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Tree-ring dating of "brush structures" in Kluane National Park and Reserve, Yukon, Canada

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ABSTRACT

"Brush structures" are temporary wooden structures built with unmodified local materials and used as shelters by First Nation Peoples in the forests of the Yukon prior to European contact. This paper reports a preliminary attempt to date these structures using dendrochronology. Investigations were carried out of four njel ("teepee like") structures and eight män-ku (low 2–3 sided wall structures) at four main sites. The primary material cored was poles (dead spruce trunks), often only 10–20 cm diameter, with narrow, sometimes extremely suppressed ring sequences. These structures are dated between 1865 and 1887, based on the latest (outermost) ring in the sampled material. The limited sampling and use of old wood in these structures (whether fire-kill, standing dead or reused from previous features) makes it difficult to give precise dates for the initial evidence of First Nation activity at these sites: more extensive sampling could provide further insight into the settlement history and construction techniques used. The sites investigated date from the latter half of the nineteenth century shortly before the first European gold rush to this region.

1. Introduction

Prior to the arrival of Europeans in the Yukon, northwestern Canada, the area that currently contains Kluane National Park and Reserve was occupied by the Southern Tuchone People who are now represented by the Champagne and Aishihik First Nations (CAFN) and the Kluane First Nation (KFN). The physical evidence of this occupation and history includes a number of "brush structures" that served as temporary shelters during hunting and gathering activities by First Nation peoples. Several archaeological reports (Johnson and Raup, 1964; Harp, 2005; Gates, 2006; Greer, 2008) have described their construction and probable functions but they have not been precisely dated. As these structures are built from local unmodified logs, the wood should be dateable by standard dendrochronological techniques, thereby providing chronological information about the human history of this region. One group of these features and related wooden structures occurs in the SW corner of Kluane National Park and Reserve (KNPR) and has been the subject of preliminary archaeological investigations (Greer, 2008). This paper presents the first attempt to date these structures by dendrochronology using tree-ring chronologies collected by Luckman et al. between 1999 and 2005 (e.g. Luckman et al., 2001, 2002, Youngblut and Luckman, 2008).

1.1. Brush structures

Brush structures are wooden structures built of axe-cut poles or logs used as temporary or permanent shelters during hunting or gathering activities by First Nations peoples. First described by Glave (1891) at the time of initial contact, they have subsequently been reported across the southwest Yukon (Greer, 2008). Johnson and Raup (1964) described relatively well preserved structures (since lost) in the Duke Meadows area north of Kluane Lake. They estimated the structures were constructed prior to 1875 based on ring counting of a willow shrub on one house floor and an abrasion scar made by a pole on a living tree. Two main types of brush structures have been described (Greer, 2008). The pole teepee or njel[3] type is a conical structure of logs or poles built against one or more standing trees. The män ku type consists of a two- or three-sided wall structure, usually less than one metre high, built of

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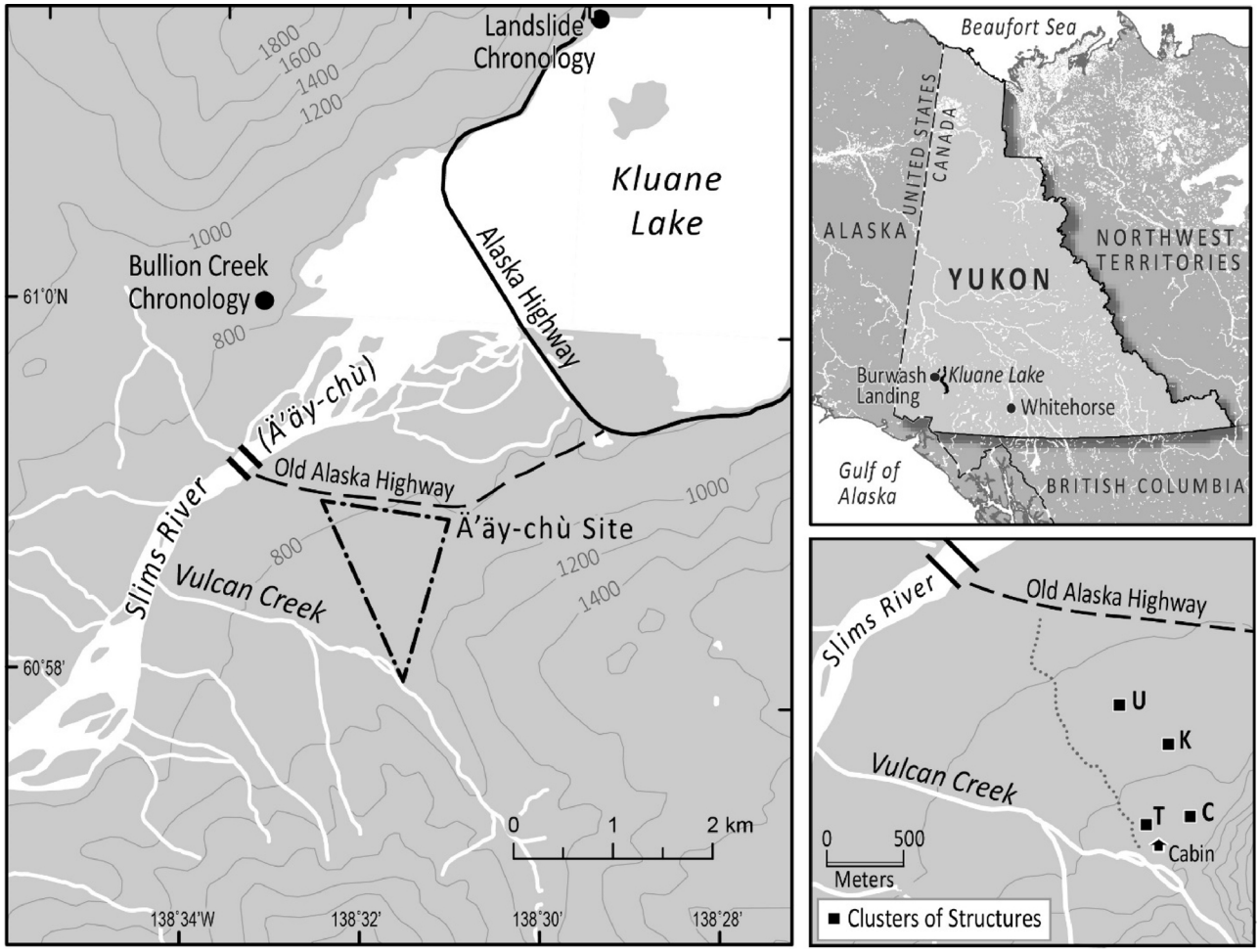

Fig. 1. Location of The Ä'äy Chù site. Main image and upper right show the location of the study area. The diagram lower right shows the locations of the sampled sites within the study area.

intersecting horizontal poles, with occasional evidence of a pole like superstructure. Both types may have been covered by brush or hides and may vary in form and size.

1.2. Site description

The Ä'äy Chù site comprises a number of brush structures and wooden constructions in the Slims River valley approximately 3 km upstream of the Slims delta at the head of Kluane Lake. The sites are situated on the alluvial fan of Vulcan Creek (Fig. 1), which enters the Slims valley from the south, and are located in a relatively undisturbed area of open white spruce forest. Some parts of the sites may have been disturbed by exploration and other activities associated with the period of gold mining in Bullion Creek directly across the river in 1903 and 1904 or during construction of the former Alaskan Highway bridge across the Slims River in the 1940s. The sites contain both major types of features – broadly conical njel (teepee) structures and two or three sided, rectangular low wall-like män ku structures. Associated with these features there are a number of cut stumps and anthropogenically modified trees. An abandoned cabin occurs close to the head of the fan and there is a large cache structure a couple of hundred metres east of the cabin. A full description of the sites is given in Greer (2008). Four groups of sites were investigated: sample site designations follow those used in Greer (2008) with an additional identifier for the sample numbers, e.g. T1-01, C3-1 etc. Site locations are given on Fig. 1.

2. Methods

2.1. Sampling

The primary goal of this project was to estimate the age of these structures by dating the tree-ring series contained in the remaining poles. Most samples were taken using a 5 mm diameter, 16-inch-long Mattson increment corer that left the sampled logs in situ and relatively undisturbed. Sampling of cross sections (discs) was limited to downed logs or poles where samples could be obtained without undue disturbance of the structure being sampled. In most cases the material sampled was sufficiently small that complete diameter cores could be taken, providing two series from each pole for subsequent measurement. Duplicate cores were necessary for some larger trees. Coring of dry dead logs without bark can present difficulties as the outermost rings may become detached, particularly at the further end of the core when the tip breaks through. There is also a tendency for cores to break during sampling. However, most cores were sound and relatively few suffered from heart rot or insect damage. Sampling of poles was taken from eight män ku and four njel (tepee) structures at four sites plus the cabin and cache structure. Thirty living and standing dead trees were sampled across the site in 2009 to provide an initial site chronology. The dominant tree species is *Picea glauca* (white spruce) and all samples are assumed to be *Picea*.

In the field cores were stored in labeled plastic straws that were partially slit to permit drying of the cores. At the UWO laboratory cores were removed from the straws, dried, mounted in grooved wooden