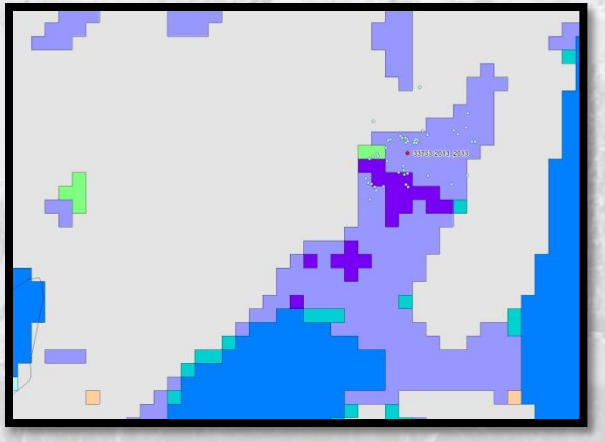
Living in a burned landscape: Woodland caribou use of residual patches for calving in the high fire/low anthropogenic Boreal Shield of Saskatchewan



Hans G. Skatter, Michael L. Charlebois, Sindre Eftestøl, Diress Tsegaye,
Kjetil Flydal, Jonathan E. Colman, John L. Kansas, Brady Balicki

SMA Environmental Forum
October 18-20, 2016 – Saskatoon, Saskatchewan

Acknowledgements

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Background

1) The woodland caribou recovery strategy (RS) (Environment Canada 2012):

- Woodland caribou require large continuous tracts of undisturbed habitat
- Forest fires alter habitat, making it unsuitable for caribou
- Caribou avoid disturbed habitat for several decades post fire

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Background

2) Disturbance is quantified as the combined effect of fires <40 years and buffered anthropogenic footprint (visible on Landsat).

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Background

3) RS disturbance models assume that all areas within fire polygons are disturbed as opposed to potential existing habitat.

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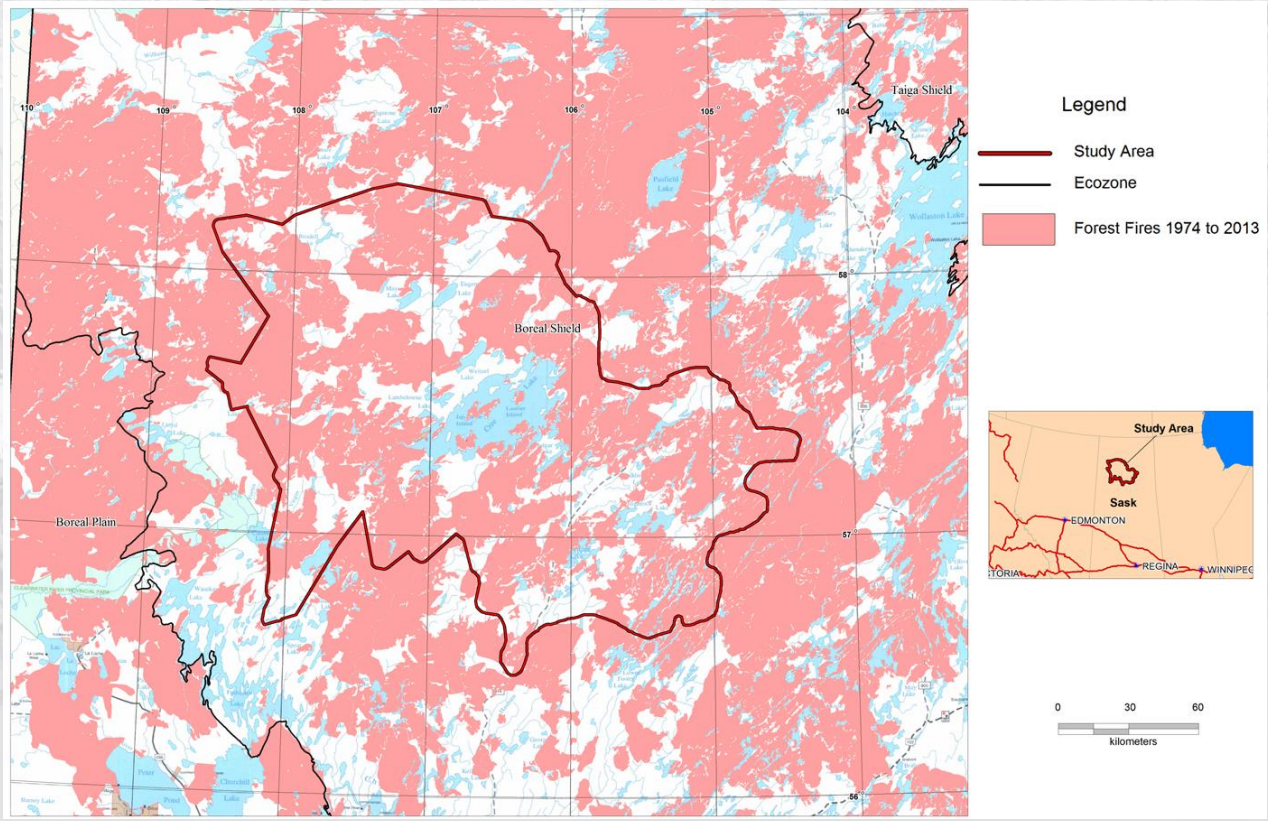
Background

4) In the Boreal Shield of Northern Saskatchewan as much as 55% of the landscape is less than 40 years old, and total buffered anthropogenic disturbance is less than 3% (Environment Canada 2012).



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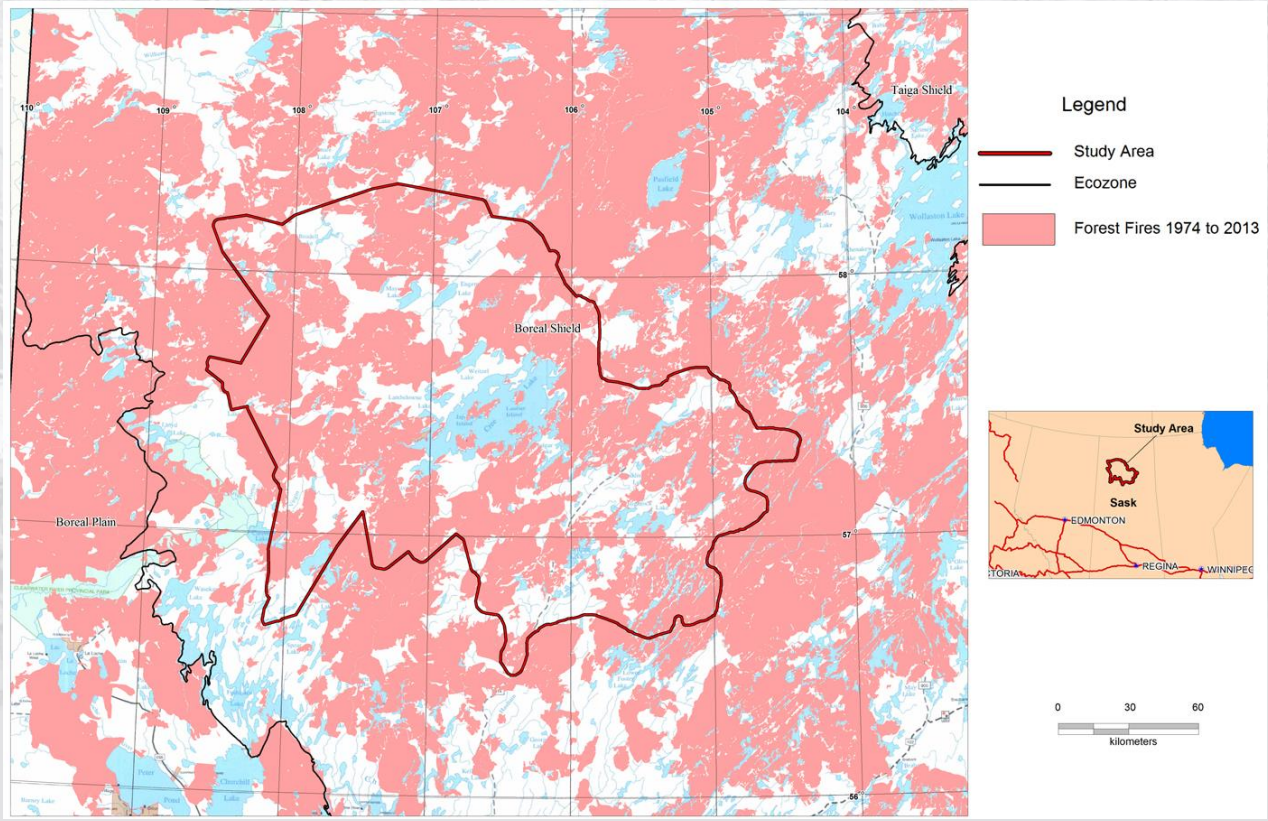

How do caribou cope with this…..?

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Study Purpose and Focus

Document woodland caribou habitat use during calving in this high fire low anthropogenic disturbance landscape.

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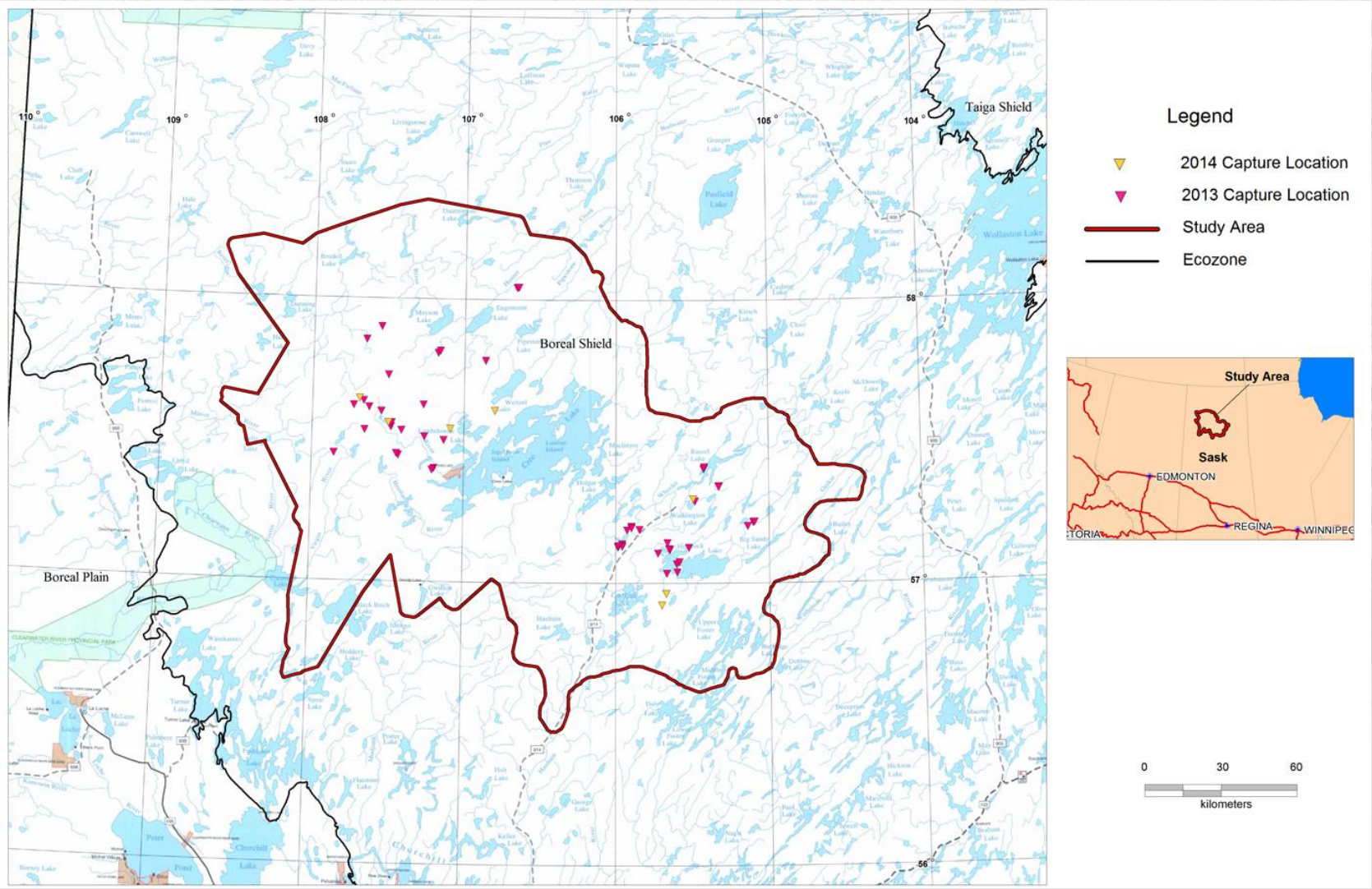
Study Area



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Methods

Caribou capture and telemetry

- March 2013: 49 caribou
- March 2014: 7 additional caribou
- GPS-Iridium satellite collars
- 3-hour duty cycle throughout
- Data collected for 2 calving seasons
- Due to mortalities/collar failure, available data was from 45 (2013) and 46 (2014) animals.

University of Saskatchewan animal use protocol No. 20120105.

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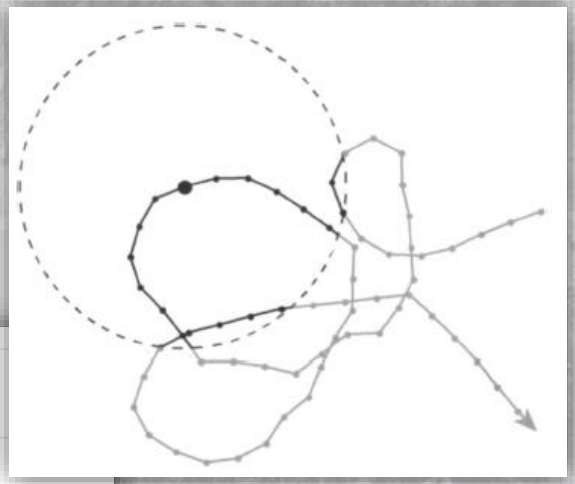
Methods

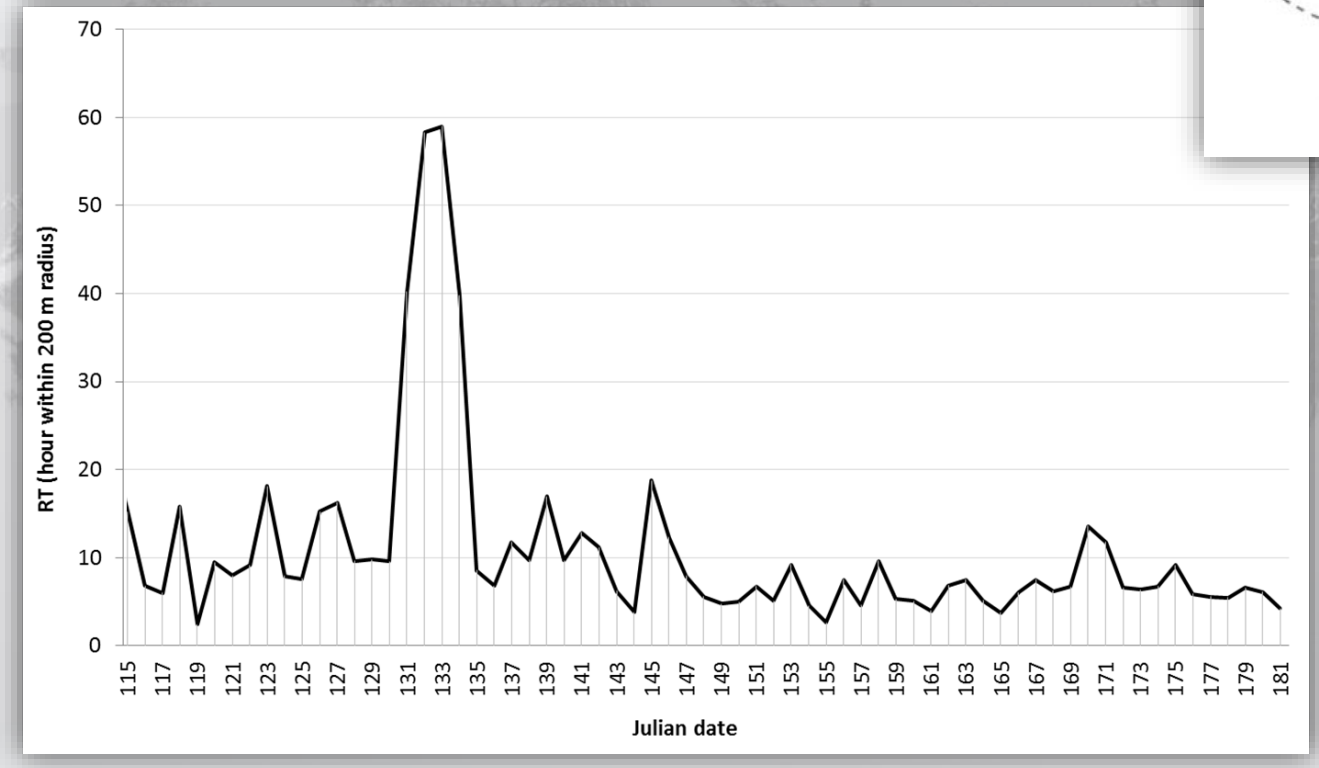
Determining calving timing

Residence Time Method (RT):

Hours spent within a 200 m radius



(Barraquand and Benhamou 2008)



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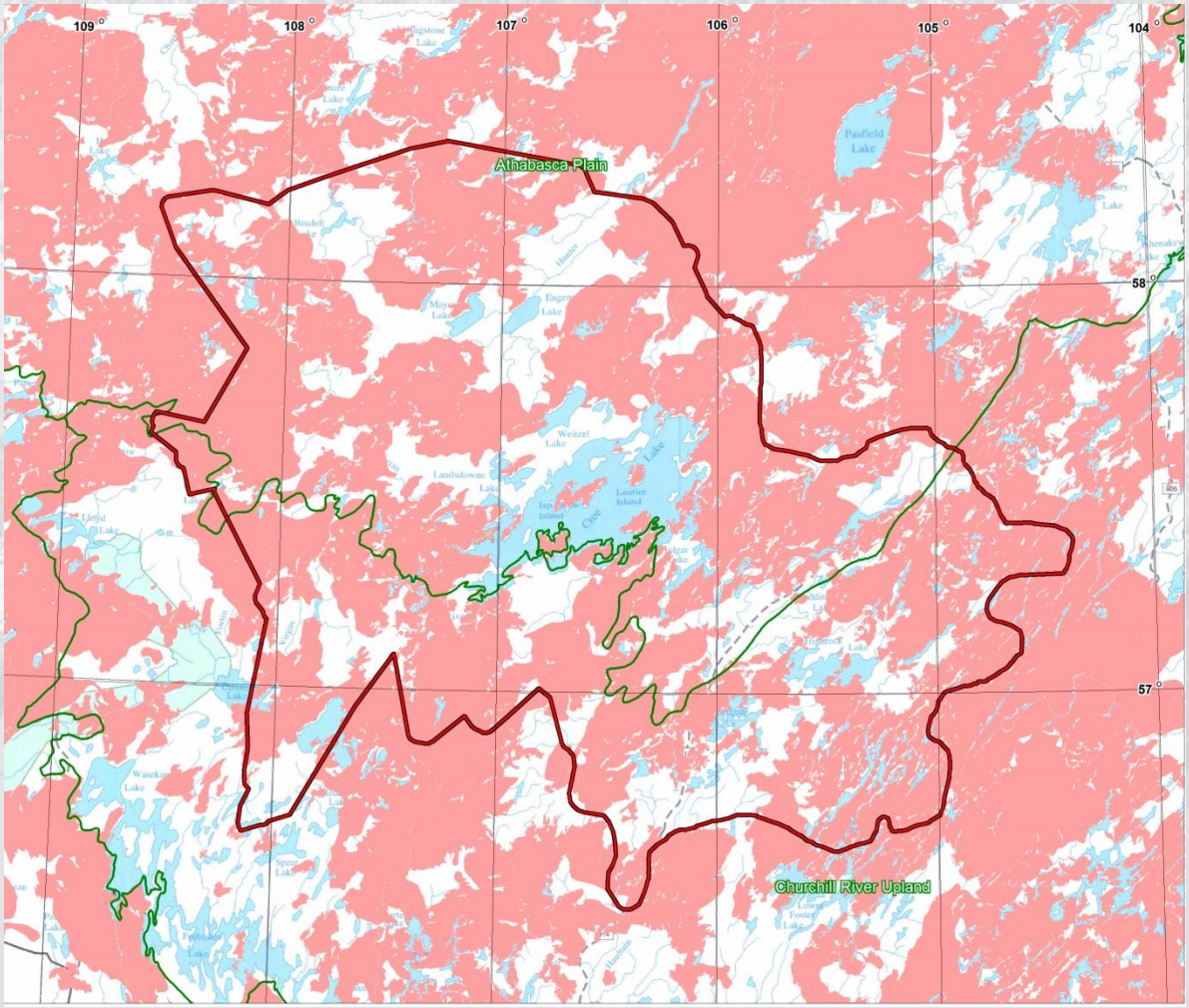
Methods

Mapping



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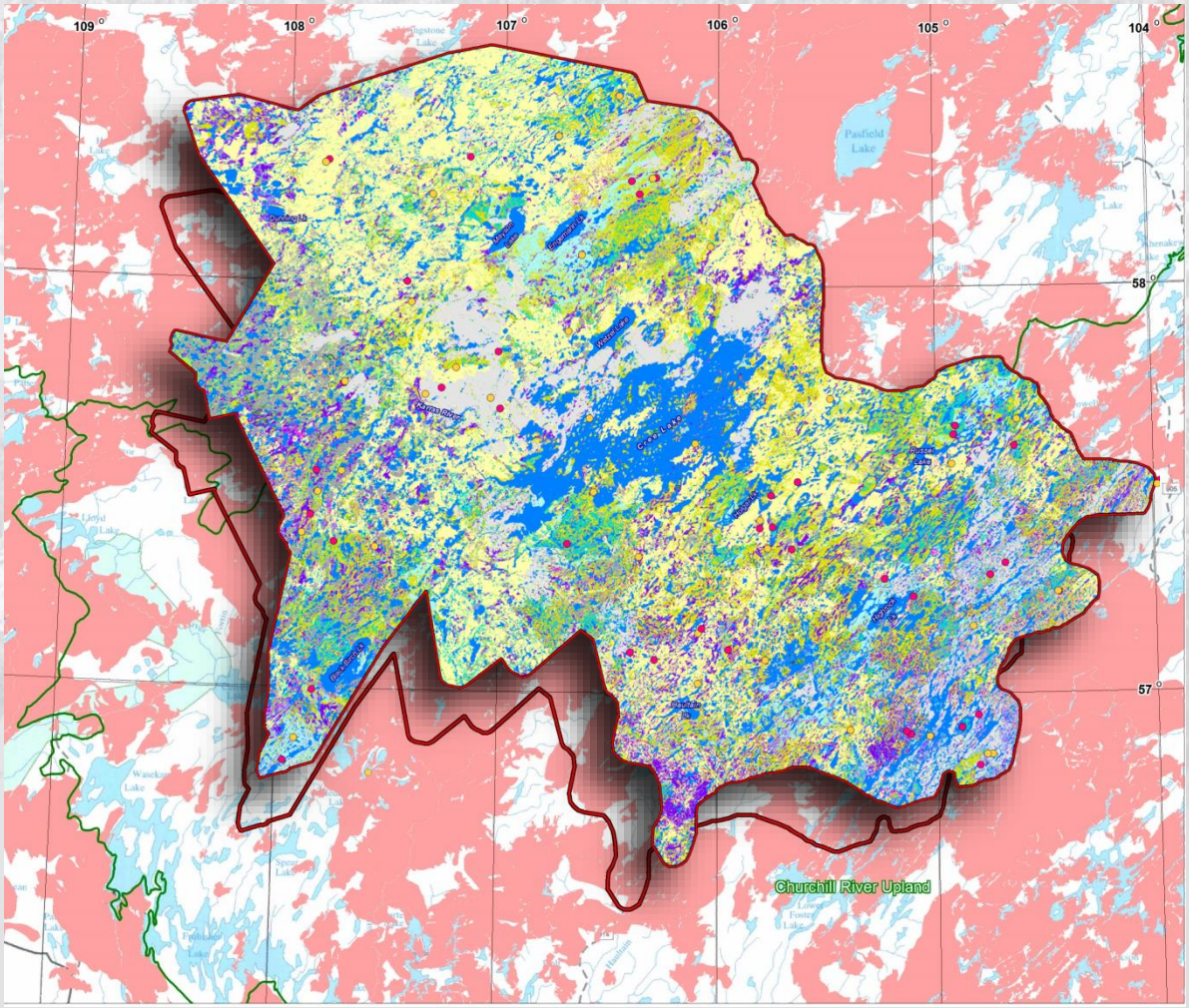
Methods

Mapping



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Methods

Land cover types

1. Recent burn

2. Regenerating forest - young

3. Regenerating forest - old

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Methods

Land cover types

4. Mature forest

5. Bog/fen

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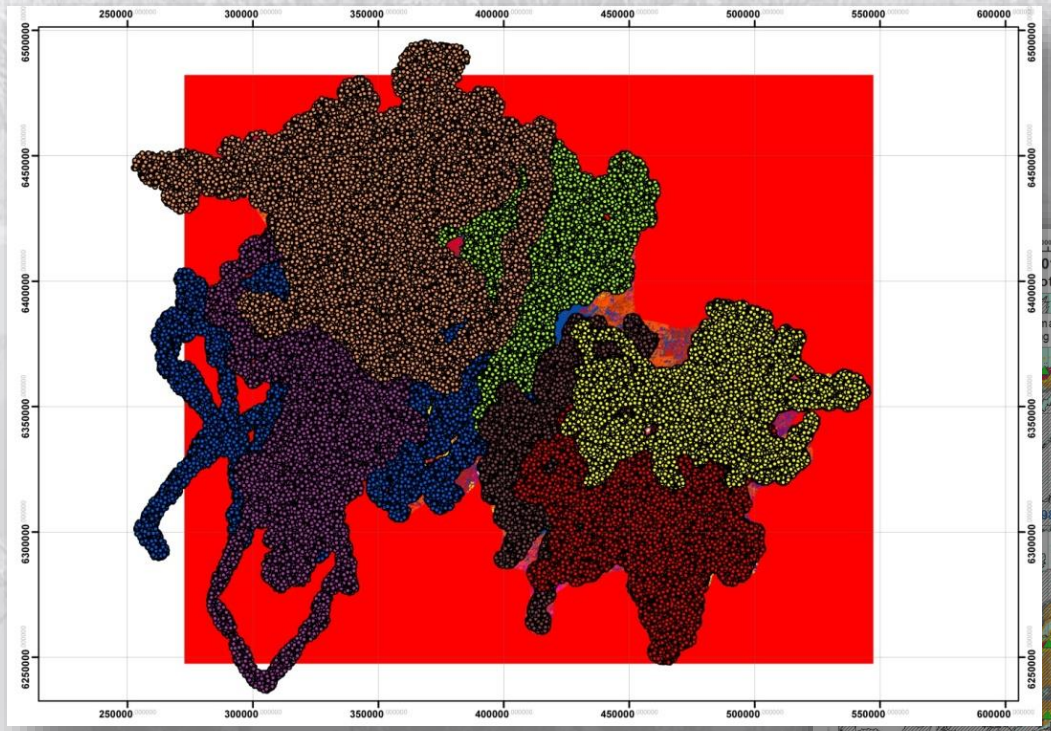
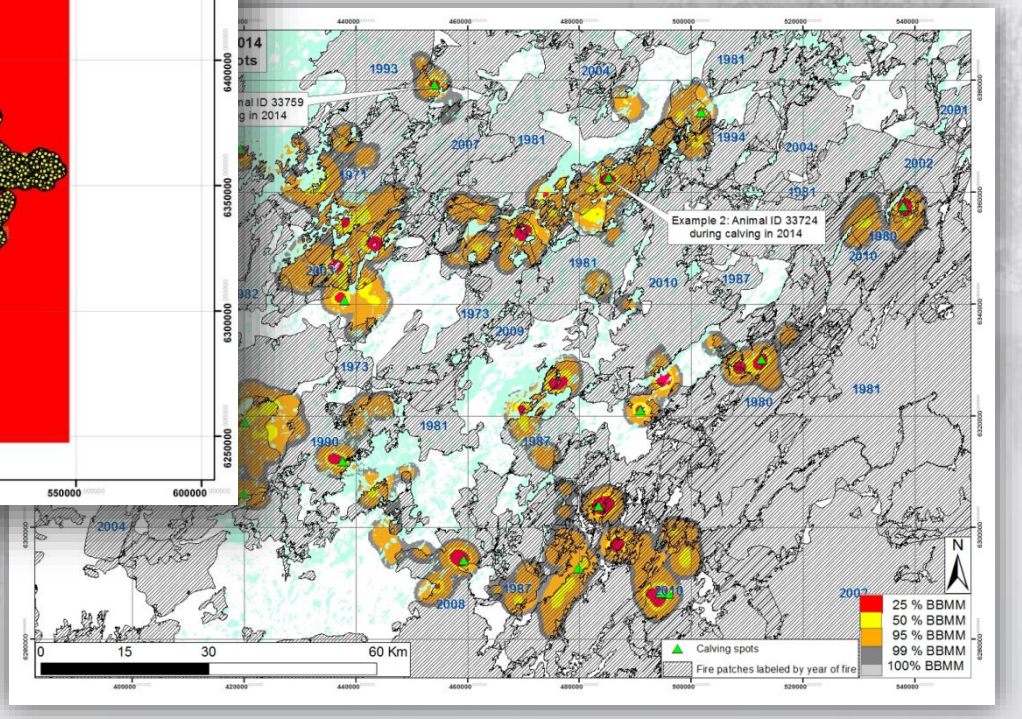
Methods

Available areas/home ranges



K-mean cluster analysis (Everitt and Hothorn 2009; Peeples 2011)



Brownian Bridge Movement Models (BBMM) (Horne et al. 2007)

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Methods

Modelling

Used three models to analyze resource selection:

1. Burned (< 40 years) vs. non-burned (> 40 years) areas
2. Residual vs. non-residual within burned (< 40 years) areas
3. Land cover types within burned (< 40 years) areas

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Methods

Modelling

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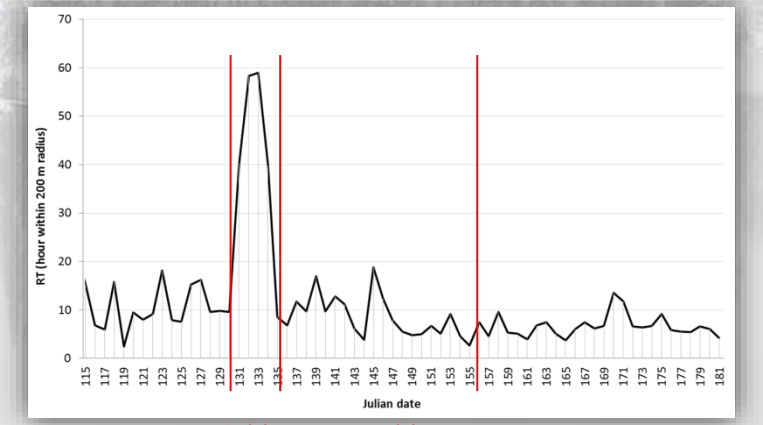
Conducted analysis for:

1. The RT peak period (calving)
2. Three week period following the RT peak period (post-calving)



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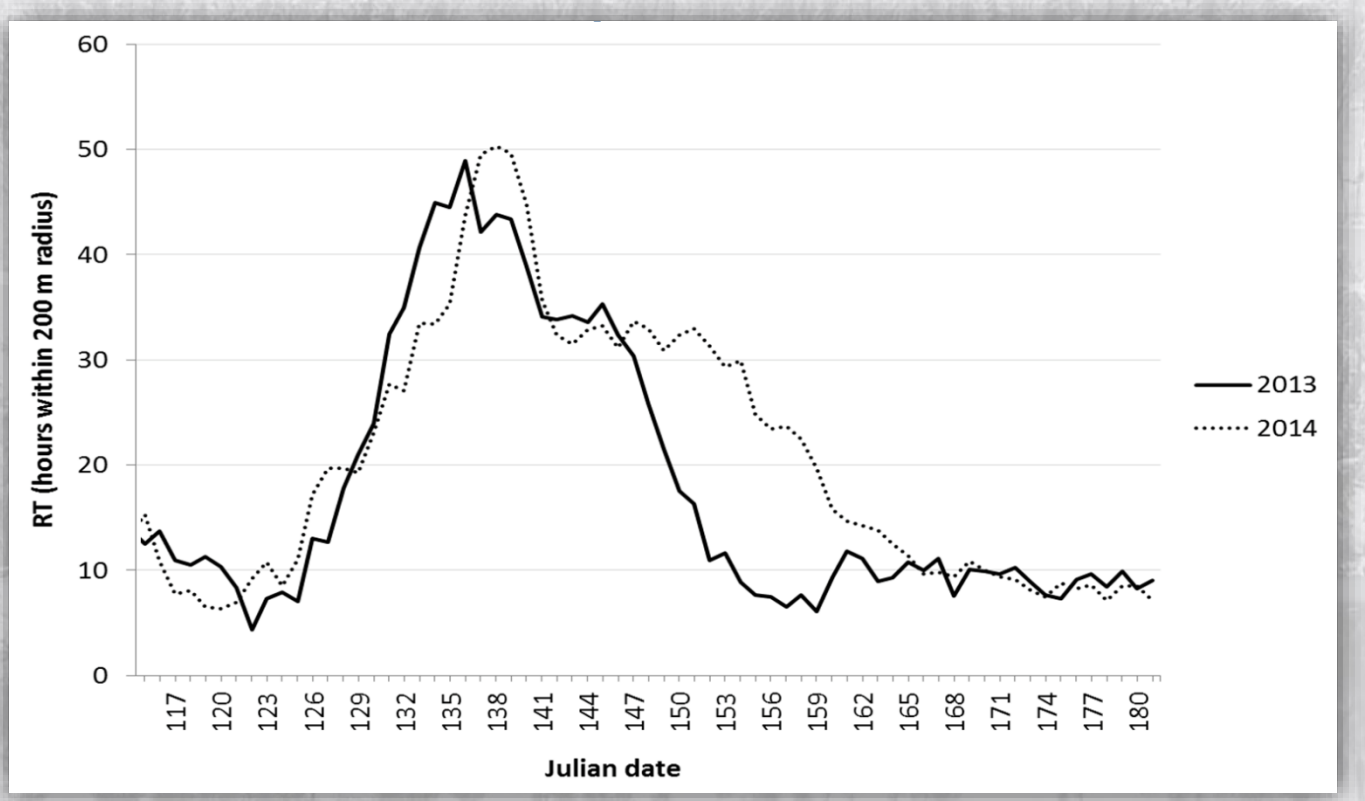
Results

Calving timing and rate



Mean residence time (RT) for all individuals for both years.

- Calving occurs May 17 (range May 5 – June 9)
- A total of 79 animals calved (88%) out of 91 individual calving seasons

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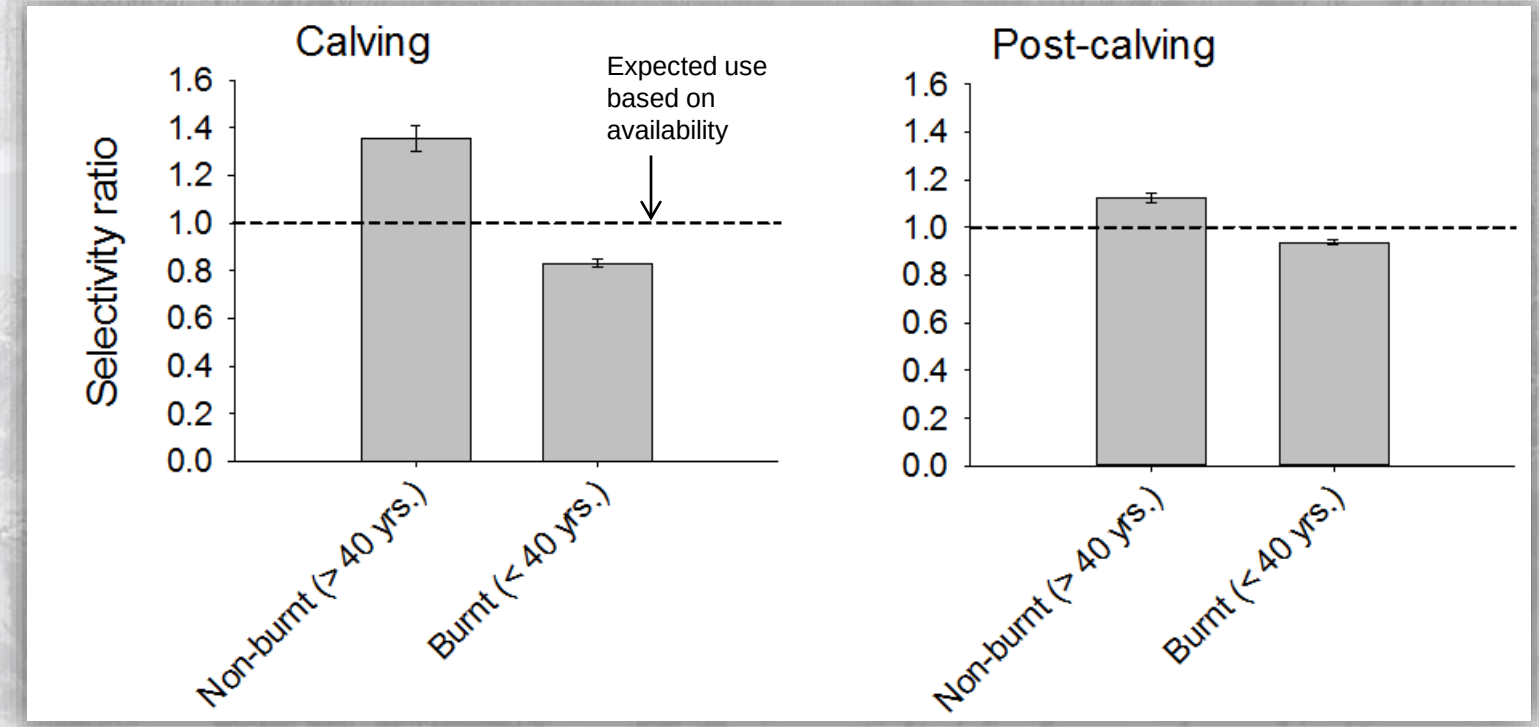
Results

Model 1: Burned vs. non-burned



A total of 48 out of 79 calving events (61%) occurred within provincial mapped fire polygons younger than 40 years.

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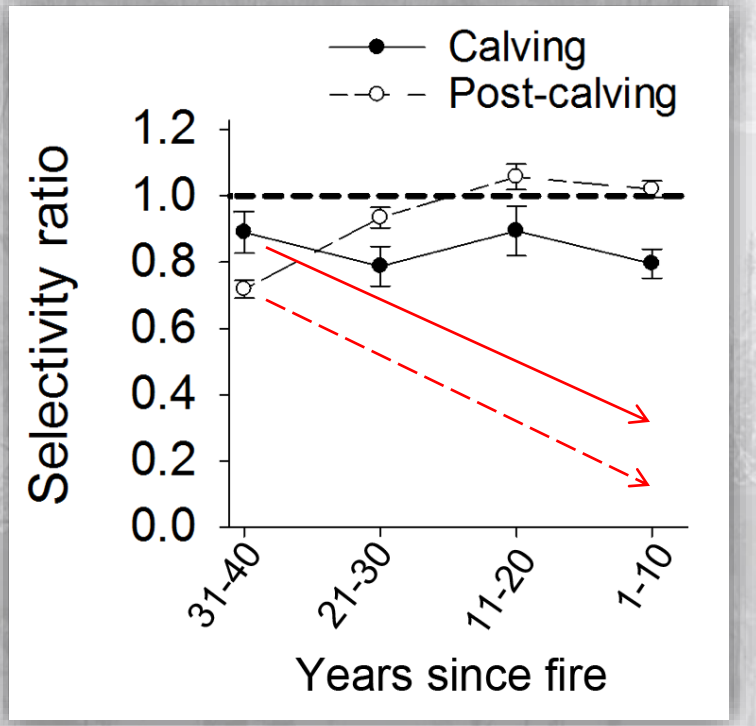
Results

Model 1: Burned vs. non-burned



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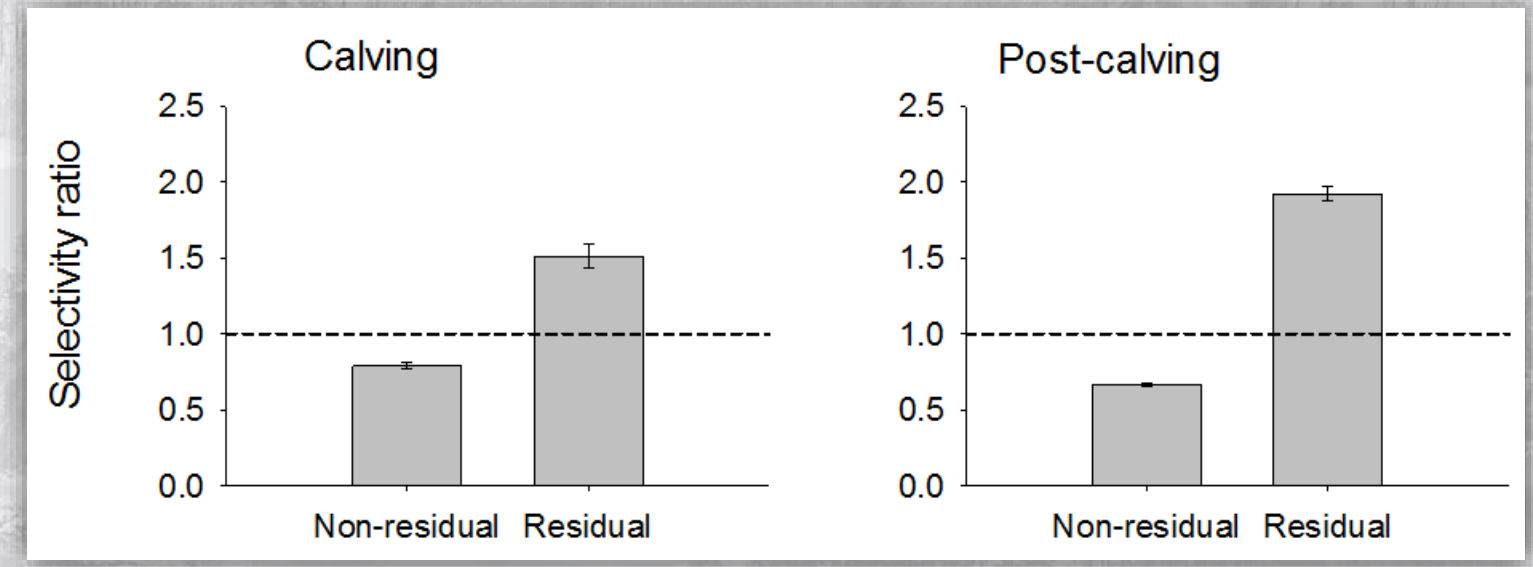
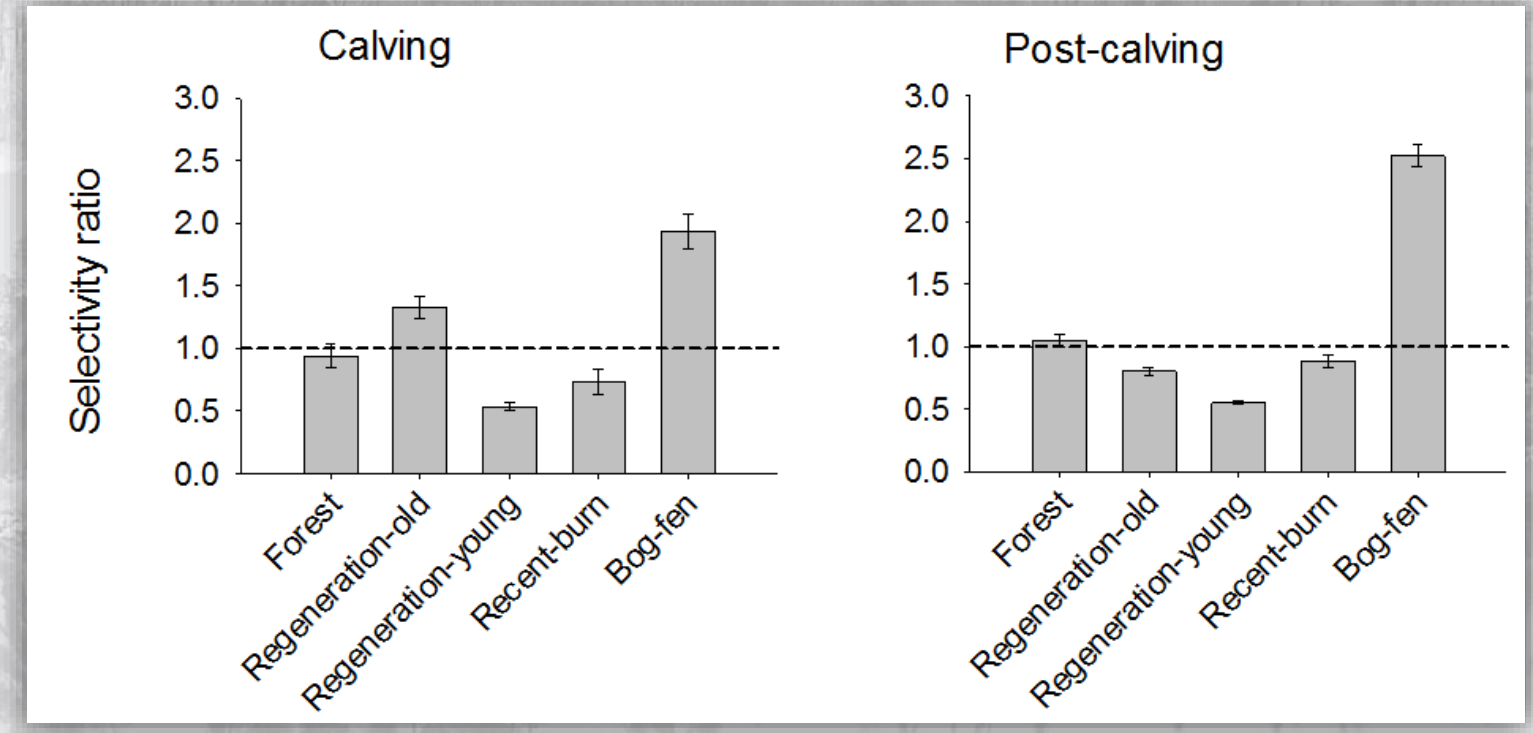
Results

Model 2: Residual vs. non residual



Results

Model 3: Land cover selection within burn polygons



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Results

Model 3: Land cover selection within burn polygons

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Results

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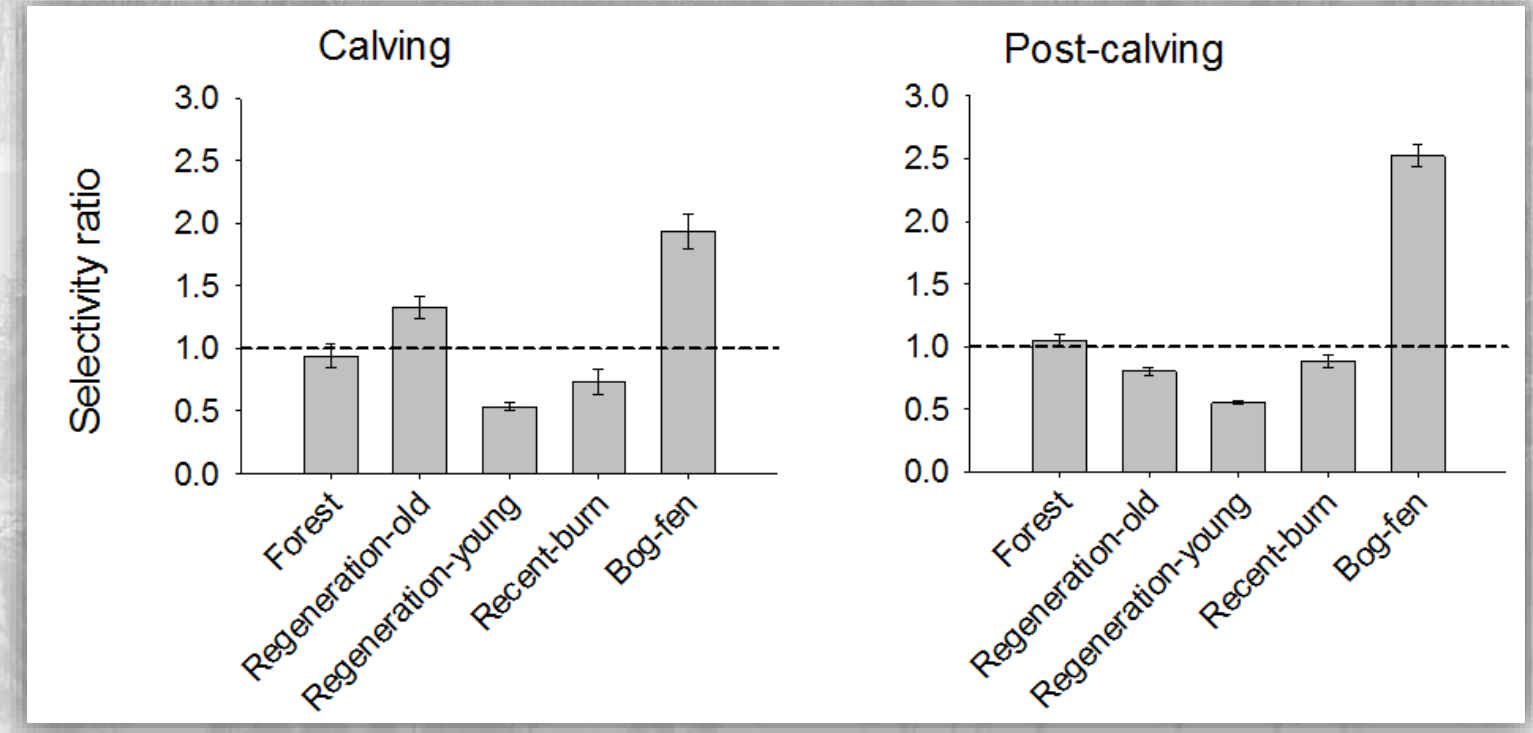

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So what does this mean?

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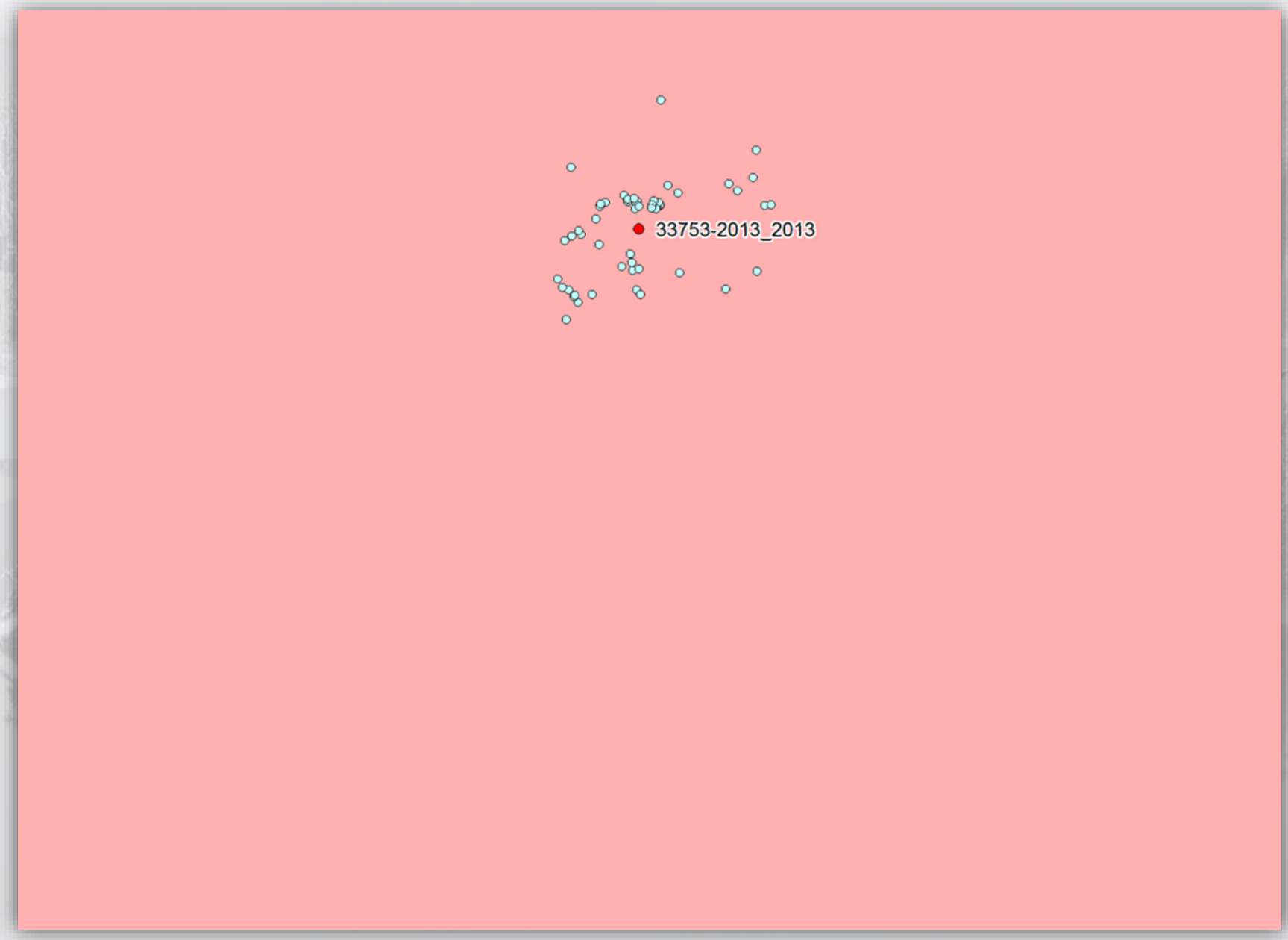

Provincial fire map

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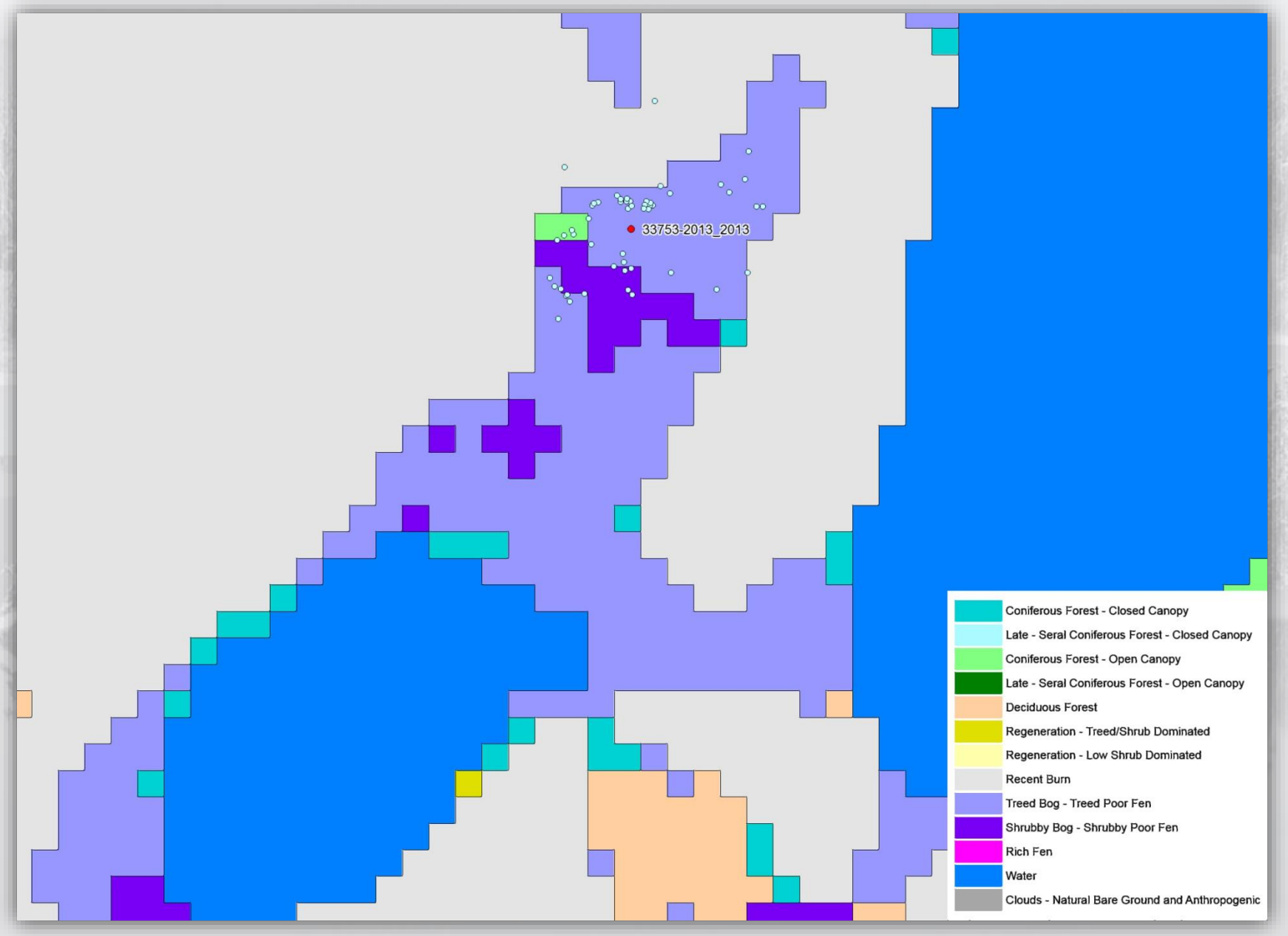

Land cover map

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Google Earth Imagery

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Burns with residuals = woodland caribou habitat

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