

Relationship of Mule Deer Winter Range Planning to Integration Report Direction

The CCLUP Integration Report (April 15, 1998) provided both short and long-term direction on integrated management for mule deer winter ranges in the Cariboo Forest Region. This direction has provided the foundation for the winter range planning process developed by the Mule Deer Working Group as well as for research and development activities which are required to implement the CCLUP direction on mule deer management. In preparation of the template for mule deer winter range planning, the Mule Deer Working Group has worked to provide a very balanced approach to co-ordinating management of timber and habitat values in accordance with integration report direction. Critical elements of this balance include the following:

- 1) plans which include long-term objectives to provide a management vision to work towards as well as providing long-term certainty for both timber flow and habitat supply
- 2) transition plans in which timber harvesting flexibility over the next 30 years is proportional to current habitat quality
- 3) limitation of the transition period to only 30 years even though a number of winter ranges will likely not meet habitat objectives at that time
- 4) special zoning and other considerations for wood lot tenures
- 5) recommendation for a minimum cutting cycle of 30 years rather than the 50 year cycle used in TSR analysis
- 6) greater flexibility to pursue commercial thinning opportunities even in winter ranges in poor habitat condition
- 7) greater flexibility for harvest prescriptions in low crown closure habitat
- 8) greater opportunities for “handbook logging” even in winter ranges which do not currently meet habitat objectives

This greatly increased flexibility will allow much more management access to valuable winter range habitat and will entail increased risk to habitat values unless forestry activities are very well managed. The increased flexibility will require more effort and greater accountability from foresters developing silviculture prescriptions on winter range as well as from those responsible for ensuring that silviculture prescriptions are carefully implemented on the ground.

Government agencies will need to carefully monitor the implementation of these plans at both the stand and whole winter range scales to ensure that habitat values are not being put at risk.

The following tables document management approaches developed by government agencies and the Mule Deer Working Group since the release of the Integration report and describes how these approaches are designed to meet Integration Report direction. Appendix 1 describes how the best current yield assumptions for the mule deer management relate to the long-term Integration Report direction that management for high and moderate crown closure and old seral on winter range will provide 66% of the yield of conventional selection harvesting practises. Appendix 2 recommends and describes a process for ongoing evaluation of how well winter range plans are meeting Integration Report direction on short-term timber flow.

Table 1. Management approaches designed to meet long-term integration report direction.

Long-term Integration Report Direction	Management Approach
1) “the Handbook for Timber and Mule Deer Management is the basic planning standard for landscape and stand level forest resource management”	<ul style="list-style-type: none"> • The “Handbook” is being used as the basis for determining the proportions of each habitat type required in each winter range plan. The only exception to this is the creation of a “transition ” snowpack class which will include some of the winter ranges formerly in the “deep” snowpack class as described in the CCLUP Mule Deer Winter Range Strategy. • Stand level guidance is based on the Handbook and will be refined for the more site specific conditions applicable to each ecological type.
2) “the predicted impact of applying the MDWR prescription is based on a timber impact availability ratio of 1.5:1 between normal Douglas-fir management and MDWR management. This ratio means that over the long term, the portions of MDWR managed for high and moderate crown closure should produce 66% of the timber produced on comparable areas without mule deer constraints.”	<ul style="list-style-type: none"> • The analysis included in Appendix 1 shows that the best current yield assumptions for moderate, high and old growth on mule deer winter ranges will provide a yield of 65 - 66%, relative to normal Douglas-fir management over all of the shallow and moderate snowpack winter ranges which cover approximately 79% of the Douglas-fir winter range area in the CCLUP. We do not currently have adequate information for assessing relative yield for the mule deer management in the transition and deep snowpack zones. In summary, the best current information suggests that we will probably be able to meet long-term integration direction using the current mule deer management prescriptions.
3) “the (<i>lodgepole</i>) pine component in mixed stands at or in excess of 40% fir content will be selectively harvested based on an 80 year rotation on an even flow basis”	<ul style="list-style-type: none"> • Short-term harvesting rules for mule deer winter ranges will allow a level of non-fir harvest compatible with even flow harvest. • In the longer term, it is expected that the Douglas-fir component of these stands will increase as they are as they are managed through partial cutting.
4) “there is no MDWR harvest constraints on (<i>lodgepole</i>) pine harvest in pure pine or in mixed stands of less than 40% fir content”	<ul style="list-style-type: none"> • management plans for mule deer winter ranges will allow this type of harvesting in all stands regardless of winter range condition

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5) “ stands identified for low crown closure management within MDWRs to be managed according to normal silviculture fir management with allowance for mule deer requirements including terrain considerations and a more clumped stem distribution. The identification of these low crown closure stands should be done through the MDWR planning process.”

Management Approach

- all stands to be managed for low crown closure in the long-term will be identified and mapped in mule deer winter range plans
- winter range plans will identify areas where the site is likely to be only capable of producing low crown closure habitat
- management prescriptions for low crown closure habitat will be more flexible with respect to residual stand structure but will still require consideration for clumpiness, and terrain considerations.

Table 2. Management approaches designed to meet short-term integration report direction.

Short-term Integration Report Direction	Management Approach
1) “ the primary objective is to achieve the crown closure objectives as quickly as possible”	<ul style="list-style-type: none"> the short-term transition strategy included in each mule deer winter range plan will balance the need to restore winter range condition with the need to harvest timber from winter ranges. The better the current condition of a winter range in relation to long term objectives, the greater the level of access and flexibility will be allowed for short-term timber harvesting.
2) “ In practice it is expected that MDWR management will shift to a wider attribute-based management over time.”	<ul style="list-style-type: none"> a wider attribute based approach has been developed as a refinement of the Handbook direction for the winter range stands in the Interior Douglas-fir Biogeoclimatic Zone which include approximately 75% of mule deer winter range habitat in the Cariboo Forest Region. This approach is described in MOF Research Extension Note #25. Over time, refined approaches will also be developed for other Biogeoclimatic Zones.
<p>3) “the overall level (<i>area</i>) of timber access (but not the location in most cases) proposed under the STTA to be available within the following types in order of priority:</p> <ul style="list-style-type: none"> MDWR which have achieved crown closure objectives and show timber availability under MDWR strategy; non-fir stands and areas to be managed for low crown closure; age class 5 Douglas-fir stands where Commercial thinning would provide benefits to MDWR values; high or moderate crown closure where selective logging can be done without impacting crown closure class.” 	<ul style="list-style-type: none"> the short-term transition strategy included in each mule deer winter range plan will balance the need to restore winter range condition with the need to harvest timber from winter ranges. It will provide increasing harvesting opportunities with increasing quality of current winter range condition in parallel with order of priority described in the integration report. It is anticipated that the total area of short-term harvesting access in the Cariboo Region identified in mule deer winter range plans will equal or exceed that of the 64,064 ha identified in the STTA. However, as pointed out in the Integration report, it will not necessarily be available in the same winter ranges and the same stand types as identified by the STTA. The total number of hectares made available by winter range plans will not be known until all plans are completed. Therefore, the approach suggested in Appendix 2 is recommended for interim monitoring to ensure that timber access being made available in individual plans is similar to that recommended by the integration report.

Appendix 1: Mule deer winter range long-term yield assumptions

The CCLUP Integration report has directed that forest management on mule deer winter ranges must be carried out in a way that would result in long term timber yields of 66% of the yield from standard uneven-aged management from moderate and high crown closure habitat. The integration report also directed that 25% of the winter range area managed for moderate and high crown closure habitat should also be managed to provide old seral habitat within the same long-term yield assumptions. The following analysis was done to evaluate of the ability to meet Integration Report direction on long term timber yield based on the best current yield assumptions for mule deer and old seral management. The analysis includes winter ranges in shallow and moderate snow zones which cover approximately 75% of the Douglas-fir mule deer winter range area in the CCLUP. Winter ranges in transition and deep snow pack zones are not included since we have no relative yield estimates for mule deer winter range harvesting in these areas.

The analysis was done in six steps as described below:

1. The long-term relative productivity assumptions for winter range management were made based on advice from Ken Day, the research forester from the UBC Research Forest who recently completed his Masters Degree studying uneven-aged forest management specifically for mule deer winter range prescriptions in dry-belt Douglas-fir. His analysis was modelled using the prescriptions provided in Research Extension Note #25 which describes the management required for maintaining high, moderate and low crown closure habitat in the IDF. These relative yield assumptions express the expected yield for each habitat type as a proportion of the expected yield from standard uneven-aged management. Other available estimates of relative yield include some subjective estimates from Ken Day which he said he thought had less validity than his modelling approach, as well as the Prognosis analysis done for the integration process. Ken's subjective estimate showed a similar relative yield for high crown closure but a lower relative yield for moderate crown closure. The Prognosis modelling showed significantly higher relative yields for both high and moderate crown closure regimes but were based on stands with a lower starting volume. Ken Day's modelling approach appears to be the best available estimate of relative yield since it was based on the most current habitat prescriptions, used a model calibrated with local data, and was done by a forester with significant expertise and credibility in the field of uneven-aged management in Dry-belt Douglas-fir. Therefore, these assumptions are used in the following analysis. The relative yield assumptions for old seral forest are based on preliminary evaluation by the Biodiversity Strategy Committee but are approximate since the attribute criteria for old seral have not been finalized and no modelling work has been done. A relative yield of between 15 - 25 was estimated for relative yield for the old growth prescription with 20% used for this analysis. The habitat proportions for winter ranges in each snow zone are those used in the integration analysis and recommended in the integration report.
2. This step simply excludes the low crown closure habitat from the analysis and adds a habitat type for old seral. Low crown closure habitat is excluded from the analysis because the

integration report assumes low crown closure habitat can be managed with prescriptions having the same yield as standard management. The old seral habitat is included to provide analysis of the impact of integration report direction that 25% of the winter range area managed for moderate and high crown closure habitat should also be managed to provide old seral habitat.

3. Step 4 first calculates the total area to be managed for high and moderate crown closure habitat in the shallow and moderate snow zones within the Cariboo Forest Region based on figures from the mule deer winter range strategy. The moderate plus high areas for each snow zone are then expressed as a proportion of the regional shallow plus moderate snowzone total for use in step 6.
4. Step 5 calculates a relative timber yield for winter ranges in each of the two snow zones. The yield assumptions from step 1 are weighted using the proportions of each habitat type within each snow zone from step 3. The weighted totals provide an estimate of the relative yield to be expected over the whole winter range in each snow zone given the assumptions from step 1. For example, the overall management for moderate, high and old habitats in the moderate snow pack zone would result in 65 % of the yield expected from standard management.
5. Step 6 calculates an overall weighted average for relative timber yields over all of the mule deer winter ranges in the shallow and moderate snowpack zones in the Cariboo Forest Region. The totals from step 5 are weighted based on the proportion of the winter ranges in each snow zone (from step 4) to calculate the weighted regional average. This figure estimates the relative yield to be expected from all of the winter ranges in moderate and shallow snowpack zones in the Cariboo forest region.

Results and Discussion

This analysis compares overall timber yields from mule deer winter ranges managed to provide moderate, high and old seral habitat as directed by the integration report with timber yield expected by application of standard management techniques. The analysis shows that relative yield assumptions of 89% for moderate, 56% for high and 20% for old seral result in overall relative timber yield of 65% for shallow and moderate snowpack winter ranges. This is within 1% of timber yield expectations from the integration report. At a relative yield of 25% for old seral, the overall relative timber yield is 66%. Therefore, based on the best current information, it seems likely that integration report long-term timber yields can be met. However, since there is no margin for error, it will be valuable to support research and adaptive management efforts to better understand the effect of stand structure on growth and yield on winter ranges to improve the precision of estimates.

Appendix 2 - Recommended procedure for interim monitoring of timber access on mule deer winter ranges

The procedure outlined below provides a method for estimating whether the short term timber access provided in individual mule deer winter range plans meets the expectations provided in the April 15, 1998 Integration report.

The Integration report assumed that, over the whole CCLUP area, the total area identified in the STTA for timber access on mule deer winter (68,064 ha.) would be available in the short-term. The integration report also stated that the area available for short-term timber access would not be in the same locations or stand types as recommended in the STTA.

The individual winter range plans, now being developed, identify short-term timber harvest opportunities compatible with integration report direction. Since all winter range plans will not be completed until 2005, it will not be possible to evaluate the total harvest opportunities made available in these plans over the whole CCLUP area as individual plans are completed. Therefore, in order to determine if the harvest opportunities identified in these plans will satisfy integration report direction, a procedure is required which will estimate the portion of the 68,064 ha which needs to be made available on each individual winter range. If, on average, the timber access targets are met or exceeded on individual winter range plans, then resource managers can be satisfied that when all plans are completed, the combined target for all winter ranges will be met.

The method described here will allocate proportions of the 68,064 ha of timber access to individual winter ranges based on the analysis done in the CCLUP mule deer winter range strategy. The strategy analysis estimated timber access by comparing current winter range condition to long-term objectives provided by the mule deer handbook. This method will meet the integration report direction that “the primary objective is to achieve the crown closure objectives as quickly as possible ” since it allocates harvest opportunities in proportion to the quality of current habitat in relation to long-term objectives. The formula below is used to calculate the Integration Report short-term timber access expectations by winter range:

$$E=(w/W)x Sx3/2$$

Where:

E= estimated area of short-term timber access allocated to each individual winter range
w= the potential harvest estimate from the CCLUP MDWR strategy for the individual winter range
W= the total harvest estimate from CCLUP MDWR strategy for all winter ranges = 67,778 ha.(38,116 ha fir and 29,662 ha. non-fir. Non-fir availability based on even flow access to 118,648 ha of mature non-fir over an 80 year rotation)

S = the total harvest estimate from the STTA for all winter ranges in CCLUP = 68,064 ha.
(44,975 ha fir and 23,089 non-fir)

3/2: The area must be multiplied by 3/2 to adjust for the 30 year transition period used for Mule Deer winter range plans compared to the 20 year period used for the STTA.

This formula is designed to calculate total regional timber access area equivalent to the STTA but distributed to individual winter ranges based on harvest expectation for the CCLUP Mule deer strategy.

The best assessment, at any given time, of how well winter range plans are meeting integration report direction on short-term timber access would come from the cumulative result of all winter range plans completed at that time. This would be done by comparing the sum of “E” for all completed winter range plans with the sum of the harvest opportunities identified on all completed plans. The timber access figures for each winter range plan will be in the Appendix of each plan and will include area available for “handbook logging, commercial thinning and an area equivalent for Douglas-fir bark beetle harvest.

Example calculation for Williams Lake/Chimney:

$E = (1532/67,778) \times 68,064 \times 3/2 = \underline{2308}$ ha. timber access expected in the 30 year transition period.

This is the timber access level which would satisfy the Integration report direction on short term timber access.

Monitoring of Timber Access Provided by MDWR Plans

Integration Direction on Short-term Timber Access

- “the over all level of timber access (but not the location in most cases) proposed under the STTA is to be available”
- “the access on individual winter ranges will vary substantially from that proposed by the STTA”.
- “ the primary objective is to achieve the crown closure objectives as quickly as possible”

Assumptions:

- CCLUP Timber access requirement for 20 years = STTA level = 64,084 ha.
- Timber access levels for each winter range should be proportional to their current condition as in the CCLUP mule deer management strategy.
- Allocate the 64,084 ha to winter ranges using proportions derived from the mule deer strategy.
- Correct for difference in time period

Example: Williams Lake - Chimney Winter Range

Thirty year timber access allocated to this winter range =

$$(1532/67778) \times 68064 \times 3/2 = \underline{\mathbf{2308 \text{ ha}}}$$

Timber access from plan over 30 years:

Low volume selection harvest	1614 ha
Commercial thinning	1454 ha
Non-fir conifer harvest*	100 ha
<u>Estimated fir beetle salvage</u>	<u>660 ha</u>
	<u>3828 ha</u>

Proportion of integration timber access provided by plan:

$$=(3828/2308) \times \% = \underline{\mathbf{166\%}}$$

*Non-fir conifer harvest represents 100% of the area of non-fir leading stands that are age class 4 and greater