5. General Management Direction

This section deals with general management direction to guide the permitting and management of land uses throughout the entire Peel Watershed Planning Region. For a discussion of how general management direction is applied to specific landscape management units (LMUs), see Section 6 of this Plan.

The management direction proposed here can be integrated into existing processes, such as the land application review process. Other management plans in effect or in preparation for the region should be consulted for additional direction and guidance (see Appendix 3).

An overview of identified ecological, cultural, and economic values and resources referenced in this section can be found in Maps 3-5, Appendix A. Detailed maps and descriptions of resource values are contained in the and the Conservation Priorities Assessment Report and Maps (Peel Watershed Planning Commission, 2008a and b) and Resource Assessment Report and Maps (Peel Watershed Planning Commission, 2008c and d). These materials are available from the PWPC website (www.peel.planyukon.ca) and should be consulted when further information is required.

Strategies, Best Management Practices, and Recommendations

This Plan assumes that, whenever possible and practical, the recommended strategies, best management practices, and recommendations will be considered and implemented. Operational decisions regarding general management directions are at the discretion of land users, assessment boards, and agencies. A summary of best management practices and recommendations from this section can be found in Appendix B.

5.1 Coordinated Land-Use Management

Integrated resource stewardship requires consideration of the economic, social, and ecological consequences of land-use decisions, and the management of lands and resources in an integrated and coordinated manner. Steps toward achieving this include establishing and refining land management objectives, designating lands for management priorities, and monitoring land-use change to minimize long-term impacts or conflicts between resource users. Without such an integrated policy and monitoring regime, significant issues can arise when new access and/or multiple land-use activities impact upon key ecological functions. In addition to this over-arching need for coordinated land-use monitoring, the PWPC therefore recognizes three important related issues that require management strategies: cumulative effects, human-caused land and water impacts, and climate change.

Key issues related to resource-policy integration:

- Land uses have impacts on other land uses. Complex land-use interactions should be managed to minimize negative impacts and promote positive impacts.
- The balance of risks and benefits accrued by respective land uses often shifts with their pace, scale, and cumulative effects.
- The relationships among land uses and the regional ecology are expected to shift with climate changes. Planning for these changes is difficult, but important;
- Considering the future anticipated land uses in the Peel watershed, increased opportunities for motorized access and predator movement as a result of new linear features will likely be larger management issues than direct habitat loss.

Management Goal 1: *Promote plan principles by ensuring social, cultural, economic, and environmental policies are applied to the management, protection, and use of land, water, and resources in an integrated and coordinated manner*

OBJECTIVES	STRATEGIES
1.1 Consider social, economic and ecological risks and benefits of land-use decisions.	1.1.1 Periodically evaluate the Peel region's management regime and future opportunities to understand social, economic, and ecological consequences of land-use decisions. 1.1.2 Evaluate land-use and development proposals to understand social, economic, and ecological consequences of climate change. 1.1.3 Establish acceptable limits of change and indicators of environmental condition. 1.1.4 Potential climate-change impacts should be considered in all land-management decisions.
1.2 Develop a landscape management framework that facilitates coordinated and integrated decision making.	1.2.1 Adopt the recommended landscape management units as defined in sections 4 to guide land-use conformity. Recognize land-use designation system defined in section 4 as applied to the landscape management units. 1.2.2 Develop and implement a results-based management framework for indicator monitoring and assessment. 1.2.3 Recognize and contribute to YLUPC's standardized, accessible regional database of identified resources and values.
BEST MANAGEMENT PRACTICES	• *See individual ecological, heritage and culture, and economic sections below.*
INDICATORS	• *See individual ecological, heritage and culture, and economic sections below. Further indicators to be determined through future research and plan implementation.*

5.2 Cumulative-Effects Management

Cumulative effects are changes to the environment and/or society that result from a land-use activity in combination with other past, present, and future activities. Negative effects are called cumulative impacts. While one activity may have only a small impact, the combined effect of a number of activities may have a significant impact.

Managing cumulative effects is best accomplished by applying a suite of integrated and coordinated actions to land management. Assessment, mitigation, government policy, legislation, and planning all play a role.

In the Yukon, no single agency or group is responsible for cumulative-effects management. Adherence to this Plan on its own is not sufficient to manage cumulative effects. However, the tools and approaches in this Plan provide responsible agencies and land users with a framework for cumulative-effects management.

Among the key issues related to managing cumulative effects:

- Assessing and mitigating land-use activities on a project-by-project basis are not effective strategies for managing cumulative effects
- Cumulative-effects management must consider both direct and indirect impacts to valued resources, resource users and affected communities
- Monitoring the impacts of multiple land-use activities is necessary to assess and evaluate potential cumulative effects.

Many of the recommended strategies and best management practices (related to industrial land-use activity) contribute to maintaining the amount of surface and hydrological disturbance below the recommended cautionary and critical cumulative-effects indicator levels. These strategies should be considered by both project proponents and decision makers.

The process for maintaining these cautionary or critical levels will involve communication between the implementing Parties. This process will recognize the discretion of the Parties to make final decisions informed by:

- selection of recommended indicators and levels;
- other land-use plan recommendations; and,
- advice from third parties, such as YESAB.

Maintaining surface and hydrological disturbance below these levels will also involve resource users, who will be expected to apply this Plan as a guide when developing project proposals, carrying out operations, and decommissioning projects. The mechanics for enforcing this recommendation will be at the discretion of the Parties and will be addressed by the Parties as part of implementation planning.

OBJECTIVES		STRATEGIES	
1.3	Minimize and manage the cumulative impact of multiple land-use activities on wildlife and fish habitat, water quality, and people.	1.3.1	Utilize results of Land Use Plan reviews to recommend measures for minimizing potential cumulative land-use impacts.
		1.3.2	Promote proactive land management through application of a results-based management framework.
		1.3.3	Develop appropriate tools, approaches, and indicators to monitor and manage cumulative impacts to land, water and ecosystems.
		1.3.4	Consider project-level contributions to regional cumulative impacts on land, water, fish, wildlife, and people.
		1.3.5	Manage location, scale, and intensity of land use.
		1.3.6	Potential climate-change impacts should be considered in all cumulative-impact assessments.

BEST MANAGEMENT PRACTICES	• *No best management practices are recommended at this time.*
INDICATORS	• *Indicators to be determined through future research and plan implementation.*

POLICY RECOMMENDATIONS	• *To be determined through future research and plan review/implementation.*

RESEARCH RECOMMENDATIONS	• *To be determined through future research and plan review/implementation.*

5.2.1 Human-caused Land and Water Impacts

5.2.1.1 Surface Disturbances

Human-caused surface disturbance is the physical human *footprint* on the land, the most visible legacy of land-use activities. Increasing levels of surface disturbance and habitat change represent increasing risks to native wildlife and fish populations and to the overall integrity of natural systems.

Approximately 7,000 kilometres of linear features, representing thousands of hectares of surface disturbance, were created in the region by historical oil and gas and mineral exploration, and transportation infrastructure (Map 5, Appendix A). Almost all historical linear features are seismic lines, tote roads, and winter trails.

Some historical features are relatively permanent and will remain in a disturbed condition for decades. Many historical linear features have recovered to the point where they are no longer functional surface disturbances. Very few of these linear features are actively used by people.

A human-caused surface disturbance is considered recovered, or returned to its natural state, when it no longer facilitates travel or access by wildlife and people[1], when increased run-off and sediment loading is no longer significant, and when its contours roughly match the original contours. In forested or shrubby areas, a feature can be considered recovered when at least 25% is covered by woody vegetation (trees and shrubs) at least 1.5m in height. In areas mostly covered with low-growing vegetation (i.e., <1.5m), a feature can be considered recovered when it is vegetated with native species of approximately equal height to the surrounding dominant vegetation and the extent of cover by this vegetation is at least 50% that of surrounding undisturbed terrain. Re-contouring certain disturbances, such as bridge abutments or elevated road beds, may also be necessary before the site can be considered fully restored to natural conditions.

As human-caused surface disturbances, including linear features, recover through natural revegetation or active reclamation, they are subtracted from the total amount of disturbed area. Reclaiming surface disturbances upon completion of activities will allow higher levels of land use to occur in relation to recommended surface-disturbance and linear-density indicator levels.

Among the key issues related to managing surface disturbances:

- Surface disturbances create direct and indirect impacts on wildlife and fish.
- Visual quality of the landscape for human use and enjoyment can be affected for long periods of time.
- Comparisons of current levels of surface disturbance to recommended indicator levels are necessary to monitor and track the cumulative effects of land use.

BEST MANAGEMENT PRACTICES – SURFACE DISTURBANCES	• *The size, intensity, and duration of all surface disturbances should be reduced.* • *Native endemic plants should be used for active reclamation of disturbed sites.*
INDICATORS	• *Surface disturbance.* • *Linear density.* • *Patch size/core area fragmentation.*

[1] This part of the definition of recovered is closely linked with human and predator access and potential effects on caribou and moose, key values in the region.

POLICY RECOMMENDATIONS	• *As a general guideline for decision makers and land users, the amount of surface disturbance in a landscape management unit should be maintained below the cumulative-effects indicator levels recommended in the Plan.* • *Site closure/remediation plans should be developed, implemented, and monitored for large-scale industrial and/or infrastructure projects that create significant surface disturbance.*[2]

RESEARCH RECOMMENDATIONS	• *To provide a benchmark for the monitoring of cumulative-effects indicator levels, the status of existing surface disturbances should be documented.* • *Determine the efficacy of the Plan's definition of "ecosystem recovery" in addressing concerns about run-off and sediment loading, particularly for non-forested/shrubby areas.*

5.2.1.2 Hydrological Disturbances

Human-caused hydrological disturbances are less obvious than surface disturbances. Nevertheless, they were often the first issues to be raised at community consultations. Alterations to water quality and flow regime increase risks to populations of fish and other aquatic species, and to the overall integrity of natural systems. Reduced water quality also can impact the health of people living in camps or on the land downstream.

The current states of water quality and flow are thought to be essentially unaltered by people. Some future land uses could incrementally alter both. In general, these effects would be increasingly diluted with distance downstream. However, a single large effect or several smaller ones could alter water quality and/or flow beyond acceptable levels. Water indicators could provide a natural way to assess the cumulative impacts of dispersed-point impacts. Further, water indicators are applicable in mountainous terrain, where surface-disturbance indicators, which often assume an essentially even distribution of disturbance, may not be.

Flows have been measured for decades at a small number of gauging stations in the watershed. Water quality and chemistry have been assessed at a larger number of locations, but typically only once. These studies generally show that the water quality and flow in the Peel watershed are very dynamic. Winter flows are typically very low, but of good quality.

[2] Land uses that do not result in the creation of functional disturbance are exempted from the requirement for site closure/remediation plans. Revegetation and reclamation of impacted sites should be considered in the preparation of these plans.

Flows spike in the summer, while quality declines. Water quality also varies naturally with the underlying rock formations. The dynamic nature of water in the Peel, the spotty baseline data, and the overarching effects of climate change may make water-based cumulative-effects indicators difficult to implement.

Among the key issues related to managing hydrological disturbances:

- Water quality and flows have large influences on culturally and economically important fish populations yet may be impacted by a number of land uses.
- The planning region is the only one in the Yukon based on hydrology. This underscores the local communities' concerns about water.
- Baseline data on water quality and flows is spotty and may not yet be sufficient for hydrological cumulative-effects indicators.
- The effects of climate change on top of natural variations from place to place or with time could make assessment of hydrological cumulative-effects indicators difficult.

BEST MANAGEMENT PRACTICES – HYDROLOGICAL DISTURBANCES	• *The size, intensity, and duration of all disturbances in wetlands, peat-lands, and riparian areas should be reduced.* • *Waste water should be held to a high standard.* • *Impoundments should be engineered and built to withstand more than foreseeable floods and earthquakes.* • *Withdrawal of water should be kept to an absolute minimum, except possibly during peak-flow periods.* • *Withdrawal of water should be avoided during winter.*
INDICATORS	• *Water quality.* • *Water flow.*

POLICY RECOMMENDATION	• *As a general guideline for decision makers and land users, the amount of hydrological disturbance from landscape management units above a monitoring station should be maintained below the cumulative-effects indicator levels recommended in the Plan.*

RESEARCH RECOMMENDATIONS	• *To provide a benchmark for the monitoring of cumulative-effects indicator levels, ongoing water quality and flow monitoring programs should be supported and, if feasible, expanded to every major tributary.* • *Interim critical-indicators levels may need to be redefined using available baseline data. They may need to be defined as a percent deviation from normal, or in absolute terms.*

5.2.1.3 Contaminated Sites

Several contaminated sites have been identified in the region. Based upon existing information, three sites (two associated with the old Hart River Mine and one with the Crest iron deposit) require remediation, and eleven require assessment. One or more sites have been decontaminated. Most documented sites consist of empty fuel drums and assorted refuse resulting from historical oil and gas or mineral exploration activities.

At this time, the number and nature of the identified sites do not appear to represent a major threat to regional ecological integrity or the health of wildlife and fish populations. Nonetheless, contaminated sites are a concern for the regional communities and local land users, and have been shown to impact the feeling of wilderness coveted by the tourism and big game outfitting sectors.

The most important strategy to minimize potential contaminated-site impacts in the region is prevention of new contaminated sites through careful mitigation, operating practices, and monitoring.

POLICY RECOMMENDATION	• *Contaminated sites should be cleaned up with those sites with most potential to impact on water quality or tourism and big game outfitting a priority.*

5.2.2 Climate-Change Effects

The Peel watershed is expected to experience some of the largest climate-related changes in Canada. Residents of the general region are concerned about the impacts of future climate change on the land, water, wildlife, and fish, and the resulting changes to the culture and traditional economy of the First Nations.

Among the key issues related to managing climate-change effects:

- Biophysical changes are expected[3], but with uncertain magnitude.
- Three general habitat types are at significant risk of change due to vegetation conversion and permafrost degradation:
- high-elevation habitats used by Porcupine caribou and sheep;
- low- and mid-elevation non-forested tundra habitats; and,
- major wetland complexes.
- Slope stability in areas underlain with permafrost is expected to decrease. This would have negative repercussions for local water quality or any human infrastructure like

[3] Predicted changes include increasing and more variable winter snow depths, increasing summer drought indices, decreased in-stream water flow, increasing fire rates, and vegetation-community change and conversion.

roads or pipelines. Several failed slopes have been detected in the Peel Plateau – an area underlain with permafrost and with large steep slopes.

- In-stream water flow rates may decrease, resulting in reduced water availability for fish overwintering and industrial land uses.
- Changing winter snow and ice conditions may affect caribou distribution, migration patterns, and range use.
- People's ability to travel on the land and by river may be affected by decreasing summer flow rates and changing winter snow and ice conditions.
- Significant deposits of coal, natural gas, and possibly oil are thought to occur in the region. If developed, these resources would contribute to climate change.

POLICY RECOMMENDATIONS	• *In the Peel Watershed Planning Region, potential climate-change impacts should be considered in all land management decisions.* • *Due to the potential cumulative effects of climate change and land-use impacts, sensitive wetland habitats and caribou habitats at risk of significant change should be managed cautiously and with a high level of conservation focus.* • *When evaluating choice of fuel sources for development projects in the region follow mitigation measures for volume of greenhouse gases discharged into the atmosphere outlined in Government of Yukon Climate Change Strategy (July 2006): a) increase energy efficiency, b) shift from high carbon to low carbon fuels, c) increase use of renewable energy sources, and) investigate carbon sequestration in vegetation and soils.*

Climate Change

A land use plan cannot manage climate-change effects. It is critical to consider and account for any climate change effects through both scientific investigation, traditional and local ecological knowledge/observations. The precautionary principle and adaptive management are relevant concepts for managing and adapting to climate change.

The Plan considers and accounts for potential climate-change effects by recommending a higher level of conservation-management focus in important caribou habitats, major wetland complexes, and major river corridors. These areas are at greatest risk from climate-change impacts.

Setting aside large intact ecosystems has been identified as being a good way to help ensure the persistence of ecological values in the face of climate change. This strategy was an important consideration for the Recommended Conservation Zones of this Plan. Climate change was also considered when selecting recommended cumulative-effects indicator levels for Integrated Management Zones (e.g., Richardson Mountains).

5.3 Aquatic Resources

5.3.1 Wetlands, Lakes, and Rivers

Wetlands, lakes, and rivers are ecologically and culturally significant and sensitive areas that provide a variety of goods and services, such as wildlife and fish habitat, carbon storage, and clean drinking water. They are also important travel and use corridors for a variety of socio-cultural and wilderness/cultural tourism activities.

In this Plan, wetlands[4] are defined as "all open water aquatic environments, both lentic (still water) and lotic (moving water) features, and their adjacent environments." Environments adjacent to wetlands include riparian and peatland (bogs and fens) habitats, although peatlands are likely underestimated by this definition. Wetland complexes are concentrated groupings of individual wetlands and may include both wetland and non-wetland habitats. Wetland complexes, and their associated peatlands, function as an integrated hydrologic system.

The Peel, Ogilvie, Blackstone, Wind, Bonnet Plume, and Snake rivers are identified as Major River corridors. The Road, Trail, and Caribou rivers are Minor River Corridors. The spatial extent of the River Corridors includes both the river channel and incised, sloped terrain with a high percentage of colluviums of major streams and rivers that flow through mountains, plateaus, or basin valleys. We used existing terrain mapping to define the River Corridors.

Various agencies have mapped known key wetlands. These wetlands are very large wetland complexes that provide habitat for wildlife, particularly waterfowl. A comprehensive and accurate map showing all wetland, lake, and river habitats in the region is not currently available. Habitat mapping is particularly lacking for fish. Known locations of spawning, occupancy, and traditional use are incompletely inventoried. We used both the 1:50,000 and 1:250,000 National Topographic Database (NTDB) to map wetlands, lakes, and rivers. We used the Yukon Key Wetlands and waterbird habitat mapping to define habitat associated with these spatial elements. Fish-habitat-potential mapping was used as a proxy for the limited fish-habitat mapping that current exists for the Peel.

Objectives for water stewardship were developed to provide land-use guidance around aquatic systems and species dependent on them. Management focus is given for fish and waterbirds. Specific strategies are aimed at minimizing human disturbances in significant or sensitive habitat, with special focus on riparian connectivity to terrestrial systems and overwintering and spawning habitat for fish.

[4] The National Wetlands Working Group (1988) defines wetlands as "land that has the water table at, near, or above the land's surface or which is saturated for a long enough period to promote wetland or aquatic processes as indicated by hydric soils, hydrophytic vegetation, and various kinds of biological activity that are adapted to the wet environment." Permafrost conditions can create poor soil drainage conditions across broad geographic areas, resulting in hydric soil conditions for much of the growing season with possible seasonal standing water. Such areas would typically not be considered wetlands.

Key issues related to managing wetlands, lakes, and rivers:

- Lack of baseline hydrological and water quality data in the tributaries of the Peel Watershed are limits to establishing threshold/indicator levels for land-use management.
- Available water flow rates and storage capacity considered inadequate to support industrial activities.
- Insufficient research on climate-change effects on watershed resources (permafrost, glacier melt, winter and peak flows) to evaluate effects from industrial activities (e.g., mine, gas developments).
- Minor alterations to wetland hydrology through construction of all-season roads, well pads, and similar features can result in significant impacts.
- Large volumes of aggregate are typically required to support all-season infrastructure in wetland environments, making reclamation difficult.
- Land-use conflicts might arise between multiple uses of wetlands, lakes and rivers: a) travel along river corridors (both adjacent and along rivers), or b) fly-in lakes.

The need to identify ecologically sensitive wetland areas should be reviewed on an ongoing basis in consideration of industrial activity levels. There is currently no wetlands policy in the Yukon to provide additional management guidance for the Plan. Several policy, management objectives, and indicators used in the Plan are identified from the Mackenzie River Basin Transboundary Water Management Agreement.

Management Goal 2: *Provide for the management, protection, and use of water and related ecosystems and the species they support for the future.*

Desired Future State

- Viable fish populations that continue to support the sustenance, cultural, economic, and recreational needs of First Nations and local residents.
- Healthy riparian and aquatic ecosystems and the species that they support, within their natural range of population size and habitats.
- Unaltered hydrological connectivity.
- Water flows and qualities that are within their natural range of variation.

OBJECTIVES	STRATEGIES
2.1 Minimize amount of human-caused surface disturbance within and adjacent to lakes, rivers, wetlands.	2.1.1 Avoid or minimize industrial land-use activities in wetlands and riparian areas. 2.1.2 Coordinate and manage road and trail access. 2.1.3 Reduce amount and minimize effect of surface and vegetation impacts in riparian areas.

2.2	Maintain wetland and riparian integrity (NF) and connectivity.	2.2.1	Avoid or minimize industrial land-use activities in wetlands and riparian areas.
		2.2.2	Coordinate and manage road and trail access.
		2.2.3	Reduce surface and vegetation impacts in riparian zones.
		2.2.4	Minimize alteration of drainage patterns, and water flow.
		2.2.5	No permanent alternation of drainage patterns or waterflow will result from human-caused surface disturbance. If alteration of waterflow must occur, the proponent must indicate the alteration results in zero-impact to aquatic ecosystems.
2.3	Maintain visual quality and aesthetics of Major River corridors.	2.3.1	Avoid or minimize industrial land-use activities in wetlands and riparian areas.
		2.3.2	Coordinate and manage road and trail access.
		2.3.3	Reduce surface and vegetation impacts in riparian and sensitive permafrost areas.
		2.3.4	Avoid large-scale industrial and/or infrastructure projects within Major River corridors.
2.4	Maintain significant seasonal habitats for wetland-dependent organisms.	2.4.1	Avoid or reduce activities in wetland habitat during important biological periods or seasons for breeding waterbirds and other wetland-dependent organisms (e.g., utilize timing windows).
		2.4.2	Prohibit all-season infrastructure in designated wetland complexes[5] (NF).
		2.4.3	Avoid in-stream aggregate (gravel) extraction (NF from fish).
2.5	Maintain quantity, quality, and rate of water flow, including seasonal rate of flow.	2.5.1	Avoid or reduce water withdrawals in sensitive wetland areas.
		2.5.2	Conforming to Yukon Government Policy, bulk removal of water from the Peel Watershed is prohibited.
		2.5.3	Surface disturbance within and adjacent to wetlands and lakes should not result in diminished water quality or quantity (BMP).
2.6	Minimize stream crossings and/or stream crossing impacts as a result of roads and trails.	2.6.1	Coordinate and manage road and trail access.
2.7	Maintain significant fish over-wintering and spawning habitat.	2.7.1	Avoid direct disturbance to sensitive over-wintering habitats.
		2.7.2	Avoid significant sea-run fish spawning habitat.
		2.7.3	Avoid or reduce activities in fish habitat during important biological periods or seasons (e.g., utilize timing windows).
		2.7.4	Avoid or reduce winter in-stream water withdrawals in, or upstream of, sensitive overwintering fish habitat.
2.8	Maintain fish migration routes and access to required seasonal habitats.	2.8.1	Avoid direct or indirect blocking of identified fish migration routes.
2.9	Manage wild fish stocks (sea-run, and non-sea-run) to be a sustainable, renewable resource.	2.9.1	Continue to promote effective fisheries management.
		2.9.2	Continued coordination of information and studies among federal, First Nation, and both territories' agencies.

[5] The Yukon Government adopted the Department of Indian and Northern Affair's Policy Statement respecting the Prohibition of Bulk Removal from the Northwest Territories and Nunavut in December, 2003. This policy defines bulk water as any water transferred out of a river basin in any individual container greater than 40 litres, or removal by any means that involves permanent out-of-basin transfer, whether by diversion, tanker, or other mechanism.

	2.9.3 Encourage research on the spawning habitat and populations of anadromous fish species in the Peel Watershed.
BEST MANAGEMENT PRACTICES – WETLANDS & LAKES	• *All-season infrastructure should be discouraged in key wetland complexes.* • *All-season infrastructure should be located a minimum distance of 100m from wetlands and lakes.*[6] • *Activities in the vicinity of wetlands and wetland complexes should be carried out during the winter.* • *If land-use activities are required in wetlands, hydrology, water flow, and natural drainage patterns should be maintained.* • *If required, surface disturbance within and adjacent to wetlands and lakes should not result in diminished water quality or quantity.*
BEST MANAGEMENT PRACTICES – MAJOR RIVERS & RIVER VALLEYS	• *To maintain visual quality and aesthetics, all-season infrastructure should be discouraged within Major River corridors (see Map 2, Appendix A).* • *Minimize construction of new permanent river crossing structures and routing of new all-season access roads through RCZ (see Map 2, Appendix A).* • *Where new all-season or winter access roads and/or trails are required to cross Major River and riparian corridors, these should be designed, constructed, and used in a manner that minimizes direct and indirect impacts to fish, wildlife, and their habitats.* • *Surface disturbance and land-use activities within and adjacent to Major River and other riparian corridors should not result in diminished water quality, quantity, or flow.* • *Whenever possible, avoid aggregate (gravel) mining activities in Major River Corridors.*
INDICATORS	• *Surface disturbance.* • *Stream crossing density.* • *Other indicators to be determined through future research and Plan implementation.*

[6] Source: Petrula (1994).

POLICY RECOMMENDATIONS	• *Water withdrawals in ecologically sensitive wetland areas should be prohibited.* • *Water withdrawals in sensitive[7] fish overwintering areas should be prohibited (see CPAR map 7 for known locations).* • *To minimize potential impacts to regional fish populations, in-stream and lake overwintering habitat should be identified in advance of the assessment process for large-scale industrial and/or infrastructure projects.*

RESEARCH RECOMMENDATIONS	• *Peel wetlands should mapped using a Yukon Wetland Classification based on the Canadian Wetland Classification System. This wetland inventory should be done in advance of any significant development.* • *Support research on long-term water quality and quantity changes and their influences on key fish habitat including possible climate-change effects.*

5.3.2 Focal Species Management

5.3.2.1. Fish

Fish populations are susceptible to a variety of impacts that can affect both population health and the integrity of habitat. The level of understanding of fish and fish habitat in the region is generally considered poor.

Whitefish, arctic grayling, lake trout, and Dolly Varden char are highly valued subsistence food for First Nation people and anglers. The fish fauna of the Peel River is unique in Yukon as it includes Mackenzie River drainage species. Aberdeen Canyon is a barrier to fish downstream of it. This has created populations of resident and isolated fish populations. Chum salmon are rarely found in the region, although rare occurrences have been reported downstream of Aberdeen Canyon. However, for the Tetlit Gwich'in, sea-running whitefish have a cultural importance akin to that of salmon for other Yukon First Nations. Therefore, whitefish spawning grounds have a high cultural value. Non-sea-run fish are present

[7] The sensitivity of fish habitat to water withdrawals depends on a variety of factors. Significant overwintering habitats in some of the Major Rivers may be relatively resilient to water withdrawals, due to their size and rate of flow. The sensitivity of overwintering fish habitats requires additional assessment.

throughout the watershed, and many important stocks migrate between summer and overwintering habitats.

Key issues related to managing fish habitat:

- Industrial land-use activities may create direct fish-habitat impacts, including habitat loss, degradation, and barriers to fish passage.
- Linear features related to industrial land-use activity (seismic lines, trails, and winter and all-season roads) may increase human access and opportunities for harvesting, potentially leading to decreased fish populations.
- Rates of fish harvest could become unsustainable, although current rates of fish harvest are considered sustainable. Fish harvesting has been fairly high on some lakes and on stocks of whitefish and Dolly Varden char in the lower Peel, but generally appears to be sustainable.
- Climate-change effects are anticipated to result in decreased peak stream-flow rates, potentially impacting fish habitats and populations.

Management issues specific to sea-run fish (anadromous):

- Whitefish, Dolly Varden char, herrings and inconnu are of immense current and historical importance as a food source for people along the Peel River and into the Mackenzie Delta.
- The population size of sea-run fish is limited by spawning habitat. Spawning habitat is localized and requires specific gravel deposition and channel complexity that is poorly understood.

Management issues specific to non-sea-run fish (potadromous):

- In-stream water withdrawals required for industrial land uses may lead to impacts on fish overwintering habitat.
- Arctic grayling and lake trout are of immense current and historical importance as a food source for people along the Peel River and into the Mackenzie Delta.
- The population size of potadromous fish is limited by overwintering habitat.
- Overwintering habitat is strongly associated with surface groundwater (aufeis is a good indicator of surface groundwater), major confluences, and lakes.

BEST MANAGEMENT PRACTICES	• *To minimize potential impacts on regional fish populations, aggregate (gravel) mining should be prohibited in and about significant fish habitats.* • *If aggregate mining is required in significant fish habitats, appropriate operational timing windows should be utilized to minimize activities during important biological periods.*
INDICATORS	• *Water quality.* • *Water flow.*

POLICY RECOMMENDATIONS	• *Given the current level and type of land-use activity, the use of ice roads or winter roads as river crossings—if conducted in accordance with best management practices—is generally considered adequate to mitigate potential impacts on fish stocks or habitats.*[8]

RESEARCH RECOMMENDATIONS	• *The need to identify sensitive fish habitat (particularly spawning and overwintering sites) should be reviewed on an ongoing basis in consideration of industrial activity levels.* • *Develop capacity to monitor fish harvest to track general trends and inform adaptive management.*

5.3.2.2. Waterbirds

Waterbirds (ducks, geese, swans, loons, and grebes) are an indicator of the health of taiga lakes and wetlands, and many have important cultural and subsistence value to local First Nations. Their key migratory and nesting habitats include wetlands, lakes, and riparian areas – places that are relatively uncommon in this generally mountainous region.

Key issues related to managing waterbird habitat:

- Waterbirds are highly dependent on wetlands and therefore are sensitive to wetland disturbances.
- The connectivity between open water, vegetated wetlands, and riparian areas are key elements for waterbirds, for feeding, nesting, raising young, and moulting.
- Lakes and wetlands are fairly uncommon elements in the planning region.
- Migratory waterbirds use wetlands in the planning region as staging and stop-over sites, a seasonal but significant use.
- Several waterbird species are regulated under the Migratory Bird Act. Particular provisions for management of migratory birds under this act may identify areas for protection or provide management guidance.
- Many waterbird species are declining in western North America.

[8] Al von Finster, Department of Fisheries and Oceans, pers. comm., February 2008.

BEST MANAGEMENT PRACTICES	• *Identify timing windows to avoid disturbance to waterfowl during sensitive stages of their lifecycles (e.g., nesting, breeding, and moulting).*
INDICATORS	• *Indicators to be determined through future research and plan implementation.*

POLICY RECOMMENDATIONS	• *Water withdrawals in ecologically sensitive wetland areas should be prohibited.*

RESEARCH RECOMMENDATIONS	• *Peel wetlands should be mapped using a Yukon Wetland Classification based on the Canadian Wetland Classification System. This wetland inventory should be done in advance of any significant development.*

5.4 Terrestrial Resources

The region contains significant ecological resources and sensitive habitats for a variety of species. Several First Nations have relied on the wildlife and fish resources of the region for thousands of years, and First Nations and non-First Nations people continue to rely on them today.

Sustaining regional wildlife requires the maintenance of regional habitat integrity and management of significant habitats. Ecologically important areas that support wildlife populations are shown in Map 3, Appendix A. Strategies to maintain terrestrial habitat integrity for wildlife populations are directed at focal species (Porcupine caribou, moose, marten, and sheep). Some of these strategies also work towards other management goals (e.g., aquatic resource goals, heritage and cultural goals).

Management Goal 3: *Provide for the management, protection, and use of land and related ecosystems and the species they support for the future.*

Desired Future State

- Viable wildlife populations that continue to support the sustenance, cultural, economic, and recreational needs of First Nations and local residents.
- Healthy terrestrial ecosystems and the species that they support within their natural range of population size and habitats.
- Maintain existing unaltered habitat connectivity

5.4.1. General Terrestrial Wildlife Management

Wildlife populations are susceptible to a variety of impacts that can affect both population health and the integrity of habitat.

Key issues related to managing wildlife and their habitat:

- Industrial land-use activities may create direct wildlife-habitat impacts including habitat loss, alteration, and fragmentation. Potential indirect wildlife-habitat effects include avoidance or reduced use of habitat around areas actively being used.
- Human and predator access facilitated by linear features associated with industrial land-use activity (seismic lines, trails, and winter and all-season roads) may provide increased opportunities for harvesting and/or predation, potentially leading to higher rates of mortality.
- The effects of climate change on wildlife habitats and populations are uncertain and require a precautionary and adaptive management approach.

OBJECTIVES		STRATEGIES	
3.1	The full complement of indigenous plant and wildlife species will continue to flourish in their natural habitats at viable population sizes, within the range of natural variations, for future generations.	3.1.1	Where the affected First Nation(s), relevant biologists, or RRCs express concern that the locations of ecologically important areas have not been adequately determined, the applicant will be required to survey the area in question to identify and delineate these important locations.
3.2	Minimize direct and indirect human-caused habitat disturbance and alteration.	3.2.1	Reduce size, intensity, and duration of human-caused physical surface disturbances (e.g., utilize low impact seismic[9], winter roads, and enhanced reclamation).
		3.2.2	Consider restrictions on motorized recreational use (e.g., ATVs)
		3.2.3	Existing habitat data, knowledge, and expertise should be used when laying out new developments in order to minimize the size, extent, duration, and level of disturbances to important habitats.
		3.2.4	At the appropriate scale, map habitats critical for wildlife movement, reproduction, forage, and cover, and apply this information in YESAA Proposals and other relevant development plans.
		3.2.5	Adopt relevant management recommendations from the Boreal Caribou Recovery Plan, the Northern Mountain Caribou Management Plan, and the Porcupine Caribou Management Board.
3.3	Minimize habitat fragmentation resultin from human activity.	3.3.1	Coordinate, manage, and minimize new road and trail access.
		3.3.2	Existing habitat data, knowledge, and expertise should be used when laying out new developments to minimize fragmentation.
		3.3.3	Avoid disruption of any identified migration routes, especially when confined to a narrow area (e.g., mountain passes).
3.4	Minimize potential habitat avoidance that results from human features and activities.	3.4.1	Avoid or reduce activities in significant wildlife habitats during important biological periods (i.e., utilize timing windows).
3.5	Minimize increases in hunting pressure as a result of new development.	3.5.1	Employees of proponents must agree not to hunt at any time while on, or travelling to or from, a work assignment, including during off-time at a work camp.
		3.5.2	Public access should be restricted on all new roads by use of strategically placed gates (e.g., on a bridge). If a strategically placed gate is not an option, a gate with a full-time guard and/or full-time road patrols should be in place. These measures should remain in place until the road has been deactivated.
		3.5.3	Public access should be restricted on all new roads that are no longer active by aggressively deactivating and restoring them, such that they are no longer accessible to all-terrain vehicles (incl. snowmobiles).

[9] Including: meandering, GPS assisted, cutlines; doglegs at junction of roads to decrease visibility to hunters; narrow cutlines (<=1.5m); heliportable cutlines. See also "Seismic Exploration Best Management Practices" by the Oil and Gas Resources Branch of the Yukon Government.

BEST MANAGEMENT PRACTICES – GENERAL	• *To the extent practicable, avoid or minimize the creation of new access roads and trails.* • *To the extent practicable, avoid or minimize the size, extent, duration, and level of activities (including air traffic) in concentrated seasonal-use areas.* • *Use appropriate operational timing windows in significant wildlife habitats to minimize activities, whenever possible, during periods of wildlife use.* • *When new access creation is necessary: 1) non-permanent winter access routes should be developed and utilized, versus all-weather access routes; 2) where possible, new access routes should be directed through less significant or sensitive wildlife habitat; 3) gates or other measures should be used to restrict hunting along new access routes.*
INDICATORS	• *Surface disturbance.* • *Linear density.* • *Patch size/core area fragmentation.*

POLICY RECOMMENDATION	• *As a general guideline for decision makers and land users, the amount of surface disturbance in a landscape management unit should be maintained below the cumulative-effects indicator levels recommended in the Plan.*

RESEARCH RECOMMENDATION	• *Habitats critical for wildlife movement, reproduction, forage, and cover should be mapped at the scale appropriate to the scale of a proposed development. This information should be applied in YESAA proposals and other relevant development plans.* • *Critical levels for patch size/core area fragmentation should be determined by qualified government biologists.*

5.4.2. Focal Species Management

5.4.2.1. Porcupine Caribou

The Porcupine caribou herd is the most important and valued ecological and socio-cultural terrestrial resource in the region. Particular emphasis on Porcupine caribou protection has been expressed by affected Gwich'in First Nations governments. Caribou management priorities are focused on areas showing concentrated and general use by animals over many years (mid-1980s to present), or where animals occupy the same area during many seasons

within a year, suggesting a high intensity of caribou use. There are many such areas of concentrated use during the winter, fall migration, rut, and spring migration. However, historically, the majority of the planning region has been used during these seasons.

The herd has been declining since 1989 and, as of March 2008, there is no evidence that the decline is reversing. Managing concentrated-use areas with a higher level of conservation focus will support the Yukon, First Nations, and federal governments in their national and international efforts to conserve the herd. The effects of hunting pressure will likely become more significant as the herd size decreases. Road access, currently limited to the Dempster Highway, will therefore become more significant to herd health.

This herd, of the barren-ground ecotype, has large seasonal ranges, long migrations, and typically high variability from season to season and year to year in how the herd utilizes its range. Nonetheless, the current concentrated-use assessment is based on the best available information. Consistent with the precautionary principle, a high degree of harvest and management caution is warranted across the herd's range. Range use may change over time in response to many factors, including changing climate and human activities.

More specific areas of concentrated use, by season, are shown in the North Yukon Resource Assessment map series (see Maps 19-24 of North Yukon Planning Commission, 2007b) and in the PWPC's Conservation Priorities Assessment Report (see Maps 8&9 of Peel Watershed Planning Commission 2008b).

BEST MANAGEMENT PRACTICES – PORCUPINE CARIBOU	• *Design and locate roads to minimize impacts to high-value caribou habitat, particularly in caribou winter range.* • *Avoid or minimize the size, extent, duration, and level of activities in concentrated seasonal use areas (see Map 3, Appendix A).* • *Avoid using or crossing seasonal migration corridors with new access routes.* • *Consider the following seasons when determining appropriate operational timing windows (seasons when Porcupine caribou occupy the region as reported by McNeil et al., 2005):* Winter: December 1 to March 31 Spring migration: April 1 to May 31 Early summer: July 1 to July 15 Mid to late summer: July 16 to August 7 Fall migration: August 8 to October 7 Rut: October 8 to November 30

POLICY RECOMMENDATION	• *Define and implement safe operating distances from the Porcupine caribou herd.* • *In light of the difficulty of excluding development from the herd's entire extensive winter range, all relevant recommendations by the PCMB pertaining to the conservation of the Porcupine caribou herd should be endorsed, including measures designed to reduce hunting pressure.*

RESEARCH RECOMMENDATION	• *Research the extent to which linear corridors increase predation of or habitat avoidance by Porcupine caribou.* • *Continue current monitoring programs.*

5.4.2.2. Northern Mountain Caribou

The planning region includes overlapping ranges of three herds of the northern mountain ecotype of caribou – the Bonnet Plume, Hart, and Redstone herds. Caribou of these herds are important to the big-game outfitting industry in this region. The status of this ecotype is classified as "special concern," indicating that populations will likely decline without adequate management. However, the current status of the herds in the region is not well known. A draft general management plan is to be released in May 2009 by Environment Canada.

It has been demonstrated that other herds of this ecotype (beyond the region) have been impacted by loss, alteration, and fragmentation of important habitat. Hunting of caribou along some parts of the Dempster Highway has already been closed out of concern for the over-harvesting of the Hart River herd, whose winter range is bisected by the Dempster Highway. On a more positive note, the Bonnet Plume herd is one of the largest and most remote of all northern mountain caribou. Almost its entire range is within the planning region.

These caribou do not migrate long distances like the Porcupine herd, and tend to use wintering areas more consistently year to year. Wintering habitat is typically forested valley bottoms – areas where roads tend to be routed. Key areas for these herds have been defined in the Yukon Key Areas Database and are more complete than those of other species in the region. However, these areas may need refining before they are sufficient for use in management decisions.

Key areas and habitat suitability are provided in the Conservation Priorities Assessment Report (see Maps 12-15 of Peel Watershed Planning Commission 2008b).

BEST MANAGEMENT PRACTICES – NORTHERN MOUNTAIN CARIBOU	• *Design and locate roads to minimize impacts to high-value caribou habitat, particularly in caribou winter range* • *Avoid or minimize the size, extent, duration, and level of activities in key areas (see Map 3, Appendix A for locations).* • *Avoid using or crossing seasonal migration corridors with new access routes.* • *Operational timing windows may be used to avoid seasonal habitat.*

POLICY RECOMMENDATION	• *Carefully review the upcoming Northern Mountain Caribou Management Plan and incorporate all relevant recommendations from it in PWRLU implementation planning.*

RESEARCH RECOMMENDATION	• *Critical habitats (over and above those in key-area database) need detailed mapping prior to any significant industrial developments.* • *Continued monitoring of the interaction between the Hart River herd and the Dempster Highway informs the current caribou hunting closure in Game Management Subzone 2-28 (this GMS straddles the Dempster Highway at the north end of Tombstone Park) and any potential similar closures within the PWPR.*

5.4.2.3. Boreal Caribou

The broad range of boreal caribou extends across the country, but the only portion of this range within the Yukon Territory is in the northeastern corner of the PWPR. This herd is not currently considered an important socio-cultural resource, owing in part to the discrete nature of its movement behaviour. However, it may become more socially important as hunting success with adjacent herds declines.

This woodland caribou species is distinct from the other ecotypes in the region and has been listed by the Federal *Species at Risk Act* (SARA) as a threatened species. These caribou have declined elsewhere in their range in response to habitat destruction, hunting, disturbance by humans (including construction of roads and pipelines), and predation. Relative to other parts of this herd's broader range, there is relatively little habitat disturbance in the PWPR. A draft Boreal Caribou Action Plan specific for NWT has been developed. Most recommendations in this document are relevant for the Yukon portion of this herd's range.

The winter habitat of these caribou includes the wet forests and adjacent peatlands common in the northeastern corner of the planning region. There are no key areas for this herd in the Yukon Key Areas Database. However, current research may help to define key areas. Range

locations and habitat suitability are provided in the Conservation Priorities Assessment Report (see Maps 10&11 of Peel Watershed Planning Commission 2008b).

BEST MANAGEMENT PRACTICES – BOREAL CARIBOU	• *Design and locate roads to minimize impacts to high-value caribou habitat, particularly in caribou winter range.* • *Avoid or minimize the size, extent, duration, and level of activities in concentrated-use areas (likely around Jackfish Lakes and Brown Bear Creek).* • *Operational timing windows may be used to avoid seasonal habitat (once clearly defined).*

POLICY RECOMMENDATION	• *Carefully review upcoming Boreal Caribou Recovery Plan specific for NWT (or the current draft version until it is released) and incorporate all relevant recommendations from it in PWRLU implementation planning.*

RESEARCH RECOMMENDATION	• *Critical areas need detailed mapping prior to any significant industrial developments.*

5.4.2.4. Moose

Moose use most of the planning region at various times of year. Areas of importance on a seasonal or annual basis are the region's lakes, wetlands, and river valleys. Moose are not subjected to as high a harvesting pressure as Porcupine caribou, but they are an important alternative subsistence species when caribou are not available.

Moose are fairly tolerant of disturbance from land-use activities, but they are susceptible to increased harvest as a result of new road and trail access. Management of linear features for design and activity level (including roads, trails, and seismic lines) is an important consideration for this species. During certain periods of the year, moose prefer younger forest and shrub habitats. Habitat conditions may therefore improve as a result of increased fire activity and regenerating land-use disturbances.

The moose key-areas database is incomplete because there have been few moose studies in the region. Key areas and habitat suitability are provided in the Conservation Priorities Assessment Report (see Maps 16-17 of Peel Watershed Planning Commission 2008b).

BEST MANAGEMENT PRACTICES – MOOSE	• *Avoid seasonal use/concentration areas, areas with high habitat suitability and migration corridors.* • *Avoid using or crossing seasonal migration corridors with new access routes.*

RESEARCH RECOMMENDATION	• *Critical areas need detailed mapping prior to any significant industrial developments.* • *Support research on moose population structure.*

5.4.2.5. Marten

Marten use most of the forested portions of the planning region at various times of year. Areas of importance on a seasonal or annual basis include older growth stands of mixed-wood or coniferous forest, particularly within river/stream valleys. Marten are an important trapping resource for First Nation and non-First Nation residents.

Marten are generally fairly tolerant of and resilient to disturbance. However, documented information on marten in the region is limited, and the species is poorly understood in northern environments.

More specific areas of suitable winter habitat for marten are provided in the Conservation Priorities Assessment Report (see Map 21 of Peel Watershed Planning Commission 2008b).

RESEARCH RECOMMENDATION	• *Support research on impacts of sensory disturbance from industrial activities on marten population and behaviours.*

5.4.2.6. Sheep

Sheep generally use high-elevation and alpine habitats, including those found in the Richardson, Ogilvie, and Wernecke mountains. Sheep hunting is a traditional part of First Nation subsistence harvest activities in the region and is the single most important species for the big game outfitting industry.

Sheep winter range is an important and sensitive habitat. Critical winter habitat for sheep generally characterized as relatively snow-free, wind-swept, south or southwest-facing slopes. Sheep have strong fidelity to specific areas, and tend to use those areas around the same time each year. Sheep populations are vulnerable to direct habitat loss and disturbance from various activities.

More specific areas of suitable habitat for sheep are provided in the Conservation Priorities Assessment Report (see Maps 18&19 of Peel Watershed Planning Commission 2008b).

BEST MANAGEMENT PRACTICES – SHEEP	• *Avoid sensitive sheep habitats and key areas, with emphasis on winter and lambing range avoidance (see Map 3, Appendix A for locations), or use timing windows.* • *Avoid helicopter or airplane disturbance to sheep – see the document "Flying in Sheep Country" (MERG, 2002).*

The recommended draft sheep management plan for the Northern Richardson Mountains (Working Group for Northern Richardson Mountains Dall's Sheep, 2008) noted that "Dall's sheep in the Southern Richardson Mountains is a shared population between the Northwest Territories and the Yukon. This population is small, isolated, and at risk to overharvest and other factors that could cause numbers to decline." This population straddles the NYPR and the PWPR boundaries.

POLICY RECOMMENDATION	• *A co-operative management plan for Dall sheep in the Southern Richardson Mountains should be developed following the principles outlined in the "Management Plan for Dall's Sheep In the Northern Richardson Mountains"*

5.4.2.7. Grizzly Bear

Grizzly bears range throughout the planning region, though less frequently in the Peel Plateau and Fort McPherson Plains in the northeast of the planning region. Grizzly bears are important to big game outfitters and are indicators of healthy and large wilderness areas. This species has been listed as a species of special concern, owing largely to its particular sensitivity to human-caused mortality (including poaching, hunting, accidents, and nuisance kills). Biologists have not studied grizzly bears in detail in the Peel watershed, and few key areas have been catalogued. Patterns of their habitat suitability indicate that broad valley bottoms are key for grizzly bears in the mountains.

More specific areas of suitable habitat for grizzly bears are provided in the Conservation Priorities Assessment Report (see Map 20 of Peel Watershed Planning Commission 2008b).

BEST MANAGEMENT PRACTICES – GRIZZLY BEAR	• *Minimize bear/human conflicts, using various "bear aware" strategies including clean camps, garbage management, and electric fencing for seasonal camps.*

RESEARCH RECOMMENDATION	• *Support mapping and ranking of feeding-season habitats, cover habitat for nursing females, and denning habitats to inform environmental assessments.*

5.4.2.8. Peregrine Falcon

In taiga regions Peregrine Falcons prey mainly on wetland birds, so they can be considered an indicator of wetland ecosystem health. Their nesting habitat, however, is primarily found on cliffs. Peregrine Falcons, therefore, must be managed as both an aquatic and terrestrial resource. The species is no longer considered endangered, but is rated as threatened under SARA. This general situation probably holds for the Peel planning region. Recent inventories indicate that the population has been growing.

There are a number of aeries (nesting areas) along the Dempster Highway, which are prone to disturbance. Further development elsewhere in the region may also disturb these birds.

OBJECTIVES	**STRATEGIES**
3.6. Minimize disturbance to Peregrine nest sites during the nesting cycle.	3.6.1. Education of tourists and highway maintenance crews on how to avoid disturbance to nesting Peregrines.
BEST MANAGEMENT PRACTICES – GENERAL	• *Disturbance, including road maintenance and other industrial activities, should be avoided near nesting sites during the nesting cycle (May to mid-August). (YFWMB: Protecting Wildlife Habitat)*

POLICY RECOMMENDATION	• *Several management recommendations for Peregrine Falcons are discussed in the document "Protecting Wildlife Habitat in the Yukon" (YFWMB, 2000). Many of these recommendations are at too fine a scale for a regional land use plan. Nonetheless, the recommendations are generally aligned with the goals of this plan.*

RESEARCH RECOMMENDATION	• *Safe operating distances and timing windows should be determined and communicated to relevant highway crews.*

More specific areas of suitable habitat for Peregrine Falcons are provided in the Conservation Priorities Assessment Report (see Map 22 of Peel Watershed Planning Commission 2008b).

5.4.2.9. Other Terrestrial Species

The region contains several other important mammal species, including black bear, wolverine, wolf, fox, and beaver. Most of these species are occasionally hunted or trapped. The Federal Species at Risk Act (SARA) lists wolverine as species with special concern status.

The majority of bird species in the region are migratory and present only during the breeding season, which extends from approximately May to September. There are twelve bird species listed on various watch-lists including four listed by COSEWIC: the Rusty Blackbird (Special Concern), the Short-eared Owl (Special Concern), Peregrine Falcon (Special Concern), and the Olive-sided Flycatcher (Threatened). Regional patterns in the number of most of these species are shown in the Conservation Priorities Assessment Report (see Map 26 of Peel Watershed Planning Commission 2008b).

There are currently no specific SARA guidelines or required management prescriptions for the species listed in the section above. There are also no immediate conservation or management concerns regarding these species in the region.

5.2.3 Rare and/or Endemic Plants

There is a nationally significant concentration of endemic plant species (i.e., species not found anywhere else) on the western portion of the planning region. However, the locations and extent of these species are poorly documented.

RESEARCH RECOMMENDATION	• *A detailed survey of rare or endemic plants should be completed prior to any significant industrial development.*

5.5 Special Features Management

The region contains a diverse assortment of significant features many with their own management strategies or recommendations. They may be important for cultural, ecological, and/or economic reasons, and yet many are relatively small features.

Key issues related to regionally significant special features:

- Extensive areas of the planning region are underlain by permafrost. Associated terrestrial and aquatic species, their habitats, human infrastructure, and potentially the carbon balance of the region all rely on the permafrost's continued stability. Surface disturbances and climate change both threaten to melt affected areas of permafrost.
- For associated animals (primarily caribou and sheep), mineral licks are far more valuable per unit area than other habitats. Disturbance to licks and trails to them will disproportionately disturb wildlife.
- Similarly, disturbance to certain mountain passes and associated trails could disproportionately disturb wildlife movements.
- Very local terrain features have high cultural, ecological, and/or potentially touristic values. Development in these areas could diminish these values.

Management Goal 4*: Promote long-term integrity of sensitive/important landforms or biophysical features.*

Desired Future State

- Use of mineral licks continues unaltered.
- Use of animal movement corridors and trails continues unaltered.
- Scenic terrain features retain their cultural, ecological, and aesthetic values.
- Degradation of permafrost is not accelerated by local actions.
- Water flows and qualities are within their natural range of variation.

OBJECTIVES	STRATEGIES
4.1 Minimize negative consequences of permafrost failure to terrestrial and aquatic habitats and human infrastructure.	4.1.1 Coordinate, manage, and minimize new road and trail access and other infrastructure on permafrost. 4.1.2 Significant development on permafrost should not occur before detailed mapping of existing and predicted permafrost depth and/or ground temperatures. (http://adaptation.nrcan.gc.ca/perspective/transport_5_e.php) 4.1.3 Avoid new surface disturbances in permafrost areas whenever possible (e.g., utilize low impact seismic[10] and winter roads with sufficient snowbase)

[10] Especially including narrow cutlines (<=1.5m) and avoidance of steeper terrain

4.2 Minimize direct and indirect human-caused disturbance and alteration to mineral licks.	4.2.1 Use timing windows to when working around mineral licks or trails/corridors to them (i.e., no human activity between mid-May to mid-July). 4.2.2 Surface disturbance should not occur near mineral licks. Minimum setback for winter roads, all-season roads, and industrial should be progressively larger. 4.2.3 All new developments should not alter the hydrology of mineral licks, regardless of setback distance. 4.2.4 Discourage wildlife viewing near mineral licks along the Dempster Highway. 4.2.5 Education of tourists and highway maintenance crews on how to avoid disturbing mineral licks.
4.3 Minimize direct and indirect human-caused disturbance and alteration to areas with high importance to animal movement.	4.3.1 Coordinate, manage, and minimize new road and trail access that crosses or parallels movement corridors. 4.3.2 Surface access between drainages should be coordinated so that only one mountain pass connecting watersheds is used over time. 4.3.3 Avoid or reduce activities in significant wildlife movement corridors during migration periods (utilize timing windows).
4.4 Minimize alteration to the spiritual, ecological, and/or scenic values of localized terrain features.	4.4.1 Development within sight of scenic landmarks, including canyons or hoodoos, should be discouraged.
BEST MANAGEMENT PRACTICES – GENERAL	• *To the extent practicable, avoid or minimize the creation of new access roads and trails on terrain underlain with permafrost.* • *Avoid surface disturbance in permafrost areas.* • *Alter project plans so infrastructure is not on or exposed to steep slopes in permafrost areas.* • *When surface access over or near a concentrated movement corridor cannot be avoided, use of the road should be timed not to coincide with animal movement.* • *Avoid development within sight or earshot of terrain features with high spiritual, ecological, and/or scenic values (e.g. canyons, hoodoos).*
INDICATORS (Plateau/Plain)	• *Indicators to be determined through future research*.
INDICATORS (Mountain)	• *Indicators to be determined through future research*.

POLICY RECOMMENDATION	• *Surface access between drainages should be coordinated so that only one mountain pass connecting watersheds is used over time.* • *Significant development on permafrost should not occur before detailed mapping of existing and predicted permafrost depth and/or ground temperatures at an appropriate scale.*

RESEARCH RECOMMENDATION	• *Detailed mapping of wildlife movement corridors and trails should be completed in advance of significant levels of industrial activity.* • *The general extent of permafrost within the entire planning region should be mapped prior to any development.* • *General permafrost mapping should be refined to include existing and predicted permafrost depth and/or ground temperatures in advance of significant levels of industrial activity on previously identified permafrost areas.* • *Minimum setback distances for industrial activity and all-season and winter roads from mineral licks should be established using both scientific and traditional knowledge.*

5.6 Heritage and Cultural Resources

Maintaining and conserving heritage, social, and cultural resources and values are important objectives of the Plan. Significant heritage resources and First Nation culturally important areas, subsistence-use areas, and travel routes are shown in Map 4, Appendix A. Although there are currently no settlements in the PWPR, several communities are connected to the region through historic and current travel routes and through the Dempster Highway and development area.

Significant heritage, traditional-use areas, and cultural resources were identified and mapped from local and traditional knowledge, with the focus on areas of importance to the First Nations that have traditional territory (Nacho Nyak Dun, Trondëk Hwëch'in, Vuntut Gwitchin) or primary/secondary use areas (Tetlit Gwich'in) in the region.

5.6.1 Heritage Resources

Heritage resources include: (i) historic sites, (ii) historic objects, and (iii) any work or assembly of works of nature or of human endeavour over 45 years old that is of value for its archaeological, palaeontological (fossil and other remains of extinct or prehistoric plants and animals), prehistoric, historic, scientific, or aesthetic features.

Historic objects include: (i) objects more than 45 years old and abandoned, (ii) archaeological objects, (iii) palaeontological objects, and (iv) objects designated under subsection (2) of the Historic Resources Act as historic objects.

Important First Nation heritage resources include First Nation camps/cabins, historical fish traps, travel routes (see also cultural resources), hunting/fishing/trapping areas, and caribou fences.

Heritage resources are scattered throughout the region with many heritage-related or culturally important camps and cabins located on S-sites (see Map 4, Appendix A). S-sites are site-specific Yukon First Nation settlement lands of heritage, cultural, or traditional economic significance to the First Nation. Similarly, many other camps and cabins are found on larger blocks of settlement land and within non-settlement land.

5.6.2 Cultural Resources

Cultural resources include places and locations associated with events, stories, and legends. Culturally important sites may include graveyards, spiritual areas (thermal springs, special places), and cabins. Culturally important areas also overlap with areas used to pursue a traditional economy according to First Nation values. Cultural identity is intrinsically linked to those areas that support a First Nation traditional economy. Many cultural sites are also linked to travel routes, traditional hunting areas, and heritage sites.

Key issues related to the maintenance of heritage sites and current traditional use areas:

- Conservation and maintenance of significant heritage and traditional use areas are important to maintain the First Nations traditional economy.
- Lack of local knowledge of cultural and heritage values in resource planning.
- First Nation communities desire continued support of resource stewardship monitoring programs for cultural and wildlife areas.
- First Nations opportunities to participate in traditional economic activities and other cultural pursuits depend on the continued availability of and access to heritage and cultural areas.
- Conflicts might arise regarding cultural resources (primarily gravesites) along the Dempster Highway Corridor and future industrial land-use impacts within these areas.
- Fish, wildlife, and the land in general have a spiritual and cultural significance that needs to be reflected in land use planning.
- Archeological research and traditional use mapping is important for more localized planning, yet is often insufficient.

Management Goal 5: *Recognize, conserve, and promote the heritage and cultural resources and the values of affected First Nations and the Yukon.*

Desired Future State

- Increase the level and extent of protection for heritage and cultural resources.
- Integrate First Nation traditional knowledge and local knowledge into resource planning to minimize impacts.

OBJECTIVES		STRATEGIES	
5.1	Apply appropriate protection and conservation measures to identified heritage and cultural resources.	5.1.1	Conduct an assessment of heritage or cultural values in areas targeted for development, before approving activities.
		5.1.2	Maintain the physical integrity of historic and cultural features as well as associated aesthetic values (i.e., visual quality, lack of debris, etc.) when undertaking any activities on or adjacent to known heritage or culturally important sites.
		5.1.3	Parties will pursue formal cultural protection designations in consultation with local First Nations and non-aboriginal residents.
		5.1.4	Before deciding whether to authorize a land use or on what terms, applicants are required to document any relevant traditional knowledge and scientific information. The level of data collection required will be appropriate to the scale and nature of the activity and the potential to impact traditional land

			use and occupancy. Responsible Authorities will consider the information presented when making their decisions.
		5.1.5	Demonstrate meaningful community involvement of affected First Nation(s), and individuals identified by the affected First Nation(s) in the development of appropriate avoidance buffers and mitigation measures that ensure the protection of important sites.
		5.1.6	Avoid developments near heritage trails (including road development). Only consider exceptions to this strategy after fairly assessing and weighing all implications (ecological, economic, safety, etc.)
5.2	Provide opportunities for the continuation of First Nations subsistence lifestyles and harvesting on the land.	5.2.1	Maintain the physical integrity of historic and cultural features as well as associated aesthetic values (i.e., visual quality, lack of debris, etc.) when undertaking any activities on or adjacent to known heritage or culturally important sites.
		5.2.2	Consistent with current policy, consult with First Nations before approving activities on non-settlement land to determine whether there might be an impact on traditional use areas or culturally important sites. Where impacts are identified, work co-operatively with the First Nations to minimize impacts.
		5.2.3	Avoid or reduce activities in significant cultural and current subsistence and traditional-use areas during important seasonal-use periods (e.g., utilize timing windows).
		5.2.4	Avoid developments near heritage trails (including road development). Only consider exceptions to this strategy after fairly assessing and weighing all implications (ecological, economic, safety, etc.).
		5.2.5	Support efforts to document, preserve, and promote First Nation culture.
		5.2.6	Integrate traditional skills camps with monitoring cultural or wildlife areas.
5.3	Minimize impact of development on First Nations' traditional-use areas.	5.3.1	Before deciding whether to authorize a land use or on what terms, applicants are required to document any relevant traditional knowledge and scientific information. The level of data collection required will be appropriate to the scale and nature of the activity and the potential to impact traditional land use and occupancy. Responsible authorities will consider the information presented when making their decisions.
		5.3.2	Assess the impact of the proposed activities on known heritage, historical, archaeological, cultural, and traditional land-use areas and culturally important sites as identified by the affected FNs
		5.3.3	Minimize land-use conflicts by avoiding or reducing activities in significant heritage and current traditional use areas during important seasonal-use periods (e.g., utilize timing windows).
		5.3.4	Minimize land-use impacts in the vicinity of identified historic resources, subsistence harvesting, and current traditional use areas.
		5.3.5	Where impacts to identified heritage and cultural sites and resources are unavoidable, implement appropriate mitigation practices.
		5.3.6	Where the affected First Nation(s) express concern and locations of important wildlife or plant gathering areas have not been adequately determined, the applicant will be required to survey the area in question to identify these culturally important locations.
		5.3.7	Conduct an assessment of heritage or cultural values in areas targeted for development before approving activities.

	5.3.8 Maintain the physical integrity of historic and cultural features as well as associated aesthetic values (i.e., visual quality, lack of debris, etc.) when undertaking any activities on or adjacent to known heritage or culturally important sites. 5.3.9 Where impacts to identified heritage and cultural sites and resources are unavoidable, implement appropriate mitigation practices. 5.3.10 Avoid developments near heritage trails (including road development). Only consider exceptions to this strategy after fairly assessing and weighing all implications (ecological, economic, safety, etc.).
BEST MANAGEMENT PRACTICES – GENERAL	• *Work camps associated with resource exploration and development activity should be sited near areas of resource production, away from identified heritage routes, historic sites, and current traditional-use areas.* • *Additional best management practices related to heritage and historic resources are available from Yukon Department of Energy, Mines and Resources, Oil and Gas Management Branch (2007a).*
INDICATORS	• *Indicators to be determined through future research and plan implementation.*

POLICY RECOMMENDATIONS	• *TBD*

RESEARCH RECOMMENDATIONS	• *TBD*

5.6.3 Traditional-Use Sites and Areas

Traditional-use areas are associated with activities such as hunting, fishing, trapping, wood cutting, berry picking, and general travel. First Nations and other residents of the region spend a considerable amount of time on the land, participating in various seasonal activities. The use and enjoyment of traditional areas depends on the continued health of the land, water, and ecosystems. The long-term availability and health of traditional-use areas contributes to the maintenance of First Nation culture and assists in providing economic opportunities within the regional mixed economy.

Traditional-use areas are shown in Figure 2.1 Section 2. Most of the PWPR has been used for traditional purposes, either currently or historically. Tetlit Gwich'in and Tr'ondëk Hwëch'in show overland travel routes on Map 4, Appendix A. Travel routes generally occur along and between the River Corridors and the Peel River. Travel within the PWPR is primarily by snowmobile in the winter season and, for short distances, walking. Dogsleds are still used

occasionally for travel, as are horses. From late spring to late fall, areas close to the Dempster Highway can be accessed by ATV via designated access and egress points. The THFN Final Agreement has specific provisions regarding heritage routes (Section 13.4.6.3 and Chapter 13, Schedule C). Within the PWPR, one THHR route was identified as per Chapter 13, Schedule C. The identified heritage route extends from Dawson to Fort McPherson.

Summer boat travel between Aberdeen Canyon and Fort McPherson is common. Some Yukon First Nation citizens and Yukon residents of Mayo, Dawson City, Keno, and Elsa, as well as NWT residents and Tetlit Gwich'in of Aklavik, Tsiigehtchic, Fort McPherson, and Inuvik travel by snow machine between Yukon and NWT (see Map 4, Appendix A). The timing of these activities, particularly related to harvesting, varies in response to the availability of resources and travel conditions. Proponents and land users are encouraged to contact the First Nation governments for further information regarding traditional-use areas and travel routes.

Key issues related to Traditional-Use Sites and Areas

- Designation of proposed Tetlit Gwich'in Historical Sites[11] along the Peel (Teetł'it njik and Tshuu tr'adaojìich'uu).
- Conservation and maintenance of significant heritage and traditional use areas are important to maintaining the First Nations traditional economy (e.g., fishing sites, springs).
- Need to support further historical research and traditional-use mapping.
- Integration of traditional-skills camps with monitoring cultural or wildlife areas.
- Recognition of the spiritual and cultural value of fish and wildlife.
- Potential for conflict between industrial land-use impacts along the Dempster Highway and cultural values (e.g., medicinal plant sites and grave sites)

[11] Fafard, M. and Kritsch I. 2003. *At the Heart of the Teetł'it Gwich'in Cultural Landscape: Application for the Designation of a National Historic Site, Teetł'it Gwich'in First Nation*. Gwich'in Social and Cultural Institute.

POLICY RECOMMENDATIONS	• *Management guidelines for identified routes and sites within the Plan should be developed jointly by the TH and Yukon governments[12] (proposed in relation to specific provisions of the THFN Final Agreement, Section 13.4.6.3 and Chapter 13, Schedule C).* • *Designation of proposed Tetlit Gwich'in Historical Sites along the Peel (Teetł'it njik and Tshuu tr'adaojìich'uu)*

RESEARCH RECOMMENDATIONS	• *Traditional-use mapping should be researched and collected.*

5.6.4 Archaeological and Palaeontological Sites

Priority areas for heritage resource conservation were identified during the Peel Watershed Planning Commission's community consultations and research. Locations of identified historic, archaeological, and palaeontological sites were obtained from Yukon Department of Tourism and Culture, Cultural Services Branch.

Key issues related to Archaeological and Palaeontological sites

- Continuous monitoring of key target areas for archaeological (Western Richardson Mountains, Snake/Peel River confluence, Upper Ogilvie , Blackstone River, and Mackenzie Mountains) and palaeontological sites (eroded river banks, Snake River, and Hungry Creek, etc.).
- Need to ensure protection of significant palaeontological and archaeological resources.

POLICY RECOMMENDATIONS	• *Known palaeontological and archaeological sites and resources should be protected from disturbance.*
RESEARCH RECOMMENDATIONS	• *Support palaeontological and archaeological research and inventory to inform assessment processes and regulatory enforcement.*

[12] Existing standards and guidelines for the management of heritage resources (Standards and Guidelines for Conservation of Historic Places in Canada) could be adopted for the management of identified routes and sites (Parks Canada, 2003).

5.6.5 Post-Contact Heritage

Documented sites and areas are not currently considered at risk from land-use activities. Project proponents should contact heritage offices of the First Nations and Yukon governments for information on the location of heritage sites of concern for a proposed development.

Key issues related to Post-Contact Heritage

- Continuous monitoring of historic sites in key target areas (old town sites, trading posts, and trading routes).

POLICY RECOMMENDATIONS	• *Known historic camps/cabins, historical fish trap locations, and other heritage resources should be protected from disturbance.*

RESEARCH RECOMMENDATIONS	• *Known historic camps/cabins, historical fish trap locations, and other heritage resources should be identified prior to exploration and development activities.*

5.7 Access Management

Transportation networks and infrastructure have a major influence on the pattern of land use and economic development in remote northern jurisdictions. Many of the impacts that result from industrial land uses, particularly to wildlife and fish populations, are a result of the direct and indirect effects of roads and people's use of them.

Transportation and access-management considerations are closely linked with maintaining regional ecological integrity and socio-cultural values. The management approaches advocated by the Plan are intended to provide opportunities to create required road and access routes, while mitigating potential impacts. All-season roads are required for extraction of mineral and hydrocarbon resources.

All-season Access

All-season access in the context of this plan is gravel roads and associated roadbed under the highways act. All-season roads in the context of the Plan are temporary roads. Once extraction and reclamation operations have been completed, all access development will be reclaimed. No new permanent roads are contemplated in this Plan.

Road, air, and water are all important modes of transportation in the region, but transportation and access options are currently very limited. Road access, outside the all-season Dempster Highway corridor, typically relies on construction of ice roads or winter roads. Major Rivers, particularly the Peel, Wind, and Snake, are important transportation corridors for residents and tourism/recreation users in the region.

Access to Resources

The Plan considered the maintenance of access to resources across the working landscape through land-use designation and cumulative-effects indicators. One of the Terms of Reference for the Plan was to define potential corridor routes. Based on the oil and gas and mining resource sectors' social acceptability and impacts to existing and potential value in other economic sectors, the Plan has proposed some general access corridors to be considered for future all-season road and access routes. The Plan does not prescribe road construction techniques.

As a general guideline, in order to minimize potential impacts to valued ecological and heritage/cultural resources, it is recommended that where road access is required, winter roads, ice roads, and other temporary access techniques be utilized preferentially over all-season roads.

Requirements and locations for new road and access construction are at the discretion of a project proponent in consideration of the strategies, best management practices, and recommended access corridors proposed in the Plan.

Key issues related to transportation and access:

- The construction and use of linear features may result in direct loss and fragmentation of wildlife habitat, and indirect impacts on wildlife, including avoidance of such features, increased harvest pressures, and/or increased levels of predation.
- Construction and use of roads may not be socially acceptable because of perceived impacts to wilderness experience.
- Roads may impact First Nations' traditional cultural-use activities and sites.
- Roads will likely result in a decrease in high-value wilderness tourism, according to industry representatives and government.
- Where roads and access routes cross rivers, improperly constructed stream crossings may impact fish directly through habitat disturbance or indirectly through increasing harvesting pressures or blockage of fish passage/migration.
- Significant water and gravel withdrawals for road building or maintenance may cause direct disturbance to fish and wildlife habitat.
- Where all-season roads and access routes become permanently established, they are likely to persist for long periods of time, making full decommissioning and reclamation difficult, if not virtually impossible, in any foreseeable future.
- Suitable soil conditions, topography, and accessibility to aggregate (gravel) are serious challenges to road construction in the region. In much of the region, aggregate is scarce and poorly mapped.
- Road construction in mountainous terrain typically has a disproportionate impact on surrounding habitats because roads and quality habitats tend to concentrate in valley bottoms.
- There is little local experience in complete restoration of all-season roads in similar ecological conditions (e.g., terrain, substrate, permafrost).
- Off-road vehicle activity cannot likely be controlled and therefore can have serious detrimental impacts on wildlife from sensory or habitat disturbance, and/or on other resource users due to noise or other aesthetic impact

Management Goal 6*: Land, water, and air access is managed so as to respect ecological, cultural heritage, and wilderness values of the areas, while providing for the full range of user needs as deemed compatible for specific sustainable development opportunities.*

Desired Future State

- Access infrastructure creates a minimum of disturbance for other land users and values.
- Access infrastructure is completely restored following use, such that disturbed areas are ecologically and aesthetically indistinguishable from their previous state.

Access – Land based	
OBJECTIVES	**STRATEGIES**
6.1 New access must minimize disturbance to species listed under SARA (at risk, threatened, or special concern).	6.1.1 Refer to access-management recommendation in the Boreal Caribou Recovery Plan (see wildlife management focal species) and in the Northern Mountain Caribou Management Plan (see wildlife management focal species). 6.1.2 Map critical wildlife habitat for the Bonnet Plume, Hart, and Redstone caribou herds currently listed as species of special concern under SARA.
6.2 Maintain opportunities to access lands and resources for economic development needs while minimizing direct and indirect human-caused habitat-disturbance impacts on environmental, social, cultural, heritage, wildlife habitat, tourism, and recreation values.	6.2.1 No new access infrastructure or development within identified Tier I Protection Zones and Remote Access Zones. 6.2.2 No new access infrastructure or development within identified River Corridor Zones, except for absolutely necessary for access to pre-existing claims. 6.2.3 Map wetlands that are hydrologically connected to identified river corridors. 6.2.4 Map the riparian zone of identified river corridors. 6.2.5 Map wetlands and riparian zones of any other possible access corridors. 6.2.6 Locating roads to minimize disturbance (e.g., noise, dust, etc.) to backcountry facilities, trails and activity areas. 6.2.7 Managing public motorized access (off-road vehicles, ORVs) to minimize human and wildlife impacts. 6.2.8 Reduce size, intensity, and duration of access and exploration access (e.g., utilize low-impact seismic, winter roads, and enhanced reclamation). 6.2.9 Coordinate, manage, and minimize new road and trail access to minimize habitat fragmentation. 6.2.10 Minimize access by using centralized access routes as designated (see Section 4 and 6 – sub-units for LMUs 2 & 3). 6.2.11 Avoid or minimize the size, extent, duration, and level of activities in concentrated seasonal-use areas or during important biological periods (e.g., utilize timing windows). 6.2.12 Avoid or minimize the creation of new access roads and trails. Utilize existing routes unless their use will cause additional long-term environmental impacts (e.g., permafrost degradation). 6.2.13 Non-permanent winter-access routes should be developed and utilized versus summer- and/or all-season access routes. 6.2.14 Gate routes or otherwise restrict hunting along new access routes. 6.2.15 Where possible, direct new access routes through less significant wildlife habitats (i.e., avoid mapped key wildlife areas) (see Map 3, Appendix A). 6.2.16 Prioritize delineation of critical wetland habitat in LMUs where access development is possible. 6.2.17 Where effects of access cannot be mitigated through seasonal operating periods, all access routes will avoid critical wetland habitats.
6.3 Minimize potential habitat avoidance that results from human activities.	6.3.1 Avoid or reduce activities in significant wildlife habitats during important biological periods (e.g., utilize timing windows, off-road vehicle mgt plan). 6.3.2 No new access infrastructure or development within identified river corridor zones.
6.4 Maintain visual quality and aesthetics for	6.4.1 No new access infrastructure or development within identified

	tourism and recreation activities that are consistent with objectives for these values		river corridor zones.
		6.4.2	Delineate the viewshed for areas of high visual aesthetic value.
		6.4.3	Avoid or reduce activities in areas of high aesthetic value.
		6.4.4	Avoid or minimize industrial land-use activities in wetlands and riparian areas.
		6.4.5	Reduce surface and vegetation impacts in riparian and sensitive permafrost areas.

6.5	Conserve archaeological resources and heritage trails, minimize impacts on First Nations' traditional use sites, and maintain the integrity and historic features of identified heritage sites.	6.5.1	Minimize land-use conflicts by avoiding road construction or reducing road density in important subsistence harvesting areas and current traditional use areas.
		6.5.2	Avoid road construction near cultural sites and places.
		6.5.3	Assess potential impacts of access and related infrastructure to identified cultural and traditional use activities, and develop appropriate access strategies
		6.5.4	No new access infrastructure or development within river corridor zones identified as First Nation travel corridors.
6.6	Avoid impacts to sensitive terrain due to land-access construction and use.	6.6.1	Delineate sensitive terrain (risk of surface erosion and slumping) and permafrost prior to an access management plan in the region.
		6.6.2	No new access infrastructure or development within identified river corridor zones.
		6.6.3	Reduce surface and vegetation impacts in riparian and sensitive permafrost areas.
6.7	Assess potential risk and benefits of new surface access (including seasonal roads, all-weather roads, and railways) and related infrastructure (gravel pits, maintenance camps etc) to identified cultural and ecological values, and resource use activities and develop appropriate access strategies.	6.7.1	All future access proposals will use the Peel Watershed Planning Region and affected communities as the scope for socioeconomic and environmental risk benefit assessment
		6.7.2	Where identified heritage, economic, or ecological values extend beyond the range of the planning region (e.g., Porcupine caribou herd), the cumulative-impact assessment and risk/benefit analysis to said values may be extended to include other planning regions and/or affected communities.
		6.7.3	Conduct a transportation planning study that will demonstrate consideration of reasonably foreseeable transportation needs for the affected zones. Strategies for such a study follow below.
		6.7.4	The transportation planning study will demonstrate that the proposed transportation corridor is the most appropriate type and/or level for the affected zones and will compare and contrast to the corridor access route designated in Section 4 and 6 – sub-units for LMUs 2 & 3.
		6.7.5	The transportation planning study will demonstrate meaningful community involvement with the affected First Nation(s) on the construction, operation, and abandonment of the transportation corridor.
		6.7.6	The transportation planning study will demonstrate discussions with other potential users of the proposed transportation corridor to identify additional considerations.
		6.7.7	The routing study will consider alternative routings and demonstrate that first consideration was given to routing the corridor through Integrated Management Zones.
		6.7.8	The routing study will consider alternative routings and demonstrate that, where there is no reasonably feasible alternative to routing the corridor through a Recommended Conservation Zone, the route follows existing transportation corridors and

	avoids Tier I Protection Zones. 6.7.9 The transportation planning study will demonstrate that the proposed transportation corridor maintains indicators below critical levels. 6.7.10 Responsible Authorities will consider the information obtained when making their decisions and will not authorize a land use except in accordance with the conditions above.
6.8 Maintain wetland and riparian connectivity	6.8.1 Minimize number of stream crossings and/or stream crossing impacts as a result of roads and trails. 6.8.2 Avoid stream crossings and road impacts on identified fish migration routes, access, or use of seasonal habitats
6.9 Ensure that all surface disturbance resulting from access and related surface disturbance is restored.	6.9.1 All access development plans will include plans to decommission roads. 6.9.2 All access development plans will include plans to restore surface disturbance to pre-disturbance vegetation coverage.
BEST MANAGEMENT PRACTICES	• *Establish no-access and related infrastructure development zones around significant cultural and ecological features.* • *To maintain visual quality and aesthetics, all-season infrastructure should be discouraged within River Corridor Zones (see Map 2, Appendix A).* • *Minimize construction of new permanent river-crossing structures and route new all-season access roads through River Corridor Zones and riparian corridors (see Map 2, Appendix A).* • *Where new all-season or winter access roads and/or trails are required to cross Major River and other riparian corridors, these should be designed, constructed, and used in a manner that minimizes direct and indirect impacts to fish, wildlife, and their habitats.* • *Surface disturbance and land-use activities within and adjacent to Major River and other riparian corridors should not result in diminished water quality, quantity, or flow.* • *Whenever possible, avoid aggregate (gravel) mining activities in Major River Corridors.*
INDICATORS	• *Surface disturbance.* • *Linear density.* • *Number of river crossings / km of river.* • *Fragmentation thresholds.*

Access – Water-based	
OBJECTIVES	**STRATEGIES**
6.10 Maintain the remote quality of identified lakes and rivers by restricting motorized recreational and commercial boat use where required.	6.10.1 On a periodic basis and where necessary, assess the ecological impacts of motorized boat use on lakes and rivers. 6.10.2 Where ecological impacts are occurring, consider restricting motorized boat use on specific lakes and rivers using the appropriate zoning tool.
BEST MANAGEMENT PRACTICES	• *TBD*
INDICATORS	• *TBD*

Access – Air-based	
OBJECTIVES	**STRATEGIES**
6.11 Minimize disturbance to wildlife due to aircraft use, particularly during sensitive periods.	6.11.1 Identify and map sheep populations. 6.11.2 Consult with regional biologists to determine other sensitive species of interest that may be impacted by air access. 6.11.3 To the extent possible, avoid repeated flights in or near sheep areas during biologically important timing windows. This strategy applies to air access for mining activities, recreation, and sightseeing. 6.11.4 Inform local pilots of known sheep areas and provide information on flying practices that minimize disturbance of sheep. Refer to the document "Flying in Sheep Country" (MERG, 2002)
6.12 Minimize disturbance to remote land- and water-based recreation and tourism activities due to aircraft use.	6.12.1 Review levels of helicopter and plane use and take steps to address conflicts and develop Best Management Practices to address remote recreation and tourism activities as they arise. 6.12.2 Where conflicts with air-based access arise, consider setting limits on the number of allowable flights. 6.12.3 Where conflicts with other users arise, consider providing information to other aircraft users (local pilots, exploration companies, etc.) about areas of concern and encouraging them to avoid those areas where possible. 6.12.4 Wherever possible, develop MOU between tourism operators and high-volume aircraft operators to avoid or mitigate conflicts and evaluate adequacy of existing BMPs. For example, periodization of flight schedules, concentration of flights to agreed to days of the week or weeks of the year, consultation and communication protocols to minimize land-use conflicts.
BEST MANAGEMENT PRACTICES	• *To the extent possible, avoid repeated flights in or near sheep areas during biologically important timing windows. This strategy applies to air access for mining activities, recreation, and sightseeing.*
INDICATORS	• *TBD*

POLICY RECOMMENDATIONS	• *Adopt existing or upcoming management plans to guide access planning in region. Examples are:*
	  • *Northern Mountain Caribou Management Plan*
	  • *Porcupine Caribou Herd Management Plan*
	  • *Boreal Caribou Recovery Plan*

RESEARCH RECOMMENDATIONS	• *Collect baseline information on biologically important season for focal species to inform timing windows for access development and related activities.* • *Delineate the viewshed for areas of high visual aesthetic value.* • *Support mapping for remote land- and water-based recreation and tourism high-value areas.* • *Delineate sensitive terrain (risk of surface erosion and slumping) and permafrost prior to an access-management plan in the region.*

Specific discussions are provided below for issues related to the Dempster Highway and access for resource development.

5.7.1. Dempster Highway

The Dempster Highway provides an important corridor for many activities, including transportation, tourism, subsistence harvesting, and communications. The highway is recognized as critical infrastructure for future regional economic development. Uninterrupted operation and maintenance of the Dempster Highway is therefore a regional priority. A co-operative Yukon Government and northern Yukon First Nations (VGFN, THFN, and NNDFN) effort to create an economic development plan for the highway area is ongoing. In 2005, the highway was designated a Northern and Remote Route under the National Highway System (Council of Ministers Responsible for Transportation and Highway Safety, 2005).

The Dempster Highway corridor is intended to encourage the location of land-use activities within the existing zone of influence of the highway. Under this recommendation, surface-disturbance and linear-density indicator reporting and evaluation would be considered only for new activities outside of the two-kilometre corridor buffer. Numerous archaeological sites exist within the corridor, and these would need to be identified and protected prior to additional development, as per existing regulations. Detailed assessment and planning of new developments within the corridor should also carefully consider visual impacts and mitigate to the extent practicable.

New potential access routes off the Dempster Highway will likely be one of the most important management issues facing the region in the future.

This recommendation and the need for more detailed management direction within the Dempster Highway corridor should be evaluated during future Plan reviews.

Key issues related to management of activities within the Dempster Highway corridor:

- The highway is a multiple-use corridor. A development corridor must be maintained to support current and future land-use activity without undermining the heritage, social, and ecological resource values in the vicinity of the highway.
- The highway is promoted as both a scenic tourism route and an industrial/ transportation infrastructure corridor important to both the Yukon and Northwest Territories. It is also used for subsistence activities.
- Access to adequate gravel resources in close proximity to the highway is required for regular maintenance and potential future upgrades.
- Suitable soil conditions, topography, and accessibility to aggregate (gravel) for new all-season road location and construction are priorities along the highway
- A potential future pipeline and related infrastructure and telecommunications would likely parallel the highway.
- Wildlife viewing along the Dempster Highway is a draw for tourists, but has demonstrated impacts on wildlife.
- Need to maintain Dempster Highway as corridor for serving NWT communities, supporting rubber-tire tourism and recreation, First Nation subsistence harvesting, exploration, and potential oil & gas/mineral development, including aggregates
- Socio-economic and environmental feasibility of construction and reclamation of new all-season access and infrastructure corridors for post-exploration extractive resource industries (oil & gas and mining)
- There is potential to develop infrastructure for tourism, such as lodges, within the Dempster Development Area.

POLICY RECOMMENDATIONS	• *In recognition of the strategic importance of the Dempster Highway and its designation as a Northern and Remote Route under the National Highway System, surface-disturbance and linear-density indicator reporting and evaluation are exempt within a distance of 1 km on each side of the highway centre line (2-km total corridor width).* • *Continue to recognize the tourism potential (wildlife viewing scenic landscapes, hiking opportunities) of the Dempster development area when considering current and industrial development or highway maintenance.* • *Develop access restrictions within the Dempster development area where habitat and use of habitat may be impacted by human activity during certain times of the year.*

RESEARCH RECOMMENDATIONS	• *Continue to monitor use of the Dempster Highway Development Area for tourism development potential.* • *Identify areas along the Dempster Highway of most importance to the tourism industry.*

5.7.2. Access Development Scenarios for Resource Development

The Eagle Plain oil and gas basin may receive significant levels of future industrial activity, particularly from the energy sector. There are also several mineral deposits that may be economically feasible. We have proposed, along with several General Management Directions, possible access corridors that may be more or less feasible, given the resource development scenario. We recommend that all access corridors are evaluated in a resource management plan for economically feasible resource-development opportunities in the Peel Watershed. We also recommend that opportunities to share access development across the Northwest Territories border be considered. This recommendation is intended to foster a coordinated approach to new road and access route development in an area where focused oil and gas, and mineral exploration and development activities are probable.

The timing and scope of this recommendation will be at the discretion of the Parties and will be addressed by the Parties as part of implementation planning. Specific strategies and best management practices related to road and access-route siting may be included as part of this future access-management plan.

POLICY RECOMMENDATION	• *All new all-season access should be restored using state-of-the-art techniques once activity has halted. A road restoration bond, levied on the proponent, is strongly recommended to ensure complete restoration.* • *In advance of significant levels of resource development activity, an access-management plan should be developed using General Management Direction for Access provided in the Plan.* • *All access-management plans should consider future access needs of economically feasible development opportunities using General Management Direction for Access provided in the Plan Scope the feasibility of a cross-territory shared access route.* • *Significant development on permafrost should not occur before detailed mapping of existing and predicted permafrost depth and/or ground temperatures at an appropriate scale. (http://adaptation.nrcan.gc.ca/perspective/transport_5_e.php)*

RESEARCH RECOMMENDATION	• *All-season road restoration techniques in other similar jurisdictions should be examined in advance of new road construction.*

5.8 Current and Potential Economic Activity:

Maintaining regional economic development opportunities and benefits that do not result in unacceptable impacts to valued ecological and cultural resources are important objectives of the Plan. The region has a mixed economy that includes both traditional First Nation pursuits, and commercial resource-use activities. Resource users of the Peel region desire to maintain opportunities in both spheres of economic activity. Areas of economic development interest and potential are shown in Map 5 - Appendix A. Areas where traditional economic activities occur are shown in Map 4 - Appendix A.

The Plan proposes management strategies related to regional sectors of interest: transportation and access, the traditional economy, tourism, recreation, guiding/outfitting, oil and gas, minerals, and aggregate (gravel) resources. Forestry and renewable energy are also discussed.

Region-wide strategies and best management practices focus on mitigating the potential land-use impacts that transportation and access might have on valued heritage, socio-cultural, and ecological values.

Key issues related to current and potential economic activity:

- Economically-beneficial activities of some sectors may be economically detrimental to others.
- Industrial activities require all-season roads or railways for full development. Surface access has implications on all values in the region.
- Economic activities bring variable economic benefits and variable increases in social infrastructure (e.g., hospitals, jails, etc.) to local communities and the Yukon as a whole.
- The ecological impact of some activities may be impossible to mitigate completely.
- All economic sectors in the region have express a clear desire for greater land-use certainty.

Management Goal 7*:* *Facilitate sustainable development opportunities and activities that result in socio-economic benefits to the affected First Nations, northern communities, and the Yukon as a whole.*

Desired Future State

- Economic activities have a minimum of disturbance to other land users and values and a maximum of benefit to local residents.
- Infrastructure is completely restored following use, such that disturbed areas are ecologically and aesthetically restored as close to natural conditions as possible.

OBJECTIVES		STRATEGIES	
7.1	Maintain opportunities to access lands and resources for a variety of land users and uses, including but not limited to transportation, subsistence harvesting, cultural pursuits, tourism, recreation, oil and gas, minerals, and gravel extraction.	7.1.1	Minimize land-use conflicts by avoiding or reducing the level of land-use activities in important subsistence-harvesting areas and current community-use areas.
7.2	Create land-use status certainty to the greatest extent possible.	7.2.1	Provide clear and consistent land-management direction and recommendations linked to Plan objectives.
		7.2.2	Develop clear guidelines and process links to YESAA.
7.3	Maintain opportunities for a mixed economy to continue, where traditional subsistence harvesting and cultural activities and wage-based economic activities co-exist, ensuring long-term maintenance of First Nation culture, people's connection with the land, and their well-being.	7.3.1	Minimize land-use conflicts by avoiding or reducing the level of land-use activities in important subsistence-harvesting areas and current community-use areas.
		7.3.2	Avoid or reduce activities in significant heritage and current community-use areas during important seasonal-use periods (e.g., utilize timing windows).
BEST MANAGEMENT PRACTICES – GENERAL		• *See individual sector discussions below.*	
INDICATORS		• *Indicators to be determined through future research and plan implementation.*	

POLICY RECOMMENDATIONS	• *TBD*

RESEARCH RECOMMENDATIONS	• *Develop and maintain a database of socio-economic activities by sector of interest, including total regional economic impact (employment, business multiplier).*

Specific recommendations are provided below for issues related to:

- First Nations Traditional Economy and Community Development;
- Tourism and Recreation;
- Guide Outfitting and Trapping;
- Mineral and Energy Resources;
- Aggregate (Gravel) Resources;
- Forest Resources; and,
- Renewable Energy.

5.8.1 First Nations Traditional Economy and Community Development

In the Peel region, a limited level of economic activity is still focused on subsistence harvesting. Residents from all four neighbouring First Nation communities spend varying amounts of time on the land, participating in traditional economic pursuits such as hunting, fishing, and berry harvesting in order to provide staple food items for themselves and feed (e.g., chum salmon) for dog teams. Trapping is still a main or supplementary economic activity when fur prices warrant. Traditional economic activities are strongly linked to the maintenance of First Nations culture and community well-being. Important subsistence harvesting and trapping areas are shown on Map 4, Appendix A.

Key issues related to maintenance and pursuit of traditional economic activities:

- The traditional economy is vital to maintaining First Nations' culture, community well-being, and ties to the land.
- Subsistence harvesting and traditional economic activities are important means of offsetting the high cost of food in northern communities.
- Subsistence harvesting opportunities may benefit from construction of new roads and trails, resulting in increased harvest of wildlife and fish resources.
- Land-use conflicts might arise between traditional economic activities and (i) industrial land uses, (ii) wilderness/cultural tourism, and (iii) Porcupine caribou herd conservation.

OBJECTIVES		STRATEGIES	
7.4	Maintain the ability of First Nations to obtain country food, plants, and other cultural-use resources.	7.4.1	Use best practices (e.g., minimal-impact seismic) for geophysical operations
		7.4.2	First Nations should undertake an annual analysis of food harvest levels within the Region to develop data on normal ranges and to report issues (particularly respecting fish and wildlife health) to the implementation and monitoring committee.
		7.4.3	First Nations should develop an inventory for country food harvest species.

7.5 First Nations are able to share in economic opportunities.	7.5.1 Before deciding whether to authorize a land use or on what terms, Responsible Authorities will require applicants to demonstrate meaningful community involvement with affected communities and individuals. 7.5.2 The degree and nature of community involvement required will be appropriate to the scale and potential impacts of the proposed land use. 7.5.3 Community involvement will begin prior to the application and will continue throughout the life of the proposed land use at intervals appropriate to the nature of activities. 7.5.4 Maintain or enhance bilateral relations between communities and industrial proponents. 7.5.5 First Nations will consider providing information on employment profile, skills, and training needs to industry on a regular basis. 7.5.6 A First Nations wildlife monitoring program would help mitigate industrial activity or inappropriate activities at important cultural sites, provide employment, and could be integrated with a traditional skills program. 7.5.7 Industry proponents to work with First Nations to develop a strategy that identifies and develops economic opportunities for First Nations in oil and gas or mining, where appropriate,. 7.5.8 First Nations should develop an interpretive cultural/environmental program for aboriginal tourism. 7.5.9 Encourage developers/proponents operating within the Peel region to report their contribution to the local economy (Keno City, Mayo, Fort MacPherson, Dawson City). 7.5.10 Increase the level of aboriginal input into development planning and implementation by meeting with Chief/Council, Elders, or affected individuals or their representatives, as issues and opportunities arise (may include open houses, for example). *7.5.11* Development proponents should support investigations into the impacts of development activities on plant and animal species traditionally used by First Nations people.
BEST MANAGEMENT PRACTICES – FIRST NATIONS TRADITIONAL ECONOMY AND COMMUNITY DEVELOPMENT	• *Consultation protocols should be developed between proponent and local communities and First Nations, and should be drafted in advance of development.* • *Direct hire/contracting policies should be developed between proponent and local communities and First Nations, and should be drafted in advance of development.*
INDICATORS	• *Indicators to be determined through future research and plan implementation.*

POLICY RECOMMENDATIONS	• *TBD*

RESEARCH RECOMMENDATIONS	• *TBD*

5.8.2 Tourism and Recreation

Tourism has been a consistent foundation to Yukon's economy for many decades and remains so today. The Peel watershed, in particular, has been a draw for river paddlers since the 1960s. Current tourism and recreation activity in the region is significant with annual revenues estimated to be over six hundred thousand dollars (estimate is based on guided and non-guided tourist data from Yukon Tourism and Culture and Yukon Parks Branch, 2008), for a range of tourism products and services that serve local, regional, national, and international clientele. The PWPR has experienced a growth in visitations during the past five years. The expansive wilderness in the region supports tourism products that attract visitors from around the world, and provides recreation opportunities for Yukon residents. The Dempster Corridor also continues to attract many visitors for sight-seeing tours and wildlife viewing, as well as people interested in a variety of highway-accessible outdoor-recreation activities. Approximately 7,000 tourists travel the Dempster Highway annually.

Recent tourism research shows continued demand in Yukon's primary tourism markets for high-quality wilderness-tourism products. There is room for the growth of existing remote-tourism products in the Peel watershed, within carrying capacity, and opportunities for road-accessible tourism. The First Nations have had a limited role in the tourism sector in the Peel watershed thus far. However, there are opportunities for the First Nations to direct, manage, participate in, and benefit from existing or new tourism products in the region.

Key issues related to tourism and recreation:

- High co-incidence of wilderness tourism activities and outfitting services within the Ogilvie, Wernecke, and Mackenzie mountains, requiring appropriate large, intact, and road-less areas through zoning and management for sustained use.
- Recognition and implementation of Bonnet-Plume Heritage River designation and management objectives.
- Carrying capacity and compatibility of expanded remote-access tourism based on ecological, cultural, sociological, and tourism-sector factors (eco-tourism, guide-outfitting).
- Lack of visual landscape inventory to enable sub-unit planning and management.
- Limited data regarding recreation (self-guided) visitation and economic impact of tourism by residents and non-residents to the Peel watershed.
- Wildlife viewing along the Dempster Highway is a draw for tourists, but has demonstrated impacts on wildlife.

Desired Future State

- A world-class tourism destination based on the area's globally significant natural features, supported by well-designed tourism/recreation infrastructure.
- A viable local tourism industry.
- Sustainable recreation and tourism activities sensitive to environmental and cultural values.
- Resource planning and management compatible with tourism needs.
- Opportunities for a wide range of recreation activities.
- Certainty of land base for recreation and tourism activities.

OBJECTIVES		STRATEGIES	
7.6	Identify opportunities for tourism and recreation development.	7.6.1	Update and continue to develop tourism-resource inventories for a range of front- and back-country tourism activities.
		7.6.2	Recognize the need for facilities to support tourism (front-country and backcountry), where appropriate.
		7.6.3	Provide opportunities for backcountry recreation and tourism development.
7.7	Provide a secure land base to support environmentally and culturally sensitive tourism/ recreation development.	7.7.1	Make non-settlement land available to support development of commercial recreation.
7.8	Manage natural, cultural, and recreation resources in front-country (e.g., along the Dempster Highway) and backcountry areas to support world-class wilderness-tourism opportunities	7.8.1	Design and locate tourism/recreation facilities and activities to minimize impacts on sensitive ecosystems, cultural/heritage sites, and recreation features.
		7.8.2	Manage levels of commercial recreation use in areas with potential carrying capacity limitations (e.g., Remote Access Lakes, Snake River Corridor).
		7.8.3	Design and locate facilities (front-country and backcountry) to respect scenic/aesthetic qualities, ecological values, and public use. Specific examples follow.
		7.8.4	Locate facilities to avoid displacement of public use.
		7.8.5	Design facilities to be aesthetically compatible with the surrounding area.
		7.8.6	Avoid disturbance to sensitive aquatic and terrestrial ecosystems (see Section 4 GMDs of Aquatic Ecosystems, Terrestrial Resources, and Special Features).
		7.8.7	Avoid proliferation of trails and, where possible, concentrate access along a single trail.
		7.8.8	Integrate tourism/recreation values and inventories into other resource planning and approval processes (e.g., sub-regional planning, environmental assessment, access management, or recommended protected area plans, etc.).
		7.8.9	Promote environmentally and culturally sensitive tourism and recreation through the following methods.
		7.8.10	Hold public consultation in the awarding of commercial recreation tenures.
		7.8.11	Encourage voluntary compliance initiatives with operators (e.g., Best Management Practices).
		7.8.12	Make information available on low-impact camping/trekking practices (e.g., "Leave no Trace")
		7.8.13	Monitor recreational activities, including wildlife viewing activities, and, where necessary, take appropriate actions to prevent seasonal or chronic

			harassment of wildlife.
		7.8.14	Coordinate strategic planning and management for recreation and tourism between Recommended Protected Zones and the adjacent land base.
7.9	Retain the natural character of high-value recreation features during access design to maintain wilderness-tourism-experience management.	7.9.1	Manage road development and other forms of access (e.g., air) near high-value recreation features to avoid/reduce impacts on those features. Methods could include the following.
		7.9.1a	Delineate the viewshed for areas of high visual aesthetic value.
		7.9.1b	Avoid or reduce activities in areas of high aesthetic value.
		7.9.1c	Locate roads to minimize disturbance (e.g., noise, dust, etc.) to backcountry facilities, trails, and activity areas.
		7.9.1d	Manage public motorized access (off-road vehicles and ATVs).
		7.9.1e	Include, in all access development plans, plans to decommission roads.
		7.9.1f	Include, in all access development plans, plans to restore surface disturbance to pre-disturbance vegetation coverage.
7.10	Maintain visual quality and aesthetics of Major River corridors.	7.10.1	Avoid or minimize industrial land-use activities in wetlands and riparian areas.
		7.10.2	Coordinate, manage, and minimize new road and trail access to minimize habitat fragmentation.
		7.10.3	Reduce surface and vegetation impacts in riparian and sensitive permafrost areas.
		7.10.4	No new access infrastructure or development within identified River Corridor Zones except for absolutely necessary for access to existing claims.
7.11	Promote development of locally based, viable tourism opportunities consistent with long-term tourism goals for the area.	7.11.1	Incorporate local knowledge into tourism/ recreation inventories, opportunity studies, etc.
		7.11.2	Emphasize local employment and business creation as criteria for awarding commercial recreation tenures.
		7.11.3	Plan and promote development of front-country attractions and infrastructure (e.g., heritage and cultural attractions, trails, wildlife viewing sites, interpretive sites, signs, trail, etc.) so that there is little or no impact on habitats or animal behaviour.
7.12	Maintain or increase opportunities for local recreation use.	7.12.1	Develop, manage, and maintain new and existing recreation sites, facilities, trails, etc., while maintaining wilderness character.
		7.12.2	Consider local recreation use areas during project-level planning.
		7.12.3	Identify resources and develop mechanisms for managing public recreation sites and facilities (e.g., user fees, multi-party partnerships, etc.).
BEST MANAGEMENT PRACTICES – TOURISM		•	*Memorandums of Understanding (MOUs) should be drafted between regional tourism operators and regionally active industrial operators to minimize conflicts.*
INDICATORS		•	*Visitor numbers to remote access lakes.*

POLICY RECOMMENDATIONS	• *Implement policy for commercial wilderness-recreation tenures.*

RESEARCH RECOMMENDATIONS	• *Collect and analyze recreational activity data (self-guided and guided) in the Peel watershed, with priority given to frequently travelled rivers and Dempster Highway.* • *Monitor use of remote access lakes.*

5.8.3. Guide-Outfitting and Trapping

Big-game outfitting has been an economic generator in the Peel watershed for decades. In order to be economically viable and ecologically sustainable, the industry requires large areas of intact wilderness and healthy wildlife populations. Big-game outfitting activities, and their associated concessions, occur in the southern half of the PWPR where wilderness tourism, mineral exploration, and some traditional harvesting also occur.

Key Issues related to big game outfitting and trapping:

- The marketing advantage of big-game outfitters in the region is that they offer clients a relatively unique experience of large, healthy, intact ecosystems that are largely roadless. When other land uses diminish the high wilderness quality, clients may opt for more accessible locales that are comparatively unimpacted. Wilderness experience of sport-hunting clientele will be impacted by:
    - Excessive traffic by tourism and recreational users. Carrying capacity, therefore, is a management concern.
    - Excessive air traffic or inappropriately located exploration camps linked to mineral exploration.
    - Development of roads and other infrastructure.
- Land-use patterns of outfitters in all concessions, including but not limited to the locations of camps and trails, is poorly documented, making outfitting and trapping consideration during project-level planning difficult.
- Big-game outfitters and trappers rely on healthy wildlife populations and, indirectly, on functional ecosystems.

Desired Future State

- Viable fish, game, and furbearer populations that continue to support the needs of outfitters and trappers.
- Large areas that can provide a quality wilderness experience.

OBJECTIVES		STRATEGIES	
7.13	Maintain wilderness characteristics valued by big-game outfitters.	7.13.1	Avoid or minimize industrial land-use activities in landscapes of importance to outfitters.
		7.13.2	Coordinate and manage road and trail access.
7.14	Manage game wildlife populations to be a sustainable renewable resource.	7.14.1	Survey and monitor game populations to ensure natural population structures are maintained.
		7.14.2	Continued coordination of information and studies between federal, territorial, and provincial jurisdictions, as well as international and non-governmental organizations.
		7.14.3	Continued monitoring of waterfowl and small game harvest through hunter surveys.
		7.14.4	Monitor harvest levels of game species by First Nations members, residents, and guide outfitters.
		7.14.5	Continue to support the work of the Renewable Resource Councils to review and provide input on wildlife management decisions and research.
		7.14.6	Apply timely hunting restrictions when there is substantiated evidence that game populations are at risk or declining (this includes verifiable local information and scientific/biological studies).
		7.14.7	Prevent unmitigated public access on new roads or trails.
		7.14.8	Coordinate strategic planning and management for wildlife and fish populations between Recommended Protected Zones and the adjacent land base.
7.15	Maintain opportunities for local, resident, and non-resident hunting.	7.15.1	Recognize the importance of the country food harvest for local residents.
		7.15.2	Provide opportunities for resident and non-resident hunters.
		7.15.3	Hunting restrictions will only occur when there is substantiated evidence that game populations are at risk or declining (this includes verifiable local information and scientific/biological studies).
7.16	Manage furbearer populations to be a sustainable renewable resource.	7.16.1	Develop and disseminate best management practices for trapping.
		7.16.2	Encourage use of humane trapping techniques, as appropriate to the species, and periodically update information.
		7.16.3	Tenure holders should consult trapline license holders and First Nations trappers before commencing development that could impact trapping activities (e.g., road development, mine development, and, where possible, mineral exploration).
7.17	Provide and maintain commercial opportunities for hunting, fishing, and trapping.	7.17.1	Maintain the rights of existing tenure holders and provide new opportunities where appropriate.
		7.17.2	Maintain and, if needed, manage grazing activities associated with guide outfitting.
		7.17.3	Consult commercial tenure holders before commencing development (road development, mine development, and, where possible, mineral exploration).

7.18 Manage wild fish stocks (sea-run, and non-sea-run) to be a sustainable, renewable resource.	7.18.1 Continue to promote effective fisheries management. 7.18.2 Continued coordination of information and studies between federal, First Nation, and both territorial agencies. 7.18.3 Encourage research on the spawning habitat and populations of anadromous fish species in the Peel Watershed.
7.19 Maintain opportunities for local, resident, and non-resident fishing.	7.19.1 Recognize the importance of the country food harvest to local residents. 7.19.2 Provide opportunities for resident and non-resident fishers, as long as fish populations are not at risk or declining.
BEST MANAGEMENT PRACTICES – GUIDE OUTFITTING & TRAPPING	• *Memorandums of Understanding (MOUs) or similar documents should be drafted between oil and gas proponents and the First Nation(s) whose traditional territory is involved in potential exploration or development.* • *Memorandums of Understanding (MOUs) should be drafted between regional big-game outfitters and regionally active industrial operators to minimize conflicts.* • *Where possible, Memorandums of Understanding (MOUs) should be drafted between local trappers (or a representative) and regionally active industrial operators to minimize conflicts.*
INDICATORS	• *Indicators to be determined through future research and plan implementation.*

POLICY RECOMMENDATIONS	• *Use of off-road vehicles by outfitters over large areas should be discouraged.*

RESEARCH RECOMMENDATIONS	• *Land-use patterns of outfitters in all concessions, including but not limited to the locations of camps and trails, should be documented in a secure way that respects outfitters' desires for privacy while facilitating future planning.*

5.8.4 Mineral Resources

Mining has been a cornerstone of the Yukon economy since the Gold Rush era. The Plan is intended to assist in establishing land-use certainty for mineral exploration and development activities. Mineral interest and activity in the region has recently been high, despite lack of land-use certainty, remoteness, and limited road infrastructure. This interest was spurred by recent high mineral prices and by generally high mineral potential and resulted in an estimated forty-eight million dollars having been spent in exploration activity between 2000 and 2008.

Currently, exploration and development activities are subject to comprehensive review processes as stipulated in various territorial and federal legislation. Exploration activities are administered by a comprehensive referral process among government agencies in association with First Nations. The YESAA process is intended to ensure all technical, social, and environmental aspects are completely assessed, including consistency with the management direction in the Plan.

Individual stakeholder companies and industry representatives have voiced strong concern about a need to utilize best management practices, existing review processes, little/no zoning, and guaranteed access for exploration and development throughout the entire Peel region. In contrast, many view mine development as incompatible with wilderness values. As previously stated, the Commission has had to view these positions in the context of its Guiding Documents, which ask that the plan ensure the long-term maintenance of wilderness values.

In letters to the Commission, legal concerns were raised by individual mining firms concerning the issue of compensation, based upon their interpretation of tenure rights and regulatory guarantees concerning "reasonable access" to such existing mineral claims. Given the polarity of positions around this central land-use management issue, the Commission sought guidance from its Senior Liaison Committee (SLC), which has representation of all the Parties (First Nations and Yukon government). Since responsibility for mineral tenures on non-settlement lands rests with the Yukon government, a statement was provided by the SLC on current policy direction recommending "no compensation and no expropriation" regarding existing claims.

In shaping its response to the mineral-access issue, the Commission considered a number of matters as part of its planning and decision-making process. In applying its Decision-Making Filters (PWPC 2008c) to the selection of a land-use scenario for the Peel region, the Commission developed a set of "required" criteria that included due regard to both the retention of wilderness characteristics and legal considerations affecting land-use management. In that process, it examined the following factors:

- Estimation of known mineral-resource potential (high-medium-low), and extent of existing mineral claims.
- Extent of pre-feasibility analysis for mine development, concerning access requirements, water and energy supply, mine operations.

- Lack of cost/benefit analysis for all sectors, including mine development and other resource-based industries (e.g., traditional subsistence economy, guide/outfitting, wilderness tourism).
- Understanding of potential land-use management issues arising from the impact of new, all-season access development upon existing resource sectors within the Peel region.
- Risk assessment on known environmental management issues affecting the feasibility of access and mine development (impacts on listed fish and wildlife species at risk, terrain stability, water quality, cultural resource use).

Based upon its review of the information, Commission members unanimously elected to adopt a "precautionary and adaptive management" approach to land-use management within the Peel region, and the accommodation of the mineral sector. The Plan, therefore, endeavored to provide a measure of certainty to the greatest extent possible for mineral exploration and development, and has recommended the following key directions in addition to earlier outlined management strategies:

- Within Integrated Management Zones, mineral exploration can proceed based upon the recommended management strategies of that zone and the Plan in general, and subject to regulatory approval processes.
- Immediate withdrawal of new mineral staking is recommended in all Recommended Protected Zones.
- Continued exploration on mineral claims in good standing within Tier II Recommended Protected Zones will be allowed during the first period of Plan implementation (i.e., "grandfathered access" to existing claims) with strict conditions concerning access planning, management, and reclamation.
- Within RCZs, any feasible mine development proposal on existing mineral claims would be subject to future Plan review according to provisions of UFA Chapter 11 concerning resolution of Land Use Plan conformance. This would enable a thorough review of all related public- and private-interest concerns.

Coal Development

The most likely scenario for coal development in the region is to provide thermal grade coal for an on or off-site coal-fired power plant for mine operations in the planning region. The likely location for such a mine site is most likely at the Crest deposit (LMU #1b) or at a nearby Wernecke Breccia deposit (Gartner Lee 2006).

Due to the high levels of surface disturbance from open-cast coal mining, and linear disturbance associated with coal transport, coal mining in LMU sub-units 2a, 3a and 3b would likely will not remain under the proposed critical indicator levels for linear and surface disturbance for these LMUs.

In addition, further research into reclamation of surface disturbance with open-cast mining techniques in areas underlain with permafrost is required.

Among the key issues related to mineral exploration/development activities:

- Mineral activities require access to large areas of land, and substantial exploration efforts are required to identify economically viable deposits.
- The construction and ongoing operations of large-scale mining activity would bring many new workers to the region.
- Mine-site operations can lead to local and downstream water impacts and localized wildlife/habitat disturbance.
- Land-use conflicts might arise between mineral activities and: (i) wilderness/cultural tourism, (ii) traditional economic activities and cultural pursuits, and (iii) ecological processes, including use of important habitats and movement.
- According to industry sector representatives and some individual firms, existing mineral claims provide some legal rights to claim holders.

Desired Future State

- An economically and environmentally sound mining industry that provides long-term benefits to the local community.
- Appropriate level of certainty of access to support a viable exploration industry.
- Responsible mineral projects approved in an efficient and timely manner and carried out with high standards of environmental management, including access and mine-site reclamation.

OBJECTIVES		STRATEGIES	
7.20	Provide a secure land base to support the exploration and development of mineral resources.	7.20.1	At all levels of planning, provide management direction that is clear, practical, and economically feasible.
		7.20.2	During formal Plan review, evaluate designation for lands closed to mineral tenures (no-staking reserves) and note the reasons for the reserve and, where appropriate, request the reserve be lifted or amended.
7.21	Provide opportunities for appropriate access for exploration and development.	7.21.1	To the extent possible, coordinate operational time windows for mineral exploration and mine development and associated access needs with the needs of other resource values, such as wildlife habitat and existing commercial activities (e.g., guide-outfitting).
		7.21.2	Consult with mineral tenure holders or industry representatives as well as First Nations and relevant stakeholder/interest groups during government access-management planning, in accordance with applicable review and referral procedures.
		7.21.3	Allow for infrastructure access, such as transmission lines and pipelines, outside Recommend Conservation Zones, subject to environmental review processes.
		7.21.4	Consider concerns for safety, the environment, and economic viability in the determination of appropriate access.
7.22	Ensure security of mineral and energy resource tenures.	7.22.1	All mineral tenures outside of Recommend Conservation Zones are secure, providing the holder complies with applicable Acts and Regulations.

7.23 Minimize impacts to the land base and meet environmental regulatory standards.	7.23.1 All proposals (including restoration and closure) will follow the procedures for environmental assessment applicable to the size and type of project. 7.23.2 Reclaim "orphaned" sites in cases of environmental hazard or threat to public safety. This strategy would be the responsibility of government. 7.23.3 Control traffic on new roads, and deactivate and restore according to existing policy and legislative requirements and access-management directions in the Plan. 7.23.4 Monitor exploration sites for compliance with environmental standards for activities on site.
BEST MANAGEMENT PRACTICES – MINERAL RESOURCES	• *Best management practices specifically for the mineral sector in the Yukon have not yet been developed. However, BMPs from other sectors (e.g., oil and gas industry) are often applicable.* • *Memorandums of Understanding (MOUs) should be drafted between mineral exploration and development companies and regional big-game outfitters, trappers, and tourism operators before substantial fieldwork begins. These MOUs should be updated yearly or as needed.*
INDICATORS	• *Indicators to be determined through future research and plan implementation.*

POLICY RECOMMENDATIONS	• *In light of the impossibility of balancing other land uses and ecological values with the massive transportation, processing, and extraction infrastructures associated with coal mining, coal mining should not be considered within the region.* • *Prioritize research, public consultation and government policy development on coal as an energy source within the Region. This policy will consider economic, environmental and social implications of Yukon's energy choices (refer to Energy Strategy for Yukon, January 2009)* • *Significant consultation with Yukon residents and especially with residents of communities around the region should occur prior to development of uranium deposits.*

RESEARCH RECOMMENDATIONS	• *Further research into reclamation of surface disturbance with open-cast mining techniques in areas underlain with permafrost*

5.8.5 Oil and Gas Resources

The Plan is intended to assist in establishing land-use certainty for oil and gas activities. While oil and gas activity in the region is currently low, the region holds moderate oil and significant natural gas potential. Access to pipeline infrastructure is considered to be a major factor limiting natural gas development in this region.

Among the key issues related to oil and gas exploration/development activities:

- Oil and gas exploration and development activities and associated land uses (transportation, gravel extraction, and water withdrawal) can cause cumulative and adverse change over large landscapes.

- Impacts could affect valued ecological resources, including the Porcupine caribou herd and other caribou populations, moose, marten, wetlands, lakes, and rivers.

- The construction and ongoing operations of large-scale oil and gas infrastructure would bring many new workers to the region.

- Coordinated and effective management of the various caribou habitats and populations requires an integrated management approach, in advance of increasing industrial land use.

- Land-use conflicts might arise between oil and gas exploration and development and: (i) wilderness/cultural tourism, (ii) traditional economic activities and cultural pursuits, and (iii) use of winter range and movement of caribou, including the Porcupine caribou herd.

- Improper oil and gas drilling waste materials or their disposal can have negative impacts.

- Almost all projected oil and gas operations occur on terrain underlain with permafrost. Damage to permafrost could result in dramatic changes in hydrology and slope failures.

- Some oil and gas basins are poorly understood and very inaccessible.

- Oil and gas exploration can proceed with winter road or air access. However, development of these resources requires all-season roads and pipelines.

Specific recommendations relating to the management of oil and gas exploration and development activities are not required at this time, as there are well-established management practices available within the Yukon government. Current standard oil and gas industry practices have a much smaller footprint and impact on ecological values than historical practices, and significantly reduce the potential for major long-term impacts. Given anticipated low levels of activity based upon industry analyses (Fakete, 2005) and little overlap with tourism values, big-game outfitting activities and key habitats, current site-

specific best management practices and recommended Plan strategies and zoning should be adequate to mitigate potential impacts of oil and gas activity.

Desired Future State oil and gas exploration and development activities

- An economically and environmentally sound energy industry that provides long-term benefits to the local community.
- Certainty of access to support a viable exploration industry.
- Responsible energy projects approved in an efficient and timely manner and carried out with high standards of environmental management, including access and well-site reclamation.

OBJECTIVES		**STRATEGIES**	
7.24	Provide a secure land base to support the exploration and development of energy resources.	7.24.1	At all levels of planning, provide management direction that is clear, practical, and economically feasible.
7.25	Provide opportunities for appropriate access for exploration and development.	7.25.1	To the extent possible, coordinate operational time windows for energy exploration and development and associated access needs with the needs of other resource values, such as wildlife habitat and existing commercial activities.
		7.25.2	Consult energy tenure holders or industry representatives as well as relevant First Nations and stakeholder/interest groups during government access-management and deactivation planning, in accordance with applicable review and referral procedures.
		7.25.3	Allow for infrastructure access such as transmission lines and pipelines outside Protected Areas, subject to environmental review processes.
		7.25.4	Consider concerns for safety, the environment, and economic viability in the determination of appropriate access.
7.26	Ensure security of mineral and energy resource tenures.	7.26.1	All energy tenures outside of Protected Areas are secure, providing holder complies with applicable Acts and Regulations.
7.27	Minimize impacts to the land base and meet environmental regulatory standards.	7.27.1	All proposals (including reclamation and closure) will follow the procedures for environmental assessment applicable to the size and type of project.
		7.27.2	Reclaim "orphaned" sites in cases of environmental hazard or threat to public safety. This strategy would be the responsibility of government.
		7.27.3	Control traffic on new roads, and deactivate and restore according to existing policy and legislative requirements and access-management directions in the plan.
		7.27.4	Monitor exploration sites for compliance with environmental standards for activities on site.
7.28	Improve the understanding of geological resources to support the discovery and development of mineral and energy resources and for informed resource-management decision making.	7.28.1	Maintain and upgrade the territorial geoscience databases for assisting mineral and energy exploration and for land-planning decision making.
		7.28.2	Encourage studies (e.g., scientific research, geological mapping, geochemical and geophysical programs, extraction and reclamation technological advances, technical workshops, and prospector training) to support opportunities for geological-resource discovery and development and for informed resource-management decision making.
BEST MANAGEMENT PRACTICES – OIL AND GAS		• *Best management practices have been developed specifically for the oil and gas sector in the Yukon.* • *Memorandums of Understanding (MOUs) or similar*	

	documents should be drafted between oil and gas proponents and the First Nation(s) whose traditional territory is involved in potential exploration or development.
INDICATORS	• *Indicators to be determined through future research and plan implementation.*

POLICY RECOMMENDATIONS	• *Significant consultation with Yukon residents and especially with residents of communities around the region should occur prior to development of coal-bed methane deposits.*

RESEARCH RECOMMENDATIONS	• *Impacts of linear features and infrastructure on wildlife populations (e.g., Porcupine caribou herd) should be determined.* • *The relationship between the rate of revegetation of disturbed areas, time since disturbance, and biophysical characterization should be determined to track footprint and linear-density levels.*

5.8.6 Aggregate (Gravel) Resources

Gravel is an important but scarce resource in the Peel region. Several existing gravel pits supply the requirements of the Dempster Highway, many within one kilometre of the highway.

Aggregate along the portion of the Dempster Highway within the planning region is in limited supply, largely because of the unique glacial history of the area.

The oil and gas and transportation sectors anticipate that substantial volumes of aggregate will be required to support the development of industrial infrastructure, particularly for road development. These future requirements would be in addition to existing required volumes utilized by Dempster Highway maintenance and upgrades.

A regional aggregate assessment has not been completed outside of the Dempster Highway corridor. However, there is an ongoing aggregate mapping project in the region. Until the results of this project are released, there is little aggregate mapping available. Potential sources of new aggregate materials are high terraces above rivers, exposed ridges and bedrock, and dry river/creek beds. Some river valleys offer potential sources of aggregate but also contain some of the most important ecological and cultural values in the region.

Key issues related to aggregate extraction activities:

- Obtaining required volumes of aggregate to support regional infrastructure development may disturb large areas of land, in some cases nearly as large as the direct infrastructure footprint itself.
- Impacts from activities on ecological, socio-cultural, and economic values include long-term habitat disturbance and visual impacts.
- Land-use conflicts might arise between aggregate extraction activities and: (i) wilderness/cultural tourism, (ii) traditional economic activities and cultural pursuits, and (iii) various ecological values.

BEST MANAGEMENT PRACTICES – AGGREGATE EXTRACTION	• *To minimize potential impacts to regional fish populations, aggregate (gravel) mining should be prohibited where it might affect significant fish habitats.* • *Minimize gravel requirements for necessary infrastructure through coordinated access, feature reduction, and geo-technical engineering.* • *Ensure efficient use of identified aggregate resources.*

RESEARCH RECOMMENDATION	• *To mitigate potential impacts on significant and/or sensitive ecological or cultural resources and values, the identification and mapping of potential sources of aggregate should be continued.*

5.8.7 Forest Resources

There is very limited or no commercial forestry potential and interest in the region. Management of forest resources for fuelwood and building materials is a local issue for the residents of Fort McPherson, especially those with cabins or camps upstream. Forest harvesting generally occurs along the Peel and Satah river corridors. Future developments may also use building materials derived from local wood. The southwest portion of the region falls within a forest management area. The forest management committee charged with this region has thus far designated it as a Hinterland Forest Zone, implying it has no commercial potential beyond local uses.

Key issues related to forest management and community harvest:

- Securing an adequate and accessible long-term wood supply for cabins, and camps.
- Trees grow very slowly in the region.
- Extensive commercial harvesting could impact other land users.

The Plan does not directly address forest-management or forest-harvesting strategies and did not consider best management practices for community forest-harvesting activities.

5.8.8. Renewable Energy

Through the Northern Canada Power Commission, a potential large-scale hydro site was identified in the planning region in the 1960s and 70s at Aberdeen Canyon. Given the scale of the conceptual project, it is not likely to be economic.

Key issues related to renewable energy production:

- Most potential mine developments will require a local power source. Probable alternatives for all but the largest mines include costly and polluting combustion of diesel fuel or hydrologically-disruptive hydroelectric power.

POLICY RECOMMENDATION	• *Given the strong interests in maintaining unaltered water quality and quantity in the Peel watershed, large and medium-scale hydroelectric projects should not occur.*

Addressing renewable energy issues was not a major focus of the Plan.