

1998 Caribou Strategy Update



Prepared by:

CCLUP Caribou Strategy Committee.

Prepared for:

Cariboo Mid-Coast Interagency Management Committee

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Summary

As part of the implementation of the Cariboo Chilcotin Land Use Plan, the CCLUP Integration Report (March 1998) tasked the Caribou Strategy Committee with the preliminary identification of 'modified harvest' areas for caribou (Eastern and Itcha/Ilgachuz) which will address timber access commitments from 2000 to 2005. The results of the updated identification of the 'modified harvest' areas is to be firm for the year 2000 but may be increasingly flexible beyond year one. It is recognized that this may change as more results of the research on caribou use, harvesting methods and terrestrial ecosystem mapping become available, however it will provide a basis for forest development planning. The complete caribou strategies are due in 2000 once five years of research has been completed.

The modified harvest areas were selected to best maintain caribou values while taking into account stakeholder values and making the best use of overlap opportunities. A large part of this task was a map-based exercise and the key products are 1:150,000 and 1:135,000 scale maps (east and west, respectively) showing proposed 'no harvest' and 'modified harvest' locations for the eastern and western areas. This report presents the background information, explaining targets and presenting rationale for any significant changes from the 'interim' 1996 Caribou Strategy. The report also provides updates on the definition of 'modified harvest' for caribou and the recommended timber harvest management approaches.

CCLUP targets for Eastern and Itcha/Ilgachuz caribou were clarified based on thorough review of boundaries, GIS calculations of productive forest land base and direction received from the IAMC.

The targets for 'modified harvest' and 'no harvest' were utilized in determining an updated interim strategy that would have least impact on caribou while following higher level plan and IAMC direction. At the landscape level, the identification of 'modified harvest' areas for Eastern and Itcha/Ilgachuz caribou utilized similar criteria as outlined in the 1996 caribou strategy report. Additional radio-telemetry information was available for determining areas of high caribou use. Detailed ecosystem mapping was not yet available for the complete area and therefore was not utilized during this update review. However, this mapping is expected to be completed by the end of 1998 and will be utilized in future updates to review and 'fine tune' the distribution of modified harvest based on habitat capability and suitability.

An updated 'Option A' for Eastern and Itcha/Ilgachuz caribou is recommended by the committee. Generally, the 'no harvest' and 'modified harvest' areas identified are very close to the targets for Eastern and Itcha/Ilgachuz caribou. Minor differences between the area targets and the areas identified in the updated option will be resolved in the final strategy option developed in 2000. Some recommendations have also been provided by the committee as to areas within the 'modified harvest' that could be developed in the short term (2000 - 2005) in both Eastern and Itcha/Ilgachuz caribou areas. Areas not

identified for the short term are considered to require additional research or information collection before the location of 'modified harvest' is firmed up.

Stakeholder representatives from the Major Licencees and Conservation Council participated in the strategy update review process. There was a free exchange of technical information and maps and several meetings were held with stakeholder representatives.

A list of key recommendations and issues is included in the report including the recommendation that another update of the 'modified harvest' distribution be done in 1999 or 2000. TEM mapping and additional caribou distribution knowledge from ongoing work will be available for incorporation into the next updated strategy. Stakeholders will have the opportunity to review and provide input into future updates of the strategy.

Acknowledgements

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I. INTRODUCTION

The information and recommendations in this report have been prepared as recommendations to the Cariboo Mid-Coast Interagency Management Committee (IAMC).

As part of the implementation of the Cariboo Chilcotin Land Use Plan, the CCLUP Integration Report (March 1998) tasked the Caribou Strategy Committee (referred to as 'the committee' hereafter in this report) with the preliminary identification of 'modified harvest' areas for caribou (Eastern and Itcha/ Ilgachuz) which will address timber access commitments from 2000 to 2005. The results of the updated identification of the 'modified harvest' areas is to be firm for the year 2000 but may be increasingly flexible beyond year one. It is recognized that this may change as more results of the research on caribou use, harvesting methods and terrestrial ecosystem mapping become available, however it will provide a basis for forest development planning. The complete caribou strategies are due in 2000 once five years of research has been completed.

The committee began this task in May 1998. Targets for 'modified harvest' areas were derived for the eastern and western areas through GIS analysis and these were subsequently reviewed and approved by the IAMC. Consultation with stakeholder representatives was initiated in May and June, with follow-up meetings on draft versions of the maps in July and August. The 1996 'Option A' maps were reviewed in the context of new caribou research information, new targets and input received from stakeholder groups.

The 'modified harvest' areas were selected to best maintain caribou values while considering stakeholder values, making the best use of overlap opportunities, and following direction from the higher level plan, the IAMC and the committee Terms of Reference. A large part of this task was a map-based exercise, and the key products are 1:150,000 and 1:135,000 scale maps (east and west, respectively) showing proposed 'no harvest' and 'modified harvest' locations for the eastern and western areas.¹ This report presents the background information, explaining targets and presenting rationale for any significant changes from the 'interim' 1996 Caribou Strategy. The report also provides

¹ The map products will also be made available digitally, upon request.

updates on the definition of ‘modified harvest’ for caribou and the recommended timber harvest management approaches.

In this report and on the associated maps the committee has dealt with preliminary identification of the entire ‘modified harvest’ area within each respective caribou deferral area rather than just the five years of harvest (to 2005) that the Integration Report directed the committee to identify. Additionally, the committee has identified large areas within the ‘modified harvest’ that it feels, from a caribou management perspective, would be acceptable to access in the first five years. The committee felt that doing so would be advantageous to all stakeholders in that this will minimize the loss of options. This approach should also provide the forest industry with more flexibility in forest development planning in the short term.

II. EASTERN CARIBOU

The Cariboo-Chilcotin Land Use Plan (CCLUP) recognizes that mountain caribou in the eastern portion of the Cariboo Region are of provincial significance and are a species at risk. Maintaining habitat values for mountain caribou has been identified as an overriding objective within the CCLUP.

Targets For Eastern Caribou and IAMC Direction

CCLUP targets for Eastern caribou by subunit were indicated in the 1996 Caribou Strategy Report though the report also identified a need to better define the area based targets for Eastern caribou. Based on a thorough review of boundaries, GIS calculations of productive forest land base and direction received from the IAMC (see Appendix II), clarification of the targets has resulted in the ‘modified harvest’ and ‘no harvest’ targets indicated in Table 1. IAMC direction to the committee on targets can be summarized as follows (for details see Appendix II):

- the 65/35 should be applied by subunit to calculate the distribution of the modified harvest. As per the Integration Report direction, the calculation should also be made for the Enhanced subunits where they fall above the high elevation line.
- minor shifts of target may be appropriate, particularly where they benefit both caribou, timber and other targets.
- refinements or modifications to option ‘A’ (1996 Caribou Strategy Report) will form the basis of the caribou strategy.

Table 1. Summary of Updated CCLUP Targets By Subunit (Areas in Hectares of Productive Forest Land) - Approved by the IAMC

CCLUP Subunit	Deferral Area	35% Modified Harvest	65% No Harvest
Cottonwood E-4	11,207	3,922	7,285
Canim E-8	7,659	2,681	4,978
Boss/Deception S-A	21,007	7,352	13,655
Quesnel Highland S-L	37,815	13,235	24,580
Quesnel Lake S-M	59,997	20,999	38,998
TOTAL	137,685	48,189	89,496

Updated Interim Strategy

The above targets for 'modified harvest' and 'no harvest' were utilized in determining an updated interim strategy that would have least impact on caribou while following higher level and IAMC direction. At the landscape level, the identification of modified harvest areas for eastern caribou utilized similar criteria as outlined in the 1996 caribou strategy report. Additional radio-telemetry information was available for determining areas of high caribou use (Figures 1 and 2). Detailed ecosystem mapping was not yet available for the complete area and therefore was not utilized during this update review. However, this mapping is expected to be complete by the end of 1998 and will be utilized in future updates to review and 'fine tune' the distribution of modified harvest based on habitat capability and suitability.

Figure 3 depicts the updated 'option A' recommended by the committee. Generally, the 'no harvest' and 'modified harvest' areas identified in Figure 3 are very close to the targets for eastern caribou (Table 2). Minor differences between the area targets and the areas identified in the updated option will be resolved in the final strategy option developed in 2000.

Table 2. Eastern Caribou Strategy Interim Updated Map Area Summaries By Subunit (Areas in Hectares of Productive Forest Land).

	35% Modified Harvest		65% No Harvest	
CCLUP Subunit	Target	Actual	Target	Actual
Cottonwood E-4	3,922	3,576	7,285	7,616
Canim E-8	2,681	2,574	4,978	4,673
Boss/Deception S-A	7,352	7,329	13,655	13,512
Quesnel Highland S-L	13,235	13,175	24,580	24,636
Quesnel Lake S-M	20,999	20,657	38,998	39,173
TOTAL	48,189	47,311	89,496	89,610

Some recommendations have also been provided by the committee as to areas within the 'modified harvest' that could be developed in the short term (2000 - 2005); however, it should be clear that other resource issues such as biodiversity or watershed hydrology might constrain short-term harvest opportunities in these areas. The recommended potential areas to harvest timber within caribou 'modified harvest' areas beyond 1999 are

listed in Table 3 below. Areas not listed are recommended not to be available in the short term until additional research or inventory information can be gathered.

Table 3. Summary of Recommended Modified Harvest Areas Available For the Period 2000 - 2005.

CCLUP Subunit	Potential Areas Available in the Short Term
Cottonwood	Areas agreed to through trade agreements (Figure 4)
Canim	Upper Horsefly and MacKay watersheds
Boss/Deception	Upper Horsefly and MacKay watersheds
Quesnel Highland	Areas within Cunningham and Keithley Creek wtrshds.
Quesnel Lake	Area between the north and east arms of Quesnel Lake and the Cariboo Mountains Prov. Park

Since TEM mapping, available in 1999, will help to further refine boundaries of 'modified' and 'no harvest' areas, we recommend no adjustments to these lines in the short term. It is possible that lines will be moved up or down through this refinement process, therefore it is preferable that in the short term cutblocks not be placed up to the boundaries in order to retain flexibility to make adjustments.

The committee will be developing criteria for reasonable operational flexibility in determining the final location for harvesting areas in relation to the boundaries of the 'modified harvest' and 'no harvest' areas as part of the Caribou Strategy in 2000.

In the short term, the field location of the main haul road accessing the Tuckett Creek drainage may, if absolutely necessary, cross through the 'no harvest' in the area.

Rationale For Changes to Interim Strategy

The updated 'option A' that is recommended by the Caribou Strategy Committee as an interim strategy has some significant changes from the 1996 'option A'. The modified harvest areas were selected to best maintain caribou values while taking into account stakeholder values and making the best use of overlap opportunities to better meet all CCLUP targets, as directed by the committee Terms of Reference (Appendix I). The rationale for the various changes by subunit is summarized as follows:

Cottonwood

Clarification of CCLUP targets by the IAMC indicated that there was a 35% 'modified harvest' target in this CCLUP subunit. Previously, in 1996, there was only 'no harvest' caribou target in this subunit. The same criteria as used in 1996 were utilized to locate the 35% modified harvest.

Canim

Clarification of CCLUP targets by the IAMC indicated that there was a 35% 'modified harvest' target in this CCLUP subunit. Previously, in 1996, there was only 'no harvest' caribou target in this subunit. The same criteria as used in 1996 were utilized to locate the 35% 'modified harvest', particularly the criteria of identifying peripheral areas instead

of central areas. TEM (terrestrial ecosystem) mapping is required to refine the map line so short term access into the proposed 'modified harvest' area within the 100 Mile TSA is not recommended until this information has been collected.

Boss/Deception

No changes were recommended in this CCLUP subunit because the 'modified harvest' was already close to the target.

Quesnel Highland

The 'no harvest area' in this CCLUP subunit was increased to be closer to the confirmed target. The Nuggett Mountain area was added to the 'no harvest' category following the criteria to select areas of higher relative use and larger, contiguous areas instead of small areas.

Quesnel Lake

The most significant changes are recommended for this CCLUP subunit. Based on increased caribou use as shown through telemetry, and the objective of having large areas of caribou habitat with either one or the other prescription, 'modified harvest' is recommended to be shifted from the Amos Creek, Devoe Creek and Black Stuart Mountain areas across the North Arm of Quesnel Lake to Lynx and Penfold Creeks. This change will improve the strategy based on the criteria of 'modified harvest' areas being large and in areas of lower use and accessibility.

Stakeholder Input

Stakeholder representatives from the Major Licencees and Conservation Council participated in the strategy update review process. There was a free exchange of technical information and maps, and several meetings were held with stakeholder representatives. During review of locations for 'modified harvest' areas the committee utilized maps of timber harvest opportunities provided by the MLSC to examine overlap opportunities. Stakeholder representatives were invited to make written and verbal presentations to the committee in regard to the draft working versions of the updated map. The MLSC technical representative made a presentation to the committee on concerns about the Eastern caribou draft map and provided the committee with written input from four licencees that operate in the eastern area. Major stakeholder issues in the Eastern caribou area are summarized as follows:

- Concern about the integration of caribou targets with other CCLUP targets
- Insufficient modified harvest identified in some licencee areas
- Ground level operational flexibility in modified harvest areas
- Specific proposed adjustments submitted by 1 licencee
- Wood quality/availability in some modified harvest areas is a concern
- Early winter ranges should be dealt with in sub-regional planning

Stakeholder input was addressed in a number of ways, including:

- some 'modified harvest' opportunities were identified in the 100 Mile House TSA;
- all trade areas (see Figure 4) in the Quesnel District have been, or are being suggested with the full involvement of the licencees;
- by identifying 'modified harvest' areas as large, contiguous areas covering a full range of elevation, slope, aspect and forest types, 'modified harvest' areas should fairly represent the range of stand conditions within the entire caribou area.
- specific proposed adjustments submitted by one licensee will be reviewed in detail in 1999 once TEM mapping is completed.

In addition, the committee has developed more detailed, updated information on the recommended modified harvest approach (below) in order to address licensee concerns and questions in this area.

Timber Harvesting Strategy

The following is an update on the interim timber harvesting approach that is recommended by the committee for Eastern caribou. Results of ongoing research will be incorporated into the complete caribou strategy due in 2000. All approaches discussed are fully compatible with the impacts modelled in the Cariboo-Chilcotin Land Use Plan Integration Report (1998).

The range of the Eastern caribou has been fairly well defined by years of radio-telemetry data (Figures 1 and 2). Unlike the Itcha/Ilgachuz caribou, the vast majority of the range of this caribou population is included within the CCLUP areas of 'modified harvest', 'no harvest' and parks. The exceptions to this include: areas that are used as low elevation early winter range in the Interior Cedar Hemlock (ICH) zone (Figure 5) and several areas outside the CCLUP caribou area that the Caribou Committee is recommending as trade for lower value caribou areas (see Figure 4) within the CCLUP caribou deferral. Given this setting, there should be a threefold approach for managing the habitat of the Eastern caribou.

1. Park and 'No Harvest' Areas

These areas provide a core habitat that will have little or no road access (some 'salvage' harvesting in 'no harvest' as per CCLUP Integration Report). This provides caribou not only with suitable space (habitat) in which to meet their needs but also a large area relatively free of harvest and harassment by humans (provided the use of snowmobiles and ATVs, and other activities are adequately controlled). Since logging will not create more early seral habitat (or very little as in the Integration Report), moose will not be enhanced which will help protect caribou from additional predation pressures caused by increased wolf numbers.

2. 'Modified Harvest' Areas

These areas will be managed to maintain caribou habitat continuously through time and space. Harvesting approaches will also discourage the enhancement of moose habitat. Stringent access control measures will be necessary.

3. Early Winter Range Outside the CCLUP Caribou Area

These areas will be managed to emulate the natural disturbance pattern and structure to the extent allowed in the Biodiversity Guidebook and landscape unit emphasis. Since there are few areas (Figure 5) that are heavily used as early winter habitat in the ICH zone (near Tasse Lake, near Hilda Lake, between Lynx Creek and Quesnel Lake, near Suey Mountain and southeast of Crooked Lake), these areas should overlap the old seral areas of the biodiversity strategy. If harvesting must take place we recommend the group selection system although there is no CCLUP provision for extended rotations for caribou in these areas. Good access management will be encouraged.

Additional dispersed use of low elevation habitat occurs in old cedar hemlock stands along the North Arm of Quesnel Lake between Isaiah Creek and Watt Creek, near the mouth of Abbott Creek and near the mouth of Lynx Creek (Figure 5). It is recommended that caribou requirements in these areas be addressed through sub-regional planning or provisions of the Forest Practices Code. There is a requirement to ensure the old growth forest attributes are maintained in a portion of the stands within the ICH zone within these landscape units. The specifics of this prescription will be defined by the year 2000.

'Modified Harvesting' Approach on Arboreal Lichen Sites Less Than 45% Slope

Mature and old stands with a slope of less than 45% are most heavily used by caribou and therefore should be managed to maintain habitat value continuously through time and space.

1. Maximize the size of cut patches and leave patches as allowed for within this NDT in the Biodiversity Guidebook.
2. Season of harvesting is not restricted by caribou concerns.
3. Harvest by applying 33% volume removal group selection.
4. Harvest openings should be 2-3 tree-lengths wide and up to 3-4 tree-lengths long. Where windthrow and windscouring of lichens are not concerns the openings could be somewhat longer. Openings should be less than 1 ha in size.
5. Harvest openings may be oriented to maximize insolation.

There are many more details that could be added to explain how the harvesting can be conducted most efficiently.

In addition, the committee recommends the following (unchanged from the 1996 Caribou Strategy Report) timber management approach in ‘modified harvest’ areas:

- one-quarter of the ‘modified harvest’ areas could be harvested within the first 20 year period. A maximum of 33% timber volume should be removed from this area. At this rate, 8% of the total volume would be taken in a 20 year period with a 240 year total rotation; assuming harvesting on an even flow basis.

‘Modified Harvesting’ Approach on Arboreal Lichen Sites Greater Than 45% Slope
 Stands with a slope of more than 45% are used less by caribou and are more difficult to harvest with a group selection system. High-lead or helicopter logging could be used to implement the logging prescription on these slopes but the value of doing so is reduced since caribou make less use of steep slopes than slopes less than 45%. Therefore, clearcutting with reserves on slopes greater than 45% is acceptable. To allow for some caribou use and stay within the impact modelled in the Integration Report (i.e., 100% of the stand is available for harvest in a 240 year period), 50% of each cutblock should be clearcut every 120 years. This will result in half of each stand being 120-240 years of age at all times, thereby providing some lichen bearing habitat. This approach acknowledges that 50% of each stand will not be suitable habitat for caribou through substantial periods of the rotation.

1. Maximize the size of cutblocks and leave patches as allowed for this NDT in the Biodiversity Guidebook.
2. Season of harvesting is not restricted by caribou concerns.
3. Apply clearcutting with 50% of the cutblock in reserves.
4. Keep the clearcut parts of the block as narrow as possible. We acknowledge there will be limitations on this for logistic reasons.
5. Plan the cutblock in such a way so that the 50% reserve area can be logically accessed for logging in 120 years.

General ‘Modified Harvesting’ Approach on Arboreal Lichen Sites of Any Slope

The committee recommends the following (unchanged from the 1996 Caribou Strategy Report):

- a 3-pass system in every landscape unit (one-third of individual landscape units could be logged in any 20-year period);

- an aggregated cut (in time and space) in specific landscape units over short time periods (5 years), followed by putting roads to bed and not entering the area again for 20 years;
- logging up to the Biodiversity Guidelines (provided a 3-pass system is utilized);
- high end of spectrum for block size (250 hectares) to be used.

'Modified Harvesting' Approach on Non-Lichen Sites

Ecosystem mapping (available in 1999) may provide a better understanding of the distribution and extent of sites without arboreal lichens. Current experience indicates that these are rare within the Eastern caribou range that is available for modified harvesting.

An appropriate harvesting system has yet to be developed for non-lichen sites. Some of these sites may be high value for other species, such as mountain goat and grizzly bear. In the short-term we recommend not proposing harvesting on these sites until a suitable approach can be developed.

III. ITCHA/ILGACHUZ CARIBOU

The CCLUP recognizes that woodland caribou in the western portion of the Cariboo Region are of provincial significance and are a species at risk. A key objective of the CCLUP is to maintain caribou winter range values by applying the Moderate Risk Option determined by the Western Caribou Working Group.

Targets For Itcha/Ilgachuz Caribou and IAMC Direction

CCLUP targets for Itcha/Ilgachuz caribou by subunit were indicated in the 1996 Caribou Strategy Report. This report also identified a need to better define the area based targets for Itcha/Ilgachuz caribou. Based on a thorough review of boundaries, GIS calculations of productive forest land base and direction received from the IAMC (see Appendix II), clarification of the targets has resulted in the 'modified harvest' and 'no harvest' targets indicated in Table 4. IAMC direction to the committee on targets can be summarized as follows (for details see Appendix II):

- the basis for the Itcha/Ilgachuz caribou targets is the moderate risk option identified by the Western Caribou Working Group and as modified by the CCLUP and the Integration Report.
- the map titled "Itcha-Ilgachuz Approved Integrated Management Areas" and dated June 8, 1995, defines the boundaries of the moderate risk option (as depicted in Figure 6). This map, in conjunction with subunit boundaries, is to be used to determine the 'no harvest' and 'modified harvest' areas by subunit.
- the CCLUP states "based on the area which is currently proposed by the Western Caribou Working Committee for deferral under the moderate risk option, 65% of the forest land base deferred under this option has been assumed to be not available for

harvest and the remaining 35% was assumed to be available under more sensitive harvesting practices.”

- in addition, the moderate risk option includes ‘modified harvest’ areas outside the deferral area.
- some flexibility exists to shift portions of the ‘no harvest’ and ‘modified harvest’ from areas within the moderate risk option deferral area to areas outside within a subunit, subject to the provision that adjustments of this type do not negatively impact the achievement of other CCLUP targets.
- some flexibility exists to shift portions of both the ‘no harvest’ and ‘modified harvest’ areas between subunits, subject to the provision that this transfer of target between subunits does not adversely affect the meeting of other CCLUP targets.
- timber harvesting opportunities must be available in the ‘B1’ polygon starting in 2000.
- refinements or modifications to ‘option A’ (1996 Caribou Strategy Report) will form the basis of the caribou strategy.

Table 4. Summary of Updated CCLUP Targets By Subunit (Areas in Hectares of Productive Forest Land) - Approved by the IAMC

CCLUP Subunit	Total Deferral Area	35% Modified Harvest	65% No Harvest	Modified Harvest Outside Deferral Area	Total Modified Harvest Area
Baezaeko E-1	33,209	11,623	21,586	10,815	22,438
Kluskus I-A	1,427	486	903	391	877
Anahim Lake I-B				2,270	2,270
Chezacut I-C				48,541	48,541
Itcha-Ilgachuz S-F	101,400	35,490	65,910	90,701	126,191
U. Blackwater S-P	6,067	2,123	3,944		2,123
TOTAL	142,103	49,722	92,343	152,718	202,440

Updated Interim Strategy

The above targets for ‘modified harvest’ and ‘no harvest’ were utilized in determining an updated interim strategy that would have least impact on caribou while following higher level and IAMC direction. At the landscape level, the identification of ‘modified harvest’ areas for Itcha/Ilgachuz caribou utilized similar criteria as outlined in the 1996 Caribou Strategy Report. Additional radio-telemetry information was available for determining areas of high caribou use (Figures 7 and 8). Detailed ecosystem mapping (TEM) was not yet available for the complete area and therefore was not utilized during this update review. However, this mapping is expected to be complete by the end of 1998 and will

be utilized in future updates of this strategy to review and ‘fine tune’ the distribution of modified harvest based on habitat capability and suitability.

Figure 9 depicts the updated ‘option A’ recommended by the Caribou Strategy Committee for Itcha/Ilgachuz caribou. Generally, the ‘no harvest’ and ‘modified harvest’ areas identified in Figure 9 are close to the overall targets for Itcha/Ilgachuz caribou (see Table 5), though some flexibility is recommended to shift portions of the ‘no harvest’ and ‘modified harvest’ between CCLUP subunits and from areas within the moderate risk option deferral area to areas outside within a CCLUP subunit. Since the committee is recommending these shifts between CCLUP subunits and outside the deferral area, only the total ‘no harvest’ and total ‘modified harvest’ is relevant, as reported in Table 5. Minor differences between the overall area targets and the areas identified in the updated option will be resolved in the final strategy option developed in 2000.

Table 5. Itcha Ilgachuz Caribou Strategy Interim Updated Map Area Summaries By Subunit (Areas in Hectares of Productive Forest Land).

	Modified	Harvest	No	Harvest
CCLUP Subunit	Target	Actual	Target	Actual
Baezaeko E-1	22,438	34,809	21,586	9,214
Kluskus I-A	877	1,779	903	
Anahim Lake I-B	2,270	16,173	0	
Chezacut I-C	48,541	32,247	0	1,514
Itcha-Ilgachuz S-F	126,191	112,764	65,910	79,227
U. Blackwater S-P	2,123	2,123	3,944	3,942
TOTAL	202,440	199,895	92,343	93,897

Some recommendations have also been provided by the committee as to areas within the modified harvest that could be developed in the short term (2000 - 2005); however, it should be clear that other resource issues such as biodiversity or watershed hydrology might constrain short term harvest opportunities in these areas. The recommended potential areas to plan within in regards to timber harvest within caribou modified harvest areas beyond 1999 are listed in Table 6. Areas not listed are recommended not to be available in the short term until additional research and/or inventory information can be gathered. The areas not to be available in the short term include the areas in the vicinity of Shag Creek and southwest of Baldface Mountain -- the concern is that future updates of the strategy in the next two years could result in shifts in the distribution of ‘modified harvest’ and ‘no harvest’ in these areas. In addition, two other areas -- northeast of the Riverside Satah Mtn. camp and the migration corridor between the Rainbows and the Ilgachuz -- require the development of appropriate practices and operational guidance and, therefore, are also recommended to be avoided in the short term.

Higher level and IAMC direction indicates that there will be timber harvest in Polygon B1 by 2000. The committee recommends no further ‘modified harvest’ in Polygon B1 to address caribou conservation concerns.

A significant unresolved issue revolves around the area west of Punkutlaenkut Lake at the head of Bryant and Holte Creeks. The area does receive winter caribou use and has other overlapping 'non-timber' resource values. The committee is not recommending 'no harvest' for this area because there is not enough 'no harvest' target to cover this area in addition to other higher priority caribou areas. Development of this area in the short term is a significant issue for conservation stakeholders and the Ulkatcho First Nation (who would prefer to see this area as 'no harvest' but particularly do not want development to occur before 2005). There is no direction indicating that harvest must occur here in the short term, however one licensee has already undertaken cutblock planning in the area.

Table 6. Summary of Recommended Modified Harvest Areas Available For the Period 2000 - 2005.

CCLUP Subunit	Potential Areas Available in the Short Term
Baezaeko	all modified harvest areas
Kluskus	all modified harvest areas
Anahim Lake	all modified harvest areas
Chezacut	all modified harvest areas
Itcha Ilgachuz	all modified harvest areas, except in the vicinity of: southwest of Baldface Mountain (modified harvest), Shag Creek*, northeast of the Riverside Satah Mtn. camp* and the migration corridor between the Rainbows and the Ilgachuz*.
U. Blackwater	all modified harvest areas

*These areas are located outside the deferral area and in accordance with the CCLUP 90 Day Report (1995) were to be available immediately. The committee is recommending that planning in these areas be avoided in the short term, if possible, until appropriate practices and interim operational guidance can be developed.

Since TEM mapping, available in 1999, will help to further refine boundaries of 'modified' and 'no harvest' areas, we recommend no adjustments to these lines in the short term. It is possible that lines will be moved up or down through this refinement process, therefore it is preferable that in the short term cutblocks not be placed up to the boundaries in order to retain flexibility to make adjustments.

The committee will be developing criteria for reasonable operational flexibility in determining the final location for harvesting areas in relation to the boundaries of the 'modified harvest' and 'no harvest' areas as part of the Caribou Strategy in 2000.

Rationale For Changes to Interim Strategy

The updated 'option A' that is recommended by the committee as an interim strategy has some significant changes from the 1996 'option A'. The 'modified harvest' areas were selected to best maintain caribou values while taking into account stakeholder values and making the best use of overlap opportunities to better meet all CCLUP targets, as directed by the committee Terms of Reference (Appendix I). The rationale for the various changes by subunit is summarized as follows:

Baezaeko

Some 'no harvest target' is recommended to be shifted from the Baezaeko CCLUP subunit to the Itcha/Ilgachuz CCLUP subunit with a subsequent increase in 'modified harvest' area. This shift would make the 'no harvest' more central to the caribou range rather than peripheral and place it outside the deferral area. Both stakeholder groups had suggested this change and it appears to have a neutral effect for caribou.

Kluskus

Due to low use and low present suitability this area was all classified as 'modified harvest'.

Anahim Lake

Some 'modified harvest' target (about 15,000 ha) is recommended to be shifted from low elevation within the Chezacut CCLUP subunit to the Anahim CCLUP subunit in order to address the mistletoe-silviculture issue in the SBPS zone and to account for recent caribou telemetry information. Although this is felt to be a basically neutral change for maintaining caribou habitat values there is an associated risk that the areas where the 'modified harvest' target have been recommended to be moved are in higher snowfall areas (in MS zone) and therefore may be less able to support caribou during hard winters. Monitoring of snowfall and caribou use in these areas will continue over the next 2 years in an attempt to determine if this is a significant concern.

Chezacut

See Anahim Lake above.

Itcha/Ilgachuz

Due to high disturbance levels in the Baldface Mountain area, it is recommended that this area be changed from 'no harvest' to 'modified harvest'; this recommendation fits the same criteria as used in 1996 that areas already fragmented by logging be identified for 'modified harvest' instead of areas of high suitability. Due to higher level direction which indicates a commitment to timber harvest in Polygon B1 beginning in 2000, the committee has recommended shifting some 'no harvest' out of Polygon B1 to the south of Punkutleankut Creek (outside of deferral area). This is an area of high caribou use based on telemetry information and the shift is favoured by the licencees.

Upper Blackwater

Significant changes have been recommended in this CCLUP subunit primarily related to clarification of targets from the IAMC. The 'no harvest' has been located in a way to cover the highest telemetry use and a corridor for movement/exchange between the Entiako and Itcha/Ilgachuz caribou herds.

Stakeholder Input

Stakeholder representatives from the Major Licencees and the Conservation Council participated in the strategy update review process. There was a free exchange of technical information and maps, and several meetings were held with stakeholder representatives. During review of locations for ‘modified harvest’ areas the committee utilized maps of timber harvest opportunities provided by the MLSC to examine overlap opportunities. Stakeholder representatives were invited to make written and verbal presentations to the committee in regard to the draft working versions of the updated map. The MLSC technical representative made a presentation to the committee on concerns about the Itcha/Ilgachuz caribou draft map and provided the committee with written input from three licencees that operate in the western area. The Conservation Council technical representative provided the committee with written comments and concerns. Major stakeholder issues in the Itcha/Ilgachuz caribou area are summarized as follows:

A. MLSC

- Concern about the integration of caribou targets with other CCLUP targets
- Concern with the partial cutting approach
- Insufficient modified harvest identified in some licencee areas
- Ground level operational flexibility in modified harvest areas
- Specific proposed adjustments submitted by 1 licencee

B. Conservation Council

- ‘No harvest’ should be located at the head of Bryant and Holte Creeks
- Timber harvest in Polygon B1 is not supported before 2005
- Further ‘no harvest’ adjustments (if necessary) should not be taken from the Moore Creek area but instead should be taken from the North Hill area in the Quesnel District.

Stakeholder input was addressed in a number of ways, including:

- a major shift of ‘modified harvest’ from the SBPS to the MS to avoid dwarf mistletoe and pine beetle problems;
- a significant shift of ‘no harvest’ from north to south of Punkutlaenkut Creek into area of poorer quality timber and significant previous logging;
- a shift of ‘no harvest’ out of the Baezaeko Enhanced zone to the northeast edge of Itcha/Ilgachuz Park in an area less desirable for harvesting;
- limiting ‘modified harvest’ in polygon B1 to address conservation concerns;

In addition, the committee has developed more detailed, updated information on the recommended modified harvest approach (below) in order to address licencee concerns and questions in this area.

Timber Harvesting Strategy

The following is an update on the interim timber harvesting approaches that are recommended by the committee for the Itcha/Ilgachuz caribou. Results of ongoing research will be incorporated into the complete caribou strategy due in 2000. All approaches discussed are fully compatible with the impacts modelled in the Cariboo-Chilcotin Land Use Plan Integration Report (1998).

The range of the Itcha/Ilgachuz caribou has been fairly well defined by years of radio-telemetry data (Figure 10). The CCLUP specifies that approximately half (56%) of the range of this caribou population is designated as parks or available for 'no harvesting' and 'modified harvesting' to meet caribou needs (see Figure 10). To maintain caribou, targets in the land use plan are included to allow for more mature and old forest habitat than the Biodiversity Guidebook since terrestrial and arboreal lichens are more abundant at these forest ages and caribou select these areas. The remaining approximately half (44%) of the range has no land use plan targets for managing for caribou so management must fit within other targets (e.g. Biodiversity Guidebook). Given this higher level plan direction there should be a threefold approach for managing the habitat of the Itcha/Ilgachuz caribou.

1. Park and 'No Harvest' Areas (35% of caribou range)

These areas provide a core habitat that will have little or no road access (some 'salvage' harvesting in 'no harvest' as per CCLUP Integration Report). This provides caribou not only with suitable space (habitat) in which to meet their needs but also a large area relatively free of harvest and harassment by humans (provided the use of snowmobiles and ATVs, and other activities are adequately controlled). Since logging will not create more early seral habitat (or very little as in the CCLUP Integration Report), moose will not be enhanced which will help protect caribou from additional predation pressures caused by increased wolf numbers.

2. 'Modified Harvest' Areas (21% of caribou range)

These areas will be managed to maintain caribou habitat continuously through time and space. Harvesting approaches will also discourage the enhancement of moose habitat. Stringent access control measures will be necessary.

3. 'Conventional Harvest' Areas (44% of caribou range)

These areas will be managed to emulate the natural disturbance pattern and structure to the extent allowed in the Biodiversity Guidebook and landscape unit emphasis. Stand level placement of Wildlife Tree Patches (WTPs) could target better caribou habitat. Good access management will be encouraged.

The following will elaborate on the management approaches in the 'conventional' and 'modified' harvest areas.

A) ‘Conventional Harvesting’ Area Outside of the CCLUP Caribou Area (44% of Itcha/Ilgachuz caribou range)

This approach acknowledges that caribou habitat values will not be maintained continuously through time or space but this is the best that can be done within the higher level plan direction. This will allow for some caribou use, but not to full capability since many areas will not be suitable caribou habitat for significant periods of the rotation. Indeed, most of this area has already been accessed and many clearcuts with no reserves are present. In this area (outside the CCLUP caribou area) the strategy is to emulate natural disturbance patterns to the extent allowed in the biodiversity guidebook. However, the Biodiversity Guidebook allows for much less mature and old forest than was present in the pre-industrial natural disturbance landscape. The approach outside the CCLUP caribou area includes clearcutting with reserves and large patch sizes.

‘Conventional Harvesting’ Approach

1. Apply the Biodiversity Guidebook for this Natural Disturbance Type (NDT) including the seral stage distribution according to the assigned emphasis of each landscape unit. Most draft landscape units have been assigned intermediate emphasis in this area.
2. Much of this area has been fragmented into medium sized clearcuts by existing harvesting. Create larger patches by aggregating cutblocks and identify available large leave areas for the medium term as specified in the Biodiversity Guidebook.
3. Place Wildlife Tree Patches (WTPs) in heavier lichen sites if they meet the requirements of WTPs according to the Biodiversity Guidebook.
4. To the extent possible, follow the access management direction as described in the 1996 Caribou Strategy Report.

B) ‘Modified Harvest’ Area Inside the CCLUP Caribou Area (21% of Itcha/Ilgachuz caribou range)

The CCLUP allows for two area designations - ‘no harvest’ and ‘modified harvest’, and specifies how much of each is allowed. Any ‘modified harvest’ that incurs longer rotations must be within the targets allowed by the CCLUP. The ‘modified harvest’ approaches described in this document are those modelled by the CCLUP Integration Report (1998).

Areas of ‘no harvest’ are identified by the committee in large, contiguous areas of caribou habitat. This minimizes the concern about access issues and serves to separate caribou and moose habitat. Similarly, areas of ‘modified harvest’ are identified as large, contiguous areas of caribou habitat.

Maximizing suitable space (i.e. suitable habitat) is an essential caribou survival strategy to successfully face predation pressures (mainly from wolves). Research throughout North America has indicated that where suitable space (habitat) is not maintained, caribou populations decline or become extirpated. Therefore, all stands should maintain their habitat value, that is, remain as suitable space for caribou continuously through time where this is ecologically possible.

One essential feature of suitable space is the presence of lichen forage. Given this key element of the strategy, stands should be managed, if ecologically possible, to retain and grow lichen continuously through time. Inside the CCLUP caribou area the strategy is to emulate the natural disturbance pattern of *patch sizes* to the extent allowed in the Biodiversity Guidebook (i.e. patch sizes up to 1000 ha). In addition to the following harvesting approaches it is essential to follow the access management direction as described in the 1996 Caribou Strategy Report.

'Modified Harvesting' Approach on Terrestrial Lichen Sites (~17% of Itcha/Ilgachuz caribou range)

The objective on these sites, which are estimated to cover 80% of the area available for modified harvesting ($80\% \times 21\% = 16.8\%$), is to maintain terrestrial lichens by minimizing mechanical damage during harvesting and by providing partial shading to maintain the proper growing environment for the lichens. Volume removal and opening sizes must be appropriate so that caribou still consider the entire stand as suitable habitat.

1. Maximize the size of cut patches and leave patches as allowed for this NDT in the Biodiversity Guidebook.
2. Harvest in winter on a suitable snowpack so that terrestrial lichens are not physically damaged.
3. Harvest only 50% of the cutblock through an irregular group shelterwood system. The remaining half of the stand can be harvested when the new trees reach about 10 to 15m in height (current estimate for this is 70 years).
4. Harvest openings should be about 2 tree-lengths wide and up to 3-4 tree-lengths long. Experience on adaptive management trials indicates that 30m x 50m openings are reasonably efficient to harvest, and may provide enough partial shade for lichens and enough light for seedling growth. Of course, research results over the mid term will answer these questions more conclusively.
5. Harvest openings may be oriented to maximize insolation.
6. Two logging methods are possible including: 1. feller/buncher (preferably a no-tail-swing model to minimize damage to residuals) and grapple skidding

(carefully done to minimize damage to residuals) to roadside processor, or 2. feller/buncher (preferably a no-tail swing model in minimize damage to residuals), processing at the stump and forwarding to roadside. Both of these methods are being tested in a replicated research trial. Since there are advantages and disadvantages to each, currently either one is acceptable.

7. If processing is done at the stump then slash should be piled to minimize contact with lichen. Slash piles should be long and narrow to minimize stocking voids. The adaptive management trials have shown that best results occur when slash is carefully piled against the trees surrounding the openings. This results in the least impact to terrestrial lichen and minimizes the loss of plantable spots. If processing is done at the roadside, minimize the area impacted.

'Modified Harvesting' Approach on Arboreal Lichen Sites (~ 4% of Itcha/Ilgachuz caribou range)

The objective on these sites, which are estimated to cover 20% of the area available for modified harvesting ($20\% \times 21\% = 4.2\%$), is to maintain arboreal lichens by minimizing mechanical damage during harvesting and by maintaining a suitable micro-climate for the lichens on the remaining stems. As the openings are reforested, the surrounding residual stand will provide the lichen fragment source to quickly inoculate the new age-class. Volume removal and opening sizes should be small enough so that caribou still consider the entire stand as suitable habitat.

1. Maximize the size of cut patches and leave patches as allowed for this NDT in the Biodiversity Guidebook.
2. Season of harvesting is not restricted by caribou concerns.
3. Harvest by applying 33% volume removal group selection.
4. Harvest openings should be 2-3 tree-lengths wide and up to 3-4 tree-lengths long. Experience on adaptive management trials indicates that 30m x 50m openings are reasonably efficient to harvest and may be suitable for lichen. Where windthrow and windscouring of lichens are not concerns the openings could be somewhat longer. Options are being tested in adaptive management trials. Openings should be less than 1 ha in size.
5. Harvest openings may be oriented to maximize insolation.
6. Two logging methods are possible including: 1. feller/buncher (preferably a no-tail-swing model to minimize damage to residuals) and grapple skidding (carefully done to minimize damage to residuals) to roadside processor or 2. feller/buncher (preferably a no-tail swing model to minimize damage to residuals), processing at the stump and forwarding to roadside. Both of these

methods are being tested in a replicated research trial. Since there are advantages and disadvantages to each, currently either one is acceptable.

7. If processing is done at the stump then slash should be piled to minimize contact with terrestrial lichen as most arboreal sites have some terrestrial lichen. Slash piles should be long and narrow to minimize stocking voids. The adaptive management trials have shown that best results occur when slash is carefully piled against the trees surrounding the openings. This results in the least impact to terrestrial lichen and minimizes the loss of plantable spots. If processing is done at the roadside, minimize the area impacted.

There are many more details that could be added to explain how the harvesting can be conducted most efficiently.

'Modified Harvesting' Approach on Dwarf Mistletoe Sites

Since dwarf mistletoe is ubiquitous in the SBPSxc, any form of partial cutting in this subzone is problematic. To address this concern the committee has proposed to move much of the 'modified harvest' in the SBPS to the MS in the southern part of the winter range (north of Chantslar Lake). Both areas receive considerable caribou use so the switch should have a neutral effect on caribou. The only concern is the possible deeper snowpack in this part of the MS compared to the SBPS. Mistletoe reaches its' ecological limit in the MSxv and is therefore far less common than in the SBPSxc. However, on MS sites, especially near the MS/SBPS ecotone, mistletoe can still be present. As currently identified, most of the 'modified harvesting' is not along the ecotone. One approach to sites with spotty mistletoe, as demonstrated by Riverside on the Satah Mountain adaptive management trials, is to plant spruce instead of pine. The implications of such a species shift on the lichen community has yet to be determined, even though spruce is considered an acceptable species in the MS in all but subxeric and xeric sites. In any case, on such blocks we recommend:

1. carefully mapping the mistletoe infected micro-sites
2. targeting the harvest openings to these areas
3. only planting spruce in parts of the block where mistletoe remains and where spread of the infection is a concern.

Decision makers should consider the possibility of modifying dwarf mistletoe rules in MS stands where very low levels of infection occur.

An appropriate system has yet to be developed for sites *heavily infected* with dwarf mistletoe (SBPS). Once again, these are probably limited to the SBPS in the area currently identified for 'modified harvesting'. One possibility is large clearcuts with large wildlife tree patches (located in the best lichen sites) occupying a greater percentage of the block than allowed by the biodiversity guidebook. Measures to slow the spread of mistletoe could be explored along the edges of the WTPs. We recommend not harvesting on such sites over the next 5 years so that the extent of these heavy infestations can be determined and an appropriate system can be developed.

General ‘Modified Harvesting’ Approach on Lichen Sites

The committee recommends the following (unchanged from the 1996 Caribou Strategy Report) timber management approach in ‘modified harvest’ areas:

- on terrestrial lichen sites, two-sevenths of the ‘modified harvest’ area could be harvested within the first 20 year period; assuming harvesting on an even flow basis.
- on arboreal lichen sites, one-quarter of the ‘modified harvest’ area could be harvested within the first 20 year period; assuming harvesting on an even flow basis.
- a 3-pass system in every landscape unit (one-third of individual landscape units could be logged in any 20 year period), notwithstanding the above;
- an aggregated cut (in time and space) in specific landscape units over short time periods (5 years), followed by putting roads to bed and not entering the area again for 20 years;
- logging up to the Biodiversity Guidelines (provided a 3-pass system is utilized);
- high end of spectrum for block size (1000 hectares) to be used for partial cuts.

‘Modified Harvesting’ Approach on Non-Lichen Sites

Ecosystem mapping (available in 1999) may provide a better understanding of the distribution and extent of sites with neither terrestrial nor arboreal lichens. Current experience indicates that these are rare within the Itcha/Ilgachuz caribou range that is available for modified harvesting.

An appropriate harvesting system has yet to be developed for these non-lichen sites. The strategy would be to use a system which may establish forage lichens in time given that this is ecologically possible on the site. For example, canopy removal and forest floor disturbance (probably using clearcutting with reserves) may possibly enhance terrestrial lichen production on moss sites in the long term. This would emulate the natural disturbance pattern of this NDT. A better understanding of lichen succession in especially the MSxv will contribute to the development of this approach.

Questions Frequently Asked About The Timber Harvesting Strategy In Itcha/Ilgachuz Caribou Habitat

Why not just harvest to emulate natural disturbance patterns?

The primary objective for this area according to the CCLUP is to maintain this provincially significant caribou herd. The emulation of natural disturbance patterns as a way to manage for biodiversity is a secondary objective. The threefold approach already described is the best approach to ensure the long-term success of these caribou.

For those concerned about biodiversity, much of the range of these caribou will be managed in a manner fully compatible with the maintenance of biodiversity. Significantly, in 79% of the range of the Itcha/Ilgachuz caribou, biodiversity and natural disturbance patterns and structure will be maintained by parks, ‘no harvest’ and ‘conventional harvest’ (to the extent allowed in the biodiversity guidebook) areas. Only 21% will be managed through ‘modified harvest’ specifically for caribou. Even in these modified harvest areas the natural disturbance pattern of patch size is recommended; while the prescription does differ from the natural stand structure in order to maintain caribou habitat continuously through time and space. In these areas research is exploring if there is any noticeable impact on elements of biodiversity.

Isn't uneven-aged management for pine stands unusual?

Yes it is unusual, but innovative solutions sometimes require approaches other than the norm. A common misunderstanding is that all the recommended ‘modified harvest’ is uneven-aged management of pine. In fact, 80% of the ‘modified harvest’ is most correctly labelled modified irregular group shelterwood i.e. not true uneven-aged management. Fifty percent of original stand is initially removed in medium sized openings (30 x 50m). Then, as previously stated, the remaining original stems can be removed when the new trees reach 10 to 15 m in height. This will produce a patchy two-aged stand.

On 20% of the ‘modified harvest’ area (arboreal lichen sites) or ~ 4% of the range of these caribou a true uneven-aged approach, namely group selection is recommended. On these areas, openings will be 30 x 50 m or even larger. Larger openings (30 x 75m, and 30 x 100m) will be tested on the Chezacut adaptive management trial.

Will pine grow in openings of 30 x 50 m?

An examination of naturally occurring openings of this size indicates that pine will grow. The question becomes —how fast will it grow? Observations show that height growth is noticeably less within 5 m from an opening edge. How long this will persist is unknown. Further from the forest edge, pine growth is similar to larger openings. Along edges, some reduction in pine growth rate may have to be accepted since maintenance of caribou is the priority in this area. Long-term growth and yield data will clarify this issue. Planting spruce along the edges receiving least light may be another option to consider on ecologically appropriate sites. However, the implications of this for lichens must first be explored.

The CCLUP Integration Report (1998) did not examine any growth rate issues with regard to partial cut treatments for any resource. Had it done so, there would undoubtedly be both positive and negative implications to the long-term yield. The need for growth

and yield data has not stopped application of any other modified harvesting modelled in the Integration Report.

Will the original stand no longer be standing if we wait to remove only 33% of the volume every 80 years on arboreal lichen sites?

Firstly, the changes to the location of the modified harvest areas places it virtually all in the MSxv. Pine in the MSxv has a longer pathological rotation than pine stands in the SBPS. Evidence of this is found in the greatly reduced incidence of mountain pine beetle and dwarf mistletoe in the MSxv. Secondly, old pine stands do exist in the MS although our inventory system was never designed to identify them. Thirdly, stands don't suddenly disappear. Stand volume reaches a maximum over time and then may indeed somewhat decrease while succession may gradually favour more spruce. Finally, it is quite possible that after a few decades of growth and yield information and lichen growth data that the cutting cycle may be shortened. We always have the option of shortening the cutting cycle if research shows this to be acceptable.

See the 1996 Caribou Strategy Report for an explanation of why we recommend long cutting cycles for arboreal lichen sites.

Why is harvesting using forwarders required since using forwarders is expensive?

The use of forwarders is NOT currently required. We are testing the use of forwarders as well as conventional skidders. It is too early to say if one system is better than the other. Both have advantages and drawbacks. Early impressions are that both systems can produce minimal impacts to terrestrial lichens if operating on a suitable snowpack.

IV. KEY RECOMMENDATIONS AND ISSUES

The following is a list of the key recommendations and issues related to the current task. Other recommendations are contained within the body of the report.

1. The updated 1998 'option A' maps for Eastern and Itcha/Ilgachuz caribou are recommended as interim guidance for forest development planning purposes for the years 2000 to 2005. The current updated identification of 'modified harvest' (and 'no harvest') should be reviewed again in 1999 or 2000 once ecosystem mapping is complete in order to fine tune boundaries and make other adjustments to get to exact targets and closer to the final strategy. Specific proposed adjustments from stakeholder groups were reviewed to determine if impacts to caribou were neutral. Some proposals were deemed to be a negative impact on caribou and were not incorporated. Other refinements will be made once TEM mapping is completed.

2. Future updates for the Itcha/Ilgachuz caribou should give further consideration to shifting some 'no harvest' target from the Upper Blackwater CCLUP subunit to areas of high wetland density and higher caribou value within the Quesnel District. Some consideration should also be given to locating some 'no harvest' in the area southwest of Baldface Mountain (currently 'modified harvest').
3. Some identified 'modified harvest' areas where there is less certainty around the location of the map line at this time are recommended to be not available for timber harvest in the short term. These areas are identified earlier in the report. All other areas would be acceptable for access in the first five years if the recommendations for aggregating the cut in time and space are followed.
4. A significant unresolved issue revolves around the area west of Punkutlaenkut Lake at the head of Bryant and Holte Creeks that the committee would like to highlight to the IAMC. The area does receive winter caribou use and has other overlapping 'non-timber' resource values. The committee is not recommending 'no harvest' for this area because there is not enough 'no harvest' target to cover this area in addition to other higher priority caribou areas. Development of this area in the short term is a significant issue for conservation stakeholders and the Ulkatcho First Nation (who would prefer to see this area as 'no harvest' but particularly do not want development to occur before 2005). There is no direction indicating that harvest must occur here in the short term, however one licensee has already undertaken cutblock planning in the area.
5. For Itcha/Ilgachuz caribou, some shifts of 'modified harvest' between subunits are recommended to best address caribou use and mistletoe-silviculture issues.
6. For Itcha/Ilgachuz caribou, a shift of some 'no harvest' outside of the deferral line is recommended to address Polygon B1 direction; this is a shift of 'no harvest' into an area of poorer quality timber and significant previous logging. The committee recommends no further 'modified harvest' in Polygon B1 to address conservation concerns.
7. For Eastern caribou, *early winter ranges* as identified in this report have no specific CCLUP target. These areas should be addressed through sub-regional planning, the identification of OGMA's (old growth management areas) or through provisions of the FPC. If harvesting must take place, we recommend the group selection system although there is no CCLUP provision for extended rotations in these areas.
8. Additional *dispersed early winter use* of low elevation habitat occurs in old cedar hemlock stands along the North Arm of Quesnel Lake between Isaiah Creek and Watt Creek, near the mouth of Abbott Creek and near the mouth of Lynx Creek. It is recommended that caribou requirements in these areas be addressed through sub-regional planning or provisions of the Forest Practices Code. There is a need to ensure that old growth forest attributes are maintained in a portion of the stands

within the ICH zone within the affected landscape units. The specific prescription will be defined by the year 2000.

9. The CCLUP 90 Day Report (1995) calls for attention to management of caribou travel corridors for Eastern caribou, as they are identified. Work is not yet complete regarding delineation of travel corridors, although current information does allow insight into their general location. It is expected that travel corridors and appropriate practices will be more clearly delineated in development of the Caribou Strategy in 2000.
10. The impacts of snowmobiling activity on present and future caribou distribution in both 'no harvest' and 'modified harvest' areas is a significant concern. It is recommended that the committee will work to define portions of the caribou range that are sensitive to snowmobile use and provide this information as input to subregional planning processes. It is recommended that this work should be completed by Fall 1998.

V. CONCLUSIONS

Based upon the current review and update of the preliminary identification of modified harvest areas, the committee has recommended several changes to the distribution of 'modified harvest' and 'no harvest' targets in both the eastern and Itcha/Ilgachuz caribou areas. These changes have been recommended primarily based on current knowledge of caribou use patterns from telemetry studies and following direction provided by the CCLUP, the Integration Report (1998) and the IAMC. Proposed changes were reviewed in the context of timber availability, based on input received from the MLSC technical representative, to ensure that areas identified as 'modified harvest' had opportunities for timber harvest. Written and verbal input received from stakeholders was reviewed and suggestions were incorporated if the potential effect on caribou was neutral.

Updates on recommended timber harvesting approaches have been included for 'modified harvest' areas in the Eastern and Itcha/Ilgachuz caribou areas. These harvesting approaches reflect the best current strategy given the higher level plan direction, knowledge of caribou needs, ecology of arboreal and terrestrial forage lichens, Engelmann spruce, subalpine fir, and lodgepole pine silviculture, and timber harvesting. Understanding gained over the next two years will be incorporated into the caribou strategy due in 2000.

Another update of the 'modified harvest' distribution is required in 1999 before the final strategy is produced in 2000. TEM mapping and additional caribou distribution knowledge from ongoing work will be available for incorporation into the next updated interim strategy. Stakeholders will have the opportunity to review and provide input on future updates of the strategy.
