

MANITOBA'S BELUGA HABITAT SUSTAINABILITY PLAN

Part of:
**TOMORROW
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Manitoba's **GREEN** Plan

Manitoba 



Manitoba's **GREEN** Plan

This document is part of “TomorrowNow - Manitoba’s Green Plan”; an eight-year strategic action plan for mobilizing Manitobans to work together to protect the environment while ensuring a prosperous and environmentally-conscious economy. In addition to the actions outlined in this plan, the province has other initiatives underway to ensure we protect the environment and sustainably manage our natural resources now, for tomorrow.

Manitoba’s goal is to be one of the most sustainable places to live on earth.

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For more information

To learn more about habitat conservation in Manitoba, please visit the Manitoba Conservation and Water Stewardship Wildlife Branch website at www.manitoba.ca/conservation/wildlife/habcons

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Belugas also play an important role in local economies through eco-tourism opportunities. Throughout the development of this plan, we also received input from local communities and tourism operators with extensive experience working with belugas in Manitoba. The valuable contributions from all of these perspectives have combined to form a comprehensive approach to conserving and protecting vital beluga habitat in Manitoba.



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SPECIES STATUS

Common Names: Beluga Whale

Scientific Name: *Delphinapterus leucas*

Sub-population: Western Hudson Bay

COSEWIC: Species of Concern



1. GOAL AND OBJECTIVES

1.1 Goals

Each spring and fall, the largest population of beluga whales (*Delphinapterus leucas*) in the world migrates along Manitoba's coast. This migration is interrupted during the summer months to feed, give birth and nurse young in Manitoba's northern river estuaries. In association with the annual beluga migration, a thriving whale watching industry has also developed a strong presence in northern Manitoba. Manitoba's goal in developing a habitat sustainability plan is to proactively protect and conserve beluga habitat in Manitoba and contribute to the overall health of the beluga population and related local economies.

1.1 Objectives

The goal of Manitoba's beluga habitat sustainability plan can be achieved through a combination of coordinated objectives;

- Identify and protect vital beluga habitat
- Develop and enhance our understanding of beluga habitat requirements and uses
- Identify future research and partnership opportunities to fill knowledge gaps
- Identify and encourage public education opportunities to foster a stronger understanding and appreciation of beluga in Manitoba

2. VALUE OF BELUGA TO THE PROVINCE OF MANITOBA

2.1 Intrinsic Value

The large aggregations of beluga found in the summer months along Manitoban shores and, in particular, in the Seal, Churchill and Nelson River estuaries, have an intrinsic value to Manitobans, and Canadians in general. There, from mid-June to late September, resides the largest population of belugas in the world, a population estimated at 57,000 animals. The high density of these white whales in Manitoba estuaries is an incomparable natural wonder.

2.2 Historic Value

Beluga have always been an important resource for peoples living in the Northern Manitoba. Historically, Inuit, Cree and Dene hunted beluga as a food source. The outer skin and fat layer provided a source of vitamins and energy in the form of “maqtaak”. The nutrient rich meat was also eaten by people and also an important food source for sled dogs. Present-day subsistence harvests by Inuit continues in some areas of Nunavut and northern Manitoba (north of Churchill), but it is no longer a current practice by First Nations in Manitoba.

The presence of large numbers of beluga also contributed to the development of a commercial whaling industry starting in the late 1800s in Churchill and York Factory. Churchill was the most active site for this industry. Various companies operated up until 1968, when the whale processing factory closed in Churchill. A small operation, which captured live belugas for aquarium display, operated in Churchill from 1967 to 1992.



2.3 Economic Value

Commercial and subsistence whaling and live-capture of belugas in Churchill have now been replaced by ecotourism. This is an opportunity for visitors to experience large numbers of beluga, as they go about their summer activities in the estuaries. The Churchill and Seal River estuaries, which harbour thousands of belugas in summer months, are the primary areas for beluga watching. This includes guided boats, zodiac, kayak, and snorkeling tours or simple shore observations of belugas from Cape Merry or Fort Prince of Whales. The beluga-related tourism industry in northern Manitoba is estimated at \$5.6 million annually between June 15 and August 30. It is expected to continue growing, as will the public's desire to observe beluga. The accessibility of belugas in summer, and polar bears in the fall, has led people to refer to northern Manitoba as a renowned destination for Arctic Safaris.

3. SPECIES INFORMATION

3.1 Species Description and Biology

The beluga (*Delphinapterus leucas*) is a medium-sized toothed whale, e.g., larger than porpoises and dolphins but smaller than pilot whales and sperm whales. Belugas are born pink, brown or grey and become slate grey in their first month. That grey colouration slowly fades with age and adults are almost entirely white. Some grey colouring remains along the dorsal ridge and the edge of flippers and tail flukes.

Adult size and weight varies in belugas between 300 and 450 cm and between 400 and 1600 kg (Heide-Jorgensen 1994). Hudson Bay belugas are amongst the smallest of the species, measuring 250-350 cm and 400-600 kg (Doidge 1990a, Stewart 1994). There is a clear difference in size between adult males and females. In Hudson Bay, males are about 15% longer than females and almost twice as heavy.

Female and male belugas become sexually mature around the age of 12¹ and have one calf every three years on average (Heide-Jorgensen and Teilman 1994, Stewart et al 2007). Mating takes place between late winter and early spring. The gestation period lasts about 14 months. Lactation may last a year or more but young belugas start eating solid food well before they are weaned.

As a result of the length of gestation and lactation, the average interval between births is about three years. Younger females may occasionally have a calf every two years but older females may have them less frequently than three years. Though some belugas can reach 80 years of age, the average life expectancy is ~ 40 years. Because female belugas can only have a calf every three years, populations tend to grow slowly, at a rate of ~ 4% per year or less (Richard 2008).

¹ Not around the age of 6 as previously assumed. Stewart et al (2007) have shown that that the ages of belugas are twice what was previously reported, due to an incorrect assumption of the relationship between age and growth layers in beluga teeth.

The number of belugas occupying the Churchill, Seal and Nelson estuaries and surrounding offshore in late July and early August 2004, was estimated at about 57,000.

3.2 Population and Distribution

The belugas that visit northern Manitoba's shores and estuaries in early summer are part of the Western Hudson Bay population. In late summer and autumn, these belugas extend their range further north to the shores of Kivalliq region of Nunavut, and west to Ontario and Quebec and to a lesser extent to the centre of Hudson Bay (see Appendix 1). Appendix 1 demonstrates the Western Hudson Bay beluga population distribution and movement. By late September, few belugas remain along the coast of Manitoba. Their return migration is not yet well understood but herds have been seen in pack ice along coastal Manitoba in May and June. As soon as the fast ice in the Nelson, Churchill and Seal estuaries break up in early summer, belugas enter them by the thousands and occupy these estuaries in large numbers all summer.

Every day, pods of belugas move in and out of the estuaries with the tide. Some belugas also move back and forth between the Churchill and Seal estuaries (Martin et al. 2001, Richard 2005), while animals from the Nelson estuary appear to remain there most of the summer, some moving northward to the other areas only later in the summer (Smith 2007).

The Western Hudson Bay or, Manitoba summering population is very large (Richard 2005). The number of belugas occupying the Churchill, Seal and Nelson estuaries and surrounding offshore in late July and early August 2004, was estimated at about 57,000 (Richard 2005). Obtaining an accurate count on belugas is challenging, as only animals visible above the surface can be counted, the population estimate could actually

range between 41,000 - 91,000 belugas. Nevertheless, despite that imprecision, these results indicate that it is the largest population of belugas in the world.

An additional 9,000 belugas were estimated to occupy the coastal Hudson Bay waters of Ontario. It is unclear if this is an extension of Manitoba's or part of a separate population such as those that summer in and around the Severn and Winisk estuaries of Ontario. The relationship between that population and other beluga populations in Hudson Bay has yet to be determined.

While the means of estimating total population size have changed since earlier surveys in 1987, numbers of belugas estimated at the surface in 1987 (Richard et al 1990) and 2004 (Richard 2005) were quite similar, suggesting no substantial change during that seventeen-year period. Nevertheless, estimates from both sets of surveys are too imprecise to accurately determine the population's trend during that period.

Belugas are born pink, brown or grey and become slate grey in their first month.



3.3 Habitat Requirements

Belugas are known to occupy deep waters in winter (Heide-Jørgensen et al 2001) but they tend to be more coastal in summer, entering bays and estuaries, and often moving along shorelines. This is particularly evident along the Manitoba coast of Hudson Bay, where they occupy three large shallow estuaries, the Seal, the Churchill and the Nelson.

The Nelson estuary has the largest aggregation of whales, with 37,000 belugas estimated through visual count surveys in July 2004 (Richard 2005). Based on aerial photographic counts, the neighbouring Churchill and Seal estuaries had a combined estimated total of about 14,000 belugas in July 2004 and about 20,000 in August 2004, with about 75%-80% of them in and around the Seal estuary at the time. These local numbers may vary as belugas move along the coast and between the two estuaries. Belugas equipped with satellite-linked transmitters have been tracked between the two estuaries (Martin et al 2001) and numbers are known to fluctuate from day to day in the Churchill estuary (Watts and Draper 1988, Richard 2005), likely as a result of such movements.

Scientists are unsure of the reason for the massive aggregations in estuaries throughout the summer and have developed a variety of hypotheses to explain them. The most common are:

- 1) females give birth and care for the newborn there (nursery hypothesis);
- 2) calves conserve energy in these warm waters (warmth hypothesis);
- 3) the warm low-salinity water of estuaries promotes skin molt (molt hypothesis);
- 4) belugas and in particular calves are protected from predators in estuaries (refuge hypothesis);
- 5) belugas feed in estuaries (feeding hypothesis);
- 6) belugas go there to socialize (socialization hypothesis).

Several of these hypotheses are possible and, in all likelihood, more than one of them may contribute to the formation of these estuarine aggregations. A growing number of newborn calves are observed alongside their mothers in the estuaries as summer progresses, although births themselves are seldom observed. Female belugas and their newborn and juveniles tend to occupy more of the Churchill estuary and range further into it than males. These observations lend support to the warmth and refuge hypotheses.

Interestingly, beluga and narwhal calves are equally well insulated against cold (Doidge 1990b), yet only belugas exhibit this estuarine-seeking behaviour. This observation suggests that water temperature in the estuary is not essential to beluga calves. In fact, belugas have long been known to aggregate in summer in the glacial estuary of Clearwater Fiord, Baffin Island, in a similar fashion to Hudson Bay estuarine aggregations but without the thermal “benefit” (Richard and Stewart 2008).

The low salinity at both locations supports the molt hypothesis. Live-captured belugas in Manitoban estuaries have demonstrated a rapid skin molt (St.Aubin et al, 1990). Scientists suggest that low salinity enhances the molt by causing exfoliation of the old outer skin layer, thus promoting its rapid breakdown. Belugas are often seen surfacing with sediments on their head and back in estuaries, suggesting that they rub off their molting skin on the bottom (Finley et al 1990). Nevertheless, if low salinity is an essential condition for molting, one wonders why females and calves tend to occupy the upper Churchill estuary more than males. Males are more often found near the mouth of the estuary where salinity is highest.

If estuaries are a refuge from predators (the main and perhaps only effective predator, other than man, being the killer whale) then, to protect their vulnerable calves, females would be expected to choose the shallow estuarine waters, where these predators can't go. Males do not travel with calves, and presumably only need only to move into the estuary when predators are detected in the vicinity.

Belugas are known to occupy deep waters in winter but they tend to be more coastal in summer, entering bays and estuaries, and often moving along shorelines.

The feeding hypothesis is supported by observations of belugas feeding on capelin near the mouth of the Churchill estuary (Watts and Draper 1986) but, while capelin do enter the mouth of Churchill estuary, they are a marine fish and tend to be more numerous in Hudson Bay. During past studies of belugas caught by whalers and Hudson Bay Inuit, scientists observed that most belugas caught in the Churchill estuary had empty stomachs, while most belugas caught at sea along the west coast of Hudson Bay had full stomachs (Doan and Douglas 1953, Sergeant 1973).

The beluga socialization hypothesis is a popular theory because of the large size of their summer aggregations and visible social behaviours observed in the estuaries. This is a difficult hypothesis to test however, because of the challenges to observe beluga social behaviour when they are at sea. Belugas are a social animal that frequently vocalize, likely to maintain group cohesion (Vergara 2011). Pods of belugas join other pods in forming the large estuarine aggregations in summer, but belugas have also been observed to forming large herds during their migrations at sea (Finley et al 1990). There is therefore no reason to believe that belugas “socialize” less when they are at sea. In fact, mating season which involves intense social interaction, takes place in the late winter – early spring (O’Corry-Crowe 2009), well before belugas have entered estuaries.

In conclusion, there is probably more than one reason belugas form large aggregations in Manitoba’s large estuaries. The most likely role of estuaries seems to be its use as a predation refuge, afforded by shallow estuarine waters, to all animals but particularly to the vulnerable newborn and their attendant mothers; but coincidentally estuaries act as nurseries during their period of occupation; and Manitoban estuaries also offer low salinity and warmth which favour rapid skin molt.

3.4 Characteristics Contributing to Vulnerability of Species Speed

Belugas are slow-swimming cetaceans. When moving in a relatively straight line, they swim at an average 4 km/hr (Richard et al 2001). Killer whales, fast boats and even large ships can easily reach twice that speed which makes belugas vulnerable to predation or boat strikes. Large ships however, have a more predictable course, from which belugas can maneuver away, making this type of vessel less of a strike concern.

Congregating numbers

The fact that most belugas aggregate by the thousands in estuaries also exposes a large proportion of the Manitoba population vulnerable to any upstream or local pollutants.

Use of shallow waters

Finally, tidal action and low water years can result in some belugas being grounded for a tide cycle, at which time they are vulnerable to predation by polar bears and harassment by gulls.

3.5 Species assessment and classification

The Western Hudson Bay population, which summers along the shores and in estuaries of Manitoba, has been assessed by Manitoba Conservation as “Not Listed” under Manitoba’s *Wildlife Act*. The population was assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2004 as “Special Concern” largely because, at the time, it had not been surveyed for 15 years (although surveys the same summer found the population to be very large, Richard 2005). A number of factors contributed to this assessment: “it may consist of more than one population” and “the population is subject to substantial removals by hunting in parts of its range” (i.e., Nunavut and Nunavik). It is also “potentially threatened by shipping and hydroelectric dams” (COSEWIC 2004). Despite that assessment, it is not presently listed under the *Species at Risk Act* (SARA).



4. CONCERNS ON THE HABITAT OF MANITOBA'S BELUGAS

A number of concerns have been raised about current or potential impacts to the habitat of belugas that inhabit Manitoba waters during the summer season. These include noise and disturbance (shipping, port development, and low flying aircraft noises), hydro-electric development, boat traffic, pollution (including port and rail accidents, and contaminants), and climate change.

4.1 Noise and Disturbance

Effects of human introduced noise in the marine environment are related to the duration, frequency, and intensity of the sounds (Southall et al 2007). This can range from small observed effects on marine life to displacement of animals from preferred habitat (Morton 2002). Noise can cause hearing damage, mask communication between animals, and mask the ability to locate and capture prey. It is important to note however that animals that are disturbed from human activity may not display avoidance and therefore no change may be detected in numbers in a given location. Some species might not avoid disturbance for many reasons, including risk of predation, no alternative habitat to occupy, and investment in that site, returning to the same estuaries year after year in the case of belugas (Gill et al. 2001). The lack of observable effects does not necessarily mean there is no effect.

Belugas are susceptible to noise exposure, particularly in the Churchill estuary, where engine noise, dredging and port operations can at times be quite high near the mouth. Sources of man-made noise further offshore in Western Hudson Bay include ship traffic, dredging of the shipping lane, onshore development, low flying aircraft, and hydrocarbon exploration.

Ship traffic introduces noise of varying intensity and duration into the marine environment depending on the location and activity of a ship. Onshore and in-water activity includes things such as onshore building

Noise can cause hearing damage, mask communication between animals, and mask the ability to locate and capture prey.

development, port and pier development and maintenance, and channel dredging. Noise from these activities has been shown to lead to displacement in other marine predators such as dolphins (Pirrotta et al 2013). Reduced vocalization as well as differences in group composition, group formation, behaviour and sighting duration were observed when Cook Inlet belugas were exposed to such noises (Kendall 2010). Low flying aircrafts, fixed-wing or helicopters, are known to cause fleeing, rest disruption, feeding and nursing interruption in wildlife (Frid 2003; Støen et al 2010). Although much of the literature on wildlife response to aircrafts is limited to terrestrial species, behavioural responses of beluga and bowhead whales have been observed. One study showed helicopters caused changes in behaviour in belugas and bowhead whales at altitudes ≤ 150 m and lateral distances ≤ 250 , while fixed wing aircrafts caused behavioural changes from altitudes of ≤ 182 m and lateral distances ≤ 250 m (Patenaude et al (2002).

It is unclear what impacts noise may have on belugas. Belugas may habituate to certain noises if they are a regular occurrence in their environment, but there could also be a subtle effect on their well-being, that is not easily discernable. For example, excessive sound masking may affect the ability of belugas to communicate with pod members (NRC 2003). If chronic, exposure to noise can interfere with the echolocation of belugas when feeding or navigating (refs) or can trigger stress hormones, potentially affecting normal functions such as reproduction, metabolism, immunity and disease resistance. If chronic noise exposure is very loud, it can permanently affect beluga hearing (Lesage 1993, Tyack 2008).

4.2 Hydroelectric Development

Hydroelectric development in northern Manitoba has altered water flow to estuaries heavily utilized by beluga in summer. Potential direct and indirect impacts of changes include water temperature, sedimentation load, river discharge and water levels, water chemistry and contaminant loads, and blockage of water flows and access up river (Lawrence 1992, Richard 1993). A lack of research on beluga distribution prior to the hydroelectric water diversion precludes any statement of impacts of the diversion on belugas, if any. However, research on tracked belugas in the Nelson River estuary suggests that beluga prefer fresh-saltwater mixing zones to higher fresh water levels (Smith 1997). This suggests that the amount of freshwater discharge may at least influence the distribution of belugas. The impacts that may have on belugas are not understood. The impoundment of the Churchill and Nelson Rivers has likely also affected the distribution and numbers of some fish species, which were preyed upon by belugas prior to these changes.

4.3 Boat traffic

Small vessel traffic has been shown to have short-term behavioural effects and theoretical long-term effects on resident killer whales (*Orcinus orca*) off the west coast of Canada (Williams et al 2002). Behavioural changes seen in killer whales have also been observed in other species in the presence of vessels in Canadian waters. These changes include avoidance (Finley 2001; Blane and Jackson 1994), increased swim-speed (Williams 1999; Williams et al 2002, Williams et al 2009), increased active surface behaviour (Trites and Bain, 2000), shorter surfacing times (Blane and Jackson 1994), increased feeding dive length (Bass 2000), increased angle between consecutive dives (Williams 1999), and less direct and erratic traveling routes (Williams 1999; Williams et al 2002, Williams et al 2009). Effects of vessel traffic on many species of whales in Canadian waters also include habitat displacement by noise pollution (Erbe and Farmer 2000).

Bejder et al. (2006) however pointed out that short-term studies on behavioural response of wildlife to boat traffic may not always provide a clear picture of the impacts of boat traffic on whales. Moderate reactions of whales observed in short-term studies may in fact not reflect all the animals if the more highly-disturbed animals had left the study site prior to the observations.

Tourism boat traffic in the Churchill and Seal River is not presently thought to have a significant impact on belugas, due to the low level of such activity. Current beluga tourism operators have developed self-regulating rules of conduct that attempt to minimize disturbance. Any increase in the level of tourism boat activity should however, be carefully considered. If these operations expanded so that the number of boats on the water at any given time encompassed a much larger portion of the estuary or if the activities of additional vessels were uncoordinated and targeted the same beluga pods, such changes could have an impact on belugas occupying these estuaries, and ultimately on the tourism industry that relies on them.

Recreational vessels, including seadoos, and port-related boat traffic add to the overall traffic in the estuary but are not bound by any specific rules of conduct, as exercised by the tourism operators. Although the Churchill estuary is heavily used, most residents are sensitive to the well-being of belugas and exercise care when navigating in the water with them.

The potential for hull and propeller strikes is particularly a concern with fast, small boats that can rapidly change their speed and course (including seadoos), if these vessels are not mindful of belugas around them. The Department of Fisheries and Oceans' whale-watching guidelines applied in other regions suggest that boaters use a slow speed if within 400 m of whales and idle when they come within 100 m of them (<http://www.qc.dfo-mpo.gc.ca/mammiferes-mammals/bonnespratiques-bestpractices-eng.html>).

4.4 Pollution

Belugas are susceptible to exposure from spills from train derailments or spills from present and proposed road crossing of rivers and their tributaries. Fuel and oil spills are of particular concern and could cause injury to their lungs if they breathe volatile components (Geraci and St. Aubin 1990). Heavy oil components from estuarine spills will sink to the bottom and pollute the sediments, rocks and bottom prey species that are ingested by belugas (eg.: Matkin et al 2008). Other sources of possible pollutants include mercury released into the watershed through hydroelectric development (Richard 1993), loading or unloading commodities at the port, vessel waste, and port and river mouth dredging. The latter have been shown to increase toxic compounds in invertebrates (Hedge 2009).

4.5 Climate Change

Climate change is a current threat to belugas in Manitoba's coastal region, a threat which will most likely increase in the future. Hudson Bay has experienced a dramatic loss in sea ice over the last thirty years. One study found that spring surface air temperature has increased in Hudson Bay by 0.26 to 0.30 degrees per decade from 1960 to 2005 and spring sea ice concentration has decreased 15.1 to 20.4% per decade in western and southwestern Hudson Bay (Hochheim et al. 2011).

For an ice-associated species such as the beluga, climate change and the resulting loss of sea ice has direct and indirect effects. In Hudson Bay less sea ice, and longer periods of ice-free time, allows new predators such as the killer whale to enter the Bay. Increased sightings and numbers have been reported for Hudson Bay (Ferguson et al 2012) and it is expected that this trend will continue as sea ice diminishes. This emphasizes the importance of shallow Manitoban estuaries as refuge for belugas from killer whales. Changes in water temperature, from fresh water outflow and sea ice melt may also affect beluga in Manitoba. In a recent study, migration timing of beluga in Eastern Hudson Bay has been linked to sea surface temperature (Bailleul et al 2012b).



Finally, climate change may also lead to an extended shipping season in and out of the Port of Churchill, opening the Churchill estuary, and other migration corridors in Hudson Bay to increased ship traffic and further threats associated with train and ship traffic, noise, and pollutants.

Appendix 2 summarizes the above-mentioned concerns.

5. RESPONSIBLE JURISDICTIONS FOR BELUGA HABITAT

5.1 Manitoba's Jurisdiction

Manitoba Conservation and Water Stewardship is the provincial department responsible for managing the river estuaries and protecting habitat that support healthy beluga whale populations.

Various legislative tools are used to manage Manitoba's wildlife and ecosystems by applying the principles of sustainable development:

- the *Wildlife Act*
- the *Endangered Species and Ecosystems Act*
- the *Provincial Parks Act*
- the *Ecological Reserves Act*

Resource-based tourism in Manitoba requires licensing of outfitters and permitting of their facilities in order to ensure that tourism development of Manitoba's natural areas and resources is done in a sustainable and environmentally responsible manner.

Eco-tourism activities which include beluga whale watching are regulated under the *Resource Tourism Operators Act*.

In addition to legislation, Manitoba's Protected Areas Initiative (PAI) is a government program dedicated to building a network of protected areas representative of Manitoba's biodiversity. Manitoba's protected areas prohibit logging, mining, oil and gas exploration and development, hydroelectric development, and other activities that significantly and adversely affect them.

Existing Aboriginal and Treaty rights are respected in protected areas, which generally remain open to hunting, trapping, fishing, and other traditional uses.

The Seal, Nelson and Churchill River estuaries, which provide habitat for migrating belugas, are fully within Manitoba's jurisdiction.



5.2 Federal Jurisdiction

Belugas are a federal responsibility and are managed as a harvestable marine resource by the Department of Fisheries and Oceans. Conservation, management and research activities throughout their migratory range are governed by the Marine Mammals Regulations under the *Fisheries Act*.

5.3 Other Partnerships

- Nunavut Wildlife Management Board
- Local Hunters and Trappers Associations

6. SUSTAINABLE HABITAT APPROACH BY CONSERVATION AND WATER STEWARDSHIP AND PARTNERS

6.1 Actions Completed or Underway

The Nelson River estuary is flanked by the Fox Lake and York Factory Resource Management Areas, both of which have established Resource Management Boards. The Boards make recommendations on land and resource uses for the purposes of resource management planning and provide a venue for communication exchange.

The Seal estuary is currently identified as an “Area of Special Interest” by the Protected Areas Initiative of Manitoba Conservation and Water Stewardship. The Seal Estuary was identified based on enduring features that still need to be captured in Manitoba’s representation of the Maguse River Upland ecoregion. Areas of Special Interest are study areas and are for discussion purposes- they are not protected in any formal manner.

A multi-year satellite telemetry study to determine the movements and habitat use of beluga along the Hudson Bay coast in Manitoba is underway. This is a joint effort between Oceans North Canada, the Department of Fisheries and Oceans and Manitoba Conservation and Water Stewardship. The first year of work was undertaken in 2012.

The Churchill Wildlife Management Area (WMA) covers an area from the Nelson River estuary up to the southern edge of Wapusk National Park and around the western side to the town of Churchill, surrounding the park. The coastal areas of the WMA are frequented by belugas from spring to fall. The estuaries along Manitoba’s northern coastline, including the Nelson and the Churchill experience large summer aggregations of belugas during the summer months. Together, this combination of provincial and federally managed land identifies habitat in the summer range of belugas as well as polar bears and birds.

Fisheries and Oceans Canada is in the process of amending the Marine Mammals Regulations (Whale Watching provisions) to reduce human disturbance of, and ultimately, support the conservation and protection of



marine mammals within its jurisdiction. Public consultation on this initiative has concluded.

Beluga watching tours have been offered on the Churchill and Seal estuaries for decades. Over time, some tour operators have developed an informal, self-regulating “Code of Conduct” which includes many proactive measures to support thriving beluga whale populations in these estuaries. Some of the measures include reduced speed when maneuvering around whales, “sharing whales” by limiting the number of boats surrounding whale groups and taking turns when viewing. Some operators have also installed propeller guards to protect belugas from moving parts of the boat and work to dissuade tourists from physical contact with belugas.

Manitoba Hydro is undertaking a Regional Cumulative Effects Assessment of existing hydroelectric developments in cooperation with Manitoba Conservation and Water Stewardship. The assessment area includes the Churchill and Nelson River systems. The retrospective assessment is being conducted in two phases: Phase 1 to summarize historical survey information related to a number of indicators. This assessment includes information related to beluga habitat and distribution studies in the Churchill estuary. An aquatics subcommittee is developing a list of study components to be included in the Phase 2 report which will identify, describe and acknowledge the cumulative effects of past Hydro

developments; describe the current state of the environment in areas affected by Manitoba Hydro's system, and describe a process for continued monitoring of and reporting on the state of the environment into the future. The report is expected to provide an assessment of any impacts Manitoba Hydro developments have had on beluga, and recommend monitoring actions if it is determined belugas have been or will be affected by Hydro projects.

The final Regional Cumulative Effects Assessment Next Steps document is anticipated in 2017.

The Marine Environment Protection Committee of the International Maritime Organization has adopted the environmental provisions of the "Polar Code." The Polar Code aims to strengthen requirements for ships operating in polar waters to prevent accidents and restrict discharge to minimize the possibility of pollution damage.

6.2 Approaches for Action

6.2.1 TomorrowNow Commitments

TomorrowNow – Manitoba's Green Plan is the government's eight-year strategic plan for protecting the environment while ensuring a prosperous and environmentally conscious economy.

The development of the Beluga Habitat Sustainability Plan, one of the commitments of TomorrowNow, seeks to identify links to other Provincial initiatives for a stronger, collaborative approach to beluga habitat conservation and to support local economies:

- *New Protection for Wetlands and Riparian Areas*

The province will develop a wetland strategy to protect prairie pothole wetlands and coastal marshes along Manitoba's large lakes, as well as areas of marine coastline that provide important habitat for polar bears, caribou herds and beluga whales.

As part of this strategy, provincially significant wetlands and beluga habitat will be identified.

- *15 New Provincial Parks, Ecological Reserves and Wildlife Management Areas*

Manitoba will add up to 15 more parks, ecological reserves, wildlife management areas or other protected areas over the next eight years.

The Seal is the most northern undeveloped major river in Manitoba (Chrs.ca) and therefore, is still relatively un-impacted by human influences. Manitoba Hydro has publicly stated there are no future hydro development plans for the Seal River (News.gov.mb.ca, 2015). In response to positive public feedback, Manitoba Conservation and Water Stewardship has committed to consult on options to protect the Seal River ecosystem as a critical habitat for the beluga whale.

6.2.2 New Recommendations

Port of Churchill Aquatic Pollutant Management Plan

The Port of Churchill, located in the Churchill estuary and opening into Hudson's Bay, is undergoing a period of growth and diversification in operations. As activities of the port coincide with beluga aggregation in the estuary, Manitoba Conservation and Water Stewardship is committed to a Federal/Provincial collaborative approach to encourage the Port to develop a comprehensive waste management plan specific to the effects of the Port's operations on marine life in the estuary. This plan would address concerns of noise as well as other pollutants such as bilge water, refuse from ships and product and/ or spillage when transferring from shore to ship and grain dust. The plan would also identify mitigative measures for the potential effects of pollutants in day-to-day port operations, as well as maintenance activities.

Marine Traffic Management Plan

Shipping traffic associated with the Port of Churchill is anticipated to continue to increase as is traffic associated with Arctic cruise ships and increased bulk marine freight. In collaboration with federal and neighbouring provincial and territorial jurisdictions, Manitoba Conservation and Water Stewardship recommends developing a Marine Traffic Management Plan to better coordinate the movement of large ships throughout the beluga migration route. The goals of the plan would be to identify beluga migration corridors and identify options to reduce noise and other risks associated with frequent ship traffic. The plan should also include a regular review or update schedule to incorporate new information regarding beluga migration and habitat needs.

Amending the Arctic Waters Pollution Prevention Act

The *Federal Arctic Waters Pollution Prevention Act* (AWPPA) aims to prevent pollution in Canadian Arctic waters. The AWPPA is a 'zero discharge' act, which states, "no person or ship shall deposit or permit the deposit of waste of any type in the Arctic waters." This act prohibits industrial waste discharge into Arctic waters and on land in the Arctic, as well as discharge of waste from ships travelling in Arctic waters and is beneficial throughout beluga's northern migration route. Currently, this act extends north of the 60th parallel and therefore, does not provide the same protection for vital beluga habitat in southern Hudson Bay where beluga travel heavily throughout the summer months with young calves. Manitoba Conservation and Water Stewardship recommends extending the application of this act to encompass southern Hudson Bay to provide protection throughout the beluga's migration range and ensure the integrity of vital habitat remains intact.

Federal Protection

Parks Canada's National Marine Conservation Area program (NMCA) seeks to represent the full range of marine ecosystems within Canada's jurisdiction. NMCAs are designated areas that are protected from specified activities such as ocean dumping, undersea mining, and oil and gas exploration and development. The goals of the program are in part, to protect depleted, vulnerable, threatened or endangered marine species and their habitat and to maintain ecological processes and life support systems. Research, monitoring and education are also goals of the program. Management of NMCAs is done in partnership with regional stakeholders, local communities, and Aboriginal peoples as well as provincial or territorial governments. The Hudson Bay marine region is yet to be represented through this program - currently, the NMCA program focus is on areas outside of this area but the Churchill and Nelson Rivers have been identified as preferred areas for inclusion in the program. These two rivers provide vital estuarine habitat for belugas and, more broadly, support the abundant biodiversity of Arctic ecosystems. Manitoba Conservation and Water Stewardship recommends prioritizing the assessment of the candidate Churchill and Nelson River marine areas. Manitoba also recognizes the importance of an ecosystem approach to conservation, and therefore, also recommends including the Seal River for consideration in the NMCA program to ensure a continuous corridor of vital beluga habitat remains intact.

Developing a Collaborative Approach

Many of Manitoba's neighbouring jurisdictions have recognized the importance of belugas and have developed management plans for their respective provinces and territories. As the beluga is a migratory species, a comprehensive beluga habitat management strategy throughout its range would provide a coordinated approach to habitat management for this species. Working with the federal and neighbouring provincial governments, Manitoba Conservation and Water Stewardship is committed to developing a collaborative approach to protect and conserve habitat to benefit the Western Hudson Bay beluga population throughout its migratory range.

6.3 Education and Public Awareness

In-Person Interpretive Programming

Tourism operators are the primary contact for most of the public's experiences with belugas and have the opportunity to provide a lasting impression. Manitoba Conservation and Water Stewardship recommends the continued development of interpretive programming with tourism operators to encourage interest in belugas and promote awareness of beluga and their habitat needs. Program messages could include, but not be limited to:

- Intrinsic value of belugas to the people of Manitoba
- Role of estuaries in beluga lifecycle and other uses of the habitat
- Climate change, pollution, and household actions that can contribute to reduced effects

Eco-Learning Opportunities

Manitoba estuaries, in particular the Churchill estuary, are used for recreational and commercial purposes by locals as well as international users. Manitoba Conservation and Water Stewardship is committed to developing province-wide partnerships to increase ecological learning opportunities. By developing and building on relationships with collaborators that share the same goals for environmental education, Manitoba can increase awareness the effects of man-made noise in an underwater environment; waste and/ or garbage; ship discharge; oil/ fuel spills; grain and grain dust on belugas in northern Manitoba and their habitat needs. Potential collaborators could include:

- Assiniboine Park Conservancy
- Canadian Parks and Wilderness Society
- Churchill Beluga Whale Tour Operators Association
- Fisheries and Oceans Canada
- Government of Nunavut
- Oceans North Canada
- Parks Canada
- Provincial Departments

6.4 Research and Monitoring

Habitat Baseline Study

Some Operations at the Port of Churchill are regulated and bound by the conditions of an *Environment Act* Licence, administered by Manitoba Conservation and Water Stewardship's Environmental Approvals Branch. As activity at the port increases, it is imperative to determine a current state of the estuarine environment in order to appropriately gauge changes and effects, to the marine environment and aquatic life, belugas included. Manitoba Conservation and Water Stewardship recommends





that the port conduct a baseline study to determine current pollutants (noise, waste, fuel, spillage etc.) as well as any changes associated with maintenance activities. Establishing a baseline level will inform if any additional mitigative measures are required to ensure vital beluga habitat remains intact.

Seasonal Distribution Study

Manitoba Conservation and Water Stewardship has contributed to collaborative research programs to determine summer migration patterns of the Western Hudson Bay beluga population along Manitoba's coastline and throughout its range. Although this has produced valuable information, the winter and spring movements of this population remain largely unknown. By partnering with research organizations, and federal organizations, to continue research efforts and increase our



understanding of the various habitat uses belugas require, Manitoba will contribute to a more comprehensive approach to habitat management which in turn would complement a broader beluga management plan.

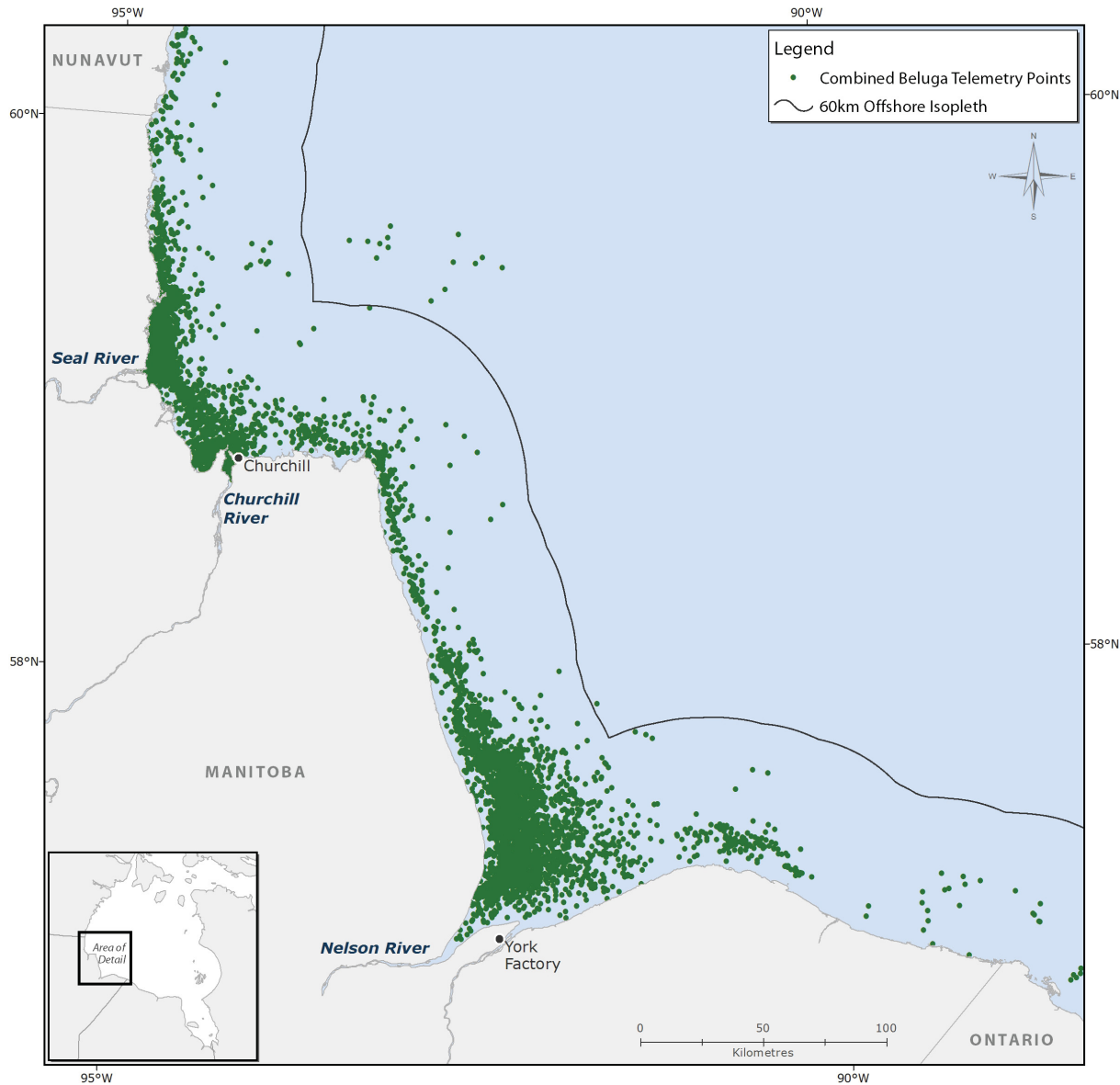
Inter-relatedness Study

The Western Hudson Bay (WHB) beluga population seen in Manitoba is the largest populations in Hudson Bay. Other populations exist in adjacent waters, though little is known about the relationships between these sub-populations. The 2004 COSWEIC assessment (COSEWIC 2004) acknowledges there is a lack of information to determine whether this is one single population, or if it consists of a number of smaller populations. By advancing our knowledge of the inter-relatedness, and developing a better understanding of the genetic diversity of this species, Manitoba can contribute to a more comprehensive beluga management plan among jurisdictions responsible for conserving and habitat and protecting the species.

Cumulative Effects Assessment and Monitoring

Manitoba Hydro will produce a retrospective report detailing the cumulative effects of hydroelectric developments on the Churchill and Nelson rivers as part of the RCEA. Part of this report will describe a process for continued monitoring and reporting on the state of the environments of these two rivers. Manitoba Conservation and Water Stewardship recognizes the need to conserve and protect vital beluga habitat and recommends that the final report provide an analysis of the effects of Manitoba Hydro operations on salinity fluctuations, water level fluctuations and fish stocks, as well as the effects these changes may have on belugas.

APPENDIX 1 - WESTERN HUDSON BAY BELUGA POPULATION HABITAT USE ALONG THE MANITOBA COASTLINE



This map displays August satellite telemetry location data from beluga tagged in the Nelson, Seal and Churchill Rivers between 1993 and 2012. The 60 km offshore isopleth displays high habitat association - 98 per cent of beluga locations are captured within this contour.

APPENDIX 2 - SUMMARY TABLE OF CONCERNS ABOUT MANITOBA BELUGA HABITAT IMPACTS

Concern	Occurrence	Frequency	Impact certainty	Impact Severity	Level of concern
Noise	Current & Anticipated	Variable	Medium	Medium	Medium
Hydro-electric development	Current & Anticipated	Variable	Low	Low	Medium
Boat traffic	Current & Anticipated	Variable	Medium	Medium	Medium
Pollution	Current (C) & Anticipated (A)	Chronic (C) & Variable (A)	Low (C) & High (A)	Low (C) & High (A)	High
Climate change	Current & Anticipated	Chronic	High	Medium	Medium

This table summarizes above-mentioned concerns on beluga habitat. As well, it states in qualitative terms what appears to be the timing of occurrence of these impacts (Occurrence), their assumed frequency (Frequency), the level of understanding the impact (Impact Certainty), an index of how severe these impacts are thought to be (Impact Severity) and, in the last column, gives a summary assessment of the relative priority that could be applied to understanding each one (Level of Concern), given the assessment in the previous columns. In all cases, the impacts are occurring at present (current) and are anticipated to take place in the future but the frequency and severity may change between now and then. In most cases, the impacts appear to be variable in frequency both now and in the future, except for pollution and climate change.

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