# Disclaimer

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# Coastal Black-tailed Deer Mapping Report

Mapping of deer winter range suitability for the entire coastal planning area was completed by Coastal Resources Mapping in 2009 to support the EBMWG focal species project because previous mapping did not provide complete coverage. Although results of this modelling exercise have not been ground-truthed, the 2009 model provides a reasonable approximation of deer winter range for the purposes of strategic planning. The model will be refined and improved over time.

## 1.0 Model parameters

Model variables include: slope/aspect, elevation, BEC variant, and solar index. BEC variant was used as a surrogate for snowpack. These variables are not independent of one another. Domain experts consider that, collectively, this combination of variables provides better predictability than if independent variables were used.

Each variable had four potential values depending on its contribution to deer winter range from 1 (best) to 4 (worst). A Habitat Rating for each map cell was then established as the sum of the ratings for each variable at that cell with the result varying from highest quality (4) to lowest quality (16) habitat.

The following were excluded from the final layer:

- Stands with leading species of western redcedar, yellow cedar and mountain hemlock;
- Forested stands less than 140 years in age; and
- Non-productive and non-forested areas.
- In the South Coast model, habitat patches <40 ha in size were excluded (smaller patches within 50 m of each other that collectively exceeded 40 ha were included).

## *Habitat ratings tables*

| Slope (degrees) | |
|---|---|
| 1 | 0-10º |
| 2 | 11º-20º |
| 3 | 21º-30º |
| 4 | 31º-50º |
| 5 | >50º |

| Aspect | | |
|---|---|---|
| 1 | N | 337°-22° |
| 2 | NE | 22°-67° |
| 3 | E | 67°-112° |
| 4 | SE | 112°-157° |
| 5 | S | 157°-202 |
| 6 | SW | 202°-247° |
| 7 | W | 247°-292° |
| 8 | NW | 292°-337° |

| Elevation (meters) | | Snowpack |
|---|---|---|
| 1 | 0-300 | shallow |
| 3 | 300-800 | moderate & deep |
| 4 | >800 | very deep |

| BEC Variants | Snowpack |
|---|---|
| BAFAun | very deep |
| BAFAunp | very deep |
| CMA un | very deep |
| CMA unp | very deep |
| CWH dm | shallow |
| CWH ds 2 | moderate |
| CWH mm 1 | moderate |
| CWH ms 2 | deep |
| CWH vh 1 | shallow |
| CWH vh 2 | shallow |
| CWH vm | moderate |
| CWH vm 1 | moderate |
| CWH vm 2 | deep |
| CWH vm 3 | deep |
| CWH wm | moderate |
| CWH ws 1 | moderate |
| CWH ws 2 | deep |
| CWH xm 2 | shallow |
| ESSFmc | very deep |
| ESSFmcp | very deep |
| ESSFmk | very deep |
| ESSFmkp | very deep |
| ESSFmw | very deep |
| ESSFmwp | very deep |
| ESSFwv | very deep |
| ESSFxv 1 | very deep |
| ESSFxvp | very deep |
| IDF dw | moderate |
| IDF ww | moderate |
| IMA unp | very deep |
| MH mm 1 | very deep |
| MH mm 2 | very deep |
| MH mmp | very deep |
| MH wh 1 | very deep |
| MH whp | very deep |
| MS un | very deep |
| SBPSmc | very deep |
| SBS mc 2 | deep |

| Slope | Aspect | Rating | | Elevation | Rating | | Subzone-variant | Rating | | Solar Index Value (Kj/$m^2$) | Rating |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 4 | | 0-300 | 1 | | BAFAun | 4 | | 0 - 3,997 | 4 |
| 1 | 2 | 4 | | 300-800 | 3 | | BAFAunp | 4 | | 3,998 - 7,561 | 3 |
| 1 | 3 | 3 | | >800 | 4 | | CMA un | 4 | | 7,562 - 10,710 | 2 |
| 1 | 4 | 3 | | | | | CMA unp | 4 | | 10,711 - 16,600 | 1 |
| 1 | 5 | 3 | | | | | CWH dm | 4 | | | |
| 1 | 6 | 3 | | | | | CWH ds 2 | 1 | | | |
| 1 | 7 | 3 | | | | | CWH mm 1 | 2 | | | |
| 1 | 8 | 4 | | | | | CWH ms 2 | 2 | | | |
| 2 | 1 | 4 | | | | | CWH vh 1 | 1 | | | |
| 2 | 2 | 4 | | | | | CWH vh 2 | 1 | | | |
| 2 | 3 | 3 | | | | | CWH vm | 2 | | | |
| 2 | 4 | 2 | | | | | CWH vm 1 | 2 | | | |
| 2 | 5 | 2 | | | | | CWH vm 2 | 3 | | | |
| 2 | 6 | 2 | | | | | CWH vm 3 | 3 | | | |
| 2 | 7 | 2 | | | | | CWH wm | 2 | | | |
| 2 | 8 | 4 | | | | | CWH ws 1 | 2 | | | |
| 3 | 1 | 4 | | | | | CWH ws 2 | 3 | | | |
| 3 | 2 | 3 | | | | | CWH xm 2 | 1 | | | |
| 3 | 3 | 2 | | | | | ESSFmc | 4 | | | |
| 3 | 4 | 1 | | | | | ESSFmcp | 4 | | | |
| 3 | 5 | 1 | | | | | ESSFmk | 4 | | | |
| 3 | 6 | 1 | | | | | ESSFmkp | 4 | | | |
| 3 | 7 | 2 | | | | | ESSFmw | 4 | | | |
| 3 | 8 | 4 | | | | | ESSFmwp | 4 | | | |
| 4 | 1 | 4 | | | | | ESSFwv | 4 | | | |
| 4 | 2 | 4 | | | | | ESSFxv 1 | 4 | | | |
| 4 | 3 | 2 | | | | | ESSFxvp | 4 | | | |
| 4 | 4 | 1 | | | | | IDF dw | 2 | | | |
| 4 | 5 | 1 | | | | | IDF ww | 2 | | | |
| 4 | 6 | 1 | | | | | IMA unp | 4 | | | |
| 4 | 7 | 2 | | | | | MH mm 1 | 4 | | | |
| 4 | 8 | 4 | | | | | MH mm 2 | 4 | | | |
| 5 | 1 | 4 | | | | | MH mmp | 4 | | | |
| 5 | 2 | 4 | | | | | MH wh 1 | 4 | | | |
| 5 | 3 | 4 | | | | | MH whp | 4 | | | |
| 5 | 4 | 2 | | | | | MS un | 4 | | | |
| 5 | 5 | 2 | | | | | SBPSmc | 4 | | | |

| Slope | Aspect | Rating | | Elevation | Rating | | Subzone-variant | Rating | | Solar Index Value (Kj/m$^2$) | Rating |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 6 | 2 | | | | | SBS mc 2 | 3 | | | |
| 5 | 7 | 3 | | | | | | | | | |
| 5 | 8 | 4 | | | | | | | | | |

### *Habitat cut-offs*

Cut-offs for habitat values (high, moderate and low) were based on a review of model output by domain experts compared against a coarse estimate of a 25% – 50% – 25% distribution of these habitat values across each sub-region.  Habitat cut-offs are as follows:

The following are the habitat cut-offs define moderate and high value habitats for the purposes of co-location:

*i.  North Coast*

| Classification | Habitat Rating |
|---|---|
| **MOUNTAINS** | |
| High | 4 to 7 |
| Moderate | 8 to 9 |
| Low | 10 to 16 |
| **COASTAL AREAS** | |
| High | 4 to 6 |
| Moderate | 7 to 9 |
| Low | 10 to 16 |

**North Coast Ecosections**

Coastal areas:

Hecate Lowland

Dixon Entrance

Hecate Strait

North Coast Fjords

Queen Charlotte Sound

Mountains:

Kitimat Range

Southern Boundary Range

Nass Mountains

Southern Boundary Range

Meziadin Mountains

*ii. Mid Coast*

| Classification | Habitat Rating |
|---|---|
| **MOUNTAINS** | |
| High | 4 to 7 |
| Moderate | 8 to 9 |
| Low | 10 to 16 |
| **COASTAL AREAS** | |
| High | 4 to 6 |
| Moderate | 7 to 9 |
| Low | 10 to 16 |

**Mid Coast Ecosections**

Coastal areas:

Hecate Lowland

Queen Charlotte Sound

Mountains:

Kimsquit Mountains

Kitimat Ranges

Nazko Upland

Nechako Upland

Northern Pacific Ranges

Western Chilcotin Ranges

Central Pacific Ranges

*iii. South Coast*

| Classification | Habitat Rating |
|---|---|
| **MOUNTAINS AND COASTAL AREAS** | |
| High | 4-6 |
| Moderate | 7 |
| Low | 8-16 |

## 2.0 Limitations and uncertainties associated with deer mapping

- Modeling at the scale undertaken in this project has inherent problems including a high likelihood of mis-identifying areas as either high or low value habitat (due to limitations in forest cover and other input variables). There is no substitute for site specific information in making decisions on the designation of critical habitat.
- In general, any issues affecting the reliability of the forest cover layer may compromise the reliability of the deer mapping output. This is an issue for all habitat mapping that uses the forest cover layer as an input.

  There is a specific issue about question about the reliability of model output for the Klinaklini. For example, there is no Mountain hemlock leading species identified in the TSA area, but there are large areas labelled as Douglas-fir leading species not noted in the TFL area indicating inconsistencies in forest cover information between the two tenure areas.
- The coastal deer model used BEC subzones as a surrogate for snow zones. BEC is a coarse surrogate for snow zones. It is a better integrator than elevational range as it takes into account shading and slope/aspect influences on vegetative cover, but the results may nonetheless be unreliable, especially at finer scales. TEM would provide a higher level of confidence in model output.

## 3.0 Recommendations to improve mapping

- There is a large amount of variability in deer habitats that is impossible to capture using GIS. The deer habitat model should be field-truthed to confirm model veracity. On-site assessment is particularly important for deer, as they select suitable habitat based on site specific habitat attributes, which may not be well-represented through modeling. Testing a range suitability model requires consideration of the interactions between the extent and location of historical logging and its likely effect on deer behaviour patterns, the severity of winter weather during the period of sampling and its likely effect on deer behaviour patterns and input data error.
- Evidence of use by deer can also be used to confirm winter range suitability, but current population levels need to be known to infer habitat quality related to levels of use. A lack of use does not necessarily indicate poor habitat quality. For example an area may be high quality habitat but not show evidence of current or recent use due to local predation or some other population limiting factor.