

# **MIGRATORY BIRDS AND IMPORTANT BIRD AREAS**

*TECHNICAL REVIEW OF THE MACKENZIE GAS  
PROJECT ENVIRONMENTAL IMPACT STATEMENT*

**NATURE CANADA**

**JUNE 2005**

This report was prepared for Nature Canada by Caroline Schultz and Stephen Hazell of Ecovision Inc. with the financial support of the Mackenzie Gas Project Public Participation Program of the Canadian Environmental Assessment Agency.

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## I. INTRODUCTION

Nature Canada is a non-profit and charitable organization, founded in 1939, with a supporter base of approximately 40,000 individuals across Canada. Its mission is to protect nature, its diversity and the processes that sustain it. Nature Canada has for more than a decade strategically promoted the permanent protection of more than 200,000 square kilometres of Canadian wildlands. More recently, Nature Canada has led in calling attention to Canada's national wildlife areas (NWAs) and migratory bird sanctuaries (MBSs) – their ecological importance, deficiencies in investment and management, and associated declines in site ecological integrity. We have also worked closely with Bird Studies Canada in the identification of nearly 600 Important Bird Areas (IBAs) in Canada, and have provided funds in support of the stewardship of approximately 100 of these sites. These areas are nationally to internationally significant in terms of providing critical bird habitat.

This report by Nature Canada is a technical review of the adequacy of the Mackenzie Gas Project environmental impact statement (EIS) and additional information volumes in addressing birds and their habitat. The report is intended to assist the Joint Review Panel in addressing identified gaps and deficiencies in environmental assessment information relating to migratory birds and habitat.

The report focuses on four main areas of concern to Nature Canada that emerged from its review of the Mackenzie Gas Project Environmental Impact Statement (EIS) in relation to migratory birds, as follows:

1. The EIS did not follow the Migratory Birds Environmental Assessment Guideline which was produced by Environment Canada as a guide to best practice in environmental assessment of migratory birds (Milko, 1998).
2. Other than bird species selected as wildlife valued components (VCs), the only other birds addressed were species at risk listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the Northwest Territories or Alberta. Species identified as conservation priorities nationally and/or continentally such as shorebirds in the Canadian Shorebird Conservation Plan (Donaldson et al. 2000) were not considered.
3. The species selected as VCs to act as surrogates for other wildlife failed to adequately address the requirements of significant bird species.
4. Important Bird Areas (IBAs) – internationally significant areas of critical bird habitat – were not documented nor were potential impacts on these areas assessed in the EIS.

The Nature Canada report briefly addresses the first three concerns, primarily to highlight gaps in the EIS. It provides a compilation of bird species of documented conservation concern known from the study area and outside the study area that are at risk of being impacted by the Project. Important Bird Areas which hold highly significant concentrations of birds and are thus vulnerable to direct disturbance and/or habitat loss or disruption are described in relation to the Project and potential impacts discussed.

## II. MIGRATORY BIRDS AND ENVIRONMENTAL ASSESSMENT

In 1998, Environment Canada published the Migratory Birds Environmental Assessment Guideline (the Guideline) to promote best practices for environmental assessment under the Canadian Environmental Assessment Act. The Guideline identifies for proponents of projects the types of information and analyses that Environment Canada would expect in the section of an Environmental Impact Statement that deals with impacts on migratory birds (Milko, 1998).

The Guideline describes the contextual and specific information requirements that should be in an EIS and the expected approach to assessing and dealing with environmental effects. The Guideline is comprehensive and must be followed to ensure that environmental impact assessments deal effectively with migratory birds and their habitats.

The guideline provides details in two main sections – Information Requirements and Environmental Effects. Key parts of the guideline are excerpted and italicized below.

### **Information Requirements**

The guideline specifies that when providing information, proponents should give particular consideration to migratory birds or habitat that meet any of the following criteria:

- *Species listed or under review by the Committee on the Status of Endangered Wildlife in Canada or species-at-risk listings in other jurisdictions;*
- *Areas of concentration of migratory birds, such as breeding areas, colonies, spring and fall staging areas, and wintering areas;*
- *Breeding and nesting areas of species low in number and high in the food chain (e.g. eagles and osprey);*
- *Species that are identified by priority ranking systems;*
- *Habitats in or near areas that have been or are in the process of being identified by land managers as particularly important to the survival of the species globally, regionally, or locally, or habitats valued by local users of the resource. These include, but are not limited to, areas with the following existing, proposed, or potential designations:*
  - *Migratory Bird Sanctuaries*
  - *National Wildlife Areas*
  - *Western Hemisphere Shorebird Reserve Network sites*
  - *Ramsar (Convention on Wetlands of International Importance Especially as Waterfowl Habitat or Ramsar Convention) sites*
  - **Important Bird Areas (IBA)**
  - *National Parks and other types of protected areas that have been established, in part, to protect migratory birds and their habitat.*

Specific information requested for migratory birds will depend, in part, on the scale of the proposed project or activity and the projected degree of impact. For example, the significance of the impact is viewed as higher if priority species or critical habitat used by birds could be affected. The regional environmental assessment practitioner of the Environmental Conservation Service of Environment Canada (ECS/EC) can provide guidance on how to obtain the specific information required and may be able to identify information sources to assist in carrying out the environmental assessment. The information identified below is generally required for an understanding of the potential impacts of a proposed project.

- *A complete project description including engineering details should be provided. This information should be provided or discussed at the earliest stage of planning to allow for modification of the project design prior to major commitments by the proponent.*
- *The geographic boundaries of the environmental effects of the proposed project must be identified (referred to hereafter as the “impact area”). The boundaries should encompass the geographic extent of the ecological processes and ecosystem components that would be affected by the project and that could potentially affect migratory birds or their habitat. Effects to consider are the mobile nature of migratory birds, their varied habitat requirements (e.g., foraging, nesting, and staging habitats), and the seasonal use of habitats. It is critical that the boundaries of the impact area be agreed to by the proponent and environmental assessment practitioners early in the planning stage.*
- *A description of the potentially affected impact area will be required. The description should address the terrain, biological settings, and land use in the area. Particular attention should be paid to habitat requirements of the migratory birds in the impact area.*
- *Maps or GIS systems that accurately locate the impact area and baseline information should be provided at the same scale as the engineering plans to allow for overlaying of maps. Maps should contain UTM coordinates or other identifying parameters.*
- *Species of migratory birds likely to be affected by the proposed project should be identified along with their seasonal occurrence, relative or absolute abundance, and population trends.*
- *The distribution of the species in the impact area with respect to habitat types (i.e., nesting, staging, feeding, and winter habitat) should be identified. Any variation in habitat use due to seasonality, or climatic or other conditions should also be described.*
- *If the potential impact area is an area of particular importance to migratory birds (e.g., containing a high abundance, high diversity, priority species, or*

*species at risk) in any season, or if it could potentially be an area of importance during periods of environmental stress (e.g., drought), then it should be identified and described. The abundance and diversity of habitats important to migratory birds relative to other elements in the regional landscape should be quantified.*

- *The habitat types expected to be affected by the proposed project should be described. The critical habitat requirements of priority species should be described.*
- *Any known or hypothesized minimal area requirements for any of the species that could be affected by the proposed project should be described.*
- *Any species or subspecies in the impact area for which there may be special genetic considerations should be identified: for example, a species at the edge of its range or a subpopulation that winters in different locales than the rest of the population. The genetic considerations should be described.*
- *Species in the impact area that have limited abundance outside the impact area should be identified. The reasons for this specificity to, or particular abundance in, the impact area should be described. For example, is it the result of biogeographic considerations or previous changes or impacts in the regional landscape outside the impact area? Species with high abundance in the impact area should also be identified.*
- *The proponent should describe the relative abundance and use of migratory bird habitats in the impact area compared to similar habitats in the regional landscape that will not be affected by the proposed project. (This identifies the uniqueness and relative use of the habitat regionally and identifies potential control sites for monitoring environmental effects.)*
- *If the impact area is known to be habitat for successfully breeding sensitive species or to have the characteristics of such a site, this should be identified. This is particularly important for landbirds in landscapes that have a relatively high degree of fragmentation.*
- *When identifying migratory birds and habitat that could be affected and for which information is provided, the food sources and/or feeding areas for migratory birds that could be disrupted by the proposed project should be identified.*
- *The degree of confidence in the accuracy of the information that is presented in the EIS should be described. Ground-truthing may be required.*

## **Environmental Effects**

The Guideline describes some general considerations for environmental effects and also describes a number of specific considerations as follows:

*Environmental effects, whether direct impacts or due to modification of habitat, should:*

- *be considered at individual species and community levels;*
- *consider any potential increase in competition with other species of birds or other animals as a result of habitat change;*
- *consider increased potential for predation or brood parasitism; and*
- *consider any quantitative or qualitative (e.g., contaminants, species shifts) changes to food sources.*

*When determining impacts, proponent should consider disturbances, such as:*

- *noise (i.e., frequency, duration, and intensity);*
- *structures that could become obstructions (e.g., hydro towers and lines);*
- *visual changes (e.g., lighting); and*
- *use by humans.*

*Proponents should determine impacts on:*

- *abundance;*
- *density;*
- *distribution; and*
- *reproductive success*

In addition to the specific effects outlined above, the Guideline also addresses cumulative effects and states that baseline information should describe the environment without any development, and elucidate and quantify the natural changes inherent in ecosystems. The Guideline specifies that the EIS should examine how migratory bird populations responded to stresses in the past as it may be useful in the prediction of the effects of a particular stress associated with the proposed project. However, the EIS should address the fact that some species may have threshold population levels below which reproductive capacity and immigration are not able to overcome stresses from adverse environmental effects.

The Guideline also outlines appropriate mitigation approaches including project relocation and timing of construction and other activities. It highlights the need to avoid activities during critical periods of migratory bird life cycles such as nesting and staging. Mitigation should be considered for each of the environmental effects predicted according to the list above but consideration must be given to the complex nature of ecosystems and the interactions of ecosystem components and stressors to the ecosystem. The Guideline also notes that mitigation measures for single or groups of migratory bird

species have the potential to have negative consequences for other wildlife and *vice versa*.

The Mackenzie Gas Project EIS did not reference or follow the Guideline and is deficient in many of the areas highlighted in the Guideline. This report focuses on two areas that fall under Information Requirements in the Guideline: (1) species identified by priority ranking systems; and (2) Important Bird Areas (which by definition also encompass *areas of concentration of migratory birds, such as breeding areas, colonies, spring and fall staging areas, and wintering areas that support numbers of birds above internationally-agreed thresholds* specified in the Guideline).

### **III. BIRD SPECIES OF CONCERN AND WILDLIFE VALUED COMPONENTS**

Bird species of concern include those listed by the Committee on the Status of Endangered Wildlife in Canada, the Government of the Northwest Territories and the Government of Alberta. These species are listed in the EIS (Volume 5; Section 10). In addition, there have been extensive efforts to set conservation priorities amongst all bird species through a number of collaborative national and North American initiatives. These include the North American Waterfowl Management Plan (NAWMP), the Canadian Shorebird Conservation Plan (Donaldson et al. 2000), Partners in Flight (for landbirds) (Rich et al. 2004), and Canada's Waterbird Conservation Plan (for seabirds, colonial waterbirds and non-shorebird, non-waterfowl wetland related species) (Milko et al. 2003). All of these plans come under the umbrella of the North American Bird Conservation Initiative (NABCI) which promotes integrated conservation of all birds in Canada, the United States and Mexico (<http://www.nabci.net/>).

Bird species are identified as requiring particular conservation attention primarily because of known population declines, limited distribution and low relative abundance or known or suspected threats (either to the birds directly or to habitat). Any proposed development activity or change in land use should address the potential effects on those priority species that require conservation attention to assess potential impacts on the overall population and establish appropriate monitoring.

Following is a summary of the species of conservation concern for shorebirds, waterfowl and landbirds. As none of the birds covered by Canada's Waterbird Conservation Plan known from the Mackenzie Gas Project Regional Study Area are of particular concern, no summary is provided for this group.

#### **1. Shorebirds**

Shorebirds are a highly significant component of the avifauna in the Regional Study Area, particularly in the tundra which provides the breeding grounds for a number of species. For 15 shorebird species, nesting is confined to the Arctic and sub-Arctic and

Canada accounts for more than 75% of North American Breeding Range. Canada thus has a strong jurisdictional responsibility to conserve many species of shorebirds. Canada supplies 100% of the breeding range for several of the important shorebird species found in the Regional Study Area, including American Golden-Plover, Whimbrel and Hudsonian Godwit.

Data collected over the past 10 to 25 years indicates that many shorebird populations are in decline (Morrison et al. 2001). A number of Arctic breeding species such as Hudsonian Godwit and Whimbrel are showing significant declines. Although there are likely to be multiple reasons for these declines, disturbance on nesting grounds is an important concern as is disturbance and loss of habitat at key migratory stopovers.

Twenty-five shorebird species have been observed in the Local and Regional Study Areas of the Mackenzie Gas Project. These species and their conservation priority categories are listed below:

	<b>Local Study Area</b>	<b>Regional Study Area</b>	<b>Conservation Priority Category*</b>
American Golden-Plover	X	X	4
Semipalmated Plover	X	X	2
Killdeer	X	X	3
Greater Yellowlegs	X	X	3
Lesser Yellowlegs	X	X	2
Solitary Sandpiper	X	X	3
Wandering Tattler		X	3
Spotted Sandpiper	X	X	3
Upland Sandpiper	X	X	2
Eskimo Curlew		X	5
Whimbrel	X	X	4
Hudsonian Godwit	X	X	4
Ruddy Turnstone		X	4
Semipalmated Sandpiper	X	X	3
Least Sandpiper	X	X	3
White-rumped Sandpiper	X	X	2
Baird's Sandpiper	X	X	2
Pectoral Sandpiper	X	X	2
Dunlin	X	X	3
Stilt Sandpiper	X	X	3
Long-billed Dowitcher	X	X	2
Wilson's Snipe	X	X	3
Wilson's Phalarope	X	X	4
Red-necked Phalarope	X	X	3
Red Phalarope	X	X	3

\* : Priority Categories identified in the Canadian Shorebird Conservation Plan. 5 = Highly Imperiled; 4 = Species of High Concern; 3 = Species of Moderate Concern; 2 = Species of Low Concern; 1 = Species Not at Risk . (Donaldson et al. 2000).

One species known from the Regional Study Area, Eskimo Curlew, is Highly Imperiled and listed as Endangered by COSEWIC and Critically Endangered by the World Conservation Union (IUCN) which produced the official global list of species at risk of extinction (BirdLife International, 2000).

Five species – American Golden-Plover, Whimbrel, Hudsonian Godwit, Ruddy Turnstone and Wilson’s Phalarope – are all Species of High Concern. American Golden-Plover and Ruddy Turnstone are at risk because of population declines, low relative abundance and threat. Whimbrel is at risk because of population decline. Hudsonian Godwit is considered at risk because of low relative abundance and threat. Wilson’s Phalarope is at risk because of population decline.

Twelve species are considered to be species of moderate concern. Killdeer, Semipalmated Sandpiper, Dunlin, Red-necked Phalarope and Red Phalarope are all declining with moderate threats or distributions. Greater Yellowlegs, Solitary Sandpiper, Wandering Tattler, Spotted Sandpiper and Stilt Sandpiper have stable populations but have known or potential threats and moderate to restricted distributions. Least Sandpiper and Wilson’s Snipe are declining but have no other known threats.

Six species – Semipalmated Plover, Lesser Yellowlegs, White-rumped Sandpiper, Baird’s Sandpiper, Pectoral Sandpiper and Long-billed Dowitcher – are all Species of Low Concern. None of the species listed for the Regional or Local Study Areas are considered to be Species Not at Risk.

Several species on the above list represent occasional sighting of species for which the Regional Study Area is peripheral to their North American range. For other species, the Regional Study Area represents a small part of an extensive range (e.g. the breeding range of Wilson’s Snipe extends across most of the northern States, includes all provinces apart from Northern Quebec and the northern tip of Labrador, and all of Yukon and NWT and part of Nunuvut). **However, for a number of species including Hudsonian Godwit, American Golden-Plover, Whimbrel, Red Phalarope, Dunlin, Long-billed Dowitcher and Semipalmated Sandpiper, have ranges for which the Regional Study Area comprises an important part of their range.** It is essential to document populations and habitat and potential development impacts for each such species that are categorized as being of High or Moderate Conservation concern rather than use a single shorebird species as a surrogate VC – Whimbrel in the case of the Production Area and Lesser Yellowlegs in the case of the Pipeline Corridor.

**It is critically important to note that the last documented sighting of the Eskimo Curlew was in the Kendall Island Bird Sanctuary (Gollop et al. 1986). It is crucial that it be assumed that the species is extant and there be absolutely no impact of development on probable breeding habitat.**

### *Wildlife Valued Components*

Only two shorebird species were selected as Wildlife Valued Components (VCs) in the Mackenzie Gas Project EIS. Whimbrel was the VC chosen as the surrogate for shorebirds in the tundra and Lesser Yellowlegs was chosen as the VC for the boreal forest of the Pipeline Corridor. Detailed analysis of the validity of the Wildlife Valued Components approach and the adequacy of the selected shorebird VCs to act as surrogates for other shorebirds is beyond the scope of this report. However, the information provided in the EIS to support the selection of Whimbrel and Lesser Yellowlegs is inadequate. The EIS should include detailed assessment of life histories and habitat requirements of the chosen VCs and of all shorebird species of conservation concern noted above to identify specifically which species requirements can be adequately addressed through the assessment of VCs and which can not.

## **2. Waterfowl**

Waterfowl are a significant concern in assessing potential impacts of the Mackenzie Gas Project. The Mackenzie River Delta is one of two areas of major waterfowl concern identified in the NWT (NAWMP, 1998) and the adjacent Beaufort Sea and Mackenzie River watershed also contain critical breeding, moulting and migration habitat for a number of waterfowl species.

Waterfowl occur in large aggregations at various locations within the Project's Regional and Local Study Areas and several of these areas support globally significant numbers of waterfowl. These areas will be discussed in Section V. There is also concern for several species of waterfowl because of documented long-term declines. Of these, the sea ducks are a particular concern and the Mackenzie Valley and Delta and Beaufort Sea provide breeding and migratory habitat for several species of concern.

North American sea ducks breed primarily throughout the northern regions of the continent. Basic biological information is very limited for some species and reliable population indices or estimates of annual productivity are lacking for all 15 sea duck species, including those that occur in the Mackenzie River and Delta area (NAWMP, 1998). Although breeding habitat conditions for most sea duck species has not changed in recent years, industrial development in key areas such as the Mackenzie River and Delta and associated off shore development in the Beaufort Sea could have a substantial deleterious impact on populations of certain sea ducks, particularly Common Eider, King Eider, Long-tailed Duck and Surf and White-winged Scoters that concentrate in the area. The EIS only addresses potential impacts on marine mammals in the Beaufort Marine Area Regional Study Area identified in the EIS. It should also have addressed significant waterfowl populations both in the Beaufort Marine Area and additional marine areas that are subject to accelerated offshore development that may result from the Pipeline being built.

Other waterfowl species of concern are the boreal-nesting Greater and Lesser Scaup, both of which are diving ducks that have also undergone serious declines. However, as selected Wildlife Valued Components scaup are addressed adequately in the EIS.

*Eider*

Common Eiders are closely tied to marine habitats. They breed and nest in colonies along marine coasts, mostly on islands or islets and occasionally on islands in freshwater. Common Eider in western Canada are the Pacific race (*Somateria mollissima v-nigra*) which is estimated to be around 100,000 birds. They breed from Coronation Gulf in the Mackenzie District of the NWT to the south side of the Alaskan peninsula. Sharp declines of 50-90% have been observed over the past 25 years on the western Alaska and Canadian breeding grounds (Suydam et al. 2000.) Common Eiders are found in large concentrations in the Beaufort Sea immediately south of heavy Arctic ice and in open leads offshore from the Mackenzie Delta during their eastward spring migration. Because they aggregate they are susceptible to disturbance and environmental threats such as oil spills (Sea Duck Joint Venture, 2004a.) Satellite telemetry studies are underway to identify migration routes and links between breeding and wintering areas. Given the population decline of this species such information is vital particularly in areas subject to accelerated development such as offshore oil and gas in the Beaufort Sea. Any development, including the Mackenzie Gas Project, must ensure no impact on the eider population and impact assessment must address indirect effects the pipeline may have on increasing development pressure in the Beaufort Sea by providing access to consumers in the south.

King Eiders are long distance travelers that migrate in flocks, sometimes with more than 10,000 birds (Sea Duck Joint Venture, 2004b) and are found in significant concentrations offshore from the Mackenzie Delta while on spring migration. They may occasionally suffer mass starvation during spring migration when weather conditions are adverse or there is insufficient open water. An estimated 100,000 died in the Beaufort Sea in 1964 as a result of such factors. Although mass mortality of this nature may be a key mechanism for regulating population size, added factors such as harvesting and environmental disturbance and threats could have a devastating impact on the King Eider population. Satellite telemetry is being used to identify the migration corridors and habitats along the Beaufort Sea coast because of the threat that offshore oil and gas development poses to migrating eiders.

*Long-tailed Duck*

Long-tailed Ducks spend most of the year in coastal marine waters but in breeding season are found in shallow wetlands of low-lying tundra south to the northern edge of the boreal forest (Sea Duck Joint Venture, 2003a.) Nests are built along the Arctic coasts and inland tundra on dry ground close to water. Long-tailed Ducks breed within the Regional Study Area of the Mackenzie Gas Project. They are susceptible to habitat alteration and oil spills and disturbance in marine areas. The Breeding Population and Habitat Survey conducted by the Canadian Wildlife Service and the U.S. Fish and Wildlife Service shows that breeding populations of Long-tailed Ducks have declined about 80 per cent since the survey began in 1957 based on surveys in a small portion of their breeding range in Alaska and northwestern Canada. Despite the decline, it is still the most abundant Arctic sea duck and populations appear to have stabilized since the early 1990s. Nonetheless, a species that has suffered large decline requires careful monitoring and

particular consideration when activities or developments are proposed that may have an impact.

### *Scoter*

Two scoter species are of conservation concern. White-winged Scoters nest on freshwater and brackish lakes in the boreal forests of northwestern Canada and males leave the females shortly after egg-laying begins to migrate to moulting grounds (Sea Duck Joint Venture, 2003). Surf Scoters nest near shallow lakes throughout the boreal forest in the NWT and Alaska. Most Surf Scoters undergo wing moult on the coast and major concentrations are found in the Beaufort Sea (Sea Duck Joint Venture, 2004).

The North American Waterfowl Breeding Survey combines Surf and White-winged Scoters as it is very difficult to distinguish between the females of the two species. The continental population of scoters has declined by more than 58% since 1978. Analyses of correlations between declining scaup and scoter populations suggest that these birds share limiting factors in the Northwest Territories. Historically over 65% of the breeding population of scoters occurred in the NWT with the Lower Mackenzie watershed providing a substantial proportion of their breeding range. Declines within the Lower Mackenzie watershed over the past 24 years are close to 70%. Concerns for both White-winged and Surf Scoters within the Regional Study Area and offshore areas along the coast relate to impacts of development in breeding areas within the boreal forest zone and coastal moulting areas. Moulting waterfowl are flightless for up to one month during the moult and must rely on resources available in a very restricted area during that time. Disturbance or impact on resources can have a deleterious effect at this vulnerable stage in their annual cycle.

Combined White-winged and Surf Scoter populations have experienced apparent long-term declines across the continent, and those populations in the boreal forest of northern Alberta, British Columbia, and the Northwest Territories (NT) may have declined by as much as 75% in the past 50 years. The main objective of the study is to evaluate how specific wetland characteristics affect the abundance, distribution, and productivity of White-winged (*Melanitta fusca*) and Surf Scoters (*M. perspicillata*) in the part of their core breeding range near Inuvik, NT. In particular, this research has been designed to look for evidence of habitat selection by these species.

### *Wildlife Valued Components*

Four waterfowl species were selected as Wildlife Valued Components to act as surrogates for waterfowl in the EIS. There were the Greater White-fronted Goose, Tundra Swan, Greater and Lesser Scaup in the tundra and Greater and Lesser Scaup in the boreal forest of the Pipeline Corridor. Detailed analysis of the validity of the Wildlife Valued Components approach and the adequacy of the selected waterfowl VCs to act as surrogates for other shorebirds is beyond the scope of this report. However, the information provided in the EIS to support the adequacy of the waterfowl selected as VCs as surrogates for other waterfowl species is insufficient. The EIS should include detailed assessment of life histories and habitat requirements of the chosen VCs and of all waterfowl species of conservation concern noted above as well as waterfowl species that

occur in large concentration that may be impacted by the Project to identify which species can be adequately addressed through the assessment of VCs and which can not.

### **3. Landbirds**

The North American Landbird Conservation Plan, which identifies landbird conservation priorities for Canada and the United States as well as parts of Mexico, lists species that require immediate management action, management, or long-term planning and responsibility in each of six avifaunal biomes that occur in Canada (Rich et al. 2004). The Regional Study Area for the Mackenzie Gas Project falls in two of these avifaunal biomes – the Arctic Avifaunal Biome and the Northern Forest Avifaunal Biome.

Landbird species that are known from the Regional and Local Study Areas and require conservation attention are listed in Table 3.1. Species denoted with the letter “A” require management to achieve continental population objectives which may be to maintain the existing population or increase it, in some cases as much as 100%. Species denoted by the letter “B” require long-term management and responsibility to achieve population objectives. The objective for most of such species is to maintain current continental populations. However, in some cases an increase in population is the indicated objective.

Table 3.1. Landbird Species in the Local and Regional Study Areas Requiring Conservation Attention.

	Local and Regional Study Areas*	
	Arctic Avifaunal Biome	Northern Forest Avifaunal Biome
Rough-legged Hawk	B	
Gyrfalcon	B	
Peregrine Falcon	B	
Spruce Grouse		B
Willow Ptarmigan	B	
Rock Ptarmigan	B	
Blue Grouse		A
Snowy Owl	B	
Short-eared Owl	A	
Yellow-bellied Sapsucker		B
Black-backed Woodpecker		B
Olive-sided Flycatcher		A
Yellow-bellied Flycatcher		B
Alder Flycatcher		B
Northern Shrike		B
Blue-headed Vireo		B
Philadelphia Vireo		B
Gray Jay		B
Boreal Chickadee		A
Bohemian Waxwing		B
Magnolia Warbler		B
Cape May Warbler		B
Bay-breasted Warbler		A
Lincoln's Sparrow		B
Swamp Sparrow		B
White-throated Sparrow		B
Harris's Sparrow	A	A
Lapland Longspur	B	
Smith's Longspur		B
Snow Bunting	B	
Rusty Blackbird		A
Pine Grosbeak		B
White-winged Crossbill		B
Hoary Redpoll	B	

\*: Species lists provided by Environment Canada for the Local and Regional Study Areas are identical.

The principle landbird species that warrant individual attention in assessing the impact of the Mackenzie Gas Project are those that come under the Management action category. These are Harris's Sparrow, Short-eared Owl (also listed as Special Concern by

COSEWIC), Bay-breasted Warbler, Boreal Chickadee, Rusty Blackbird, Olive-sided Flycatcher and Blue Grouse.

Harris's Sparrow uses shrublands, primarily transitional habitat between the tree line and tundra (Norment & Shackelton, 1993). The greatest threats to this species are on its wintering grounds in the Prairies and long term habitat change due to climate change.

Short-eared Owl uses low elevation tundra. Changes in sea level, changes in surface hydrology and an increase in shrub habitat are all threats in low elevation areas (Holt & Leasure, 1993).

Bay-breasted Warbler, Boreal chickadee, Rusty Blackbird, Olive-sided Flycatcher and Blue Grouse all use coniferous forest as their primary habitat. However, these and other species that use coniferous forest vary widely in preference for age and density of forest, degree of association with wet areas, and tolerance of deciduous or mixed forests. For instance, Rusty Blackbirds, which have undergone significant population declines, have a close association with wetland areas and are found along streams, fens, beaver ponds, bogs, and muskeg swamps while Boreal Chickadee show a preference for spruce and fir forests, particularly white spruce (Greenberg & Droege, 1999; Ficken et al. 1996; Avery, 1995; [www.borealbirds.org](http://www.borealbirds.org)).

#### *Wildlife Valued Components*

Two landbirds were selected as Wildlife Valued Components. The Peregrine Falcon was selected as the VC for the tundra and the Boreal Chickadee as the VC for the boreal forest of the Pipeline Corridor. Detailed analysis of the validity of the Wildlife Valued Components approach and the adequacy of the selected landbird VCs to act as surrogates for other landbirds is beyond the scope of this report. However, the information provided in the EIS to support the selection of Boreal Chickadee and Peregrine Falcon is inadequate. The EIS should include detailed assessment of life histories and habitat requirements of the chosen VCs and of all landbird species of conservation concern noted above to identify specifically which species requirements can be adequately addressed through the assessment of VCs and which can not.

## **IV. IMPORTANT BIRD AREAS (IBAs)**

Important Bird Areas (IBAs) are internationally recognized sites providing essential habitat for one or more species of breeding or non-breeding birds. These sites may contain threatened species, endemic species, species representative of a biome<sup>1</sup>, or highly exceptional concentrations of birds. The goal of the IBA program is to identify, document and conserve a worldwide network of sites necessary to ensure the long-term viability of naturally occurring bird populations. Important Bird Areas have been identified in more than 100 countries worldwide ([www.birdlife.org.uk](http://www.birdlife.org.uk)).

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<sup>1</sup> A biome is defined as a distinctive regional ecological unit e.g. boreal forest.

## 1. Overview of the IBA Program

The first IBA program was initiated by BirdLife International in Europe during 1985 in response to the European Economic Community's request of BirdLife to produce a priority list of sites for protection in Europe. A directory to IBAs in Europe was published in 1989. Today, IBA programs are underway in Asia, Africa, Europe, Middle East, and the Americas. IBAs are widely recognized as priority sites for biodiversity conservation and are a substantive component of many countries' biodiversity conservation strategies and policies.

The Canadian IBA program was launched in 1996 by the Canadian Nature Federation (now Nature Canada) and Bird Studies Canada, the Canadian BirdLife partners, in conjunction with the launch of parallel programs in the United States and Mexico.

Sites were identified by Bird Studies Canada with the aid of a Technical Steering Committee, using a set of criteria that are consistent with other IBA programs throughout the world, while at the same time being applicable to the Canadian context. The Technical Steering Committee included representation from Bird Studies Canada, the Canadian Nature Federation, BirdLife International and the Canadian Wildlife Service. The IBA identification process involved a major partnership with the Canadian Wildlife Service which provided much of the data used to evaluate sites but also involved many other government and non-government partners.

As with other IBA programs around the world, the criteria are organized into four categories: 1) Threatened Species, 2) Restricted Range Species, 3) Biome-restricted/representative Species and 4) Congregatory Species. Each IBA is also identified as globally, continentally or nationally significant based on its documented bird populations measured against established population thresholds, the overall guideline being that a site qualifies at the appropriate level if it holds one or more species that meet or exceed 1% of the global, continental or national population for that species. Threshold numbers have also been established for groups of species such as waterfowl and are applied when population data are for a group of species (e.g., diving ducks) (see section on IBA Criteria and Population Thresholds below for details). If an IBA site falls under one or more of the four categories, the highest level of significance determines the overall significance. For instance, if a site is identified at the global level for a congregatory species and at the national level for a threatened species the site is identified as globally significant.

Data on 1,246 potential sites that were nominated for consideration as IBAs were evaluated over a four-year period. By April 2001, 597 of these were approved as IBAs by the Technical Steering Committee. To date, 518 IBAs have been identified under the congregatory species category; 168 under the threatened species category; and 16 under the restricted-range category. A single site may be identified under more than one category. It is important to note that assessment and identification of IBAs is ongoing process. As new data become available additional IBAs will be identified and the status of existing ones may change. Possible changes in status include significance (i.e. global,

continental, or national), addition of species which qualify the site as an IBA, or disqualification if data suggest that populations supported by a site no longer reach the minimum national threshold.

## **2. IBA Criteria and Population Thresholds**

The following information on IBA criteria and thresholds is for the congregatory species IBA category only as all IBAs within the Mackenzie Gas Project study areas are in this category.

Congregatory species are defined according to Wetlands International (Rose & Scott, 1997), as recommended by BirdLife International (1997). Included are species such as shearwaters, storm-petrels, gannets, auks, and pelicans. Terrestrial species that congregate during a portion of their life-cycle (e.g. raptors) are also included in this category.

The congregatory species category covers sites that are important because they hold large concentrations of birds during one or more seasons – either breeding, wintering or migratory season. Marine, lacustrine, terrestrial, and sites over which raptors concentrate are included. Sites can qualify for a single species or under the general congregatory thresholds at the global, continental and national levels as follows:

### **2.1. Single Species Congregations**

The site is known or thought to hold on average 1% or more of the biogeographical population of a species.

#### *Global*

The site is known or thought to hold 1% or more of the global or North American population of a species.

#### *Continental*

The site is known or thought to hold 1% or more of a continental biogeographical population of a species i.e. 1% or more of the population of a flyway or a subspecies or a recognized separate regional population.

#### *National*

The site is known or thought to hold 1% or more of the Canadian population of a species or 1% or more of the Canadian population of a flyway or otherwise separate population.

Biogeographical populations at the continental level are considered important because even though some of these species are widespread in their distribution, their populations rarely exchange members. There are two reasons for treating biogeographical populations separately. First, populations with little emigration and immigration are likely to have genetic differences and thus should be conserved from the standpoint of overall avian biodiversity. Second, populations in different areas often face different pressures on their

habitats and different alternatives for their conservation and management. The latter also applies for national level populations.

There is no fundamental biological reason why 1% should be used as a threshold. However, around the world other countries and programs have applied the 1% threshold and found it to afford an appropriate degree of protection through the identification of ecologically sensible sites. In addition, the 1% measure is proportional and is self-adjusting to rarity (i.e. species with small population sizes need fewer individuals to qualify).

Where differing estimates existed, either the lowest or an average estimate was used, whichever seemed appropriate for the species; this depended on the disparity between estimates, the date of the estimate and the quality of the source. In a small number of cases 0.75% or 0.50% of the global population was used as a threshold where no North American or national populations were known.

## **2.2. General Thresholds for Congregatory Species**

The thresholds in the following table come into use if there are several different species present in large numbers or if the population thresholds of individual species are unknown.

Table 2.2.1. General Thresholds for Congregatory Species

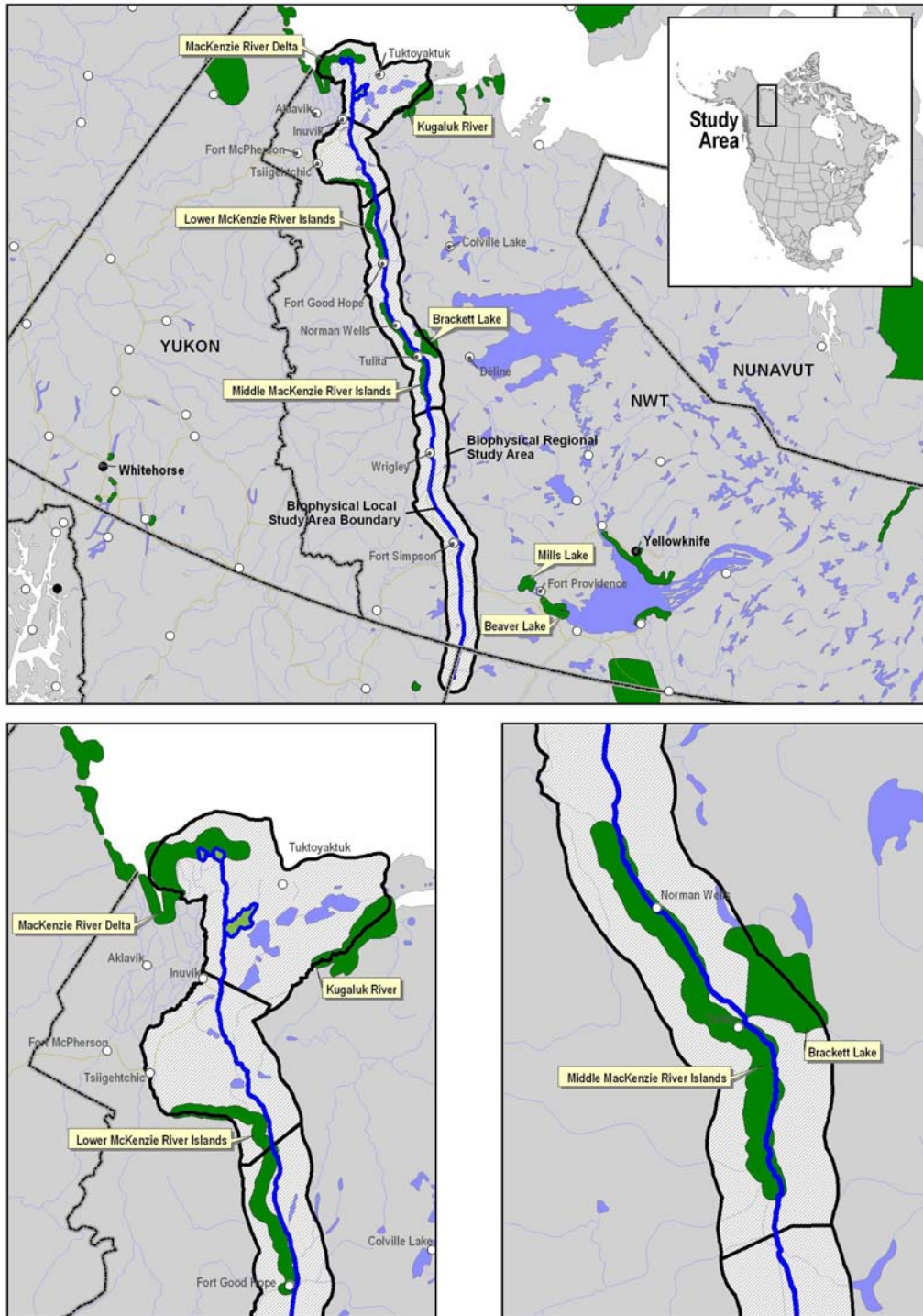
Category	Global			Continental		National	
	Minimum numbers of birds present						
<p><b>Congregations of Waterfowl</b>  <i>The site is regularly an important concentration site for waterfowl during any portion of the year. Concentrations refer to those present over a short period of time rather than over an entire season.</i></p>	20,000	15,000	10,000				
<p><b>Congregations of Seabirds or Colonial Waterbirds</b>  <i>The site is regularly an important concentration site for seabirds or colonial waterbirds during any portion of the year. Concentrations refer to those present over a short period of time rather than over an entire season.</i></p>	20,000	15,000	10,000				
<p><b>Congregations of Shorebirds</b>  <i>The site is regularly an important migratory stopover or wintering site for shorebirds. Concentrations refer to those present over a short period of time rather than over an entire season.</i></p>	20,000	15,000	10,000				
<p><b>Congregations of Raptors</b>  <i>The site is a regular migratory bottleneck for raptors. Concentrations refer to seasonal totals rather than those occurring over a brief period of time.</i></p>	20,000	15,000	10,000				
<p><b>Congregations of Wading Birds</b>  <i>The site is an important concentration site for wading birds (herons, egrets, cranes etc.) during any portion of the year. Concentrations refer to those present over a short period of time rather than over an entire season.</i></p>	10,000	5,000	500				
<p><b>Congregations of Migratory Landbirds</b>  <i>The site is a regular migratory stopover site for migratory landbirds (other than raptors). Sites nominated should contain exceptional numbers and / or diversity of migratory landbirds. Concentrations refer to seasonal totals. No absolute thresholds have been set, owing to the scarcity of quantitative data. Other evidence (# of species, landscape configuration) will be partly used to identify these sites.</i></p>	Large Concentrations	NA	NA				

### **3. Important Bird Areas within the Mackenzie Gas Project Regional and Local Study Areas**

Five Important Bird Areas, together comprising almost 6,700 square kilometers, are entirely or partially within the Regional Study Area in the Northwest Territories. Four of these – the Mackenzie River Delta IBA, the Kuguluk River IBA, the Lower Mackenzie River Islands IBA and the Middle Mackenzie River Islands IBA – are globally significant and one – Brackett Lake IBA – is continentally significant. A map of the Mackenzie Gas Project Regional and Local Study Areas showing the five Important Bird Areas is given in Figure 3.1. Each of the five IBAs in the Regional Study Area is described in subsequent sections below with information on how they meet IBA criteria and conservation issues. An additional coastal area east of Tuktoyuktuk that meets IBA criteria that was not identified in the initial IBA identification phase completed in 2001 is also described.

Two globally significant IBAs outside the Regional Study Area – Mills Lake (part of the Mackenzie River near Fort Providence) and Beaver Lake (in the western bay of Great Slave Lake where the Mackenzie begins) – are also addressed due to concerns that they could be affected by Project-related barge traffic coming down the Hay River to the Mackenzie River.

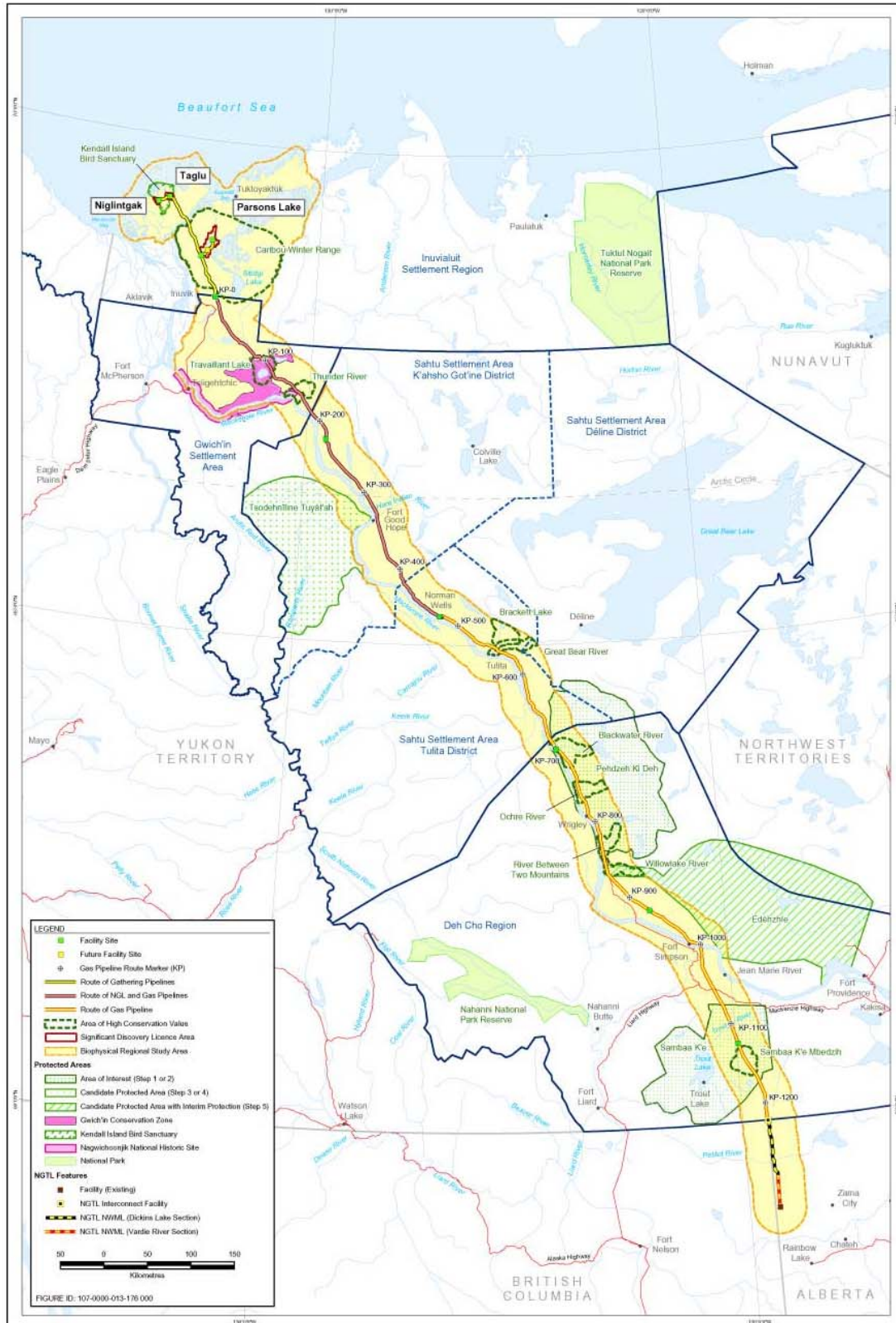
Figure 3.1. Map showing Important Bird Areas in relation to the entire Mackenzie Gas Project's Regional and Local Study Areas.



Nine areas of high conservation value were identified in the Mackenzie Gas Project EIS Additional Information for the Joint Panel Review (March, 2005). Areas of high conservation value considered included: hunting areas; undisturbed areas; areas with high species diversity; travel corridors; areas with unique habitats; and areas with high habitat diversity. Definitions did not specifically include the areas of concentration of migratory birds, such as breeding areas, colonies, spring and fall staging areas, and wintering areas or Important Bird Areas, as listed in the Information Requirements section of the Migratory Bird Environmental Assessment Guideline (Milko, 1998).

The areas identified are Caribou Winter Range in the Inuvialuit Settlement Region; Travaillant Lake and Thunder River in the Gwich'n Settlement Area; Brackett Lake and Great Bear River in the Sahtu Settlement Area (Tulita District); and Blackwater River, Ochre River, River Between Two Mountains, Willowlake River and Sambaa K'e Mbedzh in the Deh Cho Region. Of the nine areas of high conservation value only one overlaps with an Important Bird Area – continentally significant Brackett Lake IBA.

Figure 3.2. High Conservation Value Areas and Protected Areas Identified in the Mackenzie Gas Project EIS Additional Information for the Joint Panel Review.

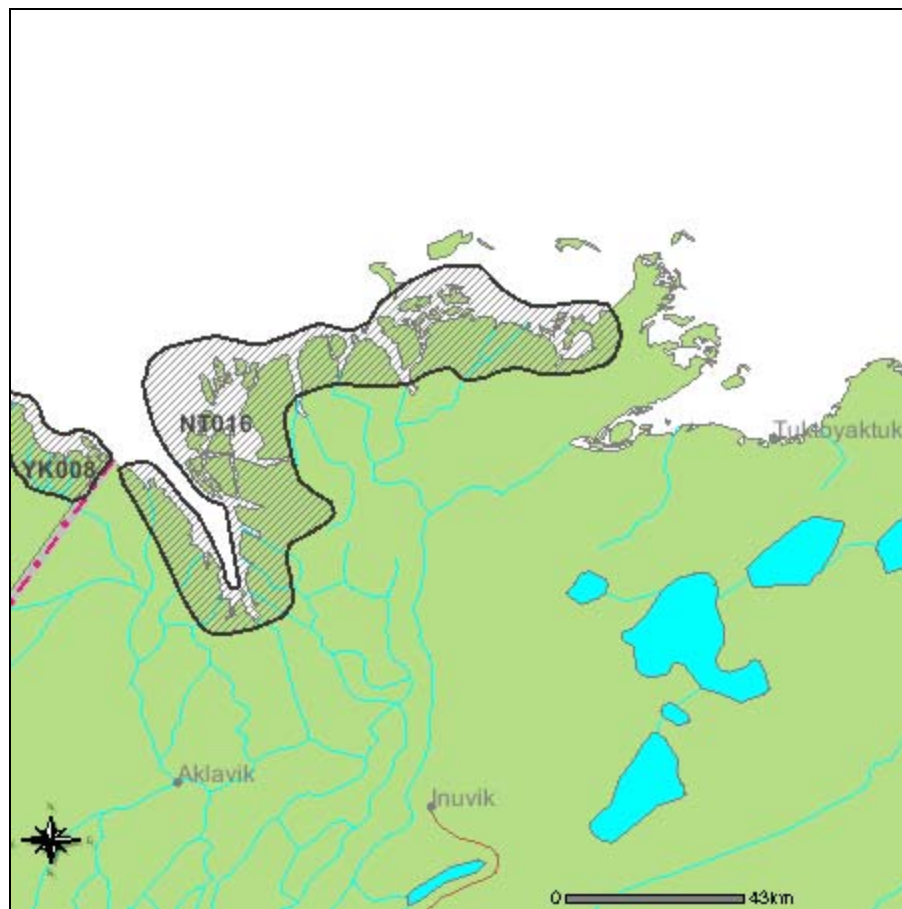


### 3.1. Mackenzie River Delta IBA

#### *General Description*

The Mackenzie River Delta IBA (69.33° N; 135.5° W) is an immense 2,889 square kilometre area of low-lying waters and deltaic islands situated just east of the Yukon/Northwest Territories border along the coast. The area includes Shallow Bay, Olivier, Ellice, Pelly and Kendall islands, as well as part of Richards Island. Much of the area is covered by fluvial deposits of silt and sand. The islands are generally marshy and covered in sedges, grasses, and horsetail, but there are shrubs in higher areas. Levees have formed along the shores of islands as a result of spring flooding. The lowlands of Richards Island are dotted with numerous lakes and ponds and contain several pingos. Approximately 80% of the IBA lies within the Regional Study Area for the Mackenzie Gas Project.

Figure 3.1.1. Mackenzie River Delta IBA



***Bird Populations***

Records for bird populations that approach or exceed IBA thresholds are provided in Table 3.1.1. The islands in the outer Mackenzie River Delta are important staging grounds from late August to late September for several species of geese and Tundra Swans. Large numbers of shorebirds migrate through the delta, but the extent of use is unknown. Depending on the weather, moderate to large numbers of Lesser Snow Geese congregate in the delta just prior to southward migration. In years when the Yukon and Alaskan north slopes are snow-covered, such as 1975, numbers can reach 323,000 (152,350 adults and 170,650 young) and the birds will stay for longer periods of time. This is about a fifth of the 1.5 million Lesser Snow Geese estimated to exist in 1975. In other years fewer (but still large) numbers were seen (15,000 adults, 10,000 young, 1973/4/6 average). The most important areas for staging Snow Geese are around Shallow Bay and northern Olivier and Ellice islands.

Peak numbers of staging Greater White-fronted Geese have ranged from 12,500 to 23,700 birds between 1973 and 1976. This represents between 1 and 2% of the North American Greater White-fronted Goose population. This species occurs mostly in the Shallow Bay area.

It is likely that a large proportion of the Black Brant population migrates through the outer Mackenzie Delta, but stopovers are probably short in duration and thus numbers are not well known. Up to 6,112 Brant were seen during single surveys conducted between 1973 and 1976 (2% of North American Brant and 5% of Black Brant).

Peak fall numbers of Tundra Swans have ranged from 1,900 to 3,100 birds. This is 1% of the current North American Tundra Swan population. This species concentrates around Malik Bay, Swan Channel, the outer section of Kendall Island MBS and eastern Shallow Bay.

During the breeding season a variable-sized colony of Lesser Snow Geese is found on small islands south of Kendall Island. At most, 8,000 birds have been recorded breeding here. Approximately 2,500 Tundra Swans, 2,800 Greater White-fronted Geese, as well as Sandhill Cranes, Brant, Glaucous Gulls, Arctic Terns, dabbling ducks, and shorebirds nest and moult in the area.

Table 3.1.1. Bird Populations in the Mackenzie River Delta IBA

Species	Season	Number	Threshold	Unit	Date	Reference
<b>Black Brant</b> (Western)	FM	6,112	G	I	1974*	Alexander et al. 1991
Greater White-fronted Goose (Mid-continent)	BR	2,800		I	1995*	Alexander et al. 1991
<b>Greater White-fronted Goose</b> (Mid-continent)	FM	23,700	G	I	1972*	Alexander et al. 1991
<b>Lesser Snow Goose (white phase)</b> (Western Central Flyway (NW Can/AK))	BR	8,000	C	I	1981*	Barry & Barry 1982
Lesser Snow Goose (white phase) (Western Central Flyway (NW Can/AK))	BR	690		P	1987	Kerbes 1988
<b>Lesser Snow Goose (white phase)</b> (Western Central Flyway (NW Can/AK))	FM	25,000	G	I	1974*	Alexander et al. 1991
<b>Lesser Snow Goose (white phase)</b> (Western Central Flyway (NW Can/AK))	FM	323,000	G	I	1975	Alexander et al. 1991
<b>Tundra Swan</b> (Eastern)	BR	2,500	G		1995*	Alexander et al. 1991
<b>Tundra Swan</b> (Eastern)	FM	2,500	G	I	1990	Alexander et al. 1991

**Notes:** (i) species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurrence. (ii) \*: date is only an approximation. (iii) BR = breeding; SU = summer, non-breeding (typically moulting birds); FM = Fall migration; WI = wintering; SM = Spring migration; RE = year round resident; O = other. (iv) I = individuals; P = pairs; G = Global; C = Continental; N = National.

### ***Conservation and Issues Related to the Mackenzie Gas Project***

The region has been subject to extensive seismic and exploratory drilling activity, and drilling on offshore artificial islands. Part of the site is within Kendall Island Migratory Bird Sanctuary, and the entire IBA has been recognized as a Key Migratory Bird Terrestrial Habitat site by the Canadian Wildlife Service (Alexander et al. 1991).

A key concern is the issue of land subsidence in the vicinity of gas reservoirs around Niglingtak and Taglu. The EIS (Volume 5; Section 10) notes that as gas is withdrawn from the reservoirs, land currently subject to periodic flooding might become more

susceptible to flooding for longer periods than in the past. Although the EIS suggests that this may affect the forage value of vegetation in the area for birds, it fails to address requirements of particular species and does not discuss the significance of that disturbed or damaged habitat in the context of nesting and other habitat uses. As land subsidence is permanent, it is vital that issues be comprehensively addressed.

A study of the environmental effects of seismic lines and drill pads in the Kendall Island Bird Sanctuary found that seismic lines negatively affect the distribution and/or abundance of a number of shorebirds and passerines (Ashenurst, 2004). The study specifically examined Savannah Sparrow, Lapland Longspur, Tree Sparrow, Common Redpoll, Whimbrel and Red-necked Phalarope. Obligate Arctic species were more sensitive to seismic lines than non-obligate species. These effects were attributed to habitat preferences of the species studied and vegetation changes along seismic lines.

Drill pads also had an impact, with Savannah Sparrows being more abundant on drill pads and Lapland Longspurs less abundant. Landscape level impacts were also noted in the study. There were approximately twice as many seismic lines per square kilometer in low-centre polygon habitat (wetland with a patterned ground structure where the interior of the polygon is wet and dominated by sedges) than in upland tundra (dry Pleistocene upland with dwarf shrubs and forbs, and sedge tussocks) meaning that this habitat is most severely impacted.

Ashenurst (2004) calculated a total seismic line footprint of 1.8% over the entire Kendall Island Bird Sanctuary. The permanent deletion of habitat by the drill pads adds a further 0.6% to the footprint. Thus seismic lines and drill pads alone comprise a 2.4% footprint which is more than double the 1% footprint mandated by Environment Canada. This footprint will increase with the inclusion of permanent features such as the runway and camp, habitat loss due to avoidance by birds, and habitat lost through subsidence. It is also important to note that the current and future footprint and greatest impact are in the low-centre polygon habitat that is critical breeding habitat for Arctic obligates. Development and exploration must be avoided in this habitat in particular.

Bird species selected as Wildlife Valued Components (VCs) in the EIS are Greater White-fronted Goose, Snow Goose, Tundra Swan, Peregrine Falcon, Whimbrel and Arctic Tern. None of the descriptions of Greater White-fronted Goose, Snow Goose, or Tundra Swan refer to the significance of these populations in global terms. Furthermore, the rationale for a species' selection as VC may be related to part of its annual cycle. For instance, in peak years as many of 20% of the entire Lesser Snow Goose population may be found in the Mackenzie Delta IBA during fall migration.

As a VC, Greater White-fronted Goose is considered to serve as an umbrella species representing other waterfowl such as brant. Given the global significance of the Mackenzie Delta IBA for Black Brant (the Western population), which can be as much as 2% of the North American Brant population and as much as 5% of the Black Brant population, it is essential that the status and impact on this species and its habitat be addressed separately.

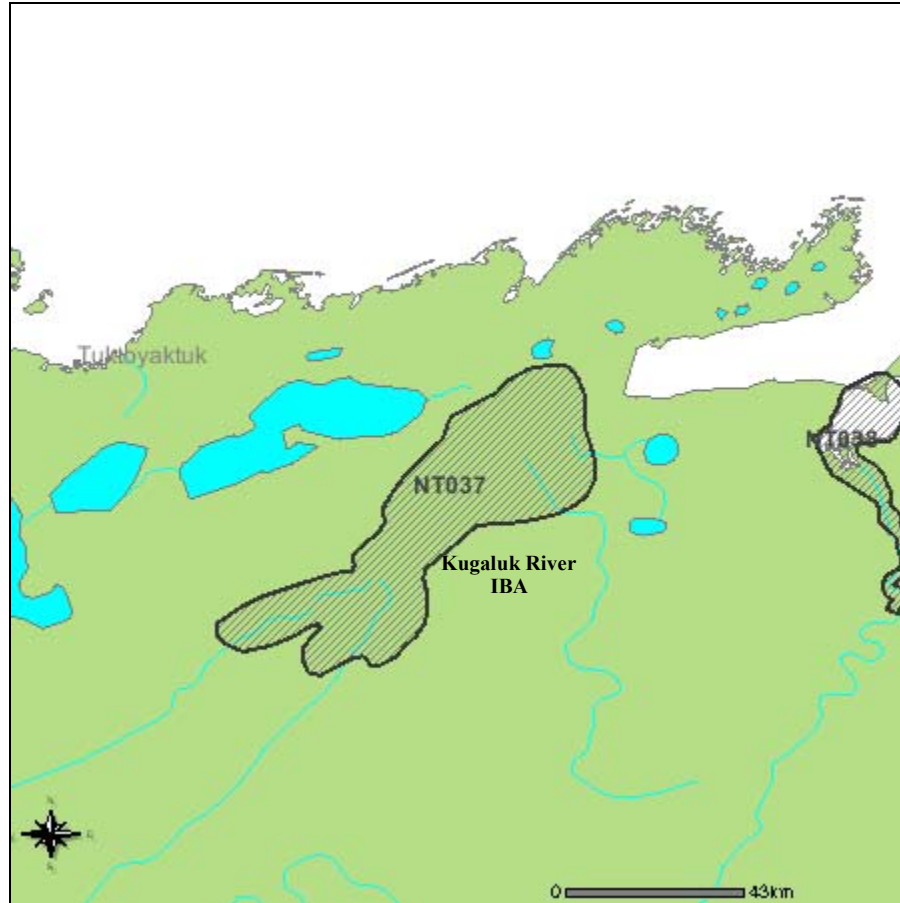
Although the Mackenzie Delta IBA was not identified on the basis of shorebird populations, the fact that it is a known area for large numbers of migrating shorebirds means that shorebirds should be taken into account when addressing conservation needs. Furthermore some of the key shorebirds in the delta area are of concern and are a high priority for conservation action. Whimbrel has been identified as a shorebird Species of High Concern in the United States and Canada due to a declining population (Donaldson, 2000). American Golden-Plover is also a Species of High Concern because of a declining population. Hudsonian Godwit again is a Species of High Concern but largely for reasons of low relative abundance and small breeding and non-breeding range. Because of the reasons for categorizing a species as one of High Concern, it is important to consider shorebird species habitat requirements and potential impacts separately rather than lumping them together under one umbrella VC.

### **3.2. Kugaluk River IBA**

#### ***General Description***

The Kugaluk, Moose and Smoke rivers drain into Liverpool Bay, a long bay that lies along the NWT mainland coast, about 100 km east of Tuktoyaktuk. An outpost camp is located at the mouth of the Kugaluk River. Kugaluk River IBA site (69.33°N; 130.83°W) covers about 40 km of the Kugaluk River, the lower 10 km of both the Moose and Smoke rivers and the upper reaches of Liverpool Bay. The IBA comprises a total area of approximately 542 square kilometres. Two large islands in the bay, one of which is Campbell Island, are also included. The site is extremely flat and the vegetation is primarily sedge and grass, marsh and meadow. Shorelines are non-vegetated tidal sand flats. The tree line passes through this site, but a recent severe fire caused the tree line to recede 16 km south of its previous location, leaving only a few relic spruce near the Moose and Smoke rivers. The Bluenose caribou herd passes through this area, and other mammals such as Grizzly Bear, Arctic Fox, Red Fox, Marten and Muskrat are common. Bearded Seals are regular in Liverpool Bay.

Figure 3.2.1. Kugaluk River IBA



### ***Bird Populations***

The IBA has been identified as globally significant for congregatory species and waterfowl concentrations and also continentally significant for congregatory species. The marshes, flats and river deltas of the Kugaluk River site are very important moulting areas for Canada Geese, Greater White-fronted Geese and Tundra Swans, although the numbers of birds present is highly variable. Between 10,000 and 20,000 Canada Geese of the subspecies *hutchinsii* and *parvipes* moult here in July and August. At their maximum, these numbers translate to 2.6% of the current Canada Goose *hutchinsii* and *parvipes* populations. At the same time of year, between 7,000 and 15,000 Greater White-fronted Geese use the area for moulting. This is as much as 2% of the mid-continent population of Greater White-fronted Goose. Between 900 and 1,400 Tundra Swans also moult here, which is more than 1% of the eastern Tundra Swan population. Small numbers of swans, as well as Lesser Snow Goose and Brant breed in the Kugaluk River.

In early June, three to four thousand Glaucous Gulls have been seen feeding on herring in patches of open water at the Moose and Smoke River deltas. This large number of gulls represents about 1% of this species' global population.

Mid-summer brings considerable numbers of other waterbirds such as Red-throated Loon, Red-breasted and Common mergansers, scoter, scaup and Oldsquaw. Most of these species are moulting or feeding.

Table 3.2.1. Bird Populations in the Kugaluk River IBA

Species	Season	Number	Threshold	Unit	Date	Reference
Canada Goose	SU	15,000		I	1985*	Alexander et al. 1988
<b>Colonial Waterbirds/ Seabirds</b>	SU	29,500	G	I	1985*	Alexander et al. 1988
<b>Glaucous Gull</b>	SU	3,000	G	I	1985*	Alexander et al. 1988
<b>Greater White-fronted Goose (mid-continent)</b>	SU	11,000	G	I	1985*	Alexander et al. 1988
Tundra Swan	SU	500		I	1985*	Alexander et al. 1988
<b>Waterfowl</b>	SU	112,800	G	I	1987	Alexander et al. 1988

**Notes:** (i) species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurrence. (ii) \*: date is only an approximation. (iii) BR = breeding; SU = summer, non-breeding (typically moulting birds); FM = Fall migration; WI = wintering; SM = Spring migration; RE = year round resident; O = other. (iv) I = individuals; P = pairs; G = Global; C = Continental; N = National.

### ***Conservation and Issues Related to the Mackenzie Gas Project***

The Kugaluk River IBA is within the much larger Reindeer Grazing Reserve and is designated an International Biological Programme Site. The latter designation recognizes the importance of the area but does not give any protection.

Although there are no apparent immediate direct threats of the project to this important waterfowl moulting area, there is potential for disturbance in the future because of the presence of several oil exploration leases. The Parsons Lake development is the nearest specific location in the Regional Study Area for which impacts are assessed. However, disturbance might also result if development on the Tuktoyaktuk Peninsula increases to the point that air traffic becomes a problem, particularly for geese which are always vulnerable during moult. Thus cumulative impact on the Kugaluk River IBA resulting from the project should be considered. Bird populations within the IBA should be monitored long-term to determine any changes in populations.

### **3.3. Lower Mackenzie River Islands IBA**

#### ***General Description***

The Lower Mackenzie River Islands IBA (67° N; 130.17° W) site starts at Fort Good Hope, Northwest Territories, and continues down the Mackenzie River for 270 kilometres to where the Tree River joins the Mackenzie. The numerous river islands found here are composed of sedimentary deposits overtop of Devonian bedrock. Spring floods result in sand bars and shorelines of sand, mud and willow trees around low-lying islands. Away from the periphery of the islands, forests of mature white spruce and

balsam poplar grow. In winter the islands are the preferred habitat of moose. The poplar stands provide cover and the willow trees are an excellent food source.

Figure 3.3.1. Lower Mackenzie River Islands IBA



### ***Bird Populations***

The IBA has been identified as globally significant for congregatory species and waterfowl concentrations. Observations made in the early 1970s suggest that most of the Western Central Flyway population of Lesser Snow Geese migrate through the lower Mackenzie River in the spring. This somewhat ill-named population is the westernmost breeding population of Snow Geese, breeding in Alaska and the western Canadian arctic. In the mid-1970s, the numbers of geese in this population was about 169,600, but has now almost reached the half million mark. In 1972, 63,900 Snow Geese were recorded on the river in late May. This is over a third of the Western Central Flyway Snow Geese population of the time. In 1973, a May 14 aerial survey recorded 13,800. Timing of the surveys is crucial since, although the use of the river by geese is intense, it is short-lived; thus one survey date in a year may not coincide with peak migration. Conversely, the numbers of geese using the area in the spring are also thought to be quite variable, which may also account for the variation between years. Although there is no recent information on bird use of the area, since the area downstream from Fort Good Hope is known to be a

traditional stopover point, it is assumed that the geese are still using the area. The geese, which arrive in the area in early to mid-May, feed along the open shorelines of the islands.

Migrations of Tundra Swans and other waterfowl using the lower Mackenzie River are similarly short-lived but immense. For instance, as many as 112,800 waterfowl were recorded along this stretch of river on May 25, 1972, but four days later fewer than 10,000 remained. The same year in May, up to 3,250 Tundra Swans were counted along a stretch of river that starts at the downstream end of this site (Tree River) and goes upstream beyond the site to Norman Wells. This number of swans represents about 1.5% of the North American population.

Table 3.3.1. Bird Populations in the Lower Mackenzie River Islands IBA

Species	Season	Number	Threshold	Unit	Date	Reference
<b>Lesser Snow Goose (white phase)</b> (Western Central Flyway (NW Can/AK))	SM	63,900	G	I	1972	Campbell & Shepard 1973
<b>Tundra Swan (Western)</b>	SM	3,250	G	I	1972	Campbell & Shepard 1973
<b>Waterfowl</b>	SM	112,800	G	I	1972	Campbell & Shepard 1973

**Notes:** (i) species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurrence. (ii) \*: date is only an approximation. (iii) BR = breeding; SU = summer, non-breeding (typically moulting birds); FM = Fall migration; WI = wintering; SM = Spring migration; RE = year round resident; O = other. (iv) I = individuals; P = pairs; G = Global; C = Continental; N = National.

### ***Conservation and Issues Related to the Mackenzie Gas Project***

Existing barge traffic that transports materials up and down river use the Mackenzie River frequently. It is not known if this causes any noticeable disturbance to feeding geese. As with many birds associated with water, the waterfowl that use the Mackenzie River during spring migration are vulnerable to water pollution and other potential changes in the water quality. Currently there are not any known problems of this sort in the lower Mackenzie River.

The EIS addresses bird species that were selected as Wildlife Valued Components (VCs) for the pipeline corridor. This means that Tundra Swans which occur in globally significant numbers in the Lower Mackenzie River Islands IBA were not addressed.

Baseline conditions for the pipeline corridor described in Section 10.3.7.1. of the EIS mention staging habitat for Snow Geese in the middle and lower Mackenzie River but do not refer specifically to either the Lower Mackenzie River Islands or the Middle Mackenzie River Islands IBAs. However, the EIS notes that two proposed compressor station locations at Little Chicago and near Norman Wells are close to spring Snow

Goose staging areas. The EIS indicates that nesting and moulting habitat for Lesser Scaup exists throughout the pipeline corridor with greatest densities of birds in areas with large wetland complexes. However, no specific information on locations of high concentrations of scaup or other waterfowl is provided.

The EIS indicates that the largest potential effect of the pipeline corridor during construction, operations, decommissioning and abandonment on snow goose habitat availability are adverse, low magnitude, local in extent and long term. The main potential impact on snow geese identified was aircraft flights during spring staging. No mention is made of specific areas of sensitivity where snow geese stage in globally significant numbers within the Lower Mackenzie River Islands IBA.

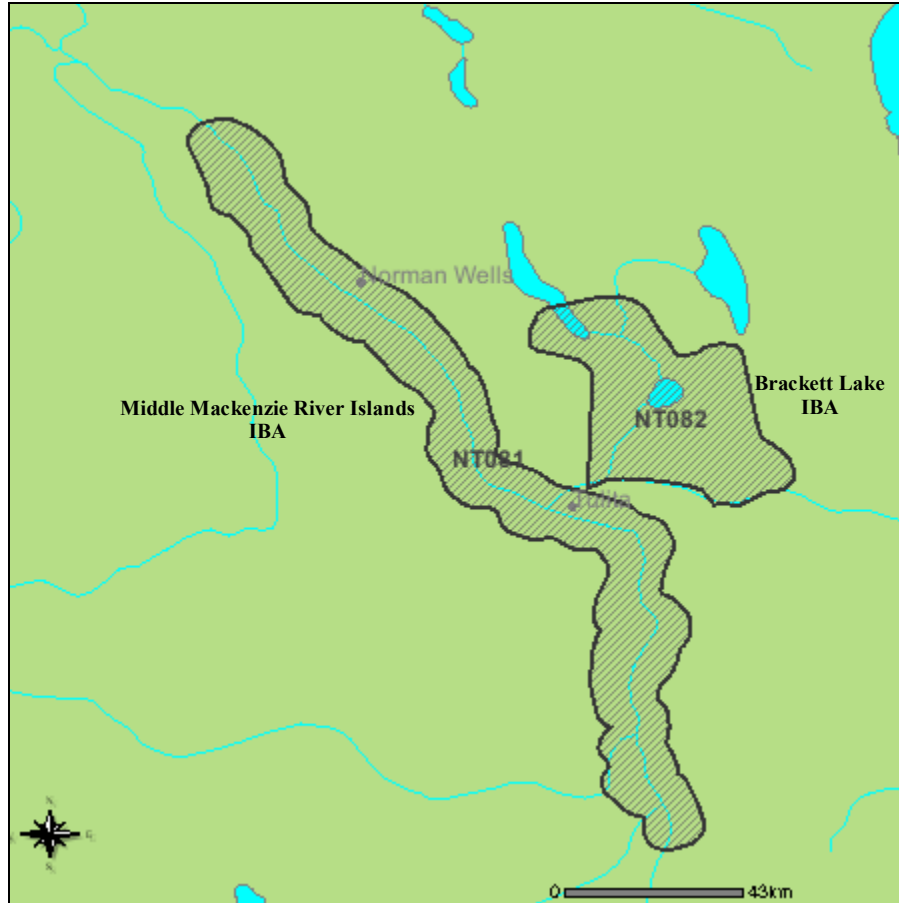
The EIS also indicates that the largest potential effect of the pipeline corridor on scaup habitat availability is adverse, low magnitude, local in extent and long term. The key potential effects are disturbance of flightless, moulting scaup between late June and mid-August and disturbance of broods in July by aircraft, barge and boat traffic. There is no indication of specific areas where scaup and other ducks would be particularly vulnerable because of high concentrations.

Any sources of negative impact on Snow Geese and scaup i.e. vegetation clearing, aircraft, barge and boat traffic will also affect Tundra Swans. Given that they concentrate in globally significant numbers during spring migration within the Lower Mackenzie River Islands IBA, specific effects need to be determined.

### **3.4. Middle Mackenzie River Islands IBA**

The Middle Mackenzie River Islands IBA site (64.88° N; 125.58° W) consists of a 250-kilometre stretch of the Mackenzie River and the associated shoreline between Redstone River and a spot 30 kilometres north of Oscar Creek. The total area of the IBA is 1,088 square kilometers. The small communities of Norman Wells and Fort Norman lie along this piece of mountain-bordered river. Of the many islands on the river, some are flat and sandy, while others are large and rocky. Shoreline vegetation in places consists of sedges, horsetails and willows, or of pondweed and other emergent plants. The forests of low-lying shorelines are a mix of White Spruce and Balsam Poplar whereas forests on higher terraces and levees are dominated by White Birch. In December, Moose often take up residence on the islands, but in March or April they return to the mainland.

Figure 3.4.1. Middle Mackenzie River Islands IBA and Brackett Lake IBA



### ***Bird Populations***

The Middle Mackenzie River Islands IBA is globally significant for congregatory species and waterfowl. Waterfowl of many kinds stop over on the Middle Mackenzie River islands during spring migration: Snow Goose, Greater White-fronted Goose, Canada Goose, Tundra Swan, as well as many duck species. Horsetail and Willow Catkins are the prime food source.

The species found in the greatest abundance in spring is the Snow Goose of the Western Central Flyway population. The geese arrive in early or mid-May and only stay for a short time. At this time of year there are few good feeding areas, except ones such as those found in the open water and exposed shorelines of the Mackenzie River. It is thought that the majority of the Western Central Flyway population uses the Mackenzie River as a migration route (IBA site NT080 Lower Mackenzie River Islands is part of this route).

In May of 1972, a maximum of 28,600 Snow Geese were counted in one day. In total, it is thought that 95,000 Snow Geese used the Mackenzie River that year. These numbers represent, respectively, 17 and 56% of the Western Central Flyway population, and about

2 and 6% of the global population of Snow Geese. The estimates used to calculate these percentages are from 1976 Snow Goose estimates (current estimates are much higher because the species has grown considerably).

Table 3.4.1. Bird Populations in the Middle Mackenzie River Islands IBA

<b>Species</b>	<b>Season</b>	<b>Number</b>	<b>Threshold</b>	<b>Unit</b>	<b>Date</b>	<b>Reference</b>
<b>Lesser Snow Goose (white phase)</b> (Western Central Flyway (NW Can/AK))	OT	95,000	G	I	1972	Campbell & Shepard 1973
<b>Lesser Snow Goose (white phase)</b> (Western Central Flyway (NW Can/AK))	SM	14,600	C	I	1973	Salter et al. 1974
<b>Lesser Snow Goose (white phase)</b> (Western Central Flyway (NW Can/AK))	SM	26,000	G	I	1980	R. Webb 1980
<b>Lesser Snow Goose (white phase)</b> (Western Central Flyway (NW Can/AK))	SM	28,600	G	I	1972	Campbell & Shepard 1973

**Notes:** (i) species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurrence. (ii) \* : date is only an approximation. (iii) BR = breeding; SU = summer, non-breeding (typically moulting birds); FM = Fall migration; WI = wintering; SM = Spring migration; RE = year round resident; O = other. (iv) I = individuals; P = pairs; G = Global; C = Continental; N = National.

### ***Conservation and Issues Related to the Mackenzie Gas Project***

Although barges use the Mackenzie River frequently, it is not known whether these transport boats cause disturbance to the migrating geese. Activities at the oil fields of Norman Wells have included dredging and the creation of artificial islands, but they are thought to have had only minor short-term effects on the geese. However, the baseline information and description of effects of all phases of the pipeline corridor should address the fact that globally significant numbers of Lesser Snow Geese concentrate in the Middle Mackenzie River Islands IBA section of the pipeline corridor specifically rather than address potential impacts (i.e. vegetation clearing, aircraft, barge and boat traffic) for the pipeline corridor in general.

### **3.5. Brackett Lake IBA**

#### ***General Description***

The Brackett Lake area of the Northwest Territories lies just north and east of the community of Fort Norman and the Mackenzie River. Brackett Lake and Brackett River are in the centre of this IBA (65.25° N; 125.17° W), while part of the Great Bear River forms the southern boundary. The IBA comprises an area of approximately 1,343 square kilometres.

The lands here are low-lying and often boggy. Black Spruce bogs, heath shrubland and raised peat bogs are the most common habitat types of the region, but sedge meadows are also found lining the shores of lakes and ponds. Moose, Black Bear, Muskrat and Beaver are common mammals and River Otter occur in the Loche and Brackett rivers.

#### ***Bird Populations***

Brackett Lake IBA is continentally significant for congregatory species and nationally significant for congregatory species and waterfowl concentrations. The forests and wetlands of the Brackett Lake area provide excellent habitat for breeding ducks - the density of ducks sometimes reaches that of the Mackenzie River Delta. In the early 1970s, densities of breeding ducks, thought to be mostly scaup, were in the order of 31 birds per square kilometre in the Brackett Lake area and 5 birds per square kilometre in the surrounding forest. This translates into roughly 5,000 to 10,000 breeding ducks.

Later in the season, thousands of staging ducks, geese, and swans use the area. Although the records are a few decades old there is no reason to suspect that waterfowl use of the area has diminished since then. Five thousand Greater White-fronted Geese have been recorded around the shorelines of Brackett Lake, and single flocks of 500 have been seen. Because the population of White-fronted Geese has fluctuated over the years it is difficult to know what portion of the population currently uses this area. However, it may be that 2% of the Canadian population stages here. Also, 1,500 Tundra Swans (of uncertain origin; possibly from both eastern and western populations) and 12,000 ducks have been recorded in the Brackett Lake area in the fall.

Although numerous species of shorebirds, such as Long-billed Dowitcher, Pectoral Sandpiper, and Lesser Yellowlegs, stage in the Brackett Lake area in the fall, the magnitude of usage is not known.

Table 3.5.1. Bird Populations in the Brackett Lake IBA

Species	Season	Number		Unit	Date	Reference
Greater White-fronted Goose (Mid-continent)	FM	5,000		I	1955	Barry 1958
Tundra Swan	FM	1,500		I	1972	Salter 1974
Waterfowl	BR	5,000		I	1985	Hawkings 1987
<b>Waterfowl</b>	FM	12,000	N	I	1955	Barry 1958

**Notes:** (i) species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurrence. (ii) \* : date is only an approximation. (iii) BR = breeding; SU = summer, non-breeding (typically moulting birds); FM = Fall migration; WI = wintering; SM = Spring migration; RE = year round resident; O = other. (iv) I = individuals; P = pairs; G = Global; C = Continental; N = National.

### ***Conservation and Issues Related to the Mackenzie Gas Project***

The importance of the Brackett Lake area has been recognized previously by the International Biological Programme, and by the Canadian Wildlife Service as a Key Migratory Bird Terrestrial Habitat Site (Alexander et al. 1991). The Brackett Lake IBA is the only one of five identified IBAs and one potential IBA in the Regional Study Area to coincide with areas of high conservation value identified in the Mackenzie Gas Project EIS Additional Information for the Joint Review Panel (March 2005). The extent of the IBA (estimated at 1,343 square kilometres) is greater than the Area of High Conservation Value (estimated at 704 square kilometres). While there have been no known threats to the birdlife documented for the Brackett Lake area to date, moulting waterfowl are sensitive to disturbance and the terrain of northern lowlands can be fairly easily altered through vehicular use.

Three existing seismic lines cross the Brackett Lake area of high conservation value (Section 7 of the Mackenzie Gas Project EIS Additional Information for the Joint Review Panel, March 2005) contributing 46 hectares of disturbance. The additional information documents that the planned north-southeast gas pipeline will dissect the southwest tip of the Brackett Lake area and contribute an additional 16 hectares of disturbance. Although the EIS Additional Information suggests that there will be no loss of effective habitat for Lesser Scaup (the predominant waterfowl species), it is necessary to determine direct disturbance during construction and ensure on-going monitoring of ducks in the area to assess changes in the breeding population. Furthermore, no consideration was given to the impacts on the Greater White-fronted Geese which may represent as much as 2% of the Canadian population.

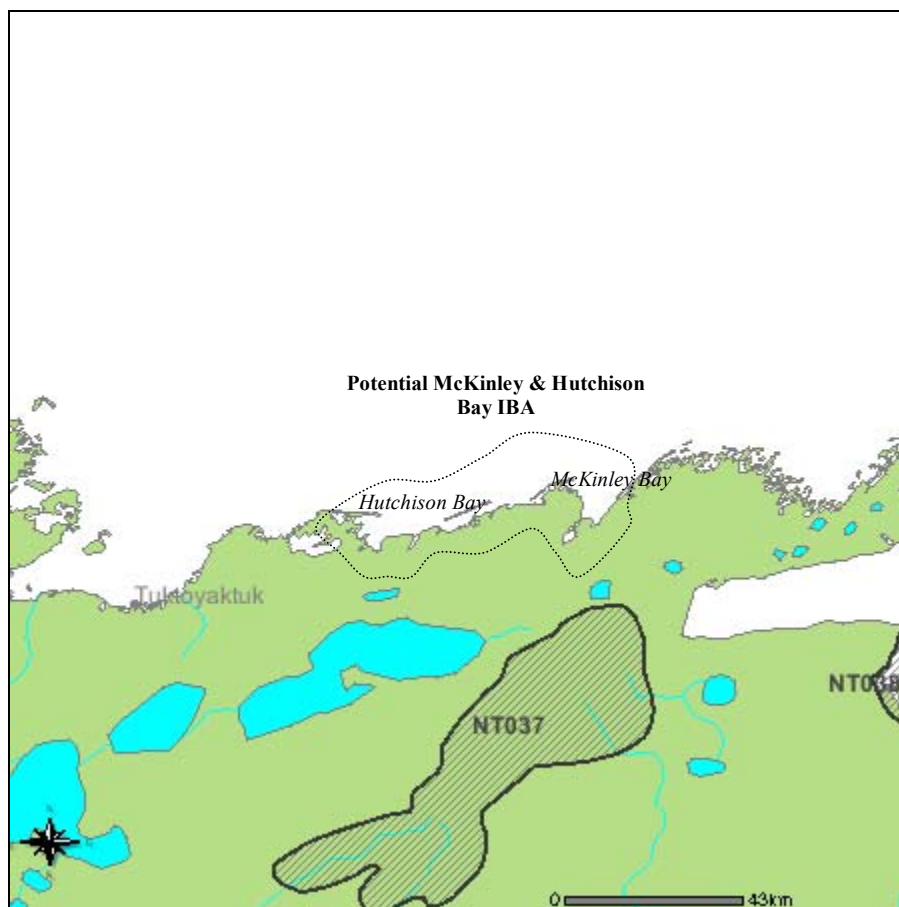
Finally, the significant staging of shorebirds in the area should also be considered although the species noted are all of low conservation concern in North America (Donaldson et al. 2000) and we do not yet have estimates of the shorebird populations in the area. The Lesser Yellowleg, one of the shorebirds known to stage in the area, is one of the VCs identified in the EIS.

### 3.6. Potential McKinley and Hutchison Bays IBA

#### *General Description*

McKinley Bay and Hutchison Bay lie to the east of the Mackenzie Delta in the Tuktoyaktuk Peninsula on the Beaufort Sea coast. Atkinson Point separates the two bays. Atkinson Point was a military radar site between 1957 and 1963. The land reverted to the Department of Indian Affairs and Northern Development (DIAND) in 1965 and was made available for scientific research until 1981. DIAND leased the land to Imperial Oil in the 1970s. A map showing the approximate extent of the potential IBA is given in Fig. 4.6.1.

Figure 3.6.1. Potential McKinley and Hutchison Bays IBA



Note: the line highlighting the general area of McKinley and Hutchison Bays is not intended to represent a potential IBA boundary.

#### *Bird Populations*

Aerial surveys for bird abundance and distribution were conducted by Canadian Wildlife Service researchers for eight years between 1981 and 1991 at McKinley Bay and Hutchison Bay in the Tuktoyaktuk Peninsula at the eastern end of the Regional Study Area on the Beaufort Sea coast. These surveys were the continuation of a long-term

monitoring study of birds in McKinley and Hutchison Bays to compare diving duck use of McKinley Bay, which is the site of a winter harbour for drillships and was a proposed location for a major year-round support base for oil and gas exploration in the Beaufort Sea, with that of Hutchison Bay, which was used as a control. The 1991 survey was designed among other things to determine if numbers of diving ducks has changed since initial surveys conducted between 1981 and 1985 (Cornish et al. 1992). As in previous survey years large numbers of diving ducks were observed off Atkinson Point, at the south end of the Bay, and in the northeast corner near a long spit.

Based on the survey data gathered on August 7, 1991 when survey conditions were best, the estimated population of diving ducks at McKinley Bay was 31,592 ( $\pm 7,953$ ), predominantly Long-tailed Duck, which was a significantly greater number than in the previous surveys. The estimated population of diving ducks at Hutchison Bay on August 7 was 11,111 ( $\pm 771$ ) with Long-tailed Duck and Scoters (scoter species not distinguished) the predominant species. The relatively low count of diving ducks on Hutchison Bay in 1991 may reflect local changes in diving duck distribution within Hutchison Bay. In 1990 surveys an estimated 27,900 ( $\pm 4006$ ) diving ducks utilized McKinley Bay and 28,591 ( $\pm 3471$ ) was the estimate in Hutchison Bay. Because of the large variation in numbers observed in the 1990 and 1991 surveys, the researchers recommended that another year of aerial surveys be conducted.

Although Long-tailed Duck and scoter were the predominant waterfowl in the survey areas, other waterfowl species frequently recorded included Northern Pintail, Greater White-fronted Goose, Brant and Tundra Swan. Red-throated Loons, Pacific Loons, Arctic Terns and Glaucous Gulls were also frequently observed.

The diving duck population estimate from McKinley Bay exceeds the global IBA threshold of 20,000 individuals for waterfowl congregations in both years. The estimate for Hutchison Bay exceeds the national threshold of 10,000 individuals in 1991 but exceeded the global threshold in 1990. Thus both sites qualify as IBAs. It is likely that further analysis will result in the identification of a single coastal globally significant IBA that includes both McKinley and Hutchison Bays.

### ***Conservation and Issues Related to the Mackenzie Gas Project***

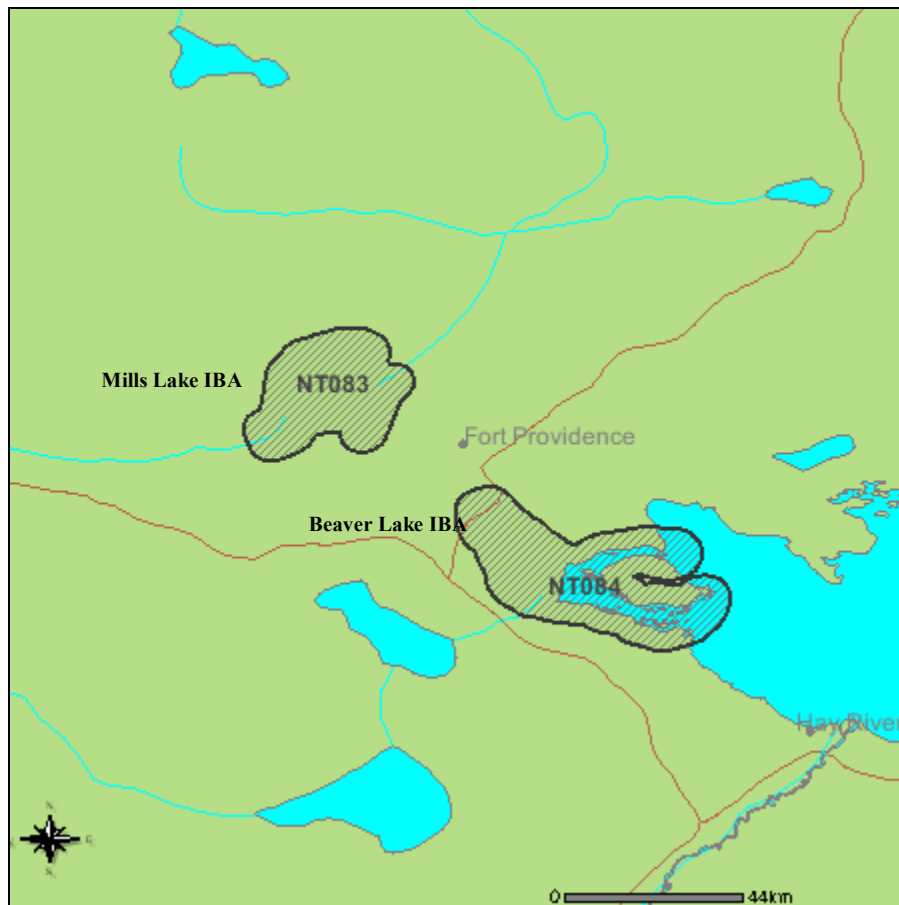
The major conservation issues in the area relate to offshore disturbance of large concentrations of Long-tailed Ducks and Scoters. The use of McKinley Bay to support offshore activities with the potential for increased marine traffic and air traffic is of concern. All sea ducks are vulnerable to offshore disturbance because they concentrate in large numbers both in spring and fall. The increased offshore development that will inevitably ensue if the Mackenzie pipeline is built has the potential to have significant impact on all sea ducks in offshore areas, including Long-tailed Ducks and scoters in near shore areas and eiders that concentrate in very large numbers further offshore during their spring and fall migrations. The indirect effect of the Mackenzie Gas Project on offshore development should be considered when assessing cumulative impacts of the project.

### 3.7. Mills Lake IBA

#### *General Description*

Mills Lake is formed by a widening of the upper Mackenzie River at a point where the Horn River joins the Mackenzie River. It is a circular lake, about 20 km wide that lies downstream from Fort Providence, Northwest Territories. The Mills Lake IBA (61.42° N; 118.25° W) includes the lake and its surrounding shorelines which are low-lying and often sandy. The lake has extensive marshes and other vegetation communities, such as floating sedge mats and other emergent and submergent aquatic vegetation.

Figure 3.7.1. Mills Lake and Beaver Lake IBAs



#### *Bird Populations*

The marsh and sedge shallow-water zones of Mills Lake attract thousands of migrating waterfowl during fall migration in September and October. The northern and eastern shoreline, and delta areas are most favoured. Unfortunately the information available on numbers of waterfowl using the area is outdated, but there is no reason to suppose that the lake is still not exceedingly important. The numbers available from 1972 show that peak numbers on one day were: 9,860 Greater White-fronted Geese, 2,190 Tundra Swans, nearly 4,000 Snow Geese, 1,390 Canada Geese (Short-Grass Prairie population) and an impressive 27,000 ducks. These ducks were primarily American Wigeon,

Northern Pintail, Mallard and Canvasback. Additionally, in some years a few thousand American Coots can be observed feeding on the Potamogeton plants growing in the lake. Several of the geese species have increased in number over the last decade and so it is unclear what percentage of the current populations uses the area. Using 1990s estimates, the numbers above represent over 1% of the mid-continent Greater White-fronted Goose population, and over 1% of the North American population of Tundra Swan. Estimates from the 1970s show that 2% of the Western Central Flyway population of Snow Geese passed through Mills Lake.

Table 3.7.1. Bird Populations in the Mills Lake IBA

Species	Season	Number	Threshold	Unit	Date	Reference
Canada Goose (short-grass prairie)	FM	1,390		I	1972	Salter 1974
<b>Greater White-fronted Goose (mid-continent)</b>	FM	9,860	C	I	1972	Salter 1974
Lesser Snow Goose (white phase) (Western Central Flyway (NW Can/AK))	FM	4,000		I	1972	Salter 1974
<b>Tundra Swan</b>	FM	2,190	G	I	1972	Salter 1974
<b>Waterfowl</b>	FM	27,000	G	I	1972	Salter 1974

**Notes:** (i) species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurrence. (ii) \*: date is only an approximation. (iii) BR = breeding; SU = summer, non-breeding (typically moulting birds); FM = Fall migration; WI = wintering; SM = Spring migration; RE = year round resident; O = other. (iv) I = individuals; P = pair; G = Global; C = Continental; N= National.

### ***Conservation and Issues Related to the Mackenzie Gas Project***

There are no known threats to the habitats of Mills Lake. Nonetheless although the possibility that river dredging for barge traffic could disturb birds if done in September. Also, there have been proposals to dam the Slave River, which if done, could affect water flow to the Mackenzie. Finally, haying and grazing, if increased in the area, would change the marsh communities.

The importance of Mills Lake has been recognized before by both the International Biological Programme, and Canadian Wildlife Service as a Key Migratory Bird Terrestrial Habitat Site.

### 3.8. Beaver Lake IBA

#### *General Description*

The Beaver Lake IBA (61.12° N; 117.13° W) includes Beaver Lake, which is the name for a wide part of the Mackenzie River where the river meets the western end of Great Slave Lake. Fort Providence, NWT is situated 20 kilometres downstream (Fig. 3.7.1). Most of the land surrounding the lake is low-lying and underlain by shales and limestones. Big Island sits at the mouth of the Mackenzie River and so separates Beaver Lake (the river) into two channels, North and South. The north shores of these channels contain large areas of sedge-grass marshes, whereas narrower marshes line the south shores. Islands of the North Channel are generally low and marshy, but the islands of the South Channel are higher and often hold small spruce-poplar forests.

#### *Bird Populations*

Tundra Swans and several species of ducks stop over in Beaver Lake during both spring and fall migration. Records from the autumn of 1972 show that 4,470 Tundra Swans were observed at this time, and in the spring of the following year, 1,175 were seen. The fall numbers equal about 2% of the current North American Tundra Swan population. This percentage may actually be higher because the overall population of the species has grown in recent years.

In the fall, roughly double the number of ducks (approximately 10,000) use the area as do in the spring (approximately 5,000). The most common species are Canvasback, American Wigeon, Mallards, and the scaup species. On one occasion, 8,000 Canvasbacks were seen in the North Channel. This is about 1% of the global population of the species.

Table 3.8.1. Bird Populations in the Beaver Lake IBA

Species	Season	Number	Threshold	Unit	Date	Reference
Canvasback	FM	8,000	G	I	1975	
Tundra Swan	SM	1,175		I	1973	Salter et al. 1974
Tundra Swan	FM	4,470	G	I	1972	Salter 1974
Waterfowl	SM	5,000		I	1973	Salter et al. 1974
Waterfowl	FM	10,000	N	I	1972	Salter 1974

#### *Conservation and Issues Related to the Mackenzie Gas Project*

Several potential industrial activities could lead to problems for waterfowl in the Beaver Lake area. Barges are a major mode of transport along the Mackenzie River and dredging is sometimes done to enable barge traffic to move with greater ease. This is a potential source of disturbance if it is done during peak migration time and would be amplified with increased barge traffic resulting from the Mackenzie Gas Project. Two additional concerns which should be addressed when assessing cumulative impacts are: (i) a proposal has been put forward to dam Slave River (which feeds into Great Slave Lake) and this could influence the water levels at Beaver Lake (the outlet of Great Slave Lake); and (ii) the possibility that a set of transmission wires may be installed by the Northwest Territories Power Corporation over the river near Fort Providence. Overhead utility lines near wetlands in other locations have caused waterfowl mortality.

## VI. Conclusion

Our review of the Mackenzie Gas Project EIS identified some serious deficiencies regarding the potential impacts of the Project on migratory birds and their habitats. This report focused on a number of key concerns and addressed these within the limited scope of funding available for review and analysis of available information on migratory birds pertinent to the Project. The concerns are: (1) the six globally significant Important Bird Areas, one continentally significant Important Bird Area, and one candidate globally significant Important Bird Area that may be negatively impacted by the Project; and (2) the potential impacts of the Project on shorebird, waterfowl and landbird species that have been identified as species of conservation concern and the inadequacy of Wildlife Valued Components to address the needs of these species or other birds that occur in notable numbers (such as within the IBAs).

Canada has a continental and global responsibility to conserve migratory bird populations which it shares with other countries, particularly those that occur in continentally and globally significant concentrations and those which have been identified as a conservation concern. Had the EIS followed Environment Canada's *Migratory Birds Environmental Assessment Guideline* these and other issues concerning the impact of the Mackenzie Gas Project on migratory birds would likely have been adequately addressed.

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