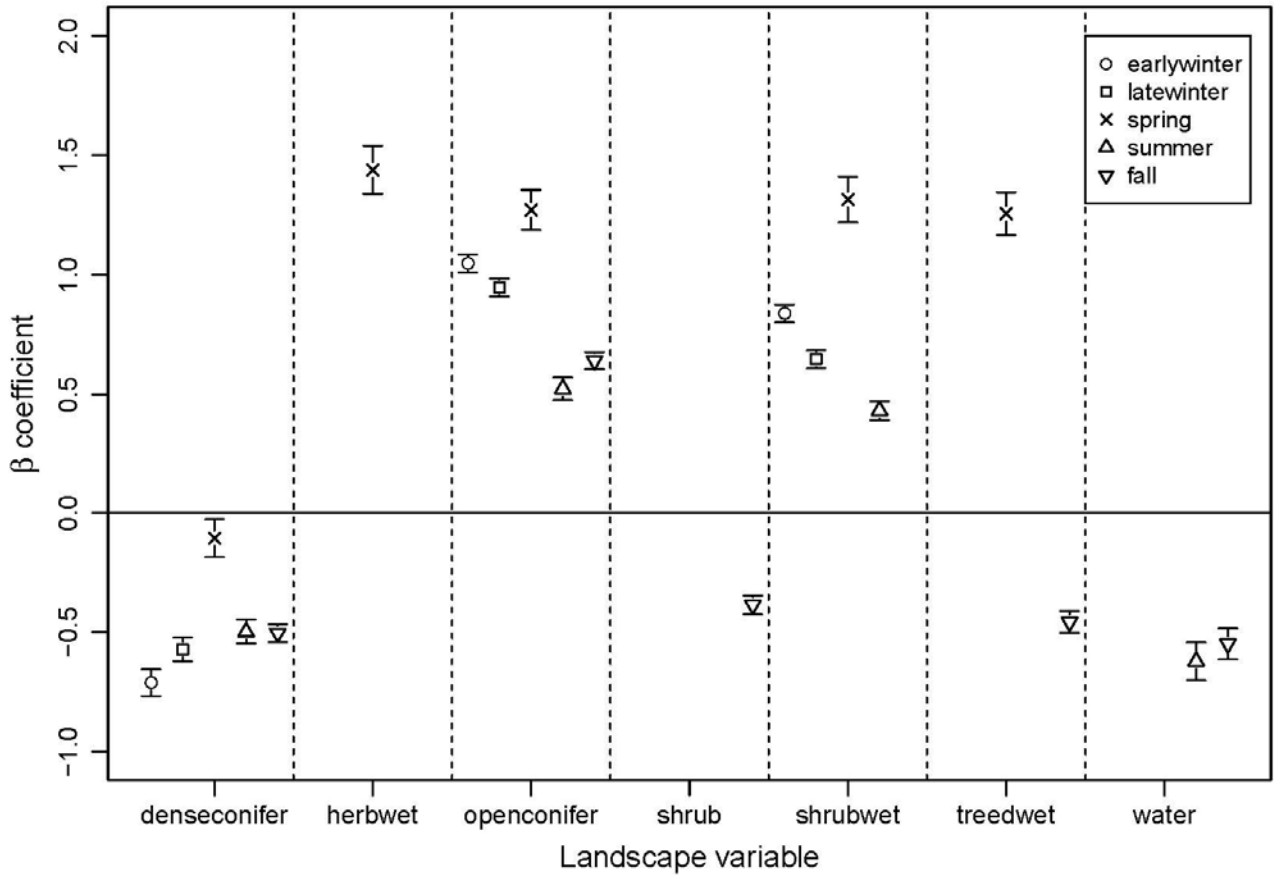
Figure 5-1-13: Resource Selection Model Coefficients for each Season for the Wabowden Range



The significant resource selection model coefficients for each season for the Wabowden Range. Coefficients > 0 indicate that caribou selected areas with this habitat type. Coefficients < 0 indicate caribou avoided areas with this habitat type.

Figure 5-1-14: Resource Selection Model Predicted Surface for Early Winter in the Wabowden Range based on Telemetry Locations

REDACTED

Resource Selection Model Predicted Surface for Early Winter in the Wabowden Range. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-15: Resource Selection Model Predicted Surface for Early Winter in the Wabowden Range based on Telemetry Locations but Validated with Aerial Survey Locations.

REDACTED

Resource selection model predicted surface for early winter in the Wabowden Range based on telemetry locations and validated with caribou occurrence based on aerial survey locations. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-16: Resource Selection Model Predicted Surface for Late Winter in the Wabowden Range based on Telemetry Locations

REDACTED

Resource selection model predicted surface for late winter in the Wabowden Range. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-17: Resource Selection Model Predicted Surface for Spring in the Wabowden Range

REDACTED

Resource selection model predicted surface for Spring in the Wabowden Range. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-18: Resource Selection Model Predicted Surface for Summer in the Wabowden Range based on Telemetry Locations

REDACTED

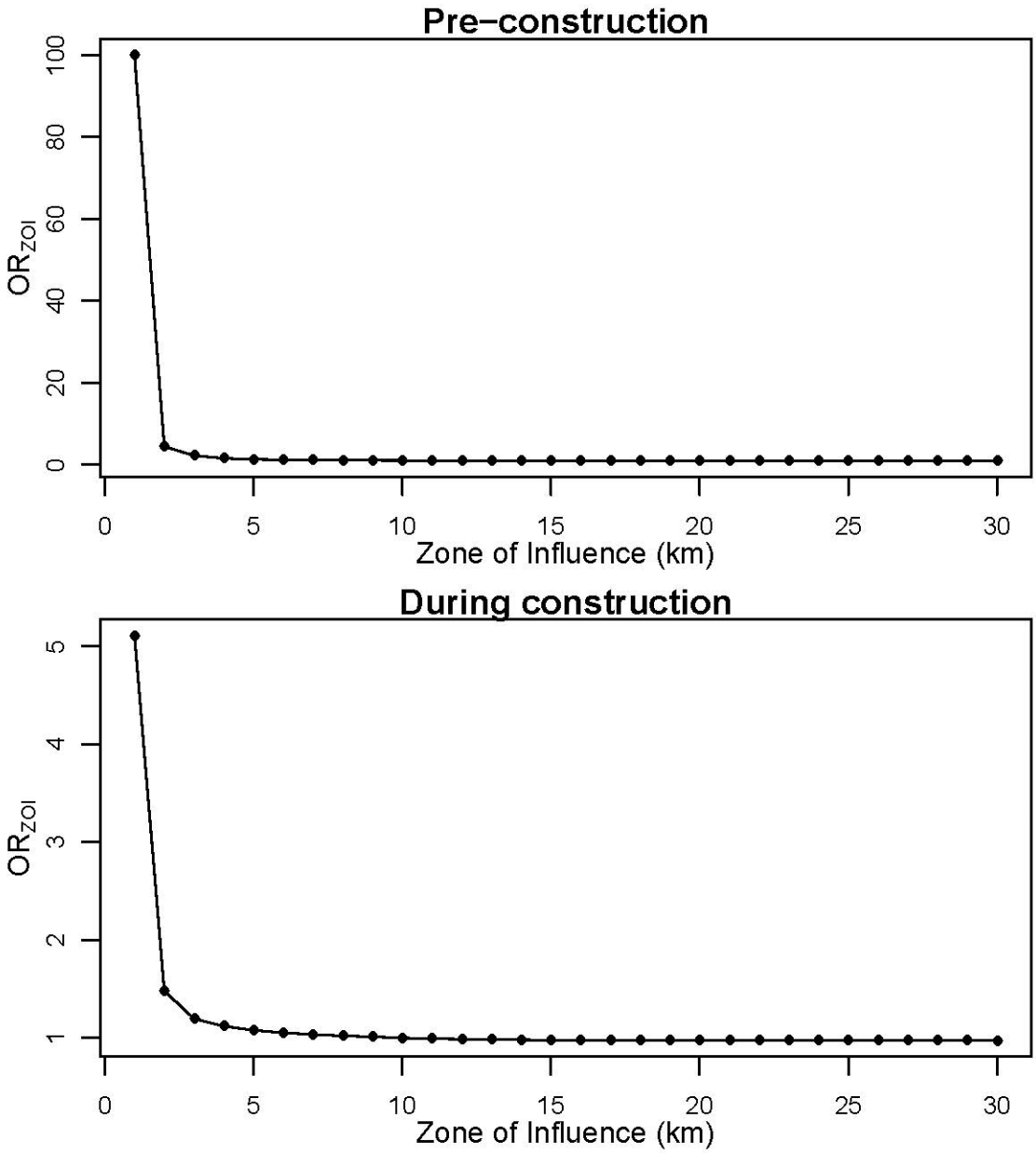
Resource selection model predicted surface for summer in the Wabowden Range. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-19: Resource Selection Model Predicted Surface for Fall in the Wabowden Range based on Telemetry Locations

REDACTED

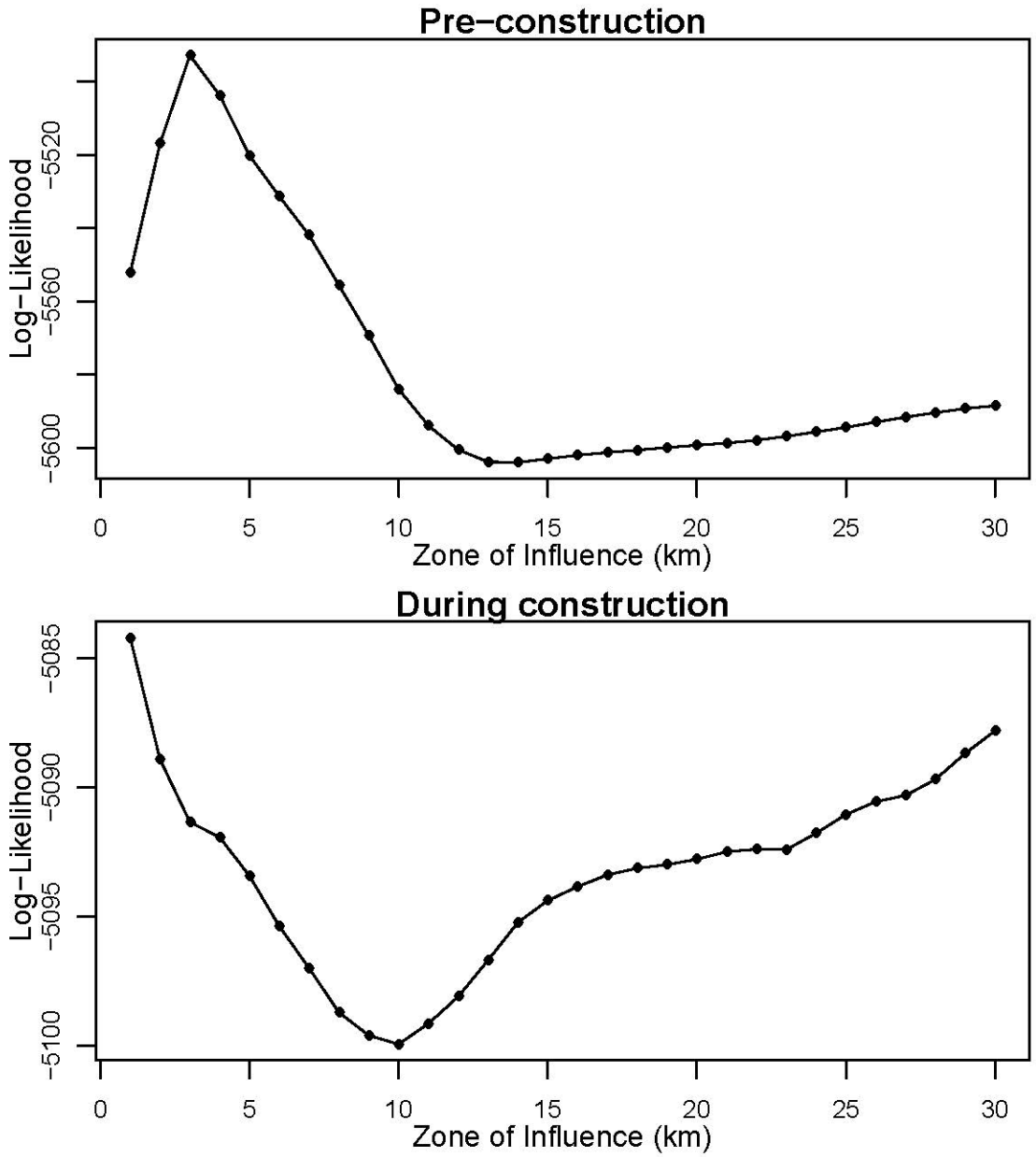
Resource selection model predicted surface for fall in the Wabowden Range. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-20: ZOI during the Pre-construction vs Construction Phases during the Early Winter in Wabowden Range



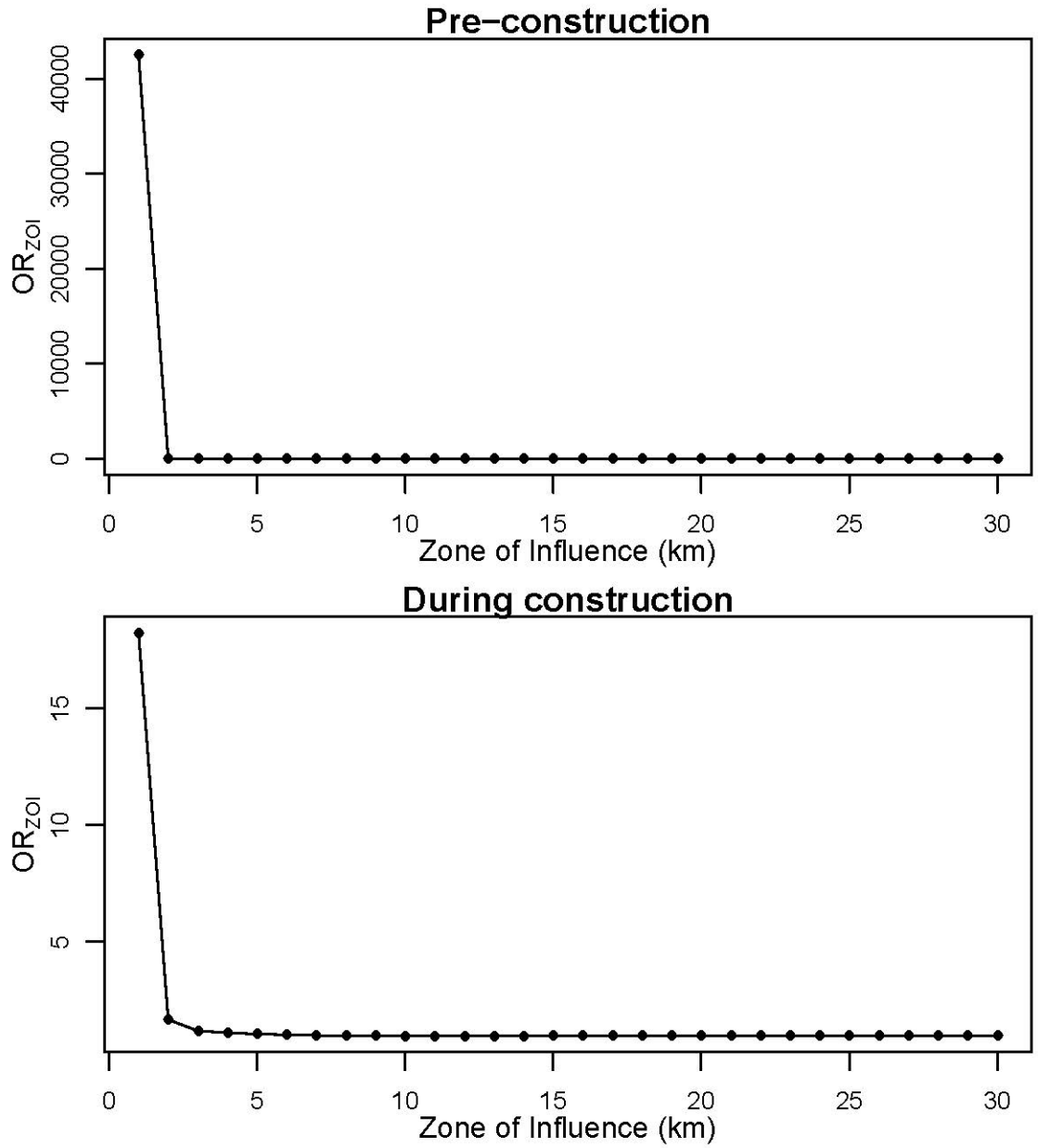
Caribou avoided the linear corridor in both the pre-construction and construction phases during the early winter period. There was a ZOI (ORzoi) around the pre-existing linear corridor (Row) during pre-construction phase and this ZOI did not change during the construction phase when the corridor was widened for the Project.

Figure 5-1-21: ZOI during the Pre-construction vs Construction Phases during the Early Winter in Wabowden Range



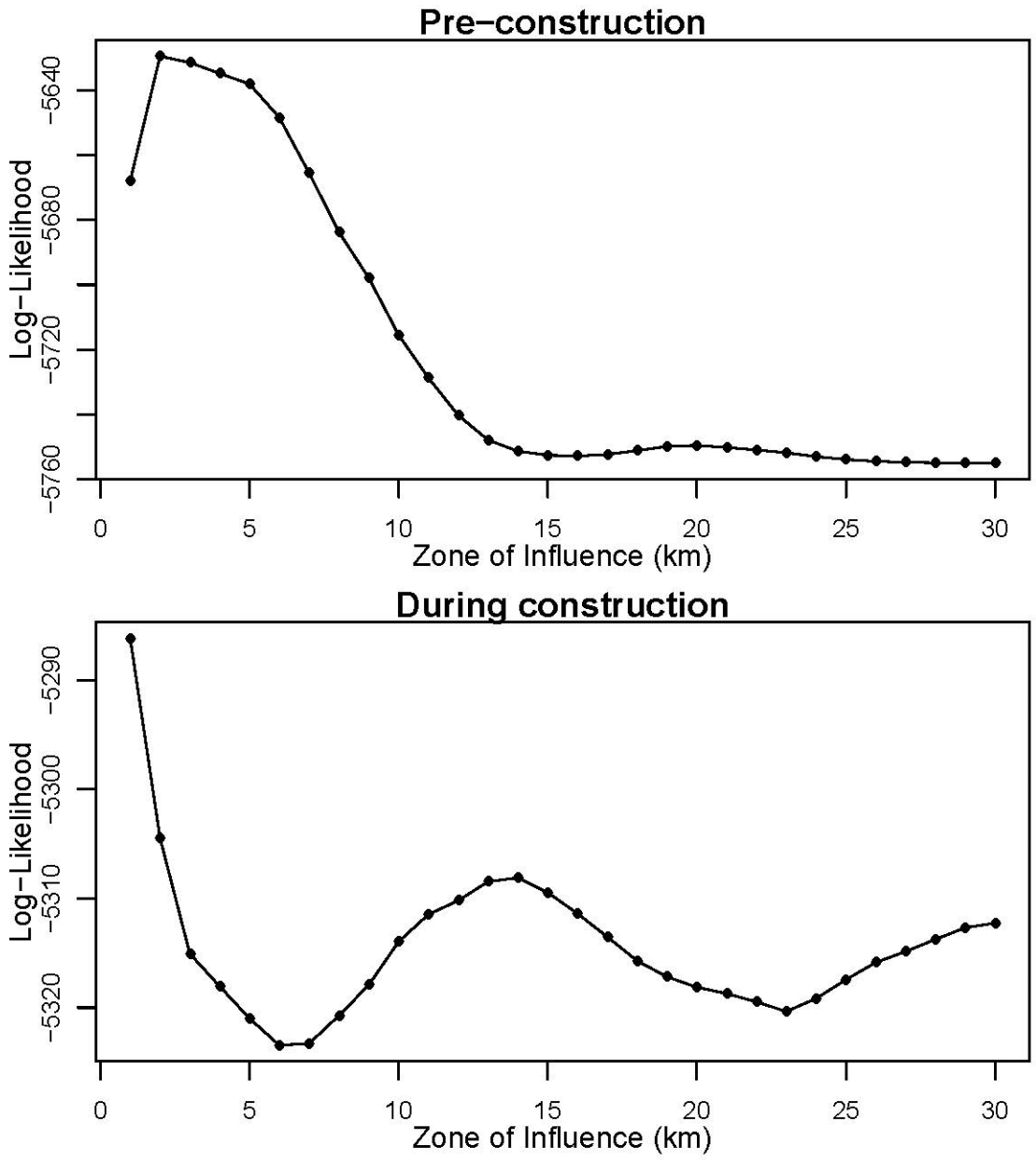
Caribou avoided the linear corridor in both the pre-construction and construction phases during the early winter period. There was a ZOI (log-likelihood) around the pre-existing linear corridor (Row) during pre-construction phase and this ZOI did not change during the construction phase when the corridor was widened for the Project.

Figure 5-1-22: ZOI during the Pre-construction vs Construction Phases during the Late Winter in Wabowden Range



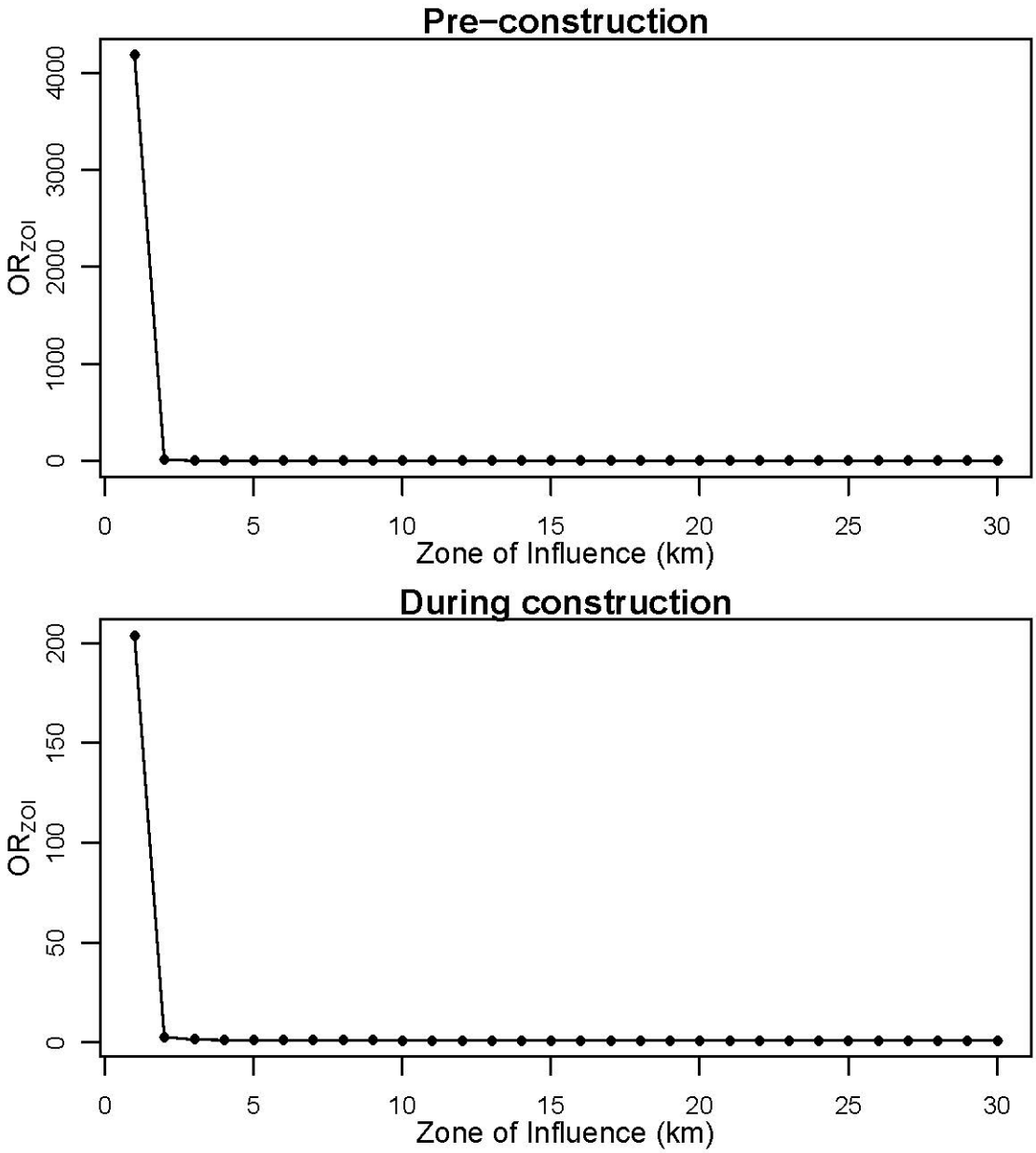
Caribou avoided the linear corridor in both the pre-construction and construction phases during the late winter period. There was a ZOI (ORzoi) around the pre-existing linear corridor (Row) during pre-construction phase and this ZOI did not change during the construction phase when the corridor was widened for the Project.

Figure 5-1-23: ZOI during the Pre-construction vs Construction Phases during the Late Winter in Wabowden Range



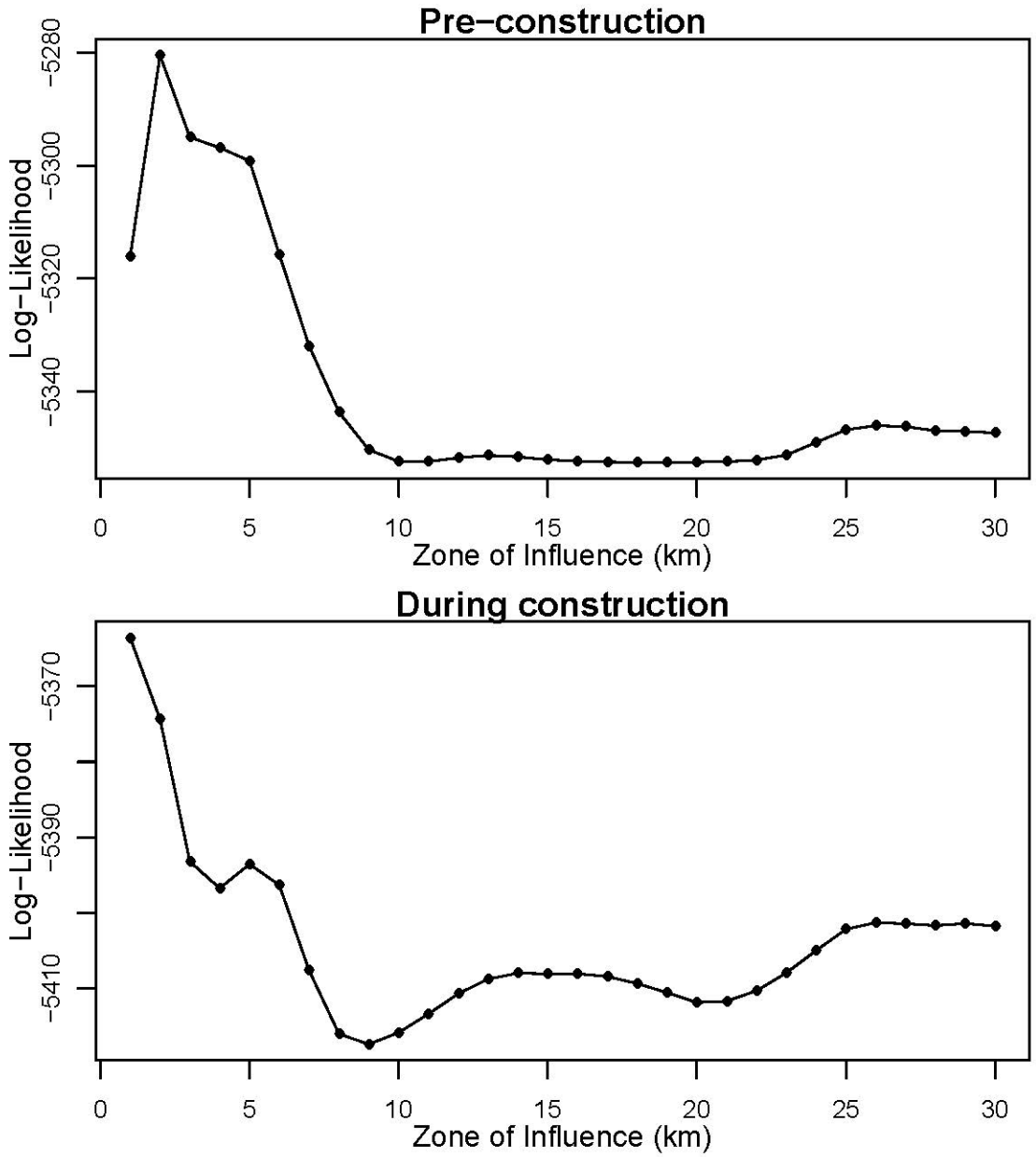
Caribou avoided the linear corridor in both the pre-construction and construction phases during the late winter period. There was a ZOI (log-likelihood) around the pre-existing linear corridor (Row) during pre-construction phase and this ZOI did not change during the construction phase when the corridor was widened for the Project.

Figure 5-1-24: ZOI during the Pre-construction and Construction Phases during the Spring in Wabowden Range



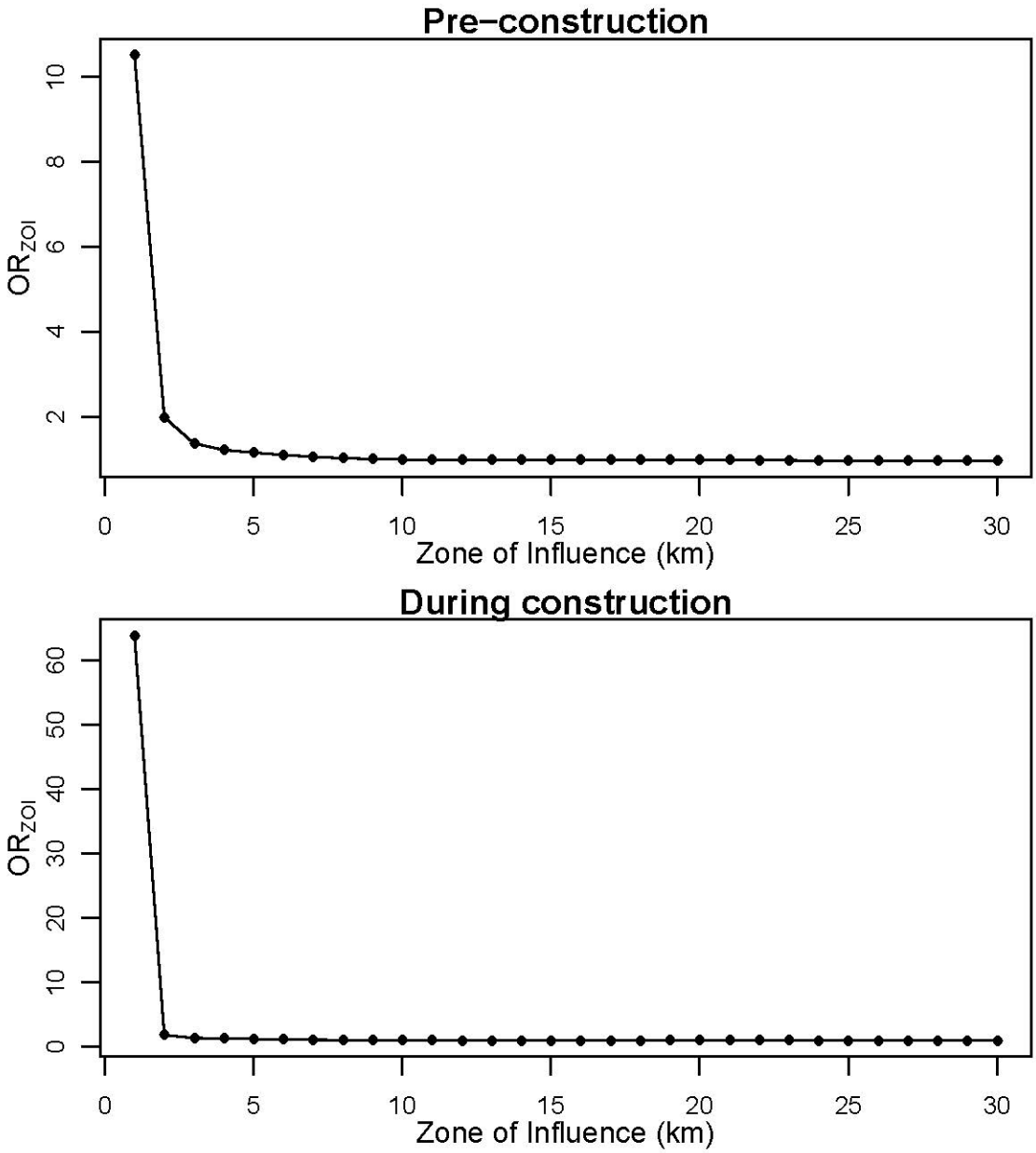
Caribou avoided the linear corridor in both the pre-construction and construction phases during the spring period. There was a ZOI (ORzoi) around the pre-existing linear corridor during pre-construction phase and this ZOI did not change during the construction phase when the corridor was widened for the Project.

Figure 5-1-25: ZOI during the Pre-construction vs Construction Phases during the Spring in Wabowden Range



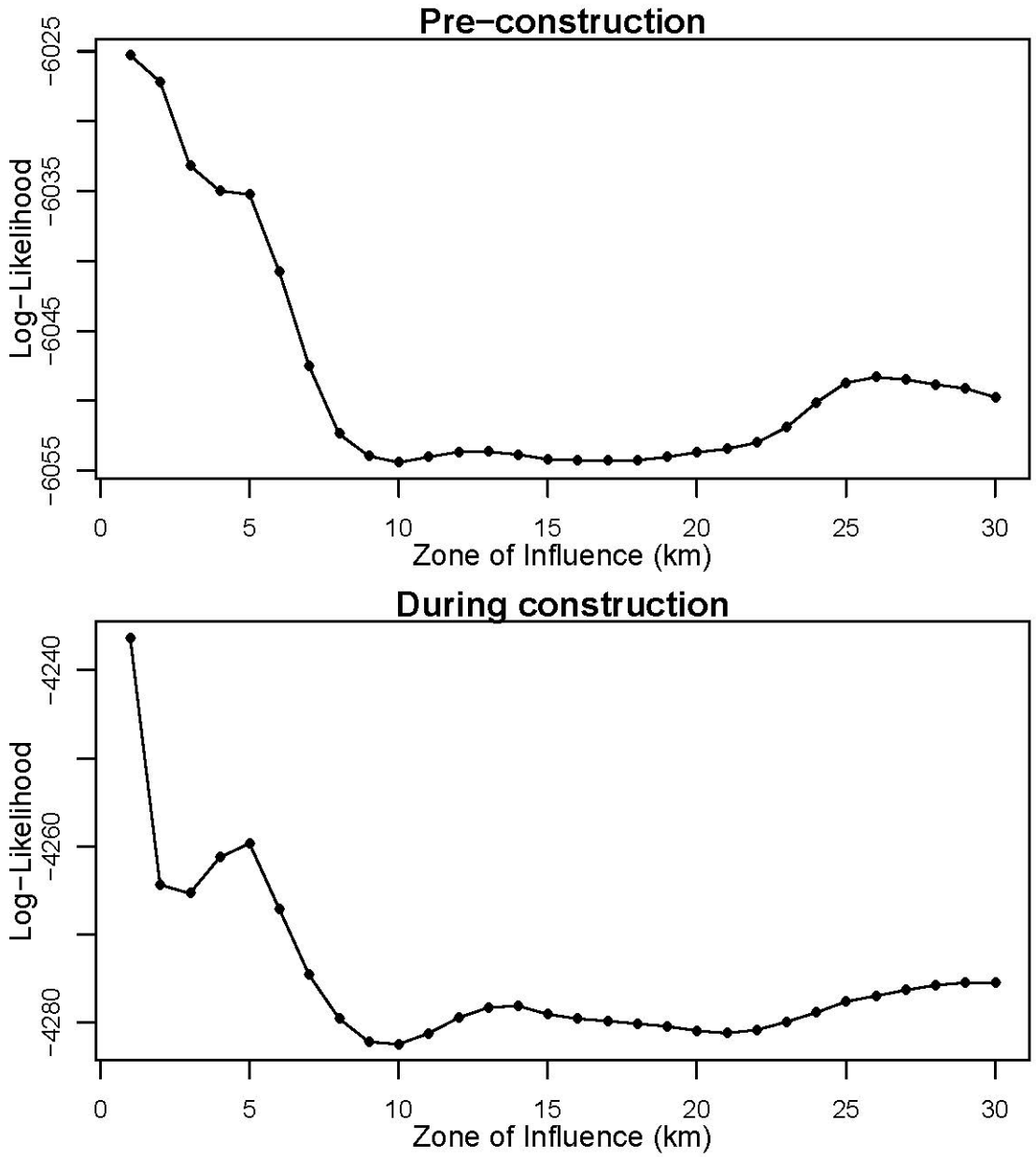
Caribou avoided the linear corridor in both the pre-construction and construction phases during the spring period. There was a ZOI (log-likelihood) around the pre-existing linear corridor (Row) during pre-construction phase and this ZOI did not change during the construction phase when the corridor was widened for the Project.

Figure 5-1-26: ZOI during the Pre-construction and Construction Phases during the Summer in Wabowden Range



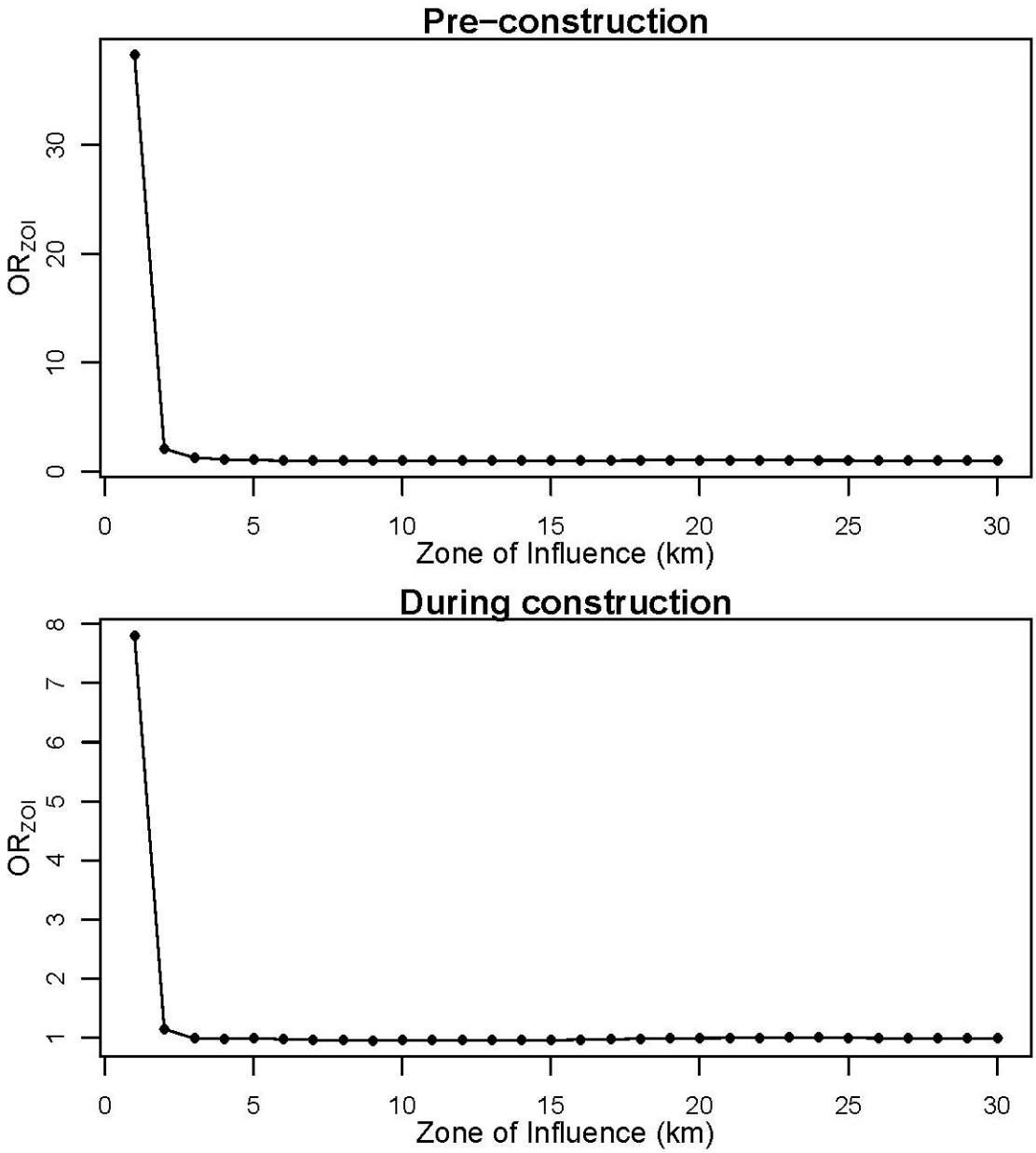
Caribou avoided the linear corridor in both the pre-construction and construction phases during the summer period. There was a ZOI (ORzoi) around the pre-existing linear corridor (Row) during pre-construction phase and this ZOI did not change during the construction phase when the corridor was widened for the Project.

Figure 5-1-27: ZOI during the Pre-construction and Construction Phases during the Summer in Wabowden Range



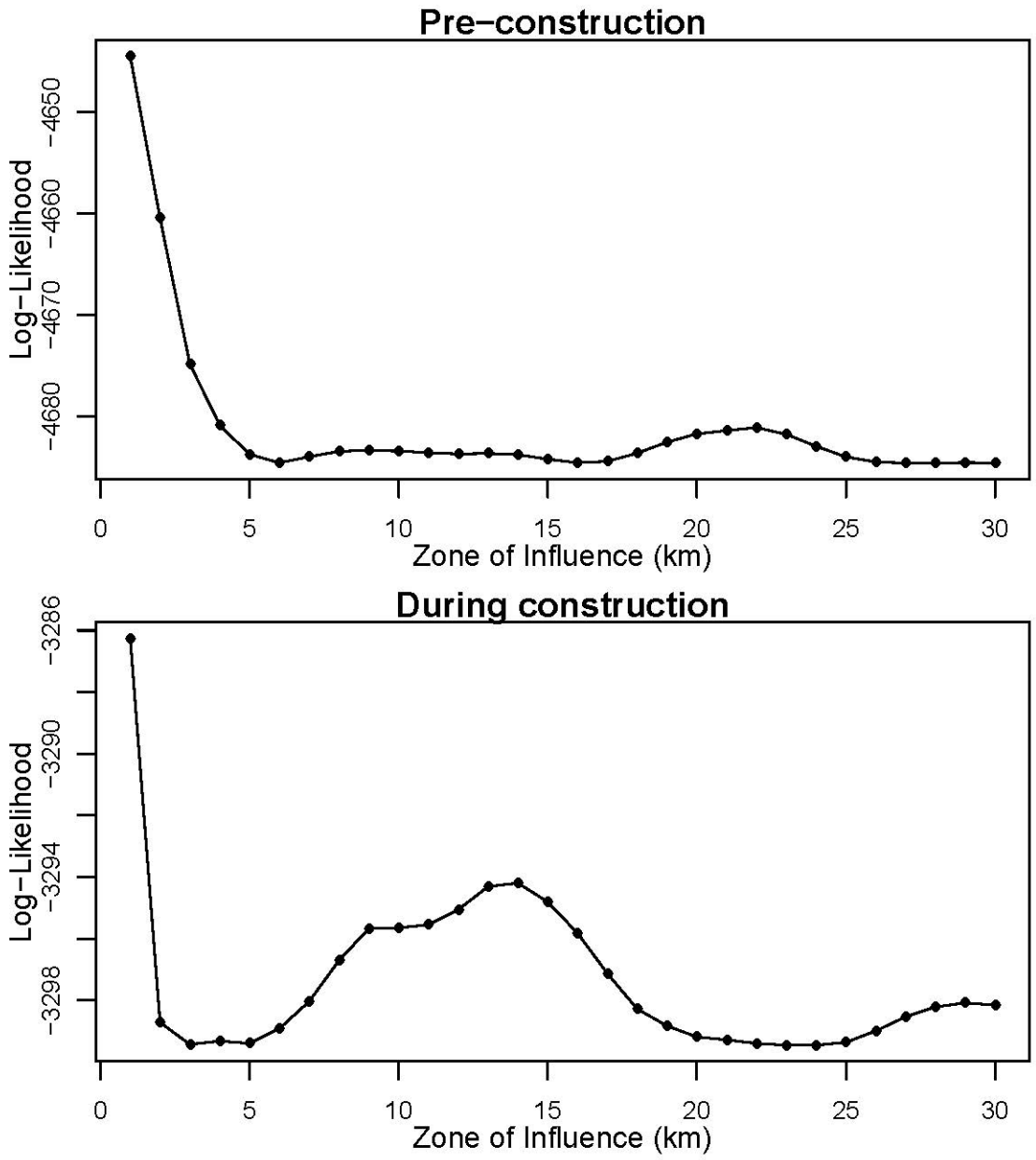
Caribou avoided the linear corridor in both the pre-construction and construction phases during the summer period. There was a ZOI (log-likelihood) around the pre-existing linear corridor (Row) during pre-construction phase and this ZOI did not change during the construction phase when the corridor was widened for the Project.

Figure 5-1-28: ZOI during the Pre-construction vs Construction Phases during the Fall in the Wabowden Range



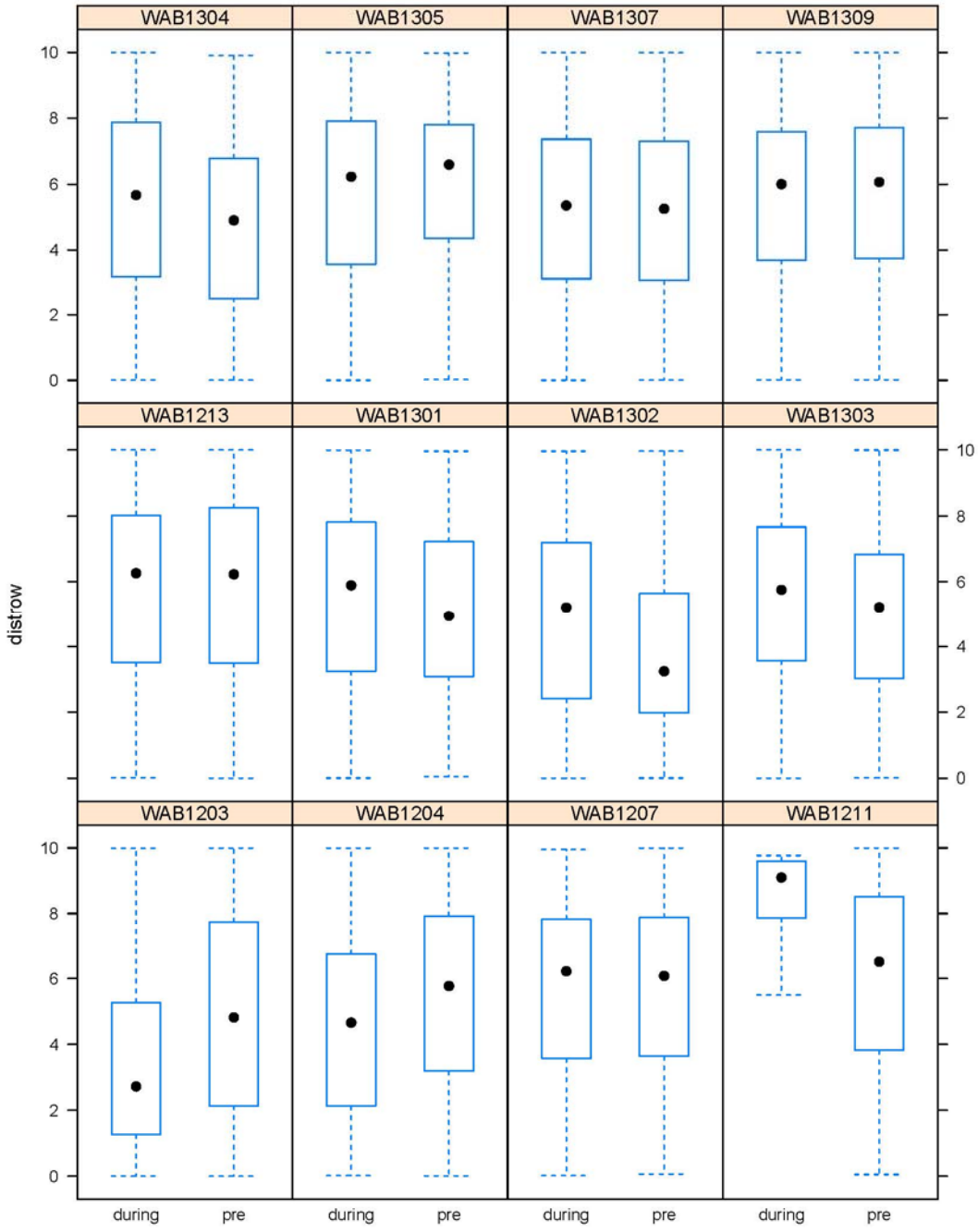
Caribou avoided the linear corridor in both the pre-construction and construction phases during the fall period. There was a ZOI (ORzoi) around the pre-existing linear corridor (Row) during pre-construction phase and this ZOI did not change during the construction phase when the corridor was widened for the Project.

Figure 5-1-29: ZOI during the Pre-construction vs Construction Phases during the Fall in the Wabowden Range



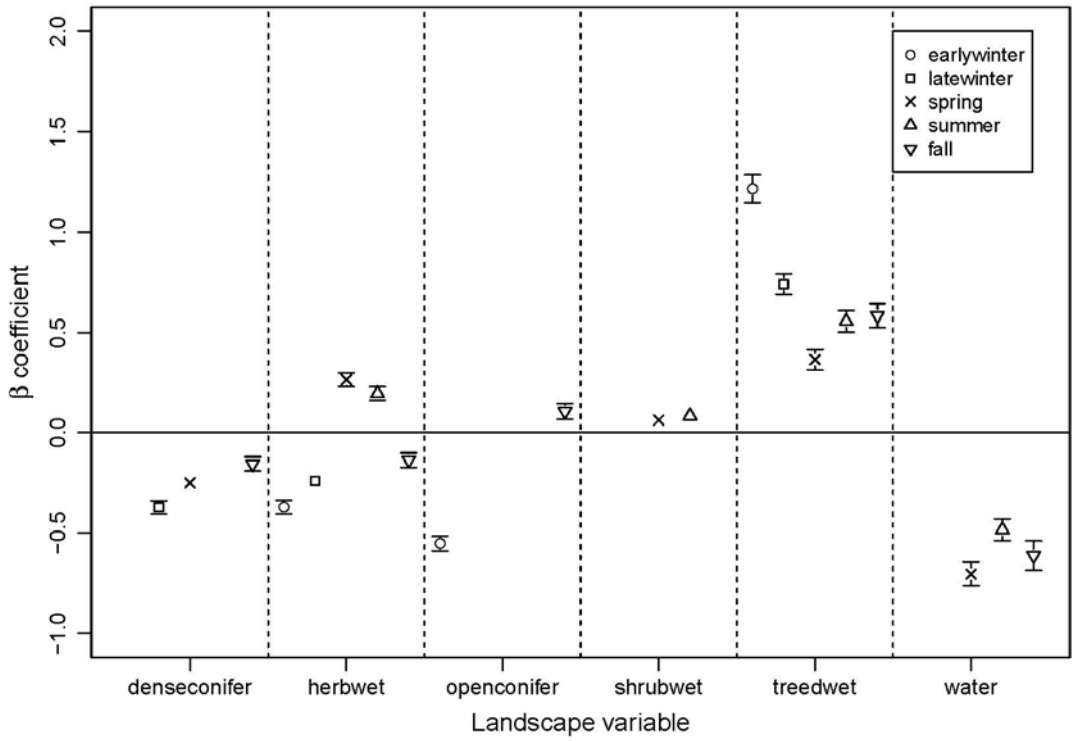
Caribou avoided the linear corridor in both the pre-construction and construction phases during the fall period. There was a ZOI (log-likelihood) around the pre-existing linear corridor (Row) during pre-construction phase and this ZOI did not change during the construction phase when the corridor was widened for the Project.

Figure 5-1-30: The Average Distance to the Project for Caribou Monitored during both the Pre-construction and Construction Phase in the Wabowden Range



There was no significant difference in the average distance for individual caribou to the Project from the pre-construction to the construction phase; corroborating the ZOI results.

Figure 5-1-31: Resource Selection Model Coefficients for each Season for the P-Bog Range



Resource Selection Model Coefficients for each Season for the P-Bog Range. Coefficients > 0 indicate that caribou selected areas with this habitat type. Coefficients < 0 indicate caribou avoided areas with this habitat type.

Figure 5-1-32: Resource Selection Model Predicted Surface for Early Winter in the P-Bog Range

REDACTED

Resource selection model predicted surface for early winter in the P-Bog range based on telemetry locations. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-33: Resource Selection Model Predicted Surface for Early Winter in the P-Bog Range based on Telemetry Locations and Validated through Aerial Survey Locations

REDACTED

RSF Predicted Surface for Early Winter in the P-Bog Range based on telemetry locations and validated through aerial survey locations. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-34: Resource Selection Model Predicted Surface for Late Winter in the P-Bog Range

REDACTED

Resource selection model predicted surface for late winter in the P-Bog Range based on telemetry locations. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-35: Resource Selection Model Predicted Surface for Spring in the P-Bog Range

REDACTED

Resource selection model predicted surface for spring in the P-Bog Range based on telemetry locations. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-36: Resource Selection Model Predicted Surface for Summer in the P-Bog Range

REDACTED

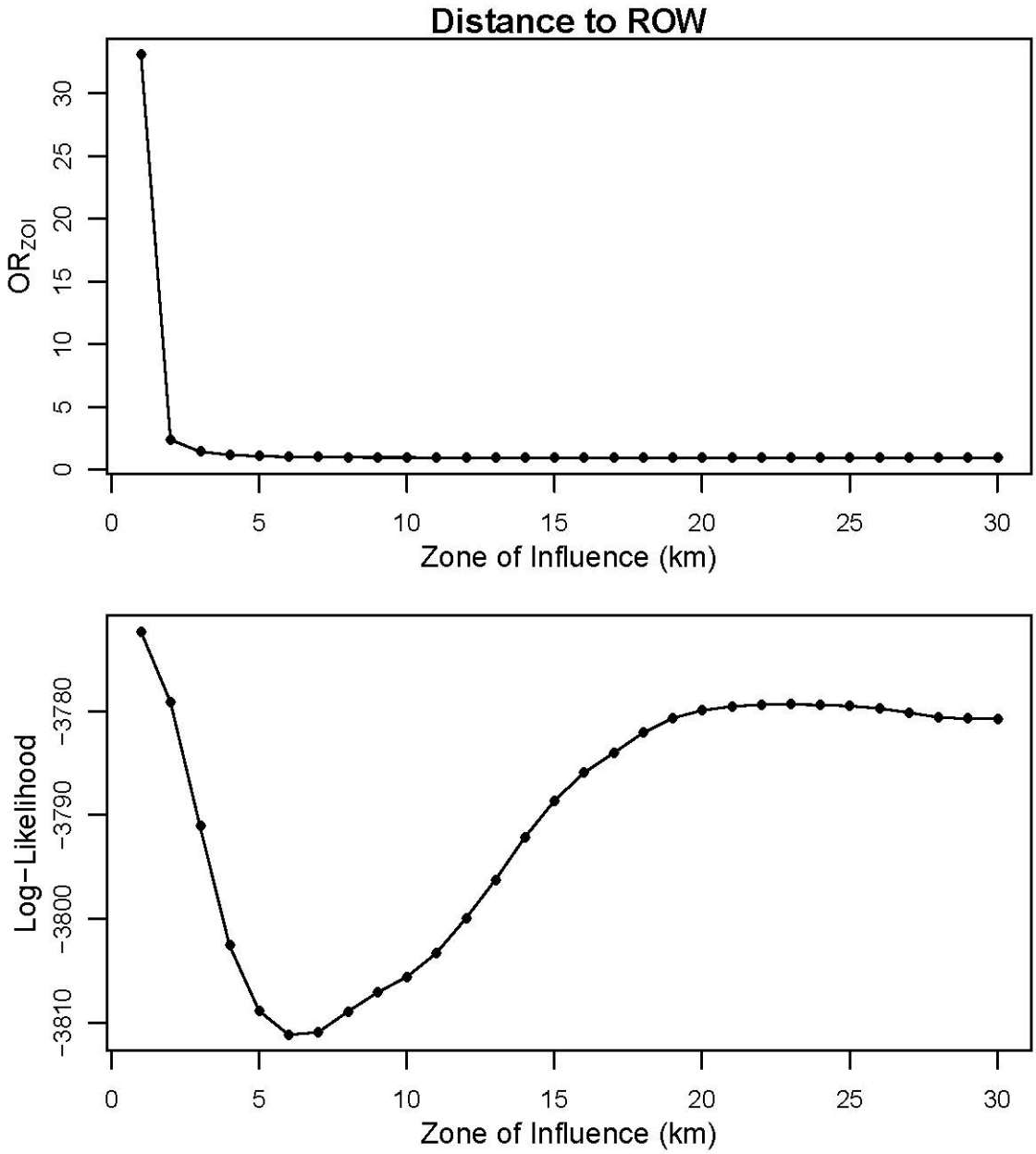
Resource selection model predicted surface for spring in the P-Bog Range based on telemetry locations. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-37: Resource Selection Model Predicted Surface for Fall in the P-Bog Range

REDACTED

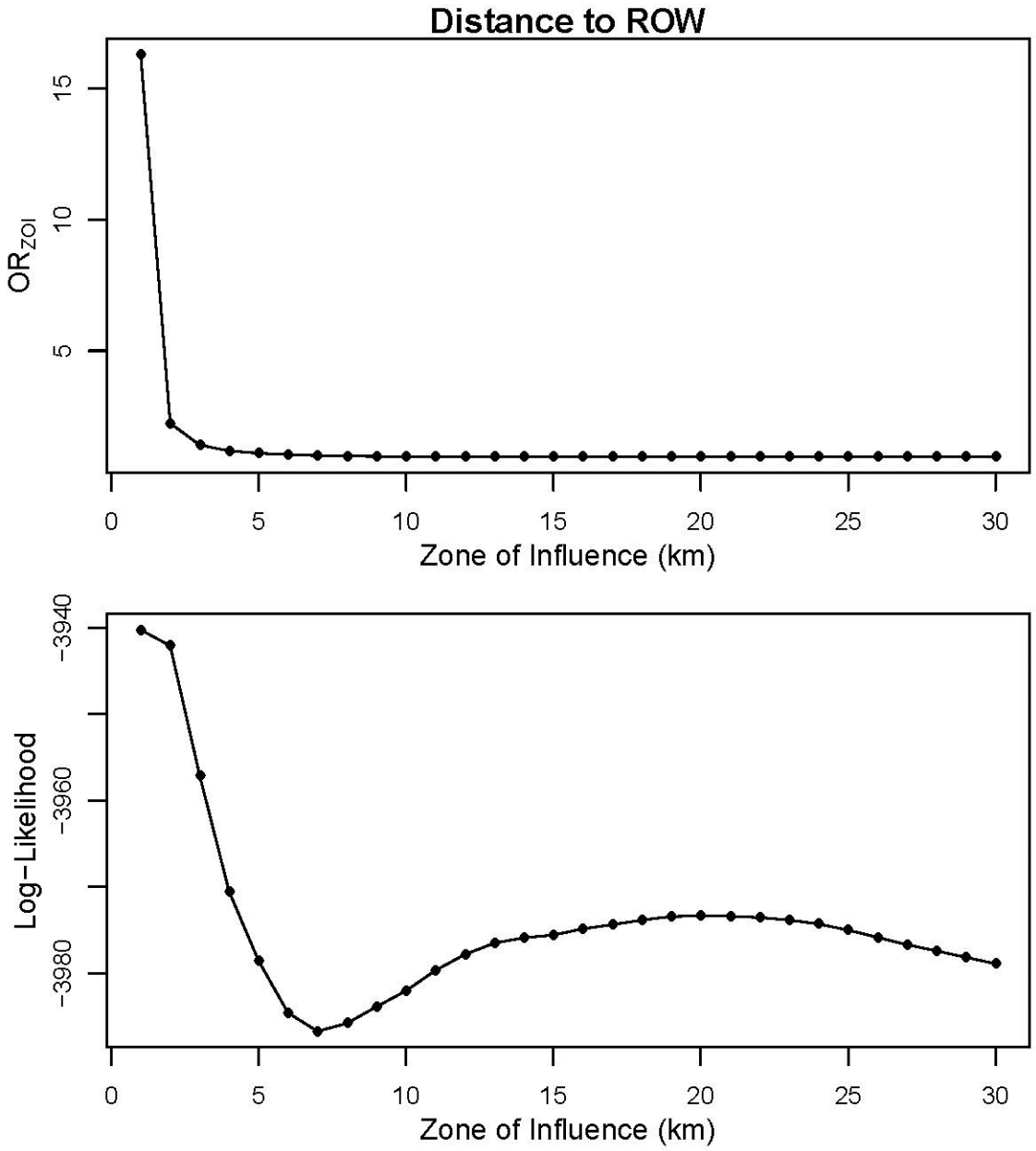
Resource selection model predicted surface for fall in the P-Bog Range based on telemetry locations. Green zones indicate areas with high probabilities of predicted caribou occurrence within the range.

Figure 5-1-38: ZOI during the Construction Phase during the Early Winter in P-Bog Range



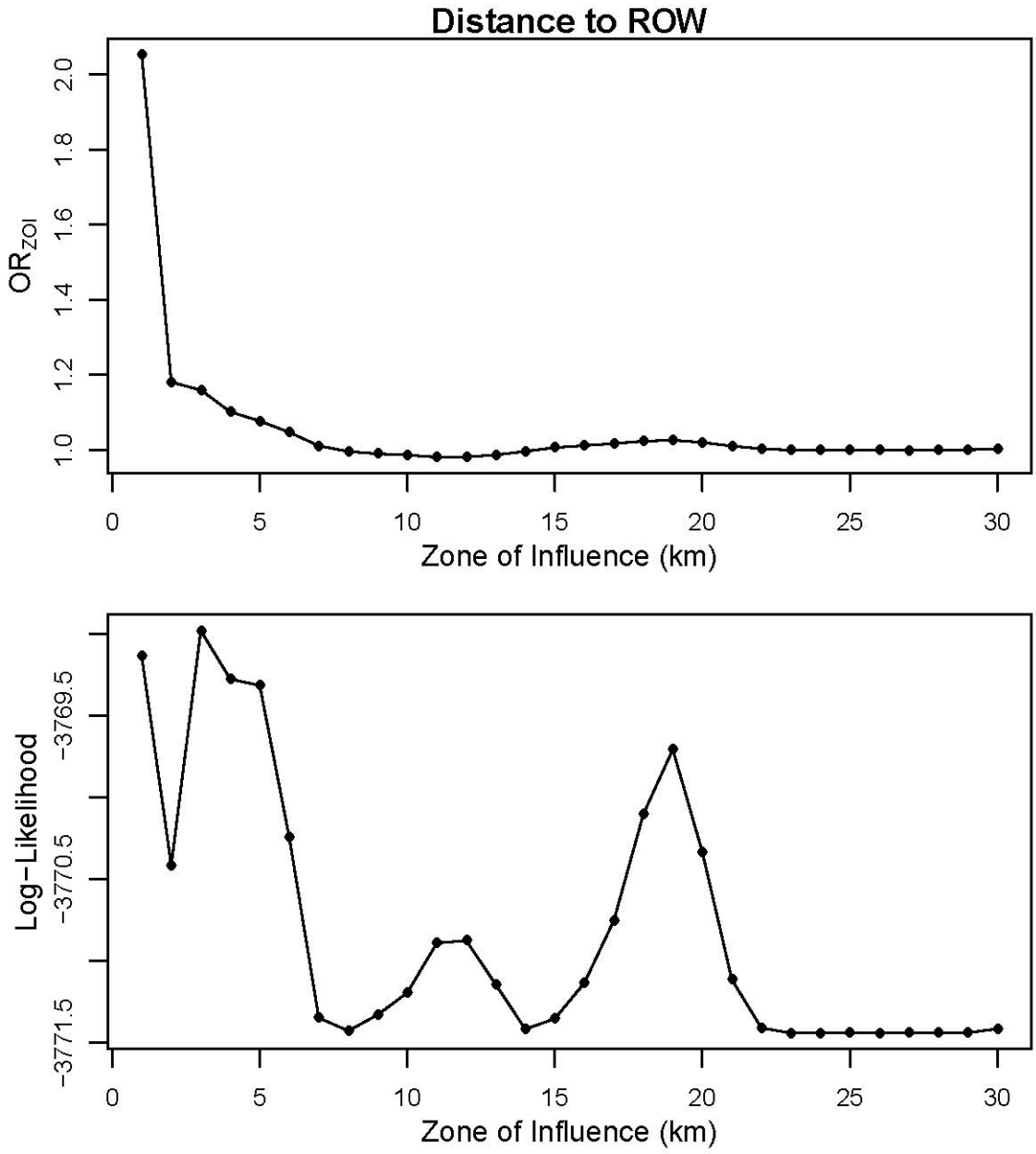
Caribou avoided the Project during construction phase in the early winter period via a short 1 – 2 km ZOI (ORzoi and log-likelihood).

Figure 5-1-39: ZOI during the Construction Phase during the Late Winter in P-Bog Range



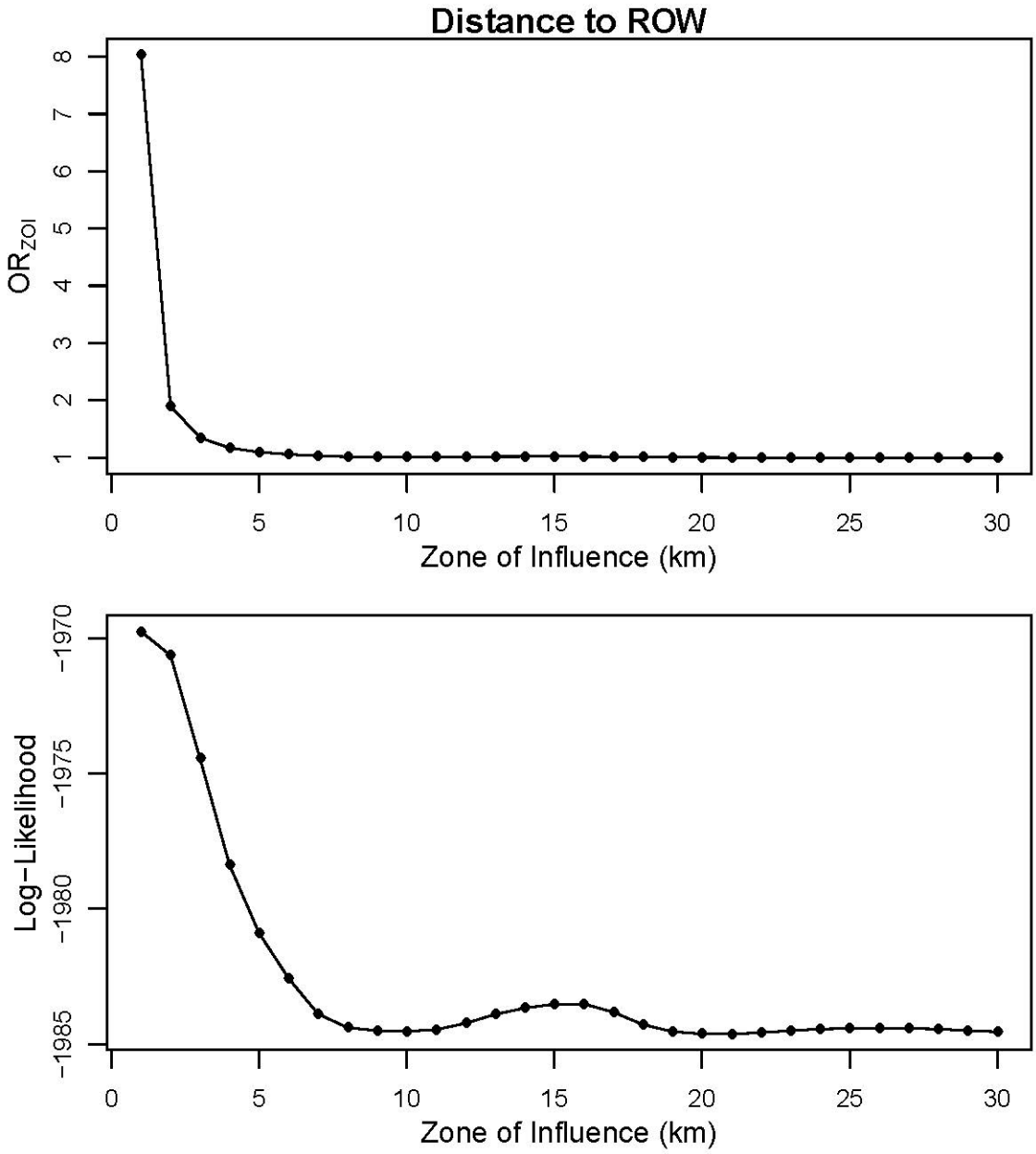
Caribou avoided the Project during construction phase in the late winter period via a short 1 – 2 km ZOI (ORzoi and log-likelihood).

Figure 5-1-40: ZOI during the Construction Phase during the Spring in P-Bog Range



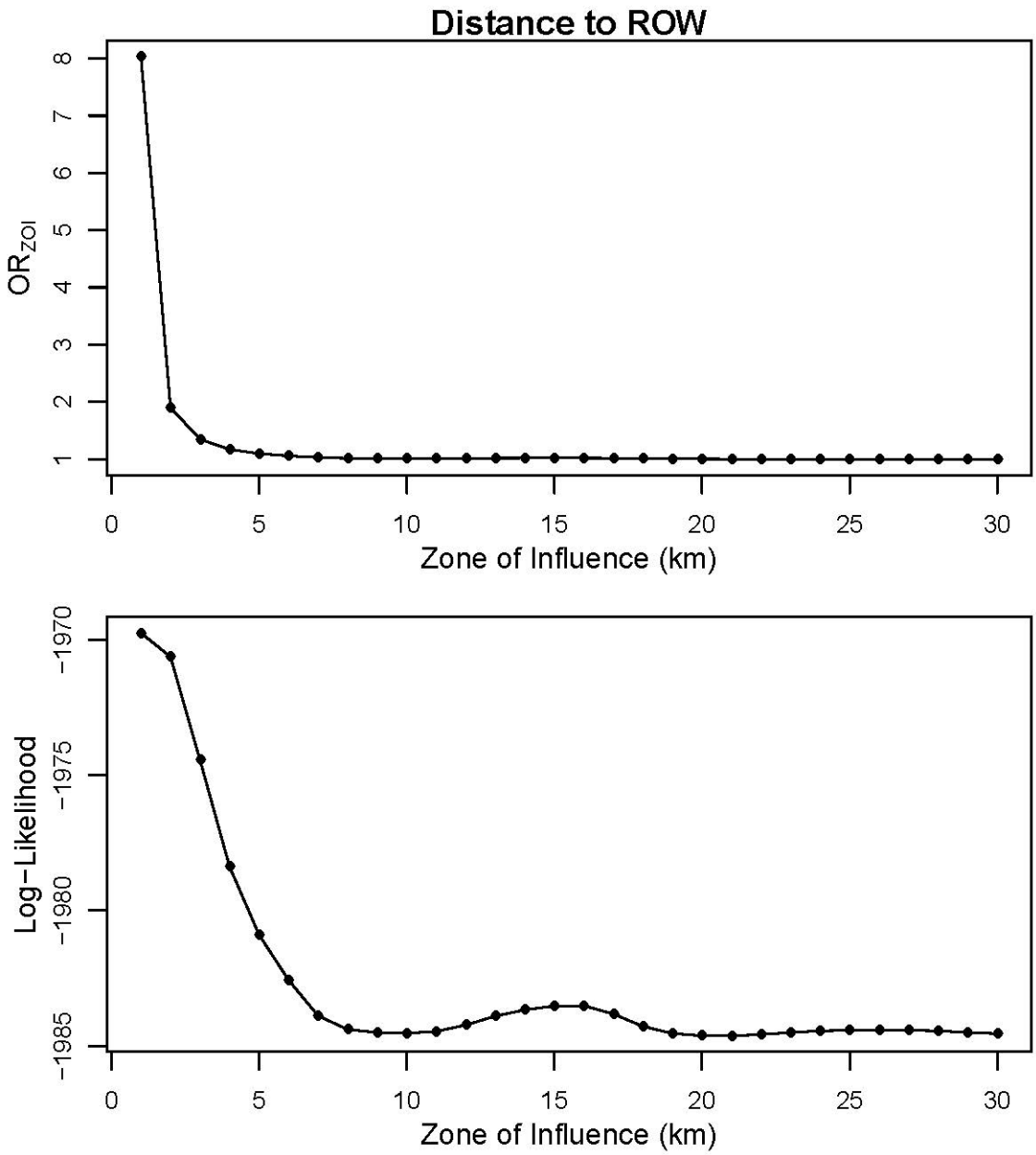
Caribou avoided the Project during construction phase in the spring period via a short 1 – 2 km ZOI. There is evidence the ZOI may have increase in the spring and summer to 3 km (log-likelihood plot), however, pattern will continue to be monitored.

Figure 5-1-41: ZOI during the Construction Phase during the Summer in P-Bog Range



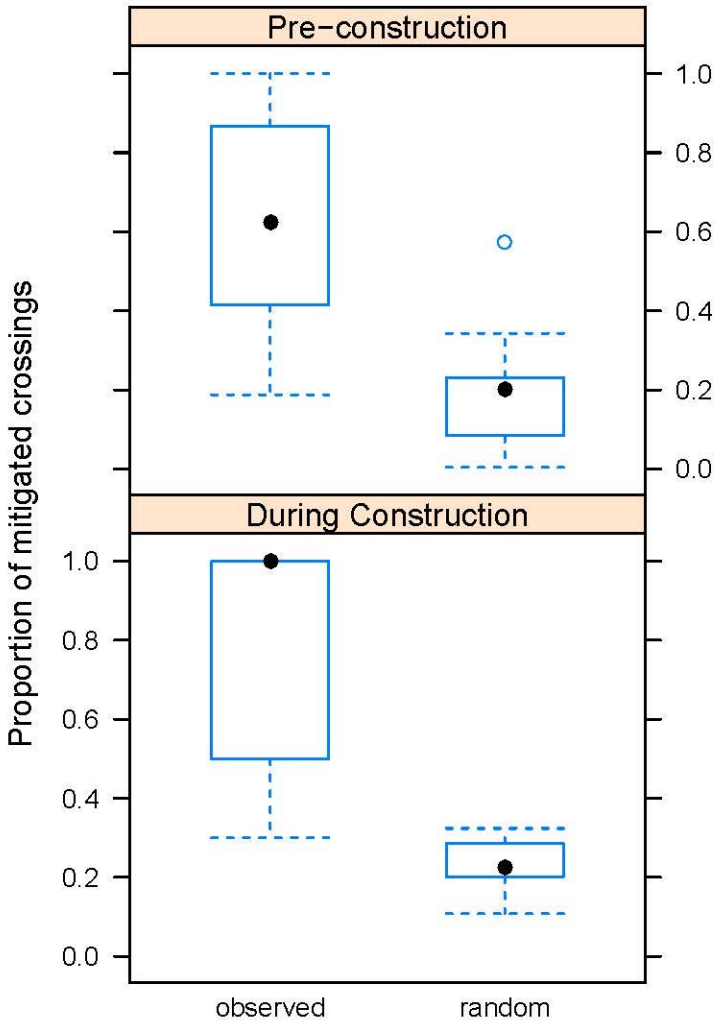
Caribou avoided the Project during construction phase in the summer period via a short 1 – 2 km ZOI (ORzoi and log-likelihood). There is evidence the ZOI may have increase in the spring and summer to 3 km (log-likelihood plot), however, pattern will continue to be monitored.

Figure 5-1-42: ZOI during the Construction Phase during the Summer in P-Bog Range



Caribou avoided the Project during construction phase in the fall via a short 1 – 2 km ZOI (ORzoi and log-likelihood).

Figure 5-1-43: The Proportion of Crossings via the Mitigated versus Unmitigated Areas of the Project in the P-Bog Range



During the pre-construction phase caribou crossed the landscape in locations where mitigation was to be applied during construction phase significantly more frequently than areas where mitigation was not being proposed. This suggests that baseline information was successfully used to place mitigation in locations that caribou were already using to buffer any Project related impacts. During construction, caribou crossed the Project in areas with vegetation mitigation applied significantly more frequently than areas where no mitigation was applied during the construction phase; suggesting that mitigation was successful in ensuring that caribou continued to move across the landscape. Caribou continued to cross the Project with the same frequency during construction as that generated through random expectations.

Figure 5-1-44: Movement Trajectories of Caribou in the Pre-construction Phase using the Areas that will become Mitigated Areas during the Construction Phase

REDACTED

This figure demonstrates that caribou were crossing the landscape in the same locations that were to become the mitigated areas of the Project. Therefore caribou continue to use these locations to cross the Project, where mitigation has been applied. This suggests that the mitigation may have contributed to caribou continuing to use the same movement trajectories.

Figure 5-1-45: Movement Trajectories of Caribou in the Construction Phase using the Mitigated Areas to cross the Project

REDACTED

This figure demonstrates that caribou use the mitigated areas (just centerline clearing) to cross the Project. This result suggests that the mitigation may have contributed to caribou continuing to use the same movement corridors across Project phases.

Figure 5-1-46: Kaplan-Meier Plots of Adult Female Woodland Caribou Monitored using GPS Telemetry Collars, February 2010 to August 2016

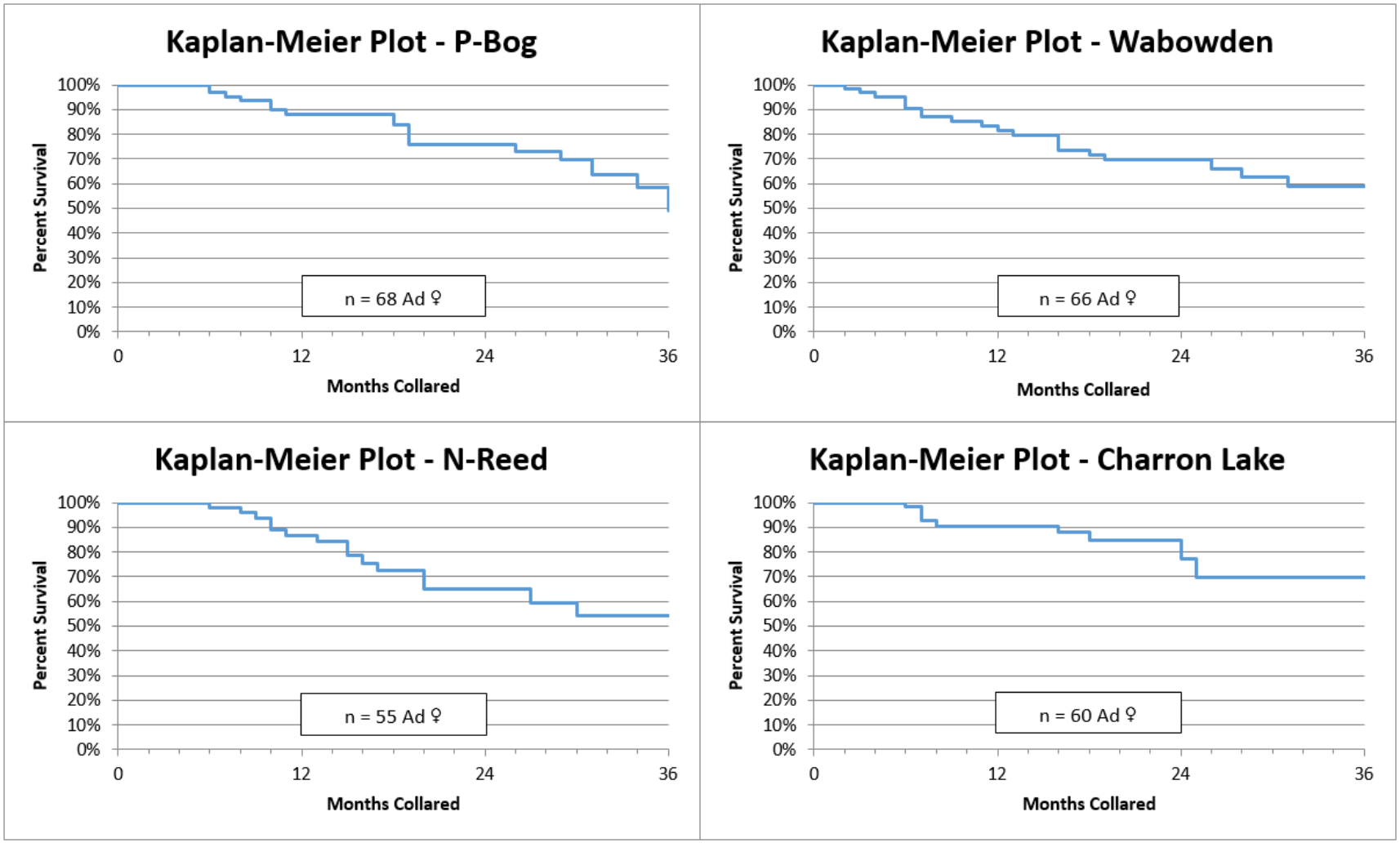
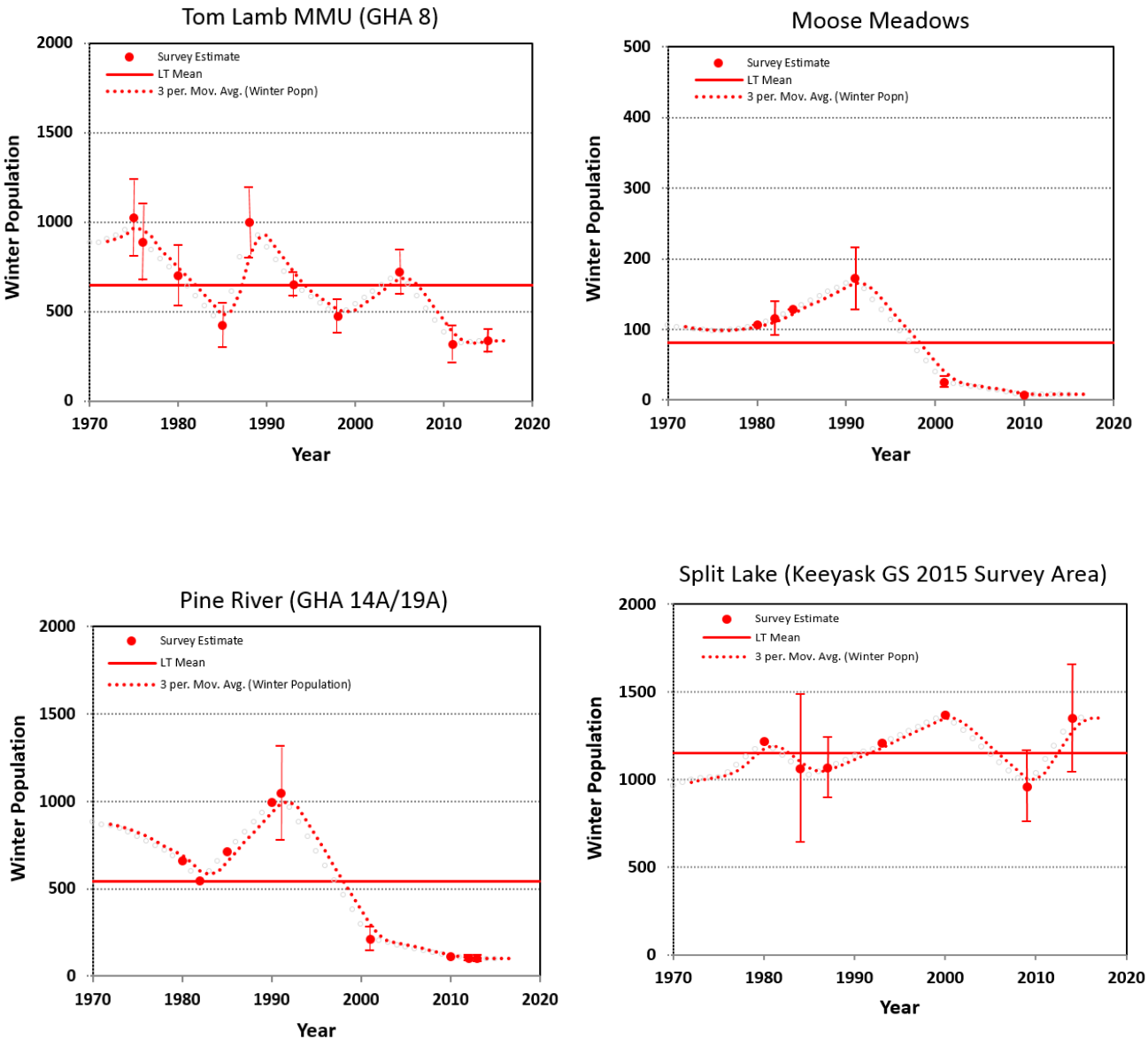


Figure 5-3-1: Abundance Trend of Moose Populations Intersected by the Bipole III Transmission Project



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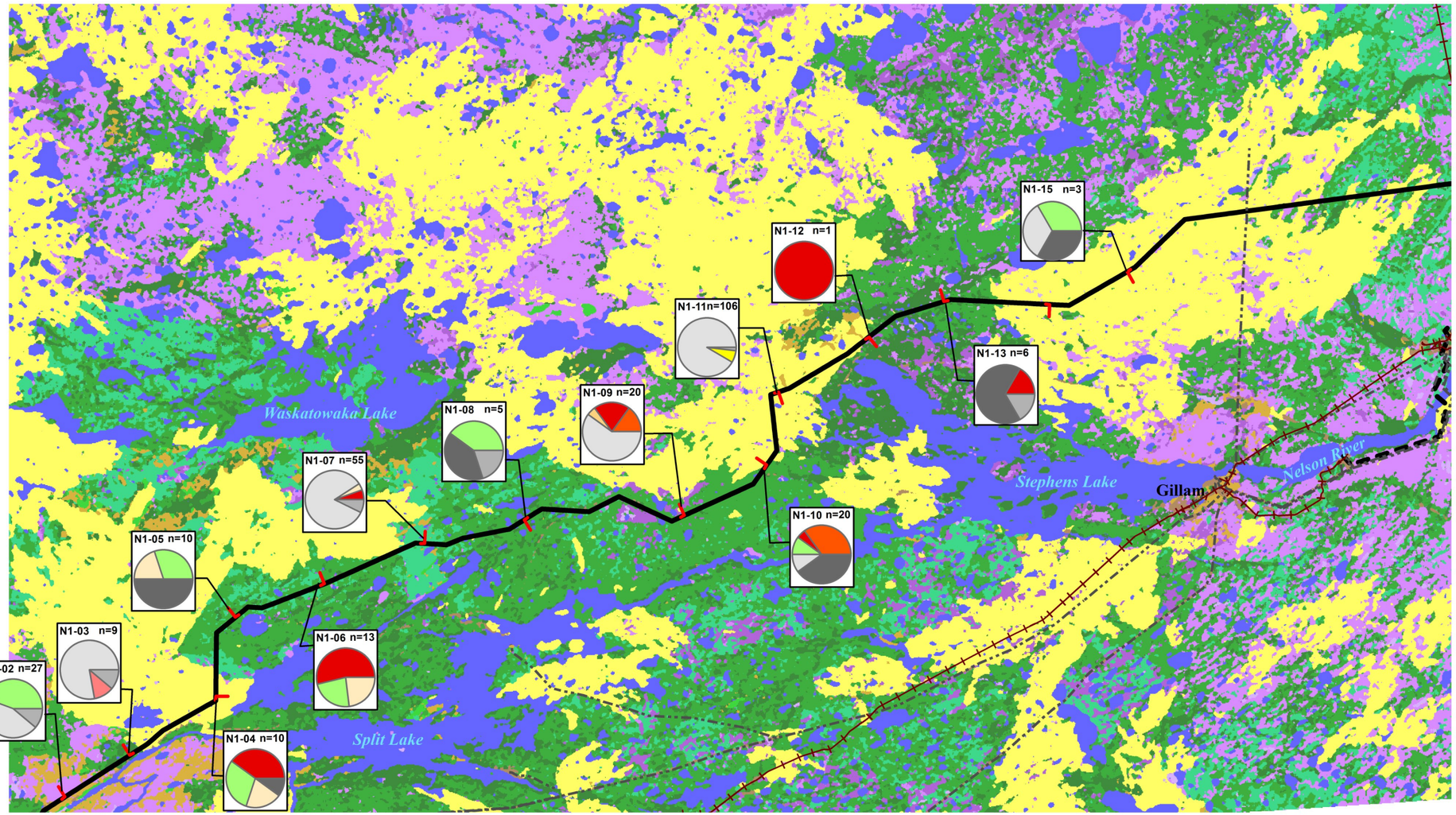


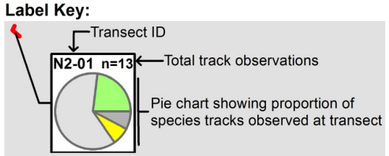
LEGEND

- Ground Transect (winter mammal survey 2016)
- Railway
- Highways
- Transmission Line
- BPIII Transmission Line Route
- AC Collector Lines

Land Cover/Vegetation Types:

- Water
- Exposed Land
- Developed
- Tall Shrubland
- Low Shrubland
- Treed Wetland
- Shrub Wetland
- Herb Wetland
- Herb
- Grassland
- Annual Crops
- Perennial Crops/Pasture
- Dense Coniferous Forest
- Open Coniferous Forest
- Sparse Coniferous Forest
- Dense Broadleaf Forest
- Open Broadleaf Forest
- Sparse Broadleaf Forest
- Dense Mixedwood Forest
- Sparse Mixedwood Forest

Label Key:



Species:

- Hare/Snowshoe Rabbit
- Squirrel
- Moose
- Woodland Caribou
- Fisher/Marten
- White-tailed Deer
- Lynx
- Gray Wolf
- Fox (Red or Arctic)
- Mink
- Otter
- Coyote
- Ermine/Weasel
- Wolverine

NOTES:
- Land cover types extracted from Canadian Land Cover database LCC2000-V (geogratis.ca)
- Highways extracted from the National Road Network (NRN) (geogratis.ca)
- Railway and Transmission line extracted from CanVec10 (geogratis.ca)

Datum: NAD83
Projection: UTM Zone 14N

0 30 60 90 120 150 Kilometres

Manitoba Hydro

amec foster wheeler

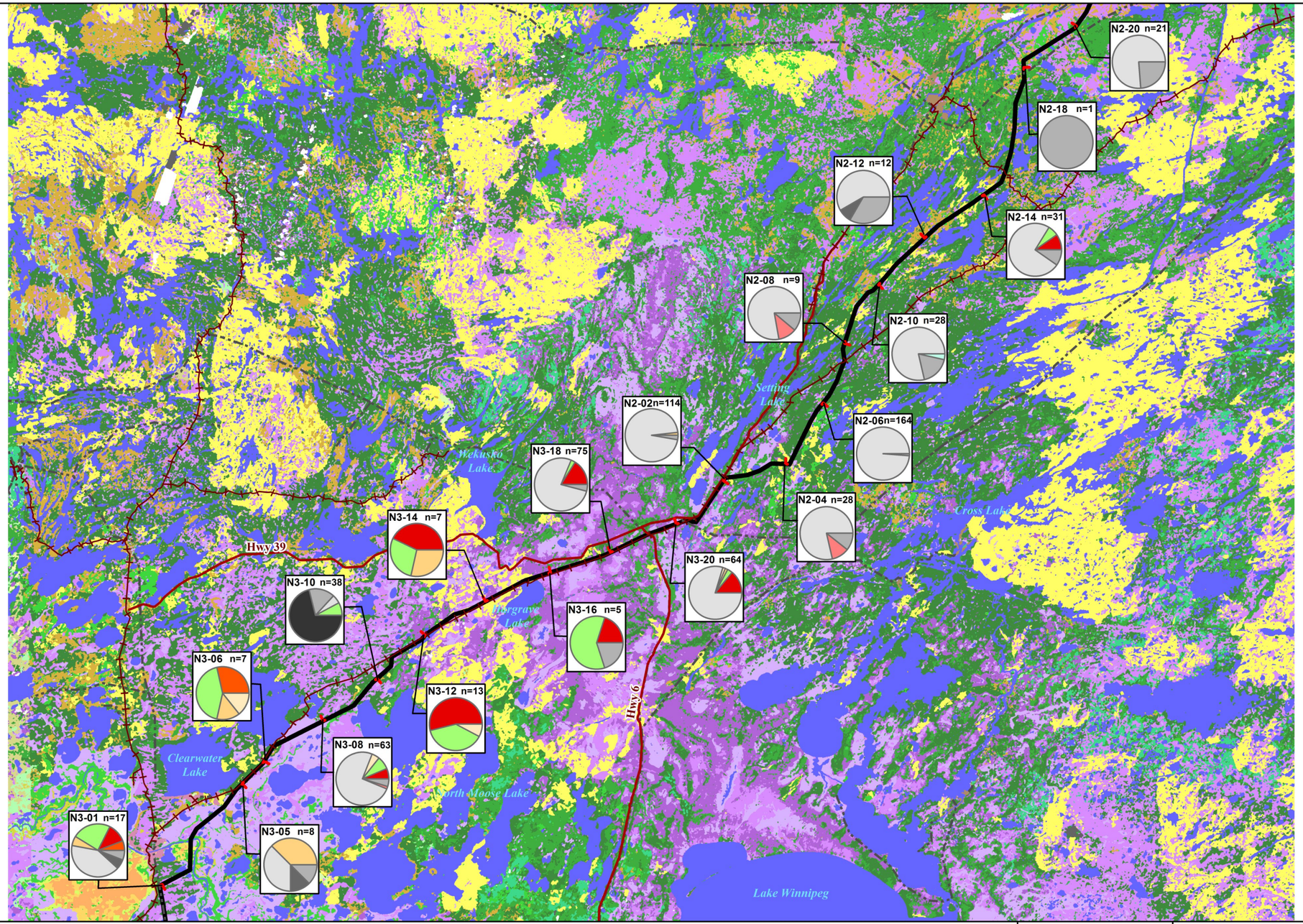
MANITOBA HYDRO BIPOLE III TRANSMISSION PROJECT

The Proportion of Tracks for each Species Observed along each Transect in February 2016 (Section N1)

PROJECT N°: WX17393 | **FIGURE: 5-5-1**

SCALE: 1:600,000 | DATE: November 2016

G:\WX17393_Man_Hydro_Bipole\III\Mammal\Annual_Report_Nov2016\MXD_Maps\Winter_GroundTenasects_PieCharts_LandCover_2016_N1_1.mxd



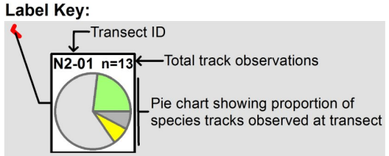
LEGEND

- Ground Transect (winter mammal survey 2016)
- Railway
- Highways
- Transmission Line
- BPIII Transmission Line Route

Land Cover/Vegetation Types:

- Water
- Exposed Land
- Developed
- Tall Shrubland
- Low Shrubland
- Treed Wetland
- Shrub Wetland
- Herb Wetland
- Herb
- Grassland
- Annual Crops
- Perennial Crops/Pasture
- Dense Coniferous Forest
- Open Coniferous Forest
- Sparse Coniferous Forest
- Dense Broadleaf Forest
- Open Broadleaf Forest
- Sparse Broadleaf Forest
- Dense Mixedwood Forest
- Sparse Mixedwood Forest

Label Key:



Species:

- Hare/Snowshoe Rabbit
- Squirrel
- Moose
- Woodland Caribou
- Fisher/Marten
- White-tailed Deer
- Lynx
- Gray Wolf
- Fox (Red or Arctic)
- Mink
- Otter
- Coyote
- Ermine/Weasel
- Wolverine

NOTES:
- Land cover types extracted from Canadian Land Cover database LCC2000-V (geogratis.ca)
- Highways extracted from the National Road Network (NRN) (geogratis.ca)
- Railway and Transmission line extracted from CanVec10 (geogratis.ca)

Datum: NAD83
Projection: UTM Zone 14N

0 60 120 180 240 300 Kilometres

Manitoba Hydro

amec foster wheeler

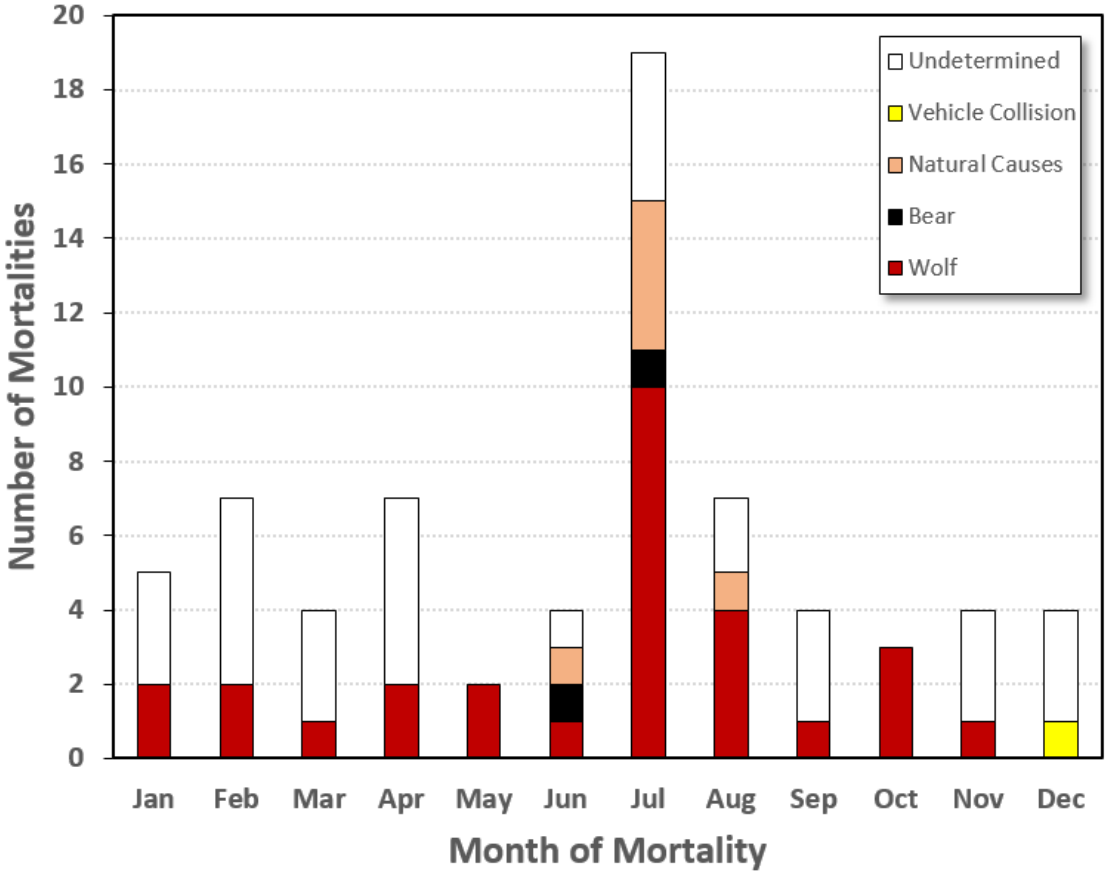
MANITOBA HYDRO BIPOLE III TRANSMISSION PROJECT

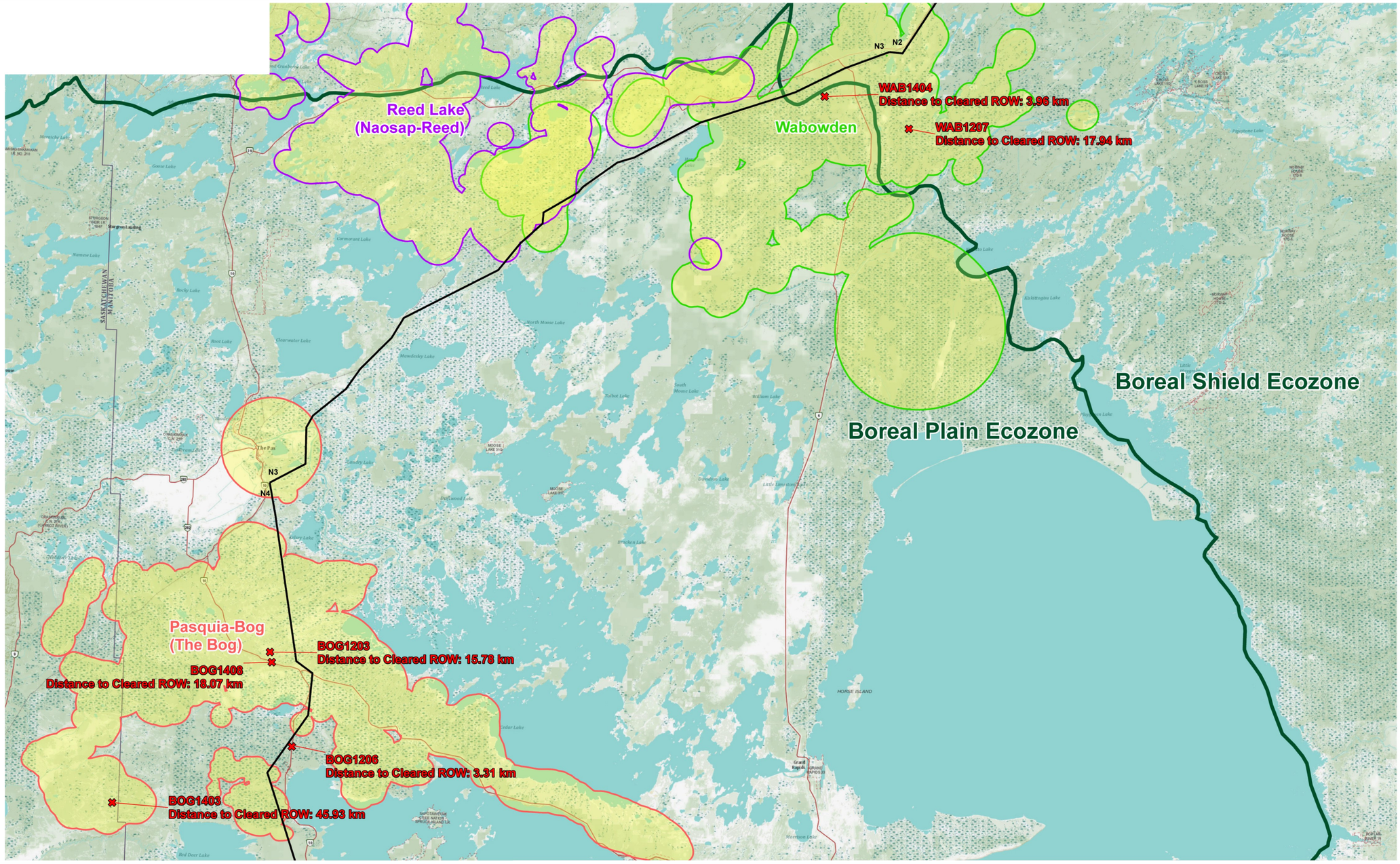
The Proportion of Tracks for each Species Observed along each Transect in February 2016 (Sections N2 and N3)

PROJECT N°: WX17393 | **FIGURE: 5-5-2**

SCALE: 1:1,200,000 | DATE: November 2016

Figure 5-6-1: Mortality Source by Month for Collared Adult Female Caribou (January 2010 – August 2016) all Caribou Ranges Pooled





G:\WX17393_Man_Hydro_Bipoleiii\Mammal\Annual_Report_Nov2016\MXD_Maps\Caribou_Mortality_Summary_1.mxd
G:\WX17393_Man_Hydro_Bipoleiii\Mammal\Annual_Report_Nov2016\MXD_Maps\Recent_Mortality_Info_BASE_1.mxd

LEGEND

- Recent Mortality Locations (Labelled with Caribou ID and Distance to cleared ROW)
- BPIII Transmission Line Route
- Ecozones
- Reed Lake (Naosap) 2010-2016 Home Range (45 collars)
- Wabowden 2010-2016 Home Range (57 collars)
- Pasquia-Bog (The Bog) 2010-2016 Home Range (61 collars)

0 40 80 120 160 200 Kilometres

NOTES:
- Background topographic map extracted from ESRI online basemap services
-

Datum: NAD83
Projection: UTM Zone 14N

Manitoba Hydro

amec foster wheeler

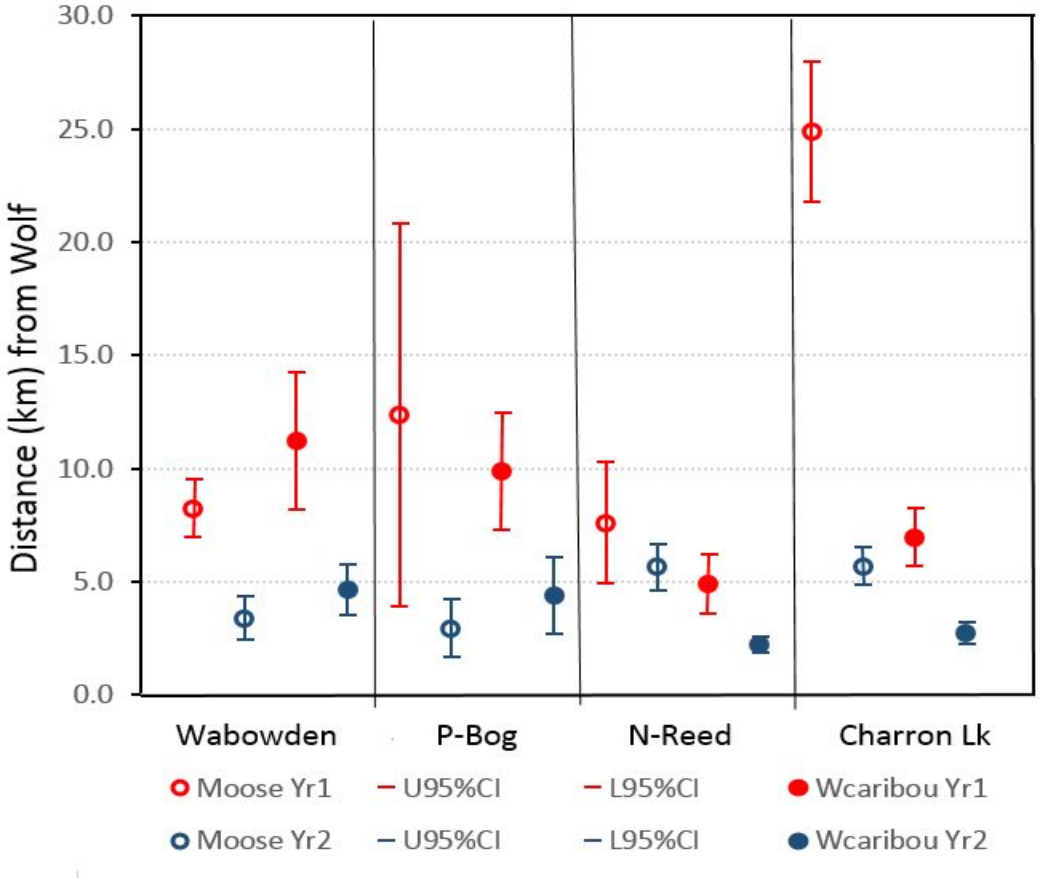
MANITOBA HYDRO BIPOLE III TRANSMISSION PROJECT

Mortality Locations for Woodland Caribou Relative to Cleared Areas of ROW

PROJECT N°: WX17393 | **FIGURE: 5-6-2**

SCALE: 1:960,000 | DATE: November 2016

Figure 5-6-3: Wolf Predation-risk to Boreal Woodland Caribou and Moose within Monitored Boreal Caribou Ranges, 2015 and 2016



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6.0 ADAPTIVE MANAGEMENT

Adaptive management is a core approach to implementation of the Bipole III Environmental Protection Plan (EPP) responsive to ongoing evaluation of predicted versus actual effects accessed through various long-term monitoring activities. Modifications to project activities are informed by assessment of mitigation effectiveness and/or detection of significant effects (after mitigation implementation) through each project phase, and are based on analysis of the monitoring program results.

The passive adaptive management approach is intended to identify where there may be data gaps and how to improve project mitigations (if warranted) and/or the monitoring program over time. This report is intended to provide such recommendations, as well as information for review by the regulatory authorities for informed input based on the monitoring program results.

6.1 Commitments Table

The Bipole III Transmission Project predicted effects and commitments relevant to mammals monitoring are summarized in Table 6-1-1, and were derived from the Bipole III Transmission Project EIS, EPP (MB Hydro 2013), Biophysical Monitoring Plan (MB Hydro 2015), CEC Review/ Report (CEC 2013), mitigation plans (MB Hydro 2014), associated technical reports, and EA License conditions.

6.2 Mitigation and Monitoring Recommendations

The following are recommended for Year 3 (2016/17) mammals monitoring based on results of Year 1 (2014/15) and Year 2 (2015/16) analyses of mammal monitoring data sets.

Boreal Woodland Caribou

- Continue with annual winter caribou calf recruitment surveys (aided by telemetry relocations) and concurrently conduct caribou-moose-wolf distribution surveys.

- Continue to acquire caribou telemetry locations to evaluate the effectiveness of the vegetation leave areas.

- Continue telemetry collar mortality investigations for mortality monitoring analysis.

Forest-tundra and Barren Ground Caribou

- Continue acquiring telemetry data for the Pen Islands and Cape Churchill populations from the collaborative forest-tundra (coastal) caribou range distribution project.

- Continue monitoring for presence of Pen Islands, Cape Churchill and Qamanirjuaq caribou winter occurrence in proximity to the Project ROW (construction segment N1) via

incidental reports from Project Environmental Monitors and Project staff, and via community consultation.

Moose

- Confirm with MB Government the population monitoring requirements for the sensitive moose areas.

- Continue to acquire moose population survey data from MB Government to track trend of moose populations intersected by the ROW, relative to adjacent reference populations and relative to past population performance.

- Continue to collect moose occurrence data concurrent with the annual calf recruitment survey to inform the predator-prey analysis and to monitor for project-related changes in predation risk.

Deer and Elk

- Continue to collect white-tailed deer and elk occurrence data via annual aerial species distribution surveys in woodland caribou ranges and occasionally in *P. tenuis* monitoring blocks, as well as via winter ground track transects and remote cameras, and via Multi-species Aerial Surveys, to monitor for ingress of white-tailed deer into woodland caribou ranges and potential mortality-risk to elk from hunter harvest as a consequence of project-related access.

- In Year 3 (2017/18) attempt a community ground-based deer pellet collection effort in both *P. tenuis* surveillance areas to acquire sufficient samples to assess current level of spiney-tailed larvae being shed by deer proximate to the ROW (i.e., in N2 and N3 construction segments). Supplemental samples can be collected by the MB Hydro environmental monitors during project winter clearing and construction, along with documentation of all deer sign/observations encountered in N1 through N4 construction segments.

Wolf and Black Bear

- Continue to collect wolf winter occurrence data concurrent with the annual woodland caribou calf recruitment survey to monitor for landscape scale changes in predation-risk to woodland caribou and moose.

- Continue use of remote camera traps and winter track transects to monitor for local scale changes in use of the ROW by predators.

Furbearers

- Continue to collect fur harvest statistics from MB Government to monitor for changes in furbearer harvest amounts and harvest rates in traplines interacting with the ROW.

- Continue collecting furbearer occurrence data via winter track transects and remote camera traps along ROW construction segments N1 to N4.

- Continue collecting wolf and wolverine occurrence data via winter aerial survey efforts concurrent with the annual Woodland Caribou Recruitment Survey, Winter Ground Track Survey, remote camera survey and multi-species Aerial Survey (if available) to inform evaluation of Project effects at local and landscape scales.

Human Access

- Continue use of remote cameras along the ROW and at major project access points to monitor seasonal use of the ROW by local resource users.

Table 6-1-1: Mammals Monitoring Commitments Registry – Bipole III Transmission Project.

Mammal VEC	Location	Commitment	Method Used to Meet Commitment	Status
General	Project	Prevent/minimize adverse environmental impacts and enhance positive impacts; continually improve EMS; meet/surpass regulatory, contractual and voluntary requirements; consider interests and utilize knowledge of affected stakeholders.	MB Hydro Environmental Management Policy - improve environmental performance through annual review of environmental objectives/targets; document/report activities and environmental performance.	Implemented, Ongoing
	Project	Provide framework for delivery, management and monitoring of environmental protection measures that satisfy corporate policies and commitments, regulatory requirements, environmental protection guidelines and BMPs and stakeholder input.	Environmental Protection Program.	Implemented, Ongoing
	Project	Environmental monitoring - Monitor the project in accordance with pre-defined plans within passive adaptive management framework, including verification of accuracy of EIS predictions, effectiveness of mitigation measures and compliance with project approval terms and conditions.	Biophysical Monitoring Plan (BMP) and Annual Monitoring Report.	BMP re-submitted January 2015, Implemented Annual Monitoring Reports Submitted
Environmentally Sensitive Sites (ESS)	Bear/Wolf/Wolverine Dens Ungulate Mineral Licks	Implement site specific environmental protection measures of any ESS potentially affected by Project construction.	Mitigated known sites during planned routing to avoid disturbance.	Completed
			Stakeholder consultation and ATK process to identify known sites.	Completed
			Pre-construction surveys (MB Hydro Environmental Monitors and Environmental Consultants) to detect potential ESS conflicts.	Complete
			Planned winter construction and minimized footprint to avoid sensitive denning periods (timing and buffer restrictions). Site-specific mitigation of any detected sites during construction.	Implemented, Ongoing
Mammal VECs	Project (N1 – N4)	Avoid wildlife disturbance during sensitive periods (denning, calving) and/or sites (dens, mineral licks) using timing windows and disturbance buffers.	Monitor pre and post construction disturbance and operational phases for effects on mammal VECs and ESSs at appropriate spatial scale for duration of the monitoring period as outlined in the Biophysical Monitoring Plan and associated annual work plans.	Implemented, Ongoing
	Project	Mitigate mammal VEC-vehicle collisions during construction phase using speed limits and access controls.	MB Hydro Environmental Monitors - Monitor occurrence to determine if reduced speed limits or access control required.	Implemented, Ongoing

Mammal VEC	Location	Commitment	Method Used to Meet Commitment	Status
	Project	Mitigate habituation of wildlife to humans.	No feeding of wildlife by project personnel, proper food storage and waste disposal to avoid attracting wildlife.	Implemented, Ongoing
	Project (N1 - N4)	Monitor mammal VEC populations.	Monitor effects of project on mammal VECs within the project zone of influence for project-related change in population size and/or range occupancy.	Implemented, Ongoing
Ungulate VECs	Project	Prevent effects of potential increased disease/parasite transmission within and among ungulate species within project zone of influence.	Monitor disease/parasite (i.e., *P. tenuis*) occurrence prevalence for ungulate populations in the project area, including ingress of white-tailed deer along project ROW.	Survey conducted February 2016; sample collection not successful. Planned community-based program for February 2017
Boreal Caribou	Caribou ranges intersected by the project (P-Bog, N-Reed, Wabowden)	Mitigate sensory disturbance during calving and rearing in calving areas during construction.	Winter construction to avoid sensitive calving/rearing period.	Implemented, Ongoing
		Access management during construction phase – to mitigate sensory disturbance and functional habitat loss during construction.	Monitor human use of ROW on core summer and winter areas. Mitigate via access control methods (gates, slash-rollback, ditching, trenching, tree-planting and accelerated revegetation) to limit recreational ATV/UTV/snowmobile use of the ROW in core winter areas and known/potential calving areas).	Implemented, Ongoing
		Mitigate sensory disturbance, functional habitat loss, and temporary range fragmentation during construction.	Locate ancillary access and staging areas to avoid core use areas and accelerate natural habitat recovery (tree planting) to establish natural low-growing vegetation (security cover) to encourage movement across the ROW	Implemented, Ongoing
		Maintain landscape function to facilitate caribou movement within core winter range.	Develop natural vegetation corridors at strategic locations on the ROW by maintaining naturally low tree cover (Black Spruce and Larch Tamarrack) in core winter range affected by the project.	Implemented, Ongoing
		Long-term monitoring of populations (recruitment, mortality, disturbance effects, range fragmentation, occurrence and distribution).	Satellite telemetry (occupancy, mortality), aerial surveys (recruitment, occurrence and distribution), non-invasive genetic sampling (population estimation).	Implemented, Ongoing
		Monitor project related changes in predation risk and/or altered predator-prey dynamics. Mitigate project-related predation risk from wolves and black bear.	Monitor predator (wolf, black bear) occurrence in caribou ranges to determine changes in predator use of the ROW and increased predation (winter aerial surveys, IR camera traps, winter track transects, telemetry collar mortality investigations). Mitigate during construction using minimal	Implemented, Ongoing

Mammal VEC	Location	Commitment	Method Used to Meet Commitment	Status
			disturbance techniques to maintain natural low vegetation cover, winter construction to limit disturbance and accelerate vegetation regeneration, and snow trail compaction to discourage movement efficiency and line of sight. During operation phase – conduct late winter annual inspection of project infrastructure to avoid creating packed snow trails to facilitate predator use.	
		Hunting Mortality – minimize and mitigate.	Prohibit hunting and firearm use by project personnel during construction. Access control in winter core areas (in collaboration with MB Government) during construction and operation.	Implemented, Ongoing
Forest-tundra / Barren-ground Caribou	Cape Churchill, Pen Islands and Beverley-Qamanirjuaq Populations	Mitigate sensory disturbance/functional habitat loss.	Access control (cooperatively developed with MB Government). Monitor proximity of populations during construction phase using existing telemetry collars (Cape Churchill and Pen Islands populations), local knowledge (all populations) and/or aerial surveys to assess numbers, concentrations and proximity to construction.	Implemented, Ongoing
		Hunter harvest – avoid excessive project related harvest during significant migration events.	MB Hydro work cooperatively with MB Government to develop an Access Management Plan, hunting closures, hunter education. MB Hydro to prohibit hunting and use of firearms by project personnel in work camps to minimize caribou mortality.	Implemented, Ongoing
Moose	ROW (N1-N4) including site access roads Keewatinoow Converter Station Sensitive moose ranges (Tom Lamb WMA/ GHA8, Moose Meadows/portion of GHA14 and Pine River/ GHA14A and 19A)	Mitigate sensory disturbance during calving and rearing in calving areas during construction.	Winter construction to avoid sensitive calving period and sensitive areas/habitats.	Implemented, Ongoing
		Access management during construction phase – to mitigate sensory disturbance and functional habitat loss during construction.	Monitor human use of ROW on core summer and winter areas. Mitigate via access control methods (gates, slash-rollback, ditching, trenching, tree-planting and/or accelerated revegetation) to limit recreational ATV/UTV/snowmobile use of the ROW in sensitive moose ranges. Decommission temporary construction access upon completion.	Implemented, Ongoing
		Pre-construction surveys to locate sensitive sites (i.e., mineral licks).	Concurrent with aerial wildlife surveys, baseline studies, ATK consultation and MB Hydro	Completed

Mammal VEC	Location	Commitment	Method Used to Meet Commitment	Status
			Environmental Monitor duties.	
		Hunting Mortality – minimize project-related contribution to hunting mortality	Prohibit hunting and firearm use by project personnel during construction. Monitor project access by hunters using remote IR cameras at major access points and along the ROW. Access control (in collaboration with MB Government) during construction and operation.	Implemented, Ongoing
		Predation Risk: - Monitor project related changes in predation risk and/or altered predator-prey dynamics. - Mitigate project-related predation risk from wolves and black bear.	Monitor predator (wolf, black bear) occurrence in caribou ranges to determine changes in predator use of the ROW and increased predation (winter aerial surveys, IR camera traps, winter track transects, telemetry collar mortality investigations). Mitigate during construction using minimal disturbance techniques to maintain natural low vegetation cover, winter construction to limit disturbance and accelerate vegetation regeneration, and snow trail compaction to discourage movement efficiency and line of sight. During operation phase – conduct late winter annual inspection of project infrastructure to avoid creating packed snow trails to facilitate predator use.	Implemented, Ongoing
	Sensitive Moose Ranges	Habitat loss and fragmentation – avoid/ minimize.	Apply minimal disturbance techniques via winter clearing, selective cutting, avoidance of unrequired shear-blading, removal of danger trees (>17 m tall) to reduce line of sight, impair predator and hunter use of ROW as a travel corridor, and facilitate wildlife movement across the ROW.	Implemented, Ongoing
		Long-term monitoring of populations (recruitment, mortality, disturbance effects, range fragmentation, occurrence and distribution).	Monitor sensitive moose ranges using a combination of, aerial surveys (recruitment, population structure, abundance, occurrence and distribution), remote IR camera studies and/or winter ground transects.	Implemented, Ongoing
Elk	C1, N4	Mitigate construction–related disturbance effects.	Monitor elk-vehicle collisions and disease risk related to potential encroachment of white-tailed deer spread of *P. tenuis.*	Implemented, Ongoing

Mammal VEC	Location	Commitment	Method Used to Meet Commitment	Status
White-tailed Deer	C1, N4, N3, N2	Monitor white-tailed deer distributions and prevalence of brainworm *(P. tenuis)* along the Bipole III transmission line.	Pellet collection for *P. tenuis* detection/ prevalence. White-tailed deer ingress along ROW via annual species distribution/recruitment surveys in woodland caribou ranges, winter ground transect surveys, trail camera traps, multi-species aerial survey and deer distribution survey of *P. tenuis* surveillance blocks.	Implemented, Ongoing
Gray Wolf		Monitor project-related changes in predator-prey dynamics (wolf use of the ROW).	Expand/enhance studies on timber wolf populations/ distribution and predation of boreal caribou within the Project Study Area. Accomplished using occurrence/distribution surveys concurrent with caribou and moose aerial surveys, telemetry collar mortality investigations, as well as remote IR camera trap studies and winter ground transect survey conducted along the ROW.	Implemented, Ongoing
Black Bear	Project	Monitor incidents of human-bear encounters during construction, or from attractants (feeding, lack of proper food storage or waste disposal).	Document incidents and report annually; identify corrective actions.	Implemented, Ongoing
		Monitor project-related changes in predator-prey dynamics (black bear use of the ROW).	Conduct studies on black bear population, distribution and predation on boreal caribou in affected caribou ranges within the Project study area. Accomplished via trail camera traps associated with winter ground transect survey, and caribou telemetry collar mortality signal investigation.	Implemented, Ongoing
Furbearers	45 Registered Traplines	Monitor change in trapping harvest resulting from increased access or sensory disturbance from the Project.	Monitor annual furbearer harvest statistics obtained from MB Government for each trapline Initiate community trapline monitoring program.	Implemented, Ongoing
	Beaver	Minimize sensory disturbance.	Mitigate local effects of sensory disturbance by use of riparian buffers at ROW crossings during clearing and maintenance activities. MB Hydro environmental monitors to monitor ROW at water crossings (within 200 m buffer of ROW) for beaver presence.	Implemented, Ongoing
	American Marten	Minimize sensory disturbance.	Clear ROW during winter months to lessen disturbance of female marten and their young. Access control (restrict recreational and public access during construction), including routing to minimize loss of forest cover in marten habitat.	Implemented, Ongoing
		Minimize project-related harvest mortality.	Monitor trapper harvest.	Implemented, Ongoing

Mammal VEC	Location	Commitment	Method Used to Meet Commitment	Status
	Wolverine	Avoid disturbance of denning sites during construction phase.	Mitigate by clearing in wolverine range (>53°N Lat.) during winter when dens not active Mitigate any denning sites (if found).	Implemented, Ongoing
		Minimize project-related harvest mortality.	Monitor trapper harvest.	Implemented, Ongoing

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8.0 CLOSURE

This report has been prepared for the exclusive use of Manitoba Hydro. The information provided herein should not be used for any other purpose, or by any other parties, without review and advice from a qualified professional biologist and/or permission of the proponent.

The findings of this report were prepared in accordance with generally accepted professional scientific principles and practice. No other warranty, expressed or implied, is given. The findings of this report are based on data acquired from specific survey designs specifically applied in the Bipole III Mammals Monitoring Program, information provided by the proponent, information provided by the Government of Manitoba, and from publically available information sources.

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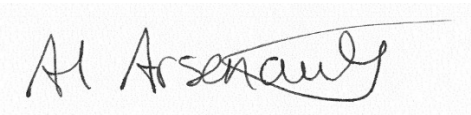

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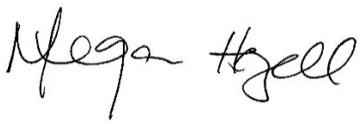

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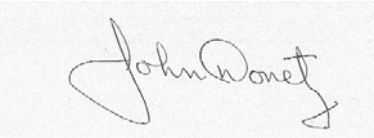

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