

Dr. Greg King & Michael Boyd

A Dendroarchaeological Analysis of the Tanner/Williams Homestead: Strathcona County, AB | February 2024



Figure 1. Tanner/Williams Homestead structure as it appeared in 2022.

Introduction

Based on concerns regarding recent declining water levels in Cooking Lake, a study was launched to investigate historic water levels, aiming to extend records into the early 1800s, prior to European settlement. This project links natural and human history by examining and connecting information of tree rings and local history.

The Augustana Tree Ring Lab, in partnership with Strathcona County resident and local history researcher Michael Boyd, conducted tree-ring sampling at several different properties around Cooking Lake. This included sampling living trees as well as several log cabins believed to be built in the late 19th century. The goal of the project was to construct a long-term chronology of tree-ring widths from around Cooking Lake to determine if they contained valuable information about the regional environment prior to European settlement.

As a landowner and thus a stakeholder in this project, we would like to provide you with the results of our findings on your property.

Site Information

Site Name: Tanner/Williams Homestead

Contact Info: Marie Tanner

ATRL Site Code: TA

Sampling Date: Summer 2022

Latitude: 53° 22' 9.4" N

Longitude: 113° 1' 34.5" W

Species: White Spruce

Historical Context

Builder/original owner: Herbert E. Williams

Location: 51012 Rng Rd 213

Legal Description: SW 4-51-21-W4

Original cabin dimensions: Length: 8 m Width: 5.5 m Height: not measured

This is the original house built on the homestead. From the homestead records Herbert E. Williams gained entry September 26, 1906 and completed the house April 8, 1908. The original footprint was 26 x 18 ft and they just kept adding on lean-to sections as more family landed (Figure 2). *"I'm not sure if those records would be helpful, but if you want them I*

can send them. At that time "Old Man Chadwick" was one of a few running a sawmill and he was just a few miles west. We think that's where Herbert got his lumber. The Chadwicks and Haley's left Missouri and travelled together to Strathcona, both settling in Cooking Lake. Herbert Williams married Irene Haley in 1911" (quote from Marie Tanner)

The house is made of wood planks and squared logs. Two core samples were obtained and a piece of a squared log was also collected in 2022.

Additionally, live trees were sampled in 2022 along a nearby dry stream bed with high banks that runs north through SW 3-51-21-W4. It was thought that trees in the streambed might have survived early fires and could be older individuals. This used to be the stream that connected Ministik Lake to Cooking Lake.



Figure 2. Photograph of the Tanner/Williams Cabin from 1933. Personal photograph from Marie Tanner.

Tree-Ring Methods

Two cores were sampled from the existing building (see Figure 1) using a 5/8" dry wood drill corer. The sampling process has no negative effects on the structural integrity of the building. Logs were selected for sampling according to their integrity (the absence of rot) and the presence of bark (indicating the outside of the tree has not been removed). Samples were always taken at the larger end of the log as this would be the oldest part of the tree.

In addition, eleven living trees were sampled from the neighbouring Edey family property using a Haglof increment borer. The trees were selected based on external characteristics that suggested they may be older/remnant trees.

Samples were stored in envelopes or core holders and taken back to the Augustana Tree Ring Lab in Camrose for analysis. The samples were glued onto slotted mounting boards and labeled with the appropriate code to indicate site along with tree or wall and log number. The samples were sanded with progressively finer sandpaper (80 to 600 grit) in order to reveal individual tree-rings. Each core was then scanned to create a digital image which was measured on the computer. This process produced measurements indicating the annual growth rates of the individual trees to 0.001 mm (Figure 3).

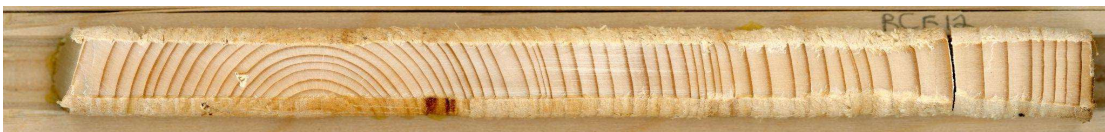


Figure 3. Example of a core sampled from a wooden cabin as part of this project.

Prior to further analysis, it was important to determine the tree species used in the construction of the cabin. Based on the presence of bark and beetle galleries as well as an examination of wood anatomy, it was confirmed that all of the samples were white spruce (*Picea glauca*).

The process of analyzing archeological data requires two steps. The first is to crossdate (pattern-match) the ring widths of the samples from the cabin to each other. A good match

suggests that the materials for construction were collected from the same regional area. The second is to match cabin logs against a set of existing tree ring measurements collected by the Augustana Tree Ring Lab from living white spruce trees located on former islands around the edges of Cooking Lake that avoided major fires in the early 1900s. This established a “master” chronology demonstrating overall tree-growth patterns through time and allows us to provide an accurate date for the cabin timbers.

Tree-Ring Results

Based on our analysis of the two cored timbers, it was determined that the last complete year of growth of the trees was 1902 and 1906. This suggests that the trees used in the construction of the cabin were cut down during the early-mid summer of 1903 and 1907, respectively and were approximately 35-40 years old when harvested (Figure 4).

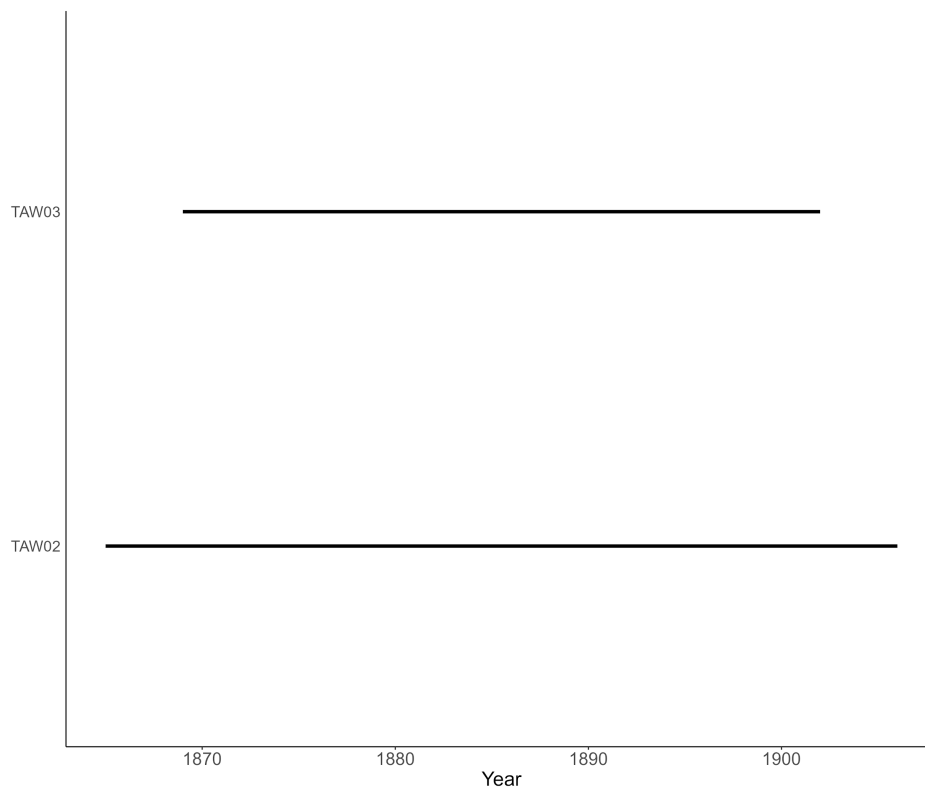


Figure 4. Segment plot showing the length of each series (individual log) sampled from the Tanner-Williams cabin

These results were based on our ability to show that all of the timbers from the structure contain a common signal as there appear to be several “marker” years we can use to align the cores. Although we could internally crossdate the samples from the Tanner-Williams cabin, we still needed to absolutely crossdate the rings to anchor it in time with trees that were living at the time of sampling to provide a known calendar date. We were able to collect a total of 40+ living and recently dead trees from various locations around Cooking Lake. With the living samples we were able to generate a 50+ year overlap period which we could use to anchor the cabin timbers. This means we can confidently assign calendar dates to the Tanner-Williams cabin.

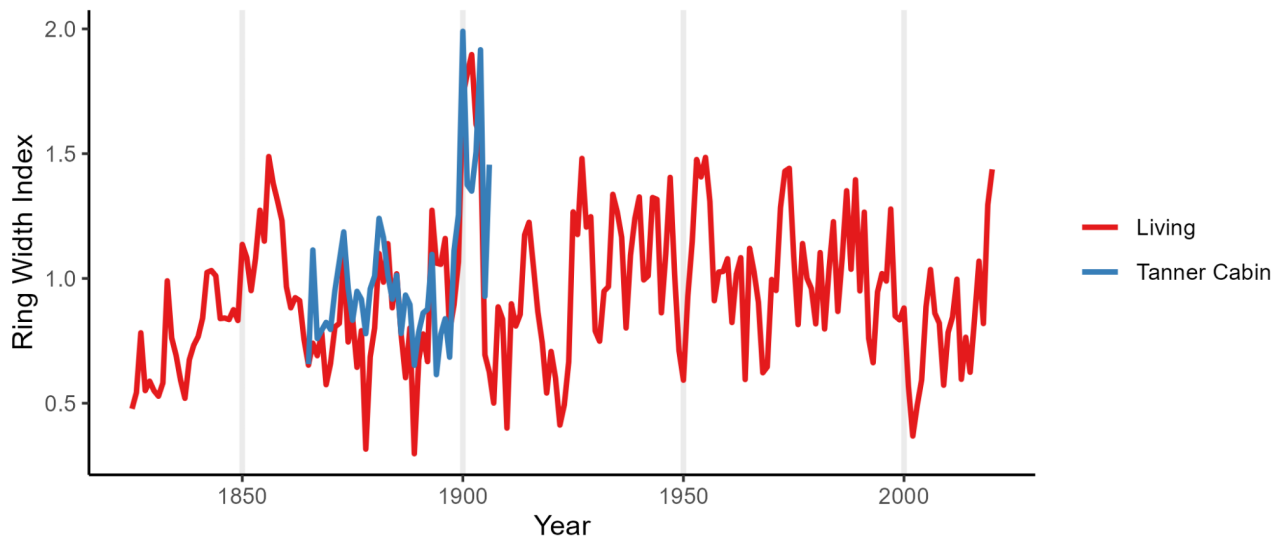


Figure 5. Overlap of the living white spruce samples (red) and the chronology from the Tanner/Williams Cabin (blue) reveals similar growth patterns that provide confidence we have accurately dated the timbers.

The additional eleven living trees sampled on the Edey property were also measured and analyzed. All of the trees were less than 100 years old, with the oldest dating to 1928 (a cluster of individuals dated to the late-1920s/early-1930s, but some were much younger). This means that none of the trees extended back to the time of cabin construction and likely grew up after initial clearing or a local disturbance.

Conclusions

In summary, the results yielded from this study showed that based on cores collected from two timbers from the Tanner-Williams cabin, there were two different complete last rings, 1902 and 1906, which means that the logs were cut in the years 1903 and 1907. The variation in ages combined with the homestead records suggests that either some dead standing trees were utilized in cabin construction, or that wood was kept and stored for several years. Two samples is not ideal for an accurate understanding of the cabin age, but given that the samples dated quite well against our regional chronology, sampling and dating another 5-8 different timbers could help to narrow the date range.

The data collected from this cabin and including that data into a longer regional master chronology are important to the local history of South Cooking Lake and could be used to support other historical research in the area. For example if other wooden structures in the region are found, it could be possible to place them in this chronology and thus determine construction dates. Furthermore, this data can be used in ongoing environmental research to learn about climatic trends in the past, enabling a better understanding about past climates and to compare these trends to the current climate.

This research was conducted at the Augustana Tree Ring Lab in Camrose, Alberta. Any questions regarding the findings of this report or follow-up questions can be directed to:

Dr. Greg King

Assistant Professor of Environmental Science | Director of the Augustana Tree Ring Lab

University of Alberta - Augustana Campus

4901 46 Ave

Camrose, AB

T4V 2R3

Phone: 780-679-1181

E-mail: gking@ualberta.ca

Thank you for your permission to collect samples and participation in this study!