Columbian Black-tailed Deer

PROJECT NAME: Sooke Hills Wilderness and Mount Wells Regional Parks

Scientific Name: *Odocoileus hemionus columbianus*

Species Code: M-ODHE

Status: Yellow-listed (Any indigenous species or subspecies (taxa) which is not at risk in British Columbia).

I. DISTRIBUTION

Provincial Range

Occurs in the southwestern corner of British Columbia, on most islands south of Rivers Inlet, including Vancouver Island, and ranges east to near the summits of the Cascade and Coast ranges. Their range extends south into the United States where the deer range through Washington and Oregon, into California.

Elevational Range

Sea-Level to Sub-alpine Habitat, although elevations greater than 1,000 metres are rarely used as winter habitat.

Provincial Context

The Columbian black-tailed deer occurs commonly throughout their range. Populations in BC are stable, and currently approximately 180,000 Columbian black-tailed deer reside in BC (Ian Hatter, pers. comm.).

Project Area:	CRD Parks Sooke Hills Watershed
Ecoprovince:	Georgia Depression
Ecoregions:	Eastern Vancouver Island
Ecosections:	Nanaimo Lowlands (NAL)
Biogeoclimatic Zones:	CDFmm, CWHxm1

Project Map Scale: 1:20,000

II. ECOLOGY AND KEY HABITAT REQUIREMENTS

General

Columbian black-tailed deer are a subspecies in interior mule deer, however Columbian black-tailed deer have smaller bodies, smaller ears and a largely black tail surrounded by a smaller white rump patch.

Columbian black-tailed deer require food, water and cover to ensure survival during the spring, summer and winter seasons. During spring, deer favour areas with early green up (e.g., low elevation areas with warm aspect on moderate to steep slopes). Summer habitat consists of areas with a suitable mix of young to old forest areas, with an adequate supply of forage and cover elements. Winter forces deer from high elevation habitat to low elevation areas, with south-facing, warm-aspect slopes or floodplain areas where snowpack is very low (i.e., CWHxm).

Plant material comprises a significant portion of Columbian black-tailed deer diet. Although deer are capable of digesting a wide variety of plants, forage preferences are determined, in part, by seasonal variations in forage digestibility and protein content, and by the nutritional requirement of the animals (Nyberg & Janz, 1990). Optimum growth occurs in the spring when plant proteins are easily digestible, whereas fall and winter represent periods of maintenance.

Columbian black-tailed deer breed during November and early December. Fawns are born during the first half of June. Females 2 years and older have higher rate of conception, than younger females.

It remains unclear whether specific habitats are used for Columbian black-tailed deer reproduction habitat. Reproduction habitat will not be rated separately.

Columbian black-tailed deer populations can have either resident or migratory individuals.

Average annual home range for migratory deer in the moderate snowpack zone is 1770 ha, whereas the home range for resident deer in the same zone is 140 ha (Nyberg & Janz, 1990).

III. HABITAT USE: LIFE REQUISITES

- **Living Habitat (LI)**

The Living life requisites for Columbian black-tailed deer are satisfied by the presence of suitable feeding and security habitat which are described in detail below.

- **Feeding Habitat (FD)**

Feeding requirements for Columbian black-tailed deer are tied closely to food availability and season. During spring, deer favour areas with early green up (e.g., low elevation areas with warm aspect on moderate to steep slopes). Important spring forage species include Fireweed, Pearly Everlasting, Bunchberry, *Rubus* species, *Vaccinium*, willow and many herbs and grasses (Nyberg & Janz, 1990). Summer habitat consists of areas with a suitable mix of young to old forest areas, with adequate supply of forage and cover elements. Key summer forage species include fireweed, pearly everlasting, salal, *Rubus* species, *Vaccinium*, willow and alder (Nyberg & Janz, 1990). Forage quality and variety is reduced in summer, although summer forage is typically greater in quantity (Walmo, 1981). Winter forces deer from high elevation habitat to low elevation areas, with south-facing, warm-aspect slopes or floodplain areas where snowpack is

very low (i.e., CWHxm). The height of key browse species, such as salal and huckleberry is important on winter ranges. During severe winters, arboreal lichens (e.g., *Alectoria, Bryoria,* and *Usnea*) and branches of Douglas-fir and Western Redcedar are major food sources. Key winter forage species include Western Redcedar, Douglas-fir, Red Huckleberry, Salal, deer Fern and arboreal lichens (Nyberg & Janz, 1990). Salal is only digestible when eaten in combination with other species. Table A1 illustrates important forage plants for Columbian black-tailed deer.

Table A1. Important forage plants for Columbian black-tailed deer in southern British Columbia (taken directly from Nyberg & Janz, 1990). The most important or preferred species are in bold type.

	WINTER FORAGE	SPRING FORAGE	SUMMER FORAGE
TREES	**Douglas-fir** western hemlock **western redcedar**	bigleaf-maple **Douglas-fir**	red alder
SHRUBS	Alaskan blueberry five-leafed bramble kinnickinnick oval-leafed blueberry **red huckleberry** rose spp. **salal** saskatoon twinflower vine maple willow spp.	***Rubus* spp**. (salmonberry, blackberry, thimbleberry, raspberry, bramble) salal **willow spp**.	**salal** willow spp.
FERNS	**deer fern**	**bracken**	
HERBS	bunchberry grass spp.	bunchberry **fireweed** grass spp. hairy cat's-ear horsetail **pearly everlasting**	**fireweed** grass spp. hairy cat's-ear **pearly everlasting**
ARBOREAL LICHENS	***Alectoria; Bryoria*** *Lobaria oregana* ***Usnea* spp**.		

- **Security habitat (SH)**

Security habitat for Columbian black-tailed deer conceals deer from hunters and predators. Foliage and trunks of trees provide the best security cover, however Columbian black-tailed deer may also use short, dense vegetation, logs or take advantage of topography (e.g., swales) as security cover. Very dense stands of young trees (e.g., sum of basal diameter exceeding 311 m (Smith & Long, 1987)) may form adequate security habitat, as they do with elk. For mule deer, a slightly larger but similar species, the most effective security cover hides 90% of the animal at a distance of 60 m or less, and security cover patches need to be 180 m or more in diameter. In general, old growth forests with a patchy conifer understory and most well-stocked stands of young trees with live branches satisfy security cover requirements. Deer forage more often in clearcuts within 100 m of cover (Kremsater, 1989).

- **Thermal habitat (TH)**

Thermal habitat allows deer to expend less energy to maintaining body temperature, allowing allocation of conserved energy to growth and reproduction. Thermal habitat can vary daily, seasonally, with prevailing weather conditions, and age, size and nutritional condition of the animal. In general, nighttime thermal cover should trap longwave radiation and maintain warmer air temperatures (occurring under a closed canopy above a deer's head or above 3 m), reduce wind at deer height (occurring in a forest stand or dense underbrush) and intercept precipitation (occurring under a closed canopy and large crown volume). In general, daytime thermal requirements are met by areas that gather heat (on or near rock bluffs, in clearcuts) or intercept excessive solar radiation (canopy closure) (Parker, 1988).

- **Winter**

Winter represents a critical season for Columbian black-tailed deer, because of energetic costs of maintaining body temperature and moving through snow. Forest cover influences snow depth, density and surface hardness (Nyberg & Janz, 1990), and deer typically expend most energy walking through crustless, dense, deep snow (i.e., sinking depths greater than 25 cm). Conditions that produce favourable snow conditions for Columbian black-tailed deer include dense young-growth (>10 m tall) and old-growth forests (Nyberg & Janz, 1990). Canopy closure (i.e., stands, taller than 10 m, with greater than 60% crown completeness) exerts the most influence on snow interception, and creates areas with snow conditions that don't limit deer movement (Bunnell, *et al.*, 1985).

IV. SEASONS OF USE

Columbian black-tailed deer require thermal, security and feeding habitat differentially throughout the year. Table A2 summarizes the life requisites for Columbian black-tailed deer for each month of the year.

Table A2. Monthly Life Requisites for Columbian Black-Tailed Deer.

Month	Season*	Life Requisite
January	Winter	Living
February	Winter	Living

March	Winter	Living
April	Early Spring	Living
May	Late Spring	Living
June	Summer	Living
July	Summer	Living
August	Summer	Living
September	Fall	Living
October	Fall	Living
November	Winter	Living
December	Winter	Living

*Seasons defined for Coast and Mountains Ecoprovinces per the Chart of Seasons by Ecoprovince (RIC, 1999, Appendix B).

For the final ratings table, ratings will be provided for the Growing (an amalgamation of Early Spring, Late Spring, Summer and Fall seasons), and Winter seasons.

- Winter Season (November - April)
- Growing Season (May - October)

Separate ratings will be assigned for thermal cover (TH); security cover (SH); and feeding habitat (FD).

V. HABITAT USE AND ECOSYSTEM ATTRIBUTES

Table A3 outlines how each life requisite relates to specific ecosystem attributes (e.g., site series/ecosystem unit, plant species, canopy closure, age structure, slope, aspect, terrain characteristics)

Table A3. Terrestrial Ecosystem Mapping (TEM) Relationships for each Life Requisite for Columbian Black-tailed Deer.

Life Requisite	TEM Attribute
Living habitat (feeding)	• site: site disturbance, elevation, slope aspect, structural stage • soil/terrain: bedrock, terrain texture, flooding regime • vegetation: % cover by layer, species list by layer, cover for each species for each layer,
Living Habitat (security)	• site: elevation, slope, aspect, structural stage

	• soil/terrain: terrain texture • vegetation: % cover by layer • mensuration: tree species, dbh, height
Living Habitat (thermal)	• site: elevation, slope, aspect, structural stage • soil/terrain: terrain texture • vegetation: % cover by layer • mensuration: tree species, dbh, height

VI. Ratings

There is a detailed enough level of knowledge of the habitat requirements of Columbian black-tailed deer in British Columbia to warrant a 6-class rating scheme.

Provincial Benchmark

Ecosection:	Nanaimo Lowlands (NAL)
Biogeoclimatic Zone:	CWHxm1
Habitats:	**Critical habitat varies with season and snowpack conditions. Table A4 shows a summary of important habitat features on different seasons and different snowpack conditions.**

Ratings Assumptions

1. Structural stage 1-4 have minimal winter value (suitability ≤ 4) for food, security and thermal values. Although these stands may be available to deer in low elevation subzones, heavy snowpack will not allow access to these habitats. Structural stage 4 may provide limited winter thermal/security habitat depending on adjacent habitat.

2. Young forests (structural stage 5) may provide security and thermal habitat (suitability ≤ 2) depending on forage availability, subzone and snowpack.

3. Mature forests (structural stage 6) provide high winter habitat (suitability = 1) because of the combination well developed shrub layers, arboreal lichen abundance, and canopy closure.

4. Old forests (structural stage 7) provide the best food availability in winter, however, because of the presence of canopy gaps offer limited thermal habitat. Regardless, with the appropriate slope, aspect, and adjacency with uneven-aged stands, old forests can be excellent Columbian black-tailed deer winter habitat (suitability = 1).

5. Structural stage 2 and 3 should provide abundant forage and be rated high (suitability = 1), when adjacent to security habitat.

6. Structural stage 5-7 provide adequate thermal and security cover for deer during the living season, however, value of the stand increases with age so that mature forests are rated highest (suitability = 1).

7. Riparian habitat should provide high habitat throughout the living season (suitability = 1).

Table A4. Important habitat features for different seasons and snowpack conditions for Columbian black-tailed deer (Nyberg & Janz, 1990).

Season/Snowpack	Habitat Feature
winter/shallow snowpack	• topographic features that reduce snowpack • patches of cover with shrub understory • small clearcut or burned openings (less than 400 m across)
spring	• topographic features that encourage early growth • openings that encourage early growth of herbaceous forage • cover near forage (i.e., within 200m)
summer	• abundant forage, especially herbs and shrubs • patches of cover interspersed with food.

VI. REGIONAL HABITAT VALUES

For Columbian black-tailed deer the benchmark habitat is the Leeward Island Mountains (LIM) ecosection, specifically the Coastal Western Hemlock (CWH) very wet maritime (vm) and dry maritime (dm) subzones (RIC 1999). Within these ecosection/subzones the Coastal Western Hemlock-Douglas-fir (CW) Broad Ecosystem Unit is benchmark winter habitat, and the Douglas-fir-Arbutus (DA) is the benchmark growing-season habitat (RIC 1999). Within this context, the Nanaimo Lowlands (NAL) (in which the Sooke Hills Wilderness and Mount Wells Regional Parks occur), is also rated as high habitat. In particular, in the NAL, the Coastal Douglas-fir (CD) Broad Ecosystem Unit in the CWHvh (CWH very wet, hypermaritime subzone) is rated as Class 3 winter habitat; and the Douglas-fir – Arbutus (DA) Broad Ecosystem Unit is rated Class 1 growing season habitat.

VII. LITERATURE CITED

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PERSONAL COMMUNICATIONS

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