

APPENDIX B

**WATERFOWL STUDY: OUTFITTER (A13 SECTION) ROUTE
CARTWRIGHT JUNCTION TO HAPPY VALLEY-GOOSE BAY
TRANS LABRADOR HIGHWAY**

**JACQUES WHITFORD PROJECT NO. NFS9308-0004
MINASKUAT PROJECT NO. M6-0004**

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CARTWRIGHT JUNCTION TO HAPPY VALLEY-GOOSE BAY
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SEPTEMBER 2003



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EXECUTIVE SUMMARY

The Department of Works, Services and Transportation (WST) is proposing to construct a two-lane, all-season gravel surface highway from Cartwright Junction to Happy Valley-Goose Bay. One alternative routing option is one proposed by the Newfoundland and Labrador Outfitters Association for a route to the south of the preferred route. A detailed environmental assessment was conducted in 2002 on the preferred route (JW/IELP 2003). In response to comments received on the environmental impact statement (EIS) and comprehensive study report (CSR), Jacques Whitford (JW) and Minaskuat Limited Partnership were contracted to prepare the following waterfowl study on the A13 section of the alternative route as identified by the Newfoundland and Labrador Outfitters Association. The objective of this study was to conduct original research to describe waterfowl distribution along the A13 section of the outfitter route.

Following the methodology used for surveys along the preferred route (JW and LMSS 2003), five aerial surveys were conducted in 2003: May 9 (early spring staging); May 23 (spring staging); June 9-10 (breeding); July 16-17 (brood/moulting); and September 4-5 (fall staging). Using either a Bell 206 L or Aerospatiale "A" Star helicopter, survey speed was approximately 50 km/hr at an altitude not greater than 30 m above ground level. Areas of open water and wetland habitat were identified by the navigator/recorder, who directed the pilot and two other experienced observers over the course of each survey. Communication through an intercom system on the aircraft used a 12-hour clock for orientation, to locate and identify observations according to species and sex. All sightings were plotted directly onto 1:50,000 NTS map sheets (with the proposed route plotted on the maps in advance) and verified using the aircraft's global positioning system (GPS).

During the May 9, 2003 survey, most lakes and wetland areas remained >75 percent ice or snow covered. Since the route crosses no major rivers and is in proximity to relatively few larger waterbodies, areas of open water were limited. Waterfowl observed in Section 1 of the highway route were associated with the Kenamu River, Brennan Lake and a another large waterbody, areas common between the preferred and outfitter routes. No waterfowl were observed in Section 2. In Section 3, American black duck and green-winged teal were observed in areas of open water along the western end of the outfitter (A13 section) route. This portion of the A13 section of the outfitter route has the most wetland and standing water.

During the May 23 survey, there were many areas of open water and waterfowl were distributed throughout the survey area, with most observations being in areas on the western and eastern portions of the route. Similar to observations made during some surveys along the preferred route in 2002, ring-necked duck represented the greatest number of individuals observed. Numbers of Canada goose and American black duck were comparatively low. With the exception of ring-necked ducks that were seen in groups of five to seven individuals in some areas, most waterfowl were seen in groups of two or singularly.



During the June 9-10 survey, all rivers and inlet and outlet areas of lakes where ducks tended to congregate were ice-free. A pattern of distribution similar to that of the May 23 survey was observed. Black ducks, generally in pairs, were commonly observed using wetland areas. Canada geese were observed in similar habitat. Thirteen Canada goose nests were also observed, all generally on small islands in string bogs or small waterbodies surrounded by wetland habitat types. Ring-necked duck were also commonly observed during the survey.

During the July 16-17 survey, Canada geese were aggregated in groups ranging from pairs and single birds with broods to groups of four to eight birds. Ring-necked ducks were generally observed in small groups of five or less birds. One grouping of 16 ring-necked ducks was observed on the eastern portion of the highway route. Common goldeneye and mergansers were distributed throughout the survey area, generally singularly. Similarly, scoters were observed singularly or in pairs along the central and eastern sections of the highway route. Several species, including Canada goose, black duck, green-winged teal, common goldeneye, red-breasted merganser, scoters, and ring-necked ducks, were observed with broods. A total of 28 young Canada geese were observed in eight separate groups. Numerous broods of black ducks were observed, totalling 59 young. Several groups of ring-necked ducks were also observed, totalling 35 young. Lesser numbers of young common goldeneye, green-winged teal, red-breasted mergansers and scoters were also observed.

During the September 4-5 survey, congregations of black ducks were observed at various locations along the route (total of 123 individuals), with the largest congregation being 11 birds. Similarly, Canada geese were observed in groups ranging from three to ten individuals, with groupings of two or three birds common (total of 84 individuals). Ring-necked ducks were distributed throughout the survey area (total of 132 individuals), mainly in groups of five or less. Other species observed included mergansers, common goldeneye, northern pintail, green-winged teal, and scoters. For the first time during surveys in support of the Trans Labrador Highway environmental assessment, white-winged scoters were seen at four locations on the eastern and central sections of the outfitter (A13 section) route.

No harlequin ducks were observed during the surveys. While it appears that harlequin ducks do not breed or breed at extremely low densities in the project area, it is known that southern Labrador is a migration route for birds returning from wintering grounds off Newfoundland and further south along the eastern seaboard (Brodeur 1997). Therefore, individuals may use waterbodies in the study area infrequently.

Similar to results observed along the preferred route, waterfowl observations during the series of surveys along the A13 section of the outfitter route indicate species occur at relatively low densities throughout wetland habitat in the study area. However, the large amount of potential habitat that is available results in waterfowl being widely distributed throughout the area. A total of 16 wetlands surveyed in June 2003



exhibited waterfowl densities greater than 0.10 birds/ha. The wetland with the highest density (1.2 birds/ha) is located approximately 160 m from the proposed highway route. Three of the sixteen immediately adjacent to or within the highway right of way.

The western portion of the outfitter (A13 section) route (approximately 30 km) appears to support a larger number of waterfowl than the eastern and central sections due to the volume of wetland and small waterbodies that are present in that area.



KATAKUAPEKASHT TIPATSHIMUN MASHINEIKAN

Ntshent meshkinanu kanakituatak (Department of Works, Services, and Transportation) nantuenitamuat tshetshi tutakinitt ussi meshkinanu tshetshi aitu pampinitshi utapana. Ne meshkinau nete tshika itimu uta Apipani nuash nete Nutapineuant. Ne kutak meshkinau tshatshi iapishtakanu ne ishinikateu (outfitter route-meshkinau) ne ishinikatimupanit Newfoundland and Labrador Outfitters Association. Nete mishte tshitashun 2002, shash tshiminu nantussenitakanu ne meshkinau tshetitmut ne itishteu (JW/IELP 2003). Ne mashineikan Environment Impact Statement mak Comprehensive Study kaitashtet tshetshi tutimat, itassemepant nenua Jacques Whitford (JW) mak Minaskuat Limited Partnership tshetshi minu nantussenimentshi aeshisha miam mate (shishipa, nishka, mak muakua) nete meshkinat kaitashtenat A13 section, nenua kaishinikatimantsi Newfoundland and Labrador Outfitters Association. Umue kuet tutakant etitu tshetshi minu nantussenimakanit aeshishat shishipat, nishkat mak muakuat nete A13 meshkinat.

Utshet niantussenitak (JW mak LMSS 2003) meshkinanu, patetat tatuau nanitussenitamupat assinu eiapitshiakant kauauashtetshesht. Ushkat ne Nissa Pishum peikushteu (9) etshishtaauakanitshi, uipat shikunut piapinit nishkat kie shishipat; minuat ne Nissa Pishum nishunu ashu nisht (23) shiakunipit aeshiish; minuat Uapunkun Pishum peikushteu mak kutunu (9-10) peniauet; minuat Shetan Pishum kutunu ashu kutuass mak kutunu ashu nishuass (16-17) uetat upuiuu; mak Ushkau Pishum neu mak patetat (4-5) tikuatshinu. Ne kauauashtetshesht kaishinikatakant Bell 206 L kie iat Aerospatiale “A” Star tipatakushipan kie metinu pamipanipan nentussenitakau assinu. Nete pampinipan iat massekut mak nete nipinu tekunit, kuet mishinatekau tshakuanu uiatak. Kunenitamupant tshakuanu tshetshi nanitam nitutuakanit aeshishat tanite etat mak tan eshinakushit nete tiat. Kassinu meshkakant tshakuan mishinatekeikanu nte assiu mashineikant.

Nissa Pishum peikushteu (9) etshishtaauakant mitshet shakeikana kie messekuia eshku mishta mishkumiu kie mishta kunu. Apu shuk mishta nanitussenitakanitshi shipua nipia tante apu mitshenikau shipua kie shakeikana nete miam meshkinu tshetitmut .Ne aeshishat (shishipit, nishkat, mak muakuat) nete tiat nu Section 1 meshkinat miam mate Tshenuameshipit, Brennan Shipit mak nete meshikamanit shipunu, ekuta pemimut meshkinanu kaishinikatet outfitter routes. Apu uapimakanit nete Section 2 aeshishat. Nete Section 3 ekute tiat shishipat nete emushepianit nipit miam nete meshkinat kaishinikatet outfitter (A13 section) route. Eukun umue meshkinau A13 ekuta miatshenikau nipia.

Nissa Pishum Nishunu ashu nisht kanitussenitakant assi, shash mushepiau nipi kie tapanit aeshishat (shishipit, nishkat, mak muakuat). Peikutau ishiuatikanipan tshakuan miam nete kaishinantussenitakant nete 2002 mishteit tshitashun, shishipat anu mitshetipant. Nishkat apu shuk tat. Pisse shishipat patetat kie ma nishuass itatupunut eku tshent kutakat aeshishat nishupunut kie ma peikupunut.



Uapukun Pishum peikushteu mak kutunu (9-10), kassinu shipua, shakeikana, kie shipissa shash apu tat nasht mishkumi. Peikutau ishinakun miam kaishiuatakant tshekuan nete Nissa Pishum Nishunu ashu nisht kanitussenitakant. Shishipat nishupunu man kie nete uapimakanut massekut. Eku nishkat peikutau nete iat uapimakanut. Kutunnu ashu nisht itatinua nishkat uisht nete mineshtukut kie nete massekut. Iat nanitussenimakanipant shishipat miam ne niantussenimakanit anishka.

Shetan Pishum kutunu ashu kutuass mak kutunu ashu nishuass (16-17) kananitussenimakanit aeshishat, nishkat nanitussenimakanipant niashipunitau nuash nete mamupinitau miam mate neupunitau kie ma nishuashtatupunitau. Eku shishipat nanitussenimakanut kamiatsшетitau patetat tatupunitau. Nete meshkinat katutakanit ekute nianitussenimakanit shishipat. Ntshent nishkat mamu punut uikanishuau kie iat peikutau shishipat. Nishunu ashu nashuash mamu nishkat tatishut enitussenimakanit kie nashuash tatipan nanitussenimakanipant. Kie iat shishipat patetat ashu peikushteu tatishipant enitussenimakanit. Nishtunu ashu patetat iuassit.

Ushkau Pishum neu mak patetat (4-5) mitshet uapimakanut shishipat ekuta miam neta uatutakant meshkinau, mamu 123 peikutamitunu ashu nishunuashunisht itatushut uapimakanit. Eku nishkat nisht kie iat kutunu tatipunut miamupinitau eku mamu etshimakanit 84 nashuashtatinu ashu neu itatishipant enitussenimakanit. Eku tshent shishipat kaishinikatakanit (ring-necked) mamu etshimakanit peikutamitunu ashu nishtunu ashu nish itatishipant, patetat tatiuau mamupinut. Enush uapimakanit tshent shishipat kaishinikatakanit (white-winged scoters) nete neuau tatipan etat, miam nete meshkinanu outfitter route (A13) uatutakanit.

Apu uapimakanit tshent shishipat (harlequin) kaishinikatakanit. Ne shishipat kaishinikatakanit (harlequin) apu shuk tat kie apu piniauet nete miam meshkinanu uatutakanit. Ntshent shishipat uetshipinit nete Newfoundland (Brodeur 1997).

Peikutau ishiuatikanu tshekuan kanitussenitakanit nete meshkinau uatutakanit. Netshent aeshishat (shishipit, nishkat, mak muakuat) kananitussenimakanit meshkinat A13 outfitter route apu shuk tshi mitshetit nete massekut tekunitshi. Netshent tiat aeshishat nete taut nipia tekunitshi. Mamu kutunu ashu kutuass itatinua nipia nentussenitakanitshi nete Uapukun Pishum 2003 mishte tshitashun ekuta miatshetit aeshishat. Nenua nipia pessish na takunua nete miam meshkinat.

Nete ushte meshkinat ekute muk miatshetit aeshishat (shishipit, nishkat, mak muakuat) tante anu nete mitshenua nipia maka nete tetaut meshkinau etikunit. Nete tetaut meshkinat apu shuk takunikau nipia.



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1.0 INTRODUCTION

1.1 Background

The Department of Works, Services and Transportation (WST) is proposing to construct a two-lane, all-season gravel surface highway from Cartwright Junction to Happy Valley-Goose Bay. This highway section is Phase III of the Trans Labrador Highway (TLH) and will link the existing TLH highway sections to the east (Phase II) and west (Phase I). The TLH - Phase III project is currently undergoing an environmental assessment under both the Newfoundland and Labrador *Environmental Protection Act* and *Canadian Environmental Assessment Act* (CEAA). As part of the environmental assessment, detailed study (a component study) was required on waterfowl in the vicinity of the proposed route for the highway.

On April 24, 2003, the Minister of Environment issued a statement regarding the environmental impact statement (EIS) and comprehensive study report (CSR) and related documentation prepared for the TLH - Phase III environmental assessment. Before a final decision could be reached on the project, additional information and study were required on various aspects of the project. WST was advised that any alternative route determined to be viable upon review of the alternative methods for carrying out the project (as outlined in the EIS/CSR) must have a waterfowl component study completed for that alternative route.

The only alternative route that was determined to be a viable alternative to the preferred route for the TLH - Phase III was the alternative route that had been identified by the Newfoundland and Labrador Outfitters Association (Figure 1.1).

This appendix provides details on the field surveys carried out along the outfitter (A13 section) route and the results of those surveys. Five aerial surveys were conducted for waterfowl along the outfitter (A13 section) route to provide the same level of information as that previously provided for the preferred route.

1.2 Study Team

Perry Trimper of Jacques Whitford was the project manager and was involved in the design and conduct of field surveys and report review. Kathy Knox of Jacques Whitford also participated in field surveys, data compilation and report preparation. Dave Kearsey of Jacques Whitford compiled the MapINFO files for all collected data. Technicians from Minaskuat Limited Partnership and/or Land Management and Survey Systems (LMSS) Limited participated in all aerial surveys and provided translation to Innu-eimun.



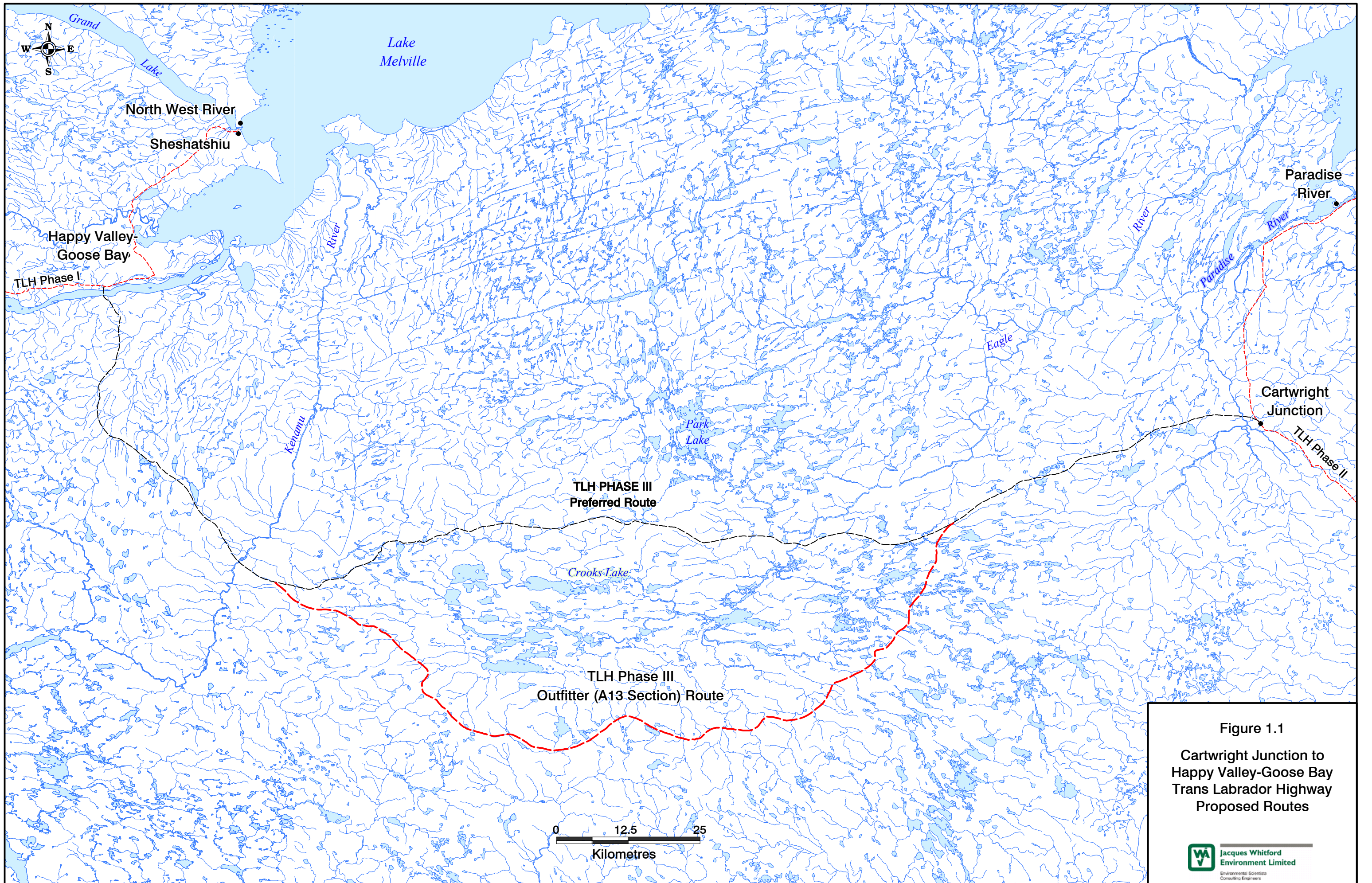


Figure 1.1
 Cartwright Junction to
 Happy Valley-Goose Bay
 Trans Labrador Highway
 Proposed Routes



1.3 Study Area

The A13 section of the outfitter route lies primarily within the boundaries of the Mecatina River ecoregion in central Labrador. The route also crosses small sections of the Eagle Plateau ecoregion along its western and eastern ends before connecting with the preferred route (Figure 1.2). Ecoregions that the preferred route and the outfitter routes have in common are the Lake Melville ecoregion, at the western end of the highway route, and the Paradise River ecoregion at the eastern end of the highway route.

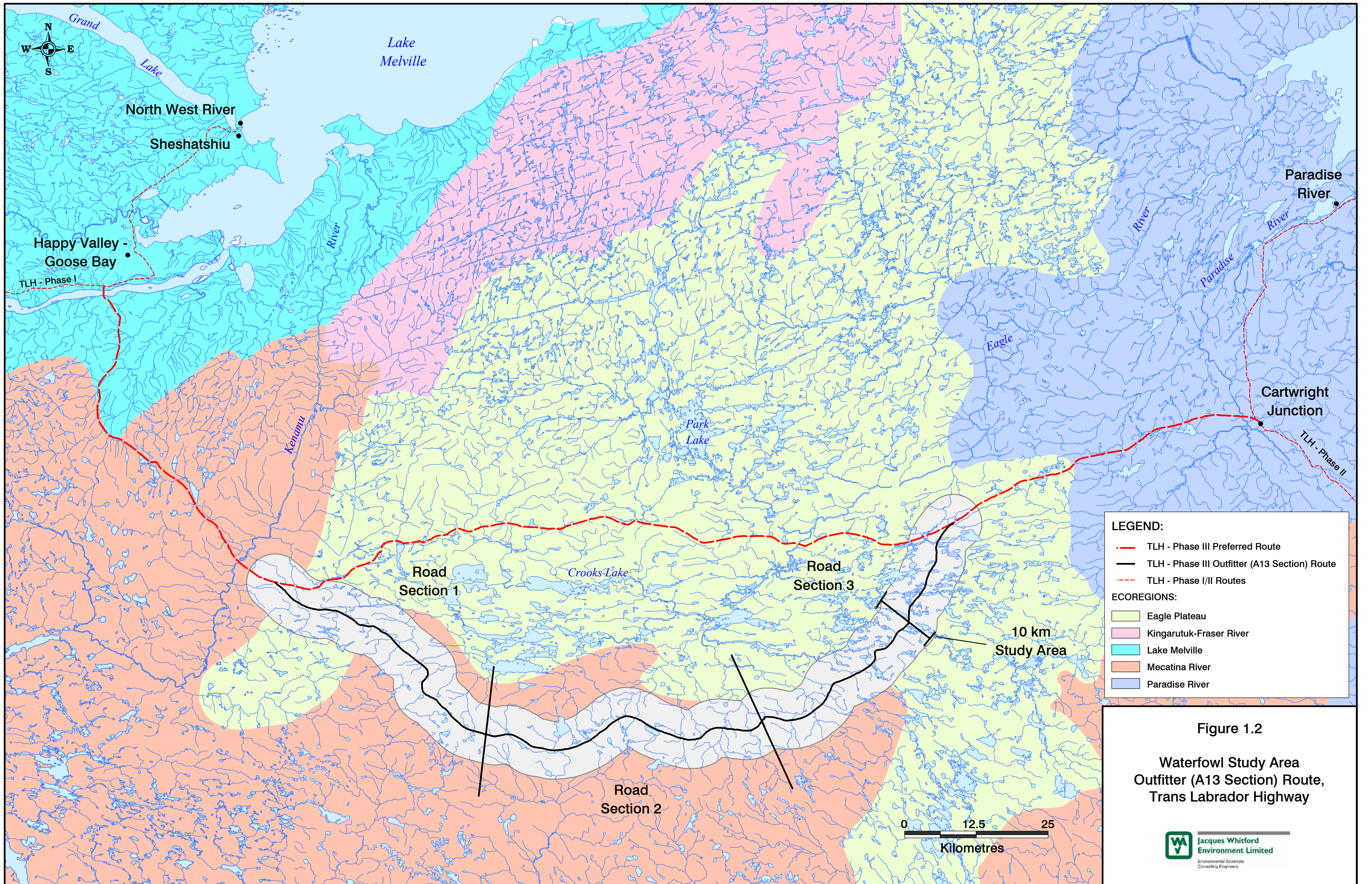
The Lake Melville ecoregion has low-lying (i.e., essentially at or near sea-level) undulating upland topography with flat river terraces and generally experiences warmer summers and shorter winters than surrounding regions. A relatively productive closed-crown black spruce forest is the dominant vegetation (Meades 1990).

The Mecatina River ecoregion, to the southeast, is dominated by fairly open black spruce forest, with ribbed fens and string bogs covering extensive areas. The climate is typically subarctic and continental, with warm summers and cold winters (Meades 1990).

The Eagle Plateau ecoregion encompasses much of both of the proposed highway routes and is characterized by a flat to rolling upland plateau where extensive string bogs dominate the landscape. Lichen woodland occurs on eskers and areas of coarse till. The climate is subarctic, with cool summers and cold winters (Meades 1990). The Paradise River ecoregion, at the eastern portion of the study area, has a boreal climate, with cool summers and short cold winters. It is characterized by undulating topography that supports closed-crown forest and domed bogs (Meades 1990).

To ensure that the area examined by this study was comparable to that assessed for the preferred route, the study area comprised areas of wetland and waterbodies within 5 km either side (i.e. 10 km wide) of the outfitter (A13 section) route (Figure 1.2).





LEGEND:


- TLH - Phase III Preferred Route
- TLH - Phase III Outfitter (A13 Section) Route
- - - TLH - Phase I/II Routes

ECOREGIONS:

- Eagle Plateau
- Kingarutuk-Fraser River
- Lake Melville
- Mecatina River
- Paradise River

Figure 1.2

**Waterfowl Study Area
Outfitter (A13 Section) Route,
Trans Labrador Highway**



 Jacques Whitford
 Environment Limited
Environmental Scientists
Consulting Engineers

2.0 METHODOLOGY

Aerial survey techniques used for this study have been developed by Jacques Whitford over the last 15 years in consultation with the Newfoundland and Labrador Wildlife Division and the Canadian Wildlife Service, and were the same as those used for surveys of the preferred route. Using either a Bell 206 L or Aerospatiale “A” Star helicopter, survey speed was approximately 50 km/hr at an altitude not greater than 30 m above ground level. Areas of open water and wetland habitat were identified by the navigator/recorder, who directed the pilot and two other experienced observers over the course of each survey. Communication through an intercom system on the aircraft used a 12-hour clock for orientation, to locate and identify observations according to species and sex. All sightings were plotted directly onto 1:50,000 NTS map sheets (equipped with the proposed route plotted in advance) and verified using the aircraft’s global positioning system (GPS). All other wildlife signs and sightings noted during aerial surveys were recorded.

Each aerial survey was timed (in consultation with knowledgeable persons) to search the study area during different periods of waterfowl activity. Survey dates, target species of waterfowl and waterfowl activity are indicated in Table 2.1.

Table 2.1 Details of Surveys

Survey Date	Activity	Target Species	Comments
May 9, 2003	spring staging	harlequin duck	all wetlands and ponds frozen, fast flowing areas on rivers and pond inlets and outlets open
May 23, 2003	staging/pair bonding	harlequin duck Canada geese dabbling ducks	rivers open, lakes mostly ice-free <150 m elevation, ponds and wetlands remained largely ice or snow covered >150 m elevation
June 9-10, 2003	breeding	all species	all waterbodies and wetland areas ice and snow-free
July 16-17,2003	brood/moulting	all species	areas likely to provide suitable brood or moulting habitat for various species were targeted - all water open
September 4-5, 2003	fall staging	all species	areas likely to provide suitable staging habitat were targeted



Spatial survey data (survey lines, species sightings, habitat features), plotted on the 1:50,000 map sheets, were digitized at 1:250,000 scale NTS map sheets using MapInfo (Version 6.0). Data management, analysis and representation was also completed using MapInfo and Vertical Mapper Contour Modeling Software (Version 2.5).



3.0 LITERATURE REVIEW

Fixed-wing transect surveys for waterfowl were conducted in the general area of the outfitter (A13 section) route in 1970 (Gillespie and Wetmore 1974) and in 1980 (Goudie and Whitman 1987). Additional fixed-wing transect surveys were completed for Canada geese in 1993 and 1994 (Bateman and Hicks 1995) to estimate average waterfowl density by ecoregion. The Eagle Plateau ecoregion, traversed by the outfitter (A13 section) route in two areas, was included in these surveys. For further discussion on previous surveys conducted in the region, refer to the Waterfowl Component Study completed by JW and LMSS (2003) for the preferred route.

Some general life history characteristics of waterfowl species that were commonly observed in the study area are detailed in Table 3.1.

Table 3.1 Waterfowl Species, Life Histories and Habitat Preferences

Species	Nesting and Brood Rearing	Diet and Foraging	Preferred Habitat
Canada Goose	Nest: ground scrape prefers nesting islands Clutch Initiation: early May Incubation: 25-30 days Fledge: 40-73 days Young: Precocial	Diet: forbs invertebrates shoots, roots seeds of grasses and sedges Foraging: surface dips, dabbles, and ground gleans	slope fen, ribbed fen, marsh, swamp, open water and small island habitats
American Black Duck	Nest: ground scrape Clutch Initiation: late April to early July Incubation: 26-29 days Fledge: 58-63 days Young: Precocial	Diet: aquatic invertebrates, seeds, tubers Foraging: dabbles	ribbed fen, marsh, swamp, open water
Green-Winged Teal	Nest: ground scrape Clutch Initiation: early May to mid June Incubation: 21-28 days Fledge: 34 days Young: Precocial	Diet: seeds, aquatic invertebrates, grass, plant shoots Foraging: ground gleans, dabbles	ribbed fen, marsh, open water
Ring-necked Duck	Nest: ground scrape sometimes use floating nest Clutch Initiation: late May to early July Incubation: 26-27 days Fledge: 49-56 days Young: Precocial	Diet: seeds, shoots and tubers of aquatic plants, aquatic invertebrates Foraging: surface feeding dives	ribbed fen, marsh, swamp, open water often nest in low-productivity wetlands avoided by other ducks



Species	Nesting and Brood Rearing	Diet and Foraging	Preferred Habitat
Common Goldeneye	Nest: cavity in snag Clutch Initiation: early to late May Incubation: 28-32 days Fledge: 56-60 days Young: Precocial	Diet: aquatic invertebrates, insects and aquatic vegetation Foraging: surface dives	marsh, river bank, riparian alder/willow thicket, open water
Common Merganser	Nest: tree cavity sometimes on ground Clutch Initiation: mid May to mid June Incubation: 28-35 days Fledge: 65-85 days Young: Precocial	Diet: fish, aquatic invertebrates Foraging: surface dives	marsh, river bank, riparian alder/willow thicket, open water
<p>Note: Clutch Initiation - time of laying first egg. Incubation - time from egg-laying to hatching. Fledge - time from hatching to first flight. Young - precocial: mobile, downy, follow parents, find their own food.</p> <p>Sources: Ehrlich et al; 1988, Goudie and Whitman 1987; Bellrose 1976.</p>			



4.0 RESULTS AND DISCUSSION

4.1 Regional Population Status of Ducks

A brief summary of the status of selected waterfowl populations in the region are provided in Table 4.1. Common names, AOU codes, scientific names, and breeding chronology of avifauna are provided in Appendix A. For a detailed discussion on the regional population status of ducks, refer to the Waterfowl Component Study completed by JW and LMSS (2003) for the preferred route.

Table 4.1 Summary of Regional Waterfowl Populations

Species	Population Estimate	Year	Region	Trend
American Black Duck	40,000 pairs	1999	Boreal Shield-Eastern	increasing
Mallard	127,800 ± 25,000	2000	eastern Canada (eastern Ontario, southern Quebec, Atlantic Canada)	unknown
Green-winged Teal	68,000 ± 7,900	2000	eastern Canada	increasing
Ring-necked Duck	144,700 ± 12,700	2000	eastern Canada	increasing
Canada Goose	175,800	2000	Newfoundland and Labrador	increasing
Harlequin Duck	7,700	1999	eastern North America/western Greenland	unknown
Barrow's Goldeneye	4,500	2000	eastern North America	unknown
Scoter sp.	940,800	2000	North America	declining

Source: CWS 2000; Robertson and Goudie 1999.

4.2 2003 Surveys Along the Alternative (A13) Route

Dabbling ducks such as American black ducks and green-winged teal rely on shallow wetlands with emergent vegetation and were generally found associated with peatlands, ribbed fens and fen-marsh complexes during breeding surveys. The bay ducks, such as ring-necked ducks and scaup species, were also associated with peatland or peatland-marsh habitat during breeding. Sea ducks such as common goldeneye and common mergansers are tree cavity nesters and were most often associated with forested rivers and lakes. Surf scoters and black scoters were generally seen on rocky shored lakes and ponds where they are known to breed. Canada geese were recorded throughout the survey area, usually associated with string bogs, ribbed fens, and along the grassy shorelines of small rivers.



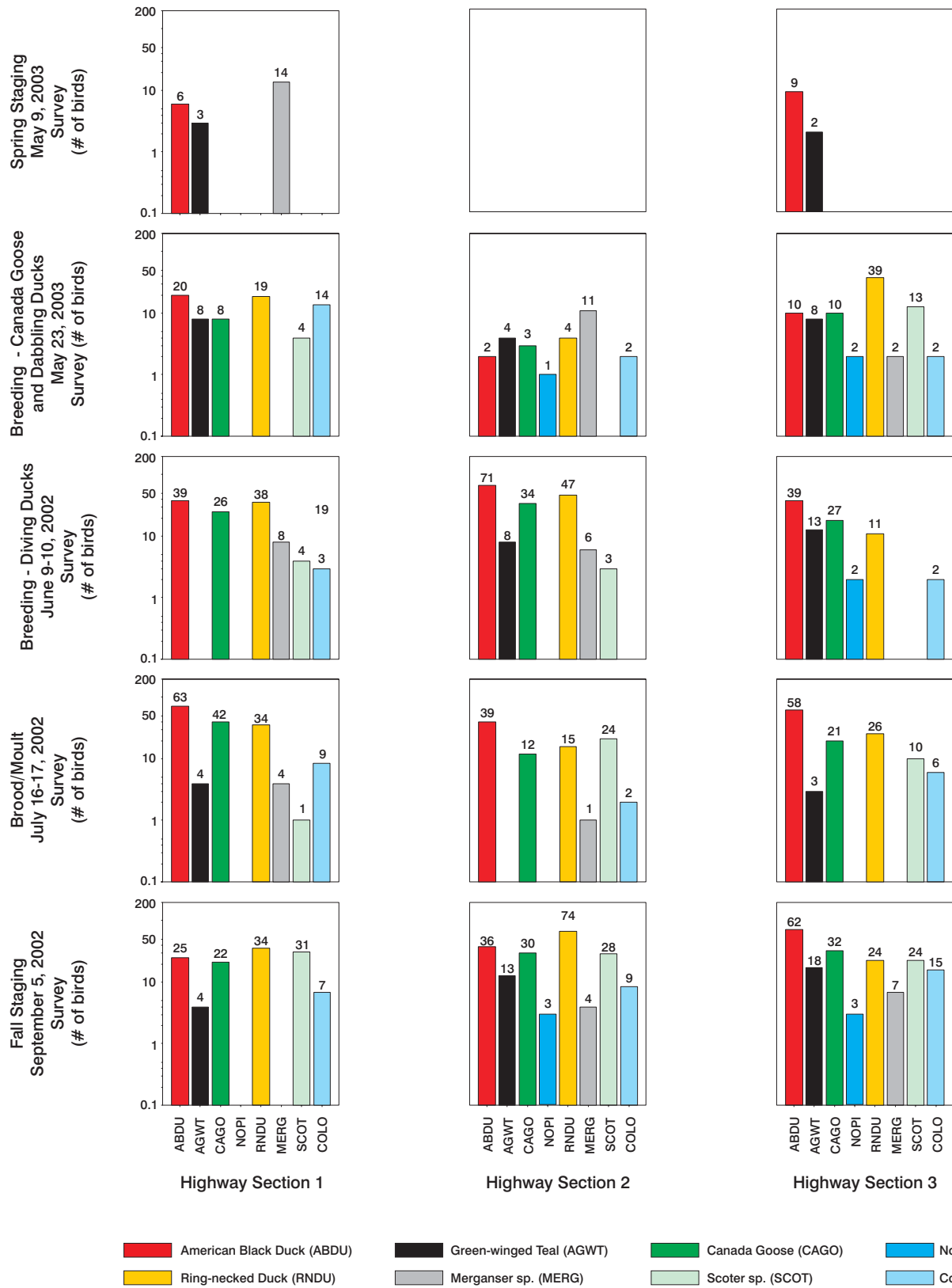
Figure 4.1 provides a summary of selected waterfowl species observed by highway segment during each survey along the outfitter (A13 section) route. Species diversity and numbers were low during the May 9 survey as much of the survey area was still ice or snow covered. Only American black duck, green-winged teal and merganser sp. were observed (Figure 4.1). By the May 23 survey, species diversity and numbers increased and during the June survey, the greatest numbers of ducks were observed (Figure 4.1). American black ducks were observed in all highway sections during most surveys and were among the most commonly observed species during surveys (Figure 4.1). Similarly, Canada geese were observed in all highway sections during most surveys with distributions being fairly even between highway sections (Figure 4.1). Ring-necked ducks were the most abundant ducks during the fall survey with a concentrations in highway sections 2 (Figure 4.1). Mergansers were observed on all five surveys in 2003 while observations of other species such as scoters, northern pintail and green-winged teals varied between surveys (Figure 4.1).

4.2.1 Spring Staging

Following is a summary of the results of surveys along the A13 section of the outfitter route in 2003. Detailed mapping of survey results is presented in Appendix B.

During the May 9, 2003 survey, most lakes and wetland areas remained >75 percent ice or snow covered. Since the route crosses no major rivers and is in proximity to relatively few larger waterbodies, areas of open water were limited. Waterfowl observed in Section 1 of the highway route were associated with the Kenamu River, Brennan Lake and a another large waterbody, areas common between the preferred and outfitter routes (Figure B1 in Appendix 1; Table 4.2). No waterfowl were observed in Section 2 (Figure 2 in Appendix B1; Table 4.2). In Section 3, American black duck and green-winged teal were observed in areas of open water along the western end of the outfitter (A13 section) route. This portion of the A13 section of the outfitters route has the most wetland and standing water (Figure 3 in Appendix B1; Table 4.2). Areas with potential to support harlequin ducks were also surveyed. No harlequin ducks were observed.





**Jacques Whitford
Environment Limited**
Environmental Scientists
Consulting Engineers

Figure 4.1
**Selected Waterfowl Observations by
Highway Section and Survey Date**
Outfitter (A13 Section) Route, Trans Labrador Highway

Table 4.2 Summary of Observations of Waterfowl and Other Avifauna on the Outfitter (A13 Section) Route Trans Labrador Highway, May 9, 2003

Number of Individuals (# of pairs identified)							
Road Section	American Black Duck	Green-winged Teal	Glaucus Gull	Herring Gull	Common Merganser	Greater Yellowlegs	Total Individuals
1	6	3	1	3	14	4	31
2	-	-	-	-	-	-	-
3	9	2	-	-	-	-	11
Total Birds	15	5	1	3	14	4	42

During the May 23 survey, there were many areas of open water and waterfowl were distributed throughout the survey area, with most observations being in Sections 1 and 3 (Figures 4 to 6 in Appendix B2; Table 4.3). Similar to observations made during some surveys along the preferred route in 2002, ring-necked duck represented the greatest number of individuals observed. Numbers of Canada goose and American black duck were comparatively low (Table 4.3). With the exception of ring-necked ducks that were seen in groups of five to seven individuals in some areas, most waterfowl were seen in groups of two or singularly.

Table 4.3 Summary of Observations of Waterfowl and Other Avifauna on the Outfitter (A13 Section) Route Trans Labrador Highway, May 23, 2003

Number of Individuals (# of pairs identified)														
Road Section	American Black Duck	Green-winged Teal	Ring-necked Duck	Canada Goose	Common Merganser	Surf Scoter	Scoter sp.	Uniden Diver	Common Loon	Common Tern	Great Black-backed Gull	Herring Gull	Greater Yellowlegs	Total Individuals
1	20	8	19	8	15	3	1	7	14	-	2	17	23	137
2	2	4	4	3	11	-	-	8	2	-	-	5	8	47
3	10	8	39	10	2	-	13	8	2	2	-	23	2	119
Total Birds	32(7)	20(7)	62(3)	21(7)	28(5)	3	14(2)	23	18(4)	2	2	45	33(6)	303



4.2.2 Breeding

During the June 9-10 survey, all rivers and inlet and outlet areas of lakes where ducks tended to congregate, were ice-free. A pattern of distribution similar to that of the May 23 survey was observed (Figures 7 to 9 in Appendix B3). Black ducks, generally in pairs, were commonly observed using wetland areas. Canada geese were observed in similar habitat. Thirteen Canada goose nests were also observed, all generally on small islands in string bogs or small waterbodies surrounded by wetland habitat types (Figures 7 to 9 in Appendix B3). Five of these nests were located in an area of wetlands and small ponds along the western section of the outfitter (A13 section) route, south of Crooks Lake (Figure 7 in Appendix B3). Ring-necked duck were also commonly observed during the survey (Table 4.4).

Table 4.4 Summary of Observations of Waterfowl and Other Avifauna on the Outfitter (A13 Section) Route Trans Labrador Highway, June 9-10, 2003

Number of Individuals (# of pairs identified)															
Road Section	American Black Duck	Green-winged Teal	Ring-necked Duck	Canada Goose	Common Goldeneye	Common Merganser	Black Scoter	Common Loon	Scoter sp.	Northern Pintail	Uniden Diver	Common Tern	Herring Gull	Greater Yellowlegs	Total Individuals
1	39	-	38	26	4	8	2	3	2	-	5	4	2	12	145
2	71	8	47	34	2	6	-	-	3	-	3	5	1	7	187
3	39	13	11	27	3	-	-	2	-	2	4	2	3	19	125
Total Birds	149 (24)	21(4)	96(4)	87(19)¹	9(1)	14(2)	2(1)	5(2)	5	2	12	11	6	38(8)	457

¹ Three Canada goose nests along Road Section 1, five nests along Road Section 2, and five nests along Road Section 3.

Common loons, herring gulls and other gulls were generally associated with medium and large waterbodies and greater yellowlegs were ubiquitous, particularly in wetland areas.

4.2.3 Broods/Moulting

A total of 495 adults waterfowl and water-related birds were observed during the July 2003 survey (Table 4.5). Several groups of moulting black ducks were observed along the highway route (Figures 10 to 12 in Appendix B4). Canada geese were aggregated in groups ranging from pairs and single birds with broods to groups of four to eight birds. Ring-necked ducks were generally observed in small groups of five or less



birds. One grouping of 16 ring-necked ducks was observed on the eastern portion of the highway route (Figure 12 in Appendix B4). Common goldeneye and mergansers were distributed throughout the survey area, generally singularly (Figures 10 to 12 in Appendix B4). Similarly, scoters were observed singularly or in pairs along the central and eastern sections of the highway route (Figures 11 and 12 in Appendix B4).

Table 4.5 Summary of Observations of Waterfowl and Other Avifauna on the Outfitter (A13 Section) Route Trans Labrador Highway, July, 16-17 2003

Number of Adult Individuals																	
Road Section	American Black Duck	Green-winged Teal	Ring-necked Duck	Canada Goose	Common Merganser	Common Goldeneye	Red-breasted Merganser	Surf Scoter	Scoter sp.	Common Loon	Scaup sp.	Sandpiper sp.	Common Tern	Herring Gull	Greater Yellowlegs	Unidentified Diver	Total Individuals
1	63 ¹	4	34	42	4	6	1	1	-	9	-	5	1	21	16	6	213
2	39 ²	-	15	12	1	3	1	2	22	2	1	-	-	13	4	5	128
3	58 ³	3	26	21	-	2	-	1	9	6 ⁴	1	-	4	2	4	17	154
Total Birds	160	7	75	75	5	11	2	4	31	17	2	5	5	36	24	28	495

¹ includes 28 moulting ducks in groups of 11 and 17.
² includes 21 moulting ducks in groups of 12 and 9.
³ includes 28 moulting ducks in groups of 6, 6, 6, 5 and 5.
⁴ one loon sitting on a nest.

During the July survey, several species including Canada goose, black duck, green-winged teal, common goldeneye, red-breasted merganser, scoters, and ring-necked ducks were observed with broods (Table 4.6). A total of 28 young Canada geese were observed in eight separate groups. Numerous broods of black ducks were observed totaling 59 young. Several groups of ring-necked ducks were also observed, totaling 35 young. Lesser numbers of young common goldeneye, green-winged teal, red-breasted mergansers and scoters were also observed (Table 4.6).



Given the remote nature of the study area and the vast amount of potential habitat, a best effort was made to survey when conditions are most suitable for observing broods (i.e., early morning during calm conditions).

Table 4.6 Summary of Observations of Broods - Outfitter (A13 Section) Route, Trans Labrador Highway, July 16-17, 2003

Species	# Young	Age
American Black Duck	6	1b
	2	1c
	33	2a
	3	3c
	15	unclassified
Total	59	
Canada Goose	4	1b
	8	1c
	4	2a
	12	unclassified
Total	28	
Common Goldeneye	4	1c
	5	unclassified
Total	9	
Green-winged Teal	9	1b
Total	9	
Herring Gull	4	unclassified
	Total	4
Ring-necked Duck	4	1b
	6	1c
	6	2a
	19	unclassified
Total	35	
Red-breasted Merganser	5	1b
	6	2a
Total	11	
Scoter sp.	6	1b
	20	unclassified
Total	26	



4.2.4 Fall Staging

The distribution of observations along each of three sections of the outfitter (A13 section) route during the September 4-5, 2003 survey are summarized in Table 4.7 and indicated on Figures 13, 14 and 15 in Appendix B5. Congregations of black ducks were observed at various locations along the route (total of 123 individuals), with the largest congregation being 11 birds seen along the eastern section of the outfitter (A13 section) route as it approaches the preferred route, approximately 7 km to the west (Figure 15 in Appendix B5). Similarly, Canada geese were observed in groups ranging from three to ten individuals, with groupings of two or three birds common (total of 84 individuals) (Table 4.7). A group of 10 Canada geese were seen approximately 2.5 km northeast of the route (Figure 13 in Appendix B5) and four groups of goslings were observed. Ring-necked ducks were distributed throughout the survey area (total of 132 individuals) (Table 4.7), mainly in groups of five or less (Figures 13, 14 and 15 in Appendix B5). Several larger groupings were observed, including 20 ring-necked ducks seen on a small lake approximately 8 km north of the route (Figure 14 in Appendix B5) and a group of 22 seen approximately 7 km south of the route (Figure 14 in Appendix B5). Some ring-necked ducks were observed with broods; it was apparent that some were flightless at that time. Few mergansers and northern pintail ducks were observed during the survey (Table 4.7). Similarly, only one common goldeneye was observed along the western portion of the outfitter (A13 section) route (Figure 15 in Appendix B5). Green-winged teal were seen along each highway section (Table 4.7), with one group of 13 birds observed approximately 7 km south of the route (Figure 14 in Appendix B5). Scoters were observed in groups ranging from one to ten birds. White-winged scoters were seen at four locations on the eastern and central sections of the outfitter (A13 section) route (Figures 13 and 14 in Appendix B5).



Table 4.7 Summary of Observations of Waterfowl and Other Avifauna on the Outfitter (A13 Section) Route Trans Labrador Highway, September 4-5, 2003

Number of Adult Individuals																
Road Section	American Black Duck	Green-winged Teal	Ring-necked Duck	Canada Goose	Merganser sp.	Northern Pintail	Common Loon	Common Goldeneye	Surf Scoter	White-winged Scoter	Scoter sp.	Sandpiper sp.	Herring Gull	Greater Yellowlegs	Unidentified Duck	Total Individuals
1	25	4	34	22	-	-	7	-	73	3	21	-	2	1	21	147
2	36	13	74	301	4	3	9	-	-	11	18	3	2	-	13	216
3	62	18	24	322	7	3	15	1	-	-	24	-	1	-	63	250
Total Birds	123	35	132	84	11	6	31	1	7	14	63	3	5	1	97	613
¹ includes six young in groups of 4,1 and 1. ² includes one young. ³ includes five young.																

4.3 Important Habitat Areas

4.4.1 Wetland Size Versus Waterfowl Abundance

In order to compare the A13 section of the outfitters route to the preferred route, an analysis of wetland size versus waterfowl abundance was conducted. A similar exercise was completed by JW and LMSS (2003) for the preferred route.

One hundred and sixty-two wetlands, with areas ranging from approximately 2 to 467 ha, were surveyed for waterfowl during the June 9-10, 2003 waterfowl survey along the A13 section of the outfitters route (Figure 4.2). In some instances where several small wetland areas merged into each other, separated by a river or a small line of forest type vegetation, these areas were represented by one polygon (i.e., considered one wetland out of the 162). Out of the 162 wetlands surveyed, 62 (38.27 percent) had at least one individual observed. Fifty-seven wetlands had between one and nine waterfowl, four had between 10 and 20 waterfowl, and one had more than 20 waterfowl. In comparison, of 138 wetlands surveyed along the preferred route, 79 (57.25 percent) had at least one individual observed. Fifty-six wetlands had between one and nine waterfowl, 14 had between 10 and 20 waterfowl, and nine had more than 20 waterfowl (JW and LMSS 2003).



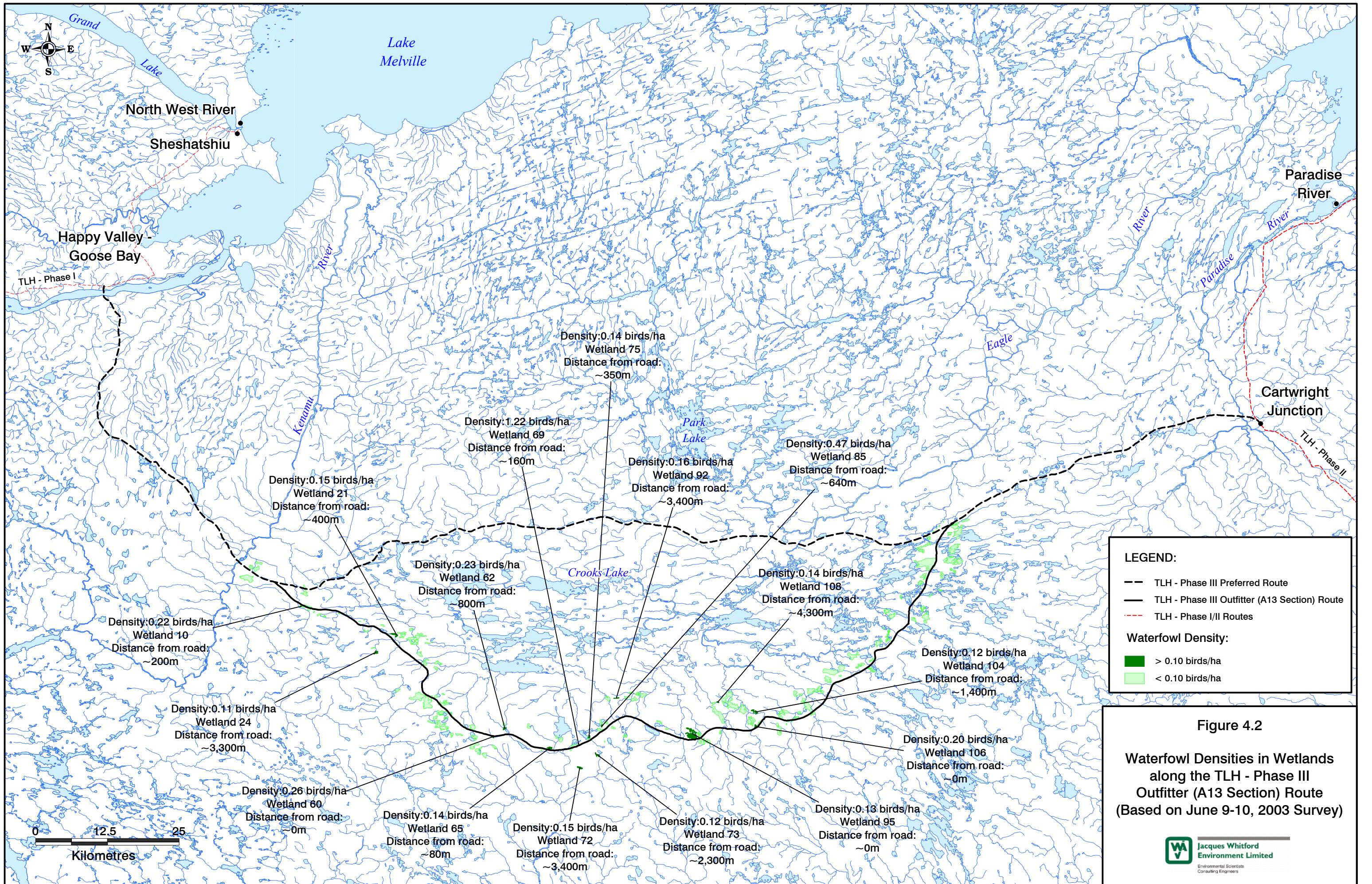


Figure 4.2
Waterfowl Densities in Wetlands along the TLH - Phase III Outfitter (A13 Section) Route
 (Based on June 9-10, 2003 Survey)

An analysis was conducted based on waterfowl density, defined as the number of waterfowl observed per hectare of wetland. Sixteen wetlands were identified to have a relatively high density (density >0.10), 18 with moderate density (density between 0.05 to 0.10), and 28 with low density (density <0.05). The wetlands with the highest density are indicated in Table 4.8 and their locations are indicated in Figure 4.2.

Table 4.8 Wetlands with Waterfowl Density > 0.10 birds/ha

Wetland No.	Area (ha)	No. of Waterfowl	Density (No. of Birds/ha)
10	4.61	1	0.217
21	33.06	5	0.151
24	26.55	3	0.113
60	11.64	3	0.257
62	17.44	4	0.229
65	28.18	4	0.142
69	2.45	3	1.223
72	25.9	4	0.154
73	24.32	3	0.123
75	14.77	2	0.135
85	10.64	5	0.47
92	12.23	2	0.163
95	195.01	25	0.128
104	33.23	4	0.12
106	24.92	5	0.2
108	7.27	1	0.137

Wetland 69 exhibits the highest density of waterfowl even though the absolute number of birds is relatively low (Table 4.8). Five of the wetlands with waterfowl densities greater than 0.10 birds/ha are >2 km from the centreline of the proposed highway (Figure 4.2). Ten of the wetlands are <1 km from the centreline, with three on the central section of the outfitter (A13 section) route being immediately adjacent to or within the highway centreline (Figure 4.2). The wetland with the highest density of birds, Wetland 69, is approximately 160 m from the centreline of the proposed highway (Figure 4.2).



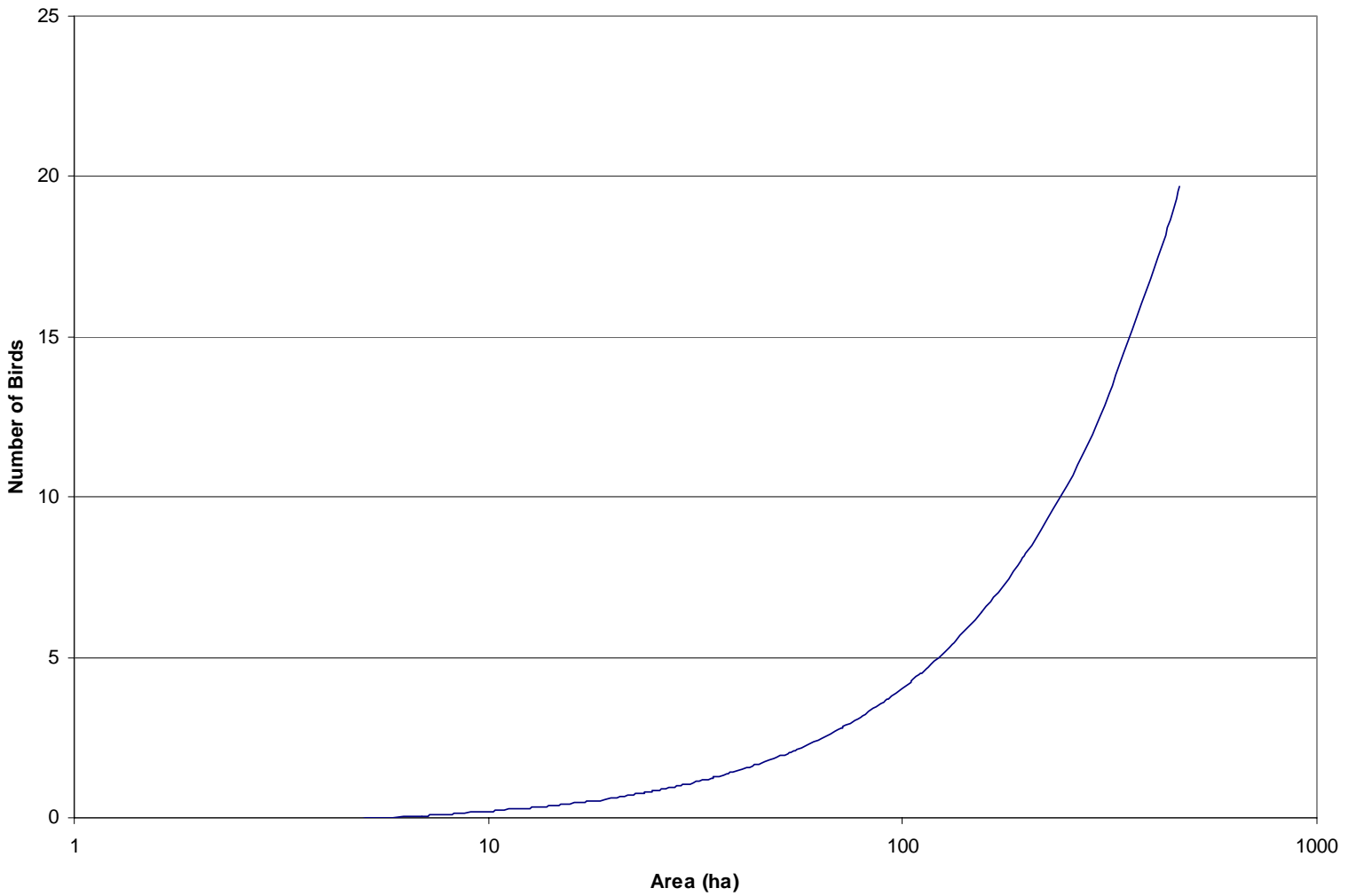
4.4.2 Probability of Occurrence of Waterfowl Versus Wetland Area

Similar to the analysis conducted for the preferred route (JW and LMSS 2003), the presence or absence of waterfowl in wetlands identified during the June 9-10, 2003 survey of the A13 section of the outfitter route was tested for wetland size using logistic regression. As was observed from the preferred route analysis, logistic regression of the 2003 data for the A13 section indicated that the larger the wetland, the greater chance that it will contain waterfowl. For example, a 400 ha wetland has a 90 percent probability that an individual waterfowl will occur there while a 20 ha wetland has only a 12 percent probability of a waterfowl occurrence.

A quadratic regression analysis was also performed on the June 2003 survey data, which indicates not only low numbers of waterfowl on small wetlands but also little change in waterfowl numbers as wetland size increases, until wetlands get very large. Only in large wetlands (>500 ha) do the number of waterfowl increase greatly. This model indicates that a 20 ha wetland will average less than one waterfowl (0.62) while a 400 ha wetland will average 16.84 waterfowl (Figure 4.3). In contrast, the regression analysis conducted for 2002 survey data along the preferred route indicated that a 20 ha wetland would average only 1.47 waterfowl, while a 400 ha wetland would average 8.69 waterfowl.



Figure 4.3 Occurrence of Waterfowl Versus Wetland Area - Outfitter (A13 Section) Route, Trans Labrador Highway



4.5 Other Wildlife Observations

Following is a brief summary of wildlife observations made during the various waterfowl surveys. As the same general areas were surveyed repeatedly, stationary structures such as raptor nests and beaver lodges were likely identified several times. Therefore, some of the following observations of these structures likely represent duplicate observations.

May 9, 2003 Survey

Extensive snow cover during this survey allowed observers to note evidence of species that otherwise would not be readily identified during an aerial survey. Tracks of river otter, bear, beaver, marten and caribou (old) were observed, as well as three moose (one adult, two yearlings), an adult bald eagle, and one black bear. Six beaver lodges, two in disrepair, were also observed.

May 23, 2003 Survey

Tracks of river otter and porcupine were observed during the survey. Observations of animals included two bald eagles (one adult, one three-year-old), three beavers, two moose, one muskrat, one porcupine, one black bear, one red-tailed hawk and one raven. Eleven beaver lodges and nine osprey nests were also recorded. Of the nests, one was collapsed, one was considered old and one was located on a rock. A total of 10 osprey were observed, including four pairs associated with nest structures and one single bird sitting on a nest.

June 9-10, 2003 Survey

As snow cover had disappeared by the time of the June survey, most observations of other wildlife activity were restricted to identification of beaver lodges. A total of 18 beaver lodges were identified during the survey, 11 of them old and in disrepair. Two porcupines were observed walking on the ground in treed bogs, and one caribou with a newborn calf was observed in an open bog area. Three osprey, two bald eagles, one red-tailed hawk and another unidentified hawk were seen flying during the survey.

July 16-17, 2003 Survey

Similar to the June survey, there were numerous observations of beaver lodges. One porcupine, one river otter and one beaver were also observed.



September 4-5, 2003 Survey

As with previous surveys, beaver lodges and signs of beaver activity were recorded. One muskrat was seen. Numerous raptors were observed, including osprey, bald eagle, red-tailed hawk, rough-legged hawk, and great-horned owl. A relatively large number of osprey were seen (23). Some of these were flying young-of-the-year.



5.0 SUMMARY

Waterfowl observations during the series of surveys indicate that waterfowl occur at relatively low densities throughout wetland habitat in the study area, although they are widespread. The few exceptions include 16 wetlands with waterfowl densities greater than 0.10 birds/ha, located at various points along the proposed highway route. Five of the wetlands with waterfowl densities greater than 0.10 birds/ha are >2 km from the centreline of the proposed highway. Ten of the wetlands are < 1km from the centreline, with three on the central section of the outfitter (A13 section) route being immediately adjacent to or within the highway centreline. The wetland with the highest density of birds, Wetland 69, is approximately 160 m from the centreline of the proposed highway.

The western portion of the outfitter (A13 section) route (approximately 30 km) appears to support a larger number of waterfowl than the eastern and central sections due to the volume of wetland and small waterbodies that are present in that area.



6.0 REFERENCES

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APPENDIX A

**COMMON NAMES, AOU CODES,
SCIENTIFIC NAMES AND BREEDING CHRONOLOGY
OF AVIFAUNA**

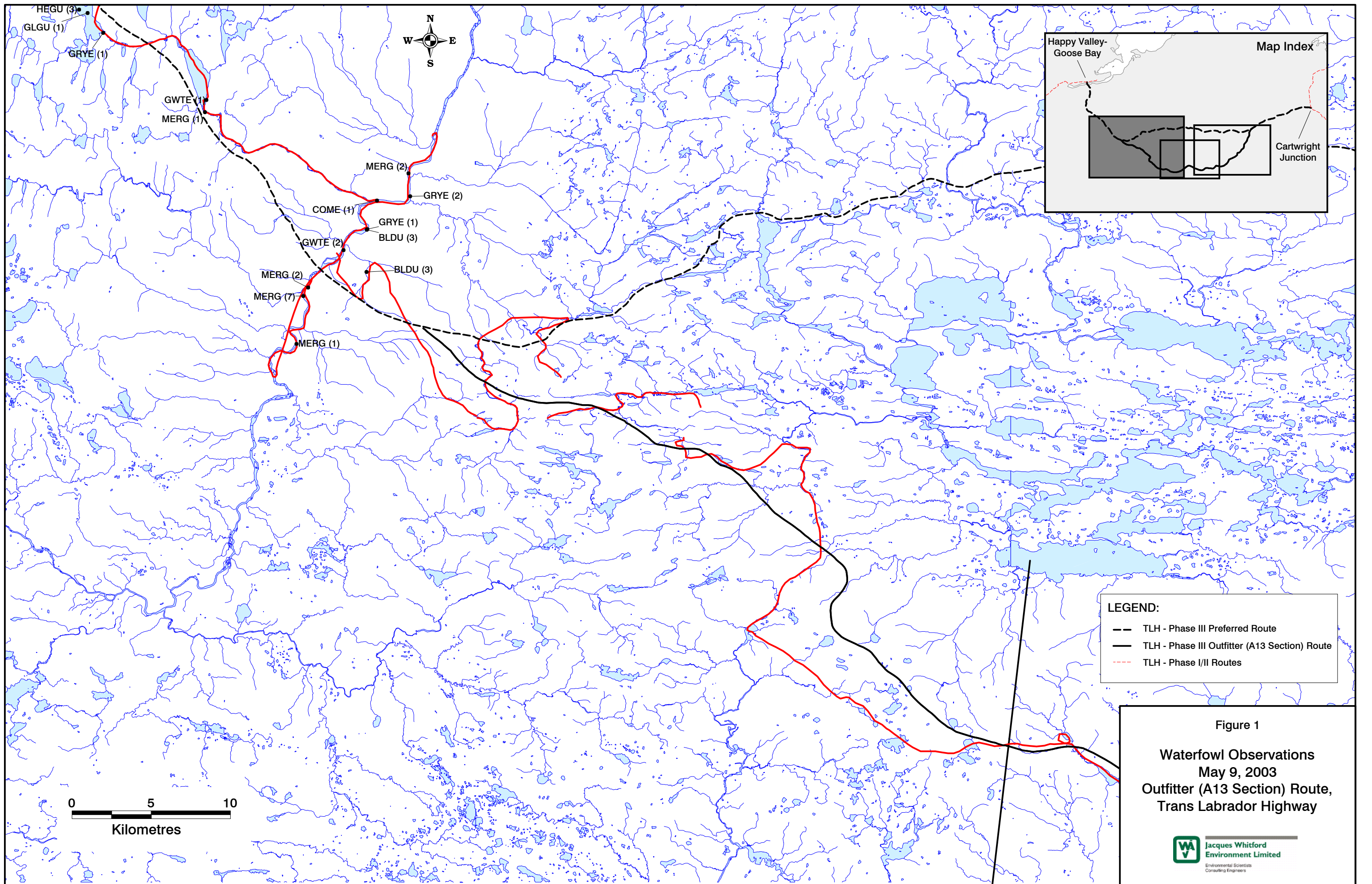
Appendix A Common Names, AOU Codes, Scientific Names and Breeding Chronology of Avifauna Recorded During Surveys or Included in Text

Common Name	AOU CODE	SCIENTIFIC NAME	Breeding Chronolgy
American Black Duck	ABDU	<i>Anas rubripes</i>	Early
Mallard Duck	MALL	<i>Anas platyrhynchos</i>	Early
Northern Pintail	NOPI	<i>Anas acuta</i>	Early
Green-winged Teal	AGWT	<i>Anas crecca</i>	Early
Canada Goose	CAGO	<i>Branta canadensis</i>	Early
Ring-necked Duck	RNDU	<i>Aythya collaris</i>	Late
Lesser Scaup	LESC	<i>Aythya affinis</i>	Late
Common Goldeneye	COGO	<i>Bucephala clangula</i>	Late
Common Merganser	COME	<i>Mergus merganser</i>	Late
Red-breasted Merganser	RBME	<i>Mergus serrator</i>	Late
Scoter sp.	SCOT	--	Late
Surf Scoter	SUSC	<i>Melanitta perspicillata</i>	Late
Black Scoter	BLSC	<i>Melanitta nigra</i>	Late
Merganser sp.	MERG	---	Late
Long-tailed Duck	OLDS	<i>Clangula hyemalis</i>	Late
Harlequin Duck	HARD	<i>Histrionicus histrionicus</i>	Late
Barrow's Goldeneye	BAGO	<i>Bucephala islandica</i>	Late
Herring Gull	HERG	<i>Larus argentatus</i>	n/a
Great Black-backed Gull	GBBG	<i>Larus marinus</i>	n/a
Common Loon	COLO	<i>Gavia immer</i>	n/a
Common Tern	COTE	<i>Sterna hirundo</i>	n/a
Greater Yellowlegs	GRYE	<i>Tringa melanoleuca</i>	n/a
Spotted Sandpiper	SPSA	<i>Actitis macularia</i>	n/a
Belted Kingfisher	BEKI	<i>Ceryle alcyon</i>	n/a
Willow Ptarmigan	WIPT	<i>Lagopus lagopus</i>	n/a
Spruce Grouse	SPGR	<i>Dendragapus canadensis</i>	n/a
Northern Harrier	NOHA	<i>Circus cyaneus</i>	n/a
Osprey	OSPR	<i>Pandion haliaetus</i>	n/a
Great Horned Owl	GHOW	<i>Bubo virginianus</i>	n/a
Bald Eagle	BAEA	<i>Haliaetus leucocephalus</i>	n/a
Red-tailed Hawk	RTHA	<i>Buteo jamaicensis</i>	n/a
Merlin	MERL	<i>Falco columbarius</i>	n/a
Short-eared Owl	SEOW	<i>Asio flammeus</i>	n/a
Rough-legged Hawk	RLHA	<i>Buteo lagopus</i>	n/a

APPENDIX B
DETAILED SURVEY MAPS

APPENDIX B1


MAY 9, 2003



LEGEND:

- TLH - Phase III Preferred Route
- TLH - Phase III Outfitter (A13 Section) Route
- - - TLH - Phase I/II Routes

Figure 1
 Waterfowl Observations
 May 9, 2003
 Outfitter (A13 Section) Route,
 Trans Labrador Highway

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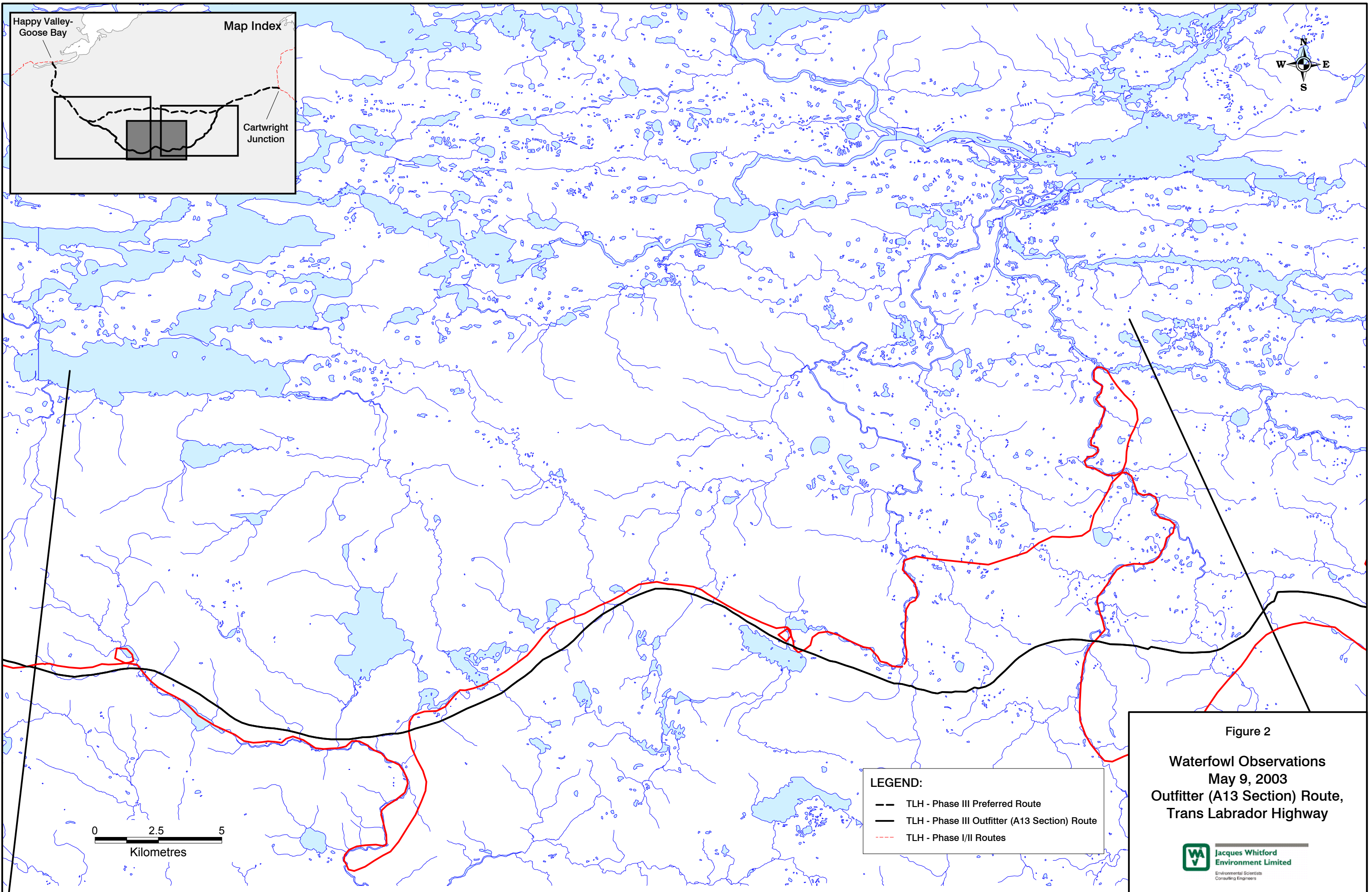


Figure 2
 Waterfowl Observations
 May 9, 2003
 Outfitter (A13 Section) Route,
 Trans Labrador Highway

LEGEND:
 - - - TLH - Phase III Preferred Route
 ——— TLH - Phase III Outfitter (A13 Section) Route
 - - - TLH - Phase I/II Routes



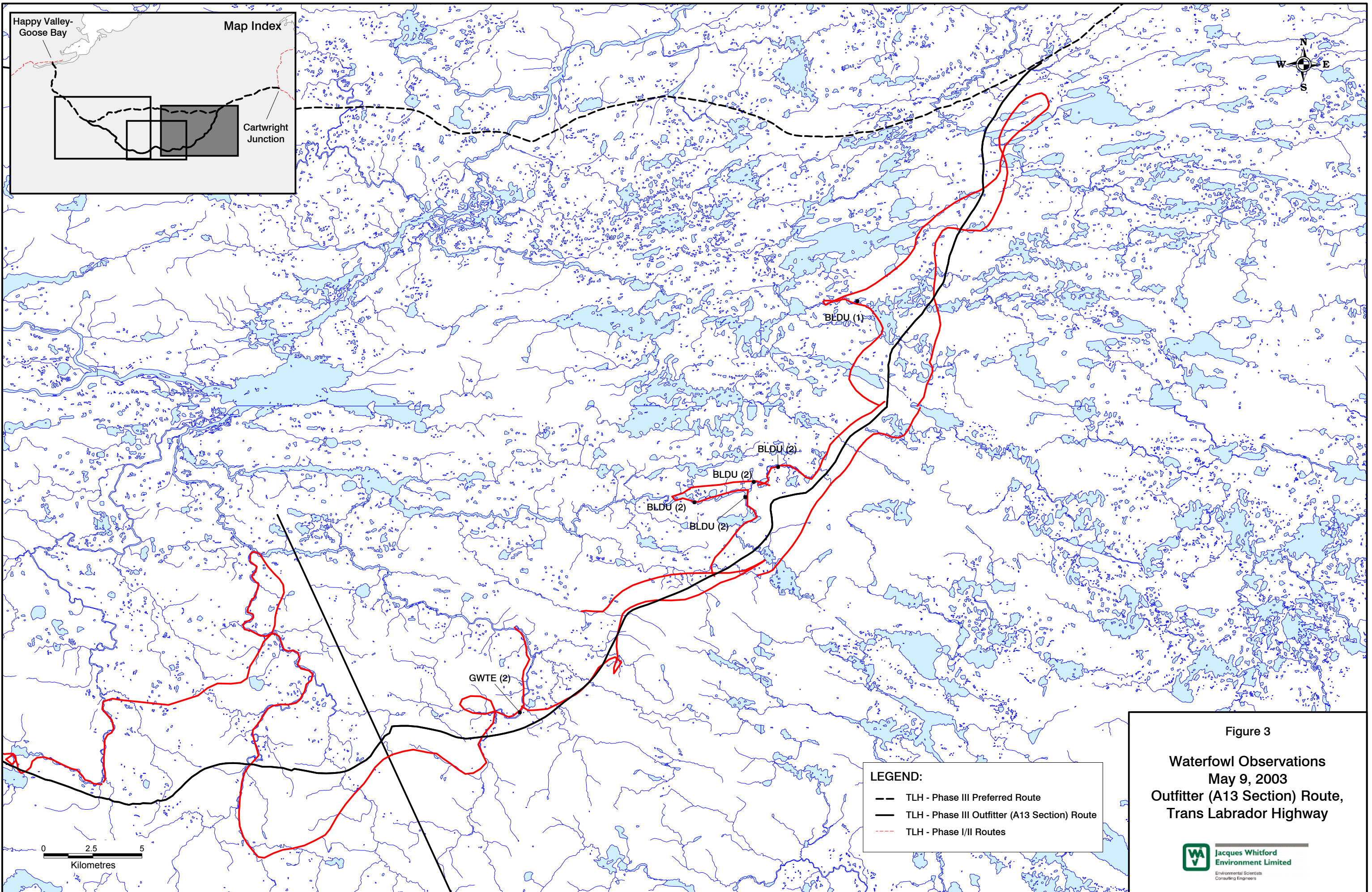


Figure 3
 Waterfowl Observations
 May 9, 2003
 Outfitter (A13 Section) Route,
 Trans Labrador Highway

LEGEND:
 --- TLH - Phase III Preferred Route
 — TLH - Phase III Outfitter (A13 Section) Route
 --- TLH - Phase I/II Routes



APPENDIX B2

MAY 23, 2003

