Archaeology with Public Schools at Cross Roads at Big Creek, Sturgeon Bay, Wisconsin

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Introduction

Cross Roads at Big Creek is a non-profit land restoration organization that is "a preserve which offers education, conducts research and provides outdoor experiences to inspire environmental stewardship in learners of all ages." Archaeology fits well into the Cross Roads mission because it is an educational outdoor experience that is easily shared with students and inspires stewardship by centering the role of humans in creating their environment. Because of this intrinsic relationship between humans and the landscape, archaeology plays an integral part of land restoration, conservation, and environmental learning.

There are two pre-European contact archaeological sites on the Cross Roads properties; the Ida Bay (47DR35) and Cove (47DR428) sites. Over the past 10 years, Cross Roads has built a commitment to archaeological research as well as public education using these two sites. In collaboration with Randy Dickson of Midwest Archaeological Consultants (MAC), and Robert Jeske of the University of Wisconsin Milwaukee (UWM) and Jeske Archaeological Consultants (JAC), Cross Roads has provided support for a long-term comparative analyses of these two sites. This research incorporates elements of academic research, site conservation, and public education. However, the work has grown organically over time, and the need for a long-term structure for the project is clear. MAC and JAC along with Cross Roads propose to take into account several commonly-held goals for archaeological research and education:

1). Identify, place in order, and reconstruct former lifestyles; when, where, and how people lived in relation to their physical and social environments.

2). Act as stewards of the archaeological record. Protect and conserve nonrenewable cultural resources.

3). Incorporate descendant and local communities into our work. Recognize the impact of our work on non-archaeologists, and respect the knowledge and viewpoints of others with whom we interact.

History of Research

Beginning in 2014, Midwest Archaeological Consultants, LLC began to work with Cross Roads as part of cultural resource management compliance. The mutual interests of Randy Dickson (MAC) and Coggin Heeringa (Cross Roads) in teaching about the past to school children began a program that included archaeological research and pedagogy. Students from 3rd grade through 12th grade engaged in hands-on learning and demonstrations of archaeology. They helped to excavate and screen material from the archaeological sites, overseen by professional archaeologists. Students also learned about flotation techniques from features they helped excavate. They also saw how the artifacts they found at the sites were manufactured by watching flintknapping demonstrations. They participated in atlatl throwing lessons to see how the artifacts were used. They also were taken on tours to understand the ecology and environmental relationships of the site occupants to the landscape. This multipronged approach allows students to experience archaeology in a holistic framework.

The Sites

Cove Site

The Cove Site (47DR428) is on a low terrace on the east side of Big Creek as it enters a small cove connected to Sturgeon Bay. The terrace is a result of late Holocene era lake level fluctuations, probably formed post-Algoma stage, ca. 3,000 BP. Previously, the area would have been under water as part of Sturgeon Bay. The notes of the General Land Office survey indicated that the environment around the site before significant Euroamerican settlement consisted of a mixed forest with hemlock, pine, red oak, pin oak, beech, maple, aspen (Sibley 1835). Based on shovel testing, the site covers roughly 15,300m^2 (ca.3.8 acres), however, the eastern portion of the site has been covered by modern gravel parking lot. It is also likely that the site extends further to the south of the Cross Roads at Big Creek property, but that area has not been shovel tested.

Ida Bay

Ida Bay (47DR35) sits on top of the Algoma lake terrace, formed ca. 3200 BP, overlooking Sturgeon Bay. Above the main part of the site is the Nippising level terrace (ca 6,000 BP) and a hundred meters to the east is the Algonquin stage (ca 11,000 BP). The notes of the General Land Office survey indicate that the environment around the site before significant Euroamerican settlement consisted of a mixed forest comprising hemlock, tamarack, pine, cedar, beech, and birch (Sibley 1835). Below the site was a swamp that extended a hundred meters to the shore of Sturgeon Bay itself. The site is approximately 6 acres in size, although it is complicated by the fact that there may be several distinct occupations on the multiple glacial beach ridges.

Previous Research and Educational Results

To date, approximately 59 m^2 have been excavated at Ida Bay and 185m^2 have been excavated at Cove site. The two sites have yielded numerous pits and hearths, and thousands of stone tools, pieces of debitage, ceramic sherds, as well as animal and botanical samples. Based on initial analysis of ceramic and point types, Ida Bay appears to be a North Bay/Middle Woodland occupation with a smaller Late Woodland component, while the Cove site is a Late Woodland occupation with a smaller North Bay/Middle component. Initial radiocarbon data support this chronology (Table 1). Four samples from food residues on ceramic sherds at the Cove site yielded calibrated calendrical dates ranging between ca. AD 870-1230. A radiocarbon sample from twigs provide a calibrated date of ca AD 1560, but we have recovered no artifacts from that recent period, and at this point do not think that date is acceptable for an occupation at the site.

Table 1. Radiocarbon Dates from the Cove and Ida Bay sites.

Sample	Lab #	Material	14C Age	(+/-)	1-Sigma	2-Sigma	Prob.
DR428-001	UGAMS-56127	Food residue	1110	20	cal AD 896 - 923		0.473
					cal AD 951 -979		0.467
					cal AD 984 - 989		0.061
						cal AD 896 - 923	0.438
						cal AD 896 - 923	0.562
DR428-002	UGAMS-56128	Food residue	990	20	cal AD 988 - 999		0.02

					cal AD 1021 - 1045		0.642
					cal AD 1085 - 1093		0.108
					cal AD 1105 - 1119		0.23
						cal AD 995 - 1004	0.047
						cal AD 1019 - 1049	0.494
						cal AD 1081 - 1134	0.384
						cal AD 1137 - 1152	0.076
DR428-003	UGAMS-56129	Food residue	860	20	cal AD 1176 - 1194		0.471
					cal AD 1200 - 1219		0.529
						cal AD 1158 - 1227	0.997
						cal AD 1249 - 1252	0.003
DR428-004	UGAMS-56130	Food residue	1150	20	cal AD 776 - 782		0.082
					cal AD 880 - 898		0.296
					cal AD 920 - 956		0.588
					cal AD 969 - 972		0.035
						cal AD 775 - 787	0.083
						cal AD 828 - 858	0.102
						cal AD 872 - 976	0.815
DR428-005	UGAMS-56126	twigs	310	20	cal AD 1522 – 1575		0.823
					cal AD 1624 – 1639		0.177
						cal AD 1503 – 1598	0.786
						cal AD 1617 – 1645	0.214
DR35-04	UGAMS-68693	deer bone	1390	25	cal AD 611-615		0.06
					cal AD 641-662		0.94
						cal AD 605-629	0.237
						cal AD 633-667	0.763

A butchered deer bone from Ida Bay returned a date of 1390±25 BP. When calibrated, the radiocarbon date translates to a calendrical date of AD 605-667. Three other food residue samples were also tested, but returned dates indicating unacceptably late or modern values. The reasons for these anomalies are yet unclear.

The radiocarbon data, as limited as it currently is, suggest that Ida Bay was occupied at least two centuries before the Cove site. Ida Bay has median calibrated date of AD 647 versus the Cove

Site's median calibrated dates of AD 918, 943, 1042, 1193. However, it is clear that we need many more radiocarbon samples.

Research Design

The history of work at the 47DR35 and 47DR428 provides a foundation for multiple lines of enquiry.

Research Questions:

I) Site integrity
   a. Geological history
   b. Cultural stratification, feature potential,

II) Site boundaries
   a. Natural vs cultural boundaries
      i. Precision mapping
      ii. Aerial photography
      iii. LiDar, thermal imaging, etc.
   b. Artifact and feature distribution
      i. Shovel tests
      ii. Ground penetrating radar

III) Research Potential
   a. Culture History
      i. Relative dating (diagnostic tools, stratification)
      ii. Absolute dating (radiocarbon)
   b. Technology
      i. Lithic (morphofunctional, usewear, raw material analysis, etc.)
      ii. Ceramics (morphofunctional, clay sourcing, etc)
      iii. Bone and antler (morphofunctional)
      iv. Copper (morphofunctional, sourcing, etc.)
   c. Subsistence Strategies
      i. Zooarchaeological (faunal)
      ii. Archaeobotanical
         1. Macro (seeds, nutshell, etc.)
         2. Micro (palynology, phytolith)
   d. Mobility Strategies
      i. Pit features
      ii. Structures
   e. Other Strategies
      i. Raw material acquisition and use
      ii. Intraregional exchange and interaction
      iii. Interregional exchange and interaction
      iv. Human-ecological relationships

Larry Meier instructs students on flagging surface artifacts visible on 47DR428.

A T.J. Walker Middle School student shows off an artifact discovered in the screen from The Cove 47DR428.

T.J. Walker Middle School students gain atlatl experience at Ida Bay 47DR35.

T.J. Walker Middle School students excavate a 1 x 1m unit at Ida Bay 47DR35.

A wickiup build by Sevastopol Middle School students at Ida Bay 47DR35.