Fisher Open Area Analysis

V. 25 April 2019

Fishers are a rare forest dependent species that is sensitive to human activities and in need of greater management attention in British Columbia. Fragmentation and loss of forested habitats can negatively impact this provincially blue-listed species by removing important structural elements and exposing fishers to increased predation risk. Fisher require movement habitat to safely travel between important habitats within their home range, access potential mates, and to new areas when dispersing. Movement habitat is supplied by trees and shrubs that provide horizontal and vertical screening where the total overhead cover is >50%. The cover does not need to be continuous, but fishers face increased predation risk when crossing openings larger than 50 m.

Fishers only can successfully establish home ranges where there is a sufficient concentration of suitable habitats, with overhead cover being a basic requirement for occupancy. Weir and Corbould[1] examined factors influencing the probability of a home range being occupied by fishers in North-Central BC. They examined a number of factors that might have affected where fishers occurred, including the area of old/mature forest, stands with ≥30% tree cover, specific ecosystem associations, estimated habitat suitability, recent logging, and wetlands. They found that fisher occupancy was best predicted by the area of wetlands and recent logging that occurred within a potential home range area. Specifically, the relative probability of a home range being occupied by a resident fisher decreased with increasing amounts of "open" habitats (i.e., wetland and recent logging) in the area. They estimated that a 5% increase in the area of wetlands or recent logging decreased the relative probability of fisher occupancy by 50% (Figure 1). At a 25% increase in the amount of open area within a home range area, the relative probability of a fisher occupying the landscape falls to almost nil.

Weir and Corbould concluded that "landscapes with previous widespread and intensive forest harvesting may lose their ability to support fishers until these harvested areas regenerate sufficiently". Their conclusions are backed up by another study on fisher occupancy from northwest Idaho, where Sauder and Rachlow found that fishers also select home ranges with ≤5% open areas[2]. In addition, that study found that fisher selected landscapes with ≥50% of the area in mature connected forests.

Based on the results of these studies, we provide details on how to conduct "Fisher Open Areas Analysis" to help forest companies identify when their activities are likely to significantly hamper the probability of fishers occupying areas in their forest tenures. This analysis was prepared in response to the 2018 findings of the Forest Practices Board investigation of timber

[1] Weir, R and F. Corbould. 2010. Factors affecting landscape occupancy by fishers in North-Central British Columbia. Journal of Wildlife Management 74(3): 405-410.

[2] Sauder, J. and J. Rachlow. 2014. Both forest composition and configuration influence landscape-scale habitat selection by fishers (Pekania pennanti) in mixed coniferous forests of the Northern Rock Mountains. Forest Ecology and Management 314(2014):75-84.

harvesting and fisher management in the Nazko area[3]. That investigation concluded that the magnitude of forest harvesting over a relatively short period of time put fishers at a high risk of population decline or extirpation. Our reviews of other areas across BC indicate that this is likely to be a problem in more landscapes than just the Nazko area.

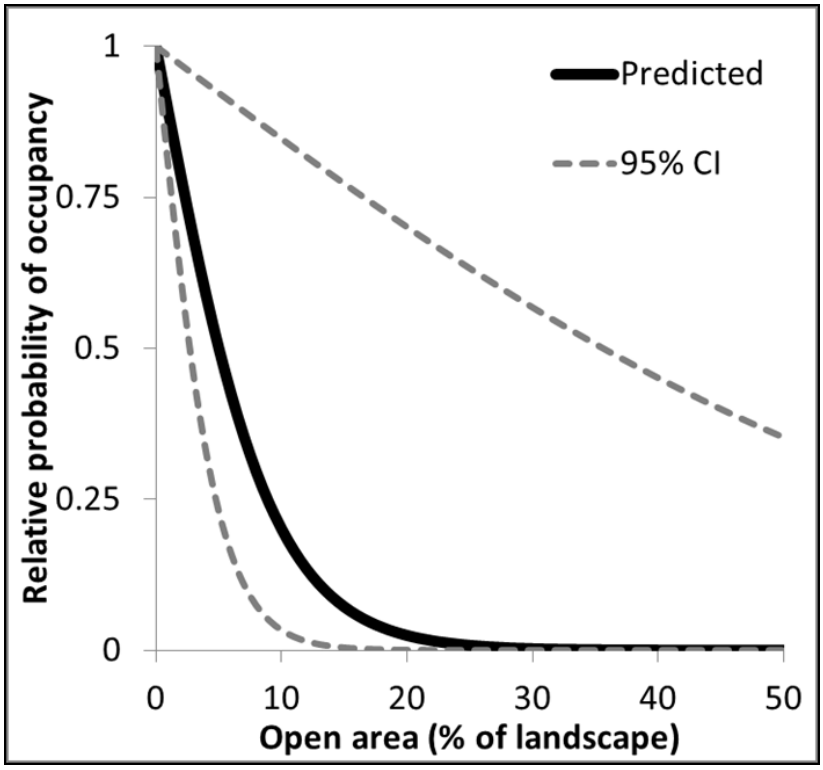

Figure 1. Open areas (logging 0-12 years old and wetlands) affect the relative probability of a home range being occupied by fishers in the Williston region of BC (Figure 1. from Weir and Corbould 2010).

The *Fisher Open Areas Analysis* is a GIS-based analysis of the amount of area in open habitats in a home range sized area around a proposed cutblock. *Open Areas* are defined as clearcut areas that have occurred within the previous 12 years, wetlands, and open range. Partial cutting silviculture systems, such as used in ungulate winter range harvesting, are likely to maintain movement habitat for fishers and are not included as an open area for this calculation. To complete the analysis, a GIS technician calculates the current total amount of *Open Areas* in a home range-sized area around a proposed block. If the harvesting of the proposed block(s) would cause the amount of *Open Areas* to exceed 5% of the home range area, harvesting should be postponed until surrounding stands within the home range area regrow sufficiently for the landscape to stay below the 5% threshold when including the new harvesting. Fisher

[3] Forest Practices Board. 2018. Timber Salvage Harvesting and Fisher Management in the Nazko Area – Complaint Investigation #16037. FPB/IRC/217. 15pp.

home range sizes vary by Fisher Habitat Zone (BCfisherhabitat.ca) with home ranges in the Boreal and Dry Zones being 30-km^2. Fishers in the Sub-Boreal Zone have two different home range sizes based on the subzone. In moist/wet subzones (SBSwk, SBSmk, SBSmm, SBSmw) fishers have home ranges of 50-km^2, while in dry subzones (SBSdw, SBSdh, SBSd) fishers have home ranges of 25-km^2. As example of applying the *Fisher Open Area Analysis*, Table 1 provides the results of a GIS analysis of open areas around a proposed cut block in the Dry Forest zone.

Table 1. Example calculation of a *Fisher Open Areas Analysis* for a 119-ha cutblock proposed in the SBPS biogeoclimatic (Dry Forest) zone, where female fishers have home ranges of 30 km² (3000 ha).

Type of Open Area within surrounding 3000 ha	Area (ha)	% of home range	Harvest Decision
Current Wetland	9	0.3%	
Current Range	21	0.7%	
Clearcut (with or without reserves) harvest in last 12 years	109	3.6%	
Subtotal Amount of 'Open Areas' over 12 year time period	139	4.6%	
Proposed Harvest	80	2.7%	
Amount 'Open' current + proposed	219	7.3%	*Postpone*

The BC Fisher Habitat Working Group has the goal of communicating information to the people that can affect the quantity and quality of fisher habitat on the landscape across British Columbia. The working group uses information from research studies to describe important habitats and identify the amounts of these habitats required by fishers. The *Fisher Open Areas Analysis* is a landscape level analysis meant to complement the stand level conditions and targets for fisher habitat currently available at BCfisherhabitat.ca. Please continue to use all the resources available at BCFisherhabitat.ca and to check the website regularly for updates on fisher habitat tools.