

COMMENTS CONCERNING THE FINAL SCREENING REPORT OF THE
PROPOSED HIGHWAY A5 EXTENSION (CEAR REFERENCE 08-01-3981)

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Dear Sir/Madam;

Re: public comments concerning CEAR reference 08-01-39821 ("Extension of Highway 5, Phase 2, section between Chelsea and Wakefield, Municipality of Chelsea and La Pêche, Quebec")

We have had the opportunity to review this assessment, and offer the following comments based on our professional experience and expertise in wetland ecology, herpetology, stream ecology, fish ecology, landscape ecology and conservation biology. Moreover, four of us (C. Callaghan, C.S. Findlay, J. Jaeger and L. Fahrig) have, collectively, more than 60 person years of experience investigating the impacts of roads on terrestrial and aquatic ecosystems. As such, we believe we speak from a position of some authority.

We note that the very short public comment period - over the Christmas holiday period, no less - has made a comprehensive evaluation of the Screening Report (SR) virtually impossible. Consequently, what follows should be considered *illustrative* rather than *comprehensive*.

While the final SR does include some positive elements (particularly commendable, for example, are the herpetile surveys which - poor timing notwithstanding - have identified almost all species likely to be present), it suffers from a number of major inadequacies. Some of these are not unique, reflecting rather more systemic problems with how environmental screenings are conducted under the Canadian Environmental Assessment Act. Nonetheless, it is our view that there are outstanding issues specific to the current undertaking that severely undermine the credibility of the SR.

Chelsea's wetland protection by-law 636-05

In 1999, the Municipality of Chelsea passed by-law 636-05 (http://www.chelsea.ca/reglements_municipaux/terres_humides_e.php). This by-law applies to all wetlands of 1000 m² or more. Section 4.15.3 of the by-law states:

“Within a wetland area, all construction, installation, development, or fencing is prohibited as is the destruction or modification of any beaver dam. Clearing and removal of vegetation is also prohibited, with the exception of purple loosestrife, buckthorn, and other plants shown on the *Répertoire de plantes pouvant être enlevées d’un milieu humide* whose removal is authorized «

Section 4.15.4 reads:

“A thirty (30) metre buffer zone must be maintained around a wetland area. This provision takes precedence over all other provisions of Zoning By-law 636-05. Any and all construction, installation, development, or fencing in a wetland area is strictly prohibited. Clearing and removal of vegetation is also prohibited, with the exception of the removal of purple loosestrife, buckthorn, and other plants shown on the *Répertoire de plantes pouvant être enlevées d’un milieu humide*, which is authorized.”

Under sections 14.5.3. and 14.5.4., construction of a road within 30 m of a wetland is expressly prohibited, with one exception: section 14.5.5 states:

“ Any construction, installation or development in a zone that includes recreation, tourism, or public land use sub-groups is subject to the Municipal Policy entitled *Municipal policy respecting wetlands mitigation measures and the community education initiative*.

All mitigation measures shall be based on the following principles:

- a.** the apparent and potential functional ecological impact of any development within the 30 m buffer zone around the edges of the wetland area shall be assessed;
- b.** should the assessment results show that major ecological impact is possible, said impact must be mitigated and/or compensated by other measures so that no net decrease in the ecological functioning of the wetland area results;
- c.** Council must approve the mitigation plan and implementation schedule and both the promoter(s) and the Municipality of Chelsea must sign a development agreement;
- d.** the applicant shall make a significant, tangible contribution to education initiatives regarding Municipality of Chelsea wetland areas.”

According to the SR, there are 4 Chelsea wetlands (MH4, MH5, V1, V12 – see Table 5.4) that satisfy the minimum size requirements set out in by-law 636-05 and for which substantial loss of wetland area is expected. There is one additional wetland (the wetland complex MH1) for which, based on map 6f2, the proposed extension will (minimally) pass through the 30 m buffer zone specified in 636-05 s. 4.15.4. (Indeed, from the map, it appears that a substantial portion of the wetland proper will be lost, although contradictorily, Table 5.4 indicates that no wetland area will be lost.)

In response to a request from Genivar, on November, 29, 2010, the Municipality of Chelsea issued a letter of non-objection to the delivery of a Certificate of Authorization (CA) to MDDEP, based on its (Chelsea's) finding that “”Selon l’analyse du dossier, le project ne contreveient en rein la reglementation municipal”.

There are several issues here:

- (1) The destruction of any part of a wetland by road construction, or the incursion of a road within a 30 m buffer zone, is expressly prohibited under 636-05 s. 4.15.3 and 4.15.4. Exceptions are permitted only under s. 4.15.5 concerning “community use.”
- (2) The original concept of “community use” as it pertains to s. 4.15.5 was never intended to apply to highway construction. The intent was rather to allow for *local* community undertakings that would have a minimal impact on wetlands (e.g. construction of a community trail or a playground structure by a local community association).
- (3) Even if one accepts the (very dubious) notion that a 4-lane highway represents *a bona fide* “community use” under s. 4.15.5, conditions (a) – (d) apply. And even if the final SR is considered to satisfy conditions (a) - which in our view it does not, for reasons given below – it is clear from Table 5.6 (49) of the SR that an evaluation of the impact on the ecological functioning of potentially affected wetlands has not yet occurred. Hence, condition (b) has not been satisfied and, as a consequence, nor has condition (c). And if neither conditions (b) nor (c) have been satisfied, (d) clearly cannot have been satisfied.
- (4) There is no evidence in the SR that Genivar, nor indeed anyone else, has consulted with the municipality with respect to the conditions 4.15.5 (a) – (d). In Table 5.6, condition (49) makes no mention of the legal requirements under 636-05, and most tellingly, does not mention that membership of the *ad hoc* committee that will, apparently, be struck to investigate wetland “compensation” will include municipal representatives.

Given the above, the inescapable conclusion is that the letter to Genivar on November 29th was premature. Indeed, it seems clear that owing to administrative confusion/oversight, the municipality failed to exercise due diligence. Since 2000, Chelsea has had a Wetlands Committee on which two of us (S. Findlay and S. Woodley) sit. This committee was specifically charged with reviewing any and all issues related to 636-05 and making recommendations to Council. The creation of the Wetlands Committee by former mayor Jean Perras was motivated by the understanding that council and staff simply did not have the required technical and scientific capacity to properly evaluate undertakings under 636-05. This problem still exists today – arguably more so. In short, Chelsea has, through administrative oversight, filed a letter of non-objection, and by doing so, is in non-conformance with the provisions of by-law 636-05.

Recommendation

- (1) MTQ consider the letter of non-objection filed by Chelsea as null and void: it is clear that Chelsea did not exercise due diligence in filing the non-objection.
- (2) The proponent must prepare a (1) detailed assessment of the impacts of the proposed A5 extension on the ecological functioning of (minimally) wetlands MH1, MH4, MH5, V1 and V12, as per 636-05 s. 4.15.5(a), as well as a detailed mitigation plan that clearly demonstrates that the impacts in (a) will be effectively mitigated as per 636-05 s. 4.15.5(b).
- (3) Once received, the assessment and mitigation plan will be reviewed by the Wetlands Committee, which will forward its recommendations to Council as per 4.15.5(c)

Evaluation of impacts on wetlands

There is a large body of published scientific work, including some by the authors, that has investigated the impacts of road construction on a wide range of wetland ecosystem services and functions. There is, for example, evidence that roads may have negative impacts on wetland water quality, wetland biodiversity and a variety of ecological functions and services such as primary and secondary production and flood control. None of these endpoints are considered in the SR. No data are provided on current wetland water quality. Moreover:

- (1) There is accumulating evidence that disturbed lands adjacent to roadways represent ideal sites for wetland colonization by invasive species, particularly invasive plant species (e.g. Catling and Carbyn, 2006; Jodoin et al., 2008). Yet the SR provides no assessment of the potential for the A5 extension to enhance this risk. Estimation of this risk requires, first and foremost, an assessment of the extent to which wetlands in the vicinity of the A5 extension already have known – and easily identifiable – exotic invasive plant species. No such information is provided in the SR, although it is possible that it exists in the CIMA (2010) wetlands report (to which we did not have access).
- (2) It is well-known that highways can be a major source of mortality for both wetland reptiles and amphibians (e.g. Steen and Gibbs, 2004; Eigenbrod et al. 2008). A number of methods have been developed to identify herptile “hotspots” (Langen et al., 2009) - areas where movement is expected to be high, with resulting high mortality. Identification of such hotspots is crucial for effective mitigation. Yet the SR makes no mention whatsoever of the potential impacts of the A5 on herptile mortality (see section 5.9, pp. 36), and there is no evidence that any attempt was made to identify herptile hotspots along/adjacent to the A5 right of way.
- (3) Many wetland breeding herptiles require multiple habitat types for different parts of their life cycle. For example, many anurans (frogs and toads) do breed in wetlands but overwinter in adjacent forest habitat. Consequently, even if all required (breeding, foraging, overwintering) habitat is maintained, barriers to

movement can result in population decline. Roads, especially highways, often represent a significant barrier to such movement (Gibbs, 1998; deMaynadier and Hunter 2000; Zanini et al. 2008). Yet the SR provides no estimates of the potential impacts of the A5 extension on herptile habitat isolation and the resulting effects on population viability.

- (4) The SR concludes (p. 33) that “However, several wetlands that will be lost completely (MH7, MH8, V1, V5, V9-2, V10, V12) are small and perform limited functions that can be offset by certain mitigation measures provided under the project.” Certainly these wetlands are (comparatively) small. And certainly, it is known that certain valued attributes of wetlands increase with wetland size (see e.g. Findlay and Houlihan, 1996). But as with other things in life, size isn’t everything. There is a reasonable amount of evidence that in modified landscape contexts, small wetlands as part of larger regional wetland networks are important for population persistence of species (notably amphibians) that have a metapopulation structure (Gibbs 1993; Russell et al., 2002). As such, the inference that because MH7, MH8 etc. are small, that they necessarily have limited functionality, is invalid and cannot be substantiated with the data (or rather, lack thereof) adduced in the SR.

Recommendation

- (1) Conduct a proper assessment of the impact of the proposed extension on (minimally) (a) wetland water quality; (b) impacts of projected losses of small wetlands to local/regional wetland function; (c) impacts of the A5 extension to amphibian and herptile movement, habitat use and movement, based on current scientific understanding of these effects as well as recognized methods for determining these effects (e.g. Houlihan et al., 2004)

Use of existing biophysical data

When conducting an environmental assessment, the responsibility rests with the proponent to identify existing data sources relevant to the issue at hand. While recognizing that resource constraints impose limitations on the data gathering exercise, we are perplexed that highly relevant data that are readily available from obvious sources appears not to have been incorporated in the SR.

- (1) *H₂O Chelsea*. This community-based water surveillance program is now in its 8th year of operation, and includes water quality data on all major surface waters in Chelsea as well as some 1300 wells. Of particular relevance to the current undertaking are systematic water quality for Meech Creek collected at 5 or more stations collected from May-September since 2004, as well as for several smaller watercourses in the proposed A5 right of way during 2008 and 2009. The H₂O Chelsea database also includes historical well water quality data on several dozen

or so wells on rues Carman, St. Clement, du Ruisseau and Croissant, as well as along Highway 105. Annual reports for H2O Chelsea dating back to 2004 are available at <http://www.h2ochelsea.ca/introduction.htm>.

- (2) *Nature Chelsea*. Nature Chelsea is a community-based research initiative designed to provide the municipality of Chelsea with high-quality information concerning the biodiversity conservation potential of municipal lands. <http://www.naturechelsea.ca/splash.php> . For the past two years, Nature Chelsea, in collaboration with the University of Ottawa, has been engaged in biodiversity research on lands immediately adjacent to the existing A5. Of particular relevance to the current undertaking is an extensive set of obtained from camera surveillance of medium and large mammals, as well as extensive plant surveys and several bioblitzes. None of this information appears to have been used in SR.

Recommendations

- (1) The proponent obtains access to the *H₂O Chelsea* and *Nature Chelsea* data, and uses these data to revise the relevant sections of the SR. It is, perhaps, superfluous to point out that the conclusions reached on the basis of these new data may well differ from those in the current version, with respect to both (a) expected impacts, and the magnitude thereof; and (b) mitigation requirements.

Impacts on wildlife movement, landscape connectivity and the ecological integrity of Gatineau Park

Since the 2005 Master Plan for Gatineau Park, conservation of the park's natural resources has been the prime planning directive. In 2010, the National Capital Commission published the Gatineau Park Ecosystem Conservation Plan (ECP). In the ECP, the first planning principle is "A management approach focused on ecosystems and directed primarily at achieving ecological integrity in order to sustain and improve the overall health of the Park and of the broader ecosystem in which it is situated." The NCC recognizes that an isolated Gatineau Park simply is of insufficient size to conserve biodiversity in the long(er) term without regional integration. Consequently, the first element in the action plan for regional conservation (ECP Table 1, p. 9) is to complete an assessment of candidate ecological corridors that are considered critical to maintaining ecological connectivity with the broader regional landscape (Fig. 1).

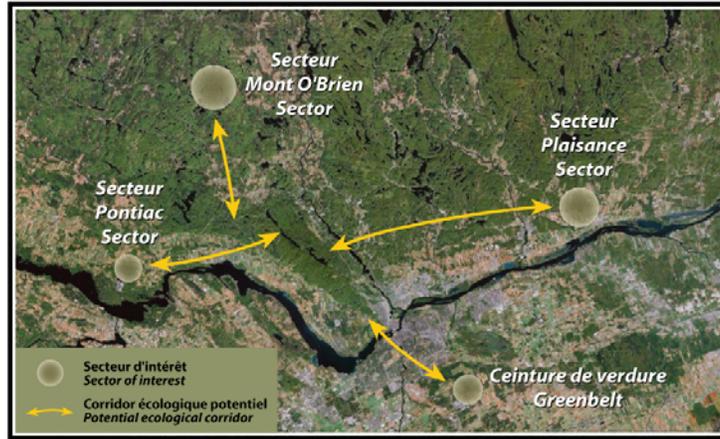


Fig. 1. Connectivity of Gatineau Park to the broader regional context, showing potential ecological corridors (adapted from del Degan Massé (2010), p. 4)

Road ecology is maturing subfield of conservation biology. Roads have numerous ecological effects which have been widely studied and documented in the scientific literature over the last 20 years (e.g., Forman et al. 2003, Jaeger et al. 2005, Jaeger and Roedenbeck 2006, Fahrig and Rytwinski 2009, van der Ree et al. 2009-2010) and handbooks for practitioners (e.g. Iuell et al. 2003, Carsignol et al. 2005). For example, based on a review of 79 studies, Fahrig and Rytwinski (2009) found that overwhelmingly, roads and traffic have a negative effect on animal abundance, with negative effects outnumbering positive effects fivefold. Road impacts include direct wildlife mortality from collisions with automobiles, habitat loss, reduced habitat quality, loss of habitat connectivity (Forman et al., 2003, Jaeger and Fahrig, 2004, Jaeger et al., 2005) and changes in movement dynamics (Fahrig 2007). Particularly problematic are large four-lane or greater highways such as the proposed A5 extension.

These impacts noted above contribute to the potential for population isolation. The demographic effects of isolation include the loss of immigration and recolonization, causing a loss of gene flow throughout the landscape and the potential for inbreeding depression. These effects may be particularly pronounced for species in protected areas – indeed, this was a major rationale for the NCC (2010) ecological corridor study. Connectivity across highways requires consideration for specific movement options as well as landscape management for regional habitat effectiveness.

Given all the above, one would expect that a major focus of the SR would be the estimated impacts of the extension on wildlife movement, wildlife mortality, ecological connectivity and the ecological integrity of Gatineau Park, especially given that the report concedes that “potential ecological corridors are currently being studied by the NCC in cooperation with municipalities, the Regional County Municipalities (RCM) and environmental groups” (p. 41) and indeed, recognizes that the “preservation of ... the movement of wildlife” is “an asset to protecting biodiversity” (p. 41). But remarkably, the SR is mute on most, if not all, these issues:

- (1) The A5 extension has considerable potential to directly affect the “corridor Nord-est du Parc”, which connects Gatineau Park with the Gatineau River and includes

- important wildlife habitat (Del Degan Massé 2010). In the SR, no mention is made of this impact, or its potential ecological consequences.
- (2) There is no mention anywhere in the SR of wildlife mortality or road kill, even though there is accumulating evidence that traffic mortality negatively affects population viability (Fahrig and Rytwinski 2009). That an assessment of the environmental impacts of a proposed 4-lane highway extension includes no consideration of wildlife associated mortality is astonishing - and not pleasantly so.
 - (3) The SR states that “The portion of the trail to be preserved under the highway along La Pêche River will facilitate wildlife movement from one side of the highway to the other in this area” (p. 41). No evidence is adduced to support this prediction. Wildlife use of highway crossing structures is an active and intensive area of applied ecological research. The effectiveness of crossing structures depends on a number of factors, including habitat/landscape context, the particular wildlife species in question, use by humans, and a number of specific design/construction attributes (Dodd et al., 2004; McDonald and St.-Clair 2004; Clevenger and Waltho 2005; Corlatti et al. 2009; Glista et al. 2009 – see also Van der Grift et al., 2011). None of these factors are considered in the SR. Hence the conclusion is completely unsubstantiated.
 - (4) The SR goes on to conclude that wildlife are “not interested” in crossing in this area. “Considering the low interest among wildlife species to cross from one side of the right-of-way to the other and their abundance on its western side, the environmental effect is currently considered to be of low intensity. Its duration will be permanent and its scope, local. Therefore, the residual environmental effect is considered not significant.” (p. 42). As no data were collected that can inform patterns of wildlife movement through or adjacent to the A5 right of way, inferences about wildlife’s motivation to do so – or not – are complete speculation. The conclusion that these effects will be insignificant is therefore completely unsubstantiated.
 - (5) The SR states (pp. 41-42) “Other highway crossing sites could also be used to a marginal degree by wildlife (e.g., water crossing structures, certain roads that pass under the highway). As well, if specific studies indicate wildlife movement problem in the Highway 5 vicinity (Phase 2), various stakeholders could meet to discuss remedial measures to mitigate the problem”. It is well known that to maximize effectiveness, highway crossings must be planned as part of highway design, not retrospectively (Van der Grift et al., 2011). Installation of wildlife crossing structures is rapidly becoming standard operating procedure for highway construction or expansion – for example, as part of the recent expansion of highway 69 between Parry Sound and Sudbury, a number of crossing structures have been installed, and the Ontario Ministry of Transportation has recently issued an RFP to assess the effects of these structures.

- (6) The SR failed to assess the potential impacts of wildlife vehicle collisions with large animals (i.e. white-tailed deer, black bears, coyotes, wolves, moose). Wildlife Vehicle collisions are an important source of human-caused mortality to mammals and are the source of significant population effects for some species (Forman et al. 2003). Wildlife Vehicle Collisions pose wildlife conservation as well as human safety issues (especially concerning large ungulates) and have been the focus of attention from ecologists, transportation planners and local communities (Trombulak and Frissell 2000). Addressing wildlife transportation issues requires access to information on the spatial and temporal movement patterns of motorists and wildlife (Hubbard et al. 2000). The success of mitigation measures to ensure wildlife movement while reducing collisions depends on having an accurate understanding of wildlife distribution and movements (Clevenger and Waltho 2005, Huijser et al. 2007). There is no evidence in the SR that any of these data were collected, nor is their importance even recognized. (We note in passing that the issue of vehicle collisions with wildlife is also a public health and safety issue – witness, for example, the recent class action proceeding filed by victims of vehicle collisions with moose in Newfoundland (<http://www.cbc.ca/canada/newfoundland-labrador/story/2011/01/11/nl-moose-suit-111.html>)
- (7) The SR failed to identify the potential need for mitigation (e.g. wildlife crossing structures) to reduce impacts on mammals. No specific sites along the Highway 5 expansion were identified as in need of mitigation of current impacts on wildlife mortality and movement. Mitigation sites can be identified through information provided by detailed wildlife movement data, habitat models, highway data, researcher opinion, and available anecdotal reports. Road kill data may be available from Gatineau SPCA, contracted to remove road kill from regional highways including the A5 and highway 105. No data were collected on the current movement pathways of mammals in areas adjacent to/in the proposed extension right of way.

Recommendations

- (1) Identify potential wildlife collision hotspots (i.e. areas with high vulnerability for collision with wildlife). Many factors contribute wildlife-automobile collision risk (e.g., topographical features, habitat quality, traffic volume, line of sight; Litvaitis and Tash 2008), and, as pointed out above, methods exist for identifying hotspots for most taxa.
- (2) Identify candidate mitigation structures to determine their efficacy for different wildlife species and species-specific responses to different structure design types. This information will be useful to developing mitigation plans by identifying where wildlife are able to cross the highway, as well as attributes of the structures that is, based on existing knowledge, likely to facilitate wildlife crossing. As part of this work, tracking wildlife movement in the snow, in and around the proposed highway expansion prior to

construction, would provide important information on mammal movement patterns. As noted above, Nature Chelsea has established and employed several protocols that would be useful here.

- (3) Identify and rank sites for mitigation priority. We recommend that mitigation sites along the proposed Highway 5 expansion are identified where opportunities for reducing wildlife–vehicle collisions and improving connectivity for all wildlife are highest, including fragmentation-sensitive species. We recommend that a relative score from low to high priority is given to each candidate mitigation site on the basis of criteria such as, for example, (1) *local conservation value* – the value of the highway mitigation to local wildlife conservation (aquatic and terrestrial sites); (2) anticipated *highway mortality* – relative rate of wildlife–vehicle collisions; (3) *opportunities for mitigation* – the degree to which mitigation options are available and can be implemented with reasonable cost; (4) *regional conservation significance* – the potential significance of highway mitigation to address wildlife conservation concerns of regional significance, especially integration of Gatineau Park into the broader regional landscape.
- (4) Design and incorporate wildlife crossing structures into the project to help restore or maintain animal movements across roads. Engineered wildlife crossings allow animals to cross roads with reduced hazard to motorists and wildlife. Crossing structures are often combined with high fencing and are proven measures to reduce road-related mortality of wildlife and maintain some connectivity of habitat (Clevenger et al. 2001, Dodd et al. 2007). Incorporating highway mitigation efforts should improve motorist safety, reduce wildlife mortalities and improve habitat linkages and animal movement from Gatineau Park to areas to the east of the Gatineau River.

Mitigation measures for herptiles

We have described some of the major information elements required to provide an adequate assessment of the impact of the proposed A5 extension on wildlife movement, wildlife mortality and ecological connectivity. The resulting conclusion (*viz.*, that impacts will be non-significant) means that serious mitigation measures designed specifically to reduce road mortality and facilitate movement, have simply not been considered. Moreover, in a number of cases, there is little, if any, evidence that the limited mitigation measures that have been proposed will indeed have the desired effect. For example, to mitigate impacts on smooth green snakes, the proponent is proposing to relocate all animals found at the dump site that is slated for destruction. We are unaware of any translocation studies on small snakes – indeed, such studies would be very difficult to do as the animals are too small to equip with radio transmitters. However, translocation studies of large snakes (Reinhart et al., 1999; King et al., 2004) and large lizards (Sullivan et al. 2004) indicate that effective translocation is difficult, with relocated animals experiencing high mortality. Indeed, a recent review (Germano and Bishop,

2009) conclude that translocation is only likely to be effective if large numbers of animals are involved, sufficient to overcome translocation-induced mortality. As this is highly unlikely to be the case here, the conclusion that translocation will mitigate predicted impacts is unsubstantiated.

Evaluation of impacts on surface water

The entire surface water section of the SR (s. 5.12) comprises two sentences:

“Surface water is considered to be generally of good quality because the flow is from west to east and therefore essentially originates in Gatineau Park. Locally, however, the presence of human facilities and farming activities can be the source of a certain amount of surface water contamination”.

No water quality data are presented, for any watercourses - streams, rivers, or wetlands. As noted above, H₂O Chelsea has extensive information on water quality in Meech Creek. Contrary to the assertion quoted above, water quality in the lower Meech Creek is substantially degraded relative to that in the headwaters, though this degradation was reduced by the removal of cattle from the Meech Creek Valley in 2006. Of particular concern are Na and Cl, which show a well-defined upstream/downstream gradient in Meech Creek. As reported in the SR (s. 5.5.2, p. 30), the highway is expected to increase salt loading to the downstream reaches of the creek as a result of road maintenance. No estimates of the resulting loading is included in the report, even though there are methods for doing so (e.g. Novotny and Stefan (2010), Gardner and Royer (2010). Moreover, there is substantial evidence that road salt can have dramatic impacts on aquatic ecosystems (Corsi et al. 2010), especially amphibians (Sanzo and Hecnar, 2006; Karraker et al., 2008; Karraker and Ruthig 2009) and macroinvertebrates (Blasius and Merritt, 2002), neither of which are considered in the SR. Methods also exist for estimating the distance from wetlands within which roads are expected to affect wetland water quality (Houlahan et al., 2004). Although section 5.10.3 does refer to the potential impacts of road salt, and correctly refers to existing toxicity standards for aquatic systems, without knowing either (a) current salt concentrations in the potentially affected watercourses; or (b) the extent to which road maintenance will result in additional loading, there is virtually no evidence to support the conclusion that “this environmental effect is deemed not significant” (p. 40).

Recommendations

- (1) Establish current water quality (WQ) conditions for all major watercourses in the vicinity of the proposed undertaking, including streams and wetlands. Assayed WQ parameters should be those for which current available scientific knowledge suggests that (a) changes in ambient concentrations have the potential to affect growth, development, fecundity or survival of aquatic species (e.g. fish, anurans) found in potentially affected waterbodies; and (b) that road construction and operation may result in changes in ambient concentrations.

- (2) Based on (1), estimate changes in ambient concentrations as a result of the proposed undertaking, and current scientific knowledge on NOAELs, generate estimates of potential impacts on aquatic organisms and, if deemed significant, how these effects might be mitigated.

Cumulative effects assessment

The Canadian Environmental Assessment Act (CEAA, s. 16(1)(a)) requires that all environmental screenings include a cumulative effects assessment (CEA). CEA was, and continues to be, the Achilles' heel of environmental assessments in Canada (Duinker and Greig, 2006), with screening reports especially being notoriously poor. As if any more were needed, the A5 report is yet one more example.

The entire cumulative effects assessment component of the report comprises 2 pages (pp. 46-48). The contents thereof suggest that the report's authors have only a vague understanding of the concept. We are told, for example, that CEA requires an assessment of baseline conditions (p. 46), which is absolutely true. Yet what follows is an attempt to characterize *current* conditions. The whole point of CEA is that "baseline" conditions are *not* current conditions, but rather *conditions at the time when valued ecosystem components (VECs) identified for the current undertaking could reasonably be expected to be affected by other undertakings in the region*. The task is then to estimate the changes in these VECs associated with the current undertaking relative to these "baseline" conditions.

The current undertaking is a highway extension. Thus, an assessment of cumulative effects should be addressing the question: what is the distribution of possible effects of the A5 extension on identified VECs relative to the extent that these VECs have already been impacted by other undertakings that have occurred over the past several decades? These "other" undertakings might be of various sorts, but must minimally include other road construction and operation projects. In particular, a *bona fide* CEA must include an assessment of the cumulative effects of the proposed A5 extension on the ecological integrity of Gatineau Park in light of other road undertakings in the last several decades, notably: (1) the extension of the A5 from Scott Road to Tulip Valley in 1995; (2) the further extension in 2009 from Tulip Valley to its current terminus; and (3) the Mackenzie King estate extension of the Champlain Parkway in Gatineau Park in 2003/2004. No such analysis is presented in the SR and there is no indication that the authors of the report recognize the need for such an analysis to fulfill (and that only minimally) the legal requirements of CEAA s. 16.1(a).

Here we are visited by a sense of déjà vu. In March, 2003, one of us (CSF) submitted a set of detailed comments on the screening assessment conducted for the proposed MacKenzie King estate extension of the Champlain parkway (Appendix A). These comments included a detailed description of how the cumulative effects assessment of that project ought to have been conducted by the project proponents, the National Capital Commission. This advice, along with a *pro bono* offer of assistance, was declined.

The present SR is concerned with precisely the same sort of undertaking, again with the NCC as a proponent, with a detailed description of how it ought to be done to

hand. Yet a CEA is – notwithstanding the unsubstantiated claims in the SR that indeed it *has* been done – again completely lacking. There is, therefore, no evidence to support the report’s conclusions that the cumulative effects will not be significant (p. 48).

Recommendations

- (1) The proponent must conduct a proper cumulative effects assessment that minimally takes into full account the current state of scientific knowledge on the impacts of roads on wetlands, habitat fragmentation, wildlife movement, wildlife mortality, and contaminant loading of water courses, employing all obvious existing data sources (including data from H2O Chelsea and Nature Chelsea, historical remote-sensed data on historical changes in regional and local landscape features, etc) and employing recognized methods (e.g. Jaeger and Holderegger 2005; Jaeger et al. 2005) for cumulative affects assessment.

Summary and conclusions

The final screening report for the proposed A5 extension is seriously deficient in at least four important respects:

- (1) It fails to consider a wide range of potential environmental impacts of highways for which there exists a substantial and growing body of scientific knowledge.
- (2) It has failed to incorporate obvious sources of existing data that are both readily available and directly relevant to the estimation of impacts of the proposed undertaking.
- (3) Most of the conclusions concerning (a) estimated impacts themselves; (b) the success of mitigation measures; and (c) the anticipated residual impacts, are based on little or no evidence. In as number of cases, the estimates of predicted or residual impacts are completely unsubstantiated, or conflict directly with the current state of scientific knowledge.
- (4) There is no cumulative effects assessment whatsoever.

We conclude the proponents have not adequately discharged their responsibilities under the Canadian Environmental Assessment Act. The next phase of the project ought not to proceed until these responsibilities have been adequately discharged.

References

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APPENDIX A

March 21, 2003

Public Consultations and Community Relations
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By e-mail: info@ncc-ccn.ca

Re: proposed MacKenzie King Estate access road, comments on Report on Public Consultation (RPC), Preliminary Environmental Screening Report (PESR), and Final Environmental Screening Study (ESS)

I have had the opportunity to review the revised (final) Environmental Screening Study (fESS), the Report of Public Consultations (RPC), and the Preliminary Environmental Screening Report (PESR). To begin, I have three general comments, the tenor of which derives from all three documents, but in particular the fESS and the RPC:

1. The major thrust of my comments on the preliminary ESS (pESS) was that neither the NCC nor the consultant had presented anything even remotely resembling compelling data to substantiate the claim that (a) a new access *road* to the estate is needed; (b) that the proposed road option (4b) has a reasonable likelihood of substantially reducing the (putative) problem of security and safety on Swamp/Barnes/Kingsmere roads; and (c) that the residual ecological effects of the proposed undertaking will be small, as concluded in the pESS. The current set of documents adduce virtually no new evidence to support any of these claims – they are, rather, almost exclusively concerned with either (a) denying the legitimacy of my (and other's) criticisms; or (b) simply reiterating what was said before, perhaps in the infantile belief that mere repetition of unsupported statements somehow makes them stronger. The sole exception to this is the new cumulative effects assessment (CEA), about which I have more to say below.
2. Given (1) above, the process we are currently engaged in cannot be considered public consultation in anything but a purely trivial sense. The objective of public consultation is to use public expertise, knowledge and opinion to help make better decisions: this is both the philosophical and operational core of civil society and civic science. Yet despite detailed and extensive technical criticism of many elements in the pESS, the only non-trivial change in the final version is found in the section on CEA; it is patently clear that this change was made only because (a) both the Commission and the consultant realized that the virtual absence of a CEA in the original document was so egregious as to be completely indefensible; and (b) the consultant had admitted in a public forum that they did not even have the *capacity* to do cumulative effects assessment (which, parenthetically, begs the question of why they were hired to do the ESS in the first place). Indeed, I

harbour a strong suspicion that if (b) hadn't occurred, the Commission would even now be attempting to defend the (non-existent) CEA in the pESS, (a) notwithstanding.

3. Given (1) and (2), it is obvious that the Commission has no interest in genuine public consultation; that is, in frank and open dialogue with the public about its undertakings and the costs and benefits of same. Rather, it regards public consultation as a necessary evil to which it is either (a) legally bound; or, as for example in the case of an environmental screening under CEAA, (b) not legally bound but able to accrue (from uniformed parties) accolades for "voluntary" public consultation when none is (legally) required, and the inevitable institutional smugness associated with same. That the Commission is so wrought with insecurity that it cannot engage in genuine public consultation has now gone beyond infuriating: it is simply pathetic.

Even though I know my comments will simply pass the Commission by like the idle wind, which it respecteth not, a sense of scientific duty compels me to offer the following - for the record, as it were:

1. In my review of the pESS, I noted that the methods used by Tecresult for amphibian and bird surveys were inadequate. It is patently clear then – just as it is now - that a single night of calling surveys (for amphibians) and a single morning of auditory bird surveys is inadequate to obtain a characterization of either birds or anuran communities. Just as an example, the ESG (2001) inventory of the area indicated that both wood frogs and spring peepers were abundant, but the pESS found none. Why? Because these two species call much earlier in the spring than when the 2002 survey was conducted! How then can the 2002 survey possibly be construed as providing "adequate characterization" of the amphibian community? Moreover, there are at least 4 species of salamanders and newts which are very likely to inhabit the area, *that do not call: the only way to assess their presence/absence is through area-constrained searches during appropriate conditions*. In contrast to the ridiculous assertion made in the RPC (p. 17), single-session calling surveys would *NEVER* be considered sufficient to characterize communities *even to the coarsest level of species composition* in basic research, either for birds or anurans: those of us who actually *do* (as opposed to *consult on*) basic research involving these taxa know this only too well. It should be obvious that if the intent is to ascertain whether there are *rare* species present, then sampling effort must be considerable: rare species, by definition, will only be found if one searches hard and long. Even for common species, if the objective is to obtain accurate and reasonably precise estimates of species *abundance* (as was apparently the goal for birds in the pESS, God knows why), the required effort is also considerably greater. All this is well-known to ornithologists and herpetologists, but not, apparently, to either Tecresult or the Commission.
2. No proper surveys were done for reptiles or mammals. The rationale given by Tecresult (RPC, p. 16) is an excuse, not a rationale, and a feeble one at that. We are told, for example, that "According to our research, no threatened, vulnerable,

- or at risk [TVAR] (mammal) species is present within the study area”. This “research” amounted, I suspect, to consultation of Gatineau Parks’s apparently Omniscient Natural History Data-Base (ONHDB): no records in the ONHDB, therefore no TVAR species present in the area. This is laughable. At least for amphibians (or rather, *anurans*) an *attempt* (albeit feeble) was made to do a systematic inventory: apparently reptiles and mammals don’t even warrant the attempt.
3. In the same vein, the RPC states that “ No threatened or vulnerable species [of birds or amphibians] likely to be present in this area has been observed.” This is disingenuous. In fact; (1) there are no records of TVAR species in the ONHDB (see (2) above); and (2) no TVAR species was observed during the surveys. But as pointed out, the surveys – as conducted – would have been very unlikely to turn up anything other than common species *due to inadequate sampling effort and/or methods*. The inference that there are, therefore, no TVAR species present, is illogical. There are several COSEWIC listed-species (e.g. northern flying squirrel, mountain dusky salamander) for which the area in and around the proposed road represents suitable habitat, and a careful and thorough survey, using sampling methodologies and effort designed specifically to detect such species (if present), should have been conducted.
 4. In my assessment of the preliminary ESS, I noted that the cumulative effects assessment, required under CEAA, was non-existent; in this version, it exists, but just barely. The 2000 Parkway sector plan notes that “*the fragmentation of Park-based ecosystems as a result of the limited area of the sector and the numerous features (roads, trails, residential communities, Camp Fortune) which impact upon the natural dispersal of flora and fauna*”. Yet while fragmentation is correctly identified as the major ecological risk associated with the proposed road, there is not even the most rudimentary analysis of changes in the extent of habitat fragmentation in Gatineau Park over the past decade, or anticipated further changes in the future. When I was told by the park director, following the Oct. 15, 2003 consultation, that the revised ESS would have a “proper” CEA, what I expected to see, *as a bare minimum*, was: (a) a calculation of road densities, amount of “interior” versus “edge” habitat for major habitat types, and various well-accepted fragmentation indices (e.g. mean and variance of habitat patch sizes, average interpatch distance, etc.) circa 1980 (i.e. at the time of the first Master Plan); (b) estimates of the changes in the variables described in (a) between 1980 and the present; (c) the additional changes associated with the proposed MacKenzie King Estate access road; (d) future changes associated with the proposed McConnell-Laramée extension; (e) comparison of (b), (c) and (d) with corresponding changes in other representative protected areas in temperate regions; and (f) an assessment of (b) – (d) in light of empirical estimates of fragmentation thresholds for fragmentation-sensitive species found in Gatineau Park, such as interior forest birds, large carnivores, and herptiles that disperse relatively long distances. All of these analyses are quite easily done – indeed, my third year BIO 3115 Conservation Biology students do them routinely as part of their term projects for the course, and, with the magnificent ONHDB to hand, why, it should be a snap for both the consultants and the Commission. Yet

- absolutely none of this analysis appears in either the final ESS or the preliminary ESR. And the suggestion that planting two trees for every one removed will substantially mitigate the cumulative effects of fragmentation from roads (PSR, p. 9; fESS, p. 105) simply leaves me speechless.
5. Given the above, it is clear to me that the conclusion reached in both the fESS and the pESR, namely, that the proposed access road will have no significant environmental impacts, is unwarranted. The (poor) quality and quantity of the data and analysis on which this conclusion is based means that that any such predictions carry with them a very high degree of uncertainty. Indeed, it is in fact *highly uncertain* that the proposed road will result in insignificant adverse effects. Thus, if indeed the Commission is committed to conducting EAs “in the spirit” of CEAA, it should, as per section 20, subparagraph 1(c), be referring the project to either the Minister or a review panel, in accordance with section 29, and should not be taking any further action until this review is completed.

On the positive side, the p&f ESS, the RPC and the PESR will provide an excellent case study for my environmental impact assessment course: every instructor knows that the pedagogical value of really bad examples is considerable.



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