



Bioblitz 2011: Tree-ring Measurements of Four Species

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Abstract

In July 2011 the MAD Lab was contacted by the Fundy Biosphere Reserve to partake in the annual provincial Bioblitz with other natural scientists from around the province. The MAD Lab acquired samples from four rarer species in the area under study: large tooth aspen (*Populus grandidentata*), American beech (*Fagus grandifolia*), white ash (*Fraxinus americana*), and ironwood (*Ostrya virginiana*). These species were measured to determine the age of each tree within the selected stands. The oldest large tooth aspen in the selected stand was 130 years, with the stand attaining a mean age of 104. The American beech site was found to have a mean age of 87.6 years, but the oldest tree that was located was 182 years. The oldest white ash cored in the stand was 122 years, with a mean age of all of the ash found to be 84.48 years. The oldest ironwood tree in the stand sampled was 167 years, with a mean age of 89.7 years.

Introduction

The 2011 Bioblitz (Figure 1) took place in Caledonia Gorge Protected Natural Area (CG PNA) and at 2832 ha, is the smallest of New Brunswick's 10 largest PNAs and representative of the Central Uplands Ecoregion (New Brunswick Museum, 2011). During the summer of 2011, the Mount Allison Dendrochronology Laboratory (MAD Lab) was asked to assess the age of several rare old-growth tree stands in the region.



Figure 1. Researchers from the 2011 Bioblitz – Caledonia Gorge pose for a promotional photo.

Site Information

Four locations were selected *apriori* to be sampled and the MAD Lab team was brought to each location take tree cores from the selected trees (Table 1).

Table 1- Site coordinates, species names, and codes.

Site Code	Species Name	Common Name	Longitude	Latitude
11QLK00	<i>Populus grandidentata</i>	Large Tooth Aspen	W64°46'42.8"	N45°47'57.9"
11RLB00	<i>Fagus grandifolia</i>	American Beech	W64°49'31.4"	N45°46'25.7"
11SLI00	<i>Fraxinus americana</i>	White Ash	W64°50'43.5"	N45°50'28.8"
11SLI00	<i>Ostrya virginiana</i>	Ironwood	W64°50'43.5"	N45°50'28.8"

Methods

At each site, forty tree cores were samples for each species (160 cores total) using a 5.1 mm increment borer. The samples were stored in plastic straws and transported back to the MAD Lab for analysis. The samples were glued into slotted mounting boards then sanded and buffed to a fine polish in order to reveal the tree rings. Annual-growth rings were counted using a mounted Velmex staging system. The age of each core was then assessed and a mean age of each stand was calculated.

Results

Large Tooth Aspen (P. grandidentata)

The oldest large tooth aspen in the stand was 130 years, with a mean age of 104.67 years (Table 2).

Table 2- *P. grandidentata* ages and time spans.

ID	Time Span		Age	ID	Time-Span		Age
11QLK01A	1899	2010	112	11QLK11B	1915	2010	96
11QLK01B	1900	2010	111	11QLK12A	1898	2010	113
11QLK02A	1883	2010	128	11QLK12B	1902	2010	109
11QLK02B	1961	2010	50	11QLK13A	1903	2010	108
11QLK03A	1992	2010	19	11QLK13B	1906	2010	105
11QLK03B	1890	2010	121	11QLK14A	1886	2010	125
11QLK04A	1883	2010	128	11QLK14B	1912	2010	99
11QLK04B	1888	2010	123	11QLK15A	1893	2010	118
11QLK05A	1933	2010	78	11QLK15B	1910	2010	101
11QLK05B	1907	2010	104	11QLK16A	1902	2010	109
11QLK06A	1881	2010	130	11QLK16B	1888	2010	123
11QLK07A	1892	2010	119	11QLK17A	1897	2010	114
11QLK07B	1903	2010	108	11QLK17B	1891	2010	120
11QLK08A	1900	2010	111	11QLK18A	1882	2010	129
11QLK08B	1939	2010	72	11QLK18B	1891	2010	120
11QLK09A	1892	2010	119	11QLK19A	1899	2010	112
11QLK09B	1929	2010	82	11QLK19B	1948	2010	63
11QLK10A	1915	2010	96	11QLK20A	1917	2010	94
11QLK10B	1913	2010	98	11QLK20B	1914	2010	97
11QLK11A	1893	2010	118	MEAN	1906.33		104.67

American Beech (F. grandifolia)

The oldest American beech in the stand sampled was 182 years, with a mean age of 87.6 years (Table 3).

Table 3. *F. grandifolia* ages and time spans.

ID	Time-Span		Age	ID	Time-Span		Age
11RLB01A	1892	2010	119	11RLB11A	1953	2010	58
11RLB01B	1895	2010	116	11RLB11B	1956	2010	55
11RLB02A	1913	2010	98	11RLB12A	1887	2009	123
11RLB02B	1819	2010	192	11RLB12B	1855	2010	156
11RLB03A	1938	2010	73	11RLB13A	1929	2010	82
11RLB03B	1946	2010	65	11RLB13B	1939	2010	72
11RLB04A	1945	2010	66	11RLB14A	1934	2010	77
11RLB04B	1929	2010	82	11RLB14B	1974	2010	37
11RLB05A	1829	2010	182	11RLB15A	1975	2009	35
11RLB05B	1914	2010	97	11RLB15B	1960	2010	51
11RLB06A	1925	2010	86	11RLB16A	1967	2010	44
11RLB06B	1912	2010	99	11RLB16B	1943	2010	68
11RLB07A	1924	2010	87	11RLB17A	1903	2010	108
11RLB07B	1922	2010	89	11RLB17B	1867	2010	144
11RLB08A	1940	2010	71	11RLB18A	1964	2010	47
11RLB08B	1947	2010	64	11RLB18B	1937	2010	74
11RLB09A	2010	2066	57	11RLB19A	1913	2010	98
11RLB09B	1938	2010	73	11RLB19B	1916	2010	95
11RLB10A	1894	2010	117	11RLB20A	1938	2010	73
11RLB10B	1888	2010	123	11RLB20B	1960	2010	51
				MEAN	1924.75		87.6

White Ash (F. americana)

The oldest white ash in the stand sampled was 122 years, with a mean age of 84.48 years (Table 4).

Table 4. *F. americana* ages and time spans.

ID	Time-Span		Age	ID	Time-Span		Age
11SLL01A	1934	2010	77	11SLL11A	1920	2010	91
11SLL01B	1908	2010	103	11SLL11B	1915	2010	96
11SLL02A	1942	2010	69	11SLL12A	1930	2010	81
11SLL02B	1944	2010	67	11SLL12B	1908	2010	103
11SLL03A	1916	2010	95	11SLL13A	1902	2010	109
11SLL03B	1932	2010	79	11SLL13B	1910	2010	101
11SLL04A	1933	2010	78	11SLL14A	1920	2010	91
11SLL04B	1916	2010	95	11SLL14B	1935	2010	76
11SLL05A	1940	2010	71	11SLL15A	1897	2010	114
11SLL05B	1919	2010	92	11SLL15B	1899	2010	112
11SLL06A	1907	2010	104	11SLL16A	1952	2009	58
11SLL06B	1919	2010	92	11SLL16B	1952	2010	59
11SLL07A	1932	2010	79	11SLL17A	1939	2010	72
11SLL07B	1928	2010	83	11SLL17B	1944	2010	67
11SLL08A	1953	2010	58	11SLL18A	1935	2010	76
11SLL08B	1939	2010	72	11SLL18B	1944	2010	67
11SLL09A	1908	2010	103	11SLL19A	1909	2010	102
11SLL09B	1889	2010	122	11SLL19B	1912	2010	99
11SLL10A	1945	2010	66	11SLL20A	1952	2010	59
11SLL10B	1940	2010	71	11SLL20B	1941	2010	70
MEAN				1926.5	84.475		

Ironwood (Ostrya virginiana)

The oldest ironwood tree in the stand sampled was 167 years, with a mean age of 89.7 years (Table 5).

Table 5. *Ostrya virginiana* ages and time spans.

ID	Time-Span		Age	ID	Time-Span		Age
11SLI01A	1893	2010	118	11SLI11B	1939	2010	72
11SLI01B	1949	2010	62	11SLI12A	1918	2010	93
11SLI02A	1934	2010	77	11SLI12B	1898	2010	113
11SLI02B	1908	2010	103	11SLI13A	1963	2010	48
11SLI03A	1956	2010	55	11SLI13B	1918	2010	93
11SLI04A	1857	2010	154	11SLI14A	1915	2010	96
11SLI04B	1913	2010	98	11SLI14B	1920	2010	91
11SLI05A	1893	2010	118	11SLI15A	1960	2010	51
11SLI05B	1889	2010	122	11SLI15B	1943	2010	68
11SLI06A	1935	2010	76	11SLI16A	1974	2010	37
11SLI06B	1921	2010	90	11SLI16B	1953	2010	58
11SLI07A	1912	2010	99	11SLI17A	1948	2010	63
11SLI07B	1941	2010	70	11SLI17B	1926	2010	85
11SLI08A	1875	2010	136	11SLI18A	1907	2010	104
11SLI08B	1844	2010	167	11SLI18B	1924	2010	87
11SLI09A	1927	2010	84	11SLI19A	1906	2010	105
11SLI09B	1931	2010	80	11SLI19B	1906	2010	105
11SLI10A	1902	2010	109	11SLI20A	1917	2010	94
11SLI10B	1932	2010	79	11SLI20B	1945	2010	66
11SLI11A	1932	2010	79	MEAN	1921.128		89.87179

Conclusion

Results illustrate the oldest stand on average was the large tooth aspen stand (11QLK00), while the oldest tree was found to be American beech (11RLB00). Stand mean ages spanned from approximately 84 to 105 years old.

References

New Brunswick Museum. 2011. 2011 Bioblitz – Caledonia Gorge. www.nbm-mnb.ca. Accessed: June 15, 2012.