

Tree-Ring Dating of Log Cabin, Tangle Creek, Jasper National Park, 1998

Parks Canada Archaeological Inventory Site #1700R



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Introduction

The Columbia Icefield area of northern Banff National Park and southern Jasper National Park was a surprisingly well-travelled area during the late 1800's and early 1900's. Numerous written and oral accounts recount the travels of various explorers, guide outfitters and their clients, and trappers through the region. Because of flooding along the Sunwapta River and the crossvalley extent of the Athabasca Glacier in this interval (see Schäffer 1911:223), the Wilcox Pass trail was the route of choice for anyone heading north from Banff or Laggan (now Lake Louise) to the Athabasca River country. This historic trail extends northward over the pass and exits this high alpine setting in the vicinity of Tangle Falls alongside the Columbia Icefields Parkway - Highway 93 (Figure 1).



★ Tangle Creek and Wilcox Pass

Figure 1. Location of Tangle Creek and Wilcox Pass, Jasper National Park, Alberta (Parks Canada 1995).

In September, 1998 with the permission of Parks Canada, researchers from the University of Victoria Tree-Ring Laboratory (UVTRL) completed a reconnaissance of historic structures along the Tangle Creek portion of the Wilcox Pass trail. While there is ample evidence of historic sites in this area including old firepits and cached teepee/tent poles, the most prominent feature is ‘Tangle Creek Cabin’ (Figure 2).



Figure 2. Picture of the front or west wall of the Tangle Creek Cabin.

The cabin is situated immediately adjacent to the trail linking Highway 93 and Wilcox Pass, and is located within 20 minutes of Highway 93. The cabin is situated on a stream terrace flanking Tangle Creek at an elevation of 1990 m asl. It is assumed by many to have been constructed sometime during the 1930s (*personal communication*, Parks Canada 1998).

Following an initial site survey, members of the UVTRL returned to collect increment core samples from the logs used to construct the cabin. This tree-ring data was used to determine when the cabin was built and provides insight into the likely builder.

Cabin construction and site

The Tangle Creek Cabin was built with undressed, Engelmann spruce (*Picea engelmannii* Parry) boles (Figures 2 and 3). Numerous stumps in the immediate area of the cabin suggest most of the timber used to build the cabin was cut on-site. The cabin measures approximately 5 x 5 m (Figure 4). While the front wall of the cabin is 1.5 m in height (west side), the roof slopes downwards to a backwall that is less than 1 m in height. The original roof has collapsed into the interior of the cabin and trees have begun to grow in the cabin interior (Figure 3).



Figure 3. Tangle Creek Cabin from the southeast.

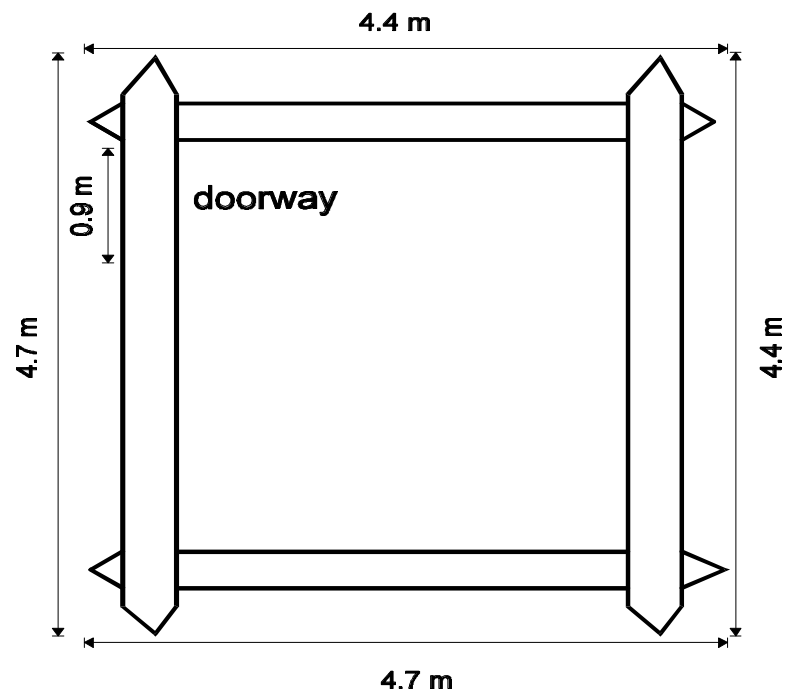


Figure 4. Survey of the Tangle Creek Cabin.

Research Methods

Standard dendrochronological research techniques were used to determine a date of construction for the Tangle Creek Cabin (*c.f.* Cook and Kairiukstis 1990). The science of dendrochronology is based on the fact that trees produce an annual radial growth increment (Baillie 1995). Because the annual radial growth characteristics of adjacent trees of a similar species are similar, a master chronology can be developed to describe these growth characteristics over the length of the stand's life span (Baillie 1995). Undated samples can be crossdated into this master chronology to identify when they were alive. Chronology building and cross-dating provide a simple and effective tool for dating historic structures (Pilcher 1983; Baillie 1995). In order to determine the date of construction of the Tangle Creek Cabin, we decided to sample the cabin in a manner that caused minimal damage to the structure. This was accomplished by extracting tree-core samples from the cabin timbers with the use of a two-thread 5 mm increment corer.

Increment core samples were extracted from all timbers in each of the four walls of the Tangle Creek Cabin. For the most part the timbers that make up the cabin walls proved to be solid from perimeter to pith. Surface rotting was, however, evident within timbers located on the ground and those of the tops of walls.

Cores were extracted from the inside walls of the cabin, at the point of maximum timber diameter, and from sections of timbers where bark was still evident. The cores were prepared for analysis at the University of Victoria Tree-Ring Laboratory. Fourteen of the 20 cores extracted were chosen for analysis based on their condition (*i.e.* a solid core with minimal rotting).

Determining the date of construction

The annual ring widths of the Tangle Creek Cabin samples were measured to the nearest hundredth of a millimetre using a computerized WinDENDRO™ (Version 6.1b, 1997) image processing tree-ring measurement system (Guay *et al.* 1992; Sheppard and Graumlich 1996). Where ring boundaries were difficult to distinguish, a 40X microscope and Velmex-type stage measurement system were employed for ring boundary verification. The measurement data were checked for errors by visually identifying common marker or pointer years (Stokes and Smiley 1968). The data were then compiled into a floating tree-ring chronology and their signal homogeneity was established was using the COFECHA program (series correlation 0.62).

The Tangle Creek Cabin floating chronology was subsequently compared to a locally prepared *P. engelmannii* master chronology (Carter *et al.* 1998) to determine when the trees used to construct the Tangle Creek Cabin were felled. The master chronology spans the interval between AD 1586 to 1997 (series correlation 0.56; mean sensitivity 0.18; autocorrelation 0.8) and compares favourably ($r^2 = 0.66$; 1586-1997) to the Athabasca Glacier *P. engelmannii* chronology compiled by Luckman *et al.* (1997).

Figure 5 presents a graphic representation of the *P. engelmannii* master chronology used in this analysis. Changes in the annual tree ring-width indices are plotted as a function of time. Superimposed on the graph are crossdated representations of the Tangle Creek Cabin core positions. As shown, nine of the 14 cores indicate the trees were felled in 1904. While the remaining five cores crossdate into the master chronology, their perimeter dates are slightly earlier. This discrepancy is presumably due to the loss of perimeter tissue.

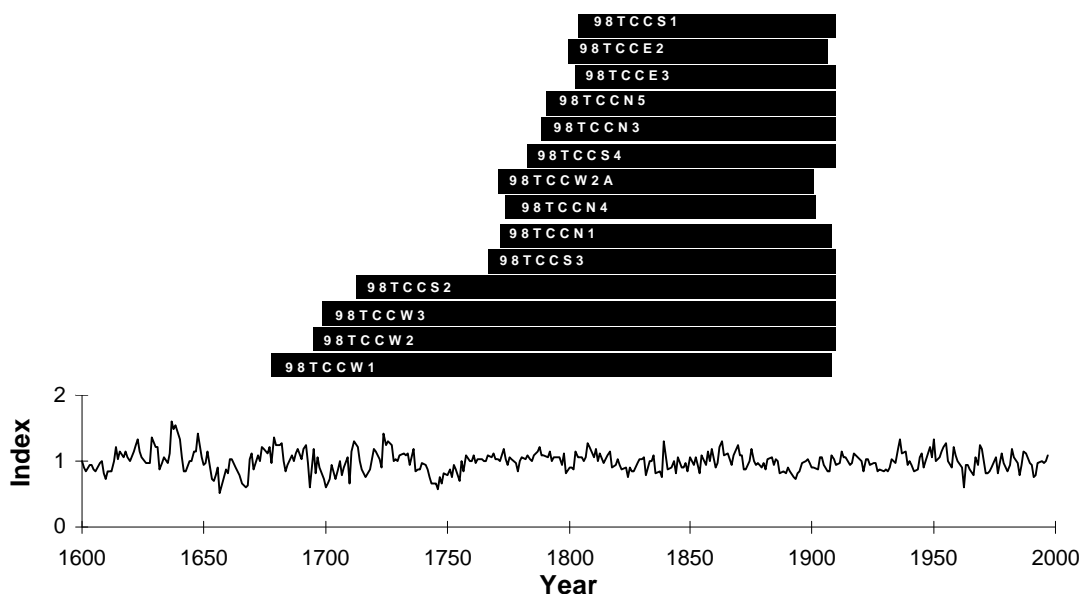


Figure 5. Graphical summary of study results. The cabin timbers are graphically represented above the Hilda Glacier master chronology; their position showing where they crossdated into the chronology and their length representing the age of trees used for the cabin timbers.

Table 1 presents a statistical summary of the individual Pearson's r values of the crossdated tree-cores. Based on this analysis, it can be stated with some certainty that the majority of trees were felled in 1904. The presence of bark on the cabin timbers indicates that the trees were left undressed after felling and that 1904 was their year of growth.

While our dendrochronological assessment firmly establishes that the logs used to construct the Tangle Creek cabin ceased to grow in 1904, the season when this occurred can also be assessed by considering the physiological characteristics of the 1904 growth ring. Wood tissue developed late in the growth season (latewood) is of higher density and, therefore, appears darker than wood developed early in the growth season (earlywood).

Table 1. Statistical summary of study results. Shown are the Pearson's r values (measure of correlation between crossdated Tangle Creek Cabin cores and master chronology at the 99% confidence level), age before felling, and the interval over which each tree lived.

CORE	CROSSDATED INTERVAL	AGE	PEARSON'S r
98TCCW1	1682-1902	221	0.626
98TCCW2	1699-1904	206	0.701
98TCCW3	1703-1904	202	0.645
98TCCS2	1717-1904	188	0.634
98TCCS3	1771-1904	134	0.553
98TCCN1	1776-1902	127	0.715
98TCCN4	1778-1896	119	0.649
98TCCW2A	1777-1895	119	0.565
98TCCS4	1787-1904	118	0.610
98TCCN3	1793-1904	112	0.704
98TCCN5	1795-1904	110	0.558
98TCCE3	1807-1904	98	0.537
98TCCE2	1804-1901	98	0.595
98TCCS1	1808-1904	97	0.516
MEAN PEARSON'S r VALUE			0.615

Microscopic assessment of the nine 1904 growth rings within the Tangle Creek Cabin samples shows that they contain an entire latewood sequence. Given the corollary absence of earlywood from 1905, we concluded the trees were felled sometime after the cessation of cambium growth in September 1904, but before growth began in May 1905 (*cf.* Alexander 1987).

In summary, given the statistical significance of the felling date of 1904, and the presence of latewood and absence of earlywood, we concluded that the construction of the Tangle Creek Cabin took place in the fall of 1904. This seems the most likely period of felling as deep, lingering snowpacks at this elevation would seem to preclude construction during the winter or spring periods. While it is certainly possible the trees were felled in the fall of 1904 and left to season before construction began, this seems an unlikely scenario given that bark was not stripped off the logs.

Local history

Once we had established a construction date for the Tangle Creek Cabin, the available historical literature was reviewed to suggest who might have built the cabin. Our review was limited to accounts relating to the Wilcox Pass and Tangle Creek areas during the early 1900's. The following section discusses evidence that we think points to Jimmy Simpson as a possible builder of the Tangle Creek Cabin.

Jimmy Simpson began his guide outfitter career in the summer of 1898 (Hart 1991). He spent the early years of his career working for such well known outfitters as Tom Wilson and Bill Peyto (Hart 1979; Hart 1991). Over this period, Simpson became familiar with the North Fork of the Saskatchewan River, the Brazeau River Basin, and Wilcox Pass (areas within a 20 km radius of Tangle Creek) (Hart 1991).

Simpson began his trapping career in 1899 to supplement the wages he earned leading summer backcountry and fall hunting trips (Hart 1991). There are several accounts of the time he spent hunting the slopes of Mt. Wilcox and the Pass for the Bighorn Sheep that populated the area (Hart 1979; Hart 1991).

Soon 1899, Simpson took Fred Ballard on as a partner (Hart 1979; 1991). Prior to the 1901 trapping season, Simpson and Ballard began constructing a series of trapping shelters between Bow Lake and the headwaters of the Alexandra River (20 km southwest of Tangle Creek) (Hart 1979). Apparently they took advantage of every chance they had to construct new cabins. One example of this occurred during the 1902 expedition of Reverend James Outram to Mts. Columbia, Forbes, Freshfield, Bryce, and Lyell. After setting up camp for their clients, Simpson and Ballard are reported to have constructed a rough cabin in the area for use on their winter trapline (Hart 1979; Hart 1991).

Simpson and Ballard continued with their partnership in 1903 and began to include areas such as those surrounding Fortress Lake, some 30 km northwest of Tangle Creek (Hart 1979; 1991). Simpson is reported to have made a number of trips into this region, including one in 1904 with Sid Unwin to the north arm of the Saskatchewan River, 8 km southeast of Tangle Creek (Hart 1991). Simpson's last season of trapping was 1910, when began to operate a horse ranch in the Kootenay Plains during the winter months (Hart 1991).



Figure 6. An example of a typical trapping cabin built by Jimmy Simpson and Fred Ballard. Fred Ballard is seen kneeling at the front door. (photo credit: Hart 1979; 1991)

While it is true that many people spent time in the Wilcox Pass and Tangle Creek areas, the Tangle Creek Cabin appears to be very similar to the trapping cabins built by Ballard and Simpson during the same time period. This similarity is apparent when you compare the appearance of the Tangle Creek Cabin (Figures 3 & 4) to the cabin credited to Simpson and Ballard in Figure 6. Note in particular, the design similarities (dimensions, height and width of the doorway, the sloping roof) and the rough undressed used in both cases.

While the historical literature does not place Simpson at Tangle Creek during the time of construction of the cabin, it certainly does place him in the general area. Given that the Wilcox Pass area was one of his favourite haunts and the cabin is similar in style to those credited to him elsewhere in the area, we suggest the Tangle Creek Cabin was built by Jimmy Simpson in the fall of 1904.

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