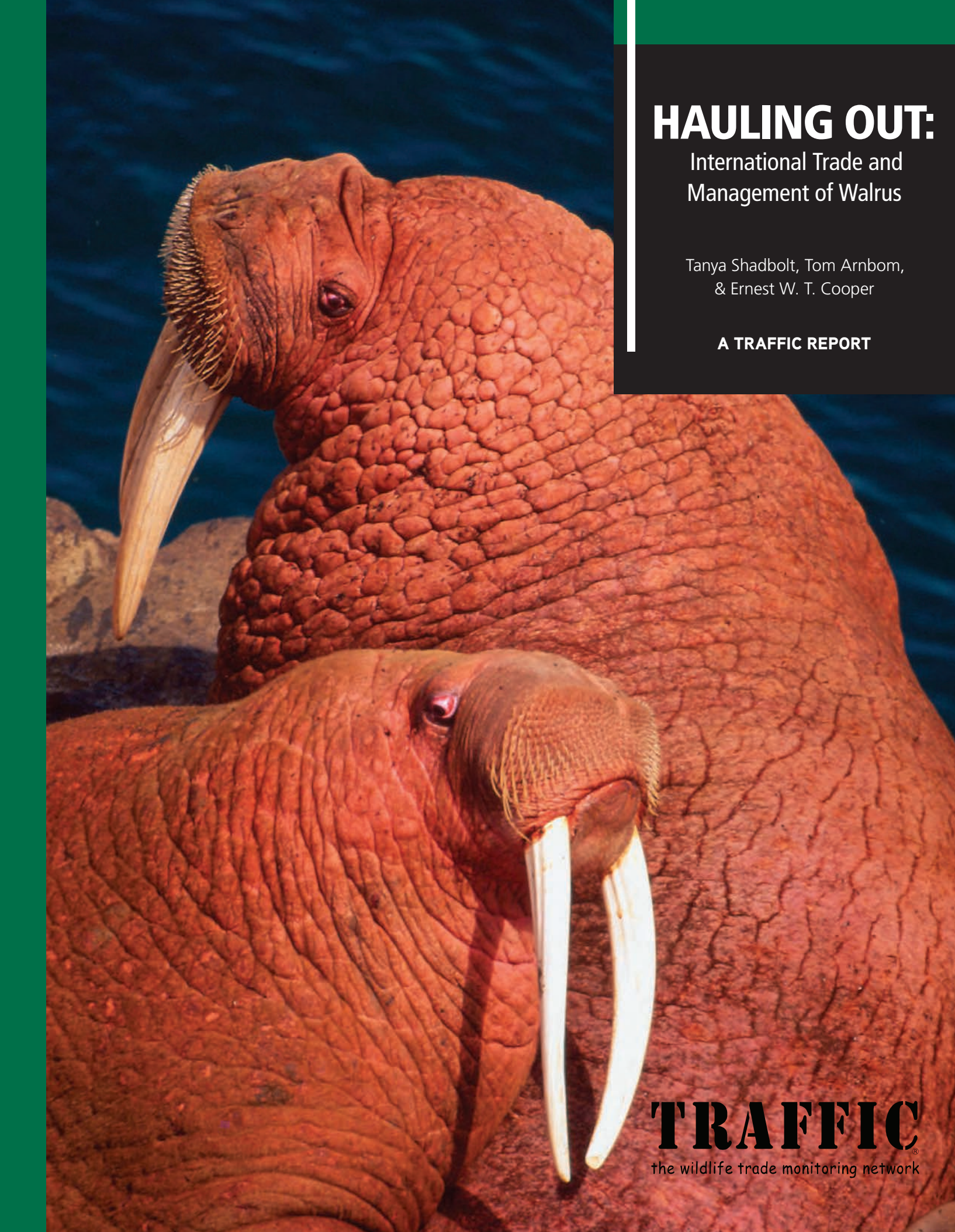




HAULING OUT:

International Trade and
Management of Walrus

Tanya Shadbolt, Tom Arnbom,
& Ernest W. T. Cooper

A TRAFFIC REPORT

TRAFFIC
the wildlife trade monitoring network

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Cover photo: Pacific walrus (*Odobenus rosmarus divergens*) males hauled out at Round Island, Alaska, United States © Kevin Schafer/WWF-Canon



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ACRONYMS

ADF&G	Alaska Department of Fish and Game (US)
ChAZTO	Chukotka Association of Traditional Marine Mammal Hunters (Russia)
CSAS	Canadian Scientific Advisory Secretariat (for DFO)
CFR	Code of Federal Regulations (US)
CoP	Conference of the Parties (for CITES)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CITES MA	CITES Management Authority
CITES SA	CITES Scientific Authority
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
EWC	Eskimo Walrus Commission (US)
EC	European Community
EU	European Union
EEC	European Economic Community
ESA	Endangered Species Act of 1973 (US)
EU-TWIX	European Union Trade in Wildlife Information eXchange
GINR	Greenland Institute of Natural Resources
HTO	Hunters and Trappers Organization (Canada)
HFTCC	Hunting Fishing and Trapping Coordinating Committee (Canada)
IUCN	International Union for Conservation of Nature
KNAPK	Kalaallit Nunanni Aalisartut Piniartullu Kattuffiat (Greenland)
KANUKOKA	Kalaallit Nunaanni Kommuneqarfiit Kattuffia (Greenland)
LPN	Listing Priority Number (for US ESA)
LEMIS	Law Enforcement Management Information System (US)
MMC	Marine Mammal Commission (US)
MMTL	Marine Mammal Transportation Licence (Canada)
MTRP	Marking Tagging and Reporting Program (US)
MOU	Memorandum of Understanding
MMPA	Marine Mammal Protection Act (US)
NDF	Non-Detriment Finding (for CITES)
NLCA	Nunavut Land Claims Agreement (Canada)
NTI	Nunavut Tunngavik Incorporated (Canada)
NAMMCO	North Atlantic Marine Mammal Commission
NMRWB	Nunavik Marine Region Wildlife Board (Canada)
NWMB	Nunavut Wildlife Management Board (Canada)
OSP	Optimal and Sustainable Population

PBR	Potential Biological Removal
QWC	Qayassiq Walrus Commission (US)
RWO	Regional Wildlife Organization (Canada)
RSFSR	Russian Soviet Federated Socialist Republic
SRG	Scientific Review Group (EU)
SARA	Species at Risk Act (Canada)
TAH	Total Allowable Harvest (for DFO Canada)
TAR	Total Allowable Removal (for DFO Canada)
US	United States
USSR	Union of Soviet Socialist Republics
USFWS	United States Fish and Wildlife Service
UNEP-WCMC	United Nations Environment Programme-World Conservation Monitoring Centre
WWG	Walrus Working Group (Canada)
WITS	Walrus International Technical and Scientific committee
WHMP	Walrus Harvest Monitoring Program (US)
WTR	Wildlife Trade Regulations (EU)
WCMC	World Conservation Monitoring Centre
WAPTR	Wild Animal and Plant Trade Regulations (Canada)
WAPPRIITA	Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (Canada)



EXECUTIVE SUMMARY

The Arctic has attracted increasing international attention in recent years from the media and from the scientific community over concerns regarding climate change and the anticipated changes that will occur in the Arctic ecosystem. This means more attention is placed on Arctic wildlife, including the charismatic walrus, which plays an important role in the Arctic ecosystem and is also of great importance to the livelihoods of Arctic peoples.

Walrus hunting has occurred for centuries. It helps to maintain cultural identity for Arctic peoples and provides a strong link to their environment. The hunt contributes to a traditional subsistence economy, providing a nutritional component to Arctic peoples' diets and income from the sale of animal products which is used to meet household living expenses and to purchase equipment for harvest activities. Changes to the Arctic ecosystem will not only affect wildlife and their habitats, but also the livelihoods of Arctic communities. 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 of walrus parts and derivatives. The purpose is to provide insight into current international trade, limitations in available information and potential impacts trade might be having on the conservation of the species. To give context to the discussion on international trade, the report provides background material on walrus, and then summarizes the walrus management structure for walrus range States (Canada, United States, Greenland [Denmark], Norway and Russia).

Lack of long-term data and poor quality of information on population estimates for walrus makes it difficult to determine whether the harvest and resulting international trade will affect the conservation of the species. While neither illegal hunting nor illegal trade appear to be at levels that would cause conservation concern for most walrus range States, there have been some infractions of legal measures. Due to challenges in identification, it is possible that some modern walrus ivory (post-1975) could be traded as “pre-Convention” in attempts to circumvent regulations. However, the extent to which this occurs (if at all) is not known.

Walrus are unevenly distributed throughout the circumpolar sub-Arctic and Arctic. They comprise two geographically isolated subspecies: the Atlantic walrus, *O. r. rosmarus*, and the Pacific walrus, *O. r. divergens*. In 2008, the International Union for the Conservation of Nature (IUCN) assessed the species as data-deficient with an unknown global population trend. The impacts of climate change on walrus are not known, but likely to have a negative effect on some stocks. Long-term ecological data on the species are limited and like most Arctic marine mammals, walrus are difficult to study. Therefore, predicting what impacts climate change could have on these species is challenging. However, in recent years, concerns over loss of summer sea ice and its effects on walrus have been of increased interest. Since the foraging success, distribution and densities of many Arctic pinnipeds are associated with suitable ice conditions, it is anticipated that changes in the sea ice extent and concentration could impact walrus. Research on impacts of climate change has focused primarily on Pacific walrus and very little on Atlantic walrus. Since there are variations in the type and extent of sea ice throughout the Arctic, the effects of global climate change will vary regionally. Consequently, the responses of walrus will differ between regions and subspecies, and will likely be influenced by ice conditions, availability of prey and

hunting pressure. As sea ice melts, walrus will lose sea ice platforms and will be more likely to congregate on coastal haul-outs. This makes walrus, particularly calves, more vulnerable to disturbances from anthropogenic activities and predators, which could increase natural mortality associated with trampling events. If sea ice is present, walrus rest on the ice and forage nearby. However, when sea ice is missing, additional physical stress may be imposed on walrus because they may have to swim longer distances to and from haul-out sites to feeding areas.

The historical commercial exploitation of walrus greatly reduced the population size of both subspecies; however, commercial hunting has not occurred since the mid-20th century. Canada, the United States, Greenland (autonomous territory of the Kingdom of Denmark) and Russia currently allow hunting of walrus for subsistence purposes. Aboriginal peoples in Canada, coastal-dwelling Alaskan Natives in the United States, and indigenous people inhabiting Chukotka (Russia) are permitted to hunt walrus for subsistence purposes. A small walrus sport hunt is permitted in Canada for non-indigenous people; however, any edible parts of this hunt must remain with the community. In Greenland, only hunters in possession of a valid hunting licence may hunt walrus. Norway (and its territories including Svalbard) is the only range State that prohibits the hunting of walrus. According to available data, on average 3,215 walrus (401 Atlantic walrus and 2,814 Pacific walrus) were harvested globally per year from 2006/2007 to 2010/2011. If the estimates for struck and lost rates are applied to the landings, on average 5,406 walrus (555 Atlantic walrus and 4,851 Pacific walrus) were killed globally per year. Struck and lost refers to animals which are struck (by a bullet or harpoon) but not retrieved. A struck and lost animal may or may not die from its wound(s). Struck and lost rates vary widely depending on the weather, location, season, hunter experience and animal behaviour. Using a higher mortality estimate (which includes a correction

factor to account for struck and lost animals), less than four per cent of the estimated global population of 150,000 to 160,000 walrus were killed during the hunt. Broken down by subspecies, this is less than three per cent of the estimated 20,000 to 27,000 Atlantic walrus population and less than four per cent of the estimated minimum 129,000 Pacific walrus population. This is a conservative estimate when considering the actual struck and lost rates may be lower than the estimated correction factors used (e.g. struck and lost rates in the United States and Russia have been estimated at up to 42% [Pacific walrus], up to 32% in Canada [Atlantic walrus] and up to 15% in Greenland [Atlantic walrus]).

For many Arctic communities, hunting activities satisfy not only cultural, social, and nutritional needs, but also the financial needs of families and households. Money earned from the sale of animal products is used for household living expenses and to

purchase equipment for harvest activities. The value of subsistence hunts is greater than the monetary value of the animal parts it generates. Cultural, nutritional and spiritual value must also be taken into account. In 1994, the annual value of sport hunting in two areas of Canada was estimated to be between CAD160,000 to CAD659,000 (USD117,000 to USD482,000). The cost of a single walrus sport hunt (paid to southern wholesalers [outfitters]) can reach USD9,000 for a five-day trip. There are no global estimates on the annual value of walrus products. However, in Alaska (United States) in 1994, the US dollar value was estimated to be in the millions. The value of walrus products vary depending on the country, the item (e.g. carved figurine, jewellery, tusk, skull), the artistic value and market (e.g. auction, tourist shop, online store). The value of skulls and tusks also varies depending on the sex, size, and quality and whether it is raw or carved. Advertised prices in 2008/2009 ranged up to USD1,880 for carved skulls with tusks, USD3,590



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for raw skulls with tusks, up to USD4,100 for carved tusks, up to USD550 for single raw tusks and up to USD835 for a pair of raw tusks.

International trade in walrus parts and derivatives is regulated by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The walrus was listed on Appendix III (by Canada) in 1975. Under this listing, CITES export permits are required for exports of walrus parts and derivatives originating from Canada, and CITES certificates of origin are required for exports from all other CITES Parties. Issuance of such documents does not require that a non-detriment finding be made prior to the export of walrus parts and derivatives (i.e. proof that international trade is non-detrimental to conservation of species is not required). Independent of CITES, some countries have restrictions on imports,

such as the United States and the European Union (EU). Since 2006, the EU has restricted the import of walrus parts and derivatives from Greenland, and the United States Marine Mammal Protection Act (US MMPA) has prohibited the import of walrus parts since 1972. However, for each case, under very specific circumstances and with issuance of permits, imports can be allowed.

All signatory countries to CITES must submit annual reports on their international trade of CITES listed species. The information is then compiled into the United Nations Environment Programme-World Conservation Monitoring Centre (UNEP-WCMC) CITES Trade Database, which can be queried online. These data are the only comprehensive international trade data available for walrus. The data provide an overview of international trade in walrus and their parts and derivatives, but the data cannot provide an estimate of actual number of walrus represented in international trade or its impact on the conservation of the species. Some of the data are based on information from permits issued, not from permits actually used. International trade in walrus is represented by a variety of items, such as carvings, bones, ivory pieces, tusks and skulls. For many of these items, it is impossible to determine the number of walrus represented by this trade. For example, one walrus could be the source of any number of scientific specimens (blood samples), carvings and bones. Only two walrus parts—tusks and skulls—can be used to make inferences on the impact of international trade because these parts can represent a finite number of animals. A minimum estimate for skull and tusks data would assume that two tusks represent one walrus, while a maximum estimate would assume that two tusks represent two walrus. Based on the UNEP-WCMC export data for skulls and tusks, a minimum of 461 walrus (149 skulls + 623tusks/2) were represented in international trade during 2005 to 2009, or an average of 92 walrus per year, to a maximum of 772 walrus (149 skulls + 623 tusks), or an average of 154 walrus per year. The majority of these

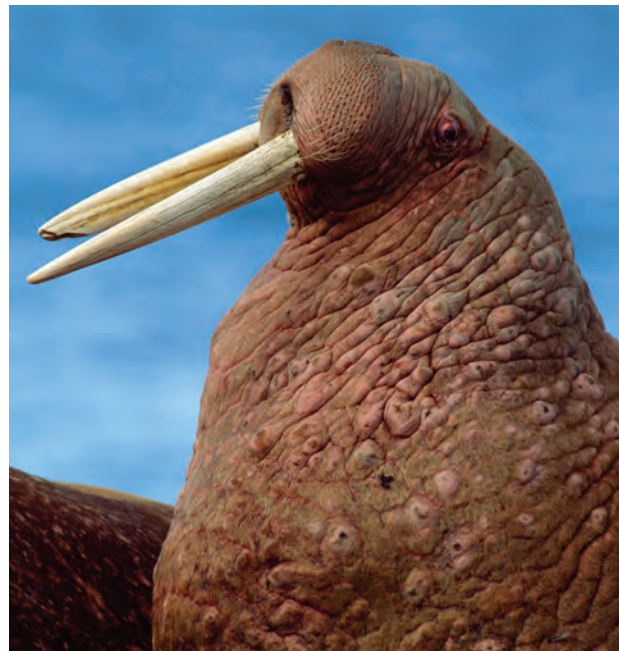
skulls and tusks were from Atlantic walrus. Very little data for Pacific walrus were recorded. However, items exported as personal and household effects (including tourist souvenirs) may not require permits; therefore, these data would not be recorded in the CITES Trade Database and would not be available for analysis (e.g. the United States does not require permits for these types of items).

The total number of items traded internationally fluctuated from 1987 to 1997 and increases were heavily influenced by numbers of tusks. These data could be incorrectly interpreted to indicate that the numbers of walrus being hunted for trade were also increasing. However, it is important to note that for most of these fluctuations, a significant number of these tusks were recorded by the United States as pre-Convention (prior to CITES listing in 1975). Since 1998, there has been variability in the quantity of items exported, variability which was primarily the result of greater numbers of bones, ivory and carvings entering international trade (which cannot be used to determine finite numbers of walrus). However, the numbers of tusks and skulls (which can be used to determine numbers of walrus) remained relatively constant throughout the same period (1998 to 2009).

Since much of the international trade consists of items other than tusks and skulls (e.g. carvings, ivory pieces, etc.), and items traded as personal and household effects may not be recorded (e.g. tourist souvenirs), it is impossible to determine the number of walrus in international trade. However, the available information does not suggest that international trade currently poses a threat to walrus conservation. Limitations in available trade data make it very difficult to make inferences on the impact of international trade, whether current provisions and regulations are adequate and whether further action is needed.

Given the uncertainties regarding the impact of international trade on walrus conservation, the first step could be to direct efforts at monitoring

international trade levels and improving collection of trade data, before considering more costly and significant changes to current management practices; such changes may not be realistic, practical or financially possible in the short term. Since some Arctic people and villages are highly dependent on the income acquired from selling Native handicrafts, any solutions should consider local needs in an effort to prevent unnecessary hardship to local communities. If new information suggests that more extensive solutions are needed, they should then be explored and management practices adapted where needed. New information and more precise data on population size, trend and demographics on both Atlantic and Pacific walrus are needed to ensure harvest levels are sustainable. These will help to ensure that resulting international trade will not be detrimental to walrus conservation and that international trade is sourced from sustainably harvested animals. Cooperation, collaboration and commitment are needed by all 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.



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Key recommendations

- The inconsistencies in CITES trade data reporting are not specific to walrus; they apply to all taxa listed under CITES. Therefore, any changes and improvements to the reporting of the 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), improved reporting of Appendix III species (which includes walrus), reporting seizure data and by following the guidelines for the preparations and submission of CITES annual reports. The result would be more consistent reporting of data and better analysis and monitoring of trade in the species. If lack of consensus among Parties impedes such changes, the walrus range States could take a proactive approach and signal that approach to the CITES Parties by improving their monitoring and reporting of CITES trade data.
- Countries that trade in walrus parts and derivatives could be more explicit when submitting information in their CITES annual reports. Improved reporting of trade in walrus parts and derivatives could facilitate better analysis of trade activities. This could include:
 - ▶ proper use of terminology codes (e.g. the term “carvings” should not be used for any ivory or bone-related product because there are existing codes for “ivory carvings”, “ivory pieces”, “ivory scraps” and “bone carvings”);
 - ▶ improvement in recording units of measurement (e.g. use number of items for tusks, but use weight for smaller items such as carvings and ivory pieces) or use multiple measurements (e.g. record both number of items and total weight);
 - ▶ future considerations could include creation of new codes (e.g. raw tusks, carved tusks, ivory jewellery, small ivory carving, and large ivory carving [size can be defined in guidelines]) and information on year of harvest and possible region.
- The reporting of items exported as personal and household effects (including tourist souvenirs) would greatly improve the understanding of trade dynamics, and provide a more accurate estimate of the number of walrus represented in international trade and whether international trade poses a threat to the conservation of the species. One way to facilitate such reporting could be through forms (e.g. declare wildlife products) or issuance of special permits.
- A range State workshop on international trade in Arctic species could help to facilitate information sharing and discussion on issues related to international trade, potential problems and recommended solutions.
- A review of existing management regimes should be conducted to ensure effective methods are used to validate and ensure “modern ivory” is not being recorded and traded as “pre-Convention”, “pre-Act” or “fossil ivory” in attempts to bypass regulations regarding commercial export of walrus parts. Clear definitions on what constitutes fossil ivory may help to prevent such attempts.
- The effects that climate change may have on walrus are not well understood. There are studies on Pacific walrus and climate change, but little more than speculation as to the impacts of climate change on Atlantic walrus. More information is needed for both subspecies, to ensure adequate measures are taken for the conservation and management of the species and to ensure that international trade will not pose a threat to the conservation of the species.

- Range States need to establish more precise struck and lost rates for multiple regions and during different seasons over a multi-year time frame. Since struck and lost rates vary substantially, it would be preferable to establish estimates for specific regions rather than apply the same rate to every region. For instance, while some locals report that loss rates are as low as five per cent, the rates often used by managers are much higher because they use rates from studies completed 20 to 40 years ago. Management authorities and Arctic communities in each range State should consider implementing programs that promote reporting of struck and lost animals. Incentive-based programs could be explored. Alternatively, trained observers could be used to record 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. Such programs could include discussion of harvest methods and techniques that can help to reduce losses.
- Given the resources and costs required to change current management practices, if concerns with international trade become evident at a later date, future considerations could also include these:
 - ▶ Range States could consider the development of modern tracking systems or documentation schemes to track and identify movement of walrus parts and derivatives. Programs for tagging walrus skulls and tusks after the hunt (e.g. pit tags, microchips, or metal tags in skulls or tusks) could help to collect information on the size and weight of tusks and skulls, and items could be marked with a unique tagging number. A similar system is already utilized in the United States. Alternatively, range States could consider developing a documentation scheme to help identify and track the source of walrus ivory

in international trade. Ivory carvings could be traded with certificates or holographic stickers: hunters and carvers could report the weight of the carvings and tusk tag number to local authorities and receive a certificate or holographic sticker. The carvings would then be associated with a tagging number and any instance where the total weight of carvings was greater than the original weight of the tusk would indicate use of an unreported (and possibly illegal) tusk. Branding strategies or certifying programs using holographic stickers or certificates could also be used as marketing tools (similar to the branding strategy for seafood that has been certified as sustainable by the Marine Stewardship Council (MSC)).

- ▶ Stakeholders and/or range States could consider developing a study on the supply chain and consumer demand dynamics for walrus parts and derivatives. This could provide more insight into the types of items traded internationally (e.g. raw vs. processed, carvings vs. tusks). 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 there is evidence of illegal trade or indications of poaching activities. If markets are better understood and monitored, measures can be taken to better manage trade activities and inform range States of emerging demand trends that could impact management efforts.
- ▶ A study on domestic trade in walrus could help to provide insight into market dynamics and international trade (i.e. there may be similar trade patterns or trade dynamics. A centralized system for recording and monitoring domestic trade could provide useful information for such a study.



INTRODUCTION

Increasing international attention has been placed on the Arctic in recent years, most notably due to concerns over climate change. The recent and anticipated loss of sea ice is a concern for many marine mammals, including walrus. Public, governmental and industrial interest in the Arctic is at an all-time high and decisions made now will affect the future of the Arctic and wildlife that reside there.

The walrus hunt contributes to a traditional subsistence economy, providing a nutritional component to Arctic peoples' diets and income from the sale of animal products which is used to meet household living expenses and to purchase equipment for harvest activities. Changes to the Arctic ecosystem will not only affect walrus and their habitat, but also the livelihoods of Arctic communities that coexist with 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.

1.1 Purpose of the report

This report focuses primarily on the international trade¹ of walrus parts and derivatives with the purpose of providing insight into current international

¹International trade is defined as "The exchange of goods and services across international borders" (First National Bank-International Trade Services, 2006) while CITES defines domestic trade as "Any commercial activity, including, but not limited to, sale and purchase, within the territory under the jurisdiction of a CITES Party" and trade as "export, import, re-export and intro from the sea" (CITES, 2008a).

trade, limitations in available information and the potential impacts this trade might be having on the conservation of the species. No attempt was made to analyse domestic trade or live trade: the intention is to provide insight into dynamics of international trade. A centralized system to track and record trade within a country does not exist for all range States. As such, this report does not provide data on the domestic trade (trade within the national borders of a country). However, in some instances, domestic trade is discussed in more general terms (e.g. types of items in trade). Since walrus are listed in Appendix III of the *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES), analysis of international trade data is possible, but 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 of or population trends related to walrus.

To provide context to the discussion on international trade of walrus parts and derivatives, the report includes background material on walrus, the status of the species and the importance of wildlife and wildlife trade in the Arctic. Since climate change is a growing concern for many Arctic marine mammals associated with sea ice, it could, and in some regions already is, affecting hunting activities (and the resulting trade in walrus). As such, the potential threat climate change poses to walrus and walrus 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 basis for management decisions within walrus range States (Canada, United States, Greenland [Denmark], Norway and Russia) and at international forums (e.g. meetings and conferences of CITES).

Walrus range across five 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. This report presents an overview of the current management regimes, which vary substantially across the global distribution of walrus. Management and trade are closely linked, so a comprehensive understanding of international trade dynamics for the species requires familiarity with how walrus are managed in the different range States (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 walrus (*Odobenus rosmarus*) is the largest species of pinniped (marine mammals including seals and sea lions) in the Arctic (Born *et al.*, 1995; NAMMCO, 2004a). They spend the majority of their time in the water (Jay *et al.*, 2001; Oakley *et al.*, 2012; Udevitz *et al.*, 2009) and for the remainder, they are hauled out on sea ice or land (COSEWIC, 2006; USGS, 2011). Walrus use sea ice as a platform to travel, moult, mate, give birth, nurse and rest between foraging trips (Fay, 1982; Jay *et al.*, 2010; Kapsch *et al.*, 2010). They are typically associated with moving pack ice; however, when ice is lacking in summer² and fall, they will congregate and haul out on land (COSEWIC,

² Seasons refer to the northern hemisphere.



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2006; Fay, 1982; Jay *et al.*, 2012; Lowry *et al.*, 2008). Although walrus occupy a large area, they are considered specialists that occupy a limited ecological food niche (Born, 2005a; 2005b; COSEWIC, 2006; Kovacs and Lydersen, 2008; USFWS, 2009b). Molluscs are their primary prey source, but they also eat a variety of small crustaceans, snails and polychaete worms (Fay, 1982; Jay *et al.*, 2011). Occasionally they may feed on pinnipeds, fish and birds (Riedman, 1990). Walrus require shallow water areas that can support their prey, access to areas where ice is not too thick and dense, and haul-out sites on either ice or land (Anderson *et al.*, 2009; Born, 2005a; 2005b; COSEWIC, 2006; Garlich-Miller *et al.*, 2011; Jay *et al.*, 2012; Kovacs and Lydersen, 2008).

Life history parameters among pinnipeds vary. Walrus in particular have a long life span (up to 40 years) (NAMMCO, 2004a) and very low reproductive rates (often half that of other pinnipeds) (Fay, 1985; NAMMCO, 2004a). Age of sexual maturity varies

between four and 10 years, depending on the subspecies and sex. However, most males cannot successfully compete for females until they are 15 years of age (Fay 1982; 1985; NAMMCO, 2004a). Females reproduce every two to three years and often have single pups, give birth 15 to 16 months after conception and nursing their pups for up to two years (Fay, 1982; 1985; NAMMCO, 2004a). Some life history traits can make walrus more susceptible to over-harvest and environmental changes (COSEWIC, 2006). However, females invest heavily in their young which can help to offset their low reproductive rates (Garlich-Miller *et al.*, 2011). A long life span can help during short-term disturbances, but low reproductive rates prevent the walrus population size from increasing if the population declines to low numbers.

Walrus are well adapted to the cold and ice. They have a thick (up to 15 cm) layer of blubber important for storing energy and insulating them from the cold, thick (two to four cm), tough skin for protection in

fight with other walrus and from sharp rocks while hauling out on land, a streamlined body and broad flippers that aid in swimming and sensitive whiskers that help in locating prey (Fay, 1985; NAMMCO, 2004a; 2004b; USFWS, 2009b). Physiologically, their bodies are able to reduce heat loss in extreme cold conditions by constricting the flow of blood to their peripheral vascular system and, like other marine mammals, they can store oxygen in their blood and muscle providing enormous blood volume which aids in diving (COSEWIC, 2006; NAMMCO, 2004b; USFWS, 2009b).

Walrus foraging habits play an important role in the Arctic ecosystem by influencing the structure of benthic invertebrate communities (Garlich-Miller *et al.*, 2011; Jay and Fischbach, 2008). As they forage, they disturb the seabed. The stiff bristles around their mouth act like fingers, which help locate and identify prey. When a food item is located, walrus pump sediment away from the prey with their flippers or by squirting water from their mouths, and then use their powerful mouths to suck prey out of the sediment (Born, 2005b; Garlich-Miller *et al.*, 2011; Oliver *et al.*, 1983). These activities create furrows or pits which open up new areas and create habitat for invertebrate larvae to colonize (Born, 2005b; Oliver *et al.*, 1983). In addition, habitat for benthic biota is provided under the discarded shells of their prey (Garlich-Miller *et al.*, 2011; Oliver *et al.*, 1983; Ray *et al.*, 2006). The disturbance of the sediment releases nutrients, oxygen and nitrogen into the surrounding water column, which are then available to phytoplankton (Born, 2005b; Ray *et al.*, 2006; USFWS, 1994). The release of nutrients during foraging may also contribute to increases in production and benthic biomass (Ray *et al.*, 2006).

1.2.1 Walrus population and conservation status

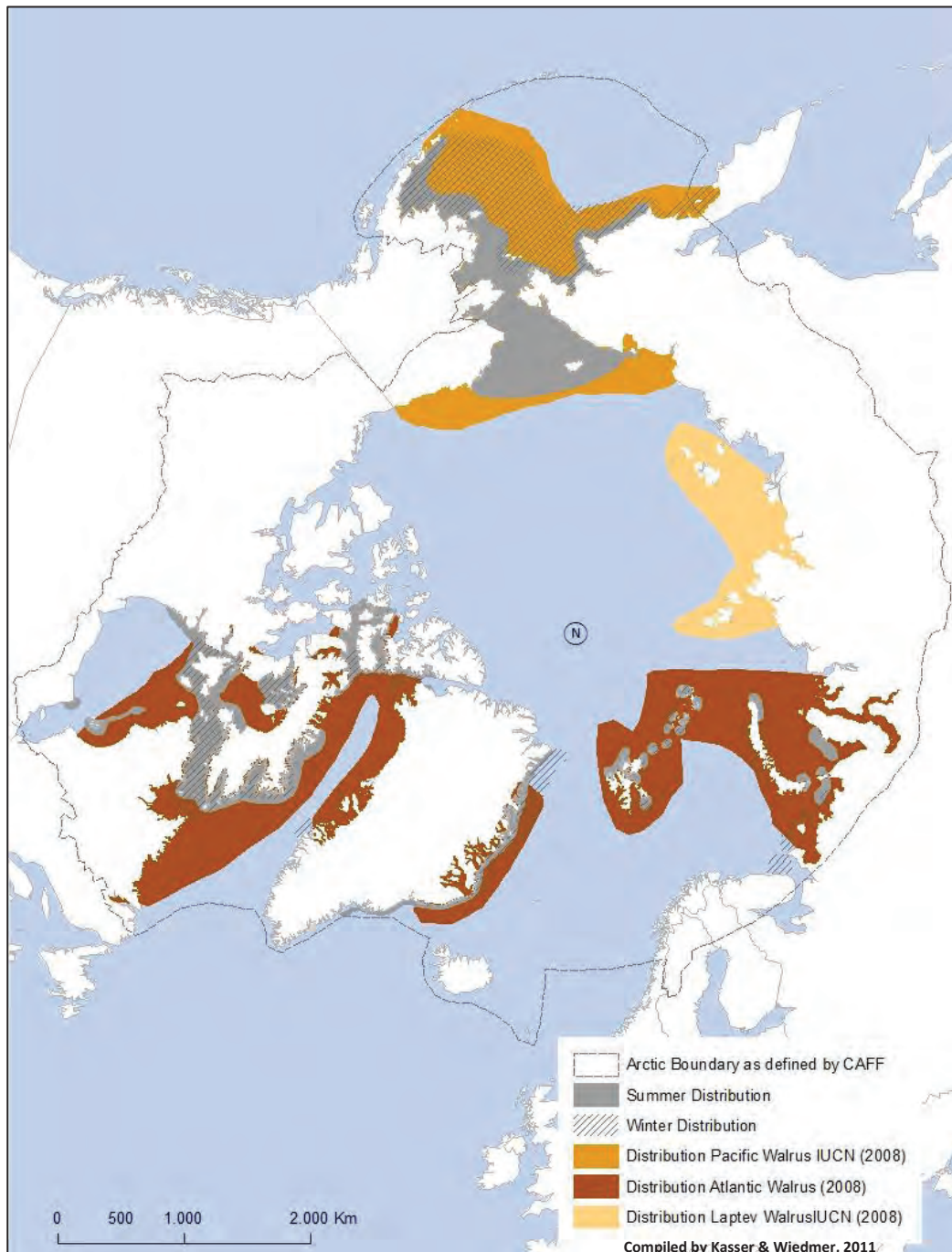
Walrus are unevenly distributed throughout the circumpolar sub-Arctic and Arctic (Figure 1.3) (Lowry *et al.*, 2008). They are found primarily in

waters near Canada, Svalbard (Norway), Greenland (Denmark), the United States and Russia (Figure 1.1). Walrus comprise two geographically isolated subspecies: the Atlantic walrus, *O. r. rosmarus*, and the Pacific walrus, *O. r. divergens* (Reijnders *et al.*, 1993; USFWS, 2010b). A third subspecies of walrus in the Laptev Sea, *O. r. laptevi*, has been proposed (and is managed as a separate subspecies in Russia); however, its taxonomic status remains uncertain (COSEWIC, 2006; Lindqvist *et al.*, 2009; Reijnders *et al.*, 1993; Richard and Campbell, 1988). A study by Lindqvist *et al.* (2009) has provided evidence based on DNA analysis suggesting that *O. r. laptevi* be abandoned and that walrus in the Laptev Seas be recognized as the westernmost population of the Pacific walrus subspecies. However, the samples used in this study were from old samples collected in the late 1880s to early 1930s (Lindqvist *et al.*, 2009). In 2013, WWF and Canon led an expedition to the Laptev Sea where DNA-samples were collected from live walrus in the region. The samples have been sent for analysis to be compared with DNA from Atlantic and Pacific walrus, but results are not yet available.

Many publications and reports are inconsistent with use of the terms “population”, “stock” or “sub-population” with regard to walrus 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 and 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.

Figure 1.1

Global walrus distribution



Source: © KASSER AND WIEDMER (2012).

The commercial exploitation³ of walrus from the 18th and 20th centuries significantly reduced the population size and population structure of the species, and some stocks have never recovered. For example, the Northwestern Atlantic population of the Atlantic walrus is now extirpated (COSEWIC, 2006; DFO, 2008; Fay *et al.*, 1989; Richard and Campbell, 1988;). The global conservation status for walrus was last assessed in 2008 by the International Union for the Conservation of Nature (IUCN). The species was designated as data-deficient⁴ in the Red List of Threatened Species with an unknown population trend (Lowry *et al.*, 2008). The global population of walrus is currently estimated at 150,000 to 160,000 animals (approximately 20,000 to 27,000 Atlantic walrus, a minimum of 129,000 Pacific walrus and an estimated 2,000 to 3,000 Laptev walrus) (Appendix A). This estimate is based on the sum of available population estimates for the various stocks; however, not all of these estimates have been accepted by the scientific community. The correction factors used to calculate some of the estimates could still be re-adjusted or modified depending on advice from scientific and management bodies. Such changes would result in adjustments to the final population estimates provided in this report. Therefore, caution should be used when using these aggregated estimates (see Appendix A for additional details).

Furthermore, many estimates are not considered adequate or accurate due to incomplete coverage of areas, and in some cases they are no more than educated guesses. Population estimates are very difficult because walrus occur in patches over vast and remote areas. Aerial surveying methods are

most often used, but these can be time-consuming, expensive and inaccurate, because an unknown proportion of the population may be hidden in the water at any given time (NAMMCO 2004a). Therefore, it is likely that there are more animals than are actually observed or estimated. An additional complication is that walrus may conduct seasonal movement divided by sex and age, which makes precise total population estimates difficult to obtain. In the span of a few days, large numbers of walrus could move from one area to another haul-out site.

Some of the main anthropogenic threats to walrus include hunting activities, noise disturbance and industrial activities. Commercial fisheries, oil and gas development, and shipping activities can cause disturbances to walrus during feeding or near haul-out sites. These activities do not currently appear to be a significant threat to the species; however, all these activities have the potential to impact walrus in the future (COSEWIC, 2006; Miller *et al.*, 2011). As sea ice melts, areas which were previously inaccessible may see increases in industrial activity or ship traffic, which may increase risk of oil spills and other pollutants. Noise from seismic activity, ships and aircraft could disturb walrus and cause them to flee from or even abandon haul-out sites for ones less disturbed (COSEWIC, 2006; Miller *et al.*, 2011). Disturbances may also increase the risk of natural mortality if animals stampede to the water and are trampled by other walrus; this has occurred more frequently in recent years. Other threats include disease and predation, changes to prey sources, alteration and destruction of habitat, and other natural mortality events, such as stampede events

³ Commercial harvest of wildlife is defined as “the act of killing wild animals or plants primarily for economic benefits. Subsistence hunting and sport hunting are not considered to be commercial harvest” (Eggers and Carroll, 2011). 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).

⁴ “A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat.” (IUCN, 2008).

(COSEWIC, 2006; Miller *et al.*, 2011). Threats to some walrus habitat are primarily influenced by loss of sea ice. Since loss of sea ice is considered a primary threat to walrus and could potentially impact hunting activities (and resulting trade) in the future, climate change is discussed in more detail in Section 1.2.2 Climate change in the Arctic ecosystem.

Atlantic walrus

There is ongoing debate on how many stocks exist within the Atlantic walrus subspecies and whether they should be labelled as stocks, populations or subpopulations. There are two general regions of distribution for Atlantic walrus: one in the western Atlantic Arctic and one in the eastern Atlantic Arctic. However, several stocks have been recognized within these regions (Reijnders *et al.*, 1993). The Atlantic walrus inhabit the coastal areas throughout the eastern Canadian Arctic, Greenland, Svalbard (Norway) and the Russian Arctic (COSEWIC, 2006; DF0, 2000; NAMMCO, 2004a), with the majority of Atlantic walrus found within northern Canada and Greenland. In winter, Atlantic walrus are found in areas where ice is thick enough to support their weight and in close proximity to leads or polynyas (open water areas surrounded by sea ice) (Born *et al.*, 1995; NAMMCO, 2004a; Steward, 2008b). Atlantic walrus breed in restricted areas of open water or near polynyas (Steward, 2008b). In summer, they are found in herds (ranging from a few individuals up to a thousand animals) hauled out on ice or land. They are typically segregated by sex and age, with adult males forming separate groups. However, mixed herds are not uncommon (Born *et al.*, 1995; NAMMCO, 2004a; Steward, 2008b).

The current population estimate for the Atlantic walrus is based on known estimates for some stocks. A minimum population estimate of approximately 20,000 animals to 27,000 animals was calculated by combining these estimates (see Appendix A). The Atlantic walrus



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population prior to the European discovery of North America numbered in the hundreds of thousands (NAMMCO, 2004a). This rough estimate was based on recorded observations by early explorers, traders and commercial walrus hunting records (NAMMCO, 2004a). However, there is no comprehensive compilation of historical records to estimate initial population levels (COSEWIC, 2006). The global Atlantic walrus population was severely reduced by extensive overharvesting for commercial purposes from the 18th to the 20th century (NAMMCO, 2004a). Since population estimates for each stock are not all well quantified, it is difficult to determine trends of increase or decrease (NAMMCO, 2004a).

Pacific walrus

Pacific walrus are larger and have longer tusks than Atlantic walrus. A single population is shared by the United States and Russia, which inhabits the Bering, Chukchi and most likely Laptev Seas. The status of walrus in the Laptev seas is uncertain and unclear on whether they are part of Pacific walrus population or if they are a separate subspecies (i.e. Laptev walrus). However, DNA and data collected from the Laptev Sea in October 2013 may help to resolve the uncertainty.



Occasionally walrus move into the East Siberian Sea and the Beaufort Sea in summer (USFWS, 2010b). In winter, nearly the entire population is found in the Bering Sea on packs of sea ice (USFWS, 1994).

The population size for Pacific walrus has never been known with certainty (USFWS, 2010b; WWF and Nature Conservancy, 2004). Pacific walrus were commercially over-exploited from the 18th to the 20th century which significantly reduced the population (USFWS, 1994). It is speculated that the adoption of quotas in the 1960s allowed the population to increase. By the 1970s and 1980s, walrus researchers were concerned that the population may have reached its carrying capacity⁵ and predicted that the population would likely decrease in response to density-dependent mechanisms (USFWS, 1994; 2013). Reduced

productivity levels in combination with the removal of United States harvest quotas/limits in 1979 resulted in a further population decline (USFWS, 2013).

The current population estimate for Pacific walrus is based on data collected from a joint United States/Russia survey in 2006. A minimum population estimate of approximately 129,000 animals was calculated (see Appendix A) (USFWS, 2010b). However, due to poor weather conditions, a large portion of available habitat was not surveyed (Speckman et al., 2011). Therefore, the population is likely larger and the number provided is considered to be a minimum estimate of population size (Speckman et al., 2011; USFWS, 2010b). Since the historic population size is unknown and past population estimates were highly variable and not comparable

⁵ In population biology, a carrying capacity is essentially the maximum population size of a species that can be sustained indefinitely in a given environment.

between years due to differences in timing of surveys, methodologies and areas surveyed, it is difficult to determine trends of increase or decrease in the population. In 2010, the United States Fish and Wildlife Service (USFWS) established a potential biological removal (PBR) of 2,580 animals for the global Pacific walrus population. Since the total human-caused removal of the global Pacific walrus was estimated to be approximately 4,963 to 5,460 walrus per year (from both the United States and Russia), which exceeds the established PBR of 2,580 animals, the USFWS classified the stock as a strategic stock⁶ (USFWS, 2010b). This survey did not include walrus from the Laptev Sea. In 2013 approximately 2,500 to 3,000 walrus were observed in the region (Sandford, 2013).

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). As a result, future climate change will impact Arctic regions in different ways, both spatially and temporally. These characteristics and features make the Arctic a complex system that has significant inputs to the global climate system (McBean *et al.*, 2005).

Three main Arctic mechanisms can impact climate change for the entire planet: changes in surface reflectivity as vegetation cover changes and as snow and ice melt; changes in ocean circulation as fresh water is added to the ocean by melting Arctic ice; and changes in the amount of greenhouse gases emitted into the atmosphere as Arctic warming progresses (ACIA, 2004). Changes in the global climate system are indisputable and are evident from observations of the increases in the global average air and ocean temperatures, rising global average sea levels (IPCC, 2007), widespread melting of snow and ice (ACIA, 2004; IPCC, 2007), reductions in the thickness and extent of sea ice and thawing permafrost, etc. (ACIA, 2004).

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 both multi-year and seasonal sea ice could affect ice-dependent species in the Arctic (Loeng *et al.*, 2005). The melting of sea ice will result in a loss of habitat for many Arctic

⁶ The US *Marine Mammal Protection Act* (MMPA) defines a strategic stock as "a marine mammal stock: A) for which the level of direct human-caused mortality exceeds the potential biological removal level; B) which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the *Endangered Species Act* of 1973 [16U.S.C.1531 *et seq.*] within the foreseeable future; or (C) which is listed as a threatened species or endangered species under the *Endangered Species Act* of 1973 [16U.S.C.1531 *et seq.*], or is designated as depleted under this chapter (Section 3)."

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 these 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). Aside from potential fundamental changes to the Arctic ecosystem, loss of sea ice may also open up areas in the Arctic that were previously inaccessible to humans and specifically to industrial activities such as shipping, extraction of natural resources such as oil and gas, and commercial fisheries (ACIA, 2005). This will likely increase shipping traffic and hence underwater noise, but how this will affect marine mammals, especially those that communicate by underwater sound, is not known. Changes in sea ice conditions may also prevent hunters from accessing marine mammals. In the fall of 2013, poor weather conditions (fog, winds and fast retreat of ice) meant fewer opportunities to hunt walrus because hunters were not able to get out onto the ice (D'oro, 2013). This resulted in a historically low harvest of walrus – less than 20% of the 10-year harvest for communities of Gambell and Savoonga (Alaska, United States) (D'oro, 2013). The villages rely on the walrus harvest, where meat is a staple food and proceeds of ivory trade pay the utility bills (D'oro, 2013). It was one of the coldest winters to hit the area in decades, and hunters were unable to maneuver their boats past unusually thick ice in the Bering Sea as the walrus herds migrated past (Carlton, 2013).

Walrus

Long-term ecological data for walrus are limited and, like most marine mammals, walrus are difficult to study. Therefore, it is difficult to predict how climate change will impact the species. However, in recent years, concern over loss of summer sea ice and its effect on walrus have increased. Since the foraging success, distribution and densities of many Arctic pinnipeds are associated with suitable ice conditions, it is expected that changes in the sea ice extent

and concentration will affect walrus (Tynan and Demaster, 1997). Walrus are specialists occupying a limited ecological food niche; thus, changes in their main prey base (e.g. bivalves) will likely impact them (MacCracken, 2012). The distribution, type and extent of sea ice vary throughout the Arctic, and climate trends and patterns of change are not uniform and are highly complex (Tynan and Demaster, 1997). Therefore, the effects this could have on marine mammals are expected to vary geographically (Tynan and Demaster, 1997). Consequently, the responses of walrus to climate change may differ between regions and subspecies and will likely be influenced by ice conditions, human pressure (harvest and disturbance) and the availability of prey (Born, 2005a; 2005b; Jay *et al.*, 2010b; MacCracken, 2012). Recent studies have provided some insight into the potential effects climate change could have on the species. However, many of the predictions and hypotheses are largely based on information known about the species, their habitat requirements, projections of summer sea ice extent and their role in the ecosystem.

Like climate change, ocean acidification is also a consequence of rising atmospheric CO₂ (Doney *et al.*, 2009). Until recently, summer sea ice cover has limited the amount of atmosphere ocean exchange possible (Loeng *et al.*, 2005; McBean *et al.*, 2005; Robbins, 2012). However, in the past few decades, melting of summer sea ice has increasingly exposed shelf waters, added freshwater to the ocean and allowed for greater atmosphere ocean exchange to occur (i.e. the Arctic Ocean could potentially absorb more CO₂) (ACIA, 2004; Loeng *et al.*, 2005; Robbins, 2012). As CO₂ is absorbed by sea water, chemical reactions occur that reduce seawater pH and carbonate ion concentrations (Doney *et al.*, 2009; Garlich-Miller *et al.*, 2011; Robbins, 2012). This process is known as ocean acidification. Since the 1800s, pH levels in the ocean have dropped by 0.1 units and predictions suggest pH reductions of 0.3 to 0.5 units by year 2100 (Caldeira and Wickett, 2005; Cumin *et al.*, 2011; Doney *et al.*

al., 2009; Orr *et al.*, 2005). Some organisms, such as clams and snails, require carbonate ions to produce calcium carbonate (aragonite and calcite) which is used for building and maintaining exoskeletons and shell material (Doney *et al.*, 2009; Garlich-Miller *et al.*, 2011; Robbins, 2012). A decrease in concentrations of carbonate ions could place some [important walrus prey] organisms at risk (Garlich-Miller *et al.*, 2011). However, there is currently no direct evidence that suggests changes in ocean acidification have resulted in alterations to walrus distribution, behaviour or population dynamics (MacCracken, 2012).

Changes in the Arctic marine ecosystems may also influence shifts in marine species composition (Grebmeier, 2012). In the northern Bering Sea, for instance, there have been indications of a northward shift to pelagic-dominated marine ecosystems, which were previously limited to the southern Bering Sea (Grebmeier *et al.*, 2006; 2012). The previously ice-dominated shallow ecosystems which favoured benthic communities and bottom feeders may be replaced by ecosystems dominated by more pelagic fish (Grebmeier *et al.*, 2006). This would result in a shift from Arctic to more sub-Arctic conditions (Grebmeier *et al.*, 2006). Changes in species composition combined with the effects of ocean acidification could result in fundamental changes to the walrus prey base and structure. However, to what extent and in what timeframe that may happen are not known.

Atlantic walrus

Atlantic walrus typically segregate according to sex and age class (Born *et al.*, 1995). However, mixed herds (of both sexes and age class) have been known to haul out together on land, even if sea ice is present (Laidre *et al.*, 2008). Many of the productive feeding areas for Atlantic walrus are closer to coastal haul-outs, possibly due to a narrower continental shelf in comparison to larger offshore shelf areas in the Bering and Chukchi Seas used by Pacific walrus (Laidre *et al.*, 2008). Fast ice



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(ice attached to the shoreline) has also been considered one of the limiting seasonal factors excluding Atlantic walrus from some feeding areas (Laidre *et al.*, 2008).

There is speculation that climate change could provide some benefits for Atlantic walrus, at least in areas they occupy currently (Born, 2005a). The islands in the Northeast Atlantic Arctic may provide more terrestrial habitat than areas near Svalbard and Frans Josef Land in the Northwest Atlantic Arctic (Kovacs and Lydersen, 2008).

An earlier sea ice break-up in spring and later sea ice formation in fall would increase the duration of open, ice-free water areas (Born, 2005a; 2005b; Laidre *et al.*, 2008). Prolonged periods of open water conditions could increase the amount of time Atlantic walrus have to access coastal areas, allowing them to spend more time inshore (Born, 2005a). Prolonged access to foraging areas could enhance body conditions (i.e. allow walrus to acquire more blubber), enabling them to better withstand and survive winter conditions (Born, 2005a; 2005b). However, if the population grows, competition for food and other resources will increase (Born, 2005a). Whether the current prey source is able to withstand increased foraging by Atlantic walrus and whether walrus are able to switch to alternative food sources if this occurs is unclear (Born, 2005a). However, there are areas in which Atlantic walrus do prey upon seals (Born *et al.*, 1995; NAMMCO, 2004a), which could eventually become an important alternative food source (Born,

2005a; Born *et al.*, 1995). Factors which contribute to low primary productivity in some Arctic waters include low temperatures, solid ice cover and limited sunlight, and nutrient availability (Born, 2005a). Reduced ice cover and shorter periods of ice coverage would allow sunlight to penetrate to a greater depth in the water column, which could potentially increase marine primary production (Born, 2005a; 2005b; Laidre *et al.*, 2008).

Available information about Atlantic walrus has been used to make inferences and hypotheses about the effects climate change could have on the species. However, there are no scientific studies or research into this particular topic. Until such research is conducted, available information is insufficient to make firm conclusions or to predict what effects climate change could have on Atlantic walrus.

Pacific walrus

Pacific walrus movements and distribution appear to be closely associated with seasonal variations of sea ice (MacCracken, 2012). Within their range, Pacific walrus inhabit areas with unconsolidated ice in close proximity to polynyas, open leads and ice-divergent regions (Jay *et al.*, 2011; Ray *et al.*, 2006; Tynan and Demaster, 1997). In winter, the majority of the population aggregate in large groups in the Bering Sea near broken pack ice that is thin enough for them to break through, but thick enough to support their weight (Born, 2005b; Jay *et al.*, 2010a; 2010b; Jay and Fischbach, 2008; MacCracken, 2012; Rausch *et al.*, 2007; Ray *et al.*, 2006; Tynan and Demaster, 1997). In spring, the majority of young walrus and females follow the receding sea ice north into the Bering Strait. By late June or July, they are distributed throughout the Chukchi Sea, using seasonal sea ice as resting and foraging platforms (Fay, 1982; Jay *et al.*, 2010a; 2010b; Jay and Fischbach, 2008; Krupnik and Ray, 2007; MacCracken, 2012; Rausch *et al.*, 2007; USFWS, 2009b). In contrast, the majority of adult males stay in the Bering Sea during summer, foraging from

coastal haul-outs in Alaska and Chukotka, and they stay in these regions until September or October (Fay, 1982; Jay *et al.*, 2010a; 2010b; Jay and Fischbach, 2008; Krupnik and Ray, 2007; MacCracken, 2012). Little is known about their fall migration, but it is suspected that as the sea ice begins to form in fall, Pacific walrus in the Chukchi Sea migrate south through the Bering Strait, often ahead of the freezing pack ice. They gather on coastal haul-outs from November to December while waiting for thick sea ice to form which can support their weight (Krupnik and Ray, 2007). Once the ice conditions are favourable, they aggregate in groups on the sea ice which transports them to the central Bering Sea (Krupnik and Ray, 2007).

An earlier, more extensive sea ice retreat beginning in June and lasting until September, and a freeze-up delayed until October and November, have been observed in recent years (Jay *et al.*, 2012). Hunters in Alaska have also observed changes in Pacific walrus migration, with spring migration occurring a month earlier and fall migration delayed by a month (MacCracken, 2012). Thus, Pacific walrus are arriving earlier, occupying more northern regions of the continental shelf and leaving later than has been observed in the past (Jay *et al.*, 2012). Pacific walrus are now foraging in nearshore areas rather than offshore areas (Jay *et al.*, 2012). In the past, young walrus and females did not typically use coastal haul-outs, possibly because of the limited distances they can travel to forage (especially females with calves in tow) or possibly to reduce calf mortality from potential trampling at crowded coastal haul-outs (Laidre *et al.*, 2008; MacCracken, 2012). The reduction of summer sea ice has increased the use of coastal haul-outs by young walrus and females (Jay *et al.*, 2011; Kavry *et al.*, 2008) both in Alaska (United States) and Chukotka (Russia).

In some instances, this has resulted in large aggregations of Pacific walrus at new coastal haul-out sites (e.g. Cape Kozhevnikov) and the revival of inactive or old coastal haul-out sites (e.g. Cape

Vankarem) (Bultunov *et al.*, 2008; Kavry *et al.*, 2008; Kochnev, 2006). In summer and fall of 2007 and 2009, thousands of Pacific walrus used haul-outs along the coast of northwestern Alaska and tens of thousands did so along the coast of northern Chukotka; this was not a common occurrence in the past (Associated Press, 2007; Bultunov *et al.*, 2008; Jay *et al.*, 2011; Joling, 2009b). In 2010, approximately 120,000 Pacific walrus were observed on coastal haul-outs on Russia's Cape Serdse Kamen in Chukotka (MacCracken, 2012). If adequate sea ice exists (as it did in 2008), Pacific walrus will not typically haul out on land (MacCracken, 2012).

As Pacific walrus gather in high densities on coastal areas, a stressful environment can be created for animals that are tired, weak and hungry (Kavry *et al.*, 2008; Kochnev, 2004). This makes them vulnerable to disturbances in which anthropogenic or predator stimuli can cause Pacific walrus to panic and create a stampede as they flee to the water (Jay *et al.*, 2011; Kavry *et al.*, 2008; Kochnev, 2004; MacCracken, 2012). During such an event, many animals (often juveniles and calves) are trampled by other walrus (Jay *et al.*, 2011; Kavry *et al.*, 2006; MacCracken, 2012). Many of these animals become injured and some die from their injuries (Kochnev, 2004). Some coastal haul-outs are situated on steep, rocky slopes which exacerbate mortality during a stampede (Kavry *et al.*, 2008). As Pacific walrus crowd these areas, they also increase the likelihood of erosion and rock slides which can also trigger stampedes (Kavry *et al.*, 2006; Williams, 2006). In 2007, thousands of animals were trampled and killed during a stampede event in Russia (Joling, 2009b); and in 2009, over a hundred animals were killed during a suspected stampede event in Alaska (i.e. there was evidence of bruising and injuries consistent with trampling) (Anon., 2009b; Joling, 2009a).

Sea ice provides platforms for offshore feeding, but it also provides constant motion over widely dispersed feeding grounds (e.g. prey patches) (Jay and Fischbach,

2008). As the sea ice recedes, Pacific walrus lose such platforms and must either haul out on coastal areas or follow the receding sea ice to the deep ocean basin where access to food is limited (Cooper *et al.*, 2006; Jay and Fischbach, 2008; Kavry *et al.*, 2008). Even if food is available, the water depth in these areas may exceed their diving capabilities (Kavry *et al.*, 2008). Although Pacific walrus are capable of diving to depths of up to 250 m (Born *et al.*, 2005), they typically feed in waters less than 80 m deep where it is easier to obtain and find prey (Cooper *et al.*, 2006; Jay and Fischbach, 2008). Data from tracked Pacific walrus in 2007 showed that they rested on remnant ice floes over shallow waters of the Chukchi Sea as the main ice edge retreated over deeper waters (Jay and Fischbach, 2008). The data suggested that in order to maintain access to preferred foraging areas, Pacific walrus will exploit sparse ice if it is present (Jay and Fischbach, 2008). Results from a recent study by Jay *et al.* (2010a) suggest that local areas for Pacific walrus activities were independent of the movement of ice floes (at a local scale) and that sea ice movements may not prevent animals from feeding intensely on local benthic prey. Pacific walrus will also travel long distances to reach suitable feeding grounds and, in summer, males will swim to and from coastal haul-outs to foraging areas (Ray *et al.*, 2006).

Nearshore prey populations are likely to be subjected to greater predation pressure as more Pacific walrus use coastal haul-outs (Jay and Fischbach, 2008). The impact this could have on prey sources is not known, and it is unclear whether increased foraging pressure will alter or deplete nearshore prey communities (Jay and Fischbach, 2008). As stated earlier, Pacific walrus play an important role in the Arctic ecosystem and can influence the benthic invertebrate community structure (Jay and Fischbach, 2008). Increased use of land haul-outs by young walrus and females in summer months could also lead to increased energy expenditures from foraging trips due to longer travel distances to access prey (Jay *et al.*, 2011). However, the

energetic consequences of this foraging behaviour are not well understood (Jay *et al.*, 2012).

Jay *et al.* (2010b) developed a model that integrated anthropogenic stresses and potential effects of changing environmental factors for the status of Pacific walrus into the 21st century. Probabilities of robust and persistent status of the population decreased from levels of 95% in 2004 to 78% by 2050 and to 60% by 2095, while probabilities of vulnerable, rare and extirpated increased from levels of five per cent in 2004 to 22% by 2050 and to 40% by 2095 (Jay *et al.*, 2010b). These probabilities indicate a trend to worsening conditions for Pacific walrus. However, the degree of uncertainty increased over future periods, and hunting and sea ice habitat had the greatest influence on probabilities of future population outcomes (Jay *et al.*, 2010b).

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 (Figure 1.2). It is a highly complex and integrated system which encompasses an ice-covered ocean that spans approximately 14 million km². 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,

most notably 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 indigenous peoples and recent arrivals, hunters and herders living on the land, and city dwellers (Huntington *et al.*, 2005b). Indigenous people throughout the Arctic have distinct cultures, traditions and languages and can be subdivided according to different language families⁷ (Figure 1.3), but all have a close connection to their surrounding environment (Huntington *et al.*, 2005b; Nuttall *et al.*, 2005).

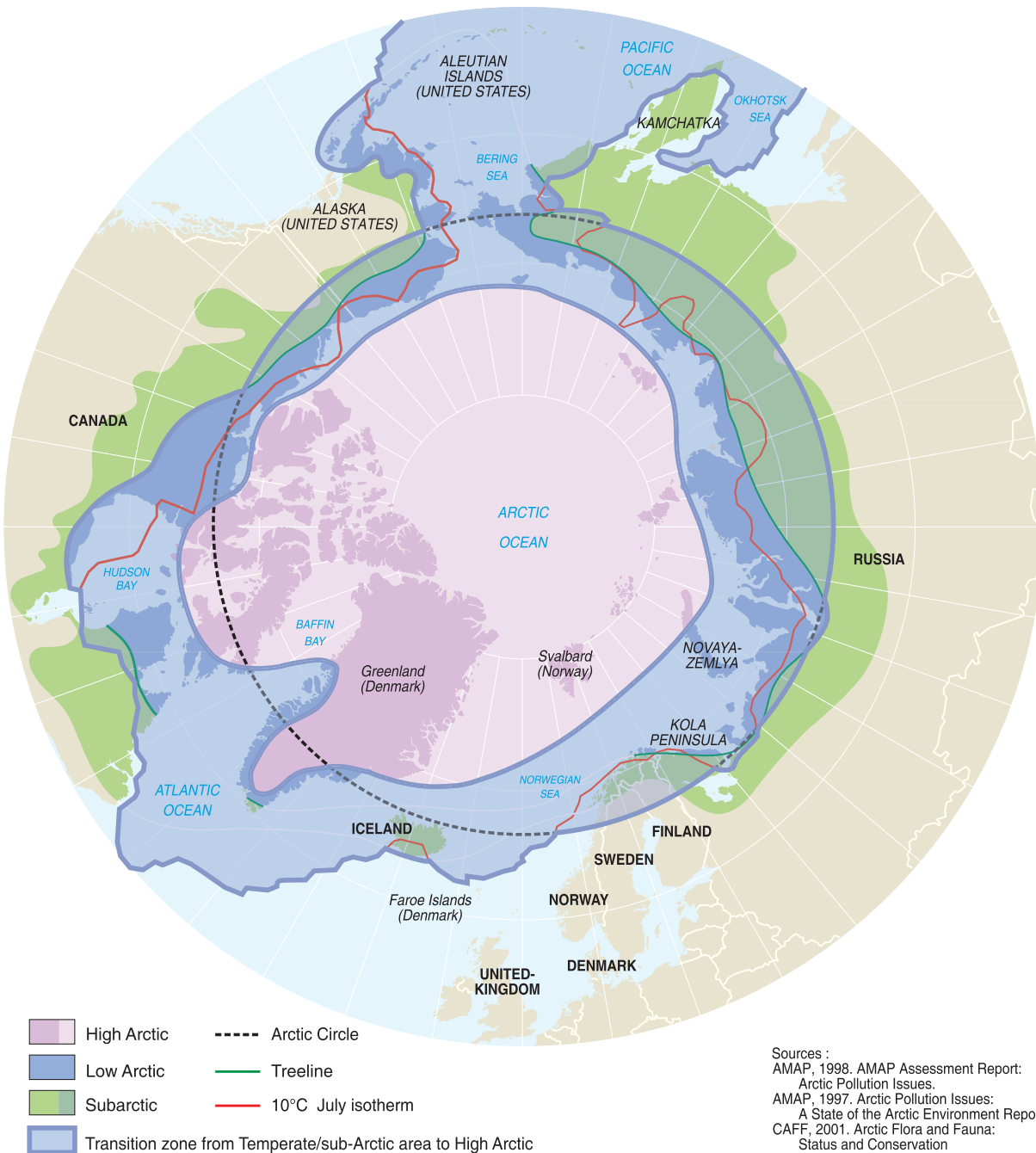
Wildlife is of great spiritual significance and has provided a foundation for the development of many Arctic cultures. Wildlife is often portrayed in mythologies, festivals, oral histories and sacred places (Klein *et al.*, 2005; Nuttall *et al.*, 2005). Many Arctic communities still rely on hunting, fishing, herding and gathering renewable resources as an important part of their livelihood and as a main source of subsistence (Huntington *et al.*, 2005b; Nuttall *et al.*, 2005). These activities provide a strong link 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).

Walrus have been hunted for many centuries. Commercial exploitation of walrus in Canada began in the late 17th century when walrus were hunted for

⁷ The subdivisions of Arctic language families include: Inughuit and Kalaallit of Greenland; Inuit, Inuvialuit, Athapaskans, and Dene of northern Canada; Iñupiat, Athapaskans, Yup'ik, Alutiiq, and Aleuts of Alaska; Yukaghir, Chukchi, Even, Evenk, and Nenets of the Russian far north and Siberia; and the Saami of Fennoscandia and Russia's Kola Peninsula (Nuttall *et al.*, 2005).

Figure 1.2

Definitions of the Arctic



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

Figure 1.3

Demography of indigenous peoples of the Arctic based on linguistic groups



Source: © HUGO AHLENIUS, UNEP/GRID-ARENDAL, 2010.

Note: This figure does not include the Cree of Eeyou Istchee in Québec (Canada) or the six Coastal Cree Nations of Ontario (Canada).

blubber (oil), skins, meat, tusks (ivory), etc. (Reeves, 1978; Born, 2005b; NAMMCO, 2004a; USFWS, 1994). This was the primary cause of the extirpation of the Canadian Northwest Atlantic walrus population (Richard and Campbell, 1988). In Greenland, the commercial trade in walrus products dates back to the late 9th century when walrus parts were a significant trade item for the Vikings. In the 17th and 18th centuries, walrus skins, oil and tusks were important trade commodities in Europe (Born, 2005b). Atlantic walrus were also harvested in Russia (in the Barents and Kara Seas) in the 12th century, mainly for their skins, tusks and blubber, for use in Russia and western Europe (Timoshenko, 1984; Chapsky, 1939). Pacific walrus were harvested in the Russian Arctic in the early 16th century, when tusks were the primary target, and until the middle of the 20th century, skins and blubber were sought (Arseniev, 1927; Chapsky, 1934). Pacific walrus were also commercially harvested in the United States⁸ during the 19th and 20th centuries during the pelagic whaling industry (Bockstoce and Botkin, 1982; Garlich-Miller *et al.*, 2011). This exploitation led to the decline of both the Atlantic and Pacific walrus populations. From 1869 to 1879, an average of more than 12,000 walrus were killed per year and their numbers fell by half (Fay *et al.*, 1989). The population appeared to recover between 1880 and 1900, but exploitation began again and at a higher rate, peaking in the 1920s. In Russia during the 1930s, between 1,000 to 8,000 walrus were killed each year, and by the mid-1950s the population was again reduced to almost half its size (Fay *et al.*, 1989). In Canada, hunting was the main cause of the loss of the Northwest Atlantic population, which is now extirpated (DFO, 2008). However, walrus have not been commercially hunted since 1928 in Canada, since 1937 in the US, since 1952 in Norway and its territories, and since 1956 in Greenland and Russia. At present, walrus are hunted only for subsistence purposes, with the exception of a small sport hunt in Canada (Anon., 1928; 1952; 1956a; 1956b; USFWS 1994).

Historically, walrus were a vital resource providing food, shelter and tools to Arctic communities (Knudtson, 1998; Richard and Campbell, 1988). Walrus meat provided nutrition, hides were used in the construction of skin boats, blubber was a source of oil for cooking and heating, and the tusks were carved into tools, weapons such as harpoon tips, and handicrafts (Knudtson, 1998; USFWS, 1994).

Today, walrus hunting contributes to the subsistence economy in Arctic communities (Anderson and Garlich-Miller, 1994; COSEWIC, 2006). The meat is food for humans and dogs, while the tusks and bacula (penis bones or oosiks) can be sold for additional income (Anderson and Garlich-Miller, 1994; Born *et al.*, 1995; COSEWIC, 2006; USFWS, 1994). The hunt is a traditional activity that contributes to spiritual and cultural well-being (COSEWIC, 2006).

Box 1.1 Edible walrus parts

Many communities in the Arctic consume walrus meat. It can be eaten raw or boiled, or it can be aged (fermented) to make “igunak” or “igunaq” which is considered a delicacy (Anderson and Garlich-Miller, 1994; Born *et al.*, 1995; COSEWIC, 2006; Fall *et al.*, 1991). In some regions the hide, flippers, blubber and organs are also consumed (Fall *et al.*, 1991). The hide can be boiled, cooked with a layer of blubber attached or aged for later consumption. Flippers can be fermented to make “taaqaassaaq”; and small amounts of walrus blubber are also eaten raw or cooked, although seal blubber is more desirable (Fall *et al.*, 1991). Mollusks found inside the walrus stomach are also considered a delicacy (COSEWIC, 2006).

⁸ The State of Alaska was purchased from the Russian Federation on March 30, 1867 and officially became a state of the United States on January 3, 1959 (Gislason, 2010).

Trade⁹ in animal parts has existed for many years, but during the past few centuries, the income acquired from trade in animal parts such as meat, skins, ivory and handicrafts has become important for many Arctic communities (Klein *et al.*, 2005). This income helps cover basic living costs (e.g. heating of homes, goods and services, travel) and helps cover equipment and fuel costs for subsistence activities (Klein *et al.*, 2005). This is particularly important in regions such as the Arctic, where there are few alternate sources of income and the cost of living is very high¹⁰. The products from a walrus hunt are either used by the community (e.g. meat) or traded and sold domestically and/or internationally (e.g. skulls, tusks, handicrafts) (COSEWIC, 2006). The financial return on the sale of items provides an incentive to conserve the species and their habitat. Economic benefits play an important role around the world in ensuring the conservation of wildlife and maintaining healthy populations (CAMPFIRE, 2009; Environment Canada, 2010; USAID, 2009).

1.2.4 Regulating international trade of wildlife

International trade in walrus parts and derivatives is monitored through CITES, which is an international agreement between governments created to ensure that the international trade¹¹ in wild animals and plants does not threaten the survival of those

species (Anon., 1973a; 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., 1973a; 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 supportable NDFs is critical to securing the conservation goals and objectives of CITES. Generally, international trade in species listed in CITES requires the issuance 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-Convention¹² specimens and personal and household effects (Anon., 1973a; Cooper and Chalifour, 2004).

Species listed in Appendix I are those threatened with extinction and international trade in those species must be accompanied by import and export permits (or re-export certificates) which can only be issued under specific conditions (Anon., 1973a). Species listed in Appendix II are those not currently

⁹ For the purposes of this report, the term “trade” does not distinguish the type of trade (e.g. domestic, international, personal, 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.

¹⁰ Due to factors such as a limited consumer market resulting from a low population density and the very high cost of transporting food, fuel and other necessities of life into the Arctic and to remote communities.

¹¹ 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).

¹² 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).

threatened with extinction but could become so if their trade is not regulated;¹³ international trade in those species must be accompanied by export permits (or re-export certificates) which can only be issued under specific conditions (Anon., 1973a). 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 by export permits (from the country listing that species) or certificates of origin (from all other countries) which can only be issued under specific conditions (Anon., 1973a). Unlike Appendix I and II, the issuance of export permits for Appendix III species does not require the exporting country to make an NDF (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 (Anon., 1973a). Walrus are currently listed in Appendix III (by Canada). A summary on walrus with respect to CITES is provided in sections 4.2.1 and further information on CITES can be found in Appendix B.

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 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. Walrus are currently listed on Annex B. A summary on walrus with respect to the EU WTR is provided in sections 4.2.2 and further information on the EU WTR can be found in Appendix B.

A Scientific Review Group (SRG) was established to examine all scientific questions related to the application of the EU WTR and can form opinions regarding the imports of a particular species from a particular country of origin (which are listed under Annex A or B, but not C or D) and whether they comply with the regulations. 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. If the concern is not resolved, the European Commission can impose a formal import suspension which is published in the EU Official Journal (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 trade is allowed, while a “no opinion” means the SRG has concluded there is no trade or insignificant trade.

¹³ Species may also be listed in Appendix II because they cannot easily be distinguished from other species listed in Appendix I or II.



METHODS

The information in this report was compiled via literature review, review of Internet resources and analysis of available international trade data. The authors also conducted interviews with relevant experts and authorities familiar with trade and the management of walrus.

Currency in this report is written as the currency that was provided in the cited works and references. However, the USD currency is provided in parentheses using the conversion rate of the year the cited work was published. All currency conversions used the historical exchange rates provided from 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.

Walrus 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, which holds over 10 million records of international trade data in CITES-listed species. Approximately 700,000 records of data are reported annually and entered into the UNEP-WCMC CITES Trade Database, which can be queried online (UNEP-WCMC, 2010). Walrus range

State export data (Canada, Greenland, Norway, United States, and Russia 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, the 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, the 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, the gross/net trade reports often overestimate the volume of trade because when the quantities reported differ 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 current reports. 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 walrus range States.

The authors excluded data on the international trade in live animals (i.e. for zoos) because the purpose of the report is to look at international trade in walrus

parts and derivatives, not trade in live animals. 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 and/or volume 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 walrus range States (excluding re-export data) were used for the analysis as these data can provide some indication of the impact of international trade on walrus conservation (e.g. removal of an animal from its habitat and export from a range State). 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 data¹⁴ 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 concerns 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 was likely an error in reporting (because walrus never ranged into these countries). In some instances the source country was not indicated, thus resulting in export data that should have been recorded as re-export data. As such, only walrus range States’ export data were included in the analysis.

¹⁴ CITES defines re-export as the export of “any specimen that has previously been imported” (Anon., 1973a).

The analysis included all sources, except for items recorded as confiscated or seized specimens (source code “I”). Specimens recorded as seized or confiscated are relatively incomplete and do not represent all CITES seizures internationally. 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. 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-EU/non-US 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). This means the available data 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 seizure data 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 (e.g. one skull, many bones, many carvings, many teeth, meat). Therefore, determining a finite 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; for example, a skull.

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 five-year trade; instead, the authors provided an 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 item per year as a means to detect trends in international trade. Only trends in the international trade in tusks and skulls (which can be attributed to individual animals) were analyzed separately 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;
- the quantity of skulls exported by each range State according to purpose of export, by year; and
- the quantity of skulls with their destination according to purpose of export, by year.

Information on the value of sport hunting and the value of walrus 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 walrus products from 2009 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*).



HARVEST MANAGEMENT

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.”

Walrus hunting is a regulated and/or monitored activity for most stocks. The species is managed in the range States under each country’s domestic legislation and regulations and in some cases through multi-national agreements (see Appendices B and C for more detailed information). Canada and Greenland are the only range States that allow hunting of Atlantic walrus and walrus in the Laptev Sea, while Norway and its territories and Russia prohibit hunting of Atlantic walrus and Laptev walrus.

The United States and Russia both allow hunting of Pacific walrus for subsistence purposes.

It is not possible to provide a precise number of walrus killed globally during the hunt since the harvest data for range States are compiled using different times scales. Furthermore, animal losses associated with the hunt are not known, or they vary depending on the region, season and year.

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.”

Table 3.1

Walrus killed by country, harvest season 2006/2007 to 2010/2011

SUBSPECIES	RANGE STATE	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	5-YEAR AVERAGE
Atlantic walrus (~13,600 to 20,400 in Canada and Greenland)	Canada/Greenland	597 (836)	342 (463)	288 (393)	344 (469)	436 (604)	401 (555)
	Canada	452 (665)	209 (307)	185 (272)	216 (318)	307 (452)	274 (403)
	Greenland	145 (171)	133 (156)	103 (121)	128 (151)	129 (152)	128 (152)
Pacific walrus (~129,000)	Russia/United States	2,333 (4,022)	3,549 (6,119)	2,220 (3,827)	3,233 (5,574)	2,735 (4,716)	2,814 (4,851)
	Russia	1,047 (1,805)	1,173 (2,022)	778 (1,341)	1,110 (1,914)	1,053 (1,815)	1,032 (1,779)
	United States	1,286 (2,217)	2,376 (4,097)	1,442 (2,486)	2,123 (3,660)	1,682 (2,900)	1,782 (3,072)
Total	All	2,930 (4,858)	3,891 (6,582)	2,508 (4,220)	3,577 (6,043)	3,171 (5,320)	3,215 (5,406)

Source: DFO, (2009; 2013c); Grønlands Statistik, (2011); USFWS, (2013)

Note: Canadian data are compiled from the management year (April 1 to March 31), Greenland data are compiled from calendar year (i.e. data in 2006/2007 column are Greenland data acquired for the 2006 calendar year). Numbers in parentheses are harvest data corrected for animals struck and lost. The correction factors used are based on the struck and lost rates according to the rates used by range States for management purposes (42% for both the United States and Russia; 32% for Canada and 15% for Greenland). Some of these rates have been calculated based on data collected from various studies, while some were from observations during the hunt. Since some of these studies were completed over 20 years ago, the rates used may not be reflective of the actual current rate of animals struck and lost and caution should be used when referring to such estimates. The estimates, including animals struck and lost (in parentheses), were calculated by the authors and are not official government estimates.

However, it is possible to provide a rough estimate of the number of walrus harvested. Reported harvest numbers may be corrected to account for struck and lost animals; however, these rates vary according to the range State¹⁵. According to the available data, on average 3,215 walrus (401 Atlantic walrus and 2,814 Pacific walrus) were harvested globally per year from 2006/2007 to 2010/2011. If the struck and lost factors are applied to the harvest data, on average 5,406 walrus (555 Atlantic walrus and 4,851 Pacific walrus) were killed globally per year. Using the higher mortality estimate which includes struck and lost rates, less than four per cent of the estimated global population of 150,000 to 160,000 walrus were killed during the hunt (see Table 3.1). Broken down by subspecies, this is less than three per cent of the estimated 20,000 to 27,000 Atlantic walrus population and less than four per cent of the estimated minimum 129,000 Pacific walrus population (walrus in the Laptev Sea are fully protected) (see Table 3.1). This is a conservative estimate, considering the actual struck and lost rates may be lower than the estimated correction factors used.

3.1 Canada

Only Atlantic walrus are found in Canada. Seven of the 10 extant stocks occur in Canada: five are found only in Canada and two are shared with Greenland (see Appendix A). An additional population used to be found in Canada but has been extirpated. In Canada, Atlantic walrus can only be hunted by Aboriginal people for subsistence purposes (Hall, 2003) or sport hunting by non-Aboriginals. This has been permitted since 1995 and requires a licence (COSEWIC, 2006). One territory (Nunavut) and one province (Québec, specifically northern Québec, which is known as Nunavik) participate in the subsistence and sport hunts (COSEWIC, 2006).

Atlantic walrus are managed in accordance with various pieces of legislation, regulations and policies in addition to land claims agreements. A summary of these is provided in greater detail in Appendices B and C. In Canada, responsibility for management of wildlife lies primarily with the provinces and territories, except for matters related to international agreements, international trade in wildlife and aquatic/fisheries resources (including marine mammals) which is the responsibility of the federal government (Environment Canada, 2009). In addition, co-management boards and regional governments created under land claims agreements play an essential role in wildlife management decisions (see Appendix C).

Therefore, the management and conservation of Atlantic walrus in Canada falls under the jurisdiction of the federal government: specifically, Fisheries and Oceans Canada (DFO) (Anon 1993a). However, the *Nunavut Land Claims Agreement* (NLCA), signed in 1993, gave Nunavut Inuit the right to harvest walrus in the Nunavut Settlement Area (Nunavut prior to its formation) (Anon 1993b). As per the NLCA, the Nunavut Wildlife Management Board (NWMB) was created in 1994 as an Institution of Public Government (Anon, 1993b; NWMB, 2008b). Although the federal government retains ultimate responsibility for wildlife management, the Nunavut Wildlife Management Board (NWMB) is the main instrument for wildlife management in Nunavut (Anon 1993b; NWMB, 2008b). Within the boundary areas of Nunavut (Areas of Equal Use and Occupancy), wildlife resources are shared with Inuit from Nunavik, who also participate in wildlife management through membership in the NWMB (NLCA, S.40.2.14) (Anon 1993b; Hall, 2003). In Nunavik (northern Québec), the Nunavik Marine Region Wildlife Board (NMRWB) is the main instrument for wildlife

¹⁵ Struck and lost rates have been estimated as the following: up to 42% for (both the US and Russia [Pacific walrus]), up to 32% for Canada (Atlantic walrus) and up to 15% for Greenland (Atlantic walrus). More detailed information is provided in range State summaries in Table 3.1 below.

management in Nunavik (Anon., 2006b; NMRWB, 2010). Regional Wildlife Organizations (RWO) and the Hunters and Trappers Organization (HTO) are co-managing partners who play an important role in the management of walrus by regulating harvesting practices, techniques and management among their members (Anon., 1993b; COSEWIC, 2006). As such, DFO, the co-management boards and resource user groups share responsibility for the conservation and management of Atlantic walrus in Canada (Hall, 2003; COSEWIC, 2006).

The DFO Science Sector is the basis for sound decision making, providing all scientific information and advice on marine and aquatic issues, including species at risk and environmental impact assessments (DFO, 2013e). To help inform management and policy decisions, the DFO Science Sector provides information on the risks of such decisions and the likelihood of achieving policy objectives under alternative management tactics and strategies. DFO's science advisory processes are managed by the Canadian Science Advisory Secretariat (CSAS) which coordinates the peer review of scientific issues for DFO (DFO, 2013e). Although Canada is not a signatory to the North Atlantic Marine Mammal Commission (NAMMCO), which provides scientific advice on harvest sustainability, Canada does participate as an official observer nation (see Appendix B for more information on NAMMCO).

3.1.1 Hunting regulations

Commercial hunting of walrus was banned in Canada on June 20, 1928, when regulations on the protection of walrus in the Hudson Bay and adjacent waters were introduced. This regulation, also known as the *Walrus Protection Regulations* (PC1036), prohibited the hunting of walrus by non-Aboriginals (Anon, 1928). The regulations were amended many times and finally replaced in 1993 with the current *Marine Mammals Regulations* (SOR/93-56) (Anon.,

1993a). Provisions for walrus hunting in Canada are currently implemented through the *Marine Mammals Regulations* (SOR/93-56) under the enabling statute, the *Fisheries Act of Canada* (R.S., 1985, c. F-14).

A Total Allowable Harvest (TAH) has been established for some wildlife in Nunavut; however, no such levels have been established for walrus. The NWMB requested that DFO provide advice on TAH levels for walrus. However, due to the poor quality of information on minimum population size and little data for losses associated with the hunt, DFO was not able to provide valid scientific advice on TAH for most walrus stocks in Nunavut. Improved information on both population estimates and hunting losses were needed before a valid assessment could be made. In 2011, the NWMB was asked to establish the basic needs level for beluga, narwhal and walrus, and doing so would require information on the TAH.

There is much uncertainty as a result of insufficient data, such as accuracy of population estimates, reported landings (harvest statistics), reporting of hunting losses and little information on struck and lost rates (which vary widely and should be quantified by community and type of hunt). Such uncertainty affects the calculation of TAH; however, it does not affect the estimation of PBR from which Total Allowable Removals (TARs) are calculated (DFO, 2013b; Stewart and Hamilton, 2013).

In November 2013, using the best available information, DFO published TARs for six of the seven Canadian stocks. DFO Science used the PBR method to provide advice on sustainable harvest for data-poor populations (walrus are considered data-poor under the Precautionary Approach). Data from several aerial surveys were used to calculate the TAR levels. The sum of the recommended TARs for stocks in the high Arctic population is 27 to 31 animals; more specifically 10 to 11 animals for the Baffin Bay stock, seven to eight animals for the west Jones Sound stock and 10

to 12 animals for the Penny Strait-Lancaster Sound stock. As a whole, the central Arctic population lacks sufficient data for a meaningful population estimate and advice on TARs. However, the TAR for both the north and central Foxe Basin stocks is 106 to 166 animals in total and 18 to 30 animals for the Hudson Bay-Davis Strait stock. The relationship between the six stocks and the walrus distributed in the seventh stock (south and east Hudson Bay) is unknown and a TAR could not be recommended as there are no reliable population estimates for the stock (DFO, 2013b; Stewart and Hamilton, 2013).

The assessment did not suggest any immediate concerns about the sustainability of the high Arctic walrus population; however a better understanding of walrus movements and total hunting mortality (from Canada and Greenland) is needed before assessing the sustainability of a cumulative harvest. Insufficient data on the central Arctic population makes it difficult to calculate meaningful population estimates and advice on TARs. This is partly attributed to incomplete surveys of areas where walrus are, survey counts being negatively biased, adjustment factors being based on small samples or data from other areas, animal losses not being reported and incomplete harvest statistics. Similarly, a better understanding of walrus movements and more complete harvest statistics are needed on the central Arctic population before assessing the sustainability of a cumulative harvest (DFO, 2013b; Stewart and Hamilton, 2013).

In 1998, the NWMB approved the establishment of a Walrus Working Group (WWG) composed of representatives from DFO, Makivik Corp., NWMB, Qikiqtaaluk Wildlife Board and representatives from the communities of Arctic Bay, Cape Dorset, Coral Harbour, Hall Beach, Igloolik and Sanikiluaq (IAND, 1999; 2000). The WWG met in 1999 to discuss the development of a walrus management plan (IAND, 2000; NAMMCO, 2004a). Changes to walrus management in Nunavut must consider the

views of Nunavut [and Nunavik] Inuit, traditional Inuit knowledge and the best available scientific information, and this is facilitated through walrus working groups (NWMB, 2013a).

The Foxe Basin walrus working group (established in 2007) and the Baffin Bay-High Arctic walrus working group (established in 2010) are therefore made up of representatives from HTOs, RWOs, Nunavut Tunngavik Incorporated (NTI), DFO, NWMB, and communities of Arctic Bay, Grise Fiord, Hall Beach, Igloolik, Pond Inlet and Resolute Bay (DFO, 2013a; NWMB, 2013a). These working groups are collaborating on the development of a draft Integrated Fisheries Management Plan for walrus in Nunavut (DFO, 2013a; Minister of Aboriginal Affairs and Northern Development, 2011). The groups have discussed management issues, developed maps and terms of reference, consulted with communities and drafted text for the Integrated Fisheries Management, which is still under development (DFO, 2013a).

Hunting tags and licences are not required for all walrus hunting activities in Canada. However, any person authorized to hunt walrus must keep a record for a period of two years after any activity, and produce records when required to do so by a Fisheries Officer. These records are to include information on the time and place the walrus was taken, the sex and colour of the animal (Anon., 1993a). Box 3.3 provides a summary of regulations in Canada (Anon., 1993a).



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Box 3.3 Marine Mammals Regulations of the Canadian Fisheries Act

Source: Anon., 1993a.

- Subject to section 6, no person can fish for marine mammals unless under the authority of a licence (Section 5).
- Only an Indian or Inuk (or beneficiary covered under the agreement which they are enrolled) may hunt up to four walrus a year for food, social or ceremonial purposes without a licence (Section 6).
- Walrus which are killed must be done in a manner that kills them quickly and the hunter must have proper equipment to retrieve it (Section 8 and 9).
- Hunters must make a reasonable effort to retrieve wounded or killed walrus without delay, should not discard or abandon it, and must not waste any edible parts of it (Section 10).
- No person (other than Indian, Inuk or beneficiary covered by agreement) shall buy, sell, trade or barter edible parts of a walrus (Section 13).
- A marine mammal transportation licence is required for transportation of walrus parts from one province/territory to another (Section 15 and 16).
- Walrus taken must be recorded, and include information on the time, place, and sex of the walrus taken. The record must be kept for a period of two years and presented to a fisheries officer if ever requested (Section 17).
- If a hunter chooses to use firearms, they are permitted to use either a rifle with bullets that are not full metal jackets or a shotgun with rifled slugs where both weapons must exceed the muzzle energy of 2033.8 joules (1,500 foot pounds). Any other firearm is not permitted (Section 25)
- No one may hunt for walrus once a notice has been given out by a Fisheries Officer that the annual fishing quota has been reached (Section 26).

Quotas

There are no established national quotas for Canada. As per the *Marine Mammals Regulations*, an Inuk or Indian may take up to four walrus in a year without a licence unless a community quota is in place. Community quotas exist in Coral Harbour where they are allowed 60 walrus per year, and in Clyde River where they are allowed 20 per year, as well as 10 per year in Sanikiluaq and 10 per year in Arctic Bay. After a Fisheries Officer gives notice that the community's annual quota has been reached, walrus hunting must cease (Anon., 1993a).

Sports hunting

Although sport hunting is not permitted under the Marine Mammal Regulations, the NLCA does permit Inuit to assign their individual hunting rights to others (DFO, 2003). Walrus sport hunts have been approved annually since 1995 (COSEWIC, 2006). Sport hunters are allowed to take the tusks, skull and baculum home with them, depending on the import requirements of their country; however, the meat must stay in the community (COSEWIC, 2006). Non-Aboriginals may hunt under a licence issued by DFO (Hall, 2003) and sport hunt applications from communities in Nunavut and Nunavik are reviewed by the NWMB annually

Table 3.2

Number of walrus killed by sport hunt in Nunavut, 1999/2000-2010/2011

CANADIAN POPULATION	REGION	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
Up to 19,000 animals (includes stocks shared with Greenland)	Baffin region	10	7	13	14	15	10	15	6	0	0	0	0
	Hall Beach	0	1	0	4	1	0	3 (15)	4 (15)	-	-	0 (10)	0 (15)
	Igloolik	10	6	12	10	14	10	12 (25)	2 (25)	Nd (25)	M	M	-
	Cape Dorset	0	0	1	0	0	0	0 (2)	-	-	-	-	-
	Grise Fiord	-	-	-	-	-	-	-	-	-	0 (5)	-	-
	Kimmirut	-	-	-	-	-	-	0 (3)	0 (2)	-	-	-	-
	Pangnirtung	-	-	-	-	-	-	-	-	-	-	0 (10)	-
	Qikiqtaaluaq	-	-	-	-	-	-	0 (5)	0 (5)	-	-	-	-
	Kivalliq Region	0	0	2	2	0	0	2	3	0	4	9	8
	Arviat	-	-	-	-	-	-	-	-	-	-	-	0 (6)
	Coral Harbour	0	0	2	2	-	-	2 (2)	3 (7)	Nd (17)	4 (4)	9 (22)	8 (24)
	Rankin Inlet	-	-	-	-	-	-	-	-	-	Nd (4)	-	-
	Total	10	7	15	16	15	10	17	9	0	4	9	8

Source: DFO (2013c). Data are compiled from management year (April 1 to March 31).

Notes. Figures in parentheses are the number of sport hunts which were approved, while other figures indicate how many approved sport hunts resulted in a successful hunt. Figures do not include struck and lost animals.

M: The Igloolik HTA implemented a moratorium on sport hunting

ND: Data were not reported to DFO

- indicates no sport hunts were conducted

0 indicates the sport hunt was not successful

(Hall, 2003; DFO, 2003). Licences for the sport hunt are subject to approval by the NWMB (COSEWIC, 2006) and reporting struck and lost animals is a requirement of this licence (NWMB, 2013b). The NWMB has developed an interim policy for walrus sport hunts. Prior to approving a sport hunt for a particular community, the NWMB ensures the community has met four conditions:

- “(i) no conservation concern arises;
- (ii) hunter and public safety are maintained;
- (iii) humane harvesting takes place and the whole animal is used; and
- (iv) the developing industry is healthy and will continue to deliver a quality product, thus serving and promoting the long-term economic, social and cultural interests of Inuit harvesters (see NLCA in Appendix C (b) (iii))” (NWMB, 2013b).



Furthermore, until the walrus working group can offer more detailed recommendations, the NWMB is encouraged to apply three criteria when deciding on the number of sport hunts for a community:

- “1. In a community that is not subject to a quota (beyond the individual limit of 4), attempt to ensure that the combination of community and sport hunts does not exceed the average total harvest for the previous 5 years (condition i);
2. Ensure that a hunt plan is in place that meets the safety, humane and other requirements necessary under the NLCA, the Fisheries Act and the Regulations (conditions ii and iii); and
3. Ensure that the community or enterprise starts with a relatively small and closely monitored number of hunts (the “pilot” stage), prior to permitting an expanded sport hunting effort (condition iv)” (NWMB, 2013b).

In the 12 years from 1999/2000 to 2010/2011, approximately 120 walrus were sport-hunted in Nunavut (Table 3.2). The number of approved sport hunts is higher than number of sport hunts which have occurred possibly because hunts may have been cancelled due to poor weather conditions. In most instances, the number of successful sport hunts is less than half of the total that has been approved for sport hunting (Table 3.2).

3.1.2 Hunting seasons, methods and techniques

There is no particular harvesting season within Canada (Anon., 1993a), although some communities conduct the harvest at specific times of year (e.g. most hunters from Igloolik and Hall Beach hunt on the pack ice during spring and early summer) (NAMMCO, 2006a).

A combination of traditional methods and modern equipment is used for walrus hunting in Nunavut (e.g. traditional sleds towed by snowmobiles, boats with outboard motors, harpoons with seal skin lines and floats or modern floats) (NAMMCO, 2004b). Hunters from some communities must travel long distances to access areas with walrus; only a few communities have easy access to them. As such, hunters may make only one to two hunting trips each year, in which several animals are taken (NAMMCO, 2006a). In most cases rifles used for killing walrus are .30 calibre, .303 calibre or smaller (NAMMCO, 2004b). In some areas, walrus are hunted from boats in open water during summer (NAMMCO, 2004b; 2006a). Hunters often shoot a walrus somewhere in the body to slow it down, which lets them get close enough to harpoon it and then kill it with a lethal shot (NAMMCO, 2004b). Smaller numbers of animals are taken at the floe edge and at breathing holes during winter (NAMMCO, 2004b).

Losses associated with the hunt

Struck and lost refers to animals which are struck (by a bullet or harpoon) but not retrieved. A struck and lost animal may or may not die from its wound(s). Struck and lost rates vary depending on the weather, location, season, hunter experience and animal behaviour (DFO, 2000). Struck and lost rates have been estimated at approximately 30 to 32%; however, Inuk hunters believe loss rates to be lower, closer to five per cent (DFO 2000; COSEWIC, 2006). Reporting of struck and lost animals is required for sport hunts,

but not for subsistence hunts. A maximum struck and lost rate of 32% is used by DFO for management purposes (DFO, 2013a).

Since loss rates can be higher in open water, hunters prefer to kill walrus on ice or land (COSEWIC, 2006). For hunts in shallow water, hunters can harpoon the animal before it is shot to reduce the chance of losing it. It is then retrieved with grappling hooks or at low tide (DFO, 2003). NWMB, DFO and NTI have established a working group of experienced hunters to make recommendations on harvesting methods and equipment used to hunt marine mammals (NAMMCO, 2004b). In March 2013, Nunavut hosted a workshop on marine mammals struck and lost, discussing the issues and potential solutions. Findings of this workshop are not yet publically available.

3.1.3 Harvest statistics

Catch data of Atlantic walrus in Canada are inconsistent, incomplete and vary widely in quality; they are at best rough estimates. However, they are unlikely to be overestimates (NAMMCO Annual Report, 2010; COSEWIC, 2006). The data have been collected from various agencies using different methods and collected for different purposes (COSEWIC, 2006). The annual management year for walrus in Canada is April 1 to March 31. Tables 3.3 and 3.4 provide summaries of the Canadian harvest by jurisdiction for the 1999/2000 to 2010/2011 hunting seasons. Appendix D provides a breakdown of harvest data by community.

Table 3.3

Number of walrus killed during recent subsistence and sport hunt in Canada from 2007/2008 to 2010/2012

CANADIAN ATLANTIC WALRUS POPULATION	PROVINCE/TERRITORY	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012
Up to 19,000 animals (includes stocks shared with Greenland)	Nunavut	142	124	209	265	187
	Including struck and lost estimates	209	182	307	390	275
	Nunavik (northern Québec)	67*	61*	36*	42*	42**
	Including struck and lost estimates	99	90	53	62	62
	Total	209	185	216	307	229
	Including struck and lost estimates	307	272	360	452	337

Source: DFO, (2013c; 2013d). Data are compiled from management year (April 1 to March 31).

Note: Figures include sport hunts. In an attempt to provide an estimate of the maximum number of animals that could be killed during the hunt, harvest numbers were corrected for animals struck and lost using a rate of 32%, a rate which has been used by DFO in the past. The corrected rates were calculated by the authors and were not provided by DFO. As such, the struck and lost estimates are not official government figures.

* Numbers provided by Makivik Corporation in part under the Trichinellosis Prevention Program.

** For 2011/2012, there were two sources of reporting information: a report from the Makivik Corporation under the Trichinellosis Prevention Program and reports by Uumajuit wardens and technicians from the Kativik regional government. In instances of discrepancy, the higher reported number was provided in this table.

Table 3.4

Number of walrus killed during past subsistence and sport hunt in Canada
(1999/2000 to 2004/2005)

CANADIAN ATLANTIC WALRUS POPULATION	PROVINCE/TERRITORY	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007
Up to 19,000 animals (includes stocks shared with Greenland)	Nunavut	241	284	59	368	140	152	262	103	246	395
	Including struck and lost estimates	354	418	87	541	206	224	385	151	362	581
	Nunavik (northern Québec)	76	46	17	3	6	21	42	42	47*	57*
	Including struck and lost estimates	112	68	25	4	9	31	62	62	69	84
	Total	317	330	76	371	146	173	304	145	293	452
	Including struck and lost estimates	466	486	112	546	215	254	447	213	431	665

Source: DFO (2013c; 2013d). Data are compiled from management year (April 1 to March 31).

Note: Figures include sport hunts. In an attempt to provide an estimate of the maximum number of animals that could be killed during the hunt, harvest numbers were corrected for animals struck and lost using a rate of 32%, a rate which has been used by DFO in the past. The corrected rates were calculated by the authors and were not provided by DFO. As such, the struck and lost estimates are not official government figures.

* Numbers provided by Makivik Corporation in part under the Trichinellosis Prevention Program.

3.1.4 Illegal hunting and illegal trade

The authors could find no documented information to suggest illegal hunting or illegal trade is a management concern for Canada. Some offences have occurred and were investigated. From 2003 to 2008, United States and Canada jointly investigated the export of walrus products to the US. Although the animals were legally harvested in Canada, import into the United States contravened United States law. The investigation resulted in charges and fines in the United States (further details in section 3.5.4).

3.2 Greenland

Only Atlantic walrus are found in Greenland. Three of the 10 extant stocks occur in Greenland: one is found solely in Greenland and two are shared with Canada (see Appendix A). Atlantic walrus are harvested in

Greenland primarily for subsistence purposes, and may only be hunted by residents who hunt as a full-time occupation and are in possession of a commercial hunting licence (Anon., 2006a; DFO, 2013a).

Atlantic walrus are managed in accordance with various pieces of legislation, regulations and policies. A summary is provided in greater detail in Appendices B and C. Two ministries are responsible for the management of Greenland's living resources: Ministry of Nature and Environment (previously the Ministry of Infrastructure and Environment), responsible for international agreements, conventions and nature conservation; and the Ministry of Fisheries Hunting and Agriculture, responsible for the management and policy matters for all living resources (JCNB, 2009).

The Department of Fisheries, Hunting and Agriculture is responsible for the management of Atlantic walrus in Greenland (Grønlands Naturinstitut, 2011), and

the local municipal authorities play an important role by assisting in the monitoring of quotas and harvests in the municipalities (Anon., 2006a). Scientific advice on harvest sustainability is provided by NAMMCO's Scientific Committee and the NAMMCO Scientific Committee Working Group on Atlantic Walrus (Grønlands Naturinstitut, 2011).

3.2.1 Hunting regulations

Greenland has regulated walrus hunting in various regions since the late 1920s (Born *et al.*, 1995) and

introduction of a ministerial order in 1956 provided regulations on walrus hunting (Anon., 1956b; 1994). New regulations introduced in 2006 included a quota system for walrus hunting (Anon., 2006a). Provisions for the harvest of Atlantic walrus in Greenland are currently implemented through the *Greenland Home Rule Executive Order No. 20 of 27 October 2006 on protection and harvest of walrus* (Anon., 2006a).

This legislation included protection for calves and females accompanied by calves (Qaanaq is exempt from this) and protection of walrus on land or at

Box 3.4 Executive Order No. 20 of 27 October 2006 on the protection and hunting of walrus

- Walrus are on land or haul-outs are protected. Adult females and females with calves are fully protected (Qaanaq is exempt from this). Hunting of walrus is only permitted in the areas and periods outlined in the regulations (Section 2).
- Walrus hunting is subject to quota restrictions for the following regions and periods (Section 3):
 - ▶ West Greenland from 66° N (southern edge of the mouth of Søndre Strømfjord) and 70°30' N (northwest tip of Hare Island), in the period from 1 March to 30 April, both days included.
 - ▶ North-West Greenland, in the areas north of 70°30' N (northwest tip of Hare Island), in the period from 1 October to 30 June, both days included.
 - ▶ East Greenland, in the local authority districts of Ittoqqortoormiit and Ammassalik, in the period from 1 October to 30 June, both days included.
- Only those in possession of a permit may hunt walrus (Section 5).
- Only those in possession of a valid commercial hunting licence can obtain a permit to hunt walrus. This licence may not be transferred or sold and allows for the catch of one walrus in the quota year in which the licence was issued. (Section 6 & 8)
- The use of airplanes, helicopters, or any kind of motorized vehicles, and vessels over 20 GRT/15 GT are not permitted for hunting walrus or as means of transportation to and from the hunting area (unless approved for removal of *sassat* (or *savssat*) catches in inclement weather). Hunters are permitted to use a rifle with a minimum caliber of .30-06 (7.62 mm). Only full metal jacket bullets are permitted. The use of fully-automatic and semi-automatic rifles are not permitted. A walrus must be harpooned before it is shot, and one or two floats need to be attached to the harpoon. (Section 9)
- The catch and wounding of all walrus must be reported and documented in a hunting form and sent to the local authority as soon as possible (Section 11)

Table 3.5

Quotas for the Atlantic walrus hunt in Greenland, 2006-2012

GREENLAND ATLANTIC WALRUS POPULATION	REGIONS	2006 (OCTOBER TO DECEMBER ONLY)	2007	2008	2009	2010	2011	2012
Up to 5,400 animals (includes stocks shared with Canada)	North Water	-	99	80	75 (-2)*	64 (-16)*	64 (-12)*	64
	West Greenland	60	71	65	38	61 (-1)*	61 (-1)*	61
	East Greenland	15	30	30	23	18	18	18
	Total	75	200	175	136	143 (-17)	143 (-13)	143

Source: Quotas for 2006 (Grønlands Selvstyre, 2009b), quota for 2007 (Grønlands Hjemmestyre, 2007), quota for 2008 and 2009 (Grønlands Selvstyre, 2009a), quota for 2010-2012 (Grønlands Selvstyre, 2011).

Note: Numbers in parentheses are deductions to account for animals that were overharvested from the previous season; they have been deducted from the original quota.

*Exceeded quota in the previous year

haul-out sites. It also regulates the type of hunting equipment permitted, the hunting season and regions in which walrus may be hunted (Anon., 2006a). Box 3.4 provides a more detailed summary of regulations for walrus hunting in Greenland.

The hunting of walrus in Greenland is controlled through a quota system (Anon., 2006a). The quotas are determined in consideration of biological advice, international agreements, users' knowledge, and in consultation with the Hunting Council (Anon., 2006a). Quotas are ultimately determined by the Greenland government but are based on recommendations from the Ministry of Fisheries, Hunting and Agriculture (Anon., 2006a; Grønlands Naturinstitut, 2011). Regional quotas are determined for each of the three walrus stocks that are exploited in Greenland (Anon., 2006a; Grønlands Naturinstitut, 2011) (see Table 3.5).

Quotas are distributed among the local authorities by the Ministry of Fisheries, Hunting and Agriculture after consultations with the Kalaallit Nunanni

Aalisartut Piniartullu Kattuffiatthe Association of Fishermen and Hunters in Greenland (KNAPK) and the Kalaallit Nunaanni Kommuneqarfiit Kattuffia—the National Association of Local Authorities in Greenland (KANUKOKA). The local authorities are responsible for issuing numbered permits to applicants holding valid commercial hunting licences. The local authority controls the allocation of quotas through careful monitoring. Once the quotas are reached, it is the responsibility of the municipal authorities to stop the harvest and notify the Ministry of Fisheries, Hunting and Agriculture that the quotas have been reached (Anon., 2006a).

The hunt is monitored through a licencing and dual reporting system by municipal authorities (Anon., 2006a). Prior to hunting a walrus, a hunting permit must be obtained from the local authority. Only hunters in possession of a valid commercial hunting licence will be issued a permit (Anon., 2006a). A general reporting system (PINIARNEQ) was introduced in 1993, which requires hunters to report

their total harvest of all species for each month (from September to September). A second reporting system was introduced in 2006, which requires hunters to complete a catch report form for each walrus landed (Anon., 2006a; Grønlands Naturinstitut, 2011). Reporting of animals struck and lost is mandatory. After each hunt, any animal harvested or wounded must be recorded by the hunter in a catch reporting form and delivered to the local authority (Anon., 2006a; Grønlands Naturinstitut, 2011). This is in addition to hunters reporting the harvest under the PINIARNEQ reporting system (annual reporting of monthly catches) which is cross-referenced with the hunters' catch report forms (Anon., 2006a; NAMMCO Annual Report, 2010). At the end of each month, the local authority submits the hunting forms to the Department of Fisheries, Hunting and Agriculture (Anon., 2006a).

Although not required under CITES provisions, Greenland has been proactive in making NDF assessments in 2007 and 2011. Results of the 2011 assessment indicated that current levels of exploitation of walrus in Greenland and the export of walrus products from Greenland are not detrimental to the three subpopulations/stocks that range into Greenland (Grønlands Naturinstitut, 2011). In 2010, NAMMCO provided scientific advice on sustainable removals that included landed walrus and animals that were struck but lost. At that time, it was suggested that there was a 70% probability that the population would increase to earlier levels if the combined harvest (Canada and Greenland) were lower than 68 for northwest Baffin Bay, 89 for West Greenland-Baffin Island and 20 for East Greenland (Grønlands Naturinstitut, 2011). In November 2013, the NAMMCO Scientific Committee Working Group on Atlantic Walrus met again to discuss walrus, assess population estimates and provide advice on harvest sustainability. Results from the meeting, such as advice on harvest sustainability, are not yet available.

3.2.2 Hunting seasons, methods and techniques

The hunting of walrus is subject to restrictions and seasons vary depending on the specific geographic area (see Box 3.4).

Walrus are hunted in Greenland by boat or from the ice edge (NAMMCO, 2004b). In both cases walrus must be harpooned prior to being shot. Females and calves are fully protected, except in Qaanaaq (Northwest Greenland) (DFO, 2013a). Airplanes, helicopters and motorized vehicles cannot be used during the hunt (See Box 3.4).

- In West Greenland, fishing vessels (less than 20 Gross Register Tonnage [GRT]) are also used for hunting walrus; the animal is first harpooned before being shot (Anon, 2006a). Walrus are also shot on the ice or in open water (NAMMCO, 2004b).
- In Northwest Greenland, walrus are primarily hunted from small boats or fishing vessels in May and June and in October, and sometimes at the floe edge using dog sleds (DFO, 2013a; NAMMCO, 2004b; WWF-Denmark, 2005). Walrus are also hunted at breathing holes (NAMMCO, 2006a) and when the ice first appears in late fall, they are hunted at the floe edge (NAMMCO, 2004b).
- In East Greenland, walrus are hunted in open water from small boats, from land or from the ice edge (NAMMCO, 2004b; WWF-Denmark, 2005). Walrus are also taken while they rest on the ice (WWF-Denmark, 2005).

Losses associated with the hunt

Loss rates vary with location, season, hunting method and hunter skill (NAMMCO, 2004a). Firearms have made killing walrus easier, but they have also increased the proportion of animals struck and lost (NAMMCO, 2004b). Loss rates are generally highest for open water hunts and lower for hunts on land and

at ice haul-out (NAMMCO, 2006a). The experience, skill and judgment of the hunter are important factors determining the incidence of struck and lost animals (NAMMCO, 2006a). The estimated loss rate varies from as low as zero (reported by hunters) to 15 to 25% (observed by scientists in the 1970s) (Born *et al.*, 1995; Grønlands Naturinstitut, 2011). A rate of approximately 15% has been accepted by NAMMCO as an estimate for animals lost (Grønlands Naturinstitut, 2011). The regulations introduced in 2006 require that any animals struck and lost are recorded (Anon., 2006a); however, these figures were not available to the authors.

3.2.3 Harvest statistics

From 1999 to 2005 (prior to introduction of quotas), approximately 2,044 walrus were harvested. The lowest number killed in one year was 194 and the

highest was 343, for an average of 292 walrus per year (Table 3.6). From 2006 to 2010 (after introduction of quotas), approximately 637 walrus were harvested, with a low of 103 and a high of 145, for an average of 127 walrus per year (Table 3.6). Appendix D provides a breakdown of harvest data by community.

3.2.4 Illegal hunting and illegal trade

The authors did not find documented evidence of illegal hunting or illegal trade of walrus in Greenland.

3.3 Norway

The Directorate of Fisheries is responsible for the overall policy and political matters regarding walrus management in Norway (S.T. Stub, Advisor for the

Table 3.6

Number of walrus killed in Greenland from 1999 to 2010 (quotas introduced in 2006)

GREENLAND ATLANTIC WALRUS POPULATION	PROVINCE/TERRITORY	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Up to 5,400 animals (includes stocks shared with Canada)	North Water	128	43	194	171	181	99	137	72	80	66	91	60
	including struck and loss estimates	151	51	228	201	213	116	161	85	94	78	107	71
	West Greenland	146	264	93	91	77	76	95	60	43	28	33	62
	including struck and loss estimates	172	311	109	107	91	89	112	71	51	33	39	73
	East Greenland	26	7	10	34	11	4	16	5	10	9	4	6
	including struck and loss estimates	31	8	12	40	13	5	19	6	12	11	5	7
	Other regions	11	15	46	35	15	15	4	8	-	-	-	-
	including struck and loss estimates	13	18	54	41	18	18	5	9	-	-	-	-
	Total	311	329	343	331	284	194	252	145	133	103	128	128
	including struck and loss estimates	366	387	404	389	334	228	296	171	156	121	151	151

Source: Grønlands Statistik (2011); NAMMCO Annual Report (2011). Data are compiled from calendar year (i.e. January 1 to December 31).

Note: In an attempt to provide an estimate of the maximum number of animals that could be killed during the hunt, harvest numbers were corrected for animals struck and lost using a rate of 15%, a rate which has been accepted by NAMMCO. The corrected rates were calculated by the authors and were not provided by the Greenland government. As such, the struck and lost estimates are not official government figures.

Directorate of Fisheries, in litt. to T. Shadbolt, March 31, 2009). Walrus hunting has not been permitted in Norway or its territories since 1952 (Anon., 1952; Born et al., 1995). A summary of regulations and legislation pertaining to Atlantic walrus in Norway and Svalbard is provided in Appendices B and C. The authors did not find documented evidence of illegal hunting or illegal trade of walrus in Norway.

3.4 Russia

All walrus subspecies are found in Russia. Two of the extant Atlantic walrus stocks are found in Russia; one is found only in Russia and another is shared with Norway (see Appendix A). Although the taxonomic validity of the Laptev walrus is debated in the scientific community (the debate centres on whether it is a separate subspecies or the westernmost population of Pacific walrus), the Russian government recognises and manages it as a separate subspecies (NAMMCO Annual Report, 2010; Lindqvist *et al.*, 2009; Reijnders *et al.*, 1993; Vaisman *et al.*, 2009). Pacific walrus comprise a single population that is shared with the United States.

Walrus in Russia are managed in accordance with various legislation, regulations, and policies. A summary is provided in greater detail in Appendices B and C. Atlantic and Laptev walrus are fully protected (including no subsistence hunting) and both are managed by the Department of State Policy and Management of Hunting and Wildlife of the Ministry of Natural Resources and Ecology of the Russian Federation (Vaisman *et al.*, 2009). Only Pacific walrus may be hunted by indigenous people inhabiting Chukotka for subsistence purposes (Vaisman *et al.*, 2009). The Federal Fishery Agency's Division of Fisheries Inspection is responsible for the management of Pacific walrus in Chukotka (Meek *et al.*, 2008). Several non-governmental organizations, including the Association of Traditional Marine Mammal Hunters of Chukotka (ChAZTO), share monitoring and management activities concerning

Pacific walrus. The ChAZTO Pacific Walrus Commission was formed in 1997 (Lunn *et al.*, 2002). Bilateral workshops were held in 1994 and 2004 between non-governmental Russian groups and local and federal groups in the United States to facilitate the exchange of information on Pacific walrus harvesting (Meek *et al.*, 2008). Since 1975, United States and Russian scientists have conducted several joint population studies of walrus under the 1972 bilateral Agreement on Cooperation in the Field of Environmental Protection (MMC, 2003).

3.4.1 Hunting regulations

Regulations for walrus hunting were first provided in 1921 for specific areas of the Russian Arctic. In November 1956, the Russian Soviet Federated Socialist Republic (RSFSR) Council of Ministers issued Decree No. 738 *On Protection of Arctic Animals* which prohibited the hunting of all walrus subspecies with the exception of subsistence hunting (Anon., 1956a; Vaisman *et al.*, 2009). Full protection for both Atlantic and Laptev walrus was provided in 1982 when they were listed in the Red Data book, which prohibited all hunting (including subsistence) (Anon., 1982a). Only the Pacific walrus may now be hunted for subsistence purposes (Vaisman *et al.*, 2009).



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Before the late 1950s, hunting of Pacific walrus was largely unregulated. From the 1930s to 1950s, a vessel-based commercial hunting program sponsored by the USSR government was initiated (Fay, 1982). It has been speculated that up to 8,000 animals (not including those struck and lost) were harvested annually through this program (Fay, 1982). The Pacific walrus population was greatly depleted (Fay *et al.*, 1997). To curtail this decline, strict quotas were introduced and the harvest was limited almost entirely to male walrus. These restrictions greatly reduced the harvest and provided protection for females and calves (Garlich-Miller *et al.*, 2006). From 1972 to 1982, quotas were set at 2,000 animals per year, but from 1982 to 1993 quotas ranged from 3,600 to 4,000 (Grachev, 2004). In 1993, quotas were reduced to 3,000 animals annually (Vaisman *et al.*, 2009). In 2004 quotas were reduced to 2,000 and in 2006 and 2007 quotas were reduced again to 1,500 per year. In 2008, quotas were increased to 1,900, decreased to 1,500 in 2009 and decreased again to 1,300 in 2010 (see Table 3.9) (Garlich-Miller *et al.*, 2011).

Prior to 2004, subsistence quotas were issued under Order No. 349 of the Union of Soviet Socialist Republics (USSR) Ministry of Fisheries of 30 June 1986 *On approval of the Rules on conservation and harvesting of marine mammals*. This order also regulated hunting methods, hunting seasons and prohibited sport and amateur hunting. Since 2004, harvest quotas have been set in accordance with the provisions of Federal Law No. 166-FZ *On Fisheries and conservation of Aquatic Biological Resources*. Walrus may only be hunted when a fishery inspector is present, and any animals struck or lost are counted toward the quotas (Vaisman *et al.*, 2009).

Quotas are issued through a decree of the Russian Federal Fisheries Agency and are determined with input from scientists at the Pacific Research Fisheries Center (Chukotka Branch-ChukotTINRO) (Garlich-Miller *et al.*, 2011). Quotas in Chukotka Region are allocated by the local government under

the supervision of local fisheries inspectors. Every settlement on Chukotka gets a portion of the quota. Hunters are issued a set number of licences and are permitted to hunt walrus until their licences are used. Fisheries inspectors collect information such as age and sex for every walrus that is killed (Vaisman *et al.*, 2009).

Pacific walrus are considered a fisheries species and is listed as such under Order No. 131 of the Federal Fisheries Agency of 1 September 2008 *On approval of the list of aquatic biological resources which are considered to be fisheries targets*, but only for subsistence purposes (Vaisman *et al.*, 2009).

3.4.2 Hunting seasons, methods and techniques

Hunting of Pacific walrus in the Chukotka Autonomous Okrug is carried out by all local Native villages on the Pacific and Arctic coasts of Chukotka (NAMMCO, 2006a; NAMMCO, 2004b). Pacific walrus are hunted along the Pacific coast from spring until fall, and on the Arctic coast in summer and fall (NAMMCO, 2004b). In the Bering Sea and in the Sea of Okhotsk, walrus may be harvested from boats and on the coast from April 10 to July 1, and from September 15 to March 1 (Vaisman *et al.*, 2009).

Pacific walrus are hunted on land, on ice and on open water. On land, hunters use harpoons instead of rifles because the sound of a gunshot will often alert the walrus and can cause a stampede. If the area is accessible by boat, walrus are killed using a harpoon/lance. Walrus on the ice floe are shot from a boat or from a neighbouring ice floe. If hunters cannot get onto the ice floe, they will often attempt to harpoon the animal before it enters the water. Boats are used to hunt walrus on the open water. With a rifle, hunters will often injure the animal with a non-lethal body shot so that it can be approached and harpooned before given a lethal shot. Harpoons and attached floats help reduce hunting losses (NAMMCO 2004b; 2006a).

Losses associated with the hunt

According to many researchers, the struck and lost rate for Pacific walrus in Russia ranges from 40 to 50%. However, that rate is dependent of many factors and may vary greatly (NAMMCO, 2004b). Community-based monitoring of Russian walrus hunts suggests that struck and lost rates range between four and 20%. Higher rates are often associated with open water hunts, while rates are lower on land and ice haul-outs (NAMMCO, 2006a). Factors determining

the incidence of struck and lost are the hunter's experience, skill and judgment (NAMMCO, 2006a).

Monitoring of struck and lost animals on Chukotka is done at the local level. To track of the number of walrus harvested and to obtain information on struck and lost animals; a person in each village is designated to observe the hunt and interview hunters. That person collects information on the age and sex of walrus that are taken, and collects teeth samples for ageing and tissue samples for genetic analyses (NAMMCO, 2006a).

Table 3.7

Number of Pacific walrus killed in Russia from 1997 to 2010

RUSSIAN PACIFIC WALRUS POPULATION	YEARS	QUOTA	LANDINGS	ESTIMATED STRUCK AND LOST ANIMALS	TOTAL INCLUDING ESTIMATED STRUCK AND LOST RATES
129,000 animals (includes stocks shared with the United States)	1997	ND	731	529	1,260
	1998	ND	950	688	1638
	1999	3,000	1,670	1209	2879
	2000	3000	1212	878	2090
	2001	3000	1332	965	2297
	2002	3000	1317	954	2271
	2003	3000	1425	1032	2457
	2004	2000	1118	810	1928
	2005	2000	1436	1040	2476
	2006	1500	1047	758	1805
	2007	1500	1173	849	2022
	2008	1900	778	563	1341
	2009	1500	1110	804	1914
	2010	1300	1053	762	1815

Source: Russian data were provided to the USFWS (2013), courtesy of Chukotka TINRO. Quotas are taken from Garlich-Miller et al., (2011).

Note: ND is no data available. In an attempt to provide an estimate of the maximum number of animals that could be killed during the hunt, harvest numbers were corrected for animals struck and lost using a rate of 42%, a rate which has been used by the United States. The corrected rates were calculated by the USFWS and not by the Russian government. As such, the struck and lost estimates are not official figures.

3.4.3 Harvest statistics

According to the most recent available catch data from 2006 to 2010, approximately 5,161 Pacific walrus were landed in Russia over that five-year period. The lowest number killed in one year was 778 and the highest was 1173, for an average of 1,032 animals per year (Table 3.7) (MMC, 2010b; USFWS, 2013).

3.4.4 Illegal hunting

The authors did not find documented evidence of illegal hunting of walrus in Russia. Subsistence quotas in recent years have never been fully used. There may be little incentive for illegal hunting activities.

In August 2008, there were reports of 800 walrus carcasses found on the eastern coast of Chukotka (Federation News, 2008a; 2008b). The Ministry of Natural Resources began an investigation to determine if animals were illegally killed or had died of natural causes. Some of the carcasses appeared to have bullet holes and many had tusks removed (which could have occurred post-mortem). One carcass was sent for analysis (Federation News, 2008a; 2008b). In 2007, over a thousand dead walrus were found scattered along the same coast, and it is possible that the carcasses found in 2008 were from the 2007 event (Polar Bear Patrol, 2007; 2008). Experts from the Polar Bear Patrol analysed available information and suggested that it would have been impossible to hunt and kill that number of walrus during that July since sea ice was still present. In such situations walrus prefer to haul-out on sea ice; it would have been difficult to hunt so many walrus on the ice and very unusual to then bring the bodies onto shore (Polar Bear Patrol, 2008). The authors were unable to find any additional information regarding the results of the Ministry of Natural Resources' investigation. In December 2007, several hundred dead walrus were also scattered along the beaches close to Ryrkaipiy (Cape Schmidt, Chukotka) and according to local

authorities almost 600 walrus were trampled in a stampede in the fall of 2007.

3.5 United States

Only Pacific walrus are found in the United States, specifically in Alaska. Pacific walrus comprise a single population that is shared with Russia.

Pacific walrus are managed in accordance with various pieces of legislation, regulations, and policies. A summary is provided in greater detail in Appendices B and C. The USFWS is currently responsible for the management and conservation of walrus in the United States. This authority was transferred from the State of Alaska to the USFWS when the *Marine Mammal Protection Act* (MMPA) was implemented in 1972 (NOAA, 2008; USFWS, 1994). Prior to this, the State of Alaska regulated walrus hunting (USFWS, 1994). In the United States, only qualified coastal-dwelling Alaskan Natives are permitted to hunt Pacific walrus for subsistence purposes or for making and selling authentic Native handicrafts or clothing, providing the harvest is not wasteful (Anon., 1972; USFWS, 1994). The MMPA regulations defines wasteful manner as "... any taking or method of taking which is likely to result in the killing or injuring of marine mammals beyond those needed for subsistence purposes or for the making of authentic Native articles of handicrafts and clothing or which results in the waste of a substantial portion of the marine mammal and includes without limitation the employment of a method of taking which is not likely to assure the capture or killing of a marine mammal, or which is not immediately followed by a reasonable effort to retrieve the marine mammal" (50 CFR 18.3 and 50 CFR 216.3).

3.5.1 Current hunting regulations

In the United States, all marine mammals (including walrus) are protected under the MMPA (Public

Law 92-522), enacted by the United States federal government in 1972 (Anon., 1972). The Marine Mammal Commission (MMC) is an independent agency of the federal government created under Title II of the MMPA to provide independent oversight of policies and programs pertaining to marine mammals carried out by the federal regulatory agencies (MMC, 2010a). The primary focus is on the protection and conservation of marine mammals (MMC, 2010a). The MMPA also has provisions under section 119 for cooperative management agreements with Alaskan Native organizations to provide co-management of subsistence use by Alaskan Natives. In 1997, the USFWS signed a formal co-management agreement with the Eskimo Walrus Commission (EWC) (Garlich-Miller *et al.*, 2011) (see Appendix C). The Alaska Department of Fish and Game (ADF&G) works closely with the USFWS through their marine mammal program, which conducts research projects that complement and/or supplement those undertaken by Alaska Native organizations and federal agencies. The ADF&G promotes co-management of marine mammals with Alaska Native marine mammal organizations (ADF&G, 2010). A conservation plan for walrus in Alaska was developed in 1994 to ensure walrus in Alaska are healthy functioning components of the Bering-Chukchi Shelf ecosystems and to maintain the populations within their optimum sustainable range. This ensures that walrus remain a sustained resource for coastal Native inhabitants of the region (USFWS, 1994).

The introduction of the MMPA transferred the authority for walrus management from the State of Alaska to the USFWS. However, provisions under the MMPA can allow states to re-assume the management of marine mammals under guidelines developed by federal agencies. In 1972, the State of Alaska resumed management of Pacific walrus for a short period of time but with federally imposed provisions limiting the hunt to 3,000 walrus per year. In 1977 the people of Togiak filed a lawsuit against the United States

(People of Togiak v. United States, 77-0264), arguing that the freedom to hunt marine mammals granted in the MMPA could not be restricted by reinstituting state conservation laws (Rosenblatt, 1979). The court agreed, and transferred management authority back to the USFWS in 1979 (USFWS, 1994).

The MMPA provides for more liberal regulations on walrus hunting compared to the previous Alaska state regulations. Prior to the MMPA, from 1960 to 1972, Alaska state regulations imposed a limit of five females per subsistence hunter per year, with no limit on the number of males (USFWS, 1994). Under the MMPA, qualified Alaskan Natives are permitted to take walrus at any time of the year for subsistence purposes, or for the purposes of making and selling traditional clothing and handicrafts, without regulations on the sex, age, time of hunt and number of walrus providing the harvest is not wasteful and the population is not determined to be depleted (USFWS, 1994; Anon 1972). The federal government is required to manage the population within optimum sustainable population (OSP) levels (USFWS, 1994). The OSP is defined by the MMPA under Section 3 (9) to be “with respect to any population stock, the number of animals which will result in the maximum productivity of the population or the species, keeping in mind the carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element”. OSP is further defined under its regulations (50 CFR 216.3) as “a population size which falls within a range from the population level of a given species or stock which is the largest supportable within the ecosystem to the population level that results in maximum net productivity. Maximum net productivity is the greatest net annual increment in population numbers or biomass resulting from additions to the population due to reproduction and/or growth less losses due to natural mortality.” Under the MMPA, the Native harvest cannot be restricted if the populations are above their maximum net productivity level, are healthy and the harvest is non-wasteful (USFWS, 1994;



Anon 1972). If the population is considered depleted (which occurs when the population falls below its OSP), then actions can be taken to regulate the Native harvest (USFWS, 1994). Estimates of four critical values are needed to determine a precise calculation of the OSP range: current population size, annual female harvest rates over the last 150 years, carrying capacity and where maximum net productivity occurs relative to carrying capacity. Since the latter two are not known or cannot be calculated with precision for Pacific walrus, the OSP cannot be defined in a statistically rigorous manner (USFWS, 1994).

Although the MMPA has not needed to take action to regulate the harvest (i.e. there are no federally imposed quotas), some local management programs have been developed (Garlich-Miller *et al.*, 2011). For example, the communities of Gambell and Savoonga on St. Lawrence Island formed Marine Mammal Advisory Committees to implement local regulations imposing limits on the number of adult/sub-adult walrus that can be killed per hunting trip. Another example is the Walrus Island-State Game Sanctuary, which has provisions for hunting in the area (Garlich-Miller *et al.*, 2011). The

sanctuary was created in 1960 by the State of Alaska, which prohibited walrus hunting in the area (Round Island) (Anon., 1960; BBNA, 2009). In the early 1990s, the Board of Game was petitioned by hunters from Bristol Bay to reinstate subsistence access to traditional hunting grounds (BBNA, 2009). After several years, permission was granted and in 1995 the Qayassiq Walrus Commission (QWC) was formed. In September 1995, the USFWS entered into a cooperative agreement with the ADF&G, the QWC and the EWC to establish a co-management plan for a limited subsistence walrus hunt on Round Island (EWC, 1997). Under the terms of this agreement, Native hunters honour a self-imposed harvest limit and season (Okonek and Snively, 2005). A maximum of 20 walrus may be taken including any walrus struck and lost, and the QWC Commissioners and hunters decide the allocation for each village prior to each season (Okonek and Snively, 2005). Struck and lost animals are subtracted from the total allowable catch for the villages (Okonek and Snively, 2005).

The MMPA implemented a moratorium on hunting and importation of marine mammals (including walrus) unless exempted or authorized under the MMPA, which requires permits issued by the Secretary of the Interior. However, coastal-dwelling Alaskan Natives are exempt from the moratorium. Any qualified Alaskan Native that lives on the coast of the north Pacific Ocean or the Arctic Ocean is permitted to take marine mammals for subsistence purposes or for making and selling authentic Native clothing and handicrafts, provided it is not done in a wasteful manner (Anon., 1972).

Amendments to the MMPA in 1994 allowed for marine mammal products to be imported into the United States if they were (Anon., 1972):

- legally possessed and exported in conjunction with travel out of the United States providing the products were then imported back into the United States by the same individual; or

- acquired out of the United States as a part of cultural exchange by an Alaskan Native residing in Alaska; or
- owned by a Native inhabitant of Russia, Canada or Greenland and imported for non-commercial purposes in conjunction with travel to the United States or as part of a cultural exchange (Anon., 1972).

In 2008, the USFWS was petitioned to list Pacific walrus under the United States Endangered Species Act of 1973 (ESA) (US Federal Register, 2011; USFWS, 2011). The USFWS announced a 12-month finding in February 2011 (76 FR 7634). In that finding, and after reviewing the best scientific information, the USFWS identified the potential threats to the Pacific walrus according to various factors. In summary, the primary threats were identified as loss of sea ice due to climate change and, in the foreseeable future, subsistence hunting. Therefore, the USFWS found that the listing of the Pacific walrus under the ESA was warranted. However, the listing was precluded as a result of higher priorities for amendments to the list of endangered and threatened wildlife and plants, and the Pacific walrus was added to the candidate species list. A species on the candidate list is given a listing priority number (LPN) to ensure that species most need of protection are addressed first. The highest priority ranking is an LPN of 1 down to the lowest LPN of 12. The Pacific walrus has been assigned an LPN of 9 (US Federal Register, 2011; USFWS, 2011). A final decision on the listing is expected in 2017 (USFWS in litt. to T. Shadbolt, March 25, 2013). If the species becomes listed under the ESA, it will automatically be designated as depleted under the MMPA and further action can be taken to manage the species.

Walrus hunting is monitored through two separate programs administered by the USFWS: the Marking Tagging and Reporting Program (MTRP) and the Walrus Harvest Monitoring Program (WHMP) (Garlich-Miller and Burn, 1999; MMC, 2010b). The USFWS derives its harvest estimates by comparing and extrapolating data from these programs (MMC,

2003). Created in 1988, the MTRP is a federally mandated, year-round state-wide program which requires hunters to present walrus tusks to USFWS representatives for tagging within 30 days of harvest (Garlich-Miller and Burn, 1999; USFWS, 2008b). In the 1960s and 70s, the ADF&G carried out a harvest monitoring program which was taken over by the USFWS in 1980 (MMC, 2003). The WHMP was established as a co-managed effort between the EWC and the USFWS. This program began monitoring the subsistence harvest of walrus in Gambell, Diomede, Wales and Savoonga (EWC, 1997; Garlich-Miller and Burn, 1999), but now operates only in Gambell and Savoonga (USFWS in litt. to T. Shadbolt, March 25, 2013). Once hunters return from a hunting trip, village residents (under contract to the USFWS) meet their boats and collect information on the size and demographics of the harvest by interviewing hunters and obtaining biological samples (EWC, 1997; Garlich-Miller and Burn, 1999).

3.5.2 Hunting seasons, techniques and methods

Under the MMPA, Alaskan Natives are permitted to hunt walrus at any time of the year (USFWS, 1994). However, the QWC established a hunting season for walrus hunted on Round Island (Walrus Island-State Game Sanctuary) from September 10 to October 20 (BBNA, 2009; Okonek and Snively, 2005).

Most walrus hunting in Alaska takes place in spring, from March to May (USFWS in litt. to T. Shadbolt, March 25, 2013). Most hunters prefer to hunt on ice floes in single small boats or small groups of boats, as open water hunts are often less successful (NAMMCO, 2006a). Hunters typically use rifles to shoot the animal on the ice and then harpoon them if necessary (NAMMCO, 2006a). If a lethal shot is not possible, hunters try to immobilize the animal with a first shot so that it cannot enter the water and be lost (NAMMCO, 2006a). Hunters

Table 3.8

Number of Pacific walrus killed in the United States from 1999 to 2012

US PACIFIC WALRUS POPULATION	YEAR	WALRUS HARVESTED	ESTIMATED STRUCK AND LOST ANIMALS*	TOTAL INCLUDING ESTIMATED STRUCK AND LOST RATES
129,000 animals (includes stocks shared with Russia)	1999	2830	2049	4879
	2000	2428	1758	4186
	2001	1880	1361	3241
	2002	2248	1628	3876
	2003	2162	1566	3728
	2004	1549	1122	2671
	2005	1399	1013	2413
	2006	1286	931	2217
	2007	2376	1721	4097
	2008	1442	1044	2486
	2009	2123	1537	3660
	2010	1682	1218	2900
	2011	1240	898	2138
	2012	1626	1176	2802

Source: USFWS, (2013). Data are adjusted for unreported harvest.

Note: In an attempt to provide an estimate of the maximum number of animals that could be killed during the hunt, harvest numbers were corrected for animals struck and lost using a rate of 42%, a rate which has been used by the USFWS. The corrected rates were calculated by the USFWS.

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taking animals on the ice try to have a harpoon ready in case the animal tries to escape into the water or is pushed or pulled into the water by other walrus (NAMMCO 2004b; Fay *et al.*, 1994).

Losses associated with the hunt

Struck and lost rates for modern walrus hunting are estimated to be from four per cent to over 50% (NAMMCO, 2004b; 2006a). For Pacific walrus hunted between 1952 and 1972, Fay *et al.* (1994) found an average struck and lost rate of 42% which is the rate currently used by the USFWS (USFWS, 2010b). To avoid losses, hunters try to avoid shooting an animal in the water. If forced to (e.g. because animals are scarce), they attempt to harpoon the animal before administering a fatal shot (Fay *et al.*, 1994). Hunters have also been trying to improve struck and lost rates by using more powerful rifles, attach more floats to the animals and by shooting at as close a range as possible (NAMMCO, 2004b).

3.5.3 Harvest statistics

According to the most recent available catch data, in the last five years (2008 to 2012) approximately 5,873 Pacific walrus were harvested in the United States, or an average of 1,175 walrus per year. The lowest number harvested in a single year was 1,240 and the highest was 2,123 (Table 3.8) (MMC, 2010b; USFWS, 2013).

3.5.4 Illegal hunting and illegal trade

The authors could find no documented information to suggest illegal hunting is a significant management concern for Alaska. However, many charges have been laid in regard to trade in walrus parts which indicates that there are some problems. These charges appear to be primarily with illegal domestic trade (between the State of Alaska and the lower 48 states), but some are international in nature.

Documented cases of illegal domestic trade and hunting of walrus include:

- In 1989, leaders of the Alaska Native walrus hunting community urged the USFWS to investigate walrus poaching. In 1990, “Operation Whiteout” was initiated by undercover agents of the USFWS who set up a storefront business in Anchorage. During the investigation, the agents bought and sold ivory wholesale (USFWS, 1992), engaged in hundreds of transactions involving trade in walrus ivory and videotaped an illegal harvest. By 1992, a total of 29 people were charged with 80 counts of illegal activities; but 25 people were convicted on 39 counts. Four of the convicted people received jail sentences ranging from two to six months and one received a sentence of one year of probation with two months spent in a halfway house (Highbeam Research, 1992). A total of 314 kg (693 pounds) of ivory tusks, 32 walrus heads, six polar bear skins, four seal skins and nine sea otter skins were sold to undercover agents during the investigation (USFWS, 1992).
- In 2003:
 - ▶ An Alaskan Native who worked as a marine mammal tagger under contract to the USFWS in his village was investigated for selling raw tusks and falsifying records. The man was required to pay USD2,500 in fines. Eight raw tusks and six walrus heads were abandoned to the USFWS (USFWS, 2004; 2005).
 - ▶ Five people were charged with killing 41 walrus on the ice floe offshore of St. Lawrence Island with the intention of selling the tusks without using the rest of the animal. The hunters attempted to conceal their actions by discarding the carcasses in the ocean but poor weather conditions forced them to leave some of the carcasses on the ice (Associated Press, 2004; USFWS, 2004; 2005). Two people

- were convicted: one received a three-year jail sentence and the other was sentenced to 12 months' probation and 900 hours of community service (USFWS, 2006).
- ▶ Complaints of a wasteful harvest led to five men being charged with an unlawful take of walrus near Barrow, Alaska (USFWS, 2004; 2005). Six walrus heads were seized in the investigation. One of the defendants was sentenced to seven years of jail time (USFWS, 2006).
 - In 2004, an Alaska resident supplied tags and tagging certificates to a non-Native. The non-Native used the tags for beach-found ivory which was sold to non-Natives for USD1,500 to USD2,000 per walrus head (USFWS, 2005).
 - In 2005, a pawn shop owner in Alaska was fined USD3,750 for purchasing raw walrus ivory and later fined USD1,250 for illegal trafficking (USFWS, 2006).
 - In 2007:
 - ▶ An Alaskan resident was sentenced to six months in prison and fined USD20,000 for unlawful collection and selling of walrus bone and ivory. A co-defendant was sentenced to eight months in prison (USFWS, 2008a).
 - ▶ An Alaskan resident was sentenced to eight months in prison for conspiring to sell walrus ivory and other parts. The defendant claimed that the items were found on the beach. Under United States law, beach ivory can be collected by non-Natives, but it must be registered within 30 days and cannot be re-sold or traded without permission from the USFWS. A total of 10 walrus head mounts were seized and 50 walrus teeth, a baculum, two jaw bones, a skulls and a tusk head mount were all abandoned to the USFWS (US Department of Justice, 2007).
 - In 2008:
 - ▶ An Alaska resident pleaded guilty to illegally transporting and selling a walrus head mount, tusk and jawbone (Anchorage Daily News, 2008).
 - ▶ A man was sentenced to eight months in prison for conspiring to sell walrus parts, and a co-defendant was sentenced to six months in prison and forced to pay a USD15,000 fine and USD5,000 in restitution (USFWS, 2009a).
 - ▶ A man was fined USD3,000 for selling marine mammal products (including walrus) to an undercover officer (USFWS, 2009a).
 - In 2009, an Oregon resident was sentenced to three years' probation and a USD10,000 fine for selling walrus ivory illegally. The man was planning to act as a retailer and market the items in Oregon, but was caught when he tried to sell items to a USFWS undercover agent (US Department of Justice, 2009).

Documented cases of illegal international trade in walrus include:

- In 2003, the Wildlife Enforcement Directorate of Environment Canada received information from a Nunavut wildlife enforcement officer on the illegal activities of two Nunavut big game outfitters. Some of the information suggested that walrus trophies had been illegally exported to the United States. Various offices of the Wildlife Enforcement Directorate and the USFWS investigated the case from 2003 to 2008. The USFWS interviewed more than 30 United States hunters across the region which resulted in the seizure of four individual tusks, two walrus skulls with tusks, a baculum and an individual walrus tooth. All items were forfeited to the United States government. Charges were laid in the United States and fines totalling USD18,325 were levied (R. Labossiere, Wildlife Enforcement Directorate, in litt. to E. Cooper, February 19, 2008).

- In 2007 in Dallas, Texas, defendants paid USD10,050 in fines for smuggling a walrus trophy to the United States from Canada (USFWS, 2008a).
- In 2007, wildlife inspectors found walrus bones and carvings coming from Bali to the United States that were falsely declared. The importer was fined USD5,025 (USFWS, 2008a).
- In 2008, a Virginia resident was fined USD5,000 and received a year's probation for smuggling a walrus penis bone (baculum) into the United States from Russia. Federal agents had warned the defendant about trading in marine mammals parts, but the defendant ignored the warning and later lied to the agents (Juneau Empire, 2008).
- In 2011, three people were charged with the illegal sale and transportation of walrus parts and tusks to out-of-state buyers. Two of the defendants had purchased more than 227 kg (500 pounds) of walrus tusks from an individual in Alaska during

2010 and 2011, and the third defendant marketed the tusks via the internet and contacted potential buyers. The defendants attempted to conceal the illegality of the tusk sales to non-Alaskan Native buyers by using a Bureau of Indian Affairs number belonging to one of the defendants, the walrus tusk tag number and a letter identifying the items as gifts. The investigation found that approximately 104 kg (230 pounds) of walrus tusks were sold (valued at approximately USD22,000). The three defendants pleaded guilty to the charges: one defendant was sentenced to 108 months in prison to be followed by a three-year term of supervised release; the second defendant was sentenced to 42 months in prison, to be followed by a three-year term of supervised release and the third defendant (who marketed the tusks) was sentenced to three years' probation (US Department of Justice, 2011a; 2001b).



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TRADE AGREEMENTS AND REGULATIONS

4.1 Walrus range State regulations and restrictions on trade

Canada

No edible parts of a walrus can be sold, bought, bartered or traded, except by Aboriginal peoples in certain jurisdictions (Anon., 1993a). There are no restrictions on the possession or sale of non-edible walrus items within the country, provided the items were acquired legally. However, any transportation of a walrus or its parts and derivatives from one province or territory to another requires a Marine Mammal Transportation Licence (MMTL) (Anon.,

1993a). Export of walrus products out of Canada requires CITES documentation (i.e. an export permit), unless the item is considered a tourist, personal or household effect (as defined by Canadian regulations).

Greenland

Before any walrus part can be sold, the hunting permit used to harvest the walrus must be stamped by the local authority or settlement office who will then register the harvest. 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 show that the catch has been registered by a municipal authority (Anon., 2006a). If the local settlement office is closed, selling

may occur if registration of the harvest and sale takes place immediately after the office opens. Any sale or resale of the skulls, tusks and bones must also be accompanied with a copy of a signed and stamped hunting permit. This requirement provides for increased control and helps prevent the sale of illegally hunted walrus. The purchase of or receiving of walrus parts that were hunted illegally is prohibited (Anon., 2006a). Export of walrus products out of Greenland requires CITES documentation. A CITES Export permit is required for exporting items for personal use (which must be transported in personal luggage) and a different kind of CITES Export permit is required for exporting gifts and items sent by mail (Greenland Home Rule, 2008).

The United States

Items from the subsistence harvest (e.g. modern ivory post-1972) and beach-found ivory¹⁶ can be sold to non-Alaskan Natives (non-indigenous people) provided they are first fashioned into authentic Native handicrafts. To be considered Native handicrafts, items must be significantly altered from their raw appearance and cannot be fashioned using pantographs, multiple carvers or other mass copying devices (Anon., 1972). Non-Alaskan Natives can be in possession of raw beach-found ivory provided it has been registered within 30 days of its find, but this ivory cannot be transferred to another owner without written permission from the USFWS (USFWS, 2012). Fossil ivory does not need to be carved into a Native handicraft before being sold and can be sold to anyone as a raw tusk (USFWS, 2007b; 2012). There is also substantial trade in fossil ivory collected or mined from ancient walrus haul-out sites (e.g. on St. Lawrence Island and surrounding islands) (Hollowell, 2006). These areas provide a source of natural deposits of ivory, bones, and tusks from animals that died years

ago (Hollowell, 2006). Fossil ivory can be collected from private or reservation lands with permission from the landowner (USFWS, 2001). It is not regulated under the MMPA and does not need to be registered before being traded or sold. However, this ivory cannot be collected if found on state or federal public lands (USFWS, 2001). Meat and other edible parts of a walrus may only be sold to an Alaska Native or sold within an Alaskan Native village (Anon., 1972). Walrus ivory cannot be exported out of the United States for commercial purposes unless the item is approved as a pre-Act specimen (i.e. antique or fossil ivory) (USFWS, 2012). Modern ivory (post-1972) and beach-found ivory cannot be exported for commercial purposes even if carved into a handicraft. However, modern ivory and beach-found ivory made into authentic Native handicrafts can be exported for non-commercial purposes (C. Hoover, Division of Management Authority, in litt. to T. Shadbolt, February 3, 2012). Walrus parts and derivatives can only be imported with issuance of permits under specific circumstances (e.g. pre-Act specimens, part of cultural exchange involving Alaskan Natives) (Anon., 1972; USFWS, 2012). Walrus parts and derivatives permitted for export out of the United States (as explained above) require a CITES permit or certificate, except for items which are considered personal or household effects (as per the definitions of the United States (USFWS, 2007b; 2012).

Norway (and its territories)

Hunting of walrus has been prohibited since 1952 (Anon., 1952). Therefore, there is generally no trade in walrus from Norway or its territories unless the item was acquired prior to 1952, or if it was proven to be beach-found from Svalbard prior to 2001. Export of walrus products out of Norway and its territories requires CITES documentation (e.g. a pre-Convention certificate).

¹⁶ Modern ivory is ivory that has been harvested from a walrus since 1972; beach-found ivory is ivory found on the beach within .4 km (1/4 mile) of the ocean; fossil ivory is ancient ivory with a composition that has changed from ivory to mineral; pre-Convention ivory is ivory that was acquired prior to November 16, 1975 (the date that Canada listed the walrus in Appendix III); and pre-Act ivory is ivory acquired prior to 1972 (introduction of the MMPA). All antique ivory is both pre-Convention and pre-Act but not all pre-Convention and pre-Act ivory is antique.

Russia

Commercial hunting of Atlantic and walrus from the Laptev Sea has been prohibited since 1956 and for subsistence harvest since 1982; as such, trade in these walrus is prohibited (Anon., 1956a; 1982a). Russia does, however, allow hunting of Pacific walrus for subsistence purposes and there are no restrictions on possession or sale of Pacific walrus parts and derivatives providing the harvest was legal; proper documentation is required to confirm legal origin (Vaisman *et al.*, 2009). Export of Pacific walrus products out of Russia requires CITES documentation (e.g. certificate of origin).

4.2 International regulations and restrictions on international trade

4.2.1 CITES

Limited regulation of the international trade in walrus, 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 submitted a reservation¹⁷ to the Appendix III listing but withdrew it in 1984 (CITES, 2008b). The Netherlands submitted a proposal to list walrus in Appendix II in 1987 but it was withdrawn before being put to a vote (USFWS, 1994; Anon., 1987). As a result, range States agreed to exchange scientific information on walrus regularly. As well, an International Workshop on the Ecology and Management of Walrus Populations was organized and the Walrus International Technical and Scientific committee (WITS) was established (Stewart *et al.*, 1993). A

proposal was considered again prior to CoP 8 in 1992 but a proposal was not submitted (USFWS, 1994). An Appendix III listing for a species can be requested at any time, by any range State, for a species native to that country. Since the walrus is listed in Appendix III, a CITES export permit is required prior to export of walrus parts and derivatives from Canada. Exports of walrus parts and derivatives from any other country must be accompanied by a CITES certificate of origin which verifies origin of species. Re-export of Canadian walrus parts and derivatives from another country would require issuance of a CITES re-export certificate (Anon., 1973a; Cooper and Chalifour, 2004). Further information on CITES can be found in section 1.2.4 *Regulation international trade of wildlife* and also in Appendix B.

Some countries have taken measures that go beyond the minimum requirements of the Convention, requiring additional permits or certificates (e.g. EU Wildlife Trade Regulations [EU WTR]). Any range State can list a species within their borders in Appendix III at any time, because this does not require a vote by the CITES Parties. Furthermore, a country making an Appendix III listing is not required under CITES to make an NDF prior to exporting specimens. Appendix III's purpose is to monitor trade to help the listing country evaluate whether export may have an impact on the conservation of species in question (Anon., 1973a; Cooper and Chalifour, 2004).

4.2.2 EU WTR

As stated earlier, the EU implements CITES through the EU WTR. In 1984, trade in walrus was regulated in the EU when the species was listed on Annex C2¹⁸ under *Council Regulation (EEC) No. 3626/82*. When

¹⁷ As per the text of the Convention, 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 Convention with respect to trade in the species concerned (Anon., 1973b).

¹⁸ Annex C2 of the previous EU WTR (Council Regulation (EEC) Reg. No. 3626/82) included both CITES Appendix II and III species. Annex C2 was equivalent to the current EU WTR (Council Regulation (EC) Reg. No. 338/97) Annexes B and C.

that regulation was replaced in 1997, the walrus was listed on Annex B under *Council Regulation (EC) Reg. No. 338/97* (UNEP-WCMC, 2011). Annex B are equivalent to CITES Appendix II; however, these provisions for Annex B are more strict than what is required by CITES. Trade in Annex B species (e.g. walrus parts and derivatives) requires import permits, and a second NDF, in addition to export permits or re-export certificates (C. O’Criodain, WWF International, in litt. to T. Shadbolt, September 25, 2013). On September 26, 2006, the SRG formed a negative opinion on the import of walrus from Greenland (UNEP-WCMC, 2011; European Commission, 2006). There was concern that the current or anticipated levels of trade could have a harmful effect on the conservation of the species (European Commission, 2006). As a result, EU member states must reject all applications to import walrus parts or derivatives from Greenland. This resulted in an import ban; however, as long as Greenland issues export permits, items classified as personal and household effects are not affected and can be imported into EU member states providing they are in the personal luggage or part of a household move, or trophies taken by the person concerned and imported later, after curing (C. O’Criodain, WWF International, in litt. to T. Shadbolt, September 25, 2013; Greenland Home Rule, 2008). On August 13, 2008, the SRG imposed a formal import suspension on walrus parts and derivatives originating from Greenland. This import suspension was published as a “Suspension Regulation” in the EU Official Journal, *Commission Regulation (EC) No 811/2008 of 13 August 2008 suspending the introduction into the Community of specimens of certain species of wild fauna and flora* (Anon., 2008b). On June 17, 2013, the import suspension was still listed in the EU Official Journal *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* (Anon., 2013). Further information

on the EU regulations can be found in section 1.2.4 *Regulation international trade of wildlife* and also in Appendix B.

4.2.3 Customs Union (CU)

With the creation of the Customs Union (CU) formally established in 2007, CITES listed species can now be traded freely within the CU countries without border control (Taylor *et al.*, 2012). The CU is an integrated customs area between the Russian Federation and the Republics of Belarus and Kazakhstan. However, other countries have expressed interest in joining the CU (Taylor *et al.*, 2012). The Republic of Kyrgyz has been negotiating for accession to the CU since 2011 (Taylor *et al.*, 2012), which is expected in the near future (Vaisman *et al.*, in prep). The Republic of Tajikistan (currently not a Party to CITES) has also expressed interest, but because it does not border a current CU member country, Tajikistan will have to wait until the Republic of Kyrgyz is officially a member of the CU (Taylor *et al.*, 2012). Although it does not share borders with existing members, in September 2013 Armenia’s President Serzh Sargsyan publicly stated that Armenia is joining the CU (Rodeheffer, 2013). The Eurasian Economic Commission for Europe (ECE) became operational in February 2012 and has been established as the permanent governing body of the CU (Eurasian Economic Commission, 2013).

While formally the CU is not meant to affect CITES implementation and enforcement in the CU member countries (i.e. according to the regulations in place, CITES-listed species are not covered by the ECU), it does have implications for wildlife trade (Vaisman *et al.*, in prep.). Removal of previous border controls between the CU member countries inevitably removes several barriers to legal and illegal wildlife trade and reduces opportunities for border control and enforcement (Taylor *et al.*, 2012). Potential implications and ramifications of high conservation concern include: lack of co-ordination and exchange

of information on all levels of CITES implementation, which is necessary for consistency within the CU and to avoid abuse of the system; lack of internal trade monitoring; reduced ability to control and monitor exports of native species; and fewer barriers to transport of legal and illegal wildlife trade (Taylor *et al.*, 2012). Article XIV.3 of the Treaty states: “The provisions of the present Convention shall in no way affect the provisions of, or the obligations deriving from, any treaty, convention or international agreement concluded or which may be concluded between States creating a union or regional trade agreement establishing or maintaining a common external Customs control and removing Customs control between the parties thereto insofar as they relate to trade among the States members of that union or agreement. However, as of 2012, it does not appear that the CU has implemented legislation (regarding CITES) nor has it taken steps for the

coordinated monitoring and enforcement actions necessary for effective wildlife trade regulation within the CU (Taylor *et al.*, 2012).

When the EU experienced a similar situation in the 1980s (i.e. a single market resulting from absence of systematic internal border controls levels), the EU decided that provisions of CITES needed to be implemented in all EU Member States uniformly and in a co-ordinated manner through the adoption of a comprehensive set of EU regulations that were applicable to all EU Member States—the EU WTR. These were introduced with three co-ordinating bodies established at the EU level to allow for regular and frequent information exchange and consistent decision-making for the different aspects of CITES implementation, ranging from scientific to management and enforcement issues (European Commission, 2012).



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WALRUS TRADE

Walrus are important both culturally and spiritually, and valued as a subsistence resource (NAMMCO, 2004b, USFWS, 2008b). They provide a source of food (meat consumed by humans and dogs) and raw materials for traditional equipment and the making of handicrafts (Garlich-Miller et al., 2011). Walrus ivory is the most common walrus product in international trade. It includes the teeth, tusks and skulls (with tusks intact) which are traded in their raw form, carved or used to make handicrafts (e.g. figurines, jewellery) (Anderson and Garlich-Miller, 1994; COSEWIC, 2006; Hall, 2003; NAMMCO, 2004b; USFWS, 1994)

5.1 Types of items in trade *Canada*

In some cases, items may be legally traded within a range State (domestic trade), but not for export out of the country (international trade). Furthermore, the domestic and international markets for walrus items vary depending on the country, the purpose of the items (e.g. carvings versus tusks), in addition to the artistic value of the item.

In Canada, trade includes raw and carved bones (e.g. bacula¹⁹, lower jaws), raw and carved skulls, tusks, teeth, carved ivory handicrafts and other minor items (UNEP-WCMC CITES Trade Database; Hall, 2003).

¹⁹ In Canada, the term “bone” is applied to the baculum (penis bone) of a male walrus.

Greenland

In Greenland, trade includes skulls, tusks, teeth, carved ivory handicrafts (including jewellery), ivory figurines known as “tupilaks”, bones (e.g. bacula, lower jaws) and other minor items (UNEP-WCMC CITES Trade Database; Grønlands Naturinstitut, 2011; Born, 2005b).

Norway

There is no legal domestic trade of local walrus killed after 1952. A variety of products such as tusks and carvings are traded in Norway; these are remnants of the historical sealing and hunting expeditions that took place prior to protection in 1952. There is also trade in beach-found ivory acquired in Svalbard prior to 2001 (I. Gjertz, Research Council of Norway, in *litt.* to T. Shadbolt, March 4, 2013).

Russia

In Russia, trade includes sculptures and carvings made from bones and ivory, as well as carved skulls and tusks. Skins are also traded locally and used in the construction of “biddarah” (kayak) covers and for straps used in dog harnesses (Mymrin, 2007, Vaisman *et al.*, 2009). Small pieces of ivory are also used for knife handles (Vaisman in *litt.* to T. Shadbolt, July 30, 2013; Knifewood, 2013).

United States

In the United States, trade includes handicrafts and/or pre-Act²⁰ specimens only. Pre-Act fossil ivory does not need to be carved into Native handicrafts before being traded in the United States (USFWS, 2007b; 2012). The majority of items in trade consist of parts and

derivatives, including ivory jewellery, ivory and bone carvings, and ivory pieces and tusks (Garlich-Miller *et al.*, 2011). Walrus hides are also used for rope and in the construction of covers for wooden boat frames (USFWS, 2008b). Walrus whiskers are marketed to tourists as toothpicks (E. Cooper, pers. obs.).

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.

- **Reporting of Appendix III data.** Doubts about the effectiveness of Appendix III and difficulties in its implementation have resulted in some Parties being unwilling to take on the administrative burden of implementing Appendix III. As such, international trade by these Parties will not be submitted in their annual report; thus it is not captured in the CITES Trade Database.
- **International trade for personal and household effects.** Some Parties may not require documentation for items exported for these purposes (which includes tourist souvenirs). If not required, this information will not be recorded and not submitted in annual reports or reported in the UNEP-WCMC CITES Trade Database.
- **Export data are not always accurate.** Export data may not represent the actual number of items

²⁰ Pre-Act specimens are any marine mammals taken prior to December 21, 1972, when the United States MMPA came into effect (Section 102(e) of the MMPA of 1972).

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). The United States was the only walrus range State that reported based on the permits used for all years. For 2000 to 2003 and 2006, Greenland reported on permits used, but for all other years the source of data was not specified. Russia did not specify the basis of reporting. Norway reported a combination of permits issued (1996 to 1998, 2001, 2004 and 2005) and actual trade (1999, 2000 and 2003), but the basis of trade was not specified for all other years. Canada did not specify the basis of their reporting in any year (K. Malsch, Species Programme UNEP-WCMC, in. *litt.* to T. Shadbolt, December 1, 2010). Greenland did not report export data for 2007.

- **Import data are not consistent.** Import data are not always recorded 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 export permit was issued (e.g. the export 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), 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. For instance, a sport hunter might obtain a CITES permit for a skull but indicate that the item was “personal” in nature, which may be confused with personal purposes, rather than “hunting trophy” purposes.
- **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 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 walrus in the wild. This is important information when considering the impact of trade on conservation of a species.
- **Inconsistent reporting of seizure data.** The CITES Trade Database is not a seizure database. Seizures data are not always reported, or are reported with insufficient detail and do not indicate the reasons an item was seized.



A fossil walrus tooth that has been carved into a figurine of an eagle

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 the limitations to the use of the data.

The international trade in walrus parts and derivatives involves a variety of items (e.g. skulls, tusks, teeth, bones, carvings). It is impossible to

precisely determine the number of harvested walrus represented in international trade because some of these items (e.g. carvings or teeth) could originate from a single walrus or from many walrus. When examining the data, considering the items in trade and the purpose of export for these items was important. For instance, 5,500 walrus items in trade could be interpreted as significant based on the 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 teeth and carvings, and only 100 of the items were skulls, the conservation impact of this trade would be considered to be lower than if the majority of items were skulls, which can be attributed to a finite number of animals. It is important to note that trends in the numbers and/or types of items in trade do not necessarily reflect harvest levels.

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

Approximately 7,181 walrus parts and derivatives were reported in the export data in a five-year period (2005 to 2009). Eight main items made up this trade. Carvings comprised the highest volume of items recorded, followed by tusks, teeth, bones/parts, specimens, skulls, ivory parts and other items. The purpose of export for each type of item, according to each walrus range State, is summarized in Table 5.1.

During a five-year timeframe, Greenland exported the highest number of items, followed by Canada, the United States and Russia in that order. Figure 5.1 provides a visual representation of international trade globally, while Figures 5.2 to 5.5 are illustrated according to each range State (except Norway which exported no items). The types of items and the purpose of export for each item are summarized in these figures.

Table 5.1

Walrus items reported in export data during a five-year period (2005 to 2009 inclusive)

COMMODITY (PURPOSE OF EXPORT)	COUNTRY OF EXPORT				TOTAL
	CANADA	GREENLAND ¹	RUSSIA	UNITED STATES	
Carvings	165 (93)	4837 (1)	158 (155)	161 (1)	5321 (267)
Educational	6 (5)	5			11 (5)
Personal	30 (20)	4789		101	4920 (20)
Travel exhibitions	116 (64)	3	2		121 (64)
Scientific		8 (1)			8 (1)
Commercial trade	13 (4)	32		60 (1)	105 (22)
unknown			156 (155)		156 (155)
Tusks	562 (1)	54 (1)	9 (1)	12	637 (3)
Hunting trophies	5				5
Personal	250 (1)	53 (1)	8	12	323 (2)
Travel exhibitions			1 (1)		1 (1)
Commercial trade	307	1			308
Teeth	164	129	0	0	293
Personal	67	129			196
Commercial trade	97				97
Bones and parts	173	68	1 (1)	11 (2)	253 (3)
Hunting trophies	3				3
Personal	63	57		10 (1)	130 (1)
Travel exhibitions			1 (1)		1 (1)
Commercial trade	107	11		1 (1)	119 (1)
Specimens	0	20	0	206	226
Scientific		20		206	226

*table continued on next page**Source:* Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

Note: Numbers in parentheses represent the proportion of items recorded as pre-Convention items. Remaining items were wild, unknown or not recorded.

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).

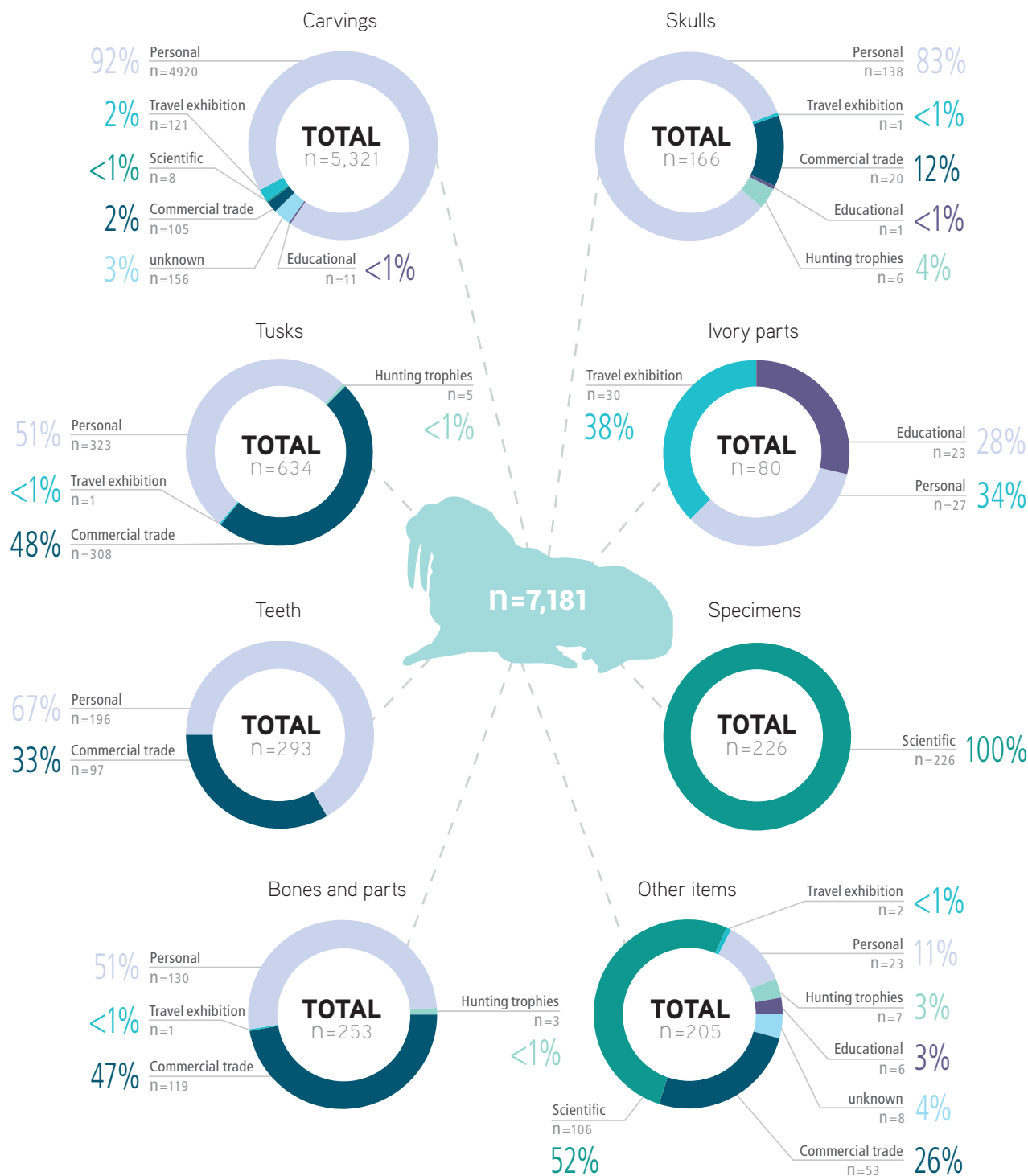
Table 5.1

Walrus items reported in export data during a five-year period (2005 to 2009 inclusive) *continued*

COMMODITY (PURPOSE OF EXPORT)	COUNTRY OF EXPORT				TOTAL
	CANADA	GREENLAND ¹	RUSSIA	UNITED STATES	
Skulls	52	113	0	1(1)	166 (1)
Educational		1			1
Hunting trophies	6				6
Personal	30	108			138
Travel exhibitions		1			1
Commercial trade	16	3		1 (1)	20 (1)
Ivory parts	0	0	0	80 (13)	80 (13)
Educational				23 (4)	23 (4)
Personal				27 (1)	27 (1)
Travel exhibitions				30 (8)	30 (8)
Other items	59	123	8 (5)	15 (2)	205 (7)
Educational				6	6
Hunting trophies	7				7
Personal		20		3	23
Travel exhibitions				2 (2)	2 (2)
Scientific		103		3	106
Commercial trade	52			1	53
unknown			8 (5)		8 (5)
TOTAL	1175 (94)	5344 (2)	176 (162)	486 (36)	7181 (294)
Educational	6 (5)	6	0	29 (4)	41 (9)
Hunting trophies	21 (20)	0	0	0	21 (20)
Personal	440 (65)	5156 (1)	8	153 (2)	5757 (68)
Scientific	0	131 (1)	0	209	340 (1)
Travel exhibitions	116	4	4 (2)	32 (10)	156 (12)
Commercial trade	592 (4)	47	0	63 (20)	702 (24)
unknown	0	0	164 (160)	0	164 (160)

Figure 5.1

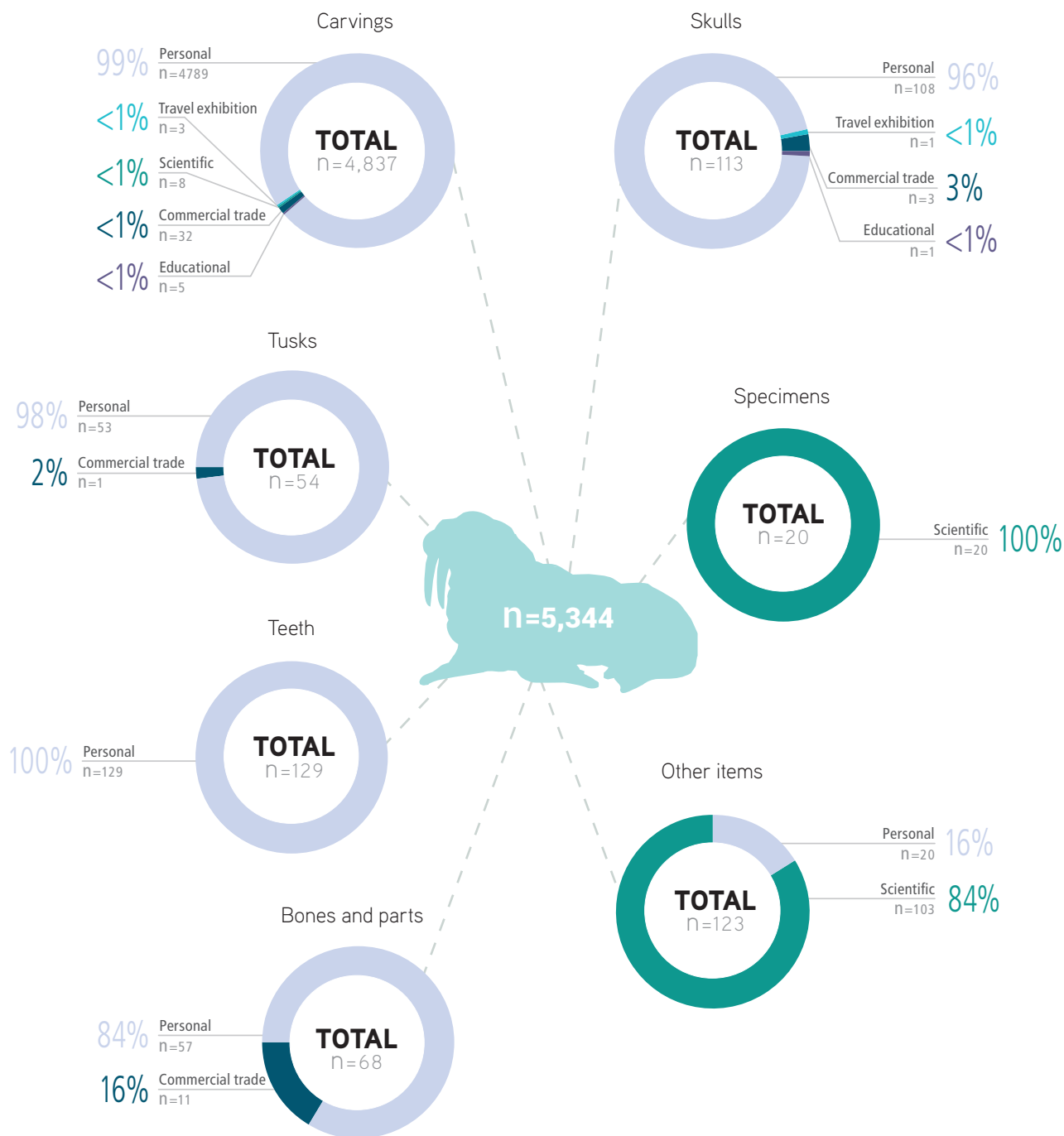
Walrus items recorded by range State export, sum of five-year data (2005 to 2009)



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

Figure 5.2

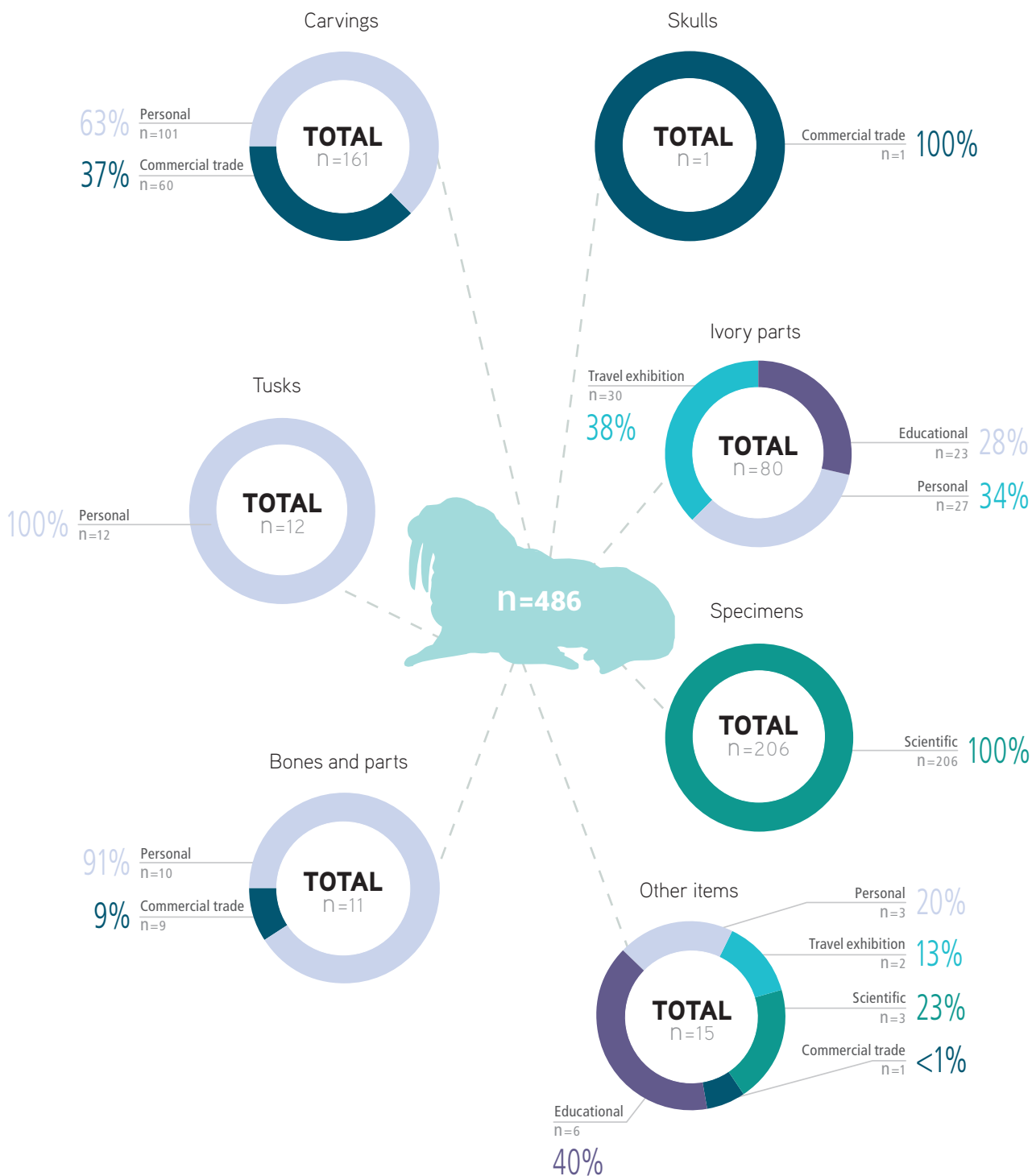
Walrus items from Greenland and their purpose of export, sum of five-year data (2005 to 2009)



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

Figure 5.3

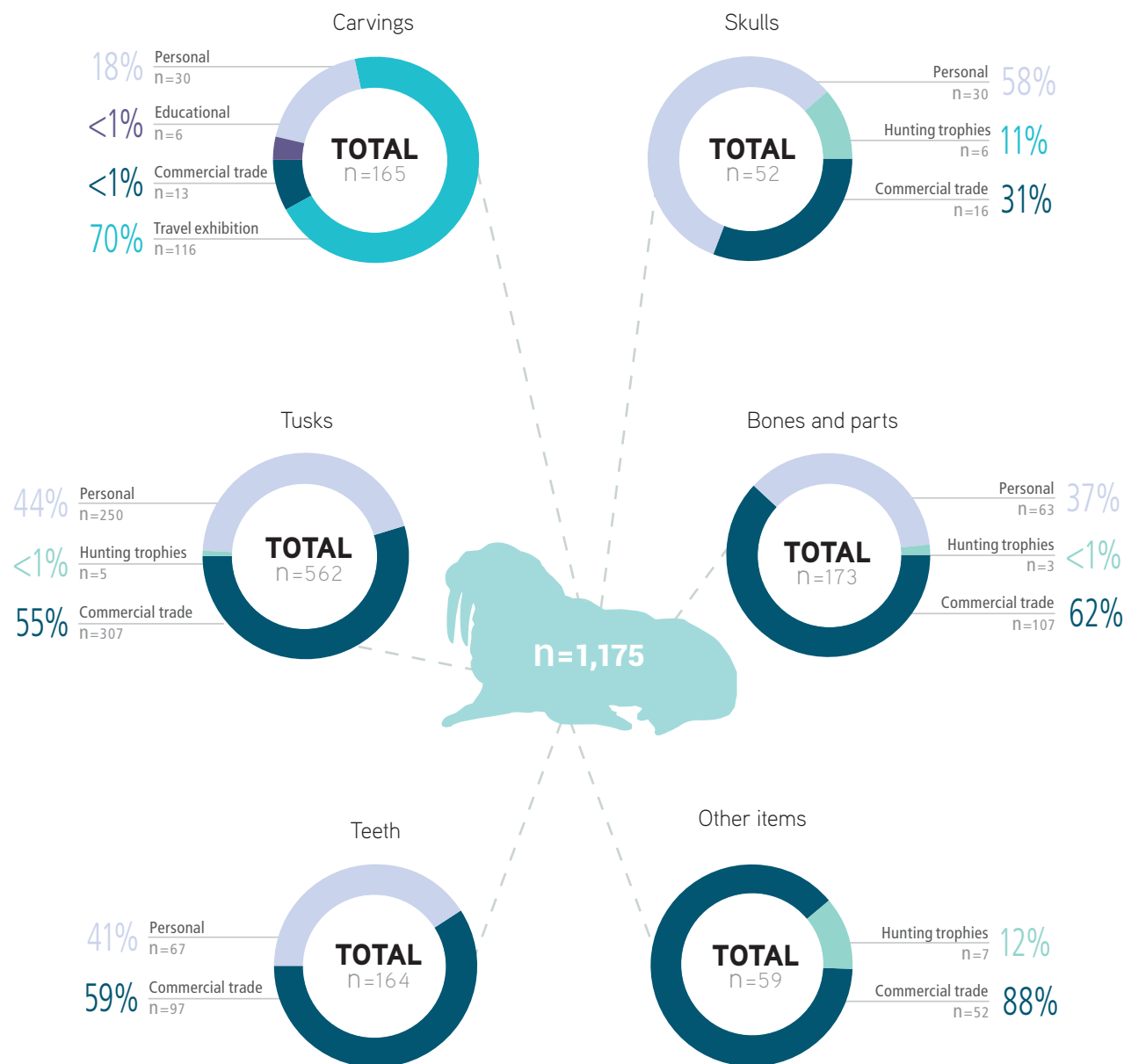
Walrus items from the United States and their purpose of export, sum of five-year data (2005 to 2009)



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

Figure 5.4

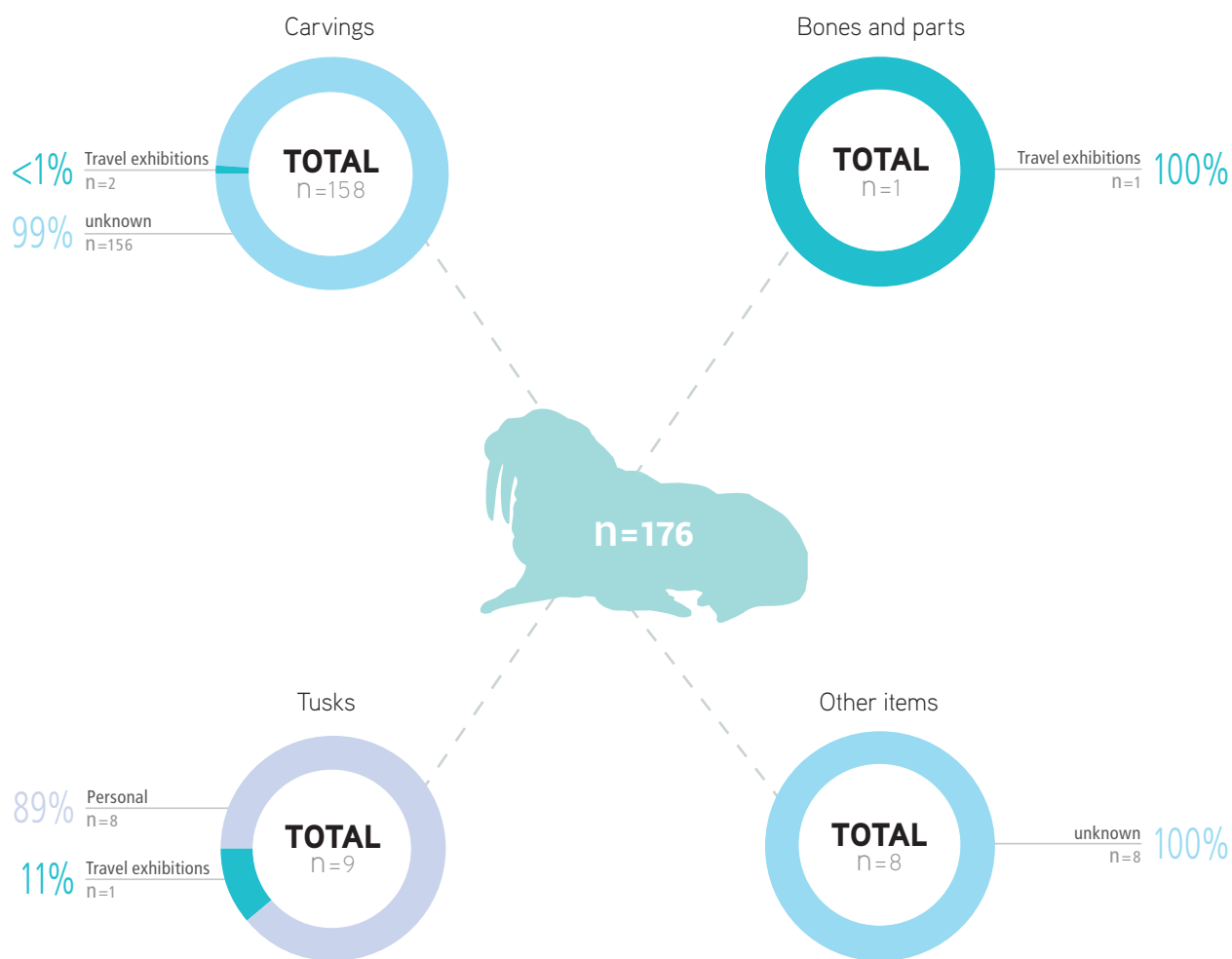
Walrus items from Canada and their purpose of export, sum of five-year data (2005 to 2009)



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

Figure 5.5

Walrus items from Russia and their purpose of export, sum of five-year data (2005 to 2009)



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

5.3.2 Trends in Items (1987 to 2009 export data, per year)

The CITES Guidelines on submitting annual reports provides 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 structure²¹. 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:

- **Bones, ivory and carvings.** This includes the UNEP-WCMC CITES Trade Database terms for skeletons, bones (e.g. baculum), bone products, bone pieces, bone carvings, ivory carvings, ivory pieces and carvings;
- **Other items.** This includes the UNEP-WCMC CITES Trade Database terms for claws, trophies, bodies, skins, skin pieces, leather items, leather products, garments, plates, scraps, hair, meat, genitalia and unspecified items.

According to the UNEP-WCMC CITES Trade Database, approximately 15,282 kg of walrus parts and derivatives were reported in the export data from 1987 to 2009 (Table 5.2). Since these items are recorded by weight, it is impossible to determine the number of walrus represented by this trade.

The majority of items in the export data recorded by weight were reported by the United States (approximately 15,114 kg). Approximately 12,289 kg of these items were reported by the United States as being exported to Indonesia; however, there were no entries recorded in Indonesia import data. Since the United

States reported data on items exported, it is probable that Indonesia did not record the imports of the items.

According to the UNEP-WCMC CITES Trade Database, approximately 29,523 walrus parts and derivatives were reported in the export data from 1987 to 2009. The types of items reported are summarized in Table 5.3 (below). It is possible to see variations in the trends of items traded over the years and how they influenced the overall trade (Figures 5.6, 5.11 and 5.12). The data show increases (peaks) in the total numbers of items recorded in 1988, 1989, 1992, 1994, 1997, 2002, 2005 and 2008. The trade appears to be variable over time, which a noticeable shift from tusks to bones, ivory and carvings after 1998. The increases were influenced by specific items traded, as follows:

- 1988: increased numbers of bones, ivory and carvings;
- 1992, 1994 and 1997: increased numbers of tusks;
- 2002: increased numbers of specimens and teeth;
- 2005 and 2008: increased numbers of tusks. For 2005, it is possible that the tusks recorded by the USFWS were fossil but incorrectly reported as wild.

The data show decreases (troughs) in the total numbers of items recorded in 1990, 1993, 1996, 2000, 2003, 2007 and 2009. The decreases were influenced by specific items traded as follows:

- 1990, 1993 and 1996: decreased numbers of tusks;
- 2000: decreased numbers of bones, ivory and carvings;
- 2003: decreased numbers of specimens and, to a lesser extent, bones, ivory and carvings;
- 2007: decreased numbers of bones, ivory and carvings (possibly due to missing Greenland export data);
- 2009: decreased numbers of bones, ivory and carvings; and tusks.

²⁰ The explanations for description of tooth, tusks and carvings are: tooth, “teeth – e.g. of whale, lion, hippopotamus, crocodile, etc”; tusks, “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 walrus range States have specified items as “bone carvings” or “ivory carvings” while other entries only indicate “carvings” which is reflected in the UNEP-WCMC CITES Trade Database

Table 5.2

Walrus items reported by weight (kg) in export data, per year, 1987 to 2009

YEAR	BONES, IVORY AND CARVINGS	TUSKS	TEETH	SPECIMENS	MEAT	TOTAL
1987	0	2				2
1988	0	158			10	168
1989	0	225				225
1990	0	1241 (45)				1241 (45)
1991	27 (27)					27 (27)
1992	139 (139)	683 (683)				822 (822)
1993	77 (77)	552 (552)	68 (68)			697 (697)
1994	220	191	32		1	444
1995	344	901 (45)	29			1274 (45)
1996	84	302 (36)	33			419 (36)
1997	38	463 (83)			7	508 (83)
1998	215 (158)	461 (461)	92 (92)			768 (711)
1999	104	478 (61)	282	30	2	896 (61)
2000	4450 (23)	514 (40)	58 (18)			5022 (81)
2001	706 (133)	7 (7)				713 (140)
2002	179 (171)	17		2		198 (171)
2003	212 (136)	27				239 (136)
2004	204 (61)					204 (61)
2005	255 (44)		3	117		375 (44)
2006	230 (18)	24				254 (18)
2007	417 (198)					417 (198)
2008	331 (331)					331 (331)
2009	39 (39)					39 (39)
TOTAL Items	8271 (1554)	6246 (2013)	597 (178)	149	20	15283 (3746)

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

Note: Numbers in parentheses represent the proportion of items recorded as pre-Convention items. There remaining items were recorded as wild or unknown.

Table 5.3

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

YEAR	BONES, IVORY AND CARVINGS	TUSKS	TEETH	SPECIMENS	SKULLS	OTHER ITEMS	TOTAL
1987	269	14	112		14	15	424
1988	1360	11	75		6	31	1483
1989	220	862	30	156	19	21	1308
1990	536 (2)	126	10		20	10	702 (2)
1991	543 (28)	295	1	38	21	130	1028 (28)
1992	449 (197)	1233 (1155)	12	2	31	34 (2)	1761 (1354)
1993	722 (147)	29	69	4	80	10	914 (147)
1994	452 (3)	1180 (2)	115	1	41	2	1791 (5)
1995	338 (7)	880 (7)	119		51	2	1390 (14)
1996	509 (5)	9	528	1	48	12	1107 (5)
1997	471 (62)	830 (1)	73		36	7	1417 (63)
1998	1142 (619)	80 (8)	40	1	19	29 (4)	1311 (631)
1999	846 (45)	65 (1)	94 (40)	28	39 (1)	211 (2)	1283 (89)
2000	548 (26)	211 (46)	15	33	4	8 (1)	819 (73)
2001	1038 (445)	51 (6)	15	250	15	7	1376 (451)
2002	987 (41)	97 (1)	114 (1)	430	44 (1)	13	1685 (44)
2003	1095 (196)	66 (11)	204	39	37	9	1450 (207)
2004	1482 (164)	137	139 (39)	162	52	9	1981 (203)
2005	1712 (7)	96 (1)	172		35	10	2025 (8)
2006	1401 (60)	125	98	20	37	9	1690 (60)
2007	74 (16)	178 (1)		99	14	53	418 (17)
2008	1007 (160)	130			39	9	1185 (160)
2009	791 (31)	94	16	42	24	8	975 (31)
TOTAL Items	17,992 (2098)	6799 (1240)	2051 (80)	1306	726 (2)	649 (9)	29523 (3592)

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

Note: Numbers in parentheses represent the proportion of items recorded as pre-Convention items. There remaining items were recorded as wild or unknown.

Items that could represent an individual walrus

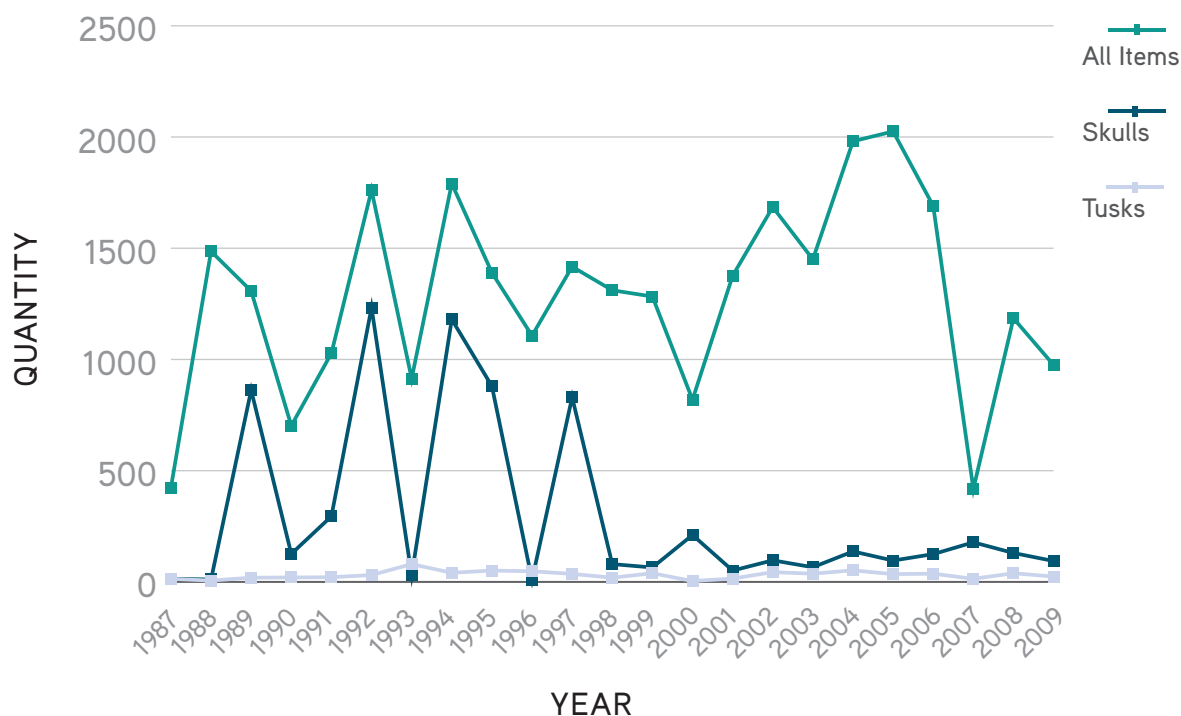
A walrus skull is not usually traded without the tusks, so it is reasonable to assume that a skull can be sourced from one walrus and two tusks could be sourced from either one walrus or from two different walrus. Only these two items can provide an estimate of walrus represented in international trade. Since the walrus must be dead for a skull or tusk to be traded, this can also provide insight to the potential impact of trade on the conservation of the species. Purpose of export and destination countries can also provide insight on the dynamics of the trade (e.g. purpose of trade, where markets are located), which is not necessarily the same for skulls and tusks. Thus the

data are examined as separate items (tusks are analysed separate from skulls). The term “bodies” is another item which could be used to represent an individual animal. However, since this term is open to interpretation, it is not possible to know whether a body would also include the skull (or tusks). Bodies accounted for less than 50 items in total during 1987 to 2009 and were not included.

Tusks account for 6,799 of the items reported from 1987 to 2009. Figure 5.6 illustrates increases (peaks) in the number of tusks recorded in 1989, 1992, 1994, 1997 and 2000. The data do not indicate whether tusks were carved or uncarved. These increases in numbers of tusks were primarily for commercial purposes, the majority of which were exported by

Figure 5.6

Trends in reported exports of skulls and tusks per year, 1987 to 2009



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

the United States. In 1992 the majority of these items were recorded by the United States as pre-Convention. For the years 1989, 1994 and 1997, the United States' export data were recorded as wild-sourced tusks in the UNEP-CITES Trade Database. However, the United States' CITES permits (which provide data for

submission of its CITES annual report) record data in the "Description" block (Block 9 of the permit) on whether the item was pre-Convention and in the "Source" block (Block 10 of the permit) on whether the item was from unknown or wild origin. However, since the United States' CITES annual report database

Table 5.4

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

COUNTRY OF EXPORT (PURPOSE OF EXPORT)	YEAR					TOTAL
	2005	2006	2007	2008	2009	
Canada	75	124	178 (1)	101	84	562 (1)
Hunting trophies			2		3	5
Personal	19	73	52 (1)	74	32	250 (1)
Commercial trade	56	51	124	27	49	307
Greenland¹	12	1	0	17	10	40
Personal	11	1		17	10	39
Commercial trade	1					1
Russia	9 (1)	0	0	0	0	9 (1)
Personal	8					8
Travel exhibitions	1 (1)					1 (1)
United States	0	0	0	12	0	12
Personal				12		12
TOTAL	96 (1)	125	178 (1)	130	94	623 (2)
Hunting trophies	0	0	2	0	3	5
Personal	38	74	52 (1)	103	42	309 (1)
Travel exhibitions	1 (1)	0	0	0	0	1
Commercial trade	57	51	124	27	49	308 (1)

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

Note: Numbers in parentheses represent the proportion of items recorded as pre-Convention items. Remaining items were wild, unknown or not recorded.

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).

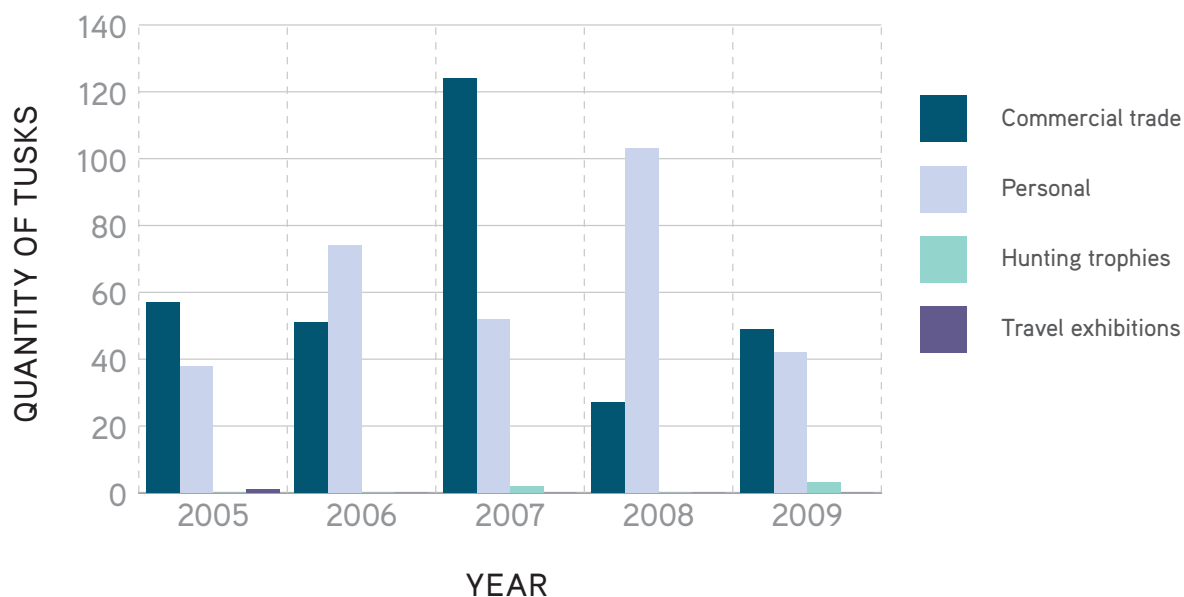
only allows the entry of one source code and because the United States pre-Convention certificates record two sources (pre-Convention source in Block 9 and wild or unknown source in Block 10), in some cases the source from Block 10 has been recorded in the electronic data and their pre-Convention status (reflected in Block 9) was inadvertently not reflected in the data (C. Hoover, Division of Management Authority, in *litt.* to T. Shadbolt, December 17, 2012). Therefore, it appears most likely that the tusks exported by the United States in 1989, 1994 and 1997 were in fact pre-Convention. In addition, the vast majority of these were not recorded by the importing countries, suggesting that the importing country did not report the imports (e.g. Indonesia did not report any imports even though United States reported export there). It is also important to note that United States prohibits the commercial export of uncarved, non-fossil tusks; furthermore, raw pre-Convention

tusks must be also be considered fossils before they can be exported out of the United States for commercial purposes (USFWS in *litt.* to T. Shadbolt, March 25, 2013).

The number of tusks in international trade increased gradually from 2005 to 2007, and then declined from 2008 to 2009; with the 2009 levels falling almost to 2005 levels. However, the recorded purpose of export fluctuated (Table 5.4 and Figure 5.7). An increase in the number of tusks exported for commercial trade was observed in 2007 (influenced by Canadian exports), followed by a decrease in 2008. An increase in the numbers of tusks exported for personal purposes was observed in both 2006 and 2008, again the result of Canadian exports. The reason for the fluctuations in the purpose of export is unclear, but could be a result of changes in market dynamics or result of inconsistent reporting of the data.

Figure 5.7

Purpose of walrus tusk reported exports, per year, 2005 to 2009



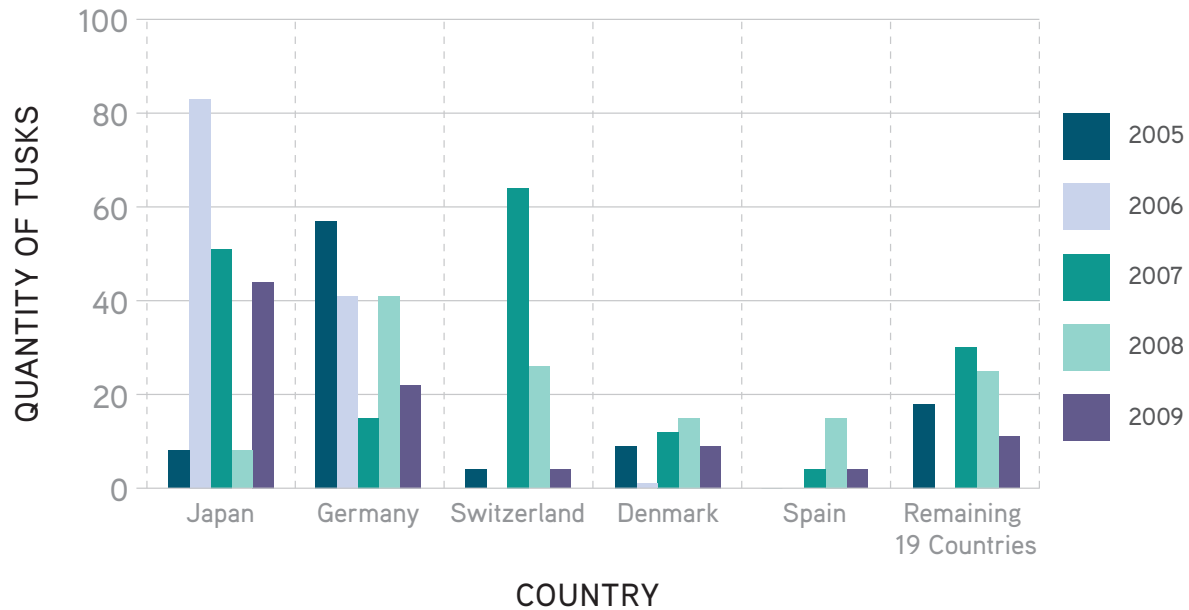
Source: Comparative tabulation of export data extracted from the UNEP-WCMC CITES Trade Database.

The 2005 to 2009 export data contained 24 different destination countries for walrus tusks. The number of tusks exported to key destination countries fluctuated

with no apparent trends (Table 5.5 and Figure 5.8). The majority of the tusks were exported to Japan, Germany, Switzerland, Denmark and Spain.

Figure 5.8

Key destination countries for walrus tusks, according to 2005 to 2009 export data, per year



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

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A small walrus tusk that has been sectioned longitudinally and polished (left) and a seal figurine carved from walrus tusk ivory (right)

Table 5.5

Key destination countries for walrus tusks, according to 2005 to 2009 export data, per year

DESTINATION COUNTRY (PURPOSE OF EXPORT)	YEAR					TOTAL
	2005	2006	2007	2008	2009	
Japan	8	83	51	8	44	194
Personal		42	14	8	15	79
Commercial trade	8	41	37		29	115
Germany	57	41	15	41	22	176
Hunting trophies			2			2
Personal	12	31	4	40	4	91
Commercial trade	45	10	11	1	18	85
Switzerland	4	0	64	26	4	98
Personal	4		2		4	10
Commercial trade			62	26		88
Denmark	9	1	12	15	9	46
Personal	8	1	12	15	9	45
Commercial trade	1					1
Spain	0	0	4	15	4	23
Hunting trophies					1	1
Personal	0	0	4	15	3	22
Remaining 19 countries*	18 (1)	0	30 (1)	25	11	84 (2)
Travel exhibitions	1 (1)					1 (1)
Hunting trophies					2	2
Personal	14		16 (1)	25	7	62 (1)
Commercial trade	3		14		2	19
TOTAL	96 (1)	125	178 (1)	130	94	623 (2)
Hunting trophies	0	0	2	0	3	5
Personal	38	74	52 (1)	103	42	309 (1)
Travel exhibitions	1 (1)	0	0	0	0	1
Commercial trade	57	51	124	27	49	308 (1)

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

Note: Numbers in parentheses represent the proportion of items recorded as pre-Convention items. Remaining items were wild, unknown or not recorded.

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).

* Less than 17 tusks were exported to an individual country over the five-year period

Skulls account for 726 of the items reported in international trade from 1987 to 2009. Figure 5.6 (above) illustrates the trends in the quantity recorded which appear to be relatively stable. In most years less than 50 skulls were recorded, with the exception of 1993 when 80 skulls were Greenland exports for personal and scientific purposes.

From 2005 to 2009, the quantity of skulls remained relatively stable with slight declines in 2007 and 2009. The recorded purpose of export was primarily for personal purposes (Table 5.6 and Figure 5.9).

The 2005 to 2009 export data recorded 18 different destination countries for walrus skulls (Table 5.7 and Figure 5.10). The majority of the skulls were exported to Denmark, Netherlands, Germany and Belgium. The number of skulls exported to key destination countries did not fluctuate significantly, except in 2007 when skulls were not exported to Denmark. However, this is likely a gap in the available data as Greenland did not report its exports that year.

Table 5.6

Number of walrus skulls and purpose of reported exports, per year, 2005 to 2009

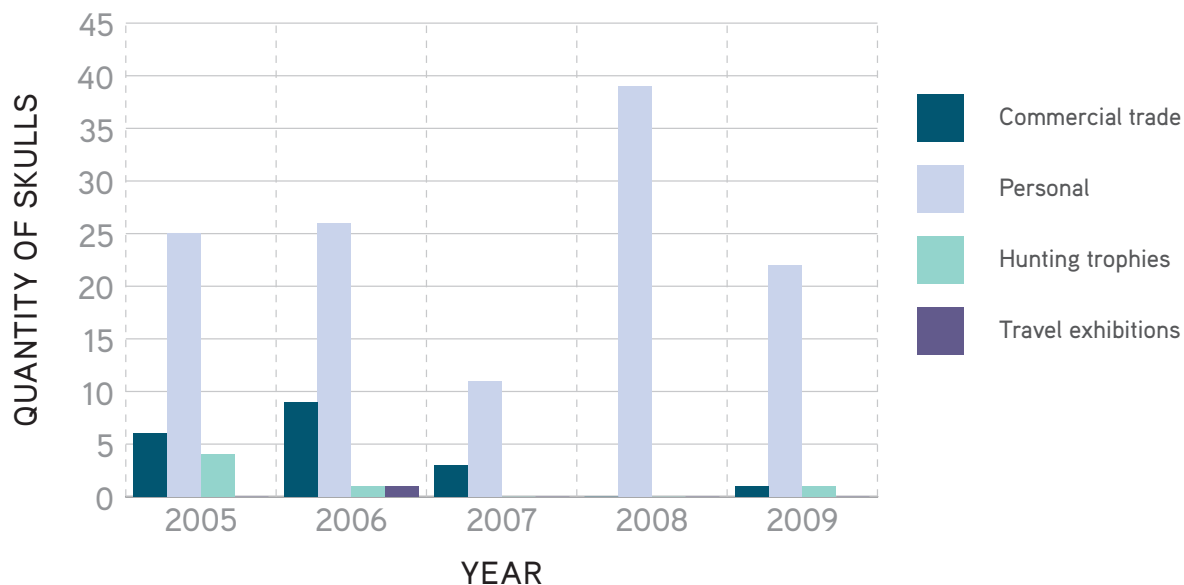
COUNTRY OF EXPORT (PURPOSE OF EXPORT)	YEAR					TOTAL
	2005	2006	2007	2008	2009	
Canada	13	12	14	6	7	52
Hunting trophies	4	1			1	6
Personal	4	4	11	6	5	30
Commercial trade	5	7	3		1	16
Greenland¹	22	25	0	33	17	97
Personal	21	22		33	17	93
Travel exhibitions		1				1
Commercial trade	1	2				3
TOTAL	35	37	14	39	24	149
Hunting trophies	4	1	0	0	1	6
Personal	25	26	11	39	22	123
Travel exhibitions	0	1	0	0	0	1
Commercial trade	6	9	3	0	1	19

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).

Figure 5.9

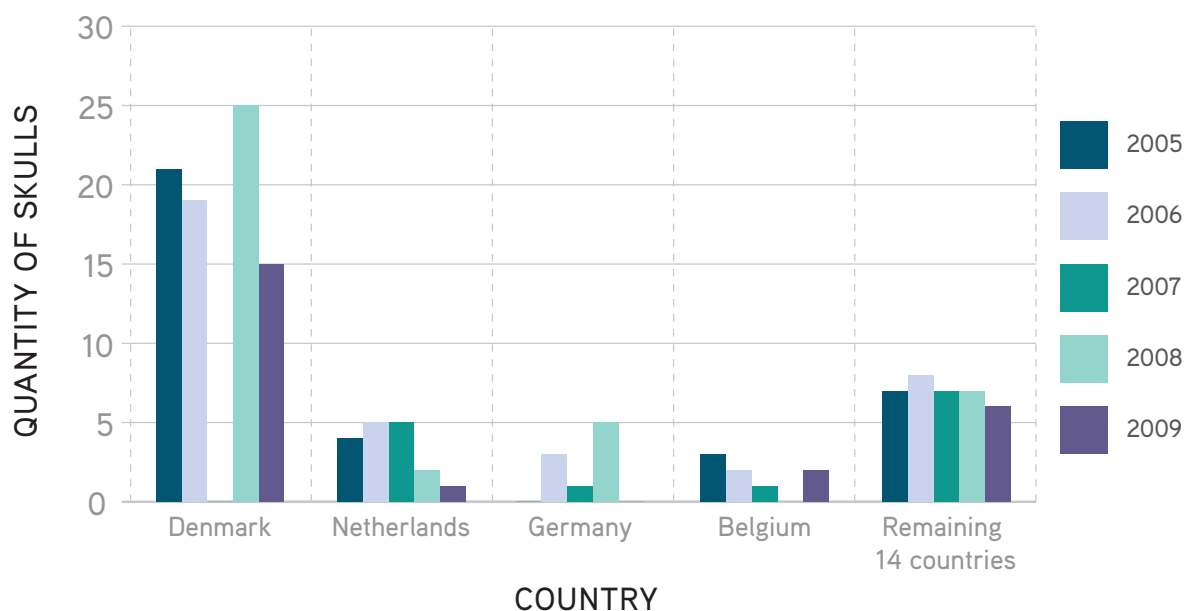
Purpose of walrus skull reported exports, per year, 2005 to 2009



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

Figure 5.10

Key destination countries for walrus skulls, according to 2005 to 2009 export data, per year



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

Table 5.7

Key destination countries for walrus skulls, according to 2005 to 2009 export data, per year

DESTINATION COUNTRY (PURPOSE OF EXPORT)	YEAR					TOTAL
	2005	2006	2007	2008	2009	
Denmark	21	19	0	25	15	80
Personal	20	17		25	15	77
Travel exhibitions		1				1
Commercial trade	1	1				2
Netherlands	4	5	5	2	1	17
Personal		1	2	2	1	6
Commercial trade	4	4	3			11
Germany	0	3	1	5	0	9
Personal		1	1	5		7
Commercial trade		2				2
Belgium	3	2	1	0	2	8
Personal	3	1	1		1	6
Commercial trade		1			1	2
Remaining 14 countries*	7	8	7	7	6	35
Hunting trophies	4	1			1	6
Personal	2	6	7	7	5	27
Commercial trade	1	1				2
TOTAL	35	37	14	39	24	149
Hunting trophies	4	1	0	0	1	6
Personal	25	26	11	39	22	123
Travel exhibitions	0	1	0	0	0	1
Commercial trade	6	9	3	0	1	19

Source: 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).

* Less than 6 skulls were exported to an individual country over the five-year period.

Items that cannot represent an individual animal

It is not possible to determine the number of walrus represented by the remaining items recorded in trade. For many of the items described such as carvings and ivory carvings, there is no way to determine how many animals represent the trade. A “carving” could be a small ivory figurine or it could be a fully carved tusk. Likewise, “teeth” could be interpreted as molars or a tusk. Furthermore, “specimens” is not well defined and could refer to items such as blood or tissue samples resulting from research activities.

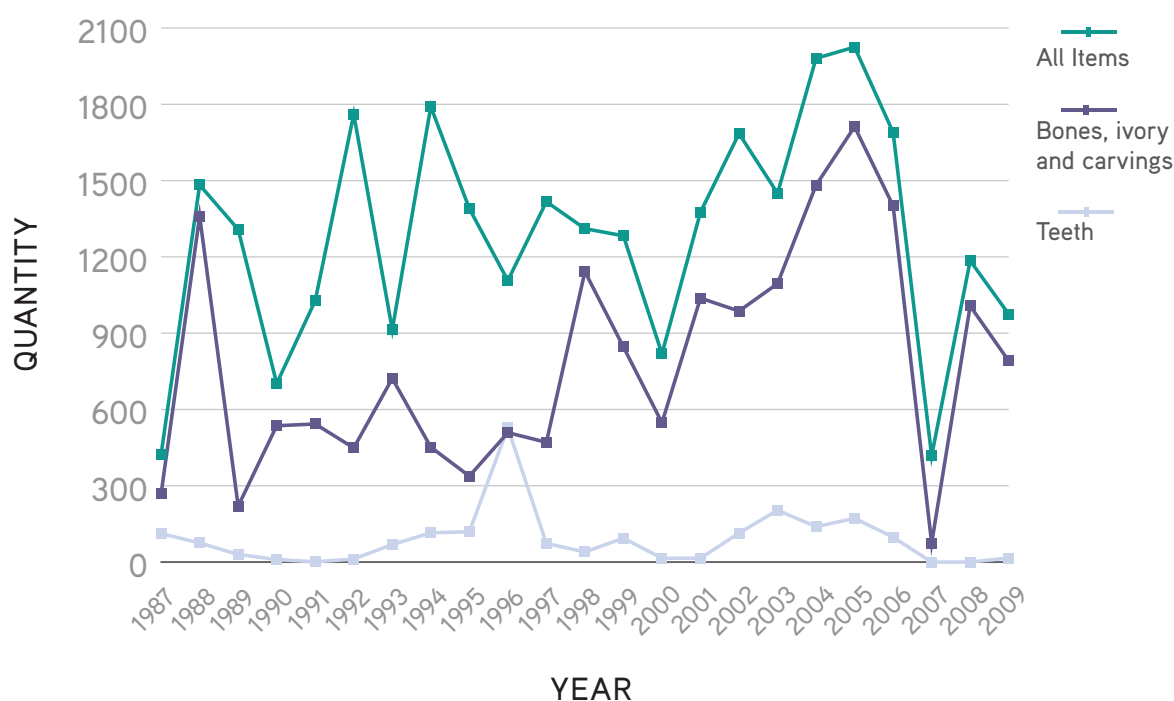
Bones, ivory and carvings (skeletons, bones, bone products, bone pieces, bone carvings, ivory carvings,

ivory pieces and carvings) account for 17,992 of the items reported from 1987 to 2009. Figure 5.11 illustrates increases (peaks) in the numbers recorded in 1988, 1990/1991, 1993, 1998, 2001, 2005 and 2008. These increases are summarized as follows.

- 1988 and 1993: increases were primarily for commercial trade;
- 1990/1991: primarily for commercial trade and to a lesser extent personal trade;
- 1993: primarily for commercial trade;
- 1998: primarily for travel exhibitions and to a lesser extent commercial trade and personal trade;
- 2001: primarily for travel exhibitions and to a lesser extent personal trade;

Figure 5.11

Trends in reported exports of bones/ivory/carvings and teeth, per year, 1987 to 2009



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

- 2005: primarily for personal
- 2008: primarily for personal trade and to a lesser extent unspecified purposes.

A large decrease in number of bones, ivory and carvings was observed in 2007, likely due to the missing 2007 Greenland data. Greenland was the primary exporter of these items in other years.

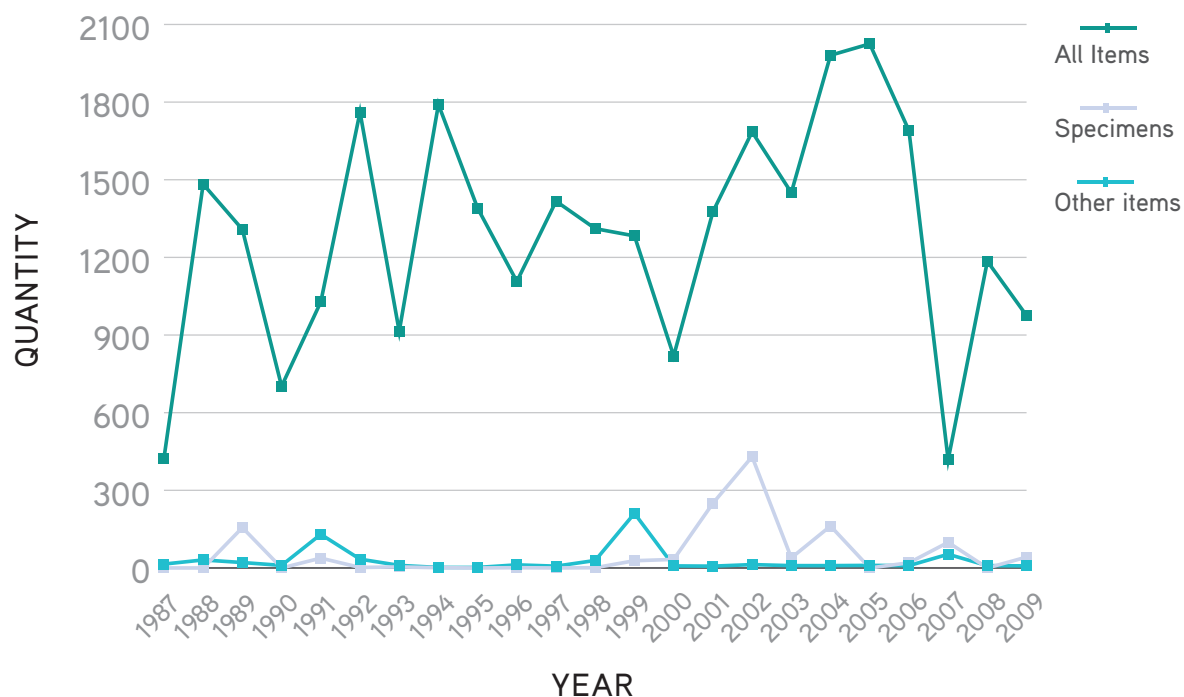
Teeth account for 2,051 of the items reported from 1987 to 2009. Figure 5.11 illustrates increases (peaks) in the number of teeth recorded in 1996, 2003 and 2005. In 1996 and 2005 this was due to increased numbers of items traded for commercial purposes, while in 2003 this was due to increased numbers of items exported for scientific purposes.

Other items (claws, trophies, bodies, skins, skin pieces, leather items, leather products, garments, plates, scraps, hair, meat, genitalia [which could be penis bones] and unspecified items) account for 649 of the items reported from 1987 to 2009. Figure 5.12 illustrates increases (peaks) in the quantity of items recorded in trade in 1991, 1999 and 2007. The increase in 1991 was the result of greater numbers of leather items which had an unknown purpose. The increase in 1999 consisted of claws for commercial trade and the increase in 2007 consisted of genitalia for commercial trade.

Specimens (e.g. blood or tissue samples) account for 1,306 of the items reported from 1987 to 2009. Figure 5.12 illustrates increases (peaks) in the quantity of

Figure 5.12

Trends in reported exports of specimens and other items, per year, 1987 to 2009



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

specimens recorded in 1989, 2002, 2004 and 2007. These increases were mostly the result of increased numbers of specimens traded for scientific purposes.

5.4 Impact of international trade on walrus

As previously mentioned, the commercial exploitation of walrus for oil, blubber and tusks from the 18th to the 20th century greatly reduced the global population of both the Pacific and Atlantic subspecies. However, the alleviation of this exploitation allowed the species to increase to their current size in latter half of the 20th century. Today, walrus parts and derivatives in international trade are sourced from walrus killed during the subsistence hunt, or from the historical commercial harvest (i.e. pre-Convention items).

The total number of items reported in the export data fluctuated, and increases from 1987 to 1997 increases were influenced mainly by increases in trade in tusks. The data could mistakenly be interpreted to indicate that the number of walrus hunted for trade was also increasing. However it is important to note that during these years, a significant number of the tusks were recorded as pre-Convention tusks by the United States. Since 1998, the quantity of items exported has varied, primarily the result of greater numbers of bones, ivory and carvings entering international trade. It is impossible to determine how many walrus are represented by trade in these items. However, the numbers of tusks and skulls (which can be used to estimate the number of walrus involved) remained relatively constant throughout that time period. It is also important to note that exports of personal items and household effects (including tourist souvenirs) may not require certificates or permits for export, depending on the range State's laws (e.g. a permit for this purpose is not required by the United States or Canada). This means that international trade in these items may not be recorded and will not be contained in the UNEP-WCMC CITES trade data. This applies

to all item types, and therefore international trade could be higher than indicated in the UNEP-WCMC CITES Trade Database.

A rough estimate of the number of walrus represented in international trade can be made by examining the numbers of skulls and tusks in export data. Since there is no way to determine whether two tusks represent one walrus or two walrus, a minimum and maximum estimate is provided. The minimum estimate (assuming that two tusks represent one walrus) indicates that 461 walrus ($149 \text{ skulls} + 623 \text{ tusks} / 2$) were represented in international trade from 2005 to 2009, an average of 92 walrus per year. The maximum estimate (assuming that two tusks represent two walrus) indicates that 772 walrus ($149 \text{ skulls} + 623 \text{ tusks}$) were represented in international trade from 2005 to 2009, an average of 154 walrus per year. The majority of these skulls and tusks were from Atlantic walrus. These figures could be the result of countries such as Canada reporting trade data based on permits issued, not on permits actually used. Furthermore, these data do not record the year the walrus was killed, only the year it was traded. There is no direct link between harvest and trade data, so some of these tusks and skulls could have come from walrus killed in previous years; for instance, it is possible that an animal was killed in 1990 but not traded until 2006. The data could also underestimate the number of walrus in international trade, since walrus products exported as personal and household effects (which include souvenirs) may not require permits/certificates. Thus, they are not contained in the international trade data.

All the skulls (149) and 602 (out of 623) of the tusks recorded in the export data from 2005 to 2009 were from Canada or Greenland, and thus were from Atlantic walrus. This could mean that almost all of the walrus products in international trade are from Atlantic walrus; or it could mean that products from Pacific walrus are mostly personal and household

effects and are without CITES certificates or permits. In the United States, trade in walrus parts and derivatives for personal and household effects does not require documentation. This means the information is not recorded and not submitted in the United States annual reports or reported in the UNEP-WCMC CITES Trade Database (USFWS, CITES Division of Management Authority, in litt. to T. Shadbolt, April 8, 2013). According to CITES World (2003) there is insufficient awareness of Appendix III and how it contributes to the work of the Convention. Doubts about the effectiveness of Appendix III and difficulties in its implementation have made some Parties being unwilling to take on the administrative burden of implementing Appendix III. An example of this was the Appendix III listing of big-leaf mahogany, which initially did not result in effective implementation because of lack of understanding of Appendix III requirements (CITES World, 2003).

Although import data were not analyzed for this report, it appears that not all import data are being reported. For example, Indonesia did not report imports of walrus products from the United States, although the United States reported exports to Indonesia (which is also the case for many other Appendix III species exported to Indonesia). This suggests that not all of the data on international trade is being reported.

There can be challenges in accurately differentiating fossil ivory from modern ivory, especially if the fossil ivory is well preserved (E. Cooper, pers. obs.). The Arctic's frozen ground serves to preserve and protect ivory from the elements very well. Like modern ivory, some well-preserved fossil ivory lacks mineralization, cracks, fissures and a darker appearance, characteristics which help to identify it as fossil or antique ivory.

There are also methods which can be used to alter the physical appearance of modern ivory to resemble antique or fossil ivory. It is possible that some of

these methods have been exploited to circumvent regulations (E. Espinoza, National Fish and Wildlife Forensic Lab USFWS, pers. comm. to T. Shadbolt, February 13, 2013).

Due to the uncertainties and data limitations discussed above, combined with the fact that NDFs are not required to for issuance of CITES export permits for walrus parts and derivatives, it is difficult to determine the total impact of international trade. However, the available information does not suggest that international trade currently poses a threat to walrus conservation.

Research regarding the current and projected effects of climate change on walrus is lacking and the impacts for Pacific walrus may differ than those for Atlantic walrus. However, there has been growing interest and more research in recent years which will likely improve the understanding of the impacts of climate change on both walrus subspecies. Loss of sea ice may also open up areas in the Arctic that were previously inaccessible to humans, while an expected and concurrent increase in the number of walrus hauling out onshore may result in easier human access to walrus. Changes in sea ice timing and occurrence will also disrupt traditional hunting as walrus either shift distributions or conditions make subsistence hunting more difficult in some years. Given the potential impacts of climate change, it will be important to ensure that international trade does not pose a threat to the species.

5.5 Socioeconomic importance and value of walrus parts and derivatives

Many Arctic communities are characterized by a mixed economy, which combines both a market economy and a 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 meet cultural, social and nutritional needs, but also financial needs of families and households. Hunters use money earned from the sale of animal products to purchase equipment for harvesting activities (including rifles, boats, snow machines, and fuel) and to meet demand for modern standards of living (Nuttall *et al.*, 2005).

In some Arctic regions, use of snowmobiles has decreased the need for sled dogs. As a result, there is less demand for walrus meat to be used for dog food (USFWS, 1994). Although Pacific walrus meat is still eaten by indigenous people in some communities, its importance may have decreased compared to that of tusks, since ivory carvings provide cash income for hunters (USFWS, 1994; 2007b).

The value of a subsistence hunt cannot be determined solely by the monetary value of the animal parts because this does not take into account other aspects of the hunt, such as providing food to the community and the cultural importance of the hunt itself. The monetary value of the international trade in walrus and its parts and derivatives is not known. In 1994, the dollar value of the walrus harvest for Alaskan Natives was estimated to be in the millions (USFWS, 1994). A socioeconomic report in 1992 and 1993 on summer walrus hunts in Canada's northern Foxe Basin (Anderson and Garlich-Miller, 1994) estimated the value of the hunt at CAD160,000, CAD386,000 or CAD659,000 (estimates varied depending on the type of substitution costs: import substitution, alternative market, or country food substitute) (Anderson and Garlich-Miller, 1994). No other reports highlighting the socioeconomic importance and value of walrus have been identified.

Value of walrus parts derived from subsistence harvest

The value of walrus products varies depending on the type of item; however, their value is also a function of artistry. Although raw tusks or fully carved tusks may be sought after, the value of other products, such as carvings, varies (Grønlands Naturinstitut, 2011). Walrus carvings can be found in souvenir shops in Russian international airports and in hotels in the country's eastern regions, but foreign tourists are not numerous in these areas so demand is limited. Russians reportedly do not purchase walrus carvings often because they are expensive and not considered fashionable (A. Vaisman, TRAFFIC-Russia *in litt.* to T. Shadbolt, March 10, 2009). However, in recent years a new limited market for walrus tusks, specifically a small-scale trade in pieces of walrus ivory, has emerged in Russia,. These pieces are used in the making of objects such as knife handles, which is often a hobby for knife collectors (Vaisman *in litt.* to T. Shadbolt, July 30, 2013; Knifewood, 2013).

The value of walrus tusks varies depending on the tusks' size and quality. In Canada in 1993, tusks weighing between 1.4 kg and 2.7 kg could be sold for CAD55/kg and the baculum for CAD10 (Anderson and Garlich-Miller, 1994). In Greenland, a skull with good tusks could be sold for USD1,600 (DKK10,000) and USD500 to USD835 (DKK3,000 to DKK5,000) in tourist shops (Born, 2005b; Hjarsen, 2004). In Russia, walrus tusks and bones range in price from a few hundred dollars to USD4,000 depending on the item and artistic value (A. Vaisman, TRAFFIC-Russia *in litt.* to T. Shadbolt, March 10, 2009).

In 2008/2009, online stores and auction houses advertised a variety of walrus products for sale. Table 5.8 provides a summary of the walrus parts/products with their advertised values.

Table 5.8

Walrus products advertised on the internet

ITEM	COUNTRY	ADVERTISED PRICE (FOREIGN CURRENCY)	ADVERTISED PRICE (USD)
Tusks ¹	Canada	-	USD275-550 per tusk
Pair of tusks ²	Canada	CAD485-885	USD458-835
Carved tusks ³	Russia	RUB75,000 -138,000	USD2,230-4,102
Skull with tusks ²	Canada	CAD695-1,995	USD656-1882
Skull and tusk mount ⁴	USA	-	USD1,875
Scrimshawed skull with tusks ⁴	USA	-	USD3,550-4,875
Engraved and carved skull with tusks ³	Russia	RUB120,000	USD3,587
Small figurines ^{4, 5}	USA	-	USD171-800
Small figurines ⁶	Russia	RUB4,400	USD 131
Large figurines ⁴	USA	-	USD2,950
Large figurines ⁶	Russia	RUB46,300	USD1,376
Bacula (Oosiks) ²	Canada	CAD175-199	USD165-188
Bacula (Oosik) and ivory ⁴	USA	-	USD 901
Fossil bacula (Oosik) and ivory ⁴	USA	-	USD 651
Bacula ³	Russia	RUB35,000-39,000	USD1,040-1,165
Ivory knife handle ⁷	USA	-	USD1,650
Scrimshawed ivory knife handle ^{8,9}	USA	-	USD450-1,050
Whisker toothpick ⁴	USA	-	USD25
Whisker earrings ^{4, 10}	USA	-	USD37
Whisker necklace ¹¹	USA	-	USD90
Ivory earrings ^{12, 13}	USA	-	USD22-150
Ivory bracelet ^{13, 14}	USA	-	USD150-200
Ivory necklace ¹³	USA	-	USD200

Source: 1. The Chichester Group, 2008
 2. Arctic Art Sales, 2008
 3. Nord Kompleks Studio, 2009
 4. EBay Private Sale, 2008
 5. The Raven's Journey, 2009

6. Kostorez, 2009
 7. Tiensvold Custom Knives, 2009
 8. Karam Handmade Knives, 2006
 9. Hoffman Knives Collection, 2001
 10. Fort Green Museum and Alaskan Gifts, 2009

11. Alaska Native Arts, 2009
 12. Village Trading Post, 2009
 13. Alaskan Native Treasures, 2009
 14. Kellers Trading Company, 2009

Sport hunting

Sport hunting of walrus is currently only legal in Canada. Similar to sport hunting for polar bears, sport hunting for walrus also provides local guides an opportunity to work on the land and use traditional skills (Foote and Wenzel, 2009). These skills are not utilized in typical employment opportunities in their communities. Local hunting guides also have a sense of pride in what they do and in the opportunity to demonstrate their skills to visiting hunters (Foote and Wenzel, 2009). Guiding provides Arctic communities with an additional source of income. Sport hunting of walrus by non-Native residents has been allowed in Canada since 1995 (COSEWIC, 2006). International sport hunters are allowed to take non-edible trophy parts (e.g. tusks, bacula, skulls) home, providing their

country allows the import of such items. Edible parts of the walrus, such as the meat, must remain with the community (Anon., 1993a; COSEWIC, 2006).

In 2007, a guided sport hunt for walrus cost USD6,000 to USD6,500 for a six-day trip (Ameri-Cana Expeditions Inc. 2007). In 2012, depending on the company, a guided sport hunt for walrus cost USD7,000 for a six-day trip (Andrew Lake Lodge, 2012) to USD9,000 for a five-day trip (Ameri-Cana Expeditions Inc., 2012). This does not include airfare or accommodation before or after the trip. After the outfitter takes out booking fees, a hunt costing USD6,000 could bring USD3,500 to USD4,100 to the community, while guides receive USD1,200 to USD1,750 and assistant guides receive USD300 to USD500 (Chivers, 2002).



A pendant made from a fossil walrus tooth

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CONCLUSIONS

Walrus range across a vast and diverse Arctic ecosystem and they are genetically isolated into two distinct subspecies, Atlantic and Pacific walrus. As such, walrus will be subjected to many stressors (threats) that vary from region to region, affecting each subspecies in different ways and over differing time scales. The impacts of these stressors on walrus conservation will be dependent on the health of the population/stock and the resilience of each region's ecosystem.

The impacts of climate change on walrus and their habitat are not well understood, but the loss of summer sea ice and the effects this could have on walrus warrant legitimate concern. Lack of long-term data and precise population estimates make it difficult to determine sustainable harvest levels and whether resulting trade is from sustainable sources. New and improved information gathering and reporting can help to assess various threats, including climate change, and ultimately can be used in adaptive management.

There are substantial limitations to analysing walrus CITES trade data as they are currently reported. It

is difficult to assess current levels of international trade and whether regulations are adequate to ensure sustainability of walrus populations. Some of the main findings, uncertainties and concerns are provided below.

Management

- From 2006/2007 to 2010/2011 on average, 3,215 to 5,406 walrus were killed each year from a global population of approximately 150,000 to 160,000 walrus. This is less than four per cent of the global population.

- ▶ For Atlantic walrus, on average 401 to 555 walrus were killed each year from an estimated population of 20,000 to 27,000 animals. This is less than three per cent of the global Atlantic walrus population.
- ▶ For Pacific walrus, on average 2,814 to 4,851 walrus were killed each year from a minimum estimated population of 129,000 animals. This is less than four per cent of the global Pacific walrus population.
- As sea ice melts, greater opportunities for development and transport routes will likely emerge, potentially increasing disturbances to walrus. Changes in weather and sea ice conditions could also make walrus hunting easier or more difficult. Response to loss of sea ice and increasing pressure from human development will vary between subspecies, by region and over time. The predicted overall impact on walrus is not well understood. However, given their reliance on sea ice habitat, there is conjecture that loss of sea ice due to climate change may negatively impact walrus populations unless they are able to adapt to ice-free conditions. One concern over walrus' increased use of land haul-outs is higher mortality associated with disturbance events, which occur when animals flee to the water and some animals are crushed by others.
- If walrus from some stocks begin to show signs of decline due to the impact of climate change, adaptive management can help to minimize additional stresses or pressures on the species. This may be more applicable to Pacific walrus, which are anticipated to be more negatively impacted by climate change.
- Scientific estimates of population size and/or population trend metrics are poor and local residents' impressions of abundance do not always align with scientific survey results. This poses a challenge for wildlife professionals and policy-makers, since the range States aim to manage walrus in accordance with sound conservation practices based on the best available scientific data. Without accurate population information, it is difficult to determine whether exploitation is sustainable.
- The number of struck and lost animals associated with hunting is a concern for walrus management. There are few studies on struck and lost rates, and most are 20 to 40 years old. These studies have focused on particular regions during particular times. Since struck and lost rates vary by region, hunting method, experience of the hunter, and season, applying the same correction factor to the national harvest is likely to result in bias and inaccurate estimates of the number of animals killed. However, from a precautionary perspective this is the best available information to provide insight to the total number of walrus killed by hunting (i.e. the number of walrus harvested plus struck and lost animals).
- Policies, legislation and regulations are only effective if there are adequate measures or means to implement and enforce them. Monitoring and enforcement activities are hampered across range States due to the remote nature and sheer size of the habitat, limited infrastructure and insufficient funding. As such, co-management systems may be effective and economic solutions to this challenge.
- Walrus range States have made efforts to improve the management and conservation of walrus, including the introduction of quotas in some regions (e.g. Greenland). The Walrus International Technical and Scientific committee (WITS) was established in the 1990 at the first International Workshop on the Ecology and Management of Walrus Populations. A second workshop was held in 1993 to continue to strengthen the coordination, communication and cooperation among managers and resource users. However, there have not been recent meetings and the group is no longer active.

International trade

- Analysis of CITES trade data could not provide a precise estimate of number of walrus represented in international trade. Only two items, tusks and skulls, can be used to make inferences for the number of animals in international trade. On average, between

92 (minimum) to 154 (maximum) walrus were believed to be represented in international trade in a given year, with the majority being Atlantic walrus. All the skulls (149) and 602 (out of 623) of the tusks recorded in the export data from 2005 to 2009 were from Atlantic walrus. Carvings represent the highest number of items in international trade; however, there is no way to determine how many animals these items represent.

- Available data may underestimate the number of walrus represented in international trade since the trade consists of many different types of items which may be sourced from an unknown number of walrus in addition to those animals represented by tusks and skulls. Furthermore, products (including tusks and skulls) exported as personal and household effects (including souvenirs) may not require issuance of permits/certificates and are unaccounted for in the UNEP-WCMC CITES trade data.
- Export of Appendix III specimens does not require an NDF. Since NDFs are not required, countries do not have to prove that international trade is not detrimental to walrus in the wild before issuing permits. This makes it very difficult to determine the impact of international trade on walrus or if items in international trade are sustainably sourced. As such, the current CITES listing of walrus does not provide an indication on whether international trade is detrimental to the conservation of the species.
- Although range States are required to report international trade in all species listed under the Convention, some range States may have problems with implementing provisions for Appendix III species. As such, the reporting of international trade may not be as accurate as for those species listed in CITES Appendices I or II.
- It is difficult to accurately distinguish the various sources of ivory from one another: fossil ivory, antique ivory, beach ivory and modern ivory.

Furthermore, whether the items are raw or processed can further complicate matters. This could result in some modern ivory (from walrus hunted post-1975) to be declared to be from other sources (e.g. fossil ivory) in an attempt to circumvent regulations.

- Where permissible by law, walrus hunting provides economic benefits to Arctic peoples through the sale of goods from the hunt (e.g. tusks, skulls and bones). The walrus sport hunt also provides a source of income through guiding. Income from these activities is used to meet basic living needs and to help fund future subsistence activities. Thus, the financial return from guiding and from the sale of items provides an incentive to encourage and maintain sustainable walrus populations/stocks.
- Few cases of illegal trade have been recorded, making it difficult to assess the extent of the problem or to determine where to allocate resources to address the issue. However, there does appear to be illegal domestic trade occurring in the United States as indicated by the many charges and convictions that have been reported.
- Insight into certain aspects of international trade dynamics were 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 (i.e. antique, fossil, beach-found or modern ivory), nor can they indicate who is involved in the kind of trade transactions (e.g. tourist souvenirs purchased from stores or from local people, commercial manufacturers who process the ivory, cultural exchanges between indigenous people, etc).
- Uncertainty with regard to implementation of CITES within the CU make it unclear on how trade in CITES-listed species such as walrus is being monitored and regulated and what enforcement actions are in place to address violations of CITES provisions.



RECOMMENDATIONS

Managers, enforcement authorities, biologists, Arctic communities and a spectrum of concerned conservation organizations may have differing opinions on particular topics or have different methods for achieving and measuring success or failure. However, they do share a common goal: to conserve wildlife.

New information and more precise data on both Atlantic and Pacific walrus is needed to ensure stocks don't decline to low unsustainable numbers. This information and data can help inform management decisions to ensure harvest levels are sustainable and are tied to specific and logical management targets. This will help to ensure resulting international trade will not be detrimental to walrus conservation. Given the uncertainties in regard to the impacts of climate change on walrus and limitations in available trade data, interested parties will need to work together and pool resources to have a greater impact on conservation of the species. Cooperation, communication and commitment are needed by all to

help fill in the gaps. Successful management will result in subspecies that are healthy, stable, resilient to threats and a resource to local communities for the longest possible time.

Given the uncertainty with regard to international trade (whether it poses a threat to walrus conservation) and the relatively low to moderate levels of reported international trade, it may be more appropriate to direct efforts at monitoring trade levels in the short term and acquiring more information before considering more costly and lengthy solutions which may not yet be needed for walrus 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 be explored and management should be adapted to ensure conservation of the species. Since some Arctic people and villages are highly dependent on the income acquired from selling Native authentic handicrafts, any action taken should also bear in mind local needs in an effort to prevent any unnecessary local hardships.

International Trade

- The inconsistencies in CITES trade reporting are not specific to walrus; they apply to all taxa listed under CITES. 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), improved reporting of Appendix III species (which includes walrus), reporting seizure data and by following the guidelines for the preparations and submission of CITES annual reports. This would provide more consistent reporting of data and improve the analysis and monitoring of trade in the species. If lack of consensus among Parties impedes such changes, the range States could take a proactive stance as a signal to the CITES Parties by improving their monitoring and reporting of CITES trade data.
- Countries that trade in walrus parts and derivatives could be more explicit when submitting information in their CITES annual reports. Improved reporting of trade in walrus parts and derivatives could help to facilitate better analysis of trade activities. This could include:
 - ▶ proper use of terminology codes (e.g. the term “carvings” should not be used for any ivory or bone product as there are existing codes for ivory carvings, ivory pieces, ivory scraps and bone carvings);
 - ▶ improvement in recording units of measurement (e.g. using number of items for tusks, but using weight for smaller items such as carvings, ivory pieces), or use of multiple measurements (e.g. recording both number of items and total weight);
- The reporting of items exported as personal and household effects (including tourist souvenirs) would vastly improve the understanding of trade dynamics. It would provide a more accurate estimate of the number of walrus represented in international trade and whether international trade poses a threat to the conservation of the species. One way to facilitate such reporting could be through forms (e.g. declaring wildlife products) or issuance of special permits. This could be specific to trade in walrus or applicable to other CITES-listed species.
- A range State workshop on international trade in Arctic species could help to facilitate information sharing and discussion on issues related to trade, potential problems and recommended solutions.
- An updated and circumpolar socioeconomic study on the importance of trade in Arctic species (including walrus) would provide useful information to facilitate dialogue and insight into the potential effects of restricting hunting and trade.
- A review of existing management regimes should be conducted to ensure effective methods are being used to validate and ensure modern ivory is not being recorded and traded as pre-Convention, pre-Act or fossil ivory in an attempt to bypass regulations regarding commercial export of walrus parts. Clear definitions on what constitutes fossil ivory may help to prevent such attempts.

Management

- Walrus range States should 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 of the species remains within sustainable limits despite the impact of climate change on the Arctic environment.
- The effects that climate change may have on walrus are not well understood. Although there have been studies on Pacific walrus, there is little more than speculation as to the impacts of climate change on Atlantic walrus. More information is needed for both subspecies to ensure adequate measures are taken for the conservation and management, and that trade will not pose a threat to the conservation of the species.
- Mitigating disturbance to known land haul-out sites could help minimize the number of animals killed during stampede events. This could include protection and restriction of access to known haul-out sites during certain times of the year.
- Range States should review existing domestic and international policies, laws and agreements to ensure that adequate penalties and means to prosecute violations exist.
- Range States should improve dialogue and collaboration on law enforcement pertaining to hunting and trade of Arctic species, including walrus. Regular information exchange between enforcement agencies would help to identify and address enforcement challenges in the Arctic.
- Range States need to establish more precise struck and lost rates for multiple regions and during different seasons over a multi-year timeframe. Since struck and lost rates vary substantially, it would be preferable to have established estimates



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for specific regions rather than applying the same rate to every region. For instance, some locals say that loss rates are as low as five per cent, but the rates often used by managers are much higher as they use historical rates from previous studies completed 20 to 40 years ago. Management authorities and Arctic communities in each range State should consider implementing programs that promote reporting of struck and lost animals. Incentive-based programs could also be explored. Alternatively, 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. This could include workshops to discuss harvest methods and techniques that can help to reduce losses.

- Gaps in current understanding with regard to walrus and climate change, harvest and trade could be reduced by incorporating Traditional Ecological Knowledge. Aboriginal peoples have coexisted with walrus for centuries and their knowledge may help to fill existing gaps. A comprehensive report on this would complement and supplement current knowledge, which could be facilitated through workshops, interviews and discussions with local hunters, elders and communities.

Future considerations

- Improvements to the reporting of the walrus data in annual reports could help to facilitate better analysis of trade activities. This could include:
 - ▶ creation of new codes (e.g. raw tusks, carved tusks, ivory jewellery, small ivory carving, and large ivory carving [with size defined in guidelines]).
 - ▶ information on year of harvest and possible region (e.g. addition of a separate code as supplementary information which could be included on the online query option. The code would allow tracking of products coming from individual walrus stocks).
- Range States could consider the development of a modern tracking system or documentation scheme to track and identify trade of walrus parts. Programs for tagging walrus skulls and tusks after the hunt (e.g. inserting pit tags, microchips, or metal tags in skulls or tusks) could help to collect information on the size and weight of tusks and skulls and items could be marked with a unique tagging number, similar to a system already in use in the United States). Alternatively, range States could consider developing a documentation scheme to help identify and track the source of walrus ivory in international trade. Ivory carvings could be traded with certificates or holographic stickers, where hunters and carvers report the weight of the carvings and tusk tag number to local authorities and receive a certificate or holographic sticker. This would associate carvings with tagging numbers and any instance where the total weight of carvings was greater than the original weight of the tusk would indicate use of an unreported (and possibly illegal) tusk. Branding strategies or certifying programs using holographic stickers or certificates could also be used as a marketing tool (similar to the branding strategy for seafood that has been certified as sustainable by the Marine Stewardship Council (MSC)).
- A study on domestic trade patterns and dynamics 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 walrus parts and derivatives which could provide more insight into the types of items in international trade (e.g. raw vs. processed, carvings vs. tusks). 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 there is evidence of illegal trade or indications of poaching activities. If markets are better understood and monitored, then measures can be taken to better manage trade activities and inform range States of emerging demand trends that could impact management efforts. Attention could be directed towards countries which have not reported import data, even though export data indicate they are destination countries for walrus ivory.
- Development of a policy which outlines the procedures and regulations for addressing provision of CITES, highlighting coordinated monitoring and enforcement of such trade within the CU and enforcement actions in place to address violation of CITES provisions.

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APPENDIX A

WALRUS POPULATION ESTIMATES

Table A1

Walrus population estimates

ATLANTIC WALRUS				
COUNTRY	STOCK/ MANAGEMENT UNIT	RECENT ESTIMATE (YEAR)	COMMENTS	NATIONAL STATUS
Canada	Northwest Atlantic	Extirpated	Also referred to as the Maritime Stock Source: DFO, (2008).	Canada: Northwest Atlantic stock [previously maritime population] is designated as extirpated under SARA (DFO, 2008). All other stocks are considered Special Concern under COSEWIC (COSEWIC, 2006), and are not listed under SARA. COSEWIC is conservation status and SARA is legal designation of status.
	Northern Foxe Basin	Between 8,153 (CV = 0.07) to 13,452 (CV = 0.43) walrus* (2011)	* This is estimate used by DFO to calculate TAR in November 2013 (DFO, 2013b; Stewart and Hamilton, 2013). These two stocks were previously classified as the Foxe Basin stock. The Foxe Basin area was last surveyed in August/September 2010 and 2011. Although they are now separate stocks, the methods used to identify them (i.e. isotopic and morphological differences) were not possible from the air.	
	Central Foxe Basin	Included in above estimate	Results of the survey estimated between 10,379 animals (CV: 0.42) to 13,452 animals (CV: 0.43). Data from 2010 estimated a minimum counted population of 3,861 animals or adjusted using correction factors to 6,480 animals. Data from 2011 estimated a minimum counted population of 8,153 animals or adjusted using correction factors to 10,379 animals. However, since the coverage area was incomplete and the number of haul-outs were reduced to avoid double counting, it is possible that there may have been 13,452 walrus (CV = 0.43) in 2011. This would be assuming that the tagging data from a single haul-out were representative of other haul-outs (Stewart et al., 2013c).	
	South and East Hudson Bay	270 to 300	This stock has not been surveyed in recent years. The estimate is based on unpublished third-party data from only one haul-out site. Approximately 270 walrus were seen at Cape Henrietta Maria, at the northwestern corner of James Bay in 2006 (COSEWIC, 2006; DFO; 2013a).	
	West Jones Sound	503 walrus* (95% CI: 473 to 534) (2008)	*This is estimate used by DFO to calculate TAR in November 2013 (DFO, 2013b; Stewart and Hamilton, 2013). This stock was last surveyed in August 2008 and 2009. The adjusted minimum counted population was estimated at 503 animals in 2008 (95% CI 473 to 534) and 470 animals in 2009 (95% CI 297 to 1,732) (Stewart et al., 2013d). An adjusted estimate of the 2008 data (higher estimate) was also provided to NAMMCO walrus working group in November 2009 using a different correction factor to account for walrus not present at the haul-out sites. Using this method an estimate of 1,450 walrus (95% CI: 997-2,008) was presented to the NAMMCO working group (NAMMCO Annual Report, 2010). This stock was previously classified as part of the Baffin Bay/ North Water stock.	

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Table A1

Walrus population estimates *continued*

ATLANTIC WALRUS				
COUNTRY	STOCK/ MANAGEMENT UNIT	RECENT ESTIMATE (YEAR)	COMMENTS	NATIONAL STATUS
Canada	Penny Strait- Lancaster Sound	Between 661 (CV = 2.08) and 727 (CV = 0.07) walrus* (2009)	*This is estimate used by DFO to calculate TAR in November 2013 (DFO, 2013b; Stewart and Hamilton, 2013). The estimate of 661 differs slightly from the 672 estimate below resulting from a different method of adjustment. This stock was last surveyed in August 2007 and 2009. The adjusted minimum counted population was estimated at 672 animals in 2007 (95% CI 575 to 768) and 727 animals in 2009 (95% CI 623 to 831) (Stewart et al., 2013d). An adjusted estimate of the 2009 data (higher estimate) was also provided to the NAMMCO walrus working group in November 2009 using a different correction factor to account for walrus not present at the haul-out sites. Using this method an estimate of 2,010 walrus (95% CI: 1,416 to 2,852) was presented to the NAMMCO working group (NAMMCO Annual Report, 2010). This stock was previously classified as part of the Baffin Bay/ North Water stock.	
Canada/ Greenland	Baffin Bay/ North West Greenland and the North Water	Canada uses an estimate of 1,249 walrus* (95% CI: 1,370) (2009)	This stock was last surveyed in May 2009 and 2010 by Greenland, and in a joint survey with Canada and Greenland in August 2009. The results were presented to the NAMMCO walrus working group; however, it was requested that all the survey data be re-assessed to include corrections for instantaneous availability bias (NAMMCO Annual Report, 2010). However, the re-adjusted estimates have not yet been presented to or accepted by the NAMMCO walrus working group. The next meeting is being held in November 2013. - The original estimates provided to the NAMMCO walrus working group in November 2009 was 2,676 animals (95% CI: 1,140 to 4,920) for the May 2009 survey and 1,616 animals (95% CI: 876 to 2,980) for the August 2009 survey (NAMMCO Annual Report, 2010). - The re-adjusted estimates of the Greenland survey resulted in an estimate of 1,499 animals (95% CI: 1,077 to 2,087). This included the re-adjustment of the May 2009 survey (1,238 animals; CV 0.19) and new data from a May 2010 survey (1,759 animals; CV 0.29) (Heide-Jørgensen et al., 2013b). - The re-adjusted estimate of the joint Canada and Greenland survey in August 2009 resulted in an estimate of 1,249 animals (CV=1.12, 95% CI = 1,370) (Stewart et al., 2013a). In 2013, Witting and Born, (2013) used modelling to provide a 2012 abundance estimate using data from the 2009 and 2010 Greenland surveys. However, the model did not incorporate data from the Canada/Greenland survey in August 2009. Results of the model estimated a 2012 abundance of 1,400 animals (95% CI: 1,000 to 2,000). This stock was previously classified as part of the Baffin Bay/ North Water stock.	Greenland: critically endangered for the northwater stock (now classified as baffin bay/ north west greenland and the north water); endangered for the west greenland stock (now hudson bay-davis strait /west greenland and south east baffin island); and near threatened for the east greenland stock under the greenland red list 2007 (boertmann, 2007).

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Table A1

Walrus population estimates *continued*

ATLANTIC WALRUS				
COUNTRY	STOCK/ MANAGEMENT UNIT	RECENT ESTIMATE (YEAR)	COMMENTS	NATIONAL STATUS
Canada/ Greenland	Hudson Bay- Davis Strait / West Greenland and South East Baffin Island	Canada uses an estimate of between 1,420 (CV = 0.07) and 2,533 (CV = 0.17) walrus* (2007) Greenland survey estimate in 2012 was 1,408 walrus (95% CI: 922 to 2,150) (2012). Lower than the estimate of 2,533 in 2007.	*This is estimate used by DFO to calculate TAR in November 2013 (DFO, 2013b; Stewart and Hamilton, 2013). The estimate of 1,420 and 2,533 differ slightly from the 2,502 estimate below resulting from a different method of adjustment. This stock was surveyed in May 2006, 2008 and 2012 by Greenland; and partially by Canada in September 2007. The results were presented to the NAMMCO walrus working group; however, it was requested that all the survey data be reviewed and revised to include corrections for instantaneous availability bias (NAMMCO Annual Report, 2010). - The original Greenland estimates provided to the NAMMCO walrus working group in November 2009 was 2,791 animals (95% CI: 1,036 to 7,522) for the May 2006 survey and 3,240 animals (95% CI: 863 to 12,170) for the May 2008 survey (NAMMCO Annual Report, 2010). The re-adjustment of the 2006 data was 1,105 animals (95% CI 610 to 2,002), 2008 data were 1,137 animals (95% CI: 468 to 2,758) and new data from a May 2012 survey estimated 1,408 animals (95% CI: 922 to 2,150) (Heide-Jørgensen et al., 2013a). - The original estimate provided for the 2007 Canadian survey in September was 1,056; however, to account for animals not hauled out, the working group felt that a corrected estimate of 3,030 animals (CV=0.20) could be used for modelling purposes (NAMMCO Annual Report, 2010). The re-adjusted estimate of the joint Canada and Greenland September survey resulted in an estimate of 2,502 animals (95% CI: 1,160 to 3,345) (Stewart et. al., 2013bb). However, the re-adjusted estimates and the new 2012 survey results have not yet been presented to or accepted by the NAMMCO walrus working group. The next meeting is being held in November 2013. - In 2013, Witting and Born, (2013) used modelling to provide a 2012 abundance estimate of 3,900 animals (95% CI: 2,500 to 5,300) using data from the 2006, 2008 Greenland surveys and the 2007 Canadian survey. However, the model did not incorporate the newest data from the recent 2012 Greenland survey, nor did it include the re-adjustments for the 2006, 2007 and 2008 estimates (Witting and Born, 2013).	

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Table A1

Walrus population estimates *continued*

ATLANTIC WALRUS				
COUNTRY	STOCK/ MANAGEMENT UNIT	RECENT ESTIMATE (YEAR)	COMMENTS	NATIONAL STATUS
Greenland	East Greenland	1,429 (95% CI: 616- 3,316) (2009)	This stock was surveyed in August 2009. The results estimated approximately 1,429 animals (95% CI: 616-3,316) (NAMMCO Annual Report, 2010; Witting and Born, 2013).	Svalbard (Norway): Vulnerable under the 2010 Norwegian Red List for Species (Kålås <i>et al.</i> , 2010).
Greenland	East Greenland	1,429 (95% CI: 616- 3,316) (2009)	This stock was surveyed in August 2009. The results estimated approximately 1,429 animals (95% CI: 616-3,316) (NAMMCO Annual Report, 2010; Witting and Born, 2013).	Russia: Atlantic walrus is listed as Decreasing Numbers (category 2) in the 2001 Red Data Book of the Russian Federation which establishes both the conservation and legal status (Danilov-Danilian, 2001).
Russia	Kara Sea - Southern Barents Sea - Novaya Zemlya	3,943 (95% CI: 3,605-4,325) (2011)	This stock was surveyed in August 2011. Results of this joint Norwegian/Russian survey of the Pechora Sea region estimated 3,943 animals (95% CI: 3,605-4,325) (Lydersen <i>et al.</i> , 2012).	
PACIFIC WALRUS				
COUNTRY	STOCK/ MANAGEMENT UNIT	RECENT ESTIMATE (YEAR)	COMMENTS	NATIONAL STATUS
Russia/ United States	Pacific (subspecies comprises one population)	1,429 (95% CI: 616- 3,316) (2009)	This population was surveyed in 2006 by a joint United States/Russia project. This is considered a minimum estimate. Due to poor weather conditions, it was not possible to survey all regions. Results of the survey estimated a minimum population of 129,000 animals (95% CI: 55,000-507,000) (Speckman <i>et al.</i>, 2011; USFWS, 2010b). It has been suggested that the Laptev Sea is actually the westernmost population of the Pacific walrus (Lindqvist <i>et al.</i>, 2009).	US: No listing status under the United States Endangered Species Act. Russia: The Pacific walrus is not listed in the 2001 Red Data Book of the Russian Federation (Danilov-Danilian, 2001).

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Table A1

Walrus population estimates *continued*

LAPTEV WALRUS				
NOTE: STATUS AS DISTINCT SUBSPECIES IS SUBJECT TO DEBATE, AND IS OFTEN CONSIDERED BELONGING TO PACIFIC WALRUS				
COUNTRY	STOCK/ MANAGEMENT UNIT	RECENT ESTIMATE (YEAR)	COMMENTS	NATIONAL STATUS
Russia	Laptev	Unknown; estimated between 2,000 to 3000 animals in 2013.	Russia, walrus from the Laptev Sea are managed as a separate subspecies. It has been suggested that the Laptev Sea is the westernmost population of the Pacific walrus (Lindqvist et al., 2009). However, the samples from Laptev walrus were very limited so the sample size used for the analysis was very small. In 2013, a research team with the WWF Canon Expedition took samples from walrus in the Laptev sea to be used for scientific analysis. During the expeditions, 2,000 to 3,000 walrus were estimated in the area (Sandford, 2013).	Russia: laptev walrus is listed as rare (category 3) in the 2001 red data book of the russian federation which establishes both the conservation and legal status (Danilov-Danilian, 2001).

NOTE: Not all estimates provided have been accepted and may be re-adjusted pending on advice from scientific and management bodies. As such, the estimates provided in the table could change and cautious should be used when referencing these estimates. In addition, some of the estimates used have negative biases in animal counts due to incomplete coverage and detection.

APPENDIX B

MULTILATERAL AGREEMENTS, AND INTERNATIONAL COMMITTEES AND COMMISSIONS

1 CITES

CITES is an international agreement between governments created to ensure that the international trade²² in wild animals and plants does not threaten the survival of those species (Anon., 1973a; 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 of CITES-listed species to the CITES Secretariat (UNEP-WCMC, 2010). This information is then 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 and permits are issued by the CITES Management Authority (MA)²³ under certain conditions which vary for each level of protection (Cooper and Chalifour, 2004).

²² 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).

²³ A CITES Management Authority (MA) is responsible for implementing the convention in its country, and for issuing permits and certificates on behalf of their 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).

Species listed in **Appendix I** are those 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., 1973a). 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 will 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 because 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., 1973a). 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 will 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, the shipment requires issuance of a certificate of origin. In the case of re-export, a certificate must be granted by the CITES MA²⁴ of the state of re-export (Anon., 1973a). 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 will receive humane treatment.

NDFs

Completion of scientifically supportable NDFs is critical to securing the conservation goals and objectives of CITES. The term NDF is not used directly 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*”²⁵;

²⁴ 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).

²⁵ The exporting country must determine that an export will not be detrimental; the importing country determines if the import will be for purposes (i.e. what will be done with the wildlife 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 further on what is entailed in completing an NDF. Consequently, CITES Parties have come to see this as an area where they have sovereignty and have been reluctant to accept binding provisions on the matter. Nevertheless, there is ample guidance available on how NDFs should be made, the essentials of which are summarized on the CITES Web site (CITES, 2012b). 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 where there are concerns and examine 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 look at a small subset 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-convention²⁶ specimens and personal and household effects.

- 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 specimen²⁷ that was acquired prior to the listing of the species under CITES, providing the MA is satisfied 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, concerning ‘pre-Convention’ specimens* provides further clarification and recommends that Parties use the date the species was first included in the Appendices and the date on which a specimen was acquired (i.e. removed from the wild, born in

²⁶ Pre-Convention specimens are any 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).

²⁷ 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”.

captivity or artificially propagated in a controlled environment) and, if the 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 on whether they will permit trade in specimens under these exemptions. This will depend on their internal legislation and policies and how they implement the provisions of CITES in their countries, and this 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., 1973a). 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, as follows:

- Decision 15.15 directed to the Animals and Plants Committees: "Given the implications of climate change for science-based decision-making, the Animals and Plants Committees shall identify the scientific aspects of the provisions of the Convention and of Resolutions of the Conference of the Parties that are actually or likely to be affected by climate change, report their findings, and make recommendations for further action in relation to the Convention and to Resolutions of the Conference of the Parties as appropriate, at the 62nd meeting of the Standing Committee";
- Decision 15.16 directed to the Secretariat: "The Secretariat shall request from the secretariats of other multilateral environmental agreements information on their activities that may be linked to climate change and CITES, and report to the Animals and Plants Committees and the Standing Committee";
- Decision 15.17 directed to the Standing Committee: "The Standing Committee shall consider the reports of the Animals and Plants Committees and the Secretariat and report at the 16th meeting of the Conference of the Parties".

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), where 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 European Union (EU) is a unique political and economic partnership between 28 European countries. Denmark is a member of the EU, but Greenland is not, as it chose to leave the EU in 1985 (see Appendix A). Walrus are found in Greenland, but do not range into any EU member states; however, walrus products are traded from 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’Criadain, WWF International, *in litt.* to T. Shadbolt, December 12, 2008).

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). This included 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; 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, with the abolition of internal customs controls in 1993, these Regulations were no longer considered adequate and it was agreed that more detailed uniform rules were needed. Consequently, after several years of negotiation, 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 2001 and then 2006 by Commission Regulation (EC) No 865/2006 laying down detailed rules concerning the implementation of Council Regulation (EC) No 338/97. This last Regulation has subsequently been amended on a number of occasions but a consolidated text can be viewed on the eur-lex.europa.eu website.

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. The former requires approval by the EU Council of Ministers, and has not happened to date. The latter can be done by the European Commission, working with Committee comprising Member States Authorities²⁸. To account for changes to the Appendices adopted at CoPs, this regulation has been amended many 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 regulations**, *Commission Regulation (EC) No 865/2006*, can be amended by the European Commission working in consultation with the CITES Committee mentioned above. Amendments are undertaken for various reasons, but primarily to implement various provisions adopted at CoPs, other than amendments to the CITES Appendices (i.e. Resolutions, changes to personal and household effects, changes to rules for sample collections and for the design of documents, etc.). As a result, 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, the Commission, with the CITES Committee, also regularly adopts **suspensions regulations**, (the most recent being *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*) is also used in some instances to suspend the introduction into the EU of particular species from certain countries (European Commission and TRAFFIC Europe, 2013; European Commission, 2013).

Together, these regulations (basic, implementing and suspension 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 a number of 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 both internal and international trade, and

²⁸ Except for amendments to Annex A other than those that are necessary to ensure alignment with amendments to Appendix I arising from a CITES CoP – see elsewhere in the above text.

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 that were listed on Annex IV of the EU's Habitat Directive²⁹ (*Council Directive 92/43/EEC*) in 1997, when the Regulations were first adopted, and that are also listed on any of the CITES Appendices, are 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. Species (CITES-listed or not CITES-listed) that are or may be in international or community demand which are considered threatened with extinction, or are thought to be so rare that trade would imperil their survival in the wild, may also be listed in Annex A. Therefore, 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 species³⁰. 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 state's reservation³¹, 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 if it is judged that trade controls are necessary in order to render other listings on Annexes A or B effective. 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

²⁹ 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, which prohibited the commercial use of a species listed in its Annex IV (C. O'Criodain, WWF International, *in litt.* to T. Shadbolt, December 15, 2008).

³⁰ For example, if a non-threatened species resembles another threatened species to the extent that distinguishing between them is unlikely.

³¹ The member states have to agree to the reservation.

include any CITES Appendix II species that are subject to an EU member state's reservation (there were none as of November 2013). Trade of Annex C species into and out of the EU is regulated through the issuance of export permits, re-export certificates and, for the case of import, import notifications³² (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' reservations³³. 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). As such, it is primarily a trade monitoring tool.

Exceptions for personal and household effects

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

³² 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.

³³ Reservations have been entered in respect of certain fox and mustelid species.

³⁴ Exceptions are referred to as derogations in EU legislation.

countries into the EU. The Regulation established a Scientific Review Group (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 they comply with the regulations. Opinions are often formed when the CITES SA 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 SRG³⁵. 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 it is not satisfied or if no reply is received, the European Commission can 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. In the case of no opinion, should trade subsequently arise, the decision regarding whether such trade is sustainable is made in the first instance by the SA of the member state in question in the normal way (European Commission and TRAFFIC Europe, 2013; European Commission, 2009).

3 NAMMCO Agreement

A Memorandum of Understanding (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 effective of human activities (e.g. marine pollution) (Anon., 1996). The NAMMCO Agreement established an international organization known as the North Atlantic Marine Mammal Commission (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-

³⁵ 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 will proceed. In other words, the default position is that an import permit is issued unless negative concerns are flagged.

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).

Walrus are one of the species covered by the NAMMCO Agreement. Both Norway and Greenland are signatory to the Agreement; however, walrus are not as abundant in Norway and they are also fully protected from hunting in Norway. Although Canada is not a signatory Party, it does attend meetings as an observer and provides updates and information on stocks. In 1995, an Ad Hoc Working Group on the Atlantic Walrus was established (NAMMCO, 1995).

4 Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)

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., 1979; CoE, 2011). Walrus is listed in Appendix II (Anon., 1979). The Convention aims to conserve wild flora and fauna and their natural habitats with emphasis on endangered and vulnerable species including those which are a 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 in regard to 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., 1979).

The Convention provides exceptions to the provisions if there is no other satisfactory solution and it will not be detrimental to the survival of the population concerned, as written under Chapter III(9) (Anon., 1979):

- *for the protection of flora and fauna;*
- *to prevent serious damage to crops, livestock, forests, fisheries, water and other forms of property;*
- *in the interests of public health and safety, air safety or other overriding public interests;*
- *for the purposes of research and education, of repopulation, of reintroduction and for the necessary breeding;*

- *to permit, under strictly supervised conditions, on a selective basis and to a limited extent, the taking, keeping or other judicious exploitation of certain wild animals and plants in small numbers.*

At annual meetings, a Standing Committee monitors implementation of the Convention by reviewing various types of Party reports, processing case-files and adopting recommendations. Any Parties that make exceptions to the provisions must submit a detailed report on the matter. A Group of Experts monitors implementation of the Standing Committee recommendations concerning species or habitats. These Groups of Experts meet every two or three years to address specific conservation problems and propose recommendations to the committee (CoE, 2011).

Appendices of the Bern Convention

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 as dictated in Appendix IV. Species listed in Appendix I, II and III have varying levels of protection as follows (Anon., 1979):

- Appendix I lists species of wild flora that may not be deliberately picked, collected, cut, uprooted, possessed or sold,
- Appendix II lists species of wild fauna protected by the following:
 - ▶ *all forms of deliberate capture and keeping and deliberate killing;*
 - ▶ *the deliberate damage to or destruction of breeding or resting sites;*
 - ▶ *the deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and hibernation, insofar as disturbance would be significant in relation to the objectives of this Convention;*
- *the deliberate destruction or taking of eggs from the wild or keeping these eggs even if empty;*
- ▶ *the possession of and internal trade in these animals, alive or dead, including stuffed animals and any readily recognisable part or derivative thereof, where this would contribute to the effectiveness of the provisions of this article.*
- Appendix III lists species of wild fauna which are regulated to keep the population out of danger.

5 Walrus International Technical and Scientific committee (WITS)

In 1987, a proposal to list walrus in CITES Appendix II was submitted by the Netherlands. The proposal was withdrawn before being put to a vote; however, the ranges States agreed to exchange scientific research on a regular basis. A workshop on walrus was organized, originally as an extension of an *Agreement Between the USA and the USSR in the Areas of Environmental Protections*; however, participation was extended to include participation from all walrus range States. This workshop, called the International Workshop on the Ecology and Management of Walrus Populations, was convened in Seattle, Washington (USA) from March 26-30, 1990, and included representatives from Canada, Greenland/Denmark, Norway, Russia, the USA, and the Netherlands. During the workshop it was agreed that a group should be formed to continue communication among the range States; thus the WITS committee was created in as an informal international forum to share information among walrus managers, researchers and resource users. A second workshop, the 2nd Walrus International Technical and Scientific (WITS) workshop, was held in Winnipeg, Manitoba (Canada) from January 11-15, 1993, to continue to strengthen the coordination, communication and cooperation among managers, resource users and managers of walrus. The second meeting included representatives from Canada, Greenland, Norway, the USA, and the Netherlands; representatives from Russia were not present (Stewart *et al.*, 1993).

APPENDIX C

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 (e.g. national parks). The federal government also has jurisdiction over international and interprovincial 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.).*Chalifour, 2004).

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 concern³⁶ (Anon., 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).

When the Atlantic walrus was assessed by COSEWIC in 1987, the maritime population, now known as the Northwest Atlantic population, was designated as extirpated (COSEWIC, 2006; DFO, 2008). When SARA was established, this population was listed on Schedule 1 of SARA as an extirpated species (COSEWIC, 2006; DFO, 2008). No other populations are listed by SARA; however, the species is currently being considered for listing under SARA (DFO, 2007).

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 1967) (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 (DFO, 2010). 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) and was last amended on June 29, 2012 (Anon, 1985; DFO, 2011b). 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 fisheries, and the conservation and protection of fish (DFO, 2011).

In 1928, the Canadian federal government introduced the *Walrus Protection Regulations*, which were made by Order in Council P.C. 1928-1036 dated 20 June 1928 under the Canadian *Fisheries Act* of 1927 (R.S.C 1927) (Anon., 1928). This regulation prohibited commercial hunting and limited the harvest for local consumption purposes only (Anon., 1928). This regulation was amended many times providing varying degrees of protection and regulations on walrus hunting. It was revoked and replaced in 1993 by the most recent regulations, the *Marine Mammals Regulations* (SOR/93-56) under the Canadian *Fisheries Act* (R.S., 1985, c. F-14) (Anon., 1985; Anon., 1993a). As per the MMR, the transport of any Canadian marine mammals between provincial or territorial boundaries requires a marine mammal transportation licence (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

³⁶ 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).

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., 1992; 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 km² 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). Five of these agreements which involve Inuit and Inuvialuit peoples of Canada are summarized below.

James Bay and Northern Québec Agreement (JBNQA)

The Nunavik Inuit and Cree peoples of Québec, the Government of Canada, the Government of Québec, the James Bay Energy Corporation, Hydro-Québec and the James Bay Development Corporation signed the *James Bay and Northern Québec Agreement* on November 11, 1975 (Anon., 1975; PWGSC, 2009). During negotiations, the main goal of Nunavik Inuit was to secure their land base and traditional ways of life. They also wanted to improve their quality of life including educational and health services, community infrastructure and services and police and justice services (Makivik Corporation, 2010).

The *James Bay and Northern Québec Agreement* provided Nunavik Inuit with ownership of 8,152 km² of land, exclusive harvesting rights over 81,596 km² of land and a financial settlement of CAD91 million (USD88 million at 2010 rates) which is a total of CAD225 million (USD218 million at 2010 rates) for both Cree and Nunavik Inuit (PWGSC, 2009). The Agreement established non-ethnic governance and influenced the decision to transfer responsibility for services from the Government of Canada to the Government of Québec (Makivik Corporation, 2010).

The Hunting, Fishing and Trapping Coordinating Committee (HFTCC) was established under the *James Bay and Northern Québec Agreement* to study, manage and on occasion monitor and/or regulate the hunting, trapping and fishing regime (HFTCC, 2010; PWGSC, 2009). The HFTCC's role is outlined in Table B.

Nunavik Inuit Land Claims Agreement

The Government of Canada, Government of Nunavut and the Makivik Corporation (representing Nunavik Inuit) signed the *Nunavik Inuit Land Claims Agreement* on December 1, 2006. The Nunavik Inuit Settlement Area encompasses the Nunavik Marine Region (Nunavut offshore islands adjacent to Québec) and the Labrador Inuit Settlement Area portion of the Nunavik Inuit/Labrador Inuit overlap area (Anon., 2006b; INAC, 2008). The *Nunavik Inuit Land Claims Agreement* reflects a successful overlap agreement with three other Aboriginal groups in the region – the Crees of Eeyou Istchee, Labrador Inuit and Nunavut Inuit. (INAC, 2008). It also provides the Nunavik Inuit with the right to harvest any species of wildlife in the Nunavik Marine Region for social, economic, and cultural needs (INAC, 2008). The main objectives or goals of the *Nunavik Inuit Land Claims Agreement* are as follows (Anon., 2006b):

- “to provide for the continuation of harvesting by the Crees of Eeyou Istchee and the Nunavik Inuit in the Cree/Inuit Offshore Overlapping Interests Area, regardless of land claims agreement boundaries;
- to identify the Cree/Inuit Offshore Overlapping Interests Area and the three (3) zones comprised within this Overlap Area;
- to identify a Joint Inuit/Cree Zone within this Overlap Area, and with respect to such Joint Zone to provide for:
 - ▶ the joint and equal ownership of lands and the joint and equal sharing of other interests, benefits and revenues by the Crees of Eeyou Istchee and the Nunavik Inuit;
 - ▶ the sharing of wildlife between the Crees of Eeyou Istchee and the Nunavik Inuit in accordance with the harvesting interests of both groups;
- to identify an Inuit Zone within this Overlap Area and with respect to such zone, to provide for:
 - ▶ the joint and equal participation of the Crees of Eeyou Istchee and the Nunavik Inuit in the management of the lands, resources and wildlife, including joint and equal participation in regimes for wildlife management, planning, land and water management and development impact assessment in such zone;
 - ▶ the ownership of lands by the Nunavik Inuit and other interests, benefits and revenues of the Nunavik Inuit;
 - ▶ the sharing of wildlife between the Crees of Eeyou Istchee and the Nunavik Inuit in accordance with the harvesting interests of both groups;
 - ▶ the participation of the Crees of Eeyou Istchee in the management of wildlife, including participation in the regime for wildlife management to be provided for in the Nunavik Inuit Final Agreement;
- to identify a Cree Zone within this Overlap Area and with respect to such zone, to provide for:
 - ▶ the ownership of lands by the Crees of Eeyou Istchee (save those islands described in schedule 6) and other interests, benefits and revenues of the Crees of Eeyou Istchee;
 - ▶ the sharing of wildlife between the Crees of Eeyou Istchee and the Nunavik Inuit in accordance with the harvesting interests of both groups;
 - ▶ the participation of the Nunavik Inuit in the management of wildlife, including participation in the regime for wildlife management provided for in the Crees of Eeyou Istchee Final Agreement;
- to promote cooperation and good relations between the Crees of Eeyou Istchee and the Nunavik Inuit and with third parties.”

The *Nunavik Inuit Land Claims Agreement* gave Nunavik Inuit ownership of 5,100 km² of land (including surface and subsurface rights), an additional 400 km² of land to be shared with the Québec Cree in a joint zone, a financial settlement of CAD54.8 million (USD53.2 million at 2010 rates) paid over nine years, CAD57.6 million (USD55.9 million at 2010 rates) for implementation of the *Nunavik Inuit Land Claims Agreement* paid over 10 years, royalties on resource development in the Nunavik Marine Region, rights to harvest wildlife in the Nunavik Marine Region to fulfill their social, economic and cultural needs, and national park status for the Torngat Mountains National Park Reserve of Canada (INAC, 2008).

The *Nunavik Inuit Land Claims Agreement* established the Nunavik Marine Region Wildlife Board (NMRWB) for matters regarding wildlife management (INAC, 2008). Although the government retains ultimate responsibility for wildlife management, the NMRWB is considered the main instrument for wildlife management and main regulator of access to wildlife in the NMR (Anon., 2006b; NMRWB, 2010). The NMRWB's role is described in more detail in Table B.

The Nunavut Land Claims Agreement³⁷

The Inuit of the Nunavut Settlement Area (as Nunavut was known prior to its formation) and the Government of Canada signed the *Nunavut Land Claims Agreement* was signed on May 25, 1993 (Anon., 1993b). Covering a fifth of Canada's land mass, the Nunavut Land Claims Agreement 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 Nunavut Land Claims Agreement provided Nunavut Inuit with ownership of approximately 352,00 km² 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 to 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 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

³⁷ The Nunavut Land Claims Agreement is also known as the Nunavut Final Agreement. For more information on this Agreement please refer to Anon. (1993b).

Table B

Co-management boards, councils, committees and organizations in Canada

BOARD/COUNCIL/ COMMITTEE/ ORGANIZATION	REGION	MEMBERSHIP	ROLES
Regional Wildlife Organization Section 5.7.4 of the <i>Nunavut Land Claims Agreement</i>	Nunavut	Membership-based	- Regulate harvest techniques and practices among members of the HTOs (including the use of non-quota limitations), and managing harvesting among HTOs in the region. - Allocate and enforce community basic needs levels and adjusted basic needs levels among HTOs in the region.
Hunters and Trappers Organization Section 5.7.2 of the <i>Nunavut Land Claims Agreement</i>	Nunavut	Membership-based	- Regulate harvesting techniques and practices among members (including the use of non-quota limitations) and manage harvesting among members - Allocate and enforce community basic needs levels and adjusted basic needs levels among members.
Nunavut Wildlife Management Board Section 5.2.1 of the <i>Nunavut Land Claims Agreement</i>	Nunavut	Eight representatives and a chair: - four from Designated Inuit Associations - three from the Governor in Council on advice of ministers responsible for fish and marine mammals, the Canadian Wildlife Service and Aboriginal Affairs and Northern Development Canada (previously called Indian and Northern Affairs Canada) - one from the Commissioner-in-Executive Council - one independent chairperson.	- Participate in research activities, identify wildlife management research requirements and conduct the Nunavut Wildlife Harvest Study. - Establish, modify or remove levels of total allowable harvest and non-quota limitations, allocate resources to other residents and operators and establish qualifications respecting guides and setting trophy fees. - Approve plans for the management and protection of particular wildlife or wildlife habitats, approve the designation of rare, threatened and endangered species and approve changes to boundaries of Conservation Areas which relate to the protection and management of wildlife and their habitat.
Hunting, Fishing and Trapping Coordinating Committee (HFTCC) Section 24.4.1 of the <i>James Bay and Northern Québec Agreement</i>	Parts of Quebec	12members/representatives: - six from parties (three from the Cree Native party, three from the Inuit Native party) - six from government (three from the Government of Québec and three from the federal government).	- Review, manage, and in some cases supervise and regulate the established Hunting, Fishing and Trapping Regime. - Provide recommendations or advice to the appropriate ministers on harvest guidelines, enforcement of the Hunting, Fishing and Trapping Regime, protection of species, conservation and management of wildlife, etc.
Nunavik Marine Regional Wildlife Board (NMRWB) Section 5.7.1 of the <i>Nunavik Inuit Land Claims Agreement</i>	Northern Québec (Nunavik)	A chair and six representatives: - three from the Makivik Corporation - three from governments (Fisheries and Oceans Canada, Environment Canada, and the Government of Nunavut.	- Participate in research activities. - Establish, modify or remove levels of total allowable take for a species or population of wildlife, and establish non-quota limitations. - Cooperate with wildlife management institutions that deal with species harvest in the Nunavik Marine Region and provide advice to relevant management institutions on matters relating to the protection, conservation, management and regulation of wildlife and wildlife habitat as required.

Source: Anon., 1993b; 2006b; NWMB, 2008b.

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). The NWMB's role is described in more detail in Table B.

2 Greenland Legislation

In 1953, Greenland became an autonomous county of Denmark (Government of Greenland, 2009). In subsequent opposition to Danish administration, under the *Home Rule Act No. 577 of 29 November 1978*, Greenland became 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, 2008). However, Greenland is a member of Overseas Countries and Territories of the European Union Association (OCTA). 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., 2009a; 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., 2009a; 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., 2004). The Ministry of Nature and Environment (previously the Ministry of Domestic Affairs, Nature and Environment) 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 walrus

Efforts to regulate the hunting of Atlantic walrus in areas of Greenland began in the late 1920s beginning in the Avanersuaq area (Northwest Greenland), in 1938 for Danish trappers in Northeast Greenland, in

1949 in the West Ice area (the area of the Greenland Sea covered with pack ice in winter, between Greenland and Jan Mayen Island and north of Iceland) and in 1956 for East Greenland north of the Scoresby Sound area (Born *et al.*, 1995).

In 1956, limited regulations on walrus hunting were provided under the *Ministerial Order No. 301 on the catch of walrus in Greenland, 16 November 1956 and Landsråd Rules regulating walrus catch in the Davis Strait and Baffin Bay, 16 November 1956*³⁸ (Anon., 1994). These regulations were amended and/or replaced many times. The current regulations, *Greenland Home Rule Executive Order No. 20 of 27 October 2006 on protection and harvest of walrus*, also introduced quotas for walrus hunting in Greenland (Anon., 2006a).

3 Norwegian Legislation

Walrus are found in the Svalbard archipelago, located north of mainland Norway in the Arctic Ocean. The archipelago's largest three islands are Spitsbergen, Nordaustlandet (North East Island) and Edgeøya (Edge Island). Discovered in 1596, people of different nationalities were active in the archipelago at a time when no laws or courts were in place. However, at the beginning of the 20th century, interest in mining and concern over ownership of land and mineral deposits created a need for legislation and courts (Governor of Svalbard, 2008c).

The *Treaty of Versailles*, signed on June 28, 1919, was one of the treaties that ended World War I and allowed for the creation of the *Spitsbergen Treaty*, now known as the *Svalbard Treaty*. It was signed on February 9, 1920, but did not come into force until August 14, 1925 (Anon., 1920; Governor of Svalbard, 2008c). Approximately 40 countries signed the treaty, but

Norway alone was given sovereignty over the Svalbard archipelago. However, citizens from signatory countries were given equal rights to residence, property, research activities and commercial activities such as mining, hunting, fishing, etc. (Governor of Svalbard, 2008c). The Directorate of Fisheries (Norway) is responsible for the overall policy or political matters regarding walrus management (S.T. Stub, Advisor for the Directorate of Fisheries, in litt. to T. Shadbolt, March 31, 2009).

Svalbard legislation

Svalbard Act

As mentioned, the *Svalbard Act of 17 July 1925* came into effect in 1925, and established Svalbard as a part of the Kingdom of Norway. This made all Norwegian civil laws, procedural laws and criminal laws applicable to Svalbard unless otherwise stipulated (Anon., 1925; Governor of Svalbard, 2008a).

Svalbard Environmental Protection Act

The *Svalbard Environmental Protection Act, Act of 15 June 2001 No.79 Relating to the Protection of the Environment in Svalbard*, came into effect on July 1, 2002. This Act is essentially a collection of environmental legislation, the main purpose of which is to protect untouched areas of Svalbard (Anon., 2001; Governor of Svalbard, 2008b). Under this Act, the environmental protection authorities for Svalbard include the Norwegian government, the Ministry of the Environment, directorates as decided by the ministry and the Governor of Svalbard (Anon., 2001). The Governor of Svalbard is the supreme environmental authority and is responsible for matters regarding wildlife and its management in Svalbard (Governor of Svalbard, 2008d).

³⁸ Translated from Danish text "Landsrådsvedtægt om regulering af hvalrosfangst i Davisstrædet og Baffins Bugt af 16 november 1956 og".

Legislation and regulations applicable to Svalbard

Implementation of CITES

In 1976, Norway ratified CITES under Act No. 29 of 13 December 1946 relating to the provisional ban on imports and Act No. 30 of 13 December 1946 relating to the provisional ban on exports (om innførselsregulering og utførselsregulering) (Anon., 1997). These acts were replaced by Act No. 32 of 6 June 1997 relating to the regulation of imports and exports (Lov om innførsle- og utførselsregulering) (Anon., 1997) and delegation of authority pursuant to the Act regulating importation and exportation of goods (No. 618 of 1998) (Anon., 1998).

A new regulation for CITES was adopted by 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., 2008a; Anon., 2002a). 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).

Protection of walrus

In 1952, regulations on walrus hunting in Norway and its territories (including Svalbard) were provided under Royal Decree, *Fredning av hvalross Kongelig Resolusjon 20 Juni 1952* (Protection of Walrus Royal Decree of 20 June 1952) which also prohibited Norwegian citizens from hunting walrus in other places (Anon., 1952; Born *et al.*, 1995). Protection for walrus in Svalbard is now facilitated under present legislation *Environmental Protection Act, Act of 15 June 2001 No.79* relating to the protection of the environment in Svalbard (T. Punsvik, Environmental Advisor for the Governor of Svalbard, *in litt.* to T. Shadbolt, March 9, 2009; I. Gjertz, Research Council of Norway, *in litt.* to T. Shadbolt, March 4, 2013). Under this Act, walrus are not only protected from harvest but their haul-out sites are protected against disturbances (I. Gjertz, Research

Council of Norway, *in litt.* to T. Shadbolt, March 4, 2013). This Act is only applicable to land territory of Svalbard and its surrounding 22.2 km (12 nautical miles) of ocean waters but not to mainland Norway or any other Norwegian territory (I. Gjertz, Research Council of Norway, *in litt.* to T. Shadbolt, March 4, 2013). Norwegian law applies beyond 22.2 km (12 nautical miles) from the coast of Svalbard.

On mainland Norway, laws regarding walrus are administered by the Ministry of Fisheries and Coastal Affairs. In 1983, walrus on mainland Norway were managed under an Act relating to sea-water fisheries of June ,3 1983 (Lov av 3. Juni 1983 nr. 40 Saltvannsfiskeloven). This Act was replaced in 2008 by an Act relating to the management of wild marine resources of June 6, 2008 (Lov av 6. Juni 2008 nr. 37 Lov om forvaltning av viltlevende marine ressurser) (I. Gjertz, Research Council of Norway, *in litt.* to T. Shadbolt, March 4, 2013). In the Norway Exclusive Economic Zone, laws and regulations are administered by appropriate ministries and enforced by mainland police supported by the Norwegian Coast Guard (I. Gjertz, Research Council of Norway, *in litt.* to T. Shadbolt, March 4, 2013).

4 Russian Legislation

Red Data Book of the Russian Federation

The Red Data Book of the Russian Federation is an official document that lists species considered rare and endangered (Vaisman *et al.*, 2009). Listed species are classified into one of six categories (Vaisman *et al.*, 2009):

Category 0: probably extinct

Category 1: endangered

Category 2: decreasing

Category 3: rare

Category 4: uncertain status

Category 5: rehabilitated and rehabilitating

The first edition of the Red Data Book for the former USSR was published in 1978 and the first edition of the Red Data Book for the Russian Federation in 1983 (Decree of the USSR Council of Ministers No. 313 of April 12, 1983 *On the Red Data Book of the USSR*; Decree of the Government of Russian Federation No. 158 of February 19, 1996 *On the Red Data Book of the Russian Federation*). The Red Data Book has been revised many times, most recently in 2001 (Vaisman *et al.*, 2009) and is the responsibility of the federal government. The species listed are subject to special protection and are managed by the Department of State Policy and Management of Hunting and Wildlife of the Ministry of Natural Resources and Ecology of the Russian Federation (Vaisman *et al.*, 2009; A. Vaisman, TRAFFIC-Russia in litt. to G. York, September 7, 2011). Legislative recognition for the Red Data Book is provided by the federal law *On Wildlife* (No. 52-FZ of 1995) and by the federal law *On Environmental Protection* (No. 7-FZ of 2002) (Vaisman *et al.*, 2009).

Atlantic and Laptev walrus were first included in the Red Data Book of the RSFSR in 1982 (Decree No. 500 of the RSFSR Council of Ministers of September 9, 1982) which was extended to the Red Data Book of the Russian Federation (Decree of the USSR Council of Ministers No. 313 of April 12, 1983 *On the Red Data Book of the USSR*; Decree of the Government of the Russian Federation No. 158 of February 19, 1996 *On the Red Data Book of the Russian Federation*) (Vaisman *et al.*, 2009). Atlantic walrus are currently listed under category 2 (Decreasing numbers), and Laptev walrus are currently listed under category 3 (Rare) in the Red Data Book of the Russian Federation of 2001 (Ministry of Natural Resources of the Russian Federation, 2008; Danilov-Danilian, 2001). Therefore, hunting of Atlantic and Laptev walrus is strictly prohibited (Vaisman *et al.*, 2009). Pacific walrus are not listed in the Red Data Book (Vaisman *et al.*, 2009).

Hunting and commercial use of species listed in the Red Data Book are generally prohibited. The

exceptions are cases that are specified through various pieces of legislation, primarily through the federal law *On Wildlife* (Vaisman *et al.*, 2009). The harvest of species included in the Red Data Book was administered by Soviet-era regulations until 1997, when the Government of the Russian Federation issued Decree No. 13 of 6 January 1997 *On Approval of the Rules for the Taking of Animals Belonging to the Species Included in the Red Book of the Russian Federation, except for Aquatic Biological Resources*” (Vaisman *et al.*, 2009).

On Environmental Protection

The federal law *On Environmental Protection* (No. 7-FZ of 2002) is the legal Act regulating nature protection and natural resources use. It is based on the Constitution of the Russian Federation and its jurisdiction, which includes the territory of the Russian Federation, the Exclusive Economic Zone, territorial waters and the continental shelf of the Russian Federation. Article 60 of the Act states: “... animals and other organisms that are listed in the Red Data Books are subject to a ban on any economic use throughout the entire territory” (Vaisman *et al.*, 2009).

On Wildlife

The federal law *On Wildlife* (No. 52-FZ of 1995) regulates all aspects related to the conservation, protection and use of wild animals and their habitats (Vaisman *et al.*, 2009). The law has been changed many times; the current version is based on the Constitution of the Russian Federation and the federal law *On Environmental Protection* (Vaisman *et al.*, 2009). Exceptions for hunting and commercial use of species listed in the Red Data Book of the Russian Federation are not generally permitted. However, exceptions may be granted for cultural, scientific and other purposes, but require the issuance of a special permit by the Federal Supervisory Natural Resources Management Services (Rosprirodnadzor) (Article

24) (A. Vaisman, TRAFFIC-Russia *in litt.* to G. York, September 7, 2011). This article states that “...actions that might lead to mortality, population declines, or alteration of habitats of species listed in the Red Data Books are not allowed” (Vaisman *et al.*, 2009).

Legislation for the implementation of CITES

The Russian Federation has been a CITES Party since the Convention came into force under the former 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. However, no legislation regulates trade in CITES-listed species within its borders (Lyapustin *et al.*, 2007; Vaisman *et al.*, 2009). 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).

Regulations concerning walrus

Efforts to regulate and reduce hunting of Atlantic walrus in Russia began in 1921 (Born *et al.*, 1995). Hunting from sealing vessels ceased in 1935, and killing of walrus by the sealing and fishing industries was prohibited in 1949 (Born *et al.*, 1995).

Commercial hunting of walrus in Arctic waters and islands and shore lands bordering the Arctic Ocean was

banned on November 21, 1956 by the Russian Soviet Federated Socialist Republic (RSFSR) Council of Ministers when they adopted Decree No. 738 *On Protection of Arctic Animals*. This Decree banned hunting of all walrus subspecies with the exception of hunting for subsistence purposes in certain regions on the basis of annual quotas and licences issued by the executive authorities of the respective regions and the Yakutia ASSR Council of Ministers³⁹ (Pankratov, 1972; Vaisman *et al.*, 2009).

Hunting of Atlantic walrus and Laptev walrus for subsistence purposes was prohibited when they were listed in the Red Data Book in 1982 (Vaisman *et al.*, 2009). However, because Pacific walrus are not listed in the Red Data book, they are not afforded the same protection.

Conservation and harvesting of marine mammals was regulated by Order No. 300 of the USSR Ministry of Fisheries in 1975, which was renewed in 1986 through Order No. 340 of June 30, 1986 *Validating the regulation on conservation and catch of marine mammal*. This applied to all USSR territory including internal waters and the USSR economic zone (Vaisman *et al.*, 2009). Quotas are now regulated under Federal Law No. 166 *On Fishery and conservation of Aquatic Biological Resources*, which also protects walrus on their rookeries (haul-out sites) and prohibits access to those areas. It does this by banning vessels from passing within three to five kilometres, banning aircraft from passing lower than two kilometres and prohibiting hunting with 500 metres of rookeries (Vaisman *et al.*, 2009).

Pacific walrus are considered a fisheries target in Order No. 131 of the Federal Agency of Fisheries of September 1, 2008 *On approval of the list of aquatic biological resources which are considered to be fisheries targets*; however, they may only be hunted for subsistence purposes. (Vaisman *et al.*, 2009).

³⁹ Subsistence hunting was approved for collective enterprises (kolkhozes) in the Chukotka and Koryak autonomous regions and in the northern areas of Yakutia Autonomous Republic (Vaisman *et al.*, 2009).

5 United States Legislation

Under the United States Constitution, the conservation and management of wildlife is a shared responsibility of the state and federal governments (Kannan, 2009). The State of Alaska was purchased from the Russian Federation on March 30, 1867 and officially became a state of the United States on January 3, 1959 (Gislason, 2010). The State of Alaska managed walrus until the passing of the MMPA in 1972, when authority over the species was transferred to the USFWS (USFWS, 1994).

The commercial harvest of walrus was banned in 1901, but resumed on a smaller scale after the First World War. In 1937, the United States Department of Commerce regulation was introduced, and the Walrus Act was passed by Congress in 1941 prohibited the hunting of walrus except by Native hunters (USFWS, 1994). In 1972, the Walrus Act was replaced by the *Marine Mammal Protection Act* (MMPA) (Anon., 1972; USFWS, 1994). The following are federal laws and Acts for the protection and management of walrus in the United States.

Endangered Species Act

The United States enacted the *Endangered Species Act of 1973* (ESA) on December 28, 1973, replacing the *Endangered Species Conservation Act of 1969* (Anon., 1973b). The ESA's purpose was to ensure the conservation of species that are endangered or threatened throughout all or a significant portion of their range, and to ensure the conservation of the ecosystems on which they depend (NOAA, 2011). More than 1,900 species are listed as threatened or endangered under the ESA (NOAA, 2011). A species is considered endangered if it is in danger of extinction throughout all or a significant portion of its range,

while a threatened species is one that is likely to become endangered in the future (NOAA, 2011).

The ESA is implemented through regulations found in the Code of Federal Regulations (CFR). According to section 9 of the ESA once a species is listed as endangered, certain actions are prohibited. These actions are specified in §17.21 of title 50 of the CFR (50 CFR) which refers to (among other things) the take, import, export and interstate shipment (for commercial activities) of endangered species. This differs from species listed as threatened under the ESA, where specific prohibitions and exceptions to them are not specified. Instead the Secretary of the Interior is given discretion under section 4(d) of the ESA to specify prohibitions and any exceptions to them which are necessary to provide for the conservation of the species. Using this discretion, general prohibitions were developed under section 50 CFR 17.31 and exceptions to them as stated in 50 CFR 17.32, which apply to most threatened species. For other threatened species, a special rule under section 4(d) of the ESA can be developed which details prohibitions and exceptions to them which are tailored to the particular conservation need of the species. This special rule can include some prohibitions and authorizations under 50 CFR 17.31 and 17.32, or additional ones which may be more or less restrictive than those dictated in 50 CFR 17.31 (US Federal Register, 2008a). Once a marine mammal is listed under the ESA, the species automatically has a depleted⁴⁰ status under the MMPA (US Federal Register, 2008a).

The United States signed CITES on March 3, 1973 and was the first country to ratify the Convention on January 14, 1974. It came into force on July 1, 1975 and is implemented in the United States via section 8 of the ESA (Anon., 1973b). The Secretary of the

⁴⁰Section 3 (1) of the MMPA defines the term "depleted" or "depletion" as "...a species or population stock is below its optimum sustainable population... [or]...a species or population stock is listed as an endangered species or a threatened species under the Endangered Species Act" (Anon., 1972).

Interior delegated responsibility to the Director of the USFWS, and the USFWS is the CITES MA and SA for the United States (USFWS, 2010a).

Fisherman's Protective Act

Section 8 of the *Fisherman's Protective Act of 1967* (22 U.S.C. 1978, as amended)—better known as the *Pelly Amendment*—was enacted as a means of influencing international species conservation (Anon., 1967). The United States Congress originally enacted the *Pelly Amendment* of 1971 in response to unsuccessful efforts to persuade other countries to comply with the ban on high-seas salmon fishing that was promulgated by the International Commission for the Northwest Atlantic Fisheries (Greanias, 1998). In 1978, Congress amended the *Pelly Amendment* to authorize the President to impose trade sanctions against a country for engaging in trade that diminishes the effectiveness of any international program for endangered or threatened species—including CITES—even if the trade is legal under the laws of the offending country (Greanias, 1998). The United States government has used the *Pelly Amendment* several times in recent years to promote the conservation of CITES-listed species. For example, on December 18, 1996, the United States Secretary of Commerce certified Canada under the *Pelly Amendment* for its hunt of two bowhead whales in 1995. President Clinton opted not to impose trade sanctions, but did take other actions including the decision to withhold consideration of Canadian requests for waivers to an existing moratorium on the importation of seals and/or seal products into the United States (Clinton, 1997).

Lacey Act

The *Lacey Act* was signed on May 25, 1900 (Anon., 1900). It originally focused on the conservation of native game and wild birds and preventing the introduction of non-native or exotic species into native ecosystems (USFWS, 2007a). The *Lacey Act* has

been amended several times (Anon., 1981), including amendments in May 2008 that provide further protection to a broader range of plants (US Federal Register, 2008b). Under the *Lacey Act*, it is unlawful to import, export, sell, acquire or purchase fish, wildlife or plants taken, possessed, transported or sold in violation of United States or Indian law; or in violation of state or foreign law (USFWS, 2007a). The law covers all fish and wildlife and their parts and products, as well as all plants and their parts and products, with certain exceptions (USFWS, 2007a).

Marine Mammal Protection Act (MMPA)

The MMPA (Public Law 92-522) was enacted by the United States in 1972 in response to concerns among the public and scientists about significant declines in some marine mammal populations due to human activities (NOAA, 2009). The MMPA protects all marine mammals, including walrus, and establishes a national policy to prevent stocks and species of marine mammals from declining to the point where they are no longer significant functioning elements of the ecosystem they inhabit (NOAA, 2009). The main goal of the MMPA is to maintain or return marine mammals to their optimum sustainable populations (US Federal Register, 2008a). The MMPA established a moratorium on the taking and importation of marine mammals (including products derived from them) unless exempted or authorized under the MMPA for certain specified purposes (US Federal Register, 2008a). The moratorium does not apply to coastal-dwelling Alaskan Natives if the taking of marine mammals is for subsistence purposes or for the purpose of creating and selling authentic Native handicrafts and clothing, provided this is not accomplished in a wasteful manner (Anon., 1972). Authentic handicrafts and clothing can be sold in interstate commerce, but edible portions of the marine mammals can only be sold in Alaskan Native villages and towns (Anon., 1972). However, if a

marine mammal is considered depleted, the Secretary of the Interior may impose regulations upon the taking of such species by coastal-dwelling Alaskan Natives (Anon., 1972).

The Marine Mammal Commission (MMC) is an independent agency of the United States government created under Title II of the MMPA to provide independent oversight of policies and programs pertaining to marine mammals carried out by the federal regulatory agencies (MMC, 2010a). The primary focus is the protection and conservation of marine mammals. Their duties include the following (Anon., 1972):

- “undertake a review and study of the activities of the United States pursuant to existing laws and international conventions relating to marine mammals, including, but not limited to, the International Convention for the Regulation of Whaling, the Whaling Convention Act of 1949, the Interim Convention on the Conservation of North Pacific Fur Seals, and the Fur Seal Act of 1966;
- conduct a continuing review of the condition of the stocks of marine mammals, of methods for their protection and conservation, of humane means of taking marine mammals, of research programs conducted or proposed to be conducted under the authority of this Act, and of all applications for permits for scientific research, public display, or enhancing the survival or recovery of a species or stock;
- undertake or cause to be undertaken such other studies as it deems necessary or desirable in connection with its assigned duties as to the protection and conservation of marine mammals;
- recommend to the Secretary and to other federal officials such steps as it deems necessary or desirable for the protection and conservation of marine mammals;

- recommend to the Secretary of State appropriate policies regarding existing international arrangements for the protection and conservation of marine mammals, and suggest appropriate international arrangements for the protection and conservation of marine mammals;
- recommend to the Secretary such revisions of the endangered species list and threatened species list published pursuant to section 4(c)(1) of the ESA of 1973, as may be appropriate with regard to marine mammals; and
- recommend to the Secretary, other appropriate Federal officials, and Congress such additional measures as it deems necessary or desirable to further the policies of this Act, including provisions for the protection of the Indians, Eskimos, and Aleuts whose livelihood may be adversely affected by actions taken pursuant to this Act.”

The MMPA has provisions under Section 119 for cooperative management agreements with Alaskan Native organizations to conserve marine mammals and provide co-management of subsistence use by Alaskan Natives. The Eskimo Walrus Commission (EWC), established in 1978, represents coastal walrus-hunting communities throughout Alaska and is recognized as addressing issues of State-wide interests (NAMMCO, 2004b). A co-management agreement was signed by the USFWS and the EWC in 1997 (EWC 1997). The EWC also has co-operative agreements with Russia (NAMMCO, 2004b).

APPENDIX D

DETAILED HARVEST STATISTICS AND QUOTAS

Table D1

Canadian Atlantic Walrus subsistence hunt in Nunavut, 1998/1999-2011/2012

	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012
Baffin Region	236	263	47	354	138	86	241	92	216	358	112	117	184	255	165
Arctic Bay (quota of 10)	0	3	1	2	2	0	0	1	nd	0	1	nd	0	1	0
Qikiqtarjuaq	3	0	0	0	1	33	1	0	nd	9	6	nd	nd	6 °	5 °
Clyde River (quota of 20)	0	1	0	0	1	0	0	2	nd	1	0	nd	nd	nd	0
Resolute Bay/ Creswell Bay	0	nd	1	0	nd	1	6	4	1	0	1	nd	2	3	2
Grise Fiord	12	11	5	4	2	3	7	5	2	5	4	nd	7	2	4
Hall Beach	109	80	0*	88	40	5	88	66	78	104	35	33	70	75 °	35 °
Igloolik	84	133	10*	174	52	10*	111	10*	112	186	54**	74 ^m	89 ^m	141	101
Pond Inlet	0	0	1	5	3	0	1	0	1	0	0	nd	nd	3	0
Cape Dorset	8	4	10 °	46	11	5	1	nd	6	25	nd	nd	nd	1	2
Iqaluit	0	27	15 °	19	7	1	1	nd	10	9	11	nd	14	14	14
Kimmirut	nd	nd	nd	0	0	4	7	4	6	2	nd	nd	nd	7	0
Pangnirtung	16	4	3	15	19 °	9	15	nd	nd	15	nd	10	nd	nd	nd
Sanikiluaq (quota of 10)	4	nd	1	1	0	15	3	nd	nd	2	nd	0	2	2	2
Kivalliq Region	5	21	12	14	2	66	21	11	30	37	30	7	25	10	22
Arviat	nd	0	2	1	nd	3	5	nd	1	0	0	nd	nd	0	0
Chesterfeild In.	nd	0	nd	4	nd	nd	4	3	3	0	2	0	nd	nd	7
Coral Harbour (quota of 60)	5*	9	8	1	2*	30 °	10	nd	17	18	4**	4*	15 °	8*	11
Rankin Inlet	nd	12	nd	7	nd	12	2	2	3	13	6	3**	6	2	4
Whale Cove	nd	0	0	0	nd	1	nd	nd	nd	0	0	nd	nd	0	0
Repulse Bay	0	0	2	1	nd	20	nd	3	6	6	12	nd	4	nd	0
Kugaaruk (Pelly Bay)	0	0	0	0	nd	0	nd	3	nd	0	6	nd	nd	nd	0
Total	241	284	59	368	140	152	262	103	246	395	142	124	209	265	187

Source: DFO (2013c).

Note: Figures do not include animals struck and lost. Figures include sport hunts.

* Only data for sport hunts were provided. Data on subsistence harvests were not available.

** Only data for subsistence harvests were provided. Data on sport hunts were not available.

nd: Data were not reported to DFO.

m: The Igloolik HTA implemented a moratorium on sport hunting.

e: Value was originally reported with an associated error and has been replaced with an average value to provide a more precise annual estimate of landings:

Qikiqtarjuaq: subsistence harvest in 2010 was originally reported as 5-6, value was replaced with average of 6; subsistence harvest in 2011 was originally reported as 4-5, value was replaced with average of 5.

Hall Beach: subsistence harvest in 2010 was originally reported as 70-80, value was replaced with average of 75; subsistence harvest in 2011 was originally reported as 30-35, value was replaced with average of 33.

Cape Dorset: subsistence harvest was originally reported as 10 +/- 2, value was replaced with average of 10.

Iqaluit: subsistence harvest was originally reported as 15 +/- 2, value was replaced with average of 15.

Pangnirtung: subsistence harvest was originally reported as 19 +/- 1, value was replaced with average of 19.

Coral Harbour: subsistence harvest in 2002 was originally reported as 25-30, value was replaced with average of 28; subsistence harvest in 2009 was originally reported as 5-6, value was replaced with average of 6.

Table D2

Canadian Atlantic Walrus subsistence hunt in Nunavik, 1998/1999-2011/2012

	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012
Eastern Hudson Bay	22	18	1	0	0	14	24	12	15	18	26	30	20	14	17
Kuujjuarapik	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Umiujaq	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inukjuak	5	8	0	0	0	0	4	0	3	0	0	8	0	0	0
Puvirnituk	6	0	0	0	0	0	9	0	8	9	21	13	17	9	12
Akulivik	9	10	1	0	0	14	11	12	4	9	5	9	3	5	5
Hudson Strait	51	24	10	0	5	0	18	30	30	31	40	31	16	26	21
Ivujivik	23	1	7	0	0	0	9	0	8	11	13	8	0	5	5
Salluit	20	7	0	0	1	0	2	10	17	14	24	17	7	14	11
Kangiqsujuaq	0	5	1	0	4	0	1	9	0	4	0	0	2	1	3
Quaqtaq	8	11	2	0	0	0	6	11	5	2	3	6	7	6	2
Ungava Bay	3	4	6	3	1	7	0	0	2	8	1	0	0	2	4
Kangirsuk	0	4	0	3	0	7	0	0	0	0	1	0	0	0	0
Aupaluk	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Tasiujaq	0	0	0	0	0	0	0	0	2	3	0	0	0	1	0
Kuujjuaq	0	0	6	0	0	0	0	0	0	5	0	0	0	1	0
Kangiqsualujjuaq	3	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	76	46	17	3	6	21	42	42	47	57	67	61	36	42	42

Source: DFO (2013d).

Note: Figures do not include animals struck and lost. Figures include sport hunts.

. * Numbers provided by the Makivik Corporation in part under Trichinellosis Prevention Program.

** For 2011/2013, there were two sources of reporting information: a report from the Makivik Corporation under Trichinellosis Prevention Program and reports by Uumajuit wardens and technicians from the Kativik regional government. Where there was a discrepancy, the higher reported number was provided in this table.

Table D3

Detailed Quotas for the Atlantic walrus hunt in Greenland, 2006-2012

REGIONS	2006 (OCTOBER TO DECEMBER ONLY)	2007	2008	2009	2010	2011	2012
North Water	-	99	80	75	64 (-16)*	64 (-12)*	64
Qaanaq	-	80	70	70	64 (-16)*	64 (-12)*	64
Upernavik		19	10	5 (-2)*	-	-	-
West Greenland	60	71	65	38	61	61 (-1)	61
Upernavik	-	-	-	-	8 (-1)*	8	8
Uummannaq	60	11	23	12	19	19	19
Qeqertarsuaq		5					
Ilulissat		5					
Qasigiannnguit		2					
Aasiaat		2					
Kangaatsiaq		14	13	7	8	8	8
Sisimuit		29	27	17	22	22 (-1)*	22
Maniitsoq		3	2	2	4	4	4
East Greenland	15	30	30	23	18	18	18
Ittoqqortoormiit	15	15	15	13	11	11	11
Ammassalik		15	15	10	7	7	7
Total	75	200	175	136	143 (-17)	143 (-13)	143

Source: Quotas for 2006 (Grønlands Selvstyre, 2009b), quota for 2007 (Grønlands Hjemmestyre, 2007), quota for 2008 and 2009 (Grønlands Selvstyre, 2009a), quota for 2010-2012 (Grønlands Selvstyre, 2011).

*Exceeded quota in the previous year.

Table D4

Landed walrus in Greenland prior to the introduction of quotas, by region, 1998-2005

	1998	1999	2000	2001	2002	2003	2004	2005
North Water	89	128	43	194	171	181	99	137
Qaanaq	72	101	126	171	147	160	90	78
Upernavik	17	27	17	23	24	21	9	59
West Greenland	109	146	264	93	91	77	76	95
Uummannaq	2	3	8	12	23	16	10	23
Disko Bay*	15	32	56	20	20	16	17	11
Kangaatsiaq	30	41	20	28	16	13	20	6
Sisimuit	62	70	80	33	32	32	29	55
East Greenland	7	26	7	10	34	11	4	16
Ittoqqortoormiit	6	26	5	10	5	11	3	2
Tasiilaq (Ammassalik)	1	-	2	0	29	0	1	14
Other regions	13	11	15	46	35	15	15	4
Total	218	311	329	343	331	284	194	252

Source: Catch data are provided by (Greenland Statbank, 2011).

Note: Figures do not include animals struck and lost.

*Disko Bay includes the communities of Ilulissat, Qeqertarsuaq, Aasiaat and Qasigiannuguit.

Table D5

Landed Atlantic walrus in Greenland and quotas by region, 2006-2009

REGIONS	2006		2007		2008		2009		2010	
	QUOTA	HARVEST	QUOTA	HARVEST	QUOTA	HARVEST	QUOTA	HARVEST	QUOTA	HARVEST
North Water	-	72	99	80	80	66	75	91	48*	60
Qaanaq	-	67	80	67	70	54	70	86		
Upernavik	-	5	19	13	10	12	5 (-2)*	4		
Not identified	-	0	0	0	0	0	0	1	48	60
West Greenland	60	60	71	43	65	28	38	33	61	62
Uummannaq		4	11	0		0		7		
Qeqertarsuaq			5							
Ilulissat		3	5	5	23	3	12	7		
Qasigiannuit			2							
Aasiaat			2							
Kangaatsiaq		4	14	13	13	2	7	2		
Sisimuit		49	29	25	27	22	17	15		
Maniitsoq			3		2		2			
Not identified	60	-	-	-	-	1	-	2	61	62
East Greenland	15	5	30	10	30	9	23	4	18	6
Ittoqqortoormiit	15	1	15	10	15	9	13	3		
Tasiilaq (Ammassalik)		4	15	0	15	0	10	1		
									18	6
Other regions	-	8	-	0	-	-	-	-	-	-
Total	75	145	200	133	175	103	136	128	127	128

Source: Quotas for 2006 started in October (Grønlands Selvstyre, 2009b), quota for 2007 (Grønlands Hjemmestyre, 2007), quota for 2008 and 2009 (Grønlands Selvstyre, 2009a; NAMMCO Annual Report, 2011). Catch data are provided by (Grønlands Statistik, 2011; NAMMCO Annual Report, 2011).

Note: Figures do not include animals struck and lost (except in last row).

*Exceeded quota in the previous year.



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