



IMPERIAL OIL RESOURCES NWT LIMITED

2026 Updated Wildlife Management and Monitoring Plan

Norman Wells Operations

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Plain Language Summary

Imperial Oil Resources (Imperial) retained Tłegóhłı Reclamation Services Advisian (TRSA) Limited Partnership, operating as TRSA, to prepare an updated Wildlife Management and Monitoring Plan (WMMP) in 2026 for Imperial's Norman Wells Operations (NWO). NWO is located within the Sahtu Settlement Area (Sahtu Region) within the Mackenzie River watershed in the NWT of Canada. The region is characterized by sensitive subarctic ecosystems, including extensive wetlands, riparian habitats, and important wildlife movement corridors. The area supports diverse wildlife populations, including boreal woodland caribou (*Rangifer tarandus caribou*; federally listed as Threatened), several migratory bird species, and culturally significant species that are relied upon by local Indigenous communities.

With Cessation of Production (CoP) scheduled for 2026, NWO transitions to an Interim Care and Maintenance (IC&M) period that bridges the gap between CoP and final closure and reclamation of the NWO. This WMMP updates the previous wildlife management plan which was designed for Operation and Production State. This WMMP design was guided by the Government of NWT (GoNWT) Tier 1 WMMP Guidelines and supports compliance with Water Licence S13L1-007 (as amended) as well as applicable federal and territorial regulatory requirements and best management practices pertaining to wildlife. These include the Northwest Territories *Wildlife Act*, the territorial *Species at Risk (NWT) Act*, the federal *Species at Risk Act*, the *Migratory Birds Convention Act* (MBCA), the Northern Land Use Guidelines (NLUG), incorporation of traditional knowledge, and engagement with local Renewable Resource Councils, including the Sahtu Renewable Resources Board (SRRB).

This WMMP establishes a comprehensive framework to manage and monitor potential effects of surveillance and closure activities on wildlife and wildlife habitat at NWO. The management approach is supported by defined performance metrics, monitoring triggers, and continuous improvement mechanisms. The WMMP structure includes a mitigation hierarchy of avoidance, minimization, rectify, and offset, with an emphasis on avoiding sensitive habitats and key seasonal periods wherever feasible. Where avoidance is not possible, mitigation measures are implemented to reduce habitat loss and fragmentation, maintain ecological connectivity, minimize sensory disturbance, and reduce the risk of human-wildlife conflict. Specific strategies include application of species-appropriate setbacks, timing restrictions, wildlife sweeps, implementation of spill prevention and response measures, and monitoring. Monitoring programs include a remote camera and autonomous recording unit (ARU) program, a wildlife sweep program, and wildlife incident reporting program, which will collectively assist in long term monitoring of wildlife use and habitat health within the NWO. Monitoring results will inform periodic evaluation of mitigation effectiveness and guide adjustments to management practices over time, with annual wildlife summary reports.

Through implementation of this WMMP, Imperial aims to minimize environmental impacts, maintain ecological function, and uphold commitments to regulatory compliance and Indigenous engagement while contributing to the long-term sustainability of wildlife resources in the region.



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PROJECT EN-PLN-00001 : 2026 Updated Wildlife Management and Monitoring Plan - Norman Wells Operations

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Acronyms and Abbreviations

Term	Description
AEMP	Aquatic Effects Monitoring Program
ARU	autonomous recording unit
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPF	central processing facility
CWS	Canadian Wildlife Service
ECCC	Environment and Climate Change Canada
ENR	Environment and Natural Resources
ECC	Department of Environment and Climate Change
GoA	Government of Alberta
GoC	Government of Canada
GoNWT	Government of Northwest Territories
IBA	Important Bird Area
IWA	Important Wildlife Area
MBCA	<i>Migratory Birds Convention Act</i>
MBR	<i>Migratory Birds Regulations</i>
MRBB	Mackenzie River Basin Board
MVRMA	<i>Mackenzie Valley Resource Management Act</i>
NEEC	National Environmental Emergencies Centre
NLUG	Northern land use guidelines
NT1CR	NT1 Caribou Range
NWO	Norman Wells Operations
NWT	Northwest Territories
RAPs	restricted activity periods
RRCs	Renewable Resource Councils
SAR	Species at Risk
SARA	<i>Species at Risk Act</i>
SARC	Species at Risk Committee
SARNWTA	<i>Species at Risk (NWT) Act</i>
SDMCLCA	<i>Sahtu Dene and Métis Comprehensive Land Claim Agreement</i>
SLWB	Sahtu Land and Water Board
SRRB	Sahtu Renewable Resources Board
WMMP	Wildlife Management and Monitoring Plan
WMZ	wildlife management zone



1. Introduction

Imperial Oil Resources Northwest Territories (NWT) Limited (Imperial) retained Tłegóhł Reclamation Services Advisian (TRSA) to prepare an updated Wildlife Management and Monitoring Plan (WMMP) for their Norman Wells Operations (NWO). The NWO is jointly-owned by Imperial and the Government of Canada and is wholly operated by Imperial. NWO is an upstream oil and gas production and processing facility located about 700 kilometres (km) northwest of Yellowknife, NWT (Figure 1-1).

Imperial is committed to minimizing impacts to wildlife, through adopting and refining wildlife management, mitigation, and monitoring methods. This document has been prepared to update the previous WMMP which was designed for operation and production activities, completed in 2005 (Imperial 2005) and was intended to meet the requirements of Imperial's Water Licence (S13L1-007) issued by the Sahtu Land and Water Board (SLWB). This WMMP design was guided by the Government of NWT (GoNWT) Tier 1 WMMP Guidelines (Table 1-1) and in some cases meets Tier 2 content (e.g., adaptive management; GoNWT 2021).

This WMMP outlines and describes strategies that will be implemented to meet territorial and federal regulations, environmental commitments, and best management practices, including the Northern Land Use Guidelines (NLUG; GoNWT 2015a, 2015b, 2015c, 2015d). Where relevant, this WMMP adopts applicable best management practices described in other jurisdictions (e.g., Government of Alberta [GoA] 2024). This WMMP further outlines the specific mitigation and monitoring components that will be implemented, metrics to track WMMP success, and the adaptive management approach used to improve the effectiveness of mitigation measures. The objective of the WMMP is to manage and mitigate potential impacts to wildlife and monitor the effectiveness (measure the performance) of the management and mitigation strategies and contribute to the long-term sustainability of wildlife resources.

Table 1-1: Concordance Table

Tier 1 WMMP Content (GoNWT 2021)	Section(s) in this Document
1.3 Engagement	Section 1.3
1.4 Mention of associated operational or management plans	Sections 1.4, 3
2.1 Project Description	Section 1.1
2.2 Project Map	Figure 1-1
3.1 Affected species or habitat features	Section 2
3.2 Potential impacts to wildlife and wildlife habitat	Section 2.4
4. Wildlife and Wildlife Habitat Mitigation	Section 3
4.2 Infrastructure design and camp layout for bear safety and/or to prevent denning, nesting, and roosting	Figure 1-1, Section 3
4.3 Management of camp waste and other wildlife attractants	Section 3.2.2
4.4 Timing restrictions and/or setback distances to protect wildlife and wildlife habitat features	Appendix A



Tier 1 WMMP Content (GoNWT 2021)	Section(s) in this Document
4.8 Management of hazards to wildlife (e.g., open pits, tailings ponds, roads, airstrips, spills)	Sections 3, 4.3, 3.4
4.9 Wildlife deterrence procedures	Appendix B
4.11 Description of the role community wildlife monitors in implementing aspects of the plan	Section 7
5.1 Mitigation Monitoring	Sections 4, 5
5.3 Project Footprint size reporting	Section 6
8. Reporting Protocols	6
9. Roles and Responsibilities	Sections 5, 7
12.2 Monitoring forms and data sheets	Appendix C
12.3 Reporting form templates	Appendix D

1.1 Project Description

NWO is Imperials longest standing operation in Canada, operating since 1920. Over the years, Imperial produced oil from wells drilled in the vicinity of the Town of Norman Wells and the MacKenzie River. The oil-bearing reservoir, largely under the Mackenzie River, was at depths ranging from 320 meters to 625 meters below ground surface. The production and injection wells were connected through a flowline network to a Central Processing Facility (CPF). Production wells were located in three distinct areas: on the mainland, the natural islands (Goose, Bear, and Frenchy's), and the six artificial islands (1-Rayuka, 2-Rampart, 3-Dehcho, 4Ekwe, 5-Itch K'ee and 6-Little Bear; Figure 1-1). Crude oil production, received at the CPF, was processed for shipment via the Enbridge Line 21 pipeline to Alberta.

1.1.1 Interim Care and Maintenance

In January 2026, Imperial announced its intent for cessation of production (CoP) for the Norman Wells asset. Consequently, Imperial has prepared a Surveillance State Plan (SSP) to manage the Interim Care and Maintenance period between CoP and final closure and reclamations, with a focus on maintaining regulatory compliance, operational integrity, and stakeholder relationships. The SSP establishes a framework for continued monitoring and maintenance activities, including well suspension programs, surface casing vent monitoring, infrastructure inspections, road maintenance, snow clearing, security, building operations, marine fleet, fuel, aviation, ice road construction and maintenance, environmental monitoring, decontamination and demolition, well abandonment, remediation and reclamation work, and emergency response readiness, all aligned with Canadian Energy Regulator (CER) requirements and corporate Safety, Security, Health, and Environment (SSHE) standards. It presents a phased approach to well suspension and abandonment, supported by ongoing inspection, testing, and data collection programs to ensure long-term integrity while minimizing future closure risks and costs. Additionally, the SSP addresses logistics, power supply, facility operations, waste management, and workforce transition considerations necessary to sustain a reduced but functional operational footprint during this period. Finally, it emphasizes the importance of regulatory reporting, community engagement, and proactive planning for permits, contracts, and asset disposition to support an efficient and compliant transition toward final closure and reclamation.



1.2 Environmental Setting

NWO is located within the Taiga Plains ecoregion of NWT, specifically within the North Mackenzie Plain Low Subarctic ecoregion (Ecosystem Classification Group 2009). This region is characterized by a broad, gently undulating plain associated with the Mackenzie River valley, where uplands and extensive wetlands are closely intermixed. Vegetation communities are dominated by open to semi-closed coniferous forests of black spruce (*Picea mariana*) and white spruce (*Picea glauca*), with a shrub understory consisting of dwarf birch (*Betula glandulosa*), Labrador tea (*Rhododendron groenlandicum*), mosses, and lichens. Extensive peatlands, including peat plateaus, polygonal peat plateaus, and fens, are a defining feature of the landscape, while riparian zones along the Mackenzie River and its tributaries support taller and more productive white spruce forests, with limited occurrences of Alaska paper birch (*Betula neoalaskana*) and trembling aspen (*Populus tremuloides*) near the northern limits of their distribution. The regional climate is classified as Low Subarctic and is marked by long, cold winters and short, cool summers. Mean annual air temperatures range from approximately -3.5 to -9 °C, with average winter temperatures in the coldest months (January and February) commonly between -25 and -29 °C, and average summer temperatures in the warmest months (June, July, and August) ranging from about 11 to 16.5 °C, with highs around 30 to 33 °C. Annual precipitation is relatively low, averaging approximately 230 to 350 millimetres (mm), with a large proportion falling as summer rainfall and winter snowfall. Discontinuous permafrost is widespread and strongly influences soil development, vegetation patterns, and hydrology throughout the region (Ecosystem Classification Group 2009).

The NWO is located predominantly on the north shore of the Mackenzie River. Elevations range from approximately 50 to 70 metres above sea level (masl). The river flows in a west-northwesterly direction past the Town of Norman Wells. The valley within which this major river flows is bounded on the south by the Mackenzie Mountains and on the north by the Franklin Mountains (Imperial 2026).

The Mackenzie River drainage basin is the largest river basin in Canada and the tenth largest river basin in the world. The Mackenzie River system flows roughly $4,200$ km from the headwaters of the Athabasca River at the Columbia Icefield in Jasper National Park, Alberta, and the snowfields of the upper Peace River headlands in northeastern British Columbia to its final destination at the Beaufort Sea in the NWT (Mackenzie River Basin Board [MRBB] 2004). The river empties a volume of approximately $10,000$ to $19,000$ cubic metres per second (m^3/sec) into the Beaufort Sea of the Arctic Ocean along the Mackenzie River delta, accounting for 60% of the freshwater that flows into the Arctic Ocean from Canada and about 9% of the freshwater discharged to all the oceans by all Canadian watersheds (MRBB 2004).



Bosworth Creek drains a small watershed (~125 km²) near the Town of Norman Wells. It originates at the outlet of Hodgson (Jackfish) Lake and travels northwest approximately 8 km before bending southwest towards the NWO to eventually drain into the Mackenzie River (Collins et al. 2011). Bosworth Creek is an important part of the local landscape and is used frequently by residents for recreation. Seasonal habitat surveys were completed for Bosworth Creek as part of the Mackenzie Gas Project in 2002 (Imperial 2026). Wetted channel widths along the stream ranged from 3.5 to 16 metres (m) and habitat was primarily riffles, with the remainder composed of shallow and moderate-depth run habitat. Coarse gravel and cobble substrate predominated in most habitat types. Unstable or slumping banks were common, with both banks showing signs of erosion at high flow (Imperial 2026).

1.3 Engagement

The GoNWT co-manages wildlife resources with the various indigenous communities within its borders. NWO falls within the Sahtu Settlement Area (Sahtu Region) and thus the Sahtu Renewable Resource Board (SRRB), which is the main instrument of wildlife management in the Sahtu Region, established by the Sahtu Dene and Métis Comprehensive Land Claim Agreement (Government of Canada [GoC] 1993). Under the Norman Wells Water Licence S13L1-007, the Mackenzie Land and Water Board (MVLWB) requires an engagement plan, adopted by the Sahtu Land and Water Board (SLWB). Imperial created the Norman Wells Water Licence S13L1-007 Community Engagement Plan as part of the water licence application issued on March 1, 2015 (SLWB 2015).

As described in the Norman Wells Water Licence S13L1-007 Community Engagement Plan (NWO Community Engagement Plan; Imperial 2015), Imperial has been engaging with the Renewable Resource Councils (RRCs) in five communities within the Sahtu Region:

- Déline Renewable Resource Council
- Fort Good Hope Renewable Resources Council
- Tulita Renewable Resources Council
- Norman Wells Renewable Resources Council
- Behdzi Ahda (Coville Lake) Renewable Resource Council

The NWO Community Engagement Plan also includes engagement with the Sahtu Secretariat Incorporated and district land corporations, band councils and community governments, territorial and federal regulators, and other regional agencies and elected officials.

Prior to the NWO Community Engagement Plan, Imperial was engaging with the nearby Indigenous communities. For more details, please refer to the NWO Community Engagement Plan (Imperial 2015).



1.4 Wildlife Legislation, Regional Plans, and Guidelines

This WMMP integrates wildlife management and mitigation measures into ongoing activities at NWO in a manner that is consistent with legislative requirements, regulatory guidance, and approved project-specific commitments. Wildlife legislation, regional plans, and guidelines pertaining to NWO are summarized below.

1.4.1 NWT Wildlife Act

The NWT *Wildlife Act* (GoNWT 2013) is administered through the GoNWT Department of Environment and Climate Change (ECC). Under the *Wildlife Act*, the DECC (the Minister) determines when a project specific WMMP is required. When required, a WMMP at minimum must include the following:

- a description of potential disturbance to big game and other prescribed wildlife, potential harm to wildlife and potential impacts on habitat;
- a description of measures to be implemented for the mitigation of potential impacts; and
- the process for monitoring impacts and assessing whether mitigative measures are effective

Wildlife are defined in the *Wildlife Act* as:

- a) all species of vertebrates and invertebrates found wild in nature in the NWT, and individuals of those species, except
 - i) fish as defined in section 2 of the *Fisheries Act* (Canada), and
 - ii) other prescribed species and subspecies;
- b) species of wildlife referred to in paragraph a) that are domesticated or held in captivity, and individuals of those species; and
- c) prescribed species or subspecies of vertebrates and invertebrates, and individuals of those species or subspecies.

Under the *Wildlife Act*, it is prohibited, unless authorized by a licence or permit to do so, destroy, disturb or take an egg of a bird, the nest of a bird when the nest is occupied by a bird or its egg, and the nest of a prescribed bird. Also, the *Wildlife Act* protects dens, beaver dams and lodges, muskrat push-ups, and hibernaculum from being broken into, destroyed, or damaged. Similarly, no person shall engage in an activity that is likely to result in significant disturbance to big game or other prescribed wildlife or unnecessarily chase, fatigue, disturb, torment or otherwise harass game or other prescribed wildlife, unless authorized by a licence or permit to do so.



1.4.2 Species at Risk (NWT) Act

The *Species at Risk (NWT) Act* (SARNWTA) is a territorial law that outlines processes to identify, protect, and recover vulnerable wildlife in the NWT (GoNWT 2009). Enacted by the GoNWT, it applies across both public and private lands and complements federal legislation (see section below). The SARNWTA legislates responsibility for wildlife, establishes criteria for setting up dedicated committees and dictates how species are evaluated. The NWT Species at Risk Committee (NWTSRC) is established under the SARNWTA and evaluates the biological status of species using a blend of western science and traditional Indigenous and community knowledge (GoNWT 2009). The SARNWTA further establishes the Conference of Management Authorities (CMA) which is made up of the wildlife co-management boards and governments in the NWT that share responsibility for the conservation and recovery of species in the NWT (CMA 2017).

1.4.3 MacKenzie Valley Resource Management Act

The MacKenzie Valley Resource Management Act (MVRMA) establishes an integrated co-management regime for lands, waters, and resources in the MacKenzie Valley. It implements aspects of the Gwich'in, Sahtú, and Tłı̨chǫ land claim agreements, while enabling resident participation in resource management (MVRMA 1998).

Wildlife conservation and protection are indirectly but integrally through land use planning, regulatory permitting, environmental assessment and review processes, and guiding principles that emphasize suitable use, habitat protection, and respect for Indigenous harvesting rights. The MVRMA does not create a standalone wildlife management statute, but requires wildlife considerations in decision-making.

1.4.4 Species at Risk Act

The regulatory agency pertaining to wildlife for administering the federal Species at Risk Act (SARA) is the Canadian Wildlife Service. Under SARA:

- Section 32(1) prohibits the killing, harming, harassing, or capturing of a threatened, endangered, or extirpated species.
- Section 33 prohibits the damage or destruction of the residence of a threatened, endangered, or extirpated species.
- Section 58(1) prohibits the damage or destruction of any part of designated critical habitat of a threatened, endangered, or extirpated species.

Species assessments are conducted by the independent Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Once a species is assessed, the federal government may legally list it under Schedule 1 of SARA. If a proposed activity is likely to contravene Sections 32, 33, or 58 a formal review and potential authorization is required. Section 79 of SARA also requires proponents and federal authorities to identify potential effects to listed species and to implement measures to avoid or reduce those effects.



Critical habitat (or designated habitat) is identified for species listed as Endangered or Threatened under the SARA. Critical habitat is defined under Section 2 of the SARA as:

"...the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species".

Critical habitat is typically defined (spatially) and is a key legislated component of a species' recovery plans under SARA.

1.4.5 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA) of 1994 (MBCA 1994) provides legal framework for governing the Migratory Birds Regulations (MBRs). Under Section 5(1) of the MBRs, *"a person must not...capture, kill, take, injure, or harass a migratory bird or attempt to do so; destroy, take, or disturb an egg; and damage, destroy, remove, or disturb a nest, nest shelter, eider duck shelter or duck box"* unless authorized by the MBR (2022).

Certain species listed in Schedule 1 of the MBRs build nests that may be reused over multiple years. As such, their nests may remain protected even when unoccupied, unless specific conditions set out in Section 5(2) of the MBRs are met. These include submitting written notice to Environment and Climate Change Canada (ECCC) a prescribed number of months in advance and confirming that the nest has not been reused during that time. Until those conditions are met, the nest remains protected year-round.

NWO lies within Bird Conservation Region (BCR) 8: Boreal Taiga Plains (ECCC 2025a). This BCR corresponds with a nesting period of between early-May to late-August, depending on broad habitat types. In forested habitats in BCR 8, most birds nest between May 4 and August 15. In open habitats in BCR 8, most birds nest between May 4 and August 22. In wetland habitats in BCR 8, most birds nest between May 7 and August 11 (ECCC 2025a). With these periods per habitat type combined, the period for the migratory bird nesting period is between May 4 and August 22.

1.4.6 Boreal Woodland Caribou and Range Plans

NWO overlaps the range of boreal woodland caribou (*Rangifer tarandus caribou*), a species listed both territorially and federally as 'Threatened' in NWT (see Section 2). This range is designated as the NT1 Caribou Range (NT1CR) under the federal recovery strategy (ECCC 2020) and represents the geographic boundary within which critical habitat for boreal woodland caribou is located (ECCC 2020, see Section 0). The NT1CR serves as a habitat supply system (i.e., critical habitat) that must function for boreal woodland caribou to be self-sustaining. As areas of disturbed habitat (including natural disturbance regimes [fire]) and undisturbed habitat cycle on the landscape, boreal woodland caribou shift their range over space and time in accordance with changes in the location of habitat containing biophysical attributes for life stages such as calving, rutting, and winter survival within the range (ECCC 2020).



The NT1CR has been classified as likely self-sustaining (ECCC 2020) and traditional and community knowledge suggests that boreal caribou population trends may be stable or increasing in the Sahtu Settlement Area (CMA 2017). Although boreal woodland caribou may be declining in other areas within NWT, considering the slow pace of development, existing and planned conservation efforts, and the currently low level of human disturbance in the region, the risk of critical habitat in the NWT portion of NT1CR being destroyed by human activities is likely low (CMA 2017, GoNWT 2019a).

Together, with the territorial recovery strategy (CMA 2017) and the federal recovery strategy (ECCC 2020), the population and distribution objective of the NT1CR is to maintain a self-sustaining status, which constitutes a minimum of 65% of the area within the NT1CR being maintained as undisturbed habitat which holds the necessary biophysical attributes to carry out life processes (CMA 2017, GoNWT 2019b, ECCC 2020). Undisturbed habitat is defined as areas that have not burned in the past 40 years, and areas that are further than 500 metres (m) from human disturbance footprints, such as roads, seismic lines, and forestry cut blocks (GoNWT 2019b, ECCC 2020).

The NWT framework for boreal woodland caribou range planning sets out five regional plans across the NT1CR to manage disturbance at a finer scale, support the federal 65% undisturbed habitat threshold, and integrate Indigenous knowledge, co-management, and land-use planning (GoNWT 2019b). The regions are Gwich'in, Sahtú, Wek'èezhì, and Southern NWT. The official tracking in the federal SARA Conservation Agreement lists the schedule for the Sahtú Range Plan as "In progress" through 2026, with implementation marked as "Not started" (GoC 2024).

In the absence of a regional range plan for boreal woodland caribou, this WMMP has been designed in alignment with the objective of maintaining a self-sustaining herds. This WMMP outlines a management hierarchy of avoid, minimize, rectify, and offset (see Section 3), and outlines species-specific setbacks (Appendix A) for working near caribou or caribou habitat, guided by the NLUG (GoNWT 2015a, 2015b, 2015c, 2015d).

1.4.7 Northern Land Use Guidelines

The GoNWT publishes a series of guidelines that establish best practices for minimizing environmental impacts from land use activities on public land. These guidelines promote a hierarchy of avoidance, minimization, and restoration, with strong emphasis on protecting wildlife habitat, maintaining movement corridors, and adhering to timing restrictions, applying spatial setbacks, and achieving progressive and final reclamation that supports wildlife use (GoNWT 2015a, 2015b, 2015c, and 2015d). Where relevant and in the context of NWO activities, this WMMP has been aligned with these guidelines in mind (e.g., Appendix A).



1.4.8 Land and Water Boards

The NWO Community Engagement Plan, administered by SLWB, commits Imperial to:

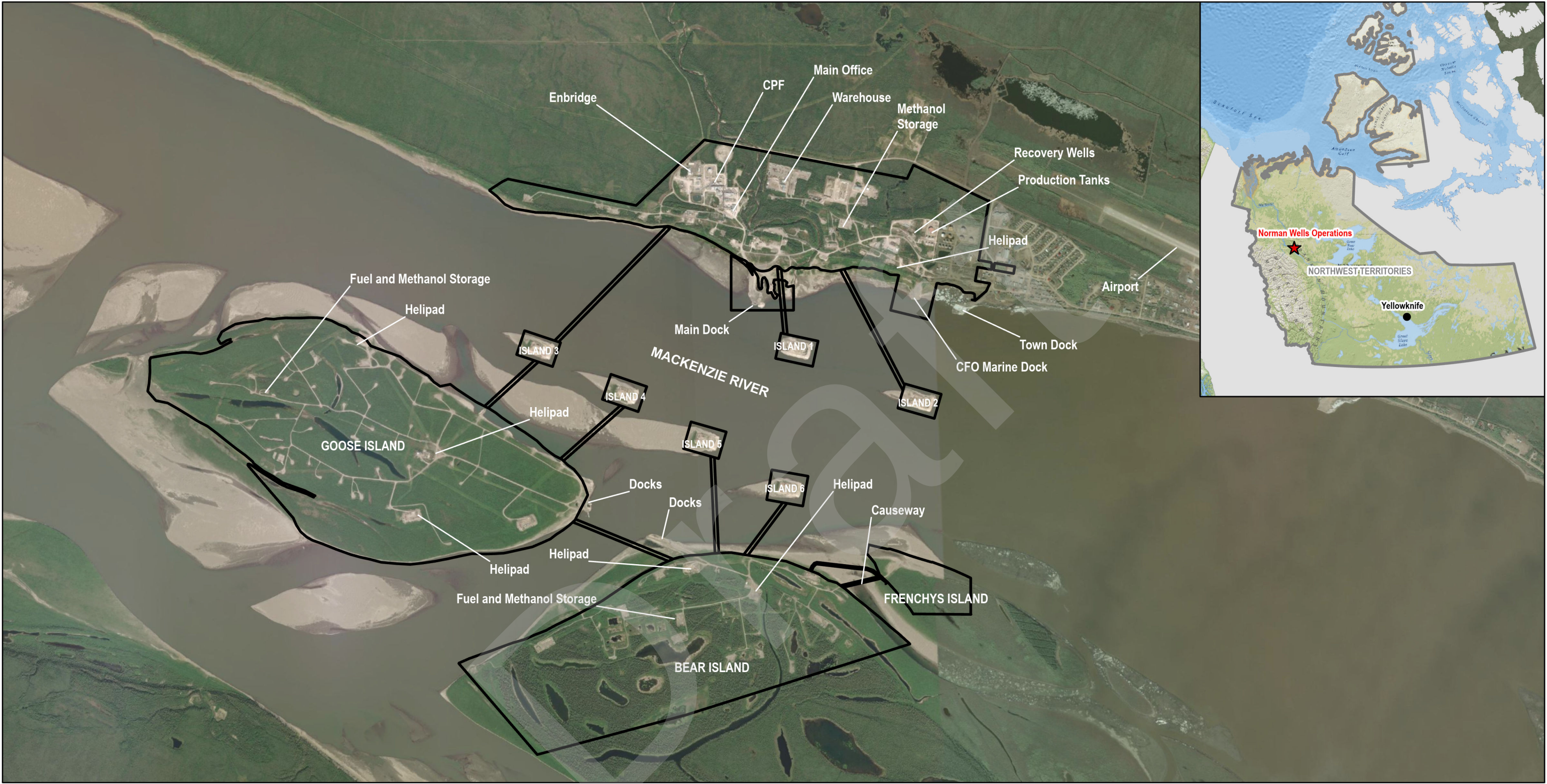
- gather and incorporate traditional knowledge, including knowledge on hunting, fishing, trapping, and harvesting activities and limiting the impacts on these traditional lifestyle activities;
- engage with the Sahtu RRCs in the five communities (see Section 1.3); and
- adhere to the Aquatic Effects Monitoring Program (AEMP; Imperial 2026).

This WMMP reflects the commitments in NWO Community Engagement Plan by identifying wildlife values relevant to the Norman Wells area, assessing wildlife interactions, and applying mitigation measures that are consistent with land use best practices in the Sahtu Settlement Area.

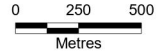
Implementation of the WMMP is coordinated with other regulatory plans (e.g., Environmental Protection Plan (Imperial 2024a) and Spill Contingency Plans (Imperial 2024b, 2024c) to ensure that wildlife considerations are embedded within routine operations and emergency response consistent with the MVLWB expectations for integrated environmental management.

1.5 WMMP Boundary

This WMMP applies to all active and inactive areas within Imperial's NWO and associated facilities (roads, wells, pipelines, etc.). This includes the areas shown in Figure 1-1. Areas outside of this can be reported on but should not be included as measures of performance unless associated with NWO and related activities, as determined relevant by an Imperial environmental advisor.



Legend
— Imperial Lease Boundary



1:30,000
NAD 1983 UTM Zone 9N

Data Source: Vantor, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

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IMPERIAL OIL RESOURCES LIMITED
NORMAN WELLS OPERATIONS
WILDLIFE MANAGEMENT AND MONITORING PLAN

LOCATION OF NORMAN WELLS OPERATIONS



Date:	23-JUN-26	Drawn by:	KR	Edited by:	KR	App'd by:	
Project No.	417085-64658			FIG No	1-1		REV B

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2. Wildlife at Norman Wells

The Taiga Plains ecoregion has been documented to have more than 50 mammal species and approximately 250 regularly occurring bird species (Ecosystem Classification Group 2009). The North Mackenzie Plain supports wildlife that are characteristic of the transition zone between the boreal forest and the subarctic forest-tundra. Wildlife in this region are strongly influenced by the availability of riparian corridors, extensive peatlands, fen complexes, and post-fire shrublands, resulting in an overlap of boreal and subarctic species. Large mammals commonly associated with the region include moose (*Alces alces*), boreal woodland caribou (*Rangifer tarandus caribou*) and barren-ground caribou (*Rangifer tarandus groenlandicus*), gray wolf (*Canis lupus*), grizzly bear (*Ursus arctos horribilis*), black bear (*Ursus americanus*), red fox (*Vulpes vulpes*), arctic fox (*Vulpes lagopus*), and a variety of furbearers such as marten (*Martes americana*), mink (*Neogale vison*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), and river otter (*Lontra canadensis*), many of which are closely tied to forested wetlands and watercourses along the Mackenzie River and its tributaries. The North Mackenzie Plain also provides important habitat for migratory and breeding birds, particularly waterfowl, shorebirds, wading birds, and birds of prey, which are supported by the extensive network of wetlands, lakes, and river systems. Although overall wildlife diversity is lower than in the more southerly boreal portions of the Taiga Plains, the North Mackenzie Plain remains an ecologically important landscape where wetland and riparian habitats support regionally significant wildlife populations and seasonal movements (Ecosystem Classification Group 2009).

2.1 Key Range and Wildlife Layers

The NWO is in Wildlife Management Zone (WMZ) “S” (GoNWT 2024). The range of boreal woodland caribou overlaps NWO (Figure 1-1). Boreal woodland caribou are currently listed as Threatened by the COSEWIC and legally listed as such under the *Species at Risk Act* (GoC 2026, GoC 2002). Boreal woodland caribou are also listed as Threatened under the SARNWTA (GoNWT 2026a).

2.1.1 Important Wildlife Areas

The NWO is in proximity to four Important Wildlife Areas (IWA) and one Important Bird Area (IBA). These include a muskox (*Ovibos moschatus*) IWA, located in the Sahtu Muskox Areas, three moose IWAs, and the Middle MacKenzie River Islands IBA (Figure 2-1). The moose IWAs include the Sahtu River IWA, the Norman Wells to Fort Good Hope Winter Road IWA, and Three Day Lake IWA (GoNWT 2026b).

IWA are defined by GoNWT (2012) as:

- areas that many animals use traditionally, around the same time each year (e.g., caribou calving grounds),
- places where animals consistently occur in relatively large numbers,



- areas that animals repeatedly use under adverse conditions as refugia (e.g. muskox habitat during extreme climate conditions),
- areas where there are source populations,
- places that house a species in very low numbers that may be identified as important, and
- unique areas used by many different species such as wetlands and mineral licks.

For IWA consideration, the focus species of the IWAs must meet certain criteria, including (GoNWT 2012):

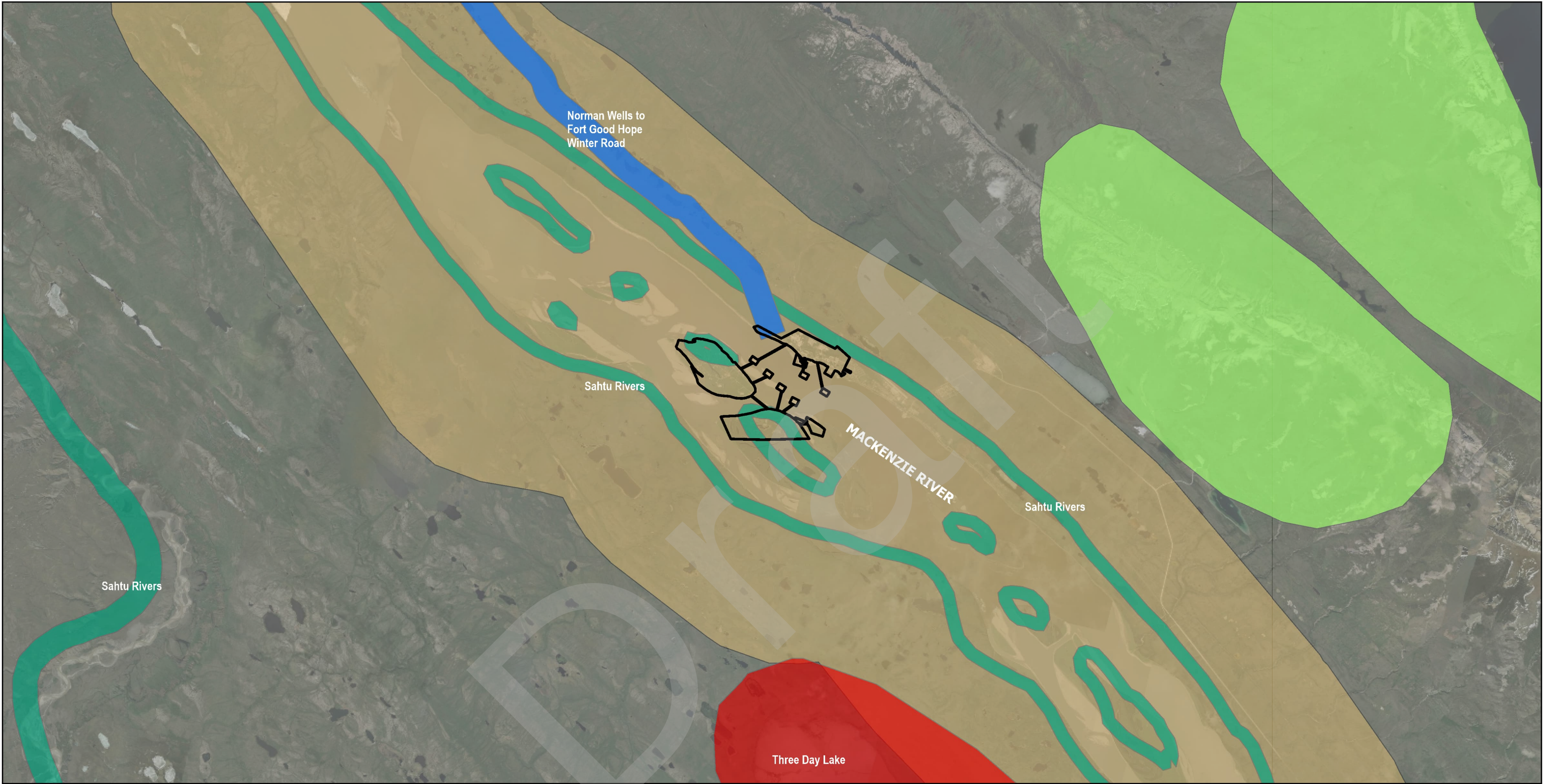
- having high socio-economic importance; or
- federally assessed as 'Endangered' or 'Threatened' by COSEWIC; or
- federally assessed as 'Special Concern' by COSEWIC and territorially assigned a status rank of 'Sensitive' or higher in the NWT

The three IWAs for moose within NWO are important because of moose prevalence using the west bank of the Mackenzie River for winter grazing. The river valleys and associated floodplains are favorable for proximity to vegetation with high browse value such as birch and willows (GoNWT 2012). The Sahtu muskox IWAs are a mix of upland habitats with ridgelines and eskers that are historically important for muskox in the area, documented by aerial footage and traditional knowledge of the area (GoNWT 2012).

2.1.1.1 Important Bird Areas

IBAs are identified using information about bird populations and use of the area. IBAs provide habitat for threatened birds, large groupings of birds, and birds restricted by range or by habitat. If a bird species occurs in sufficient numbers during one or more seasons (e.g., winter, migration, breeding), they can become a trigger species and the habitat can be classified as an IBA (Birds Canada 2026). In Canada, IBAs complement and overlap with many federal, territorial, and provincially protected areas but are not legally protected in their own right.

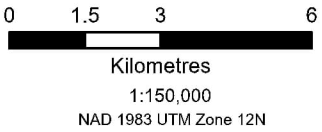
The Mackenzie Valley forms one of North America's most travelled migratory corridors for waterfowl that breed along the Arctic coast. The Middle Mackenzie River Islands IBA (IBA #NT081) encompasses a 250 km stretch of the Mackenzie River, between the Redstone River and an area north of Oscar Creek, NWT. It includes numerous sandy and rocky river islands with rich riparian vegetation and boreal forest habitats that provide critical stopover and feeding areas for migrating waterfowl during spring. It is particularly significant for snow geese (*Anser caerulescens*) of the Western Central Flyway, with tens of thousands using the islands annually, alongside Canada geese (*Branta canadensis*), greater white-fronted geese (*Anser albifrons*), tundra swan (*Cygnus columbianus*), and a variety of duck species. The IBA plays a key role in supporting globally important concentrations of migratory birds at a time when suitable feeding habitats are limited (Birds Canada 2026).



Legend

- Imperial Lease Boundary
- Important Bird Area (IBA)
- Important Wildlife Area (IWA) - Muskox
- Important Wildlife Area (IWA) - Moose**
- Sahtu Rivers
- Three Day Lake
- Norman Wells to Fort Good Hope Winter Road

Data Sources:
Wildlife Areas - Govt. of NWT, Species and Habitat Viewer
Imagery: Earthstar Geographics



IMPERIAL OIL RESOURCES LIMITED
NORMAN WELLS OPERATIONS
WILDLIFE MANAGEMENT AND MONITORING PLAN

IMPORTANT WILDLIFE AREAS

	Date:	13-JUL-26	Drawn by:	KR	Edited by:	KR	App'd by:	
	Project No.	417085-64658			FIG No	2-1		REV E
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2.2 Species at Risk

Federally and territorially listed wildlife species of management concern, known as Species at Risk (SAR), have been documented and have the potential to occur at NWO. The categories in respect of listed SAR with relevance to NWO means one of the following categories:

- Ranked in the NWT General Species Rank (NWTGSR) as 'Sensitive', 'May Be At Risk', or 'At Risk' (GoNWT 2026c);
- Assessed by NWT Species at Risk Committee (NWTSRC) as 'Special Concern', 'Threatened', or 'Endangered' (GoNWT 2026c);
- Listed in the territorial SARNWTA as 'Special Concern', 'Threatened', or 'Endangered' (GoNWT 2009);
- Assessed by COSEWIC as 'Special Concern', 'Threatened', or 'Endangered' (GoC 2026); or
- Listed under Schedule 1 of the federal SARA as 'Special Concern', 'Threatened', 'Endangered', or 'Under Consideration' for listing (GoC 2002).

At least 18 SAR have historical occurrence records and the potential to occur within 2 km of the WMMP Boundary (Table 2-1, GoC 2026, GoNWT 2026a). Regarding legal protections under the SARNWTA and SARA, boreal woodland caribou is the only SAR listed under the SARNWTA. Under SARA, two species are 'Under Consideration' to be listed as 'Threatened', 12 are 'Special Concern', three are 'Threatened', and one is 'Endangered' (Table 2-1).

2.2.1 Critical Habitat

Two species have mapped areas containing critical habitat that overlap the NWO. These include the gypsy cuckoo bumble bee (*Bombus bohemicus*) and the boreal woodland caribou (Figure 2-2 and Figure 2-3, respectively). The biophysical features required by gypsy cuckoo bumble bee include but are not limited to open woodlands, shrubland, taiga, peatlands, meadows, gardens, and vegetated road verges and utility corridors with small mammal burrows or rotten stumps or fallen dead wood with host bumble bee nests (ECCC 2025b).

The biophysical attributes for boreal woodland caribou depend on the type of habitat and life stage. At a broad scale, boreal woodland caribou require mature coniferous forests of 100 years or older, with preference for bogs and black spruce forests with abundance lichens, sedges, and mosses (ECCC 2020). During the calving and post-calving season, they require open coniferous forests and riparian areas next to abundant standing water, and females show high fidelity to calving sites (CMA 2017, ECCC 2020).



Table 2-1: Species at risk with potential to be present within 2 kilometres of the WMMP Boundary.

Common Name	Scientific Name	NWTGSR ¹	NWTSARC ²	SARNWTA Status ³	COSEWIC ⁴	SARA Status ⁴
Birds						
Bank Swallow	<i>Riparia riparia</i>	At Risk	Not applicable	Not applicable	Threatened	Threatened
Barn Swallow	<i>Hirundo rustica</i>	Sensitive	Not applicable	Not applicable	Special Concern	Threatened
Common Nighthawk	<i>Chordeiles minor</i>	Sensitive	Not applicable	Not applicable	Special Concern	Special Concern
Harris's Sparrow	<i>Zonotrichia querula</i>	Sensitive	Not applicable	Not applicable	Special Concern	Special Concern
Horned Grebe	<i>Podiceps auritus</i>	Sensitive	Not applicable	Not applicable	Special Concern	Special Concern
Lesser Yellowlegs	<i>Tringa flavipes</i>	Sensitive	Not applicable	Not applicable	Threatened	Under Consideration
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Sensitive	Not applicable	Not applicable	Special Concern	Special Concern
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Sensitive	Not applicable	Not applicable	Special Concern	Special Concern
Rusty Blackbird	<i>Euphagus carolinus</i>	Sensitive	Not assessed	No status	Special Concern	Special Concern
Short-eared Owl	<i>Asio flammeus</i>	At Risk	Not assessed	No status	Threatened	Special Concern
Fish						
Bull Trout	<i>Salvelinus confluentus</i>	Sensitive	Not applicable	Not applicable	Special Concern	Special Concern
Insects						
Gypsy Cuckoo Bumble Bee	<i>Bombus bohemicus</i>	At Risk	Data deficient	No status	Endangered	Endangered
Suckley's Cuckoo Bumble Bee	<i>Bombus suckleyi</i>	At Risk	Not assessed	No status	Threatened	Under Consideration
Transverse Lady Beetle	<i>Coccinella transversoguttata</i>	Secure	Not assessed	No status	Special Concern	Special Concern
Yellow-banded Bumble Bee	<i>Bombus terricola</i>	Sensitive	Not at Risk	No status	Special Concern	Special Concern
Mammals						
Boreal Woodland Caribou	<i>Rangifer tarandus caribou</i>	At Risk	Threatened	Threatened	Threatened	Threatened
Grizzly Bear	<i>Ursus arctos horribilis</i>	Sensitive	Special Concern	No status	Special Concern	Special Concern
Wolverine	<i>Gulo gulo</i>	Sensitive	Not At Risk	No status	Special Concern	Special Concern

Notes:

1 - GSR is a broad, preliminary assessment that categorizes species as secure, sensitive, or potentially at risk and helps prioritize species, particularly those ranked *May Be at Risk*, for more detailed species-at-risk assessments by NWTSARC or COSEWIC (GoNWT 2026c).

2 - Listing from the NWTSARC (GoNWT 2026c).

3 - Official listing on the SARNWTA (GoNWT 2009).

4- COSEWIC and SARA listings from the SARA species list search (GoC 2026).

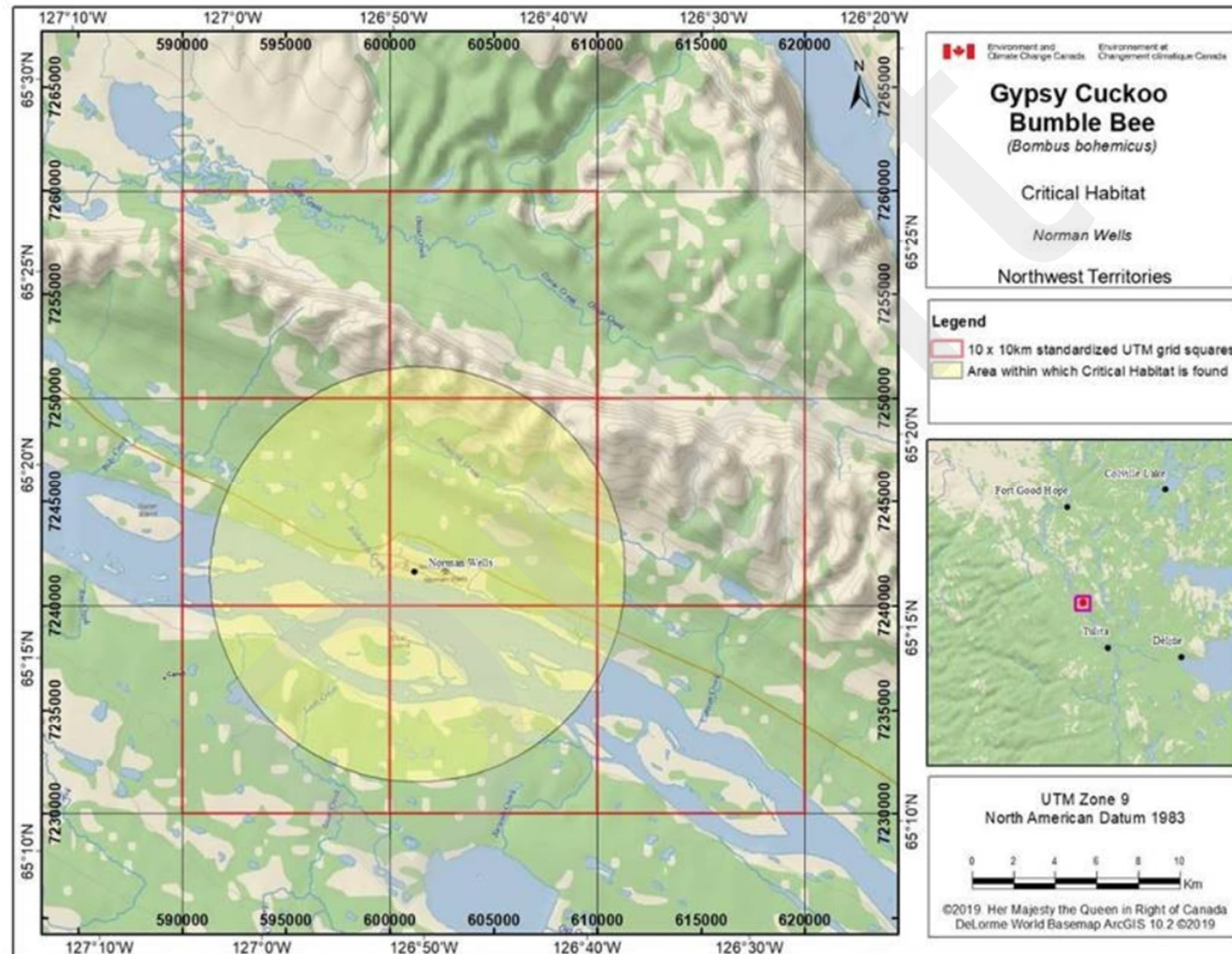


Figure 2-2: Area containing critical habitat for the gypsy cuckoo bumble bee, copied from the federal recovery strategy, for reference only (ECCC 2025)



Figure 2-3: Overview of NWT showing the mapped range of boreal woodland caribou (NT1CR), copied from the territorial recovery strategy, for reference only (map prepared by B. Fournier, Environment and Natural Resources, January 2015; CMA 2017).



2.3 Species of Cultural Significance

The Sahtu Settlement Area is subject to the *Sahtu Dene and Métis Comprehensive Land Claim Agreement* (SDMCLCA; GoC 1993). Wildlife is central to the cultural identity, livelihoods, and traditional way of life of the Sahtu Dene and Métis, and this connection is explicitly recognized and protected in the SDMCLCA. The SDMCLCA affirms that hunting, fishing, trapping, and gathering are not merely subsistence activities but are culturally, nutritionally, spiritually, and socially significant practices that sustain intergenerational knowledge, community sharing, and relationships to the land.

There are five distinct Sahtu communities described under the SDMCLCA (GoNWT 2023):

- Colville Lake;
- Délı̨ne;
- Fort Good Hope;
- Norman Wells; and
- Tulita.

Culturally important wildlife species to the Sahtu communities include (GoC 1993):

- moose;
- caribou;
- muskox;
- Dall's sheep (*Ovis dalli*);
- fish;
- migratory and game birds; and
- a wide range of fur-bearing animals.

Wildlife harvesting rights are structured to ensure these species remain available to meet the ongoing cultural and traditional needs of Sahtu communities, with harvest allocations explicitly considering cultural use, traditional sharing practices, and food security. Through co-management institutions such as the SRRB and local RRCs, Sahtu traditional knowledge and harvesting customs are embedded in wildlife management decisions, reinforcing the role of wildlife as a living cultural resource to be conserved for present and future generations (GoC 1993).



2.4 Potential Impacts to Wildlife and Wildlife Habitat

NWO is situated next to wildlife habitat and has established infrastructure and extraction activities that has potential to introduce harmful substances on the landscape. Uncontrolled interaction may lead to direct mortality and impacts to habitat quality if not appropriately mitigated. The cessation of production also necessitates the disturbance of land; therefore, the short and long-term loss of habitat must also be managed. Potential impacts on wildlife from Imperial's NWO activities are:

- Direct mortality from collision with vehicles and infrastructure
- Degradation of habitat quality, including wetlands and aquatic habitat
- Increasing risk of human-wildlife conflict and habituation of wildlife
- Impacts to and loss of important wildlife features, such as dens and nests
- Contact with spills or other deleterious substances such as salt and hydrocarbon impacted soils

The strategies to mitigate these potential impacts on wildlife are detailed in the following sections.



3. Wildlife Management

Wildlife management at NWO is based on a mitigation hierarchy of avoid, minimize, rectify, and offset, detailed below (GoNWT 2022a).

3.1 Mitigation Hierarchy

3.1.1 Avoid

Imperial's priority is to avoid negative impacts on wildlife. This will be achieved through both spatial and temporal avoidance measures. Imperial has committed to avoiding, to the extent possible, unique and important wildlife areas and habitats (e.g., muskox IWA). Moreover, before clearing and decommissioning of dispositions, wildlife sweeps are required and will follow the criteria outlined in Appendix A. If important wildlife features (e.g. nests, dens, roosts) are identified, then appropriate species-specific setback buffers will be applied (see Appendix A and Section A.3.1 for definition of important wildlife features). The efficacy of the setbacks will be monitored through observing wildlife for signs of behavior that may indicate disturbance and setback distances may need to be adjusted based on the advice of a qualified wildlife professional (see Section A.3.2).

Imperial has also committed to avoiding, to the extent possible, seasons where wildlife may be more sensitive to disturbance. This includes avoiding the caribou calving season, and the raptor and migratory bird nesting season. In isolated circumstances, where work is required during these seasons, a wildlife sweep will be performed and setbacks for important wildlife features will be implemented, as per Appendix A.

Imperial uses a constrained planning approach as a primary tool to ensure activities have been integrated with surrounding terrain. During the planning phase of a development, constraints are identified and appropriate mitigative actions defined. Imperial will conduct a desktop review of their lease area for key wildlife habitats, historical wildlife occurrences, key seasons, and other sensitive ecological features during the planning process and modify the footprint and schedule as needed. Constraints may include known historical occurrences of wildlife features, critical habitat features, proximity to water, regulatory restricted activity periods (RAPs), land use and surficial geological or hydrological issues. Review of ortho-imagery, light detection and ranging data (LiDAR), and other pre-existing data are used to ensure any known sensitive habitat features are understood at a planning stage and avoidance is prioritized. The best practice to mitigate will be evaluated during the pre-planning process.



3.1.2 Minimize

If spatial and temporal avoidance is not possible, Imperial will minimize effects by implementing mitigation measures following the hierarchy tiers. This is Imperial's second. Minimization of project effects on wildlife occurs from the pre-planning stage through operations, using an integrated land-management approach. Pre-planning is used to minimize habitat loss, fragmentation, and other effects on wildlife and occurs through pad (and other infrastructure) design, the pre-disturbance assessment process, and harmonization with other users of the land. Mitigations to minimize project effects are outlined in Section 3.2.

3.1.3 Rectify

Progressive reclamation is the reclamation of areas within the lease that are no longer needed and will go through a permanent reclamation and closure process. Reclaimed areas will provide foraging habitat for wildlife species that prefer early successional habitats, such as moose and black bears. As the reclaimed sites mature, wildlife species composition and utilization is expected to increase and reflect the habitat availability of maturing forest types including increased availability of food, breeding habitat, and shelter.

3.1.4 Offset

As a last step NWO will evaluate countermeasures to any unavoidable, residual impacts to wildlife and habitats to achieve a no net loss in biodiversity. Imperial believes that energy infrastructure can be developed, ceased, and decommissioned responsibly, in a manner that supports bird, caribou, and other wildlife habitat restoration and supports the recovery or self-sustaining status of caribou populations. Imperial remains committed to efforts to improve wildlife habitat in areas prioritized for restoration to maximize the benefit to the land.

3.2 Management Objectives

In addition to the mitigation hierarchy, the wildlife management strategy for NWO has three objectives:

1. Maintain Important Wildlife Features and Important Wildlife Areas
2. Limit Potential for Human-Wildlife Conflict
3. Reduce Disturbance and Mortality of Species at Risk

These objectives and associated mitigations are detailed below, followed by adaptive management (Section 3.3) and wildlife monitoring (Section 4) to evaluate effectiveness of the mitigations. Performance metrics are provided in Section 5.



3.2.1 Maintain Important Wildlife Features and Important Wildlife Areas

Some operational and decommissioning activities, such as vegetation clearing, can directly and indirectly affect wildlife. For example, vegetation clearing during sensitive periods can result in the loss of nests and nesting habitat, abandonment of young, increased parental vigilance (leading to lost foraging opportunities), increased stress, or disruption of torpor and hibernation in overwintering mammals. In addition, certain landscape features and vegetation communities have high biodiversity potential or provide critical habitat necessary for survival. Important wildlife features and species-specific setbacks and duration are defined in Appendix A. IWAs including IBAs and critical habitat at NWO that are to be maintained are identified in Section 2.

Mitigations planned to maintain important wildlife features and IWAs (including IBAs and critical habitat) include:

- Implementing RAPs as identified in Appendix A, where possible.
- Vegetation clearing and site preparation activities will avoid migratory bird habitat between May 4 and August 22, where possible.
- Implementing wildlife sweep program for all activities, in alignment with Section 4.2 and Appendix A, Section A.3.
- Where Key Seasons have not been identified for species requiring special management action, Imperial will use sensitive periods in the species life-history based on information in published literature or specified in Appendix A.
- Educating staff on key seasons and where important wildlife features, IWAs, IBAs, and critical habitat are present and how to notify Imperial environmental advisors (Appendix C and Appendix D).
- Avoid or minimize work along shorelines and within winter habitat for moose, where possible.
- Altitude restrictions for any drone or helicopter programs will follow setbacks identified in the NLUG (2015a).
- Wildlife crossing of linear developments will be facilitated by the provision of breaks and crossing points (10 m wide every 500 m) in material piles, particularly at any identified intersections with wildlife movement corridors.
- Debris or snow berms along roads will not exceed 1.5 m in height, else there will be 3 m wide breaks every 250 m (and at any identified intersections) to facilitate wildlife movement.
- Snow berms created by ploughing of access routes will be placed on alternate sides of the route at 100 m intervals.
- Culverts will be kept clear of debris, which will allow the movement of small mammals and aquatic species.
- Best practices for reclamation, as per applicable guidelines, will be implemented.



3.2.2 Limit Potential for Human-Wildlife Conflict

The mechanisms behind human-wildlife conflict are not fully understood and the sole effect of physical anthropogenic features and their attraction or avoidance by wildlife is not always known and varies among species, but generally conflicts are typically linked back to food associations (Vistnes and Nellemann 2001, Latham et al. 2011a, SARC 2017, Scrafford et al. 2017). In addition, the causes for species avoidance can be challenging to isolate from sensory disturbances, human presence, and activity (Dyer et al. 2001, Walters et al. 2014).

Food, domestic wastes, and petroleum-based chemicals (e.g., greases, gasoline, glycol-based antifreeze) can attract wildlife, including predators and scavengers such as foxes, corvids, gulls, and bears. These predators can subsequently also have negative effects on the local bird populations (Imperial 2024a), but sometimes development can have positive effects on bird populations by providing refugia and structures to support nesting (Morozov 2022). The storing of food, domestic wastes, and petroleum-based chemicals must be conducted in a way that makes them inaccessible to wildlife at all times. Waste management protocol and responsibilities can be found within the Norman Wells Operations Waste Management Plan (Imperial 2021). The lodging and accommodations used by Imperial workers are provided in the Town of Norman Wells and as such are not in care and control by Imperial. Therefore, because a camp is not part of the NWO asset, camps are not directly addressed regarding waste management and bear safety, however workers are guided by the GoNWT Safety in Bear Country pamphlet (GoNWT 2018).

Human-wildlife conflict refers to situations in which interactions between humans and wildlife result in negative impacts on people, wildlife, or both—typically when the actions or needs of one adversely affect the other. Feeding wildlife is a primary cause that leads to most human-wildlife conflicts (Abas et al. 2025). Encroachment of development in habitat can contribute to wildlife becoming habituated, food conditioned, or tolerant of human presence and can increase the likelihood for human-wildlife conflict to occur. These incidents can escalate to an attack where contact is made, and can result in physical injury or death of a worker. In these cases, the animal may need to be euthanized or relocated. NWO overlaps grizzly bear and black bear habitat; therefore, there is potential for human-wildlife interactions and without mitigation, conflict is possible.

Mitigations planned to limit potential for human-wildlife conflict include:

- Project personnel will receive wildlife awareness training and security will be notified of bear observations to communicate with workers. Wildlife awareness training will promote awareness of hazards associated with feeding wildlife and vehicle-wildlife collisions.
- Feeding wildlife is prohibited.
- Bins for waste and recycling are and will continue to be bear proof for all outdoor waste and recycling containers unless the waste is contained within a bear proof facility or fence.
- Waste will be trucked offsite for disposal and removed from site regularly.
- Imperial mitigates concerns related to over-fishing and over-hunting pressures by restricting hunting and fishing by workers in the lease area.



- Imperial prohibits employees, contractors, and agents from bringing hunting equipment, including firearms onto project areas.
- Harassment of animals is prohibited.
- Implement wildlife deterrence procedures (Appendix B).
- Project personnel and contractors are required to report all human-wildlife interactions and conflicts to a project representative (see Section 7 and Appendix D).
- Timely engagement with SRRB and Department of Environment and Climate Change (ECC) offices should bear or other wildlife related incident occur.
- Roadside areas should be re-vegetated with native plant species that have low-palatability to reduce attractiveness to wildlife.
- Signage on main access road will be erected to increase awareness of wildlife issues.
- Access to project areas will be restricted to authorized personnel only.

3.2.3 Reduce Disturbance and Mortality of Species at Risk

Historically, boreal woodland caribou were separated spatially from wolves because they occurred in low densities in peatlands and mature coniferous forests, whereas wolves and their primary prey (moose) were found in upland habitats (James et al. 2004, Boutin et al. 2012).

Anthropogenic disturbances in caribou habitat have led to the creation of early-seral habitats. For some boreal woodland caribou populations, this in turn has increased alternative prey (moose and deer) and their primary predators (wolves), leading to increased interaction with caribou (Boutin et al. 2012) and ultimately, the reduction of caribou populations. In addition, linear developments (i.e. seismic lines, pipelines, and roads) into caribou habitat can facilitate wolf movement thereby increasing their abundance, distribution, their access and travel speed, and hunting success (James and Stuart-Smith 2000, Latham et al. 2011b, Dickie et al. 2017).

The boreal woodland caribou population that overlaps NWO (NT1CR; see Sections 1.4.6 and 2.2.1) has been classified as likely self-sustaining (ECCC 2020, CMA 2017). Moreover, considering the slow pace of development, existing and planned conservation efforts, and the currently low level of human disturbance in the region, the risk of critical habitat in the NWT portion of NT1CR being destroyed by human activities is likely low (CMA 2017, GoNWT 2019a).

Regardless, habitat alteration and loss represent a threat to caribou and other wildlife SAR. Anthropogenic disturbance may reduce the suitability of adjacent habitat, increase the rate of predation, increase access for hunting opportunities, and can create a barrier to movement (GoA 2012). This avoidance typically occurs during late-winter when human activity is highest (Dyer et al. 2001), but also in areas where activity is high regardless of season (Pigeon et al. 2017). In addition to avoidance, Wasser et al. (2011) found that human activity increased stress levels for caribou. Specifically, female caribou travel to calving areas in April where they give birth to young in May (Dzus 2001). Calf mortality is highest in the first 30 days following birth, but probability of survival greatly increases after they reach one year of age (Dzus 2001, GoA 2017b). Maintaining high juvenile survival rates (recruitment) is a critical demographic driver and that combined with



range habitat condition and adult female survival are key for maintaining a self-sustaining population (ECCC 2020).

At a site level, wildlife contact with process-affected water or hydrocarbons poses risk to wildlife health leading to direct mortality or morbidity (Imperial 2024b). Imperial's goal is to have no spills occur on land or water, with a focus on driving the environmental consequence of accidental releases to zero. Imperial's Spill Contingency and Response Plan (SCARP; Imperial 2024b) acts as a supplemental plan to Imperial's NWO Emergency Response Plan (ERP; Imperial 2024c) and the Imperial Upstream Core Emergency Response Plan (Core ERP; Imperial 2023). All three plans are integrated together. In conjunction, the SCARP is also used with the Mackenzie River Tactical Response Plan (MRTRP; Imperial 2024d). This is a geographic-specific response plan for oil spills to the Mackenzie River related to the NWO. It includes response strategies specific to a bank, shore, or waterways and is aimed at minimizing impacts on sensitive resources threatened by a spill.

Mitigations planned to reduce disturbance and mortality of SAR are:

- Implement wildlife deterrence procedures, including fencing (see Appendix B).
- Increasing spill awareness through training.
- Applying lessons learned from past incidents.
- Locations of vehicle-wildlife collisions or other wildlife mortality events and the species involved will be tracked to identify hot spots of where additional mitigation (e.g. increased signage, lighting, or speed limits) may be required.
- Taking particular care in pre-planning, keeping in mind erosion prevention and control measures and implementing those measures prior to the nesting season.
- Width of linear features will be minimized during project routing, planning construction, and reclamation to reduce predators from interacting with prey SAR populations.
- Imperial avoids using rodenticides as the primary method of rodent control, which could lead to secondary poisoning of wildlife.
- Safe driving practices are required while driving in NWO.
- In the event of a process water or hydrocarbon spill, the following equipment and mitigations may be deployed depending on the type, scale, and season of release to the environment:
 - Imperial will follow their spill response plan in the event of a spill (Imperial 2024b).
 - Perimeter fences will be erected to exclude wildlife, where required, around areas where the release has collected.
 - Wildlife deterrents will be deployed such as fladry, scarecrows, propane cannons, and owl (and other predator) effigies (see Appendix B).
 - Berms will be constructed to contain releases from entering surrounding environments.
 - A qualified wildlife professional will be instructed to sweep and monitor (using remote cameras and/or Autonomous Recording Units [ARUs]) release area and receptor environments for the presence of wildlife, as determine by Imperial environmental advisors.



- Workers will report all wildlife incidents to onsite environmental advisors (see Section 4.3 and Appendix D).

3.3 Adaptive Management

Adaptive management is defined as using continuous evidence-based learning and knowledge as monitoring occurs to adjust management actions taken. This involves assessing, designing, implementing, monitoring, evaluating, and adjusting plans to reassess new information gathered (Greig et al. 2008).

Monitoring metrics will be analyzed and reported in annual summary report submissions (see Section 6). This will allow for the review of mitigation effectiveness and result in recommendations for the implementation of additional or modified mitigations and other changes to the program. Opportunities to change or improve management, mitigations, and monitoring will be outlined in those documents. Over time, it is anticipated that as results reveal confidence in the successful use of assigned mitigations, that monitoring may be reduced in frequency and intensity. Focus will then be placed on increasing monitoring efforts, such as on specific populations that are sensitive to disturbance.

Imperial is continually improving and evolving techniques in clearing, construction, and other operational activities to facilitate reduced footprint and environmental impacts, and to improve reclamation outcomes. Imperial will continue developing and using techniques that allow for reduced overall surface disturbance to access resources and will apply best practices, including adopting new practices, where appropriate.

3.4 Emergency Spill Response

In the event a pollution incident results or may result in an immediate and/or long-term harmful effect on the life or health of wildlife and/or their habitat, the incident is defined as a wildlife emergency and will be promptly reported to ECCC, ECC, and the Department of Fisheries and Oceans Canada (DFO), when required (Imperial 2024b).

The National Environmental Emergencies Centre (NEEC) will coordinate ECCC's overall response to the incident with support from CWS, regional ECC wildlife emergency support and DFO, as required. During a wildlife emergency, wildlife under CWS jurisdiction includes migratory birds defined under the MBCA (1994) and wildlife species listed under Schedule 1 of SARA. For wildlife not under CWS's jurisdiction, such as mammals and resident birds ECCC's NEEC would provide guidance and support with other agencies (Imperial 2024b).

The ECC and CWS are the responsible authorities for authorizing activities affecting wildlife including issuing permits under the *Wildlife Act* and MBCA / SARA, respectively. Activities requiring permits could include collecting, transporting, hazing, and treating affected wildlife. Sahtú communities would also be notified and engaged providing timely updates while the emergency response progresses. Additional details including updated reporting contact information can be found in the SCARP (Imperial 2024b).



4. Wildlife Monitoring

Wildlife monitoring for NWO includes a wildlife remote camera and ARU program, a wildlife sweep program, and a wildlife incident reporting program. A summary of another monitoring program, external to the WMMP but with relevance to fish, is provided for reference only as fish are not defined as wildlife under the *Wildlife Act* (see Section 1.4.1).

4.1 Remote Camera and ARU Program

The proposed remote camera and ARU program is based on deployment of four remote cameras year-round including two on the mainland and one per island and seasonal deployment of two ARUs including one on the mainland and one on one of the islands (Figure 4-1). The study design, data management and analysis is provided below.

4.1.1 Study Design

Wildlife indicators, Species at Risk, and species of cultural significance will continue to be monitored to provide information about Project-related effects. To carry out this approach, Imperial is proposing to use remote cameras for continuous (year-round) monitoring of wildlife presence and relative abundance, with the exception of May and June on Goose Island due to ice break timeline. The remote cameras will target small to large wildlife with focus on snowshoe hare (*Lepus americanus*), Canada lynx (*Lynx canadensis*), marten (*Martes americana*), foxes (*Vulpes* spp.), bears, moose, and game birds (GoNWT 2013). The remote cameras will monitor relative abundance index (RAI; Debata and Swain 2018) and patterns of species richness. The presence of birds will be monitored once every three years using ARUs (see Section 6 for a proposed schedule). ARU monitoring once every three years is proposed to balance efficiencies of data collection and data processing costs. ARUs will be deployed from approximately May to August, or as ice conditions permit for island access.

A total of 4 remote camera and 2 ARU locations have been proposed within the WMMP boundary (Figure 4-1, Table 4-1). One remote camera will be deployed on Goose Island due to cultural significance and wildlife corridor between the islands. Another remote camera and ARU will be deployed along the waterway on Bear Island. The other two cameras will be deployed on the mainland with proposed positioning being one camera near the west end of NWO along the Mackenzie River within the IWA for moose and the other positioned along Bosworth Creek near where the second ARU is proposed (Figure 4-1, Table 4-1). Bosworth Creek has anecdotally been reported as a wildlife corridor.



Cameras and ARUs will be installed by a qualified wildlife professional who has experience successfully capturing a broad range of wildlife species on remote monitoring devices. Cameras will be installed at a suitable height and angle that will enable capture of passing small- to medium-sized wildlife. A full body photo-capture of moose is not necessary and a photo of the legs of moose is sufficient for identification. ARUs for detection of birds will be installed at approximately 1.5-2 m (approximately human ear height) above the ground on trees that are unlikely to be cut down by beavers (e.g., coniferous species). Trees selected for ARU positioning will be of sufficient size for stability but not so large that the microphones are blocked by the trunk of the tree (i.e., trees selected will be approximately 15-centimetres in diameter at breast height or less). Branches will be trimmed to reduce clutter and maximize microphone effective range.

Table 4-1: Proposed Coordinate Locations of Remote Cameras and ARUs.

Label	Description of Location	Latitude	Longitude
Camera 1	Bear Island	65.255855°	-126.875036°
Camera 2	Goose Island	65.263717°	-126.918128°
Camera 3	Bosworth Creek	65.284985°	-126.866848°
Camera 4	Mainland (Moose IWA)	65.286163°	-126.903974°
ARU 1	Bosworth Creek	65.284774°	-126.866488°
ARU 2	Bear Island	65.256044°	-126.875771°

4.1.2 Data Management and Processing

Data collected by the remote cameras will be retrieved twice a year (once in the summer and once in the winter prior to ice breakup). The camera located on Goose Island may need to be removed for a short period in which the island has limited access with no ice road or boat access, although if a safe spot is found, it can remain in place. Annual maintenance will include battery change and trimming new vegetation growth in front of the field of view to minimize false triggering and reduce subsequent processing time. Where numerous false triggers are recorded, pre-processing will include deleting false triggers to preserve storage space and reduce processing time. To avoid data loss, data will be downloaded to a local machine first to remove false triggers and then uploaded to WildTrax (University of Alberta 2026). WildTrax is a private and secure online platform designed for managing, storing, processing, and sharing environmental sensor data and has been maintained as a centralized storage location for data of this type from other Imperial sites. WildTrax will be used to store and process the camera images. Images will be tagged in WildTrax with species name and number of individuals captured. Memory cards will be reformatted after the images are backed up on WildTrax.

All ARU data will be uploaded to the WildTrax platform for storage and processing. Data for all ARUs will be analyzed using two methods: 1) randomized selection and 2) WildTrax machine based learning functions (BirdNet v2.1 and Hawkears v1.0.8). All ARU data assessment will be completed by a trained biologist.



For each ARU, six recordings will be selected using a randomized selection process. Three morning recordings (between half hour before sunrise to 08:00) will be selected between the period of May 7 – August 11 to target bird species. Daily timeframes and date ranges will be chosen based on when each group of targeted species are most likely to be detected by sound (GoA 2013). If the weather conditions during a selected recording are unsuitable, such as in the event of heavy rain or high winds, a different recording will be selected following the same randomized process. Each selected recording will be manually assessed both visually via spectrograms provided in WildTrax and auditorily. All songs and calls heard will be identified to species, tabulated, and tagged in WildTrax spectrograms.

Using BirdNet v2.1 and Hawkears v1.0.8 machine-based learning functions within WildTrax, all recordings will be automatically scanned to detect and classify bird and amphibian species by sound and produce output tables which include summaries of recording identification, species common name, species scientific name, trigger start time, and confidence level. Given that the species classification output from both BirdNet v2.1 and Hawkears v1.0.8 are imperfect, the WildTrax output results will be processed through R Statistical Software to reclassify based on region and remove all non-resident, migrant, and vagrant species. From the remaining species list, only the recording with the most tags and highest confidence levels will be manually reviewed to check for false positives.

For both assessment methods, if it is not possible to identify to species due to call being distant or obscured by noise, calls will be identified to the lowest taxonomic level possible (e.g., family or genus). Where species are incidentally heard during the manual assessment of WildTrax outputs but are not initially identified through WildTrax machine-based learning tools, species will be added to the final species list. Species that are identified during the manual assessment of randomized recordings but not identified through WildTrax functions will also be added to list. As such, the list provided for each ARU will represent species manually identified in that ARU during the monitoring period. All results will be tabulated using a detect/non-detect (“x”) method.

4.1.3 Data Analyses

Understanding animal abundance and density are important for informing wildlife conservation and management. There are several peer-reviewed studies that support linear relationships between RAI and true animal abundance (Rovero and Marshall 2009, Jenks et al. 2011, Palei et al. 2015). The challenge comes with determining true abundance, which is not always feasible. Indices of relative abundance serve as a mechanism to form a basic understanding of wildlife within a study area (Jenks et al. 2011). Where individuals cannot reliably and readily be distinguished from each other of the same species, such as black bear, determining true abundance is often not easy or reliable, especially where the same individual can be recorded multiple times (Jennelle et al. 2002). For these reasons, caution is warranted when future results are interpreted because the indices that will be used have not been correlated with data on population size of each species. No inferences on true abundance and density are necessary based on the indices identified herein. The indices that will be analyzed serve as a form of monitoring



wildlife presence, activity, species richness, and patterns of species compositions to help inform potential mitigation strategies.

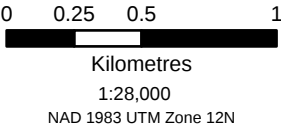
Metrics for mammals and game birds will include photographic detection rate (PDR) and RAI (Jenks et al. 2011, Debata and Swain 2018). PDR is the ratio of photographs of a species to active camera time. The RAI = $A/N * 100$, where A is the total number of detections of a species by all cameras and N is the total number of camera trap days by all the cameras throughout the study area (Jenks et al. 2011). Photos will be rated as independent events if the time between consecutive photographs of the same subject is more than 30 minutes apart (Debata and Swain 2018). PDR will be calculated for each of the cameras and RAI will be calculated for the study area for each species.

Metrics for birds will include species presence, richness, and community composition. At both of the ARU locations and collectively across the study area, patterns in species presence, richness, distribution, and community composition will be explored, when relevant.



- Legend
- Imperial Lease Boundary
 - ARU Location
 - Camera Location

Imagery: Vantor



IMPERIAL OIL RESOURCES LIMITED NORMAN WELLS OPERATIONS WILDLIFE MANAGEMENT AND MONITORING PLAN				
REMOTE CAMERA AND ARU PROGRAM				
	Date:	23-JUN-26	Drawn by:	KR
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4.2 Wildlife Sweep Program

The wildlife sweep program will include implementation of the Restricted Activity Periods, Wildlife Setback Distances, and Wildlife Sweep Protocols, as detailed in Appendix A. A wildlife sweep is a visual search of a proposed project developments or activities (including an appropriate buffer) that is completed prior to land or vegetation disturbance to ensure the site is free of wildlife and to identify important wildlife features that must be avoided during associated land use activities (Appendix A). Wildlife sweeps are recommended year-round prior to construction or land disturbing activities, and are valid for 7 days, 10 days, or longer (depending on time of year and target species; see Appendix A). Wildlife sweeps will be performed by a qualified wildlife professional, as defined in Appendix A.

4.3 Wildlife Incident Reporting Program

All wildlife incidents such as injured wildlife, vehicle collisions, feeding of wildlife, and habituation of wildlife will be recorded by the onsite supervisors, this information will then be directed to the Imperial environmental advisors for additional support. This information will then be tracked by Imperial environmental advisors and summarized as part of reporting requirements (see Section 6). Incidents involving habituation of bears will be monitored and appropriate parties will be contacted to provide guidance on next steps.

The procedure when wildlife are identified is as follows:

- If wildlife could cause issues in a work area or if work could be a risk to wildlife (e.g., bears or birds in nesting season on the Islands), stop and communicate over the radio what was observed and location of the observation.
- If there is problem wildlife, notify the supervisor and Safety, Security, Health, & Environment (SSHE) Advisor.
 - A site alert will be posted to distribute alerts for persistent or problem wildlife.
- If there are any hazards relating to wildlife that are not instantly resolvable or resolved or if mitigations of other hazards can be made, the process is as follows:
 - Communicate to supervisor on site.
 - A maintenance notification is created that identifies the hazards.
- If any wounded or deceased wildlife are identified, the SSHE Advisor then contacts the Imperial environmental advisor immediately.
- If notification to ECC is required, the hotline is contacted (i.e., in the event of problem predatory wildlife and/or deceased and injured wildlife).



4.4 Other Monitoring (Fisheries)

The AEMP is external to the WMMP. Fish are not included with the definition of wildlife under the *Wildlife Act* (GoNWT 2013) and accordingly are not considered as part of this WMMP, but they are of cultural significance. The AEMP was developed to meet Water Licence requirements and assess aquatic conditions. It asks whether routine or historic activities are altering accumulated environmental state, using upstream, near-field, and downstream comparisons across key waterbodies, including the MacKenzie River and Bosworth Creek (Imperial 2026). The program integrates seasonal water quality monitoring with small-bodied and large-bodied fish studies to evaluate environmental change and biological responses. It details study design, field methods, laboratory analyses, statistics, thresholds, and reporting needed to detect, interpret, and respond to aquatic effects (Imperial 2026).

The AEMP fulfills requirements under the SLWB Water License and uses an adaptive monitoring approach, meaning actions are taken once early signs of environmental change are detected. The AEMP monitors water chemistry four times a year (including under-ice conditions) and measures key habitat-relevant parameters such as metals, salts, nutrients, and hydrocarbons in both the upstream and downstream habitats. These measures help determine whether water conditions remain suitable for fish survival and reproduction. The AEMP uses small, non-migratory fish as indicators of ecosystem health and evaluates fish condition downstream compared to those upstream to evaluate impacts of NWO on fish populations. The AEMP functions as a preventative safeguard for fish habitat in the Norman Wells area by:

- continuously monitoring water quality and fish health;
- using sensitive indicator species;
- comparing conditions to natural background levels; and
- triggering responses before serious ecological harm occurs.



5. Performance Metrics

Performance metrics and indicators have been chosen to be practical, suitable to the size and scale of NWO, meaningful, and within the context at which development has been occurring at Norman Wells since the 1920s (Table 5-1). Each metric has a defined target to assess the success and efficacy of the mitigations. These targets are anticipated to be achievable; however, a threshold target has been identified where additional mitigation measures will be applied as necessary. Performance targets should not necessarily be linked to project compliance, but rather as a tool for continuous improvement of wildlife management.

All of the metrics require some degree of tracking by onsite staff or Imperial environmental advisors (Table 5-1). In few cases, qualified wildlife professionals will be required for direct monitoring to identify important wildlife features and setback distances (Appendix A) and implement the remote camera and ARU program (Section 4.1).



Table 5-1: Performance metrics to measure efficacy of mitigations to meet management objectives

Objective	Metric	Target	Threshold for Adaptive Management	Monitoring Method	Assumptions
Maintain Important Wildlife Features and Important Wildlife Areas	Number of important wildlife features disturbed	Zero disturbances per year	1 or more events where behavioural signs indicate disturbance or stress, without prior authorization.	Wildlife Sweep Program Tracked by Imperial Environmental Advisor	Abandonment of protected feature constitutes disturbance. Data from the remote camera and ARU program will provide information on trends in wildlife presence in the NWO.
	Disturbance activities during RAPs.	Zero events where habitat clearing is performed in a RAP without justification	1 or more events where habitat clearing was performed without a valid wildlife sweep.	Wildlife Sweep Program Tracked by Imperial Environmental Advisor	Planning will aim to avoid disturbance works within RAPs and wildlife sweeps are performed in advance of all disturbance works regardless of time of year. Data from both the wildlife sweep program and remote camera and ARU program will support recommendations for setback distances and duration.
Limit Potential for Human-Wildlife Conflict	Number of incidents of wildlife human-wildlife conflict/interactions	Zero (0) incidents per year	1 or more incidents	Wildlife Incident Reporting Program Tracked by Imperial Environmental Advisor	Human–wildlife conflict refers to situations in which interactions between humans and wildlife result in negative impacts on people, wildlife, or both—typically when the actions or needs of one adversely affect the other (e.g., feeding, removal, or habituation of prescribed wildlife such as foxes, bears, and moose).
Reduce Disturbance and Mortality of Species at Risk	Number of incidents of SAR mortality	Zero (0) incidents per year	1 or more incidents	Wildlife Incident Reporting Program Tracked by Imperial Environmental Advisor	Incidents are defined as events related to contact with harmful substances, collisions, and unnecessarily chase, fatigue, disturb, torment or otherwise harass game or other prescribed wildlife, unless authorized by a licence or permit to do so. Where multiple individuals are involved in an incident at the same time, it is considered 1 incident.



6. Schedule and Reporting

The proposed schedule for implementation of the WMMP is provided in Table 6-1. Reporting instructions including where to submit and frequency of reporting are provided in Table 6-2.

Table 6-1: Proposed schedule for implementation of the WMMP

Task	Date or Timeframe
Wildlife Mitigation	Ongoing
Wildlife Incident Tracking	Ongoing, as needed
Adaptive management	As needed
Wildlife Sweep Program	As needed
Wildlife Deterrent Procedures	Case by case
Wildlife Monitoring Summary Report	Annual submissions

Table 6-2: Reporting instructions

Information Type	Where to Submit (GoNWT 2021)	Timing / Frequency
Human Wildlife Conflict and Mortality Incidents	Regional ECC office and federal ECCC for migratory birds and SAR	Immediately or as soon as reasonably safe to do so (within 24 hours)
Wildlife Sweep Report	Imperial environmental advisors and project team	Within 24 hours following completion of the wildlife sweep
Wildlife Monitoring Summary Report	- ECC Regional Office, Wildlife Division (WMMP@gov.nt.ca) - Land and Water Board Registry - Sahtu Renewable Resource Board	Annually, due on or before March 31 of each year, to report on previous calendar year

The wildlife monitoring summary report will include, at a minimum, the following:

- The methods and results of the monitoring conducted;
- The mitigations implemented and a discussion of the effectiveness of the mitigations relative to the performance metrics;
- Adaptive management measures taken;
- Changes in habitat availability and habitat conditions for wildlife SAR and wildlife species of cultural significance;
- A summary of discussions and engagement with stakeholders
- A summary of the role community wildlife monitors had in implementing aspects of the WMMP



7. Roles and Responsibilities

Roles and responsibilities as it pertains to this WMMP are provided in Table 7-1.

Table 7-1: Roles and responsibilities as it pertains to this WMMP.

Role	Responsibility
Imperial Environmental Advisor	• Guide management practice based on this WMMP. • Track performance metrics for integration with the Wildlife Monitoring Summary Report. • Report to Government and regulatory bodies, when required. • Engage and consult with stakeholders and Indigenous communities.
Onsite Supervisors	• Record wildlife incidents such as mortalities. • Record human-wildlife concerns from workers. • Report to Imperial environmental advisors for all wildlife related information to ensure proper regulatory bodies are being reported to.
Contractor (e.g., equipment operators)	• Understand the objectives and mitigation outlined in this WMMP. • Report any wildlife incidents, human-wildlife conflict, and important wildlife features.
Qualified Wildlife Professional	• Conduct the wildlife sweep program. • Advise on setback distances and duration. • Conduct the remote camera and ARU program. • Review, process, and analyze remote camera and ARU program data. • Prepare wildlife monitoring summary report.
Community Wildlife Monitor	• Consulted for Indigenous and traditional knowledge implemented at NWO. • Lead or participate in wildlife sweeps. • Lead or support remote camera and ARU program, such as determining location of sites and performing equipment maintenance, battery changes, and memory card replacements.



8. Closure

TRSA is committed to assisting Imperial with the implementation of effective wildlife management and monitoring at NWO. We thank Imperial for the opportunity to continue to develop meaningful programs to deliver service for complex and challenging sites. We trust that this WMMP satisfies your current requirements and provides suitable documentation for your records. If you have any questions or require further details, please contact Megan Blaxley at megan.blaxley@worley.com.

Prepared by,

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9. References

- Abas, A., A.H.A Rahman, T.T.A. Hadi, T. Md Fauzi, and A.H.M. Yusof. 2025) A bibliometric review of global research on human–wildlife conflicts. *Frontiers in Environmental Science* 12:1517218.
- Birds Canada. 2026. Middle Mackenzie River Islands Important Bird Area (NT081). BirdLife International, Birds Canada, and Nature Canada. Important Bird and Biodiversity Areas of Canada. Available at: <https://www.ibacanada.org/site.jsp?siteID=NT081&lang=en>. Accessed April 2026.
- Boutin, S. M.S. Boyce, M. Hebblewhite, D. Hervieux, K.H. Knopff, M.C. Latham, A.D.M. Latham, J. Nagy, D. Seip, and R. Serrouya. 2012. Why are caribou declining in the oil sands? *Frontiers in Ecology and the Environment* 10:65-67.
- Burnham, K.P and D.R. Anderson. 2010. *Model Selection and Multimodel Inference. A Practical Information-Theoretic Approach*. Second Edition. Springer, New York.
- CMA (Conference of Management Authorities). 2017. Recovery Strategy for the Boreal Caribou (*Rangifer tarandus caribou*) in the Northwest Territories. *Species at Risk (NWT) Act* Management Plan and Recovery Strategy Series. Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT. 57 + x pp.
- Collins, L.A., C.D. Murray, and R.T. Stainton. 2011. Bosworth Creek water quality data report: Final Report. Institute for Watershed Science, Report No. 02-11, 69p. Prepared for the Environmental Studies Research Funds (ESRF), Department of Natural Resources, Government of Canada.
- Debata, S., and K.K. Swain. 2018. Estimating mammalian diversity and relative abundance using camera traps in a tropical deciduous forest of Kuldiha Wildlife Sanctuary, eastern India. *Mammal Study* 43:1-9.
- Dickie, M. R. Serrouya, R.S. McNay, and S. Boutin. 2017. Faster and farther: wolf movement on linear features and implications for hunting behaviour. *Journal of Applied Ecology* 54:253-263.
- Dyer, S.J., J.P. O'Neill, S.M. Wasel, and S. Boutin. 2001. Avoidance of industrial development by woodland caribou. *Journal of Wildlife Management* 65:531-542.
- Dzus, E. 2001. Status of the woodland caribou (*Rangifer tarandus caribou*) in Alberta. Alberta Environment, Fisheries and Wildlife Management Division, and Alberta Conservation Association. *Wildlife Status Report* 30, Edmonton, AB, PP. 47.
- ECCC (Environment and Climate Change Canada). 2020. Amended Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada. *Species at Risk Act* Recovery Strategy Series. Ottawa. xiii + 143pp.



- ECCC (Environment and Climate Change Canada). 2025a. Nesting periods. Available at: <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html>. Accessed June 2026.
- Ecosystem Classification Group. 2009. Ecological regions of the Northwest Territories: Taiga Plains (Rev. ed.). Department of Environment and Natural Resources, Government of the Northwest Territories.
- Environment and Climate Change Canada. 2025b. Recovery Strategy for the Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. viii + 80 pp.
- GoA (Government of Alberta). 2012. Caribou Protection Plan Guidelines and Caribou Calving Information. Available at: <https://open.alberta.ca/dataset/a8fc5fb2-1995-4725-b63f-1c3067403d9d/resource/8a438e5f-bbb9-4a2c-b4d8-1c23aaaa67a5/download/2012-caribouprotectionplan-cariboucalvinginfo-2012.pdf>. Accessed June 2026.
- GoA (Government of Alberta). 2013. Sensitive Species Inventory Guidelines. Environment and Sustainable Resource Development. April 2013. Available at: <https://open.alberta.ca/dataset/93d8a251-4a9a-428f-ad99-7484c6ebabe0/resource/f4024e81-b835-4a50-8fb1-5b31d9726b84/download/2013-sensitivespeciesinventoryguidelines-apr18.pdf>. Accessed June 2026.
- GoA (Government of Alberta). 2024. Master schedule of standards and conditions. Available at: <https://open.alberta.ca/publications/master-schedule-of-standards-and-conditions>. Accessed June 2026.
- GoC (Government of Canada). 1993. Sahtu Dene and Métis Comprehensive Land Claim Agreement (Vols. I–II). Available at: <https://www.srrb.nt.ca/docman/public/2028-sahtu-dene-metis-comprehensive-land-claim-agreement/file>. Accessed April 2026.
- GoC (Government of Canada). 2002. *Species At Risk Act*, S.C. 2002, c. 29. Current to March 17, 2026. Last amended on February 26, 2026. Available at: <https://laws.justice.gc.ca/eng/acts/S-15.3/page-10.html#h-435647>. Accessed April 2026.
- GoC (Government of Canada). 2024. Amending agreement: Species at Risk Act conservation agreement for the conservation of the Boreal Caribou. Available at: <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/conservation-agreements/amending-agreement-to-sara-conservation-agreement-for-conservation-of-boreal-caribou.html>. Accessed June 2026.
- GoC (Government of Canada). 2026. Species at risk public registry: Species search. Available at: <https://species-registry.canada.ca/index-en.html#/species>. Accessed April 2026.
- GoNWT (Government of the Northwest Territories). 2009. *Species at Risk (NWT) Act*. S.N.W.T. 2009, c. 16. Amendments in force October 31, 2017. Available at:



<https://www.justice.gov.nt.ca/en/files/legislation/species-at-risk/species-at-risk.a.pdf>.

Accessed April 2026.

GoNWT (Government of the Northwest Territories). 2012. Important Wildlife Areas in the Western northwest Territories. Environment and Natural Resources. Manuscript Report No. 221. Available at: https://www.gov.nt.ca/sites/ecc/files/221_public_no_appendix_c.pdf. Accessed April 2026.

GoNWT (Government of the Northwest Territories). 2013. Wildlife Act. SNWT 2013, c. 30. In force with amendments up to January 1, 2020. Available at: [justice.gov.nt.ca/en/files/legislation/wildlife/wildlife.a.pdf](https://www.justice.gov.nt.ca/en/files/legislation/wildlife/wildlife.a.pdf). Accessed April 2026.

GoNWT (Government of the Northwest Territories). 2015a. Northern Land Use Guidelines: Seismic. Available at: https://www.gov.nt.ca/sites/ecc/files/resources/nlug_seismic_2015_english_-_16_sept_2015.pdf. Accessed April 2026.

GoNWT (Government of the Northwest Territories). 2015b. Northern Land Use Guidelines: Access: Roads and Trails. Available at: https://www.gov.nt.ca/sites/ecc/files/resources/nlug_seismic_2015_english_-_16_sept_2015.pdf. Accessed April 2026.

GoNWT (Government of the Northwest Territories). 2015c. Northern Land Use Guidelines: Camp and Support Facilities. Available at: https://www.gov.nt.ca/sites/ecc/files/resources/nlug_camps_2015_english_16_sept_2015.pdf. Accessed April 2026.

GoNWT (Government of the Northwest Territories). 2015d. Northern Land Use Guidelines: Pits and Quarries. Available at: https://www.gov.nt.ca/sites/ecc/files/resources/nlug_-_pits_and_quarries_-_16_september_2015.pdf. Accessed April 2026.

GoNWT (Government of the Northwest Territories). 2018. Safety in Grizzly and Black Bear Country. Available at: https://www.gov.nt.ca/ecc/sites/ecc/files/resources/2025_bear_brochure_en_0.pdf. Accessed June 2026.

GoNWT (Government of the Northwest Territories). 2019a. Species at Risk Act Conservation Agreement for the Conservation of the Boreal Caribou. Available at: https://www.gov.nt.ca/ecc/sites/ecc/files/resources/species_at_risk_act_conservation_agreement_for_the_conservation_of_the_boreal_caribou_2019.pdf. Accessed June 2026.

GoNWT (Government of the Northwest Territories). 2019b. A Framework for Boreal Caribou Range Planning. Available at: https://www.gov.nt.ca/ecc/sites/ecc/files/resources/boreal_caribou_range_planning_framework_2019_-_cadre_de_planification_de_laire_de_repartition_du_caribou_boreal_2019.pdf. Accessed June 2026.



- GoNWT (Government of the Northwest Territories). 2021. Wildlife Management and Monitoring Plan (WMMP). Process and Content Guidelines. Updated June 3, 2021. Available at: https://www.gov.nt.ca/ecc/sites/ecc/files/resources/wmmp_process_and_content_guidelines_jun_2021_complete_002.pdf. Accessed June 2026.
- GoNWT (Government of the Northwest Territories). 2022a. Guidelines for Exploration and Development Projects in Boreal Caribou Habitat in the Northwest Territories. Available at: https://www.gov.nt.ca/ecc/sites/ecc/files/resources/nwt_caribou_guidelines_bilingual_feb24_final_2_2_0.pdf. Accessed June 2026.
- GoNWT (Government of the Northwest Territories). 2023. Sahtu Dene and Métis. Executive and Indigenous Affairs. Available at: <https://www.eia.gov.nt.ca/en/priorities/concluding-and-implementing-land-and-resources-and-self-government-agreements/sahtu-3>. Accessed April 2026.
- GoNWT (Government of the Northwest Territories). 2024. Hunting and trapping summary. Department of Environment and Climate Change. Available at: https://www.gov.nt.ca/ecc/sites/ecc/files/resources/2024_ecc_hunting_and_trapping_summary_en_web.pdf. Accessed April 2026.
- GoNWT (Government of the Northwest Territories). 2026a. Species at risk report: Map and details [Generated report on April 2, 2026]. NWT Species and Habitat Viewer. https://www.maps.geomatics.gov.nt.ca/Html5Viewer/index.html?viewer=NWT_SHV. Accessed April 2026.
- GoNWT (Government of the Northwest Territories). 2026b. Moose and Muskox IWAs: Map [Generated map on April 2, 2026]. NWT Species and Habitat Viewer. https://www.maps.geomatics.gov.nt.ca/Html5Viewer/index.html?viewer=NWT_SHV. Accessed April 2026.
- GoNWT (Government of the Northwest Territories). 2026c. NWT Species Search. NWT Species General Status Ranking. Available at: <https://www.gov.nt.ca/species-search/>. Accessed April 2026.
- Greig, L., D. Marmorek, and C. Murray. 2008. Guide for Preparation of Adaptive Management Plans. Prepared for Fisheries and Oceans Canada. Available at: https://reviewboard.ca/upload/project_document/EA0708-007_Submission_from_DFO_on_Adaptive_Management_Plan_Requirements.PDF. Accessed April 2026.
- Imperial (Imperial Oil Resources NWT Limited). 2005. Norman Wells Operations Area Wildlife Management Plan. Prepared by Gartner Lee Limited and Imperial Oil Resources. December 2005. 20pp.
- Imperial (Imperial Oil Resources NWT Limited). 2015. Norman Wells Water Licence S13L1-007: Community Engagement Plan (Revision 2). Submitted to the Sahtu Land and Water Board.



- Imperial (Imperial Oil Resources NWT Limited). 2021. Norman Wells Operations Waste Management Plan. Norman Wells, Northwest Territories. September 2021.
- Imperial (Imperial Oil Resources NWT Limited). 2023. Imperial Upstream core Emergency response plan. Available at: [https://registry.mvlwb.ca/Documents/S13L1-007/S13L1-007%20-%20Imperial%20Upstream%20core%20Emergency%20Response%20Plan%20\(ERP\)_May%2021_24.pdf](https://registry.mvlwb.ca/Documents/S13L1-007/S13L1-007%20-%20Imperial%20Upstream%20core%20Emergency%20Response%20Plan%20(ERP)_May%2021_24.pdf). Accessed June 2026.
- Imperial (Imperial Oil Resources NWT Limited). 2024a. Norman Wells Operations Environmental Protection Plan. Norman Wells, Northwest Territories. March 2024.
- Imperial (Imperial Oil Resources NWT Limited). 2024b. Norman Wells Operations Spill Contingency and Response Plan (SCARP). Norman Wells, Northwest Territories. May 2024.
- Imperial (Imperial Oil Resources NWT Limited). 2024c. Norman Wells Operations Emergency Response Plan. Norman Wells, Northwest Territories. May 2024.
- Imperial (Imperial Oil Resources NWT Limited). 2024d. Mackenzie River Tactical Response Plan (MRTRP). Version 1, November 2023. Published April 25, 2024.
- Imperial (Imperial Oil Resources NWT Limited). 2026. Aquatic Effects Monitoring Program. Norman Wells Operations. 26 March 2026 (DRAFT).
- James, A.R.C. and A.K. Stuart-Smith. 2000. Distribution of caribou and wolves in relation to linear corridors. *Journal of Wildlife Management* 64:154-159.
- James, A.R.C., S. Boutin, D.M. Herbert, and A.B. Rippin. 2004. Spatial separation of caribou from moose and its relation to predation by wolves. *Journal of Wildlife Management* 68:799-809.
- Jenks, K.E., P. Chanteap, D. Kanda, C. Peter, P. Cutter, T. Redford, J.L. Antony, J. Howard, and P. Leimgruber. 2011. Using relative abundance indices from camera-trapping to test wildlife conservation hypotheses - An example from Khao Yai National Park, Thailand. *Tropical Conservation Science* 4(2): 113-131.
- Jennelle, C.S., M.C. Runge, and D.I. MacKenzie. 2002. The use of photographic rates to estimate densities of tigers and other cryptic mammals: a comment on misleading conclusions. *Animal Conservation Forum* 5(2): 119-120.
- Latham, A.D.M., M.C. Latham, M.S. Boyce, and S. Boutin. 2011b. Movement responses by wolves to industrial linear features and their effect on woodland caribou in northeastern Alberta. *Ecological Applications* 21:2854-2865.
- Latham, A.D.M., M.C. Latham, N.A., McCutchen, and S. Boutin 2011a. Invading white-tailed deer change wolf-caribou dynamics in northeastern Alberta. *Journal of Wildlife Management*.75:204-212.



- MBCA (Migratory Birds Convention Act). 1994. S.C. 1994, c.22. Current to May 26, 2026. Last amended on March 26, 2026. <http://laws-lois.justice.gc.ca>. Accessed June 2026.
- MBR (Migratory Birds Regulations). 2022. SOR/2022-105. Current to May 26, 2026. Last amended on October 4, 2024. <http://laws-lois.justice.gc.ca>. Accessed June 2026.
- Morozov, N. S. 2022. The role of predators in shaping urban bird populations: 1. Who succeeds in urban landscapes? *Biology Bulletin* 49(8):1057-1080.
- MRBB (Mackenzie River Basin Board). 2004. Mackenzie River Basin State of the Aquatic Ecosystem Report 2003. Mackenzie River Basin Board.
- MVRMA (Mackenzie Valley Resource Management Act). 1998. S.C. 1998, c. 25. Current to May 26, 2026. Last amended on November 27, 2024. <http://laws-lois.justice.gc.ca>. Accessed June 2026.
- Palei, H.S., T. Pradhan, H.K. Sahu, and A.K. Nayak. 2015. Estimating mammalian abundance using camera traps in the tropical forest of Similipal Tiger Reserve, Odisha, India. *Proceedings of the Zoological Society* 69(2):181-188.
- Pigeon, K. D. MacNearney, B. Nobert, and L. Finnegan. 2017. Caribou and wolf behavior in relation to oil and gas development. Prepared for the British Columbia Oil and Gas Research and Innovation Society (BCIP-2016-15). fRI Research Caribou Program, Pp. 35 + appendices.
- Rovero, F., and A.R. Marshall. 2009. Camera trapping photographic rate as an index of density in forest ungulates. *Journal of Applied Ecology* 46(5):1011-1017.
- SARC (Species at Risk Committee). 2017. Species Status Report for the Grizzly Bear (*Ursus arctos*) in the Northwest Territories. Yellowknife, NT. 153pp.
- Scrafford, M.A., T. Avgar, B. Abercrombie, J. Tigner, and M. Boyce. 2017. Wolverine habitat selection in response to anthropogenic disturbance in the western Canadian boreal forest. *Forest Ecology and Management* 395:27-36.
- SLWB (Sahtu Land and Water Board). 2015. *Issuance of Type "A" Water Licence S13L1-007* [Water licence issuance letter]. Available at: https://mvlwb.ca/Documents/S13L1-007/S13L1-007%20-%20Issuance%20Letter%20-%20Mar%205_15.pdf. Accessed June 2026.
- University of Alberta. 2026. WildTrax. Available at: <https://portal.wildtrax.ca/>. Accessed June 2026.
- Vistnes, I. and C. Nellemann. 2001. Avoidance of cabins, roads, and power lines by reindeer during calving. *Journal of Wildlife Management* 65:915-925.



Walters, K., K. Kosciuch, and J. Jones. 2014. Can the effect of tall structures on birds be isolated from other aspects of development? *Journal of Wildlife Management* 38:250-256.

Wasser, S.K., J.L. Keim, M.L. Taper, and S.R. Lele. 2011. The influence of wolf predation, habitat loss, and human activity on caribou and moose in the Alberta oil sands. *Frontiers in Ecology and the Environment* 9:546-551.

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Appendix A. Restricted Activity Periods, Wildlife Setback Distances, and Wildlife Sweep Protocol



A.1 Restricted Activity Periods

Month	Prescribed Wildlife	Nesting Migratory Birds	Sensitive Nesting Raptors	Mineral / Salt Lick	Boreal Woodland Caribou	Moose & Muskox	Grizzly Bear and Black Bear	Wolverine	Wolves	Foxes	North American Beaver	Gypsy Cuckoo Bumble Bee
January	Restrictions during breeding and birthing seasons and species-specific setbacks for active/occupied Important Wildlife Features based on advice from qualified professional					Calving	Activity Restrictions and species-specific setback from occupied dens	Activity Restrictions 2,000 m occupied dens			Restrictions for active Beaver Dam and Lodge Removal without authorization from ENR	
February					Mid Winter							
March					Late Winter (Highest Risk)							
April					Dispersal							
May		Vegetation Clearing Restrictions Nesting Season and taxa- or species-specific setbacks from occupied nests	Vegetation Clearing Restrictions Nesting Season and taxa or species-specific setback from occupied nests	Activity Restrictions 250 m	Calving / Post-calving (Highest Risk)				Activity Restrictions 150 m occupied dens	Activity Restrictions 100 m occupied dens		Activity Restrictions 100 m active nests and host nests
June												
July												
August		Vegetation Clearing Restrictions Nesting Season and taxa- or species-specific setbacks from occupied nests			Rut							
September												
October												
November												
December							Activity Restrictions and species-specific setback from occupied dens	Activity Restrictions 2,000 m occupied dens				



A.2 Wildlife Setback Distances

Group	Taxa, Species, or Feature	Measure Setback From	Setback Duration *	Recommended Setback Distance	Notes
Birds	Waterfowl (listed as Secure)	Occupied nests	June 1 – August 31	100	GoNWT (2015)
	Waterfowl (listed as Sensitive, May be At Risk, or At Risk)	Occupied nests	June 1 – August 31	250	GoNWT (2015)
	Horned Grebe	Occupied nests	May 1 – July 31	250	GoNWT (2015), GoA (2024)
	Shorebirds (listed as Secure)	Occupied nests	May 1 – July 31	30	ECCC (2025a)
	Shorebirds (listed as Sensitive, May be At Risk, or At Risk)	Occupied nests	May 1 – July 31	250	ECCC (2025a)
	Songbirds (listed as Secure)	Occupied nests	May 1 – August 15	30	ECCC (2025a)
	Songbirds (listed as Sensitive, May be At Risk, or At Risk)	Occupied nests	May 1 – August 15	100	ECCC (2025a)
	Bank Swallow	Occupied nests	May 1 – August 31	100	ECCC (2025a)
	Barn Swallow	Occupied nests	May 1 – August 31	100	ECCC (2025a)
	Common Nighthawk	Occupied nests	May 1 – August 31	200	GoNWT (2015)
	Raptors (listed as Secure)	Occupied nests	March 15 – August 31	100	GoA (2024)
	American Goshawk / Sharp-shinned Hawk	Nesting sites	April 1 – August 31	500	GoNWT (2015)
			September 1 – March 31	5	
	Bald Eagle	Nesting sites	April 15 – August 31	500	GoNWT (2015), GoA (2024)
			September 1 – April 14	50	
	Golden Eagle	Nesting sites	April 15 – August 31	800	GoNWT (2015), GoA (2024)
			September 1 – April 14	50	
	Osprey	Nesting sites	April 1 – August 31	300	GoA (2024)
			September 1 – March 31	5	
	Peregrine Falcon	Nesting sites	March 15 – July 15	1000	GoA (2024)
			July 16 – March 14	50	
	Short-eared Owl	Occupied nests	May 1 – July 31	250	GoNWT (2015)
Mammals	Boreal woodland caribou	Late-Wintering Areas	March 22 – April 5	500	GoNWT (2015, 2022)
		Calving / Post-Calving Areas	May 1 – July 12		
Mammals	Black Bear	Occupied dens	September 30 – March 30	100	GoNWT (2015), GoA (2024)
	Grizzly Bear	Occupied dens	September 30 – March 30	200	GoNWT (2015), GoA (2024)
	Moose	Calving Areas	May 15 – June 15	100	GoNWT 2026
	Muskox	Calving Areas	April 1 – June 15	500	GoNWT (2015)
	Muskrat	Occupied houses	Year-round	100	GoA (2024)
	North American Beaver	Occupied lodges	Year-round	100	GoA (2024)
	Foxes	Occupied dens	May 1 – July 15	100	GoNWT (2015)
	Wolf	Occupied dens	May 1 – September 15	150	GoNWT (2015)
	Wolverine	Occupied dens	October 15 – July 15	2000	GoNWT (2015)
	Mineral / Salt Lick	Lick site	April 1 – July 15	250	GoNWT (2015)
	Other prescribed wildlife	Important wildlife feature	Until deemed inactive	Advice from qualified professional	
Insects	Gypsy cuckoo bumble bee	Occupied nests and host nests	May 1 to August 31	100	ECCC (2025b)

* The exact timing of wildlife sensitive periods varies by region and species. For example, the approximate breeding period for most migratory birds near NWO is early-May to late-August. However, there will be species differences and annual differences as to when birds nest (e.g., early or late spring). The restricted activity periods and setback duration are a general guide as the specific timing of wildlife and bird activities may vary from year to year (GoNWT 2015a).



A.3 Wildlife Sweep Protocol

The purpose of a wildlife sweep is to assess that a site is free of important wildlife features (GoA 2020). A definition of important wildlife features in the context of NWO is provided below (see Section A.3.1). A wildlife sweep must be conducted prior to an activity that results in land or vegetation disturbance where there is risk of important wildlife features being disturbed or destroyed. It is a risk-based approach with the intent of quickly assessing a site so that important wildlife features may be avoided. A wildlife sweep is not intended to be a comprehensive wildlife survey. A wildlife survey refers to a comprehensive survey for all Species at Risk observations and features, near the proposed area of development (e.g., GoA 2013).

The wildlife sweep must be completed by a qualified professional (see Section A.3.2) and include a complete search of the planned footprint plus appropriate buffer distance. The appropriate buffer search radius should be determined following consultation with a qualified professional who will assess the potential for important wildlife features based on habitat and determine disturbance level. Best practice is to include a 100 m buffer for high disturbance activities (e.g., forest clearing in the winter) and 30 m buffer for low disturbance activities (e.g., mowing vegetated ditches during the nesting season). Disturbance is defined as an alteration of habitat (e.g., natural landscape or previously altered habitat) including but not limited to clearing, vegetation cutting, grubbing, excavation, dewatering, remedial or soil salvage, drilling, noise disturbance associated with known important wildlife features that are occupied, and decommissioning of artificial wildlife habitat (e.g., structures that may support nesting). Disturbance may also include work activities next to wildlife habitat including but not limited to areas of woody debris, ponded water, and areas with vegetation regrowth.

The setback distances for important wildlife features are provided in Section A.2, and are based on GoNWT (2015a) and GoA (2024) guidelines. These distances may vary depending on disturbance level, landscape context, and the alert distance or flush distance of the animal (ECCC 2023). The final distance should be determined by a qualified professional and the distances listed in Section A.2 are provided as a starting point. When the alert or flush distance cannot be reliably determined due to limited visibility of the nest, these setback distances should be used. When setbacks cannot be achieved, and footprints cannot be modified, SRRB and ENR will be notified regarding alternative mitigations that have been recommended by a qualified professional and to request authorization for a variance to the setbacks listed herein.

During the raptor and migratory bird nesting season (Section A.1), the wildlife sweep will include an assessment for bird nests using behavioural cues that indicate the presence of nests (a non-intrusive nest search). This will include periodically stopping, listening, and counting the number of bird species and calls, and recording their behaviour.

Between March 15 and August 31, wildlife sweeps are valid for seven (7) days following completion of the wildlife sweep (Table A-1). Between September 1 to November 14, wildlife



sweeps are valid for 10 days following completion of the wildlife sweep and starting November 15, wildlife sweep completed are valid until end of day on March 14 (Table A-1). If work activities have not been initiated prior to the sweep expiration date, another sweep of the footprint and buffer is required to account for any new nests or other important wildlife feature that may have been established since the date of the initial sweep.

Table A-1: Wildlife Sweep Validity Periods

Time of Year	Validity Period *	Rational	Notes
March 15 to August 31	7 days	Raptor and Migratory Bird Nesting Season	GoNWT (2015), GoA (2024), ECCC (2025a)
September 1 to November 14	10 days	Shoulder season to when bears occupy their winter dens	GoNWT (2015), SARC (2017)
November 15 to March 14	Valid until March 14	Low-risk time of year, outside of the nesting season and bears are in their dens	GoNWT (2015), GoA (2024), ECCC (2025a)

* If work activities have not been initiated within the validity period, another sweep must be completed to account for new features that may have been created since the initial sweep date.

A.3.1 Important Wildlife Features

Imperial's strategy to identify important wildlife features includes pre-planning activities and wildlife sweeps. Mitigations may be species-specific and should be determined in consultation with a qualified professional. The following will be considered important wildlife features at NWO:

- occupied nests, dens, burrows, roosts, lodges, and other residences of prescribed wildlife, pursuant to the *Wildlife Act* (GoNWT 2013) and nests of migratory birds, pursuant to the MBCA and MBRs;
- stick nests of sensitive raptor species when they are occupied and unoccupied if they are likely to be reused (where re-use is likely the nest should be designated as active regardless of occupancy until it has not been used for two nesting seasons, at which point it would be considered inactive and no longer an important wildlife feature); and
- active mineral / salt licks and calving areas when they are being used for the intended purpose by prescribed wildlife, pursuant to the *Wildlife Act* (GoNWT 2013).

Wildlife features that are not being used for the intended purpose and unlikely to be reused, or not limited on the landscape are not considered important wildlife features. This includes but is not limited to unoccupied nests, dens, and burrows; ungulate bedding areas; and red squirrel (*Tamiasciurus hudsonicus*) or other squirrel species dreys, burrows, or middens.

Occupancy of a wildlife feature will be determined by direct observation (e.g. territorial display and other behaviour) or detection of an individual through sign (e.g., fresh faeces, feathers, viable eggs, tracks, trampled vegetation, or sign of digging/excavation). Additionally, an evidence-based approach may be used to support the decision (e.g., species life history characteristics, abrupt departure (e.g., flushing), behaviours indicating disturbance (e.g., increased vigilance, abruptly stopping normal behaviours, alarm calls, distraction displays, or aggression).



If an important wildlife feature is detected, and status cannot be readily determined, other mechanisms may be employed by qualified professionals (e.g., remote camera, borescope) to monitor or inspect the feature. Occupied features will be protected by species-specific setbacks and monitored until a qualified professional has determined that the feature is no longer being used for the intended purpose.

A.3.2 Qualified Wildlife Professional

A qualified wildlife professional is someone with education, knowledge, or experience to identify wildlife, wildlife behaviour, locate important wildlife features, and provide recommendations to protect important wildlife features. Recommendations will be based not only on the setbacks listed herein but also on an assessment of planned disturbance level, landscape context, and the alert distance or flush distance of the animal.

The individual shall be registered with an organization or association which requires that members follow a Code of Ethics and are competent in their field of practice. This includes a strong understanding of applicable legislation pertaining to wildlife in the region, including SARA, MBCA, MBRs, and the *Wildlife Act*.

The qualified wildlife professional will be responsible for directing wildlife sweeps and other wildlife monitoring duties, avoiding inadvertently causing disturbance to important wildlife features while conducting sweeps, compiling wildlife observations, submitting daily wildlife sweep reports, and providing recommendations and guidelines within the daily wildlife sweep reports including setback distances and durations in alignment with this WMMP.

If a qualified wildlife professional cannot be present to conduct the wildlife sweep, the wildlife sweep report must be reviewed and signed off by a qualified wildlife professional.

A.4 References

ECCC (Environment and Climate Change Canada). 2023. Guidelines to avoid harm to migratory birds. Available at: <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html>. Accessed June 2026.

ECCC (Environment and Climate Change Canada). 2025a. Nesting periods. Available at: <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html>. Accessed June 2026.

Environment and Climate Change Canada. 2025b. Recovery Strategy for the Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*) in Canada. *Species at Risk Act Recovery Strategy Series*. Environment and Climate Change Canada, Ottawa. viii + 80 pp.



- GoA (Government of Alberta). 2013. Sensitive Species Inventory Guidelines. Environment and Sustainable Resource Development. April 2013. Available at: <https://open.alberta.ca/dataset/93d8a251-4a9a-428f-ad99-7484c6ebabe0/resource/f4024e81-b835-4a50-8fb1-5b31d9726b84/download/2013-sensitive-species-inventory-guidelines-apr18.pdf>. Accessed June 2026.
- GoA (Government of Alberta). 2020. Wildlife Sweep Protocols: sensitive species inventory guidelines. Available at: <https://open.alberta.ca/publications/wildlife-sweep-protocols-sensitive-species-inventory-guidelines>. Accessed June 2026.
- GoA (Government of Alberta). 2024. Master schedule of standards and conditions. Available at: <https://open.alberta.ca/publications/master-schedule-of-standards-and-conditions>. Accessed June 2026.
- GoNWT (Government of the Northwest Territories). 2013. Wildlife Act. SNWT 2013, c. 30. In force with amendments up to January 1, 2020. Available at: justice.gov.nt.ca/en/files/legislation/wildlife/wildlife.a.pdf. Accessed April 2026.
- GoNWT (Government of the Northwest Territories). 2015. Northern Land Use Guidelines: Seismic. Available at: https://www.gov.nt.ca/sites/ecc/files/resources/nlug_seismic_2015_english_-_16_sept_2015.pdf. Accessed April 2026.
- GoNWT (Government of the Northwest Territories). 2022. Guidelines for Exploration and Development Projects in Boreal Caribou Habitat in the Northwest Territories. Available at: https://www.gov.nt.ca/ecc/sites/ecc/files/resources/nwt_caribou_guidelines_bilingual_feb24_final_2_2_0.pdf. Accessed June 2026.
- GoNWT (Government of the Northwest Territories). 2026b. Moose and Muskox IWAs: Map [Generated map on April 2, 2026]. NWT Species and Habitat Viewer. https://www.maps.geomatics.gov.nt.ca/Html5Viewer/index.html?viewer=NWT_SHV. Accessed April 2026.
- MBCA (Migratory Birds Convention Act). 1994. S.C. 1994, c.22. Current to May 26, 2026. Last amended on March 26, 2026. <http://laws-lois.justice.gc.ca>. Accessed June 2026.
- MBR (Migratory Birds Regulations). 2022. SOR/2022-105. Current to May 26, 2026. Last amended on October 4, 2024. <http://laws-lois.justice.gc.ca>. Accessed June 2026.
- SARC (Species at Risk Committee). 2017. Species Status Report for the Grizzly Bear (*Ursus arctos*) in the Northwest Territories. Yellowknife, NT. 153pp.



Appendix B. Wildlife Deterrence Procedures



B.1 Wildlife Deterrence Procedure

Wildlife deterrence is implemented when there is risk to wildlife coming into contact with hydrocarbons, process affected water, or other deleterious substances. The deterrence procedure at NOW is a multi-layered system which includes immediate clean-up of contaminants and water sampling to confirm absence of harmful substances (eliminate risk), passive deterrence measures (attraction reduction) and active deterrence measures (direct deterrence). The following describes the wildlife deterrence approach at NWO:

Eliminate Risk

As a first line of deterrence, risk to wildlife is removed, where possible, by:

- Routinely testing ponded water on site and any water that is released from site is sampled to ensure composition of water is compliant with safe release criteria, as per water sampling guidelines, Specifically,
 - As part of other commitments (SNP sampling program), the retention pond near the CPF, the runoff pond near the tank farm, and the ponds adjacent to the bio-cells are routinely tested (Figure B-1). The ponds near the bio-cells are also pumped down as required to maintain no more than approximately 30 cm of water.
- Proper waste management and handling to remove food attractants and minimize wildlife presence.

Attraction Reduction

As a second line of deterrence, risk or attractants to wildlife is reduced, by:

- Vegetation management across site limits vegetation growth and reduces habitat attractiveness to birds and other wildlife.
- Fencing including chain-link fencing where there is risk to wildlife to deter large wildlife including bears and moose. Specifically,
 - The retention pond near the CPF is fenced and lined with an impermeable membrane (Figure B-1). Additionally, the pond is planned to be decommissioned in late 2026.
 - The soil storage bio-cells are fenced with temporary fencing and improvements by means of erecting a 6-foot chain-link fence are planned (Figure B-1).

Direct Deterrence:

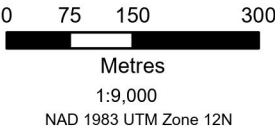
As a last line of deterrence, wildlife areas are made to be perceived as unappealing or unsafe to wildlife by deploying and maintaining visual and audible deterrents, including:

- Visual deterrents: predator effigies, human effigies (scarecrows), bird kites, flags and reflective tape suspended on ropes crossing risk areas, and setup as advised by a qualified professional. Visual deterrents are to be inspected regularly and replaced when damaged, faded, or dirty.
- Auditory deterrents: propane cannons active during migratory season, predator calls, or wildlife alarm calls, setup as advised by a qualified professional. Auditory deterrents are to be inspected regularly (e.g., daily checks) and propane or batteries replaced as needed.



Legend

— Imperial Lease Boundary



Imagery: Vantor

IMPERIAL OIL RESOURCES LIMITED
NORMAN WELLS OPERATIONS
WILDLIFE MANAGEMENT AND MONITORING PLAN

WILDLIFE DETERRENCE FENCING IN NWO



Date:	23-JUN-26	Drawn by:	KR	Edited by:	KR	App'd by:	
Project No.	417085-64658			FIG No	B-1		REV B

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Appendix C. Example Monitoring Forms, Data sheets, and Templates



C.1 Wildlife Sweep Form

Wildlife or Bird Nest Sweep Completion Date: _____

Wildlife or Bird Nest Sweep Expiration Date: _____

Site Information:

- Site Name: _____
- Site LSD: _____
- Site Locations: Latitude _____ Longitude _____
- Size Site (approx.): _____
- General Land Cover Type: _____
- Site habitat complexity rank: _____
- Survey Start time: _____
- Survey Effort: _____
- Temperature (Celsius): _____
- Estimated Cloud Cover (%): _____
- Wind: _____

Wildlife Feature Details:

Wildlife Feature	Species	Occupancy Status	Comment	Feature Photo
a text answer	a text answer	a text answer	a text answer	https://live.prontoforms.com/data/181/views/277115003/attachments/2691?disposition=attachment

Species Observations

Common Name	Observation Type	Count	Age Class	Gender Class	Behaviour	Territorial Status	COSEWIC Status
a text answer	a text answer	1	a text answer	a text answer	a text answer	a text answer	a text answer



Figure of Sweep area with GPS tracks of biologists:

Site Photos:

Recommended Setbacks

Results Summary: _____

Recommendations: _____

Draft



Appendix D. Example Reporting Form Templates



D.1 Wildlife Incident Reporting Form

Date: _____

Time: _____

Species: _____

Location: _____

Comment: _____

Security notified: ___ YES ___ NO

ENR notified: ___ YES ___ NO

Draft