Waterfowl Component Study Addendum:

Cartwright Junction to Happy Valley - Goose Bay Trans Labrador Highway

JACQUES WHITFORD ENVIRONMENT LIMITED
AND
MINASKUAT LIMITED PARTNERSHIP

JW Project No.: NFS09308-0004
Minaskuat Project No.: M6-0004

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WATERFOWL COMPONENT STUDY ADDENDUM: CARTWRIGHT JUNCTION TO HAPPY VALLEY-GOOSE BAY TRANS LABRADOR HIGHWAY

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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. 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 was required on waterfowl in the vicinity of the proposed route for the highway.

Following submission of the waterfowl component study to the Department of Environment, the document was examined to determine whether it fulfilled the requirements of the guidelines. Before a final decision can be reached on the project, the requirement for further information has been identified. A deficiency statement outlining comments and requirements for further information on waterfowl was provided to WST in April 2003. The deficiency statement outlines the specific requirements for further information. In addition, WST was advised that any alternative route determined to be viable upon review of the alternative methods for carrying out the project must have a waterfowl component study completed for that alternative route.

This addendum addresses questions and comments as outlined in the deficiency statement, presenting a response to each individual comment and question. Deficiency statement comments were addressed using in-house sources and data and, where necessary, communication/interviews with representatives from various resource management agencies. The topics covered by the addendum include those related to:

- general comments;
- study area;
- aerial surveys;
- regional population status of ducks;
- broods/moulting;
- fall staging;
- wetland size versus waterfowl abundance;
- probability of occurances of waterfowl versus wetland areas;
- wetland and riparian habitat potential for waterfowl; and
- editorial revisions.

The waterfowl component study for the alternative route, which was determined to be a viable alternative to the preferred route, is presented as Appendix B to the addendum. The alternative route, subject to further study, was the route identified by the Newfoundland and Labrador Outfitters Association, referred to as the outfitter route. Only a portion of the outfitter route was covered during the field surveys described in Appendix B, as the remainder of the route overlapped with segments of the route that had been previously assessed. The new study focused on the section of the outfitter route (i.e., the section identified as A13 in the environmental impact statement and comprehensive study report for the preferred route) that had not been assessed. Appendix B provides details on the field surveys carried out along the outfitter (A13 section) route and the results of those surveys.

KATAKUAPEKASHT TIPATSHIMUN MASHINEIKAN

Ntshent meshkinanu kanakituatak (Department of Works, Services, and Transportation) nantuenitamuat tshetshi tutakinit ussi meshkinanu tshetshi aitu pampinitshi utapana. Ne meshkinau nete tshika itimu uta Apipani nuash nete Nutapineuant. Umue kutak tsheut tapitik nete Nutapineuant uaitimutakanit meshkinau kie ne ishinikateu Phase III. Shash umue tshitshipinanu meshikinau eueueshtakant mak enitussenitakant assi nete miam uatutakant meshkinau. Ne niakituatak meshkinanu kananitussenitakanit ishinikatakanut Newfoundland and Labrador Environmental Protection Act and Canadian Environmental Assessment Act (CEAA). Nantussenimakanipant aueshishat (shishipit, nishkat, mak muakuat) nte miam tshetutakanit meshkinanu.

Katshi itisheikant mashineikan nete Department of Environment, kuet nantussenitakant tshetshi ma minuakue. Eshku eka tshissenitakant tsheissishuet nenu mashineikan katutakanat, minuat kutak tshekuan nanitussenitakanu. Ne meshkinanu kanakituatak (Department of Works, Services, and Transportation) minakanipant mashineikanu tshetshi etitu nantussenimat aueshisha miam mate (shishipa, nishka, mak muakua). Kie itakanipant tshent meshkinanu kanakituatak (Department of Works, Services, and Transportation) kutak meshkinau uitutimeku tshika nanitussenimauat aueshishat (shishipit, nishkat, mak muakuat).

Mashineikan mishekanipan tshetshi etitu minushtet kie kukuetshimakanipant auenitshent kie tan essishuet uinuau. Natakanipant nete uitshuat tshetshi kukuetshimakanit kie tshetshi uapimakanit tipan ntshent utshimauat. Ne mashineikan kamisheikant eukun umue tshekuan takunipant nete mashineikant.

- nitamuk tshekuan euauitakant
- ne kananitussenitakant assi
- nete kapimpant kanitussenitak
- tanetishit shishipat nete netussenitakant
- emamupinit uikanishimau
- etikuatshinit etat
- nipia etatinikau mak etatishit aueshishat (shishipat kie nishkat)
- tan tshipa itashut aueshishat mak nenua nipia etatinikau
- nenua etatinikau nipa tan tshipa itishut aueshishat (shishipat mak nishkat)
- eueuetishtakanit ne mashineikan

Ne aueshishat (shishipit, nishkat, mak muakuat) kananitussenimakanit nete kutak ussi meshkinau tshetutakant ishinikateu neta kamisheikant mashineikan Appendix B, ekuta neta tshipa minuau tapitakant

ne meshkinau itenitakanu. Ne kutak meshkinau tsheiapishtakant ne ishinikateu (outfitter route-meshkinau) ne ishinikatimupanit Newfoundland and Labrador Outfitters Association. Ne outfitter route kaishinikatet meshkinau apishish nantussenitakanipan tante shash nte ueshkat tshinantussenitakanipan, ne Appendix B keishinikateua nte mashineikant. Ne ussi meshkinau outfitter route kaishinikatet eukun an muk anutshish nantussenitakanipan (nete mashineikant kaishinikatet environment impact statement ekuta itishteu A13) eukuan an kakanantussenitakant. Ne Appendix B kaishinikatet ekuta uiatakant mashinekant ne kanantussenitakant meshkinau outfitter route (A13 section) kie tshekuan itishtepan.

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1.0 INTRODUCTION

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 was required on waterfowl in the vicinity of the proposed route for the highway.

1.1 Regulatory Framework

The proposed TLH - Phase III is subject to a cooperative environmental assessment that meets the requirements of the provincial environmental assessment process as outlined under the *Environmental Protection Act*, and the federal environmental assessment process as outlined by the CEAA. Following release from the environmental process, the project will be subject to various environmental approvals.

The TLH - Phase III project was registered pursuant to the *Environmental Assessment Act, 2000* on April 3, 2002. This act was later repealed and its contents were incorporated into the *Environmental Protection Act,* which received royal assent on May 22, 2002. Following both government and public review, the Minister of Environment determined on June 19, 2002 that further environmental assessment (an Environmental Impact Statement (EIS)) was required for the proposed project. Consistent with subsection 52(1) of the *Environmental Protection Act*, the Minister appointed an Environmental Assessment Committee, with representation from all relevant provincial and federal government departments and agencies, to provide advice on scientific and technical matters related to the proposed undertaking.

The TLH - Phase III project is also subject to CEAA, the federal environmental assessment legislation. The Department of Fisheries and Oceans (DFO) is the lead Responsible Authority (RA) for the federal assessment as there is a requirement for approvals under the *Navigable Waters Protection Act* (NWPA) and potential for issuance of authorizations under the *Fisheries Act*. Representatives from DFO, Environment Canada and Parks Canada have been included in the joint provincial/federal Environmental Assessment Committee appointed for the environmental assessment. DFO determined that the TLH - Phase III was subject to a comprehensive study under CEAA and required a comprehensive study report (CSR) to be prepared..

At the provincial level, the environmental assessment is also subject to a Memorandum of Understanding (MOU) between Innu Nation and the Departments of Environment, and Labrador and Aboriginal Affairs. As per Section 53 of the *Environmental Protection Act*, the Environmental Assessment Committee prepared guidelines for preparing the EIS for the TLH - Phase III project. Following public review and approval from the Minister of Environment, the final guidelines were provided to the project proponent in December 2002. The guidelines established the framework for preparing the EIS/CSR by outlining the format and information requirements, including requirements for component studies.

With respect to a component study on waterfowl, the guidelines outlined the following requirements:

Component studies shall be prepared for the following VECs (where new information becomes available as a result of baseline studies, additional component studies may be required):

- *Migratory Birds (with emphasis on waterfowl and including but not limited to harlequin duck).*

Following submission of the EIS/CSR and related studies to the Department of Environment, the EIS/CSR and related documentation was examined to determine whether it fulfilled the requirements of the guidelines. Before a final decision can be reached on the project, the requirement for further information has been identified. A deficiency statement outlining comments and requirements for further information on waterfowl was provided to WST in April 2003. The deficiency statement is provided in Appendix A.

1.2 Component Study Overview

The Waterfowl Component Study for the TLH - Phase III environmental assessment was prepared between May 2002 and January 2003. The objective of the study was to conduct original research and compile available information to describe waterfowl populations along the proposed route of the TLH - Phase III. The results of the component study were used to support the environmental assessment being carried out for the project.

The study area for the project lies within the boundaries of four ecoregions in central Labrador: Lake Melville at the western boundary; Mecatina River; Eagle Plateau; and Paradise River at the eastern boundary. To ensure that the study area for the component study encompassed physical disturbance from the proposed project, a conservative buffer area was also examined. Therefore, the study area encompassed wetland areas and waterbodies within 5 km of either side (10-km study corridor) of the proposed route. Rivers with potential habitat for harlequin duck were surveyed for 10 km on either side of the proposed highway crossing locations.

The study involved five aerial surveys, timed (in consultation with knowledgeable persons) to correspond with different periods of waterfowl activity (i.e., spring staging, breeding (two surveys), brood/moulting and fall staging). Existing literature on waterfowl surveys previously carried out in central Labrador was also reviewed for the component study.

The surveys provided information on species found in the area, numbers observed and important habitat areas. The number of birds observed during the May 9 survey was relatively low, with species congregated in areas of open water such as along the Kenamu River and an area approximately 10 km west of Cartwright Junction. Many observations were of groups of >4 birds.

During the May 21 surveys, ducks were still congregated on the Churchill River and Traverspine River, with numerous small groups of mergansers, black ducks and Canada geese. Similarly, ducks continued to congregate along the open water areas of the Kenamu River, where green-winged teal and mergansers were commonly observed. During the June 1-2 surveys, no birds were observed along the Churchill River and dispersal to wetlands and small waterbodies from earlier spring concentrations along larger rivers and lakes was evident. Overall, the density of waterfowl in the survey area was low. However, waterfowl were widespread over the region.

The brood/moulting survey on July 18 found ducks, particularly black ducks, Canada geese and ring-necked ducks in groups. The fall staging survey on August 27-28 found that various species were commonly found in groups of four or more individuals. Congregations of black ducks were observed at various locations along the route. Similarly, Canada geese were observed in groups ranging from three to twelve individuals, with groupings of less than 10 birds common.

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.

Waterfowl observations during the series of surveys indicate these species occur at relatively low densities throughout wetland habitat in the study area. Few exceptions include nine wetlands with waterfowl densities greater than 0.10 birds/ha, located at various points along the proposed highway route. The wetland with the highest density (0.59 birds/ha) is located approximately 500 m from the proposed highway route. Most of the remaining nine wetlands are greater than 1,000 m from the highway.

Important areas noted during the surveys include:

- spring staging period: Traverspine and Kenamu Rivers and a tributary of Paradise River approximately 10 km west of Cartwright Junction;

- moulting period: a small unnamed lake 5 km west of Crooks Lake, approximately 10 km south of the highway route and a tributary of the Eagle River approximately 20 km southeast of Park Lake, 4 km south of the highway route; and

- fall staging period: an unnamed lake 25 km east of the Kenamu River, within 100 m of the highway route.

The component study (JW and LMSS 2003) was submitted to the provincial Department of Environment on January 16, 2003.

1.3 Component Study Addendum

On April 24, 2003, the Minister of Environment issued a statement regarding the EIS/CSR and related documentation prepared for the TLH - Phase III environmental assessment. The Waterfowl Component Study was determined to require additional work. The additional work requirements related to aerial survey coverage, concerns regarding the timing of the survey conducted in spring 2002 and a description of wetland and riparian habitat. The deficiency statement, as issued to WST and provided in Appendix A, outlines the specific requirements for further information. In addition, 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.

This addendum addresses the questions and comments as outlined in the deficiency statement (Appendix A), presenting a response to each individual comment and question. Deficiency statement comments were addressed using in-house sources and data and, where necessary, communication/interviews with representatives from various resource management agencies.

The waterfowl component study for the alternative route, which was determined to be a viable alternative to the preferred route, is presented as Appendix B to the addendum. The alternative route, subject to further study, was the route identified by the Newfoundland and Labrador Outfitters Association, hereafter referred to as the outfitter route. Only a portion of this route was covered during the field surveys, as the remainder of the route overlapped with segments of the preferred route. The study focused on the A13 section, as

identified in JW/IELP (2003). Details on the field surveys carried out along the alternative (A13) route and the results of those surveys are provided in Appendix B. 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.

2.0 RESPONSE TO COMMENTS

2.1 General Comments

Comment 1:

The Component Study is consistent in its description of waterfowl occurring in relative low densities, which is incorrect and inaccurately represents the importance of the area for waterfowl. Once population estimates/densities are recalculated (see below), provide the context for how the study area densities compare to other known densities in Labrador. Also, provide the context for the contribution of these birds to the population.

Response 1:

The importance of Labrador to breeding waterfowl is a function of the large area which supports a substantial total population. Literature reporting on waterfowl densities in Labrador consistently indicates that densities are relatively low, as in most boreal-sub-arctic zones (i.e., Goudie and Whitman 1987; DND 1994). It is acknowledged that the Eagle Plateau is relatively important for waterfowl in Labrador due to the large amount of water present in the area. In fact, the Waterfowl Component Study noted that: *The results of surveys conducted in 2002 confirmed the relative importance of the Eagle Plateau area for waterfowl breeding, with 76 percent of waterfowl observations during the June breeding survey occurring within this ecoregion*. No waterfowl population estimates/densities were calculated in the waterfowl component study. Therefore, it is not possible to compare results with other known densities in Labrador.

Comment 2:

Provide segregated information on common and red-breasted mergansers given their differing breeding phenologies and habitat requirements.

Response 2:

While the figures in the component study (Figures 4.2a - 4.6d) do not differentiate between the two merganser species, segregated observations of mergansers are provided in the summary of observations by road section and survey date provided in Appendix B of the component study. The survey information on common and red-breasted mergansers is summarized in Table 2.1.

Table 2.1 Survey Information on Common and Red-breasted Mergansers

Species	Number of Birds Observed by Highway Section (all surveys)					Total Birds (all surveys)
	1	**2**	**3**	**4**	**5**	
Common Merganser	91	86	22	34	29	**262**
Red-breasted Merganser	0	2	7	0	0	**9**
Total Birds (all surveys)	**91**	**88**	**29**	**34**	**29**	**271**

2.2 Study Area (Component Study Section 1.4)

Comment 3:

The study area is described as comprising areas of wetlands and waterbodies within 5 km either side of the proposed route yet the flightlines depicted on Figures 4.2a through 4.6e indicate that substantial tracts of wetlands were not surveyed. Discuss the survey coverage and relate the flightlines to the homogeneous distribution of wetlands, especially on the Eagle River Plateau. Describe how detected waterfowl populations/numbers may underrepresent actual numbers in the study area, and the likelihood of important wetlands and concentrations having been omitted and/or missed. Provide the rationale for omitting important areas of coverage, and reevaluate population estimates by extrapolation to include wetlands that were not surveyed.

Response 3:

Surveys concentrated on the areas of wetland habitat that were considered to have potential to support waterfowl. The sheer volume of wetlands along some sections of the road route made it impossible to survey all wetland area. However, substantial tracts of wetlands were surveyed and the survey line shown on Figures 4.2a through 4.6e encompassed a survey area of approximately 250 m either side of the aircraft. As noted in the response to Comment 1 above, no population estimates were made. Therefore, it is not possible to reevaluate population estimates.

Comment 4:

Provide an explanation as to why the study area comprised a 5 km radius of the proposed route instead of the 10 km radius required by the Terms of Reference issued by the proponent to the consultant. Evaluate the validity of the study results given the reduced study area.

Response 4:

The survey methodology used focussed on areas of potential habitat in a 10 km-wide corridor, centred on the highway. This area is considered sufficiently large enough to obtain information on distributions of waterfowl to support an assessment of effects of highway construction and operation on waterfowl in the region.

2.3 Aerial Surveys (Component Study Section 2.1)

Comment 5:

Provide an explanation as to why flight lines approximately 500 m apart such that a minimum of two passes are made on each side of the road right-of-way were not flown as required by the Terms of Reference issued by the proponent to the consultant. Evaluate the validity of the study results given the reduced flight lines.

Response 5:

The Terms of Reference required that flights approximately 500 m apart were to be conducted for raptors, similar to the methodology used for the raptor study conducted for Phase II of the TLH. The methodology for conducting the waterfowl surveys indicated that effort was to be focussed in areas along the proposed preferred route that have the most potential to provide suitable habitat, similar to the methodology used in the water survey study conducted for Phase II of the TLH. No transect-type surveys were indicated for waterfowl. In fact, the survey methodology used for the waterfowl survey covered more area than would have been covered by following two parallel transects along each side of the highway.

Comment 6:

Provide the rationale for the survey dates as they relate to the three distinct breeding phenologies of waterfowl groups, i.e., (i) early nesting geese-dabbler duck group, (ii) late nesting diving duck group, and (iii) harlequin duck which have specialized habitat requirements.

Response 6:

The proponent was advised that a series of surveys must be conducted to address the different activities of waterfowl and the breeding phenologies of different waterfowl groups, specifically geese/dabblers and diving ducks. Potential harlequin duck habitat was searched during all five surveys that were conducted for the waterfowl component study. The May 9 survey was conducted to determine areas where first ice-free zones occurred and staging waterfowl congregated. The May 21 survey targeted the geese and dabbling duck species that tend to nest early, while the June 1-2 survey targeted diving ducks that tend to nest slightly later. As indicated in Figure 4.1 in the Waterfowl Component Study, geese, black ducks, green-winged teal, and northern pintail were consistently observed during both the May 21 and the June 1-2 survey. As expected, diving ducks such as ring-necked ducks and scoters were observed during the June 1-2 survey, indicating that these surveys dates were suitable for determining the presence of these groups.

Comment 7:

Describe how the lateness of the 2002 spring chronology could be expected to affect:

a) spring staging observations on May 9, since lakes/ponds and wetlands were still ice-covered;
b) breeding observations on May 21 for Canada Geese and Dabbling Ducks since most lakes/ponds and wetlands on the Eagle River Plateau were still ice-covered;
c) late nesting species observations on June 1-2 since waterbodies on the Eagle River Plateau were still 50% ice-covered;
d) brood observations on July 18, especially for late nesting species; and
e) fall staging observations on August 28-29 in light of a), b), c) and d).

Response 7:

a) A number of areas on the larger rivers, fast flowing sections of streams and inlets, and outlets of most ponds had open water during the May 9 survey. Waterfowl were congregated together in these areas, providing a useful indicator of sites where early spring staging occurs.

b) It is acknowledged that at higher elevations a number of waterbodies and wetlands at higher elevations were still ice-covered during the May 21 survey. However, as shown by the survey results, many areas were open and had waterfowl associated with them. Many observations during this survey were of pairs of waterfowl.

c) The reference to waterbodies at higher elevations having 50 percent ice cover referred to heights of land around the Traverspine River and select high points along other portions of the preferred route. Most wetlands and waterbodies on the Eagle Plateau were open, as evidenced by the number of waterfowl observed during this survey. As noted in the response to Comment 6, Figure 4.1 in the Waterfowl Component Study indicates geese, black ducks, green-winged teal, and northern pintail were consistently observed during both the May 21 and the June 1-2 surveys. Later nesting diving ducks, such as ring-necked ducks and scoters, were observed during the June 1-2 survey, indicating that these surveys dates were suitable to capture the presence of these groups.

d) As indicated in the Waterfowl Component Study, the aerial survey technique was not designed to necessarily maximize brood observations; rather, the survey attempted to identify areas where birds were located during this period, particularly areas where large groups of moulting birds might be found.

e) During the fall staging survey, waterfowl were generally observed in groups, indicating that birds had begun to congregate together to stage prior to migration, thus indicating that the survey was appropriately timed. Another indication that the August 28-29 survey was appropriately timed to assess fall staging activity was the fact that no common goldeneye or scoters were observed, indicating that many individuals of these species may have already moved to the Labrador coast to stage.

2.4 Regional Population Status of Ducks (Component Study Section 4.1)

2.4.1 Inland Ducks and Canada Geese

Comment 8:

Compare the proposition that "nesting success is more influenced by spring temperature than availability of water" with published works linking predator and prey dynamics with cycles in productivity and populations in the north boreal zone.

Response 8:

The statement being referred to in the Waterfowl Component Study is: *waterfowl populations in eastern North America tend to be more stable as nesting success is more influenced by spring temperatures than availability of water*. The availability of water in Labrador is not a limiting factor to nesting success of waterfowl, as is often the case in certain areas in western North America. Rather, the timing of spring break up and spring temperatures can affect the timing of nesting in Labrador but rarely causes the dramatic fluctuations in nesting success that has been observed in western North America, when years of low or no water results in little or no successful breeding. Consequently, waterfowl populations in eastern North America tend to be more stable.

2.4.2 Sea Ducks

Comment 9:

Compare the information presented on Harlequin Duck and Barrow's Goldeneye with most recent COSEWIC status reports for the two species.

Response 9:

The most recent Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status report available on harlequin duck is Thomas and Robert (2000). This report indicates sightings of individuals and pairs on some rivers to the west and southwest of the Eagle River Plateau area. As noted in the Waterfowl Component Study, repeated surveys along rivers intersecting the proposed highway have not recorded any observations of harlequin ducks. The only known observation southeast of the Churchill River to date is one

pair observed on St. Paul's River in 1998 (F. Phillips, pers. comm.). Thomas and Robert (2000) indicate that *southern Labrador (i.e, south of the Churchill River) has probably few breeding harlequin ducks relative to northern Labrador (P. 40)*. Similarly, the Waterfowl Component Study acknowledged that harlequin ducks may breed at extremely low densities in the project area.

The latest information available on the breeding, moulting and wintering distribution of male Barrow's goldeneye is found in Robert et al. (2002). Robert et al. (2002) confirm that the main breeding area is located in the boreal forest just north of the St. Lawrence estuary and gulf (breeding areas averaged 64.8 km from the St. Lawrence corridor), rather than in northern Quebec and Labrador as was previously believed. Similarly, transmittered males returned to the St. Lawrence estuary to winter after moulting in the north at sites in Hudson Bay (four birds), Ungava Bay (four birds), northern Labrador (two birds), Baffin Island (one bird) and inland near the Quebec-Labrador border (one bird). This information confirms earlier information on the breeding range of Barrow's goldeneye identified in Robert et al. (2000) and cited in the Waterfowl Component Study.

Comment 10:

Provide a more comprehensive presentation, with references, on the international conservation concern for sea ducks. Relate global issues and concerns for sea duck conservation including perspectives of the Sea Duck Joint Venture under the North American Waterfowl Management Plan. Place Labrador in its perspective importance to interior breeding of sea ducks. Update sea duck references provided as available.

Response 10:

Concerns related to sea duck conservation are based on a number of issues including:

- expansion of human activity into northern breeding areas;
- increased urbanization and industrialization in traditional wintering areas;
- increased predation pressure due to larger populations of gulls and other predators; and
- indirect factors such as bioaccumulation of contaminants (including exposure to lead) and climate change.

These concerns are exacerbated by the fact that sea ducks are the most poorly understood group of waterfowl in North America and most species have delayed sexual maturity, long life spans and low annual recruitment (Sea Duck Joint Venture Management Board 2001). Sea ducks as a group have not received priority in waterfowl conservation and management programs (Goudie et al. 1999). In the past, it was assumed that

there was low harvesting effort on sea ducks. However, large harvests in southern areas and subsistence use in the north are now of concern. With the exception of mergansers, all species of sea ducks are exhibiting continental declines (Goudie et al. 1999).

Recent telemetry work on surf scoters from Chesapeake Bay and black scoters from Restigouche River, New Brunswick indicate that the Ungava Peninsula is used by these scoter species for breeding and moulting. However, no birds with transmitters were recorded breeding in the area of Labrador, south of Lake Melville. Moulting locations were identified for both species along the Labrador coast at Groswater Bay (Perry and Lohnes 2003). Similarly, preliminary findings of telemetry studies on common eider indicate that birds breeding in Canada winter in Newfoundland and Labrador and Greenland in approximately equal proportions (NAWMP 2002). This kind of information provides an indication of the importance of Labrador to sea ducks, although there continues to be little information available about interior breeding activity by these species. In general, Labrador represents a large area of potential habitat that is relatively pristine and has little human disturbance. Due to this fact, Labrador is likely important to the long-term maintenance of North American sea duck populations.

Comment 11:

Discuss trends in available data for Labrador-Quebec with respect to winter inventory data from the Atlantic Coast.

Response 11:

Winter inventory data for seaducks from surveys along the Atlantic coast are provided in Table 4.1 of the Waterfowl Component Study. The available data from these Atlantic coast surveys are restricted to scoters and long-tailed duck, namely from the U.S. Fish and Wildlife Service (CWS 2000). The survey results indicate that surf scoters are the most commonly observed scoter species overall and during most annual surveys. White-winged scoters are the least common scoter species observed. Wintering numbers of black and surf scoters seem to be increasing (CWS 2000).

During inland surveys for the TLH - Phase III in 2002, a similar pattern was observed, with surf scoters being seen more frequently than black scoters and no white-winged scoters being observed. Overall, the number of scoters observed was relatively low.

Surveys conducted by Bateman and Hicks (1995) found a similar pattern, with black scoters only representing a greater percentage of species composition than surf scoters in the Nipishish Lake ecoregion. In the Eagle Plateau ecoregion, surf scoters represented 48.8 percent of the indicated pairs of diving ducks, while no black scoters were identified (Bateman and Hicks 1995). Goudie and Whitman (1987) estimated the breeding pair population of scoters to be 2,150 +/- 2,150 for southeastern Labrador but did not break the estimate out by scoter species.

Atlantic coast winter surveys show no clear trend in the numbers of long-tailed ducks for the last 10 years, although a long-term decline in the population is apparent from surveys in the western prairies and western boreal Canada (CWS 2000).

Bateman and Hicks (1995) saw few long-tailed ducks during surveys in Labrador, and none in the Eagle Plateau area. Goudie and Whitman (1997) do not present any data on long-tailed ducks. Only two long-tailed ducks were observed during waterfowl surveys for the TLH - Phase III.

Comment 12:

Provide the source identifying Barrow's Goldeneye breeding location as the north shore of the St. Lawrence River.

Response 12:

As noted in the Waterfowl Component Study, the source identifying breeding locations as the north shore of the St. Lawrence River is Robert et al. (2000). The full citation is provided in Section 6.0 References in the Waterfowl Component Study and also listed in Section 3.0 (References) in this addendum. A copy of the cited paper can be provided upon request.

2.5 Broods/Moulting (Component Study Section 4.2.3)

Comment 13:

Brood age class data collection is standard protocol for conducting brood surveys. Provide an explanation if these data were not collected. Provide any age class information that was collected.

Response 13:

Available information on brood age class was provided in Appendix B of the Waterfowl Component Study. Ageing was based on criteria after Gollop and Marshall (1954). During the July 18, 2002 survey, four Canada geese were identified as age class 2A, six black ducks were identified as age class 2A, and a second group of 7 black ducks were identified as age class 1C.

Comment 14:

Relate age class data to an assessment of the likelihood that the timing of the survey was too early.

Response 14:

Class 2A ducks are partly feathered while class 1C birds are downy, with no feathers. The estimated age of class 2A ducklings is 15 to 25 days and class 1C ducklings is 9 to 14 days. Ducklings 9+ days old are mobile and visible, thus a survey conducted on July 18, 2002 is not considered to have been conducted too early.

As noted in the Waterfowl Component Study, aerial surveys were not designed to necessarily maximize opportunities for brood observations. The intent of all surveys was to determine the areas being used by waterfowl during various periods.

Comment 15:

Clarify how the lack of observations of scoters may have been affected by the survey's focus on habitat not utilized by scoter broods.

Response 15:

Scoter broods tend to congregate in ponds and lakes with high concentrations of benthic invertebrates that provide forage. As can been seen from the survey flightlines indicated on Figures 4.5a to 4.5e in the Waterfowl Component Study, numerous lakes were surveyed during the July 18, 2002 survey. As noted in response to Comment 14, aerial surveys were not necessarily designed to maximize opportunities for brood observations. The survey intent was to determine areas being used by waterfowl during various periods.

2.6 Fall Staging (Component Study Section 4.2.4)

Comment 16:

Describe how the strong presence of ring-necked ducks observed may or may not support that the species has expanded greatly into Labrador over the past two decades.

Response 16:

It is difficult to confirm that the number of ring-necked ducks observed during 2002 surveys is indicative of a large expansion of ring-necked ducks into Labrador because there have been relatively few waterfowl surveys in the area of the proposed highway, and data on ring-necked duck observations in Labrador prior to 2002 are limited. In the Boreal Shield-Eastern region, annual observations of ring-necked duck have increased 2.9 percent from 1990 to 2000 (CWS 2000). Surveys by Bateman and Hicks (1995) indicate that ring-necked ducks represent a relatively low percentage of the species composition of total diving ducks recorded in various ecoregions, with the exception of St. Paul's River, where diving ducks comprise almost 35 percent of the species seen. Ring-necked ducks represented 6 percent of the species composition in the Eagle Plateau region. Goudie and Whitman (1987) considered ring-necked ducks and bufflehead together and added them only into a total diving ducks calculation, indicating that the numbers of ring-necked ducks seen during the 1980 to 1982 surveys was likely low.

Black Duck Joint Venture Survey plots in the vicinity of the proposed highway route (see Tables 4.2 and 4.3 in the Waterfowl Component Study), indicate a yearly variation in the number of ring-necked ducks seen although the area covered by the two plots is small. From Black Duck Joint Venture Surveys in southern Quebec, breeding population estimates of ring-necked ducks from 1990 to 2002 range from a low of 39,000 in 1998 to a high of almost 84,000 birds in 2000. Approximate numbers of ring-necked ducks observed in 2001 and 2002 were 53,000 and 42,000 birds, respectively (Bordage and Lepage 2002).

While the recent survey data and anecdotal information (F. Phillips, pers. comm.) suggest that the number of ring-necked ducks may be increasing in south-central Labrador, further data are required before any assumption can be made that the species has greatly expanded into Labrador in recent years.

Comment 17:

Provide age class data for ring-necked duck broods. Provide an explanation if these data were not collected.

Response 17:

Ring-necked duck broods were estimated to be largely Class 3 (some may have been Class 2). These birds were essentially the same size as the adults; however, they were still with a hen. There were other birds in the groupings that appeared to be adults in moult. Only a few individuals were flying.

Comment 18:

Describe the likelihood that most or all ring-necked ducks would not have been capable of flight by the 2002 sport hunt season opening date.

Response 18:

The purpose of the Waterfowl Component Study was to identify waterfowl species and numbers using the area of the proposed highway. Discussion on the implications of increased access following highway construction and the suitability of migratory bird hunting season dates is outside the scope of the Waterfowl Component Study.

The season for hunting migratory birds in Central and Southern Labrador opens the first Saturday in September. In 2002, the opening date was September 7. Broods observed during the August 28-29, 2002 survey exhibited variability in size, with some appearing to be age class 2. As well, some groups were still behaving as broods, a further indication that young in these groups were unable to fly. It is estimated that some young observed during this survey would require up to 10 more days before being able to fly. Therefore, it is possible that some individuals would not have been flying on the sport hunt season opening date in 2002.

Comment 19:

Describe how fall staging by sea ducks (notably scoters) and other late nesting species may not have been captured by these surveys.

Response 19:

Areas surveyed during the fall staging survey included lakes with potential to support scoter broods if they were present at that time. The relatively low number of waterfowl seen on this survey may indicate that individuals of many species had, by this time, moved to the Labrador coast prior to migration. Since the 2002 surveys did not include any coastal or estuarine areas, these important fall staging sites along the Labrador coast were not captured. The intent of the survey was to identify areas in the vicinity of the highway being used by waterfowl during various periods.

2.7 Wetland Size Versus Waterfowl Abundance (Component Study Section 4.4.1)

Comment 20:

Provide the rationale for the suggested similarity between waterfowl abundance (Table 4.4) and waterfowl density (Table 4.5) considering the Tables have only two wetlands in common.

Response 20:

The first sentence, Paragraph 4, Section 4.4.1 of the Waterfowl Component Study is replaced with the following: *An analysis was also conducted based on waterfowl density, defined as the number of waterfowl observed per hectare of wetland.*

Comment 21:

Provide an evaluation as to which is more relevant to assessing the "significance' of wetlands or if both criteria can be considered equally applicable.

Response 21:

Both criteria are relevant for understanding the relationship between wetland size and use by waterfowl. It is logical to expect that as wetland size increases, the likelihood of having a larger number of birds occur on the wetland increases and, as noted in the Waterfowl Component Study, there does appear to be a higher probability of occurrence of waterfowl on a wetland as wetland size increases. This information can then be used to address the "significance" of a particular wetland based on the density of birds using it (i.e., is there a greater number of waterfowl using a particular wetland than would be expected based on the size of

the wetland). Wetlands meeting this criteria may have particularly important attributes, such as higher productivity or its location in relation to waterbodies, that make them more attractive or "significant" to waterfowl.

Comment 22:

Describe how waterfowl use may be influenced by wetland proximity, e.g., a small, isolated wetland compared to a small wetland in a complex that provides larger edge habitat than a large wetland.

Response 22:

As noted in the response to Comment 21, juxtaposition of wetlands in relation to surrounding habitat types likely has a large influence on patterns of use by waterfowl. The wetlands with the highest densities of birds along the preferred route for the TLH - Phase III tended to be adjacent to rivers or lakes and were not particularly large in relation to other wetlands and wetland complexes in the region. As noted in the Waterfowl Component Study, several small wetlands often merged into each other, separated by a river or line of forest/scrub vegetation. These areas were represented as a single polygon in the analysis of survey data, taking into account that it is likely the increased edge may provide attributes that are more attractive to waterfowl.

2.8 Probability of Occurances of Waterfowl versus Wetland Areas (Component Study Section 4.4.2)

Comment 23:

Elaborate on the relationship presented in Figure 4.8 and explain why actual numbers of waterfowl are not strongly related to wetland area.

Response 23:

As indicated in Figure 4.8, no waterfowl were observed on wetlands <10 ha in size, there were 10 or less waterfowl observed on wetlands <100 ha in size, and the greatest number of waterfowl observed were seen on wetlands >1,000 ha in size. This indicates that there is some relationship between numbers of waterfowl and wetland area. However, a number of wetlands >100 ha and >1,000 ha had no waterfowl associated with them, indicating that attributes other than size influence wetland use by waterfowl. These attributes would

include the amount of surface water on the wetland, productivity (i.e, food availability) on the wetland, and position of the wetland in relation to other features such as rivers and lakes.

Comment 24:

Compare the results of a quadratic regression for the waterfowl to wetland size relationship with the logistic regression presented.

Response 24:

Logistic and quadratic regressions have two different purposes. A logistic regression is used when the dependent variable is 'limited' (discrete not continuous), while a quadratic equation can be used with continuous data when the relationship between the dependent and independent variable is not linear. As such, a logistic regression can be applied to binary data (1 = waterfowl present; 0 = waterfowl absent). A quadratic regression, on the other hand, can be used to describe the relationship between waterfowl number and wetland area.

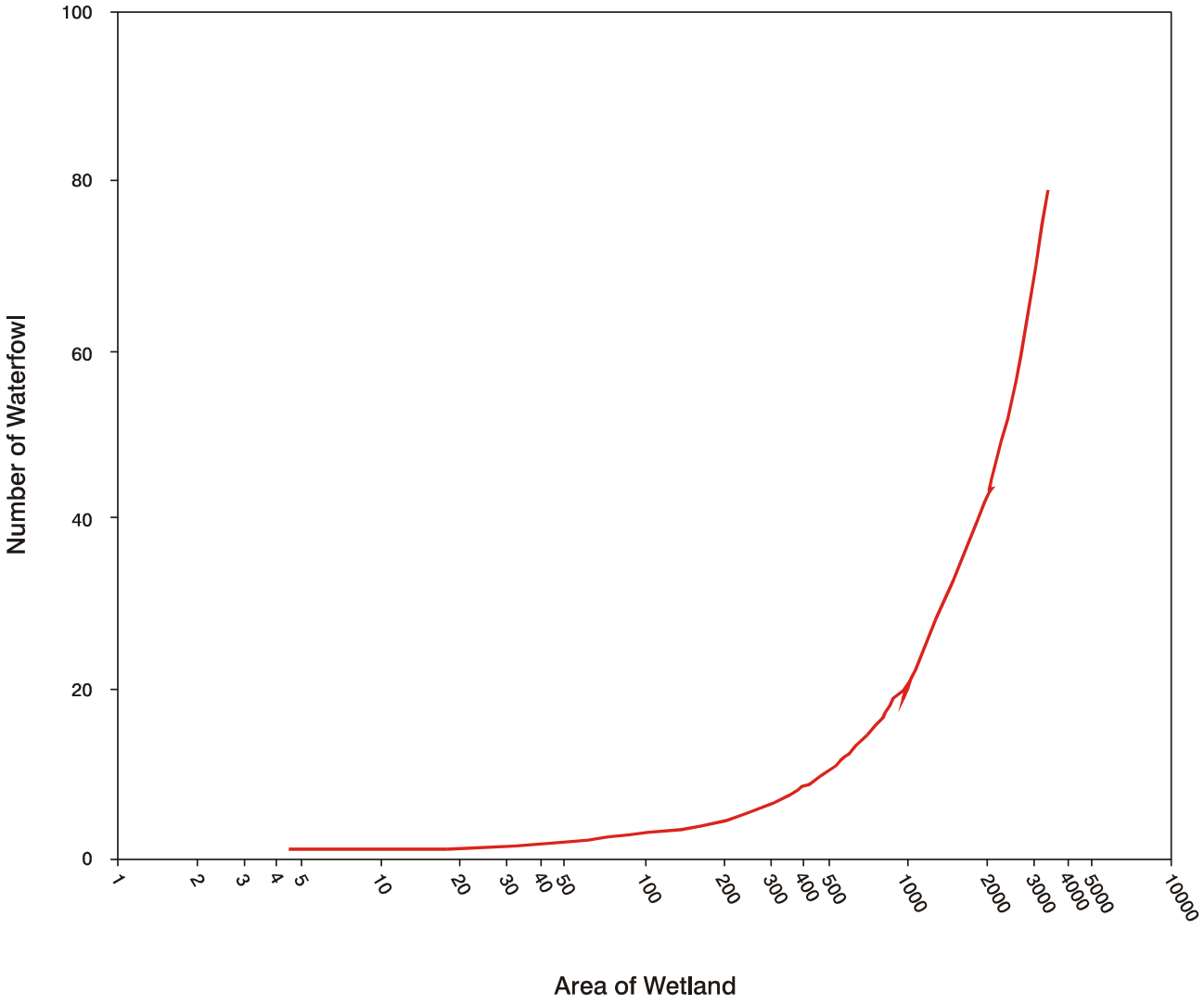
In addition to the logistic regression completed for the Waterfowl Component Study, a quadratic regression analysis was completed for this addendum, which indicates not only low numbers of waterfowl on small wetlands, but also little change in waterfowl numbers as wetland size increases until wetlands get very large. This model indicated that a 20 ha wetland will average only 1.47 waterfowl, while a 400 ha wetland will average 8.69 waterfowl (Figure 2.1). Only in large wetlands (>500 ha) do the number of waterfowl increase greatly. These results are similar to those observed using the logistic regression (JW and LMSS 2003).

2.9 Wetland and Riparian Habitat Potential for Waterfowl

Comment 25:

Provide a description of habitat potential which is identified as an objective for the Component Study in Section 1.2. Use this information when extrapolating waterfowl populations in areas of the study area that were not surveyed.

Figure 2.1 Number of Waterfowl Versus Wetland Area



Response 25:

Wetlands within 100 m of the highway right-of-way were characterized as to wetland type and form. Various forms of bogs made up 72.5 percent of the wetland types, including dome bogs, basin bogs, shore bogs, slope bogs and string bogs. Fens comprised 15.4 percent of the wetland types, including Atlantic ribbed fen, slope fen and stream fen. Five kettle marshes were identified, representing 1.4 percent of all wetlands, and 37 stream swamps were identified, representing 10.7 percent of the wetlands.

2.10 Editorial Revisions

Comment 26:

Literature citations should always be to the primary source.

Response 26:

All references to secondary sources in the Waterfowl Component Study were cited as such since they belonged to one of the following categories: unpublished internal government documents; personal communications; a data source in the primary source and not referenced in the primary source; or indicated to be reports in preparation.

Comment 27:

Methods are interspersed throughout results and discussion. Each survey was done differently. Methods used for each life history stage should be described in methodology.

Response 27:

Each waterfowl survey was done with the same methodology described in Section 2.1 of the Waterfowl Component Study. The results and discussion sections do not indicate otherwise.

Comment 28:

There are many figures with a great deal of raw data. These could be presented as appendices with summary tables of results in the text to facilitate interpretation.

Response 28:

It was felt that it was important to provide detailed results of the surveys in the text of the Waterfowl Component Study in order for readers to have a good understanding of distribution and abundance of waterfowl across the landscape of the study area. Summary tables of results by survey date and road section were provided in Appendix B. As well, Figure 4.1 in the text provided a summary overview of observations by highway section and survey date.

Comment 29:

Section 1.2 should state that waterfowl have four discreet life history stages around the breeding period: spring staging, nesting, brood rearing and fall staging. Since waterfowl behaviour and habitat requirements differ between stages, each will be treated separately.

Response 29:

The following paragraph is added after Paragraph 1 in Section 1.2 of the Waterfowl Component Study: *Waterfowl have four discreet life history stages around the breeding period: spring staging; nesting; brood rearing; and fall staging. Since waterfowl behaviour and habitat requirements differ between stages, each are treated separately.*

Comment 30:

Section 4.1 relates reproductive rates in sea ducks to determination of population status. Reproductive rate of a species is completely unrelated to the concept of determining population status. The two statements should therefore not be linked.

Response 30:

Sentence 4, Paragraph 1, Section 4.1 (Section on Sea Ducks) of the Waterfowl Component Study is amended to read: *Most species of sea duck have delayed sexual maturity, long life spans and low annual recruitment. Sea ducks are the most poorly understood group of waterfowl in North America (Sea Duck Joint Venture Management Board 2001).*

Comment 31:

Tables 4.2 and 4.3 should clearly indicate the reduction in Plot size in 1996, otherwise it appears there is an inexplicable decline in birds after 1995.

Response 31:

The following sentence is added to the end of Paragraph 5, Section 4.2.2 of the Waterfowl Component Study: *It should be noted that prior to 1996, the Black Duck Joint Venture Survey plots were 100 km^2. Block size was reduced to 25 km^2 in 1996.* In addition, the following note is added at the bottom of Tables 4.2 and 4.3: *Prior to 1996, Black Duck Joint Venture Survey plots were 100 km^2. Plot size was reduced to 25 km^2 in 1996.*

Comment 32:

Include available data on scoters in Tables 4.2 and 4.3.

Response 32:

The following information is added to Table 4.2 Bird Counts at Plot 24 - Mud Lake - Black Duck Joint Venture Surveys 1990-2000:

Species	Survey Year/# Birds Observed							
	1990	1991	1992	1993	1994	1996	1998	2000
Black Scoters	0	5	0	0	0	0	0	0
Surf Scoters	48	35	4	29	16	15	18	22

The following information is added to Table 4.3 Bird Counts at Plot 22 -Paradise River - Black Duck Joint Venture Surveys 1990-2000:

Species	Survey Year/# Birds Observed							
	1990	1991	1992	1993	1994	1995	1998	1999
Black Scoters	0	0	0	0	0	0	0	0
Surf Scoters	0	0	0	0	1	0	0	0

Comment 33:

Reconcile the number of wetlands surveyed with wetland waterfowl observations in section 4.4.1 and adjust percentages as necessary.

Response 33:

The second sentence in Paragraph 3, Section 4.4.1 of the Waterfowl Component Study is revised to read: *Of these 79 wetlands, 56 had between one and nine waterfowl, 14 had between 10 and 20 waterfowl, and nine had more than 20 waterfowl; the remaining 59 wetlands had no waterfowl observed on them.*

Comment 34:

Classify avifauna listed in Appendix A as either early or late breeding chronology.

Response 34:

The table in Appendix A is revised as follows to include a column indicating early or late breeding chronology:

Common Names, AOU Codes, and 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	*Anas rubnipes*	Early
Mallard Duck	MALL	*Anas platyrhynchos*	Early
Northern Pintai1	NOPI	*Anas acuta*	Early
Green-winged Teal	AGWT	*Anas crecca*	Early
Canada Goose	CAGO	*Branta canadensis*	Early
Ring-necked Duck	RNDU	*Aythya collaris*	Late
Lesser Scaup	LESC	*Aythya affinis*	Late
Common Goldeneye	COGO	*Bucephala clangula*	Late
Common Merganser	COME	*Mergus merganser*	Late
Red-breasted Merganser	RBME	*Mergus serrator*	Late
Scoter sp.	SCOT	--	Late
Surf Scoter	SUSC	*Melanitta perspicillata*	Late
Black Scoter	BLSC	*Melanitta nigra*	Late

Common Name	AOU CODE	SCIENTIFIC NAME	Breeding Chronolgy
Merganser sp.	MERG	---	Late
Long-tailed Duck	OLDS	*Clangula hyemalis*	Late
Harlequin Duck	HARD	*Histrioricus histrionicus*	Late
Barrow's Goldeneye	BAGO	*Bucephala islandica*	Late
Herring Gull	HERG	*Laris argentatus*	n/a
Great Black-backed Gull	GBBG	*Larus marinus*	n/a
Common Loon	COLO	*Gavia immer*	n/a
Common Tern	COTE	*Sterna hirundo*	n/a
Greater Yellowlegs	GRYE	*Tringa melanoleuca*	n/a
Spotted Sandpiper	SPSA	*Actitus macularia*	n/a
Belted Kingfisher	BEKI	*Ceryle alcyon*	n/a
Willow Ptarmigan	WIPT	*Lagopus lagopus*	n/a
Spruce Grouse	SPGR	*Dendragapus canadensis*	n/a
Northern Harrier	NOHA	*Circus cyaneus*	n/a
Osprey	OSPR	*Pandion haliaetus*	n/a
Great Horned Owl	GHOW	*Bubo virginianus*	n/a
Bald Eagle	BAEA	*Haliaetus leucocephalus*	n/a
Red-tailed Hawk	RTHA	*Buteo jamaicensis*	n/a
Merlin	MERL	*Falco columbarius*	n/a
Short-eared Owl	SEOW	*Asio flammeus*	n/a
Rough-legged Hawk	RLHA	*Buteo lagopus*	n/a

3.0 REFERENCES

3.1 Personal Communications

Phillips, F. Conservation Officer, Department of Forest Resources and Agrifoods, Northwest River, Labrador.

3.2 Literature Cited

Bateman, M.C. and A.H. Hicks. 1995. *Waterfowl Populations in Labrador - Data Compilation and Analysis*. Report prepared for Department fo National Defence by Canadian Wildlife Service, Environment Canada, Sackville, NB.

Bordage, D. and C. Lepage. 2002. *Black Duck Joint Venture Helicopter Survey in Quebec*. Environment Canada, Canadian Wildlife Service, Quebec Region.

CWS (Canadian Wildlife Service Waterfowl Commitee). 2000. *Population Status of Migratory Game Birds in Canada: November 2000*. CWS Migratory Birds Regulatory Report Number 1.

DND (Department of National Defence). 1994. *Environmental Impact Statement: Military Flight Training. Main Report*. Department of National Defence, Ottawa, ON.

Gollop, J.B. and W.H. Marshall. 1954. *A Guide for Aging Duck Broods in the Field*. Miss. Flyway Tech. Sect Leaflet.

Goudie, R.I., M.R. Petersen and G.J. Robertson. 1999. *Behaviour and Ecology of Sea Ducks*. Occasional Paper Number 100. Environment Canada, Canadian Wildlife Service.

Goudie, R.I. and W.R. Whitman. 1987. Waterfowl Populations in Labrador, 1980-82. Pp. 45-63. In: A.J. Erskine (ed.) *Waterfowl Breeding Population Surveys, Atlantic Provinces*. Canadian Wildlife Service Occasional Paper Number 60, Sackville, NB.

JW and LMSS (Jacques Whitford and Land Management and Survey Systems). 2003. *Waterfowl Component Study Trans Labrador Highway (Happy Valley - Goose Bay to Cartwright Junction)*.

NAWMP (North American Waterfowl Management Plan). 2002. Canadian Habitat Matters. http://www.nawmp.ca/pdf/chm2002-e.pdf

Perry, M.C. and E.J.R. Lohnes. 2003. General Map: Surf Scoters 2001-2002 and General Map: Black Scoters 2002. Atlantic Seaduck Project. Patuxent Wildlife Research Center, Laurel, MD. http://www.pwrc.usgs.gov/resshow/perry/scoters/default.htm.

Robert, M., R. Benoit and J.P. Savard. 2002. Relationship among breeding, molting, and wintering areas of male Barrow's goldeneyes (*Bucephala islandica*) in eastern North America. *The Auk*, 119(3): 676-684.

Robert, M., D. Bordage, J.P. Savard, G. Fitzgerald and F. Morneau. 2000. The Breeding Range of the Barrow's Goldeneye in Eastern North America. *Wilson Bulletin*, 112 (1): 1-7.

Sea Duck Joint Venture Management Board. (2001). *Sea Duck Joint Venture Strategic Plan 2001-2006*. Report by SDJV Continental Technical Team as part of the North American Waterfowl Management Plan Conservation Partnership, Anchorage Alaska; Sackville, NB.

Thomas, P.W and M. Robert. 2000. *Updated COSEWIC Status Report of the Eastern Canada Harlequin Duck* (*Histrionicus histrionicus*). Report prepared for COSEWIC.

APPENDIX A

WATERFOWL COMPONENT STUDY
DEFICIENCY STATEMENT

CARTWRIGHT JUNCTION TO HAPPY VALLEY-GOOSE BAY
TRANS LABRADOR HIGHWAY
WATERFOWL COMPONENT STUDY DEFICIENCY STATEMENT
Issued April 2003

THROUGHOUT

- the Component Study is consistent in its description of waterfowl occurring in relative low densities which is incorrect and inaccurately represents the importance of the area for waterfowl. Once population estimates/densities are recalculated (see below) provide the context for how the study area densities compare to other known densities in Labrador. Also provide the context for the contribution of these birds to the population.

- provide segregated information on common and red-breasted mergansers given their differing breeding phenologies and habitat requirements.

Section 1.4 Study Area

- the study area is described as comprising areas of wetlands and waterbodies within 5 km either side of the proposed route yet the flightlines depicted on figures 4.2a through 4.6e indicate that substantial tracts of wetlands were not surveyed. Discuss the survey coverage and relate the flightlines to the homogeneous distribution of wetlands, especially on the Eagle River Plateau. Describe how detected waterfowl populations/numbers may underrepresent actual numbers in the study area, and the likelihood of important wetlands and concentrations having been omitted and/or missed. Provide the rationale for omitting important areas of coverage, and reevaluate population estimates by extrapolation to include wetlands that were not surveyed.

- provide an explanation as to why the study area comprised a 5 km radius of the proposed route instead of the 10 km radius required by the Terms of Reference issued by the proponent to the consultant. Evaluate the validity of the study results given the reduced study area.

Section 2.1 Aerial Surveys

- provide an explanation as to why flight lines approximately 500 metres apart such that a minimum of two passes are made on each side of the road right-of-way were not flown as required by the Terms of Reference issued by the proponent to the consultant. Evaluate the validity of the study results given the reduced flight lines.

- provide the rationale for the survey dates as they relate to the three distinct breeding phenologies of waterfowl groups, i.e., i) early nesting geese-dabbler duck group; ii) late nesting diving duck group, and iii) harlequin duck which have specialized habitat requirements.

- describe how the lateness of the 2002 spring chronology could be expected to affect:
  a) spring staging observations on May 9, since lakes/ponds and wetlands were still ice-covered,
  b) breeding observations on May 21 for Canada Geese and Dabbling Ducks since most lakes/ponds and wetlands on the Eagle River Plateau were still ice-covered,
  c) late nesting species observations on June 1-2 since waterbodies on the Eagle River Plateau were still 50% ice-covered,
  d) brood observations on July 18, especially for late nesting species,
  e) fall staging observations on August 28-29 in light of a), b), c) and d).

Section 4.1 Regional Population Status of Ducks

Inland Ducks and Canada Geese

- compare the proposition that "nesting success is more influenced by spring temperature than availability of water" with published works linking predator and prey dynamics with cycles in productivity and populations in the north boreal zone.

Sea Ducks

- compare the information presented on Harlequin Duck and Barrow's Goldeneye with most recent COSEWIC status reports for the two species.

- provide a more comprehensive presentation, with references, on the international conservation concern for sea ducks. Relate global issues and concerns for sea duck conservation including perspectives of the Sea Duck Joint Venture under the North American Waterfowl Management Plan. Place Labrador in its perspective importance to interior breeding of sea ducks. Update sea duck references provided as available.

- discuss trends in available data for Labrador-Quebec with respect to winter inventory data from the Atlantic Coast.

- provide the source identifying Barrow's Goldeneye breeding location as the north shore of the St. Lawrence River.

Section 4.2.3 Broods/Moulting

- brood age class data collection is standard protocol for conducting brood surveys. Provide an explanation if this data was not collected. Provide any age class information that was collected.

- relate age class data to an assessment of the likelihood that the timing of the survey was too early.

- clarify how the lack of observations of scoters may have been affected by the survey's focus on habitat not utilized by scoter broods.

Section 4.2.4 Fall Staging

- describe how the strong presence of ring-necked ducks observed may or may not support that the species has expanded greatly into Labrador over the past two decades.

- provide age class data for ring-necked duck broods. Provide an explanation if this data was not collected.

- describe the likelihood that most or all ring-necked ducks would not have been capable of flight by the 2002 sport hunt season opening date.

- describe how fall staging be sea ducks (notably scoters) and other late nesting species may not have been captured by these surveys.

Section 4.4.1 Wetland Size Versus Waterfowl Abundance

- provide the rationale for the suggested similarity between waterfowl abundance (Table 4.4) and waterfowl density (Table 4.5) considering the Tables have only two wetlands in common.

- provide an evaluation as to which is more relevant to assessing the "significance' of wetlands or if both criteria can be considered equally applicable.

- describe how waterfowl use may be influenced by wetland proximity, e.g., a small, isolated wetland compared to a small wetland in a complex that provides larger edge habitat than a large wetland.

Section 4.4.2 Probability of Occurrence of Waterfowl Versus Wetland Areas

- elaborate on the relationship presented in Figure 4.8 and explain why actual numbers of waterfowl are not strongly related to wetland area.

- compare the results of a quadratic regression for the waterfowl to wetland size relationship with the logistic regression presented.

OMITTED - Wetland and Riparian Habitat Potential for Waterfowl

- provide a description of habitat potential which is identified as an objective for the Component Study in Section 1.2. Use this information when extrapolating waterfowl populations in areas of the study area that were not surveyed.

EDITORIAL REVISIONS

- literature citations should always be to the primary source.

- methods are interspersed throughout results and discussion. Each survey was done differently. Methods used for each life history stage should be described in methodology.

- there are many figures with a great deal of raw data. These could be presented as appendices with summary tables of results in the text to facilitate interpretation.

- section 1.2 should state that waterfowl have four discreet life history stages around the breeding period: spring staging, nesting, brood rearing and fall staging. Since waterfowl behaviour and habitat requirements differ between stages, each will be treated separately.

- section 4.1 relates reproductive rates in sea ducks to determination of population status. Reproductive rate of a species is completely unrelated to the concept of determining population status. The two statements should therefore not be linked.

- Tables 4.2 and 4.3 should clearly indicate the reduction in Plot size in 1996, otherwise it appears there is an inexplicable decline in birds after 1995.

- include available data on scoters in Tables 4.2 and 4.3.

- reconcile the number of wetlands surveyed with wetland waterfowl observations in section 4.4.1 and adjust percentages as necessary.

- classify avifauna listed in Appendix A as either early or late breeding chronology.