Manitoba Lake Sturgeon Management Strategy

2024

Economic Development, Investment, Trade and Natural Resources
Fisheries Branch

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Manitoba Lake Sturgeon Management Strategy (2012)
Lake Sturgeon Management in Manitoba (1997)
Lake Sturgeon Management in Manitoba (1994)

Table of Contents

List of Abbreviations/Acronyms

Canadian Food Inspection Agency	CFIA
Committee on the Status of Endangered Wildlife in Canada	COSEWIC
Churchill River Diversion	CRD
Designatable Unit	DU
Department of Fisheries and Oceans	DFO
Ecologically Significant Area	ESA
Fisheries Branch	The Branch
Generating Station	GS
Manitoba Hydro	MB Hydro
Lake Sturgeon Stewardship and Enhancement Program	LSSEP
Nelson River Sturgeon Board	NRSB
Saskatchewan River Sturgeon Management Board	SRSMB
Species at Risk Act	SARA

Supporting Appendices List

Appendices A through F provide reference information that supports the narrative of this report. Appendices include:

Appendix A	Map	The MB Hydro Generating System, including diversion channels
Appendix B	Text	Lake Sturgeon Management Board Membership
Appendix C	Map	Indigenous Resource Use Areas
Appendix D	Tables	Lake Sturgeon Stocking Records
Appendix E	Text	Available Provincial Regulatory Instruments
Appendix F	Text	Available Federal Regulatory Instruments

Executive Summary

The Manitoba Lake Sturgeon Management Strategy 2024 provides direction to Manitoba Economic Development, Investment, Trade and Natural Resources staff through the establishment of Lake Sturgeon management goals and approaches. The Strategy recognizes the work of others that supports the management of this species and ensures their awareness of the management and research issues of interest to the Department. The intent is for approaches of the Department and partner organizations to align under a common purpose: the recovery of Lake Sturgeon populations in Manitoba.

Lake Sturgeon were historically abundant in the Hudson Bay drainage basin in Manitoba, south of the Seal River. Their late onset of sexual maturity and intermittent reproduction made them vulnerable to many human influences including overharvest and loss of habitat. Lake Sturgeon commercial fisheries beginning in the late 19th century and continuing intermittently into the 1990s, depleted many Lake Sturgeon stocks. In some cases, stocks were extirpated, while in others only remnant populations remained.

The outlook for Lake Sturgeon in Manitoba is improving. Stocks in most river reaches are either stable or increasing. Recruitment has increased on portions of the Winnipeg, Saskatchewan, and Nelson rivers. The increased abundance is in large part attributable to the elimination of commercial harvest, and, to a lesser degree, elimination of angler retention of Lake Sturgeon and restrictions placed on Indigenous subsistence fisheries in some areas. Indigenous community leadership in recovering Lake Sturgeon has been important to this achievement.

Stocking, with appropriate safeguards, is being used to rebuild certain severely depleted stocks and replace extirpated Lake Sturgeon populations. Manitoba Hydro produces the large majority of hatchery-raised Lake Sturgeon in Manitoba, to support mitigation and offsetting measures related to the construction of the Keeyask Generating Station (owned by the Keeyask Hydropower Limited Partnership).

Lake Sturgeon have proven adaptable to major habitat alterations in some systems, which may be attributable to the species' broad habitat niche: Lake Sturgeon historically occurred in lakes and rivers in both the Prairie and Boreal biomes. Protecting key habitat complexes is expected to become increasingly important for recovery as populations grow.

Manitoba-based research conducted by industry, universities, sturgeon boards and government has made significant contributions to the understanding of stock status, genetics, early life history, habitat preference and disease. This research continues.

The Manitoba Lake Sturgeon Strategy 2024 details the life history, historical background and current status of Lake Sturgeon in Manitoba, Manitoba's management goals for Lake Sturgeon and the management approaches intended to achieve them. While some elements of this strategy will be delivered by Fisheries Branch, often in collaboration with other parties, some elements will be delivered by external organizations or researchers, subject to Provincial approvals. The sturgeon boards on the Nelson and Saskatchewan rivers are notable examples of non-government organizations participating in Lake Sturgeon recovery efforts.

This document replaces the 2012 Manitoba Lake Sturgeon Management Strategy.

Introduction

In Manitoba, Lake Sturgeon were historically found in larger rivers, lakes, and estuarine waters within the Hudson Bay watershed south of the Seal River. Late maturity and low reproductive rates rendered Lake Sturgeon vulnerable to many human influences. Commercial fisheries, particularly during the late 19th and early 20th centuries, when the federal government managed fishery resources within Manitoba's boundaries, depleted many Lake Sturgeon stocks. Commercial depletion was delayed in northern regions until efficient transportation infrastructure was developed.

The Province of Manitoba formally assumed responsibility for fisheries management within its borders on proclamation of the federal Natural Resources Transfer Act (1930). Provincial efforts to continue commercial Lake Sturgeon fisheries at sustainable levels largely served to maintain stocks in a depleted state. The final closure of all commercial Lake Sturgeon fisheries in Manitoba in the mid 1990s has been important with respect to preventing the further decline of Lake Sturgeon and allowing a portion of stocks to begin to rebuild.

Other harvest control measures have also assisted Lake Sturgeon recovery, although to a lesser degree. These include a province-wide ban on angler harvest and the implementation of Conservation Closures to restrict Indigenous subsistence harvest in portions of the Winnipeg and Nelson rivers. Conservation Closures have been successful in allowing population rebuilding to begin in specific Lake Sturgeon populations where unrestricted subsistence harvest following the 1990 Sparrow decision exceeded the stock replacement rates of already depleted populations.

Stocking of Lake Sturgeon has been important to replacing the extirpated stock in the Assiniboine River and rebuilding stocks on the Red and Nelson rivers. Stocking is also required as a mitigation measure related to the construction of Keeyask Generating Station (GS).

Sturgeon management boards on the Nelson and Saskatchewan rivers arose out of concern for Lake Sturgeon stocks and the desire of Indigenous communities to ensure that there would continue to be Lake Sturgeon to harvest. The support of Indigenous communities has been essential to ongoing recovery efforts.

Hydroelectric development on the Winnipeg River in the early part of the 20th century and along major rivers in northern Manitoba beginning in the mid 20th century has resulted in widespread modification of Lake Sturgeon-bearing habitat, as have numerous navigations, flood-control and water management projects that were developed beginning in the early 20th century. Lake Sturgeon have persisted and are recovering in numerous modified river reaches but were adversely affected in others. Habitat modifications are expected to become more limiting to continued Lake Sturgeon recovery as populations rebuild following reductions in harvest related mortality.

The Branch continues to assess Lake Sturgeon stocks and work with other parties including Indigenous communities, commercial fishers, anglers, Manitoba (MB) Hydro and other organizations to recover depleted, and replace extirpated, stocks.

The Manitoba Lake Sturgeon Management Strategy 2024 provides guidance to achieve the coordinated management, protection, and recovery of Lake Sturgeon populations in Manitoba. It builds upon past Lake Sturgeon management strategies by reviewing progress in recovering

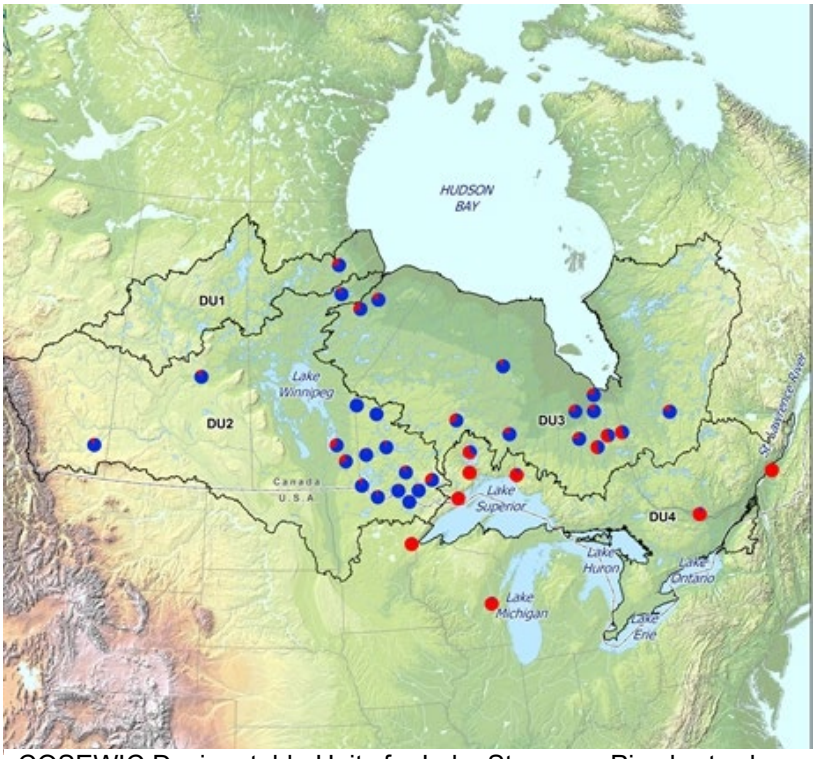
Lake Sturgeon, outlining the current status of stocks, providing current Manitoba management approaches and activities and identifying emerging challenges for Lake Sturgeon management. It is intended to ensure Manitoba's perspective on stock status and management goals and approaches is available to the general public, Indigenous peoples, industry and other levels of government.

Section One: Lake Sturgeon Biology

Distribution and Status

The Lake Sturgeon (*Acipenser fulvescens*) occurs across central and southern Canada and the north-central and eastern regions of the United States. Lake Sturgeon likely invaded Manitoba at the close of the last ice age and primarily from the Missourian glacial refugium. Within Manitoba, Lake Sturgeon are widely distributed in the Churchill, Nelson, and Hayes rivers watersheds within the larger Hudson Bay watershed.

Manitoba Lake Sturgeon comprise three genetically distinct Designatable Units (DU) as determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)[1]. These are DU 1 Western Hudson Bay – Churchill River, DU 2 Saskatchewan – Nelson Rivers and DU 3 Southern Hudson Bay – James Bay.



COSEWIC Designatable Units for Lake Sturgeon. Pie charts show population ancestry (COSEWIC)[1].

COSEWIC had assessed Lake Sturgeon into 8 DUs in its 2006 report. It re-evaluated the status of populations across Canada in 2017. COSEWIC maintained its previous assessments and evaluated DU 1 and a reconfigured DU 2 as Endangered while the renamed DU 3 population was assessed as Special Concern.

Species At Risk Act (SARA) listing requires a determination by the federal Minister of Fisheries and Oceans. The federal Minister, at the time of publication of this Strategy, has not acted on the COSEWIC recommendations and Lake Sturgeon is not a federally listed species under SARA.

[1] For further information on the COSEWIC assessment see: https://www.cosewic.ca.
For further information on the federal listing process for SARA see: Species listing process: Species at Risk Act - Canada.ca.

Size

The Lake Sturgeon is the largest freshwater fish in Manitoba. The largest known specimen, taken in the Roseau River in 1903, had a mass of 184.6 kg and an estimated length of greater than 3 m. The heaviest Lake Sturgeon reported from the Lake Winnipeg commercial fishery was 125 kg. Three Lake Sturgeon over 190 cm in length have been reported by anglers to the Manitoba Master Angler Program in the past 25 years, the largest a 199.39 cm specimen from the Red River in 1996. Notwithstanding these large maximum sizes, most post-commercial fishery specimens are 0.9 to 1.5 m long and 5 to 35 kg in mass.

Longevity

Lake Sturgeon is a long-lived species. There is an historic record of a specimen achieving 150 years of age, but there is uncertainty regarding the accuracy of this age determination. A number of sources estimate maximum post-commercial-harvest ages to be about 55 years for males and 80 years for females. A greater maximum age is theoretically possible: assuming a 3-5% annual mortality rate, and no senescence, a small proportion of Lake Sturgeon would reach 150 years of age.

Reproductive Processes

Lake Sturgeon exhibit comparatively late age at maturity. First spawning is observed in females 14 to 33 years old and males 14 to 22 years old. In most areas of Manitoba, mature males are thought to spawn every one to three years, while females spawn every four to six years.

Lake Sturgeon may migrate long distances to spawn, but migration is not necessarily a prerequisite for spawning. River and lake populations may behave differently during the pre-spawning period, with lake populations moving to spawning areas early, possibly during winter, while river populations wait until rivers are ice-free. River populations of Lake Sturgeon are reported to spawn earlier than lake populations, likely reflecting the earlier warming of rivers compared to lakes.

Mature Lake Sturgeon often congregate at the base of rapids, rocky shoals, or boulder gardens. Spawning begins at water temperatures greater than 11º C. Spawning habitat consists of swift water, 0.5 to 1.3 m sec^{-1}, over gravel, cobble, boulder, sand and hardpan substrates. Water depth at spawning locations varies from 0.1 to 4.5 m. Water depth is presumed less important for spawning than a combination of water persistence and velocity that precludes dewatering and maintains oxygenation of deposited eggs. Lake Sturgeon eggs sink and are adhesive.

Female Lake Sturgeon can release many thousands of 2.7 to 3.5 mm diameter eggs in a single spawning event, with 3,000,000 eggs previously being estimated for one large female. Egg yield increases with female age and size.

Incubation and Early Development

Lake Sturgeon larvae hatch in 5 to 10 days and are nourished by a yolk sac for 9 to 19 days after hatching. The sex ratio of larvae is assumed to be 1:1 at hatch. Larvae are thought to disperse downstream after they hatch based on the hydrology and hydraulics associated with the spawning area. There is debate over whether larvae actively select suitable rearing habitat.

Under good conditions, young-of-year Lake Sturgeon grow rapidly, from 1.7 to 1.8 cm at hatching to 11 to 20 cm length by autumn. Growth rates are temperature dependent, with faster growth rates associated with warmer water temperatures. Relatively high rates of growth continue to approximately age 25, or about the age of maturity.

Diet

Although the Lake Sturgeon's ventral mouth implies benthic feeding, Lake Sturgeon is an opportunistic feeder and both pelagic and inverted feeding at the surface of the water are known. Young Lake Sturgeon may feed on amphipods, a variety of aquatic insects, oligochaetes, molluscs, and fish eggs. A shift in diet has been reported to occur when Lake Sturgeon reaches 70 to 80 cm in length, from a diet comprised mainly of soft bodied organisms to a wider range of benthic organisms including hard-bodied bivalves and crayfish. Feeding occurs year-round.

Habitat

Adult Lake Sturgeon occur in both river and lake environments. The species inhabits depths of 1 to 10 m or more over mud, clay, sand, or gravel substrates. This species occupies, at least seasonally, a wide range of water temperatures (0.5 to 24°C) and may enter and migrate through saline coastal estuaries.

Lake Sturgeon-bearing rivers must exhibit sufficient longitudinal connectivity to provide access to the suite of habitats required for each life-stage. Access to spawning, larval and juvenile habitats is critical, followed by sufficient river area to support reproductively capable fish. Longitudinal connectivity must be considered at the scale appropriate to the river and the population inhabiting that system. In shallow rivers exposed to periodic drought and flood cycles, longitudinal connection can be lost during extended periods of drought and expanded past normal barriers during high water conditions. In large rivers, longitudinal connectivity likely is less dynamic.

There is little evidence supporting specific habitat needs for lake populations in Manitoba. However, the general plasticity of this species suggests that lake populations likely adjust to many environmental circumstances. Lake populations presumably are limited by spawning habitat and larval nursery areas. Tributary rivers may provide critical spawning habitat for lake populations.

Movement Outside Spawning Period

The Lake Sturgeon has been described as largely sedentary, making localized (1 to 20 km) seasonal movements, with high site fidelity outside of spawning migration, although extensive non-spawning movement of tagged fish is known. Younger, smaller Lake Sturgeon do not move as far as older, larger individuals.

Section Two: Socio-Economic Context

Commercial Fishery

Limited commercial fishing for Lake Sturgeon occurred in Manitoba prior to the onset of the industrialized fishery in the late 1800s. Lake Sturgeon were considered a nuisance and were discarded, fed to livestock, composted as fertilizer, or dried and burned as fuel. In the late 19th century, export markets developed for smoked sturgeon and caviar and fishers began targeting Lake Sturgeon. Harvests from southern fisheries peaked about the turn of the century. For Lake Winnipeg, Lake Sturgeon production peaked at 445 tonnes in 1900 and the stock was collapsed by 1910.

As Lake Sturgeon landings from southern fisheries declined and transportation networks expanded northwards, the industrialized harvest of northern populations began. Following over-harvest in many northern locales, the Lake Sturgeon fishery was closed in 1960 to allow Lake Sturgeon stocks to recover. Commercial Lake Sturgeon fisheries were re-opened from the 1970s through the mid-1990s, which maintained populations in their still depressed state. All commercial fisheries for Lake Sturgeon were finally closed by 1996. Lake Sturgeon carry a significant value, making them vulnerable to illegal, unreported, and unregulated harvest, which potentially complicates harvest management.

Current commercial fisheries that capture Lake Sturgeon as incidental by-catch may be affected by efforts to recover Lake Sturgeon and the growing need for fishery certification. For example, Lake Sturgeon is occasionally taken in the Lake Winnipeg fishery. Efforts to restore Lake Sturgeon to Lake Winnipeg, even in part, may require regulatory adjustments to the fishery to reduce by-catch. Given the importance of the commercial fishery to many communities, additional restrictions could raise concerns regarding the economic viability of the fishery.

Conversely, enhanced protection of Lake Sturgeon may be essential to ensuring future market access for Manitoba fish products in an era of sustainability-oriented fish markets. Fisheries cannot be certified as sustainably managed if measures are not in place to limit harm to endangered, threatened, or otherwise protected species.

Subsistence Fishery

Subsistence Lake Sturgeon harvest is a culturally important activity to Indigenous people and is the second highest priority allocation for this species following allocation of Lake Sturgeon for conservation purposes. It is believed that subsistence fishing harvest of Lake Sturgeon has remained relatively stable through the 20th century. Although provincial subsistence harvest restrictions were eliminated by Manitoba following the *Sparrow* decision, currently subsistence harvest is limited by low Lake Sturgeon abundance, the implementation of Conservation Closures on certain waters, and the implementation of voluntary harvest limits on certain waters by local Indigenous-led sturgeon boards/committees or Indigenous communities.

Angling Fishery

Depressed Lake Sturgeon populations do not provide high value angling opportunities and in most areas the species does not contribute to local or tourism-based angling. Thus, the angling value of Lake Sturgeon is small relative to the estimated $600 M value of Manitoba's angling industry.

Three circumstances suggest that there is potential to create valuable angling tourism fisheries for Lake Sturgeon as species recovery continues. First, as Lake Sturgeon populations rebuilt in the Winnipeg River, a number of angling outfitters began offering catch and release Lake Sturgeon

angling in areas under and despite the Conservation Closure. Guided outfitting and targeted angling for Lake Sturgeon on the Winnipeg River have since been largely eliminated following affirmation of the Conservation Closure applied to catch and release angling. Second, in the Assiniboine River upstream of the Portage Diversion control structure, a limited catch and release angling fishery for Lake Sturgeon has developed as stocked fish have grown to a size of interest to anglers and good angling locations have been identified. Finally, there has been an increase in angler interest in Lake Sturgeon on the Saskatchewan River in the vicinity of The Pas, as the Lake Sturgeon population rebuilds. These instances support an interpretation that further interest in Lake Sturgeon angling will develop as populations more broadly recover, and that the economic and social value of the Lake Sturgeon angling fishery will increase.

Hydroelectric Development

Lake Sturgeon are an important species from a hydroelectric development perspective. MB Hydro has made a strong effort to increase understanding of Lake Sturgeon and promote species recovery as a result. Lake Sturgeon have persisted for decades in many river reaches that have been affected by the development of GSs and in some cases have increased in abundance where harvest was restricted. Because societal demands for hydroelectric power will grow and further projects may be developed in response to measures to curb greenhouse-gas caused climate warming, the need to better understand the impacts of hydroelectric development will continue to be important.

A formal listing of Lake Sturgeon under SARA as “Endangered”, as recommended by COSEWIC for DU 1 and DU 2, would complicate the further development of Manitoba rivers and could require mitigation measures at hydro-power facilities, along with associated socio-economic costs. Irrespective of a formal SARA listing, current Fisheries Act requirements, including Fisheries Act authorizations, may also require mitigation towards recovery of this species.

Section Three: Manitoba Lake Sturgeon Management Goals

Manitoba's Lake Sturgeon management goals are:

1) Prevent further depletion of existing populations.
2) Recover Lake Sturgeon populations, in areas with suitable habitat, to levels where they can be considered stable[2] and self-sustaining.
3) Further recover stocks that are stable and self-sustaining to an abundance that will support harvest.
    - Target abundance levels may change over time due to climate change, increasing human population and demands on surface waters.

Limiting or eliminating human sources of Lake Sturgeon mortality, whether caused by commercial harvest, Indigenous subsistence harvest, angling, hydroelectric and other in-stream developments, and habitat modification, is the primary requirement for rebuilding Lake Sturgeon populations. Lake Sturgeon management in Manitoba must continue to ensure that human-caused mortality does not prevent Lake Sturgeon recovery.

Stocking Lake Sturgeon will remain important to achieving management goals where only remnant populations remain, stocks were extirpated, and mitigation of in-stream developments may be required.

[2] A stable population is one that exhibits an abundance and age and size structure that remains within specified limits through time and that includes at least second-generation post-harvest recruits. Specified limits may not include an abundance of less than minimum viable population size. A population may exhibit stationary, cyclic or chaotic dynamics, provided that it remains within the specified limits, and be considered stable.

Section Four: Management Partnerships

The Branch engages in partnerships and works with numerous groups and agencies including Saskatchewan River Sturgeon Management Board, Nelson River Sturgeon Board and Kischi Sipi Namao Committee; Indigenous communities; MB Hydro; Species at Risk and Science programs at Fisheries and Oceans Canada (DFO); University of Manitoba; Ontario Ministry of Natural Resources and Forestry, Saskatchewan Ministry of Environment, Minnesota Department of Natural Resources and North Dakota Game and Fish Department; local angling groups and others. These partnerships are essential to achieving Lake Sturgeon recovery in Manitoba.

Approach:

- Maintain existing and seek new partnerships.
- Work with partners to enhance communications regarding Lake Sturgeon status, recovery targets, conservation recommendations and management actions that may be/are being implemented to achieve species recovery.
- Where the interests of partners overlap, seek the integration of their plans and actions.

Several partnership examples operating on provincial, regional, and local scales are discussed in more detail below. The discussion is not exhaustive.

Province-wide Partnership: Manitoba Hydro

MB Hydro's hydroelectric generating system (Appendix A), which includes generating stations and a variety of water control works, has resulted in extensive modification of the Winnipeg, Saskatchewan, Nelson, and Churchill rivers watersheds, all of which historically supported large populations of Lake Sturgeon. As such, MB Hydro is an important partner in understanding and mitigating the impacts of hydroelectric development and achieving Lake Sturgeon recovery. Manitoba and MB Hydro achieve these goals through both co-operative and regulatory mechanisms.

MB Hydro and Manitoba jointly signed a Memorandum of Understanding Respecting Lake Sturgeon that formalized a collaborative partnership to support the recovery of Lake Sturgeon populations. The agreement, active between 2013 and 2018, set out both parties' common interests in Lake Sturgeon and committed $50 K annually to Manitoba via MB Hydro's Lake Sturgeon Stewardship and Enhancement Program (LSSEP) to conduct mutually agreed upon Lake Sturgeon stock assessment and research projects. The LSSEP's long-term objectives include ensuring that the net effect of Hydro's current activities do not contribute to a decrease in existing Lake Sturgeon abundance; ensuring the operation and development of its facilities in a manner that will not jeopardize the sustainability of Lake Sturgeon populations; and promoting the recovery of Lake Sturgeon populations in Manitoba. The LSSEP continued to fund some Branch activities past expiration of the Memorandum of Understanding. A second Memorandum of Understanding is under development with MB Hydro in 2024.

The Branch also maintains a regulatory role over MB Hydro operations through issuance of permits, decision-making authority with respect to hatchery Lake Sturgeon health issues, participation in environmental reviews and oversight of compliance with Environment Act Licence conditions.

Regional Partnerships: Sturgeon Management Boards/Committees

Sturgeon management boards/committees provide a forum where Indigenous communities, governments and hydroelectric utilities can meet, exchange ideas and cooperatively initiate projects that contribute to the management and conservation of Lake Sturgeon. The boards/committees provide opportunities for local people to bring their insight and knowledge to the active management of this species. There are three sturgeon management boards/committees.

The *Nelson River Sturgeon Management Board* (Nelson River Sturgeon Board | Facebook) (NRSB) was created in 1992. The Board originally included six upper Nelson River Indigenous communities that met as part of a Wildlife Advisory Planning Board to discuss concerns with the sustainability of Lake Sturgeon harvest and conserving a stock that was exploited by several Indigenous communities. Membership currently includes seven communities. The Board's area of interest is the Nelson River between Lake Winnipeg and Kelsey GS. The NRSB has proven effective in promoting Lake Sturgeon conservation in its area of interest, in part through stocking Lake Sturgeon, school aquarium programs and operation of the Silas Ross Memorial Lake Sturgeon Rearing Facility at the Jenpeg GS.

The *Saskatchewan River Sturgeon Management Board* (Sask. River Sturgeon) (SRSMB) was created in 1998. The Board is comprised of Indigenous communities, commercial fisher associations, electric utilities and provincial management agencies from both Manitoba and Saskatchewan. The Board's area of interest is the reach of the Saskatchewan River between E.B. Campbell Hydroelectric Station in Saskatchewan and Grand Rapids GS in Manitoba and includes Cedar Lake. This board is a critical tool for managing a population that occurs across two provincial jurisdictions, and has proven effective in sharing information, establishing objectives, and coordinating research.

The *Kischi Sipi Namao Committee* (ksnc.ca) was established in 2013. The committee is comprised of the Keeyask Hydropower Limited Partnership, MB Hydro and five Indigenous communities in the vicinity of lower Nelson River hydroelectric GSs. The Branch participates in the committee as a non-voting member. The committee's area of interest is the Nelson River downstream of Kelsey GS to Hudson Bay and includes the Hayes River system.

Board/committee memberships are provided in Appendix B.

The Branch considers sturgeon management boards/committees effective in addressing Lake Sturgeon management and conservation issues and is committed to working with them. Ensuring the success of Indigenous-driven boards in managing subsistence harvest is critical to achieving long-term Lake Sturgeon recovery and sustainable Indigenous subsistence fisheries. Sturgeon board/committee successes are noted in the relevant reach narratives in Section Six.

Local Partnerships: Indigenous Communities

In addition to participation in sturgeon boards/committees, individual Indigenous communities undertake stewardship of Lake Sturgeon populations in their traditional areas. The Branch works with individual Indigenous communities at a local level wherever possible towards achieving long-term Lake Sturgeon recovery and sustainable Indigenous subsistence fisheries.

Several Indigenous communities have Resource Management Boards with a mandate for land and resource use planning within defined Resource Areas (Appendix C). These boards were created through formal agreements between Manitoba and the Indigenous communities or

through legislation. Resource management allocations and plans must be submitted to these boards for activities that apply within the respective Resource Areas. This requirement applies where there is an overlapping sturgeon management board/committee.

Local Partnerships: Angling Associations

Angling associations have an interest in the recovery of local Lake Sturgeon populations to levels where catch-and-release angling is permitted and a further interest in ensuring that, where permitted, angling activities do not detrimentally affect Lake Sturgeon stocks. The Branch has worked collaboratively with the Lac du Bonnet Fish and Game Association and the University of Manitoba to assess the occurrence and persistence of physiological stress on angled and released Lake Sturgeon. Anglers in Brandon have also worked collaboratively with the Branch to gather information on stocked Lake Sturgeon in the Assiniboine River.

Section Five: Management Activities

Stock Assessment

Understanding the status of Lake Sturgeon stocks is necessary to monitor the effectiveness of management measures and to track population recovery against targets. Stock assessments inform future management of Lake Sturgeon. Stock assessments are also used to support sturgeon board/committee recommendations for subsistence harvest and provincial management of angling opportunities by demonstrating the need for and effectiveness of management regimes. Sturgeon boards/committees, MB Hydro and the Branch all conduct stock assessments, both collaboratively and individually, to support their respective efforts to recover Lake Sturgeon populations and, where required, to meet regulatory conditions related to in-stream developments. The Branch identifies priority areas for stock assessment in part to guide the efforts of partner organizations.

Management Approach:

- Compile and analyze existing externally collected Lake Sturgeon data.
- Work with sturgeon boards/committees to continue to assess Lake Sturgeon stocks in the Nelson River, the Saskatchewan River and Cedar Lake.
- Conduct stock assessments on the Winnipeg River with research staff and MB Hydro.
- Undertake or facilitate stock assessments in the Churchill River above and below Missi Falls, and in the Assiniboine River above and below the Portage Diversion.
- Finalize population targets, including demographic targets, for all river reaches, in co-operation with partners where appropriate.
- Communicate stock assessments and population targets to resource users.

Evaluation of Water Regime Effects

Hydroelectric development, surface water management, municipal, agricultural, and other industrial development can result in changes to water regimes. These include withholding of snowmelt runoff to reduce flooding and/or fill reservoirs, watering, and dewatering cycles due to hydroelectric peaking, water withdrawals to meet agricultural or other human needs, and diversion of flows through a variety of manmade and natural channels for flood control and hydroelectricity generation. In some cases, habitat impacts resulting from changes in the water regime have affected the distribution and success of Lake Sturgeon. Manitoba will continue to assess the impacts of water regime changes on Lake Sturgeon populations.

Management Approach:

- Develop a better understanding of how habitat availability and Lake Sturgeon habitat use is affected by flow or water level changes in the following:
    - Churchill River
    - Nelson River
    - Assiniboine River and tributaries - between Shellmouth Dam and the Portage Diversion.

Lake Sturgeon Stocking and Fish Culture

In areas where Lake Sturgeon have been extirpated or depleted to the point where recovery is not likely within reasonable time frames, Lake Sturgeon can be raised in hatcheries and stocked into suitable habitat to speed population recovery. Lake Sturgeon may also be transferred from high-density to low-density populations to support recovery.

Stocking activities must ensure that source stocks are genetically suitable for the area being stocked and that disease transmission and harm to the source and receiving stocks is minimized. Stocking programs must also consider the target density of intended populations. Stocking should not be used to support harvest levels exceeding the natural reproductive capacity of any population. Manitoba regulates fish culture and stocking through its fish stocking policy and the issuance of Live Fish Handling Permits.

Manitoba, MB Hydro, the Keeyask Hydropower Limited Partnership, the NRSB and the SRSMB have conducted considerable stocking of Lake Sturgeon into Manitoba waters (Appendix D). In addition, Saskatchewan and Minnesota have stocked Lake Sturgeon into waters that flow into Manitoba. Monitoring of stocked Lake Sturgeon in Manitoba has shown that survival of stocked young-of-the-year fingerling or smaller fish is very limited. As a result, recent stocking programs have focussed on stocking yearling fish, which have high survival rates.

The re-establishment of a Lake Sturgeon stock in the Assiniboine River and the resurgence of Lake Sturgeon in the Red River, is indicative of the benefits of stocking where populations were extirpated or reduced to remnant status. Manitoba will review and consider allowing further stocking where genetic, brood stock, wild stock and disease concerns are addressed by proponents.

MB Hydro has funded a National Science and Engineering Research Council Industrial Research Chair in Conservation Aquaculture at the University of Manitoba in support of Lake Sturgeon culture and stocking.

Management Approach:

- Develop a Lake Sturgeon stocking policy to apply to all organizations proposing to stock Lake Sturgeon. The policy will address:
    - The suitability of stocking as a management tool
    - Population recovery targets
    - Suitable stocking rates
    - The implications of proposed stocking on receiving populations
    - Identification and protection of suitable brood stocks
    - Disease testing requirements for brood stock, offspring and wild stock used as a source stock.
- Review all new stocking requests through the joint federal-provincial Introductions and Transfers Committee.
- Support studies and communicate with organizations to improve Lake Sturgeon culture success.
- Determine if imprinting and spawning site fidelity affect stocking success.
- Determine factors limiting stocking success for young-of-year Lake Sturgeon.
- Promote research to assess if polyploidy in cultured Lake Sturgeon is a management concern.
- Limit stocking to Lake Sturgeon produced from brood stock sourced from the river basin to be stocked.
    - Where stocks were extirpated, the Branch will determine the source stock.
- Consider stocking the Churchill River above Southern Indian Lake if stock assessments confirm the population has been reduced to remnant status.
- Consider the stocking of juvenile Lake Sturgeon from recovering populations, where density dependent competition is limiting growth rates, to locations with low Lake Sturgeon abundance within the same river basin.

Lake Sturgeon Disease

The Branch supports efforts to investigate best practices for detection and control of disease in cultured Lake Sturgeon and determining the extent of disease in the wild.

Lake Sturgeon herpesvirus and Namao virus occur in Manitoba with occasional outbreaks of Namao virus occurring in hatchery facilities. The prevalence and implications of these diseases are not fully understood; in particular, the levels of disease endemism and its implications for stocking cultured fish. The successful use of a test for Namao virus is assisting in this effort.

The Canadian Food Inspection Agency (CFIA) addresses diseases of cultured finfish, molluscs, and crustaceans through the National Aquatic Animal Health Program. It has a mandate to prevent the entry and limit the spread of fish diseases of concern, as they relate to movement and trade. Under the CFIA, White Sturgeon iridoviral disease is the only disease that is regulated with respect to Lake Sturgeon and that is reportable to CFIA. This disease has not been found in wild stocks or hatcheries in Manitoba. As both regulator and manager, the Branch's interest in disease extends beyond CFIA's mandate.

Management Approach:

- Continue to ensure Live Fish Handling Permit conditions include approved bio-security measures that minimize disease risks into and within hatcheries and minimize the prevalence of disease in the wild.
- Determine appropriate sample sizes to test for the presence of diseased Lake Sturgeon in hatchery settings.
- Continue to work with the CFIA.
- Support research into tests for Lake Sturgeon viruses.
- Support further research to determine the prevalence of Lake Sturgeon viruses in wild populations.
- Support exposure studies to determine age susceptibility for Lake Sturgeon viruses.
- Support research into the taxonomic description and understanding of currently undescribed Lake Sturgeon pathogens.

Genetic Analysis, Stock Discrimination

The genetic integrity, structure and diversity of Lake Sturgeon stocks is an important consideration when recovering and rebuilding wild stocks. This concern is driven primarily by the need to ensure the stocks that result from recovery efforts are well-adapted to their environment and to reduce the risk of detrimentally altering stocks.

Based on a MB Hydro funded analysis of microsatellite DNA, COSEWIC concluded that Manitoba Lake Sturgeon populations share a common ancestry and that there are no functional genetic differences among them. Based on this evidence, COSEWIC reduced the number of DUs from eight to four. A separate MB Hydro funded analysis of single nucleotide polymorphisms concluded that in some rivers "populations existed historically in relatively small stretches of river, with only one-way (downstream) gene flow occurring."

Management Approach:

- Support further research to determine the degree to which Lake Sturgeon stocks differ genetically, the degree of diversity within those stocks and the extent of range overlap among genetically distinct stocks.
- Determine the number of brood stock required to maintain population genetic diversity in cultured Lake Sturgeon.

Fish Passage

Maintaining the ability for Lake Sturgeon to disperse and migrate assures these life history tactics are available for Lake Sturgeon to respond to climate change, drought and increasing human demand for water and hydroelectricity that may result in the periodic contraction and expansion of their range. The provision of fish passage to prevent fragmentation of fish habitat allows for the continuation of these patterns of dispersal and is a potential mechanism to maintain Lake Sturgeon populations. As noted above, genetic studies of Manitoba Lake Sturgeon indicate that, in stepped-gradient shield systems like the Winnipeg and Nelson rivers, populations existed historically in relatively small stretches of river, with only one-way (downstream) gene flow occurring. This indicates Lake Sturgeon populations were historically segregated by barriers to upstream movement.

Currently, there are no specific measures in place to allow either up or downstream passage of all sizes and age classes of Lake Sturgeon at control structures, reservoirs, or hydroelectric generating stations in Manitoba. However, there is evidence of Lake Sturgeon of a variety of sizes successfully moving downstream over the spillways of some barriers. Some downstream movement through GSs is also known to occur at MB Hydro facilities where large propeller-style turbines may allow injury-free passage of small Lake Sturgeon. At this time there are no feasible designs for upstream Lake Sturgeon passage on the scale needed to address the kinds of facilities found in Manitoba. This is an area of active research within North America.

In addition to the practical limitations of current techniques to address fish passage, the desirability of providing passage must be considered on a site-by-site basis. In some cases, providing upstream access to altered habitats will not address life history needs and may result in increased downstream movement through or over structures with the associated risks of injury or mortality. In contrast, the creation of an impassable barrier where none had existed would extinguish gene flow, individual movement, and inter-population interactions.

Management Approach:

- Consider fish passage on a site-by-site basis to maintain Lake Sturgeon populations.
- Continue to monitor developments in fish passage designs for Lake Sturgeon.
- Encourage research examining movement of Lake Sturgeon over barriers.
- Participate on regulatory review committees that provide oversight via Environment Act Licence and Fisheries Act Authorizations for major works.
- Consider stock genetics when considering fish passage requirements.

Habitat Enhancement

Habitat enhancement can be an effective means of mitigating impacts of development by providing life-stage specific habitats. This can take the form, for example, of constructed spawning riffles and nursery areas. Other jurisdictions have had success with enhancement of spawning habitat.

Management Approach:

- Monitor the scientific literature, research conducted by MB Hydro and methods from other jurisdictions; consider its application at existing and future development sites where enhancement might prove beneficial.

Recreational Angling and Commercial Fishery Management

The Manitoba Fishery Regulations under the Fisheries Act (Canada) are the primary regulatory tool Manitoba uses to protect Lake Sturgeon from non-subsistence harvest, and that are used to impose seasonal restrictions on access to Lake Sturgeon. While there are no current opportunities for non-subsistence harvest of Lake Sturgeon, there may be future opportunities as populations recover. These opportunities would be formally established through amendments to the Regulations.

Catch and release angling for Lake Sturgeon is permitted where no Conservation Closures are in place. Such angling is not expected to have a significant impact on Lake Sturgeon populations: a recent study concluded that, despite experiencing short-term physiological stress responses when caught and released, Lake Sturgeon did not experience short-term post-angling mortality. However, to protect spawners when they are most vulnerable, spring closures to recreational angling for Lake Sturgeon were introduced in 2023 in Manitoba.

There is no legal commercial fishery for Lake Sturgeon anywhere in Manitoba.

Appendices E and F include regulatory measures available for use by the Manitoba and federal government with respect to managing Lake Sturgeon recovery, including with respect to harvest management.

Management Approach:

- Continue the current prohibition on recreational angler retention of Lake Sturgeon.
- Continue the current prohibition on commercial harvest of Lake Sturgeon.
- Consider the implications of Zebra Mussels where they have invaded Lake Sturgeon habitat.

Section Six: Historical Narratives and Management Approaches by River Reach

Churchill River

Saskatchewan Border to Missi Falls Control Structure

Records for the commercial Lake Sturgeon fishery, dating prior to 1940, do not report production on the scale that caused depletion of stocks elsewhere. It is thought that the Churchill River was heavily fished, and stocks depleted, but that delivery records were blended with the Saskatchewan River fishery. When the commercial Lake Sturgeon fishery reopened in 1970 after a decade-long province-wide closure, production was low until the fishery was closed in 1995. Current subsistence harvest is low and there is little Lake Sturgeon by-catch in other food fisheries.

No population estimate is available for this reach, however, the presence of occasional large fish and few small fish supports an interpretation that this reach contains a remnant population of Lake Sturgeon. Recovery potential may be limited by insufficient brood stock and low recruitment.

Water levels and flows in this reach are influenced by the operation of SaskPower's Island Falls GS. It was built in 1930 to provide power to Flin Flon and the associated mining/smelting operation. After SaskPower took over facility operation in 1985, the flow regime changed to accommodate seasonal peaking. Habitat is believed to be detrimentally affected by the water regime but is considered acceptable for Lake Sturgeon.

The Missi Falls Control Structure impounds Southern Indian Lake and diverts a portion of flows from the Churchill River through the Churchill River Diversion (CRD) to the Rat/Burntwood River system, which joins the Nelson River above Split Lake. The CRD allows Churchill River Lake Sturgeon downstream access to the Rat/Burntwood system, an area that is not known to have previously supported Lake Sturgeon. Lake Sturgeon have been caught by anglers in the Burntwood River near Thompson; these are assumed to have originated from the Churchill River system.

Granville Falls is a barrier to upstream movement. Other significant rapids and falls are Bloodstone Rapids, Pukatawagan Falls and Twin Falls. It is not known if Lake Sturgeon can move upstream through these areas.

Mathias Colomb Cree Nation at Pukatawagan, O-Pipon-Na-Piwin Cree Nation on Southern Indian Lake and Marcel Colomb Cree Nation at Lynn Lake have expressed interest in Lake Sturgeon recovery in this reach. Assessment work began in 2017, when the Branch, supported by LSSEP funding, conducted a habitat and juvenile assessment in the Leaf Rapids and Granville Falls area. Suitable juvenile rearing habitat was identified although high flows that year limited gill net effectiveness and no Lake Sturgeon were caught. There are reports from local fishers of small Lake Sturgeon caught in the Granville Falls area.

Lake Sturgeon occur in the Hughes River system, a tributary to the Churchill River. There are no records of commercial harvest on this system. A juvenile Lake Sturgeon was caught and released from index nets set in Hughes Lake in 2009.

Management Approach:

- Determine if recruitment is occurring and, if confirmed, assess whether it is sufficient to recover stocks.
- If it is demonstrated that natural recruitment is either not occurring or is insufficient to secure the stock, then stocking will be considered. The Lake Sturgeon population in the lower Churchill River near the mouth of the Little Churchill River is an appropriate parent source.

Missi Falls Control Structure to Hudson Bay

Following completion of the CRD in 1976 this reach was substantially dewatered. High flows periodically occur during wet years. There was an expectation that fish stocks would be adversely affected by reduced flows when diversion of flows began.

Based on test netting, Lake Sturgeon in the Churchill River adjacent to the mouth of the Little Churchill River appear to be stable and self sustaining. There have been several population estimates, all indicating several hundred to over one thousand adults in this area. There is evidence of both immigration to and emigration from the area, which complicates assessment. Adults and juveniles are also captured further downstream as far as the Churchill Weir, but in much lower numbers. In the most upstream portion of this reach, nearer the Missi Falls Control Structure, very few Lake Sturgeons have been captured.

Manitoba, MB Hydro, and Tataskweyak Cree Nation have all conducted monitoring and/or research in the reach below Missi Falls since the 2012 version of this strategy, and much has been learned with respect to abundance, range, and habitat. Tataskweyak Cree Nation has assumed an active stewardship role of Lake Sturgeon in this reach. MB Hydro has initiated studies that may be employed to improve the environment for fish downstream of Missi control structure, as directed by Manitoba in 2021 when the Churchill River Diversion final licence was issued under the Water Power Act (Manitoba).

This reach is in the Split Lake Resource Area. The Split Lake Resource Management Board has a mandate for land and resource use planning. The Board has not prepared any land or resource use plans that would affect Lake Sturgeon but is aware of issues affecting Lake Sturgeon on the Churchill River.

Management Approach:

- An instream flow needs assessment is required for the reach where Lake Sturgeon are concentrated, including an assessment of the contribution of habitat in the Little Churchill River to the population.

- The Split Lake Resource Management Board should develop a Lake Sturgeon management plan that includes monitoring of Lake Sturgeon stocks and harvests to ensure that harvest is sustainable.

Saskatchewan River

Saskatchewan Border to Grand Rapids GS

The Lake Sturgeon commercial fishery peaked at the beginning of the 20th century and resulted in stock depletion. Some of the production attributed to the Saskatchewan River may have been delivered from other areas of northern Manitoba. After the initial stock depletion, this fishery continued producing small amounts of fish, interspersed with periods of fishery closure. When the Manitoba portion of the fishery reopened after the province-wide closure in 1970, there was a brief peak in production, followed by limited production until the fishery was closed in 1994. Limited subsistence harvest and recreational catch-and-release angling of Lake Sturgeon occurs. The latter has increased in recent years.

The Lake Sturgeon population in this reach may have been contiguous with the Lake Winnipeg population prior to the establishment of the Grand Rapids dam.

Water levels and flows in the upper reaches of this area are affected by SaskPower's E.B. Campbell Hydroelectric Station. The lower reach of this area is Cedar Lake and the Grand Rapids GS forebay. Water levels and outflows for Cedar Lake are controlled by Grand Rapids GS.

The SRSMB has conducted annual population monitoring, as well as movement and habitat studies, and developed communications material and a ten-year management plan for Lake Sturgeon in 2002. In 2014, the management plan was updated for a further 10-year period. The SRSMB has proven an effective means for communities, First Nations, electric utilities, and government agencies to share information, establish objectives and coordinate research. It remains a critical tool for managing across jurisdictions.

Lake Sturgeon were stocked into this reach between 1999 and 2007. Most stocking, 136,200 fry and 350 fingerlings, occurred in Saskatchewan, while 7,567 fingerling Lake Sturgeon were stocked in Manitoba. No further stocking is anticipated.

The abundance of Lake Sturgeon in this reach has increased dramatically since index netting began in the 1990s (see population estimates below), with most of the increase due to sub-adult Lake Sturgeon. Recent SRSMB population estimates for adults are in the range of 10,000

individuals. Manitoba Master Angler records[3] show little change in the number of large Lake Sturgeon reported by anglers in recent years. An increasing number of Lake Sturgeon are being reported as incidental bycatch by commercial fishers in Cedar Lake and other Saskatchewan River fisheries. Assessments are currently being conducted on lower portions of the reach, including Cedar Lake.

The upper end of this reach is in the Opaskwayak Cree Nation Resource Management Area and the lower end in the Cedar Lake Resource Management Area. The Mosakahiken Cree Nation Resource Management Area also includes a portion of this reach.

POPAN Model Lake Sturgeon population estimates (adults and sub-adults) for the Saskatchewan River (SRSMB data).

Year	Estimated Abundance	Year	Estimated Abundance
1997	1,822	2010	7,497
1998	1,919	2011	6,887
1999	2,328	2012	13,656
2000	1,793	2013	12,546
2001	1,627	2014	20,866
2002	1,326	2015	
2003	1,742	2016	17,617
2004	2,157	2017	
2005	2,850	2018	24,266
2006	2,618	2019	
2007	3,264	2020	20,482
2008	5,482	2021	
2009	6,411	2022	28,700

[3] Manitoba Master Angler Program records comprise voluntary angler entered records of Lake Sturgeon ≥109 cm in total length. Reports are thought to be generally reflective of the relative abundance of large fish over time, but several caveats apply. For longer-term records, general angling effort may have varied over time. Reports may also be hyper-responsive relative to Lake Sturgeon abundance. Below an undetermined threshold little targeted angling is likely to occur, but as abundance increases, reports are entered and high-quality angling locations are identified and advertised, angling effort may increase faster than populations grow. Further, the angler reporting rate is not accurately known for Lake Sturgeon and may have changed over time.

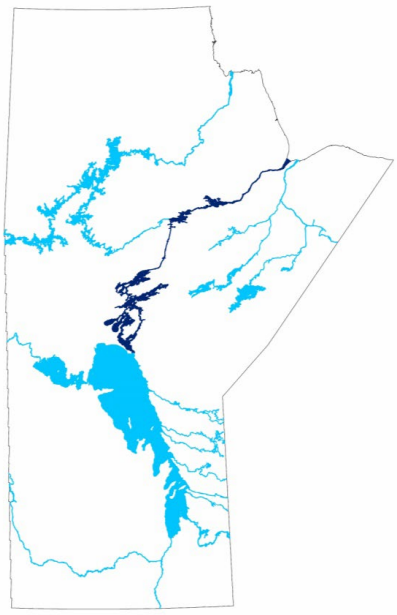
Manitoba Master Angler records of Lake Sturgeon ≥ 109 cm.

Year	Number of Records	Year	Number of Records
1986	2	2005	0
1987	0	2006	0
1988	0	2007	0
1989	0	2008	1
1990	0	2009	0
1991	1	2010	1
1992	0	2011	0
1993	0	2012	1
1994	2	2013	4
1995	2	2014	4
1996	0	2015	5
1997	0	2016	5
1998	1	2017	2
1999	1	2018	2
2000	0	2019	0
2001	3	2020	0
2002	5	2021	8
2003	1	2022	3
2004	0	2023	3

Management Approach

- Continue to work with the SRSMB in the management of the subsistence fishery and communication and outreach programs.
- Continue to monitor the population and assess the effectiveness of the management measures in place.
- Continue to survey the extent of Lake Sturgeon downstream into Cedar Lake.
- Increase education and outreach to ensure that sub-adult Lake Sturgeon are not harvested until they complete at least one reproductive cycle.
- Continue to collect reports of incidental and targeted Lake Sturgeon captures by anglers, through the Manitoba Master Angler program.
- Develop and implement metrics to evaluate the effect of Zebra Mussels on Lake Sturgeon in this area.

Nelson River



Lake Winnipeg to Whitemud Falls

Historical harvest from this area is not fully known due to the combination of historical delivery records from several waters. This area was depleted by the late 1950s. Commercial delivery records and local knowledge indicate that a remnant population existed after this time.

The bycatch of Lake Sturgeon in the Playgreen Lake commercial fishery remains low. There is minimal subsistence Lake Sturgeon fishing by members of the Norway House Cree Nation and almost all the reported bycatch has been released. There is occasional targeted subsistence fishing in the Jenpeg GS tailrace and in Eves Rapids by Cross Lake First Nation members. The level of subsistence fishing pressure is not considered high enough to have a significant impact on recovery, although the Branch considers that minimal harvest is desirable.

The Lake Sturgeon population in this reach may have been contiguous with the Lake Winnipeg population.

The completion of Jenpeg GS and the associated channel alterations for Lake Winnipeg Regulation in 1979 resulted in habitat modifications. Jenpeg GS was constructed at the site of a rapids which was both a spawning area and a migration route to spawning areas further upstream. The Ominawin Bypass Channel upstream of Jenpeg GS was constructed in an area considered to be a spawning site. Two Mile Channel was built to allow increased flow of water from Lake Winnipeg into Playgreen Lake. It carries suspended sediment from erosion on the Lake Winnipeg shoreline into Playgreen Lake. This sediment is carried north towards Eight Mile Channel and is thought to have affected habitat along that route. There were anecdotal accounts of Lake Sturgeon being caught in the Lake Winnipeg commercial fishery on Mossy Bay when the Two-Mile Channel opened and accounts from Norway House that Lake Sturgeon largely disappeared from Playgreen Lake at that time. Lake Sturgeon continue to be observed in the tailrace below Jenpeg GS, in Eves Rapids below the Cross Lake Outlet Weir, and below Sea Falls near Norway House.

The NRSB completed a Lake Sturgeon management plan for the area in 2016 and actively promotes it. Lake Sturgeon stocking is an initiative of the Board in partnership with the Branch and MB Hydro. Since the mid 1990s the Board has conducted annual spawn collection from Nelson River Lake Sturgeon in association with regional Branch staff, as described in the following section (Whitemud Falls to Kelsey GS). Eggs are hatched at MB Hydro's Grand Rapids Fish Hatchery, where the resultant fry are reared to fingerling size or larger. Some may be transferred after several weeks to NRSB's Silas Ross Memorial Lake Sturgeon Rearing Facility at Jenpeg for further rearing until stocking in fall. Grand Rapids Hatchery currently rears as many fingerlings as possible over winter for stocking in spring as yearlings. Recent monitoring has shown that Lake Sturgeon stocked as yearlings have a significantly higher survival rate. As of 2023, approximately 600,000 fry, 133,000 fingerling, and 10,700 yearling or older Lake Sturgeon have been stocked into this reach.

Studies funded by MB Hydro's LSSEP, and federal government funding programs have combined to provide detailed information on the survival and habitat preferences of the stocked Lake Sturgeon. These studies examined Pipestone Lake, Little Playgreen Lake, the area downstream of Jenpeg GS and the Sea Falls portion of this reach. The studies found that post-stocking survival of yearlings is high with limited downstream dispersal, depending on year class. This has implications for long term stocking strategies: stocking is best planned to ensure that high quality habitats are not over-stocked.

No population estimate is available for this reach. However, based on the studies described above, abundance of juvenile Lake Sturgeon in the Sea Falls area has increased dramatically due to stocking (hatchery tags are detected in approximately 90% of juvenile Lake Sturgeon captured). In recent years, catch per unit effort in juvenile gill net gangs (1"- 6" mesh sizes) appears to have stabilized as the NRSB has reduced stocking near Sea Falls and expanded to Pipestone Lake and Little Playgreen Lake. As some cohorts of stocked Lake Sturgeon have begun to grow beyond juvenile size (>800mm fork length), adult gill net gangs (8"- 12" mesh sizes) have also been set in recent studies.

Mean Lake Sturgeon catch per unit effort (#/100m/24h) in Sea Falls area.

Year	Juvenile nets	Adult nets
2015	7.6	
2016	8.0	
2019	8.1	
2021	7.2	1.1

In Pipestone Lake, abundance appears to have increased over the past decade, as demonstrated by catch per unit effort in both juvenile and adult gill net gangs. In 2023, almost 86% of juvenile Lake Sturgeon captured in Pipestone Lake carried hatchery tags. Of those fish, 77% had been stocked in Pipestone Lake, 21% in the Sea Falls area and 2% in Little Playgreen Lake.

Mean Lake Sturgeon catch per unit effort (#/100m/24h) in Pipestone Lake.

Year	Juvenile nets	Adult nets
2013	1.2	
2015	1.8	0.3
2023	3.7	1.1

Abundance in the Cross Lake portion of this reach remains low; however, some spawning is believed to occur immediately downstream of Jenpeg GS.

This reach is within the Norway House and Cross Lake Resource areas. The Norway House Resource Management Board is kept informed on the activities of the NRSB. Cross Lake First Nation does not have a Resource Management Board.

Management Approach:

- Continue to work with the NRSB in the management of the subsistence fishery and the delivery of stocking, communication, and outreach programs.
- Support the NRSB's annual recommendations to harvesters.
- Work with the NRSB to ensure that stocked Lake Sturgeon are protected from harvest until they complete at least one reproductive cycle.
- Assess habitat changes in Playgreen Lake.

- Stock yearling Lake Sturgeon across a larger number of sites.
- Recover the population to the point where it is utilizing all the available habitat.
- Monitor for effects of Zebra Mussels on Lake Sturgeon in this area.

Whitemud Falls to Kelsey GS

By the 1950s this area was the heart of the Nelson River commercial Lake Sturgeon fishery, producing about 80% of the deliveries from the Nelson River. The commercial fishery was closed in 1960 as catches declined and was reopened in 1970 with an increased mesh size, minimum size limit and reduced quotas. The management regime introduced in 1970 was considered sustainable until the 1990s. The quota was normally caught, implying that it was limiting harvest. However, the minimum size limit and large minimum mesh size resulted in exploitation being focused on larger, predominantly female fish. Although the population size and age composition appeared sustainable, the sex ratio likely was not. The reduction in female brood stock likely increased this population's vulnerability to overharvest and limited the stock's ability to recover.

Following the *Sparrow* decision in 1990 and Manitoba's decision to remove regulations on the subsistence harvest of Lake Sturgeon, harvest increased in this reach. Concerns about this fishing led to a reduction in the commercial quota in 1991 and the closure of the commercial fishery in 1992. Through a combination of regulatory closures, voluntary harvest reduction, public education and reduced catch success, subsistence harvest in this area has declined since the early 1990s.

Kelsey GS affected the Nelson River upstream to the Inlet of Sipiwesk Lake. Both Kelsey GS and Jenpeg GS resulted in flooding of shorelines on Sipiwesk Lake and the Nelson River upstream of Kelsey GS. This caused ongoing erosion and sediment loading. Despite the years that have passed since the GSs were constructed, high water events continue to result in bank destabilization and erosion.

The Nelson River upstream of Sipiwesk Lake is not affected by Kelsey GS. This is a high gradient, bedrock-controlled reach, with more than one channel and numerous fast water stretches. The fluctuation of water levels and flows due to Jenpeg GS operations is significant. Normal system operations see flows drop during the late winter and continue to be reduced throughout the spring and early summer. The timing of the reduction in flow may be critical to Lake Sturgeon success, since it occurs before the spawning, hatch, and larval periods, after which water levels remain relatively stable. The drawdown results in a reduction in the amount of habitat compared with what would have been available prior to Lake Winnipeg Regulation.

A decline in the Landing River spawning run led Manitoba to introduce a Conservation Closure in 1996 that closed this reach of the Nelson River to all harvest from May 1 until and including June 15. This closure applies to all Lake Sturgeon fishing, including subsistence fishing. Further, a 16 km stretch of the river extending 8 km upstream and downstream of the mouth of the Landing River is closed year-round.

One of the first approaches of the NRSB was to enhance Lake Sturgeon populations by stocking. The first spawn taking occurred in 1994 in the Landing River near the confluence with the Nelson River. The loss of the Landing River spawning run resulted in spawning areas in the main stem of the Nelson River replacing the Landing River site for taking spawn. Eggs are hatched at MB Hydro's Grand Rapids Fish Hatchery, and resultant fry are reared as described in the section above (Lake Winnipeg to Whitemud Falls). In recent years, the NRSB has also

hatched some of the egg's streamside at their spawn collection camp. The resultant fry is stocked nearby in the Nelson River. While most of the Lake Sturgeon hatched at Grand Rapids are stocked upstream between Playgreen Lake and Whitemud Falls, in a few years when larger numbers of Lake Sturgeon were raised some were stocked into this reach as well. As of 2023, over 900,000 fry, 16,000 fingerling and 26 yearling Lake Sturgeon have been stocked into this reach.

The NRSB conducted a mark-recapture study that documents the decline in the number of adult Lake Sturgeon in the Landing River area through the 1990s. A subsequent NRSB study started in 2006 provides evidence for an increase in abundance in more recent years. The increase is attributable to small Lake Sturgeon. This is a positive sign of recruitment which may be tied to the closure of the commercial fishery.

Annual Peterson* (1993 – 1999 and 2001 - 2019) and Petersen and Jolly-Seber (2006-2022) Lake Sturgeon population estimates for the Landing River area, 1993-2022.

Year	Petersen Abundance	Year	Petersen Abundance	Jolly-Seber Abundance
1993	2,939	2006	1,830	
1994	2,097	2007	2,003	1,810
1995	1,489	2008	2,646	2,986
1996	1,212	2009	2,284	2,698
1997	929	2010	2.389	2,433
1998	951	2011	3,451	2,442
1999	1,010	2012	3,978	2,808
2000	692	2013	2,906	2,487
		2014	3,092	2,713
		2015	2,521	2,919
		2016	2,549	3,272
		2017	2,916	2,950
		2018	3,919	3,302
		2019		2,976
		2020		
		2021		3,473
		2022		3,130

*Petersen estimates of abundance do not account for immigration into and emigration from a population of fish and should be used with caution.

Several studies have been funded by MB Hydro's LSSEP program. These include assessments of juvenile abundance and habitat use in the vicinity of the Landing River in 2013 and 2017. Results confirm natural recruitment in this area. An assessment of juvenile abundance and habitat use where the Nelson River enters Sipiwesk Lake was completed in 2016. It found suitable juvenile habitat and small numbers of juveniles downstream of Duck Rapids and Red Rock Rapids, at the end of each channel around Bear Island. An assessment of spawning habitat use in the Bladder Rapids area was completed in 2018; small numbers of adults and juveniles were captured.

The NRSB has proven to be an effective partner for the Branch and MB Hydro to deliver projects, including stocking and communications, school Lake Sturgeon programs and operation of the Silas Ross Memorial Lake Sturgeon Rearing Facility at Jenpeg GS. The Board completed a management plan for the area in 2016 and actively promotes it. Communication and outreach programs are delivered by the NRSB, supported in part by grants from Aboriginal

Funds for Species at Risk. The program delivers school tours at the Jenpeg rearing facility, school presentations and a program where schools raise Lake Sturgeon for release.

Part of this reach is within the Cross Lake Resource Area.

Management Approach:

- Support the NRSB's annual recommendation for subsistence harvest and the measures identified in its management plan.
- Continue to work with the NRSB in the management of the subsistence fishery and the delivery of stocking, communication, and outreach programs.
- Maintain the Conservation Closure until stocks can sustainably meet the subsistence harvest demand.
- Monitor the population and continue to assess the effectiveness of the management measures in place.
- Increase education and outreach to ensure that as young Lake Sturgeon grow to catchable size, they are not harvested prior to completing at least one reproductive cycle.
- Assess the flow regime from Whitemud Falls to Sipiwesk Lake to ensure that it is not detrimental to Lake Sturgeon spawning and nursery success.
- Monitor for effects of Zebra Mussels on Lake Sturgeon in this area.

Kelsey GS to Kettle GS

In this area the historical commercial fishery had depleted Lake Sturgeon by the time of the initial 1960 closure. When the Lake Sturgeon fishery reopened in 1970 this area did not produce a significant commercial catch and by the time it was closed in 1992 this reach had not produced Lake Sturgeon in many years. Lake Sturgeon by-catch in the current commercial fishery for other species is thought to be low. The only harvest is subsistence harvest.

The completion of Kelsey GS in 1961 separated stocks in Split Lake from the Nelson River upstream, although genetic studies indicate that the Grand Rapids where Kelsey GS was constructed was already an historical upstream barrier to Lake Sturgeon movement. The completion of the CRD in 1976 increased discharges from the Burntwood River and the amount of suspended material entering Split Lake at its mouth. The increased inflow also increased water levels and flows in Split Lake and the Nelson River downstream.

The completion of Kettle GS in 1974 separated stocks in this area from the lower Nelson River, although the Kettle Rapids where Kettle GS was constructed appear to also have been an historical upstream barrier to Lake Sturgeon movement, as indicated by recent genetic studies. Kettle GS back-flooded Moosenose Lake and the Nelson River as far as Gull Rapids, creating Stephens Lake, the GS forebay. The forebay is a significantly altered environment with large, flooded areas.

The reach from Split Lake downstream to Stephens Lake, includes Clarke Lake and Gull Lake as well as Birthday Rapids and Gull Rapids. This reach is affected by increased flows arising from the CRD, increased winter flows which affect ice formation. Construction of Keeyask GS by the Keeyask Hydropower Limited Partnership (Tataskweyak Cree Nation, York Factory First Nation, Fox Lake Cree Nation, War Lake First Nation, and Manitoba Hydro) began in 2014 at Gull Rapids, where the Nelson River enters Stephens Lake. The in-water works are now complete, and most construction and project effects are now in place.

Mark-recapture tagging as well as acoustic telemetry studies associated with construction of Keeyask GS indicated that adult Lake Sturgeon tend to remain in the various water bodies in which they have been captured, but some movements (both upstream and downstream) over Gull Rapids and Birthday Rapids were observed prior to impoundment. Since the Keeyask spillway was commissioned in August 2018, upstream passage through Gull Rapids is no longer possible. Movements of adult sturgeon upstream and downstream out of the Keeyask Reservoir increased in the first three years following impoundment (2021-2023), as anticipated in the environmental impact assessment. Continued monitoring is required as a condition of Keeyask GS licensing.

Lake Sturgeon spawning is known to occur in several locations in this reach including near Kelsey GS, at the mouths of the Grass and Odei rivers, downstream of First Rapids in the Burntwood River, at Birthday Rapids and below Keeyask GS.

Abundance of adults has been estimated a number of times between 2001 and 2023 in several portions of this reach including the riverine area between Kelsey GS and Split Lake, the Burntwood River at the confluence with the Nelson River, Gull Lake and Stephens Lake. Population estimates[4] indicate there are several hundred adult Lake Sturgeon in each of these areas and population trajectories are increasing, except for Gull Lake (now Keeyask Reservoir) where the population decreased in the first few years following impoundment as adults redistributed upstream and downstream within the reach.

Recent abundance estimates for wild juvenile Lake Sturgeon have also been conducted in this reach and indicate that there are a few thousand wild juveniles in each of Split Lake, Gull Lake, and Stephens Lake. Catch per unit effort has remained relatively stable in the Keeyask Reservoir area over the past two decades, while in Stephens Lake it has increased.

The Environment Act Licence and the Fisheries Act Authorization for Keeyask GS require a 25-year commitment to stock Lake Sturgeon and monitor their success, with the objective of maintaining self-sustaining populations upstream and downstream of the GS. Spawn has been collected below First Rapids in the Burntwood River and at Birthday Rapids in the Nelson River in alternating years since 2013. As of 2023, approximately 530,000 fry, 13,000 fingerling and 4,000 yearling Lake Sturgeon have been stocked into this reach. In the Burntwood River, near the confluence with the Nelson River, there have been approximately 70,000 fry, 9,000 fingerling, 2,300 yearling and 188 two-year-old Lake Sturgeon stocked. Monitoring in 2023 indicates that there are approximately 1,000 hatchery reared sturgeon in each of Keeyask Reservoir and Stephens Lake, accounting for approximately 30% of the overall juvenile Lake Sturgeon population.

The Kischi Sipi Namao Committee has an interest in this reach, which is entirely within the Split Lake Resource Area. The Split Lake Resource Board has had some involvement in Lake Sturgeon management activities. There is potential for this role to be expanded now that construction of the Keeyask GS is complete and road access is available.

[4] For detailed information on abundance estimates, movements, stocking, etc. see: Environmental Monitoring | Keeyask Hydropower Limited Partnership

Management Approach:

- Work to expand the engagement of the Split Lake Resource Management Board in Lake Sturgeon management.
- Work with the Kischi Sipi Namao Committee to identify and address Lake Sturgeon management issues in this reach.
- The Branch will continue to sit on the Keeyask Fisheries Regulatory Review Committee which is responsible for annual oversight of habitat enhancement, monitoring and mitigation programs required under the Fisheries Act Authorization and Environment Act Licence.
- Monitor for effects of Zebra Mussels on Lake Sturgeon in this area.

Kettle GS to Longspruce GS

This is a 17 km reach between Kettle GS and Longspruce GS. Kettle GS was completed in 1974, Longspruce GS in 1979, both at sites of large rapids. It is uncertain whether Lake Sturgeon could have traversed the rapids. The GSs separate Lake Sturgeon in the lower Nelson River from upstream reaches. Habitat is thought to be limiting and it is not known if habitat exists for all life history stages. No population estimate is available. The potential for stable, self-sustaining populations to establish is considered low. MB Hydro is funding investigations in this area and assessing enhancement potential. Harvest is thought to be low.

This reach is within the Split Lake Resource Area.

Management Approach:

- The Split Lake Resource Management Board may wish to consider the future management direction for this area.
- Work with the Kischi Sipi Namao Committee to identify and address Lake Sturgeon Management issues in this reach.
- Monitor for effects of Zebra Mussels on Lake Sturgeon in this area.

Longspruce GS to Limestone GS

This is a 22 km reach between Longspruce GS and Limestone GS. Longspruce GS was completed in 1979 at the site of large rapids. It is uncertain whether Lake Sturgeon could have traversed the rapids. The GSs separate Lake Sturgeon in the lower Nelson River from upstream reaches. Habitat is thought to be limiting and it is not known if habitat exists for all life history stages. No population estimate is available. The potential for self-sustaining populations to establish is considered low. MB Hydro is funding investigations in this area and assessing enhancement potential. Harvest is thought to be low.

This reach is within the Split Lake Resource Area.

Management Approach:

- The Split Lake Resource Management Board may wish to consider the future management direction for this area.
- Work with the Kischi Sipi Namao Committee to identify and address Lake Sturgeon Management issues in this reach.
- Monitor for effects of Zebra Mussels on Lake Sturgeon in this area.

Limestone GS to Hudson Bay

Historical commercial production from this area likely was low. By the 1950s, this area was not a significant producer of commercial Lake Sturgeon. When the Nelson River fishery reopened

in 1970 the area from Kettle GS downstream was a separate management area and there was little harvest. No fishing was occurring when this area was closed to commercial fishing in 1994.

Limestone GS was completed in 1990. Immediately below Limestone GS daily water level fluctuations can dewater areas of riverbed as MB Hydro varies flows to meet daily peak power demands. Water level fluctuations decrease with distance downstream of Limestone GS.

Studies conducted as part of the environmental assessment of the Limestone GS, and subsequent studies funded by MB Hydro as part of the environmental assessment for the proposed Conawapa GS, found that the Lake Sturgeon population in the lower Nelson River was larger than first thought, self-sustaining and one of the healthier Lake Sturgeon stocks on the Nelson River, although no formal population estimate is available. These studies identified movements between this reach, including the Weir River, and the Hayes and Gods River systems. Genetic studies funded by MB Hydro demonstrate that the lower Nelson River and Hayes River populations are discrete, despite the intermingling of stocks from these areas. Two spawning areas have been identified in this reach: Lower Limestone Rapids and the Weir River. Both offer potential as spawn collection sites if stocking is determined to be desirable for this area.

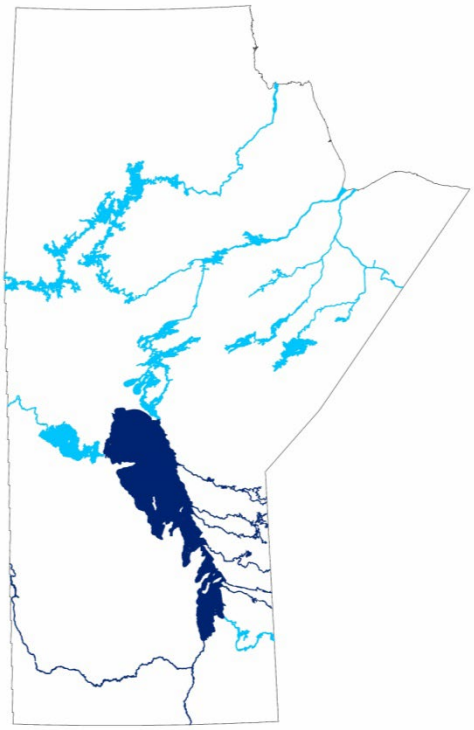
With the construction of the Conawapa road, access into this area improved. When the road was built, it was assumed that construction of Conawapa GS would follow soon afterwards and that a resource management plan would be developed for the area. However, neither has occurred. With improved access an increased number of harvesters accessed the area and harvest of the stock around the mouth of the Weir River increased. The Fox Lake Resource Management Board has expressed concern about the number of people harvesting Lake Sturgeon. The development of a resource use plan for this area is within its mandate.

This area is within the Split Lake, Fox Lake, and York Factory Resource Management Areas. The majority lies within the Fox Lake Resource Management Area including both identified spawning sites. Although the Fox Lake Resource Management Board has a mandate for resource use planning in this area, there has been limited discussion of Lake Sturgeon management with the Board.

Management Approach:

- Work with the Kischi Sipi Namao Committee to identify and address Lake Sturgeon Management issues in this reach.
- If there is interest, work with the Fox Lake Resource Management Board to develop a management plan for Lake Sturgeon in this area.
- Monitor for effects of Zebra Mussels on Lake Sturgeon in this area.

Red River, Assiniboine River, Lake Winnipeg



Assiniboine River

Lake Sturgeon were extirpated through a combination of historical fishing and possibly dam construction that blocked fish movement.

The Assiniboine River in Manitoba is controlled by three major water control structures, of which two are operated by Manitoba Transportation and Infrastructure. The Shellmouth Dam, west of Inglis, Manitoba, was constructed for water storage and downstream flood protection. The dam is an impassable barrier to upstream movement. The impoundment created Lake of the Prairies. The Assiniboine River Diversion is situated west of the city of Portage La Prairie. During high water events it provides flood protection downstream of the structure by diverting waters from the Assiniboine River to Lake Manitoba. The structure is a barrier to upstream fish movement. The Diversion also provides a route for Lake Sturgeon to enter Lake Manitoba. Lake Manitoba and upstream tributary waters are not thought to have historically supported Lake Sturgeon populations.

The Brandon 3rd Street Dam was constructed to ensure adequate water for the city's water treatment plant. It was replaced by a fish passable rock ramp in 2011 that maintains the previous level of water on the upstream side. Tagged Lake Sturgeon have moved upstream and downstream over this structure.

Nearly all the major tributaries of the Assiniboine River, including the Souris, Little Saskatchewan and Birdtail rivers, have water control structures that are impassable barriers to upstream movement.

Lake Sturgeon were first stocked near the City of Brandon in 1996. In total, 19,000 fry, 12,416 fingerling, 205 yearling and 95 older Lake Sturgeon have been stocked between the Portage Diversion and Shellmouth Dam. In 2015, 33 juveniles with acoustic receivers were stocked in Brandon and Spruce Woods Provincial Park. These Lake Sturgeon have been tracked as far upstream as St. Lazare and into the Qu'Appelle River. Three of these fish successfully passed downstream over the Portage Diversion Spillway Dam and into the Red River. The oldest stocked Lake Sturgeon would have been 25 years of age in the spring of 2021, the approximate expected age of first maturity for the stocked fish.

In fall of 2022, the Branch in collaboration with MB Hydro's LSSEP conducted an inventory of juvenile Lake Sturgeon in the Assiniboine River and identified an area near St. Lazare where three cohorts were found: 2014-, 2015- and 2016-year classes. Based on these findings, it appears that successful spawning and natural recruitment may be occurring in the Assiniboine River.

A limited recreational catch-and-release fishery has developed in the vicinity of the City of Brandon following stocking of Lake Sturgeon. The Lake Sturgeon range, according to angler and Manitoba Master Angler reports, is from the Qu'Appelle River in Saskatchewan downstream to Portage la Prairie and up the Little Saskatchewan River to the base of Rivers Dam.

No abundance estimate is available for the Assiniboine River.

Manitoba Master Angler records of Lake Sturgeon ≥ 109 cm.
There are no reports prior to 2004.

Year	Number of Records	Year	Number of Records
2004	1	2014	6
2005	0	2015	19
2006	0	2016	16
2007	11	2017	54
2008	11	2018	57
2009	1	2019	49
2010	1	2020	71
2011	4	2021	120
2012	5	2022	74
2013	11	2023	89

Management Approach:

- Determine if stocked Lake Sturgeon have begun reproducing. If they have, identify spawning habitat.
- Consider conducting a mark-recapture population estimate for the reach between the Portage Diversion and the Shellmouth Dam.
- Establish movement, range, and critical habitat requirements, including river flows, to assist in protecting the stocked population.
- Continue to collect reports of Lake Sturgeon captures by anglers through the Manitoba Master Angler program and other venues.

Red River

Historically, the Red River provided Lake Sturgeon habitat and likely was a migration corridor for Lake Sturgeon from Lake Winnipeg to access spawning areas including Lister Rapids and possibly upstream tributaries. The construction of the St. Andrews lock and dam in 1910 that allowed navigation past Lister Rapids, created a partial barrier to upstream movement and flooded Lister Rapids. It is unknown if remaining Lake Sturgeon spawn in the tailrace of the dam. While historic records exist of Lake Sturgeon using small tributaries of the Red River, it is not known if this use was extensive. Manitoba Master Angler records report a small but increasing number of catches of Lake Sturgeon in the Red River in recent decades.

Manitoba Master Angler records of Lake Sturgeon ≥ 109 cm.
There are no reports prior to 1996.

Year	Number of Records	Year	Number of Records
1996	1	2010	2
1997	0	2011	4
1998	0	2012	4
1999	0	2013	5
2000	1	2014	7
2001	0	2015	23
2002	1	2016	9
2003	1	2017	4
2004	1	2018	4
2005	0	2019	9
2006	1	2020	12
2007	0	2021	21
2008	1	2022	6
2009	1	2023	14

The Lockport lock and dam structure is equipped with a fish ladder, but its design does not allow passage of mature Lake Sturgeon. Other large-bodied fish species including Channel Catfish (*Ictalarus punctatus*) and Bigmouth Buffalo (*Ictiobus cyprinellus*) are known to move upstream past the structure when both the dam gates are open and water levels are high, and/or to pass through the locks when the dam gates are closed, but it is not known if Lake Sturgeon do so.

A Lake Sturgeon recovery strategy that includes stocking and habitat protection and restoration, including removal of barriers to fish passage has been initiated in the United States portion of the watershed. Through a co-operative effort of Rainy River First Nations of Ontario, the Red Lake Band of Chippewa, the Minnesota Department of Natural Resources and the United States Fish and Wildlife Service, more than 2,100,000 fry, 569,334 fingerling, 4,462 yearling and 375 juvenile Lake Sturgeon have been stocked into Red River tributaries and headwater lakes since 2002. A small number of female Lake Sturgeon from these stockings reached maturity in the Unites States portion of the river in 2021, but it is not yet known if successful reproduction has occurred. Some of these Lake Sturgeon have been recaptured in the lower Red and Assiniboine rivers and Lake Winnipeg. No population estimate is available for the Red River.

Provincial stocking of the upper Assiniboine River may also aid recovery in the Red River, as some Lake Sturgeon have passed over the Portage Diversion and now reside in the Red River. Measures to limit commercial fishery by-catch of Lake Sturgeon in Lake Winnipeg in the vicinity of the mouth of the Red River may assist recovery of this stock.

Management Approach:

- Continue to collect reports of incidental Lake Sturgeon captures by anglers through the Manitoba Master Angler program and other venues.
- Continue to co-operate with DFO on the Lake Winnipeg Basin fish movement study, which includes Lake Sturgeon.
- Monitor for effects of Zebra Mussels on Lake Sturgeon in this area.

Tributaries to the East Side of Lake Winnipeg

The main tributaries on the east side of Lake Winnipeg include the Bloodvein, Pigeon, Berens, and Poplar rivers. Lake Sturgeon occur in these rivers. Populations have not been affected by commercial harvest or industrial development. No population estimates are available. Given potentially impassable rapids or falls near the mouth of each of these rivers, it is possible that the populations in the upstream portions of these rivers are distinct from the Lake Winnipeg population and that the Lake Sturgeon that traditionally spawned in the river mouths were from the Lake Winnipeg population. Province-wide regulatory measures restricting commercial and recreational angling harvest apply.

Management Approach:

- No action is required.

Lake Winnipeg

The largest commercial Lake Sturgeon fishery in Manitoba occurred on Lake Winnipeg late in the 19th and early in the 20th centuries. Stocks were depleted to near extirpation and have since remained below historical levels. The commercial fishery for Lake Sturgeon was closed and all incidental Lake Sturgeon by-catch in the current commercial fishery must be released immediately, if live, or submitted to Fisheries Branch, if dead.

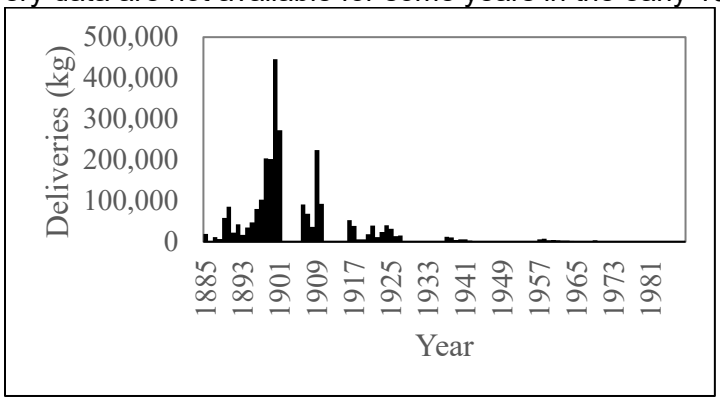
It is not known if a lake-spawning population was present prior to exploitation or whether the population structure included a number of discrete stocks that spawned in tributary rivers. It is possible that Lake Winnipeg could be repopulated from recovering and stable stocks in its tributaries. There is evidence that Lake Sturgeon from tributary rivers, including the Red and Winnipeg rivers, move into Lake Winnipeg and become at least temporarily resident.

Manitoba Master Angler records report a small number of captures of Lake Sturgeon in recent years, mostly in Traverse Bay, into which the Winnipeg River empties. No population estimate is available for Lake Winnipeg.

The Branch supports measures such as those voluntarily adopted by Poplar River First Nation, which has implemented a plan that protects Lake Sturgeon in the vicinity of that community from the commercial fishery.

It is unknown what effects the invasion of Zebra Mussels and several non-native fish species might have on the potential future abundance of Lake Sturgeon in Lake Winnipeg.

Historical Lake Sturgeon deliveries from the Lake Winnipeg commercial fishery (1885-1988). Delivery data are not available for some years in the early 1900s.



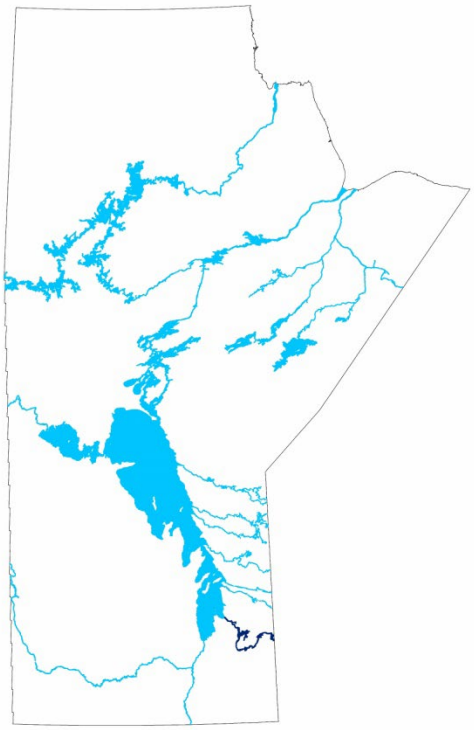
Manitoba Master Angler records of Lake Sturgeon for angler identified locations of Lake Winnipeg and Traverse Bay. There are no reports prior to 2006.

Year	Number of Records	Year	Number of Records
2006	1	2015	2
2007	1	2016	2
2008	0	2017	2
2009	0	2018	1
2010	1	2019	0
2011	0	2020	14
2012	2	2021	6
2013	0	2022	7
2014	1	2023	1

Management Approach:

- Support Poplar River First Nation in the implementation of its Lake Sturgeon plan.
- Monitor reports of capture of Lake Sturgeon by commercial and subsistence fishers and anglers, the latter through the Manitoba Master Angler program.
- Continue to enforce against illegal harvest of Lake Sturgeon in the commercial fishery.
- Consider measures to reduce incidental Lake Sturgeon by-catch in the commercial fishery. Any such measures should also support efforts to secure future fishery certification.
- Monitor for effects of Zebra Mussels on Lake Sturgeon in this area.

Winnipeg River



Whitedog GS (Ontario) to Pointe du Bois GS

This reach encompasses portions of the Winnipeg River in Manitoba and Ontario. The Manitoba portion is ~46 km in length between the provincial border and the Pointe du Bois GS. Flows in this reach and farther downstream are controlled by Whitedog GS on the Winnipeg River and Caribou Falls GS on the lower English River (a tributary to the Winnipeg River).

Most of this reach has undeveloped shorelines, except at Pointe du Bois, and three angling lodges in the upstream portion of the river.

Spawning occurs below the Ontario GSs, however, due to the operational regimes of these facilities, recruitment is low and sporadic. Spawning in the Manitoba portion of this reach has not been documented. A Conservation Closure is in place for the Manitoba portion of this reach.

Numerous age classes are present although adult fish are uncommon. Netting in the Lamprey Rapids area confirms low Lake Sturgeon density between the border and Pointe du Bois. MB Hydro's LSSEP funded a 2014 study targeting juvenile Lake Sturgeon downstream from Whitedog and Caribou GSs in Ontario to Pointe Du Bois GS. Nineteen juvenile and one sub adult Lake Sturgeon were captured. A 2013 LSSEP funded survey concluded that potential spawning habitat in this reach is limited, but that suitable habitat for young-of-the-year, sub-adults, and adults is available.

Current population size and trend is not known, and population status is considered critically low.

Management Approach:

- Maintain Conservation Closure.
- Cooperate with Ontario on management strategies.
- Seek opportunities to conduct population assessments.
- Work with Indigenous communities; determine whether there is interest in developing a sturgeon board.

Pointe du Bois GS to Slave Falls GS

This 10 km reach of the Winnipeg River is primarily riverine in nature. It flows through moderate to steep scoured bedrock interspersed with islands and reefs. Habitat is available to support all life stages of Lake Sturgeon. Development in the reach includes the town of Pointe du Bois and cottages extending 3 km downstream along the western shoreline. The Pointe du Bois GS is operated as a run-of-the-river facility. Spillway reconstruction occurred in 2015 and a generating unit replacement project is currently underway.

Lake Sturgeon in this reach were the subject of a commercial fishery, which depleted the stock. Ongoing subsistence harvest then maintained the population close to extirpation. The population increased in abundance since the implementation of a Conservation Closure in 1993, which prohibited all harvest.

Current information from research studies and work related to the Pointe du Bois GS indicates that the population may have reached carrying capacity in the early 2,000s. Lake Sturgeon in this reach now show signs of reduced growth, condition, survival, and recruitment, which are likely density dependent. The most recent estimate of adult (>800 mm fork length) abundance, based on 2019 - 2021 mark-recapture data, is 2,332 individuals (2,035 – 2,672; 95% confidence interval). Juvenile (<800 mm fork length) abundance, based on 2012 - 2020 mark-recapture data, is 6,063 individuals (5,172 – 7,106; 95% confidence interval) for pre-2011 cohorts and 1,069 individuals (660 - 1,732; 95% confidence interval) for post-2012 cohorts.

A catch-and-release recreational fishery for Lake Sturgeon in this reach began to gain popularity in the 2010s, with effort concentrated in the GS tailrace. Manitoba Master Angler records for the Winnipeg River, largely fish taken between Pointe du Bois and Seven Sisters GSs, reflects this activity. As the fishery expanded and conservation concerns were raised, the Conservation Closure was advertised in the 2018 Manitoba Fishing Guide and targeted angling has since been curtailed, as evidenced by the large decline in the number of reported Master Angler catches of Lake Sturgeon since 2018.

Manitoba Master Angler records of Lake Sturgeon ≥ 109 cm for the Winnipeg River (summed records for angler identified locations of Otter Falls, Dorothy Lake, Nutimik Lake, lower Whiteshell River and Winnipeg River).

Year	Number of Records	Year	Number of Records
1964	3	1995	21
1965	0	1996	17
1966	0	1997	19
1967	1	1998	33
1968	1	1999	23
1969	3	2000	44
1970	0	2001	46
1971	0	2002	106
1972	0	2003	136
1973	2	2004	72
1974	2	2005	85
1975	0	2006	83
1976	1	2007	88
1977	5	2008	162
1978	14	2009	131
1979	2	2010	111
1980	10	2011	157
1981	16	2012	120
1982	5	2013	146
1983	10	2014	158
1984	11	2015	219
1985	21	2016	310

1986	13	2017	185
1987	36	2018	5
1988	36	2019	1
1989	29	2020	4
1990	20	2021	6
1991	26	2022	0
1992	10	2023	6
1993	10		
1994	19		

In 2005, 7,000 Lake Sturgeon fry were stocked in this reach as part of a research study.

Management Approach:

- Maintain Conservation Closure, but plan for restoration of limited Indigenous subsistence harvest and recreational catch-and-release angling.
- Continue to monitor stock abundance and size structure.
- Ensure development does not affect habitat.
- Work with Indigenous communities; determine whether there is interest in developing a sturgeon board.
- Consider transfer of juvenile Lake Sturgeon from this reach to stock other Winnipeg River reaches.

Slave Falls GS to Seven Sisters GS

This 40 km reach of the river flows through a series of lakes and riverine sections characterized by moderate to steep shorelines and numerous islands and reefs. Flow regulation in this reach is through the Slave Falls GS which is operated as a run-of-the-river facility. Development is extensive from Nutimik Lake downstream, and is primarily provincial campgrounds, cottages, and the town sites of Pinawa and Seven Sisters.

This reach has been the site of significant research over the past two decades. The Branch has conducted a tagging program in the upper portion (Numao and Nutimik lakes) of this reach since the early 1980s, in addition to extensive work on Lake Sturgeon life history conducted by researchers with the Canadian Rivers Institute and University of Manitoba. Following documented declines in the early 1990s, contemporary population estimates indicate increases in the Numao and Nutimik lakes portion of this reach following implementation of a Conservation Closure in 1993 that prohibited all harvest. Currently, the Lake Sturgeon populations of Numao and Nutimik lakes appear to be at or surpassing carrying capacity as evidenced by reduced growth, condition, survival, and recruitment, which are likely density dependent.

Lake Sturgeon population estimate (adult and sub-adult, >500 mm fork length) in the Numao and Nutimik lakes portion of the reach.

Year	Estimated Abundance	Year	Estimated Abundance (95% confidence interval)
1991	5,839	2006	NA*
1992	13,495	2007	NA*
1993	5,788	2008	NA*
1994	9,026	2009	24,349 (18,059 – 32,828)
1995	7,956	2010	21,968 (16,156 – 29,872)
1996	9,107	2011	19,820 (14,387 – 27,304)
1997	3,333	2012	25,343 (17,308 – 37,110)
1998	13,030		
1999	10,571	2014	25,664 (19,925 – 33,055)
		2016	20,890 (15,461 – 28,225)
		2018	22,654 (17,790 – 28,849)
		2020	18,442 (13,596 – 25,015)

*Low recapture rates in 2006/07/08, unreliable estimates

Studies have shown that juvenile Lake Sturgeon within this reach, as in the Pointe du Bois GS to Slave Falls GS reach, rarely move between basins that are separated by high velocity areas of constriction. They therefore occupy spatially limited home ranges, finding year-round habitat in relatively small river sections, e.g. Numao and Nutimik lakes. Therefore, despite the lack of physical barriers obstructing passage to lower-density downstream basins, it appears that site fidelity in these populations, even in the face of starvation, is high.

In the downstream portion of this reach, Lake Sturgeon populations have also increased since the Conservation Closure was implemented in 1993. Populations in Dorothy, Margaret, Eleanor, and Sylvia lakes currently exhibit balanced size structure, high adult densities, and high condition factors more reflective of a healthy population than in upstream areas that are at carrying capacity and where density dependent effects are strong.

As noted in the Pointe du Bois GS to Slave Falls GS reach, Master Angler records from this reach also reflect increasing popularity of the fishery until curtailed in 2018 to comply with the Conservation Closure.

Spawning has been documented below Slave Falls GS and at Sturgeon Falls in Nutimik Lake.

Between 1998 and 2009, approximately 115,000 fry, 16,000 fingerling, 4,500 yearling and 230 adult Lake Sturgeon were stocked in this reach.

Management Approach:

- Maintain Conservation Closure, but plan for restoration of limited Indigenous subsistence harvest and recreational catch-and-release angling.
- Work with Indigenous communities; determine whether there is interest in developing a sturgeon board.
- Continue to monitor stock abundance and size structure.

- Consider transfer of juvenile Lake Sturgeon from this reach to stock other Winnipeg River reaches.

Seven Sisters GS to McArthur Falls GS

This 35 km reach of river is characterized by moderate to gently sloping shorelines with a mix of boreal forest and developed farming and residential shorelines. A portion of the west shoreline of Lac du Bonnet is a dike constructed as part of hydroelectric development. The upper 20 km of the reach is riverine and widens into Lac du Bonnet. It receives flows from the Bird River to the east and the Whitemouth River to the south. Numerous islands and reefs are scattered throughout the reach. Flow regulation in this reach is through the Seven Sisters GS which is operated as a run-of-the-river facility. Development in this reach is extensive and includes the town sites of Seven Sisters and Lac du Bonnet and cottage development along significant portions of the shoreline.

Academic research downstream of the Seven Sisters GS between 2008 and 2010 indicated that the adult population was comprised of at least several hundred individuals. Since 2013, the Branch has conducted six inventories, primarily in the riverine portion of the reach, and catch per unit effort has been increasing over time. A preliminary population estimate for adults and sub-adults (>500 mm fork length) from this program (based on 4.5% PIT tag recapture rate in 2023) is 15,032 (7,165 – 31,535; 95% confidence interval). Future estimates should improve in accuracy as recapture rates increase. Growth rates are similar to other populations in Manitoba.

Mean Lake Sturgeon catch per unit effort (#/100m/24h; >500 mm fork length).

Year	Sets	Catch per Unit Effort
2013	31	3.07
2015	38	5.32
2017	43	4.83
2019	36	6.71
2021	36	10.38
2023	100	7.18

Angler reports and incidental catches in index netting programs targeting other species have also increased since 2012 and indicate a range of size classes are present.

Lake Sturgeon successfully spawn below the Seven Sisters GS.

Between 1997 and 2009, approximately 7,500 fry, 1,500 fingerling, 7,000 yearling and 230 adult Lake Sturgeon were stocked in this reach.

Management Approach:

- Maintain Conservation Closure.
- Work with Indigenous communities; determine whether there is interest in developing a sturgeon board.
- Continue to monitor stock abundance and size structure.
- Consider collection of Lake Sturgeon tissue samples to determine the presence of Cesium^{137} to measure the environmental effects of Atomic Energy of Canada's Whiteshell facility.

McArthur Falls GS to Great Falls GS

This 9 km reach extends from McArthur GS to Great Falls GS. It is riverine with scattered islands and reefs and flows through a mix of moderate to gently sloping shorelines with a mix of scrub brush, boreal forest and developed land. A portion of the west shoreline is a dike constructed as part of hydroelectric development. Flow regulation in this reach is through the McArthur GS, which is operated as a run-of-the-river facility. Development along this reach is minimal with only the town site of McArthur Falls at the site of the GS.

MB Hydro LSSEP studies have improved understanding of the population within the McArthur GS to Great Falls GS reach. Fall gill net inventories for juveniles (1"- 6" mesh sizes) and adults (8" – 12" mesh sizes) indicate that the adult population is low, but recruitment is occurring.

Mean Lake Sturgeon catch per unit effort (#/100m/24h).

Year	Juveniles	Adults
2011	5.0	
2020	2.1	1.4
2021	2.0	2.3
2022*	1.5	0.3
2023	6.2	2.2

*High flows in 2022 made gillnetting difficult.

Incidental catches of sturgeon by anglers are reported to have increased since 2012.

Between 1996 and 2002, 7,500 fry and 4,100 fingerling sturgeon were stocked into this reach.

Management Approach:

- Maintain Conservation Closure.
- Work with Indigenous communities; determine whether there is interest in developing a sturgeon board.
- Seek opportunities to conduct population assessments.

Great Falls GS to Pine Falls GS

This 23 km reach of the river is characterized by moderate to gently sloping shorelines with a mix of boreal forest and farming and residential shorelines. It receives inflow from the Maskwa River and Catfish Creek. Development in this reach occurs on both sides of the river and includes the communities of McArthur Falls, Whitemud Falls, Silver Falls, St. George and Powerview. In addition, there is residential and cottage development scattered along the shoreline.

MB Hydro LSSEP studies since 2010 have improved understanding of the population within the Great Falls GS to Pine Falls GS reach. Fall gill net inventories for juveniles (1" – 6" mesh sizes) and adults (8" – 12" mesh sizes) indicate that adult abundance is low, but juveniles are moderately abundant. Spawning occurs at Whitemud Falls and downstream of Great Falls GS. A mark-recapture population inventory and an adult movement study with acoustic tags are ongoing within this reach.

Mean Lake Sturgeon catch per unit effort (#/100m/24h).

Year	Juvenile nets	Adult nets
2011	6.2	
2020	6.2	1.2
2021	5.2	1.9
2022*	3.0	0.6
2023	5.7	3.2

*High flows in 2022 made gillnetting difficult.

Population estimates of juvenile Lake Sturgeon (<800mm fork length).

Year	Estimated Abundance (95% confidence interval)
2021	5,284 (3,900 – 7,159)
2022	5,288 (3,905 – 7,160)
2023	8,822 (6,394 – 12,171)

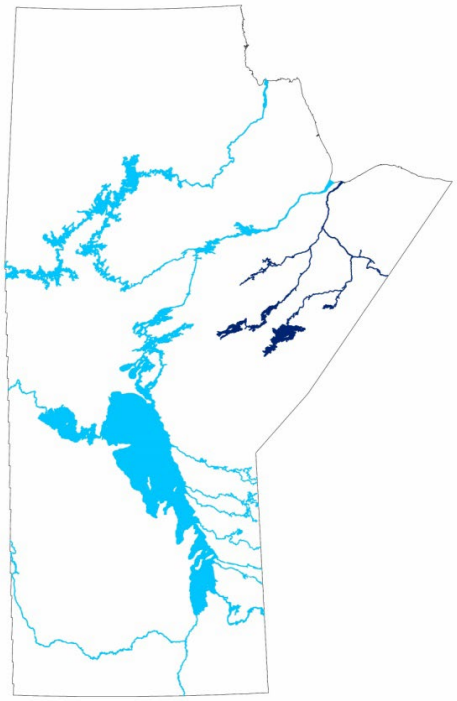
Incidental catches of Lake Sturgeon by anglers are reported to have increased since 2012.

In 2002, 7,000 fry were stocked into this reach.

Management Approach:

- Maintain Conservation Closure.
- Work with Indigenous communities; determine whether there is interest in developing a sturgeon board.
- Continue to monitor stock abundance and size structure.
- Seek opportunities to conduct population assessments.

Hayes River



This area includes the Fox, Bigstone, Gods and Hayes rivers. Historic commercial fishery records group these rivers together. Although records show that commercial fishing occurred as early as the 1940s, harvest was not on the scale that depleted other sturgeon populations in Manitoba.

When commercial fishing reopened in 1970 following the province-wide closure, this area was separated into three reaches: Gods River, Hayes River and Fox/Bigstone rivers. Most harvest came from the Fox/Bigstone rivers. The single commercial fisher on the Fox/Bigstone was given five years notice in 1995 of the province's intent to close the fishery. The fishery produced little thereafter before officially closing in 1999. At present, subsistence harvest is low and sustainable.

A small fly-in catch-and-release sturgeon angling fishery operated on the Fox River from the mid 1990s through at least 2015, based on Manitoba Master Angler Program records.

This area is not considered depleted, and stocks are in good condition, however productivity is lower than for larger rivers.

Tagging studies conducted by MB Hydro on the lower Nelson resulted in recaptures as far upstream in Hayes River tributaries as the Ontario border. Despite this movement, genetic studies concluded that lower Nelson River and Hayes River populations are genetically distinct.

Management Approach:

- The existing regulatory prohibitions on harvest are adequate to protect this population.
- Harvest pressure should be monitored: a management plan with supporting stock assessment should be developed if increased subsistence harvest is likely.

Section Seven: Anticipated Lake Sturgeon Recovery Timelines

The implementation of the management goals and approaches described above is anticipated to improve knowledge of the status of Lake Sturgeon populations and provide for ongoing recovery in the majority of river reaches in Manitoba. However, the lack of available information on the density, biomass and demography of stable, self-sustaining, unharvested populations, or sustainably harvested populations, will continue to be an impediment to Manitoba's full understanding of the status of sturgeon recovery in its waters. Further effort is needed to develop recovery benchmarks, including abundance and demographic targets, to use as the basis for declaring Lake Sturgeon population recovery in Manitoba.

Overall, the recovery of stable, self-sustaining sturgeon populations in reaches where stocks have been depressed is expected to require a protracted period due to the late age of maturity and intermittent spawning of this species. Inter-cohort interactions between relatively small numbers of adults and abundant post-harvest recruits may affect recovery trajectories, as may intra-cohort competition among post-harvest recruits. The latter may reduce juvenile recruitment, juvenile growth rates and delay onset of maturity as has been observed in some Winnipeg River populations. There is emerging evidence, as noted by the lack of recruitment over several years and across multiple populations, including both depressed and recovering populations in the Winnipeg River system, that recruitment may be constrained by regional weather and hydrologic conditions. This may also affect recovery trajectories.

Rebuilding an abundance of large mature sturgeon may require 50 to 70 or more years following harvest cessation. Achieving age and size distributions that are not dominated by the first generation of post-harvest recruits may require longer.

Fortunately, unsustainable harvest of Lake Sturgeon populations in Manitoba's rivers ceased more than 20 to 30 years ago and stocks are either clearly rebuilding or beginning to show signs of rebuilding.

Section Eight: Restoring Subsistence Harvest and Recreational Angling Opportunities

Opportunities will arise to reinstate currently prohibited and restricted uses of sturgeon as stocks recover and the required conservation allocation of sturgeon, the highest priority allocation, has been achieved. These initially include subsistence harvest and recreational catch-and-release angling opportunities where Conservation Closures are currently in place, and increased subsistence harvest where it is otherwise limited.

Indigenous subsistence harvest is the second highest priority allocation for Lake Sturgeon. To provide sustainable subsistence harvest of stocks that achieve population targets and are stable and self-sustaining, and to allow stocks to continue to rebuild where required, the subsistence harvest mortality of sturgeon should not, as a first approximation, exceed 1% of the population annually. Regulatory requirements for this harvest could be implemented and include the reporting of harvest and collection of biological data from retained Lake Sturgeon. Any further increase in harvest rate should require evidence that the conservative rate of harvest is not preventing the further recovery of sturgeon stocks, where final population targets have not been achieved.

When harvest is permitted, the best advice to harvesters is on the importance of protecting spawning areas, limiting total harvest, and limiting harvest of larger fish, which tend to be mature females. Focusing harvest on juveniles and males outside the spawning period would be a beneficial strategy. It is recognized that, in many areas, Indigenous peoples traditionally harvested mature Lake Sturgeon when they were aggregated for spawning. Thus, the traditional form of the fishery in many areas' conflicts with an effective management strategy. Communication will play a key role in achieving harvest that is consistent with meeting and maintaining recovery objectives.

Recreational catch-and-release angling, which does not require an allocation, because no harvest occurs, should be restored simultaneously with the restoration of Indigenous subsistence harvest opportunity where Conservation Closures are currently in place. Recreational harvest of sturgeon, as the third ranked allocation of sturgeon, will not be permitted in the immediate future.

The commercial harvest of Lake Sturgeon, the lowest ranked allocation, will not be permitted for the foreseeable future.

Section Nine: Conclusion

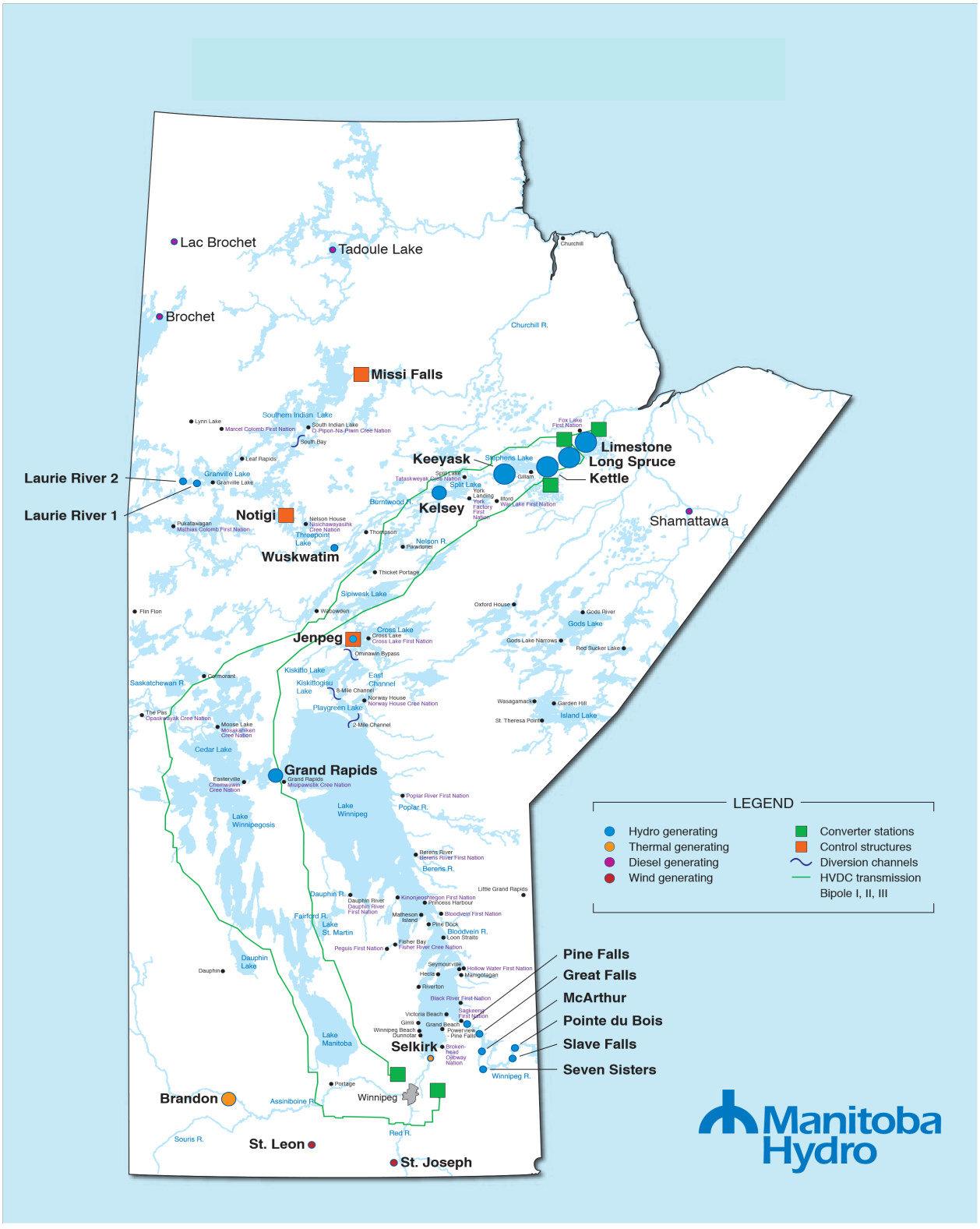
The outlook for Lake Sturgeon in Manitoba is improving. More is known about the status of sturgeon populations, and most are now either stable or increasing in abundance following reductions in direct human-caused mortality. Stocking of hatchery-reared sturgeon is showing indications that it may be an effective technique to initiate the replacement of extirpated populations and rebuild remnant stocks.

Important partnerships have been developed and a wide range of Indigenous communities, levels of government, industry, and academia are collaboratively working towards Lake Sturgeon recovery. The sturgeon boards and committees have proven to be effective mechanisms for involving local fishers and Indigenous communities in Lake Sturgeon management.

Research and monitoring in Manitoba have made significant contributions to the understanding of Lake Sturgeon stocks as well as sturgeon genetics, early life history, habitat preference and disease. Advancements have been made in knowledge and techniques with respect to sturgeon culture and best stocking practices. Research is continuing a wide variety of sturgeon related projects.

As recovery efforts continue, sturgeon populations are anticipated to continue to increase in abundance. The development of population recovery targets will be essential to effective management and sustainable use of populations.

Appendix A: The MB Hydro Generating System



Appendix B: Lake Sturgeon Management Board Membership

Saskatchewan River Sturgeon Management Board membership

Cumberland House Cree Nation MB Economic Development, Investment, Trade and Natural Resources, MB Hydro Chemawawin Cree Nation Opaskwayak Commercial Fishermen's Co-op SaskPower Saskatchewan Environment	Cumberland House Fishermen's Co-op Fisheries and Oceans Canada Opaskwayak Cree Nation Mosakahiken Cree Nation Cedar Lake Fisheries Inc. Saskatchewan Northern Affairs Saskatchewan Watershed Authority

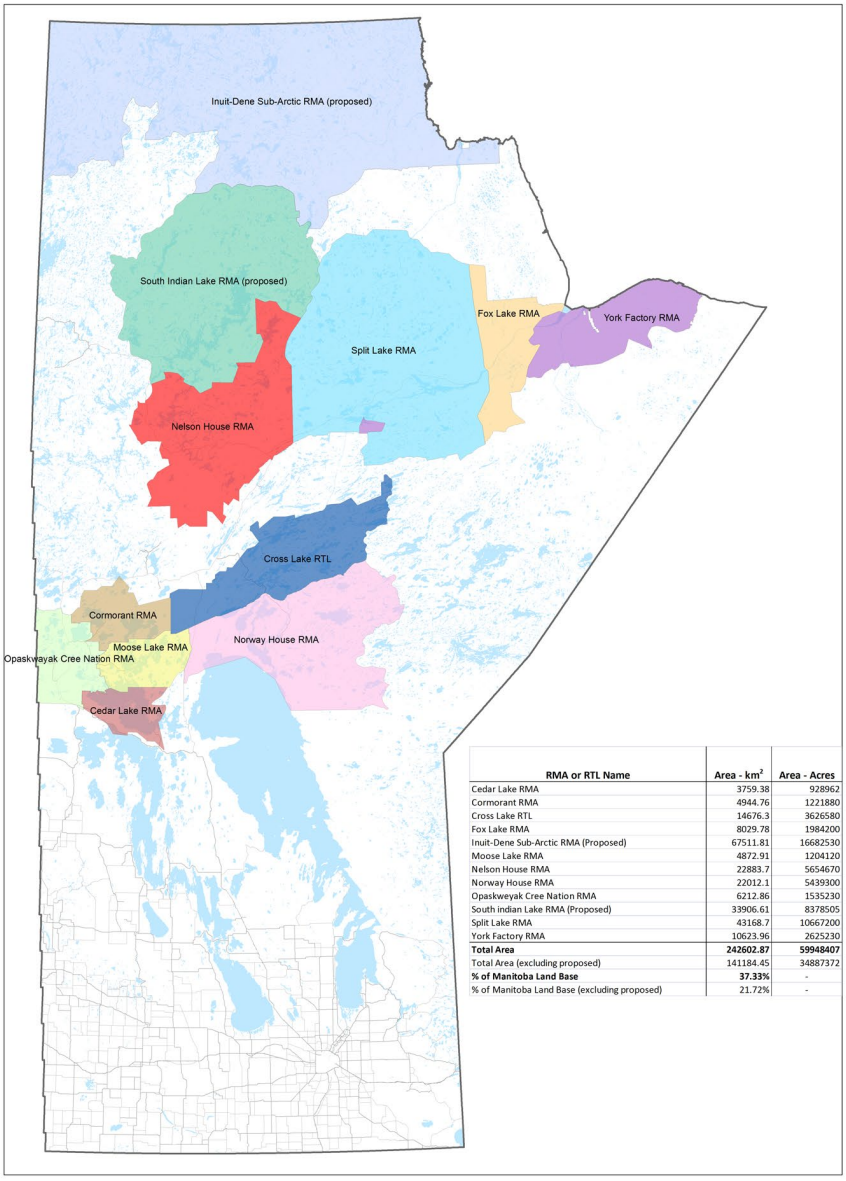
Nelson River Sturgeon Board membership

Cross Lake First Nation Pikwitonei Thicket Portage York Factory Cree Nation MB Economic Development, Investment, Trade and Natural Resources	Norway House Cree Nation Tataskweyak Cree Nation Wabowden MB Municipal and Northern Relations MB Hydro

Kischi Sipi Namao Committee membership

Tataskweyak Cree Nation War Lake Cree Nation Shamattawa Cree Nation (currently inactive) MB Economic Development, Investment, Trade and Natural Resources	York Factory Cree Nation Fox Lake Cree Nation MB Hydro Keeyask Hydropower Limited Partnership

Appendix C. Indigenous Resource Areas of Manitoba



RMA or RTL Name	Area - km²	Area - Acres
Cedar Lake RMA	3759.38	928962
Cormorant RMA	4944.76	1221880
Cross Lake RTL	14676.3	3626580
Fox Lake RMA	8029.78	1984200
Inuit-Dene Sub-Arctic RMA (Proposed)	67511.81	16682530
Moose Lake RMA	4872.91	1204120
Nelson House RMA	22883.7	5654670
Norway House RMA	22012.1	5439300
Opaskweyak Cree Nation RMA	6212.86	1535230
South Indian Lake RMA (Proposed)	33906.61	8378505
Split Lake RMA	43168.7	10667200
York Factory RMA	10623.96	2625230
Total Area	**242602.87**	**59948407**
Total Area (excluding proposed)	141184.45	34887372
% of Manitoba Land Base	**37.33%**	-
% of Manitoba Land Base (excluding proposed)	21.72%	-

Resource Management Areas managed by IMR (AMAC) *DRAFT*

Prepared by: Indigenous and Municipal Relations; Agreements Management and Aboriginal Consultations

Source: Manitoba GIS Database

Date: November 30, 2016

Map Legend

- Cedar Lake RMA
- Cormorant RMA
- Cross Lake RTL
- Fox Lake RMA
- Inuit-Dene Sub-Arctic RMA (proposed)
- Moose Lake RMA
- Nelson House RMA
- Norway House RMA
- Opaskwayak Cree Nation RMA
- South Indian Lake RMA (proposed)
- Split Lake RMA
- York Factory RMA

This map is not final and is for discussion / illustrative purposes only

Manitoba

Appendix D: Lake Sturgeon Stocking Records

Stocking records listed in this appendix may be incomplete due to errors in reporting.
Stockings reported as Yearlings (+) will occasionally include small numbers of two-year-old or older fish.
Survival of stocked fry and fingerling Lake Sturgeon in Manitoba has proven to be very limited. As a result, recent stocking programs have focussed on stocking yearling fish, which have proven to have high survival rates.

Churchill River

- **Churchill River, Saskatchewan Border to Missi Falls Control Structure**
  No stocking has occurred.

- **Churchill River, Missi Falls Control Structure to Hudson Bay**
  No stocking has occurred.

Saskatchewan River

- **Manitoba portion of the Saskatchewan River**

	Stocking		
Year	Fry	Fingerlings	Yearlings (+)
1999		7,500	
2000			
2001			
2002			
2003		67	
Total		7,567	

- **Saskatchewan portion of the Saskatchewan River**

	Stocking		
Year	Fry	Fingerlings	Yearlings (+)
1999	33,000		
2000	22,200	350	
2001			
2002			
2003			
2004	4,500		
2005			
2006	35,500		
2007	41,000		
Total	136,200	350	

Nelson River

- **Nelson River, Lake Winnipeg to Whitemud Falls**

	Stocking		
Year	Fry	Fingerlings	Yearlings (+)
1994		1,025	
1995			
1996			
1997			
1998		346	
1999		324	
2000		3,534	
2001		9,200	
2002		3,362	
2003		7,392	
2004	1,300		
2005			
2006		1,756	
2007		500	
2008		469	471
2009		157	43
2010		1,144	2
2011		4,063	591
2012	11,000	31,500	464
2013	76,770	21,515	912
2014	379,775	2,473	1,210
2015	54,207	8,911	852
2016	30,143	5,299	1,282
2017	38,814	4,882	842
2018		2,140	793
2019		2,150	805
2020			621
2021		5,180	172*
2022		4,613	794
2023		10,359	822
Total	592,009	132,294	10,676

* 2+ years old

- **Nelson River, Whitemud Falls to Kelsey GS**

	Stocking		
Year	Fry	Fingerlings	Yearlings (+)
1997			26
1998		141	
1999			
2000		1,767	
2001		9,347	
2002			
2003		5,210	
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012	14,600		
2013	85,000		
2014	69,000		
2015	112,000		
2016	146,000		
2017	210,000		
2018	24,000		
2019	140,000		
2020			
2021	26,500		
2022	60,000		
2023	28,000		
Total	915,100	16,465	26

- **Nelson River, Kelsey GS to Kettle GS**

	Stocking		
Year	Fry	Fingerlings	Yearlings (+)
2014	152,926	4,656	
2015			841
2016	376,301	1,581	
2017			1,183
2018		1,942	
2019			788
2021		1,050	
2022		3,458	802
2023			398
Total	529,227	12,687	4,012

- **Burntwood River** (a tributary of the Nelson River)

Year	Stocking		
	Fry	Fingerlings	Yearlings (+)
2014			595
2015			
2016			23
2017	71,740	3,765	
2018			739
2019		3,681	
2020			574
2021			188*
2022		1,739	
2023			397
Total	71,740	9,185	2,516

* 2+ years old

- **Nelson River, Kettle GS to Longspruce GS to Limestone GS**
  No stocking has occurred.

- **Nelson River, Limestone GS to Hudson Bay**
  No stocking has occurred.

Red River

Using fish supplied by the Rainy River First Nations in Ontario, more than 2.1 million fry, 567,334 fingerling, 4,402 yearling and 375 juvenile sturgeons have been jointly stocked by the Minnesota Department of Natural Resources, the United States Fish and Wildlife Service and the Red Lake Band of Chippewa into Red River tributary waters since 2002.

Assiniboine River

Year	Stocking				Source
	Fry	Fingerlings	Yearlings	Juveniles/Adults	
1996		1,000			Winnipeg River
1997		1,000	200		Winnipeg River
1998					
1999		1,000			Saskatchewan River
2000	2,000	1,000			Saskatchewan River
2001		156			Nelson River
2002	2,000				Winnipeg River
2003		160		7	Winnipeg River
2004		200		55	Winnipeg River
2005					
2006			5		Winnipeg River
2007					
2008		7,900			Winnipeg River
2009					
2010					
2011					
2012					
2013	15,000				Winnipeg River
2014					
2015				33	Winnipeg River
Total	19,000	12,416	205	95	

Tributaries to the East side of Lake Winnipeg

No stocking has occurred

Lake Winnipeg

No stocking has occurred

Winnipeg River

- **Winnipeg River, Ontario-Manitoba Boundary to Pointe du Bois GS**
  No stocking has occurred.

- **Winnipeg River, Pointe du Bois GS to Slave Falls GS**

	Stocking			
Year	Fry	Fingerlings	Yearlings	Adults
2009		7,000		
Total		7,000		

- **Winnipeg River, Slave Falls GS to Seven Sisters Falls GS**

	Stocking			
Year	Fry	Fingerlings	Yearlings	Adults
1998			300	
1999			166	
2000	103,938	1,000	3,000	
2001				
2002	11,500			
2003				
2004		2,150		
2005		2,500	620	230
2006				
2007				
2008		10,000		
2009			415	
Total	115,438	15,650	4,501	230

- **Winnipeg River, Seven Sisters Falls GS to McArthur Falls GS**

	Stocking			
Year	Fry	Fingerlings	Yearlings	Adults
1997		66		
1998				
1999				
2000			7,000	
2001				
2002	7,500	400		
2003				
2004				221
2005				
2006				
2007				
2008		997		
Total	7,500	1,463	7,000	221

- **Winnipeg River, McArthur Falls GS to Great Falls GS**

Year	Stocking			
	Fry	Fingerlings	Yearlings	Adults
1996		2,200		
1997		1,900		
1998				
1999				
2000				
2001				
2002	7,500			
Total	7,500	4,100		

- **Winnipeg River, Great Falls GS to Pine Falls GS.**

Year	Stocking			
	Fry	Fingerlings	Yearlings	Adults
2002	7,500			
Total	7,500			

Hayes River

No stocking has occurred.

Appendix E: Available Provincial Regulatory Instruments

Recreational Angling and Commercial Fishing Regulations

Under the Manitoba Fishery Regulations:

- spring closures prohibit recreational angling for Lake Sturgeon during spawning season, and
- all Lake Sturgeon caught while either recreational angling or commercial fishing must be released.

This is the primary regulatory tool currently protecting Lake Sturgeon from non-subsistence harvest. While there are currently no opportunities for recreational or commercial harvest of sturgeon, there may be future opportunities as populations recover. This would be implemented through the regulation of retention limits under the Manitoba Fishery Regulations.

Conservation Closures

When other approaches prove inadequate to conserve Lake Sturgeon stocks, a regulatory closure of all fishing, including constitutionally-protected Indigenous subsistence fishing, may be implemented through Conservation Closures. Conservation Closures must meet the test defined in *Sparrow* (1990) and impose the minimum possible infringement on the Indigenous right to fish. Crown consultation generally is necessary prior to imposing a Conservation Closure. Conservation Closures can also be applied when an Indigenous community express concerns about the status of stocks in a locally important area and requests that a closure be put in place.

A Conservation Closure prohibits all fishing for a species in an area for a specific period unless the fishing occurs under the authority of a General Fishing Permit. These permits can be used to minimize the level of infringement caused by a complete closure by allowing limited fishing under specific conditions. Conservation Closures have been in place on the Winnipeg River and a portion of the Nelson River since 1996.

The Branch undertakes periodic reviews of Lake Sturgeon Conservation Closures. These reviews consider:

- Is the closure effective and meeting its purpose?
- Is the closure necessary?
- Are conditions surrounding the closure appropriate?

If the review concludes that a change in a closure is necessary, Crown consultation would normally be required before making the change.

Scientific Collection Permits/Live Fish Handling Permits

Permits are required by anyone capturing, handling, or retaining fish for research or salvage purposes including the handling of fish for fish culture. These permits ensure the proposed activities pose as little risk to Lake Sturgeon, or the receiving environment, as possible and that the Branch's management objectives are supported. They also ensure that Manitoba is aware of all Lake Sturgeon research activities. They are required by all organizations working with Lake Sturgeon unless they are working directly under the authority of the Branch. The conditions on these permits are the primary instrument for regulating disease protection and control measures for Lake Sturgeon.

Environmental Review

Manitoba internally circulates Environment Licences and Crown Land use applications which provides the Branch the opportunity to review, provide comment and have input into licence conditions. The Branch considers impacts on Lake Sturgeon and its habitat in its review of these applications and makes recommendations intended to protect this species.

Endangered Species Act (Manitoba)

Manitoba's Endangered Species Act (1990) does not currently list any finfish species.

Fish Sanctuaries

A Fish Sanctuary prohibits all fishing in a specific area. This tool has only been used once in Manitoba and has not been used for Lake Sturgeon to date.

Appendix F: Available Federal Regulatory Instruments

Species at Risk Act

SARA defines a process that leads to a recommendation to the Federal Minister and a decision on listing. The Branch contributes to this process by providing information and expertise, preparing summary documents, and participating in the development of the Recovery Potential Assessment and Recovery Strategy documents for each Designatable Unit. These documents contribute to the understanding of the current status of Lake Sturgeon in each area.

After a species is listed under SARA, DFO can enter into a Conservation Agreement with "*any government, organization or person to benefit a species at risk"*. These agreements can be used as a "*mechanism to achieve legal and effective protection of species at risk and their critical habitat"*.

Federal Fisheries Act

The primary mandate for fish habitat protection lies with DFO. The *Fisheries Act* (Canada) was amended in 2019 and new policies are currently being developed. Manitoba provides comment on legislative and policy development through a Federal-Provincial/Territorial Task committee to the Canadian Council of Fisheries and Aquaculture Ministers. Regardless of the federal policy in place, the Branch continues to provide information upon request to assist in DFO's review of applications.

There is the provision through Governor-in-Council for the establishment of Ecologically Significant Areas (ESAs). ESAs are areas in which no works or undertakings can occur without a special authorisation. It is understood that acquiring an authorisation within an ESA would require meeting a higher test than outside an ESA. This tool is in an early state of development. Manitoba presumes it has the opportunity to inform the federal Minister on the value and merits of the use of this tool in Provincial waters.

National Marine Protected Areas

The federal government has designated one freshwater National Marine Protected Area outside Manitoba. This tool has not been used in Manitoba to date.