

Fire History in Jasper National Park

Raphael Chavardès, MSc student

A “hot” topic for conservation of forests in western North America is wildfire as a disturbance process. A Masters student in the Tree-Ring Laboratory at the University of British Columbia is reconstructing fire history using tree-ring evidence including fire scars, tree ages and growth rates to understand the characteristics of historic wildfires in the montane forests of Jasper National Park. Specifically the research aims to answer the following questions: What were the frequencies of historic fires? How have these changed over the 20th Century? What were the climate drivers of historic fires at inter-annual to multi-decadal scales? The records obtained post laboratory analysis will provide a baseline to determine the effectiveness and impacts of fire exclusion on forest composition, structure and function. This information can not only guide ecological restoration efforts and anticipate changes to the wildfire regime over the next century as climate changes, but is also useful for ecosystem management guided by natural range of variability in areas both within and adjacent to Jasper National Park.

Past fire history studies yielding time-since-fire-maps were conducted in the Athabasca River valley near Jasper townsite in the late 1970s and 1990s (Figure 1). Over July 2012, a team of scientists including Dr. Lori Daniels, Ashley Dobko, Taylor Martin, Skyler Desroches and Raphaël Chavardès from the Tree-Ring Lab conducted fieldwork to locate the same sites of the late 1990s study, approximately 15 km north of the Jasper townsite in a combined 2,000 hectare area. The sites were on contrasting aspects (east- and northwest- facing) of the Athabasca River valley with transects extending from montane to subalpine ecoregions along the elevational gradient (Figure 2). For this study, a subset of 10 transects with 29 plots were selected on both sides of the Athabasca River valley. The goal was to reconstruct repeat disturbances at individual sites. Surprisingly, the team managed to locate 10 of the plots established 15 years ago and established 19 new plots. Another nice surprise was the astonishing find of recorder trees, such as one Douglas-fir approximately 300 years old which yielded four fire scars (Photo 1).

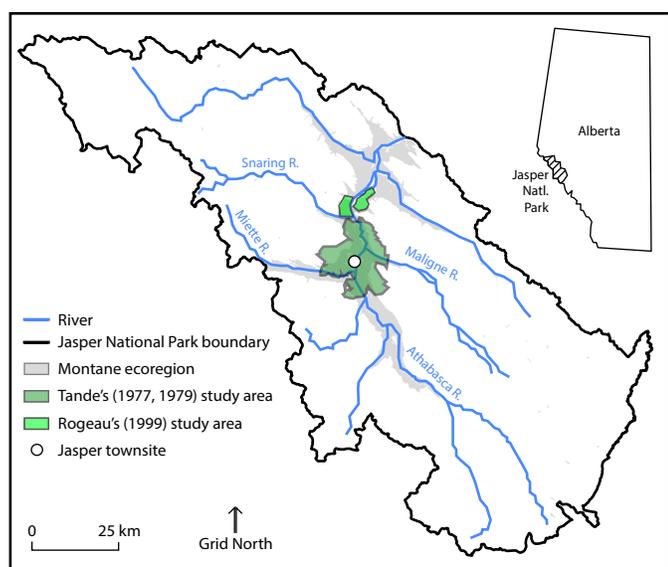


Figure 1. Fire history study areas in Jasper National Park, Alberta. For this research, the Rogeau study area was resampled (1999).

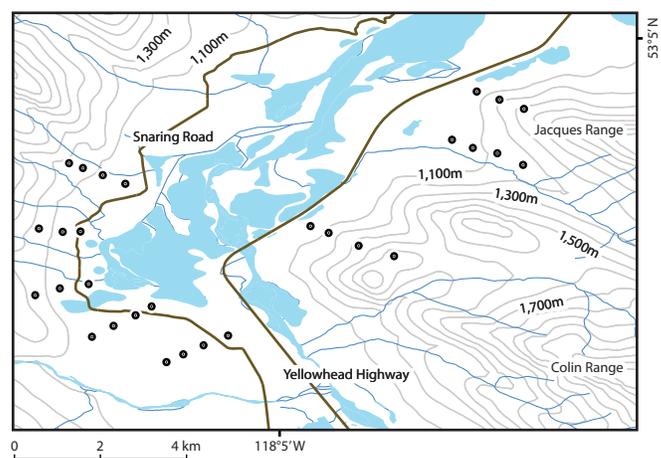


Figure 2. Selected plots (black dots) in the Athabasca River Valley, 15 km north of the Jasper townsite.

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Photo 1. Sanded Douglas-fir cookie which shows multiple scarring. Cross-dating with a local Douglas-fir master chronology, Douglas-fir tree cores and other cookies will help determine the year of these scarring events.

Although the team encountered several challenging hikes loaded with equipment over warm days, a pack of wolves under a day of rain and lightning, it remained careful and focused to achieve the goal of safely obtaining the required data. For one transect it was fortunate to have a helicopter drop organized to the top of the peak adjacent to Morro; this permitted the crew to blaze through three plots, two of which were situated on steep terrain, in one day. Exceptionally, the field work ran smoothly due to the convenient weather conditions,

cool and wet at times which decreased the potentially hazardous fire-risk, yet warm and slightly windy over most days to offer respite from driven bugs.

The next stages include the finalization of the sanding, measuring and cross-dating of the recuperated samples as well as the dating of their scars in the Tree - Ring Laboratory, work currently performed by Olivier Villemare-Côté and Raphaël Chavardès.

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