews the JWG recommendations before they are sent to the Commission (CITES, 2006).

## Hunting regulations

Narwhal hunting in Greenland is regulated under the *Self-Government Executive Order No. 7 of 29 March 2011 on the protection and hunting of belugas and narwhals*<sup>17</sup> and is controlled through a quota system (allocation of quotas for communities or regions) (Anon., 2011). The harvest is monitored through a licence and reporting system by municipal authorities and by APNA (Anon., 2011; Witting *et al.*, 2008). In Greenland, narwhals are hunted primarily for subsistence purposes and may only be hunted by residents who have a valid professional hunting certificate or recreational hunting licence (Anon., 2011).

The Department of Fisheries, Hunting and Agriculture recommends harvest management decisions using advice on sustainable harvest levels, user knowledge and harvest statistics (JCNB, 2009). The APNA decides on how much weight to give to different sources of information (JCNB, 2009). Quotas are based on the management recommendations of the JCNB and on advice from the Hunting Council (Witting *et al.*, 2008). The Department of Fisheries, Hunting and Agriculture proposes the quotas to the Cabinet, which makes the final decision (Witting *et al.*, 2008). The Department of Fisheries and Hunting instructs the municipal authorities (or municipal council) to distribute the quotas among the settlements and individual hunters, and the Department of Fisheries and Hunting may lay down provisions for the harvest of narwhals (Witting *et al.*, 2008). Once quotas are reached, it is the responsibility of municipal authorities to stop the harvest and

notify the Department of Fisheries, Hunting and Agriculture that quotas have been reached (Witting *et al.*, 2008) (see also Appendix D).

In Greenland, before a narwhal hunt occurs, hunters must apply for a licence from local authorities (Witting *et al.*, 2008). After the hunt, hunters must fill out a reporting form for every animal landed or wounded. This includes biological information and information on the licence and hunter (Witting *et al.*, 2008). In addition to reporting individual catches, once per year hunters are required to give a monthly report on species hunted, which includes narwhals (Witting *et al.*, 2008). Reporting is mandatory in order to have hunting permits renewed (Witting *et al.*, 2008). All catches are to be reported through the catch reporting form in the Piniarneq (catch-reporting logbook) (Anon., 2011).

According to the most recent five-year data (2007 to 2012), an average of 367 narwhals were landed per year, ranging from 294 to 450 animals (see Appendix D). The introduction of quotas in 2004 resulted in fewer narwhal landings compared to previous years.

Any overharvest or illegal harvests are subtracted from the municipal quota for the following year (Witting *et al.*, 2008). From 2004 to 2009 in West Greenland, there were several instances of quotas being raised; however, the excess harvest was subtracted from quotas for the following year (APNA, 2007, 2009; Greenland Home Rule, 2006, 2008).

## 3.3 Other Narwhal range States

Although the majority of the global narwhal population is found in waters of Canada and Greenland, narwhals are vagrant in other countries, but there is no active harvest in these States.

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<sup>17</sup> The full provisions on the narwhal hunt are detailed in the *Self-Government Executive Order No. 7 of 29 March 2011 on the protection and hunting of belugas and narwhals* (Anon., 2011).



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# TRADE AGREEMENTS AND REGULATIONS

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## 4.1 Narwhal range State regulations and conditions of trade

### *Canada*

Any edible parts of a narwhal cannot be sold, bought, bartered or traded except by Aboriginal peoples in certain jurisdictions (Anon., 1993a). A narwhal tusk can only be possessed, bought, sold, bartered or traded if the licence (MMT) is attached to the tusk (Anon., 1993a). Any transportation of a narwhal or its parts and derivatives from one province or territory to another requires a Marine Mammal Transportation Licence (MRTL) (Anon., 1993a).

Export of narwhal products from Canada requires CITES documentation. Canada's NDFs for narwhals are discussed in section 4.2.1 and Box 4.1.

### *Greenland*

Before any narwhal part can be sold, the hunting permit applicable to that animal must be stamped by the local authority or settlement office, which will then register the catch. When a sale takes place, the hunter must endorse, via signature, a copy of the stamped permit, which then accompanies the item being sold. The copy must also show that the catch has been registered by a municipal authority (Anon., 2011). If the municipal office is closed, a sale can occur if registration of the harvest and sale takes

place immediately after the office is open. Purchasing or receiving narwhal parts that were hunted illegally is prohibited (Anon., 2011). Only professional hunters who can produce a valid professional hunting certificate and a stamped permit may sell their products (edible or non-edible) at local markets or via other forms of informal sale. Edible parts (i.e. muktuk, meat or blubber) can be sold to authorized buyers; however, they may not be sold from vessels. If a sale quota has been allocated by a government, buyers must submit daily reports on quantities purchased to the Department of Fisheries and Hunting. This includes selling meat, blubber and muktuk directly to businesses, institutions and restaurants. These businesses must be able to prove they bought the items from professional hunters and they must produce a signed invoice with a copy of the professional hunting certificate and stamped permit. Narwhal tusks require a copy of the permit number attached to the tusk when being sold (Anon., 2011). On June 6, 2006, the Greenland government imposed a ban on the export of all narwhal items, including tourist souvenirs, originating from Greenland due to a negative NDF issued in 2005. (Greenland Home Rule Government, 2008a; 2008b; Greenland Institute of Natural Resources, 2009) (See Box 4.1). Greenland's NDFs for narwhals are discussed in section 4.2.1 and Box 4.1.

## Remaining range States

Narwhal hunting has been prohibited in Norway and its territories since 1967 and in Russia since 1956 (Anon., 1956; D. Paulsen, Norway Directorate of Fisheries, *in litt.* to T. Shadbolt, March 21, 2011). Narwhals are not hunted in the United States and since 1972 have been afforded protection under the US *Marine Mammal Protection Act* (MMPA) along with all other cetaceans (Anon., 1972). Narwhal parts and derivatives can only be imported to the United States with issuance of permits under specific circumstances

(Anon., 1972). There is no legal domestic trade of narwhals from these remaining range States; any such items in trade would likely be antique, pre-CITES or for scientific purposes.

## 4.2 International regulations and conditions of international trade

### 4.2.1 CITES

Regulation of the international trade in narwhals and their parts and derivatives was implemented in 1975 when the species was listed in Appendix III of CITES at the request of Canada (CITES, 2008b). In 1977 Denmark made a reservation<sup>18</sup>, stating that it would not recognize the listing under the CITES. However, Denmark withdrew its reservation in 1979 when the EU submitted a proposal to list all cetaceans in Appendix II, which was adopted by all signatory countries and which transferred narwhals to Appendix II (CITES, 2008b). In 1985, narwhals were proposed for a CITES Appendix I listing, but the proposal was not accepted and the species remains in CITES Appendix II to this day (Reeves, 1992; COSEWIC, 2004). As previously discussed, an Appendix II listing requires that a CITES export permit (or re-export certificate) be issued by an exporting country prior to the export (or re-export) of any narwhal part or derivative unless exempt from the provisions of the CITES (see Appendix B). Furthermore, all narwhal range States<sup>19</sup> are required to complete an NDF for international trade in Appendix II species before permits may be issued. In some instances, countries have taken measures beyond the minimum requirements of CITES, requiring additional permits or certificates (e.g. EU EU WTR) (Anon., 1973; Cooper and Chalifour, 2004).

<sup>18</sup> As per the text of the CITES, any Party may (by notification in writing) make a reservation with respect to an amendment to Appendix I or II. Until the reservation is withdrawn, the Party is to be treated as if it was not a Party to the CITES with respect to trade in the species concerned (Anon. 1973a).

<sup>19</sup> CITES defines a range State as a state "whose territory is within the natural range of distribution of a species" (CITES, 2008a).

## Narwhal range State implementation of NDFs

Negative NDFs have been issued for narwhals in both Canada and Greenland; however, some have since been lifted (see Box 4.1) (DFO, 2010b; 2010c; NTI, 2012; Greenland Institute of Natural Resources, 2005; 2009).

Prior to 2010, NDFs in Canada were issued on case by case basis; while published standing NDFs were issued in 2010 with ongoing revisions as new information became available (DFO, 2010b; 2010c). As of January 2014, a negative NDF is still in effect for one summering aggregation (Parry Channel, Jones Sound and Smith Sound); as such, narwhal parts and derivatives from this

### Box 4.1 CITES Non-detriment findings for narwhal range States

#### Canada

- In 2008, DFO provided recommendations for the TAH (based on the total allowable landed catch (TALC) after removal of animals struck and lost) of narwhal stocks in Canada. Conservation concerns were identified for several management units/stocks because the actual harvest levels exceeded the recommended TALC, or because a population estimate for some stocks was lacking. As a result, in December 2010 the CITES SA issued a negative NDF for these management units/stocks, temporarily prohibiting the international trade of narwhal products originating from several stocks (Admiralty Inlet, Northern Hudson Bay, East Baffin Island, and Parry Channel, Jones Sound and Smith Sound). However, no conservation concerns were identified for hunting narwhals from the Somerset Island and Eclipse Sound stocks, so narwhal parts and derivatives from those stocks were still permitted in international trade (DFO, 2010a).
- On February 11, 2011, Nunavut Tunngavik Incorporated (NTI) filed a lawsuit with the Federal Court of Canada against DFO for issuing the negative NDF. The lawsuit claimed that the information used to make the assessment was outdated and did not include the most recent information available (Nirlungayuk, 2011). In June 2011, NTI agreed to halt legal action after DFO agreed to consult with Inuit, and an agreement was reached between the Government of Canada and NTI concerning narwhal management (DFO, 2011c; NTI, 2011).
- In late 2011, DFO recommended a new TALC for the Admiralty Inlet stock based on new population estimates obtained from a 2010 survey (Asselin and Richard, 2011). With the updated information, DFO issued a positive NDF in October 2011, removing trade restrictions for four communities retroactive to 2010 (DFO, 2012c).
- In 2012, a new TALC was recommended for Northern Hudson Bay based on new population estimates obtained from a 2011 survey (Asselin *et al.*, 2012; DFO, 2013a). With this new information, DFO issued another positive NDF in May 2012, removing trade restrictions for 12 of the communities retroactive to 2010.
- Restrictions are still in place for one community, Grise Fjord, because there is insufficient scientific information on the distribution or abundance of narwhals in Jones Sound, Smith Sound or Parry Channel to determine whether harvests levels are sustainable. This may be classified an unknown stock (NTI, 2012).
- Areas of Parry Channel, Jones Sound and Smith Sound have recently been surveyed and results are expected for early 2015. This information will be used when developing the NDF for this stock (Environment and Biodiversity Science, DFO *in litt.* to E. Cooper, February 5, 2014).

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#### **Box 4.1** CITES Non-detriment findings for narwhal range States (*cont'd*)

##### **Greenland**

- In 2005, the CITES SA for Greenland was asked by the JWG to report NDF findings on the export of narwhal parts and derivatives from Greenland. Since the number of animals landed was higher than the JWG recommendations for removals, a positive NDF could not be made (Greenland Institute of Natural Resources, 2005), on June 6, 2006 the Greenland government decided to introduce a temporary export ban on all narwhal parts originating from Greenland until a positive NDF could be made or additional information could be provided (Greenland Home Rule Government 2008a, 2008b).
- In 2009, the CITES SA recommended that a positive NDF be issued for export of narwhal parts and derivatives since new information suggested that the harvest levels are within scientific recommendations (Greenland Institute of Natural Resources, 2009).
- This export ban remains in effect as of February 2014, and because it also applies to tourist items, there is no legal export of narwhal products originating from Greenland for any purpose (Greenland Home Rule Government, 2008a; 2008b).

stock cannot be exported from Canada (DFO, 2010b; 2010c; NTI, 2012) (See Box 4.1). This prohibition will be in effect until a positive NDF is made. Results from recent scientific surveys of Parry Channel, Jones Sound and Smith Sound areas will be finalized in early 2015 and this information will be considered when developing the NDF for that area (Environment and Biodiversity Science, DFO *in litt.* to E. Cooper, February 5, 2014).

In 2009, the Scientific Authority (SA) for Greenland recommended a positive NDF for all stocks in Greenland; however, the export ban remained in effect as of January 2014 (Greenland Institute of Natural Resources, 2009) (See Box 4.1).

### **4.2.2 EU WTR**

As stated earlier, the EU implements CITES via the EU WTR. In 1984, trade in all cetaceans was regulated in the EU when the species was listed on Annex C1<sup>20</sup>

(the equivalent of the current Annex A) under *Council Regulation (EEC) Reg. No. 3626/82*. As a result, the importation of all cetacean products into the EU was prohibited for commercial purposes. However, this did not apply to narwhals originating from Greenland (Reeves, 1992). By listing all cetaceans in Annex C1, the EU enacted trade regulations that were stricter than those required by CITES (all cetaceans were listed in CITES Appendix I or II). It also meant that all EU states would have to treat any cetacean as if it were listed on CITES Appendix I.

When the regulations were replaced in 1997, all cetaceans were listed on Annex A, under *Council Regulation (EC) Reg. No. 338/97*, which prohibited the commercial trade to, from and within the EU with very few exceptions. A concession was included for cetaceans originating from Greenland, which stated: “*specimens, including products and derivatives other than meat products for commercial*

<sup>20</sup> Annex C1 of the previous EU WTR (*Council Regulation (EEC) Reg. No. 3626/82*) included CITES Appendix I species. Annex C1 was equivalent to the current EU WTR (*Council Regulation (EC) Reg. No. 338/97*) Annex A.



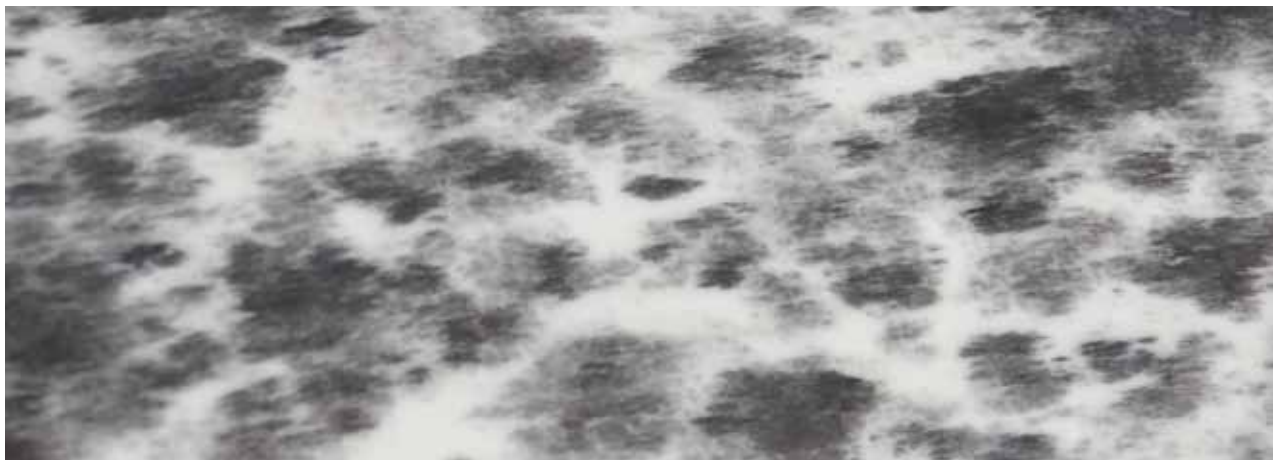
*purposes, taken by the people of Greenland under licence granted by the competent authority concerned shall be treated as belonging to Annex B*". Narwhals and their parts and derivatives from Greenland are treated as an Appendix B species except for meat traded for commercial purposes, which is still listed on Annex A. Therefore, trade in Greenland narwhals is permitted but requires the issuance of import permits, export permits and re-export certificates. Trade in meat from Greenland for commercial purposes and trade in all narwhal parts from other range States (i.e. Canada) for commercial purposes is prohibited, with the exception of specific provisions for Annex A species that require issuance of import permits, export permits and re-export certificates (UNEP-WCMC, 2011).

The Scientific Review Group (SRG) of the EU WTR examines all scientific questions related to the application of the EU WTR and can form opinions (positive opinion, negative opinion or no opinion) regarding the imports of a particular species from a particular country of origin and whether they comply with the regulations (See Appendix B).

On December 13, 2004, the SRG formed a negative opinion on the import of narwhals originating from Greenland (UNEP-WCMC, 2011). As a result, EU member states were required to reject all import applications, which resulted in a temporary import ban

into the EU; however, as long as Greenland issued export permits, items classified as personal and household effects were not impacted and could be imported by EU member states (see Appendix B) (C. O'Criodain, WWF-International, *in litt.* to T. Shadbolt, January, 30, 2009). On February 2, 2010, the SRG removed the negative opinion due to new information (i.e. Greenland's current quota system, running from 2009 to 2012, which is based on scientific advice and more accurate population abundance numbers), and formed a "no opinion". Therefore, all permit applications must be referred to the SRG (UNEP-WCMC, 2011). As of April 2012, Greenland does not require issuance of CITES export permits for household items (Greenland CITES MA *in litt.* to E. Cooper, January, 10, 2014).

On December 13, 2004, the SRG formed a positive opinion on the import of narwhals originating from Canada; however, on June 30, 2009, the SRG removed it. With no SRG opinion in place, the decision regarding whether trade is sustainable is made by the Scientific Authority of the importing EU member state (See Appendix B for more details) (UNEP-WCMC, 2011). Since narwhals from Canada are considered Annex A, trade in the species into the EU is only permitted under specific provisions for Annex A species that require issuance of import permits, export permits and re-export certificates (European Commission and TRAFFIC Europe, 2013).



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## NARWHAL TRADE

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*Muktuk is a highly prized food commodity and considered a delicacy in communities where it is consumed. Tusks, teeth<sup>21</sup>, bones and other products of the hunt are traded and sold as raw materials or are carved or fashioned into handicrafts or jewellery and sold (COSEWIC, 2004; CITES, 2006; Ford, 2006; Reeves, 1992; Reeves and Heide-Jørgensen, 1994; Greenland Institute of Natural Resource, 2009).*

### 5.1 Types of items in trade *Canada*

Ivory and muktuk are the most valuable parts of a narwhal (Reeves, 1992; 1993b; COSEWIC, 2004). Markets for narwhal products vary depending on the country, the declared purpose for the items and the artistic value of the items.

Trade in Canada consists of raw and carved tusks, skulls (usually with tusks), teeth, carved ivory handicrafts and other minor items (UNEP-WCMC CITES Trade Database; COSEWIC, 2004; Reeves and

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<sup>21</sup>All narwhals have two embedded teeth in their upper jaw. In males, the left tooth grows outward to form the tusk that projects from the upper jaw. In females, the two teeth normally remain embedded within the skull as unerupted teeth, as does a normal male's right tooth. However, up to 2% of females can grow a tusk, and some males can have a double tusk.

Heide-Jørgensen, 1994). Broken tusks or smaller tusks may be used to make sculptures, rings and earrings. The market for carvings appears to be limited, possibly due to the dimensions of the ivory material available (Reeves, 1992), the difficulty in carving narwhal ivory and the value of a full tusk. The most commonly exported items from Canada are whole tusks (Reeves, 1992; UNEP-WCMC CITES Trade Database).

## Greenland

Trade in Greenland consists of tusks, skulls, teeth, carved ivory handicrafts, ivory figurines known as “tupilaks” and other minor items (UNEP-WCMC CITES Trade Database; Jensen and Christensen, 2003; Reeves and Heide-Jørgensen, 1994). Carvings were the most commonly exported items from Greenland (UNEP-WCMC CITES Trade Database) when export was permitted. Since the definition of “carvings” is vague, some of these items could be carved tusks. Until the existing export ban is lifted, narwhal items can only be traded domestically.

## 5.2 Accuracy of CITES trade data

Data recorded in the UNEP-WCMC CITES Trade Database are compiled from information provided in the Parties’ annual reports; therefore, the accuracy of the data depends completely on the quality of the reporting by the CITES Parties. Unfortunately, some annual reports do not always provide accurate and precise data, and reporting of data is not always consistent between Parties. When considering CITES trade data, the following caveats should be considered:

- **Export data are not always accurate.** Export data may not represent the actual number of items exported since some Parties report data from permits issued, not from permits used. Although CITES recommends that annual reports provide the actual number of items exported based on

permits used, some Parties instead report the numbers of items that were listed on issued permits or certificates. Unfortunately, the number of items approved for export in a CITES export permit may not be the same as the number of items actually shipped (i.e. exporters may export fewer items than approved on permits). For 2000 to 2003 and for 2006, Greenland reported on permits used, but for all other years the source of data was not specified. Canada did not specify the basis of its reporting in any year (K. Malsch, Species Programme UNEP-WCMC, *in litt.* to T. Shadbolt, December 1, 2010). The UNEP-WCMC CITES Trade Database did not provide Greenland export data for 2007.

- **Import data are not consistent.** Import data are not always reported in annual reports, which makes it difficult to compare CITES import and export data. Some items may have not been reported by the importing country, or they may have been imported in a different calendar year than the year in which the export permit was issued (e.g. the permit could be issued in November, but the goods not shipped until the following January).
- **Inconsistent terminology.** The importing country and exporting country may report the same items using different terminology (e.g. purpose of trade, units of measurement, etc.), which means that data may not correlate between countries (J. Caldwell, UNEP-WCMC CITES Trade Database Manager, *in litt.* to T. Shadbolt, March 9, 2009; UNEP-WCMC, 2010).
- **Inconsistent use of purpose codes, items descriptions, and units of measurement.** Transaction codes (e.g. purpose of export) are important for monitoring trade in CITES-listed species because they help determine the nature of the trade. They also allow CITES Parties to monitor the volume of non-commercial and commercial trade. Since the purposes of transaction codes are not adequately defined,

they are open to interpretation and not used consistently by the various CITES Parties.

- **CITES trade data are not comparable to harvest data.** Harvest statistics are compiled based on management seasons (which may overlap between two calendar years), while the CITES trade data are compiled based on a single calendar year. Furthermore, the export or import of an animal product may occur years after the animal was actually hunted.
- **Unknown source of items (from live or dead animals).** While most items in trade clearly require the death of an animal (e.g. skulls and tusks), some items (such as specimens) could have been sourced from a live narwhal in the wild. This is important information when considering the impact of trade on conservation of the species.
- **Inconsistent reporting of seizure data.** Seizures data are not always reported, or are reported with insufficient detail and do not indicate why an item was seized.

## 5.3 Analysis of export data

Sections 2 *Methods* and 5.2 *Accuracy of CITES trade data* of this report provide detailed explanations of what data were used for analysis, why some data were included and excluded, and limitations on the use of the data.

Since a large portion of the international trade in narwhal parts and derivatives is recorded as carvings, it is impossible to precisely determine the number of harvested narwhals represented in international trade. For instance, any number of carvings could originate from a single narwhal or from multiple narwhals. When examining the data, considering

the items in trade and the purpose of export for these items was important. For instance, 5,500 narwhal items in trade could be interpreted as significant based on that quantity. However, without looking at the data in more detail, they can be misinterpreted. If 5,400 of those items consisted of specimens such as carvings, and only 100 were tusks, the conservation impact of this trade could be lower than if the majority of items were tusks, because tusks can be attributed to a finite number of animals. It is also important to note that trends in the numbers and/or types of items in trade do not necessarily reflect harvest levels.

### 5.3.1 Trends in Items (1987 to 2009 export data per year)

The CITES Guidelines on submitting annual reports provide explanations for wildlife terms; however, these are only guidelines and recommendations. Hence, CITES Parties can ultimately interpret and record data in the manner most appropriate for their reporting structure<sup>22</sup>. Given the inconsistent use of terms, the authors grouped similar and related items together for greater clarity in analysis. These groups are defined as follows:

- **Tusks.** This includes the UNEP-WCMC CITES Trade Database<sup>23</sup> terms for tusks;
- **Bones, ivory and carvings.** This includes the UNEP-WCMC CITES Trade Database terms for skeletons, bones, carvings, ivory pieces;
- **Other items.** This includes the UNEP-WCMC CITES Trade Database terms for claws, bodies, skins, skin pieces, scraps, oil, meat, derivatives and unspecified items.

<sup>22</sup> The explanations for description of tooth, tusks and carvings are: tooth “teeth – e.g. of whale, lion, hippopotamus, crocodile, etc.”; tusks as “substantially whole tusks, whether or not worked. Includes tusks of elephant, hippopotamus, walrus, narwhal, but not other teeth”; and carvings as “carvings (including wood, and including finished wood products such as furniture, musical instruments and handicrafts). NB: there are some species from which more than one type of product may be carved (e.g. horn and bone); where necessary, the description should therefore indicate the type of product (e.g. horn carving)”. Some of the range States have specified items as “bone carvings” or “ivory carvings” while other entries simply indicate “carvings” which is reflected in the UNEP-WCMC CITES Trade Database.

<sup>23</sup> A guide to using the UNEP-WCMC CITES Trade Database is available on the CITES website at: [http://www.unep-wcmc-apps.org/citestrade/docs/EN-CITES\\_Trade\\_Database\\_Guide.pdf](http://www.unep-wcmc-apps.org/citestrade/docs/EN-CITES_Trade_Database_Guide.pdf).)



According to the UNEP-WCMC CITES Trade Database, 6,145 kg of narwhal parts and derivatives were reported in the export data from 1987 to 2009 (Table 5.1). Since these items are recorded by weight, it is impossible to determine the number of narwhals represented by this trade. The majority of items in the export data recorded by weight were reported by Greenland (approximately 6,045 kg), most of which were recorded as meat being exported to Denmark (6,023 kg). Prior to the export ban, the import of narwhal meat into Denmark from Greenland was only permitted under special circumstances (Hjarsen, 2003). Greenlanders living in Denmark were allowed to import a small amount of meat and blubber (five kg limit per shipment). However, there was no personal or annual limit (Hjarsen, 2003).

According to the UNEP-WCMC CITES Trade Database, 27,358 narwhal parts and derivatives were reported in the export data from 1987 to 2009 (see Table 5.2). The data show minor increases in the total numbers of items recorded from 1994 to 1997; while from 1999 to 2005 and 2008 the total number of items recorded increased to levels much higher than in previous years. These items were primarily exported for commercial trade and personal purposes. A large decrease in number of items was observed in 2006 and 2007, possibly due to Greenland's export ban in 2006 and the absence of 2007 Greenland export data in the CITES Trade Database.

# Table 5.1

Narwhal items (kg) reported in export data, per year, 1987 to 2009

YEAR	NARWHAL ITEMS				TOTAL ITEMS
	MEAT	SKINS	TUSKS	SPECIMENS	
1987	0	0	0	0	0
1988	20	0	0	0	20
1989	525	0	0	0	525
1990	97	0	0	0	97
1991	10	0	0	0	10
1992	0	0	0	0	0
1993	0	0	0	0	0
1994	17	0	0	0	17
1995	12	0	0	0	12
1996	1,023	0	0	0	1,023
1997	618	0	0	0	618
1998	2,558	0	0	0	2,558
1999	0	0	21	0	21
2000	11	30	0	<1	41
2001	57	0	0	0	57
2002	659	5	0	0	664
2003	147	0	0	0	147
2004	200	0	0	0	200
2005	135	0	0	0	135
2006	0	0	0	0	0
2007	0	0	0	0	0
2008	0	0	0	0	0
2009	0	0	0	<1	0
<b>TOTAL Items</b>	<b>6,089</b>	<b>35</b>	<b>21</b>	<b>&lt;1</b>	<b>6,145</b>

Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

Note: No items were recorded as pre-Convention. All items were rounded to nearest decimal. Specimens were originally recorded as grams and converted to kilograms (i.e. 480 g in 2000 and 1.5 g in 2009).

# Table 5.2

Narwhal items reported in export data, per year, 1987 to 2009

YEAR	NARWHAL ITEMS						TOTAL ITEMS (KG)
	BONES, CARVINGS AND IVORY	TUSKS	SKULLS	TEETH	SPECIMENS	OTHER ITEMS	
1987	173	65	1	50	340	2	631
1988	146	151	2	40		0	339
1989	185	291	1	1		0	478
1990	114	445	2	1		0	562
1991	211 (2)	412		1		4	629 (2)
1992	238	228 (1)				47	513 (1)
1993	290	48 (1)		212		0	550 (1)
1994	520	229 (1)		84		0	833 (1)
1995	627	185		97		0	909
1996	696	207		52	1	0	956
1997	562	244	2	28		1	837
1998	263	197	3	5		0	468
1999	139	184 (2)	5	757	12	0	1,097 (2)
2000	821	260		255		75	1,411
2001	656 (37)	236 (5)		23	307	9	1,231 (43)
2002	2,084	267 (12)	7	62	262	8	2,689 (11)
2003	1,823	186 (24)		59		130	2,198 (24)
2004	3,358	197	6	268	100	157	4,086
2005	2,788	108	1	104		8	3,009
2006	751	135	8	111		9	1,014
2007	0	213	4			0	217
2008	1,556	245	4		250	0	2,055
2009	270	191	3	7	168	8	647
<b>TOTAL Items</b>	<b>6,089 kg</b>	<b>35 kg</b>	<b>21 kg</b>	<b>&lt;1 kg</b>			<b>6,145 kg</b>

Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

Note: Numbers in parentheses represent the number of items recorded as pre-CITES. An additional 72 items were recorded in the export data which are not presented in the table: eight items exported by non-range States and 64 items exported by other range States (61 skins and one specimen from the United States and two pre-CITES tusks from Russia). These items were not included because of the high probability that they were typographical errors or because the quantities were not sufficient to include in the analysis.



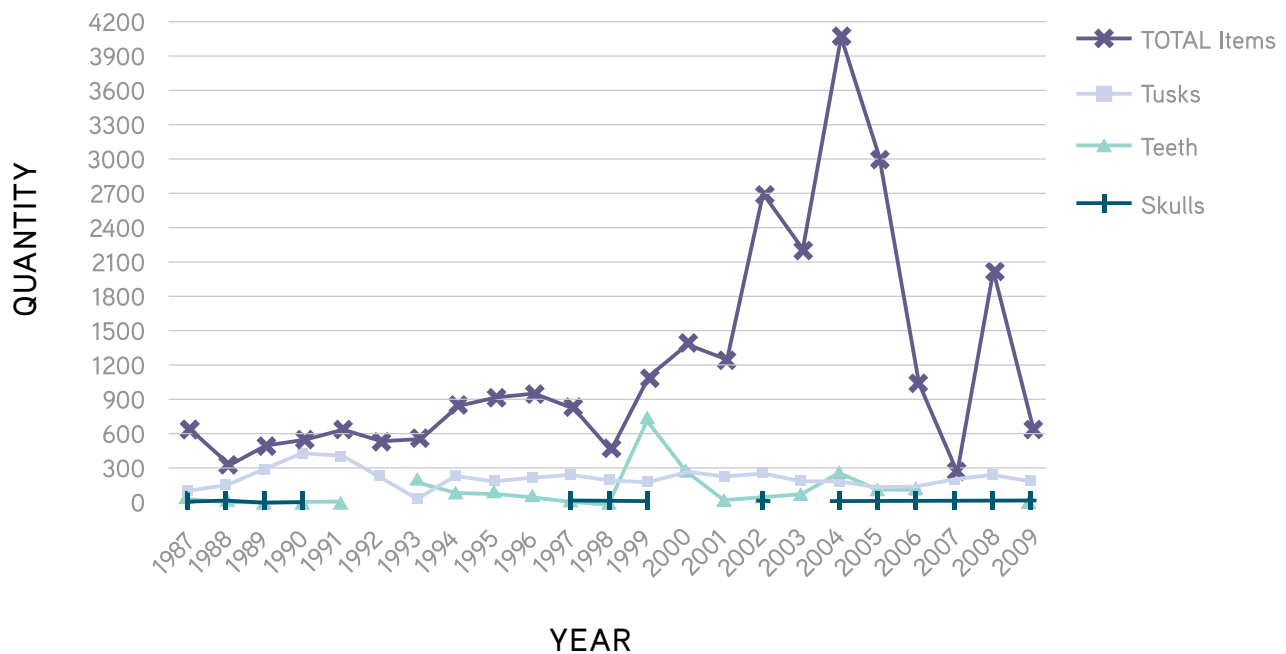
## Items that could represent an individual narwhal

The numbers of tusks, skulls and teeth in trade can be used to estimate the numbers of individual narwhals represented in international trade. Generally, a female narwhal will have two teeth and a male will have one tooth and one tusk, although a very small number of females may grow a tusk and occasionally a male will have two tusks. It is therefore reasonable to assume that one tusk represents one animal (in rare cases two tusks can represent one animal). In some

instances the skulls may be traded without the tusk; or skulls and tusks from one animal may be reported separately on permits, even when the tusk is attached to the skull (Environment Canada CITES SA *in litt.* to E. Cooper, February 13, 2014). Thus the data are examined as separate items (tusks are analysed separate from skulls). The purpose of export and the destination countries can also provide insight on the dynamics of trade. The term “bodies” is another item which could be used to represent individual animals. However, it is not possible to know whether a body would include the skull (or tusks). Bodies accounted

## Figure 5.1

Reported exports (number of items) of narwhal tusks, teeth and skulls, per year, 1987 to 2009



Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.



for only five items in total during 1987 to 2009 and were instead included in Figure 5.4.

**Skulls** account for 49 of the items reported in the export data from 1987 to 2009. Exports of skulls were not frequent; however, Figure 5.4 illustrates the most notable records. Skulls were exported primarily for personal and scientific purposes.

**Teeth** account for 2,217 of the items reported in the export data from 1987 to 2009. Figure 5.1 illustrates an increase in the number of teeth recorded in 1993. These items were primarily exported for personal purposes. Although there are separate codes for tusks and teeth, not all countries use the terms consistently. For example, in 2009, Italy, Slovenia and China all recorded imports of “teeth” while the exporting country recorded the same items as “tusks”. There is no way to confirm whether or not these teeth were tusks.

**Tusks** account for 4,923 of the items reported from 1987 to 2009. Figure 5.1 illustrates an increase in the number of tusks recorded from 1989 to 1991 and a decline in 1993. The increases in numbers of tusks were primarily for commercial purposes and personal trade. After this period, the quantity of tusks exported remained relatively stable, fluctuating between 200 to 300 tusks per year.

The number of tusks in international trade increased gradually from 2005 to 2008 and declined slightly in 2009. However, the recorded purpose of export fluctuated (see Table 5.3 and Figure 5.2). An increase in the number of tusks exported for commercial trade was observed in 2006 and 2007 (influenced by Canadian exports), followed by a considerable decrease in 2008. While an increase in the numbers of tusks exported for personal purposes was observed in 2007 (Canadian exports) and 2008 with increases in reported exports from both range States. The reported exports were highest in 2007 despite the absence of 2007 Greenland export data in the CITES Trade Database. Furthermore, the Greenland export

ban prohibited the commercial exports of narwhal items beginning in 2006. However, items related to movement of personal and household effects (but not tourist souvenirs) were still permitted to be exported provided the items were accompanied by appropriate permits. As of April 2012, Greenland does not require issuance of CITES export permits for household items (Greenland CITES Management Authority *in litt.* to E. Cooper, January, 10, 2014). The reason for

the fluctuations in the purpose of export for Canada is unclear, but could be a result of changes in market dynamics or inconsistent reporting of data.

The 2005 to 2009 export data recorded 31 different destination countries for narwhal tusks and skulls. The number of tusks exported fluctuated over that time frame with some noticeable trends (see Table 5.4 and Figure 5.3). Nine of the top 10 destination

## Table 5.3

Number of narwhal tusks and purpose of reported exports, per year, 2005 to 2009

COUNTRY OF EXPORT (PURPOSE OF EXPORT)	YEAR					TOTAL
	2005	2006	2007	2008	2009	
<b>Canada</b>	<b>50</b>	<b>120</b>	<b>213</b>	<b>149</b>	<b>118</b>	<b>650</b>
Educational					2	2
Personal	30	50	121	147	85	440
Commercial trade	20	70	81	2	31	208
<b>Greenland<sup>1</sup></b>	<b>58</b>	<b>15</b>	<b>0</b>	<b>96</b>	<b>73</b>	<b>242</b>
Personal	58	15		96	70	239
Scientific					3	3
<b>TOTAL</b>	<b>108</b>	<b>135</b>	<b>217</b>	<b>245</b>	<b>191</b>	<b>892</b>
Educational	0	0	0	0	2	2
Personal	88	65	128	243	155	679
Commercial trade	20	70	85	2	31	209
Scientific	0		0	0	3	3

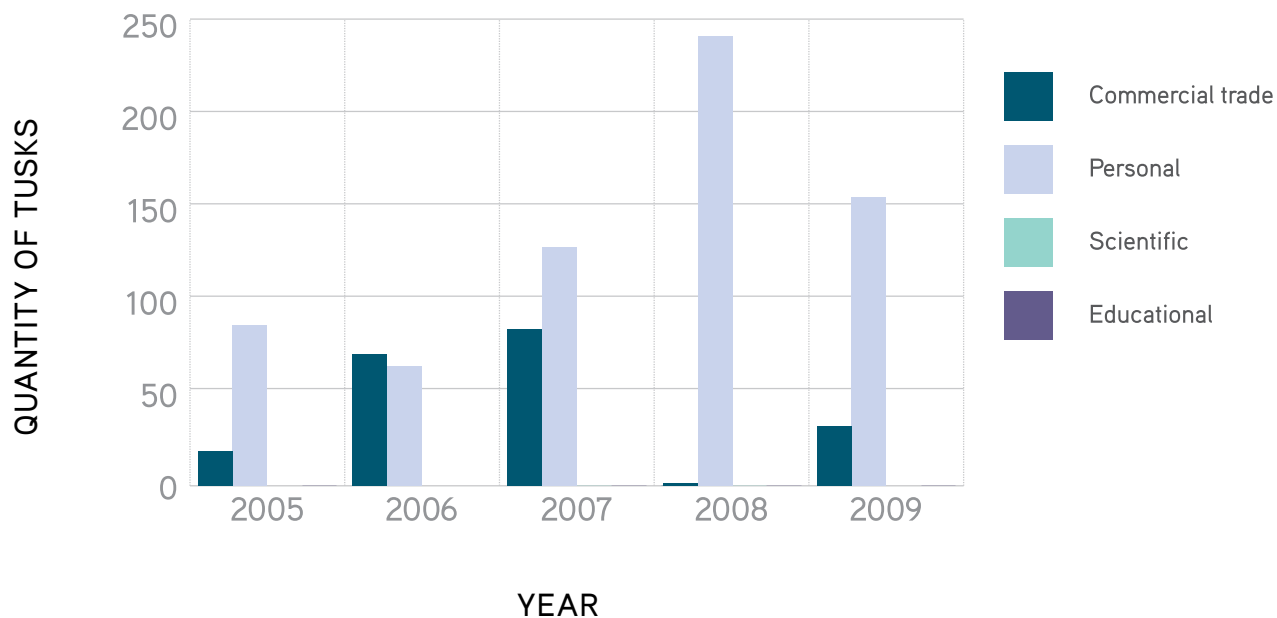
Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

Note: The majority of items were recorded as tusks; only 20 skulls were recorded from 2005 to 2009 (12 from Canada and eight from Greenland).

1. Some country codes in the UNEP-WCMC CITES Trade Database refer to political entities that issue permits, but are not actually sovereign nations (e.g. Hong Kong or Greenland).

# Figure 5.2

Purpose of reported exports of tusks, per year, 2005 to 2009



Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

Note: The majority of items were recorded as tusks; only 20 skulls were recorded from 2005 to 2009 (12 from Canada and eight from Greenland).

countries are in the EU. Greenland reported that the majority of tusks were exported to Denmark (n=227), while Canada reported the export of the majority of its tusks to the remaining countries (n=650). Since narwhals from Canada are considered an Annex A species in the EU, such imports to the EU are not generally permitted; however, some exceptions apply. Since none of the Canadian tusks exported to EU countries were recorded as pre-Convention and many of the tusks were recorded in the corresponding import data, the tusks must either have been imported under special circumstances with the accompaniment of import permits, or some authorities may not be interpreting the EU regulations correctly.

## *Items that don't represent individual animals*

It is not possible to determine the number of narwhals represented by the remaining items recorded in trade. Carvings could consist of small ivory figurines or a fully carved tusk. Many carvings could be made from a single tusk (representing one narwhal) or from many different tusks (representing many narwhals). Furthermore, the term “specimens” is not well defined in the data and could refer to a wide range of items including blood or tissue samples resulting from scientific research activities.

# Table 5.4

Top 10 destination countries for narwhal tusks, 2005 to 2009 export data, per year.

DESTINATION COUNTRY (PURPOSE OF EXPORT)	YEAR					TOTAL
	2005	2006	2007	2008	2009	
<b>Denmark</b>	<b>54</b>	<b>21</b>	<b>0</b>	<b>93</b>	<b>67</b>	<b>235</b>
Personal	54	14		93	64	225
Scientific		7			3	10
<b>Japan</b>	<b>13</b>	<b>52</b>	<b>53</b>	<b>5</b>	<b>17</b>	<b>140</b>
Personal	2	9	13	5	1	30
Commercial trade	11	43	40		16	110
<b>Netherlands</b>	<b>2</b>	<b>2</b>	<b>24</b>	<b>47</b>	<b>12</b>	<b>87</b>
Personal	2	2	24	47	12	87
<b>France</b>	<b>0</b>	<b>16</b>	<b>32</b>	<b>18</b>	<b>13</b>	<b>79</b>
Personal			16	18	12	46
Commercial trade		16	16		1	33
<b>Germany</b>	<b>11</b>	<b>12</b>	<b>19</b>	<b>20</b>	<b>13</b>	<b>75</b>
Personal	10	12	19	20	13	74
Commercial trade	1					1
<b>Italy</b>	<b>4</b>	<b>10</b>	<b>17</b>	<b>30</b>	<b>2</b>	<b>63</b>
Personal	2	4	16	30	2	54
Commercial trade	2	6	1			9
<b>Switzerland</b>	<b>1</b>	<b>10</b>	<b>31</b>	<b>6</b>	<b>15</b>	<b>63</b>
Personal	1	9	4	4	3	21
Commercial trade		1	27	2	12	42
<b>Belgium</b>	<b>0</b>	<b>3</b>	<b>22</b>	<b>4</b>	<b>20</b>	<b>49</b>
Personal		3	22	4	20	49
<b>Austria</b>	<b>7</b>	<b>8</b>	<b>4</b>	<b>6</b>	<b>11</b>	<b>36</b>
Personal	6	8	4	6	11	35
Commercial trade	1					1
<b>Spain</b>	<b>2</b>	<b>2</b>	<b>9</b>	<b>3</b>	<b>7</b>	<b>23</b>
Personal	1	2	9	3	7	22
Commercial trade	1					1
<b>Remaining 21 countries*</b>	<b>15</b>	<b>7</b>	<b>6</b>	<b>17</b>	<b>17</b>	<b>62</b>
Educational					2	2
Personal	10	3	5	17	13	48
Commercial trade	5	4	1		2	12
<b>TOTAL</b>	<b>109</b>	<b>143</b>	<b>217</b>	<b>249</b>	<b>194</b>	<b>912</b>
Educational	0	0	0	0	2	2
Personal	88	66	132	247	158	691
Commercial trade	21	70	85	2	31	209
Scientific	0	7	0	0	3	10

Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

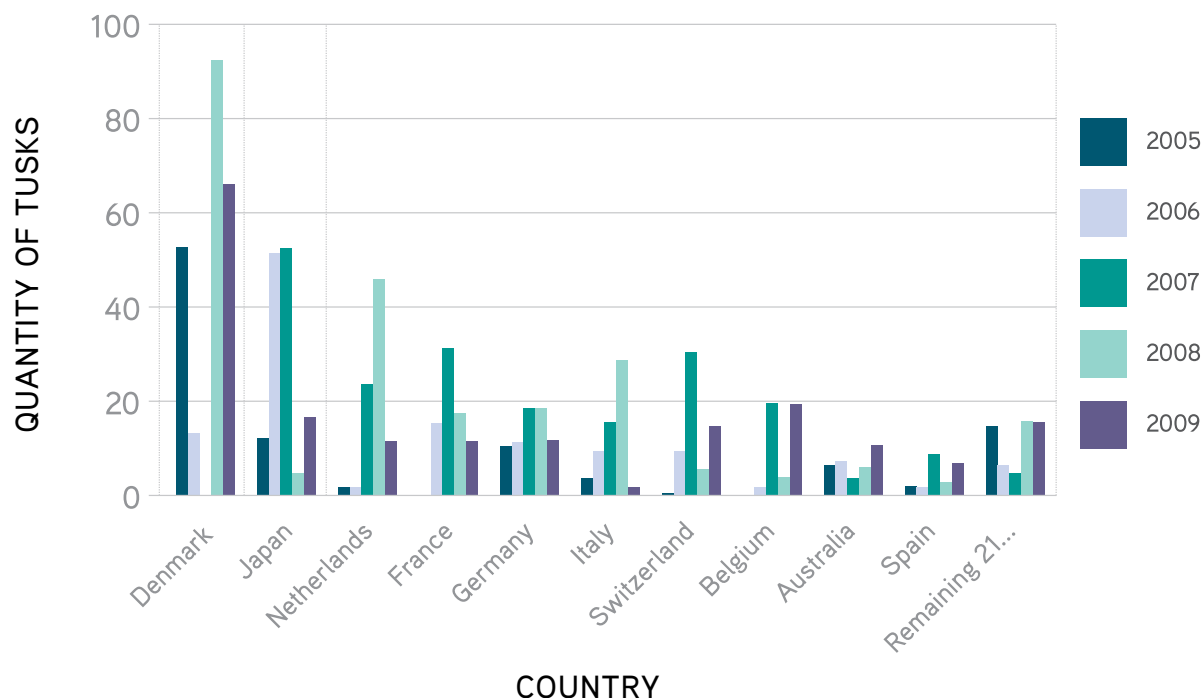
Note: The majority of items were recorded as tusks; only 20 skulls were recorded from 2005 to 2009 (12 from Canada and eight from Greenland).

1. Some country codes in the UNEP-WCMC CITES Trade Database refer to political entities that issue permits, but are not actually sovereign nations (e.g. Hong Kong or Greenland).

\* Each remaining country exported less than seven tusks over the five-year period.

# Figure 5.3

Top 10 destination countries for narwhal tusks, 2005 to 2009 export data, per year



Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

Note: The majority of items were recorded as tusks; only 20 skulls were recorded from 2005 to 2009 (12 from Canada and eight from Greenland).

1. Some country codes in the UNEP-WCMC CITES Trade Database refer to political entities that issue permits, but are not actually sovereign nations (e.g. Hong Kong or Greenland).

\* Each remaining country exported less than seven tusks over the five-year period.

**Bones, ivory and carvings**<sup>24</sup> account for 18,271 of the items reported from 1987 to 2009. The majority (n=18,016) of these items were recorded as “carvings”. Figure 5.4 illustrates increases in the number of bones, ivory and carvings recorded from 1994 to 1997, from 2000 to 2005 and in 2008. These items were primarily exported for commercial trade and personal purposes. A large decrease in number of bones, ivory and carvings was observed in 2006 and 2007, possibly due to Greenland’s export ban in 2006 and the absence of 2007 Greenland export data in the CITES Trade Database.

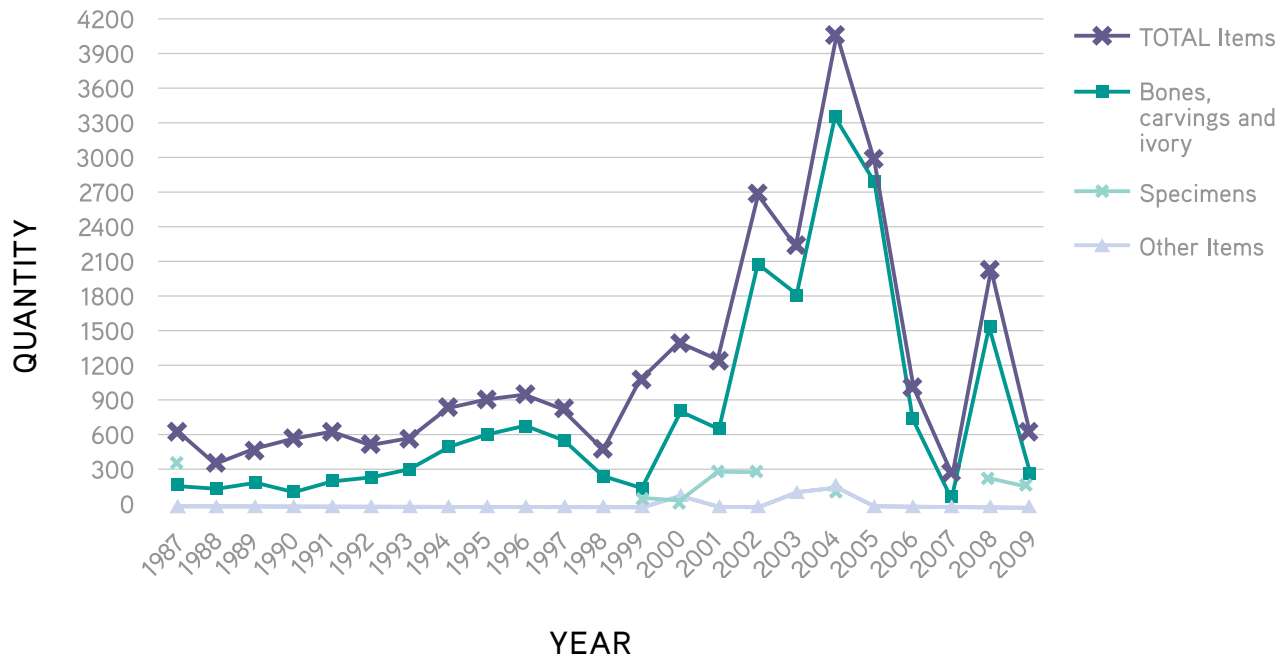
**Specimens** (e.g. blood or tissue samples) account for 1,440 of the items reported from 1987 to 2009. Exports of specimens were not frequent; however, Figure 5.4 illustrates the most notable records in 1987, 2001, 2002, 2004, 2008 and 2009. Specimens were exported primarily for scientific purposes.

**Other items** (claws, bodies, skins, skin pieces, scraps, oil, meat, derivatives and unspecified items) account for 458 of the items reported from 1987 to 2009. Exports of these items were not frequent; however, Figure 5.4

<sup>24</sup> The specific terms used in the CITES Trade Database were skeletons, bones, ivory carvings and ivory pieces.

# Figure 5.4

Reported numbers of bones/ivory/carvings, specimens and other items, exported per year, 1987 to 2009



Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

illustrates the notable volumes of trade in 2000, 2003 and 2004. These items were exported primarily for commercial trade and personal purposes.

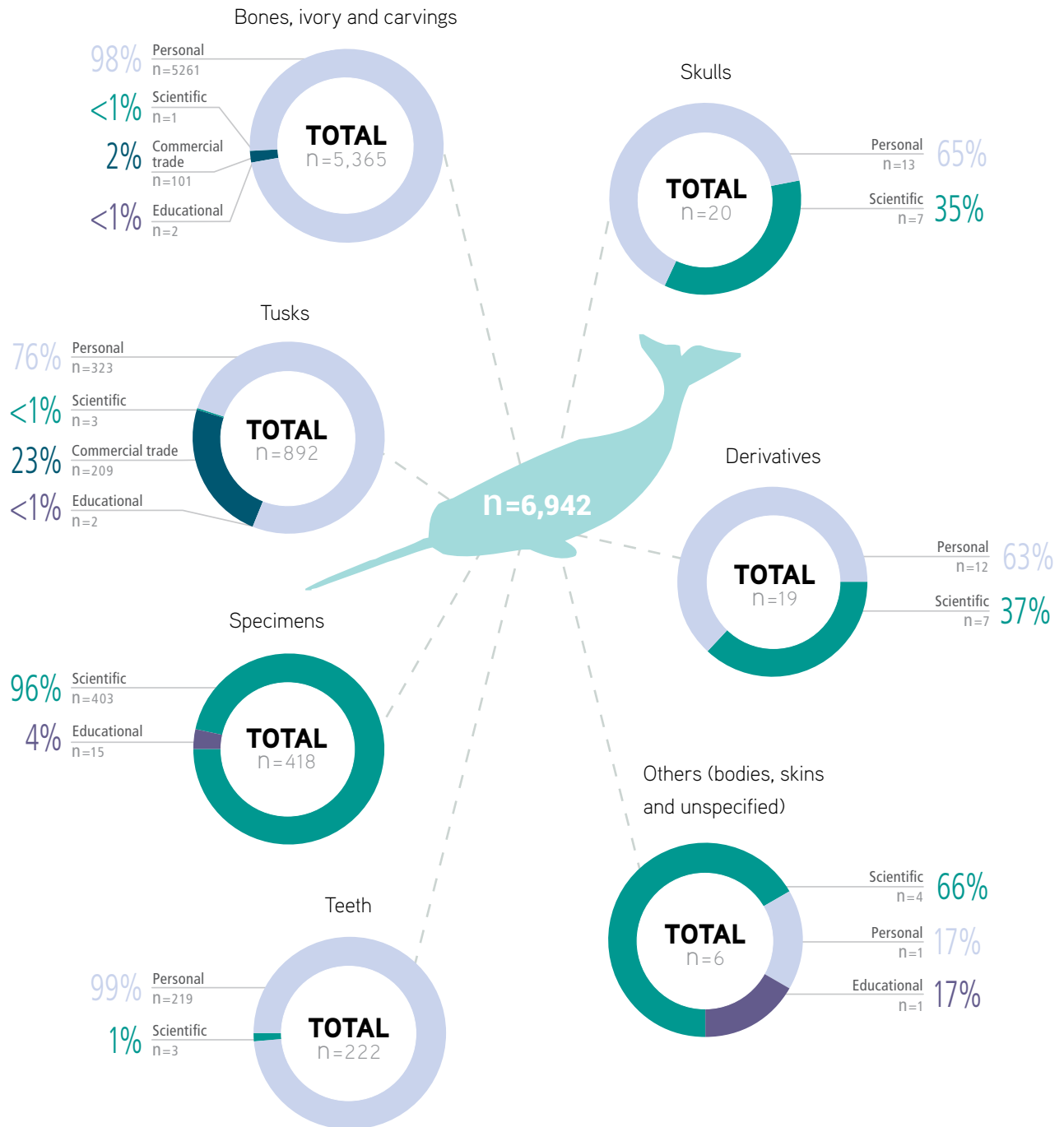
### 5.3.2 Recent international trade (sum of 2005 to 2009 export data)

A total of 6,942 narwhal parts and derivatives were reported in the export data in a five-year period (2005 to 2009). Seven main types of items made up this trade (see Figure 5.5). Bones, ivory and carvings comprised

the highest volume of items recorded, followed by tusks, specimens, teeth, skulls, derivatives and other items. The purpose of export for each type of item, according to each narwhal range State, is summarized in Table 5.5. During a five-year timeframe, Greenland exported the highest number of items, mainly comprised of bones, ivory and carvings. However, Canada exported the highest number of tusks, which can be attributed to an individual animal. Figures 5.6 and 5.7 provide a visual representation of international trade for Canada and Greenland. The types of items and the purpose of export for each item are summarized in these figures.

# Figure 5.5

Narwhal items recorded by range State export, sum of five years (2005 to 2009)

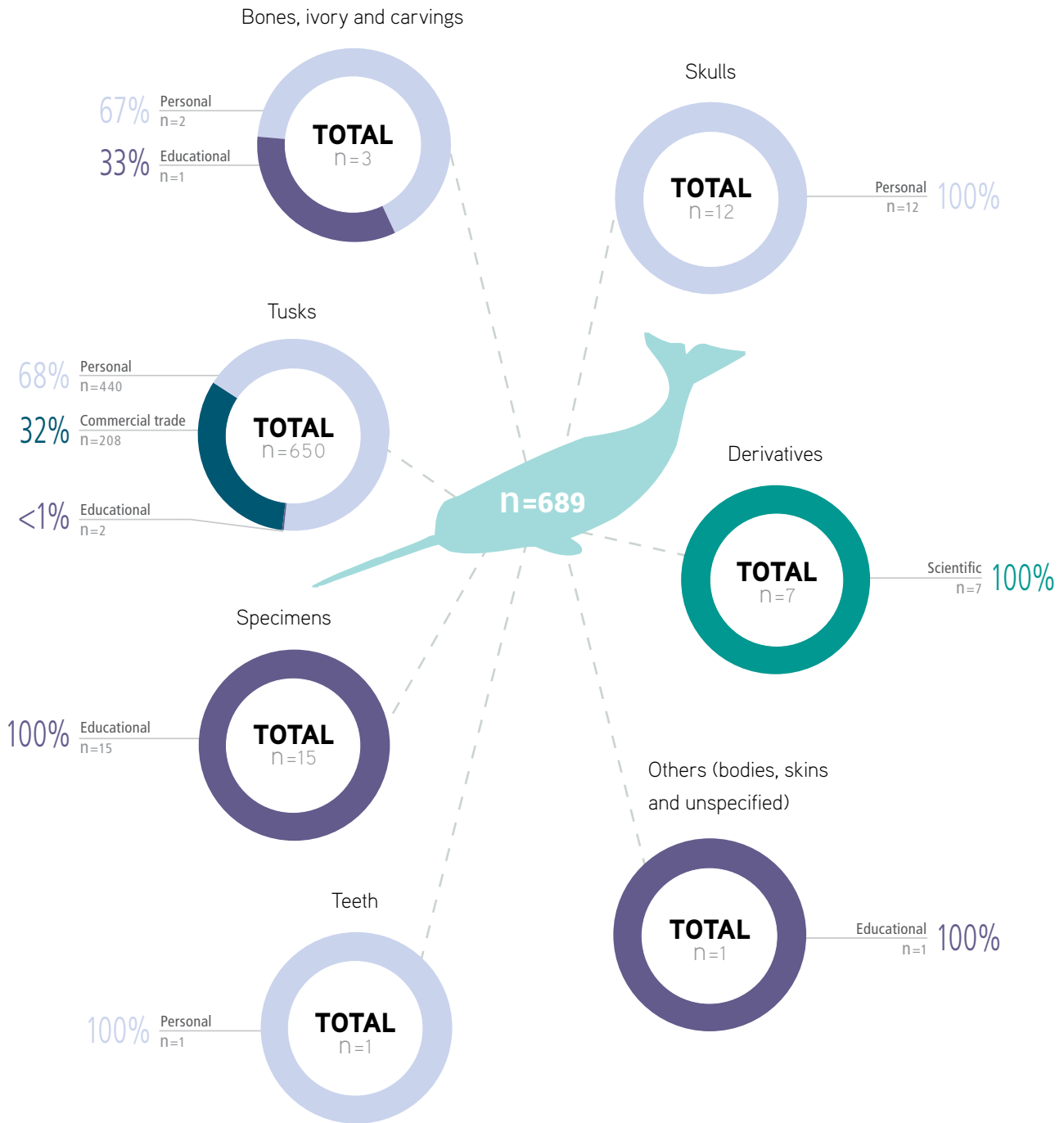


Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.



# Figure 5.6

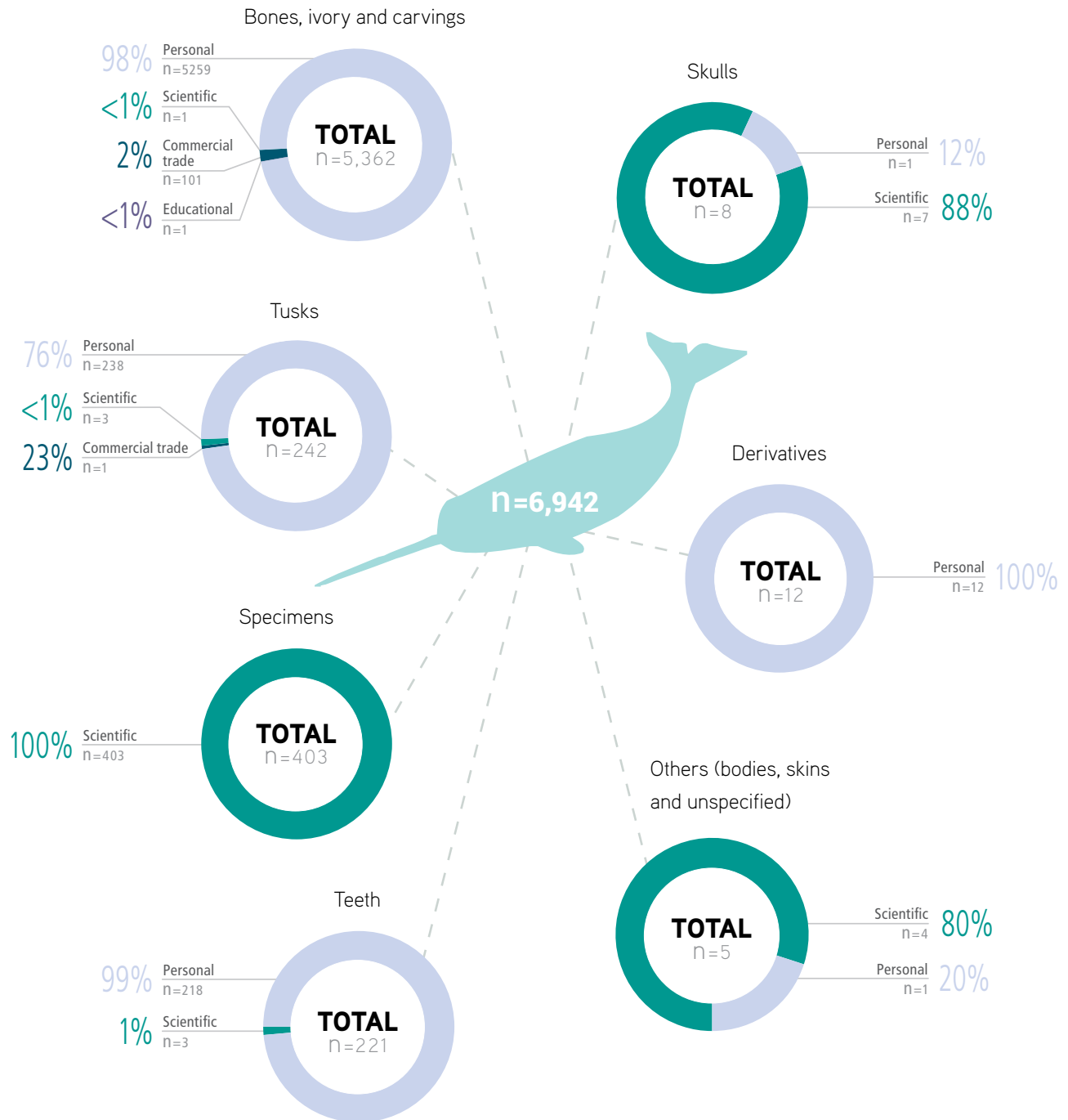
Narwhal items from Canada and their purpose of export, sum of five years (2005 to 2009)



Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

# Figure 5.7

Narwhal items from Greenland and their purpose of export, sum of five years (2005 to 2009)



Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

# Table 5.5

Narwhal items and purpose of export reported in export data during a five-year period (2005 to 2009 inclusive)

TYPE OF ITEMS (PURPOSE OF EXPORT)	COUNTRY OF EXPORT		TOTAL
	CANADA	GREENLAND <sup>1</sup>	
<b>Bones, ivory and carvings</b>	<b>3</b>	<b>5362</b>	<b>5365</b>
Educational	1	1	<b>2</b>
Personal	2	5259	<b>5261</b>
Scientific		1	<b>1</b>
Commercial trade		101	<b>101</b>
<b>Tusks</b>	<b>650</b>	<b>242</b>	<b>892</b>
Educational	2		<b>2</b>
Personal	440	238	<b>678</b>
Scientific		3	<b>3</b>
Commercial trade	208	1	<b>209</b>
<b>Specimens</b>	<b>15</b>	<b>403</b>	<b>418</b>
Educational	15		<b>15</b>
Scientific		403	<b>403</b>
<b>Skulls</b>	<b>12</b>	<b>8</b>	<b>20</b>
Personal	12	1	<b>13</b>
Scientific		7	<b>7</b>
<b>Derivatives</b>	<b>7</b>	<b>12</b>	<b>19</b>
Personal		12	<b>12</b>
Scientific	7		<b>7</b>
<b>Others (bodies, skins and unspecified)</b>	<b>1</b>	<b>5</b>	<b>6</b>
Educational	1		<b>1</b>
Scientific		4	<b>4</b>
Personal		1	<b>1</b>
<b>TOTAL</b>	<b>689</b>	<b>6253</b>	<b>6942</b>
Commercial trade	208	102	<b>310</b>
Personal	455	5729	<b>6184</b>
Scientific	7	421	<b>428</b>
Educational	19	1	<b>20</b>

Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

1. Some country codes in the UNEP-WCMC CITES Trade Database refer to political entities that issue permits, but are not actually sovereign nations (e.g. Hong Kong or Greenland).

## 5.4 Illegal trade of narwhal parts and derivatives

Information on illegal international trade in narwhal items is not always publically available or is anecdotal. There have been some concerns with legally purchased tusks being exported from Canada illegally. Although Environment Canada does not have jurisdiction over narwhals, the Canadian Border Services Agency has been requesting more export inspections by Environment Canada enforcement officers (who are responsible for CITES-listed species). When Environment Canada inspects a shipment and finds marine mammal products, DFO is contacted because marine mammal species are managed by DFO. However, due to lack of resources or limited availability, DFO officers cannot always inspect all shipments (Wildlife Enforcement Division, Environment Canada, *in litt.* to T. Shadbolt, May 7, 2009).

During some inspections of exports, Environment Canada enforcement officers have noticed that some narwhal tusks do not have MMT attached and, at times, only have CITES permits attached. Under the *Marine Mammal Regulations* a narwhal tusk cannot be sold, bought, traded, bartered or possessed unless the tag is attached to the tusk (Anon., 1993a). Since the tags are made of paper, they are easily lost or removed from the tusk. In some instances, a CITES broker (a company that obtains permits on behalf of clients) may remove hunting tags, believing that tags are no longer needed once the CITES permit is attached (Wildlife Enforcement Division, Environment Canada, *in litt.* to T. Shadbolt, May 7, 2009). This makes it difficult for enforcement officers to gauge the legality of narwhal tusks because it is difficult to determine their origin (i.e. some tusks are only accompanied by CITES permits, while others have an MMTL which is required to transport the items across provinces or territories). This means that some items may be illegally transported unintentionally (Wildlife Enforcement Division, Environment Canada, *in litt.* to T. Shadbolt, May 7, 2009).

A 30-month investigation into smuggling of narwhal tusks into the United States, called “Operation Longtooth”, resulted in multiple convictions in both Canada and the United States (Environment Canada, 2013). The investigation began in 2009 when the enforcement branch of Environment Canada received information from enforcement agencies in the United States on illegal importing of narwhal tusks into the United States from Canada (Environment Canada, 2013). Two Canadian sellers were smuggling tusks across the Canada-United States border in a vehicle with tusks concealed in a hidden compartment (Canfield, 2013; Boswell, 2013). Although the tusks were harvested as part of the regulated subsistence hunt and the Canadian sellers legally purchased the tusks from retail stores in northern Canada, the import of tusks into the United States contravenes the US MMPA (Canfield, 2013; Boswell, 2013). Since the United States prohibits the import of narwhal tusks, CITES permits can only be issued under very specific circumstances. However, no such permits were issued, and thus the act was also in contravention to provisions of CITES for both Canada and the United States. A brief summary of other charges and/or convictions related to smuggling of narwhal tusks is as follows:

- In 2009, an antiques dealer in the state of Massachusetts (United States) was charged with nine counts related to the illegal importation and sale of narwhal tusks (and sperm whale teeth) into the United States (US Department of Justice, 2011; Leagle, 2012; Boswell, 2013). In 2010, the dealer was convicted on eight counts and sentenced to 33 months in prison followed by a 24-month supervised release and a \$725 special assignment (US Department of Justice, 2011; Leagle, 2012; Boswell, 2013). In 2012, conviction on several of the counts was appealed but was rejected (US Department of Justice, 2011). According to court documents (Leagle, 2012), two Canadians acquired and smuggled the narwhal tusks across the border.

- In 2012, two Americans (one from New Jersey, another from Tennessee) were charged with 29 counts related to the illegal importation of narwhal tusks into the United States (US Department of Justice, 2012; Boswell, 2013). One defendant was estimated to have sold approximately USD1.1 million worth of tusks; while the other was estimated to have sold between USD400,000 to USD1 million worth of tusks (US Department of Justice, 2014). Both men have pled guilty (US Department of Justice, 2014). One defendant is scheduled for sentencing in March 2014, facing counts for conspiring to illegally import and illegally traffic narwhal tusks and conspiring to commit money laundering crimes which has a maximum penalty of 20 years in prison and fines of up to USD250,000 (US Department of Justice, 2014). A date for sentencing of the co-defendant has not been set, but he faces counts of conspiring to illegally trafficking narwhal tusks which has a maximum penalty of five years in prison and fines of up to USD250,000 (US Department of Justice, 2014). According to the plea, the Americans partnered to buy more than 100 tusks from a Canadian resident beginning in 2003, aware that the tusks were illegally imported (US Department of Justice, 2014). After receiving the tusks, they marketed and sold the tusks using internet sales and direct sales to US buyers and collectors of ivory (US Department of Justice, 2014).
- In November 2013, one of the Canadian sellers involved in the previously mentioned 2009 incident was convicted of seven counts related to the illegal export of approximately 250 narwhal tusks to the United States (Environment Canada, 2013) between the years 2003 and 2009. He received an eight-month conditional sentence to be served in the community, including four months of house arrest and a fine of CAD385,000, the largest fine ever levied in Canada for an offence under the *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA)* (Environment Canada, 2013). In addition, he was prohibited from possessing or purchasing marine mammal products for a 10-year period and forfeited possessions related to the act (a truck and trailer) (Environment Canada, 2013).



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In August 2008, a case of illegal hunting was indicated in Rømer Fiord in East Greenland where edible and usable parts of up to 48 narwhals were left behind by hunters (Greenland Home Rule 2009a, 2009b). According to the regulations, flensing (stripping the skin) and all edible and other usable parts of a landed narwhal must be taken home or disposed of, leaving the capture site clean (Anon., 2004a). The Greenland government strongly condemned the illegal activities and handed the case over to police for further investigation (Greenland Home Rule, 2009a, 2009b). In response to this incident, the APNA and Ittoqqortoormiit Municipality organized a public meeting to review the rules for harvest and good fishing ethics. They reiterated that hunters were required to clean up capture sites and provide catch reports as per the regulations (Greenland Home Rule, 2009a). Prior to 2009, East Greenland did not have quotas, but they have now been implemented for this region.

## 5.5 Impact of international trade on narwhals

Trade in narwhals has been documented since the 16th century, with official exports documented in Greenland after 1774 and in Canada in the early 1900s (Reeves, 1992; Reeves and Heide-Jørgensen, 1994). This trade continued, but appeared to decline in the early to mid-1980s, possibly due to the introduction of the EU WTR, which considered Canadian narwhals an Annex A species. As a result,

restrictions were imposed on the import of narwhal parts and derivatives from Canada into the EU, most notably prohibiting the import of items for commercial purposes (Reeves, 1992; Reeves and Heide-Jørgensen 1994).

The total number of items reported in the export data fluctuated, with the most noticeable fluctuations beginning in 1999, which was heavily influenced by the numbers of carvings reported. This could mistakenly be interpreted as an increase in the numbers of narwhals being hunted for trade. However, carvings cannot be correlated to an exact number of animals, and the number of tusks (which can represent a narwhal) remained relatively constant throughout the same period of time. A rough estimate of the minimum number of narwhals represented in international trade can be made by examining the numbers of tusks in the export data.

An estimated 892 narwhals were represented in legal international trade from 2005 to 2009, for an average of 178 animals per year (from a low of 108 in 2005 to a high of 245 in 2008) (see table 5.3). The majority of these tusks were from Canadian narwhals. These figures could be overestimates because some countries report trade data based on the number of items for which permits were issued, not on the number of items actually exported. However, given that these numbers do not factor in the narwhals represented by carvings and that narwhal products imported as personal and household effects may not require CITES documentation by some countries, the actual number of narwhals represented in legal trade from 2005 to 2009 may be higher than 892 animals.

From 2003 to 2009, as previously noted, approximately 250 narwhal tusks were illegally smuggled from Canada to the United States in the case known as Operation Longtooth. If these tusks entered into legal trade, it is possible that a minimum of 1,142 narwhals could have been represented in international trade from 2005 to 2009, for an average of 228 animals per year.

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Unfortunately, there is no direct link between harvest and trade data, so it isn't possible to determine which of these tusks came from animals hunted from 2005 to 2009 and how many originated from animals hunted prior to that period. However, an average of 178 animals per year (or 228 animals per year if the Operation Longtooth estimates are included) is well below the number of animals hunted in Canada and Greenland each year (see Table 3.1) and does not suggest that the current international trade volume poses a threat to the species.

## 5.6 Socio-economic importance and value of narwhal parts and derivatives

Many Arctic communities are characterized by a mixed economy, which is a combined market economy and subsistence economy (Environment Canada, 2011). This includes the commercial harvesting of fish and wildlife, mineral extraction, tourism, forestry and harvesting renewable resources from the land and sea (Nuttall *et al.*, 2005). Hunting activities are not only intended to satisfy cultural, social and nutritional needs, but also to meet the financial needs of families and households. Hunters earn money from the sale of animal products to purchase equipment and to meet the cost of modern standards of living (Nuttall *et al.*, 2005). Although the harvest of narwhals is important for subsistence purposes (CITES, 2006), sale of the non-edible animal parts also provides financial opportunities to hunters (COSEWIC, 2004; Reeves and Heide-Jørgensen, 1994).

The total monetary value of the international trade in narwhals and its parts and derivatives is not known. However, according to Reeves (1992) in 1990, hunters in

Arctic Bay (Nunavut) earned approximately CAD75,000 for 55 tusks purchased by the Hunters and Trappers Association (HTA). Hoover *et al.* (2013) estimated the economic value of narwhal hunts of two communities in Hudson Bay for the 2007 season, where the total revenue ranged from CAD81,267 to 1,413,947 with a mean value of CAD529,928 (USD450,438). This was considering the average revenue of CAD366,100 from meat (likely referring to muktuk); CAD154,487 from tusks, teeth, and carvings of males; and CAD9,339 from tooth and vertebra carvings from females (Hoover *et al.*, 2013). Values were estimated based on the replacement cost of meat (taken to be mainly muktuk), and the dollar value hunters would receive if they sold the tusks to the local Coop<sup>25</sup>. On average, the estimated revenue generated per male narwhal was approximately CAD6,542 (Hoover *et al.*, 2013). According to Heide-Jørgensen (1994), in Greenland the trade in products from narwhals and white whales (belugas) provides important cash income to communities and the combined value of muktuk from these species exceeds the total revenue obtained from the sale of all other edible products in Greenland. The income obtained from selling narwhal tusks and muktuk allows hunters to purchase hunting gear, boats and other important items (Heide-Jørgensen, 1994).

The individual value of narwhal products varies depending on the type of item; however it is also a function of the artistry involved in certain items. The value of tusks also varies depending on their size and quality. Value is reflected in a tusk's length and quality; including whether the tip was broken, presence of cracks, amount of corkscrew, and whether it was single or double tusked (Reeves, 1992). According to Reeves (1992), narwhal tusks were traditionally purchased from Canadian hunters based on weight, size and condition of the tusk. Wholesalers would then resell tusks based on quality and length. Rare double-tusked

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<sup>25</sup> Tusks were valued at CAD100 per foot (.3 m) for a tusk up to six feet (1.83 m) long and CAD15 per inch (2.54 cm) extra for anything longer. Tusks used for carvings were worth CAD60 to CAD200 per foot (.3 m).

## Table 5.6

Advertised value of narwhal tusks on the Internet, 2008 to 2013

LENGTH OF TUSK	YEAR			
	2008/2009	2010	2011/2012	2013
3ft	USD700 to USD800	USD1,500	-	USD1,400
4ft	USD900 to USD2,000	USD3,500	USD2,500	USD1,850 to USD1,925
5ft	USD3,000 to USD3,500	USD1,250 to USD3,500	USD2,800 to USD3,500	USD2,800 to USD3,600
6ft	USD4,500 to USD5,000	-	USD3,250 to USD6,100	USD3,500 to USD6,000
7ft	USD5,500 to USD7,500	USD7,500	USD6,100 to USD9,600	USD7,300 to USD9,500
8ft	-	-	USD12,500	-
8ft tusk with skull	-	-	-	USD18,750
Double tusk	-	USD25,000	USD25,000	-

Source: Chichester Group (2008 to 2012) and Polar Art and Exotics (2013). Use of Waybackmachine.

## Table 5.7

Advertised value of narwhal items on the Internet, 2008 to 2010

ITEM	ADVERTISED PRICES 2008 TO 2010
Tusk <sup>1,4</sup>	USD2,765-12,500
Tusk with broken tip <sup>1,4</sup>	USD925-2,900
Skull with tusk <sup>4</sup>	USD9,500
Double tusk with skull <sup>4,5</sup>	USD19,000-25,000
Baby tusk <sup>2,4</sup>	USD600-2,400
Double baby tusk <sup>4</sup>	USD2,800
Tusk pieces (per inch) <sup>2</sup>	USD150
Tusk cross cuts <sup>2</sup>	USD7.50-35
Tusk cross cut with scrimshaw <sup>2</sup>	USD145
Ivory pistol grips <sup>2</sup>	USD975-1,000
Ivory carvings <sup>1</sup>	USD315

Unless otherwise stated, items are not carved. These items were advertised on the Internet from 2008 to 2011 and converted to USD using www.oanda.com.

Source: 1. Arctic Art Sales (2011a,b)

3. Canadian Ivory (2011)

5. Inuit Gifts (2011)

2. Boone Trading Company (2011a,2011b)

4. Chichester Group (2011)



skulls, with tusks over eight feet (2.44 m) long and heavily spiralled tusks commanded premium prices. According to Reeves and Heide-Jørgensen, (1994), in Greenland tusks were purchased based on quality (an intact tip was graded A and a broken tip was graded B). Both Reeves and Heide-Jørgensen, (1994) and Reeves (1992) provide a detailed review of both the Canadian and Greenland narwhal ivory trade, including some information on the domestic trade within each country.

In Greenland in 2003, tusks were advertised for sale in tourist shops for USD1,539-2,300; while rings carved from ivory ranged from USD61-76; necklaces were offered for USD515 and earrings were offered for USD53 (CITES, 2004). In 2005, raw tusks were advertised for sale in tourist shops for USD222 per kg and USD2,613-3,266 for complete tusks. In Canada in 2010, a top-quality seven-ft (2.13 m) carved narwhal tusk was advertised for CAD15,000, while five- to seven-ft (1.52 m to 2.13 m) uncarved tusks were advertised for CAD3,000 to CAD5,000 (P. Ewins, WWF-Canada *in litt.* to T. Shadbolt, February 19, 2012).

From 2008 to 2011, online stores and auction houses advertised a variety of narwhal products for sale. Table 5.6 and Table 5.7 provides a summary of the narwhal parts/products with their advertised values. Prices may reflect value and artistry and not necessarily the narwhal part.

The price of muktuk in Canada and Greenland varies depending on the time of year and the location at which it is being sold. In Canada, the demand often exceeds supply (COSEWIC, 2004). Muktuk is consumed locally and can be traded and sold to other communities in Nunavut (COSEWIC, 2004). Information on the sale of muktuk is recorded by the community HTAs and is not publically available for analysis. In 1990, Iqaluit stores (Nunavut) sold frozen muktuk for CAD17.60-18.99 per kg (USD14.21-15.33 per kg) (Reeves, 1993b). In the spring of 2009,

narwhal muktuk was being sold for CAD22 per kg (USD17 per kg) at Iqaluit Enterprise (K. McDonald, WWF-Canada, *in litt.* to T. Shadbolt, April 23, 2009). This was similar to prices in the early 2000s when muktuk was sold in Iqaluit supermarkets during summer and fall (P. Ewins, WWF-Canada *in litt.* to T. Shadbolt, February 19, 2012).

In Greenland, muktuk is traded and sold, including to those communities that do not participate directly or regularly in the hunt (Jensen and Christensen, 2003). The sale of muktuk in Greenland is regulated and monitored by the Greenland government under the same regulations that guide the harvesting of narwhals in Greenland (Anon., 2011). According to Statbank Greenland, from 2002 to 2008 Greenlandic muktuk was purchased from hunters ranging in price from DKK43.70 (USD5.56) per kg in 2002 to DKK104.52 (USD20.61) per kg in 2008; estimating a total value of DKK 751,690 (USD95,615) in 2002 and DKK1,358,786 (USD267,953) in 2008 (Statbank Greenland, 2011).

The use of narwhal products as a traditional medicine has not been well documented. In 2003, the Whale and Dolphin Conservation Society sent a questionnaire to Chinese medicine shops in Japan in an attempt to better understand the market in that country. Some shops responded to the survey and affirmed that ground narwhal tusk is used in a tonic to treat toxicity, fever, measles, pain and venereal disease. However, none of the stores offered ground narwhal tusk for sale. All shops that responded were visited by the Whale and Dolphin Conservation Society. One small chain store was found to offer tonic containing ground narwhal tusk for sale to men in their 50s and 60s. The price ranged from USD540 for 50g to USD929 for 100g (CITES, 2004).



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# CONCLUSIONS

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*The impacts of climate change on narwhals and their habitat are not well understood, but the loss of sea ice and the impacts this could have on narwhals legitimately warrant concern. As sea ice melts, human development and activity will likely increase in narwhal habitat, causing disturbances to narwhals and possibly altering hunting pressures (making them easier or harder to reach by hunters).*

It is likely that the current unprecedented rapid climate change may negatively impact narwhals through changes to abundance of preferred prey and availability and changes in sea ice conditions could result in increased mortality associated with ice entrapments. Changes in the timing of sea ice formation and melt may significantly disrupt traditional hunting; as narwhals could shift their distributions or changing conditions could make subsistence hunting more difficult in some years. The responses to loss of sea ice and increasing human pressures will probably vary between populations, by region and over time. Given the potential impacts of climate change, it will be important to ensure that international trade does not

pose a threat to the species. The main findings from this study are summarized in the following bullets:

## Management

- Canada and Greenland are the only range States that allow narwhal hunting. Based on reported harvest data, from 2006/2007 to 2010/2011, an average of 979 narwhals were landed per year from a global population of at least 100,000 animals. Canada harvest data reported that, on average, 621 narwhals were landed per year, while Greenland harvest data reported on average 358

narwhals were landed per year. These estimates do not take into account animals struck and lost during the hunt.

- Scientific estimates of population size and trends are limited for some narwhal populations. Without accurate population information, it is difficult to determine whether narwhals are being managed and harvested sustainably. However, estimates of current harvest levels for most stocks appear to be conservative and are considered sustainable by the range States.
- The number of struck and lost animals associated with the hunt is a concern for narwhal management, a topic which is beyond the scope of this study. Although applying one correction factor to a national harvest may result in inaccurate estimates of the total number of animals killed or significantly injured during the hunt, it is currently the best information available to account for animal losses. These estimates are considered when calculating recommendations for sustainable harvest levels, and so improved research on struck-and-lost rates is highly desired.
- Monitoring and enforcement of narwhal hunts is hampered due to the remote nature and sheer scale of narwhal habitat, limited infrastructure and insufficient funding. However, establishment and implementation of co-management systems and community support has assisted with this challenge.
- Concerns have been expressed about management actions in some regions of Canada and Greenland. Both countries have improved their management actions through the introduction of quotas in some regions and by completion of new population estimates to inform management decisions and development of TAH and NDFs. Establishing whether these actions have been sufficient is beyond the scope of this study.

## *International trade*

- Analysis of the 1987 to 2009 CITES trade data could not provide a precise estimate of number of narwhals represented in international trade. Numerically, items described as bones, carvings or ivory represented the highest number of items in international trade, but they cannot be correlated to number of animals. Furthermore, terminology used on CITES permits is not always used consistently by all Parties and some items that were described as carvings may actually have been whole carved tusks. However, despite this, tusks can be correlated to a number of animals, and this can be used to make a minimum estimate on the number of narwhals represented in international trade.
- Although the number of carvings traded per year fluctuated greatly, from a high of 3,358 (in 2004) to a low of 270 (in 2009)<sup>26</sup>; international trade in number of tusks was relatively consistent each year. Over a 23-year period (1987 to 2009), a total of 4,923 tusks were legally exported, an average of 214 per year, and a median of 207 per year. The majority of tusks were exported from Canada (n=650). Over a five-year period (2005 to 2009), a total of 892 tusks were legally exported for an average of 178 per year, and a median of 191 per year. If including the 250 smuggled tusks identified in the Operation Longtooth investigation, over a 23-year time frame (1987 to 2009), a total of 5,173 tusks could have been in legal international trade, for an average of 225 per year; over a five-year time frame (2005 to 2009), a total of 1,142 tusks could have been in legal international trade, or an average of 228 per year. This is well under the average combined reported total of 979 (which also includes animals from the N Baffin Island 2008 ice entrapment) narwhals

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<sup>26</sup> Greenland export data for 2007 were not available in the UNEP-WCMC CITES Trade database; which is why carvings data were recorded as zero.

landed in Canada and Greenland each year. If the number of narwhals landed in Greenland is excluded from this comparison (considering most, if not all whole tusks in international trade originate from Canada) then the average of 228 tusks per year is still less than half of the approximately 500 animals hunted in Canada annually. There is no indication, therefore, that international trade is currently a threat to the conservation of narwhals. However, these numbers should be considered an underestimate given that they do not take into account the animals represented by narwhal ivory carvings. Plus, products exported as personal effects may not be included in the UNEP-WCMC CITES trade data.

- Few cases of illegal trade in narwhal products have been recorded, plus assessing the extent and impact of illegal trade is difficult. However, the joint Canada-United States multi-year investigation (“Operation Longtooth” which started in 2009) uncovered a substantial smuggling operation indicating that a lucrative market for narwhal tusks exists in the United States. This market may well be driving additional illegal trade activities that have not yet come to light. In the case of “Operation Longtooth”, the tusks that were smuggled to the United States were legally purchased in Canada, so although the tusks were illegally traded, they were sourced from legal hunts. The impact on the conservation of narwhal populations was considered to be negligible. Given that there is no evidence of large-scale illegal hunting of narwhals, it does not appear that illegal activities are currently a widespread threat to the species.
- Activities and decisions by Canada and Greenland indicate that they are taking the necessary steps to ensure international trade is not detrimental to the conservation of narwhals through development of scientifically supportable

NDFs. As of 2014, Canada still has a positive NDF for all narwhals stocks with the exception of Parry Channel, Jones Sound and Smith Sound. Narwhal parts and derivatives from these areas cannot be exported from Canada and this prohibition will be in effect until a positive NDF is made. In 2009, the Greenland CITES Scientific Authority (SA) recommended a positive NDF for narwhals from Greenland; however, the government has chosen to maintain an export ban. As of 2014, this ban is still in effect.

- Insight into the dynamics of international trade was not possible given how the data are currently recorded in the UNEP-WCMC CITES Trade Database. For instance, the data do not differentiate between raw or processed ivory, or sources of ivory (which region in country), nor can they be used to determine who is involved in trade transactions (e.g. tourists purchasing souvenirs from stores or from local people, commercial manufacturers who process ivory, cultural exchanges between indigenous people, buyers that purchase tusk to export to their country for sale).



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# RECOMMENDATIONS

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*It is apparent that the best way to ensure international trade does not become a threat to narwhal conservation is to ensure that any allowed hunting of narwhals is at sustainable levels across their range where they are legally hunted. Monitoring and collecting new information on narwhals and their habitats will greatly improve understanding of the species.*

**W**ildlife trade data will help inform management decisions to ensure that harvest levels are sustainable and are tied to specific and logical management targets. Any trade resulting from legal, truly sustainable hunting will therefore be of little concern from a conservation point of view. The challenge will be to adapt management activities as appropriate in an Arctic environment that is expected to continue to change considerably in the near future because of unprecedented rapid climate change.

It may be most appropriate to direct efforts at monitoring short-term trade levels and acquiring more information before considering more costly and

lengthy solutions, which may not yet be needed for narwhal conservation. It may not be realistic, practical or financially possible in the short-term to consider activities and actions that require a significant amount of resources or changes in current management practices. However, if new information suggests that more extensive actions are needed, they should then be explored and management should be adapted. Since some Arctic people and communities are dependent on the income generated from selling products from hunting activities, any action taken should also bear in mind local needs in an effort to prevent any unnecessary local hardships due to loss of income caused by reductions in quotas or restrictions on exports.

Cooperation, communication and commitment are needed by all interested parties, working together and pooling their resources to have a greater impact on conservation of the species, especially considering the changing Arctic environment. Successful management will result in populations and stocks that are healthy, stable, resilient to threats and a continued resource to local communities. Like other Arctic mammals, narwhals are a potent symbol of the challenge a warming world faces, and they are vital part of the Arctic ecosystem. The recommendations of this report are as follows:

## International Trade

- More consistent reporting of CITES trade data would allow for better analysis and monitoring of trade in narwhals. Inconsistencies in CITES trade reporting are not specific to narwhals; they apply to all taxa listed under the Convention. Therefore, any changes and improvements to the reporting of data would require the agreement, participation and commitment of the signatory Parties. This could be facilitated by development and agreement on definitions for the purpose of transaction codes, reporting trade data for the actual items traded rather than on permits issued (as recommended by CITES Res Con 11.17), reporting seizure data and by following the guidelines for the preparations and submission of CITES annual reports. If lack of consensus among Parties impedes such changes, then those countries that trade in narwhal parts could take a proactive stance as a signal to the CITES Parties by improving their monitoring and reporting of trade data.
- Countries that trade in narwhal parts and derivatives need to be explicit when reporting information in their CITES annual reports. Precise reporting of trade in narwhal parts and derivatives will help to facilitate better analysis of trade activities. This could include the following:
  - ▶ Proper use of terminology codes. For example, the term “teeth” should be used for un-erupted teeth and the term “tusks” for erupted teeth; the term “carvings” should not be used for any ivory or bone-related product as there are existing codes for “ivory carvings”, “ivory pieces”, “ivory scraps” and “bone carvings”.
  - ▶ More precise recording units of measurement. It would be easier to approximate the numbers of animals represented in international trade if smaller items such as carvings and ivory pieces were be recorded by weight.
  - ▶ Creation of new codes to better define the products in trade. Possible examples include “raw tusks”, “carved tusks”, “and ivory jewellery”.
  - ▶ Recording information on the region and year of harvest. This would require a separate code for supplementary information, which could be included in online database query options. This would allow tracking of products coming from individual narwhal stocks.
- Range States could consider the development of a permanent tagging method to facilitate tracking of high-value narwhal parts such as tusks, skulls and carvings. Potential options include pit tags, microchips, or metal tags similar to those used on reptile skins. Carvings and other smaller items could be marked with a unique tagging number or traded with a certificate or holographic stickers that could associate carvings with hunting tag numbers.
- The data collected via implementation of a permanent tagging program would allow authorities to ensure that trade occurs from approved stocks in accordance with NDFs and would generally assist authorities in validation of legal trade. Alternatively, Canada and Greenland could consider developing a joint documentation scheme to help identify and track the source of narwhal ivory in international trade.
- Information on items exported as personal and household effects (including tourist souvenirs) should be collected and reported. This would allow for a



more accurate estimate of the number of narwhals represented in international trade and the impact of international trade on the conservation of the species. One way to facilitate such reporting could be through completion of wildlife declaration forms like those used by the United States.

- An updated and circumpolar socioeconomic study on the importance of trade in Arctic species (including narwhals) would provide useful information to facilitate dialogue and insight into the potential effects of restricting hunting and trade. This study could involve a review of:
  - ▶ the impact of the export bans resulting from negative NDFs;
  - ▶ the impact of the stricter-than CITES measures for narwhals (i.e. Canadian narwhals are considered an Annex A species under the EU WTR; US MMPA prohibit imports).

## Management

- Narwhal range States should continue to ensure that population and harvest monitoring is adequate to adaptively manage harvest in accordance with sound conservation practices based on the best available scientific data. Updated population estimates and improved harvest reporting will help ensure that harvest remains within sustainable limits despite the impact of climate change on the Arctic environment.
- Ongoing monitoring and collection of new information aimed at improving the understanding of potential impacts of climate change on narwhals is needed to ensure adequate measures are taken for the long-term conservation and management of the species.
- Range States should improve dialogue and collaboration on law enforcement pertaining to hunting and trade of narwhals. Regular information exchange between enforcement agencies would help to identify and address enforcement challenges in the Arctic. This could also include a component for

community engagement promoting awareness of regulations and policies. The relevant enforcement authorities from Canada and Greenland should actively participate in the Arctic enforcement workshop to be hosted by Canada in 2014 or 2015, as announced during the 2013 International Polar Bear Forum in Moscow.

- Range States need to establish more precise struck and lost rates for multiple regions and during different seasons for a multi-year time frame. Since struck and lost rates appear to vary substantially in different situations, it would be preferable to have established estimates for specific regions rather than applying the same rate to every region. Management authorities and Arctic communities in each range State should consider implementing programs that promote reporting of struck and lost animals. Trained observers could be used to record the information so hunters do not lose opportunities to hunt. The development of community outreach and/or awareness programs focused on improved reporting could help underscore the benefits of reporting.

## Future considerations

- A study on domestic trade patterns and dynamics in narwhals could help to provide insight into market dynamics and international trade. A centralized system for recording and monitoring domestic trade could provide useful information to assist in such a study.
- Stakeholders and/or range States could consider developing a study on the supply chain and consumer demand dynamics for narwhal parts. Analysis of import data, export data and re-export data can help determine patterns of trade and countries (or regions) of interest. Such a study could help determine market drivers, whether items stay in initial country of import, or whether they are a hub for additional international trade. If markets are better understood and monitored, then range States would be better informed for making sound management decisions.



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# APPENDIX A

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## NARWHAL POPULATIONS

Three narwhal populations are currently recognised: the Hudson Bay population, the Baffin Bay population and the East Greenland population. Although migrations may vary among the populations and stocks within a population, a general migration pattern has been observed. In spring and summer (May through July), narwhals occupy areas in front of the receding fast ice edge before migrating to coastal ice-free summering grounds at the end of summer (July and August) (Koski and Davis, 1994; Heide-Jørgensen *et al.*, 2003). Just before summering areas begin to freeze and fast ice begins to form (September and October), they migrate to their offshore wintering grounds which are covered with dense pack ice (Heide-Jørgensen *et al.*, 2002a, 2003; Heide-Jørgensen and Laidre, 2006; Koski and Davis, 1994). They arrive in late October and early November and remain there until departing for their spring migration in April (Laidre and Heide-Jørgensen, 2005a; Heide-Jørgensen *et al.*, 2003).

The Hudson Bay narwhal population has a distinct geographic distribution compared to that of the Baffin

Bay and East Greenland populations and is considered genetically distinct (DFO, 1998b; 2010c; 2012a; 2012b; Richard, 2010; Richard, 1991). It occupies the southernmost part of Canada's narwhal range.

The Baffin Bay narwhal population is shared between Canada and Greenland and is found in waters of the Canadian High Arctic and West Greenland. These narwhals winter together in Baffin Bay and adjacent waters, including Davis Strait (DFO, 2012b, 2012d; Heide-Jørgensen *et al.*, 2013a). In summer, they migrate seasonally to various recurring summering grounds, where they inhabit inshore bays and fjords (DFO, 2012d; Heide-Jørgensen *et al.*, 2013a). A large portion of the population aggregates in Canada, ranging from East Baffin Island to coastal waters to the High Arctic archipelago, while the remainder summer in waters near West Greenland, most commonly in Inglefield Bredning and Melville Bay (DFO, 2012b). Four summering aggregations/stocks have been identified in Canada: Admiralty Inlet, Eclipse Sound, Somerset Island

and East Baffin Island (DFO, 2012d; DFO, 2010a, 2010c); two summering aggregations/stocks have been identified in West Greenland (Inglefield Bredning and Melville Bay) (Heide-Jørgensen *et al.*, 2010; DFO, 1998a; Jensen and Christensen, 2003); and an unidentified stock which includes Parry Channel, Jones Sound and Smith Sound has tentatively been identified as a separate management unit (DFO, 2012d; DFO, 2010a, 2010c).

The East Greenland narwhal population has a distinct geographic distribution compared to those of the Baffin Bay and Northern Hudson Bay populations and is considered genetically distinct (NAMMCO Annual Report, 2012). Information on the East Greenland population is less abundant; however, narwhals are reported to occur on the eastern coast of Greenland as far south as Umiiviip Kangertiva (Dietz *et al.*, 1994).

## Table A1

Narwhal population estimates based on most recent surveys.

COUNTRY	POPULATION	STOCK/ MANAGEMENT UNIT	RECENT ESTIMATE (WITH YEAR)	COMMENTS	NATIONAL STATUS
Canada	Northern Hudson Bay	Northern Hudson Bay	12,485 (2011) (95% CL: 7,515 – 20,743)	Northern Hudson Bay narwhals are geographically separate and genetically distinct from Baffin Bay narwhals and East Greenland narwhals.  The population was last surveyed in August 2011 with an estimate of 12,485 animals (Asselin <i>et al.</i> , 2012).	<b>Canada:</b> All narwhals in Canada are listed as Special Concern under COSEWIC (COSEWIC, 2004). They are not listed under SARA. COSEWIC is conservation status and SARA is legal designation of status.
Canada	Baffin Bay* (narwhals from both range States winter together)	Admiralty Inlet summer aggregation	18,049 (2010) (95% CL: 11,613-28,053)	This stock was last surveyed in August 2010. Two surveys were performed yielding estimates of 24,398 (CV=0.25) and 13,729 (CV=0.40) narwhals. The combined estimate of the surveys was 18,049 (CV=0.23) narwhals (Asselin and Richard, 2011).	
		Eclipse Sound summer aggregation	20,225 (2004) (95% CL: 9,471-37,096)	This stock was last surveyed in August 2003 and 2004. The survey estimated 20,225 animals (Richard <i>et al.</i> , 2010).	
		Somerset Island summer aggregation	45,358 (1996) (95% CL: 23,397-87,932)	This stock was last surveyed in 2002; however, it did not cover the Peel Sound area. The 2002 survey (Prince Regent and Gulf of Boothia) estimated 27,656 animals (95% CL: 9,080-66,061) (Richard <i>et al.</i> , 2010).  This stock was also surveyed in July/August of 1996. However, the survey did not cover the Gulf of Boothia. This estimate has been used by the Canadian government for assessment purposes (i.e. determining TAH) rather than the 2002 estimate (Abraham, 2013). As such, this estimate been provided in the table. The 1996 survey estimated 45,358 animals (Innes <i>et al.</i> , 2002).  Data from tagged animals suggest that some narwhals from this stock winter in Uummannaq (Heide-Jørgensen <i>et al.</i> , 2013a).  There are tentative plans for a survey in the next five years to survey Somerset Island for narwhals (NAMMCO Annual Report, 2012).	

*table continued on next page*

# Table A1

Narwhal population estimates based on most recent surveys. *continued*

COUNTRY	POPULATION	STOCK/ MANAGEMENT UNIT	RECENT ESTIMATE (WITH YEAR)	COMMENTS	NATIONAL STATUS
Canada	Baffin Bay* (narwhals from both range States winter together)	East Baffin Island summer aggregation	10,073 (2003) (95% CL: 5,333- 17,474)	This stock was last surveyed in August 2003. The survey estimated 10,073 animals (Richard <i>et al.</i> , 2010).  There are tentative plans for a survey in the next five years to survey East Baffin Island for narwhals (NAMMCO Annual Report, 2012).	<b>Canada:</b> All narwhals in Canada are listed as Special Concern under COSEWIC (COSEWIC, 2004). They are not listed under SARA. COSEWIC is conservation status and SARA is legal designation of status.
Possible/ Canada Greenland stock	Baffin Bay* (narwhals from both range States winter together)	unknown hypothesised stock: • Parry Islands • Jones Sound • Smith Sound	unknown  There is very little information on narwhals from these areas. However, recent data have indicated that there are genetic differences between narwhals from Jones Sound and those from Somerset Island (DFO, 2012d; DFO, 2013a).  Areas of Parry Channel, Jones Sound and Smith Sound have recently been surveyed and results are expected for early 2015 (Environment and Biodiversity Science, DFO <i>in litt.</i> to E. Cooper, February 5, 2014).		
Greenland	Baffin Bay* (narwhals from both range States winter together)	Inglefield Bredning summer aggregation	8,368 (2007) (95% CI:5,209- 13,442)	This stock was last surveyed in August 2007. The survey estimated 8,368 animals (Heide-Jørgensen <i>et al.</i> , 2010).  In May 2009 and 2010 two surveys were conducted in North Water and produced a combined estimate of 7726 animals (CV 0.38; 95% CI 3761–15 870). (Heide-Jørgensen <i>et al.</i> , 2013b). This was similar to the 2007 summer estimate by Inglefield Bredning (Heide-Jørgensen <i>et al.</i> , 2013b).	
Greenland	East Greenland	Melville Bay summer aggregation	6,024 (2007) (95% CI:1,403- 25,860)	This stock was last surveyed in August 2007. The survey estimated 6,024 animals (Heide-Jørgensen <i>et al.</i> , 2010).	<b>Greenland:</b> Critically Endangered for the West Greenland population and Data Deficient for the East Greenland stock under the Greenland Red List 2007 (Boertmann, 2007).
		East Greenland (summer range extends into Svalbard (Norway) and Franz Josef Land (Russia)	6,444 (2008) (95% CI:2,505- 16,575)	This stock was last surveyed in August 2008. The survey estimated 6,444 animals (Heide-Jørgensen <i>et al.</i> , 2010).	

NOTE: Not all estimates provided have been accepted by scientific and management bodies (i.e. NAMMCO, JCNB) and some estimates may be re-adjusted pending their review. As such, estimates provided in the table should be referenced accordingly.



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# APPENDIX B

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## MULTILATERAL AGREEMENTS, COMMITTEES AND COMMISSIONS

### 1 CITES

CITES is an international agreement between governments created to ensure that the international trade<sup>27</sup> in wild animals and plants does not threaten the survival of those species (Anon., 1973; Cooper and Chalifour, 2004). CITES came into force on July 1, 1975, with 18 countries implementing the Convention in that same year. As of May 2013, 178 countries implement CITES (CITES, 2013). CITES Resolution Conf. 11.17 (Rev. CoP14) requires that all signatory countries

submit annual reports on their international trade in CITES-listed species to the CITES Secretariat (UNEP-WCMC, 2010). This information is compiled into the UNEP-WCMC CITES Trade Database. Species covered by the Convention are listed in one of three Appendices depending on the level of protection needed. Permits are issued by the CITES Management Authority (MA)<sup>28</sup> under certain conditions which vary for each level of protection (Cooper and Chalifour, 2004). Narwhals are listed in Appendix II.

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<sup>27</sup> Article I(c) of CITES defines trade as “*export, re-export, import and introduction from the sea.*” Article I(d) defines re-export as the “*export of any specimen that has previously been imported*” and Article I(e) defines introduction from the sea as “*transportation into a State of specimens of any species which were taken in the marine environment not under the jurisdiction of any State*” (Anon., 1973a).

<sup>28</sup> A CITES Management Authority (MA) is responsible for implementing the convention in its country, and for issuing permits and certificates on behalf of its country. A CITES Scientific Authority (SA) is responsible for providing technical and scientific advice to its MA, including advice on if the export of a specimen will be detrimental to the survival in the wild of the species involved (CITES, 2008a).

Species listed in **Appendix I** are those that are threatened with extinction. Both an import permit from the importing country and an export permit or re-export certificate from the country of export are required for international trade in Appendix I specimens (Anon., 1973). Permits may be issued only under specific conditions, including the following:

- Trade in a species must not be detrimental to the conservation of that species;
- An Appendix I specimen may not be used for primarily commercial purposes;
- An import permit must be issued for an Appendix I specimen before an export or re-export permit may be issued;
- Specimens must be legally acquired;
- Live animals must receive humane treatment.

Species that are not currently threatened with extinction but could become so if their trade is not regulated are listed in CITES **Appendix II**. Species may also be listed in Appendix II if they cannot easily be distinguished from other species listed on Appendix I or II. Trade in Appendix II specimens requires a CITES export permit issued by the exporting country. Re-exports require CITES re-export certificates (Anon., 1973). Export permits and re-export certificates may be issued only under specific conditions, including the following:

- Trade in a species must not be detrimental to the conservation of that species;
- Specimens must be legally acquired;
- Live animals must receive humane treatment.

Individual countries may list species in Appendix III when those countries wish to regulate the export of

certain native species. If an Appendix III specimen originates from the listing country, a CITES export permit from that country is required for export. If the specimen originates from another country, then the shipment requires a certificate of origin. For re-export, a certificate must be granted by the CITES MA<sup>29</sup> of the State of re-export (Anon., 1973). The issuance of export permits for Appendix III species does not require the exporting country to show that international trade in the species is not detrimental to the conservation of that species. However, the exporting country must determine that the specimens were legally acquired before issuing export permits. Permits may be issued only under specific conditions, including the following:

- Specimens must be legally acquired;
- Live animals must receive humane treatment.

## NDFs

Scientifically supportable NDFs are critical to securing the conservation goals and objectives of CITES. The term NDF itself is not used in the Convention text, but it arises from the following legally binding provisions in that text:

- Article III states that an **export** permit or an introduction from the sea certificate for an Appendix I species shall be granted only when a Scientific Authority of the state of export has advised that this action will “*not be detrimental to the survival of that species*”;
- Article III also states that an **import** permit for an Appendix I species shall be granted only when a Scientific Authority of the state of import has advised that the **import** will “*be for purposes which are not detrimental to the survival of the species involved*”<sup>30</sup>;

<sup>29</sup> A CITES Management Authority (MA) is responsible for implementing the convention in its country, and for issuing permits and certificates on behalf of its country. A CITES Scientific Authority (SA) is responsible for providing technical and scientific advice to its MA, including advice on whether the export of a specimen will be detrimental to the survival in the wild of the species involved (CITES, 2008a).

<sup>30</sup> The exporting country must determine that an export will not be detrimental; the importing country must determine if the import will be for purposes (i.e. what is done with the species in the importing country) that are not detrimental.



- Article IV states that an **export** permit or an introduction from the sea certificate for an Appendix II species shall be granted only when a Scientific Authority of the state of export has advised that this action will “*not be detrimental to the survival of that species*”.

The Convention text does not elaborate on what is required to make an NDF. Consequently, CITES Parties have come to see NDFs as an area where they have sovereignty and are reluctant to accept binding provisions on how they should be made. Nevertheless, there is ample guidance available on how NDFs should be made, which is summarized on the CITES Web site (CITES, 2012). Also, at the 16th meeting of the Conference of the Parties to CITES (CoP16) in March 2013, the Parties adopted a new resolution providing non-binding guiding principles for Scientific Authorities to take into account in making NDFs. In addition, Parties have adopted a measure known as the review of significant trade in Appendix II species (Resolution Conf. 12.8 (Rev. CoP13) Review of Significant Trade in specimens of Appendix-II species) which allows the CITES Scientific Committees to scrutinize trade patterns, identify species of concern and determine whether or not exporting countries are complying with the requirement to make NDFs. Those Committees can refer cases of non-compliance to the Standing Committee, which may decide to recommend that Parties cease trading in the relevant species with the country in question.

Despite all of these provisions, implementation of NDFs is not consistent between Parties or for different

taxa. Since the review of significant trade can only consider a small sub-set of cases of most concern, it is not possible to ascertain the scientific credibility of NDFs made for many taxa.

## Exemptions to CITES

There are several exemptions to the provisions of the Convention; however, the most commonly used are reservations, pre-Convention<sup>31</sup> specimens and personal and household effects, which are summarized as follows:

- As per Article XXIII, a reservation can be taken on any specimen included in the Appendices or any part or derivative specified in relation to a species included in the Appendices. However, reservations can only be taken under the following conditions: once a State becomes a Party to CITES; within 90 days of an amendment to Appendices I or II; or any time with regard to species listed in Appendix III. A reservation is a statement made by a Party to the effect that it does not consider itself a Party to the Convention with regard to trade in specimens of the species on which it entered the reservation (i.e. it does not recognize the listing and reserves the right not to issue CITES documents with respect to trade in the species).
- As per Article VII:2 of the Convention, the provisions of CITES (Articles III, IV and V) do not apply to any specimen<sup>32</sup> that was acquired prior to the listing of the species under CITES, provided that the MA is satisfied that the specimen was acquired prior to the CITES listing and the MA can issue a certificate to that effect. Resolution Conf. 13.6 *Implementation of Article VII, paragraph 2,*

<sup>31</sup>Pre-Convention specimens are specimens acquired prior to the provisions of CITES. If a certificate is issued by an MA for such specimens, then no other certificate or permit is required by CITES to authorize the export, import or re-export of such items (CITES, 2008a).

<sup>32</sup> Article I, paragraph (b) of the Convention defines Specimen as “(i) any animal or plant, whether alive or dead; (ii) in the case of an animal: for species included in Appendices I and II, any readily recognizable part or derivative thereof; and for species included in Appendix III, any readily recognizable part or derivative thereof specified in Appendix III in relation to the species; and (iii) in the case of a plant: for species included in Appendix I, any readily recognizable part or derivative thereof; and for species included in Appendices II and III, any readily recognizable part or derivative thereof specified in Appendices II and III in relation to the species”.

*concerning 'pre-Convention' specimens* provides further clarification and recommends that Parties use the date on which the species was first included in the Appendices, the date on which a specimen was acquired (i.e. removed from the wild, born in captivity or artificially propagated in a controlled environment) and, if such date is unknown, to use the date on which it was first possessed by a person.

- As per Article VII:2 of the Convention, specimens considered personal and household effects may be exempt from CITES provisions under certain conditions. Resolution Conf. 13.7 (Rev. CoP14) *Control of trade in personal and household effects* provides further clarification on what qualifies as a personal and household effect: it must be personally owned or possessed for non-commercial purposes, be legally acquired, and at the time of import, export or re-export it must be worn, carried or included in personal baggage, or be part of a household move.

Although there are exemptions to some provisions of CITES, it is ultimately the Parties' decision to permit or prevent trade in specimens under these exemptions. This will depend on internal legislation and policies and how they implement the provisions of CITES in their countries, which can vary greatly from one country to another.

## Meeting of the Conference of the Parties (CoP)

The Convention requires the Secretariat to call a CoP every two to three years. CoPs are attended by Party delegations and other interested stakeholders. At these meetings, the Parties may amend Appendices I or II (by a two-thirds majority of the Parties present and voting) and make recommendations to improve the implementation of the Convention (Anon., 1973). These recommendations take the form of Decisions and Resolutions which are defined as follows (Cooper and Chalifour, 2004):

- Decisions are generally short-term instructions to committees, working groups, the Secretariat or Parties;
- Resolutions are long-term acts, terms of reference, recommendations or interpretations of the Convention that are put into practice to improve the implementation of the Convention.

## CITES and climate change

At CITES CoP15, concerns about climate change were brought to the attention of the CITES Secretariat and the Parties (CoP15 Doc. 10.1). The Secretariat felt that other agreements were more suitable and equipped to address the causes of climate change or the overarching mitigation and adaptation measures required to deal with it. However, the Secretariat did feel that the Parties should recognize these impacts and the implications they could have on the implementation of CITES, and work with sister organizations to address some of the wider impacts of climate change. A working group was established at CoP15 to address the issue of the implications of climate change on CITES and, as a result of the work of this group, the Parties adopted three decisions related to CITES and climate change: Decision 15.15 directed to the Animals and Plants Committees, Decision 15.16 directed to the Secretariat, and Decision 15.17 directed to the Standing Committee.

A Joint Animals and Plants Committee Intercessional Working Group on Climate Change was convened to produce draft findings and recommendations in compliance with Decision 15.15. The working group report (AC26/PC20 Doc. 6) indicated that there were six CITES decision-making processes already in place which provided the scope to accommodate climate change considerations. The Animals and Plants Committee agreed with the findings and indicated that current provisions of the Convention and resolutions were sufficiently comprehensive and flexible to take into account the implications of climate change for science-based decision-making.

A report was submitted at the 62nd meeting of the Standing Committee (SC 62. Doc18); it was accepted and the Standing Committee agreed to report the findings at CoP16. At CoP16 in March 2013, the report of the Standing Committee was noted by the Parties and Decisions 15.15, 15.16, and 15.17 were repealed.

## 2 EU Wildlife Trade Regulations

The EU is a unique political and economic partnership between 27 European countries. Denmark is a member of the EU, but Greenland chose to leave the EU in 1985 (see Appendix A). Narwhals are found in Greenland, and do not range into any EU member states; however, narwhal products are traded between Greenland to Denmark (and other EU member states). Although Greenland has its own wildlife trade legislation and is not bound by the EU WTR, any EU member state (including Denmark) choosing to trade this species with Greenland must treat Greenland as a non-member State for the purposes of the EU WTR and issue the appropriate export, import or re-export documents (C. O’Criodain, WWF International, *in litt.* to T. Shadbolt, December 12, 2008). Narwhals are listed on Annex A; however, there has been a caveat for narwhals from Greenland which are considered an Annex B species (except for meat for commercial purposes which is still considered Annex A).

Prior to 1984, only a handful of EU member states were signatories to CITES and the absence of systematic border controls made implementation of CITES difficult. On January 1, 1984, two regulations came into force to implement CITES in all EU member states, including those not signatories to CITES. All taxa listed in CITES were made subject to these regulations, and additional restrictions were placed on trade in certain taxa listed in the Annexes of these regulations (European Commission and TRAFFIC Europe, 2013). These regulations included the *Council Regulation European Economic Community (EEC) No.*

*3626/82 of 3 December 1982 on the implementation in the Community of the Convention on international trade in endangered species of wild fauna and flora (the basic regulation), and the Commission Regulation (EEC) No. 3418/83 of 28 November 1983 laying down provisions for the uniform issue and use of documents required for the implementation in the Community of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (the implementing regulation, which essentially addresses practical aspects of implementation). However, in 1997 both regulations were replaced, respectively, with Council Regulation European Community (EC) No. 338/97 on the Protection of the Species of Wild Fauna and Flora by Regulating Trade Therein, and; Commission Regulation (EC) No. 939/97, laying down detailed rules for the implementation of Council Regulation (EC) No. 338/97 on the protection of species of wild fauna and flora by regulating trade therein, which was replaced again in 2006 by Commission Regulation (EC) No 865/2006 laying down detailed rules concerning the implementation of Council Regulation (EC) No 338/97.*

The **basic regulation**, *Council Regulation (EC) No 338/97*, can be amended in two ways: by amending the text of the regulation or by updating the Annexes of the regulation. To account for changes to the Appendices adopted at CoPs, this regulation has been amended multiple times, with the most recent being *Commission Regulation (EU) No 750/2013 of 29 July 2013 amending Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein*. This essentially updated the Annexes to reflect the most recent changes adopted at CoP16 (European Commission and TRAFFIC Europe, 2013; European Commission, 2013).

The **implementing regulation**, *Commission Regulation (EC) No 865/2006*, can be amended in various ways. To account for other various provisions adopted at CoPs (resolutions, changes to personal and household effects, changes to rules for sample collections and

for the design of documents, etc.), this regulation has been amended by several other regulations as follows (European Commission and TRAFFIC Europe, 2013; European Commission, 2013):

- *Commission Regulation (EC) No. 100/2008 of 4 February 2008 amending, as regards sample collections and certain formalities relating to the trade in species of wild fauna and flora, Regulation (EC) No. 865/2006 laying down detailed rules for the implementation of Council Regulation (EC) No. 338/97;*
- *Commission Regulation (EU) No 791/2012 of 23 August 2012 amending, as regards certain provisions relating to the trade in species of wild fauna and flora, Regulation (EC) No 865/2006 laying down detailed rules for the implementation of Council Regulation (EC) No 338/97; and*
- *Commission Implementing Regulation (EU) No 792/2012 of 23 August 2012 laying down rules for the design of permits, certificates and other documents provided for in Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein and amending Commission Regulation (EC) No 865/2006.*

In addition to these regulations, a **suspensions regulation** is also used in instances to suspend the introduction into the EU of particular species from certain countries (European Commission and TRAFFIC Europe, 2013; European Commission, 2013). The most recent suspension regulation is *Commission Implementing Regulation (EU) No 578/2013 of 17 June 2013 suspending the introduction into the Union of specimens of certain species of wild fauna and flora*,

Together, these three types of regulations form the legal basis for CITES implementation in the EU (European Commission and TRAFFIC Europe, 2013; European Commission, 2013). There are

also additional non-binding recommendations for commission regulations which set out actions Member states could take for more effective enforcement of the regulations referred to as *Commission Recommendation No 2007/425/EC identifying a set of actions for the enforcement of Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein* (European Commission and TRAFFIC Europe, 2013; European Commission, 2013).

The Council Regulation and Commission Regulations govern internal and international trade, and provide additional provisions for the import, export and re-export of specimens listed in Annexes A, B, C, and D of the regulations (see section 4.2.1). The Annexes correspond to the CITES Appendices, although they may provide stricter provisions than the CITES Appendices and may also include species not listed under CITES. For consistency, any species listed on Annex IV of the EU's Habitat Directive<sup>33</sup> (*Council Directive 92/43/EEC*) that are also listed on any of the CITES Appendices are automatically listed in Annex A of *Council Regulation (EC) No. 338/97* (C. O'Criodain, WWF International, *in litt.* to T. Shadbolt, December 15, 2008). Although the regulations are applicable to all EU member countries, national legislation supplemented by administrative measures are required in order to set up the requisite MAs and SAs and to provide for criminal sanctions against a range of specific breaches of the regulations (European Commission and TRAFFIC Europe, 2013).

## Regulation Annexes

Annex A includes all CITES Appendix I species. These are generally species (CITES-listed or not CITES-listed) that are or may be in international or community demand and are considered threatened with extinction,

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<sup>33</sup> In 1992, the EU Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora) was introduced, prohibiting the commercial use of a species listed in its Annex IV (C. O'Criodain, WWF International, *in litt.* to T. Shadbolt, December 15, 2008).

or are thought to be so rare that trade would imperil their survival in the wild, and may also be listed in Annex A. This may also include those species in CITES Appendices II or III, or other species not listed under CITES, especially if they are protected by other EU legislation. A species that does not qualify for listing in Annex A on conservation grounds can still be listed if most of the species in the same genus are already listed in Annex A and if its listing is essential for the effective protection of the previously listed species<sup>34</sup>. Commercial trade of Annex A wild species to, from and within the EU is prohibited and trade in the species is regulated by provisions comparable to CITES Appendix I. Some provisions allow for trade in Annex A species, but they require issuance of import permits, export permits and re-export certificates (European Commission and TRAFFIC Europe, 2013).

Annex B includes all CITES Appendix II species that are not already listed in Annex A. These are generally species (CITES-listed or not CITES-listed) traded internationally at levels that, if unregulated, could affect the survival of the species or the survival of populations in certain countries. It can also include any CITES Appendix I species that are subject to an EU member states' reservation<sup>35</sup>, should that arise (it has not arisen to date) and CITES Appendix III and non-CITES species. Species may be listed in Annex B if they do not qualify for Annex A or B for conservation reasons, but for which trade controls are necessary. Trade of Annex B species into and out of the EU is regulated by provisions comparable to CITES Appendix II (requiring export permits and re-export certificates), but these provisions go further in that import permits are required for

import into the EU that can only be issued when it has been established that the import would not have a detrimental effect on the survival of the species or the extent of territory occupied by the relevant population (European Commission and TRAFFIC Europe, 2013).

Annex C includes all CITES Appendix III species that are not already listed in Annex A or B, and can include any CITES Appendix II species that are subject to an EU member state's reservation (there were none as of February 2012). Trade of Annex C species into and out of the EU is regulated through the issuance of export permits, re-export certificates and, in the case of import, import notifications<sup>36</sup> (European Commission and TRAFFIC Europe, 2013). These requirements are stricter than CITES, which does not require any import documentation for trade in Appendix III species.

Annex D includes CITES Appendix III species that are subject to EU member states' reservations. However, Annex D mainly includes non-CITES species that are not already listed in Annex A, B or C, and which are imported into the EU in numbers that are thought to warrant monitoring. Trade of Annex D species into the EU is regulated through a requirement for import notifications (European Commission and TRAFFIC Europe, 2013).

### *Exceptions for personal and household effects<sup>37</sup>*

*Council Regulation (EC) No. 338/97* provides less strict permit requirements for trade in specimens of species on its Annexes that are considered personal and household effects (European Commission and TRAFFIC Europe, 2013). However, this only applies

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<sup>34</sup> For example, if a non-threatened species resembles another threatened species such that distinguishing between them is unlikely.

<sup>35</sup> The member states have to agree to the reservation.

<sup>36</sup> An import notification does not require any prior permission from the MA; it is simply a form that must be completed by the importer before the specimen clears customs.

<sup>37</sup> Exceptions are referred to as derogations in EU legislation.

to specimens made of dead animals or plants that are:

- Contained in the personal luggage of travellers, or carried on the person who is going to or coming from a third country;
- In the personal property of a person transferring her or his normal place of residence to or from the EU (house removal containers can be transported separately from the importer);
- Hunting trophies imported for non-commercial purposes.

Tourist souvenirs made of dead specimens listed in the Annexes fall within the scope of the definition for personal and household effects (European Commission and TRAFFIC Europe, 2013).

For EU residents, an import and export permit is required for trade in such specimens listed in Annex A. Trade in such specimens listed in Annex B requires an export permit issued by a third country, or an import permit if the third country does not issue such permits (European Commission and TRAFFIC Europe, 2013). For non-EU residents, an import permit is not required for trade in specimens listed in Annexes A and B as long as they are not used for commercial purposes or to be given away as gifts, and are contained in the personal luggage of the traveller. However, an export permit may be required if the national legislation of the country where the person resides requires such permits (European Commission and TRAFFIC Europe, 2013).

Items that are not considered personal and household effects are (European Commission and TRAFFIC Europe, 2013) are as follows:

- Goods purchased over the Internet, by phone or by mail, even if for personal use;

- Live animals and plants;
- Specimens made of dead animals or plants that are to be given away as gifts, or used for commercial purposes.

## *SRG opinions on imports*

The introduction of Council Regulation (EC) No. 338/97 provided the EU with the legal authority to suspend imports of certain species from certain countries into the EU. The EU established a SRG to examine all scientific questions related to the application of the EU WTR. The SRG can form opinions regarding the imports of a particular species from a particular country of origin and whether the import complies with the regulations. Opinions are often formed when the CITES Scientific Authority of one or more member states concludes that the import would have a detrimental effect on the survival of the species or the extent of territory occupied by the relevant population, in which case the relevant CITES SA consults the European Commission, which consults the SRG.<sup>38</sup> A case can also be examined directly by the SRG if the European Commission considers it warranted (European Commission and TRAFFIC Europe, 2013).

If the SRG feels that the import would have a detrimental effect on the survival of the species or the extent of territory occupied by the relevant population, a “negative opinion” is formed. This requires all EU member states to reject all import permit applications for the species or country of concern until the negative opinion is removed. The European Commission consults with the range States affected and the negative opinion may be lifted if the SRG is satisfied with the range States’ response. If not satisfied or if no reply is received, the European Commission can

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<sup>38</sup> If the SA concludes that there will be no detrimental effect – and assuming that the species is not already subject to a negative opinion or is not one of the small number of cases where the SRG has agreed that any applications should be subject to prior consideration by the SRG – then an import permit can be issued and trade can proceed. In other words, the default position is that an import permit is issued unless negative concerns are flagged.

impose a formal import suspension. The so-called Suspensions Regulations, which list the import suspensions, are published in the EU Official Journal once or twice each year (European Commission and TRAFFIC Europe, 2013). If the SRG feels that trade will not have a harmful effect on the conservation of the species a “positive opinion” may be formed, and the trade is allowed. A “no opinion” may also be formed if the SRG concludes that trade levels were insignificant and likely to remain that way, or if there was insufficient data to issue a confident positive or negative opinion. In the case of a “no opinion”, should trade subsequently arise, the MA must consult the SA for an NDF before granting the permit. The decision regarding whether such trade is sustainable is made in the first instance by the SA of the importing member state. If the “no opinion” is combined with the need for all import applications to be referred to the SRG for decision-making, individual importing member countries cannot make the decision on whether to allow or refuse an application and must instead wait for feedback from the SRG on every application (European Commission and TRAFFIC Europe, 2013).

### 3 MOU on the Conservation and Management of Narwhal and Beluga and the Canada/Greenland Joint Commission for the Conservation and Management of Narwhal and Beluga (JCNB)

The MOU on the Cooperation and Management of Narwhal and Beluga was signed on December 7, 1989 between DFO of the Government of Canada and the Ministry of Fisheries and Industry of the Greenland Home Rule Government (Anon., 1989). At that time

scientists believed that there was sharing of stocks between Canada and Greenland, so the MOU was established to address management and conservation issues regarding these joint stocks (CITES, 2006). As per the MOU, a Joint Commission was established, known as the JCNB which consisted of two representatives from each Party who may be assisted by experts or advisors at meetings (Anon., 1989).

The function of the commission is to (Anon., 1989):

- *Establish terms of reference for the scientific working group;*
- *Be responsible for the exchange of data and information and the coordination of such research projects as the Parties have agreed to carry out jointly;*
- *Submit to the Parties proposals concerning scientific research to be undertaken jointly or separately;*
- *Submit to the Parties recommendations respecting the conservation and management of stocks.*

A Scientific Working Group (SWG) was established to provide scientific advice as requested by the JCNB and to assess research results and coordinate exchange of data (Anon., 1989).

The JCNB SWG meets jointly with the North Atlantic Marine Mammal Commission (NAMMCO) Scientific Committee working group on the Population Status of Narwhal and Beluga in the North Atlantic to discuss the conservation and management of beluga and narwhals. This meeting is known as the Joint Working Group (JWG) (NAMMCO, 2001).

The last JWG meeting was held in Winnipeg, Canada in 2009 to discuss stock structure, biological parameters, catch statistics, abundance, assessments, traditional knowledge and impact of human-made noise (NAMMCO Annual Report, 2009). The next meeting of the JWG is in the Spring of 2014.

## 4 NAMMCO Agreement

A MOU on cooperation between countries bordering the North Atlantic Ocean in research, conservation and management of marine mammals was signed on April 19, 1990 in Tromsø, Norway. The objectives laid down under the MOU were then adopted under the *Agreement on Cooperation in Research, Conservation and Management of Marine Mammals in the North Atlantic* (NAMMCO Agreement) which was signed by Norway, Iceland, Greenland and the Faroe Islands on April 9, 1992 in Nuuk, Greenland (Anon., 1996; NAMMCO, 2011). The signatory parties desired to enhance cooperation in research on marine mammals and their role in the ecosystem including the effect of human activities (e.g. marine pollution) (Anon., 1996). The NAMMCO Agreement established an international organization known as NAMMCO. The objective of NAMMCO is to contribute to the conservation, rational management and study of marine mammals in the North Atlantic through regional consultation and cooperation (Anon., 1996). NAMMCO provides a forum where member countries can exchange information on matters relating to marine mammal conservation and management (including topics such as hunting methods) (NAMMCO, 2011). NAMMCO consists of a council, management committees, a scientific committee and a secretariat. The decision making body of the Commission is the Council, which meets annually to review advice from the Scientific Committee, review hunting methods and coordinate recommendations for further research (NAMMCO, 2011). The function of the council is to (Anon., 1996):

- *Provide a forum for the study, analysis and exchange of information among the Parties on matters concerning marine mammals in the North Atlantic;*
- *Establish appropriate Management Committees and coordinate their activities;*

- *Establish guidelines and objectives for the work of the Management Committees;*
- *Establish working arrangements with the International Council for the Exploration of the Sea and other appropriate organizations;*
- *Coordinate requests for scientific advice;*
- *Establish cooperation with States not Parties to this Agreement in order to further the objective set out in Article 2.*

The function of the management committees are to “propose to their members measures for conservation and management...[and]...make recommendations to the Council concerning scientific research” and the function of the scientific committee is to “scientific advice in response to requests from the Council, utilizing, to the extent possible, existing scientific information”, while the secretariat performs any functions that the Council decides (Anon., 1996). Working groups can also be established for specific topics (NAMMCO, 2011).

Narwhals are one of the species covered by the NAMMCO Agreement. Both Norway and Greenland are signatory to the agreement; however, narwhals are not as abundant in Norway and they are also fully protected from hunting in Norway. Although Canada is not a signatory party, it attends meetings as an observer and provides updates and information on stocks. In 1999, the Scientific Committee of NAMMCO established a Working Group on the Population Status of Narwhal and Beluga in the North Atlantic. This working group has joint meetings with the JCNB SWG to discuss the conservation and management of beluga and narwhals. This meeting is known as the Joint Working Group (JWG) (NAMMCO, 2001).



## 5 The CMS/Bonn Convention and the Bern Convention

The *Convention on the Conservation of Migratory Species of Wild Animals*, also known as the *CMS* or the *Bonn Convention*, was signed on June 23, 1979 in Bonn, Germany (Anon., 1979b; UNEP/CMS, 2011). The Convention is an intergovernmental treaty to conserve terrestrial, marine and avian migratory species throughout their global ranges. It aims to promote cooperation among the Parties, non-signatory range States, other intergovernmental organizations (IGOs), non-governmental organizations (NGOs) and partners in media and the corporate sector. A UNEP Secretariat provides administrative support to the Convention, while the CoP acts as the decision-making body at triennial meetings. A Standing Committee provides policy and administrative guidance between CoP meetings, while a Scientific Council consisting of experts appointed by member states and the CoP gives advice on technical and scientific matters (UNEP/CWS, 2011). Species covered by the Convention are listed in one of two Appendices depending on the level of protection needed. Migratory species threatened with extinction are listed in Appendix I and migratory species that could benefit from international cooperation are listed in Appendix II (UNEP/CWS, 2011; Anon., 1979b). Narwhals are listed on Appendix II of the Bonn Convention (Anon., 1979b).

The *Convention on the Conservation of European Wildlife and Natural Habitats*, also known as the *Bern Convention*, was signed on September 19, 1979 in Bern, Switzerland and came into force on June 6, 1982 (Anon., 1979a; CoE, 2011). The Convention aims to conserve wild flora and fauna and their natural habitats with emphasis on endangered and vulnerable species, including migratory species. Signatory parties are to take measures to maintain the populations

of listed species to a level that corresponds to a scientific, ecological and cultural requirement. Signatory parties are expected promote national policy, national planning and development, education and coordinated research for the conservation of wild flora, wild fauna and their natural habitats, with particular attention to endangered and vulnerable species. Furthermore, signatory parties must take appropriate legislative and administrative measures to conserve the habitat of wild flora and fauna, especially those listed in Appendices I (flora), and II (fauna) (Anon., 1979a). Species covered by the Convention are listed in one of three Appendices depending on the level of protection that is needed for the species, in addition to the restrictions on the methods of killing, capture and other forms of exploitation. Narwhals are listed in Appendix II (Anon., 1979a).



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# APPENDIX C

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## RANGE STATE LEGISLATION

### 1 Canadian legislation

Under the Constitution of Canada, the conservation and management of wildlife are a shared responsibility of the federal, provincial and territorial governments. Section 35(1) gives constitutional protection to the rights of aboriginal people in Canada—Inuit, Indian and Métis people. This section dictates that existing treaty and Aboriginal rights are recognized and affirmed (Anon., 1982b). The provinces and territories have jurisdiction over wildlife within their borders, while the federal government has jurisdiction over coastal and inland fisheries (including marine mammals), migratory birds and wildlife on federal land (i.e. national parks). The federal government also has jurisdiction over international and inter-provincial trade (Anon., 1867). Management is also subject to land claims agreements (e.g. *Nunavut Land Claims Agreement*, *Inuvialuit Final*

*Agreement*, etc.) or agreements with other nations (MOUs, bilateral agreements, etc.).

### *Federal legislation*

#### *Species at Risk Act*

The *Species at Risk Act* (SARA) was proclaimed in June 2003. SARA's purpose is to prevent Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, to provide for the recovery of extirpated, endangered or threatened species as a result of human activity, and to manage species of concern to prevent them from becoming endangered or threatened (Anon., 2002b). The Act established an official list of statuses for species at risk (Schedule 1): extirpated, endangered, threatened or of special concern<sup>39</sup> (Anon.,

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<sup>39</sup> SARA defines extirpated species as "a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild"; endangered species as "a wildlife species that is facing imminent extirpation or extinction"; threatened species as "a wildlife species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction"; and species at risk as "an extirpated, endangered or threatened species or a species of special concern" (Anon., 2002b).

2002b; Government of Canada, 2009). However, before a species can be listed under SARA, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the scientific advisory body for SARA, must perform a species assessment assessing the conservation status of wildlife species that may be at risk in Canada (Government of Canada, 2010). The best available scientific information along with community and Aboriginal knowledge is evaluated to determine the risk of extinction. After its assessment, COSEWIC recommends the appropriate status to the Governor in Council (Government of Canada, 2009). COSEWIC is also required to reassess the species at least once every 10 years, or at any time if there is reason to believe that the status may have changed substantially (Government of Canada, 2010). If the assessment is adopted by SARA, measures to protect and recover a listed species are implemented (Government of Canada, 2009).

In 2004, COSEWIC assessed the narwhal as being of special concern; however, the narwhal was not immediately listed on Schedule 1 of SARA because DFO requested extended consultations to determine if the status should be accepted under SARA (COSEWIC, 2004; Government of Canada, 2011). On March 21, 2006, preliminary consultations concluded pending consultation with the NMRWB (Government of Canada, 2011). As of 2013, the species had not yet been listed under SARA. If listed under SARA in the future, then the federal government would take on additional management responsibilities, including a narwhal management plan developed jointly with co-managing partners and other interested agencies and individuals (DFO, 2005). This management plan would establish specific management or conservation measures to help guide hunts, assist HTOs to manage the populations and to guide any other non-consumptive activities such as tourism and shipping (DFO, 2005).

## Fisheries Act

Prior to 1987, the legislative authority for the protection and conservation of sea coast and inland fisheries in Canada

was bestowed to the Parliament of Canada as per the *Constitution Act* of 1867 (previously known as the *British North America Act* of 1867 (DFO, 2011b). The *Fisheries Act* of 1868 (31V. C60) was then enacted to carry out this responsibility. Exclusive legislative authority to regulate, protect and conserve all of Canada's fisheries resources was granted to the federal government. The *Fisheries Act* has been revised many times with the most recent being the *Fisheries Act of 1985* (R.S.C. 1985, c. F-14) (Anon., 1985; DFO, 2011b) and was last amended on June 29, 2012. The current Fisheries Act does not define its purpose in the legislation; however, it mainly deals with matters that include the protection of fish habitat and prevention of pollution, the proper management and control of the fisheries, and the conservation and protection of fish (DFO, 2011b).

In 1971, the federal government introduced the *Narwhal Protection Regulations* under the enabling statute the *Fisheries Act of Canada* (R.S., 1985, c. F-14) (Anon., 1985). This regulation prohibited commercial hunting and limited the harvest for local consumption purposes only (Anon., 1985). This regulation was amended many times, providing varying degrees of protection and regulations on the harvest. The regulation was revoked and replaced in 1993 by the *Marine Mammals Regulations* (SOR/93-56) under the *Canadian Fisheries Act* (R.S., 1985, c. F-14) (Anon., 1985; Anon., 1993a). These regulations provide more details on marine mammals. As per the *Marine Mammals Regulations*, the transport of any Canadian marine mammals between provincial or territorial boundaries requires a MMTL, which applies to marine mammals and their parts (Anon., 1993a).

## Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act

In 1975, Canada ratified CITES and implemented it through the *Export and Import Permits Act*. This Act was replaced by *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act*

(WAPPRIITA), which received royal assent in 1992 but it did not come into force until May 14, 1996, when the enabling regulations, the *Wild Animal and Plant Trade Regulations* (WAPTR), were passed (Anon., 1970; Anon., 1992b; Cooper and Chalifour, 2004). WAPPRIITA incorporates the animals and plants included on the CITES Appendices into Canadian law by listing them on Schedule I of the WAPTR. Interprovincial trade within Canada is also regulated by WAPPRIITA and WAPTR. The CITES MA and CITES SA for Canada is the Canadian Wildlife Service (CWS) (CITES, 2010).

## Land claims agreements

Land claims agreements are essentially modern-day treaties that are negotiated in areas of Canada where Aboriginal rights and/or titles have not been addressed by existing treaties. These agreements are negotiated between Aboriginal groups, the Government of Canada and the relevant province or territory. Although they may differ, most include topics such as wildlife harvesting rights, land ownership, financial settlement, participation in land, resource, water, wildlife and environmental management and measures to protect Aboriginal culture and promote economic development. Some agreements also include provisions for Aboriginal self-government (INAC, 2009).

Twenty-two comprehensive land claims and two stand-alone self-government agreements have been concluded and implemented in Canada since 1973. The settlements have provided protection for traditional ways of life respect for Aboriginal land rights (approximately 40% of Canada's land mass), Aboriginal ownership of 600,000 km<sup>2</sup> of land, participation in land and resource management decisions, access to future resource management decisions, capital transfers of over CAD2.8 billion (USD2.7 billion at 2010 rates) and associated self-government rights and political recognition. These agreements have taken an average of

20 to 25 years to be finalized (INAC, 2010). The agreement most applicable to Inuit and narwhals is the *Nunavut Land Claims Agreement*.<sup>40</sup>

The Inuit of the Nunavut Settlement Area (Nunavut prior to its formation) and the Government of Canada signed the *Nunavut Land Claims Agreement* (NLCA) on May 25, 1993 (Anon., 1993b). Covering one-fifth of Canada's land mass, the NLCA is the largest land claims agreement in Canadian history (NWMB, 2008a). Its main objectives or goals are as follows (Anon., 1993b):

- “To provide for certainty and clarity of rights to ownership and use of lands and resources, and of rights for Inuit to participate in decision-making concerning the use, management and conservation of land, water and resources, including the offshore;
- To provide Inuit with wildlife harvesting rights and rights to participate in decision-making concerning wildlife harvesting;
- To provide Inuit with financial compensation and means of participating in economic opportunities;
- To encourage self-reliance and the cultural and social well-being of Inuit.”

The NLCA provided Nunavut Inuit with ownership of approximately 352,000 km<sup>2</sup> of land (18% of Nunavut), a cash settlement of CAD1.14 billion (USD1.11 billion at 2010 rates) paid over 14 years, a share of royalties from development of Crown natural resources and land, rights to harvest wildlife throughout the Nunavut Settlement Area, exclusive rights to use water on Inuit-owned lands (including water flowing in and through Inuit-owned lands), input into wildlife management through participation in the NWMB (NTI, 2009) and the right for self-determination and self-government (Government of Nunavut, 2009).

Although Nunavut has the same status and power as the other territories in Canada, it is unique in that it incorporates

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<sup>40</sup>The Nunavut Land Claims Agreement is also known as the Nunavut Final Agreement. For more information on this Agreement, refer to Anon. (1993b).

Inuit beliefs and values into the system of government. Rather than using an Inuit-specific self-government model, the Inuit pursued their self-determination through a public government structure. Nunavut is governed through a public government framework which represents all residents - Inuit and non-Inuit alike. The public government structure includes an elected legislative assembly consisting of a premier, speaker, seven-member cabinet and 10 regular members. The system also includes the Nunavut Court of Justice and the Nunavut Public Service (Government of Nunavut, 2009).

The NWMB was established as a result of the *Nunavut Land Claims Agreement* for matters regarding wildlife management. Although the government retains ultimate responsibility for wildlife management, the NWMB is considered the main instrument for wildlife management in Nunavut (NWMB, 2008b).

## 2 Greenland legislation

In 1953, Greenland became an autonomous county of Denmark (Government of Greenland, 2009). In subsequent opposition to Danish administration, Greenland obtained its own *Home Rule Act No. 577 of 29 November 1978*, thereby becoming a distinct community in the Kingdom of Denmark (Anon., 1978). On May 1, 1979 the Greenland Home Rule Government was formally established (Government of Greenland, 2009).

Denmark joined the European Economic Community (EEC) (now the European Union) in 1973. However, in 1979 Greenland held a referendum on its EU membership and decided to leave the EU in 1985. As such, it does not abide by EU regulations (Greenland Home Rule Government, 2008c). However, Greenland is a member of Overseas Countries and Territories of the European Union Association . On June 21, 2009 Greenland was granted self-determination under *Greenland Self-Government Act No. 473 of 12 June 2009*, an extension of powers enacted in the *Greenland Home Rule Act No. 577 of 29 November 1978* (Anon., 2009; Government of Greenland 2009). As a result, the people of Greenland were recognized as a people pursuant to international law

with the right to self-determination, and *Kalaallisut* was established as the official language of Greenland (M. Frost, WWF-Denmark *in litt.* to T. Shadbolt, May 15, 2012). These two acts allowed Greenland to elect its own government and parliament. Under the *Self-Government Act*, Greenland has sovereignty on matters regarding health, education, fisheries, hunting, mineral and hydrocarbon resources, conservation, environment and climate. Greenland can also take jurisdiction in other areas such as justice affairs (Anon., 2009; Government of Greenland, 2009). The Self-Government Act further establishes the economic relationship between Greenland and the Kingdom of Denmark and principles for possible future independence (M. Frost, WWF-Denmark *in litt.* to T. Shadbolt, May 15, 2012).

### Implementation of CITES

Denmark (including dependent territories such as Greenland) ratified CITES in 1977. In 1985, the Greenland CITES MA obtained the authority to issue CITES permits. In 2004, Greenland introduced its own legislation to implement CITES under *Home Rule Order No. 12 of 13 September 2004 on export and import of wild animals and plants, etc. covering the Convention of 3 March 1973 on International Trade in Endangered Species of Wild Fauna and Flora (Washington Convention/CITES)* (Anon., 2004b). The Ministry of Environment and Nature (previously the Ministry of Domestic Affairs, Nature and Environment) is the CITES MA in Greenland and the Greenland Institute of Natural Resources (GINR) is designated as the CITES SA (CITES, 2010).

Even though Greenland is part of the Kingdom of Denmark, items may not be freely traded between the two. Permits are required to import Annex A and B species into Denmark (C. O'Criodain, WWF International, *in litt.* to T. Shadbolt, December 12, 2008).

### Regulations specific to narwhals

In 1992, limited regulations for hunting of narwhals were provided in *Home Rule Order No. 10 of 19 June*

1992 on beluga whale and narwhal hunting (Anon., 1992a). These regulations were amended and/or replaced many times. In 2004, *Home Rule Executive Order No. 2 of 12 February 2004 on the protection and hunting of belugas and narwhals* introduced quotas for the harvest of narwhals in West Greenland (Anon., 2004a). In 2009, the government introduced a new quota system that included catch limits for East Greenland. In 2011, the system became legally binding with the introduction of the *Self-Government Executive Order No. 7 of 29 March 2011 on the protection and hunting of belugas and narwhals*, which replaced the existing 2004 regulations (Anon., 2011).

### 3 Other range States

Although narwhals are mostly distributed in the North Atlantic region in the eastern Canadian Arctic and along the east and west coast of Greenland, they can occur in northern parts of the Svalbard and Jan Franz Jospet Land archipelagos (Norway and Russia), and are rarely seen in Alaska (United States).

#### *Norway (and its territories)*

Narwhals are not common in Norway or Svalbard, but they are occasionally seen in the region, mainly in northern areas (Lydersen *et al.* 2007). Narwhals were not a target species for Norwegian whale hunters. Norway has not hunted any whale species, except Mink whales, since 1967 (D. Paulsen, Norway Directorate of Fisheries *in litt.* to T. Shadbolt, March 21, 2011). Hunting of narwhals has not been permitted in Norway or its territories since 1967 (D. Paulsen, Norway Directorate of Fisheries, *in litt.* to T. Shadbolt, March 21, 2011). Narwhals are fully protected in Svalbard and throughout Norway (Lydersen *et al.*, 2007). The species is also given protection and regulated under the Svalbard *Environmental Protection Act, Act of 15 June 2001 No.79 relating to the protection of the environment in Svalbard* (Anon., 2001; T. Punsvik, Environmental Advisor for the Governor of Svalbard, *in litt.* to T.Shadbolt, March 9, 2009).

Norway is a signatory to CITES and currently implements CITES through Royal Decree, Regulation no. 1276 of 15 November 2002 for the implementation of the Convention of 3 March 1973 on CITES, which came into effect in 2003 (Anon., 2008; Anon., 2002a). The Directorate of Fisheries (Norway) is responsible for the overall policy or political matters regarding narwhal management (S.T. Stub, Advisor for the Directorate of Fisheries, *in litt.* to T. Shadbolt, March 31, 2009). The Directorate of Nature Management in Norway is responsible for the management of CITES), and is the CITES MA and SA for Norway (CITES, 2010).

#### *Russia*

Narwhals are seldom recorded in Russia. However, they have been protected in Russia since 1956 under *Decree No. 738 of 21 November 1956 of the RSFSR Council of Ministers On Arctic wildlife conservation measures*, and have been listed under the Red Data Book since 1982 (*Decree No. 500 of 9 September 1982 of the RSFSR Council of Minister*) (Anon., 1982a). Narwhals are currently listed under category 3 (Rare) in the Red Data Book (2001 edition). (Danilov-Danilian, 2001). Therefore, hunting of narwhals is prohibited in the Russian Federation (Vaisman *et al.*, 2009).

The Russian Federation has been a CITES Party since the Convention came into force under the former Union of Soviet Socialist Republics (USSR) in 1976. Under the Constitution of the Russian Federation, all international agreements are automatically considered a part of national legislation once they come into force. The Convention's text is considered a legal document in Russia and additional pieces of legislation relate to implementation of CITES in Russia (Lyapustin *et al.*, 2007; Vaisman *et al.*, 2009). These laws regulate import and export of CITES-listed species. The Federal Supervisory Natural Resources Management Service (Rosprirodnadzor) is the CITES MA for the Russian Federation (A. Vaisman, TRAFFIC-Russia *in litt.* to G. York, September 7, 2011) and the All Russian Institute of Nature Protection is one of the CITES SAs for the Russian Federation (CITES, 2010).





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# APPENDIX D

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## DETAILED HARVEST STATISTICS AND QUOTAS

# Table D1

Canadian narwhal subsistence hunt, 2007 to 2011

COMMUNITY HUNTING BAFFIN BAY NARWHALS	2007		2008		2009		2010		2011	
	QUOTA	LANDINGS	QUOTA	LANDINGS	QUOTA	LANDINGS	QUOTA	LANDINGS	QUOTA	LANDINGS
Clyde River	50	42	50	17	50	13	50	50	50	36
Grise Fiord	20	20	20	23*	20	5	20	21 BA	20	N/A
Hall Beach	10	0	10	0	10	0	10	2	10	1
Igloolik	25	1	25	0	25	1	25	27	25	0
Iqaluit (Frobisher Bay)	10	3	10	0	10	0	10	0	10	1
Pangnirtung	40	1	40	21	40	0	40	28	40	3
Resolute Bay (includes Creswell quota of 12)	32	9	32	10	32	11	32	8	32	4
Taloyoak (Spence Bay)	10 F	0	10 F	3	10 F	5	10 F	2	10 F	1
Gjoa Haven	10 F	1	10 F1	0	10 F	1	10 F	1	10 F	1
Kugaaruk (Pelly Bay)	25 HL, F	40	25 HL, F	35	25 HL, F	42	25 HL, F	45	25 HL, F	50
Arctic Bay	130 HL	127	130 HL	132	130 HL	129	130 HL	128	130 HL	130
Pond Inlet	130 HL	65	130 HL	692 IE	130 HL	44	130 HL	62	130 HL	112
Qikiqtarjuaq (Broughton I.)	90 HL	88	90 HL	80	90 HL	90	90 HL	89	90 HL	90
<b>Baffin Bay Narwhal Population</b>	<b>582</b>	<b>397</b>	<b>582</b>	<b>1018</b>	<b>582</b>	<b>341</b>	<b>582</b>	<b>463</b>	<b>582</b>	<b>429</b>

*table continued on next page*

# Table D1

Canadian narwhal subsistence hunt, 2007 to 2011 *continued*

COMMUNITY HUNTING BAFFIN BAY NARWHALS	2007		2008		2009		2010		2011	
	QUOTA	LANDINGS	QUOTA	LANDINGS	QUOTA	LANDINGS	QUOTA	LANDINGS	QUOTA	LANDINGS
Arviat	-	-	-	-	-	-	3**	3	-	-
Baker Lake	-	-	-	-	-	-	2**	0	-	-
Cape Dorset	10	0	10	0	10	0	10	2	10	0
Chesterfield Inlet	5	3	5	2	5	4	4**	2	5	5
Coal Harbour	10	1	10	1	10	8	9**	6	10	7
Kimmirut (Lake Harbour)	10	1	10	0	10	0	10	1	10	0
Rankin Inlet	10	9	10	1	10	8	9**	9	10	8
Whale Cove	5	0	5	0	5	2	4**	1	5	1
Repulse Bay	72 HL	74*	72 HL	25	72 HL	97 Co	71**	82*	72	72
<b>Hudson Bay Narwhal Population</b>	<b>122</b>	<b>88</b>	<b>122</b>	<b>29</b>	<b>122</b>	<b>119</b>	<b>122</b>	<b>106</b>	<b>122</b>	<b>93</b>
<b>Total Quotas and Landed Catch</b>	<b>704</b>	<b>485</b>	<b>704</b>	<b>1047</b>	<b>704</b>	<b>460</b>	<b>704</b>	<b>569</b>	<b>704</b>	<b>522</b>

Source: Abraham, (2013); DFO, (2012d; 2011a); Kingsley *et al.*, (2013)

Information was taken from the Marine Mammal Tag returns in addition to any notes in the file. This does not include found tusks or any struck and lost animals. Management Year is from April 1 to March 30.

Note: Some estimates differed slightly from those in DFO, (2012d). However, these estimates were used for allocation models by DFO; therefore these estimates were instead provided in the table. These slightly different estimates were provided by DFO, (2011a) for Arctic Bay in 2007, Pond Inlet in 2008, Resolute Bay in 2009 and Pangnirtung in 2008. Slightly different estimates were provided by Abraham, (2013) for Igloodik in 2011 and Resolute Bay in 2011. Data for Grise Fjord in 2011 was not available, thus the total estimate for 2011 may be higher.

QR- Quota Removed for communities participating in the Community Based Management (CBM) program

HL- Harvest Limit approved by the NWMB for communities participating in the CBM program

C- Community decision to limit the harvest to 100

Co- Carryover of tag(s) from the previous year

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

IE- Ice entrapment, 624 narwhals were humanely harvested with DFO's permission. 73 narwhals were harvested prior to the ice entrapment.

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

\*\* Two communities (Arviat and Baker Lake) were allocated tags from the Kivalliq Wildlife Board Communities for 2010, which were taken from other communities

‡ The Gulf of Bothia communities (Gjoa Haven, Kugaaruk, and Taloyiak) of the Kitikmeot Regional Wildlife Board (KRWB) have a combined harvest limit of 75 narwhals since 2006 (45 quotas are community specific and 30 are additional NWMB harvest allocations for the region). The 30 tags are suballocated by the KRWB annually.

†1 The community of Cambridge Bay was allocated 2 tags from Gjoa Haven reducing Gjoa Haven tags to 8 ; however, the tags were unused and returned

# Table D2

Greenland narwhal subsistence hunt, 2007 to 2012

GREENLAND NARWHAL HUNTING REGIONS	2007/2008		2008/2009		2009/2010		2010*		2011		2012	
	QUOTA	HARVEST	QUOTA	HARVEST	QUOTA	HARVEST	QUOTA	HARVEST	QUOTA	HARVEST	QUOTA	HARVEST
<b>West Greenland</b>	<b>300</b>	<b>335</b>	<b>410</b>	<b>374</b>	<b>310</b>	<b>292</b>	<b>310</b>	<b>184</b>	<b>310</b>	<b>249</b>	<b>329</b>	<b>313</b>
Inglefield Bredning**	85	107	90	114	85	86	85	89	85	53	85	131
Melville Bay**		0		0	81	73	81	52	81	79	83 b	83
Inglefield Bredning South**	215	228	320 a	260	144	133	144	43	144	117	161 c	99
<b>East Greenland</b>	<b>No quota</b>	<b>13</b>	<b>No Quota</b>	<b>76</b>	<b>85</b>	<b>12</b>	<b>85</b>	<b>30</b>	<b>85</b>	<b>45</b>	<b>129 d</b>	<b>48</b>
<b>Total</b>	<b>300</b>	<b>348</b>	<b>410</b>	<b>450</b>	<b>395</b>	<b>304</b>	<b>395</b>	<b>214</b>	<b>395</b>	<b>294</b>	<b>458</b>	<b>361</b>

Source: Department of Fisheries, Hunting and Agriculture, 2013

Note: The harvest data for Greenland are currently reported based on the calendar year January 1 to December 31. Quotas in East Greenland was first introduced in 2009/2010.

\* Quota period was moved from 1 June-31. July to 1 January 31.dec in 2011

\*\* Inglefield Bredning (Qaanaaq) has a 5-year technical quota of 425 animals; Melville Bay was recognized as a separate component in 2009/2010, prior to this Savissivik was part of Inglefield Bredning and Upernavik was part of Inglefield Brednings South.

a. Original quota was 230, after a political decision it creased by an additional 90 for a new total of 320.

b. Original quota was 81, with the transfer of 2 animals for a new total of 83.

c. Original quota was 144, with the transfer of 27 animals for a new total of 161.

d. Original quota was 85, with the transfer of 44 animals for a new total of 129.



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