From Fire to Fruit: Opportunities for the Integration of Archaeological Data with Anishinaabe Wild Harvest

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Abstract

Over the last decade there has been a growing recognition that most landscapes in North America were created and maintained through indigenous fire regimes. This paper discusses the intersection between contemporary Anishinaabe fire management initiatives, food sovereignty, and archaeological data. Ethnographically, Indigenous peoples have used intentional forest burning to promote the growth of underbrush, berry patches, and mast-producing trees. As initiatives among tribes in Northern Michigan, like the Center for Cooperative Ecological Resilience, explore these practices there are opportunities to move beyond wildfire management and into food sovereignty.

Access to affordable food and access to healthy food options are a substantial focus among tribes in Northern Michigan. The wild harvest of berries has huge potential as a means of self-determination and medicine. However, to implement fire management techniques for the benefit of wild harvests, it requires an understanding of forest ecology pre-European influence. Excavations from the Cloudman site in Northern Michigan have yielded data on the species

composition of plant communities in the pre-contact, and the utilization of the local forests by Anishinaabe ancestors. Considering this research, there are new opportunities to combine archaeological data with contemporary goals.

Introduction

In Michigan, Indigenous food sovereignty programs are not only gaining momentum, increased funding and awareness is helping propagate them much like the very foods they plant (Mills 2021). Seemingly disparate organizations have appeared across the landscape with the common goals of providing their communities the spiritual, nutritional, and economic benefits of Indigenous food production. The growth in food sovereignty programs have provided tribal organizations new farms, educational programing, and unique collaborations. For instance, Bemadizijig ogitiganiwaa (People's garden) that began in 2013 and the Coastal Marsh Restoration in the St. Mary's River that in 2019 seeded areas of Munuscong Bay with manoomin (wild rice, Zizania palustris). Still, for a region known historically for its reliance on foraging for subsistence, wild food collection from terrestrial sources has lived on the periphery of Anishinaabe Indigenous food sovereignty (Davidson-Hunt 2005; Densmore 1974; Dunham 2009). In particular, maple sugaring, the collection of mast, and berrying have only played a supporting role. The use of these products cannot be overlooked as a major source of economic and personal stability.

Each year foraging rights allow tribes to collect forest resources for both personal and economic uses. Foraging within the Michigan State and National Forest systems contributes a significant portion of wild food resources. For example, in 2020, 58,893 individual permits were issued by the Sault Ste. Marie Tribe of Chippewa Indians for hunting, fishing, gathering, and trapping within the 1836 Ceded Territory, which includes almost 40% of the current land area of Michigan (Sault Ste. Marie Tribe of Chippewa Indians Natural Resources Department 2020). Two treaties in particular dictate rights of access to public lands for 7 of the 12 federally recognized tribes within Michigan. These are the 1842 Treaty of LaPointe and 1836 Treaty of Washington. So, it is no great leap to expect that continued wild food availability relies on sustainable practices, in particular the re-engagement of Anishinaabe forest management systems.

Fire Regimes for Wild Foods

Within the past five years, there has been an explosion in collaborative environment management programs that integrate indigenous sustainability practices (Knopf 2015; Palmer 2021). Forest management initiatives while focused on more explicitly ecological pursuits, share many of the same goals as food sovereignty. When it comes to the quality and quantity of forest resources, each desire those outcomes, albeit for slightly different reasons (Bissonnette et al. 2018). Though both goals require dealing with a forested landscape that has suffered under at the hands of lumber industry, invasive species and, until the last forty years, a misunderstanding of forest dynamics that have significantly impacted the delicate ecosystems of the Great Lakes. Those issues are compounded by the ever-present threats of climate change. Environmental restoration programs seek a more effective and sustainable answer for the devastation. Often forest management involves implementing Indigenous techniques practiced for generations. For example, the 2018 collaboration between the Sault Ste. Marie Tribe of Chippewa Indian's Inland Fish and Wildlife Department, Hiawatha National Forest, Inter-Tribal Council of Michigan, and Michigan State University have pooled their skills and labor to develop an adaptive management plan for prescribed fire within the Hiawatha National Forest (www.saulttribe.com 2022). One of the goals of the partnership is to investigate the impact of indigenous fire ecology and how these regimes can benefit culturally important trees (Gary Rollof, personal communication). It is within this realm that archaeology has the unique position to offer its service.

Anishinaabe forest management regimes, with particular emphasis on fire ecology, are currently in the process of testing and experimentation (Ishkode Project Report 2019). We understand full well from traditional ecological knowledge, oral history, and historic accounts that Anishinaabe peoples were and are active caretakers of the forests. Fire regimes are known to provide, enriched soil, removal of pests, more productive flowering events increasing berry growth, and ideal environments for pioneer species like birch and ash that have important cultural uses (Smith 2011; Fidelis and Zirondi 2021; Payette et al 2021). But as noted, this process relies heavily on literal trial by fire. The point being it is not as clear what the goal post should be, what the plant communities should look like. Further, while traditional ecological knowledge (TEK) is a profound resource for this type of work, the methods used to gain this information often come from horizontal experience. Meaning, that TEK is from people who engage with the landscape across large distances. It is more difficult to gain a long-term picture of the impact of traditional fire regimes from one catchment. For better or worse, archaeology has the unique position of contributing the missing element. Through macrobotanical evidence from archaeological sites, the understory plants collected, and a suite of information on the woodland composition is accessible through the archaeological record.

Archaeological Material and Human Landscape Interaction

It is now that I would like to zero in on an archaeological case study to highlight the particularities of archaeobotanical data. Only 50 miles by canoe from Sault Ste. Marie, the Cloudman site of Drummond Island boasts over 600 years of near continuous occupation (Branster 1995; Kooiman 2018; Kooiman and Walder 2019). The Cloudman site is positioned in a tucked away river that flows in from the St. Mary's (Fig.1). While it is coastal, it is also shielded from major weather patterns coming off the more deadly Great Lakes. Primarily my data is drawn from cultural deposits within the Late Woodland Period (AD 600 and 700) and the early French Period (AD 1650-1700). The relevant data comes from the macrobotanical assemblage. Samples were drawn from the 2019 field season at the Cloudman site on Drummond Island. In total, 15 samples have been analyzed spanning the woodland into historic period (AD 700- 1700).

The forest and island ecology around the coasts of Michigan developed out of human interventions beginning with the major climatic change ca. 3000 BP. During this period the pine-dominated landscape gave way to hemlock-dominated forests accompanied by birch, beech, cedar, and maple. By the period associated with the first occupation of the Cloudman Site, habitats took on a similar composition as the later historic periods (Branster 1995). Mesic northern forests became the standard with sugar maple as the most dominate tree type. Canopy trees are often a mixture of ash, yellow birch, red oak, hemlock, lime, and to a lesser extent, beech, as it is sensitive to the intensity of cold winters. Of the non-wooded habitats, Great Lakes marshes of the St. Mary's River corridor are associated with less acidic soils, distinct water meadows, and submergent and emergent marshes (Albert 2003).

Figure 1. Location of the Cloudman site on Drummond Island in Chippewa County Michigan

While charred seeds are present for identification, a large portion of the analysis of the macrobotanical remains involves anthracological analysis. Anthracology is a discipline within archaeobotany that studies charred wood remains from archaeological contexts. This discipline began with the growing recognition that charred wood or charcoal is ubiquitous within many archaeological samples and that its presence was a vital piece of cultural data (Asouti 2003; Asouti and Austin 2005; Scott and Damblon 2010). Wood plays an enormous role within human cultures—past and present (Costa Vaz et al. 2017). Given the ubiquity of charred wood produced from those activities, anthracological analysis can help us gain insights into resource collection and management systems over the course of the various occupation phases.

Charcoal fragments were examined through the assistance of reference material from the ethnobotany collections at the University of Michigan Museum of Anthropological Archaeology and online sources such as InsideWood database (InsideWood. 2004-onwards). Fragments were sectioned on three anatomical planes; Transverse, tangential, and radial sections. These diagnostic sections were observed under reflected light microscopy (Fischer series). This approach allowed for identification to the genus level, as well as opportunities to document alterations caused through carbonization.

During identification, several dendrological characteristics and alterations were recorded. These were meant to address the quality of the wood, the minimum diameter, and the tree ring evenness. To assess the quality of the wood, the goal was to rank each fragment by the level of cellular deformation and record the presence or absence of radial cracks and vitrification (Extreme shine). The most relevant features for the purposes of this paper are the minimum ring diameter and ring evenness, as these features provide insights into whether trees in the catchment were being cleared from the landscape, or whether only limbs were used.

Findings

First, raspberry seeds (*Rubus* spp) were ubiquitous across every period. The charred seeds appear in both general fill and hearth contexts as well. Their presence is matched by bedstraw *(Galium* spp). Though bedstraw is not a food product, is it a good indication of consistent clearing around the habitation area. Birch, ash, oak, and maple were also ubiquitous within every sample of every period. Similarly, hemlock and willow commonly appear in the firewood assemblages (Fig. 2).

Taxa	Late-Woodland AD 600–1000	Late Late Woodland AD 1200-1500	Early Historic Post AD 1650
Acer (Maple)	X	X	X
Betula (Birch)	X	X	X
Fraxinus (Ash)	X	X	X
Prunus (Stone fruit)		X	X
Quercus (Oak)	X	X	X
Salix (Willow)	X		X
Tsuga (Hemlock)	X		X
Ulmus (Elm)		X	

Chance of occuring in wetlands

>99%	66%-99%	34%-66%	1%-33%	< 1%

Figure 2. Ubiquity of tree taxa within each period.

Additionally, acorn shells were present in each Late Woodland sample, suggesting that the long occupation periods both relied on and had consistent access to this food source.

The constant presence of berry and acorns around the same site is a fascinating example of the possibilities of sustainable harvesting. *Rubus* spp. in the company of food producing maple and oak, with very little evidence of gymnosperms, is good evidence of intentional management. The natural forest sequence does not progress over the course of the Late Woodland Period. If we also take paper birch as an example, this species reaches on average eighty years of age before it's life cycle ends. They are rapidly growing trees but, not long lived. Stands of these trees may produce good seed crops every other year covering 1 million to over 35 million seeds per acre (Wisconsin DNR 2015). However, they are also very dependent on the appropriate conditions to germinate. For a birch to germinate at all let alone reach its maximum diameter, they require a great deal of sunlight. On the shade and moisture tolerance chart (Fig 2.). It can be seen that birch is one of the most shade intolerant of all the trees represented in the samples. This intolerance combined with the relatively short lifespan and near constant presence across hundreds of years provides evidence for regular forest openings within the site's catchment allowing for the light loving species to continue to flourish.

The tree diameter data provides another interesting example of the constant promotion of forest clearing events. The ring evenness across periods shows that ring size barely deviated from the average of 2 mm per tree ring. Generally, if a tree management system relies on coppicing or pollarding, that cuts trees to promote growth, we would see both inconsistent ring sizes but, also highly regular minimum tree diameters (Thiébault 2006). The mean diameter ranges from 120.06 mm to 40.69 mm across periods and the diameters generally fit a bell curve. This pattern indicates that pollarding is not likely (O'Hara et al. 2018). However, the minimum diameters do not exceed 130 mm, which shows that primarily small/young trees or branches or used more often than not. While this is possibly explained by labor and energy requirements, it is also evidence of new growth trees that would occur from fire management regimes instead of coppicing (O'Hara et al. 2018; Warren et al. 2013).

Overall, the evidence reveals that the fire management systems were successful on a local scale for hundreds of years. Not only were berry crops maintained, but regular forest openings were also sustained. While more research is required to evaluate the rarity of other wood management systems like shelter wood methods, the plant communities represented are in-line with cyclical burning.

Conclusions

The importance of restoring local habitats intersects with several important tribal and environmental needs. The management of forested areas can greatly expand the possibility for wild harvested food and overall food sovereignty. Those integrative practices have the potential to play an enormously powerful role for Anishinaabe wild food harvesting. For example, a case study from Canada reveals that berries were meant for intercommunity trade and use within the home (Parlee et al. 2005). During the 2003 collecting season (A low yield year), it was estimated that 5,000 liters of blueberries, cloudberries, and cranberries were collected community wide. When directly asked the question, “Why is berry picking important to you?” the women involved in the study told them that it is not simply to provide for themselves, although berries supplied a good source of vitamins during the winters, it was a specific communal activity and provided the means for connecting community members together through sharing. Though, the impact of wild food collection should not be simply reduced to numbers, as it is clear that part of the value of these foods is the opportunities these good provide for gaining access to a wider network of foods through community giving. All in all, studies reveal any work to actively increase wild resources are associated with benefits to health, cultural survivance, social networks, self-governance, and spirituality (Norrgard 2009).

Moreover, it is established the people's connection to the land goes far beyond a surface level trope of the Indian environmentalist. The ability to maintain their connection to the land and traditional lifeways is a direct rejection of and fight against colonial domination (Kuokkanen 2011; Lomawaima 2013). Increasingly, cultural revitalization, sovereignty, and activism movements have been gaining momentum in the Native world. During the 1970's it happened during the Wisconsin Walleye War and recently it has happened at Standing Rock. Based on these examples, clearly the struggle for self-determination is tied very closely to the ability of any Native group to maintain control over natural resources (Barker 2015).

As for the potential for archaeology, first, this data reaffirms the long-term connection between the Anishinaabe and stewardship. Second, the macrobotanical remains can contribute insights into how forested landscapes can have a long-term and stable forest sequence. In addition to providing a long-terms view of what the original forest pattern looked like, it solidifies that TEK methods have produced the idealized outcomes for wild food production that are desired by current initiatives. The Cloudman site outlines continuous practice that will hopefully provide a target for contemporary management programs. Accordingly, I have an active data sharing agreement with the Center for Cooperative Ecological Resilience (CCER). My goals are to unify as much of the information provided from their work and archaeology. As this research moves forward, a clearer view of forest management will emerge. The next stages of this project are to utilize the soil samples taken during excavations. I have the opportunity to fine tune which samples are tested for which microfossils with the express input from tribal bodies. This work will hopefully continue to inform strategies to restore and maintain fire-dependent forests.

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