

**CARTWRIGHT JUNCTION TO HAPPY VALLEY-GOOSE BAY
TRANS LABRADOR HIGHWAY
ENVIRONMENTAL IMPACT STATEMENT AND COMPREHENSIVE STUDY
DEFICIENCY STATEMENT
Issued April 2003**

**Part I: Sections of the Guidelines which have not been adequately addressed
or have not been addressed at all**

3.3.2 Alternative Methods of Carrying Out the Project

N The Guidelines require discussion of the following alternative routing criteria: avoidance of wetland areas; avoidance of adverse effects and enhancement of benefits on existing or potential tourism operations; avoidance of environmentally sensitive areas; avoidance of additional stress on land and resources through increased access; avoidance or reduction of effects on Innu land use; avoidance or reduction of effects on the proposed Akamiuapishku/Mealy Mountain National Park; and, avoidance or reduction of effects on Woodland Caribou (Red Wine and Mealy Mountain herds). The EIS/CSR discussion provided is limited to minimization of construction and operating costs and provision of a direct and economical route for highway users, without consideration of the aforementioned criteria. It is also advised that the Guidelines require specific inclusion of each of two routes as one of the alternative methods of carrying out the undertaking: the route identified by Innu members and the route identified by the Newfoundland and Labrador Outfitters Association. Discussion of the alternative routing criteria identified above should be presented for at least each of these two routes. Specific considerations included in the criteria could include: the number of water crossings required by each alternative; the ability of either route to mitigate potential effects likely as a result of increased access to trophy trout lakes on the Eagle River Plateau and the area's salmon pools; the availability of either route to engage a variety of scenic vistas and/or natural tourist attractions which could increase automobile sightseeing touring and other tourism markets, etc. A rating table should be presented to show how the preferred route came to be so using the criteria identified.

3.6 Construction

N The Guidelines require discussion of stream crossing structures address a number of considerations, including any feasible alternatives to the proposed crossing structure, and information of any infilling required. The EIS/CSR does not provide any discussion of alternative crossing designs. The only infilling information provided is for the proposed causeway at the Churchill River crossing. However, there was no ground habitat survey done at this site for the Fish and Fish Habitat Component Study, and no information on habitat characteristics, fish species present and any fishing activity in this area was provided. Considering the extent of infilling and depending on the nature of the habitat and its link to a

fishery, Fisheries and Oceans Canada may determine that the Churchill River crossing would result in a harmful alteration, disruption or destruction of fish habitat. The Churchill River crossing design will need to incorporate fish habitat considerations, and in particular, it is important that hydraulic conditions in the vicinity not be significantly altered.

4.1 Existing Environment

N The Guidelines require a description of hydrological conditions consisting of hydrologic, hydraulic and design parameters and the methodologies used to determine the dimensions and capacities for all watercourse crossings. The Table of Concordance indicates that hydrological conditions, including hydrologic, hydraulic and design parameters are included in Section 3.3.2. They are not included in that section nor do those characteristics appear to be included anywhere in the EIS/CSR.

5.0 ENVIRONMENTAL EFFECTS

N The Guidelines require a comprehensive analysis of environmental effects of fish and fish habitat in accordance with the listed criteria. The analysis was not done for any alternative route(s), and the analysis of the preferred alternative is not addressed completely.

N Resource use and users are identified in the Guidelines as a VEC. Potential protected areas are required to be considered and the Eagle River has been identified as a potential candidate for designation under the Canadian Heritage Rivers System. There is no analysis of the predicted effects of each project alternative on the potential for designation of the Eagle River under the Canadian Heritage Rivers System.

6.1 Mitigation

N The Guidelines require full consideration of the precautionary principle however it is not evident that full consideration was utilized in impact avoidance through scheduling and siting constraints (e.g., the EIS/CSR indicates that the proponent's major mitigation initiative was to select the route that avoids wetlands yet the preferred route runs through the middle of the major wetland/string bog complexes in the headwaters of the Eagle River watershed. The precautionary principle seem needs to be considered in assessing the potential for the highway's effects on fish and the fishery or to propose mitigation for those effects.

N The Guidelines require the proponent to include an assessment of the present capacity of resource agencies to mitigate and monitor cumulative environmental effects resulting from increased access to the study area. Instead the Cumulative Effects Assessment makes the assumption that relevant government agencies will have adequate resources to effectively carry out their mandate with respect to enforcement. The EIS/CSR should comply with the

requirement of the Guidelines or the proponent should also use the assumption that relevant government agencies will **not** have adequate resources to effectively carry out their mandate with respect to enforcement and generate a second Environmental Effects Summary for each of the VECs based on that assumption. The Environmental Effects Summary prepared for the second assumption should then be compared to the Environmental Effects Summary prepared for the first assumption. Although planning and control measures are available to regulate activities associated with increased access, in the opinion of several agencies current resources are not believed adequate to enforce such regulations, considering the difficulties associated with enforcement across the large, sparsely populated area along the highway corridor. Options to be considered in addressing this issue could include the requirement to increase dedicated staff and funding to resource agencies for conservation and protection in the area, and cooperation with aboriginal groups and other regulatory agencies.

7.2 Effects Evaluation and Selection of Preferred Alternative

N This evaluation and selection is not provided. The evaluation of highway alternatives, as required by 3.3.2 above, should be supported by a substantive accounting of the environmental effects and socio-economic implications of each alternative. The option that represents the greatest gain, for the least environmental cost, should be apparent from the analysis to be provided.

Part II: Sections of the Environmental Impact Statement and Comprehensive Study for which additional information is required, for which revisions or clarification is required and for which the analysis and/or interpretation is not correct

1.4.3.3 Caribou Component Study

N The Science Division was responsible for conducting the study, not the Inland Fish and Wildlife Division.

2.2.1 Alternative (sic) to the Project

N The description of alternatives to the project highlights the planned reduction in alternative transportation means - including air and marine services - and puts considerable emphasis on associated financial cost savings. Economic costs and benefits are indeed important considerations. However the Canadian Environmental Assessment Agency's Operational Policy Statement on the consideration of project alternatives also emphasizes the importance of considering environmental costs and benefits. This is not currently reflected.

N A shift away from marine and air services toward ground transportation will presumably increase the need for individuals to acquire and operate their own vehicles for transportation, and increase the frequency of commercial and personal travel. The completion of Phase III will also likely support this increase by enhancing ground transportation access. This, in turn, will likely have an effect on the resulting volume of Greenhouse Gas (GHG) emissions. The environmental assessment of a project of this magnitude should examine the potential change in overall GHG emissions associated with a shift in transportation mode. The examination should include a comparison of fuel consumption and associated GHG emissions from current transportation modes and from anticipated transportation modes if the highway were to proceed. An accounting of GHG emissions and losses of GHG sinks associated with the highway compared with an unaltered environment is required by the Guidelines.

2.2.2 Alternative Means for Carrying out the Project

N One of the technical/engineering factors listed is watercourse location. Identify whether during route location any consideration was given to proximity of proposed crossings to major inflows or outflows of ponds or lakes, or to obstructions. Pond and lake inflows and outflows are areas of high productivity, and should be avoided as preferred crossing locations where possible. Crossings at or near major waterfalls, or other obstructions (e.g., stream #23 and #24), may be a problem as fish could concentrate at these sites and be particularly susceptible to heavy angling pressure. This could be a particular concern for anadromous fish.

2.2.2.4 Alternative Routes through Central Labrador

Route Proposed by Outfitters (A13)

N The EIS/CSR states that Innu raised concerns with this route. Describe the concerns raised.

N Fisheries and Oceans Canada (DFO) notes that the outfitters' alternative route would eliminate the need for a bridge on the South Branch of the Eagle River. By reducing easy access to the Eagle River, this route may alleviate concerns over increased angling pressure on the fish stocks of the Eagle River watershed, in particular the large Eastern brook trout and salmon, and the potential for negative effects on the sport fishing industry that this area supports. From a conservation and protection perspective, this alternative route would be more protective of the Eagle River fish stocks than the proponent's preferred route. Provide an effects evaluation of this protection as required by Section 7.2 of the Guidelines.

2.3 Regulatory Approval Requirements

N Table 2.1 acknowledges a requirement to submit an application to Navigable Waters Protection, Canadian Coast Guard for any bridges, causeways, pipe arch culverts and cylindrical culverts 1500 mm or larger. Photographs should accompany applications. Any temporary watercourse diversion must also be included with the original application for that specific crossing.

2.4.4 Watercourse Crossings

N Table 2.3 identifies a causeway/bridge configuration for the Churchill River crossing. Provide the rationale for that decision. A 60 m bridge span has been proposed for the Paradise River crossing yet for the Kenamu and Eagle River South Branch, two bridge spans of 30 m each are proposed. Provide the rationale for that decision. From a fish habitat perspective, clear span bridges would be preferable wherever feasible.

N Table 2.3 also identifies that there are 31 crossings in Type I/II habitat yet only 17 pipe arches are proposed. Of the 17 pipe arches, seven are located in Type III/IV habitat, hence the majority of crossings in Type I/II habitat are cylindrical culverts. DFO considers that bottomless arch culverts are the preferred type to avoid any harmful alteration, disruption or destruction of fish habitat (HADD). Why are no bottomless arch culverts proposed? What criteria were used in selection of culvert type? Culverts and bridges must be sized to maintain as much of the natural stream width as possible. It would appear from the information presented in the EIS/CSR and the Fish and Fish Habitat Component Study that this is not always the

case. Wherever infilling is proposed at any crossing location DFO requires site-specific habitat information for HADD determination purposes.

N A number of discrepancies have been noted between the EIS/CSR and the Fish and Fish Habitat Component Study. For example, a comparison of Table 2.3 in the EIS/CSR and Tables 3.4 and 3.5 in the Fish and Fish Habitat Component Study revealed a number of inconsistencies. In Table 3.4 and 3.5, there are 9 stream crossings that have drainage areas ranging from 13.1 km² up to 140 km² that are not scheduled for pipe arch type or bottomless culverts (#46, #48, #52, #55, #61, #71, #77, #82 and #87). Also there are two locations that cross a pond or a steady that have large drainage areas and have no indication as to the type of culvert to be used. These need to be reviewed. Additionally, Table 2.3 details several crossings that have large pipe arch type culverts for watershed drainage areas that are 5.0 km² or less. There is a possibly a mix-up with respect to culvert designations in the two reports.

N According to the EIS/CSR, the actual engineering surveys for the culvert and bridge installations have not yet been completed and the detailed design information was not available at the time of the report completion. Without the information on stream crossing structures and stream crossings as specified in Sections 3.6 and 4.1 of the Guidelines, it is not possible to determine the appropriateness of any proposed culvert installations with respect to fish passage and whether or not it would constitute an obstruction to resident or anadromous fish species. In addition, it is not possible to determine whether there is the potential for HADD of fish habitat associated with stream crossing installations and to quantify the extent of any HADD. In general, even though the EIS/CSR recognizes the negative effects to fish populations that can result from the improper design and installation of culverts, the information presented is not sufficient for DFO to ascertain whether culverts will be properly designed and installed at proposed stream crossings.

2.4.4.1 Design Criteria for Crossing Structures

N This section states that details for each watercourse crossing would be submitted prior to construction. It is important that the detailed design information be submitted after completion of the preliminary design stage and prior to the tender of the construction contract. This would enable DFO to assess the type of culverts proposed, determine the appropriateness of the proposed stream crossing design and identify any installations that are problematic with respect to fish passage or potential for HADD.

N Appendix D, Department of Works, Services and Transportation - Relevant Specifications, Form 421, Form 423, and Form 424 are specifications that will be used by contractors to bid on the work. These Forms should detail the design criteria for proper culvert installation regarding maximum slope for the type of culvert. Embedment depths of 300 mm (150 mm where bedrock is encountered) are specified in Forms 421 and 423. The

guidance from Gosse et al (1998) should be adhered to with regard to embedment depths. Form 424 does not have any criteria for culvert installation.

2.4.4.4 Pipe Arch and Cylindrical Culverts

N This section states that most of the stream crossings can be accommodated using cylindrical culverts ranging in size from 800 to 3 000 mm in diameter. This section discusses the design criteria with respect to slope and velocity for culverts >25 m but there are no design parameters discussed for culverts <25 m, arch-type culverts or bottomless culverts. Also, the criteria provided for culverts >25 m do not appear to incorporate any biological considerations. It appears from the EIS/CSR that the only fish species considered as being affected are Atlantic salmon and brook trout. This needs to be clarified, since culvert design may need to take into account the provision of fish passage for other species in some locations.

N Where baffles or weirs are proposed, specific biological and engineering input is required and is essential to ensure adequate fish passage. The proponent should provide specific design criteria and site conditions under which circular, arch-pipe, bottomless and baffled culverts are to be utilized to provide adequate fish passage.

2.5.2.7 Site Rehabilitation and Monitoring

N All revegetation should be done using native species and seed sources only.

2.9 Effects of the Environment on the Project

N The discussion of effects of the environment on the project is inadequate. Potential effects on crossing structures are mentioned but no further discussion is offered. Also, there is no discussion of potential environmental effects resulting from structural failures as specifically required by Section 5 of the Guidelines.

N The potential effects of changes in precipitation volumes, changes in tidal flow, and related changes to flood risk do not appear to have been discussed or analysed. These basic factors should be incorporated in the EIS/CSR, and should explicitly take into account the potential effects of climate change. Recent experiences with winter weather and related potential effects on project operation (e.g., road closures) should be part of this discussion.

2.10 Environmental Management Planning

N This section indicates that the Environmental Management Plan will be finalized after the project is released from the environmental assessment process. The proponent is encouraged

to use the environmental assessment process as a tool to support the development of its environmental management plan and include as much detail as possible regarding the form and content of the environmental management plan within the EIS/CSR.

2.10.3 Environmental Protection Measures

N Based on the information presented, it does not appear that the identified environmental protection measures will enable compliance with the *Migratory Birds Convention Act* (MCBA) and its regulations. For example, Environmental Protection Measure #1.5 for highway construction indicates that “where active migratory bird nests are present or suspected, vegetation clearing will not be conducted until eggs have hatched and young are mobile.” In practical terms, how will the presence or suspected presence of active nests be established? Details should be provided in the EIS/CSR. Given the difficulty in identifying nests, Environment Canada strongly recommends that clearing activity be avoided during the nesting season for migratory birds. The recommendation also applies to maintenance activities related to Environmental Protection measure #2.7 for highway operation.

N Table 2.7, the following sentences should be added to 1.5: “Trees will be inspected for active bird nests prior to removal. Whenever possible, trees with active nests will be left standing until such time as the young have fledged.”

N Table 2.7, 1.9 should be modified to read “All merchantable or forest product timber will be salvaged and will be the property of the contractor. Merchantable timber should not be piled in the vicinity of a blasting operation or in any other area where construction activities could negatively impact the value or utility of the timber.”

N Table 2.7, the second 1.1 should be 1.10 and should be modified to read “Fires will be located a minimum of 10 m from the existing tree line and/or adjacent piles of slash and piled merchantable timber, or as directed by the Conservation Officer.”

N Table 2.7, add 3.12 which should read as follows: “Uncontrolled blasting, caused by failed discharges or otherwise, will be reported immediately to DFRA or DFO officials. Where uncontrolled blasting results in degradation to terrestrial or aquatic habitats, mitigative measures as recommended by DFRA or DFO will be implemented.”

N Table 2.7, add 3.13 which should read as follows: “Blasting areas will be surveyed for caribou and other wildlife species. Presence of wildlife in the immediate area will result in postponement of blasting activities. Guidelines for mitigation of the impacts of blasting activities on wildlife will be developed in consultation with the Inland Fish and Wildlife Division.

N Table 2.7, add 8.10 which should read as follows: “Efforts will be made to deter nuisance animals using non-lethal deterrents. Nuisance animals will be reported to DFRA and if relocation is necessary, it will be at the expense of the proponent.”

2.10.5 Emergency Response and Contingency Plans

N Table 2.10, add 5.5 which should read as follows: “The Inland Fish and Wildlife Division will be notified immediately if any species at risk or raptor nests are located by Works, Services and Transportation personnel or contractors.”

N Table 2.10, add 5.6 which should read as follows: “Works, Services and Transportation staff will maintain a logbook to record sightings of wildlife species. The Inland Fish and Wildlife Division will be consulted for direction on the development and maintenance of the logbook.”

2.10.8.2 Environmental Effects Monitoring

N This section should be revised to indicate that breeding bird, rare plant and beaver surveys will be conducted prior to the start of each construction season. Data collected should be copied to Inland Fish and Wildlife Division along with the proposed mitigative measures. The section should be expanded to provide more detail on proposed monitoring protocols to evaluate the accuracy of effects predictions made in the EIS/CSR.

3.2.1.3 Rare and Endangered Vascular Plant Species

N Additional information is required on the methodology for the rare plant survey. Trained botanists should perform the surveys and sampling protocols should be standardized and rigorous enough to ensure adequate data collection for analysis, effects assessment and mitigation. Plant samples should be collected and arrangements should be made to have the samples provided to a Newfoundland herbarium. The Inland Fish and Wildlife Division can be consulted for further direction.

3.2.3 Wildlife

N The EIS/CSR states that the Mealy Mountain Caribou Herd (MMCH) numbers less than 600 animals. The estimated population of the Mealy Mountain Caribou Herd from the most recent census is approximately $2\,500 \pm 1\,500$ animals (Otto 2002a).

N Recent information indicates that the Red Wine Herd is moving closer towards Goose Bay. There is a potential for this herd to be impacted by the highway. Given the very low population estimate for the Red Wine Herd and the level of effects associated with the low level

flying activity, additional information should be provided to assess the potential effects of the highway and possible mitigation measures that could be applied to protect this herd during construction and operation.

N Although there are no confirmed sightings of wolverine since the 1950s there are a number of unconfirmed sightings, some along the preferred route. Knox (1994) summarizes all sightings. This information should be presented to facilitate an assessment of the potential effects of the proposed route on potential wolverine recovery habitat.

3.3 Freshwater Environment

N Characterization of the lower portion of Paradise River as not suitable for angling is incorrect. In fact, angling on tributary streams is quite good and Paradise River has recently become a scheduled salmon river. Eagle River is a scheduled salmon river, and supports a significant recreational fishery and commercial outfitting operations. Both river systems are unobstructed and Atlantic salmon and sea run trout can and do presently ascend both rivers into their upper reaches. Paradise River has spawning areas in its lower reaches in both the main stem and tributary streams. Table 3.4 should list Arctic charr and rainbow smelt for Paradise River. The statement that ‘there are 16 scheduled salmon rivers in the area and all are located in the Eagle River and Paradise River watersheds’ is incorrect. Also, the statement that ‘most if not all angling undertaken at these camps is hook and release’ is incorrect. It should say ‘some,’ as a lot of salmon are retained.

6.0 ENVIRONMENTAL EFFECTS ASSESSMENT

N The conclusion and recommendations of the Labrador Innu Land Use Component Study should be incorporated into the effects assessment to provide an integrated and comprehensive evaluation of effects and allow the further incorporation of appropriate conclusions and findings into the Environmental Protection Plans.

N Section 5 of the Guidelines clearly indicates that particular emphasis shall be placed on the significant increase in human access and the attendant implications for increased development pressure along with induced development (e.g., forest harvesting, fish harvesting, fur harvesting). However, the EIS/CSR provides little discussion of these potential effects.

N The cumulative environmental effects sections for each of the VECs seems to be very narrow in scope and compounds the averaging out of effects in its predictions. Cumulative environmental effects from opening up a previously inaccessible remote area often have a more significant environmental effect than the original development. The cumulative environmental effects predictions rely heavily on the use of assumptions. While it is acknowledged that

cumulative effects may not be the sole responsibility of the proponent for mitigation and enforcement purposes, it is the proponents responsibility to accurately and comprehensively provide a prediction of effects. Although forestry activity will undoubtedly occur after the highway is constructed, its potential effects on some of the VECs needs to be addressed. Also current provincial harvesting guidelines offer significantly more protection to habitat requirements than is described (e.g., 20 m buffer around waterbodies). Further, harvesting guidelines specific to District 19 offer significantly more habitat protection than is seen in other jurisdictions and again this is not reflected in the EIS/CSR. Examples are: forestry activity is not likely to be concentrated in core MMCH habitat; harvesting guidelines prohibit activities within 800 m of active raptor nests, and not all raptors can be similarly characterized in their reaction to nearby harvesting activity; and, staging areas for waterfowl, especially that for threatened species, would not be considered for forest harvesting.

N The assertion repeated throughout that mitigating the effects is, for the most part, beyond the ability and responsibility of the proponent is not entirely justified. For example, if a change in the proposed route, or some other mitigative measure, would substantially lessen the environmental implications of development pressure, then such a mitigation measure should be given adequate consideration by the proponent. Indeed, the difficulty in directly mitigating environmental effects of future activities does not preclude the need to give them full discussion and consideration, and to develop mitigation recommendations or adopt any mitigation measures that are feasible.

N A comprehensive discussion of reasonably foreseeable induced development is also important in evaluating the suitability of the proposed routing. Conceivably, future development will be concentrated around the proposed routing, resulting in a higher level of development pressure and greater environmental effect in its immediate vicinity. Therefore, the EIS/CSR should demonstrate that the proposed routing will not introduce development pressure to sensitive habitat areas that could result in significant cumulative effects. Without this analysis, a potentially major source of environmental effect would be overlooked.

N Beyond the requirement of the Guidelines to consider induced effects, the CEA Agency's *Operational Policy Statement on Addressing Cumulative Environmental Effects* suggests that a cumulative effects assessment include projects that are "reasonably foreseeable." It is stated repeatedly under individual "mitigation" sections for VECs that many of the potential adverse effects of the highway stem from the improved access provided by the highway and the associated increase in human presence and activities in this previously remote area. This statement acknowledges that induced development, increased development pressure and increased human access are "reasonably foreseeable" activities. Therefore, they should receive full consideration.

N At numerous points in the EIS/CSR, and summarized in section 7.1, compliance with various guidelines and standard contract language are identified as mitigative measures. However, specific descriptions of the actual measures and how they will be applied are sporadic. The EIS/CSR should describe the proposed mitigation strategy and specific mitigation measures - in an appendix if necessary - rather than rely upon a list of guidelines. For example, the proponent indicates that it will confer with the Inland Fish and Wildlife Division regarding mitigation for raptor nests within the right-of-way. Does this mean that the raptor nest guidelines will be applied? If so, the EIS/CSR must be definitive in this regard. If not, then the guidelines should not be presented as mitigation.

N The EIS/CSR should identify information gained from Phase II mitigation experience. For example, using the raptor example above, how did conferring with Inland Fish and Wildlife Division protect raptor nests? Was the mitigation successful? How many nests were removed? How many times was construction delayed for nesting? How and where was the road realigned to avoid raptor nests? Previous mitigation experiences, particularly for Phase II, should be reflected for all applicable VECs throughout.

N Similarly, the effects analysis for each VEC should reflect the failure rate in planned mitigation as evidenced by previous phases of the Trans Labrador Highway. For example, the EIS/CSR concludes that residual effects on fish and fish habitat will be insignificant when standard mitigation measures are applied. However, evidence from Phase II seems to indicate there were failures at stream crossings. These failures should be considered when conducting the analysis for the proposed highway.

N Section 6.3 of the Guidelines clearly indicates basic requirements for a follow-up program. It is important that the assessment be conducted in a manner that supports an adaptive management approach. Accordingly, the EIS/CSR should include provisions for implementation of a follow-up program that allows the accuracy of effects predictions and the effectiveness of mitigation measures to be tested throughout the life of the project. The proponent should address if there is an expectation that responsible agencies may need to carry out monitoring programs and the costs of doing so. It is with follow-up results in hand that the provisions for project management can be adapted to ensure a commitment to avoid significant adverse environmental effects is respected.

N The testing of effects predictions and mitigation measures is especially important in cases where there is a lack of site-specific data. Under these circumstances, predictions often rely heavily on experience elsewhere and expert opinion. Uncertainty regarding effects resulting from a certain type of project under a specific set of environmental conditions dictates that the proponent demonstrate preparedness for a range of potential outcomes to be confirmed through follow-up.

N As it stands, the proposed follow-up program is inadequate. In many cases, a follow-up program for VECs either has not been developed, or would not permit an evaluation of the accuracy of effects predictions and the effectiveness of mitigation procedures. From the information provided, it appears that most of the follow-up proposed would actually occur before project construction, with no corresponding follow-up effort during and after construction. The proponent is advised to consult the CEA Agency's *Operational Policy Statement: Follow-up Programs Under the CEEA* that outlines how follow-up would be applicable to all phases of project implementation.

N The Guidelines refer to the precautionary principle and state that "the best available technology and best management practices must be considered." The EIS/CSR is deficient on this item with respect to stream crossings. There are no culvert selection criteria presented. DFO notes that the proponent has not proposed to use any bottomless arch culverts and that the majority of culverts are cylindrical pipes. DFO strongly recommends open bottom/bottomless arch culverts to minimize potential effects on fish and fish habitat, maintain fish passage, and sufficiently accommodate watercourse flows, particularly in sensitive habitats, as a mitigation against HADD of fish habitat. It is also suggested that natural stream conditions (i.e., widths, habitat) be maintained to the extent possible (Gosse et al, 1988).

6.1 Raptors

6.1.6 Existing Knowledge

N Define 'vicinity' and 'close proximity.' Caution should be used in interpreting data from studies where raptors established successful nest sites in the 'vicinity' of roads and highways. There is a difference between a bird establishing a nest near a road and having a new road constructed near a nest. Effects may be much greater for new developments in areas that were previously undisturbed.

6.1.7 Mitigation

N Additional discussion should be provided on options for mitigation. Mitigation guidelines for other developments recommend that no activity take place within 800 m of an active eagle or osprey nest during nesting (March 15 - July 15). A 200 m no activity buffer should be maintained at all other times of the year. Relocation of these nests likely is not an option as the nests would have to be moved too far to be considered out of the impact area. Data presented in the Component Study suggests that the string bog complex of the Eagle River watershed represents a relatively high density area for osprey. Without information on raptor densities in other areas (alternative routes) it is difficult to estimate the relative effect of the highway on raptor populations.

6.1.10 Cumulative Environmental Effects

N Additional discussion should be directed towards the potential effects of increased access. Although regulatory and enforcement capabilities are outside the direct mandate of the proponent, limitations in human and financial resources for responsible government departments make it extremely unlikely that mitigation of increased access will be totally effective.

6.2 Waterfowl and Passerine Birds

N Waterfowl and passerine birds are considered together in most sections of the EIS/CSR. Presentation of information in this manner is confusing. It is also implied that a passerine bird component study was undertaken, which is not the case. Given the differences between waterfowl and passerines, including important differences in the nature and extent of potential interactions with the highway, these migratory bird groups should be discussed separately.

N Table 6.5 indicates that Environmental Effects Evaluation of construction and operation is Not Significant (Minor). Relate this conclusion to the finding described in the Tourism and Recreation Component Study that tallymen reported the disappearance and growing scarcity of certain species along a corridor 10 km wide on both sides of the main road system for the La Grand hydroelectric development. Clarify also why the Environmental Effects Criteria Ratings describe effects as irreversible, considering that effects have been described as Not Significant (Minor).

6.2.3.1 Waterfowl

N The significance of the study area to waterfowl is not evident from the EIS/CSR. The data presented in the report indicate that there are large numbers of birds in the study area. The Eagle River Plateau is one of the most important areas for waterfowl in Labrador. Therefore, the significance of the study area to waterfowl in Labrador should be identified and the contribution of this population to the Atlantic Flyway should be recognized.

N The low number of waterfowl found in the spring survey should be discussed in terms of the heavy ice conditions at the time.

N It is stated that although suitable habitat for Harlequin Ducks exists along rivers that will be crossed by the highway, no breeding Harlequins were found. It should also be stated that these rivers may provide habitat in the future as the populations recover and expand their breeding range.

6.2.6.1 Waterfowl

N Although some species may use highway rights-of-way, use does not indicate a preference. These areas may be sub-optimal habitat or may be used by non-breeding individuals. Interpretation of 'use' data without additional information on the demographics of individuals using the area and in relation to use of other areas must be done with extreme caution.

6.2.7 Mitigation

N It is indicated that "removal of forest vegetation in areas where active nests are identified, (will occur) outside of the nesting period in sensitive areas." It is unclear why avoidance of clearing during the nesting period would only be practiced in sensitive areas, as the *Migratory Birds Convention Act* (MBCA) applies to all migratory birds regardless of health of their populations. Again, clearing activity should not be undertaken when migratory birds are breeding or nesting.

6.2.9 Environmental Effects Evaluation

N The finding that environmental effects are "not significant (minor)" is not supported by the text. In addition, the rating does not consider cumulative effects and increased access. It also does not consider potential changes in hydrology (see Wetland section) that would irreversibly affect waterfowl habitat.

N Effects prediction cannot be made in isolation from cumulative effects. Increased access will likely change the forest landscape, primarily through forest harvesting. These changes will likely be considerable and will likely have significant effect upon forest bird populations.

N Any conclusions offered in the EIS/CSR must be predicated on provisions for ensuring survey results are reviewed in consultation with Environment Canada, and that mitigation and follow-up measures acceptable to the Responsible Authorities and Environment Canada are developed before work on the highway is allowed to proceed.

6.2.11 Environmental Monitoring and Follow-up

N Environment Canada notes the commitment to conduct breeding passerine bird surveys prior to construction, currently scheduled for 2003. The proponent states that the purpose of the surveys is "to establish a baseline for possible future monitoring." From Environment Canada's perspective, the purpose of this survey effort is not only to provide baseline information, but also to identify the presence of any bird populations particularly sensitive to disturbance or habitat loss (e.g., rare species or species known to be in decline). Given that the

current scheduling arrangements do not allow survey results to be incorporated into the EIS/CSR, provisions for ensuring an appropriate mitigation and follow-up program that will be in place before any work on the highway is allowed to proceed should be described. Such a mitigation and follow-up program must be acceptable to the Responsible Authorities and to Environment Canada and must include the following elements to be effective:

- methods quantifying habitat losses, and provisions for a review of these data by the Canadian Wildlife Service of Environment Canada;
- a description of the full range of available mitigation options including: adjustments to the highway corridor; modifications to clearing schedules and techniques during construction and maintenance phases; and on-site habitat creation or rehabilitation.
- a description of the circumstances under which each mitigation option would be considered and a commitment to mitigation implementation; and
- provisions for follow-up on effects accuracy and on mitigation effectiveness and a commitment to implement additional measures based on follow-up results.

6.3 Caribou

6.3.1 Boundaries

N The total area (km²) should be indicated.

N The statement on consistency of calving areas does not seem confirmed by information presented on the following page. If 60 % of females calve less than 15 km from previous calving locations and >30 % were less than 5 km from previous calving locations one would conclude a relatively high site fidelity given that 3 of the 6 collared animals moved >100 km in the approximately six month monitoring period. The issue of scale is not adequately addressed so interpretation of site fidelity data in relation to the impact area is difficult. Also, no indication is provided regarding the degree of movement exhibited by females within the calving grounds.

6.3.2 Methods

N The study area is very narrow. Given that caribou are mobile and that the initial telemetry data indicates considerable variability in movement patterns, a 20 km study area (as opposed to 2 km) centered on the highway would be more appropriate. More information should be presented here on the history and historic range distribution of the herd. Local traditional knowledge should have been incorporated into the discussion. There is very little empirical data presented on movement parameters. The terms ‘near,’ ‘relatively sedentary’ and ‘widely dispersed’ are used often, without quantification of the distances involved. Without more specific information, assessing the potential effects is not possible.

N The study was conducted by the Science Division, not the Inland Fish and Wildlife Division. VHF collars were used in the study, not satellite collars. There were four females collared and two males collared, not six females.

6.3.3.2 Herd Abundance

N The survey information indicates five discrete groups were located around Park Lake and two smaller groups were located at the coast. The number and composition of these groups should be provided. More detailed information on the dates when observations were made, the number of hours spent flying, the numbers of animals seen in each location, etc. would facilitate the assessment. A comparison of the survey and classification results for this herd with information from other woodland caribou herds in the area and from historic classification results for this herd with information from other woodland caribou herds in the area and from historic classifications conducted on the MMCH would provide a better background against which to judge current information. It is unclear why a male:female sex ratio of 1:2 would suggest high survival rates or how this would necessarily result in a large increase in population size. More information is required on other demographic parameters such as birth rates, recruitment rates and mortality rates in order to make conclusions regarding the population trajectory of the herd.

6.3.3.3 Migration Pattern

N This section needs clarification. Only six animals were collared. Number, rather than percentages, should be used here. The 70% of the locations that were more than 40 km north of the highway may well represent only two or three animals. Different symbols should be used for each of the animals to facilitate the assessment of movement patterns. An indication of the actual date when each point was collected would facilitate the evaluation of movement rates.

6.3.6 Existing Knowledge

N The literature review for this section is not complete. There is a significant body of recent literature on the impacts of both linear and other developments on caribou. The more recent literature indicates effects of development that are subtle but that have the potential to result in population level changes in caribou herd dynamics. Information from this more recent body of literature should be included in the EIS/CSR. As well, many of the studies on caribou in Newfoundland have been conducted on populations that were increasing. The effects of development on a caribou population that is decreasing or stable may be very different than the effects observed on a population that is increasing.

6.3.7 Mitigation

N More information should be provided on the mitigation associated with blasting. How will the proponent determine if caribou are in the area? What criteria will be used to halt activity in the area? What area will be examined for caribou? Will the mitigation be applied over the entire construction period?

6.3.8 Environmental Effects Assessment

N Without better information on habitat selection, habitat use and movement patterns the assertion cannot be accepted that the habitat at the periphery of the range (which cannot currently be defined with any accuracy) is marginal or less critical than other habitat. Caribou use different portions of the range during different seasons. Critical range areas may lie at the periphery of the entire range area.

6.3.8.1 Construction

N Recent work by Schaefer et al (2002) indicates that caribou may not habituate quickly to disturbance. The majority of the Mealy Mountain Caribou range has been previously undisturbed. Construction and operation activities associated with the highway are going to introduce a significant new component to the caribou range. Issue can be taken with the conclusion that caribou in disturbed areas will select an alternate undisturbed site and that no reduction in herd productivity is anticipated. If this conclusion is based on work that has been conducted elsewhere that clearly demonstrates there is no decrease in caribou productivity associated with development of a similar nature, that study should be cited explicitly and the data on pre- and post- development productivity estimates should be provided.

Work done by Hill (1985) and Mahoney (1985) were on woodland caribou in Newfoundland. During this time, Island caribou populations were increasing rapidly. The population status of the Mealy Mountain Herd remains unclear and the herd is designated as “Threatened.” The scientific basis for concluding that MMCH will likely reoccupy areas that were disturbed during construction based on data from Island populations in an expansion phase is weak. To verify this assertion, data from more recent studies on animal response to disturbance for declining caribou populations should be used.

Data on only six animals, four females and two males, does not provide sufficient information on which to base any conclusions regarding habitat use patterns or the potential effects of the road, particularly during the sensitive calving and post-calving periods.

6.3.9 Environmental Effects Evaluation

N The conclusion that the residual environmental effects will be minor (not significant) is not well substantiated by the information presented in the EIS/CSR.

N Table 6.9 indicates that the level of confidence in the effects prediction is high. Based on the information presented, the evaluation is debatable. The Caribou Component Study submitted for the highway indicates there is insufficient information to assess effects, therefore the conclusion of a high level of confidence in the evaluation is unsubstantiated.

6.3.10 Cumulative Environmental Effects

N More discussion needs to be provided on options for mitigating the effects of increased access on caribou populations. According to the opinions of resource agencies resources available to agencies for enforcement are limited and the potential for adverse effects does exist.

6.3.11 Environmental Monitoring and Follow-up

N A monitoring program must be developed to evaluate the effects predictions generated in the EIS/CSR. At a minimum, evaluation of habitat use must be made for calving and post-calving both pre-construction and post-construction. As well, a monitoring program should be developed to assess the ability of animals to cross the highway once it is constructed. The Inland Fish and Wildlife Division should be consulted for the development of appropriate monitoring protocols.

6.4 Furbearers

6.4.7 Mitigation

N Mitigation should specifically provide for surveys to be conducted for active beaver ponds prior to each construction season. A 30 m treed buffer should be maintained on all active beaver ponds.

6.4.9 Environmental Effects Evaluation

N Table 6.11 indicates that Environmental Effects Evaluation of construction and operation is Not Significant (Minor). Relate this conclusion to the finding described in the Tourism and Recreation Component Study that tallymen reported the disappearance and growing scarcity of certain species along a corridor 10 km wide on both sides of the main road system for the La Grand hydroelectric development. Clarify also why the Environmental Effects Criteria Ratings describe effects as irreversible, considering that effects have been described as Not Significant (Minor).

6.5 Fish and Fish Habitat

N The opening statement of this section says ‘several species of fish are present....’ There are 20 species listed.

N Baseline information for fish and fish habitat is not well quantified. Similarly, the value of this resource to the outfitting industry and its contribution to the local economy is not adequately characterized. To assume that enforcement agencies will have adequate resources in place after the highway is constructed to monitor fishing activities may not be realistic. Further collection of baseline information to quantify the effects, and more comprehensive mitigative measures to ensure the protection of this resource, is required.

N The EIS/CSR does not describe key features of the area’s recreational fishery and use the precautionary assumption that the recreational fishery’s ability to compete on these features is fragile. These features include: fish size, variety and catch rate together with length of the fishing season; pristine surroundings; level of angler crowding and type and quality of services. It also does not discuss the level to which these features can be degraded and still maintain the viability of the lodges in the area. Specifically, a description of the trophy nature of the brook trout stocks on the Eagle River Plateau, their fragility and the likelihood that increased access will attract sufficient fishing effort to threaten their sustainability is required.

N Potential environmental effects and mitigation have been described. While DFO is in agreement that the measures listed will reduce the potential for environmental effects, there are additional measures that should be considered in addressing Section 6.1 of the Guidelines, as follows:

- with respect to culverts, while pipe arch culverts are preferred to cylindrical culverts, bottomless arch culverts are the preferred type from a fish and fish habitat perspective. Clear span bridges are preferred to those requiring in-river pilings. Culverts must provide passage for all species and life stages that could be present at each crossing to avoid habitat alienation.
- an additional item should be added - appropriate measures will be taken to control sedimentation. Roads by their nature tend to channelize and concentrate runoff and promote erosion, particularly in the approaches to the stream crossings. It will be important that the appropriate mitigations are undertaken both during construction and afterwards to minimize sediment problems. There will need to be consideration for bank erosion at the road crossings and the appropriate bank stabilization conditions provided. Guidance on these items is contained in Gosse et al (1998), particularly in the section on Linear Development.
- there is a growing awareness that road crossings and the associated ‘rights-of-way’ can increase the amount of sunlight reaching a stream and this can contribute to stream

warming. This can be exacerbated in smaller streams. Consideration should be given to keeping the clearances and rights-of-way to a minimum and maintaining as much natural riparian vegetation as possible.

6.5.1 Boundaries

N The description of ecological boundaries states that temporal boundaries are year-round for brook trout and only seasonal for anadromous species. This is incorrect as anadromous juveniles are present year-round.

N Figure 6.2.1 should show watershed boundaries. Also the Churchill River, Traverspine River and Otter Brook should be labelled. The Eagle River appears fragmented in two places to the north of the area between crossings #78 and #79; this should be corrected.

6.5.2 Methods

N Fish habitat surveys/habitat characterization were not conducted at all sites, since at some sites the stream could not be seen and for some there was no place to land.

N It is stated that ‘because actual engineering surveys have not been completed, detailed design information is not available and precise watercourse crossing sites have not been confirmed.’ DFO recognizes this, however the EIS/CSR should address how the proponent intends to provide the stream crossing information as required in Section 3.6 of the Guidelines. DFO recommends that the proponent provide basic design information and precise watercourse crossing locations as soon as this information becomes available. This will allow Fisheries and Oceans Canada the opportunity to identify areas of potential concern, to address any possibilities for re-design or relocation of crossings if warranted, and to initiate discussions concerning special protection measures for these areas. Depending on the type of habitat present, the proposed crossing structure (culvert type, bridge), i.e., whether there is to be any infilling, there is the potential for HADD at some locations. If it is determined that a HADD will likely result, the proponent must provide a precise quantification of the habitat, and DFO must decide if the HADD should be authorized and can be compensated for. Issuance of a Section 35 (2) *Fisheries Act* authorization will not occur until a compensation agreement is developed between the proponent and DFO. Given the time requirements for these steps to take place, the requirement for the proponent to provide the needed information to DFO in a timely manner is strongly emphasized. It is also recommended that the proponent meet with DFO prior to the collection of site-specific information at surveyed stream crossings.

6.5.3 Existing Environment

N The barriers to fish migration in Table 6.12 is incorrect. The barriers listed for Paradise River are not barriers for the area of the watershed where the Phase III highway is to be located and so are irrelevant in the current context. Muskrat Falls is not a barrier to eels and is also irrelevant to Phase III as it is above the crossing. During summer low flows, Muskrat Falls may not be a barrier to other species as well.

6.5.3.2 Description of Watersheds

N The crossing type should be indicate in the “Comment’ column, specifically for the proposed bridges and pipe arches.

N There are some errors in transferring information from the Fish and Fish Habitat Component Study to tables in this section. For example, Crossing 8 information states it is 0-2 m wide, yet Table 6.17 states it is 2-5 m wide and there are other discrepancies. In Table 6.20, crossing 48 is 2-5 m wide, whereas in the Component Study it is said to be 5-20 m wide. For Eagle River, there are 14 crossings with a basin area of less than 2 km².

6.5.3.3 Fish Surveys

N The statement is made that ‘DFO have made a preliminary determination that the planned highway construction methods are not likely to result in a harmful alteration, disturbance or destruction (HADD) as described under Section 35 (2) of the *Fisheries Act*.’” (Note that the word ‘disturbance’ is incorrect, it should be ‘disruption.’) This statement could be interpreted as DFO having already made a decision on HADD in advance of the EIS/CSR, which is not the case. Such a decision can only be made when the exact crossing locations are determined, as noted elsewhere, and DFO has reviewed site-specific habitat information and the designs of the crossing structures. As noted earlier, infilling could result in a HADD and require an Authorization. In discussions with the proponent in May of 2002, DFO advised that the proponent should make the assumption that all crossing locations will be in fish habitat and that any of the species known for the particular watershed could be present at each location. Also, DFO was willing to proceed without fish survey information at crossing locations on the assumption that the proponent would design and construct stream crossings in such a manner as to avoid HADD.

6.5.3.4 Fish Species

N While it is agreed that Atlantic salmon and brook trout are most widely distributed and potentially most likely to be affected by the project, the discussion should not be limited to these two species only, as per Section 4.1 of the Guidelines. Summaries should be presented for other species as well. There has been limited, or no consideration, given to other species. It is recognized that information is sparse for much of the area, however there are other sources

besides Anderson (1985) that could have been used, e.g., Labrador Hydro Project for Churchill River, outfitters, TEK, local residents, DFO scientists, etc.

N It is stated that brook trout have a similar life cycle and seasons to Atlantic salmon. This is inaccurate since brook trout life cycle and their habitat utilization are actually quite different than for Atlantic salmon. As an example, salmon remain at least one full year at sea while migratory brook trout return to freshwater and overwinter after only a couple of months at sea. While as stated, population status of brook trout is poorly known, it can be deduced from catches in the small existing angling fisheries that populations of large sized trout exist in many of the lakes and streams proposed to be crossed by the highway. Also, since most of the fish populations are probably lightly exploited, the standing stock should be equivalent to the carrying capacity of the habitat.

6.5.6 Existing Knowledge

N The information in Table 6.24 needs to be updated to reflect more current information. Migration times for the anadromous fish species is earlier than July 1 and later than end of August in Labrador. Trout, charr and salmon of adult and smolt stage migrate out in early spring around the ice breakup time. Charr, trout and salmon adults migrate into rivers in Labrador earlier and later than stated; also juvenile charr and trout migrate into rivers in late summer and fall (September and October). See DFO's Canadian Stock Assessment Secretariat website at http://www.dfo-mpo.gc.ca/csas/Csas/English/Index_e.htm.

N Observations from Exxon Valdez are irrelevant here as the highway is crossing freshwater not marine. Salmon and trout parr do not feed on phytoplankton, they feed on invertebrates that are in the stream or fall into the stream from surrounding vegetation. Therefore, some feeding occurs on the surface meaning that an oil spill would be problematic for salmonids.

6.5.7 Mitigation

N The third bullet "culverts will be countersunk where required to maintain..." should be changed to delete the phrase 'where required.'

N Construction personnel must not fish while on site. Survey work being conducted by the proponent and the Inland Fish and Wildlife Division is attempting to determine pre-access fish population inventory. Fishing by construction personnel will invalidate survey results. The possibility of closing the area to fishing during the construction phase should be explored with resource management agencies.

6.5.8.1 Construction

N Reference is made to Gosse et al (1998) and WDFW (1999) with respect to proper culvert installation and provision of fish passage. DFO stresses the importance of implementing appropriate mitigative techniques to reduce or eliminate potential negative effects to fish and fish habitat, and acknowledges the proponent's statement that all crossing structures will be designed and installed to provide fish passage (unless there is clear evidence that the culvert is not located in fish habitat).

6.5.9 Environmental Effects Evaluation

N Table 6.25, the Environmental Effects Summary - Fish and Fish Habitat requires additional explanatory justification. Construction and operation effects are proposed to be of nil to low magnitude, of not significant (minor) significance and confidence levels are described as high. These characteristics seem inconsistent with statements on pages 268, 270 and 285 which indicate that the status of both the Labrador salmon stock and the brook trout population in the study area is poorly known. The strong drawing power associated with world class trophy brook trout and internationally competitive catch rates for salmon together with the 120,000 residents who could be interested in fishing these newly accessible stocks would seem to point to different characterization of effects than those provided. The predicted environmental effects should also be placed in the context of statements elsewhere in the EIS/CSR that while provincial angling effort declined by nearly half since 1990 the Labrador effort nearly tripled, and that angling activity has increased (as much as tripled) with the completion of Phase II of the Trans Labrador Highway. Such comments suggest that one should expect dramatic increase in fishing effort and catch of trophy trout and salmon in the study area following highway construction. The Environmental Effect Summary appears to have omitted consideration of the fishery entirely.

6.6 Species at Risk

N It is unclear why the consideration of species of special conservation concern (includes floral and faunal species listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), identified as S1, S2 and S3 by the Atlantic Canada Conservation Data Centre (ACDC), designated in provincial listings, or of otherwise high conservation priority) is limited to two bird species. It is expected that the EIS/CSR would address any floral or faunal species of special conservation concern that could be adversely affected by the proposed highway. In support of this, it was indicated in the Guidelines for both floral and faunal species of special conservation concern that "available data, survey results and detailed mitigation measures that demonstrate a special emphasis on avoidance of environmental effects is to be include." As it stands, consideration of species of special conservation concern is inadequate.

N Appendix F clearly establishes that many rare plant species may be present within the right-of-way, and identifies 33 areas that should be surveyed. However it appears that these surveys have not been conducted, and there is no analysis of the potential effect of the highway on plant species of special conservation concern. The number of sites potentially supporting rare plants highlights the importance of conducting surveys in those areas. The results of surveys and appropriate analysis of potential effects on rare plants should be included in the EIS/CSR if conclusions regarding the likelihood and significance of effects on floral species of special conservation concern are to be supported.

6.6.7 Mitigation

N Additional information should be provided on methods to be used for locating active short-eared owl nests within 800 m of the highway route alternatives.

6.7 Geomorphology

6.7.11 Environmental Monitoring and Follow-up

N The EIS/CSR provides an overview of acid-generating rock considerations, identifies avoidance as the preferred mitigation option, and indicates that the proponent is committed to carrying out a field investigation, prior to the start of construction to further define the acid generation potential along the route. In many cases, however, the EIS/CSR defers specific procedural information to the environmental protection plan. Therefore, the EPP should be submitted to Environment Canada for review and confirmation that the sampling protocol, and proposed methods for dealing with acid-generating rock, are appropriate and will allow adverse effects to be avoided. Similar to other highway projects in the region, and other projects involving acidic material, Environment Canada is prepared to discuss proposed site-specific management approaches when the presence of acid-generating rock is suspected or discovered.

6.8 Water Resources

6.8.3.1 Watershed Areas

N For ease of review, information on the bridge or culvert size and approximate width of stream should be located in the same table (Tables 6.29 through 6.38). It would appear that there may be infilling associated with a number of crossings, e.g., crossing #22 has a width of >20 m, yet the proposed crossing is a 5 890 x 3 710 pipe arch; crossing #73 is 90 m wide, yet the proposed crossing is a bridge with 2 x 30 m spans; crossing #79 is 40 m wide, with a 20 m span bridge proposed. As noted previously, DFO requires site-specific habitat information at all locations where infilling is proposed in order to make a HADD determination.

N In Tables 6.34 to 6.38 define “T” and “P” in the last column. Is it Total and Partial?

6.8.3.2 Water Quality

N There is no QA/QC information for the water chemistry results. A description of water sampling protocols is also useful information that should be included.

N Tables 6.41 to 6.45 are summaries of water chemistry results. However, there are no results for specific samples. Hence, results of analyses, sample numbers and date sampled should be included in an appendix. This information will be useful for future sampling activities if the need arises.

6.8.3.3 Salt Loading

N It is noted that road salt is typically ineffective for the climate in the project area, and would only be applied as less than 5% of a sand/salt mixture to improve manageability during freezing. However, it is also noted that salt may be stored on site at a number of locations along the proposed highway and at maintenance depots. Since storage areas have been acknowledged as primary sources of salt contamination in the environment, estimated volumes of salt to be stored and storage design criteria should be identified and provisions for avoiding adverse effects described.

6.9 Wetlands

6.9.1 Boundaries

N The objective of *The Federal Policy on Wetland Conservation* is mentioned. However, the goal of the “No Net Loss” of wetland function advocated in the policy is not included in the discussion. The goal of “No Net Loss” is fundamental to the effectiveness of wetland conservation efforts, given the cumulative effect of developments and related activities on wetland function. Indeed, the North American Wetlands Conservation Council (Canada) recommends the adoption of “No Net Loss” goals in project management. The “No Net Loss” approach to addressing effects on wetlands should be reflected in the EIS/CSR.

6.9.3 Existing Environment

N No evaluation of wetland function (e.g., hydrology and habitat) appears to have been conducted. The Guidelines require that the description of the present environment must include wetland resources, including location, size and class of any wetland within a predicted zone of influence and conduct of a wetland evaluation using a comprehensive valuation methodology that assesses component, functional and attribute values. Without this evaluation, the

conclusion that the highway will not have a significant effect on wetlands and wetland function cannot be reasonably supported, especially given the scale of the project, the total area of wetland directly destroyed, and the effect to wetland function caused by potential changes in hydrology.

N The absence of a discussion on the importance of wetland function to the Eagle River Plateau eco-region habitat is of great concern. This extensive complex of string bogs is extremely important wildlife habitat, yet it is not discussed. A discussion of wetlands in the project area is insufficient without explicit consideration of the Eagle River Plateau and the habitat and hydrological function it supports.

6.9.7 Mitigation

N It is claimed that the highway route will avoid wetlands where feasible. This commitment to avoidance has not been demonstrated. The EIS/CSR should include a comprehensive discussion of how the proposed route avoids wetlands or minimized the effects on wetlands (e.g., an alternate route that would run adjacent to, instead of through, wetland areas).

N Mitigation measures to protect the hydrologic regime are vague and insufficient. Section 6.9.6 describes the adverse effects that roads can have on wetland hydrology, but these effects are not analysed in relation to the proposed highway. The mitigation section should describe the appropriate technologies that will be applied and how these technologies will allow maintenance of current hydrological conditions.

6.9.8.1 Construction

N Contrary to the suggestion, the loss of 230 ha of wetland constitutes a considerable loss of wetland area and may constitute a considerable loss of wetland function.

6.9.11 Environmental Monitoring and Follow-up

N This section indicates that monitoring requirements for wetlands have not been identified and Table 6.50 indicates that no monitoring or follow-up (of effects on wetlands and wetland function is) required. There appears to be a considerable gap in knowledge of wetland function in the project area and the potential effects on wetlands this highway could present. The provision for a comprehensive follow-up program that verifies effects predictions and the effectiveness of mitigation measures is of great importance to the credibility of the environmental assessment. This can only be accomplished after an adequate analysis of wetland function and potential effects of the highway on wetland function has been completed.

6.12 Resource Use and Users

N The EIS/CSR acknowledges that there may be increased fishing activity (legal and illegal), increased use of certain rivers or lakes and potential congestion. It also suggests increased harvesting of wildlife and fish resources may lead to resource depletion, resulting in indirect effects on resource populations and resource use and users. The EIS/CSR does not reveal the potential effects of creation of road access to obstruction pools where salmon congregate for longer periods and the opportunities for efficient poaching. Similar effects might occur with respect to spawning beds where the timing and location of trout and salmon aggregations can also be easily predicted. The EIS/CSR as well states that angling for brook trout and char is limited in Sandwich Bay because residents can legally net these species. There should be discussion as to whether there will be an interaction effect whereby local experience with this gear type encourages its use in interior lakes when access has increased. The consequence of such efficient gear combined with ATVs and fish finders used on populations of large trout that are slow growing and relatively low in numbers should be evaluated, as should the potential for a decline in catch rates for lodge clients. Application of the precautionary principle in this instance would require the assumption of the worst case scenario and an indication of mitigation required.

N Section 6.12.8.2 states that the effects of highway operation would likely affect outfitting operations. There is no attempt to quantify the effect or adopt the precautionary principle and assume the worst case scenario and apply appropriate mitigation. Given the stated conclusion and the Environmental Effects Criteria Ratings in Table 6.60, explain how the Environmental Effects Evaluation has determined that the effect of operation would be Not Significant (Minor), bearing in mind that potential significant adverse effects are indicated for salmon lodge outfitters on the Eagle River, trophy trout lodge outfitters on the Eagle River Plateau and suspected for caribou outfitters in western Labrador as a result of increased access for resident hunting of George River Caribou.

N One of the specific measures designed to mitigate project effects on resource use and users is the requirement that all hunting, fishing or trapping activities by project personnel during construction be carried out according to applicable legislation. How does the proponent intend to monitor these activities? As an added measure of protection for the fish resource, DFO suggests that the proponent consider requiring contractors to have a no fishing policy for construction personnel. This approach is in place for the Voisey's Bay project and is considered appropriate for this road construction project, given the concerns over potential exploitation of fish stocks.

N Regarding the need for increase management measures to address potential effects on fish resources, DFO recognizes that new management approaches will be required to address the issues arising from Phase III of the Trans Labrador Highway. A regulatory amendment

which will allow individual species management (in contrast to the current multi-species approach) is anticipated to be in place this year, and this will be a key component of DFO's management strategy for this area. In the fall of 2003, DFO will begin consultations with user groups, including aboriginal groups, in the development of its new five year management plan. DFO commits to the maintenance of aboriginal access to the resource for food, social and ceremonial purposes. The department has already had preliminary discussions in Goose Bay with the Labrador Salmonid Advisory Committee, which represents all major user groups. Key items discussed included the need for the development of a long-term management plan prior to the completion of the highway, monitoring and enforcement capacity, and the importance of education and public awareness in reducing the potential for detrimental effects on the fishery.

6.13 Akamiupishku/Mealy Mountain National Park

N The Guidelines require consideration of the highway's effects on the establishment, operation and ecological integrity of the proposed Akamiupishku/Mealy Mountain National Park. The proposed park was to be described in terms of its size, geographic area, ecological integrity and wilderness character (including landscape aesthetics, vistas and noise-scapes). Federally the proposed park is representative of the East Coast Boreal Forest, Natural Region 21 and provincially, the proposed park is representative of five of Labrador's ten ecoregions under the Natural Areas Systems Plan. The ecological integrity and wilderness character of either the Natural Region or the five ecoregions was not described nor was the potential effect of the highway on those ecological integrity's and wilderness characters assessed. The effect of the highway on the proposed parks size, geographic area or ecological integrity and wilderness character has not been provided (e.g., should the approach be adopted with respect to the exclusion of the Trans Labrador Highway from the national park as with the Kluane National Park exclusion of the Alaska Highway, what are the effects on the Akamiupishu/Mealy Mountains National Park's size and geographic extent, what are the effects on the Natural Region's and ecoregions' ecological integrity and wilderness character through exclusion of habitat on the opposite side of the highway, etc.).

6.14 Tourism and Recreation

N The EIS/CSR doesn't offer baseline information about the area's tourism industry. It does not describe the contribution of the tourism industry to the local economy in terms of spending and employment. Further, it does not address key questions about the interaction between the highway and the tourism industry: the opportunities for tourism growth from hunting, fishing and adventure tourism markets assuming no road; the risks that the highway will result in less opportunity to increase (or even reduce) volumes of higher spending markets; the potential for increased spending from new automotive markets in excess of any losses and the availability of mitigation that will lead to minimal loss of high spenders and significant gains in the

lower spending automotive markets. In addition the EIS should provide discussion of tourism employment implications of decline in demand for labour intensive lodge operations (cooks, wait staff, pilots, guides, maintenance, etc) in comparison to lower consumption automotive touring markets availing of store bought foods, gas, camping. It would be instructive to provide an evaluation of the number of automotive visitors required to replace the spending of one lost lodge client, without accounting for the differences in employment requirements of the two types of visitors.

N Explain why the Environmental Effects Summary in Table 6.65 could not have characterized the Environmental Effects Evaluation as Significant based on the experience of lodge closures in the province as a result of increased crowding, reduced catch rates and reduced pristineness. Include in the explanation the effects of those closures on multiple sectors (airlines, bushplanes, guides, craft, hotel/motel, restaurants, etc.) from reduced business. Evaluate whether ancillary forestry, cabin and other development will be sufficient to cause closures of outfitting operations on the Eagle River Plateau and Eagle River.

7.1 Mitigation Measures

N Under “Wetlands” in the summary of mitigation measures presented in Table 7.1, and elsewhere throughout the EIS/CSR, it is indicated that the proponent will conduct a field investigation of potential areas for rare and endangered plant species. However, nothing further is indicated. Certainly more information on the proposed surveys is required. And, again, if breeding bird surveys are to occur after the EIS/CSR is completed, it is important that appropriate mitigation and follow-up measures acceptable to the Responsible Authorities and Environment Canada be developed before work on the highway is allowed to proceed. It would be preferable that these surveys be conducted before the EIS/CSR is finalized.