

Appendix E: Identifying Habitat patches as Values at Risk for Boreal Caribou

In order to identify high priority boreal caribou habitat patches to designate as VAR for consideration in fire management decisions, the late winter predictive RSF model was used (see Figure B-6). The rationale for focusing on late winter habitat is that boreal caribou are displaying their strongest preference for areas that have not burned in at least 60 years at that time of year, and to a lesser extent, areas that have not burned in the last 40-60 years (DeMars et al. 2020). Older forests relied upon by boreal caribou in late winter should be more vulnerable to wildfire due to higher accumulation of fuels as forests age. To focus on the most highly selected late winter habitat, areas with predicted RSF scores falling in RSF bins 8-10 were used, as they had the highest selection ratios (based on a comparison of the number of used vs. random locations falling within each of the 10 RSF bins). This was further narrowed down to areas in RSF bins 8-10 that occurred in patches >60 km² in size, based on an assessment of late winter home range sizes that showed that 90% of boreal caribou had home ranges that were 60 km² or greater at that time of year (Figure E-1).

The predictive RSF maps in Appendix B are fine-scale raster layers, with predicted habitat preferences calculated for 30 x 30 m grid cells of 900 m² (0.0009 km²). This results in very detailed polygons when only the patches >60 km² consisting of late winter RSF bins 8-10 were considered. To simplify things for fire management decision making, a grid of 1 x 1 km cells was overlaid on top of the late winter polygons, and the proportion of each grid cell covered by these polygons was calculated. Grid cells with >25% coverage of late winter habitat polygons were considered in the final boreal caribou VAR grid layer and were broken down into three categories (25-50%, 50-75% and >75% coverage of highly preferred late winter habitat; Figure E-2).

The boreal caribou VAR grid layer based on late winter habitat aligns fairly well with caribou fire protection priority polygons identified by the Tłı̨chǫ Government based on community workshops held in 2019 (Figure E-3). Most of the VAR patches also fall within Enhanced and Intensive management class areas in the Range Plan, although there are a few large patches that fall within Basic management areas. The boreal caribou VAR grid layer, Tłı̨chǫ Government fire protection priority polygons, and map of management class areas have been provided to GNWT-ECC Forest Management Division for incorporation into their fire management decision mapping support tool called "SPARCS" (Spatial Precipitation and Risk Calculation System). This information was used in fire management decisions in summer 2021 and onwards and will need to be updated every five years.

Limitations and other considerations

Decisions about whether to action fires that start within areas identified as VARs for boreal caribou are made on a case-by-case basis and will depend on a number of factors, including:

- the number of fires burning at any given time;
- other higher priority values that may be threatened elsewhere (human life and property);
- distance from fire bases;

- fire growth rate and direction of spread; and
- whether the NWT is experiencing a drought year versus a wetter than average summer.

Figures E1 to E4 show a 70 km radius around communities that have fire management resources (bases). Generally, initial attack of fires is limited to areas within this radius. In many cases, the GNWT may not be able to action fires that start within a boreal caribou VAR area. Allocating resources to a fire in boreal caribou habitat that is far from a fire base may divert resources that are needed quickly elsewhere to address higher priorities like human life and property. When responding to a fire in a boreal caribou VAR area, response options include a direct initial attack, or an indirect attack such as using prescribed fire. More recently, prescribed fire is being incorporated into response practices to help slow fire growth or help break up forest connectivity to reduce potential fire growth and reduce risk to VAR areas. Where initial attack is attempted and is unsuccessful, another response including abandoning response on the fire may have to be undertaken. In the event that an initial attack is unsuccessful, a wildfire situation analysis will be completed to assess response options against the Forest Fire Management Policy.

Any fire response decisions will need to consider the natural range of variation in fire disturbance and forest age class distribution, and fire regime characteristics typical of the ecological units within the region (e.g., ecoregions). GNWT-ECC Forest Management Division is currently working on improving knowledge of NWT fire regimes and natural range of variation. Ultimately, fire response should not force the forest environment into an unnatural state, especially to the point where fuel build-up results in very severe fires. In wetter years it may be preferable to let fires burn to reduce fuel loading and fuel continuity, so that more severe large fires are less likely during drought years.

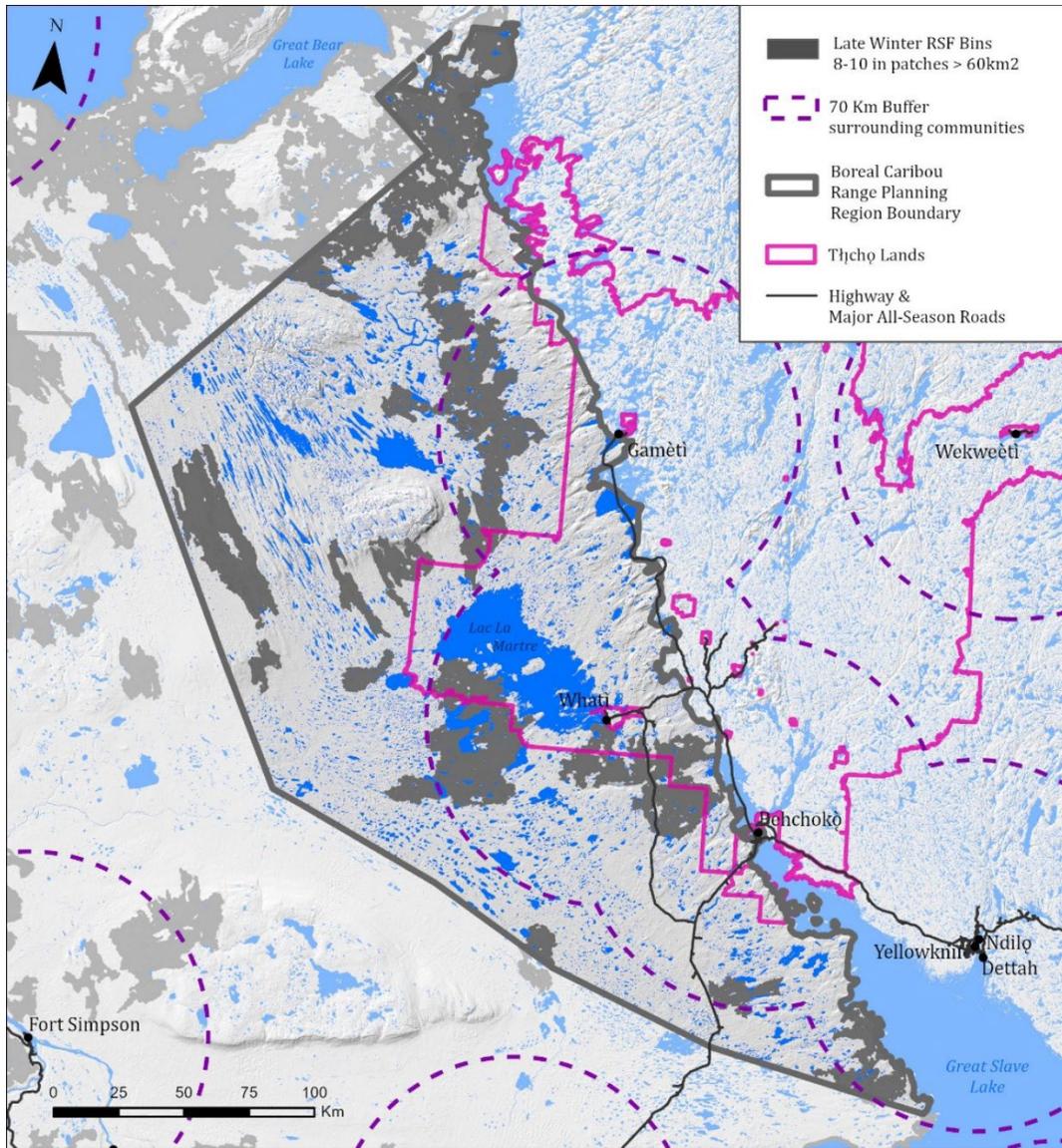


Figure E-1. Late winter habitat highly selected by boreal caribou corresponding to RSF bins 8-10, occurring in patches >60 km².

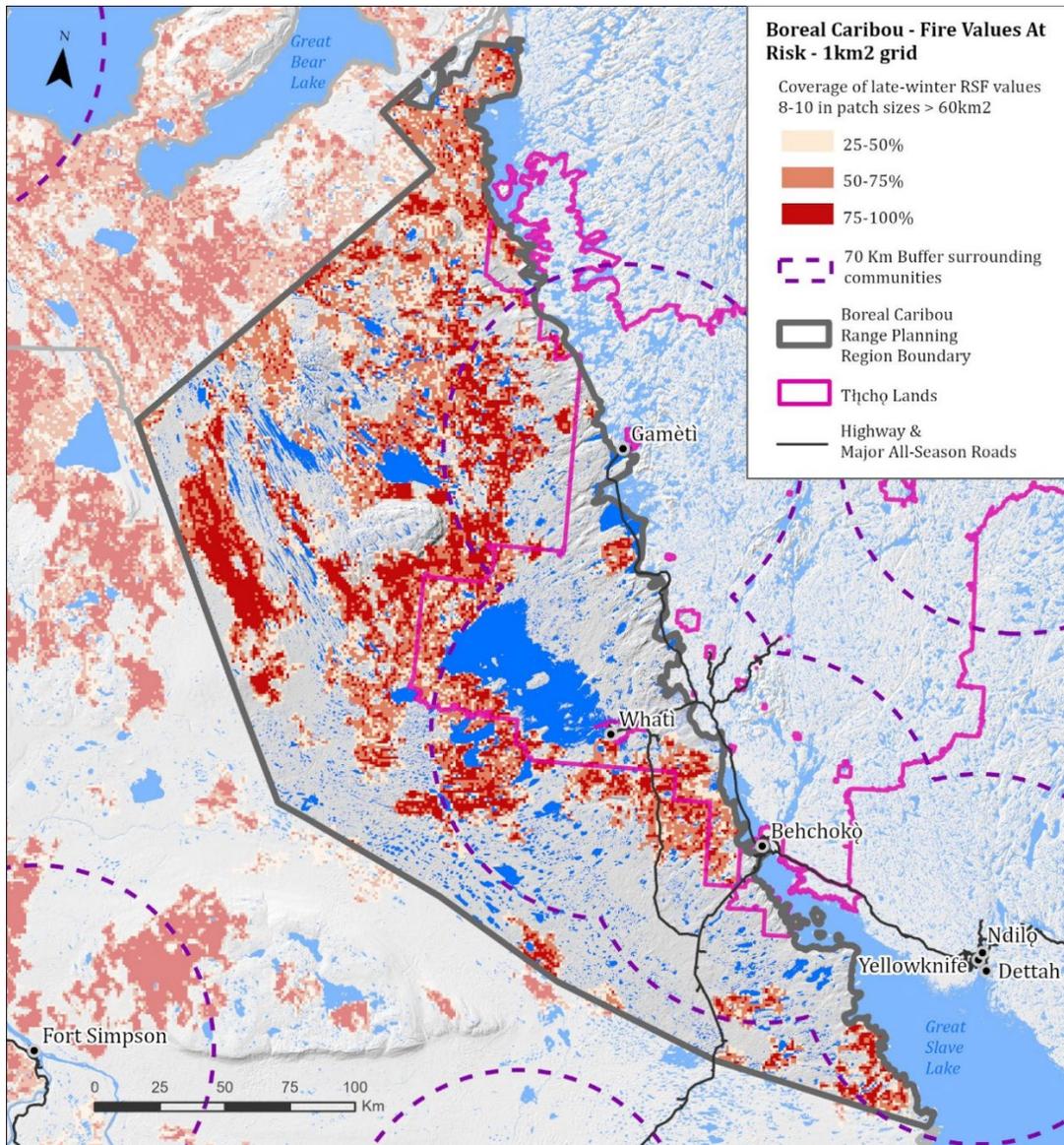


Figure E-2. Boreal caribou fire VAR grid layer showing the percentage coverage of >60 km² patches of highly selected late winter habitat within 1 km² grid cells.

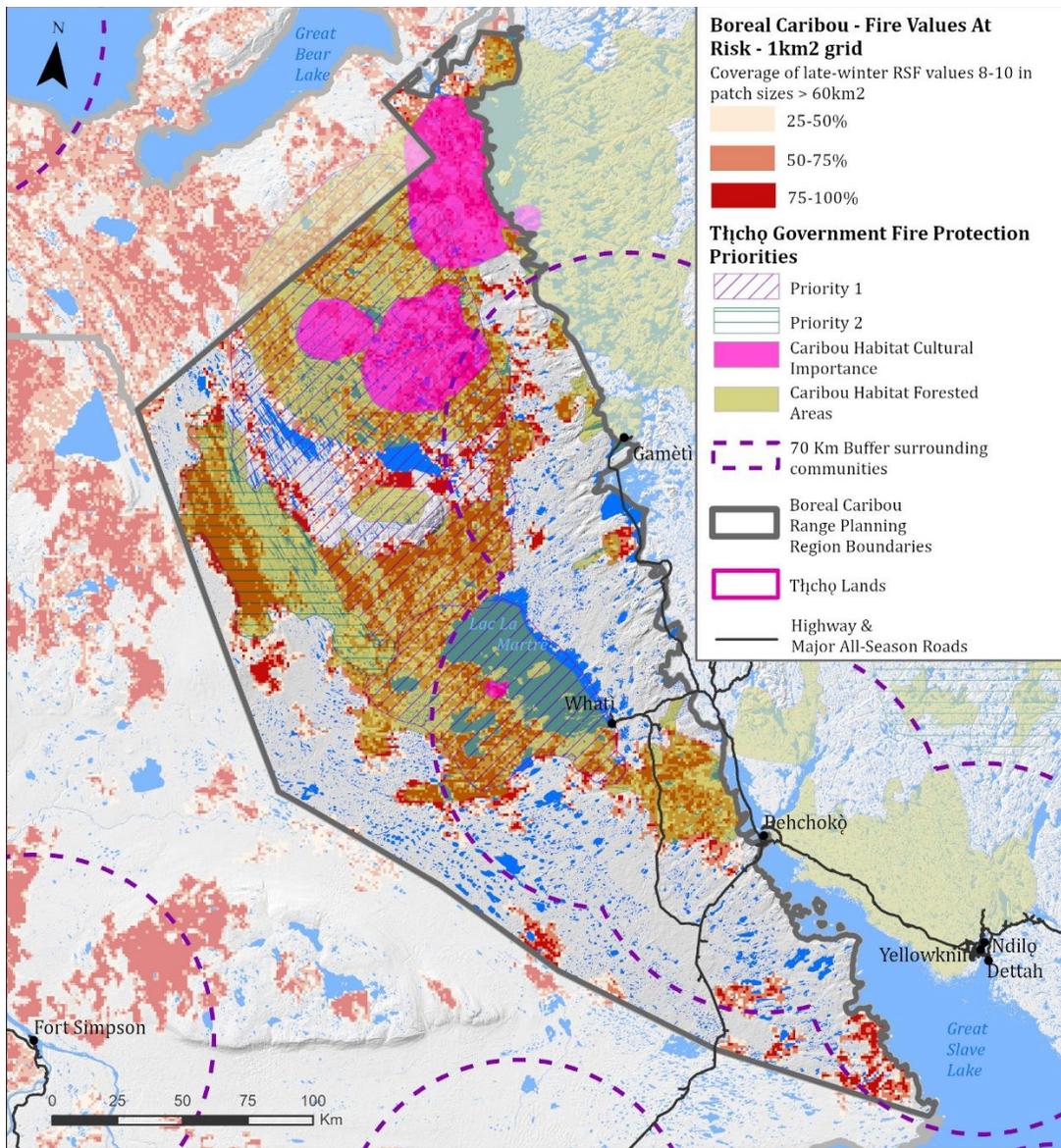


Figure E-3. Overlap between the boreal caribou fire VAR grid layer and fire protection priority polygons identified by the Tłı̨chǔ Government at community workshops held in 2019.

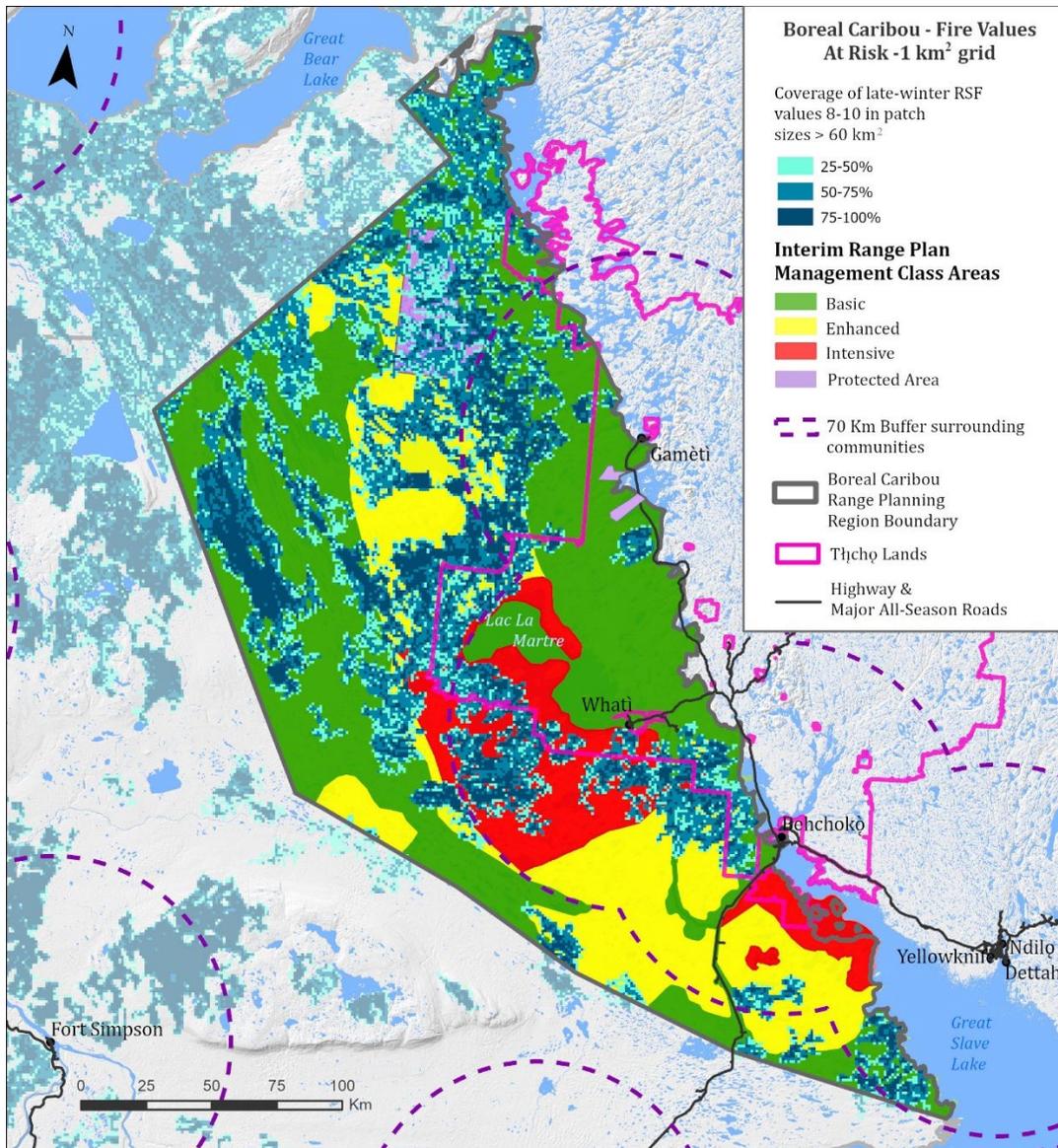


Figure E-4. Overlap between the boreal caribou fire VAR grid layer and Basic, Enhanced and Intensive management class areas in the Range Plan.