

7.5 Species – Habitat Model for Mule Deer

Common Name:	Mule Deer
Scientific Name:	<i>Odocoileus hemionus</i>
Species Code:	M-ODHE
B.C. Status:	Yellow-listed
Identified Wildlife Status:	None
COSEWIC Status:	Has not been examined.

7.5.1 Distribution

7.5.1.1 Provincial Range

The mule deer is common throughout most of the province with the exception of the northwestern and north central regions where it occurs only in restricted localities (RIC, 1997d). In 1980, the population of mule deer was estimated to be 100,000 +/- 20% based on limited inventory, known harvests, research findings, and opinions of regional wildlife biologists (Petticrew and Jackson, 1980). Three subspecies of the mule deer are found in British Columbia: the black-tailed deer, Interior mule deer, and Sitka deer (Cannings and Harcombe, 1990). This species-habitat model will concentrate on the habits of the Interior mule deer subspecies, which is the most widely distributed subspecies, being found throughout the Interior from the Coast mountains east to the Rockies (Banfield, 1987) with high densities in the Kootenay, Caribou, Okanagan and Thompson-Nicola Regions, and in the Peace River area (Petticrew and Jackson, 1980).

7.5.1.2 Distribution in Study Area

Low numbers of mule deer are present throughout the La Biche and Sandy Creek areas are incidental occurrences (B. Webster, personal communication) and occur in both the MAU and MUP eco-sections (BWBSmw2 variant) represented within the study areas. Deer presence in these areas may be attributable to juvenile dispersion during non-winter months (B. Webster, personal communication).

7.5.1.2 Elevational Range

Elevations within the study areas range from 220 to 850 m. Elevation is not considered a limiting factor to habitat use within the study areas.

7.5.2 Ecology and Habitat Requirements

Mule deer are broadly adapted to many habitats and prefer open coniferous forests. Generally, habitat use ranges from higher elevation moister areas such as parkland and wet meadows in the summer to lower elevation sites during the winter. Preferred winter range has abundant forage (usually riparian habitats) interspersed with mature stands having high canopy closure (Stevens and Lofts, 1988).

A lack of adequate deer winter range is likely the main factor limiting the deer population in this area. Snow depth is probably a major factor limiting deer distribution, and severe winters may be very hard on populations within the study area. High winter mortality is likely due to winter stresses and heavy wolf predation within the area. Bad winters are reported to be very hard on the deer populations within the area (J. Hart, personal communication; M. Labine, personal communication; B Webster, personal communication). The best winter habitat in the flat areas is along the rivers valleys which is the main travel corridor of wolves, therefore winter mortality is very high (B. Webster, personal communication).

7.5.3 Habitat Use (Life Requisites and Seasons)

7.5.3.1 Living

Mule deer generally migrate seasonally, moving to summer ranges at upper elevations and down to lower elevation winter ranges in the fall (Petticrew and Jackson, 1980). They may also remain at lower elevations throughout the year.

7.5.3.2 Feeding

7.5.3.2.1 Growing Season

The mule deer has a diverse diet including a variety of grasses, forbs, shrubs, trees, sedges, agricultural crops, mushrooms, and lichens depending on season (Petticrew and Jackson, 1980). Mule deer are generally found in areas of high vegetational heterogeneity (Morgantini, 1979). Early and intermediate seral stages after burning or logging often provide abundant foods and are good growing season habitats providing sufficient security cover is available. Deer are rarely found in dense woods. They may be found in variety of landform types and generally inhabit steeper and more broken terrain than do white-tailed deer (Luttmerding *et al.*, 1990).

7.5.3.2.2 Winter Season

Deer move to lower elevation, warm aspect slopes in winter or to floodplains where snowpacks are low. In severe winters, mature coniferous forests are very important to provide cover, reduced snow depth, and forage. Important winter browse species in the study area are probably saskatoon, red-osier dogwood, and willows. Arboreal lichens (*Usnea spp.*, *Alectoria spp.*, and *Bryoria spp.*) are an important winter food item (where they occur) obtained mainly as litterfall. Winter forage is mainly comprised of shrubs and litterfall with shrubs being preferred but not necessarily available on most winter ranges (Waterhouse *et al.*, 1994).

7.5.3.2.3 Spring Season

Adjacency of early spring range to winter range is critical. Steep south-facing slopes are often the first areas to green up in early spring (Luttmerding *et al.*, 1990). Herbaceous open areas and floodplain forests may also be important spring areas.

7.5.3.3 Security Habitat

Interspersion of food and cover is very important in determining deer habitat quality. Optimal habitat consists of open areas interspersed with forests. Minimum security cover for mule deer has been defined as vegetation capable of concealing 90% of a deer from view at a distance of 60 m or less (Thomas *et al.*, 1979). The stand's density and diameter of trees and the density of understory vegetation determine its value as security cover (Nyberg and Janz, 1990). Tree boles and foliage provides the best cover, yet short, dense vegetation and CWD can provide adequate screening in some areas (Nyberg and Janz, 1990). In flat terrain, small trees 1 to 2 m in height can provide effective security cover; in broken terrain, both large and small trees can provide effective cover (Armeleder and Dawson, 1992). Security cover also reduces deer energy expenditure by reducing the need and the distance to flee (Armeleder and Dawson, 1992; Armeleder *et al.*, 1986).

7.5.3.4 Thermal Habitat/Bedding

Multi-layered stands provide the best thermal habitat as they protect deer from the chill factor associated with low temperature and increasing wind speed much more effectively than do single-layered, even-aged stands (Armeleder *et al.*, 1986; Thomas *et al.*, 1979). A mix of trees 1 to 10 m in height is effective at reducing air movement at deer level (Armeleder and Dawson, 1992; Thomas *et al.*, 1979). In the summer, closed canopies of various coniferous stands provide shade if required. Mule deer generally use specific bed sites and will return to them repeatedly (Collins and Urness, 1983).

7.5.3.5 Seasons of Use

Table 22: Seasons of Use With Rated Life Requisites for Mule Deer in the La Biche and Sandy Creek Study Areas.

Month	Season*	Rated Life Requisites
January	W	LI-ST, FD
February	W	LI-ST, FD
March	W	LI-ST, FD
April	W	LI-ST, FD
May	G	LI-ST, FD
June	G	LI-ST, FD
July	G	LI-ST, FD
August	G	LI-ST, FD
September	G	LI-ST, FD
October	W	LI-ST, FD
November	W	LI-ST, FD
December	W	LI-ST, FD

- as defined in RIC (1997a).

Table 23: Seasons of Use Summary for Mule Deer in the La Biche and Sandy Creek Study Areas.

Habitat Use	Code	Months of Use*
Living during the growing season	LI_G	May-September
Living during the winter season	LI_W	October-April

*as defined in RIC (1997a).

Habitats used for reproduction have not been rated and are therefore not included in the following table. There are very few deer in the Fort Nelson area so specific times of calving and rutting are not known (J. Hart, personal communication). Mule deer are thought to calve in May within the Fort Nelson area, and the rut is speculated to occur in early-mid October (J. Hart, personal communication).

7.5.4 Hierarchy of Life Requisites

- Winter Foraging – Winter is the most limiting season for forage availability.
- Growing Season– Ample forage is required for spring, summer, and fall.
- Security and Thermal cover is required during both the growing and winter season.

7.5.4.1 Rating Scheme – 6 Class, 2 Season

A 6-Class rating scheme of high (1), moderately high (2), moderate (3), low (4), very low (5), and nil (6) is employed due to the substantial level of knowledge on habitat use of mule deer (Resources Inventory Committee, 1997a). The used ratings scheme is defined in Table 24.

Table 24: Relative Quality Classes (from RIC, 1997a and RIC, 1997g).

Code	Quality relative to the best in B.C.	Suitability/Capability
1	Equivalent (75%-100% of best)	High
2	Slightly less (50%-75% of best)	Moderately high
3	Moderately less (25%-50% of best)	Moderate
4	Substantially less (5%-25% of best)	Low
5	Much less (0%-5% of best)	Very low
6	The habitat or attribute is absent	Nil

Ecosystem units will be rated for security habitat (SH) and food (FD) values for two seasons: Growing (G) and Winter (W).

7.5.4.2 Provincial Benchmark

The provincial standard (best in B.C.) for Interior mule deer is the EKT and FRB eco-sections (Rasheed, 1998). Class 1 habitat (75% to 100% of the best in B.C.) is found within the THB, MPB, OKR, SOB, and SOH eco-sections (Rasheed, 1998). As the La Biche and Sandy Creek areas fall within the MUP and MAU eco-sections, Class 1 habitat, if present, is expected to be limited within these areas.

As a smaller scale reference, a biophysical habitat capability mapping project for the northeastern portion of British Columbia (Habitat Inventory Section, 1994) assigned a habitat capability value for mule deer of Class 3 (25% to 50% of the best in B.C.) for the MUP eco-section, BWBSmw2 variant. The ETP eco-section (at this time the MAU eco-section was still part of the ETP eco-section) BWBSmw2 variant was given a capability rating of Class 5 (0% to 5% of the best in B.C.) (Habitat Inventory Section, 1994).

Referring to the habitat capability maps produced for northeastern B.C. (Habitat Inventory Section, 1994), the major rivers and the majority of the La Biche study area are given Class 3 (25% to 50% of the best in B.C.) capability for mule deer while most of the Sandy Creek area is given Class 5 (0% to 5% of the best in B.C.) capability.

7.5.4.3 Assumptions

Habitat ratings for mule deer are presented in sections 7.5.4.4. and 7.5.4.5. Further study is needed to validate and refine these ratings. The following assumptions have been made:

- In winter, food value ratings for units may be based primarily on either the presence of preferred food items or on the accessibility of these food items. In deep winter snow conditions, the more open habitats will not be accessible to deer. This model assumes all habitats in stage 1 to 4 will be inaccessible to deer in winter, and they are therefore given low food and security ratings regardless of the forage species present. These ratings will not be accurate for very mild winters when some habitats in the lower structural stages may be accessible to deer.
- Structural stages 2 to 3 should provide abundant forage and have good spring and summer values for deer if adjacent to cover. Clearcuts should provide moderate to high summer values, yet mule deer will likely not forage in the middle of large clearcuts due to lack of adjacent cover. They will generally only forage within 200 m of cover. Structural stages 4 to 7 should provide good security cover and increase the value of more open feeding areas adjacent to them.
- Riparian stands, open deciduous-dominated, and mixed forests should provide moderate value to deer due to good diversity and abundance of shrubs and herbs. Coniferous forests will generally have low foraging value as these stands generally have less diversity and less forage available. Dense, mature stands with a high conifer component may likely become very important in winter when snow depths preclude use of most other habitats. Low-lying areas with reduced snow depth along major floodplains (mainly spruce stands) likely become important for foraging and cover in winter.
- Warm aspect, generally south-facing slopes are important winter range for deer. These are very limited within the study area, yet when they occur with mature AM/01 stands may provide suitable winter range. Adjacency of good spring range to winter range is critical and may be lacking in these areas.
- Deer are unlikely to be using very wet areas. Therefore, wet ecosystems including BS/08 and SG units will probably have low values.
- Areas where domestic cultivars have been introduced are likely to provide good forage for deer. These areas include various seismic lines and the pipe line. Vegetation on the pipe line is also likely to green up early in spring due to heat created by the pipe line. Also, cotton-grass units are very good.

- Understory characteristics including shrub composition and density will determine the value of units as security habitat. Units with very sparse understory will generally provide low security cover. Coniferous shrubs will provide better visual screening than deciduous shrubs in winter. Larger trees will provide better security as will more CWD and structural diversity. Some stage 3a units will provide moderate security cover if vegetation is tall enough to screen standing deer. Stage 3b forests should provide good security cover.
- Low snow depths were considered to enhance security habitat ratings as they should allow less restrictive movement. In winter, mature ecosystem units which were likely to have better snow interception were given higher security habitat ratings. In winter, mature stages should also provide greater production and litterfall of arboreal lichens.

7.5.4 References

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