

Ancient Forest

Socio-economic Benefits of Non-timber Uses of BC's Inland Rainforest
Research Bulletin, October, 2015

Protected Area Proposed for Ancient Forest/Chunt'oh Whudujut

On July 17, 2015, the Government of British Columbia signed an agreement with the Caledonia Ramblers Hiking Club Society and the Lheidli T'enneh First Nation to ensure the Ancient Forest is protected as an official area under provincial legislation. A "Class A" Provincial Park is the likely outcome for the area (see map on page 2), which covers more than 12,000 hectares.

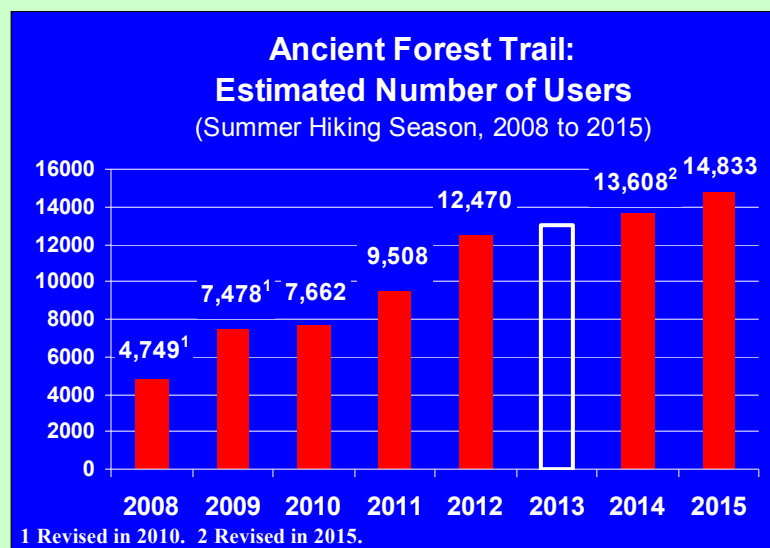
In the Lheidli dialect, the term "ancient forest" translates to *chunt'oh whudujut*, which literally means, "the oldest trees."

A "Class A" Provincial Park is the highest level of park protection within British Columbia. Under the *Park Act* (5(3)),

this class of park is "dedicated to the preservation of their natural environments for the inspiration, use and enjoyment of the public." Decisions about the management and development are guided by the principle aim to "preserve or maintain the recreational values of the park involved" (8(2)). Other "Class A" Provincial Parks in the region include Mount Robson, West Twin, Slim Creek, and Sugarbowl-Grizzly Den.

The Government also announced a public consultation process to gather input on the proposed protected area. Meetings were held in McBride, Crescent Spur, Dome Creek, Lheidli T'enneh First Nation, and Prince George. The Government sought input from the public on several important questions:

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The purpose of this research bulletin is to communicate the results of on-going research on the socio-economic benefits of non-timber uses of the inland rainforest of the upper Fraser River valley in British Columbia. The information contained in this bulletin may be distributed freely with proper citation, as follows:

Connell, David J. 2015. *Socio-economic Benefits of Non-timber Uses of BC's Inland Rainforest: Research Bulletin, October 2015*. Prince George, BC: Ecosystem Science and Management, University of Northern British Columbia.

For more information about this study please contact Dr. David J. Connell (email: david.connell@unbc.ca; tel.: 250-960-5835).

Protected Area Proposed (continued)

- How much of the up to 12,000-hectare area should be protected?
- What activities should be allowed on the site?
- What is the public's role in ensuring the long-term conservation of the Ancient Forest?
- Should the Province continue to support efforts to have the Ancient Forest designated as an UNESCO World Heritage Site?

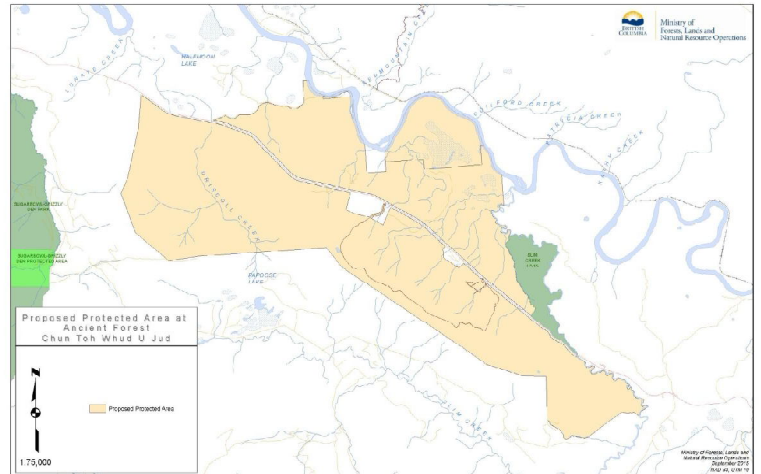
The Ancient Forest Consultation Paper (see link below) provides background information about the proposed protected area and identifies key issues related to First Nations, ecological values, resource industry, and recreational activities. The paper also presents the provincial government's position on the UNESCO designation. The document states, "The Province supports the call to have Ancient Forest designated a UN World Heritage Site." One of the prerequisites for the UNESCO designation is that the site be protected under legislation, which is one reason why protecting the Ancient Forest as a provincial park is important.

Formally, an application to UNESCO is first endorsed and then nominated by the Federal Government. In addition to protection through legislation and policies, the nominated site must meet the following three conditions:

- an up-to-date and approved management plan;
- characteristics that clearly demonstrate "out-standing universal value" in comparison with other similar sites around the world;
- First Nation, stakeholder, and community support for the nomination.

BC Parks is responsible for developing management plans for protected areas in the province. A plan must present the vision, direction, and objectives for a protected area, including appropriate levels of visitor use and facility development. A management plan must also address other uses of the park, including activities that existed at the time the park was established. In the area proposed for the Ancient Forest, such existing activities include one guide outfitter

Proposed boundaries for protected area



operating in the area, one range tenure, and five trap lines. The plan will provide details about how these activities will be managed within the protected area.

Forestry is another important resource industry in the area. According to the assessment by the Ministry of Forests, Lands, and Natural Resource Operations, as stated in the consultation paper, "There has been very little commercial forestry activity because of limited markets available for cedar and extremely high operating costs. Removing the proposed protected area from the timber harvesting land base will have less than a 1% impact on the volume of timber available in the Prince George Timber Supply Area." This led to the conclusion, "This [proposed protected area] will not affect any existing jobs or mills."

After the consultation is completed, a recommendation will be presented to the Minister of Forests, Lands, and Natural Resource Operations and the Minister of the Environment. A final decision is expected before the end of 2015 with the necessary legislation and policies presented during the January sitting of the Legislative Assembly.

Links:

- Public consultation website:
<http://engage.gov.bc.ca/ancientforest/>
- Ancient Forest Consultation Paper:
• <http://engage.gov.bc.ca/ancientforest/files/2015/10/Ancient-Forest-Consultation-Paper-Oct-6-2015.pdf>
- BC Parks planning and management:
<http://www.env.gov.bc.ca/bcparks/planning/>

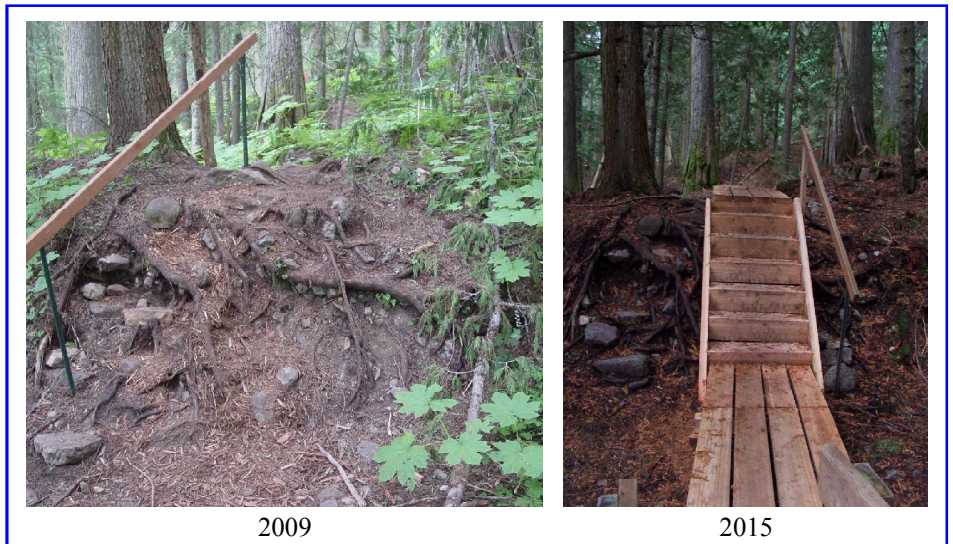
Trail Tread Protection Project: Update

With contributions from Nowell Senior

In spring 2014, members of the Caledonia Ramblers Hiking Club began work on the Ancient Forest Trail Tread Protection Project. This plank pathway, made of cedar boards laid on stone foundations, protects the forest floor and helps to keep people on the trail.

Over 876 metres of plank pathway were built in 2014 (refer to last year's research bulletin for more details), which included the entire Big Tree Loop and about 134 metres on the east side of the trail. This year, volunteers built an additional 573 metres so that the main loops of the trail are now planked. As shown in the pictures, some of the more difficult portions of the trail have been replaced with steps to make the hike easier and safer. Next year, the portion of the trail up to the waterfall will be built and additional boards will be added throughout the trail to increase the width of the pathway to almost a metre wide.

When the Trail Tread Protection Project is completed, the forest floor of the entire trail will be protected by plank pathways, the Universal Boardwalk, steps, and bridges.



Images: D. Connell

Estimating the Number of Visits to the Ancient Forest Trail

When considering choices between protecting an area as a provincial park and other uses, such as logging and mining, the arguments often centre on opportunities for new jobs and potential losses. While it is possible to estimate impacts on employment in resource industries, it is often more difficult to come up with estimates for recreational and tourism benefits. Much of this difficulty is due to a lack of data about the number of existing or potential users.

Since 2008, as part of an effort to assess the social and economic benefits of non-timber uses of the ancient forests in the upper Fraser River valley, we have provided estimates of the number of visits to the Ancient Forest Trail (AFT) (see chart on page 1). Our estimates show an increase of 212% over the eight-year period, from 4,749 visits in 2008 to 14,833 in 2015. We use these numbers to estimate direct economic benefit from tourists using the trail (see previous bulletins for more details). The table below shows these economic estimates for the 2015 hiking season.

Estimates of direct economic benefits from tourists

	Estimated number of tourists	Tourist spending per half day	Estimated direct economic benefits
Low	7,341	\$27.50	\$201,890
Medium	7,341	\$47.50	\$348,719
High	7,341	\$67.50	\$495,547

But, you might ask, how accurate are these numbers? As indicated on the chart on page 1, the estimates of trail visits for different years have been revised based on new information gathered after the initial estimate was made.

The reality is, estimating the number of visits to the AFT is not as easy as it might seem. The process is carried out over an entire hiking season, from the Victoria Day long weekend in May until the Thanksgiving long weekend in October. The process also involves two sources of data: readings from electronic devices installed on the trail and surveys of trail users. The information from the surveys is used to verify the reliability of the counters and to establish estimates for several variables used to interpret the data from the trail counters.

The most important question concerns the validity of the final estimate: Is the estimate an accurate measure of the number of visits to the AFT? As a point of clarification, the count is an estimate of the number of visits, not visitors; some people visit the trail more than once during a hiking season, but this is not factored into the final estimate. Other questions are related to the reliability of the counter, for example: do we know that the counters always count accurately and consistently? That is, does a counter miss any people walking by or count one person as two or more passings? As well, people often ask, does the device count animals?

The counting device we use is a PTC-3 counter, which is a passive, infrared unit designed specifically for trails and is used throughout BC and other parts of the world. The PCT-3 is manufactured in Valemount, BC, by Carson Electronics. The infrared unit is very sensitive to differences in temperature. When a person walks by the counter, the device measures a change in temperature because the warmth from the person's body is sensed as a difference from the background temperature, and the device registers a count of one. The device is sensitive enough to count two people who are following each other closely, but may count two people who are walking side-by-side as one person. Thus, it is ideal to locate the counter in a place where people are most likely to walk in single file and where people are not likely to linger, whereby they cross through the sensor's range more than once. For the most accurate readings, the device must be placed so that people pass one to three metres from the sensor.

Based on our experience, and from trying different locations, we believe that we have found locations that minimise the number of inaccurate counts, either due to missed counts or double counts. We have no evidence of animals having any effect on the counts. If such counts do take place, we assume that they are rare. However, in order to count the most people as accurately as possible, we found it necessary to aim the counter at the waist height of an average adult. Typically, this means that young children (about

Estimating the Number of Visits (continued)

four years old and younger if they are walking) do not cross the sensor's range and, therefore, are not counted.

We have two PCT-3 devices installed at the AFT. One counter (C1) is located along the route to Big Tree; the other is located on the boardwalk (C2). Due to the width of the boardwalk, there is no place where people are more likely to walk in single file. Based on on-site observations, people often walk side-by-side when passing the counter. Correspondingly, we found. The C1 counter is much more reliable, but with a greater chance of over-counting, presumably because a low number of people linger in the area.

The counters are read fairly regularly, often two times each week, although there may be longer periods between readings. In 2014 and 2015, the counters were read over forty times throughout each hiking season.

However, as one may guess from the factors identified, reading the counters on a regular basis is not enough. The reliability of each counter must be verified. Our primary means to verify the counter readings is to conduct surveys of trail users. For this purpose, we intercepted trail users at the end of their

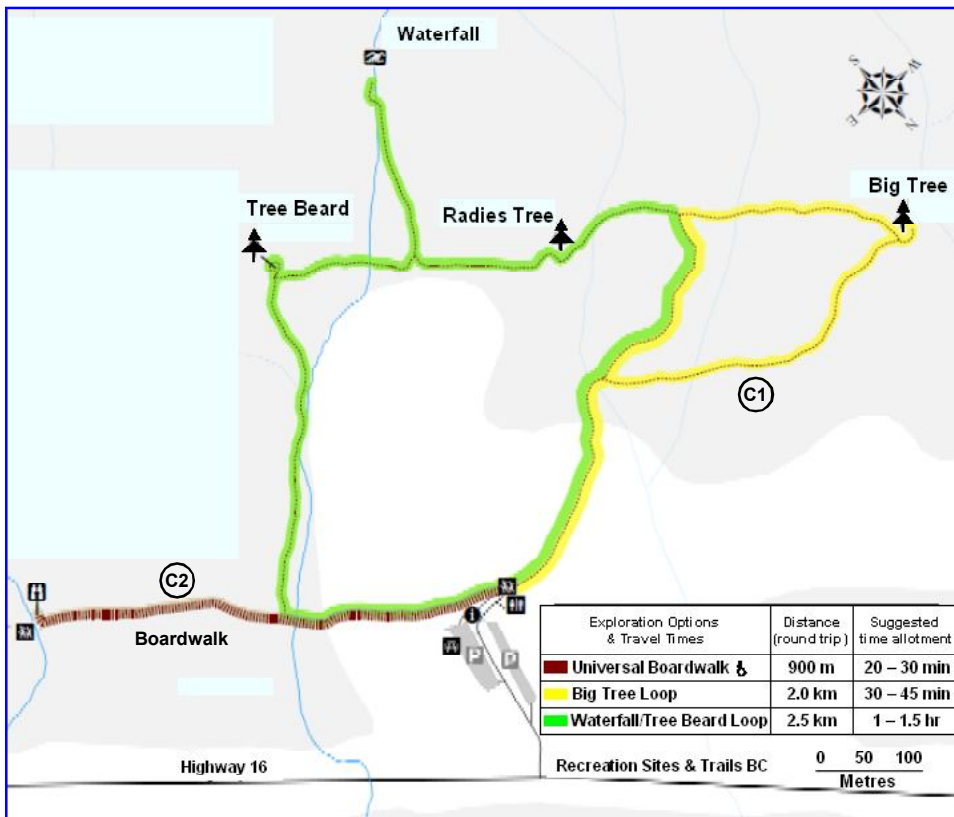
hike. Between 2008 and 2015, 1,623 surveys were administered, with 527 completed in 2012, when 31 days were spent at the AFT. In 2014, 248 surveys were completed; in 2015, 313 surveys were completed.

The trail user intercept surveys were used in two ways. For reasons discussed in more detail next, we collected information about the routes that people hiked. As well, on each day that the surveys were conducted, we compared the readings from the counter against the actual number of people who hiked the trail. These comparisons enabled us to assess whether there were over- and under-countings.

A critical element needed to estimate the number of visits accurately is to know which routes people hiked. This information is needed in order to interpret and adjust the readings from the counters. As shown on the map of the AFT, the trail offers different routes to follow. The actual routes taken, based on the results of our surveys, are shown in the table on page 6. We recorded 12 routes, with most people (41.9%) hiking all of the AFT, including the boardwalk.

The results of the user surveys enabled us to calculate percentages for different variables needed to

Map of Ancient Forest Trail



adjust the counter readings, including the percentage of people being single- and double-counted based on the route they hiked. We also adjusted the readings for people not counted because they walked a route that bypassed both counters. Based on the analysis, we used the following estimates to adjust the counter readings for the 2015 hiking season:

- 10.3% of people not counted
- people counted by each counter: C1 - 68.1%; C2 - 63.0%
- 3.3% of all people double-counted by C1 (5.0% of people who pass C1 are double-counted)
- 47.2% of all people double-counted by C2 (everyone who passes C2 is double-counted)

Estimating the Number of Visits (continued)

Routes of hikers during 2015 season (percentages of all hikers)

	BT	BT loop	AFT loop	AFT +BW	BT loop +BW	AFT via SC	AFT via SC+BW	BW	BW +WF	WF via BW	WF via SC	BT +BW	Other
	2.7%	5.6%	17.1%	41.9%	0.1%	8.8%	4.1%	15.1%	1.2%	1.0%	0.5%	0.6%	1.3%
C1	2x	1x	1x	1x	1x							2x	
C2				2x	2x		2x	2x	2x			2x	

BT – Big Tree; AFT – Ancient Forest Trail; BW – boardwalk; SC – short cut; WF – waterfall.

C1 – counter installed on route to Big Tree

C2 – counter installed on boardwalk

1x – counted once; 2x – counted twice (i.e., there and back)

Over the years, one of the surprising factors that emerged from the intercept surveys is a dramatic shift in the routes that people hiked. It appears that most of these changes are related to the on-going development of the trail itself, such as the installation of the boardwalk and planking. In the early years of the trail, before the Universal Boardwalk was opened in 2013, almost everyone hiked in a counter-clockwise direction because signs pointed in that direction – and because it looked like the appropriate direction to travel. Thus, our primary aim was to estimate the percentage of people who were double-counted because they went to Big Tree and back. We had only one counter (C1) installed prior to 2013.

When the boardwalk was installed, it not only provided a different, more accessible way to access the trail, but the look-and-feel of the trail was also altered substantially. Rather than being drawn naturally toward Big Tree, the physical presence of the boardwalk suggested that this was the intended starting point. Due to the accessibility features of the boardwalk, many people who could not walk the whole trail, either because of physical ability or time constraints, walked only the boardwalk portion of the trail. Thus, a significant portion of people changed not only the route they hiked but also the direction they hiked. For these reasons, we installed a second counter on the trail along the boardwalk. Everyone who went to the end of the boardwalk had to pass the counter on their return, and were double-counted. The installation of the planking also appears to have draws hikers along routes not typically followed in earlier years, such as using the ‘short cut’ route.

There were also unexpected technical issues, like electrical storms. As we discovered, lightning strikes in the region sometimes reset the counters to zero. While this limitation was mitigated by frequent counter readings, it created the need to use averages to fill missing data gaps. We also experienced acts of vandalism in 2013, which was one of the reasons why no count was estimated for that year.

As a consequence of different lessons learned, the annual estimates of trail users were revised on two occasions. In 2010, the estimates for 2008 and 2009 were revised based on new data about the reliability of the counters and systematic over-counting during the 2009 season. The 2014 estimate was revised based on data collected in 2015. The additional data helped us better understand the reliability of each counter, which then enabled us to refine our adjustments of the trail counts for the 2014 season.

In the end, all of the above issues and adjustments must be considered when assessing the validity of the final estimate for each year: is the final estimate an accurate reflection of the actual number of visits to the AFT? We believe that the final estimate is valid, while keeping in mind that it is only an estimate. The best indicator we use to assess overall validity is the discrepancy between the final estimate we arrive at for each counter. Due to different routes hiked and the related single- and double-counting, each counter produces a very different number by the end of the season, and thus two different results. It is only after we make all of the necessary adjustments can we assess how close the two results are to each other. In 2015, the two results varied by 3.17%, which we view as an indicator of strong validity.