

# How Does Habitat Classification Affect Snow Depth?



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## Introduction

How does habitat classification affect snow depth? For my project, I was interested in the relationship between the snow depths and types of deer habitat. This question is important because if Juneau has a heavy winter, then we know what habitat would be most suitable for the deer. Most of the plants that the deer prefer to feed on grow within five inches of the ground. Thus a heavy winter would cover any remaining vegetation in the habitat, preventing deer to have access to their preferred forage. I hypothesized that habitat classification does affect the snow depth. Especially the habitats that provide a great amount of canopy coverage.



**Fig. 1.** This photo is showing "Sitka Black Tailed Deer in an open area". Image from the following site:  
<http://www.flickr.com/groups/qemdfinch/discuss/72157602813437880/>

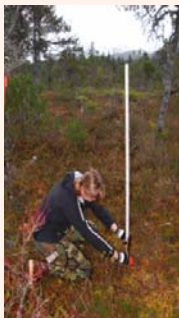
## Materials and methods

### Materials:

- 1" Diameter PVC pipe 1.5 Meter Long (Snow Stakes)
- Data Sheets
- Metal Rebar
- Measuring tape (cm)
- Overhead canopy cover grid sheet
- Garmin GPS
- Lots of Hiking Equipment

1. Study locations were established in three elevation zones. The first zone was set from 0-500 feet of elevation, the mid was 500-1000 feet and the final was between 1000 and 2000 feet
2. Within each zone three sites were established in different deer habitat/ecosystems. These sites were within areas

**Fig. 2.** Myself at a snow stake after making a record of 0 cm. of snow.

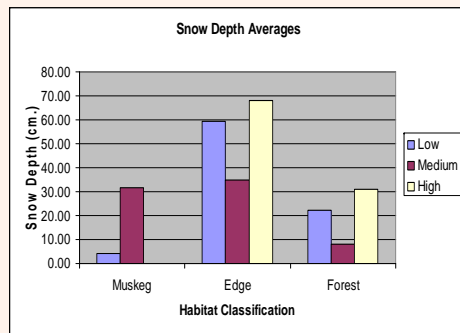


## Methods (continued)

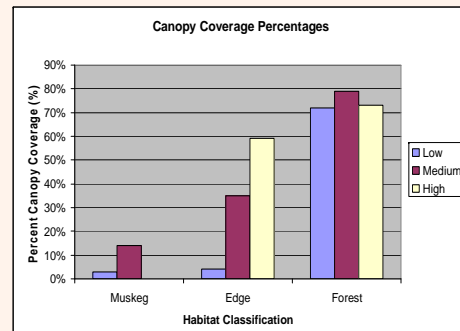
3. (continued) classified as either muskeg, edge, or forest.
4. Within each habitat site three snow stakes were established along a transect line.
5. Snow data was collected from these plots, as well as canopy coverage data.
6. To collect canopy coverage percentages, a grid transparency was held directly over the observers head at a height of 10 inches. The observer then estimated the fraction of the circle that was covered by the branches of the overhead trees.
7. To collect snow depth, the observer hiked to each of the 8 sites and measured snow depth at two different dates throughout the months of January and February. An average for each site was calculated based on the plots per site and the two dates data was collected.

## Results

- Fig. 3 – Canopy Coverage Percent Graph
- Fig. 4 – Snow Depth (cm.) Graph



**Fig. 3** shows Snow Depth Averages. On it's 'X Axis' is "Habitat Classification" and on it's 'Y Axis' is "Snow Depth (cm.)".



**Fig. 4** is currently showing Canopy Coverage Percentages. On the 'X Axis' is "Habitat Classification" and on the 'Y axis' is "Percent Canopy coverage (%)". This is the second of two graphs and it's percent in exact numbers is in the Fig. 6 Table.

## Results (Continued)

### Snow Depth Measurements

Elevation	Muskeg	Edge	Forest
<b>Low</b>	4.25 cm.	59.25 cm.	22.33 cm.
<b>Medium</b>	31.67 cm.	35.00 cm.	08.05 cm.
<b>High</b>	N/A	68.06 cm.	30.92 cm.

**Fig. 5.** This is the first of the two tables having the recorded data for Snow Depth that goes along with Fig. 3 (Graph 1). Under elevation is the Habitat Elevation, and alongside the Elevation, to the right, is Habitat Classification. You'll find that on the 'X Axis' on Fig. 3 (Graph 1).

### Canopy Coverage Percentages

Elevation	Muskeg	Edge	Forest
<b>Low</b>	3%	4%	72%
<b>Medium</b>	14%	35%	79%
<b>High</b>	N/A	59%	73%

**Fig. 6.** This is the second of the two tables having the recorded data for Canopy Coverage Percentages that goes along with Fig. 4 (Graph 2). Under Elevation is the Habitat Elevation, and alongside the Elevation, to the right, is Habitat Classification. You'll find that on the 'X Axis' on Fig. 4 (Graph 2).



**Fig. 7** Above, is a picture of Edge/Forest Area, similar to the type of environment that I worked with.

## Conclusions

How does habitat classification affect snow depth? My hypothesis that snow levels would be increased in open habitat locations was supported by my results. I think this is because, in the open habitats, there are less trees (and canopy) to intercept the snow fall. In the forest, I think that the trees don't necessarily block the snow completely, but instead, the branches catch small amounts of snow and then the snow melts.

Having less snow accumulate under the forest canopy is important because it plays a large role in our ecosystem. This is important because it provides a sanctuary for the deer, making the survival rates go up in the harsh weather.

If I could do this project over again, I would make my trips up to the different study plots more frequent and during the same time intervals. I also would like to have my study sites established earlier in the season so that I could collect data from our snow falls in December.

As a follow up study, I would like to focus on collecting data on deer distribution across these study sites during the winter months.

## Literature cited

"Relationships Between Sitka Black Tailed Deer and Their Habitats." (Washington Fish & Game) – 1984, Hanley, A. Thomas

<http://www.treesearch.fs.fed.us/pubs/7718>

"Sitka Black Tailed Deer Records" (Alaska Fish & Game)  
Text: Harry Merriam, John Schoen & Dave Hardy  
Illustrations: R.T. Wallen

Revised and reprinted 1994, website revisions 2003

[http://www.adfg.state.ak.us/pubs/notebook/biggame/bt\\_deer.php](http://www.adfg.state.ak.us/pubs/notebook/biggame/bt_deer.php)

## Acknowledgments

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~ Bethany

## For further information

Please contact [kovachda@hotmail.com](mailto:kovachda@hotmail.com). More information on this and related projects can be obtained at

[http://www.juneauempire.com/stories/111107/out\\_20071111001.shtml](http://www.juneauempire.com/stories/111107/out_20071111001.shtml)

[http://www.uas.alaska.edu/envs/edge/edge\\_2007\\_flyer.html](http://www.uas.alaska.edu/envs/edge/edge_2007_flyer.html)