



Manitoba Lake Sturgeon Management Strategy

2012

Conservation and Water Stewardship
Fisheries Branch



Executive Summary

This document updates and builds upon the earlier 1997 strategy titled *“Lake Sturgeon Management in Manitoba”*, and is intended to review progress towards the recovery and protection of populations in Manitoba, to set new goals and objectives based upon current knowledge, and to identify new and emerging challenges.

Lake sturgeon, an evolutionary ancient fish, were historically found in North America’s large lakes and rivers within the Hudson Bay, the Great Lakes, the Mississippi and the St. Lawrence drainage basins. Among freshwater fish, they have a unique life history. Their long life, large size, slow growth, and late onset of sexual maturity combined with an intermittent reproductive cycle make them vulnerable to many human influences including overharvesting, pollution, and loss of habitat. In most jurisdictions, commercial fisheries in the late 19th and early 20th centuries depleted lake sturgeon stocks to the point where many have not recovered.

The outlook for lake sturgeon has improved significantly since the first Manitoba lake sturgeon strategy was launched in 1992 and there continues to be progress towards achieving the goals identified in the Province’s 1997 strategy. There is evidence that most of the major rivers in Manitoba have lake sturgeon stocks that are no longer considered to be declining. Recruitment is increasing on portions of the Winnipeg, Saskatchewan and Nelson rivers. The increased abundance of small sturgeon on all of these systems may be related to the elimination of harvest by recreational and commercial fisheries province-wide, and limitations on subsistence harvest on the Winnipeg River and portions of the Nelson River.

Research in Manitoba has made significant contributions to the understanding of stocks in some areas as well as genetics, early life history, habitat preference and disease. This work continues and is highly valued. Manitoba has been working on lake sturgeon culture since 1994 and has worked with researchers and with other jurisdictions to advance knowledge and techniques.

The experience of managing lake sturgeon in Manitoba has shown that limiting mortality is the single most effective means of sustaining lake sturgeon stocks. The failure to do this effectively during the latter part of the 1800s and the early part of the 1900s in the historical commercial fishery led to dramatic declines that left lake sturgeon stocks throughout most of the province in the state they are today. Protecting habitat is also important but lake sturgeon in several parts of the province have demonstrated that they can adapt to fairly severe habitat alterations while proving unable to adapt to excessive levels of harvest.

Objectives intended to achieve Manitoba's goals for lake sturgeon are detailed in this report. While many of these objectives will be undertaken and delivered by Fisheries Branch most often in collaboration with other parties, a number of objectives can be undertaken by other organizations or researchers subject to the appropriate approvals.

Fisheries managers have a wide range of non-regulatory and regulatory tools available. The sturgeon boards on the Nelson and Saskatchewan rivers have proven effective. Lake sturgeon culture has developed from the first effort on the Nelson River in 1994 and there are indications that it can be an effective tool for restoring severely depleted or near extirpated stocks.

The background and current status of stocks in each river reach is described in the following report as are the management approaches for each respective reach. The reaches that were the focus of the 1997 strategy on the Winnipeg, Saskatchewan and Nelson rivers, all of which were described as depleted or declining, are now showing signs of improvement. Stocking in the Assiniboine River provides evidence that this tool can be effective for re-introducing lake sturgeon populations in areas where they have been extirpated.

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Part I Lake Sturgeon Strategy

Introduction

Lake sturgeon, an evolutionary ancient fish, were historically found in North America's large lakes and rivers within the Hudson Bay, the Great Lakes, the Mississippi and the St. Lawrence drainage basins. Among freshwater fish, they have a unique life history. Their long life, very large size, slow growth, and low reproductive rates including late onset of sexual maturity, make them vulnerable to many human influences including overharvesting, pollution, and loss of habitat.

In most jurisdictions, commercial fisheries in the late 19th and early 20th centuries depleted lake sturgeon stocks to the point where many have not recovered. Depletion of Manitoba's commercial lake sturgeon followed the same pattern as evidenced elsewhere in North America although it was delayed slightly as transportation infrastructure developed through relatively remote regions. In many cases, after the initial commercial fishing depletion, ongoing low level harvests may have contributed to the lack of stock recovery. In addition to widespread stock depletion due to overfishing, loss of access to critical migratory habitat with hydroelectric development began to occur on the Winnipeg River in the early part of the 20th century, subsequently along major rivers in northern Manitoba in the mid 20th century, and with flood-control and water management projects in south central Manitoba also in the mid 20th century.

The Province of Manitoba formally assumed responsibility for fisheries management under the federal Natural Resources Transfer Act (1930). By this time, most lake sturgeon stocks were already depleted and efforts to continue the fisheries at sustainable levels only maintained stocks in a depleted state. Possibly one of the most successful management measures put in place was the closure of the Manitoba commercial lake sturgeon fishery which was completed by 1999. Consequently, management efforts in Manitoba, similar to other jurisdictions, show a mixed record of successes.

Almost every First Nation located on lake sturgeon bearing waters considers lake sturgeon to be important for both subsistence and cultural reasons. Following the *Sparrow* decision (1990) Manitoba chose to remove all limitations from subsistence harvest. In most cases, this decision did not affect stocks. However, in a few areas harvest levels exceeded what stocks could sustain. Management boards on the Nelson and Saskatchewan rivers arose out of concerns about the condition of lake sturgeon stocks and the desire of First Nations to ensure that there would continue to be lake sturgeon available to harvest. In some cases, to ensure protective

measures were implemented in a timely way, Manitoba introduced Conservation Closures on part of the Nelson River and the Winnipeg River to prevent further depletion of stocks that had become critically low.

In the years since, Fisheries Branch has remained involved in assessing lake sturgeon stocks and working with other parties including First Nations, communities, fishers and Manitoba Hydro to improve lake sturgeon management and recover stocks. With the introduction of the Federal *Species at Risk Act* (SARA) in 2003, there has been increased interest in and resources available to study lake sturgeon and to recover stocks.

The purpose of the *Manitoba Lake Sturgeon Management Strategy 2012* is to provide guidance towards the coordinated management, protection and recovery of lake sturgeon populations in Manitoba. It builds upon past lake sturgeon management approaches by reviewing progress under the previous plan, describing available management tools, outlining the current status of stocks and management approaches and identifying emerging challenges for lake sturgeon management.

Goals for Lake Sturgeon Management

Manitoba's lake sturgeon management goals are:

- To ensure that existing populations are protected from depletion.
- In areas with suitable habitat, restore lake sturgeon populations to levels where they can be considered stable and self-sustaining.

Lake Sturgeon Management Objectives

These objectives represent the priorities that Fisheries Branch has identified for lake sturgeon management for the period that this document remains in effect. Some of these objectives will be undertaken directly by Fisheries Branch while others are expected to be pursued by other organizations.

Sturgeon Boards

The Nelson River Sturgeon Board and Saskatchewan River Sturgeon Management Board have proven to be an effective means of bringing people together to work for the common cause of improving lake sturgeon populations. In other areas, resource management boards offer a similar opportunity to work with local users to manage lake sturgeon stocks.

Objectives are to:

1. Continue to support the work of the Nelson River Sturgeon Board and Saskatchewan River Sturgeon Management Board.
2. Increase representation on the boards by inviting other First Nations and communities on the rivers to join.
3. Continue efforts to establish a sturgeon board for the Winnipeg River.
4. Working in cooperation with the sturgeon boards to develop stock specific management plans where they are desirable.
5. Assist Resource Management Boards with a mandate for resource management planning in developing plans to manage lake sturgeon stocks in their Resource Management Areas. Where the interests of sturgeon boards and Resource Management Boards overlap, Fisheries Branch will work to integrate their actions and plans where possible.

Stock Assessment

Understanding the status of stocks is necessary to ensure that the goal of self-sustaining stocks is being met. First Nation fishers in particular expect that recommendations to limit harvest be supported with both a demonstrated need and proof of effectiveness.

Objectives are to:

1. Continue to work with the Nelson River Sturgeon Board to assess lake sturgeon stocks in the Nelson River upstream of Kelsey Generating Station and remain current on lake sturgeon studies conducted by Manitoba Hydro and its partners on the Nelson River downstream of Kelsey Generating Station.
2. Continue to work with the Saskatchewan River Sturgeon Management Board in the Saskatchewan River.
3. Continue to conduct stock assessment on the Winnipeg River and work with researchers and Manitoba Hydro in assessing additional reaches.
4. Undertake or require stock surveys to be undertaken in areas where information is lacking. The following areas are considered priorities:
 - Churchill River: Missi Control Structure to Churchill.
 - Assiniboine River: stocked lake sturgeon.
 - Nelson River East Channel: stocked lake sturgeon.
 - Saskatchewan River: Cedar Lake.
 - Hayes River: utilization by fish also utilizing the Nelson River.

Lake Sturgeon Culture

Lake sturgeon culture offers the only tool available to replenish stocks that are severely

depleted or near extirpated. Its use must be carefully considered to ensure that it meets the objective of supporting recovery of lake sturgeon populations without introducing new issues for existing wild stocks. While stocking can make sense as a recovery tool, it does not make sense as a means to sustain harvest levels. Stock sustainability issues should be addressed by limiting harvest. Once harvest sustainability issues are addressed, stocking can be considered as an option to enhance recovery.

Objectives are to:

1. Develop a Directive on lake sturgeon stocking which addresses issues with the:
 - Suitability of stocking as a management tool in different situations.
 - Identification and protection of suitable brood stocks.
 - Standardization of conditions on Scientific Collection and Live Fish Handling permits to ensure that management objectives are met.
2. Continue communication with other organizations involved in lake sturgeon culture in order to improve techniques and success rate.
3. Ensure that conditions on Scientific Collection and Live Fish Handling permits issued for lake sturgeon culture activities are standardized and ensure that the Branch's management objectives are being met.
4. Ensure that all lake sturgeon stocking activities follow existing Introductions and Transfers processes.
5. Improve spawn taking techniques to enhance yields and consistency while minimizing stress on brood fish.
6. Examine the degree to which imprinting during rearing and spawning site fidelity are issues and how they could impact stocking success.
7. Determine the optimal size for stocking (fry, fingerling, yearling, et cetera)
8. Improve culture techniques, including optimizing feeding, density and temperature factors.

Genetic integrity

The genetic integrity and diversity of existing stocks should be preserved. Effectively addressing this concern requires an understanding of the existing genetic structure of populations.

Objectives are to:

1. Consult with experts and other jurisdictions to establish current best practices. Use these practices to establish guidelines and ensure that they are followed for lake sturgeon culture and stocking in Manitoba.
2. Support efforts to determine the degree to which different lake sturgeon stocks differ genetically and the degree of diversity within those stocks.

3. In the absence of specific information on the genetic structure of existing stocks, stocking should be limited to within Designatable Units (DUs).

Disease

Evidence of lake sturgeon herpesvirus and iridovirus has been found in Manitoba lake sturgeon. This is an especially significant issue for lake sturgeon culture activities. It is not known if there are any implications for wild stocks. Fisheries Branch will support efforts by researchers and those involved in lake sturgeon culture to investigate the extent of disease in the wild and best practices for detection and control of disease in lake sturgeon culture. The Canadian Food Inspection Agency (CFIA) has the mandate to limit the spread of disease. Its legislation restricts activities that pose a risk to the spread of fish diseases. Manitoba will continue to work with CFIA to control the spread of fish disease in the province.

Objectives are to:

1. Support research that determines the extent to which lake sturgeon herpesvirus and iridovirus are endemic in wild populations.
2. Support the development of practical tests for these diseases that can be used to screen brood sources and eggs before admitting them into a hatchery.
3. Develop a Directive and implement protocols to reduce the risk for transmission of these diseases both within hatcheries and back into the wild.

Fish Passage

Fragmentation of fish habitat is a common concern expressed in the literature. The lack of upstream fish passage at existing water control facilities is frequently raised as a concern - for example, there are no specific measures in place for either up or downstream passage of fish at any of the hydroelectric generating stations in Manitoba. In addition to the practical limitations of current techniques to address fish passage issues, the desirability of providing passage must be considered on a site by site basis. In some cases, providing upstream access to habitats that have been altered does not help address life history needs, and may result in increased downstream movement through generating stations. This increases the risk of injury or mortality without providing any offsetting benefit.

Objectives are to:

1. Continue to monitor developments in upstream fish passage designs. At this time there are no feasible designs for lake sturgeon passage on the scale needed to address the kind of facilities found in Manitoba. This is an area of active research within North America and a continual effort to keep current is necessary.
2. If a feasible design is developed, consider whether or not fish passage should be

established on a site-specific basis with respect to Manitoba's fisheries management objectives.

3. Encourage research examining the tendency of lake sturgeon to move downstream over barriers.

Water Regime

Water regimes are closely linked to lake sturgeon habitat requirements, which vary depending upon life stage and the time of year. Lake sturgeon often migrate upstream to spawn and usually spawn in clean, coarse cobble and rubble below impassable barriers such as a waterfall or a dam. Once hatched, lake sturgeon drift downstream to shallow bays or slow-moving areas of the river with sand or detritus substrates. Juvenile lake sturgeon then typically move to deeper waters (>9 m), depending upon availability of food. Adults are opportunistic, benthic feeders typically preferring areas with sand, gravel and detritus. Adult lake sturgeon tend to over-winter in deeper water in lakes and riverine areas. Man-made changes to water regimes including changes to flow and river and lake levels can therefore, alter lake sturgeon habitat or access to that habitat.

Water regimes can be altered by the construction of dams, reservoirs, and diversions for flood control, water supply, and hydroelectric power generation as well as by water withdrawals. There is potential for these altered flows to affect the success of several life history stages. In areas where water regime is limiting due to man-made alterations, modifications to the regime should be examined.

Objectives are:

1. To develop a better understanding of habitat availability and lake sturgeon use in the following reaches:
 - (i) Lower Churchill River in the vicinity of the mouth of the Little Churchill - this is an important population in an area that is potentially extremely limiting. Conditions in dry years may be even more limiting.
 - (ii) Lower Nelson River downstream of Limestone Generating Station - this area is subject to daily changes in flows as the upstream generating stations meet peak demands. This results in significant dewatering of habitat in the area immediately downstream of Limestone Generating Station.
 - (iii) Nelson River downstream of Whitemud Falls - This area is subject to seasonal flow changes arising from Jenpeg Generating Station and Lake Winnipeg regulation. Flows typically decline in the spring and summer, dewatering large stretches of habitat in this reach.

Habitat Enhancement:

Other jurisdictions have documented success with enhancement of habitat, primarily spawning habitat. This can take the form of shoreline riprap or constructed spawning riffles below generating stations. In areas where spawning habitat is limited, the creation of artificial spawning habitat can be a useful enhancement or mitigation tool.

Objectives are to:

1. Stay current on literature and methods from other jurisdictions. Examine these for opportunities to apply these methods in Manitoba.
2. Stay current on research being conducted by Manitoba Hydro and consider the application of this research at existing and proposed future generating stations.

Future Hydroelectric Development:

Manitoba Hydro has plans for additional generating stations on the Nelson River and for refitting generating stations on the Winnipeg River. In reviewing these proposals, both the direct and cumulative impacts on lake sturgeon will be considered. Fisheries Branch will provide recommendations to the Departmental review of Environment Licence Applications and provide information on management objectives to Fisheries and Oceans Canada (DFO) review of these projects.

Objectives are to:

1. Ensure that Fisheries Branch possesses the information and expertise to contribute to environmental review of future hydroelectric projects.

Conclusions

Significant progress has been made since release of the previous version of this strategy *Lake sturgeon Management in Manitoba (1997)*. More is known now about the status of most populations and the benefits of the harvest closures introduced in the 1990s may be becoming apparent. Important partnerships have developed and a wide range of First Nations, communities, industry, and researchers are working towards the goal of lake sturgeon recovery.

The Nelson River Sturgeon Board and Saskatchewan River Sturgeon Management Board have proven to be highly effective mechanisms for coordinating lake sturgeon studies and most importantly, involving local fishers, communities and First Nations in ongoing discussions on lake sturgeon management. Both boards have the potential to expand their scope to encompass their respective river systems. This remains an objective of the boards that is shared by Fisheries Branch. The Winnipeg River remains an important reach that does not have a similar structure despite several attempts. This remains an objective for Fisheries Branch.

Research in Manitoba has made significant contributions to the understanding of stocks in some areas as well as genetics, early life history, habitat preference and disease. This work continues and is highly valued.

Manitoba has been working on lake sturgeon culture since 1994 and has worked with researchers and other jurisdictions to advance knowledge and techniques. The field has expanded significantly since that time and there is a wealth of information now available from other jurisdictions. Experimental stocking on the Assiniboine and Nelson rivers have provided some indications that stocking can be an effective technique provided that concerns with genetic integrity and diversity are addressed.

The outlook for lake sturgeon has improved significantly since the first Manitoba lake sturgeon strategy in 1992. Recruitment is increasing on portions of the Winnipeg, Saskatchewan and Nelson rivers. The increased abundance of small fish on all of these systems may be related to the significant decline in harvest resulting from the elimination of harvest by recreational and commercial fisheries province-wide, and limitations on subsistence harvest on the Winnipeg River and portions of the Nelson River.

Part II Background

Goals from Lake Sturgeon Management in Manitoba (1997)

The following goals were identified in *lake sturgeon Management in Manitoba (1997)*. Most of these goals are considered met. The goals and a summary of their current status are:

To ensure future options by eliminating any non domestic harvest of lake sturgeon until stocks have been rehabilitated or stabilized at targeted levels.

This goal is considered fully addressed. The Nelson River was closed to commercial fishing in 1992, the Churchill and Saskatchewan rivers were closed in 1994 and by 1999 the last commercial lake sturgeon fishery in the province (Fox/Bigstone Rivers) was closed. Commercial fisheries for other species are not allowed to keep lake sturgeon caught as bycatch. The lake sturgeon limit for recreational angling is zero. The only harvest of lake sturgeon allowed in Manitoba is subsistence fishing under constitutionally-protected Aboriginal and Treaty Rights other than those areas closed under Conservation Closures.

Heighten the awareness in the public of the lake sturgeon situation in the Province.

Manitoba has contributed to the development of material by the Saskatchewan River Sturgeon Management Board and Nelson River Sturgeon Board. This work includes web sites, displays, posters, and pamphlets. Additional information has also been developed and distributed by DFO under the SARA process.

Compile baseline information and data on lake sturgeon stocks.

Fisheries Branch is working with the sturgeon boards on reaches of the Saskatchewan and Nelson rivers, and is continuing to work on reaches of the Winnipeg River. Work is being done by researchers on the Winnipeg River and, on behalf of Manitoba Hydro, on reaches of the Winnipeg, Nelson, Churchill and Hayes rivers. Fisheries Branch remains current on these activities and provides input into the planning and design of these studies as the opportunity arises. There has been a tremendous increase in the information available on the status of lake sturgeon stocks throughout the Province since the strategy was first introduced in 1992.

Determine level of domestic harvest. Monitor the level of domestic harvest.

Some monitoring of subsistence harvest occurs, but not on a widespread systematic basis. The development of systematic monitoring remains a desirable objective for areas with significant subsistence fishing pressure.

Identify and protect a viable source for lake sturgeon eggs to support the lake sturgeon culture program.

In order to meet the objective of maintaining genetic integrity, spawn collection sites are needed on at least one reach of each major river system that might eventually be restocked:

- **Churchill River:** The only potential site identified on the Churchill River is at the mouth of the Little Churchill. There are no special conservation measures in place for this area.
- **Saskatchewan River:** Most of the sites identified on the Saskatchewan River are upstream in Saskatchewan. There are no special conservation measures in place for these areas.
- **Nelson River:** One of the prime candidate sites for taking lake sturgeon spawn at the time of the previous strategy was the mouth of the Landing River. This run was severely depleted by overharvest during the 1990s and has not recovered. Another spawn collection site has been identified nearby on the main stem of the Nelson River. There is a year round Conservation Closure in effect for an area that includes this location. Other potential spawn collection sites include lower Limestone Rapids, the mouth of the Weir River and where the Odie and Burntwood rivers join prior to entering Split Lake. There are no special conservation measures in place for these areas.
- **Winnipeg River:** Potential spawn collection sites on the Winnipeg River are below Slave Falls, below Sturgeon Falls and below Point du Bois generating stations. The year round Conservation Closure in effect on the Winnipeg River includes these areas.

Maintain the genetic integrity of separate or discrete lake sturgeon stocks.

Testing has confirmed that there are genetic differences between Winnipeg, Saskatchewan and Nelson rivers stocks. Additional testing is ongoing to determine the degree to which stocks within these rivers are distinct. There has been no transfer of stock from one river system into another within Manitoba with the exception of the Assiniboine River where local stocks were considered extirpated. Cross basin transfers have occurred outside of Manitoba with lake sturgeon from the Rainy River, Ontario population stocked into the upper reaches of the Winnipeg River system in Ontario and the Red River System in Minnesota.

Management practices in place to pursue genetic variability in stocked fish include: the use of wild brood stock to ensure that the source parents are different every year, and fertilizing from multiple males.

Management Measures

There are a wide range of management tools available to fisheries managers for the management and conservation of lake sturgeon in Manitoba.

Collaborative Approaches

Sturgeon Management Boards

The Nelson River Sturgeon Board and Saskatchewan River Sturgeon Management Board differ in their origins, membership (Appendix A), structures and operating procedures. However both boards fulfill the same key role of providing a forum where First Nations, communities, governments and hydroelectric utilities can meet, exchange ideas and cooperatively initiate projects which contribute to the management and conservation of lake sturgeon. One of the fundamental roles that sturgeon boards can fill is to provide subsistence harvest recommendations to local fishers. This process can provide an opportunity for local people to bring their insight and knowledge to the active management of this species.

Fisheries Branch considers the boards to be a highly effective means of addressing lake sturgeon management and conservation issues and is committed to continuing to work with them. There is potential to expand the geographic area and increase representation of First Nations and communities on both boards. This approach is considered more desirable than any effort to create additional management structures on these river systems.

The Winnipeg River is notable in its lack of a sturgeon board, despite repeated efforts to develop one. The establishment of a sturgeon board for this area remains a desirable management tool.

Resource Management Boards

Some First Nations in Manitoba have resource management boards which have a mandate for both land and resource use planning within defined Resource Areas. These boards have been created through formal agreements between Manitoba and the First Nation or under legislation. Some of these agreements were intended to address the impacts of hydroelectric development and arose from the Northern Flood Agreement or other impact related agreements while some First Nations resource management boards on the east side of Lake Winnipeg have resulted under the *East Side Traditional Lands Planning and Special Protected Areas Act*. Resource management allocations and plans must be submitted to these boards for activities that apply within their respective Resource Areas. This requirement applies even if

there is an overlapping sturgeon board. Fisheries Branch will work to coordinate the efforts of lake sturgeon management and resource management boards.

Education and Communication

Communicating the status of stocks, risks to their sustainability and conservation recommendations to fishers, community members and the public at large is a useful way of achieving management goals. Communication and education efforts work to develop a common understanding of the issues surrounding this species and its recovery. The sturgeon boards have produced materials and programs to promote lake sturgeon awareness. The SARA process has also generated some materials and program funding for communication and education efforts. There is a need for additional material.

The most effective advice to harvesters is on the importance of protecting spawning areas, limiting harvest until stocks recover and minimizing harvest of larger fish, which tend to be females. When delivering this message it is also useful to be able to demonstrate current trends in the local stock, particularly whether or not management efforts are making a difference.

Partnerships/Networking

In addition to the efforts to address the goals laid out in *Sturgeon Management in Manitoba (1997)*, Fisheries Branch has endeavoured to engage in partnerships and work with other agencies whenever possible. Already noted are the partnerships that make up the Nelson River Sturgeon Board and the Saskatchewan River Sturgeon Management Board. Effective relationships have also been developed with the Species at Risk program at DFO, researchers at the University of Manitoba, University of New Brunswick, Canadian Rivers Institute, Freshwater Institute, and other management agencies including Ontario Ministry of Natural Resources, Saskatchewan Ministry of Environment, Wisconsin Department of Natural Resources, and many others. Manitoba Hydro has contributed both financially and through involvement with the sturgeon boards and has sponsored research and studies that advance the understanding of lake sturgeon in Manitoba. Manitoba Hydro has set out commitments to “*maintain and enhance Lake Sturgeon populations in areas affected by Manitoba Hydro’s operations, now and in the future*” in its 2008 Lake Sturgeon Stewardship and Enhancement Program (and subsequently updated in 2012). The growth of this network has required the cooperation of many people and agencies and plays a significant role in improving the prospects for lake sturgeon in Manitoba.

There may be potential for Manitoba to enter into formal agreements regarding lake sturgeon management and recovery activities. These agreements should align with Manitoba's lake sturgeon management objectives.

Conferences and Workshops

One of the valuable contributions of the SARA process has been the technical workshops which brought together people from different organizations including sturgeon boards, First Nations, hydroelectric utilities, consultants, researchers, other provinces and experts from the United States. These workshops have contributed to information exchange and the development of networks that have contributed to lake sturgeon management and recovery. Fisheries Branch and participants in the sturgeon boards have also attended lake sturgeon conferences outside of the province through the American Fisheries Society, Midwest Fish and Wildlife and the International Symposium on Sturgeon. These events offer the opportunity to network, contribute to professional development and demonstrate Manitoba's investment in lake sturgeon management.

Provincial Regulatory Instruments

Recreational Angling and Commercial Fishing

Under the Manitoba Fishery Regulations, all lake sturgeon caught while either recreational angling or commercial fishing must be released. This is the primary regulatory tool protecting lake sturgeon from incidental or unintentional harvest.

Conservation Closures

When other approaches prove inadequate to conserve lake sturgeon stocks a regulatory closure of all fishing, including constitutionally-protected Aboriginal and Treaty subsistence fishing, may be necessary. Conservation Closures must meet the test defined in *Sparrow* (1990), and must impose the minimal possible restriction on the right to fish. Since Conservation Closures directly infringe on constitutionally-protected Aboriginal and Treaty rights, Crown consultation is normally necessary prior to imposing a closure.

Conservation Closures are considered a management tool of last resort. They are used in situations where the alternative regulatory tools available are considered inadequate and where the management of the stock requires additional protection. Conservation Closures can also be applied when a First Nation or community expresses concerns about the status of stocks in a locally important area and requests that the closure be put in place.

Conservation Closures are currently in place on the Winnipeg River and a portion of the Nelson River.

A Conservation Closure prohibits all fishing for a species in an area for a specific period of time 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 some fishing under specific conditions (number of permits issued, season, gear limits, mesh size, quota, etc.).

Scientific Collection Permits/Live Fish Handling Permits

Permits are required by anyone capturing, handling or retaining fish for research purposes including aspects of fish culture. These permits ensure that scientific and environmental research poses as little risk to lake sturgeon as possible and the Branch's management objectives are supported. They also play an important role in ensuring that Manitoba is aware of all the lake sturgeon research activities that are occurring. They are required by all organizations working with lake sturgeon unless they are working directly under the authority of Fisheries Branch.

Environmental Review

Manitoba has a system of circulation for Environment Licences and Crown Land use applications which gives Fisheries Branch the opportunity to review, provide comment and have input into conditions. Among other possible impacts, Fisheries Branch considers possible impacts on lake sturgeon and lake sturgeon habitat in its review of these applications and makes recommendations intended to protect this species.

Endangered Species Act

Manitoba's Endangered Species Act (1990) does not currently list any fish species. Lake sturgeon have been listed as Threatened under both Alberta's Wildlife Act and Ontario's Endangered Species Act (2007).

Federal Regulatory Instruments

Habitat protection/rehabilitation

The primary mandate for fish habitat protection lies with DFO through the *Fisheries Act* (Canada). The primary tool for this is through the *Policy for the Management of Fish Habitat*. Fisheries Branch provides information upon request to assist in DFO's review of applications.

Species at Risk Act (SARA)

In 2008, COSEWIC recommended that most lake sturgeon populations in Manitoba be listed as Endangered. SARA defines a process that leads to a recommendation to the Federal Minister and a decision on listing. Fisheries Branch contributes to this process by providing information and expertise, preparing summary documents, and participating in the development of Recovery Strategies for each DU. These documents are a valuable contribution 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*.

Manitoba considers the management measures currently in place to be sufficient and that listing under the federal *Species at Risk Act* is not necessary at this time - specifically, closure of all commercial lake sturgeon fisheries by 1998 and the restriction of recreational fisheries to catch and release - to be effective and suitable for recovering lake sturgeon populations in areas where sufficient lake sturgeon and habitat are available to support a natural recovery. In general, domestic harvest of lake sturgeon is considered to be sustainable. Conservation Closures have been applied in areas that were not considered sustainable.

Management Activities

Management Guidelines

The experience of managing lake sturgeon in Manitoba has shown that limiting mortality is the single most effect means of sustaining lake sturgeon stocks. The failure to do this effectively during the historical commercial fishery lead to the dramatic declines that left lake sturgeon stocks throughout most of the province in the state they are in today. Protecting habitat is also important - lake sturgeon in several parts of the province have demonstrated they can adapt to fairly severe habitat alterations while proving unable to adapt to excessive levels of harvest.

Lake sturgeon stock management in Manitoba now focuses on ensuring that anthropogenic mortality is kept low enough that populations remain sustainable. In areas with populations that are already depleted, continuing a low level, sustainable harvest will maintain populations, but will also prevent any recovery of the stock. Recovery only occurs once the mortality is reduced. There is mounting evidence that the combination of Conservation Closures, closure of the commercial fishery and elimination of recreational angling harvest is allowing some stocks to start recovering.

Lake sturgeon are more vulnerable to harvest when concentrated for spawning than they are at any other time in their life history. In addition, most of the fish present are fully mature. This is not the ideal segment of the population to target for harvest. Instead, it is better to focus harvest on juveniles and males, and limit harvest of reproductively mature female fish. From a management perspective, lake sturgeon harvest should not occur during spawning. In many areas, this was a time when First Nations traditionally harvested lake sturgeon. This represents a challenge when working with First Nations on lake sturgeon management, as the traditional form of the fishery conflicts with the most effective management strategy.

Fish Culture

In areas where lake sturgeon are extirpated or are depleted to the point where recovery is not likely within reasonable time frames, hatcheries can raise lake sturgeon to stock into suitable habitat. Stocking activities must be planned to ensure that spawn sources are genetically suitable for the area being stocked, that the likelihood of disease transmission is minimized and that harm to the contributing brood stock is minimized.

Fisheries Branch first became involved in lake sturgeon culture when spawn was collected working with the Nelson River Sturgeon Board in 1994 at Landing River. Over time the network of expertise to draw from has increased.

Stocking has occurred on a limited basis throughout the province. Fisheries Branch considers stocking to be a potentially useful stock recovery technique and the only option available in some areas where stocks are remnant or extirpated. COSEWIC and the SARA process generally do not support stocking as a recovery tool and do not consider stocks recovered through stocking to constitute recovery under SARA because of the likelihood of changes in the genetic composition of the resulting stock.

Prior to increasing the use of stocking as a stock enhancement tool, issues such as disease detection and control and the preservation of genetic integrity and diversity need to be resolved. As these issues are resolved, Fisheries Branch will continue to develop skills with small scale stocking and will support researchers in this field.

Instream Flows Needs Assessment

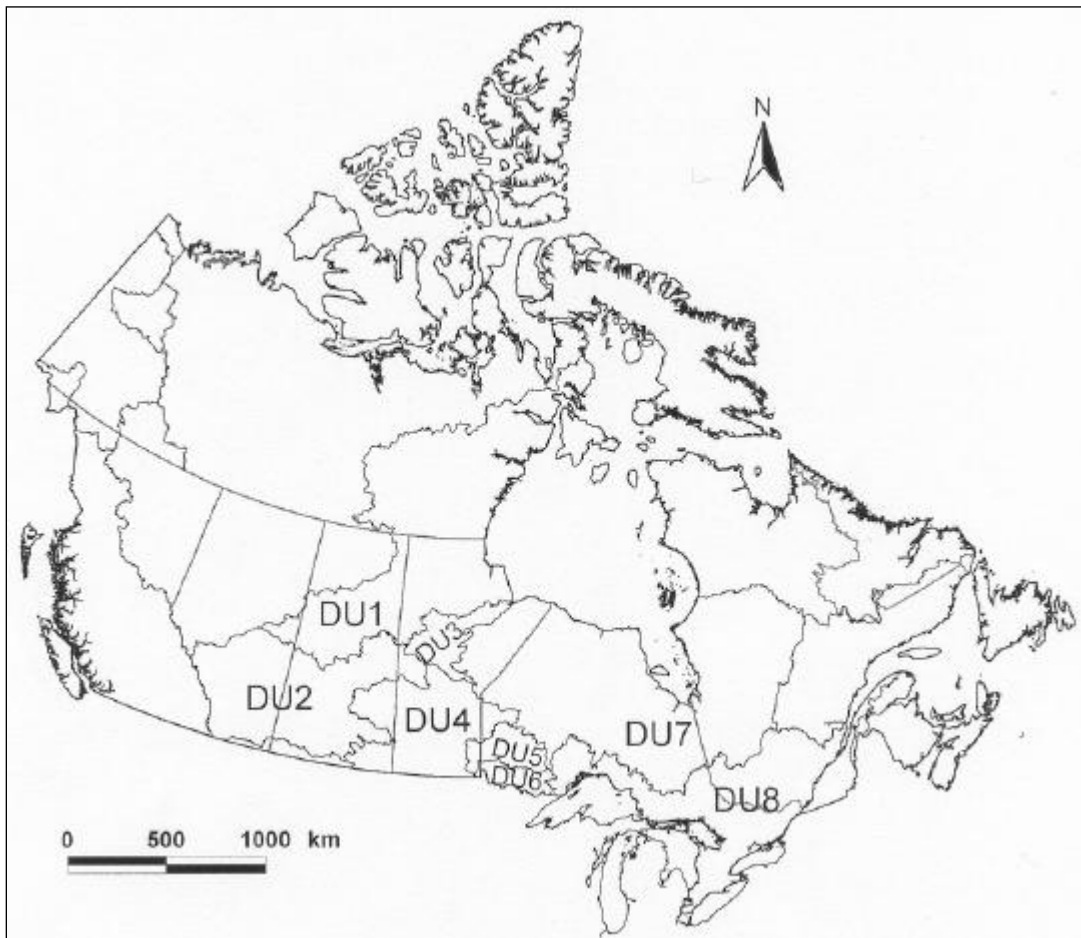
Hydroelectric development can result in substantial changes in the water regime. In some cases significant habitat impacts can result. Instream Flow Needs Assessment is a tool which determines the amount of flow necessary to ensure that riverine processes are maintained. In areas where the water regime has been identified as potentially limiting lake sturgeon

productivity Instream Flow Needs Assessment should be used to examine the implications of the current regime and the potential benefit of alternatives.

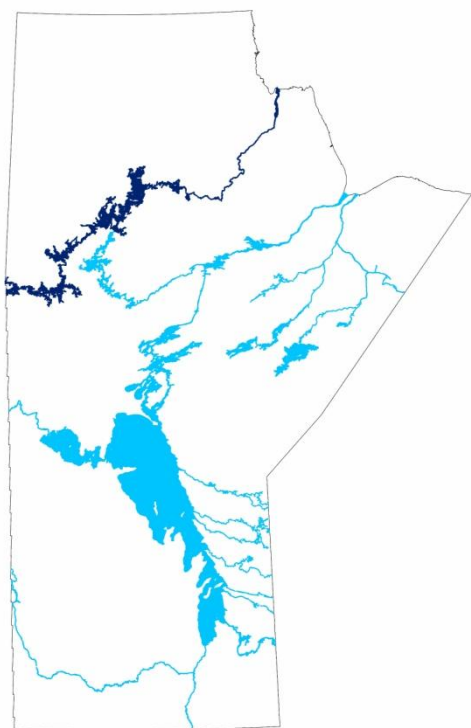
Part III Current Lake Sturgeon Stock Status

The history and current status of lake sturgeon stocks in each area are described to the best knowledge of Fisheries Branch staff. Information arises from files, field studies, local knowledge and information provided by researchers and consultants.

In the interest of consistency with the SARA process, river reaches identified in previous versions of this document now include the designations used by and DFO. Under the SARA process each major watershed is considered a Designatable Unit (DU) and separate reaches within each DU are Management Units (MU). Only MUs found within Manitoba are addressed with the exception of those in DU6 which contains only a small portion of Lake of the Woods in Manitoba. The distribution of lake sturgeon Designatable Units in Canada is illustrated below.



Churchill River (DU 1)



The Churchill River spans Manitoba with a length of over 800 km from where it crosses the Saskatchewan border to Churchill, where it flows into Hudson Bay. The river is divided into two Management Units separated by Missi Control Structure at the outlet of Southern Indian Lake. The upstream reach extends upstream to Island Falls Generating Station in Saskatchewan.

Saskatchewan Border to Missi Falls Control Structure (MU 2):

Although records of the commercial fishery date back to prior to 1940, they do not include any record of fish production on the scale that caused depletion of stocks in other areas. It is likely that the Churchill River was fished heavily earlier, but that the records were blended with another fishery, possibly the Saskatchewan River.

When the fishery reopened in 1970 after the Province wide closure, lake sturgeon production remained low until it was closed again in 1994. The presence of occasional large fish and lack of reports of smaller fish leads to the conclusion that this is a remnant population consisting of only a limited number of large fish.

Water levels and flows throughout this reach are influenced by the operation of SaskPower's Island Falls Generating Station upstream in Saskatchewan. It was built in 1930 to provide power to Flin Flon and the mining/smelting operation there. After SaskPower took over operation in 1985 the flow regime changed as it was used to meet seasonal peak demand.

There are rapids and falls on this reach that may be natural barriers to upstream movement. Granville Falls, upstream of where the river enters Granville Lake is definitely a barrier. Other significant rapids and falls are Bloodstone Rapids, Pukatawagan Falls and Twin Falls. It is not known if lake sturgeon moved upstream through these areas, but it is possible that they do, at least under certain flow conditions.

The downstream end of this reach is Missi Control Structure. Built near the site of Missi Falls

and completed in 1976, this structure diverts Churchill River flows through a constructed channel to the Rat/Burntwood river system, which then joins Nelson River flows above Split Lake. The diversion channel offers Churchill River lake sturgeon an opportunity to enter the Rat/Burntwood system, an area that did not previously have lake sturgeon. There are credible anecdotal accounts of lake sturgeon caught by anglers in the Burntwood River in the vicinity of Thompson. These lake sturgeon are assumed to have originated from the Churchill River system.

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 each expressed interest in lake sturgeon recovery. Limited resources have prevented any assessment work from being conducted on this reach of the Churchill River.

Current Status:

- This area is considered to be historically depleted by commercial fishing.
- Subsistence fishing is minimal, even as by-catch.
- Habitat is affected by the water regime, but is considered suitable for lake sturgeon.
- Recovery potential is limited by lack of brood stock. The potential for recovery in a reasonable period of time appears to be very low and stocking may be the only recovery tool available.

Management Approach:

- Once stocking is established as a recovery tool in other areas, and providing that a genetically suitable source of spawn can be found, stocking could be considered as one of the only options available to enhance recovery. The source with the most potential to be suitable is the population on the lower Churchill River near the mouth of the Little Churchill River.

Missi Falls Control Structure to Hudson Bay (MU 3):

Following completion of the Churchill River Diversion (CRD) in 1976 this portion of the Churchill River was substantially dewatered but higher flows periodically occur, particularly during wet years. At the time of the diversion there was an expectation that fish stocks throughout this stretch of river would be impacted by the reduced flows, including lake sturgeon. Despite this, lake sturgeon appear to have maintained a self sustaining population in the Churchill River near the mouth of the Little Churchill River. This area has become an increasingly important subsistence fishery for Tataskweyak Cree Nation under the Alternative Access Program. Given the challenges that lake sturgeon face in this area, it may prove more difficult than normal to manage harvest sustainably. There is insufficient information on the size of the stock, its range,

the habitats on which it relies, the rate of recruitment and the level of exploitation that can be sustained.

In dry years, there is substantial dewatering of habitat in this area as the combination of minimum releases from Missi Control Structure and minimal runoff within the watershed fails to maintain “normal” river levels. There would be value in conducting an instream flow needs assessment of this stretch of the river.

This reach is in the Split Lake Resource Area and 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 so far, but are aware of issues affecting lake sturgeon on the Churchill River.

Current Status:

- This is one of the most impacted stretches of water in the Province. Notwithstanding this, test netting confirms that it is sustaining a viable lake sturgeon population with strong evidence of ongoing recruitment.
- Increased subsistence harvest in this area will be a challenge to manage sustainably without substantially better information than is currently available.
- This may be the only available source of Churchill River stock if future restocking in upper Churchill reaches is desired. Caution against stock depletion is required.

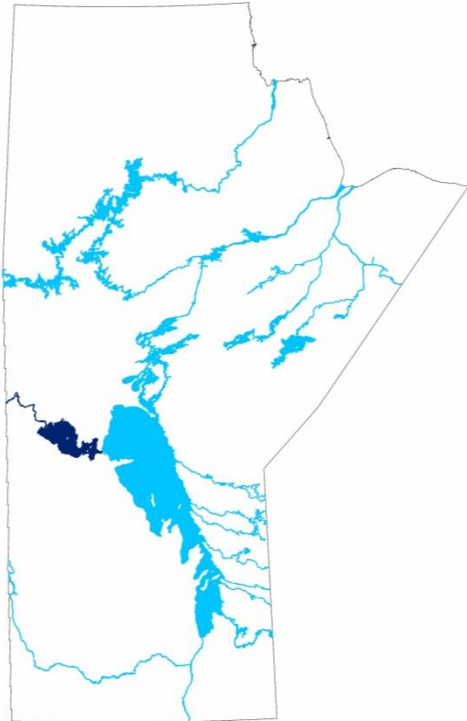
Management Approach:

- An instream flow needs assessment should be completed for the portion of the river where lake sturgeon are concentrated.
- The Split Lake Resource Management Board should develop a lake sturgeon management plan with ongoing monitoring of lake sturgeon stocks and harvests to ensure that harvest through the Alternative Access Program is sustainable.
- Conduct a survey to determine the extent of the range that lake sturgeon occupy in this area.

Saskatchewan River (DU 2)

The Saskatchewan River extends almost 300 km from the Saskatchewan border to its mouth on Lake Winnipeg at Grand Rapids. This reach of river extends upstream into Saskatchewan up to the E.B. Campbell Generating Station. The lake sturgeon population utilizes waters on both sides of the border. The Saskatchewan River Sturgeon Management Board has representation

from both Saskatchewan and Manitoba in recognition of the fact that lake sturgeon management requires a coordinated approach across the border.



***Saskatchewan Border to Grand Rapids
Generating Station (MU 4):***

This area was referred to as MU 6 in the Saskatchewan River Recovery Potential Assessment. The Recovery Team has reclassified the Saskatchewan River reaches and this reach is now called MU 4.

Production from the Saskatchewan River commercial lake sturgeon fishery peaked at the beginning of the 20th century. This early commercial fishery resulted in stock depletion. As noted previously, there is potential that some of the commercial fishery production attributed to the Saskatchewan River was actually harvested from other areas of northern Manitoba but was delivered in The Pas. After the initial stock depletion, this fishery continued producing relatively small amounts of fish, interspersed with periodic closures. When the Manitoba portion of the fishery reopened after the

province-wide closure in 1970, there was a brief peak in production in the late 1970s, followed by relatively low levels of production until it was closed again in 1994.

Water levels and flows in the upper reaches of this area are affected by the operation of SaskPower's E.B. Campbell Generating Station, completed in 1963. The lower reach of this area is Cedar Lake and the Grand Rapids forebay. Water levels and flows are controlled by the operation of Grand Rapids Generating Station, completed in 1968.

The Saskatchewan River Sturgeon Management Board conducts annual population monitoring studies. The trend over the past five years has been a stabilizing and potentially increasing population, with most of the increase being smaller lake sturgeon. The presence of smaller lake sturgeon is a significant change from the population when the Board was founded in 1994. This increase may be related to the closure of the commercial fishery. The Board has also conducted movement and habitat studies and developed communications material. The Board developed a *Ten-Year Management Plan* in 2002 and has been operating under it since.

The lake sturgeon population in this reach moves across the border into Saskatchewan and appears to be at least somewhat dependant on spawning habitat in Saskatchewan. The Saskatchewan River Sturgeon Management Board remains a critical tool for managing across jurisdictions.

Stocking on the Saskatchewan River started in 1999 when eggs were collected from the Saskatchewan portion of the river and were raised at Grand Rapids Hatchery in Manitoba. Grand Rapids Hatchery was also used in 2000. Subsequently, all eggs were raised at the Fort Qu'Appelle Hatchery in Saskatchewan. Most of the stocking occurred in the upstream portion of the reach in Saskatchewan (Appendix B, Tables B-1 and B-2). Saskatchewan last raised and stocked lake sturgeon in 2007, completing a five year trial program. The success of this stocking was to be evaluated before committing to additional stocking.

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

Current Status:

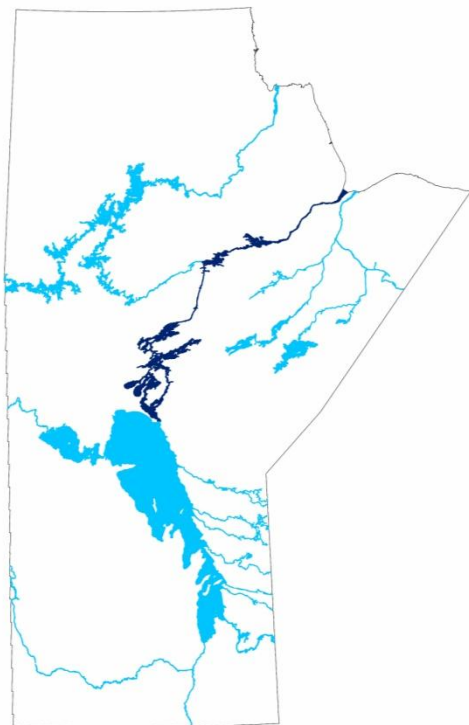
- The Saskatchewan River Sturgeon Management Board continues to assess the status of the lake sturgeon population through separate studies on the Saskatchewan and Manitoba portions of the Saskatchewan River.
- The estimated population of this area is increasing. There is increased representation by smaller fish.
- No work has been done on lower portions of the reach, including Cedar Lake, Moose Lake and the Grand Rapids forebay.
- Harvest is restricted to subsistence fishing.
- The Saskatchewan River Sturgeon Management Board has proven an effective means for the communities, First Nations, hydroelectric utilities and government agencies to share information, establish objectives and coordinate research.

Management Approach:

- Continue to work with the Saskatchewan River Sturgeon Management Board in the management of the subsistence fishery and the delivery of stocking, communication and outreach programs.
- Expand participation in the Board by encouraging Chemawawin Cree Nation and Mosakahiken Cree Nation to join the Board.

- Monitor the current population in this area and continue to assess the effectiveness of the management measures in place.
- Survey the extent of lake sturgeon downstream into Cedar Lake.
- If the young lake sturgeon presently being observed lead to an increase in the population size, increase education and outreach to ensure that they are not harvested and have an opportunity to contribute to the recovery of this area.

Nelson River (DU 3)



The Nelson River extends almost 700 km as it drains Lake Winnipeg to Hudson Bay. Hydroelectric development starting in the 1960s created barriers which are now used to separate the Management Units. It is not known how many of these sites constituted natural barriers.

Lake Winnipeg to Whitemud Falls (outlet of Cross Lake) (MU 1):

This population may have been contiguous with the Lake Winnipeg population and is considered to have been substantially depleted at the same time as the Lake Winnipeg commercial fishery. Records from that period make it difficult to separate harvest from specific waterbodies so the actual historical harvest from this area is not known.

By the late 1950s this area was considered thoroughly depleted. However, commercial records and local knowledge indicate that a remnant population continued to exist.

Although already depleted by commercial harvest, the completion of Jenpeg Generating Station and the associated channel improvements for Lake Winnipeg Regulation in 1979 resulted in habitat impacts which affected the remnant population. Jenpeg Generating Station is constructed at the site of rapids which was considered both a spawning area and a migration route to spawning areas further upstream. The Ominawin Bypass Channel upstream of Jenpeg Generating Station was constructed in an area considered a spawning site. Two Mile Channel was built to increase the flow of water from Lake Winnipeg into Playgreen Lake. It brings

significant amounts of suspended sediment from erosion on the Lake Winnipeg shoreline into Playgreen Lake. This sediment is carried north towards the Eight Mile Channel and is thought to have affected spawning reefs on that route. There were anecdotal accounts of lake sturgeon being caught in the Lake Winnipeg whitefish fishery on Mossy Bay when the Two Mile Channel opened, along with accounts from Norway House of the remaining remnant population of lake sturgeon largely disappearing from Playgreen Lake at that time.

Lake sturgeon continue to be observed in the tailrace below Jenpeg Generating Station, in Eves Rapids below the Cross lake Outlet Weir, and below Sea Falls near Norway House. Sea Falls is the site of a cable ferry crossing and is also a popular local boat launch. There is a large amount of local traffic in this area, including subsistence fishing targeting other species that results in excellent local observations.

This area was targeted for experimental stocking which began in 1994. The stocking is conducted in partnership with the Nelson River Sturgeon Board. The Board conducts the spawn taking in association with Regional Fisheries Branch staff, owns and operates a rearing facility located at Jenpeg and has one of its staff working at Grand Rapids Fish Hatchery raising lake sturgeon. As of 2011, 35,163 lake sturgeon fingerlings and 1,104 yearlings have been stocked at various locations in this reach, with the majority of them being stocked below Sea Falls (Appendix B, Table B-3). The source of all of the stocked fish was the Nelson River near the mouth of the Landing River in the next reach downstream (MU 2).

While there has been no formal study of the effectiveness of this stocking effort, there are many anecdotal accounts of incidental lake sturgeon catches in the Sea Falls area in recent years. Most of these accounts are of smaller lake sturgeon (40 to 60 cm).

Fishing pressure for lake sturgeon is minimal in this area. There is no targeted recreational angling. The bycatch of lake sturgeon in the Playgreen Lake commercial fishery approaches zero. There is almost no targeted subsistence lake sturgeon fishing by members of the Norway House Cree Nation and almost all of the reported bycatch has been released. There is some occasional targeted subsistence fishing in the Jenpeg Generating Station tailrace and in Eves Rapids by Cross Lake First Nation members. The level of fishing pressure is not considered high enough to have a significant impact on recovery, although given the status of stocks in this area, minimal harvest is desirable.

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 Nelson River Sturgeon

Board and lake sturgeon stocking in this area. The Cross Lake First Nation does not have a Resource Management Board.

Current Status:

- The only harvest is from low level subsistence fishing.
- Stocking appears to be working, although definitive evidence has yet to be collected.
- The population is showing signs of recovery.
- The Nelson River Sturgeon Board has proven an effective means for promoting lake sturgeon conservation in this area through stocking releases, school aquarium programs and its operation of the Jenpeg Rearing Facility.

Management Approach:

- Continue to work with the Nelson River Sturgeon Board in the management of the subsistence fishery and the delivery of stocking, communication and outreach programs. Support the Sturgeon Board's annual recommendations to harvesters.
- Investigate the current population in this area and assess the effectiveness of the stocking program.
- Increase education and outreach to ensure that as stocked lake sturgeon start to reach catchable size, they are not harvested.
- Assess habitat changes in Playgreen Lake. This objective is not limited to lake sturgeon habitat and may be pursued through other programs.
- Increase level of stocking, moving from small scale experimental stocking to larger scale stocking with the long term objective of recovering the population to the point where it is utilizing the habitat currently available and can sustain some level of subsistence harvest.
- Given the lack of a spawn source within MU1, continue to stock with lake sturgeon from MU2.

Whitemud Falls to Kelsey Generating Station (MU 2):

By the 1950s, this area was the heart of the Nelson River commercial lake sturgeon fishery, producing about 80% of the total production from the Nelson River. The commercial fishery was closed in 1960 as catches once again declined and was reopened in 1970 with an increased mesh size, minimum size limit and dramatically reduced quotas.

This population was likely separated from lower Nelson stocks with the construction of Kelsey Generating Station in 1961. The generating station back flooded an area which extended to the inlet of Sipiwesk Lake (lower Duck and Red Rock rapids).

The completion of Jenpeg Generating Station in 1979 and the introduction of Lake Winnipeg Regulation resulted in a change in water regime in this area. Kelsey Generating Station had flooded the Nelson River as far upstream as the inlet of Sipiwesk Lake. With the introduction of Lake Winnipeg Regulation, Jenpeg Generating Station introduced seasonal flow changes to the entire reach, including the areas not affected by Kelsey Generating Station. These developments increased flows during the winter, and normally decreased them during the spring as Lake Winnipeg was recharged. They also resulted in increased flows and levels during high water years as the increased capacity of the Lake Winnipeg outlet was used to control water levels on Lake Winnipeg. Both Kelsey Generating Station and Jenpeg Generating Station resulted in flooding of shorelines on Sipiwesk Lake and the Nelson River upstream of Kelsey Generating Station. This flooding resulted in ongoing erosion, shoreline loss and sediment loading. Despite the number of years that have passed since the generating stations were constructed, periodic high water events have resulted in additional bank destabilization and erosion.

The area upstream of Sipiwesk Lake is not affected by Kelsey Generating Station, but is affected by the operation of Jenpeg Generating Station. This is a high gradient, rock controlled reach of the Nelson River, which moves through more than one channel. There are numerous fast water stretches in this reach. The fluctuation of water levels and flows due to Jenpeg Generating Station operations is significant. Normal system operations see water flows drop during the late winter, with flows continuing to be reduced throughout the spring and early summer. The timing of this reduction in flow is thought to be critical, since it must not occur during the spawning, hatch or larval periods. Past experience has been that drawdown occurs prior to this period and that water levels then remain relatively stable. However, the drawdown does result in a reduction in the amount of aquatic habitat compared with what would have been available prior to Lake Winnipeg Regulation.

The management regime introduced for the commercial fishery in 1970 was considered to be sustainable until the 1990s. The reduced quota established in 1970 was considered to be effective. The quota was normally caught, implying that it was the limiting factor in harvest, not the mesh size or minimum size limit. The minimum size limit and large minimum mesh size likely resulted in exploitation being focused on larger fish, which would normally be predominantly female. Although the population size and age composition appeared sustainable, the sex ratio likely was not. This has been demonstrated as an issue in other jurisdictions where size-related harvest restrictions have increased harvest of females over males. This reduction in female brood stock due to commercial harvest may have increased this population's vulnerability to overharvest and limited the stock's ability to recover.

Following the *Sparrow* decision in 1990 Manitoba decided to remove all regulations on the subsistence harvest of fish that occurred under constitutionally-protected Aboriginal and Treaty Rights. Subsistence harvest of lake sturgeon in this reach increased and started specifically to target spawning lake sturgeon. Concerns about the impact of this fishing led to a reduction in the commercial quota in 1991 and the closure of the fishery in 1992. Concerns about the difficulty of conserving a fish stock which was exploited by several different communities led to the establishment of the Nelson River Sturgeon Board. When the Nelson River Sturgeon Board was formally established through the resolution of a Cross Lake Northern Flood Agreement claim it had representatives from six communities (Table A-2). The Board's primary area of interest is this stretch of the Nelson River.

The Board focuses on education and encourages harvesters to comply voluntarily with its harvest recommendations. These recommendations have varied in initial years as the Board tried to reconcile the need for lake sturgeon conservation and the practical constraints of lake sturgeon harvesting. As numbers of adult lake sturgeon started to decline dramatically, the Board's annual recommendation remained consistent - no fishing before spawning was completed (after June 15), limit harvest to one per family per year and avoid harvest of larger (presumed female) fish. The majority of harvesters supported these voluntary measures. However, enough harvest continued to occur that the population dropped dramatically and the spawning run at Landing River effectively disappeared.

The reduction in adult population and decline in the Landing River spawning run led Manitoba to introduce a Conservation Closure in 1994 that closed this reach of the river to all harvest from May 1 until after June 15. This closure applies to all lake sturgeon fishing, including subsistence fishing occurring under constitutionally-protected Treaty and Aboriginal Rights. A 16 km stretch of the river, extending 8 km up and downstream of the mouth of the Landing River is closed year round.

One of the first objectives of the Sturgeon Board was to enhance lake sturgeon populations by stocking. The first spawn taking occurred in 1994, and spawn taking efforts in the Landing River area have occurred every year since. The loss of the Landing River spawning run made this activity difficult. However, spawning areas in the main stem of the Nelson River were identified and have replaced the initial site for taking spawn. While most of the lake sturgeon were stocked in the upstream reach downstream of Playgreen Lake, in years where larger numbers of lake sturgeon were raised, some were stocked into this reach (Table B-4).

A five year mark and recapture study documented the decline in the number of adult sized lake sturgeon through the 1990s. A subsequent study started in 2006 and is showing a steady

increase in numbers. Although the population trend is increasing, the increase is dominated by smaller fish. This is a positive sign of recruitment which may be tied to the closure of the commercial fishery.

Part of this reach is within the Cross Lake Resource Area. The Cross Lake First Nation does not have a Resource Management Board.

Current Status:

- The Nelson River Sturgeon Board has completed two five year mark and recapture projects assessing the status of lake sturgeon in this reach. The first project ran from 1992 to 1997 and documented a dramatic drop in the population of adults in this reach. The second project, supported in part by the Habitat Stewardship Program, started in 2007 and documented the increasing population and the fact that the increase arose from large numbers of small fish being caught.
- Communication and outreach programs were also delivered by the Nelson River Sturgeon Board, 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 offers a program where schools raise lake sturgeon for eventual release.
- Harvest remains strictly subsistence fishing. Through a combination of regulatory closures, voluntary harvest reduction, public education and reduced catch success, subsistence harvest in this area has declined significantly since the early 1990s.
- A Conservation Closure has been in place since 1994. This is the only reach of the Nelson River subject to a conservation closure.
- The Nelson River Sturgeon Board has proven an effective mechanism for Fisheries Branch and Manitoba Hydro to deliver projects, such as stocking and communications, school lake sturgeon programs, stocking releases, and operating the Jenpeg Rearing Facility.
- Support the Nelson River Sturgeon Board annual recommendation for subsistence harvest.
- In 2010, the commercial fishers on the Nelson River between Sipiwesk Lake and Kelsey Generating Station agreed to close all gill netting for the commercial fishery in the 16 km closed zone.

Management Approach:

- Continue to work with the Nelson River Sturgeon Board in the management of the subsistence fishery and the delivery of stocking, communication and outreach programs.
- Retain the Conservation Closure until stocks recover to the point where they can sustainably meet the subsistence harvest demand. Continue to assess its effectiveness

and ensure that it is both adequate and necessary to conserve stocks with the minimum level of infringement possible.

- Monitor the current population in this area and continue to assess the effectiveness of the management measures in place.
- Increase education and outreach to ensure that as the young lake sturgeon forming the basis of the population increase start to reach catchable size, they are not harvested. Assess the flow regime in the stretch from Whitemud Falls to Sipiwesk Lake to ensure that it does not affect lake sturgeon spawning and nursery success.

Kelsey Generating Station to Kettle Generating Station (MU 3):

The historical commercial fishery was considered to have depleted this area by the time of the 1960 closure. When the fishery reopened in 1970 this area never produced a significant commercial catch. By the time the commercial fishery was closed again in 1992, this area had not produced any lake sturgeon in many years.

The completion of Kelsey Generating Station in 1961 separated stocks in Split Lake from the Nelson River upstream. The completion of the CRD in 1976 increased discharges from the Burntwood River and increased 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 Generating Station in 1974 separated stocks in this area from the lower Nelson River. Kettle GS back flooded Moosenose Lake and the Nelson River as far as Gull rapids, creating Stephens Lake, the Kettle 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, in particular increased winter flows which also affect ice formation. In 1995, the Split Lake Resource Management Board initiated a study that found lake sturgeon in Gull Lake. Studies funded by Manitoba Hydro as part of the planning for the proposed Keeyask Generating Station have added substantially to the knowledge of lake sturgeon populations and habitat use in this area.

Manitoba Hydro has also funded studies that have examined spawning utilization of potential spawning habitat near Kelsey Generating Station, at the mouth of the Grass River and the mouth of the Burntwood and Odie rivers. Anglers fishing near the mouth of the Odie River frequently report incidental catches of smaller lake sturgeon.

This reach 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, especially if development of Keeyask Generating Station is approved.

Although Tataskweyak Cree Nation and York Factory Cree Nation are members of the Nelson River Sturgeon Board, the Board was formed to address issues upstream of Kelsey Generating Station, and is not active downstream.

Current Status:

- This reach is considered historically depleted by the commercial fishery. By the 1950s it was not considered a commercially productive reach and never produced significantly once the fishery reopened in 1970.
- Construction of Kelsey Generating Station in 1960 would have cut off upstream movement of the remaining remnant population.
- However, recent studies have shown that there is a significant population in Gull Lake. Lake sturgeon in Split Lake appear to move to First Rapids near the mouth of the Burntwood River, presumably to spawn.
- Manitoba Hydro continues to fund studies in this area in support of future development plans.
- The only harvest is subsistence harvest.
- Commercial by-catch is thought to be extremely low.

Management Approach:

- Work to expand the engagement of the Split Lake Resource Management Board in lake sturgeon management.
- Over the long term, it would be preferable to have Tataskweyak Cree Nation and York Factory Cree Nation also bring lake sturgeon management discussions in this area to the Nelson River Sturgeon Board. They are already members, and the information being gathered in this area is of interest to the other Board members.

Kettle Generating Station to Longspruce Generating Station (MU 4):

Kettle Generating Station was completed in 1974 on the site of large rapids. There is some debate about the degree to which lake sturgeon would have traversed the rapids, although it seems likely that the rapids were capable of allowing fish movement. The generating station separated lake sturgeon in the lower Nelson River from upstream reaches. This is a short reach of river between two generating stations (Kettle and Longspruce). Habitat is thought to be limiting and it is not known if sufficient habitat exists for all life history stages. Manitoba Hydro

is funding investigations in this area and assessing the potential for enhancement. The ability of this reach to support a self sustaining population is not known, although there are examples in the Winnipeg River of self sustaining populations in reaches smaller than this one.

This area is fully within the Split Lake Resource Area.

Current Status:

- Lake sturgeon are known to exist in this reach, but it is considered unlikely that there is a self sustaining population. The potential for a self sustaining population to establish is considered low, and dependant on there being suitable habitat to support all life history stages. Lake sturgeon in this area are isolated by the generating stations both upstream and downstream.
- Harvest is thought to be minimal.

Management Approach:

- Other areas continue to be a higher priority with more potential to recover stocks.
- Manitoba Hydro continues to fund studies in this area in support of future development plans.
- The Split Lake Resource Management Board may wish to consider the future management direction for this area.

Longspruce Generating Station to Limestone Generating Station (MU 5):

Longspruce Generating Station was completed in 1979 on the site of a rapids. This is a short reach of river between two generating stations (Longspruce and Limestone). Habitat is thought to be limiting and it is not known if sufficient habitat exists for all life history stages. Manitoba Hydro is funding investigations in this area and assessing the potential for enhancement. The ability of this reach to support a self sustaining population is not known, although there are examples in the Winnipeg River of self sustaining populations in smaller areas. Based on the Winnipeg River example, it is thought that the limiting factor will be the availability of habitat to support all life history stages as opposed to the size of the reach.

This area is fully within the Split Lake Resource Area.

Current Status:

- Lake sturgeon are known to exist in this reach, but it is considered unlikely that there is a self sustaining population. The potential for a self sustaining population to establish is considered low, and dependant on there being suitable habitat to support all life history

stages. Lake sturgeon in this area are isolated by the generating stations both upstream and downstream.

- Harvest is thought to be minimal.

Management Approach:

- Manitoba Hydro continues to fund studies in this area in support of future development plans.
- The Split Lake Resource Management Board may wish to consider the future management direction for this area.

Limestone Generating Station to Hudson Bay (MU 6):

Limestone Generating Station was completed in 1990. This reach extends downstream without longitudinal barriers until it reaches Hudson Bay.

This stretch of river is subject to regular fluctuations in water flows and levels as Manitoba Hydro varies flows through the three lower Nelson River generating stations to meet power demands. The extent of the water level fluctuations decreases with distance downstream of Limestone Generating Station. Immediately below Limestone Generating Station, the water level fluctuations can be dramatic, dewatering large areas of river bed on a daily basis. The affect of this on different life history stages has not been assessed.

Historical commercial production from this area was not thought to be high although early records make it difficult to distinguish harvest areas accurately. By the 1950s this area was not considered a significant source of commercial lake sturgeon. When the Nelson River fishery reopened in 1970, the area from Kettle Generating Station downstream was a separate management area and there was almost no harvest. When this area was closed to commercial fishing in 1994 there was already no fishing occurring.

The combination of lack of commercial production, extensive hydroelectric development upstream and its remoteness lead to conclusions that there were few lake sturgeon in this reach. However, studies conducted as part of the environmental assessment of the Limestone Generating Station found that the lake sturgeon population in the lower Nelson River was much higher than previously thought. Studies funded by Manitoba Hydro as part of the environmental assessment for the proposed Conawapa Generating Station has shown that this is one of the healthier lake sturgeon stocks on the Nelson River.

These studies have also identified movements between this reach and the Hayes and Gods river systems (DU 7). The extent of these movements is not yet known, nor is the degree to which

lake sturgeon populations in the lower Nelson and Hayes River system may be related and/or interdependent. Manitoba Hydro continues to fund studies to examine where lake sturgeon from the lower Nelson and Hayes are genetically similar to one another.

Two significant spawning areas have been identified in this area - Lower Limestone Rapids and Weir River. Both offer potential as a spawn collection site if stocking is eventually determined to be desirable for this area.

Studies funded by Manitoba Hydro have added substantially to the knowledge of lake sturgeon populations and habitat use in this area.

This area is within the Split Lake, Fox Lake and York Factory Resource Management Areas. The majority of it is within the Fox Lake Resource Management Area including the spawning sites identified at Lower Limestone Rapids and the mouth of the Weir River. Although the Fox Lake Resource Management Board has a mandate for resource use planning in this area, there has been only limited discussion of lake sturgeon management with the Board. There is potential for this role to be expanded, especially if development of Conawapa Generating Station is approved.

Unlike Tataskweyak Cree Nation and York Factory Cree Nation, Fox Lake Cree Nation is not a member of the Nelson River Sturgeon Board. The Board was formed to address issues upstream of Kelsey Generating Station, and is not active downstream. However, there would be value in broadening the discussion of lake sturgeon management on the Nelson River by including Fox Lake Cree Nation.

With the construction of the Conawapa road, access into this area improved. When the road was first built, it was assumed that construction of Conawapa Generating Station would follow soon afterwards and that a resource management plan would be developed for the area. When construction of the dam was postponed the road and access remained, but no management plan was developed. With the improved access an increased number of harvesters had access to the area and harvest of the stock around the mouth of the Weir River increased. The Fox Lake Resource Management Board has had some concerns about the number of people accessing the area and harvesting lake sturgeon. The development of a resource use plan for this area is within its mandate.

Current Status:

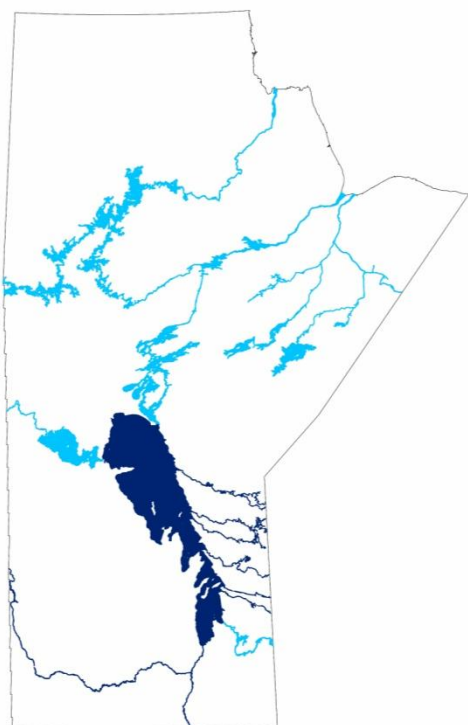
- Stocks appear to be in good shape despite a highly varied flow regime.
- Until recently, harvest was not a concern. Since the construction of the Conawapa Road, harvest in the Weir River area has increased. The Fox Lake Cree Nation and Fox Lake Resource Management Board are concerned.

Management Approach:

- Work with the Fox Lake Resource Management Board to develop a resource use plan for lake sturgeon in this area. The development of this plan may be tied to the proposed development of Conawapa Generating Station since the Fox Lake Cree Nation is a partner in the development.
- Manitoba Hydro continues to fund studies in this area in support of future development plans.
- The Nelson River Sturgeon Board is not active in assessing lake sturgeon populations in this area, however there would be advantages to Fox Lake Cree nation becoming involved in the discussions with the other communities on the Board. Encourage Fox Lake Cree Nation to join the Nelson River Sturgeon Board.

Red – Assiniboine River, Lake Winnipeg (DU 4)

Lake Winnipeg, its east side tributaries and the Red and Assiniboine rivers cover a massive area, most of it historically depleted of lake sturgeon.



Assiniboine River (MU 1):

Lake sturgeon were known to occur throughout this river, but were extirpated by historical fishing and barriers to fish movement.

The Assiniboine River is controlled by three major water control structures. The Shellmouth Dam situated west of Inglis, Manitoba was constructed for downstream flood protection and created Lake of the Prairies. This is an impassable barrier and has eliminated any movement into the upper reaches of the Assiniboine River.

The Brandon 3rd Street Dam is within the City of Brandon. It was constructed to ensure adequate water

for the city's water treatment plant. This can be a barrier to movement during low water events. Plans are in place to correct this.

The Portage La Prairie Assiniboine River Diversion is situated west of the City of Portage La Prairie. During high water events it provides flood protection by diverting waters from the Assiniboine River north to Lake Manitoba instead of east to the City of Winnipeg. This is a barrier during low or high water events and may adversely affect movement. The Diversion also provides a route for lake sturgeon to enter Lake Manitoba, a waterbody that did not traditionally have lake sturgeon.

Nearly all the major tributaries of the Assiniboine River such as the Little Saskatchewan River, Birdtail River and Qu'Appelle River have established water control structures that are complete barriers to upstream movement.

In 1996, lake sturgeon were stocked near the City of Brandon. Stocking has continued depending on stock availability until present. A total of 16,683 lake sturgeon have been stocked to date, with the stock originating from three separate areas - the Winnipeg River, Saskatchewan River and Nelson River (Table B-5). Since there are no naturally occurring brood stocks, there is no choice but to stock from other areas. The majority of stocking has been with Winnipeg River stock.

Angler reports provide evidence that stocking has been effective. The success of stocking this area provides valuable insight into the potential to re-establish lake sturgeon populations in other areas where natural recovery is unlikely to occur.

Current Status:

- Stocking has re-established lake sturgeon in portions of the Assiniboine River. Their range, according to angler reports, is as far upstream from the Qu'Appelle River in Saskatchewan to downstream to the Spruce Woods Provincial Park. A report from a Lake Manitoba commercial fisherman indicates that a lake sturgeon was caught from the north end of Lake Manitoba. This report was never verified.
- The oldest stocked lake sturgeon would only be 16 years of age in the spring of 2012 and it is unknown if they will become a self sustaining population.

Management Approach:

- Establish whether or not lake sturgeon have started to reproduce naturally in the Assiniboine River. If they have, identify spawning habitat.

- Experimental stocking appears to be successful. Once the necessary tools for widespread stocking are in place, this area should be considered for stocking with lake sturgeon originating from the Winnipeg River.
- Establish seasonal movement, range and critical habitats requirements to assist in protecting the developing population.

Red River (MU 2&3):

Historically, the Red River provided an important movement corridor for adult lake sturgeon from Lake Winnipeg to spawning areas such as the St. Andrews rapids, as well as spawning locations in tributaries further upstream. The construction of the St. Andrews dam in 1910 created a barrier to upstream movement and flooded the St. Andrews rapids. The St. Andrews dam at Lockport is equipped with a fish ladder, but its current design disallows use for mature lake sturgeon. Significant efforts are underway to remove barriers to fish passage in the Red River south of the International border. In conjunction with barrier removal, Minnesota has initiated a lake sturgeon recovery strategy that includes stocking as well as habitat restoration and protection. While historic records exist of lake sturgeon using small tributaries of the Red River, it is unknown how extensive this use may have been.

It is unlikely that this stock will recover without a lake sturgeon recovery strategy specific to Lake Winnipeg and lower Red River. The recovery strategy would likely include stocking, enhancing river connectivity, and habitat restoration. The strategy would also need to address the substantial commercial gill net fishery on Lake Winnipeg and how it may affect the recovery efforts.

Current Status:

- Lake sturgeon in this area are considered to be nearly extirpated with a remnant population of unknown size being encountered rarely by anglers. There have been lake sturgeon stocked in the upper reaches of the Red River watershed in the State of Minnesota. Since 2002, 200,000 fry and 10,000 fingerlings (unmarked) have been stocked annually in Red River tributaries and headwater lakes. Some tagged juvenile lake sturgeon have also been released over these years. There have been several recaptures of tagged lake sturgeon on both the Red River and Lake Winnipeg originating from this stocking effort. These stockings are from the Rainy River stock (DU 6).
- A barrier to fish movement exists at Lockport, at least while gates are closed. There is possible passage through the locks and juvenile use of the fishway is unknown.

Management Approach:

- Continue to collect reports on incidental lake sturgeon captures by anglers.

Tributaries to Lake Winnipeg (MU 4, 5, 6, 7):

The main tributaries on the east side of Lake Winnipeg include the Bloodvein, Pigeon, Berens and Poplar rivers. Lake sturgeon are known to exist in these rivers. They have not been affected by commercial harvest or industrial development. Given the presence of potentially impassable rapids or falls near the mouth of each of these rivers it is considered possible that the populations in 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, not from the stock currently resident in the river.

Current Status:

- Province wide regulatory measures restricting harvest apply.

Management Approach:

- No additional action.

Lake Winnipeg (MU 8):

The largest lake sturgeon fishery in the Province occurred on Lake Winnipeg late in the 19th century. This historical commercial fishery depleted stocks to the point where they are considered nearly extirpated. Given the historic importance of Lake Winnipeg to the lake sturgeon population and its vast size, the lake has the potential to play an important role in the recovery of the species. Changes in the Lake Winnipeg fish community have occurred since the time when lake sturgeon were abundant. It is unknown what effect the change in the fish community or the change in benthic invertebrate community might have on the potential for lake sturgeon to recover.

It is unlikely that this stock will recover without a lake sturgeon recovery strategy specific to Lake Winnipeg and lower Red River. The recovery strategy would likely include stocking, enhancing river connectivity, and habitat restoration. The strategy would also need to address the substantial commercial gill net fishery on Lake Winnipeg and how it may affect the recovery efforts.

It is unclear if Lake Winnipeg could be repopulated by stocks originating in its tributaries. There are lake sturgeon in most of the major tributaries and as stocks increase there is potential for these fish to move into Lake Winnipeg and become resident there. In addition, stocking efforts in the upper reaches of some of these tributaries may also result in lake sturgeon moving into

Lake Winnipeg, and because of the stocking effort, their contribution may be greater than from naturally reproducing stocks. At this time fish from several different sources have been stocked into the Lake Winnipeg watershed including the:

- Winnipeg River (DU 5): stocked into both the Winnipeg and Assiniboine rivers,
- Saskatchewan River (DU 2): stocked into both the Saskatchewan and Assiniboine rivers,
- Nelson River (DU 3): stocked into both the Nelson River (where they have the ability to move upstream into Lake Winnipeg) and the Assiniboine River,
- Rainy River (DU 6): stocked into the upper reaches of the Winnipeg River in Ontario and the upper reaches of the Red River drainage in Minnesota.

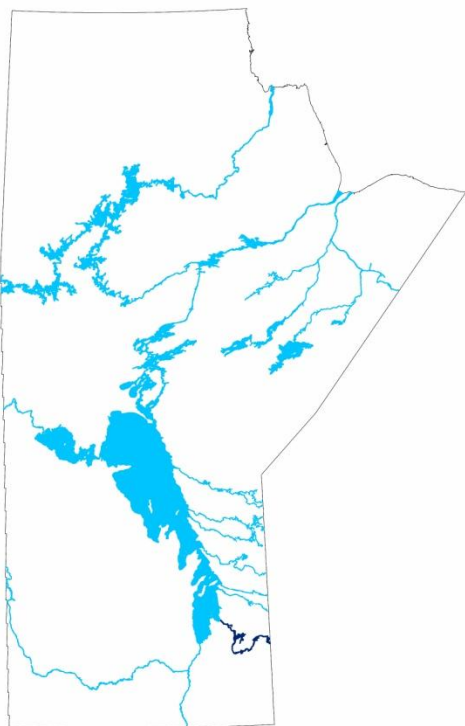
Current Status:

- Nearly extirpated.
- Province-wide regulatory measures apply which restrict harvest.

Management Approach:

- Continue to monitor occasional report of capture in commercial or subsistence fishing gear.

Winnipeg River (DU 5)



The Winnipeg River extends approximately 150 km from the Ontario Border to its mouth on Lake Winnipeg. There are six hydroelectric generating stations on the Manitoba portion of the river. These generating stations are used to divide the river into Management Units. It is not known how many of these areas constituted natural barriers prior to hydroelectric development.

Ontario to Point du Bois Generating Station (MU 4):

This MU encompasses sections of the Winnipeg River located in both Manitoba and Ontario. The Manitoba portion is approximately 46 km in length between the Ontario border and the Pointe du Bois Generating Station. Flows in MU4, and farther downstream (i.e. in MUs 5 to 9), are controlled by the Whitedog Falls

Generating Station and the Caribou Falls Generating Station in Ontario.

Recent studies in Ontario indicate that spawning does occur below the generating stations. However, due to the operational regimes (ponding and peaking) of these facilities, recruitment is sporadic. Spawning in the Manitoba portion of this MU has not been confirmed and little information is available on the population. Recent studies underway in the Ontario portion will provide updated information on this MU.

Most of the Manitoba portion of MU4 contains undeveloped shorelines except for the development at Point du Bois and three lodges in the upstream portion of the river. Fishing pressure on the Manitoba portion of the MU is minimal and would be best described as incidental catches in the recreational fishery. Targeted angling for lake sturgeon may occur but is considered minimal and all fish must be released.

Current Status:

- Most age classes are represented though adult fish are relatively uncommon, and there is evidence of recruitment but it is relatively low and sporadic based on OMNR information.
- In the Manitoba portion of MU4, the lake sturgeon occurs at lower densities than in MUs 5 and 6. Netting data from the early 1990s and recent netting in the Lamprey Rapids area substantiate the low density estimates between the Manitoba border and Pointe du Bois Generating Station.
- The current status is critical and the population trend is unknown or declining.

Management Approach:

- Maintain current Conservation Closure.
- Cooperation with OMNR in management strategies.
- Seek opportunities to conduct population assessment on the Manitoba portion of the MU.
- Assure that scientifically defensible methods can demonstrate that development will not adversely affect lake sturgeon habitat or populations.
- In the long term, work towards the development of a sturgeon board.

Point du Bois Generating Station to Slave Falls Generating Station (MU 5):

This is a relatively short reach of the Winnipeg River (10.5 km) and is primarily riverine in nature. It flows through moderate to steep scoured bedrock interspersed with islands and reefs. Maximum depth reaches 64 m in the areas below Eight Foot Falls. Development in the reach includes the town site of Pointe du Bois and cottages extending for 3 km downstream

along the western shoreline. The Pointe du Bois Generating Station is operated as a run-of-the-river facility and a major project to re-construct the spillway received environmental licencing approval in early 2012 and work has commenced.

Current information from research studies and work conducted for the Pointe du Bois reconstruction project Environmental Impact Statement support Fisheries Branch data that indicates a healthy population exists in this MU, likely at the carrying capacity of the available habitat. Although this is a relatively short reach of the river, indications are that all habitat requirements are in place to support all life stages for lake sturgeon. A recreational fishery for lake sturgeon exists in this MU with the concentration of effort below the Pointe du Bois Generating Station but as noted above for other reaches, all sturgeon must be released.

This area was stocked once as part of a research study (Table B-6).

Current Status:

- High density of lake sturgeon indicating a healthy population with a stable or increasing population.
- Likely at or near the carrying capacity for the available habitat.

Management Approach:

- Maintain current Conservation Closure.
- Ensure development does not affect habitat.
- In the long term, work towards the development of a sturgeon board.
- Monitor for potential impacts from the recreational fishery.

Slave Falls Generating Station to Seven Sisters Generating Station (MU 6):

This reach of the river is 40 km in length and flows through a series of lakes and riverine sections characterized by moderate to steep shorelines and numerous islands and reefs. The maximum depth in this reach is 40 m. Flow regulation in this reach is through the Slave Falls Generating Station and is operated as a run-of-the-river facility. Development is extensive in the lower sections of this MU, from Nutimik Lake downstream, and is primarily provincial campgrounds, cottages and the town sites of Pinawa and Seven Sisters. Recreational angling does occur for lake sturgeon in this reach and is on a catch and release basis.

This reach has been the site of significant research over the past two decades. Fisheries Branch has been conducting on an on-going tagging program since the early 1980's in addition to extensive work on various aspects of lake sturgeon life history conducted by researchers with the Canadian River's Institute (University of New Brunswick). Spawning has been documented

immediately below the Slave Falls Generating Station and at Sturgeon Falls and stocking has occurred for both management and research purposes (Table B-7).

Current Status:

- Since documented declines in the early 1990s, the population in this MU is showing signs of recovery. Research and monitoring programs indicate cohort strength is improving since the species conservation closure was implemented.
- This population is considered healthy and the population trajectory is stable.

Management Approach:

- Maintain current Conservation Closure.
- Assure that scientifically defensible methods can demonstrate that development will not adversely affect lake sturgeon habitat or populations.
- In the long term, work towards the development of a sturgeon board.
- Monitor for potential impacts from the recreational fishery.
- Continued enforcement on illegal harvest.

Seven Sisters Generating Station to McArthur Falls Generating Station (MU 7):

This reach of the river is 35 km in length 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 the hydro development. The upper 20 km of the reach is riverine in nature and widens into Lac du Bonnet. It also receives flows from the Bird River to the east and both the Whitemouth River and the Lee River to the south. Numerous islands and reefs are scattered throughout the MU and the maximum depth is 24 m just upstream of the MacArthur Generating Station. Flow regulation in this reach is through the Seven Sisters Slave Generating Station and is operated as a run-of-the-river facility. Development in this MU is extensive and includes the town sites of Seven Sisters and Lac du Bonnet and cottage development along significant portions of the shoreline.

Lake sturgeon are known to occur in this reach. However, little information on the population is available. Recent work indicates lake sturgeon are known to spawn below the Seven Sisters Generating Station. Angler reports and incidental catches in annual index netting programs targeting other species indicate various size classes are present. Stocking for research purposes has occurred in this reach however results are not known at this time (Table B-8).

Current Status:

- Given the limited information available, both the population status and trend are unknown.
- Recent studies immediately downstream of the Seven Sisters Generating Station indicate successful spawning does occur.

Management Approach:

- Maintain current Conservation Closure.
- Assure that scientifically defensible methods can demonstrate that development will not adversely affect lake sturgeon habitat or populations.
- In the long term, work towards the development of a sturgeon board.
- Monitor for potential impacts from the recreational fishery.
- Seek opportunities to conduct population assessment on the Manitoba portion of the MU.

McArthur Falls Generating Station to Great Falls Generating Station (MU 8):

This is the shortest reach of the river in the DU extending 8.6 km from the MacArthur Generating Station to the Great Falls Generating Station. It is riverine in nature 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 the hydro development. Flow regulation in this reach is through the McArthur Generating Station and is operated as a run-of-the-river facility. Development along this portion is minimal with only the small town site of McArthur Falls at the site of the generating station.

Lake sturgeon are known to occur within the MU however very little information is available. Previous experimental netting programs resulted in low numbers of captured lake sturgeon. Anglers also report catching lake sturgeon in this MU. Recent studies have been initiated on this reach to address this information gap. Stocking for research and management purposes has occurred in this reach however results are not known at this time (Table B-9).

Current Status:

- Given the limited information available, both the population status and trend are unknown.

Management Approach:

- Maintain current Conservation Closure.

- Assure that scientifically defensible methods can demonstrate that development will not adversely affect lake sturgeon habitat or populations.
- In the long term, work towards the development of a sturgeon board.
- Monitor for potential impacts from the recreational fishery.
- Seek opportunities to conduct population assessment on the Manitoba portion of the MU.

Great Falls Generating Station to Pine Falls Generating Station (MU 9):

This reach of the river is 22.5 km in length characterized by moderate to gently sloping shorelines with a mix of boreal forest and developed farming and residential shorelines. It also receives inflow from the Maskwa River and Catfish Creek. Development in this MU 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.

Lake sturgeon are known to occur within the MU however very little information is available. Previous experimental netting programs resulted in low numbers of captured lake sturgeon. Anglers also report catching lake sturgeon in this MU. Recent studies have been initiated on this reach to address this information gap. Stocking for research and management purposes has occurred in this reach however results are not known at this time (Table B-10).

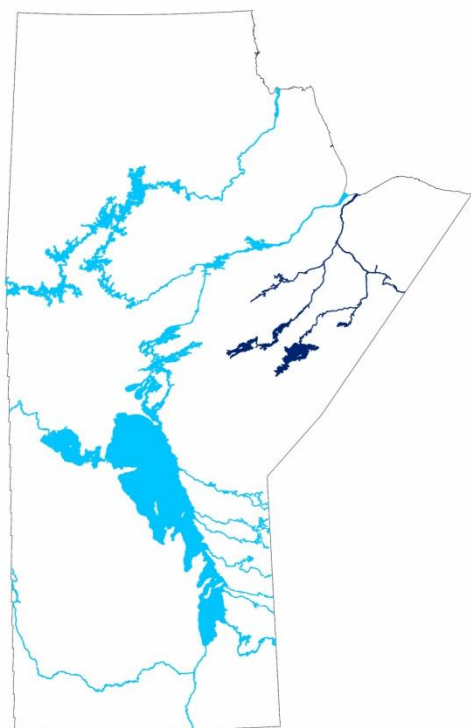
Current Status:

- Given the limited information available, the both the population status and trend are unknown.

Management Approach:

- Maintain current Conservation Closure.
- Assure that scientifically defensible methods can demonstrate that development will not adversely affect lake sturgeon habitat or populations.
- In the long term, work towards the development of a Lake sturgeon board.
- Monitor for potential impacts from the recreational fishery.
- Seek opportunities to conduct population assessment on the Manitoba portion of the MU.

Hayes River (DU 7)



This area includes the Fox, Bigstone, Gods and Hayes rivers. The historic commercial fishery originally grouped all of these rivers together. Although records show that commercial fishing occurred as early as the 1940s, there was never a harvest on the scale that depleted other major river systems in Manitoba. When fishing reopened in 1970 following the Province wide closure, this area was separated into three reaches - Gods River, Hayes River and Fox/Bigstone Rivers. When the fishery reopened there was minimal harvest in the Gods and Hayes rivers. What little production there was came from the Fox/Bigstone rivers. As part of a Province-wide decision to close the commercial lake sturgeon fishery, the fisher on the Fox/Bigstone was given five years notice in 1995 of the Province's intent to close the Fox/Bigstone fishery. At the time, this was the only commercial lake sturgeon fishery left in the Province. Over the next five years, the fishery produced little before officially closing in 1999.

This area is not considered historically depleted, however productivity appears to be much lower than it was for the larger rivers. While there does not appear to be much need for recovery of this population, there may also be issues with sustainability if harvest pressure increases.

There are recent tagging studies funded by Manitoba Hydro that show movement of lake sturgeon from the lower Nelson River far upstream into the Hayes River system. The degree to which lower Nelson and Hayes River stocks are connected is not known. Further research is warranted since the degree to which the two systems are inter-connected has management implications.

Current Status:

- Stocks throughout this reach are considered to be in good condition and not in need of recovery.
- The productivity of this system is considered to be lower than larger rivers in the province which means that any increase in harvest should be viewed cautiously.

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- Subsistence harvest by First Nations on this system is considered to be at a relatively low level and to be sustainable.
- There is no large scale development under consideration for this system.

Management Approach:

- The existing regulatory prohibition on commercial fishing and recreational angling harvest is adequate to protect this population.
- Continue to review information collected by Manitoba Hydro on movements between the Hayes and lower Nelson rivers.
- If increased subsistence harvest is proposed as part of an Alternative Access Program arising out of future hydroelectric development, a management plan with supporting stock assessment will be necessary.

Appendix A: Sturgeon Board Membership

Table A-1. Saskatchewan River Sturgeon Management Board members.

Cumberland House Cree Nation
Cumberland House Fishermen's Co-op
Fisheries and Oceans Canada
Conservation and Water Stewardship, Fisheries Branch
Manitoba Hydro
Opaskwayak Cree Nation
Opaskwayak Commercial Fishermen's Co-op
Saskatchewan Northern Affairs
SaskPower
Saskatchewan Watershed Authority
Saskatchewan Environment

Table A-2. Nelson River Sturgeon Board members.

Cross Lake First Nation
Norway House Cree Nation
Pikwitonei
Tataskweyak Cree Nation
Thicket Portage
Wabowden
York Factory Cree Nation
Manitoba Aboriginal and Northern Affairs
Conservation and Water Stewardship, Fisheries Branch
Manitoba Hydro

Appendix B: Stocking Records

Saskatchewan River Stocking

Table B-1. Lake sturgeon fingerling stocking in the Manitoba portion of the Saskatchewan River.

Year	Fingerlings Stocked
1999	7,500
2000	
2001	
2002	
2003	67
Total	7,567

Table B-2. Lake sturgeon fry and fingerling stocking in Saskatchewan portion of the Saskatchewan River.

Year	Stocking	
	Fry	Fingerlings
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 Stocking

Table B-3. Lake sturgeon fingerling stocking in the Lake Winnipeg to Whitemud Falls reach.

Year	Stocking	
	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	42*
2010	1,144	
2011	4,063	591*
Total	35,163	1,104

*Tagged.

Table B-4. Lake sturgeon fingerling stocking in the Whitemud Falls to Kelsey Generating Station reach.

Year	Fingerlings Stocked
1998	141
1999	
2000	1,767
2001	9,347
2002	
2003	5,210
Total	16,465

Assiniboine River Stocking

Table B-5. Lake sturgeon stocked into the Assiniboine River. Some stocking was in support of research projects.

Year	Stocking				Source
	Fry	Fingerlings	Yearlings+	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
Total	4,000	12,416	205	62	

*Tagged.

Winnipeg River Stocking

Table B-6. Lake sturgeon stocked into MU 5 of the Winnipeg River. Stocking was in support of research projects.

Year	Stocked			
	Fry	Fingerlings	Yearlings+	Adults
2009		7,000		
Total		7,000		

Table B-7. Lake sturgeon stocked into MU 6 the Winnipeg River. Some stocking was in support of research projects.

Year	Stocked			
	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
Total				

Table B-8. Lake sturgeon stocked into MU 7 of the Winnipeg River. Some stocking was in support of research projects.

Year	Stocked			
	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

Table B-9. Lake sturgeon stocked into MU 8 of the Winnipeg River. Some stocking was in support of research projects.

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

Table B-10. Lake sturgeon stocked into MU 9 of the Winnipeg River. Some stocking was in support of research projects.

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

