

Fisher Habitat Table: Boreal Habitat Zone

What is this table?

This table is a comprehensive reference tool developed to inform forest management decisions within the range of fishers in British Columbia. It provides concise descriptions and targets for habitat amounts for denning, resting, foraging, and movement habitat specific to the Boreal Habitat Zone. The below information will assist British Columbia forest licensees in development of cutting permits and managing operations by providing specific minimum values for select habitat targets identified and discussed for fisher in the Account and Measures for Managing Identified Wildlife (Badry 2004). By evaluating and integrating the described minimum targets, licensees can minimize the effects of forest practices, maintain potentially limiting fisher habitats within their tenures, and meet obligations under the Forest and Range Practices Act. This document provides guidance for managing fisher habitat in British Columbia. The guidance is intended to inform resources professionals and is not to be interpreted as direction nor is it legally binding. Additional information and other forest management planning tools are available at: www.BCfisherhabitat.ca.

Forest Management Considerations:

Decisions affecting fisher habitat occur in all phases of forest management. To ensure sufficient amounts of suitable habitat exists throughout the landscape, it is necessary to consider the distribution, abundance, and connectivity of habitats in areas comparable in size to a fisher home range. Harvest prescriptions that provide for sufficient retention and recruitment of structural attributes in managed stands and all stages of forest development – including a range of stem sizes, decay classes, and the ecological processes that create these structures – benefit fishers and ensure habitat is maintained in the short- and long-term. Management practices that suppress disease, death, and decay of trees or remove older-aged forests will have a detrimental effect on the supply of vital forest components fishers need for reproduction, security, and thermal cover. Balanced forest management planning plays a key role in the ability of the landscape to support fishers.

Terminology used in the table

1. **Fisher life history component** - Lists key categories of fisher life activities for which specific habitat attributes and values have been identified as important in the Habitat Zone.
2. **Maintaining habitat within landscapes** - Contains descriptions and amounts of important habitats required by fishers within a 30-km² area¹ (= *fisher implementation unit*).
 - a. **Type I** - Describes forest stands using common attributes identifiable in the VRI (Vegetation Resources Inventory; <https://www.for.gov.bc.ca/hts/vri/>). Type I fisher habitats are forested stands that usually support at least 75% of fishers' use for a given life activity (i.e., denning, resting, foraging, movement). Type II stands do not meet the minimum targets identified for Type I stands, but still support use by fishers and are important for fisher survival and reproduction.
 - b. **Amount** - Provides the minimum area of Type I stands that support a female fisher within a 30-km² area (= *fisher implementation unit*). Harvest planning and practices should be considered at the both the fisher implementation unit and cutblock level to determine potential effect on fisher habitat.
3. **Maintaining habitat within cutblocks** - Identifies the minimum characteristics of important **Structural Attributes** (i.e., "suitable" habitat structures and patches used by fishers) and provides **Strategies** to address fisher habitat needs within a cutblock. These values should be considered for integration into cutting permit tree retention guidelines. Type I stands will contain most of the structures used by A fisher in its home range, but a lower density of structures can be found and should be present in Type II stands.
4. **Why** - This column describes *why* these attributes are required for fishers. Note that multiple fisher life history components can be met by the same tree, patch, or stand. For example, a particular patch of trees could be used for denning, resting, and foraging.

How to apply this information to a Cutting Permit (Pre-harvest):

1. Download Fisher Spatial Data from www.BCfisherhabitat.ca for the Habitat Zone in which you are working. The Fisher Spatial Data identifies "Type I" stands and "Amount" as identified in the below table. Type I habitat has been analyzed within the 30-km² area surrounding each stand identified in VRI, with results aggregated to each stand including an identification of whether sufficient amounts of Type I habitat are present. Spatial data is available for the following fisher habitat life history components: Denning, Resting: Rust broom sites, and Resting: Coarse Woody Debris Sites within the Boreal Habitat Zone.
2. Overlay proposed Cutting Permit boundaries on fisher spatial data layer. Identify the Stand Condition (Type I or Type II) and Landscape Conditions for each fisher habitat life history component in the proposed cutblocks.
3. Summarize the amount of Type I and Type II stands within each cutblock. We recommend table format for future reference and ease of pre- and post-harvest comparison.

¹ A 30-km² area is the size of an average home range and should meet all the habitat requirements for a female fisher in the boreal forests of British Columbia. Male home ranges typically overlap 1 or more female home range so their needs (all habitat components except rearing/breeding habitat) would be met by the requirements identified for female fishers.

Fisher Habitat Table: Boreal Habitat Zone (BWBSdk, BWBSmw, BWBSwk, Peace region SBSwk2)

Fisher life history component	Maintaining habitat within landscapes		Maintaining habitat within cutblocks		Why? these attributes are required for fishers
	Type I VRI stand descriptions of important habitats	Amount of Type I to maintain in a 30-km ² implementation unit	Structural Attributes identify characteristics of important habitat structures and patches	Strategies to maintain habitat	
Denning habitat	<p><u>Balsam poplar (Acb) denning stands:</u></p> <ul style="list-style-type: none"> • Acb leading, secondary, or tertiary species • QMD_125 ≥19.5 cm • Stand age ≥88 years • Stand height ≥19 m <p><u>Trembling aspen (At) denning stands:</u></p> <ul style="list-style-type: none"> • At leading, secondary, or tertiary species • QMD_125 ≥21.3 cm • Stand age ≥98 years • Stand height ≥22.8 m 	<p><u>Type I stands:</u></p> <ul style="list-style-type: none"> • 1090 ha needed per 30-km² (36.3% of implementation unit) 	<p><u>Tree characteristics:</u></p> <ul style="list-style-type: none"> • Balsam poplar (Acb): ≥52 cm dbh, declining² with ≥45% total cover (tree and shrub combined) immediately surrounding. • Trembling aspen (At) ≥40 cm dbh, declining with ≥45% total cover (tree and shrub combined) immediately surrounding. • The most valuable trees for use by fisher have cavities with entrance holes (≥1.5m from ground) with typical dimensions of 5–10 cm wide by 7–15 cm tall. • Large (≥30 cm dbh) Acb and At with multiple wounds or decay sites are important for the recruitment of future den trees. 	<ul style="list-style-type: none"> • In general, harvested areas will not contain viable denning sites unless suitable trees are retained <i>and</i> forest cover is protected or develops sufficiently to provide security cover. • Train field crews to identify suitable trees (i.e., those with minimum structural attributes) for retention in proposed cutblock. • Protect suitable trees singly or in windfirm wildlife tree patches, and where practical, maintain advanced regen/brush around the trees to provide concealment cover (≥45% total cover [tree and shrub combined]). 	<ul style="list-style-type: none"> • Fishers require den cavities for birthing and raising their young. In the boreal forest, den cavities have only been found in larger diameter aspen and balsam poplar trees containing heart-rot cavities. • Female fishers often use more than one den tree in a single year. Given this, fishers need multiple suitable trees for present use and will also require new den trees to develop in the future when existing trees fall. • Type II stands can also occasionally benefit denning fishers if scattered trees or small patches of trees with the required structural attributes have been retained.
Resting habitat: Rust broom sites	<p><u>White spruce (Sw) rest stands:</u></p> <ul style="list-style-type: none"> • Sw leading, secondary, or tertiary species • Crown closure ≥50% • QMD_125 ≥18.5 cm • Basal area ≥31.4 m²/ha • Stand age ≥78 years • Stand height ≥19 m <p><u>Black spruce (Sb) rest stands:</u></p> <ul style="list-style-type: none"> • Sb leading, secondary, or tertiary species • Crown closure ≥35% • QMD_125 ≥17 cm • Stand age ≥68 years • Stand height ≥14.8 m 	<p><u>Type I stands:</u></p> <ul style="list-style-type: none"> • 483 ha needed per 30-km² (16.1% of implementation unit) 	<p><u>Tree characteristics:</u></p> <ul style="list-style-type: none"> • White spruce (Sw) ≥31 cm dbh with rust brooms • Black spruce (Sb) ≥17 cm dbh with rust brooms • Rust brooms should be ≥40 cm diameter to provide a platform for fishers 	<ul style="list-style-type: none"> • Retain trees and tree patches dispersed throughout cutblock. • Protect the trees in windfirm wildlife tree patches with crown closure ≥50% for Sw and ≥35% for Sb. 	<ul style="list-style-type: none"> • Tree-based rest sites provide fishers with places to rest and offer protection from predators, thermal cover, and opportunities for prey detection. • Rust brooms are used year round, but are used more often when temperatures are moderate (i.e., ≥ minus 10° C). • Type II stands can also occasionally benefit resting fishers if scattered trees or small patches of trees with the required structural attributes have been retained.

² Declining: appearance code 2; tree live, but unhealthy; internal decay or growth deformities present; often dead leader (DTEIF 1990).

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	Type I VRI stand descriptions of important habitats	Amount of Type I to maintain in a 30-km ² implementation unit	Structural Attributes identify characteristics of important habitat structures and patches	Strategies to maintain habitat	
Resting habitat: Coarse woody debris sites	CWD rest stands: <ul style="list-style-type: none"> • Crown closure ≥60% • QMD₁₂₅ ≥18.1 cm • Stand age ≥78 years • Stand height ≥19 m 	Type I stands: <ul style="list-style-type: none"> • 991 ha needed per 30-km² (33.0% of implementation unit) 	Single piece CWD characteristics: <ul style="list-style-type: none"> • ≥30 cm diameter. • ≥11 m in length • Decay class 2-3³ • Elevated 25-50 cm above ground • White spruce (Sw) optimal Man-made CWD piles: <ul style="list-style-type: none"> • Minimum pile dimensions ≥3 m wide by 5 m long by 2 m high • CWD piles should have ≥30% pieces ≥20 cm diameter ≥3 m long 	<ul style="list-style-type: none"> • Protect natural accumulations of CWD using machine free zones, or create piles of CWD using machinery. • Future Type I CWD rest sites can be created in harvested areas by reserving suitable pieces and by creating piles of woody debris. • Man-made piles should be at <i>minimum</i> ≥20 m³. • Pieces should not be stacked neatly, but be in a jumbled pile to create spaces for fishers. 	<ul style="list-style-type: none"> • The long, thin body of a fisher is susceptible to cold due to their high surface area to body weight ratio. • Micro-habitats that minimize heat loss are important for fishers, especially for areas with cold winter climates such as B.C. • Together, CWD and snow provide fishers with thermally efficient rest sites during winter.
Movement habitat	Movement stands: <ul style="list-style-type: none"> • Total cover ≥50% (≥30% shrub and ≥20% tree cover) 	Type I stands: <ul style="list-style-type: none"> • 2172 ha needed per 30-km² (72.4% of implementation unit) 	Tree/CWD characteristics: <ul style="list-style-type: none"> • Movement habitat is likely suitable if total cover (combination of tree and shrub cover) is ≥20% AND structural attributes that provide cover or facilitate escape from predators are available (see resting habitat for structure descriptions). 	<ul style="list-style-type: none"> • Avoid leaving large areas without some kind of connective cover. • Continuous cover is best, but if not practicable, design cutblocks to promoting corridors or connectivity. • Habitat can be supplied in harvested areas using: <ul style="list-style-type: none"> - riparian and other reserves - non-merchantable patches - single tree retention - regen patches - CWD piles 	<ul style="list-style-type: none"> • Movement habitat is needed so fishers can safely travel between important habitats within their home range, and to access new areas when dispersing. • Fishers are adverse to crossing areas >50 m (i.e., “dash distance”) without cover or other escape habitat. • Creating escape cover (e.g., CWD piles) throughout cutblocks will help fishers travel through and forage within the regenerating stand until cover returns (~10 to 20 years).
Foraging habitat: Snowshoe hare	Optimal snowshoe hare stands: <ul style="list-style-type: none"> • Average tree height ≥3 m • Tree density: ≥8000 stems/ha optimal, ≥3000 stems/ha to provide any habitat value • Cover (trees and shrubs <3 m) 80-100% optimal, 30-80% increasing suitability, and <30% unsuitable for hare 	Type I stands: <ul style="list-style-type: none"> • 262 ha needed per 30-km² (8.7% of implementation unit) 	Not applicable	<ul style="list-style-type: none"> • Re-plant cutblock at higher than usual (or clumped) density. Allow natural regeneration. • Avoid spacing stands where conifer growth is not stagnating. Where spacing is necessary, retain 25% of the stand in dense patches and strips that provide habitat and facilitate snowshoe hare dispersal. • Protect deciduous stems. • Retain CWD on cutblock to provide additional cover. 	<ul style="list-style-type: none"> • Fisher require catchable prey to survive and will target different prey species in different habitats. • Snowshoe hare habitat did not make up a large proportion of fisher home ranges in the Peace Region. Despite this, hares are important prey for fishers throughout B.C. that provide a relatively large source of calories per kill.

³ Decay class 2: intact log, hard to partly decaying, elevated but slightly sagging, bark intact or partly missing; Decay class 3: hard large pieces, partly decaying, sagging near ground or broken, traces of bark (DTEIF 1990).

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	Type I VRI stand descriptions of important habitats	Amount of Type I to maintain in a 30-km ² implementation unit	Structural Attributes identify characteristics of important habitat structures and patches	Strategies to maintain habitat	
Foraging habitat: <i>squirrels</i>	<p><u>Optimal red squirrel stands:</u></p> <ul style="list-style-type: none"> • Crown closure ≥50% • Coniferous tree height ≥ 15 m • Conifer (pine, spruce and Subalpine-fir) ≥50% of tree species cover • Spruce in tree canopy ≥60% <p><u>Optimal flying squirrel stands:</u></p> <ul style="list-style-type: none"> • Crown closure 50-85% • Coniferous tree height ≥21 m • Conifer (pine, spruce and Douglas-fir) 30-80% of tree species cover • Large deciduous tree density (≥35 cm dbh): ≥2 stems/ha 	<p><u>Type I stands:</u></p> <ul style="list-style-type: none"> • 217 ha needed per 30-km² (7.2% of implementation unit) 	Not applicable	<ul style="list-style-type: none"> • Harvested areas will not provide suitable squirrel habitat for a considerable time; however, larger WTPs (≥1.5 ha) and riparian reserves can provide some habitat after harvesting. • Concentrate WTPs on forest stands that have optimal Type I attributes. • Squirrel middens are usually located on mesic or wetter sites that can be targeted for WTPs. • Connecting WTPs with adjacent mature timber will also increase habitat quality for squirrels. 	<ul style="list-style-type: none"> • Fisher require catchable prey to survive and will target different prey species in different habitats. • Squirrel habitat did not make up a large proportion of fisher home ranges in the Peace Region. Despite this, squirrels are important prey for fishers throughout B.C. and it is likely that fisher in the Peace also make use of squirrels when foraging.

Retention Target Guidelines: Retention targets guidance (number of structures meeting structural attributes per hectare) provided for Stand Condition and Landscape Condition Targets. For each life history component, compare the Landscape Condition Targets (i.e., the amount of Type I in implementation zone) and Stand Condition (Type I or Type II) within the proposed cutblocks to identify recommended retention targets.

Colour coding follows a “stoplight” cautionary approach.

Green =	Proceed with harvest; strive to retain trees that meet the minimum structural attributes at specified target.
Yellow =	Proceed with caution; reconsider harvest; strive to retain trees that meet the minimum structural attributes at specified target.
Red =	Reconsider harvest because density of Type I in landscape is below Landscape Condition Target.

Denning Habitat Boreal Habitat Zone
Retention Feature: Acb ≥52 cm dbh or At ≥40 cm dbh (stems/ha)

Landscape Condition¹

Stand Condition	Below	Near	Above
Type I	10.0	7.5	2.5
Type II	1.2	0.9	0.3

¹ Landscape Condition Targets: Below = less than 1090 ha; Near = 1090 to 1308 ha; Above = more than 1308 ha.

Resting Habitat: Coarse Woody Debris Boreal Habitat Zone

- Retention Features: Single pieces of CWD ≥30 cm diameter, ≥11 m in length, elevated 25-50 cm above ground (pieces/ha), **AND**
- Man-made CWD piles >3 m x 5 m x 2 m high, with >30% of pieces being >20 cm diameter >3 m long (piles/ha)

Landscape Condition¹

Stand Condition	Below	Near	Above
Type I	2.0 pieces/ha plus 0.5 piles/ha	1.5 pieces/ha plus 0.38 piles/ha	0.5 pieces/ha plus 0.13 piles/ha
Type II	0.4 pieces/ha plus 0.25 piles/ha	0.3 pieces/ha plus 0.19 piles/ha	0.1 pieces/ha plus 0.06 piles/ha

¹ Landscape Condition Targets: Below = less than 991 ha; Near = 991 to 1128 ha; Above = more than 1128 ha.

Resting Habitat: Rust Broom Sites Boreal Habitat Zone
Retention Feature: Sw ≥31 cm dbh or Sb ≥17 cm dbh with rust brooms (stems/ha)

Landscape Condition¹

Stand Condition	Below	Near	Above
Type I	8.0	6.0	2.0
Type II	0.2	0.2	0.1

¹ Landscape Condition Targets: Below = less than 483 ha; Near = 483 to 611 ha; Above = more than 611 ha.



The Fisher Habitat Working Group recognizes the Habitat Conservation Trust Foundation and anglers, hunters, trappers and guides who contribute to the Trust, for making a significant financial contribution to support the British Columbia Fisher Habitat and Forestry Web Module. Without such support, this project would not have been possible.



The Fisher Habitat Working Group gratefully acknowledges the financial support of the Fish and Wildlife Compensation Program for its contribution to the British Columbia Fisher Habitat and Forestry Web Module.