

LAKE MANITOBA LAKE ST. MARTIN

OUTLET CHANNELS PROJECT

MANITOBA TRANSPORTATION AND
INFRASTRUCTURE

Wildlife Monitoring Plan

June 30, 2022

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DISCLAIMER

This document was developed to support the Environmental Management Program (EMP) for the Lake Manitoba and Lake St. Martin Outlet Channels Project (the Project). It has been prepared by Manitoba Transportation and Infrastructure as a way to share information and facilitate discussions with Indigenous rights-holders, stakeholders and the public. It has been prepared using existing environmental and engineering information, professional judgement, as well as information from previous and ongoing public and Indigenous engagement and consultation. The contents of this document are based on conditions and information existing at the time the document was prepared and do not take into account any subsequent changes. The information, data, recommendations, and conclusions in this report are subject to change as the information has been presented as draft. This draft plan should be read as a whole, in consideration of the entire EMP, and sections or parts should not be read out of context.

Revisions to draft plans have been informed by and will be based on information received from the engagement and consultation process, the Environmental Assessment process, Project planning activities, and on conditions of provincial and federal environmental regulatory approvals received for the Project. As these will be living documents, any changes to the plans that occur after Project approvals are received will be shared with regulators, Indigenous rights-holders and stakeholders prior to implementation of the change. Either a revision number or subsequent amendment would be added to the specific environmental management plan to communicate the revision or change.

PREFACE

The Lake Manitoba and Lake St. Martin Permanent Outlet Channels Project (the Project) is proposed as a permanent flood control mitigation for Lake Manitoba and Lake St. Martin to alleviate flooding in the Lake St. Martin region of Manitoba. It will involve the construction and operation of two new diversion channels: the Lake Manitoba Outlet Channel (LMOC) will connect Lake Manitoba to Lake St. Martin and the Lake St. Martin Outlet Channel (LSMOC) will connect Lake St. Martin to Lake Winnipeg. Associated with these outlet channels are the development of bridges, control structures with power connections, a new realignment of Provincial Road 239, and other ancillary infrastructure.

Manitoba Transportation and Infrastructure is the proponent for the proposed Project. After receipt of the required regulatory approvals, Manitoba Transportation and Infrastructure will develop, manage and operate the Project. This Wildlife Monitoring Plan (WMP) is one component of the overall Environmental Management Program (EMP) framework, which describes the environmental management processes that will be followed during the construction and operation phases of the Project. The intent of the EMP is to facilitate the timely and effective implementation of the environmental protection measures committed to in the Environmental Impact Statement (EIS), the requirements and conditions of the provincial licence issued under *The Environment Act*, the federal Decision Statement issued under the *Canadian Environmental Act 2012*, and other approvals received for the Project. This includes the verification that environmental commitments are implemented, monitored, evaluated for effectiveness, and adjustments made if/as required. It includes a commitment that information is reported back in a timely manner for adjustment, if required.

A key component for the success of the EMP is environmental monitoring, such that environmental management measures are inspected and modified for compliance with environmental and regulatory requirements, including those set out in provincial and federal approvals received for the Project. As indicated, monitoring results will be reviewed and used to verify predicted environmental assessment conclusions and effectiveness of mitigation measures. If unanticipated effects occur, or if mitigation measures are inadequate, adaptive management measures and subsequent monitoring will be applied as described further in individual environmental management and monitoring plans.

Monitoring results and application of adaptive management measures will inform follow-up reporting to regulators and any required revisions to environmental management plans. Manitoba Transportation and Infrastructure has initiated discussions with Indigenous rights-holders and the Rural Municipality of Grahamdale in the Project area on the establishment of an Environmental Advisory Committee (EAC). The EAC would be a platform for sharing monitoring results and discussing issues of concern. In addition, Manitoba Transportation and Infrastructure anticipates that the EAC will coordinate Indigenous Environmental Monitors and communications during the construction period and will be working with Indigenous rights-holders and stakeholders on its structure and purpose.

Manitoba Transportation and Infrastructure remains committed to consultation and ongoing engagement with Indigenous rights-holders and stakeholders that are potentially impacted by the Project. Detailed EMP review discussions were incorporated into Indigenous group-specific consultation work plans. Engagement opportunities included virtual open house events, sharing draft environmental management and monitoring

plans, sharing plan-specific questionnaires, and meetings to discuss related questions and recommendations. The intent has been to offer multiple avenues to share information about the Project so that rights-holders and stakeholders would be informed and could provide meaningful input into Project planning. The original draft EMP plans and questionnaires that were posted on the Project website for public review and comment are being replaced by the second draft of each plan as it becomes available. Feedback and recommendations received were used to update the current version of the draft plans, which are posted to the Project website at: <https://www.gov.mb.ca/mit/wms/lmblsmoutlets/environmental/index.html>.

Figure A displays a summary of the EMP process. The EMP provides the overarching framework for the Project Construction Environmental Management Program (CEMP) and the Operation Environmental Management Program (OEMP). These will be updated prior to Project construction and operation, respectively, and will consider applicable conditions of *The Environmental Act* provincial licence, *Canadian Environmental Assessment Act 2012* federal Decision Statement conditions and other approvals, any other pertinent findings through the design and regulatory review processes, and key relevant outcomes of the ongoing Indigenous consultation and public engagement processes. Until such time, these plans will remain in draft form.

The purpose of the CEMP and OEMP is to guide how environmental issues will be addressed during construction and operation, respectively, and how adverse effects of activities will be mitigated. The CEMP is supported by several specific or targeted management plans that will guide Manitoba Transportation and Infrastructure's development of the Project's contract documents and subsequently, the Contractor(s) activities, in an environmentally responsible manner and to meet regulatory compliance in constructing the Project. The OEMP will include some of the same targeted plans developed to manage issues during construction, but prior to construction completion, they would be revised and adapted to suit the specific needs during the operation phase

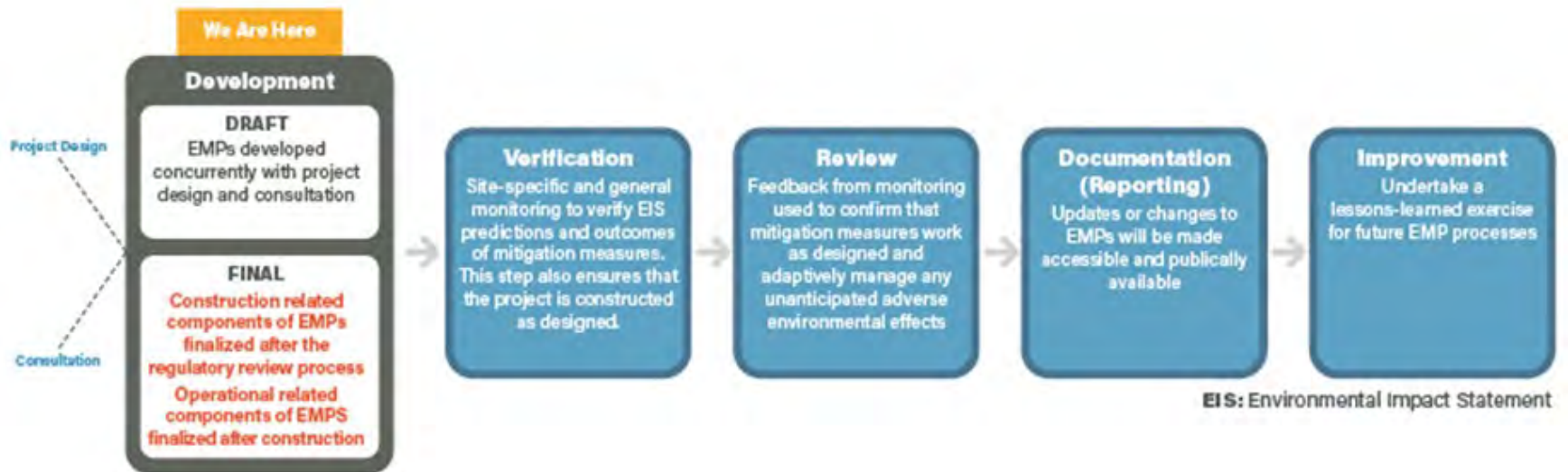


Figure A: EMP Process

LIST OF ACRONYMS

AMP	Access Management Plan
CEAA	<i>Canadian Environmental Assessment Act</i>
CEMP	Construction Environmental Management Program
cm	centimetre
EAC	Environmental Advisory Committee
EIS	Environmental Impact Statement
EMP	Environmental Management Program
EPP	Environmental Protection Plan
EWMP	Eastern whip-poor-will Habitat Management Plan
km	kilometre
LMOC	Lake Manitoba Outlet Channel
LSMOC	Lake St. Martin Outlet Channel
m	metre
MECP	Manitoba Environment, Climate and Parks
MESEA	<i>Manitoba's Endangered Species and Ecosystems Act</i>
mm	millimetre
OEMP	Operation Environmental Management Program
PDA	Project development area
PER	Project Environmental Requirements
PR	Provincial Road
RHMP	Red-headed Woodpecker Habitat Management Plan
ROW	right-of-way
RVMP	Revegetation Management Plan
SAR	species at risk
SARA	<i>Species at Risk Act</i>
WetMP	Wetland Monitoring Plan
WMP	Wildlife Monitoring Plan

1.0 INTRODUCTION

1.1 Purpose

The Wildlife Monitoring Plan (WMP) is a component of the overall Environmental Management Program (EMP) for the Lake Manitoba and Lake St. Martin Permanent Outlet Channel Project (the Project). The Project will involve the construction and operation of the Lake Manitoba Outlet Channel (LMOC), the Lake St. Martin Outlet Channel (LSMOC) and associated components such as bridges, control structures with power connections, a new realignment of Provincial Road (PR) 239, and other ancillary infrastructure, as described in the EMP Framework. The construction methodology for the LMOC and LSMOC is described in the Construction Environmental Management Program (CEMP).

The purpose of the WMP is to describe the monitoring activities that will be undertaken to address follow-up requirements identified in Volume 5, Section 12 of the Project Environmental Impact Statement (EIS). Follow-up requirements are actions implemented to verify key environmental assessment predictions, to reduce potential adverse effects on wildlife and their habitat(s), and to confirm compliance with regulatory requirements. For the wildlife and wildlife habitat valued component, monitoring will be carried out during the construction and operation phases of the Project and includes consideration of species that have been listed as culturally important by Indigenous rights-holders.

The wildlife assessment identified potential changes to wildlife habitat, mortality risk, and movement during construction and operation of the Project. As indicated, this WMP will be implemented as part of the EMP, which is described in the EMP Framework document and summarized in Section 3.7 of the Project EIS. The EMP prescribes measures and practices to avoid or reduce adverse environmental effects on wildlife (e.g., clearing outside of the primary nesting period for migratory birds, and use of buffers for wildlife and sensitive wildlife habitat). This WMP provides details on how predicted changes to habitat, mortality risk, and movement will be verified and how the effectiveness of mitigation strategies will be evaluated.

In summary, this document describes:

- regulatory requirements
- potential Project effects on wildlife
- Project-specific wildlife mitigation
- monitoring and adaptive management
- schedule and reporting protocols

1.2 Objectives

The monitoring criteria established for the WMP were informed by concerns raised through the Project EIS review and subsequent information requests received from federal and provincial regulators, Indigenous rights-holders and stakeholders. For example, the survey methods outlined in this plan facilitate the sampling of species identified by Indigenous rights-holders to have importance, such as: moose, beaver, marten, otter, lynx, and waterfowl. Thus, the monitoring criteria reflect measurable and meaningful parameters to verify key Project EIS predictions and to evaluate the effectiveness of mitigation measures. The objectives of the WMP are to:

- verify Project EIS predictions and evaluate the effectiveness of mitigation strategies for the environmental effects on wildlife and wildlife habitat (i.e., change in habitat, mortality risk, and movement), particularly as they relate to uncertainty in the assessment; and
- establish a framework for adaptive management that can be used to modify or enhance mitigation strategies for wildlife and wildlife habitat.

2.0 REGULATORY REQUIREMENTS

The Project EIS has been submitted to the Canadian Environmental Assessment Agency (now Impact Assessment Agency of Canada), pursuant to the *Canadian Environmental Assessment Act (CEAA), 2012*, and to Manitoba Environment, Climate and Parks (MECP) as an *Environment Act* Proposal, pursuant to requirements of *The Environment Act* (Manitoba). The relevant federal and provincial regulatory requirements are described below.

2.1 Federal Requirements

As defined under the CEAA 2012, monitoring and follow-up is required to verify the accuracy of the environmental assessment of a project and determine the effectiveness of measures taken to mitigate potential adverse environmental effects (CEAA 2012).

The *Species at Risk Act* (SARA) provides protection for species at risk (SAR) in Canada that are listed on Schedule 1. The legislation provides a framework to facilitate recovery of species listed as threatened, endangered, or extirpated and to prevent species listed as special concern from becoming threatened or endangered. SARA provides protection for both SAR and their critical habitat by prohibiting: 1) the killing, harming, or harassing of endangered or threatened SAR (sections 32 and 36 of SARA); and 2) the destruction of critical habitat of an endangered or threatened SAR (sections 58, 60, and 61 of SARA; Government of Canada 2002).

2.2 Provincial Requirements

The *Endangered Species and Ecosystems Act* (MESEA) provides protection to threatened and endangered ecosystems, as well as the flora and fauna SAR in Manitoba. MESEA facilitates the management and development of recovery strategies for special concern, threatened, endangered, and extirpated or extinct species to prevent further declines and promote recovery. MESEA-listed species are those that, “are of ecological, educational, aesthetic, historical, medical, recreational and scientific value to Manitoba and the residents of Manitoba” (Government of Manitoba 2015, 2019).

The Wildlife Act provides general provisions for regulating the activities relating to the take and trade of wild animals in Manitoba. A “wild animal” is defined as “an animal or bird of a species or type listed in Schedule A or declared by the regulations to be a wild animal”, and includes select amphibian, reptile and mammal species and most bird species (including those not protected under the *Migratory Bird Convention Act, 1994*) known to exist in Manitoba (Government of Manitoba 2000). *The Wildlife Act* includes protection for bird species not already afforded protection under the *Migratory Birds Convention Act, 1994* (Schedule A, Division 6), and as such, all bird species in Manitoba are considered protected by law.

3.0 PUBLIC COMMUNICATIONS AND ENGAGEMENT

The development of the WMP, and other plans that form part of the EMP, considers the comments, concerns and issues expressed through letters, emails, discussions with community elected official, community meetings, and open houses with Indigenous rights-holders, Traditional Knowledge and Traditional Land and Resource Use studies, stakeholder meetings, questionnaires, and the Project website, as documented in Chapter 5 of the Project EIS. It also considers on-going involvement with the rights-holders, through the Indigenous engagement and consultation process since the completion of the Project EIS. Manitoba Transportation and Infrastructure has undertaken and maintained engagement efforts with regulatory agencies, Indigenous rights-holders, stakeholders, and the public throughout the development of the Project and welcomes members of the public to submit questions or comments throughout the process.

Manitoba Transportation and Infrastructure will continue to engage with rights-holders, stakeholders and the public. Project updates will be discussed to solicit community feedback and collaboration on Project related items. This includes discussions on the wildlife mitigations and monitoring programs presented in this WMP. Two mechanisms established to facilitate input include the Complaint Resolution Process and the Project Environmental Advisory Committee (EAC).

Like other plans that form the EMP, the WMP is a working document that has incorporated relevant environmental effects and mitigation measures that are identified and reflect up-to-date inputs through public, stakeholder, and rights-holder engagement and consultation. As demonstrated in the Indigenous Consultation and Stakeholder Engagement Report (ICSER; Project EIS Appendix 5C), the content and implementation of these plans will be discussed with potentially affected rights-holders, enabling an opportunity to provide input and feedback. The WMP and other environmental management plans will be finalized based on input obtained from potentially affected rights-holders, and from any relevant environmental regulatory approval conditions.

4.0 PROJECT OVERVIEW

The Project will provide a permanent flood control mitigation system for Lake Manitoba and Lake St. Martin for alleviating flooding in the Lake St. Martin region. As discussed, this will be accomplished through construction of the LMOC - a new outlet channel from Lake Manitoba to Lake St. Martin, and the LSMOC - a new outlet channel from Lake St. Martin to Lake Winnipeg (LSMOC). These new channels will allow for floodwaters to be moved more quickly through Lake Manitoba and Lake St. Martin into Lake Winnipeg. The Project will result in less flooding and reduced lake levels on Lake St. Martin. Other works include re-alignment of PR 239 and a hydroelectric distribution line for operation of the LSMOC water control structure (Appendix 1, Figure 1-1).

The WMP falls within the verification step of the EMP process described in the Preface. The Project EMP contains several plans that prescribe measures and practices to avoid and reduce Project-related adverse environmental effects. For wildlife, other notable plans include the Project Environmental Requirements (PERs), Environmental Protection Plan (EPP), Revegetation Management Plan (RVMP), as well as Red-headed Woodpecker and Eastern Whip-poor-will Habitat Management Plans (RHMP and EWMP). The habitat mitigation plans include the respective species-specific monitoring commitments and monitoring; therefore, they are not discussed further in this WMP. The PERs contain general and site-specific mitigation measures and monitoring commitments associated with regulatory compliance (e.g., avoiding harm to migratory bird nests) while mitigation measures related to the wildlife monitoring activities are outlined within this WMP.

5.0 POTENTIAL PROJECT EFFECTS ON WILDLIFE

The following section describes the predicted effects on wildlife and wildlife habitat, as described in the Project EIS. The Project EIS includes baseline data gathered in 2016 (EEI 2017a and b), where Manitoba Transportation and Infrastructure supplemented the data by completing additional wildlife field investigations in 2020 (WSP 2020), 2021, and 2022. This WMP considers information from both the Project EIS (including baseline data) and recent field investigations, where available.

5.1 Change in Habitat

Project construction will remove terrestrial and aquatic habitat used by migratory birds, SAR, and other wildlife. However, with mitigation and reclamation/channel revegetation, estimates of habitat loss will be reduced. Construction noise and activity may deter wildlife, including SAR and migratory birds, from using areas within and adjacent to the active construction areas for the short-term, with animals returning to the area when disturbance ceases. Positive effects are predicted during operation and are expected to mainly benefit the Lake St. Martin Important Bird Area (Project EIS, Vol 3, Figure 8.3B-8) and its waterbird colonies through reduced flooding and erosion of shorelines, islands, and nests. Other wildlife such as muskrats, ducks, grebes, loons, and geese that occupy or nest amongst marshy lake shores are also expected to benefit from reduced flooding on Lake St. Martin.

The Project may have indirect effects on wetlands located adjacent to the LMOC and LSMOC. The channels may alter surface water drainage flows, causing changes to soil moisture regimes and hydrologic function upgradient and downgradient of the channels. As a result, wetlands may become wetter or dryer depending on their location relative to the channels. Changes to wetlands including wildlife SAR (e.g., yellow rail, least bittern, and northern leopard frog) will be monitored as part of the Wetland Monitoring Plan (WetMP; see Section 7.2).

5.2 Change in Mortality Risk

During construction, there is potential for increased wildlife mortality risk due to vehicular collision and encounters with construction equipment. Clearing outside of the sensitive breeding period for migratory birds and adherence to mitigation measures outlined in the EPP are expected to reduce mortality risk for wildlife.

During operation and maintenance, the outlet channel right-of-way (ROW) have the potential to increase predator and hunter/trapper efficiency by providing access along an open, continuous, linear corridor. Prey species encountering the outlet channels may be at a greater risk to predation, due to improved access along the open ROWs. Cover plantings (i.e., escape or concealment cover) may reduce this risk once established along parts of the ROW edges (see RVMP).

Although most wildlife species will be able to cross the channels during operation, wildlife mortality risk will be higher for species attempting to cross the channels during high flow periods. The outlet channel ROWs, and to a lesser extent the electrical distribution line, have the potential to increase mortality risk by providing a travel corridor that increases hunting/trapping and predator efficiency. Access to Project infrastructure, including the outlet channel itself, as well as the inlet, outlet and control structures, will be restricted post-construction as per the Access Management Plan (AMP). Restricting public access and adding cover plantings along edges of ROWs to reduce sight lines and provide escape cover is predicted to reduce mortality risk to wildlife. The PR 239 realignment may also increase mortality risk for wildlife; however, it is not expected to exceed existing risk associated with the current PR 239 alignment.

5.3 Change in Movement

The outlet channel ROWs have the potential to alter wildlife movement, particularly during construction and during flood events, when the channels are conveying floodwater. Terrestrial wildlife movements may be affected during flood events, which could limit dispersion of wildlife across the channel(s) for the short-term. The ROWs will be revegetated and include additional cover plantings in strategic locations to facilitate wildlife movement across the outlet channels. Movement of most wildlife, including elk (*Cervus canadensis*), furbearers, migratory birds, SAR, and species of conservation concern are not expected to change during gates closed (i.e., non-operational period), although some literature has shown that moose (*Alces alces*) response to linear features can be variable (Bartzke et al. 2015). The PR 239 realignment may affect wildlife movement; however, it is not expected to differ substantially from effects currently associated with the existing PR 239 alignment.

6.0 MITIGATION

The Project EIS lists multiple mitigation measures to reduce potential Project effects on wildlife (Sections 8.3.6.2 to 8.3.6.4). Some of these measures will be implemented and monitored during construction and/or operation as part of compliance monitoring while others will be the focus of environmental effects and mitigation monitoring. Table 1 summarizes the wildlife mitigation measures that will be monitored as part of the environmental management plans.

Table 1: Management Plans Addressing Wildlife Mitigation Measures Committed to in the Project EIS and Information Requests

Potential Effect	Mitigation Objective	Mitigation Measure (s)	Management or Monitoring Plan
Change in Habitat	Reduce loss of red-headed woodpecker nesting habitat	Add nesting structures on edge of LMOC ROW	RVMP; RHMP
	Maintain native vegetation (e.g., grassland and areas of shrubland) along outlet channels	Revegetate with a native and agronomic seed mix; weed control	RVMP
	Maintain wetland function for wildlife including SAR	Outside drains; rewatering options	WetMP
Change in Mortality Risk	Reduce wildlife collision risk with Project vehicles	Reduced travel speeds; use multi-passenger vehicles; signs to increase awareness	PERs (i.e., PER 2.11.1)
	Reduce disturbance to denning wildlife	Apply species specific setbacks to sensitive wildlife features, such as bear dens, and furbearer dens during species-specific avoidance periods (Appendix 2, Table 2-1) if encountered prior to or during construction	PERs (2.11.1); WMP (Appendix 2, Table 2-1)
	Provide escape cover for wildlife; reduce sight lines	Cover plantings (i.e., shrubs) along edges of LMOC and LSMOC ROWs	RVMP
	Reduce access to LMOC and LSMOC	Gated access road to LSMOC; signage and fencing (both temporary and permanent)	AMP

Potential Effect	Mitigation Objective	Mitigation Measure (s)	Management or Monitoring Plan
Change in Mortality Risk (cont'd)	Reduce potential to affect migratory bird nests and bat roosts	Clearing outside of the breeding and roosting period (April 1-August 31); setbacks/terrestrial buffers for sensitive wildlife features (e.g., nests, dens)	PERs 2.5.1 and 2.16; WMP Appendix 2, Table 2-1
	Reduce potential to affect nesting birds and other less mobile wildlife	During operation, where necessary, mowing of the LMOC and LSMOC ROWs will be delayed until after July 15th so grassland birds can complete a nesting cycle. This will also benefit culturally important species such as rabbits and fawns inhabiting the ROWs.	RVMP
	Reduce potential to affect migratory birds and SAR nesting within existing quarries	Existing quarry sites that become active during the migratory bird breeding season (April 1- August 31) will be investigated for the presence of migratory bird nests (e.g., swallow colonies, common nighthawk nests) prior to quarry reactivation; setbacks/terrestrial buffers would be applied as appropriate	Quarry Management Plan; PERs (2.11.1, 2.14.1); WMP Appendix 2, Table 2-1
	Reduce potential to affect beaver during dam removal	Hand or mechanical clearing of dam	PER 2.5.8
Change in Movement	Facilitate movement of wildlife across channels	Channel design will have 5:1 slopes; use of small diameter (<100 millimetres [mm]) rock in channel armouring; cover plantings along edges of LMOC and LSMOC ROW	WMP (Section 7.3); CEMP; RVMP

7.0 FOLLOW-UP AND MONITORING

As described in Section 1.2, the WMP will be used to verify Project EIS predictions and evaluate the effectiveness of mitigation strategies for the key environmental effects. A detailed description for each of the monitoring criteria, as they relate to change in habitat, mortality risk, and movement, is provided in the subsequent sub-sections.

7.1 Monitoring: Change in Habitat

The Project will disturb lands and remove vegetation through clearing and grubbing, excavation of the LMOC and LSMOC, local drainage construction, and road construction/realignment. Revegetation will be completed in some of these areas to provide erosion and sediment control and to mitigate effects on wildlife and vegetation. Predictions in the Project EIS state that revegetation measures outlined in the RVMP will provide habitat for some wildlife along the outlet channels. These measures include establishing perennial native grass groundcover on spoils, dykes, and slopes of the LMOC and LSMOC; shrubs, snags, and woody debris along portions of the LMOC ROW edges; and, shrubs and trees along portions of the LSMOC ROW edges (RVMP). Revegetation will occur during construction, after earth works are completed in year 2 or year 3, depending on the ROW segment (see RVMP, Table 1). Vegetation monitoring will occur during the growing period for 2 years post revegetation along LMOC and for 3 years post revegetation along LSMOC (RVMP).

Use of wildlife habitat enhancements (i.e., planted shrubs and trees, installed snags) will be monitored as part of the SAR habitat mitigation plans, although some information will be collected as part of the Wildlife Monitoring Plan (see Section 7.3). The RHMP summarizes residual Project effects, habitat enhancement, and monitoring commitments for red-headed woodpecker in the LMOC region. The EWMP summarizes residual Project effects, habitat enhancements, and monitoring commitments for eastern whip-poor-will in the LSMOC and LMOC regions.

The Project has the potential to indirectly affect wetlands adjacent to the outlet channels due to altered drainage flows (e.g., wetlands to the east of the LMOC). Altered drainage patterns along the east side of the LMOC, for example, could reduce habitat for migratory birds and SAR dependent on open water habitats and increase it for others that prefer shallower habitats or habitats less frequently flooded. Residual effects to wetland functions could alter the habitat effectiveness for wetland-dependent wildlife species, including migratory birds and SAR; however, the extent of the potential effects was noted as uncertain in the Project EIS.

The WetMP has been developed to monitor for direct and indirect effects of the Project on wetlands and wetland function along the LMOC and LSMOC. In the WetMP, the selection for candidate wetland monitoring sites focused on locations where wetland function could be measurably affected, and where potential Project-related effects may occur on groundwater and surface water, in consideration of other Project monitoring objectives/plans/locations (e.g., Surface Water Management Plan, Groundwater Management Plan) to help inform detailed design, proximity to locations of previous baseline monitoring sites, and areas of concern to regulators, Indigenous rights-holders, and other stakeholders. The Plan includes determining

baseline site conditions and the monitoring of wetland form, function, water quality, wildlife and SAR (e.g., yellow rail, least bittern, and northern leopard frog). The Plan includes control and potentially affected wetland sites for the LMOC across different wetland classes. These sites will be monitored in spring and fall prior to Project construction, during construction, and for five years after construction.

7.2 Monitoring: Change in Mortality Risk

The Project has potential to increase vehicle- and equipment-related wildlife mortality risk during the construction phase and increase human/predator wildlife mortality risk to harvested species (e.g., moose, rabbit), due to increased access. The increase in vehicle- and equipment-related mortality risk is expected to be low, whereas an increase in mortality risk resulting from increased access is uncertain. Monitoring will allow for the evaluation of the effectiveness of mitigation measures identified in the Project EIS and EPP, and implementation of additional measures if an increase in mortality rates or elevated access rates are observed in certain locations.

7.2.1 Mortality Reporting

Rationale

Wildlife mortality reporting will be used to evaluate the effectiveness of mitigation measures designed to reduce traffic- and equipment- related mortality risk during the construction of the Project. Monitoring criteria for a change in mortality risk is summarized in Section 7.2.3.

Objective

The objective of mortality reporting is to gather data on Project-related wildlife mortality.

Measurable Parameter

The measurable parameter for mortality monitoring is the number of Project-related wildlife mortality events (Section 7.2.3).

Design

Mortality reporting will be completed continuously during the construction phase of the Project for all Manitoba Transportation and Infrastructure and contractor personnel working within the Project development area (PDA) and local assessment area, where measurable direct effects are most likely to occur.

Methods

All Manitoba Transportation and Infrastructure Project and contractor personnel will be informed during initial Project orientation of the expectation to report all mortality events to Manitoba Transportation and Infrastructure. A form will be developed by Manitoba Transportation and Infrastructure to collect relevant information about the mortality event (e.g., location, time of day, species) and annual summaries will be developed.

Frequency

Mortality reporting will occur continuously during the construction phase of the Project (Table 2)

Decision Triggers / Thresholds for Action

More than five large (e.g., ungulates, predators) or ten small wildlife species mortality events per year.

- Action: Provide MECP Conservation Officer with GPS location and circumstances as incidents are detected and report survey results to MECP regional wildlife biologist/manager through annual data reports.
- Action: take measures to identify high risk zones with signage and implement speed restrictions.

7.2.2 Access Monitoring

Rationale

Access monitoring will be used to evaluate the effectiveness of mitigation measures designed to reduce wildlife mortality risk that may result from increased access by humans and predators (e.g., coyote [*Canis latrans*] and gray wolf [*Canis lupus*]). Access monitoring will not report on mortality events as described for mortality reporting (Section 7.2.1) but instead will report on number of human and predator detections where access is improved. Monitoring criteria for a change in mortality risk is summarized in Section 7.2.3.

Objective

The objective of access monitoring is to gather data on human and predator activity at access points along the outlet channel ROWs.

Measurable Parameters

The measurable parameter for access monitoring will be the number of human and predator access events/month at monitoring site (Section 7.2.3).

Design

Remote cameras (e.g., Reconyx™ Hyperfire™ PC900 [Reconyx 1997]) will be deployed year-round along strategic access points along the LMOC and LSMOC PDAs where humans and predators (e.g., coyote, gray wolf) are most likely to access and/or travel along the ROWs.

Methods

Surveys will use a standardized operating procedure for both deployment and data analysis, and will be completed in concert with the remote camera survey (Section 7.3.2) when possible. Camera locations will be at least 1 kilometre (km) apart (unless on opposite sides of the LMOC and LSMOC) to maintain independent sampling. Cameras will be installed at approximately 1.2 metres (m) above ground to optimize capture rates for the range mammal species that can trigger the sensors. Vegetation that might interfere with the field of view will be removed during installation and maintained during the subsequent maintenance (e.g., battery change, height adjustment to account for snow accumulation) and data download visits (i.e., every four months).

All photographs will be transferred to a central database and analyzed using photo analysis software (e.g., Reconyx MapView Professional™ [Reconyx 2010]). Each photograph is analyzed individually, and if a human or predator is identified as the cause of the trigger, a unique event is created. Each event will be classified by

human/species, vehicle type, number, age, and gender, as applicable. The start of a new camera event occurs when there is a change in human or wildlife species or a gap of 2 minutes between events when no photos are captured. Three photos are classified per event. The length of each event is determined by calculating the time between the first and last observation of an animal passing a camera. For each event, a single photo will be 'tagged' as the best representation of the event attributes (i.e., species, abundance, age, and gender). Photos that are triggered by environmental conditions (e.g., wind, vegetation, shadows) are analyzed but not classified as an event unless a human or predator was present. The number of events will be summarized by event type (human or predator) for each camera location and treatment.

Frequency

Access monitoring will be completed continuously during the operation phase of the Project for six years post-construction.

Decision Trigger / Thresholds for Action

Significant increase in human or predator access.

- Action: Consider adding or altering mitigation at outlet channel access points and report survey results to MECP regional wildlife biologist/manager through annual data reports.

7.2.3 Summary

A summary of the monitoring criteria for change in mortality risk is provided in Table 2. A summary of scheduled monitoring commitments is provided in Section 9.0.

Table 2: Monitoring Criteria for Change in Mortality Risk

Monitoring Objective	Method	Monitoring Metrics	Project Phase	Duration	Frequency
Evaluate the effectiveness of mitigation strategies implemented to reduce mortality risk	Mortality reporting	Mortality events per year	Construction	Years 1-3	Continuous
	Access monitoring	Events per month	Operation	Years 1-6	Continuous

7.3 Monitoring: Change in Movement

Operation of the outlet channels will, at times, present a semi-permeable barrier for some wildlife species (e.g., ungulates, furbearers) that limits their ability to move across the outlet channels. The Project EIS states that while wildlife may avoid crossing the outlet channels during flood events, most species will be able to cross when channels are not conveying floodwater. The prediction that wildlife movement will not be impeded outside of flood events is based on channel design, such as use of 5:1 side slopes, use of small diameter (<100 mm) rock armouring, and low flows. In addition, mitigation measures, such as the addition of cover plantings, and have been developed to facilitate wildlife movement along and across the outlet channels.

To address public concern and uncertainty regarding wildlife movement along and across the outlet channels, wildlife movement monitoring will be undertaken using a winter track survey and a remote camera survey to determine if mitigation measures (i.e., cover plantings, use of small diameter armouring rock) facilitate (i.e., do not hinder) movement of wildlife including moose, elk, white-tailed deer, Canada lynx (*Lynx canadensis*), fisher (*Pekania pennanti*), and American marten (*Martes americana*). Monitoring criteria for a change in movement is summarized in Section 7.3.3.

7.3.1 Winter Track Survey

Rationale

Mitigation measures have been incorporated into the design of the outlet channels to reduce the potential for adverse effects on wildlife movement (i.e., cover plantings and absence of riprap to facilitate movement). The winter track survey will be used to assess the effectiveness of these mitigation measures on facilitating wildlife crossing the outlet channels in winter. The survey will include examining the number of tracks that cross the ROW relative to the areas of the ROW where mitigation has and has not been applied. It is expected, for example, that more tracks will be observed in areas with the mitigation measures than without. This survey will provide information on a wide range of wildlife species, including culturally important species such as American marten, fisher, Canada lynx, moose, elk, and gray wolf (*Canis lupus*) having potential to interact with the LMOC and/or LSMOC during the winter months. The survey will include investigating mammal use of Dauphin and Fairford rivers located west of LSMOC and LMOC, respectively. Lastly, surveys will also provide incidental information into how humans and predators (e.g., gray wolf) access and interact with the outlet channel ROWs.

Objectives

The objectives of the winter track survey are to assess the effectiveness of channel mitigation measures in facilitating wildlife movement and compare crossing rates to the Dauphin and Fairford rivers during the winter.

Measurable Parameter

The measurable parameter for the aerial winter track survey is the number of wildlife track crossings/km/wildlife species (Section 7.3.3).

Design

Surveys will be undertaken along the LMOC and LSMOC ROWs to confirm crossing events relative to mitigation treatments and adjacent habitat types. Surveys will also be completed in areas adjacent to the outlet channels (for regional context), including along the centerline of the Dauphin and Fairford Rivers as comparisons and/or reference areas.

Methods

Surveys will follow standardized aerial survey protocols (ASRD 2015) and will be completed twice per winter to account for seasonal variation in wildlife movements. Surveys will be completed using a helicopter and a two-person team with the primary observer in the front left seat, and the secondary observer/data recorder in the rear right. Surveyors will focus on an area within 100 m of the helicopter in which all wildlife and tracks will be recorded. Surveys will be flown < 100 m above ground level at approximately 50 km/hour (altitude and speed will vary depending on conditions) during periods of good environmental conditions:

- wind <30 km/hour
- cloud ceiling >150 m
- precipitation not exceeding a light, intermittent snowfall
- absence of fog
- during periods of adequate daylight (from one half hour after sunrise to one half hour before sunset)
- with a snow base of ≥25 centimetres (cm; MCWS 2015, unpublished).

To identify mammal tracks in the snow during aerial surveys, surveys are typically undertaken within two to three days after a snowfall event (5-10 cm; BC MOELP 1998).

A handheld GPS will be used to collect a track log that recorded coordinates at one-second intervals. Upon observation of a mammal track or individual, the data recorder will record the species, number of tracks, and number of individuals, along with the associated time (hh:mm:ss) which will be used to extract a matching coordinate from the GPS track log. The helicopter may slow down or circle back to obtain a more accurate location for the observation. The georeferenced data will be summarized and mapped using ArcGIS® (ESRI 2012). Other wildlife detected during winter track surveys will be recorded as incidental observations.

Frequency

Surveys will be undertaken during the first year of construction and in years 2, 4, and 6 during operation, twice per year (early winter and late winter).

Decision Triggers / Thresholds for Action

Ungulate and/or predator crossings are observed but furbearers are not despite mitigation.

- Action: Review results from remote camera survey and consider if additional mitigation measures are required to enhance wildlife movement. Report survey results to MECP regional wildlife biologist/manager through annual data reports.

Wildlife crossings are not observed along the outlet channel ROWs despite mitigation.

- Action: Review results from remote camera survey and consider if additional mitigation measures are required to enhance wildlife movement. Report survey results to MECP regional wildlife biologist/manager through annual data reports.

7.3.2 Remote Camera Survey

Rationale

Mitigation measures have been incorporated into the design of the outlet channels to reduce the potential for adverse effects on wildlife movement (i.e., cover plantings and absence of riprap to facilitate movement). The remote camera survey will be used to assess the effectiveness of these mitigation measures by examining the number of wildlife photo events along the ROW relative to the areas of the ROW where mitigation has been applied. It is expected, for example, that a greater number of photograph events will be observed in closer proximity to the mitigation measures. This survey will build upon baseline surveys and will provide information on a wide range of wildlife species (e.g., American marten, fisher, Canada lynx, moose, elk, gray wolf) interacting with the LMOC and LSMOC year-round. The survey will also provide incidental information on how predators (e.g., wolves, coyotes) interact with the outlet channel ROWs.

Objective

Assess the effectiveness of mitigation measures in facilitating wildlife movement across channels.

Measurable Parameter

The measurable parameter for the remote camera survey is the number of photograph events/species and number of mammal crossings (Section 7.3.3).

Design

Remote cameras (e.g., Reconyx™ Hyperfire™ PC900 [Reconyx 1997]) will be deployed along the LMOC and LSMOC PDA using a randomly stratified design that incorporates the mitigation treatment (active mitigation vs. control sites) and side of the outlet channel (east or west). Cameras will be placed near the water line and along the edges of the ROWs. Cameras may also be placed on Project infrastructure (e.g., inlet structures, bridge) to obtain time-lapse photographs of the wetted channel and local mammal movements.

Methods

Surveys will be undertaken using a standardized operating procedure for both deployment and data analysis. Camera locations will be at least 500 m apart (unless on opposite sides of the outlet channels) to maintain independent sampling and installed at roughly breast height (1.2 m) to optimize the range of mammals that can trigger the sensors and to allow for snow depth during the winter months. Vegetation, if present will be cleared/trimmed from the line-of-sight for each camera during installation and maintained during subsequent maintenance and data download visits (i.e., every four months). Wildlife detected during camera deployment and retrieval will be recorded as incidental observations.

All photographs will be transferred to a central database and analyzed using photo analysis software (e.g., Reconyx MapView Professional™ [Reconyx 2010]). Each photograph is analyzed individually, and if wildlife is identified as the cause of the trigger a unique event is created. Wildlife captured in each event are classified by species, number, age, and sex, if possible. The start of a new camera event occurs when there is a change in wildlife species or a gap of one hour between events when no photos are captured. Three photos are classified per wildlife event. The length of each event is determined by calculating the time between the first and last observation of an animal passing a camera. For each event, a single photo is classified as the best representation of the event attributes (i.e., species, abundance, age, sex). Photos that are triggered by environmental conditions (e.g., wind, vegetation, shadows) are analyzed but not classified as an event unless an animal was present. The species and number of events will be summarized for each camera location and treatment.

Frequency

Cameras will be deployed following the completion of channel ROW revegetation. The cameras will monitor wildlife use in years 2, 4, and 6, post-construction.

Decision Triggers / Thresholds for Action

Ungulate and/or predator crossings are observed but furbearers are not despite mitigation.

- Action: Review results from remote camera survey and consider if additional mitigation measures are required to enhance wildlife movement. Report survey results to MECP regional wildlife biologist/manager through annual data reports.

Wildlife crossings are not observed along the outlet channel ROWs despite mitigation.

- Action: Review results from winter track survey and consider additional mitigation measures to enhance wildlife movement. Report survey results to MECP regional wildlife biologist/manager through annual data reports.

7.3.3 Summary

A summary of the monitoring criteria for change in movement is provided in Table 3. A summary of scheduled monitoring commitments is provided in Section 9.0.

Table 3: Monitoring Criteria for Change in Movement

Monitoring Objective	Method	Monitoring Metrics	Project Phase	Duration	Frequency
Assess mammal movement across the outlet channels and evaluate the effectiveness of mitigation strategies used to facilitate movement	Winter track survey	Number and location of wildlife crossing events	Construction and Operation	First year of construction and years 2, 4, and 6 post-construction	Twice each winter
	Remote camera survey	Number of photo events	Operation	3 years (years 2, 4, and 6 post-construction)	Continuous

8.0 ADAPTIVE MANAGEMENT

Adaptive management is a structured and systematic process focused on improving environmental management by using lessons learned to reduce uncertainty while updating policies and practices (British Columbia Ministry for Forests and Range 2015). Adaptive management allows for the flexibility to identify and implement new mitigation measures or to modify existing ones (CEAA 2015).

The initial steps in this adaptive management framework involve developing and implementing wildlife mitigation measures as committed to in the Project EIS. Wildlife mitigation measures will be monitored as described in Section 7.0, and their effectiveness evaluated and documented as part of the reporting requirement (Section 10.0). During this process, if mitigation measures are deemed deficient, a root cause analysis would be undertaken to understand how they failed to meet objectives. Regulators, rights-holders, and other stakeholders may be engaged during this evaluation and review period to identify next steps and/or adaptive measures. Should adaptive measures be implemented, monitoring and reporting would continue as described.

9.0 SCHEDULE

The proposed schedule for all Project-related wildlife monitoring described in Section 7.0, is summarized in Table 4. Although these activities are planned to commence in 2022/23, this schedule is subject to change and contingent upon federal (i.e., CEAA 2012) and provincial (i.e., *The Environment Act* license) approvals.

Table 4: Proposed Schedule for Wildlife Monitoring Activities^{1,2}

Residual Effect	Key Monitoring Activity	Project Phase								
		Construction			Post-construction					
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Change in Mortality Risk	Mortality reporting	Gray	Gray	Gray						
	Access monitoring				Gray	Gray	Gray	Gray	Gray	Gray
Change in Movement	Aerial track survey	Gray				Gray		Gray		Gray
	Remote camera survey					Gray		Gray		Gray

Notes:

¹ Gray cells indicate when monitoring activities are planned

² The proposed schedule is pending regulatory approvals

10.0 REPORTING PROTOCOLS

Annual monitoring reports summarizing activities results will be developed and provided to the Impact Assessment Agency of Canada and MECP. At the completion of the monitoring program, annual reports will be summarized into one final Wildlife Monitoring Report.

11.0 REFERENCES

- ASRD (Alberta Sustainable Resource Development). 2015. Aerial ungulate survey protocol manual. Alberta Sustainable Resource Development, Fish and Wildlife Division, Edmonton, AB.
- Bartzke, G., R. May, E. Solberg, C. Rolandsen, and E. Roskaft. 2015. Differential barrier and corridor effects of power lines, roads and rivers on moose (*Alces alces*) movements. Available at: <https://esajournals.onlinelibrary.wiley.com/doi/epdf/10.1890/ES14-00278.1>
- BC MOELP (British Columbia Ministry of Environment, Lands and Parks). 1998. Inventory methods for wolf and cougar. Standards for components of British Columbia's biodiversity No. 34. Ministry of Environment, Lands and Parks. Victoria, BC.
- British Columbia Ministry of Forests and Range. 2015. Defining Adaptive Management [online]. Available from: <https://www.for.gov.bc.ca> [accessed October 2020].
- CEA Agency (Canadian Environmental Assessment Agency). 2012. Operational Policy Statement. Follow-up Programs under the *Canadian Environmental Assessment Act*.
- CEA Agency. 2015. Practitioners Glossary for the Environmental Assessment of Designated Projects Under the Canadian Environmental Assessment Act, 2012 [online]. Available from: <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-glossary-environmental-assessment-designated-projects-under-canadian-environmental-assessment-act-2012.html> [accessed October 2020].
- EEl (EcoLogic Environmental Inc.). 2017a. Lake Manitoba outlet channel: wildlife technical report. Prepared for M. Forster Enterprises. Winnipeg, MB.
- EEl (EcoLogic Environmental Inc.). 2017b. Lake St. Martin outlet channel: wildlife technical report. Prepared for M. Forster Enterprises. Winnipeg, MB.
- Fenton, M.B., and R.M.R. Barclay. 1980. Myotis lucifugus. 142 Mammalian Species, pp. 1-8. Available at: <https://www.jstor.org/stable/pdf/3503792.pdf>. Accessed on: January 14, 2021.
- Government of Canada. 2002. *Species at Risk Act*. Available at: <http://laws-lois.justice.gc.ca/eng/acts/s-15.3/FullText.html>. Accessed June 2019.
- Government of Manitoba. 2017. Forestry management guidelines for terrestrial buffers. Available at: [Manitoba Conservation \(gov.mb.ca\)](http://www.gov.mb.ca). Accessed June 2022.
- Government of Manitoba. 2000. The Wildlife Act. Available at: <https://web2.gov.mb.ca/laws/statutes/ccsm/w130e.php>. Accessed June 2022.
- MB CDC (Manitoba Conservation Data Centre). 2021. Recommended development setback distances and restricted activity periods for birds by wildlife feature type. Available at: <https://www.manitoba.ca/fish-wildlife/cdc/pubs/mbccdc-bird-setbacks-nov2021.pdf>. Accessed June 2022.

REFERENCES

Manitoba Hydro. 2015. Assessment of potential effects on wildlife and wildlife habitat *In* Environmental Impact Statement for the Manitoba-Minnesota Transmission Project. Available at: https://www.hydro.mb.ca/projects/mb_mn_transmission/pdfs/eis/mmtpeischapter09_wildlife_and_wildlife_habitat.pdf. Accessed June 2019.

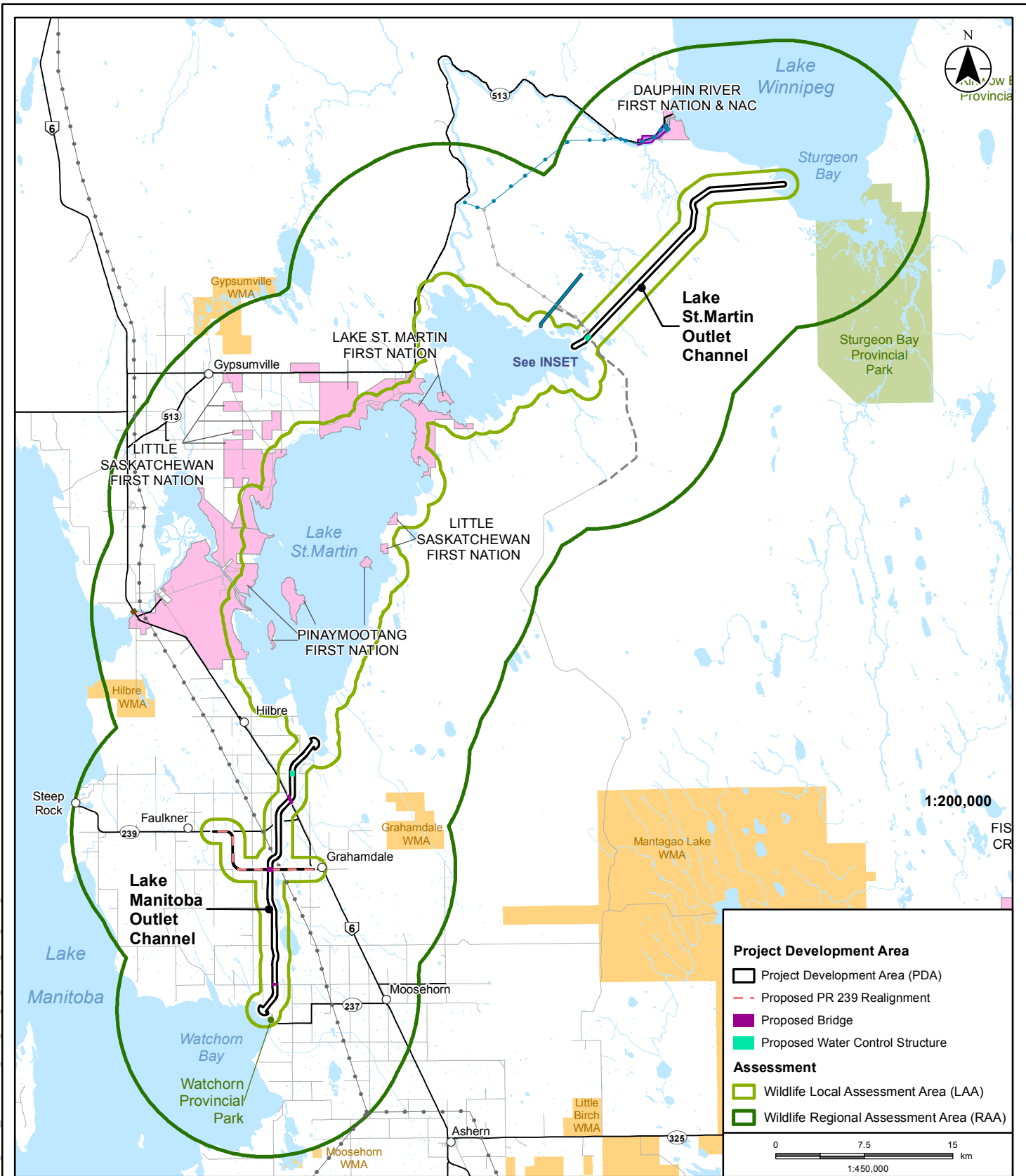
MCWS (Manitoba Conservation and Water Stewardship). 2015. Unpublished environmental parameters for aerial wildlife survey. Manitoba Conservation and Water Stewardship, Wildlife Branch, Winnipeg, MB.

Reconyx. 2010. MapView professional image management user guide. Available at: <https://www.reconyx.com/img/file/MapViewUserGuide.pdf>. Accessed October 2020.

WSP. 2020. Lake Manitoba and Lake St. Martin Outlet Channel Project: preconstruction environmental field work. Winnipeg, MB.

APPENDIX 1

Figures



Project Development Area

- Project Development Area (PDA)
- Proposed PR 239 Realignment
- Proposed Bridge
- Proposed Water Control Structure

Assessment

- Wildlife Local Assessment Area (LAA)
- Wildlife Regional Assessment Area (RAA)

0 7.5 15 km
1:450,000

Legend

- Fairford Water Control Structure
- Lake St.Martin Emergency Outlet Channel (Reach 1)
- Lake St.Martin Access Road
- Existing Transmission Line
- Existing Distribution Line
- Planned Distribution Line
- Provincial Highway (PTH/PR)
- Municipal Road
- Northern Affairs Community (NAC)
- First Nation
- Wildlife Management Area
- Provincial Park

Notes

- Coordinate System: NAD 1983 UTM Zone 14N
- Data Sources: Governments of Manitoba and Canada, Manitoba Infrastructure, Stantec Consulting
- Last Update: 6/22/2022 12:52:30 PM



Manitoba Transportation and Infrastructure
Lake Manitoba & Lake St.Martin Outlet Channels Project

Project Overview Map

Figure 1-1

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APPENDIX 2

Tables

Table 2-1: Recommended Setback Distances and Restricted Activity Periods for the Lake Manitoba and Lake St. Martin Outlet Channels Project

Species or Feature ¹		Key Wildlife Feature	Restricted Activity Period	Recommended Setback Distance by Disturbance Category (m) ²		
Common Name	Scientific Name			Low	Medium	High
American badger^a	<i>Taxidea taxus</i>	Active den	Year round	100	500	500
Black bear^b	<i>Ursus americanus</i>	Active den	Year round	150	150	150
Little brown myotis^{a,c}	<i>Myotis lucifugus</i>	Roost	May 1 – August 31	100	500	500
Northern myotis^{a,c}	<i>Myotis septentrionalis</i>	Roost	May 1 – August 31	100	500	500
Bat cave^d	-	Cave	Year round	200	200	200
Wolverine^e	<i>Gulo</i>	Den	Year round	100	250	500
Mineral lick^b	-	Mineral lick	Year round	120	120	120
Denning species (e.g., red fox, coyote, gray wolf, American marten, fisher, least weasel)^c	-	Active den	Year round	50	50	50
American white pelican	<i>Pelecanus erythrorhynchos</i>	Nesting colony	April 1 – August 31	500	750	1,000
Bald eagle	<i>Haliaeetus leucocephalus</i>	Active or traditional nest site	March 15 – July 15	250	500	1,000
Bank swallow	<i>Riparia</i>	Nesting colony	May 15 – July 31	50	150	300
Barn swallow	<i>Hirundo rustica</i>	Nest site	May 15 – Sept. 30	50	150	300

Species or Feature ¹		Key Wildlife Feature	Restricted Activity Period	Recommended Setback Distance by Disturbance Category (m) ²		
Common Name	Scientific Name			Low	Medium	High
Barred owl	<i>Strix varia</i>	Active or traditional nest site	March 15 - July 15	250	500	1,000
Bobolink	<i>Dolichonyx oryzivorus</i>	Nest site	May 15 – August 15	100	250	400
Boreal Owl	<i>Aegolius funereus</i>	Nest Site	March 1 - July 15	250	500	1,000
Canada warbler	<i>Cardellina canadensis</i>	Nest site	May 1 – July 31	200	300	450
Common nighthawk	<i>Chordeiles minor</i>	Nest site	May 1 – August 31	100	200	500
Double-crested cormorant	<i>Phalacrocorax auritus</i>	Nesting colony	April 1 – August 31	400	500	750
Eastern whip-poor-will	<i>Antrostomus vociferous</i>	Nest site	May 15 – July 16	100	200	500
Eastern wood-pewee	<i>Contopus virens</i>	Nest site	May 15 – August 15	50	150	300
Golden-winged warbler	<i>Vermivora chrysoptera</i>	Nest site	May 15 – August 6	200	300	450
Great gray owl	<i>Strix nebulosa</i>	Active or traditional nest site	Feb. 15 – July 15	250	500	1,000
Grebes	-	Nesting colony	May 15 – July 15	100	200	400
Gulls/terns	-	Nesting colony	May 1 – July 15	400	500	750
Hérons	-	Nesting colony	April 1 – August 31	400	500	750

Species or Feature ¹		Key Wildlife Feature	Restricted Activity Period	Recommended Setback Distance by Disturbance Category (m) ²		
Common Name	Scientific Name			Low	Medium	High
Horned grebe	<i>Podiceps auratus</i>	Nest site	May 1 – Sept. 15	100	200	400
Least bittern	<i>Ixobrychus exilis</i>	Nest site	May 1 – July 31	100	200	400
Northern hawk owl	<i>Surnia ulula</i>	Nest site	Feb. 15 – July 15	250	500	1,000
Osprey	<i>Pandion haliaetus</i>	Nest site	May 1 – August 15	500	1,000	1,000
Olive-sided flycatcher	<i>Contopus cooperi</i>	Nest site	May 1 – August 31	50	150	300
Piping plover	<i>Charadrius melodus</i>	Active or traditional nest site	April 15 – August 15	200	400	600
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	Nest site	April 15 – August 15	50	100	200
Rusty blackbird	<i>Euphagus carolinus</i>	Nest site	May 1 – July 31	50	150	300
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	Lek	Mar 15 - May 15	200	500	1000
Short-eared owl	<i>Asio flammeus</i>	Nest site	April 15 – Sept. 15	200	300	500
Trumpeter swan	<i>Cygnus buccinator</i>	Nest site	April 1 – July 31	500	750	1,000
Yellow rail	<i>Coturnicops noveboracensis</i>	Nest site	May 1 – July 15	100	150	350
Northern leopard frog^a	<i>Lithobates pipiens</i>	Hibernaculum and breeding habitat	Year round	10	200	500
Red-sided garter snake^b	<i>Thamnophis sirtalis</i>	Hibernaculum	Year round	200	200	200

Species or Feature ¹		Key Wildlife Feature	Restricted Activity Period	Recommended Setback Distance by Disturbance Category (m) ²		
Common Name	Scientific Name			Low	Medium	High
Snapping turtle^{3, a}	<i>Chelydra serpentina</i>	Nest site	March 15 – June 30	0	400	400

Notes:

- ¹ Recommended setback distances and restricted activity periods are derived from MB CDC’s Recommended Development Setback Distances from Birds document (MB CDC 2021) unless otherwise specified (see a-c below)
- ^a – Saskatchewan Ministry of Environment’s Saskatchewan Activity Restriction Guidelines for Sensitive Species (SK MOE 2017)
- ^b – Manitoba Hydro’s Manitoba-Minnesota Transmission Project Construction EPP (Manitoba Hydro 2015)
- ^c – Core maternity roost period for bats as defined by Fenton and Barclay (1980) and Barclay (1982 and 1984)
- ^d – Manitoba’s Forest Management Guidelines for Terrestrial Buffers (Government of Manitoba 2017)
- ^e – Environment Canada’s Petroleum Industry Activity Guidelines for Wildlife SAR in the Prairie and Northern Region (Environment Canada 2009)
- ² Low: foot traffic, occasional/infrequent/short-term small vehicle (<1 ton) or ATV use; medium: trucks>1 ton, regular/frequent/long-term small vehicle (<1 ton) or ATV use; High: road, distribution line, or outlet channel construction, forest harvest, rock crushing, asphalt batching, quarry or gravel pit operation
- ³ snapping turtle: Low disturbance category considered as foot traffic only, all other activities (i.e., occasional/infrequent/short-term small vehicle (<1 ton) or ATV use considered medium disturbance).