## Background on Fisher Equivalent Territory Area (FETA)

Fishers are territorial animals that require specific forest structures within those territories to meet their life history needs. While each individual fisher will have a unique territory shape and location (i.e., home range), we cannot identify the location of each fisher territory across BC. Therefore, we used a spatial grid of hexagons with an area of 30 km2 to represent a fisher equivalent territory area (FETA). We used a 30 km2 size because that is the measured average home range size of fisher in BC (Rich Weir, pers. comm.). These hexagons represent a territory area required by fisher, within which we can estimate habitat characteristics and assess whether they meet fisher needs.

## Habitat Category

### Denning (hab\_den)

The amount of area in hectares within a FETA classified as Reproductive Denning Habitat as per Habitat Category Descriptions (at stand level). In general, denning habitat is characterized by forest structure with large diameter, older *Populus* spp. The provincial forest inventory (Vegetation Resource Inventory) was used to estimate this forest structure. In the status box ‘Denning’ refers to the number of FETAs with area classified as denning > 232 ha.

### Movement (hab\_mov)

The amount of area in hectares within a FETA classified as movement as per Habitat Category Descriptions (at stand level). In general, movement habitat is linked to forest structure characterized by high crown cover. The provincial forest inventory (Vegetation Resource Inventory) was used to estimate this forest structure. In the status box ‘Movement’ refers to the number of FETAs with area classified as movement >1634 ha.

### Rust (hab\_rust)

The amount of area in hectares within a FETA classified as Resting Habitat: Rust broom sites as per Habitat Category Descriptions (at stand level). In general, mature spruce (*Picea* spp) forest structure characterizes the presence of rust broom. The provincial forest inventory (Vegetation Resource Inventory) was used to estimate this forest structure. In the status box ‘Rust’ refers to the number of FETAs with area classified as Resting Habitat: Rust broom sites >420 ha.

### Coarse Woody (hab\_cwd)

The amount of area in hectares within a FETA classified as Resting Habitat: Coarse woody habitat as per Habitat Category Descriptions (at stand level). In general, older- large diameter forest structure characterizes the presence of coarse woody habitat. The provincial forest inventory (Vegetation Resource Inventory) was used to estimate this forest structure. In the status box ‘CWD’ refers to the number of FETAs with area classified as Resting Habitat: Coarse woody habitat >450 ha.

### Cavity (hab\_cav)

The amount of area in hectares within a FETA classified as Resting Habitat: Cavity sites as per Habitat Category Descriptions (at stand level). In general, tall and large diameter *Populu*s Spp forest structure characterizes cavity sites. The provincial forest inventory (Vegetation Resource Inventory) was used to estimate this forest structure. In the status box ‘Cavity’ refers to the number of FETAs with area classified as Resting Habitat: Cavity sites >10 ha.

## Density (n\_fish)

The density of fisher or number of fisher per 1000 km2. We used a fisher capability rating to adjust a maximum fisher density estimate of 16.3 fisher per 1000 km2 (taken from the Williston area of the B.C). “A habitat capability rating is defined as the ability of the habitat, under the optimal natural conditions for a species to provide its life requisites, irrespective of the current condition of the habitat” (https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/wildlife/wildlife-habitats/wildlife-habitat-mapping). We calculated fisher density by habitat capability rating based on the capability rating adjustment provided in Table 1. The proportion of area of a FETA within each fisher capability rating was then multiplied by the respective fisher density estimate found in Table 1 and then summed across the number of fisher capability ratings to estimate fisher density within a FETA.

Table 1 Fisher capability ratings and their respective density estimates.

|  |  |  |
| --- | --- | --- |
| Fisher capability rating\* | Percentage (mid point) applied to 16.3 fisher per 1000 km2 | Fisher density per 1000 km2 |
| Very High | 88.0 | 14.344 |
| High | 63.0 | 10.2690 |
| Medium | 38.0 | 6.1640 |
| Low | 15.5 | 2.5265 |

\*rare was not included

In the status box ‘Max. Abudnance (n\_fish)’ refers to the summation of FETA level density estimates (after accounting for the area within a FETA; 30 km2).

## Relative Probability of Occupancy (p\_occ)

The relative probability of occupancy model (Weir and Corbould 2010) was estimated using:

[1]

Where, openness is the percentage of a FETA that is open, which includes permanently open areas (i.e., wetlands, lakes, non-vegetated, etc) and forest less than or equal to 12 years old (cutblocks and fire origin stands). Permanently open areas and forest age were queried from the Vegetation Resource Inventory projected to the year 2020.

## Abundance (abund)

Two sources of information were used to estimate fisher abundance within a FETA: the relative probability of territory occupancy using the model developed by Weir and Corbould (2010) and the fisher habitat capability rating (a 2004 spatial file provided by Rich Weir).

The estimate of fisher abundance in a FETA then follows as:

[2]

Where, N is the abundance of fisher in a FETA, *rel.prob.occupancy* is the relative probability of occupancy (Weir and Corbould 2010) , *AreaFisherCapability* is the area (in 1000 km2) of the rth fisher capability rating and Density is the density estimate for the rth fisher capability rating (R is the number of fisher capability ratings in a FETA).

In the status box ‘Abundance’ is the total sum of FETA level abundance estimates.