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This is one of a series of Best Management Practices (BMP) documents that guide the activities of BC Timber Sales Skeena Business Area. The goal of this BMP is to provide general guidance to forestry planning and layout personnel for operations adjacent to key moose habitat features within the Skeena Business Area. This guidance builds on the existing management direction provided by the documents listed below in Table 1 and should be considered in areas within and outside of known Moose Winter Range polygons,

**Table 1 – Current Moose Management Direction by Management Unit**

TSA/TFL	Higher Level Plan	Ungulate Winter Range (UWR)	Forest Stewardship Plan
Kalum	Kalum LRMP and SRMP	Draft Order #6-009	BCTS-Kalum
Kispiox	Kispiox LRMP and SRMP, Cranberry SRMP, West Babine SRMP		BCTS - Hazelton
Nass TSA	Nass South SRMP	Draft Order #6-018	BCTS-Kalum
North Coast TSA	Central and North Coast Order, North Coast LRMP	Draft Order #6-014	BCTS-North Coast
TFL 1/ Cascadia TSA	Kalum LRMP and SRMP	Draft Order #6-009	BCTS-Kalum/BCTS North Coast
TFL 41/Pacific TSA	Kalum LRMP and SRMP	Draft Order #6-009	BCTS-Kalum/BCTS North Coast

Note: An Ungulate Winter Range Plan has been completed for Polygon M\_copp-1 of the draft #6-009 order (see References).

**GENERAL MANAGEMENT CONSIDERATIONS**

- Moose require access to a mix of forest age classes to meet their life requisites.
- Wetland complexes, lakes and ponds are used by moose during all seasons for foraging.

- Snow interception cover located around key habitat features where snow depths are critical such as wetlands, mineral licks, wallows, rutting areas, major riparian corridors, and valley bottoms is important to allow for the movement of moose.
- Snow depths exceeding 90 cm are considered limiting to moose.
- Thermal cover is required to provide relief from extreme winter temperatures.

The forest management focus adjacent to key moose habitat features is to provide for forage, snow interception, thermal and security cover. Consideration should be given to the following when operating around key moose habitat features:

### **Harvest Design**

- Moose require access to all seral stages and it is important to maintain mosaics of both early and older seral stages over a harvest rotation and across the landscape.
- Design irregularly shaped harvest units with scattered shelter patches in the range of 200 meters apart to provide forage, snow interception, thermal and security cover. Ideally, shelter patches should be composed of 60% conifers that are  $\geq 10\text{m}$  in height with more than 40% canopy closure in patches  $\geq 4$  tree lengths wide to ensure snow interception and thermal cover is maintained. Where possible locate the patches directly adjacent to key habitat elements such as wetlands, lakes, riparian areas, mineral licks and wallows.
- When designing the shelter patches consider size and orientation so as to limit wind damage and blowdown. Avoiding all windthrow is not practical or necessary and dispersed retention of live standing trees may be designed to meet coarse woody debris objectives over time. Conduct windthrow hazard and risk assessments for stand edges and any dispersed retention that is exposed to prevailing winds and design the pattern to fit site specific conditions.
- Protect mineral licks and wallows using stand-level measures such as wildlife tree patches. Consider the location of roads and skid trails; disruption of natural drainage patterns and ground water can damage these features.
- Locate roads away from lakes, wetlands, mineral licks, wallows and rutting areas and completely rehabilitate or deactivate in block roads adjacent to these key habitat elements immediately after the completion of harvesting.

### **Silviculture Systems and Practices**

- Single tree selection is not a favorable silviculture system to manage moose habitat. If it is used, consideration must be given to maintaining snow interception and thermal cover and enhancing forage production.
- Group selection and small clearcuts can be used to manage forage production adjacent to key habitat elements. Opening sizes of 1-5 ha that are configured to accommodate a three pass system are ideal.
- If the silviculture objectives include management of forage production, lower stocking targets could be prescribed. Broad leaf species should be considered an acceptable crop species.

- Adjacent to key habitat elements such as wetlands, attempt to meet target stocking densities to achieve the highest security, snow and thermal cover when the stand reaches pole-sapling stage.
- Avoid brushing key browse species such as dogwood, willow and cottonwood in and adjacent to key habitat elements.
- Maintain forage by “wounding” key browse species when releasing crop species. Consider cutting stems of brush species to encourage “hedging”.
- Protection of crop species from browse damage is extremely difficult and expensive. When planting adjacent to key habitat elements, use species that are least susceptible to browsing (e.g. Engelmann and Sitka spruce).
- To stimulate browse production consider juvenile spacing to reduce crop tree density within overstocked stands. Prune crop trees to increase light penetration and support forage production longer into the rotation.

## **Roads**

- Allow for natural establishment of willows along decommissioned road right-of-ways.
- Limit road development and motorized access by recreational users within moose winter ranges. Where road avoidance is not practicable, use measures to maintain security, such as maintaining dense coniferous visual screens, deactivating/closing roads before November, building temporary roads and/or rehabilitation of road right-of-ways.
- Where practicable, limit moose disturbance in winter by using measures such as: geographically focusing roads and operations within a given winter range, restricted access and timing of activities.
- Where practicable, retain, enhance or plant visual screens to obscure the winter ranges from high-use transportation corridors

## **Sources of Additional Information**

- a) BCTS North Coast Forest Stewardship Plan – FSP Reference # 06 and 07

[http://www.for.gov.bc.ca/ftp/TSK/external/!publish/FSP/NorthCoast-FSP/FSP-Amendment-2/NC-FSP-Amendment/BCTS\\_NC\\_FSP\\_Amend%20Approved\\_Jun-8\\_2010.pdf](http://www.for.gov.bc.ca/ftp/TSK/external/!publish/FSP/NorthCoast-FSP/FSP-Amendment-2/NC-FSP-Amendment/BCTS_NC_FSP_Amend%20Approved_Jun-8_2010.pdf)

- b) BCTS Kalum Forest Stewardship Plan – FSP Reference # 12 and 13

[https://www.for.gov.bc.ca/bcts/areas/TSK/FSP\\_Kalum\\_A1.htm](https://www.for.gov.bc.ca/bcts/areas/TSK/FSP_Kalum_A1.htm)

- c) Hazelton Forest Stewardship Plan – Sections 2.6.2, 3.7.3, and 4.6.1

[http://www.for.gov.bc.ca/ftp/TSK/external/!publish/FSP/BCTS-Hazelton-FSP/FSP\\_Documents/BCTS%20Hazelton%20FSP%20Mar%2013%202008%20Approved%20July%2023%202008.pdf](http://www.for.gov.bc.ca/ftp/TSK/external/!publish/FSP/BCTS-Hazelton-FSP/FSP_Documents/BCTS%20Hazelton%20FSP%20Mar%2013%202008%20Approved%20July%2023%202008.pdf)

- d) Species at Risk Notices

<http://www.env.gov.bc.ca/wld/frpa/notices/uwr.html>

e) GAR Orders

[http://www.env.gov.bc.ca/wld/frpa/uwr/approved\\_uwr.html](http://www.env.gov.bc.ca/wld/frpa/uwr/approved_uwr.html)

f) Nass South SRMP

<http://www.ilmb.gov.bc.ca/slrp/srmp/south/nass/index.html>

g) Kalum SRMP

<http://ilmbwww.gov.bc.ca/slrp/srmp/north/kalum/index.html>

h) Kalum LRMP

[http://www.ilmb.gov.bc.ca/slrp/lrmp/smithers/kalum\\_south/index.html](http://www.ilmb.gov.bc.ca/slrp/lrmp/smithers/kalum_south/index.html)

i) Cranberry SRMP

<http://www.ilmb.gov.bc.ca/slrp/srmp/north/cranberry/index.html>

j) Kispiox LRMP

<http://ilmbwww.gov.bc.ca/slrp/lrmp/smithers/kispiox/index.html>

k) Kispiox SRMP

<http://ilmbwww.gov.bc.ca/slrp/srmp/north/kispiox/index.html>

l) West Babine SRMP

[http://ilmbwww.gov.bc.ca/slrp/srmp/north/west\\_babine/index.htm](http://ilmbwww.gov.bc.ca/slrp/srmp/north/west_babine/index.htm)

m) North Coast LRMP

<http://archive.ilmb.gov.bc.ca/slrp/lrmp/nanaimo/ncoast/index.html>

## References

1. Wall, W.B., M. Belisle, and L.A. Luke. 2011. British Columbia's interior: Moose Wildlife Habitat Decision Aid. *BC Journal of Ecosystems and management* 11(3)L45:49. <http://jem.forrex.org/index.php/jem/article/view/46/39>
2. Ministry of Forests, Lands and Natural Resource Operations, *Nass South Sustainable Resource Management Plan*, June 2012 appendix B/1 and C/1. <http://www.ilmb.gov.bc.ca/slrp/srmp/south/nass/index.html>
3. BCTS Skeena Business Area, Best Management Practice Stand Level Retention, September 2012.
4. Golder Associates., March 2013. Ungulate Winter Range No. 6009 Moose Management Plan for Polygon M\_copp-1. [G:\BCTS\PLANNING\\_TSK\SAR\\_UWR\\_WHA\\_Wildlife\Wildlife\\_General\Moose\6-009\\_Moose\\_UWR\\_Plan\12-1492-0139-R-Rev0-UWR\\_Management\\_Plan\\_15MAR\\_13.pdf](G:\BCTS\PLANNING_TSK\SAR_UWR_WHA_Wildlife\Wildlife_General\Moose\6-009_Moose_UWR_Plan\12-1492-0139-R-Rev0-UWR_Management_Plan_15MAR_13.pdf)