

6.0 ENVIRONMENTAL EFFECTS ASSESSMENT

6.1 Raptors

Raptors are predators at the top of the food chain and are often used as indicators of ecosystem quality. Within the study area, large raptors such as osprey and bald eagle are widespread. As well, suitable habitat occurs for more secretive forest-dwelling raptors such as great horned owl, boreal owl and sharp-shinned hawk. Original research and a review of available information were compiled in a Raptor Component Study (JW and LMSS 2003a).

6.1.1 Boundaries

Project boundaries for raptors are defined by the spatial and temporal extent of project activities and the anticipated zones of influence in the area surrounding the proposed highway route. This boundary is a 2-km wide corridor centered on the proposed route. Raptors generally have widespread distribution patterns, with most species in the study area considered migratory. The spatial distribution and range varies between each species; however, they have a similar breeding strategy. With the establishment of a territory and nest site (often used annually by the same individuals), both members of the pair conduct their breeding activities around the nest structure and are inflexible in terms of moving away from the nest until the young are fledged or the nest fails (JW 1998c; Trimper et al. 1998). Given that raptors require larger ranges and tend to establish defended territories, only a small proportion of any raptor population is likely to be located at any one time within the project area. Raptors in Newfoundland and Labrador are managed under the provincial *Wildlife Act* by the Inland Fish and Wildlife Division

The spatial environmental assessment boundary for raptors is defined as the range of the populations of raptors that occur in the project area. For some species this may extend well beyond administrative borders.

6.1.2 Methods

There is a relatively limited amount of information available on the status of many bird populations in North America as a whole and in Labrador, specifically. However, in terms of raptor distribution, habitat association, and population trends, extensive surveys for the larger species have been conducted throughout the region, dating back to 1987 (JW 1999). Most of this work has been conducted annually for the DND within the LLTA and an adjacent area that overlaps the proposed TLH-Phase III route. Additional surveys completed in support of this assessment further supplemented the knowledge on these species and updated knowledge on activity in relation to the proposed alignment.

Information on raptors in the project area was derived from available literature, previous surveys conducted by the study team for DND and the results of aerial surveys conducted by WST in 2002. The specific aerial survey for raptors was conducted on June 17, 2002 following methods developed previously by the study team (JW 1999; 2000). The 2006L Bell helicopter was maintained at a height of 50 to 100 m AGL. Flights were conducted at a speed of approximately 100 km/h. Consistent with Wetmore and Gillespie (1976), attention was placed on higher points of land within the coverage area and on trees adjacent to smaller tributary streams, searching for large (1 to 2 m diameter) stick nests. Common and scientific names of raptors discussed in the text are provided in Appendix E.

6.1.3 Existing Environment

Wetmore and Gillespie (1976) conducted aerial surveys for osprey and bald eagles in east-central Labrador from 1969 to 1973. They identified two areas of osprey nest concentration within the region surrounding the project area. One area was located to the southwest of Happy Valley-Goose Bay in the foothills west of the Kenamu River, the other area of concentration was in a portion of the headwaters of the Eagle River (i.e., the Parke Lake area). In similar-sized areas to the west, east and south, much fewer nests were identified (Wetmore and Gillespie 1976). Subsequent surveys conducted by Jacques Whitford for DND and WST have confirmed that the two areas identified earlier continue to support relatively high densities of osprey, compared to other areas of Labrador (JW 1999).

DND has conducted an annual Monitoring and Mitigation Program for cliff-nesting and woodland raptors since 1991 within the LLTA in Labrador, and since 1997, in a control area to the east (JW 1998c; 1999). The LLTA and the control area encompass most of the proposed highway route, with only the easternmost 30 km of the highway outside the control area. As a result of annual surveys, 543 osprey nest sites had been identified in the LLTA and control area by 1998 (JW 1999).

Wetmore and Gillespie identified only five bald eagle nests in the east-central Labrador survey area during the five-year study and they found most bald eagle nest observations were concentrated in the western Labrador study area, centered around Smallwood Reservoir (Wetmore and Gillespie 1976). Subsequent surveys by DND also support the contention that bald eagle nests are less common in the study area than in other regions of Labrador. For example, surveys for DND have recorded over 500 ospreys nests compared to less than 50 bald eagle nests in this region (DND, unpublished data). Osprey and bald eagle productivity estimates from surveys conducted in Labrador indicate that productivity is variable each year and appears related to the timing of spring break-up, early summer weather conditions (Wetmore and Gillespie 1976) and the weather during the first two weeks of life for the nestlings (JW 1999, DND unpublished data).

A raptor survey conducted in June 2002 identified raptors, nest structures and status of nests found within the 2-km wide study area (Table 6.1; Figure 6.1). Several osprey and bald eagle have been identified previously in the surrounding region by surveys for DND (JW 1999) or through waterfowl surveys conducted by the study team for WST during May to August 2002.

Table 6.1 Raptor Nest Structures and Status Within the 2 Km-wide Study Area - Survey June 18, 2002

Nest Type	# Nest Structures	# Active	# Empty	# Status Unknown
Osprey	33	13	181	22
Bald Eagle	1	0	1	0
Cliff Nest	1	0	1	0

¹ Five empty nests were considered “old”, meaning that their deteriorated condition suggested they were unavailable for use.
² Following an adjustment in the proposed TLH-Phase III route, two additional nests were identified in August.

Osprey nests tended to be concentrated in three distinct areas along the proposed highway route (Figure 6.1):

- complexes of wetlands and waterbodies associated with a tributary of the Kenamu River (i.e., outflow from Brennan Lake), west of the main stem;
- complexes of wetlands and waterbodies around Crooks Lake; and
- complexes of wetlands and waterbodies along the Eagle River and tributaries south of Park Lake.

Although suitable nesting habitat for osprey may occur throughout the study area, these three areas are characterized by large spruce trees, sufficient adjacent fish stocks, and large lakes and rivers with hillside tributaries overlooking lakes and wetland complexes. Territories tend to be smaller in these areas as a reflection of the abundance of these important habitat parameters.

Raptor observations have been recorded during Black Duck Joint Venture Surveys since 1990. Data are available from 1990 to 2000 for two plots that fall within the general area of the proposed highway route, Plot 24 - Mud Lake and Plot 22 - Paradise River (Figure 6.1). Species observed on these plots include northern hawk owl, rough-legged hawk, osprey, bald eagle, merlin, and American kestrel (CWS unpublished data). The study team has identified some of these other raptors on previous surveys as well, but the sightings tend to be infrequent, reflecting lower densities and/or the ability to detect as a result of the helicopter style survey.

Breeding Bird Survey (BBS) results are used to develop long-term trends in raptor populations for Canada as a whole and by various ecozones. Two ecozones cover Labrador, the Boreal Softwood Shield ecozone, encompassing southern Labrador, and the Taiga Shield & Hudson Plains ecozone, which represents the remainder of Labrador in the BBS database. Currently there are not enough data on raptors from BBS to develop trends for the Taiga Shield and Hudson Plains ecozone (CWS 2002). It should be noted that there are limitations to the use of BBS data for raptors:

- BBS routes are concentrated in southern Canada and there are few in the Boreal or Arctic regions;
- large raptors such as osprey and bald eagle are more conspicuous and thus more likely to be counted. In contrast, smaller species, including ground or cavity-nesting raptors, which have smaller nests and are more secretive, are likely under-represented by the surveys; and
- surveys are usually conducted in June when a number of raptors such as great-horned owl, will have already completed breeding.

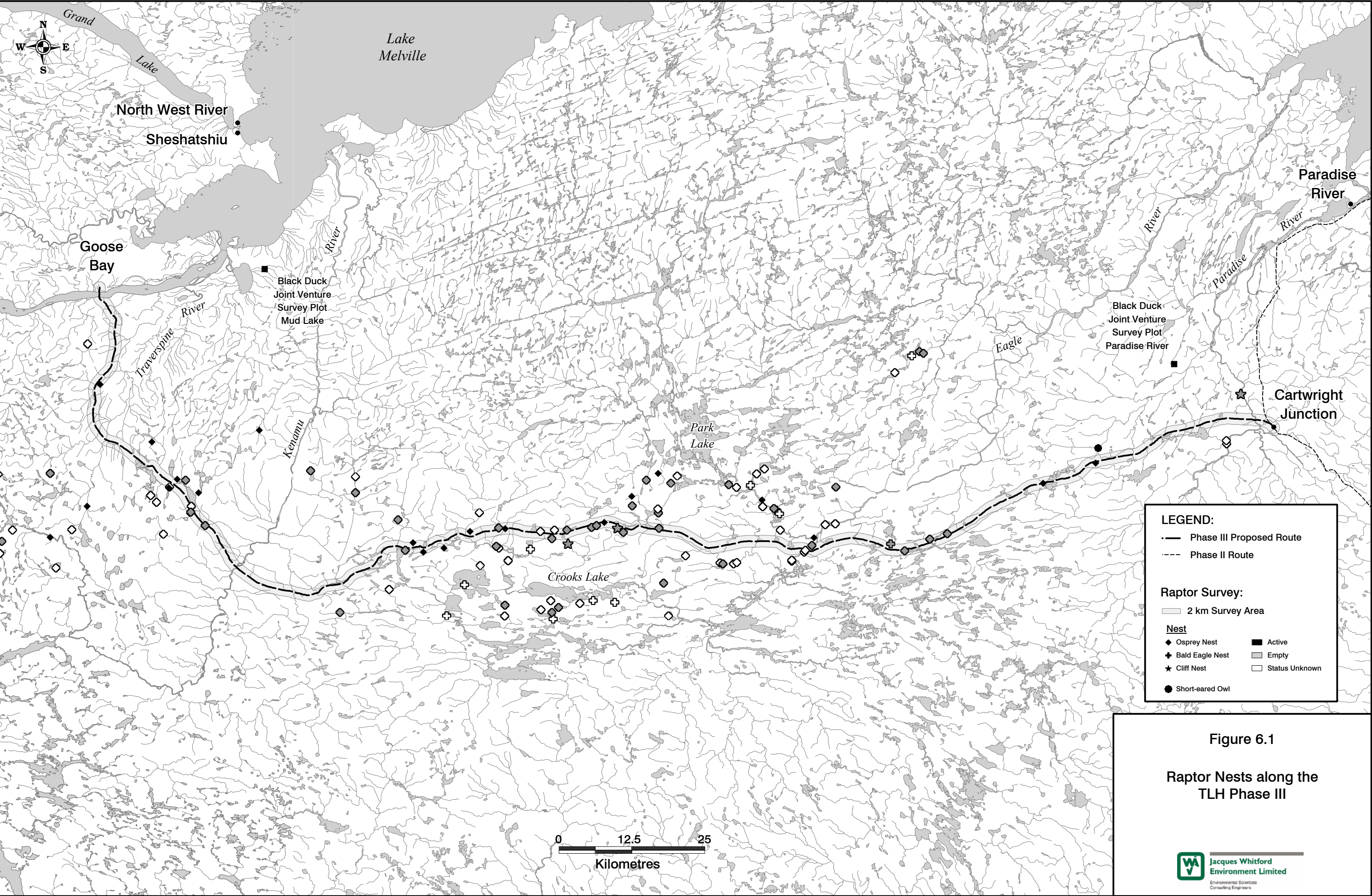


Figure 6.1

Raptor Nests along the TLH Phase III

Long-term trends from Canada-wide BBS results (1966 to 1994) indicate that osprey have statistically increased by 2 percent annually ($p < 0.05$) during this period (Kirk and Hyslop 1998). At the regional level, there was also an increase of 2.88 percent annually in osprey observations in the Boreal Softwood Shield ecozone from 1966 to 1994. The most recent trend information indicates a 6.8 percent mean annual increase (not statistically significant) in the number of ospreys observed during Canada-wide BBS from 1991 to 2000 (CWS 2002). Bald eagle populations also increased in Canada during the 1966 to 1994 period (6.88 mean annual percent change, $p < 0.05$); no trends are available for eastern ecozones (Kirk and Hyslop 1998). The Canada-wide trend for bald eagles for the period 1991-2000 shows an annual percent increase of 1.7 (not statistically significant) (CWS 2002).

BBS data also showed increasing population trends for other raptor species, including sharp-shinned hawk, red-tailed hawk, American kestrel, merlin and northern goshawk. Species that showed a declining trend include northern harrier, great-horned owl and short-eared owl (Kirk and Hyslop 1998; CWS 2002). The first breeding sites for harriers in Labrador were recently reported in central Labrador (Chubbs et al. 2000).

Species such as rough-legged hawk exhibit annual fluctuations in breeding populations based on prey availability. For example, in 1987 and 1989, rough-legged hawks were the most numerous raptor observed during aerial surveys conducted by CWS. However, no rough-legged hawks were observed 1988, a year during which it appears there was a small rodent population crash (Goudie et al. 1994). Three rough-legged hawks were observed during surveys along the proposed highway route in 2002, indicative that 2002 is not a year of high rough-legged hawk abundance in Labrador. In comparison, 10 red-tailed hawks were observed during surveys in 2002, compared to none observed during the CWS surveys from 1987 to 1989. This appears to mirror the apparent increase in red-tailed hawk numbers seen from the Canada-wide BBS.

One short-eared owl was observed during a waterfowl survey along the proposed highway route in 2002. Although uncommon, the study team has identified this species elsewhere in Labrador over the last 20 years. This species was listed as special concern by COSEWIC in 1994 and are considered vulnerable under the provincial *Endangered Species Act*. Further discussion on the short-eared owl is provided in Section 6.6 - Species at Risk.

The *anatum* population of peregrine falcons are listed as threatened by COSEWIC and the *tundra* population are considered vulnerable (COSEWIC 2002). Under the provincial *Endangered Species Act*, both *anatum* and *tundra* populations are considered threatened due to the difficulty of distinguishing the two groups, the possibility the two may inter-breed, and the fact that their ranges may overlap (DTCR 2002b). Peregrine falcons are known to breed along the Labrador coast and inland along river valleys in northern Labrador. No breeding peregrine falcons have been recorded in south-central Labrador; however, individuals have been noted moving through the area during spring and fall migrations.

6.1.4 Potential Interactions

During construction, the clearing of vegetation could remove active or potential tree nesting or (in the rare case of blasting at steep rock locations) cliff-nesting habitat for raptors.

Noise and general disturbance including use of lights, blasting activities and vehicular movement, during construction may also disturb nesting or foraging raptors. During operation, noise and regular vehicular activity may also cause disturbance to raptors, resulting in avoidance of habitat in the vicinity of the highway.

An accidental event such a forest fire may cause raptors to temporarily avoid areas previously inhabited. Contamination of waterbodies resulting from unlikely spills of fuel or other hazardous materials could lead to reduced foraging opportunities for aquatic feeders such as osprey.

6.1.5 Issues and Concerns

Issue and concerns related to raptors include:

- loss of nesting and foraging habitat due to vegetation removal;
- avoidance of habitat due to project-related disturbances (i.e., noise); and
- an accidental event such as a forest fire could result in loss of habitat.

6.1.6 Existing Knowledge

Disturbance to raptors during construction and operation of the highway may result in increased physiological stress, displacement or permanent avoidance of habitat. However, a review of various types of human disturbances concluded that these activities have had only a small environmental effect on raptor populations (Postovit and Postovit 1987). If nest sites are lost, most raptors are capable of relocating within short distances and constructing a new nest. Nest losses could be detrimental if losses occurred during the breeding season or alternative nest habitat was not available. The review of the literature also indicated that the duration and timing of disturbances were important factors. In particular, birds exposed to disturbances at the beginning of the breeding period were able to habituate and tolerate increasing levels of disturbance as the season progressed, as compared to birds abruptly disturbed during incubation.

Raptors will usually avoid areas of human presence and activity (Stalmaster 1987; Nelson 1979). However, there have been some reports of raptors continuing normal activities in areas of construction or human disturbance (reviewed in Nelson 1979). Stalmaster and Newman (1978) reported that bald eagles can tolerate and habituate to some levels of activity. Construction activities at the Bull Arm construction site, for example, did not seem to seriously disturb nearby bald eagles. There were several eagle nests in the vicinity of the site that remained active, and the birds continued to rear young in close proximity to the construction site.

The presence of a highway itself does not typically cause a disturbance response, rather, it is human presence on the highway that causes disturbance. Osprey on the Naskaupi River of Labrador were observed to be relatively tolerant of low-level military jet aircraft, yet exhibited strong reactions to the presence of the human observers (Trimper et al. 1998). In Minnesota, nesting bald eagles flushed at a mean distance of 476 m (range 57 to 991 m) from the approach of a pedestrian (Fraser et al. 1985). Breeding adult bald eagles have been found to be less likely to flush, and to flush at shorter distances, than non-breeding adults. Other studies found that pedestrians were the most disturbing stimulus to bald eagles and aircraft were the least disturbing (McGarigal et al. 1991; Grubb and King 1991).

Other raptors show similar responses to disturbance. A study that looked at flushing responses and flush distances of several diurnal raptor species found that walking disturbances resulted in more flushes by American kestrel, merlin and rough-legged hawks than vehicle disturbances (Holmes et al. 1993). Merlins perched along paved roads had shorter flush distances to walking disturbances than did individuals perched along gravel roads, and rough-legged hawks perched nearer to the road flushed at greater distances than those farther away (Holmes et al. 1993).

When birds are disturbed at nest sites, parental care of young may be affected (Trimper et al. 1998). Researchers have often identified a critical 'distance' from the nest beyond which osprey, for example, appear to be undisturbed from human activity. Osprey nesting in relatively wild areas have reacted aggressively towards humans at 0.15 km (Mullen 1985), although there have been exceptions. Melo (1975) reported one case of successful nesting by osprey with 0.03 km of a forest harvesting operation. In Alaska, the behaviour of breeding bald eagles changed when humans camped near (approximately 100 m) versus far (approximately 500 m) from nests (Steidl 1994, cited in Jalkotzy et al. 1997). Adults decreased the time and the frequency they fed nestlings, but increased the time they brooded nestlings. Similarly, in another study, the number of food items and time spent at the nest by male and female northern harriers decreased during periods of human disturbance (Fernandez and Azkona 1993).

The degree of disturbance exhibited by different wildlife species in the vicinity of roads varies. For example, large birds tend to be more sensitive to disturbance than smaller birds (Holmes et al. 1993). Raptors usually tolerate or habituate to traffic on roads (Nelson 1979). After comparing the productivity of bald eagle nests close to and remote from roads in southern Yukon, Windsor (1979, cited in Nelson 1979) concluded that road activity did not have a conspicuous effect on territorial occupancy, alternate nest sites, or the reproductive success of the eagles in the study. Osprey frequently nest on transmission line poles (JW 1998c) and sometimes in close proximity to busy highways. Boreal owls in Colorado nested within 30 m of a major highway and there was no evidence that disturbance was an important factor in nest loss or owl movements (Hayward 1990). Similarly, vehicular disturbance (0 to 16 vehicles/15 min) had no effect on productivity of burrowing owls even though nesting locations were in close proximity to the road (Plumpton and Lutz 1993). Red-tailed hawks in Alberta have also demonstrated an ability to thrive in human-altered landscapes. For 16 red-tailed hawk nest sites with records longer than four years, mean productivity was not measurably related to the distance to the nearest road (Ingraldi 1992, cited in Jalkotzy et al. 1997). A survey of 21 Coopers hawk nest sites in the northeastern United States found that nest sites were not located measurably farther from paved roads than were random sites and five nests were located within 100 m of paved roads (Bosakowski et al. 1992).

However, other raptor species may not be so tolerant of human disturbance. For example, a Norwegian study that looked at nest locations relative to human activity concluded that northern goshawks do not appear to tolerate human disturbance and thus, may avoid areas of human activity (Tommeraaas 1993). Ferruginous hawks exposed to controlled disturbance in Montana also appeared to exhibit an inability to tolerate human disturbance. The study found that only 52 percent of territories containing disturbed nests were occupied the year after disturbance, whereas 93 percent of the territories containing control nests were occupied on the following year (White and Thurow 1985). While bald eagles appear to be able to tolerate and habituate to human activity, modelling of bald eagle nest sites in Maine indicated that bald eagle nests were negatively associated with areas of land disturbed by humans compared to random sites. The length of road near nests was also a negative value (Livingston et al. 1990).

Raptors may experience mortality on roads, particularly if the road is traversing open country. The openness of the landscape and the lack of tall vegetation, particularly along the roadside, may cause raptors hunting in these open areas to see a flat landscape into which the road merges (Harding 1986). For example, in Britain, over a four-month period, 12 short-eared owls were killed along an 8 km long busy trunk road that passed through a large marsh area (Harding 1986).

Accidental events such as fire have the potential to affect raptors in the area. Although fire has the potential to destroy nesting sites, raptors (particularly eagles and hawks) are often attracted to fire because of the high availability of prey resulting from the displacement of small birds and mammals by the flames (Komarek 1969, cited in Kelsall et al. 1977). In general, with the successional stages following a fire, a forest canopy forms, resulting in a succession of birds particularly adapted to the conditions of the moment. Therefore, species formerly present eventually become re-established (Kelsall et al. 1977).

Bald eagles and osprey in particular may be affected by a fuel or chemical spill in a waterbody due to their dependence on the shoreline for nesting sites and foraging opportunities. However, there is some evidence that bald eagles are relatively tolerant of oiling and oil ingestion.

6.1.7 Mitigation

WST has attempted to reduce the project's potential effects on raptors through project design and planning. Specific mitigative measures for raptors include the following:

- minimization of vegetation removal to 30 m within the right-of-way;
- WST will confer with Inland Fish and Wildlife Division on appropriate mitigations for all active raptor nests within 800 m of the highway;
- no harassment of raptors by project personnel;
- construction vehicles will remain in the right-of-way and all-terrain vehicles will use designated routes;
- locations of raptors nests will not be released to the public; and
- design and implementation of fuel and other hazardous material spill contingency plans and emergency response in the event of an accident.

Many of the potential adverse effects of the project stem from the improved access provided by the highway, and the associated increase in human presence and activities in this previously remote area. Mitigating these potential effects is, for the most part, beyond the ability and responsibility of WST. Managing these actions and their potential effects will require the efforts of regulatory and resource management agencies, in order to ensure that applicable legislation and regulations are adequately enforced, and that future activities are undertaken in a responsible and sustainable manner. In this regard, the purpose of the environmental assessment is to identify these potential issues well in advance of their occurrence, so that appropriate measures can be identified and implemented by the appropriate agencies in an effective and timely manner.

6.1.8 Environmental Effects Assessment

6.1.8.1 Construction

There will be a loss of potential foraging and tree nesting habitat through vegetation removal along the highway right-of-way. However, the vegetation types that will be affected by construction are not considered unique within the region, and are well represented in the surrounding area. It is possible that up to five osprey nest structures will be within the highway right-of-way.

Government of Newfoundland and Labrador guidelines for construction near raptors nests recommend no construction within 800 m of a raptor nest during the nesting season and maintenance of a 200 m buffer around raptor nests outside of the nesting season. As a result of the dedicated surveys and previous knowledge of these species in the study area, 25 osprey nests have been identified within 800 m of the centre line of the proposed highway. Of these, five are considered “old” and appear to represent potential but currently abandoned territories. Eight of the 25 nests fall within 200 m of the centre line of the proposed highway route (one considered “old”, seven considered in good condition). Finally, five of those eight nests fall within 50 m of the centre line of the highway and will likely occur within the right-of-way where vegetation will be removed (Figure 6.2). However, mitigation for the removal of these structures will be put in place, or during detailed highway design; these nests will be avoided. Thus, reproductive success of the population would be redistributed but not affected to the point of being measurable at the population level.

Noise and human disturbance during construction may cause raptors to avoid habitat in the vicinity of the activity. Raptors may be particularly sensitive during the nesting and brood-rearing period from mid-May through mid-August. With appropriate mitigation for active raptor nests, it is likely that disturbance effects from construction will be primarily an avoidance of potential foraging habitat in the area of disturbance.

With the exception of the above noted areas of concentration, raptor densities in the project area are relatively low, as is the case throughout the northern boreal forest ecosystem. The relatively low densities of raptors will limit any population-based effects of project-related disturbance and vegetation removal within this species group.

Happy Valley-
Goose Bay

Nests within 50m of highway



Cartwright
Junction

0 12.5 25
Kilometres

n=5

Happy Valley-
Goose Bay

Nests between 50m and 200m from highway



Cartwright
Junction

0 12.5 25
Kilometres

n=3

Happy Valley-
Goose Bay

Nests between 200m and 800m from highway



Cartwright
Junction

0 12.5 25
Kilometres

n=17



**Jacques Whitford
Environment Limited**

Environmental Scientists
Consulting Engineers

Figure 6.2

**Raptor Nests Within 800m of
the Highway Centre Line**

6.1.8.2 Operation

An alteration of foraging patterns may result once the highway is in operation. Osprey may avoid waterbodies directly adjacent to the highway, although there are numerous examples of osprey habituating to human activity, particularly if the disturbance is not perceived as a threat. A car moving along the highway without stopping would likely not be perceived as much of a threat to foraging raptors in the vicinity of the highway. On the island of Newfoundland, osprey regularly forage in ponds that are situated in an urban setting within the city of St. John's, and also regularly forage in coastal waters alongside the paved two-lane highway to Stephenville. There will be no further loss of habitat during operation.

Due to the migratory nature of many of the species under consideration, influences external to Labrador such as contaminants (e.g., DDT) and habitat loss in wintering areas are influencing the population as well, often making it difficult to identify local causal factors such as project-related disturbances, if they exist.

6.1.8.3 Accidental and/or Unplanned Events

A forest fire could affect tree-nesting habitat for raptors for several decades. A large fire may destroy hundreds of hectares of vegetation, resulting in a decrease in raptor densities within the affected region. However, raptors living in the boreal ecosystem have adapted to a cycle of naturally occurring fires and the proportion of a population affected during any one fire would be small. For some raptor species, regeneration of burned areas will provide increased foraging opportunities as small mammal populations re-colonize these areas. Other accidental events such as a spill of fuel or other hazardous substance could contaminate waterbodies, thus affecting foraging opportunities for species such as osprey and bald eagle.

Few raptors are likely to be killed through collision with vehicles due to the low density of raptors in the region, particularly given those at greatest risk, such as the open ground hunters, occur at low density, and in consideration of the low volume of traffic expected along the highway.

With implementation of environmental protection planning, the potential for such accidental events occurring is extremely low. If such an accident should occur, the significance of its potential effects will be dependent upon the location and timing of the event and its nature and magnitude. WST's contingency planning and emergency response plans will ensure that any adverse effects are minimized.

6.1.9 Environmental Effects Evaluation

The key potential interactions between project activities and raptors include direct disturbance and loss of primarily tree-nesting habitat. The following definitions are used to rate the significance of the predicted residual environmental effects of the project on raptor species in the study area.

A **major (significant) environmental effect** to raptors is one affecting a population of a species of raptor in such a way as to cause a change in abundance and/or distribution beyond which natural recruitment (reproduction and in migration from unaffected areas) would not return that population, or any populations or species dependent upon it, to its former level within several generations. The effect is not reversible.

A **moderate (significant) environmental effect** to raptors is one affecting a portion of a population of a species of raptors in such a way as to cause a change in the abundance and/or distribution of that portion of the population or any populations or species dependent upon it over one or more generations, but does not change the integrity of any population as a whole. The effect may not be reversible.

A **minor (not significant) environmental effect** to raptors is one affecting a specific group of individuals of a species of raptors in such a way as to cause a change in abundance and/or distribution in a localised area and/or over a short period (one generation or less), but not affecting other trophic levels or the integrity of the population itself. The effect is reversible.

A **negligible (not significant) environmental effect** to raptors is one affecting a specific group of individuals of a species of raptors in such a way as to cause a change in abundance and/or distribution in a localised area and/or over a short period (one generation or less) in a manner similar to small random changes in the population due to natural irregularities, but having no measurable effect on the population as a whole. The effect is reversible.

The proposed highway is a linear development that will have minimal interaction with raptors in the region. Environmental effects will be restricted to removal of existing and potential tree-nesting habitat in the immediate highway right-of-way corridor. While this effect is of a long-term nature, it will be localized and breeding should continue through the use of adjacent habitat and/or, if required, the installation of artificial nesting platforms; thus, there will be no measurable effect at the population level. Based on the preceding discussion and proposed mitigation, the residual effects of the project on raptors are assessed as minor (not significant) for construction and operation (Table 6.2). However, an accidental forest fire may remove (at least for several decades) large areas of habitat for raptors. Therefore, the residual effects of an accidental event on raptors is considered moderate (significant) (Table 6.2). Overall, the project is not likely to result in significant adverse environmental effects on raptors.

Table 6.2 Environmental Effects Summary - Raptors

	Construction	Operation	Accidental/Unplanned Events
Mitigation: <ul style="list-style-type: none">• WST will confer with Inland Fish and Wildlife Division on appropriate mitigations for all active raptor nests within 800 m of the highway;• drainage to and through wetlands will be maintained to prevent loss of water supply to downslope areas;• no harassment of raptors by project personnel;• construction vehicles will remain in the right-of-way and all-terrain vehicles will use designated routes;• locations of raptors nests will not be released to the public; and• design and implementation of fuel and other hazardous material spill contingency plans and emergency response in the event of an accident.			
Environmental Effects Criteria Ratings			
Magnitude	Low	Low	Unknown
Geographic Extent	<1 km ²	1-10 km ²	100 km ²
Frequency	Continuous	Continuous	<10
Duration	37-72	>72	>72
Reversibility	Irreversible	Irreversible	Unknown
Ecological/Socio-economic Context	Nil		
Environmental Effects Evaluation			
Significance	Not Significant (Minor)	Not Significant (Minor)	Significant (Moderate)
Level of Confidence	High	High	High
Likelihood ¹	n/a	n/a	Low
Sustainable Use of Resources ¹	n/a	n/a	n/a
¹ Likelihood is only defined for effects rated as significant, and Sustainable Use of Resources is only defined for those effects rated as significant and likely (Canadian Environmental Assessment Agency 1994).			
Environmental Monitoring and Follow-up:			
Prior to each construction season, a survey for active raptor (specifically osprey and bald eagle) nests will be completed within 800 m of the proposed construction zone in order to determine the appropriate mitigation required for that year.			
Key:			
Magnitude:	High, Medium, Low, Nil or Unknown		
Geographic Extent (km ²):	<1, 1-10, 11-100, 101-1000, 1001-10,000, >10,000 or Unknown		
Frequency (events/year):	<10, 11-50, 51-100, 101-200, >200, Continuous or Unknown		
Duration (months):	<1, 1-12, 13-36, 37-72, >72 or Unknown		
Reversibility:	Reversible, Irreversible or Unknown		
Context:	Existing Disturbance (High, Medium, Low, Nil or Unknown)		
Significance:	Significant, Not Significant, Positive or Unknown		
Level of Confidence:	High, Medium, Low		
Likelihood:	High, Medium, Low or Unknown		
Sustainable Use of Resources:	High, Medium, Low or Unknown		

6.1.10 Cumulative Environmental Effects

As a result of its relative inaccessibility, there has been limited activity in the study area to date. Angling, hunting and trapping have been ongoing in the project area for many years, although these activities tend to be localized and of short duration at any given time. Low-level flying of military aircraft has been occurring in the region since the 1980s and more than a decade of monitoring has not identified any adverse effects on the reproductive success of osprey as a result of this activity (JW 1999). Projects such as the TLH - Phase I and II and other roads in Southern and Central Labrador have resulted in some loss of raptor habitat. Snowmobile trails are also found throughout the region. However, migratory raptors are not likely to interact with traffic on these trails as they are not present in the winter and disturbance to other year-round resident raptors would be localized and of short duration. Other projects, such as the Voisey's Bay Mine/Mill, as well as potential hydro-electric development, will have an effect on Labrador raptor populations.

In addition to these local activities, migratory raptors may be affected by a range of activities and associated disturbances within their often extensive ranges, such as vegetation clearing, and pesticides and other pollution. The extent to which these factors influence the Labrador population of migratory raptors, and particularly, those that use the proposed project area, is unknown and difficult to predict. While pollution control measures are enforced in the United States, long-term use of pesticides, or perhaps ongoing use in Central and South America, may cause effects to migrating osprey.

The most important development activity that may occur following highway construction is commercial forestry. Forestry activity can result in the loss of tree-nesting habitat for raptors over a large spatial scale. This fact, combined with the noise and other disturbances associated with the activity, may cause raptors to avoid these areas. Other indirect effects include changes to water table levels that may subsequently alter the attributes of neighbouring wetlands, ponds and bogs. However, forestry guidelines stipulate that a minimum 20 m vegetation buffer be maintained along waterbodies following forest harvesting. This would provide a measure of protection to nesting and foraging habitat of some raptor species. Other land and resource activities, such as mineral exploration, hunting and angling, may also increase due to enhanced access provided by the proposed highway, causing disturbance to raptors. Cabin development along the highway will probably also occur, creating areas of permanent human disturbance that may cause raptors to alter habitat use patterns in an area. Legislation and regulations are in place to control these activities and their potential environmental effects.

Details such as the likelihood, nature, location and timing of any actions induced by the TLH - Phase III are not known and the control of most potential induced actions and their related effects are beyond the jurisdiction of WST. Control depends on appropriate enforcement, and management planning on the part of relevant regulatory agencies. As a result, a number of assumptions have been made in assessing cumulative effects of induced actions, including:

- other projects and activities will be subject to appropriate planning and management;
- other projects and activities will be subject to the appropriate government requirements (e.g., legislation, regulations and guidelines) for protecting crown resources;

- relevant government agencies will have adequate resources to effectively carry out their mandate with respect to enforcement;
- the level of adherence to existing regulatory requirements will not measurably change; and
- the TLH - Phase III will be designated a protected road and subject to the *Protected Road Zoning Regulations* administered by MAPA.

The proposed Akamiuapishku/Mealy Mountains National Park would encompass approximately half of the highway route, including much of the most productive osprey and bald eagle habitat in the area. The creation of this park would afford a greater level of protection to raptor habitat from future activities such as cabin development and forest harvesting.

With the implementation of these mitigation measures, particularly appropriate planning and enforcement, the proposed project is not likely to result in significant adverse cumulative environmental effects on raptors in combination with other projects and activities that have been or will be carried out.

6.1.11 Environmental Monitoring and Follow-up

Prior to each construction season, a survey for active raptor nests (specifically osprey and bald eagle) will be completed within 800 m of the proposed construction zone. Active nest sites would be discussed with the construction engineers and officials from the Inland Fish and Wildlife Division to determine the appropriate mitigation required for that year.