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Proceedings of the Central and Arctic Regional Science Advisory Process to assess whether upstream passage is needed for Lake Sturgeon at the Pointe du Bois generating station (Winnipeg River)

22 October 2009

Freshwater Institute
Winnipeg, MB

Thomas Pratt
Meeting Chairperson

Holly Cleator
Editor

Compte rendu du processus de consultation scientifique régional du Centre et de l'Arctique sur la nécessité, pour l'esturgeon jaune, d'un passage vers l'amont à la centrale de Pointe-du-Bois (rivière Winnipeg)

le 22 octobre 2009

Institut des eaux douces
Winnipeg, MB

Thomas Pratt
Président de réunion

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Réviseurs scientifiques

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Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings include research recommendations, uncertainties, and the rationale for decisions made by the meeting. Proceedings also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

Avant-propos

Le présent compte rendu a pour but de documenter les principales activités et discussions qui ont eu lieu au cours de la réunion. Il contient des recommandations sur les recherches à effectuer, traite des incertitudes et expose les motifs ayant mené à la prise de décisions pendant la réunion. En outre, il fait état de données, d'analyses ou d'interprétations passées en revue et rejetées pour des raisons scientifiques, en donnant la raison du rejet. Bien que les interprétations et les opinions contenus dans le présent rapport puissent être inexacts ou propres à induire en erreur, ils sont quand même reproduits aussi fidèlement que possible afin de refléter les échanges tenus au cours de la réunion. Ainsi, aucune partie de ce rapport ne doit être considéré en tant que reflet des conclusions de la réunion, à moins d'indication précise en ce sens. De plus, un examen ultérieur de la question pourrait entraîner des changements aux conclusions, notamment si l'information supplémentaire pertinente, non disponible au moment de la réunion, est fournie par la suite. Finalement, dans les rares cas où des opinions divergentes sont exprimées officiellement, celles-ci sont également consignées dans les annexes du compte rendu.

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TABLE OF CONTENTS

SUMMARY

Manitoba Hydro must modernize the Pointe du Bois Generating Station on the Winnipeg River, which will involve replacing the spillway and associated dam segments. The new spillway may be located slightly downstream of the existing one, but still on the spillway shelf. The powerhouse may also be replaced by building a new one east of and at the same axis as the existing one, or it may be repaired or rehabilitated with no change in footprint. No decision regarding the powerhouse options has been made. The Winnipeg River, between the Pointe du Bois and Slave Falls Generating Stations, contains abundant numbers of Lake Sturgeon (*Acipenser fulvescens*) which spawn at the base of Pointe du Bois spillway shelf and at the outlet of the existing powerhouse. Lake Sturgeon in the Winnipeg River were assessed as Endangered in 2006 by the Committee on the Status of Endangered Wildlife in Canada. Changes to the Pointe du Bois Generating Station would likely impact the spawning success of Lake Sturgeon below the Station. For that reason, DFO Habitat Management requested advice from Science on whether upstream passage at the Pointe du Bois Generating Station would be beneficial or detrimental to Lake Sturgeon in the Winnipeg River given the potential negative impacts of the proposed new structures on sturgeon spawning habitat below Pointe du Bois, the overall status of sturgeon in the Winnipeg River and the uncertainty surrounding the quality of habitat upstream of Pointe du Bois.

A regional science peer review meeting was held on 22 October 2009 to develop the science advice. Meeting participants included DFO Science, Habitat Management and Species at Risk sectors of the Central and Arctic Region, and specialists from Manitoba Water Stewardship, Ontario Ministry of Natural Resources, Manitoba Hydro, Sagkeeng First Nation, North/South Consultants Inc. and State University of New York – Oswego. Several conclusions were reached. Modernization of the Pointe du Bois Generating Station would change the configuration of the station, thereby altering current flow patterns and habitat availability. These changes could impact spawning habitat suitability. The extent of impact, and its effect on spawning success, would depend on the Generating Station design option chosen. Potential advantages and disadvantages were identified with providing upstream passage for Lake Sturgeon at the Pointe du Bois Generating Station. The key potential benefits would be to increase genetic diversity within the Winnipeg River and to allow Lake Sturgeon, which may be at or near carrying capacity below the GS, to move upstream into areas where unfilled habitat may be available and Lake Sturgeon abundance is lower. The key potential disadvantage would be the loss of Lake Sturgeon from the healthy population downstream of the GS, to the area upstream where the availability of suitable habitat and potential risk of harm is unknown. Several gaps in knowledge need to be filled before a complete assessment can be conducted.

SOMMAIRE

Manitoba Hydro doit moderniser sa centrale de Pointe-du-Bois sur la rivière Winnipeg, ce qui nécessitera le remplacement de l'évacuateur de crue et de segments connexes du barrage. Le nouvel évacuateur de crue sera situé légèrement en aval de l'évacuateur de crue actuel, mais demeurera sur la même plateforme que celui-ci. La centrale actuelle pourrait également être remplacée par une nouvelle, qui se situerait à l'est de la centrale actuelle, mais dans le même axe que celle-ci. La centrale actuelle pourrait aussi être réparée ou remise en état sans qu'aucun changement ne soit apporté à sa superficie au sol. Aucune décision n'a été prise sur les options relatives à la centrale jusqu'à maintenant. Le tronçon de la rivière Winnipeg situé entre les centrales de Pointe-du-Bois et de la chute des Esclaves contient un nombre important d'esturgeons jaunes (*Acipenser fulvescens*) qui fraient à la base de la plateforme de l'évacuateur de crue et de la conduite d'évacuation de la centrale de Pointe-du-Bois. L'esturgeon jaune de la rivière Winnipeg a été désigné en tant qu'espèce en voie de disparition en 2006 par le Comité sur la situation des espèces en péril au Canada (COSEPAC). Les changements proposés à la centrale de Pointe-du-Bois auront vraisemblablement des conséquences sur la capacité reproductive de l'esturgeon jaune en aval de la centrale. Pour cette raison, Gestion de l'habitat a demandé l'avis du secteur des Sciences afin de savoir si l'aménagement d'un passage vers l'amont de la centrale de Pointe-du-Bois serait bénéfique pour l'esturgeon jaune qui fréquente la rivière Winnipeg ou si cela lui causerait du tort, étant donné les impacts négatifs que pourraient avoir les nouvelles structures proposées sur l'habitat de frai de l'esturgeon jaune en aval de la centrale de Pointe-du-Bois, la situation générale de l'esturgeon jaune dans la rivière Winnipeg et l'incertitude entourant la qualité de l'habitat en amont de la centrale de Pointe-du-Bois.

Une réunion du processus régional d'examen par des pairs des Sciences a eu lieu le 22 octobre 2009 pour la formulation de l'avis scientifique. Parmi les participants à cette réunion, mentionnons : des représentants des Sciences, de Gestion de l'habitat et d'Espèces en péril de la Région du Centre et de l'Arctique, des spécialistes d'Intendance de l'eau du Manitoba, du ministère des Richesses naturelles de l'Ontario, de Manitoba Hydro, de la Première nation Sagkeeng, de North/South Consultants Inc. et de l'Université de l'État de New York – Oswego. Les participants sont parvenus à plusieurs conclusions. La modernisation de la centrale de Pointe-du-Bois changerait la configuration de celle-ci, ce qui affecterait les profils d'écoulement actuels et l'habitat disponible. Ces changements pourraient avoir des impacts sur la qualité de l'habitat de frai. L'étendue de ces impacts et leurs effets sur la capacité reproductive de l'esturgeon jaune dépendront du concept de centrale choisi. Le compte rendu indique les avantages et inconvénients possibles de la construction d'un passage, pour l'esturgeon jaune, vers l'amont de la centrale de Pointe-du-Bois. Les avantages clés sont que ce passage pourrait accroître la diversité génétique au sein de la rivière Winnipeg et permettre à l'esturgeon jaune, qui pourrait avoir atteint ou être prêt d'atteindre la capacité biotique en aval de la centrale, de se remonter vers l'amont où des habitats non utilisés pourraient être disponibles et où l'abondance de l'esturgeon jaune est plus faible. Les principaux inconvénients sont que ce passage pourrait réduire les effectifs d'esturgeons jaunes dans la population saine en aval de la centrale au profit de la zone en amont dont on ne sait pas si elle comporte des habitats appropriés et si elle présente un risque de dommages. Plusieurs lacunes dans les connaissances devront être comblées avant qu'une évaluation complète puisse être effectuée.

INTRODUCTION

Starting in 1909, a hydroelectric generating station (GS) was built at Pointe du Bois falls, approximately 125 km east of the City of Winnipeg, on the Winnipeg River. Manitoba Hydro purchased the facility in 2002 and must now modernize it to bring it up to current dam safety guidelines.

In November 2006, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessed the Winnipeg River – English River Lake Sturgeon (*Acipenser fulvescens*) populations, known as Designatable Unit (DU) 5, as Endangered (COSEWIC 2006). Experts at a recent Fisheries and Oceans Canada (DFO) Recovery Potential Assessment (RPA) meeting identified the status of the nine Management Units (MUs) in DU5 as two healthy, one cautious, two critical and four unknown. One of healthy MUs is the river reach from the Pointe du Bois GS downstream to the Slave Falls GS (MU5), which is known to contain abundant numbers of Lake Sturgeon. This may be due, in part, to the availability of good spawning sites below the Pointe du Bois GS. Changes to the GS would likely impact this spawning habitat. It is unknown whether upstream fish passage existed at Pointe du Bois falls prior to construction of the GS, however it may have been possible during high flow years and some First Nations elders support this contention (T. Dick, pers. comm. to C. Churchward 2008). Downstream passage is possible at Pointe du Bois.

The purpose of this meeting, as described in the Terms of Reference (Appendix 1), was to assess whether upstream passage at the Pointe du Bois Generating Station would be beneficial or detrimental to Lake Sturgeon in the Winnipeg River given the potential negative impacts of the proposed changes to the GS on Lake Sturgeon spawning habitat below Pointe du Bois, the overall status of this species in the Winnipeg River and the uncertainty surrounding the quality of habitat upstream of Pointe du Bois. Meeting participants (Appendix 2) included DFO Science, Habitat Management and Species at Risk sectors of the Central and Arctic Region, and specialists from Manitoba Water Stewardship, Ontario Ministry of Natural Resources, Manitoba Hydro, Sagkeeng First Nation, North/South Consultants Inc. and the State University of New York – Oswego. The meeting generally followed the agenda outlined in Appendix 3.

The meeting was convened on 22 October 2009 at 10:30 AM. After performing a round of introductions, the Chair provided a brief introduction to the meeting. He explained the meeting objective, noting that the science advice resulting from the meeting would not include any socio-economic considerations.

PRESENTATIONS

Pointe du Bois modernization: project overview

Presenter: Halina Zbigniewicz, Manitoba Hydro

The Pointe du Bois GS was constructed 100 years ago and is now the oldest dam and power plant in Manitoba. The spillway is positioned perpendicular to the Winnipeg River at a natural set of falls (Figure 1). The powerhouse is located on the opposite side of the river at the end of an excavated channel adjacent to the falls. The spillway contains 97 bays which are operated manually. When flows are low, most water flows through the power plant rather than through the spillway. The spillway does not meet current dam safety guidelines and the concrete has deteriorated and cannot be retrofitted. The powerhouse infrastructure is also showing signs of deterioration. Three options are being considered to update the GS: (1) build a new spillway

and powerhouse, (2) build a new spillway and renovate the existing powerhouse, by replacing the generators, or (3) build a new spillway and repair/maintain the existing plant and systems. Replaced structures would be decommissioned.

There are several common elements to all three options. A new spillway and associated dam segments would be built and the existing range of water levels in the forebay and tailrace would be maintained. All of the options would involve significant construction, regulatory obligations and balance considerations related to safety (top priority), the environment, technical feasibility and cost. To date, various meetings and consultations about the proposed modernization of the GS have been held with regulators, including DFO, as well as First Nations and the public.

A tentative timeline was presented. A decision on how to modernize the GS will be made in fall 2009. Construction of a vehicle access bridge will be undertaken in winter or spring 2010. A draft EIS and second round of consultations are expected in mid-2010, filing for approvals in late 2010 and construction in 2011.

A new spillway will be built regardless of the option chosen. If the powerhouse undergoes a full rebuild then the capacity of the powerhouse will increase from the current 78 MW to 120 MW. Typically peak water flows occur in spring and spills occur at Pointe du Bois about 70% of the time. If only the spillway is replaced this will remain unchanged. However, if the generating station is also replaced the frequency of spill will change from 70% of the time, as it is now, to 30%.

There will be changes in water velocity but the magnitude has yet to be determined. The maximum and minimum heights of the forebay will not be any higher or lower, respectively, than at present (< 0.3 m). However, the forebay area will increase slightly because the new spillway will be located a little downstream of the existing one. This means the short length of river between the current location and new location of the spillway, which is now only intermittently wetted during spills, will become permanently covered with water. The number of spillway bays will be reduced from the existing 97 to less than 10, thus spill will be more concentrated. Ramping rates will be determined by the final design option chosen. The Pointe du Bois GS will remain a run-of-the-river facility.

Summary of aquatic ecosystem studies focusing on Lake Sturgeon: Pointe du Bois modernization project, 2006-2009

Presenter: Don MacDonell, North/South Consultants Inc.

Pointe du Bois GS

Before the Pointe du Bois GS was built, the Winnipeg River, between the Ontario border and Lake Winnipeg, consisted of a series of low-gradient areas interspersed with short stretches of rapids and big drops at waterfalls. Fish distribution was likely affected by numerous water falls and rapids including the Pointe du Bois falls which had a head of 45 feet (13.9 m).

Construction of the Pointe du Bois GS began in 1909. The GS became fully operational in 1926. Several other hydroelectric dams were also built on the Winnipeg River, resulting in seven well defined stretches of river within Manitoba.

Past and present Lake Sturgeon fisheries

A commercial fishery in the Winnipeg River harvested significant amounts of Lake Sturgeon: 79,000 kg in 1910; 145,437 kg between 1939 and 1947; and 28,800 kg between 1957 and 1959. Making assumptions about the average weight of Lake Sturgeon during these time periods provides estimates of the numbers of fish harvested: 4,390 18-kg fish in 1910; 7,138 15-kg fish during 1939-1942 and 2,378 15-kg fish during 1943-1947; and 2,400 12-kg fish during 1957-1959. These numbers would vary depending on the size and age of fish caught, gear used and so on. The commercial fishery ended in the 1960s. Recreational harvest for Lake Sturgeon persisted until a species conservation closure was implemented in the Manitoba portion of the Winnipeg River in 1993. No harvest is allowed although a popular catch-and-release fishery continues near the Pointe du Bois GS. The magnitude and locations of the historical domestic fishery (i.e. consumption by First Nations and others) for Lake Sturgeon in the Winnipeg River are unknown. The subsistence fishery by First Nations in Ontario waters is not currently active.

Description of Manitoba Hydro study

In 2006, Manitoba Hydro commenced an aquatic ecosystem study in the Winnipeg River above and below the Pointe du Bois GS. While the study focussed most of its attention on MU5, the 10.5 km stretch of river between the Pointe du Bois GS and Slave Falls GS, the study area encompassed the river from just upstream of Lamprey Rapids, about 13 river km above the Pointe du Bois GS (in the lower end of MU4), downstream to Scots Rapids (in the upper end of MU6), about 7 river km below the Slave Falls GS (Figure 2). Between 2006 and 2009, flow conditions in the study area varied significantly from low flow (2007) to exceptionally high flow (2009). The study was designed to understand the aquatic ecosystem around Pointe du Bois to aid in the mitigation of impacts of the proposed modernization of the GS, particularly on Lake Sturgeon. The research was not specifically directed at investigating fish passage at the Pointe du Bois GS. The investigation focussed on seven elements: habitat, water and sediment quality, lower trophic levels, fish communities and habitat associations, fish movements and spawning locations, fish mercury analysis and Lake Sturgeon studies.

The study examined several aspects of Lake Sturgeon biology and ecology within the study area, including the current size and condition of Lake Sturgeon, habitat use, important habitat and its physical attributes, and the extent of Lake Sturgeon movements. Study methods included the collection of substrate, water velocity and bathymetric data to describe habitat within the study area, egg mat, larval drift and modelling work to understand spawning, summer and fall gillnetting and mark-recapture studies to examine juvenile and adult habitat use and to generate population estimates, and the use of Floy® tags and acoustic telemetry to describe movements of Lake Sturgeon.

Habitat mapping

Habitat mapping focused on the Slave Falls reservoir (MU5). Downstream of the Pointe du Bois GS, water depths are generally between 2 and 25 m and the substrate is rocky. These conditions change below Eight Foot Falls where the bottom drops to about 200 feet (61 m) and the substrate turns to mostly sand in the main channel with some silt/clay. Water velocity within the study area depends on the flow regime, which will likely change locally once the GS has been modernized. Currently, water velocities throughout much of the study area range between 0 and 0.5 $m \cdot s^{-1}$ except in narrowed areas, like Eight Foot Falls, where water velocities can exceed 2 $m \cdot s^{-1}$. Lake Sturgeon are able to move through these higher-velocity areas. Velocities

and conditions of rapids at Eight Foot Falls and Lamprey Rapids (MU4) vary significantly depending on flow. In 2007, a low flow year, the water was relatively placid whereas in 2009, a high flow year, the rapids were relatively turbulent.

Species composition

Twenty fish species, including Lake Sturgeon, were captured in the Slave Falls reservoir (MU5) and the Pointe du Bois reservoir (MU4) between 2006 and 2009. The composition of fish species was generally similar upstream and downstream of the Pointe du Bois.

Lake Sturgeon spawning

During the current Manitoba Hydro study, egg mats were used to determine where spawning occurred. High egg densities were found in the areas where adults were spawning and in many cases identified spawning areas to within a few metres. Extensive egg deposition data provided a good understanding of the habitats that Lake Sturgeon are currently selecting for spawning.

Lake Sturgeon congregated at spawning areas just below the Pointe du Bois GS in all years. Spawning occurred below both the powerhouse and spillway with specific locations varying among years in relation to the flow regime. In years of high flow Lake Sturgeon tended to use the concentrated flow below the spillway more than below the station, but avoided areas of highest flow. Spawning was concentrated in the edge areas immediately adjacent to the highest flows. Spawning below the powerhouse was focused on specific locations. In 2007 when flow was low, they spawned over a broader area below the powerhouse and in specific areas of leakage below the spillway. Spawning started as early as May 10, or as late as June 2, depending on water temperature. No evidence of sexually mature Lake Sturgeon was found near Eight Foot Falls.

In 2008, water flow was stopped for six hours below the powerhouse while divers swam transects searching for eggs in an area where Lake Sturgeon had spawned three days earlier. Divers found eggs on the edge of where flow would have emanated from a turbine, but they found relatively few eggs in the overall area below the powerhouse. Predation was hypothesized as a possible explanation for their disappearance. Although the extent to which predation affects hatch success is unknown, it is suspected to play a role in the number of eggs hatching at Pointe du Bois. Predation also is expected to be a factor during larval drift. Higher levels of larval drift occurred during high flow (spill) years than during low flow (non-spill) years, though data are available for only one non-spill year. The study examined larval drift but not age-class strength due to issues associated with ageing Lake Sturgeon (i.e., the physical harm of removing ageing structures from fish and the reliability of ageing older fish). It was noted that the number of larvae is less important than the subsequent recruitment and that ageing juvenile Lake Sturgeon is more reliable than aging adults.

Upstream of the Pointe du Bois GS, spring gillnetting was conducted at 18 sites located above and below Lamprey Rapids in 2007 and 2009. Only two Lake Sturgeon (0.1 CPUE) were caught in 2007 compared with hundreds of fish (7.8-18.7 CPUE) caught during the same period in reaches downstream of the Pointe du Bois GS. No evidence of spawning was found around Lamprey Falls in either year in spite of significantly different flow conditions between the two years. It is not known whether Lake Sturgeon spawned there historically.

A Habitat Suitability Index (HSI) model is being developed to assess and mitigate the potential impacts of modernizing the Pointe du Bois GS on Lake Sturgeon spawning. It was uncertain

whether the model results would be transferable to other locations. Spawning adults appear to be selecting suitable spawning sites at the micro-habitat level, which may affect the precision of the model when used at other locations.

Distribution and habitat use

Between Lamprey Rapids and the Pointe du Bois GS (MU4), only 14 juvenile fish (300-800 mm fork length) were captured during summer and fall and four adult fish were captured during spring, thus an investigation of habitat use was not possible. The density of Lake Sturgeon in this reach was much lower than downstream of the GS. Researchers have found that Lake Sturgeon densities are typically low in the extreme lower portion of reservoirs in the Winnipeg River (e.g., Slave Falls, Seven Sisters). This may be attributed to the backwater effect from the generating stations which results in increased depths and lower water velocities compared to upstream reaches. Information about this species upstream of Lamprey Rapids, to the Manitoba-Ontario border, is lacking.

Below the Pointe du Bois GS, juvenile Lake Sturgeon (300-800 mm fork length) aggregated in deep-water areas between Eight Foot Falls and just upstream of Moose Creek. They were found in waters ranging from 4 to 27 m in depth, but most were captured in 15-27 m water depths. Fish with a fork length of less than 400 mm were only found at depths greater than 15 m. Juveniles were located over a variety of substrates but the highest catch-per-unit-effort (CPUE) was recorded over a mix of sand and gravel in deep, low-velocity areas. Few age-0 fish were captured during the study. They were captured below Eight Foot Falls, mostly over sand and gravel with a few over silt/clay substrate. The deep, sandy conditions in MU5 below Eight Foot Falls appear to be ideal for juvenile Lake Sturgeon

Following spawning, the majority of adult Lake Sturgeon were captured above Eight Foot Falls or farther downstream near the island between Mayos Bay and Moose Creek. They were primarily found in low-velocity areas over hard substrates, in waters ranging from 4 to 27 m in depth, though most were captured in 4-19 m water depths. Despite considerable netting effort, adult Lake Sturgeon were not captured at near-shore sites (< 3.5 m depths) in summer.

Movements

During this study, 1,780 Floy® tags were applied to Lake Sturgeon to examine the extent of movements. A small number (18) were deployed upstream of the Pointe du Bois GS (in MU4) and the rest downstream of the GS (in MU5). To date, 215 tagged fish have been recaptured. One recaptured fish had been tagged upstream of the Pointe du Bois GS and later recaptured downstream of the GS. Two others, tagged downstream of the Pointe du Bois GS, were later recaptured downstream of the Slave Falls GS (in MU6). These data indicate that at least a few Lake Sturgeon can, and occasionally do, move downstream past the GS.

Acoustic tags were surgically implanted in 32 Lake Sturgeon, including 10 juveniles, in 2006 and 2007. These tags were deployed below the Pointe du Bois GS: 13 in the upper reach and 19 in the middle reach. Based on the analysis conducted to date, all 10 juveniles implanted with acoustic transmitters in October 2006 remained downstream of Eight Foot Falls and upstream of Moose Creek which corresponded with the gillnet catch data. No adults have been detected in the lower reach of the reservoir or have moved downstream past the Slave Falls GS.

Population estimates

The Manitoba Fisheries Branch conducted an annual tagging program between 1983 and 1998. Dave Block's M.Sc. thesis examined age frequency and growth data and produced Jolly Seber population estimates for Lake Sturgeon in the Winnipeg River between the Pointe du Bois GS and Seven Sisters GS (MUs 5 and 6) for the period between 1994 and 1997. These population estimates ranged between 360 and 1,100 Lake Sturgeon with lower- and upper-most 95% CIs between 186 and 8,393, respectively (Block 2001). The most recent population estimate (1997) for the Slave Falls reservoir (MU5) was 648 fish (95% CI: 356-6,676). A more recent population estimate has been derived from the 2007 spring gillnetting data for adult fish (i.e., > 800 mm fork length) using software called Program MARK. An estimated 2,205 Lake Sturgeon (95% CI: 921-4,095) were present in MU5 in 2007. No analysis has been done yet to compare the age composition between the 1990s and 2007 population estimates. The current population contains numerous juveniles and adults suggesting that the population of Lake Sturgeon in MU5 is healthy. Due to the short length of the river between generating stations, habitat available to Lake Sturgeon is limited. The density of sturgeon in this reach of the Winnipeg River suggests that it could be near carrying capacity.

Status of Lake Sturgeon in MUs 4 and 5

MU4 is approximately 81 river km in total length between White Dog GS and Caribou GS in Ontario and the Pointe du Bois GS in Manitoba: about 27 km from White Dog GS to the Ontario-Manitoba border, 8 km from Caribou GS to the river mainstem and 46 km from the border to Pointe du Bois GS. Information on the status of Lake Sturgeon in MU 4 was based on the results of a recent DFO Recovery Potential Assessment meeting (DFO, in prep). The conservation status of Lake Sturgeon in MU4 is thought to be cautious and its population trajectory stable[1]. The Ontario Ministry of Natural Resources has conducted Lake Sturgeon research in the Ontario portion of MU4 during the past two years. There are known spawning locations there. No population estimate is available yet but hundreds of Lake Sturgeon, including juveniles, have been tagged. Researchers have age-class strength information which shows stronger cohorts were related to stronger water flows in Ontario. Few Lake Sturgeon have been found in the lower portion of MU4 in Manitoba but to date research effort there has been limited.

MU5 is 10.5 river km in length. Based on the recent Recovery Potential Assessment meeting, the current conservation status of Lake Sturgeon in MU5 is thought to be healthy and its population trajectory stable[2] (DFO, in prep.).

MUs 4 and 5 are important to the recovery of sturgeon in DU5. The recommended recovery target for DU5, to achieve a 99% probability of Lake Sturgeon persistence over 250 years assuming a balanced sex ratio and five-year spawning periodicity, is for each MU to have at least 413 annual female spawners (i.e., 4,130 adults) and 1,886 ha of suitable riverine habitat (Vélez-Espino and M.A. Koops, in prep.). MU5 does not contain enough total area to meet the recommended habitat target and, thus, the recommended abundance target. It was suggested that the density of Lake Sturgeon in MU5 could be near the carrying capacity of the habitat.

[1] Later discussions about MU4, which included additional expert opinion, resulted in a change in status to critical and trajectory to decreasing although there is evidence of some recruitment.
[2] Later discussions about MU5 resulted in a change in trajectory to stable or increasing.

GENERAL DISCUSSION

Historical commercial harvest probably was the primary cause of Lake Sturgeon population decline in the Winnipeg River. Since the only potential harvest now permitted on the Winnipeg River is First Nations subsistence harvest in Ontario, though the fishery is not currently active, habitat degradation and loss are of greater consequence to Lake Sturgeon in the waters up- and down-stream of the Pointe du Bois GS than impacts from fishing at this time. When Manitoba Hydro decides on how it will modernize the Pointe du Bois GS, DFO will likely be required to make regulatory decisions regarding the proposed changes to the GS, especially with respect to Lake Sturgeon.

Impact of Pointe du Bois modernization on sturgeon spawning habitat

Despite intensive sampling efforts, the only confirmed Lake Sturgeon spawning area in MU5 is located immediately downstream of the current Pointe du Bois GS. They currently spawn below the spillway and powerhouse, with exact locations depending on the flow conditions. During low flow years, Lake Sturgeon spawned across the face of the powerhouse as well as in leakage areas below the spillway. In years of high flow, Lake Sturgeon appeared to deposit their eggs along the edges of high velocity flows below both the spillway and powerhouse. Spawning adults may have used the lower-flow 'edge' areas to stage before moving into the edge of the high currents to release their eggs. The current configuration of the GS appears to provide suitable water flow and habitat availability for successful spawning. Modernization of the GS would change the current configuration, thereby affecting the current spawning habitat.

The proposed future configuration for the GS would reduce the number of spillway gates from 97 to less than 10. The number of gates used now depends on flow. If the powerhouse is rebuilt, spill would occur 30% of the time rather than 70% and one possible configuration of spillway and powerhouse would funnel the bulk of the flow into a smaller area. That would potentially diminish the availability of lower-flow 'edge' areas below the GS, thereby reducing the amount of suitable spawning habitat. Relocation of the spillway will be on the rock shelf downstream of the existing spillway, but will be above the current spawning area, though the exact location has not yet been decided. As Lake Sturgeon currently spawn below the spillway and powerhouse, moving the GS footprint downstream onto the spillway shelf could result in a decline in available spawning habitat. After spawning, adult Lake Sturgeon typically drift downstream beyond the immediate influence of the GS.

One design option would be to position a new powerhouse in the middle of the spillway and decommission the old one. That would likely expose the new power station to more of the full flow of the river and higher flow velocities at the intake, which might lead to more fish being entrained in the station. If the powerhouse is relocated, it may be possible to manage water flows during the spawning period for the benefit of Lake Sturgeon spawning, however there would be no flow below the current powerhouse and therefore no Lake Sturgeon spawning would occur there.

Manitoba Hydro is aiming to recreate the same hydrologic regime as is currently available using the best available information and retain or increase the total amount of wetted area, in order to maintain the same amount of spawning habitat. The precise hydraulic conditions are not yet known because no design option has been chosen. Many participants believed that it would be difficult, if not impossible, to retain the same amount and quality of spawning habitat, on an annual basis regardless of water levels, with the new GS design given the general design

features being considered (e.g., change in amount of flow through the spillway versus the powerhouse). One participant suggested that Lake Sturgeon in MU5 may not require the entire spawning habitat currently available.

The specific impacts of the new GS configuration on Lake Sturgeon spawning would depend on the design option chosen and how the river and Lake Sturgeon respond to it. Manitoba Hydro aims to use the results of their current study to develop a better understanding of how to mitigate the anticipated changes in water flow and habitat availability. Regardless, many participants believed that there is a risk that the general design features currently being considered would likely cause some degradation and/or destruction of the current spawning habitat, which would have negative consequences for Lake Sturgeon spawning success.

Passage of Lake Sturgeon at Pointe du Bois GS

Prior to the construction of dams on the Winnipeg River, it is probable that Lake Sturgeon would have been able to pass downstream but is it not known whether upstream passage was possible at all of the natural waterfalls. Historical harvest records offer no information about upstream passage but some First Nations elders believe that Lake Sturgeon could pass upstream. Historical and existing water flow information is needed to determine the frequency of high flows events, but even with these data we will never know for certain whether Lake Sturgeon could pass freely upstream. One recent Lake Sturgeon study in the Namakan River, Ontario, used radio telemetry and genetics data to examine whether natural barriers block Lake Sturgeon movements. The study results indicated that Lake Sturgeon are able to freely move upstream and downstream of many natural barriers previously thought to be impassable (Welsh and MacLeod, in prep.). Lake Sturgeon are known to use current breaks and boulders to move upstream through areas of fast water, such as the rapids in St. Marys River (between Lakes Superior and Huron). Some participants thought this may have been possible at Pointe du Bois while others did not.

Any possibility of upstream movement was removed once dams were constructed on the Winnipeg River. Fragmentation, natural or artificial, limits the movement of Lake Sturgeon within a river system, thereby affecting genetic diversity. Lake Sturgeon typically make only local movements but a few individuals have been known to travel significant distances. For example, one older juvenile tagged below Norman GS on the Ontario side of the Winnipeg River in spring 2009 was recaptured downstream, below McArthur GS, by an angler three months later after navigating through five dams (D. Leroux, pers. comm.). Current knowledge suggests that so long as a few individual Lake Sturgeon undertake more extensive movements within a river system, some genetic diversity will be retained throughout the system. However if only downstream migration is possible, then the gene pool will be replenished downstream while genetic diversity will be reduced in the upstream reaches. It may not be necessary to have upstream and downstream movement every year. To maintain a good level of genetic variability, at least one migrant that would contribute new genetic variance (i.e., a new allele) per generation (i.e., about 36 years) would have to move upstream or downstream. In practical terms, it would probably require several Lake Sturgeon to get one effective migrant. Thus, one advantage of providing upstream passage for Lake Sturgeon at the Pointe du Bois GS would be to increase genetic diversity within the Winnipeg River.

Another benefit of providing upstream passage would be to allow the Lake Sturgeon population in MU5, which may be near the carrying capacity of the habitat, to expand into MU4 where Lake Sturgeon abundance is lower, the population has not yet recovered and unfilled habitat may be available. However, there are a number of issues and current gaps in knowledge which may

affect the efficacy of providing upstream passage, such as whether Lake Sturgeon will use a fish ladder.

In the past, some fish ladders did not work for Lake Sturgeon, but more recently there has been evidence of some success. For example, the Vianney-Legendre fishway was built on the Richelieu River, a tributary of Lake Champlain, in 1997 to provide upstream fish passage for several species at risk including Lake Sturgeon. It did not prove to be particularly effective for Lake Sturgeon until 2007 when the configuration of the entry gate changed. In 2007 and 2009, about 40-55 Lake Sturgeon, ranging in size between 410 and 1400 mm total length (i.e., juveniles and adults), used the fishway in late spring. Recent research on up- and down-stream passage of Lake Sturgeon at the Conte Fish Research Centre has also shown that it is possible to move Lake Sturgeon using a spiral fish ladder (Kynard *et al.* 2004). While adult fish may use particular fishways, telemetry and tagging data collected in MU5 during the Manitoba Hydro study indicates that juvenile fish are typically sedentary. Thus it is unlikely that juveniles in MU5 would use a fishway to move upstream past the Pointe du Bois GS. The trap and transport of fish over the GS was suggested as an alternate option to a fishway, since movement of a few effective migrants per generation would serve to increase genetic diversity. A few participants believed that Lake Sturgeon would not traverse a fishway given the height of the dam at the Pointe du Bois GS.

Other concerns and knowledge gaps also need to be addressed before the advantages and disadvantages of providing upstream passage at the Pointe du Bois GS can be fully assessed. One of these is whether Lake Sturgeon would remain upstream of the GS once they encounter the deeper and slower-moving waters that typically exist immediately above a GS. Attempts to translocate Lake Sturgeon at other locations have met with limited success, although few fish and habitat conditions have been tried to date. In the Winnipeg River system, a small number of adult Lake Sturgeon were captured below Seven Sisters GS (MU7) in spring 2009 and released above the GS (MU6). Most quickly moved upstream to Sturgeon Falls where they remained for a few days and may have spawned, then moved back downstream and remained in Dorothy Lake (MU6) (S. Matkowski, pers. comm.).

There is a risk that if Lake Sturgeon were to use a fishway built at Pointe du Bois, they might encounter lower quality habitat or other conditions (e.g., subsistence harvest in Ontario) upstream of the GS. This scenario could cause reduced Lake Sturgeon abundance and spawning success in MU5 and little, or no, improvement in the status of Lake Sturgeon in MU4. Some participants expressed concern that if a significant number of Lake Sturgeon were lost from MU5 over a period of years it could put at risk one of the two healthy populations in DU5. However other participants noted that fish populations compensate for declines in abundance by increasing individual and population growth rates, survivorship and recruitment. Modelling also indicates that the 2007 Lake Sturgeon population estimate for MU5 (i.e., 2,205) gives about a 95% probability of persistence over 250 years (Vélez-Espino and Koops, in prep). Thus, even if a small number of Lake Sturgeon were lost from MU5 as a result of upstream passage to MU4, it would not significantly threaten the overall survival of this species in MU5.

Alternatively, if the migrating Lake Sturgeon encountered unsuitable habitat in MU4 they might turn back into the current and either get caught on the GS trash racks or return to MU5 by way of the spillway or through the powerhouse. The current GS configuration has a 70:30 ratio of frequency of spill versus flow only through the turbines, thus it is likely most fish find their way over the spillway. For those that do not, trash racks are located just upstream of the current powerhouse intakes with a rack spacing of 2 in. (5 cm). Passive entrainment is unlikely and turbine mortality low, especially for larger fish. One design option for the new GS is to locate the

powerhouse in the middle of the current spillway. That would expose the powerhouse to the full flow of the river, and may attract more fish to the intake channel and heighten the threat to Lake Sturgeon. A potential way to offset that problem would be to position a cut-off dam between the intake channel opening and the powerhouse

On the basis of information currently available, some participants did not see the value of providing upstream passage at the Pointe du Bois GS. They believed that energetically it doesn't make sense for Lake Sturgeon to move upstream and that Lake Sturgeon in MU5 are free to move downstream. Adding a fishway, in addition to changing the GS, might threaten the current status of Lake Sturgeon in MU5. Other participants could see value in allowing Lake Sturgeon to move from MU5, an area that may be near carrying capacity, to MU4, an area of lower abundance where unfilled habitat may be available, to assist with recovery there. There were mixed views about whether it would be possible, or useful, to hypothetically model the potential for upstream passage of Lake Sturgeon at the Pointe du Bois falls prior to the construction of the GS. One participant wondered if there has been a study that demonstrated benefits for two Lake Sturgeon populations from the provision of upstream passage between two waterbodies, both of which contained the habitat necessary for all life stages. No one was aware of such an investigation. Whether one or both populations benefit from the provision of upstream passage could depend on whether they are already at, or near, carrying capacity, as is the case in MU5 but not MU4. Participants noted that knowledge of downstream movements is also limited. For example, it is not known whether Lake Sturgeon in one MU benefit from larval drifting downstream from the MU immediately upstream.

It is currently not possible to fully assess the positive and negative impacts and relative risks associated with the provision of upstream passage for Lake Sturgeon at the Pointe du Bois GS. Several gaps in knowledge need to be filled. These include the final configuration for the modernized GS and its potential effects on Lake Sturgeon spawning habitat and success in MU5. Knowledge is also needed of the distribution and abundance of Lake Sturgeon and availability of habitat in MU4. It would also help to have a better understanding of the historical movement of Lake Sturgeon up- and down-stream at Pointe du Bois, how much movement is needed to maintain genetic variation and current genetic profiles in MUs 4 and 5.

CONCLUDING REMARKS

Participants agreed on three points: (1) at least some Lake Sturgeon in the Winnipeg River move downstream from one MU to another, (2) successful spawning occurs below the Pointe du Bois GS and (3) changes in water flow and habitat availability would occur with the new GS design. Most participants believed the proposed changes to the GS would negatively affect spawning success and that Lake Sturgeon in MU5 may be at or near carrying capacity, but consensus was not reached on these conclusions. Participants identified a number of potential advantages and disadvantages of providing upstream passage for Lake Sturgeon at the Pointe du Bois GS. One potential benefit would be an increase in genetic diversity within the DU. Another potential benefit would be to enhance Lake Sturgeon recovery, as the population status in MU4 is probably low and there may be available habitat, while the population and habitat in MU5 may be near carrying capacity. A potential disadvantage of providing upstream passage is the loss of individual Lake Sturgeon from MU5 while in MU4 the availability of suitable habitat and potential risk of harm is unknown. If migrating Lake Sturgeon returned to MU5 rather than proceeding upstream, there would be no net gain to MUs 4 or 5. Several gaps in knowledge need to be filled before the benefits, detrimental impacts and relative risks associated with providing upstream fish passage at Pointe du Bois GS can be fully assessed. Current

knowledge gaps include the final configuration of the modernized Pointe du Bois GS and its effects on Lake Sturgeon spawning habitat and success, historical movement data and current genetic profiles in DU5, Lake Sturgeon abundance and availability of habitat in MU4, and analysis of historical and existing hydrological data to understand water levels, the frequency of floods in the Winnipeg River and whether upstream passage occurred historically. It may not be possible to fill some of these gaps.

LITERATURE CITED

Block, D. 2001. Growth estimates, habitat use, and ecology of the Lake Sturgeon, *Acipenser fulvescens* Rafkesque, from Round Lake and mature reservoirs in the Winnipeg River. M.Sc. Thesis, Dep. of Zool., Univ. of Manitoba, Winnipeg, MB. 171 p.

COSEWIC 2006. COSEWIC assessment and update status report on the Lake Sturgeon *Acipenser fulvescens* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 107 p. [Available from http://www.sararegistry.gc.ca/default_e.cfm]

DFO. In prep. Recovery potential assessment of Lake Sturgeon – Winnipeg River-English River populations (DU5). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. In Preparation

Kynard, B., D. Pugh, E. Henyey, T. Parker and M. Horgan. 2004. Research on up- and downstream passage of Lake Sturgeons at S.O. Conte Anadromous Fish Research Centre. PowerPoint presentation. [Available from http://www.fws.gov/midwest/sturgeon/documents/glcoordmtg04/Kynard-STNCoordMtg04.pdf]

Vélez-Espino, L.A. and M.A. Koops. In prep. Lake Sturgeon (*Acipenser fulvescens*) recovery targets in Canadian designatable units. DFO Can. Sci. Advis. Sec. Res. Doc. In preparation.

Welsh, A. and MacLeod, D. In prep. Detection of natural barriers to lake sturgeon movement within the Namakan River, Ontario. Can. J. Zool.

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Figure 1. Current configuration of the Pointe du Bois GS (photograph courtesy of Manitoba Hydro).

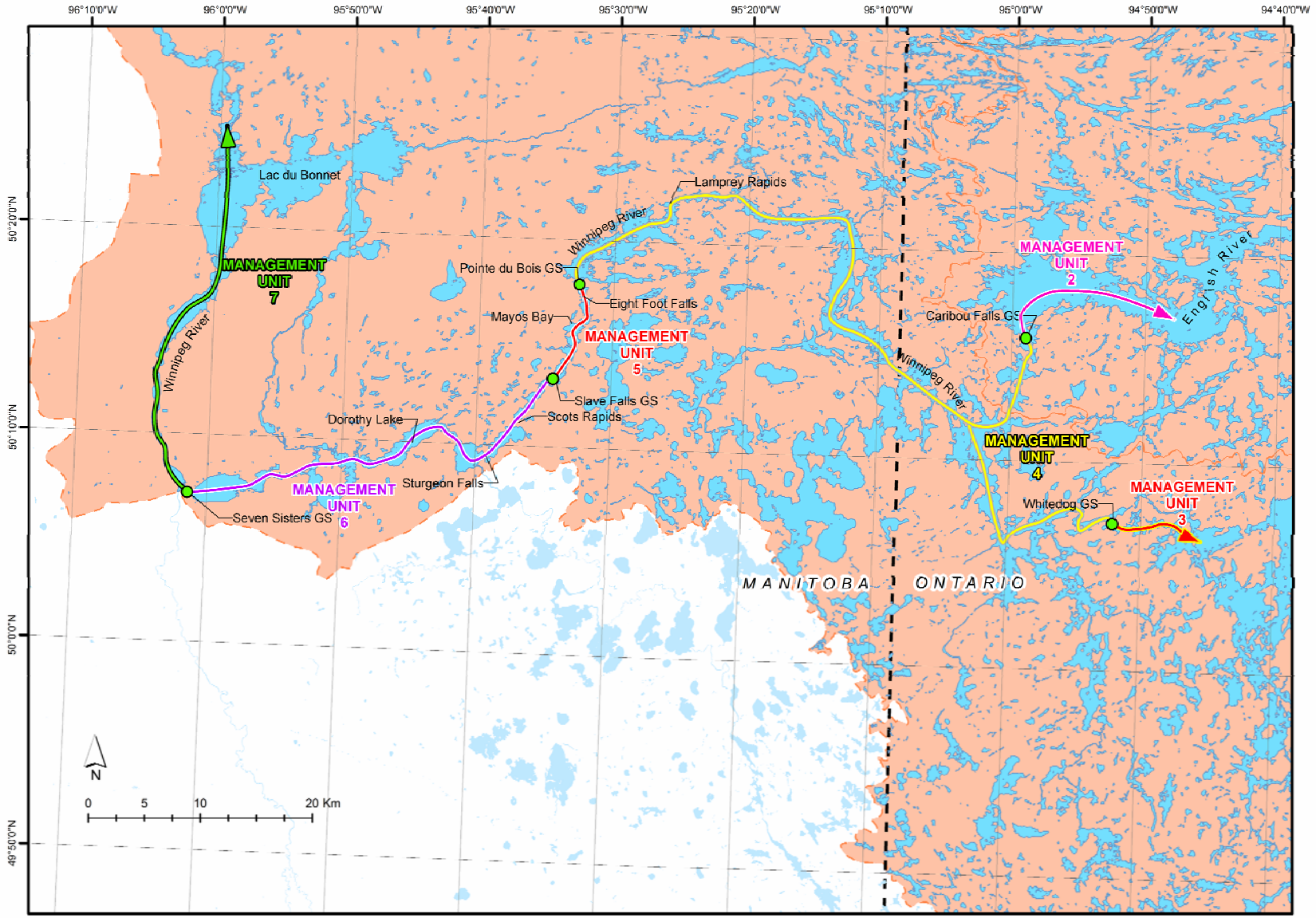

Figure 3. Portion of Winnipeg River system (DU5) that contains the Pointe du Bois Generating Station (GS) and adjoining Management Units (MUs).

APPENDIX 1: Terms of Reference

Terms of Reference

Advice on upstream passage for Lake Sturgeon at Pointe du Bois Generating Station (Winnipeg River)

Regional Advisory Meeting (Central and Arctic)

Freshwater Institute, Winnipeg, Manitoba

22 October 2009 10:30 a.m. to 4:30 p.m. (Central Daylight Time)

Chairperson: Tom Pratt

Background

Manitoba Hydro is considering modernizing the Pointe du Bois Generating Station (GS) on the Winnipeg River, which could involve constructing a completely new station (i.e., new power house, dam, and spillway) and decommissioning the old structures. The existing station was built in 1910 and was the first such station on the Winnipeg River. The Winnipeg River is much more fragmented today than it was a century ago when the Pointe du Bois GS was the only man-made blockage to upstream passage on the river. Now, there are eight hydroelectric dams along the river, two in Ontario and six in Manitoba resulting in fragmentation of fish habitat. There is currently no upstream fish passage at the existing station, although fish passage at the new station can be required by Fisheries and Oceans Canada (DFO) under Section 20 of the *Fisheries Act*, if deemed necessary.

It is unknown whether there was any natural fish passage at the Pointe du Bois falls before the current station was built. The falls themselves are about 34 feet high and consist of a series of rock shelves and pools, so it may have been historically possible for fish to move upstream during high flows and traditional knowledge seems to indicate that upstream passage was possible at this site. Downstream fish passage at the site was and is possible, although it is more dangerous now for fish that pass through the turbines. A new station design might call for more water to flow through the turbines than over the spillway, compared to the current arrangement.

In November 2006, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessed the Winnipeg River - English River Lake Sturgeon (*Acipenser fulvescens*) populations and designated them as Endangered. COSEWIC considered historical threats to have been primarily overexploitation for these Lake Sturgeon populations but dams and poaching are the most important current threats (COSEWIC 2006). The section of the Winnipeg River from Pointe du Bois downstream to Slave Falls is known to have the most abundant population of Lake Sturgeon in the Winnipeg River. This may be due in part to the availability of good spawning sites in the area. Currently Sturgeon are known to spawn at the base of the Pointe du Bois falls and at the outlet of the existing powerhouse. Both the availability and quality of spawning sites could change with a new station design due to the decommissioning of the existing powerhouse, the placement of the new spillway, and a change in the flow regime which might restrict flow width over the falls and direct more of the flow through the turbines than through the

spillway. This could negatively impact the current spawning success of Lake Sturgeon in this reach of the river.

If Manitoba Hydro modernizes the Pointe du Bois GS, DFO may be required to make regulatory decisions regarding the proposed changes to the GS, including whether Manitoba Hydro will be required to construct upstream fish passage facilities at the new Pointe du Bois GS. Potential benefits or negative consequences of upstream Lake Sturgeon passage at this site should be considered in light of the sources of uncertainty and the level of risk given this uncertainty. While monitoring and adaptive management can be required to determine whether mitigations have been effective, it would be problematic and ineffective for DFO to ask for inclusion of fish passage after the station is built. The advice provided by Science may be considered in other Habitat Management reviews of future upgrades to Manitoba Hydro stations on the Winnipeg River system and possibly to reviews of other upcoming Manitoba Hydro projects on the Nelson River, Churchill River, and Burntwood River systems.

Objectives

DFO Habitat Management has requested advice from Science on whether upstream passage at the Pointe du Bois GS would be beneficial or detrimental to the sturgeon population in the Winnipeg River given, 1) the potential negative impacts of the proposed new structures on sturgeon spawning habitat below Pointe du Bois, 2) the overall status of sturgeon in the Winnipeg River, and 3) the uncertainty surrounding the quality of habitat upstream of Pointe du Bois If it is not possible to answer this question given the current state of knowledge, what would be the relative levels of risk to Lake Sturgeon populations in the Winnipeg River of asking for upstream passage when it is not necessary/desirable and of not asking for upstream passage when it is necessary/desirable?

Products

The Regional Advisory meeting will generate a proceedings report summarizing the deliberations of the participants. This will be published in the Canadian Science Advisory Secretariat (CSAS) Proceedings Series on the CSAS website. Also, the advice from the meeting will be published as a Science Advisory Report.

Participation

DFO, provincial governments, academia, industry and aboriginal experts are invited to this meeting.

APPENDIX 2: Meeting Participants

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APPENDIX 3: Agenda

AGENDA

Advice on upstream passage for Lake Sturgeon at Pointe du Bois Generating Station (Winnipeg River)

Freshwater Institute, 501 University Crescent, Winnipeg MB

22 October 2009 10:30 a.m. to 4:30 p.m. (Central Daylight Time)

Chair: Tom Pratt

10:30 Welcome and Introductions (Pratt)

10:40 Purpose of the meeting (Pratt)

Hydro Presentation (~30 min.)
The Pointe du Bois Generating Station

Presentation on behalf of Hydro (~30 min.)
Fish passage and Lake Sturgeon ecology at Pointe du Bois

11:45-12:45 Lunch Break (lunch not provided, cafeteria available at FWI)

Presentation (~20 min)
Summary of relevant Science Advice resulting from the Recovery Potential Assessment for Lake Sturgeon in Winnipeg River (DU5)

Discussion:

- Potential Benefits of Fish Passage
- Potential Negative Impacts of Fish Passage
- Level of Risk of asking for fish passage when it is not necessary/ desirable
- Level of Risk of not asking for fish passage when it is necessary/desirable.

3:00 -3:15 Break

4:00 Review Summary Bullets

4:20 Concluding remarks / next steps

4:30 Meeting adjourns