Fisher

Martes pennanti

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Disclaimer: The following document was compiled based on a review of information currently available for this species as of November 25, 2005. This document can be used to assist with the identification of this species and to support the development of management recommendations as they relate to forestry activities. For more information on this species, please refer to the reference section or consult with a Species at Risk specialist.

Description

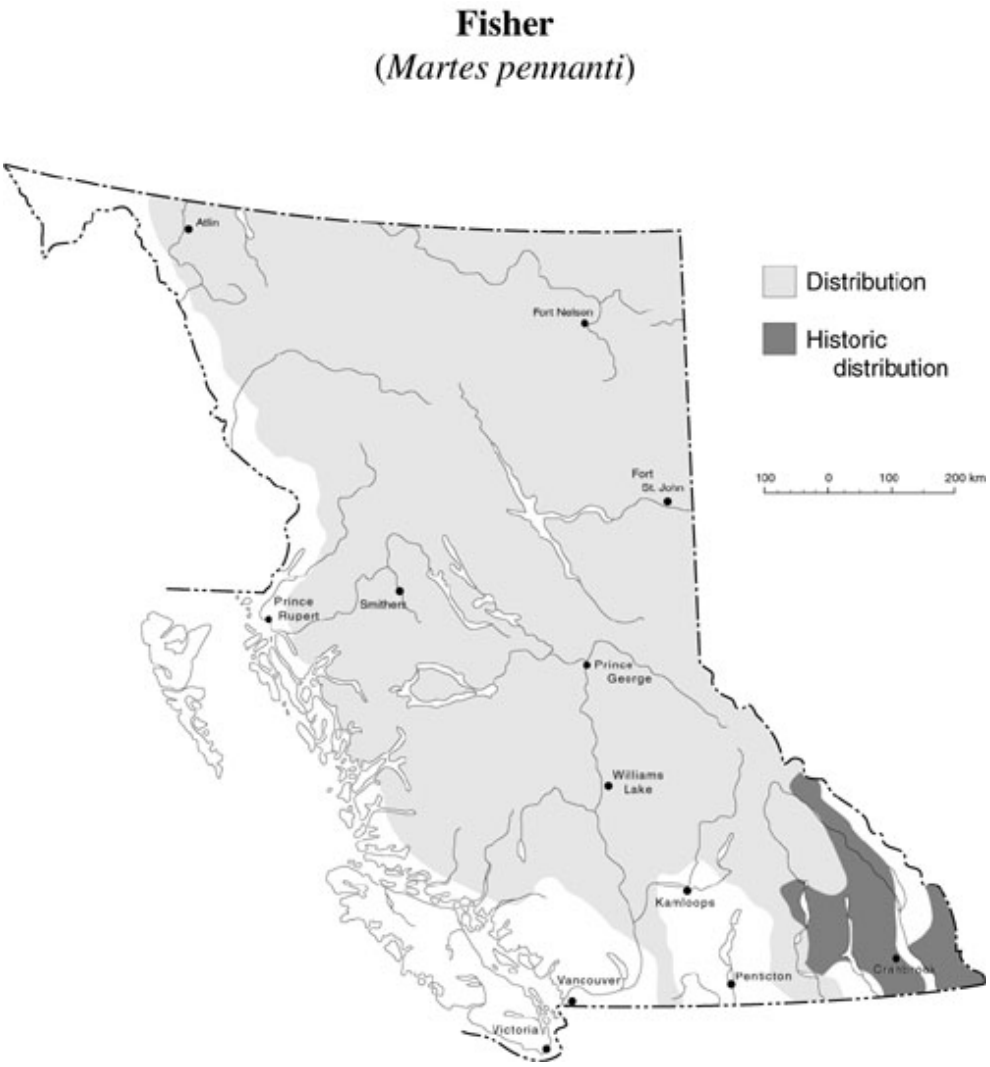
Fishers are medium-sized carnivores of the weasel family that occur in much of the temperate and boreal forests of North America. They have long, thin bodies (characteristic of most weasels) and dense coats with well-furred tails that comprise approximately one-third of their total body length. Fishers have pointed faces, rounded ears, and short legs[1]. Their fur is long and chocolate-brown in colour with considerable grizzling patterns around the shoulders and back. In British Columbia, average body weight is 2.6kg for females and 4.8 kg for males[2]. The average body length, excluding the tail, is 51 cm for females and 60 cm for males[1]. Fishers can be differentiated from American Martens by their larger body size (approximately two to three times larger), darker colouring, and shorter ears[2].

Photo courtesy of Steve Huffman

Distribution

The range of the Fisher in British Columbia is currently believed to primarily include the Boreal Plains, Sub-Boreal Interior, Central Interior, and Taiga Plains ecoprovinces. Fisher populations probably have very limited distribution in some portions of the Coast and Mountains, Southern Interior Mountains, Southern Interior, and Northern Boreal Mountains ecoprovinces[2].

Fisher populations have likely disappeared from the Cascade and Okanagan mountain ranges of the southern interior and the Columbia and Rocky mountain ranges south of Kinbasket Reservoir; these areas have low habitat suitability and no consistent harvests of Fishers over the past 15 years (total of 13 Fishers in both regions combined) despite the harvest of 56,880 American Martens (data from Provincial Fur Harvest Database). The reintroduction of 61 Fishers to the southern Columbia Mountains west of Cranbrook, may have restored a small population of Fishers in this region[2].



Distribution of the Fisher in British Columbia[2]

Forest Districts[3,4]

- Arrow Boundary Forest District (DAB)
- Central Cariboo Forest District (DCC)
- Chilcotin Forest District (DCH)
- Columbia Forest District (DCO)
- Campbell River Forest District (DCR)
- **Cascades Forest District (DCS)**
- Fort Nelson Forest District (DFN)
- Headwaters Forest District (DHW)
- North Island - Central Coast District (DIC)
- Fort St. James Forest District (DJA)
- **Kamloops Forest District (DKA)**
- Kootenay Lake Forest District (DKL)
- Kalum Forest District (DKM)
- **100 Mile House Forest District (DMH)**
- Mackenzie Forest District (DMK)
- North Coast Forest District (DNC)
- North Island Forest District (DNI)
- Nadina Forest District (DND)
- Okanagan Shuswap Forest District (DOS)
- Peace Forest District (DPC)
- Prince George Forest District (DPG)
- Quesnel Forest District (DQU)
- Rocky Mountain Forest District (DRM)
- Sunshine Coast Forest District (DSC)
- Squamish Forest District (DSQ)
- Skeena Stikine Forest District (DSS)
- Skeena Stikine Forest District - Bulkley component (DSS_B)
- Skeena Stikine Forest District - Cassiar component (DSS_C)
- Vanderhoof Forest District (DVA)

Ecoprovinces and ecosections[4]

- BOP: all
- CEI: all
- COM: CPR, CRU, KIM, MEM, NAB, NAM
- NBM: CAR, EMR, HYH, KEM, LIP, MUF, NOM, SBP, STP, TEB, TEP, THH, TUR, WMR
- SBI: all
- SIM: BBT, BOV, CAM, CCM, ELV, EPM, FLV, FRR, MCR, NKM, NPK, QUH, SFH, SHH, SPM, UCV, UFT
- SOI: GUU, HOR, LPR, NIB, NOH, NTU, OKR, PAR, SCR, SOH, SHB, TRU
- TAP: all

Biogeoclimatic Units[3,4]

- AT - Alpine Tundra
- BWBS - Boreal White and Black Spruce - all
- CDF - Coastal Douglas Fir - all
- CWH - Coastal Western Hemlock - all
- ESSF - Engelmann Spruce – Subalpine Fir - all
- ICH - Interior Cedar – Hemlock - all
- IDF - Interior Douglas-fir - dk3, dk4, dm1, dm2, dw, mw1, mw2, ww, ww2, xm

- MH - Mountain Hemlock - all
- MS - Montane Spruce - all
- PP - Ponderosa Pine
- SBPS - Sub-Boreal Pine – Spruce - all
- SBS - Sub-Boreal Spruce - all
- SWB - Spruce - Willow -Birch- all

Broad ecosystem units
Broad ecosystem units of high value are IH, SD, RR, SF (interior locations only), and WR. Those of medium value are BA, BP, DF, DL, ER, HB, IS, and SL[4].

Elevation
Fishers tend to inhabit low to mid-elevations, up to 2500 m, and are not found at high elevations. Fishers are likely confined to low elevations during periods of heavy snow[4]. The Fisher can be found most commonly in elevations between 760 and 1980m[5].

Map of Known Locations
Fisher occurrence data is considered sensitive by the Conservation Data Centre (CDC). Therefore, known location data for this species is not available to the public. Please contact the CDC to request this data at:

Phone: (250) 356-0928
Fax: (250) 387-2733

Biology
Fishers generally have a lifespan of approximately 10 years with relatively low survivorship from year to year[6]. They remain active during the winter months[2].

Reproduction
Fishers have a reproductive system that results in a low reproductive output relative to their lifespan. Female Fishers are not capable of breeding until 12 months of age and produce at most one litter per year after they have reached two years of age. Male Fishers reach sexual maturity at 12 months of age, but probably do not breed successfully until at least two years of age[2,4].

Breeding begins in early April, with females mating with more than one male. Once fertilized, the eggs develop up to a certain stage and then lie dormant for about 10 months until implantation occurs[1]. Active development of the young begin again at this point (usually mid to late February) and lasts about 40 days[7]. One to three kits are born from late March to mid-April[8]. Reported birthing dates for Fishers in British Columbia were between 23 March and 10 April. The mean date of birth for radio-tagged Fishers in the Williston region was 6 April. Captive Fishers in the East Kootenay region gave birth to litters between 17 March and 4 April[2,4].

Fisher kits become mobile at 10–12 weeks, at which time they begin to leave their dens with their mothers. Kits travel with their mothers as they mature, presumably learning how to hunt prey and survive on their own. In Maine, kits were found to disperse from their natal home range in their first autumn. However, data from the Williston region indicate that dispersal can occur later and successful establishment of home ranges may not occur until Fishers are 2 years of age[2,4].

The survival of the kits is low; one study estimated that approximately only one kit per female survive to reach the fall season[9]. The causes of kit death in captivity included improper maternal care, cannibalism, exposure, and low viability of the kits[7].

Fishers are not widely reported to exhibit strong site fidelity, except for females with natal or maternal dens. On average, female fishers in Maine discontinued using maternal dens 71 days following parturition. Female fishers may use between 1 and 5 maternal dens following abandonment of the original natal den. Observations of natal dens being reused in subsequent years by fishers have been made in both the Williston and East Cariboo regions of British Columbia[2,4].

Foraging

Fishers are generalist predators and typically eat any animal they can catch and kill, although they may specialize on Porcupines (*Erethizon dorsatum*) and Snowshoe Hares (*Lepus americanus*) in some areas[2,4,6]. Other reported foods include deer (*Odocoileus* spp., primarily as carrion), squirrels (*Tamiasciurus* spp. and *Glaucomys* spp.), voles and related species, shrews (*Sorex* spp.), birds (mostly passerine and galliform), American Martens, berries and other vegetation, and even fish and snakes[2].

Habitat

Fishers inhabit a broad range of environments across their geographic area of distribution[6]. In western conifer-dominated forests, Fishers appear to have affinities to specific habitat features, many of them found primarily in late-successional forests[4,2,10]. In B.C., preferred habitat resembles that found in SBS, SWB and BWBS Biogeoclimatic zones and more specifically riparian and dense wetland forest habitat within those zones[4,11].

Fishers defend home ranges, and in British Columbia, they are substantially larger than those reported elsewhere in North America, particularly for males, which contributes to the low density observed in the province[2,4]. For females, the average home range is about 35 km^2 and 137 km^2 for males[2].

Important Habitats and Habitat Features

One of the critical requirements for Fisher habitat is overhead cover, which provides security cover from predators[12]. Fishers generally stay in or near forests with 30% canopy closure with a productive understorey that supports a variety of small and medium-sized prey species[4]. During winter, overhead cover (e.g. moderate conifer canopy) becomes important for another reason: habitats with moderate cover intercept snow and have more dense snow packs, thus permitting more efficient locomotion for Fishers[10].

Rest Sites

The availability of rests site is also an important habitat feature. Fishers use rest sites for a variety of purposes, including refuge from potential predators and thermoregulatory cover[2,4,13].

Four distinct types of structures used for resting by Fishers have been identified in British Columbia[2,4,14]:

- **Branch rest structures** are arboreal sites that typically involved abnormal growths (i.e., brooms) on spruce (*Picea* spp.) trees, caused by spruce broom rust (*Chrysomyxa arctostaphyli*), or on subalpine fir (*Abies lasiocarpa*) trees, caused by fir broom rust (*Melampsorella caryophyllacearum*).

- **Cavity rest structures** are chambers in decayed heartwood of the main bole of black cottonwood, trembling aspen (*Populus tremuloides*), or Douglas-fir (*Pseudotsuga menziesii*) trees. Cavities are accessed through branch-hole entrances into heart rot (black cottonwood, aspen, or Douglas-fir trees) or excavations of primary cavity nesting birds (aspen trees only).

- **Coarse woody debris (CWD) rest structures** are located inside, amongst, or under pieces of CWD. The source of CWD for these sites is natural tree mortality, logging residue, or man-made piling. Coarse woody debris rest structures usually comprise of a single large (>35 cm diameter) piece of debris, but occasionally involve several pieces of smaller diameter logging residue.

- **Ground rest structures** are those that involved large diameter pieces of loosely arranged colluvium (e.g., rock piles) or pre-excavated burrows into the soil.

The selection of rest sites by fishers may be mediated by ambient temperature. One study noted that Fishers used subnivean CWD rest structures when ambient temperatures were significantly colder than when they used branch and cavity structures[2]. Fishers in British Columbia exclusively used subnivean CWD structures for the energetic benefits that they confer relative to other structures when temperatures were below –15ºC. Fishers probably use branch and cavity structures for resting during most of the year because these sites provide an adequate thermal environment for most combinations of ambient temperature and wind speed. Reasons for selecting specific rest structures probably change seasonally and thermoregulation is likely not the only factor that affects the selection of rest sites by fishers[2,4].

Whelping and Rearing

Female Fishers appear to have very stringent requirements for structures in which they rear their kits. Natal (i.e., whelping) and maternal (i.e., rearing) dens of Fishers are typically found in cavities, primarily in deciduous trees[4,6]. In British Columbia, Fishers have been recorded whelping in trees that are atypically large and uncommon across the landscape. Large diameter (average of 105cm in one study[2]), declining black cottonwood (*Populus balsamifera* spp. *balsamifera*) trees are important dens sites. Den cavities in these large trees were, on average, 15 m above ground[2]. The reason that Fishers select these types of trees for whelping is likely related to the decay characteristics of deciduous trees, which produce heart rot and cavities much earlier and at smaller diameters than coniferous trees[2].

Black cottonwood trees are prone to decay of the heartwood at an early age, but data from British Columbia suggest that cottonwood trees may be suitable for use by fishers for rearing kits when the bole at the cavity height is >54 cm diameter. Although the relationship between dbh and dbh of the den is unclear, it appears that cottonwood trees need to be >88 cm dbh; for the cavity to be used by fishers, cavity entrances may need to be >5 m above ground. Thus, for fishers to use black cottonwood trees for natal or

maternal dens, the trees may need to have heart rot and a bole diameter >54 cm at 5 m above ground[2,4].

Elements with these traits may be rare across the landscape, as indicated by observation of natal dens being reused by fishers in the both the Williston and East Cariboo regions[2,4]. Therefore suitable cottonwood trees may be an important component in the selection of a home range by female fishers.

Foraging
Fishers require the presence of available prey and adequate security cover to use habitats for foraging. Availability of prey is affected by not only the abundance of the prey, but also its vulnerability[15]. Vulnerability is affected by the presence of escape cover for the prey, which can include such features as snow cover and highly complex vegetative structure. Fishers rarely use open areas for foraging[16], and when crossing them, they usually run[17]. Sufficient overhead cover in a foraging habitat can be provided by tree or shrub cover[2,4,10].

Suitable combinations of available prey and adequate security cover likely occur in a variety of habitat types, and thus, Fishers have been reported to use a wide array of habitats for foraging. Researchers have documented Fishers using deciduous forests for hunting porcupines, riparian zones for small mammals, and densely regenerating coniferous habitats for hunting snowshoe hares[4].

Regardless of prey species, foraging by fishers is believed to involve two components: locating patches of habitat with prey and searching for prey items within these patches. Fishers appear to have a cognitive map of where suitable patches of prey may be within their home range and visit these areas to hunt for food. The characteristics of these patches are likely related to the type of prey that use them[4].

Conservation and Management

Status[3]
Provincial Rank: S2S3 (Provincially imperiled/vulnerable)
BC List: Blue (Special Concern)

Threats
Loss of forested habitat is the main long-term threat to Fisher populations. Because Fishers appear to be closely linked to the presence of late-successional forest structures, altering the availability of these habitat components likely has an effect on survival. In British Columbia, the reduction in the availability and distribution of required habitats has probably resulted from forest harvesting activities[2].

Forestry activities can affect the quality of Fisher habitat in many respects. First, timber harvesting typically removes many of the features of late-successional forests that Fishers rely upon, such as large spruce trees, and replaces them with stands that have fewer structural components and are of lower suitability. Second, forest harvesting may negatively affect the distribution of the remaining habitat so that Fishers have to search more widely to sequester sufficient resources. Third, the concomitant increase in access

that occurs with forest harvesting in previously inaccessible areas may increase trapping mortality, possibly diminishing “source” populations[4].

Prior to logging, many forests likely provided habitat structures that Fishers require for resting and reproduction (e.g., large cottonwood trees, CWD, large spruce trees). Forest harvesting, which is targeted primarily at late-successional forests, has likely altered the availability of these resources across spatial scales. The reduced availability of these habitat features has probably resulted in previously occupied landscapes becoming unsuitable for Fishers[4].

The quality of regenerating clearcuts to Fishers varies tremendously depending upon the silvicultural systems that are implemented. Fishers use many features of late-successional forests to fulfill several life requisites. Thus, the supply of these features is probably critical to the survival and reproduction of Fishers. Forest harvesting activities tend to remove many of these features and the resulting silvicultural management of the regenerating forests suppresses the development and recruitment of these structures in managed areas[4].

Many attributes that are the result of natural processes of growth, disease, and decay of forested stands appear to be important for providing habitat for Fishers. Thus, management of forested land that emphasizes tree growth and suppresses disease, death, and decay of trees may negatively affect the quality of Fisher habitat. Monotypic stands that are low in structural and plant diversity probably fulfill few life requisites for Fishers because many habitat elements that Fishers and their prey are dependent upon are missing in these habitats. Thus, maintaining structurally diverse and productive Fisher habitat in logged areas is not only a function of the method and extent of timber harvesting, but also the type of site preparation and subsequent stand tending[4].

The effects of alterations in habitat quantity and quality on Fisher populations probably depend upon the scale and intensity at which the changes have occurred. Because the stand is the dominant scale at which an individual Fisher operates within a home range, loss of habitats at this scale or larger will likely preclude use of that area by Fishers. Habitat loss at smaller spatial scales likely affects the energetics of individual animals because they have to travel more widely to find food and other resources[4].

The quality of harvested areas is likely substantially diminished for Fishers under typical clearcut and intensive forest management practices. With rotational forestry, many of the features of late-successional forests will be lost and not have the opportunity to regenerate. For example, large coniferous trees that are used by Fishers for resting may vanish with short rotations (e.g., <100 yr). The retention of CWD within harvested sites may also be insufficient to supply cold-weather resting sites. Interspersion of deciduous trees for potential resting and den sites may disappear as they are removed during stand tending. Sufficient conifer cover may be present at the later stages of the rotation under intensive forest management[4].

Management Recommendations

Consult with a Registered Professional Biologist prior to implementing the following management recommendations because certain situations may require custom solutions based on specific site characteristics.

- Budget permitting, develop a Fisher habitat model to help identify high value habitat found within your areas of interest. The complexity of the model, and therefore its accuracy, will be dependent on budgetary constraints.

- Identify locations where this species is known to occur: if available, obtain occurrence data from the Conservation Data Centre (http://srmwww.gov.bc.ca/cdc/) and if necessary conduct surveys to confirm presence or absence of this species.

Fishers select resources at several spatial scales. Therefore it is important to consider management recommendations at all spatial scales including landscape, stand, patch, and feature. Consider the following recommendations where this species is identified:

- Areas managed for Fisher should contain 30–45% mature and old forest, depending on the diversity of habitat available and prey abundance, and be suitable for Fishers. Suitable habitat is characterized by shrub cover, coniferous canopy cover, sub-hygric or wetter moisture regime, patches of large, declining trees (particularly black cottonwood), and greater than average amounts of CWD for the zone (see Tables 1, 2, 3 and 4 for more information) [4].

- Maximize landscape connectivity through the use of corridors of mature and old seral forests. Ideally, connectivity should be centred on stream systems and can be achieved by maintaining large (e.g., 100 m where ecologically appropriate) riparian buffers on either side of streams (S1–S6), focusing on riparian areas that contain suitable habitat features to support Fishers (see Tables 1, 2, 3 and 4 for more information)[4].

- Maintain stands that provide sufficient snow interception, security, foraging, and resting cover (see Tables 1, 2, 3 and 4 for more information)[4].

- Maintain natural levels, decay and size characteristics as well as dispersion of CWD. Silvicultural prescriptions should avoid producing stands in the herb structural stage with no CWD and strive to conserve stands with greater than average CWD and >30% closure of the coniferous canopy (see Tables 1, 2 3 and 4 for more information)[2,4].

- Retain patches with a high degree of structure. Fishers use patches within otherwise unsuitable stands that provide sufficient habitat for security cover, foraging, snow interception, resting, and whelping. If it is not possible to conserve stands with the features listed above, conservation of patches within these stands should be maintained. Proposed structural variables within these retention areas include relatively high volume of CWD, large diameter (>20 cm) and elevated CWD, increased canopy and high shrub closure, and increased stocking of trees (including large diameter (>40 cm dbh) and trees containing rust

brooms). If the stand that is created or otherwise altered has structural features that are less than any of the desired levels, patches with more structure should be retained (see Tables 1, 2 3 and 4 for more information)[4].

- When using wildlife tree or old forest retention to provide denning opportunities for fishers, use Table 1 to select suitable sites[4].

Table 1. Preferred wildlife tree retention (WTR) area and old growth management area (OGMA) characteristics for fishers[4].

Attribute	Characteristics
Size (ha)	≥2 ha
WTR location	Riparian and riparian-associated habitats
Tree features	Presence of cavities, particularly those created from broken branches and primary excavators. Large cottonwoods with cavities (>75 cm), trees with broom rust or witches broom (>40 cm dbh), and trees with heart rot and a bole diameter >54 cm at 5 m above ground.
Tree species	Cottonwood, fir, spruce, or balsam poplar
Tree size (dbh)	>75 cm cottonwood or fir, >40 cm spruce (minimum 25 cm). Without trees with the preferred dbh, retain the largest available in the stand for recruitment.
Decay class	2 or 3 preferred, 2–6 acceptable
Structural features	Presence of large diameter (>65 cm dbh) , elevated pieces of CWD; CWD in decay classes 2–6; declining cottonwoods (>87 cm dbh)

- It is recommended that salvage does not occur in WTR areas and OGMAs established to provide habitat for this species. In addition these areas should be designed to include as many suitable wildlife trees as possible and that they should be maintained over the long-term (>80 yr)[4].

- Do not develop roads in Fisher habitat. Where there is no alternative to road development, close road during critical times and rehabilitate[4].

- Do not use pesticides in Fisher habitat[4].

- Report new sightings to the Ministry of Environment.

Additional Information:

- To ensure the maintenance of habitat for Fishers, forest harvesting prescriptions must be developed that provide for the retention of appropriate structural attributes from all stages of forest development. Table 2 provides information on habitat that should be either conserved or not created[2,10]:

Table 2. To help maintain Fisher habitat, habitat managers should try to either conserve or avoid creating stands with particular structural features. For example, silvicultural prescriptions should try to avoid producing stands in the herb structural stage with no CWD and strive to conserve stands with >200 m_/ha of CWD and 21-60% closure of the coniferous canopy.

Structural variable	Conserve	Avoid creating
Structural stage		Herb
Forest phase	MI	MISL, NF
Total volume CWD (m^3/ha)	>200	0
Volume of hard CWD >20cm (m^3/ha)	1-25, >50	
Volume of elevated CWD (m^3/ha)	21-40	
Coniferous canopy closure (%)	21-60	
Deciduous canopy closure (%)	21-40	0
High shrub (2-10m) closure (%)	41-60	
Low shrub (0.15-2m) closure (%)		>80
Stocking of all trees (stems/ha)		0
Stocking of tress with rust brooms (stems/ha)	1-20	
Stocking of trees >40cm dbh (stems/ha)	1-100	
Stocking of hybird spruce trees (stems/ha)	401-800	

MI – mixed coniferous-deciduous forest; MISL – mixed forest, selectively logged; NF – non-forested

- If habitat managers are unable to conserve stands with the features listed in Table 2 (or if they create unsuitable stands), they should conserve patches within these stands as outlined in Table 3[2,10]:

Table 3. Recommended retention targets for structural variables to be maintained in patches within modified stands[2,10].

Structural variable	Retain patches with
Total CWD	>200m^3/ha
Hard CWD >20cm diameter	>50 m^3/ha
Elevated CWD	>0m3/ha
Coniferous canopy closure (%)	>0
Deciduous canopy closure (%)	>0
High shrub (2-10m) closure (%)	>0
Stocking of all trees (stems/ha)	1-1000
Stocking of trees with rust brooms (stems/ha)	>0
Stocking of trees >40cm dbh (stems/ha)	>0
Stocking of hybrid spruce trees (stems/ha)	>0

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