Horsefly Wetbelt Mule Deer Winter Range Study
Year 1 - Summary Report

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Executive Summary

The relationship between snow depths, topographic features (elevation, aspect slope) and deer habitat use were studied on the Horsefly Lake Wetbelt Mule Deer Winter Range (MDWR) between December 2001 and March 2002. Although the first year's data indicated some typical patterns of snow accumulation with topographic features (e.g., steep warm slopes have less snow than flat areas), further sampling is required to determine the complex interactions between topographic variables and stand structure. Preliminary data on deer habitat use indicated deer were widely dispersed during moderate to deep snow depths (36-60 cm), but shifted to areas with less snow (steeper warm slopes) during March when very deep snow depths (>60 cm) were present.

Acknowledgements
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Triton field crews consisted of Eliot Terry (M.Sc., R.P.Bio), Jim Trask (B.Sc., R.P.Bio), Dan Tisseur (B.Sc.) and Ranjit Sidhu (B.Sc.). Eliot Terry was the project biologist and responsible for data analysis and report preparation.

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1.0 Introduction

Weldwood of Canada (Williams Lake Operations) in cooperation with the Ministry of Forests and the Ministry of Water, Land and Air Protection (Cariboo Region) required data on snow depths and deer habitat use on the Horsefly Lake Mule Deer Winter Range (MDWR). The Horsefly MDWR is located in the Interior-Cedar-Hemlock (ICH) biogeoclimatic zone where snow accumulations are typically greater than drier winter ranges in the Cariboo Forest Region (e.g., Interior-Douglas Fir). The winter range is characterized by seral even-aged Douglas fir, which differs from the uneven-aged Douglas fir stands found in the IDF mule deer winter ranges (MOF 1998). Because both topographic features (elevation, aspect, slope) as well as stand structure can influence winter habitat capability and suitability (thermal cover, forage) a clear understanding of how these factors interact is necessary to develop effective deer habitat management strategies for wetbelt deer winter ranges. As such, the primary objective of this study was to collect data to determine the relationship between snow depths, topographic features (i.e., elevation, aspect slope) and stand structure for the Horsefly Lake Mule Deer Winter Range (MDWR).

2.0 Study Area

The Horsefly MDWR is situated approximately 100 km northeast of Williams Lake in the Horsefly Forest District. The winter range is located on the north side of Horsefly Lake where it extends west from Dillabough Creek to approximately half the length (~20 km) of Horsefly Lake north to Viewland Mountain. The majority of winter range is characterized by gentle plateaus with steep south facing slopes situated along Horsefly Lake.

The Horsefly MDWR lies within the Quesnel Highlands Ecosection and is represented predominately by the Horsefly Moist-Cool Interior Cedar Hemlock biogeoclimatic subzone/variant (ICHmk3). The ICHmk3 extends across the eastern portion of Horsefly Lake and occurs at elevations between 780-1250 m. On zonal sites, late seral stands are dominated by western red cedar (*Thuja plicata*), subalpine fir (*Abies lasiocarpa*) and hybrid white spruce (*Picea glauca x engelmanni*). Seral stands are dominated by Douglas fir (*Pseudotsuga menziesii*), lodgepole pine (*Pinus contorta*) and white birch (*Betula papyrifera*). Understory vegetation is dominated by tree regeneration as well as falsebox (*Paxistima myrsinites*) and black huckleberry (*Vaccinium membranaceum*). On drier sites that typically occur on crests and steep upper slopes, forest canopies are more open and dominated by Douglas fir and lodgepole pine. Shrub layers include juniper (*Juniper communis*), saskatoon (*Amelanchier alnifolia*), Douglas maple (*Acer glabrum*) soopolallie (*Shepherdia canadensis*), prickly rose (*Rosa acicularis*), falsebox, prince's pine (*Chimaphila umbellata*), and Oregon grape (*Mahonia aquifolium*). Herb layers are dominated by western fescue (*Festuca occidentalis*) and rough-leaved grass (*Oryzopsis asperifolia*) (Steen and Coupé 1997).

3.0 Methods

3.1 Sampling Periods

Three deer tracking sampling periods were initially planned each corresponding to a different snow depth interval including shallow-moderate (10-35 cm), moderate-deep (36-60 cm) and very deep snow packs (> 60 cm). Although only two deer tracking periods were completed this year (moderate-deep and very deep snow intervals), the primary plot locations (see below) were established in late December, which were representative of the first snow interval (10-35 cm) and are briefly discussed with respect to snow depths and topographic variables.

3.2 Plot Establishment

Weldwood produced an orthophoto (1:15,000), which represented habitat polygons identified using the regional stand structure slope/aspect mapping for mule deer winter ranges. Weldwood established primary plot locations during December 2001. A total of 12 plot groups[1] were established representing 15.8 km of deer transects (Table 1). The total distance tracked was distributed among five elevation bands, however, a large proportion of the sampling effort occurred between 820-1060 m (Table 2). Most plots were accessible by road and snowmobile; however, plot groups 10 (A,B, & C), 11 and 12 were accessed using a helicopter.

Table 1. Total transect length for each permanent plot group.

Plot Group	Total Transect Length (m)
1	719
2	475
3	845
4	389
5	804
6	1507
7A	1050
7B	502
8	1035
9	2169
10A	1502
10B	1656
10C	1298
11	1404
12	411
TOTAL	**15,766**

Represents deer tracking length only (i.e., not walk in/out distances). Distances are not multiples of 50 m because distances between primary plots were uneven leaving residual segments.

[1] Plot Groups represented a series of sample plots located along deer transects – see study area map (orthophoto) for locations of sample plots.

Table 2. Relative sampling effort by elevation band

Elevation (m)	Elevation Band	Total Distance Tracked (m)	% of total
< 820	1	2,843	18
820-940	2	4,124	26.2
941-1060	3	5,346	33.9
1061-1180	4	2,176	13.8
> 1180	5	1,277	8.1
Total		**15,766**	**100**

Two plot types were established - primary and secondary plots. *Primary plots* were located (by Weldwood) in forest openings and plot centers established 8-10 m from the south edge. Because primary plots were established in natural openings as well as experimental trial openings (Viewland Mountain), distances between primary plots varied. At each primary plot location (*n* = 98), the following variables were recorded: UTM coordinates using a handheld GPS, elevation (m)[2], aspect (compass bearing in degrees), percent slope and basal area. The number as well as species of live conifer trees (>12.5 cm DBH) were included in each prism swing (BAF = 8). In addition, the average of five snow depth measurements concentrated around the plot center were recorded to the nearest cm.

Secondary plots were also completed (by Triton) to provide additional data on snow depths and stand conditions. These plots were located systematically every 50 m between primary plot locations along each transect. Secondary sample points were intended to provide data "in the forest". However, to reduce any large bias associated with tree crowns and snow depth, snow measurements were taken a minimum of 2 m outside the drip-line of any tree crown – where possible[3]. The same variables recorded at primary plots were also recorded at secondary plots during the first sampling period. Except for portions of two transects where there were some errors made (7B, 9-2), the locations of the secondary plots did not change from the first sampling period. Secondary plot centers were established using blue flagging.

Tie points were (POC) ribboned in orange or blue flagging and secondary plots completed every 50 m on route to the first primary plot. Sample plots along each transect were completed in sequential order.

3.3 Deer Tracks and Pellets

Sampling was initiated two to three days following fresh snowfalls of 10 cm or more. The number of deer tracks that crossed the transect centerline between secondary plot locations were tallied every 50 m. To reduce any bias associated with double counting the same animal, tracks that crossed and then followed the transect within 1 m on either side were only counted once per 50 m segment unless they departed by more than 1 m in which case they were re-counted.

[2] Elevations were recorded using handheld GPS – elevation accuracy varied (5-20 m), but averaged +/- 10 m.
[3] In high stem density stands, this was not always possible.

Because many distances between secondary plot locations included residual segments less than 50 m, the number of deer tracks encountered along these smaller areas were prorated to equal the number of deer tracks per 50 m (i.e., 1 track/25 m = 2/50 m). In general residual segment lengths varied between 10-40 m.

The number of deer tracks per 50 m segment was converted to an index of relative abundance (tracks/50 m/week) using the hours since last snowfall as follows:

$$\text{The number deer tracks/50 m/week} = \frac{\text{number of tracks/50m}}{\text{hours since last snowfall}} \times \frac{\text{168 hours}}{\text{1 week}}$$

During each sampling period, attempts were made to collect deer pellets in each elevation band to determine winter diets. A sample of pellets (5-20) were taken from each pellet group, sealed in a zip-lock plastic bag and placed in a freezer for future analysis.

3.4 Data Analysis

Data were stratified by elevation band and slope-aspect combination according to each habitat type polygon identified on the MDWR orthophoto. The numbers of deer tracks/50 m/week as well as snow depths for each slope-aspect combination within each elevation band were averaged to provide a mean. Because slope and aspects were not recorded for residual segments, (but deer tracks were), these segments were assigned a slope-aspect category based on the closest primary plot. The basal area data was not analyzed for this report.

4.0 Results

4.1 Weather Conditions

The first sampling period was conducted February 2-5, 2002. Daytime temperatures ranged from –1°C to 3°C and were characterized as sunny with cloudy periods and calm winds. The second sampling period was completed March 1-2, 2002. Daytime temperatures ranged from 0°C to 5°C and were also characterized by sunny skies with occasional cloudy periods. No significant snow accumulation occurred during either data collection period.

Snow conditions were characterized as powder and moderately packed during the first sampling period. The second sampling period also had fresh powder but a subsurface crust had developed due to a previous freeze-thaw period that occurred in mid February. Overall, total snow accumulations were below average during the first part of the winter (December-January), but approached average snow depths by late February/March (based on personal observation only).

4.2 Snow Depths

4.2.1 Primary Plot Locations (Openings)

The average snow depths of gentle/flat areas at mid elevations (820-1060m) were < 30 cm during the December plot establishment period (Fig. 1). By early February, snow depths of gentle/flat areas had increased to 44-46 cm at mid elevations and were representative of the moderate-deep snow depth interval (30-60 cm). By early March, snow depths had increased again reaching an average of 62-70 cm at mid elevations, which were representative of the very deep snow pack conditions or third snow accumulation interval (> 60 cm) (Fig. 1). Although the lowest elevation plots (<820 m) received the least amount of snow, the relationship between snow depth and other elevation bands was less clear. In general, there was less snow on steep warm (SW) as well as very steep warm (VSW) slopes compared to other slope gradient-aspect combinations (see Fig.2).

Mean snow depths for each elevation and slope/aspect combination are presented in Appendix 1.

4.2.2 Secondary Plots ("in forest")

The snow interception ability of the forest canopy was evident in the snow depths recorded at the secondary plots. Average snow depths were 10-25 cm less at secondary plot locations compared to primary (openings) plots (Fig. 3). Similar, to the primary plots, steep warm (SW) and very steep warm (VSW) aspects received the least amount of snow compared to other slope-aspect combinations, particularly at lower elevations (see Fig. 3).

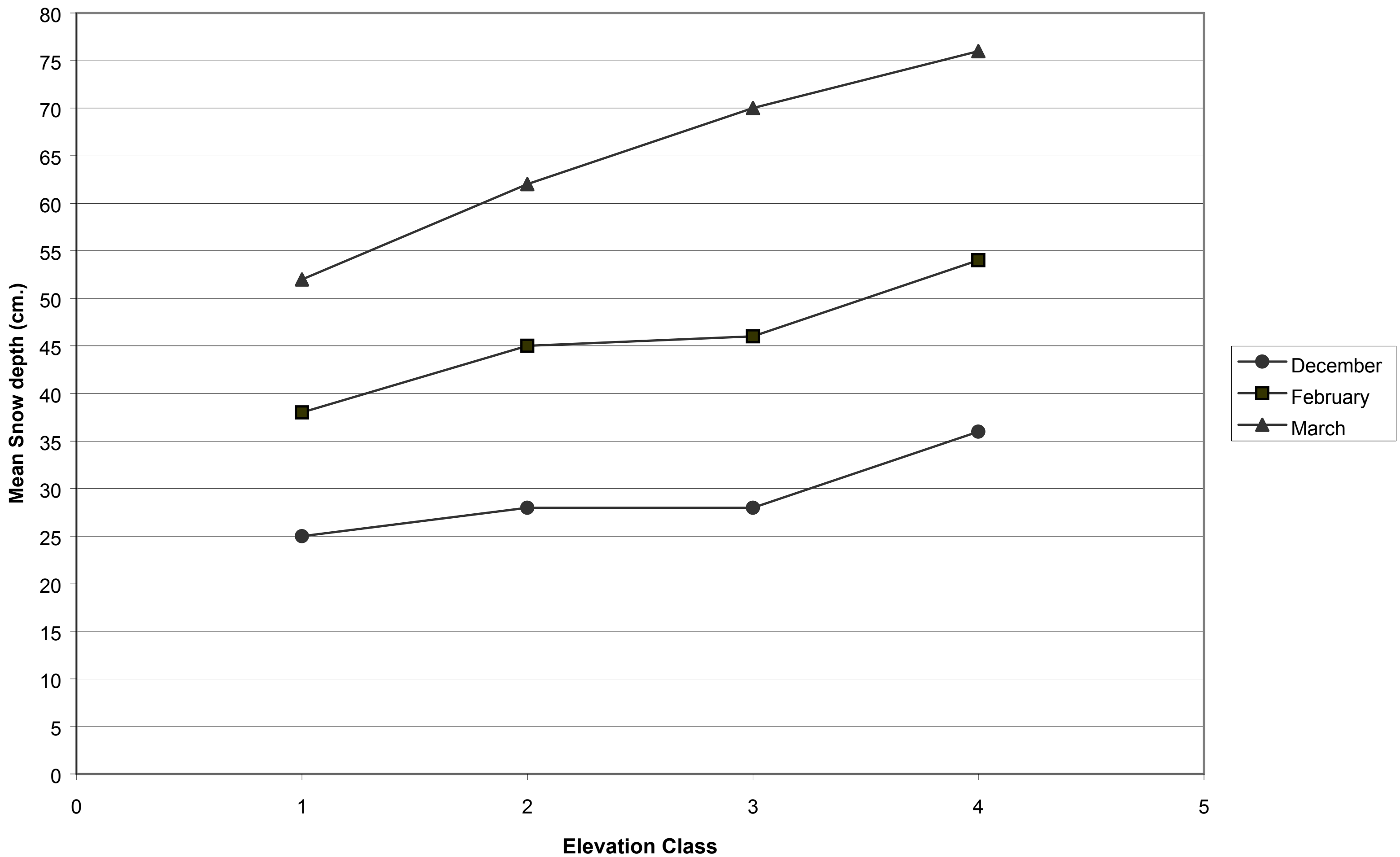

Figure 1. Mean snow depths at primary plot locations (openings) for gentle/flat (<10% slope) areas stratified by elevation band and three sampling periods. Horsefly Lake Mule Deer Winter Range 2001-2002. Elevation Bands: 1 = <820 m; 2 = 820-940 m; 3 = 941-1060 m; 4 = 1061-1180 m. note: there were no gentle/flat areas represented in elevation band 5 (>1180 m).

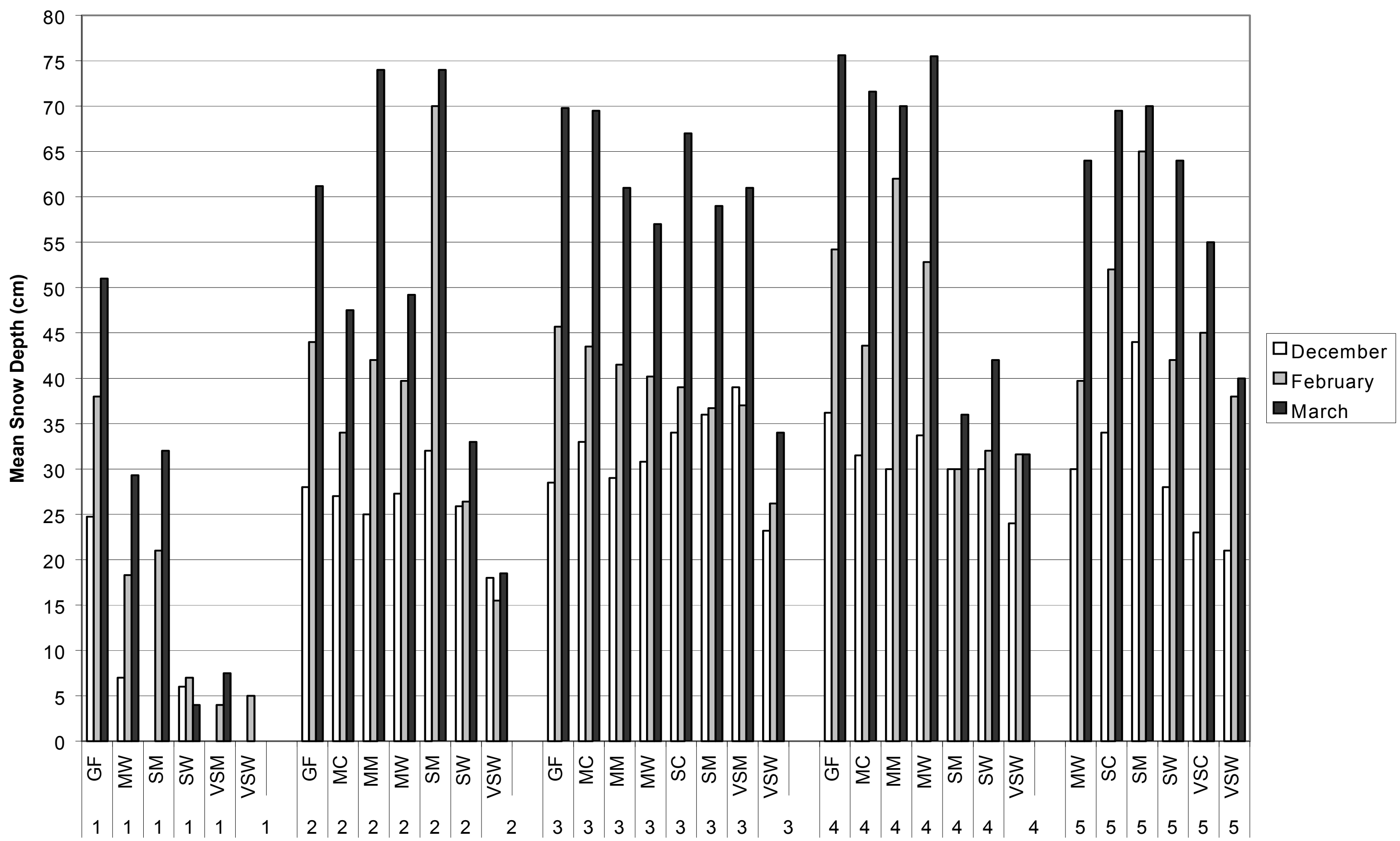

Figure 2. Mean snow depths at primary plot locations (openings) stratified by elevation band and slope-aspect category during three monthly sampling periods. Horsefly Lake 2001-2002. Elevation Bands: 1 = <820 m; 2 = 820-940 m; 3 = 941-1060 m; 4 = 1061-1180 m; 5 = > 1180 m. Slope-aspect categories: GF = gentle/flat (<10% slope); M=moderate (10-30%); S = Steep (31-60%), VS = Very Steep (>60%); Aspect categories: W = Warm (136-270°); C = Cool (316-90°); Moderate (135-89°).

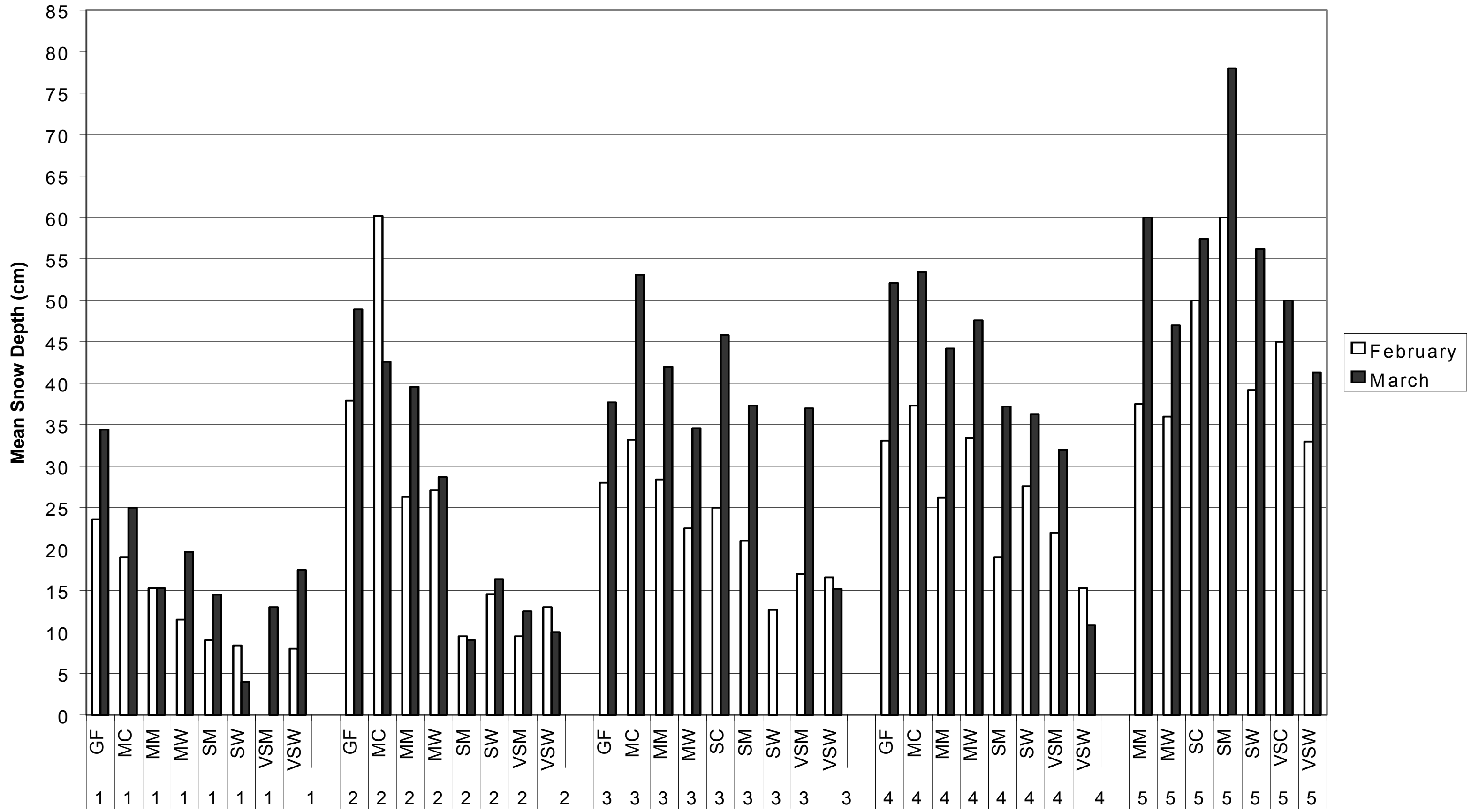

Figure 3. Mean snow depths at secondary plot locations ('in forest") stratified by elevation band and slope-aspect category during February and March sampling periods. Horsefly Lake 2002. Elevation Bands: 1 = <820 m; 2 = 820-940 m; 3 = 941-1060 m; 4 = 1061-1180 m; 5 = > 1180 m. Slope categories: GF = gentle/flat (<10% slope); M=moderate (10-30%); S = Steep (31-60%), VS = Very Steep (>60%). Aspect categories: W = Warm (136-270°); C = Cool (316-90°); Moderate (135-89°).

4.3 Deer Tracks

Deer tracks were encountered in all elevation bands during the February sampling period, however, there was a greater density of tracks observed in elevation bands two and four (Fig. 4). These areas of higher use corresponded to segments of Plot Groups 1, 2,10C and 10A (see Appendix 2). The large number of deer tracks observed in elevation band two on moderate slopes and aspects (MM) was a result of encountering a large number of tracks in one 50 m segment in Plot Group 1. By March, the deer appeared to have shifted to higher elevations, particularly elevation band four on steep warm (SW) and very steep warm (VSW) slopes (Fig. 4). These areas corresponded to 50 m segments of Plot Groups 9, 10C, and 10A (Appendix 2). These areas had 2-3 times the number of deer tracks as other slope-aspect categories within this elevation band. No deer tracks were encountered in Plot Groups 4 or 5 during February or March.

4.4 Deer Pellets

A total of 24 deer pellet groups were collected during the two sampling periods. Deer pellet samples were collected in elevation bands two, three and four (Table 3). Over half (54%) of the pellets were collected from elevation band 4 (1061-1180 m) with the remaining pellet groups encountered in elevation band two (29.2%) and elevation band three (16.6%). No deer pellets were encountered in elevation bands 1 (<820 m) and 5 (>1180 m).

Table 3. Summary of deer pellet groups collected by elevation band and plot group.

Collection Period	**Plot Sub-Group**	**Elevation band (m)**			
		820-940 m	**941-1060 m**	**1061-1180 m**	**Total**
1	1	3			3
	2	1			1
	7A			2	2
	9			1	1
	10A			2	2
	10B	1	1	1	3
	10C			3	3
	11	2			2
Total 1		**7**	**1**	**8**	**16**
2	9			1	1
	10A			2	2
	10B		2		2
	10C		1	2	3
Total 2			**3**	**5**	**8**
Grand Total (% of total)		**7 (29.2)**	**4 (16.6)**	**13 (54.2)**	**24 (100)**

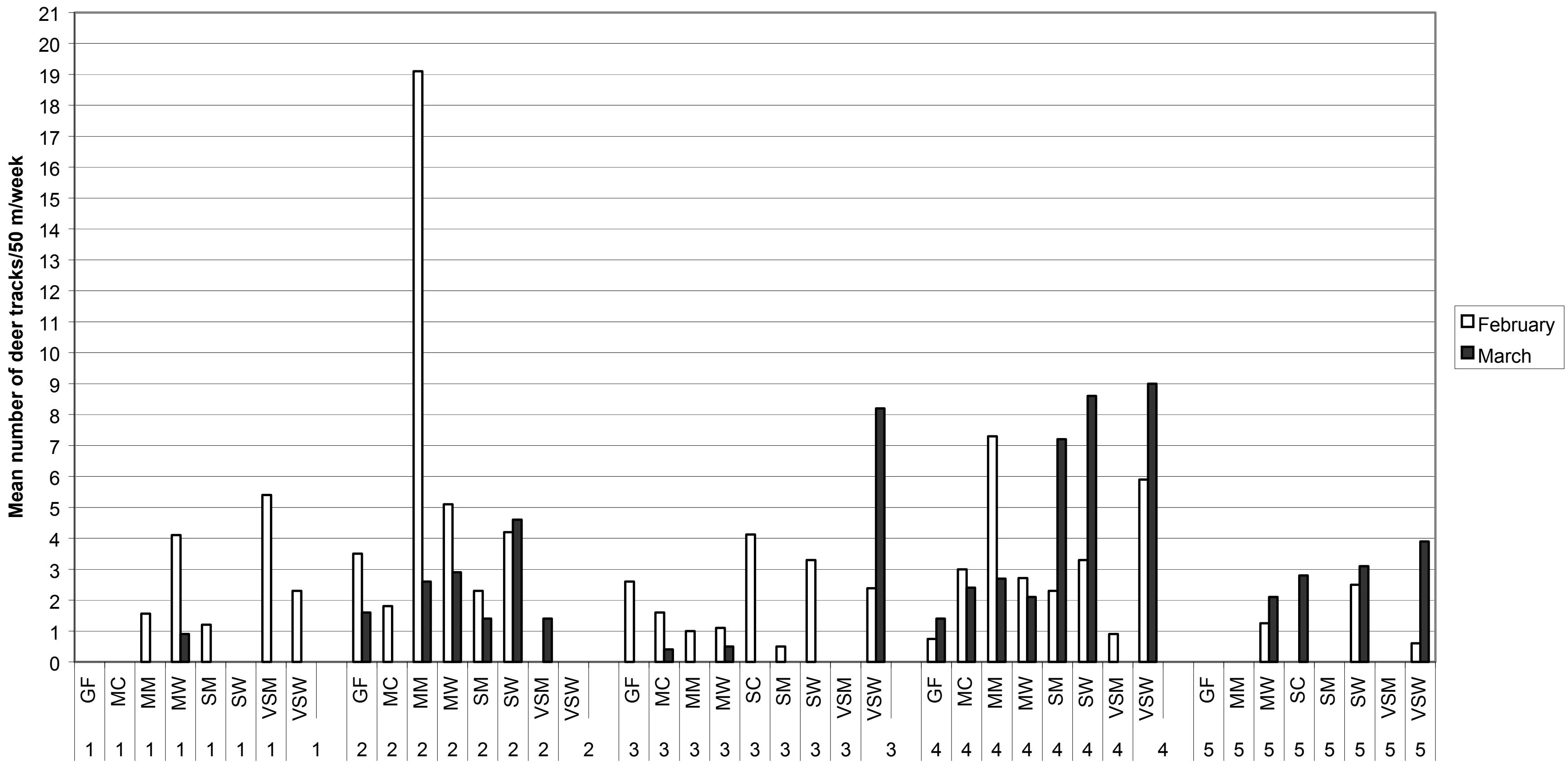

Figure 4. Mean number of deer tracks/50m/week by elevation band and slope-aspect category at moderate (February: 31-60 cm) and deep snow depths (March: > 60 cm). Elevation Bands: 1 = <820 m; 2 = 820-940 m; 3 = 941-1060 m; 4 = 1061-1180 m; 5 = > 1180 m. Slope-aspect categories: GF = gentle/flat (<10% slope); M=moderate (10-30%); S = Steep (31-60%), VS = Very Steep (>60%); W = Warm; C = Cool.

5.0 Discussion

The relationship between snow depth and topographic features will require further sampling. The preliminary data collected here indicated snow depths at primary plot locations were clearly less in the lowest elevation band compared to higher elevations. However, the snow accumulation pattern among the mid and higher elevation bands was somewhat less clear. The affect of slope-aspect on snow depths also appeared to vary among elevation bands as well as with sampling period (i.e., snow accumulation). Although there appeared to be decreasing snow depths on steeper and warmer slopes, this was only evident for some elevation bands (e.g., 1 and 2) and only during moderate snow depths. During the deeper snow sampling interval (March), the pattern appears less evident. Similarly, the snow depths at secondary plot locations also varied among elevation bands and slope-aspect categories. It is difficult to interpret these data at this time because these snow depths are partly affected by the forest canopy (basal area), which needs to be considered in future analyses.

The relative abundance of deer tracks indicated deer moved from the plateau areas during February including the Viewland Mountain area (Plot Group 6), to the steep slopes adjacent to Horsefly Lake (Plot Group 10) presumably in response to the deeper snow depths in March. Although the steep slopes had less snow compared to other slope-aspect categories, the lake margins had the least amount of snow, yet received very little use by deer. This may be related to differences in habitat quality or deer may be avoiding lake margins to reduce the risk of predation. Further sampling is required to determine if this represents a consistent trend. Overall, deer appeared to be widely dispersed during moderate-deep snow depths but became more concentrated in areas of less snow during the very deep snow accumulation period.

Deer pellets were not encountered in elevation bands one and five. Although the total km of transects sampled was less at these elevations, winter habitat suitability was also lower at these areas perhaps because they had poor snow interception capability (e.g., stands with large proportion of western red cedar) and/or lacked potential forage. In areas that received greater use by deer, we observed evidence of browsing on falsebox, Douglas maple, saskatoon and *Bryoria* spp. lichens on windthrown trees.

6.0 Critique of Inventory Protocols

The sample size of both primary as well as secondary plots needs to be considered. Due to the nature of the existing terrain, some elevation/slope/aspect combinations have only one plot. However, depending on future sampling regimes, the lack of spatial replication could be offset by repeated sampling over time. Further sampling is strongly recommended to increase the precision of the snow depth and deer track data.

It is worth noting that the total number of deer tracks encountered was slightly higher during the February sampling period ($n = 390$) compared to March ($n = 270$). This may partly reflect the patchy snow conditions on the steep south facing slopes adjacent to

Horsefly Lake during March, (i.e., reduced the number of deer tracks registered) or possible differences in track accumulation times. Whether this represented an actual decrease in deer use (i.e., migrated elsewhere due to deeper snow conditions) is also not clear from this data.

Overall, the sampling regime worked reasonably well. Identifying the route traveled as well as the location of the secondary sample plots (flagging) greatly increased the efficiency of data collection.

7.0 Literature Cited

Steen, O., and R. Coupe. 1997. A field guide to site identification and interpretation for the Cariboo Region. Ministry of Forests, Cariboo Region.

Ministry of Forests. 1998. Silvicultural systems for Douglas-fir stands on very deep snowfall mule deer winter ranges. Extension Note # 23. Ministry of Forests, Cariboo Forest Region.

Appendix 1.0 Mean Snow depths at Primary plot locations for each elevation band, slope/aspect category and sampling period.

Average of Snow Depth (cm) - December		
Elevation Band	SLP_ASP	Total
1	GF	24.8
	MW	7.0
	SM	
	SW	6.0
	VSM	
	VSW	0.0
1 Total		12.5
2	GF	28.0
	MC	27.0
	MM	25.0
	MW	27.3
	SM	32.0
	SW	25.9
	VSW	18.0
2 Total		25.4
3	GF	28.5
	MC	33.0
	MM	29.0
	MW	30.8
	SC	34.0
	SM	36.0
	VSM	39.0
	VSW	23.2
3 Total		30.0
4	GF	36.2
	MC	31.5
	MM	30.0
	MW	33.7
	SM	30.0
	SW	30.0
	VSW	24.0
4 Total		30.9
5	MW	30.0
	SC	34.0
	SM	44.0
	SW	28.0
	VSC	23.0
	VSW	21.0
5 Total		30.0
Grand Total		27.0

Appendix 1.0 con't . Mean Snow depths at Primary plot locations for each elevation band, slope/aspect category and sampling period.

Average of Snow Depth (cm) February		
Elevation Band	SLP_ASP	Total
1	GF	38.0
	MW	18.3
	SM	21.0
	SW	7.0
	VSM	4.0
	VSW	5.0
1 Total		18.6
2	GF	44.0
	MC	34.0
	MM	42.0
	MW	39.7
	SM	70.0
	SW	26.4
	VSW	15.5
2 Total		32.9
3	GF	45.8
	MC	43.5
	MM	41.5
	MW	40.2
	SC	39.0
	SM	36.7
	VSM	37.0
	VSW	26.2
3 Total		37.8
4	GF	54.2
	MC	43.6
	MM	62.0
	MW	52.8
	SM	30.0
	SW	32.0
	VSW	31.6
4 Total		44.5
5	MW	39.7
	SC	52.0
	SM	65.0
	SW	42.0
	VSC	45.0
	VSW	38.0
5 Total		45.1
Grand Total		36.1

Appendix 1.0 con't . Mean Snow depths at Primary plot locations for each elevation band, slope/aspect category and sampling period.

Average of Snow Depth (cm) March		
Elevation Band	SLP_ASP	Total
1	GF	51.0
	MW	29.3
	SM	32.0
	SW	4.0
	VSM	7.5
	VSW	0.0
1 Total		24.8
2	GF	61.7
	MC	47.5
	MM	74.0
	MW	49.2
	SM	74.0
	SW	33.0
	VSW	18.5
2 Total		42.4
3	GF	69.8
	MC	69.5
	MM	61.0
	MW	57.0
	SC	67.0
	SM	59.0
	VSM	61.0
	VSW	34.0
3 Total		56.7
4	GF	75.6
	MC	71.6
	MM	70.0
	MW	75.5
	SM	36.0
	SW	42.0
	VSW	31.6
4 Total		62.0
5	MW	64.0
	SC	69.5
	SM	70.0
	SW	64.0
	VSC	55.0
	VSW	40.0
5 Total		62.2
Grand Total		50.3

Appendix 2.0 Summary of mean number of deer tracks/50m/week stratified by sampling period, elevation band, slope-aspect and Plot Group

Secondary Plot Number	(All)

Average of Tracks/50m/week				
Sampling Period	Elevation Band	SLP_ASP2	Plot Group	Total
February	1	GF	4	0.0
			5	0.0
		GF Total		0.0
		MC	5	0.0
		MC Total		0.0
		MM	11	1.6
		MM Total		1.6
		MW	5	0.0
			11	2.3
			10B	7.0
		MW Total		4.1
		SM	11	1.2
		SM Total		1.2
		SW	10B	0.0
			10B	0.0
		SW Total		0.0
		VSM	11	5.4
		VSM Total		5.4
		VSW	11	2.3
		VSW Total		2.3
	1 Total			0.9
	2	GF	1	3.5
			2	30.2
			3	0.9
			4	0.0
			5	0.0
			11	3.9
		GF Total		3.5
		MC	1	10.5
			3	0.0
			4	0.0
		MC Total		1.8
		MM	1	32.9
			2	5.3
		MM Total		19.1
		MW	1	5.5
			2	9.3
			11	3.1
			10B	0.6
		MW Total		5.1
		SM	11	2.3
		SM Total		2.3
		SW	1	0.0

			2	7.0
			11	3.5
			10B	6.3
		SW Total		4.2
		VSM	11	0.0
		VSM Total		0.0
		VSW	1	
			11	0.0
		VSW Total		0.0
	2 Total			4.6
	3	GF	6	2.3
			8	5.6
			9	0.0
		GF Total		2.6
		MC	6	2.3
			8	2.5
			9	0.7
		MC Total		1.6
		MM	8	1.5
			9	0.0
			10B	0.0
		MM Total		1.0
		MW	6	2.7
			10B	6.1
		MW Total		4.1
		SC	8	5.3
			9	0.7
		SC Total		1.1
		SM	9	0.5
		SM Total		0.5
		SW	9	0.0
			10B	4.1
		SW Total		3.3
		VSM	9	0.0
		VSM Total		0.0
		VSW	10A	2.4
		VSW Total		2.4
	3 Total			2.0
	4	GF	6	1.1
			8	0.0
			12	0.0
			10C	1.2
			7A	0.0
		GF Total		0.7
		MC	8	0.9
			12	0.0
			10C	5.5
		MC Total		3.0
		MM	9	0.0

			12	0.0
			10C	9.7
		MM Total		7.3
		MW	6	1.5
			9	5.3
			12	0.0
			10B	4.7
			10C	4.2
			7A	0.0
		MW Total		2.7
		SM	9	1.7
			10A	4.7
		SM Total		2.3
		SW	9	2.6
			10A	11.7
			10C	2.8
			7A	1.8
		SW Total		3.3
		VSM	9	0.9
		VSM Total		0.9
		VSW	9	0.9
			10A	6.3
		VSW Total		5.9
	4 Total			3.6
	5	GF	7B	0.0
		GF Total		0.0
		MM	7A	0.0
			7B	0.0
		MM Total		0.0
		MW	7A	2.2
			7B	0.0
		MW Total		1.3
		SC	7B	0.0
		SC Total		0.0
		SM	7B	0.0
		SM Total		0.0
		SW	7A	2.9
			7B	0.0
		SW Total		2.5
		VSM	7B	
		VSM Total		
		VSW	7A	0.8
			7B	0.0
		VSW Total		0.6
	5 Total			1.1
1 Total				2.9
March	1	GF	4	0.0
			5	0.0
		GF Total		0.0

		MC	4	0.0
			5	0.0
		MC Total		0.0
		MM	11	0.0
		MM Total		0.0
		MW	5	0.0
			11	2.8
			10B	0.0
		MW Total		0.9
		SM	11	0.0
		SM Total		0.0
		SW	10B	0.0
		SW Total		0.0
		VSM	11	0.0
		VSM Total		0.0
		VSW	11	0.0
		VSW Total		0.0
	1 Total			0.1
	2	GF	1	1.6
			2	15.2
			3	0.0
			11	0.9
		GF Total		1.6
		MC	1	0.0
			3	0.0
		MC Total		0.0
		MM	1	0.0
			2	5.1
		MM Total		2.5
		MW	1	2.8
			2	1.9
			11	0.0
			10B	2.2
		MW Total		1.9
		SM	11	1.4
		SM Total		1.4
		SW	1	0.8
			2	10.2
			11	1.4
			10B	0.3
		SW Total		1.2
		VSM	11	1.4
		VSM Total		1.4
		VSW	11	0.0
		VSW Total		0.0
	2 Total			1.5
	3	GF	6	0.0
			9	
		GF Total		0.0

		MC	6	0.0
			8	0.0
			9	1.0
		MC Total		0.4
		MM	8	0.0
			10B	2.8
		MM Total		0.6
		MW	6	0.0
			9	4.2
			10B	5.3
		MW Total		3.2
		SC	8	0.0
			9	0.0
		SC Total		0.0
		SM	9	0.0
		SM Total		0.0
		SW	9	0.0
			10B	20.3
		SW Total		16.2
		VSM	9	0.0
		VSM Total		0.0
		VSW	10A	8.2
		VSW Total		8.2
	3 Total			3.0
	4	GF	6	2.9
			8	0.0
			12	0.0
			10C	2.0
			7A	0.0
		GF Total		1.4
		MC	8	0.0
			9	11.7
			12	1.4
			10C	1.7
		MC Total		2.4
		MM	9	1.4
			12	0.0
			10C	3.7
		MM Total		2.7
		MW	6	0.0
			9	9.3
			10C	5.3
			7A	0.0
		MW Total		2.1
		SM	9	4.3
			10A	22.4
		SM Total		7.3
		SW	9	2.3
			10A	25.2

			10C	10.3
			7A	0.0
		SW Total		8.6
		VSM	9	0.0
		VSM Total		0.0
		VSW	9	0.0
			10A	9.5
		VSW Total		9.0
	4 Total			4.6
	5	MM	7A	0.0
			7B	0.0
		MM Total		0.0
		MW	7A	2.6
			7B	0.0
		MW Total		2.0
		SC	7B	2.7
		SC Total		2.7
		SM	7B	0.0
		SM Total		0.0
		SW	7A	3.1
		SW Total		3.1
		VSM	7B	0.0
		VSM Total		0.0
		VSW	7A	3.9
		VSW Total		3.9
	5 Total			2.4
2 Total				2.7
Grand Total				2.8