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***ALTERNATIVE PARKING LOT OPTIONS AT  
MACMILLAN PARK: COMPARATIVE IMPACTS ON  
THE NATURAL ENVIRONMENT.***

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***Draft***

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## 1.0 INTRODUCTION

This assessment, carried out by Donald A. Blood and Associates Ltd. for B.C. Parks, compares potential impacts of three parking lot options at the south edge of MacMillan Provincial Park. These alternatives are:

- Option A. - The 1996 Plan,
- Option B. - The Western Canada Wilderness Committee Option proposed in July, 2001.
- Option C. - A slight revision of the 1996 Plan, in which the footprint is shifted 30 m to the west (away from the Cameron River).

This report is based largely on available information for Option A (e.g. Blood, 2001; Materi *et. al.*, 1996), and on field inspection carried out at the Option B site in late July, 2001.

## 2.0 KINDS OF IMPACTS ON THE NATURAL ENVIRONMENT.

### 1). **Loss or Disturbance of Red or Blue-listed Ecosystems.**

The project area falls within the CWHxm2 subzone/variant, a subzone in which all mature or old-growth ecosystems are either Blue-listed or Red-listed. This status is due to extensive logging which has resulted in a scarcity of natural old-growth. The Site Series that predominate in the proposed development areas are 05 (Western redcedar-sword fern) and 07 (Western redcedar-foamflower), both of which are Blue-listed. Site preparation, access roads, cut and fill, stump-pulling, etc. can result in some effects which extend beyond the strict footprint of the parking lot. Those effects are expected to vary between the two general sites, one of which (1996 Plan) is located in second growth which originated following logging, while the other (2001 Option) would be in selectively logged old-growth.

### 2). **Removal of Danger Trees Having Wildlife Value.**

Some veteran trees, either living or in the form of snags, may have to be removed if they pose a hazard to workers who would be involved in construction of the parking facility. Those trees are a component of the ecosystems referred to above, but also have individual values, for example for cavity-nesting birds. Due to its' international significance, MacMillan Park is not subject to B.C. Parks general policy of danger tree removal for purposes of *public* safety, however WCB is expected to be concerned about *worker* safety in this area. It is anticipated that the extent of danger tree removal will vary between the three options.

**3). Effects on Cameron River Riparian Corridor.**

It is important to retain a riparian corridor along the river 1). to protect fisheries/water quality values, 2). to protect the Blue-listed riparian ecosystem itself, and 3). to provide wildlife habitat and a movement corridor for elk. Although all project options provide for such protection, the degree of protection (amount of separation) varies between options.

**4). Effects on Local Hydrology.**

There are no permanent streams through any of the proposed parking sites, although evidence of some seasonal ponding and/or winter flow is evident in wet swales. Such depressions are mostly 1.0 to 2.5 m below the level of adjacent terrain. Culverting may be needed in some areas to accommodate winter-season flows, and particularly long-term flooding events. This need varies between sites and can result in varying amounts of site disturbance in order to provide flood protection or drainage works.

**5). Impacts on Roosevelt Elk.**

A small elk herd is resident in the Cameron River valley and makes use of MacMillan Park, including the proposed project sites. Environmental groups and individuals have expressed considerable concern for these elk. Impacts on the elk can include direct loss of habitat which is taken up by the parking lots and avoidance by the elk of adjacent habitats due to the disturbing influence of the visiting public. Those effects can vary between sites. Also, the potential to enhance habitat as compensation for direct habitat loss can vary between sites.

**6). Impacts on Other Wildlife.**

Many species of forest wildlife occur in the area, and most are adapted to a life in old-growth forest (e.g. cavity-nesting birds). Site development could therefore affect a range of species. That effect will vary primarily in accordance with the amount of old growth (living trees or snags) and other vegetation that is removed.

**3.0 RELATIVE MAGNITUDE OF POTENTIAL IMPACTS.****3.1 *Loss or disturbance of Blue-listed Ecosystems. Option A - (1996 Plan).***

This site is entirely within a stand of second-growth that was logged (following windthrow?) in the late 1950's. It supports a relatively dense, uniform stand of Douglas fir with little understory diversity. Only sword fern is relatively abundant in the understory. Large woody debris is uncommon.

If the parking area, visitor center, [etc. is](#) confined to this site then there will be no direct impacts on rare ecosystems.

### **Option B - (2001 Option).**

This would occupy narrow openings in the old-growth forest that were created by selective logging of veteran trees (almost entirely Douglas-fir) that were wind-damaged in January, 1997. That selective logging also included removal of some large trees peripheral to the actual lineal openings, however, the forest character is still relatively natural in those adjacent areas. In order to fit the various project components into this area, considerable site disturbance is required, i.e.:

- pulling of very large stumps (which can disrupt the roots of adjacent trees),
- cut and fill required in slightly undulating terrain, particularly where crossing of seasonal drainageways is needed,
- forest clearing to connect openings which are currently not completely connected to one another.

The above actions will result in some encroachment into adjacent habitats which are considered to be "at risk".

### **Option C**

Like Option A, this configuration can be achieved by removal of second-growth, i.e. without encroachment into old-growth stands.

#### **3.2 *Removal of danger trees having wildlife value.***

### **Option A - (1996 Plan).**

Since this site is in a second growth stand, no old-growth wildlife trees would be directly impacted. It is possible that up to 12 danger trees in immediately adjacent areas would have to be removed for reasons of worker safety (Appendix I).

### **Option B - (2001 Option).**

Because this option makes use of narrow "openings" in old-growth forest, the number of potential danger trees within 1  $\frac{1}{2}$  tree lengths of work areas is relatively large (about 24). These have considerable value for wildlife. The actual number of trees to be removed is subject to WCB confirmation. In any event, this impact is potentially high. For additional detail on wildlife ratings and tree locations, see Appendix I.

### **Option C**

This variation of Option A could result in up to 15 danger trees having to be removed (Appendix I).

#### ***3.3 Effects on Cameron River Riparian Corridor. Option***

##### **A - (1996 Plan).**

This plan included a 50 m-wide riparian strip in which no development would occur (except for trails, which have subsequently been omitted). Riparian ecosystems, as defined by their vegetation, are entirely within that 50 m strip, so that no direct impact should occur.

##### **Option B - (2001 Option).**

This option is well-removed from the Cameron River (at least 200 m away) and therefore no direct impacts will occur.

##### **Option C**

This would provide an 80 m-wide riparian leave strip, which is a slight improvement over Option A.

#### ***3.4 Effects on local hydrology.***

##### **Option A - (1996 Plan).**

This site is slightly hummocky but does not vary greatly in elevation, and no drainageways or sites of winter standing water are present (other than the abandoned gravel pit). The site could be cleared and developed without disruption of any surface drainage.

##### **Option B - (2001 Option).**

The parking areas would be immediately adjacent to some swales which are subject to winter flows or retain standing water in winter. One or more of these might have to be crossed (presumably culverted) to allow for traffic circulation. These local drainages eventually reach the Cameron River and could carry silt or other suspended material to the river.

### **Option C**

As for Option A.

### **3.5 Impacts on Roosevelt elk**

#### **Option A - (1996 Plan).**

Forest clearing for parking and related facilities would include only dense second growth forest which, due to shading, produces relatively little elk forage (primarily sword fern). The adjacent riparian strip produces a much higher biomass of elk forage, and receives greater use by elk. The impact of direct and permanent loss of habitat would be low. Some impact on elk use of the riparian zone is possible due to the proximity of the parking lot and visitor facilities. However, elk are quite adaptable and any such impact is expected to be minor and to be almost entirely restricted to daylight hours in the summer months.

Adoption of the 1996 Plan would allow the openings which are proposed for parking in the 2001 Option, and are currently utilized regularly by elk, to be enhanced as a compensation measure.

#### **Option B - (2001 Option).**

These openings now support a considerable amount of herbaceous and shrubby vegetation, some of which is grazed by elk. Fresh tracks and droppings, as well as older (winter) pellet groups were observed. The combination of small but new openings supporting early-seral vegetation, adjacent old-growth cover, and lush forage along drainage swales in the old-growth stands provides good elk habitat. Hectare for hectare, the parking lot at this location would permanently remove better quality elk habitat than that lost due to the 1996 Plan, and would therefore have a greater impact on elk. It is not clear whether that impact could be mitigated through on-site enhancement.

### **Option C**

This option could slightly mitigate any impact of Option A on elk use of the riparian corridor, since it would provide a wider leave strip.

### **3.6 Impacts on other wildlife.**

#### **Option A - (1996 Plan).**

The second-growth at this site is of considerably less value for wildlife than old growth forest. For example, cavity nest sites are essentially not available, large woody

debris is scarce, and the diversity of forage resources (e.g. berries) is very low. Development of this site would have a fairly minor impact on local wildlife.

### **Option B - (2001 Option).**

Although it may be argued that existing openings would be developed for parking, resulting in no impact on existing habitat values, the fact is that the openings are used by wildlife (e.g. elk; black bears; songbirds) and that some adjacent habitats, including veteran trees or snags, would be adversely affected. The impact of development at this site, on wildlife in general, would be as great as at the 1996 Plan Site, and perhaps greater.

### **Option C**

Impacts would be essentially the same as for Option A. **4.0**

## **CHOICE OF LEAST-IMPACT OPTION**

For comparison of the relative impact of the two parking lot sites on natural values, each of six potential impacts was rated as Nil, Low, Medium or High. Corresponding numerical values are 0, 1, 2, and 3 respectively.

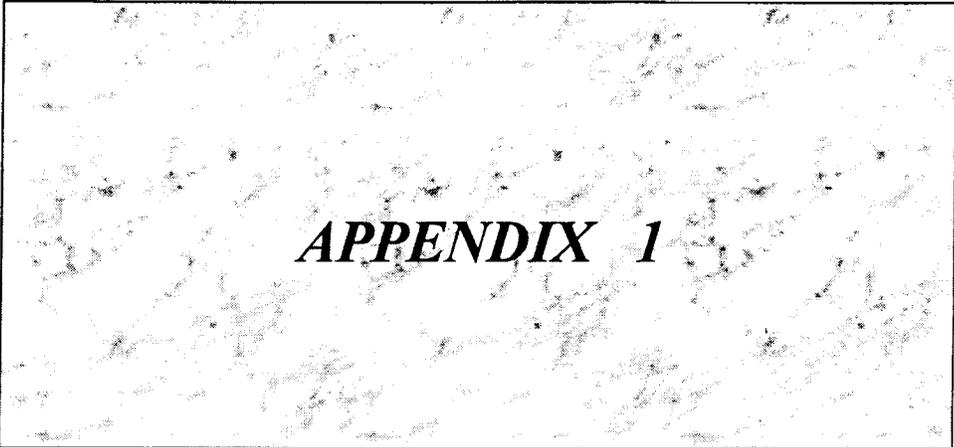
|    | <b>Kind of Impact</b>               | <b>Impact Rating</b> |                 |                 |
|----|-------------------------------------|----------------------|-----------------|-----------------|
|    |                                     | <b>Option A</b>      | <b>Option B</b> | <b>Option C</b> |
| 1. | Impact on Rare Ecosystems           | N (0)                | M (2)           | L-N (0.5)       |
| 2. | Loss of Veteran Wildlife Trees      | L (1)                | H (3)           | L-M (1.5)       |
| 3. | Impact on Cameron R. Riparian Zone  | L-N (0.5)            | N (0)           | N (0)           |
| 4. | Potential Effects on Local Drainage | L-N (0.5)            | M (2)           | L-H (0.5)       |
| 5. | Impact on Elk and Elk Habitat       | L (1)                | M (2)           | L-N (0.5)       |
| 6. | Impact on Other Wildlife            | L (1)                | M (2)           | L (1)           |
|    | <b>TOTAL</b>                        | <b>4</b>             | <b>11</b>       | <b>4</b>        |

The low numerical scores for Options A and C (4), compared to Option B (11), suggest that either A or C would be preferable to B

## **5.0 REFERENCES**

- Blood, D.A. 2001. New parking area at MacMillan Park, Selected Environmental Concerns. Report prepared for B.C. Parks, Strathcona District, by D.A. Blood and Associates Ltd., Nanaimo. July 23, 2001. 12 pp. + appendices.
- Materi, J., C. Henderson and D. Blood. 1996. Environmental planning services provided for MacMillan Park Development. Report prepared for B.C. Parks, Strathcona District, by D.A. Blood and Associated Ltd., Nanaimo. 41 pp. + appendices.

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***APPENDIX 1***

## **APPENDIX 1.**

### **Wildlife / Danger Tree Assessment of Alternative Parking Lot Concepts**

#### ***Background & Methods***

A detailed Wildlife/Danger Tree Assessment of the original parking lot concept, developed by Graeme & Murray Consultants Ltd. (Option A), was carried out in 1996 (Materi *et.al.*, 1996). The current work (July, 2001) involved assessment of two additional parking lot concepts. Option B is centred around a variable-width forest opening about 200 metres west of the original site. This open area resulted from a wind event in January of 1997. Merchantable timber was salvaged from the blowdown area in subsequent years. Option C has a configuration similar to the original (Option A) parking lot concept, but shifted approximately 30 m to the west. It would incorporate part of a smaller area of windthrow originating from the 1997 storm.

Workers' Compensation Board (WCB) regulations require that tree hazards are removed or safety zones designated to provide a safe work site during construction of the parking lot. Trees or snags with significant root or stem defects typically need to be felled if they occur within 1.5 tree lengths of the work area. Hazardous tops and limbs need attention if they would fall in the work area, or a distance of less than 1.5 times their length. With the latter types of defects, it may be possible to remove the hazard by limbing or topping.

Given the height of veteran trees on the site (up to 60 m), it was decided that hazardous trees would be inspected within an envelope extending roughly 100 m from the nearest edge of the parking lot (Figure 1). Rough locations for hazardous trees on the site were based on reference points provided by Kyler Land Surveying Ltd. in their July 24, 2001 fieldwork. Trees were assessed following the protocols described in the *Wildlife/Danger Tree Assessor's Course Manual for Parks and Recreation Sites* (1998), which are deemed acceptable to the WCB. Due to the large size of many of the trees on the site, a gas-powered drill with a 40 cm ship auger bit was used in place of an increment borer to evaluate stem and root condition. While the former has a low level of precision, it was considered the only practical means of evaluating these two critical components of the assessment. In addition to trees with external defects, a number of outwardly healthy veteran trees on the site were checked for the presence of Brown Cubical Rot (*Laetiporous sulphureus*), since this disease may reach advanced stages before showing any signs of decadence (Allen *et al.* 1996). Following boring, all holes drilled into healthy trees were sealed to prevent the ingress of fungal spores and/or damaging insects.

## ***Results and Discussion***

It is evident from the fieldwork that a large proportion of the stand at Option B has been impacted at some point by major wind events. A number of older trees showed historical evidence of such events with their stems bent at odd angles. A few others showed more recent evidence of wind damage in the form of heavy leans, dangling limbs or cracked stems. Some veteran trees showed little sign of wind damage, but were becoming senescent and susceptible to insect damage and fungi.

As indicated in Table 1 and Figure 1, a total of 24 trees in the Option B parking lot were assessed as requiring some attention to remove hazards to construction and maintenance personnel. About 80 % would need to be cut down while the remainder would require monitoring, safety zones, or other treatments. Of the trees requiring complete removal, roughly three-quarters possessed high wildlife habitat ratings and one quarter moderate ratings. Virtually all of the trees requiring other work were rated high for wildlife habitat values.

It should be noted that the entire area potentially impacted under Option C was not subjected to detailed inspections during the most recent fieldwork. However, much of the area immediately north of Option C is comprised of second-growth forest about 40 years old. In addition, some of the fieldwork conducted during the 1996 assessment of Option A is equally applicable to Option C. As indicated in Table 1, at least eight hazardous trees would require some attention. Thirteen would need to be removed and two would require monitoring or other treatment. About half the trees to be removed under this option would rate high for their habitat values; the remainder possess moderate wildlife values.

Compared to Option A (the original parking lot location) Option B would require the removal of twice as many trees with high wildlife ratings (15 versus 6 trees). Option C would require the removal of about the same number of highly rated trees as Option A. All three options are fairly similar with respect to the number of moderately-rated trees requiring removal. It is therefore concluded, that from a tree hazard perspective, Option B is the least desirable location for the parking lot. Options A and C appear to be similar in terms of overall tree hazards, although Option A is slightly better in relation to moderately-rated hazard trees.

**DONALD A. BLOOD & ASSOCIATES LTD.**

*Wildlife Resource and Environmental Consultants*

**MEMO**

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**TO:** Mr. Larry Boudreau  
Recreation Officer  
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Parksville, B. C.,  
[e-mail: Larry.Boudreau@gems8.gov.bc.ca](mailto:Larry.Boudreau@gems8.gov.bc.ca)  
[budmcfarland@home.com](mailto:budmcfarland@home.com)  
[tdobrien@ark.com](mailto:tdobrien@ark.com)

**DATE:** August 2, 2001

**FROM:** Don Blood

**SUBJECT: Environmental Assessment of Parking Lot Options at MacMillan Provincial Park.**

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Dear Mr. Boudreau;

This memo is to bring you up to date on our environmental assessments for this project, which began in 1996:

**1. 1996 Assessment:**

- this included considerable fieldwork, and was intended to provide environmental input needed for engineering design of the project (at current Site A),
- alternative locations were not investigated,
- resulted in the report "Environmental Planning Services Provided for MacMillan Park Development" by J.J. Materi, C. Henderson and D.A. Blood (November, 1996).
- included resource inventory, hazard tree survey and impact assessment,
- concluded that the development would have "... a minimal impact on significant vegetation, wildlife and aquatic resources ..." provided that key mitigative measures were implemented.

**2. Assessment of Issues Raised by the Public:**

- in early July 2001, D. Blood was asked to respond to four issues which had been raised concerning the 1996 design (potential impacts on elk, on water quality, on windthrow susceptibility, and on spread of root disease),
- the above issues were addressed by contacting experts, review of post-1996 reports on MacMillan Park, review of post-1996 legislation, and further field inspection,
- a report "New Parking Area at MacMillan Park, Selected Environmental Concerns" was prepared on July 23, 2001 (12 pp. + Appendices),

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**MEMO**

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- the report concluded that the hypothesized impacts were not of concern or could be managed/mitigated, but that septic disposal is undesirable at this location and should be replaced with an alternative system.

**3. Comparative Assessment of Parking Options:**

- this involved field inspection in late July, 2001 of habitat conditions, drainage and hazard trees at a proposed new location (Option B) so that it could be compared with the 1996 Plan (Option A) and a slightly revised version of the 1996 Plan (Option C).
- our report on this, titled "Alternative Parking Lot Options at MacMillan Park: Comparative Impacts on the Natural Environment" (7 pp. + Appendix) was produced on August 2, 2001.
- the report concluded that Options A and C would have considerably less impact on the natural environment than would Option B, and that the effects of A and C were very similar.

I trust that this summarizes our MacMillan Park involvement to your satisfaction. Please let me know if additional detail is needed. Many thanks.

Yours sincerely,  
D.A. Blood, M.Sc., R.P.Bio.

cc: file  
DAB/sao