

# THE ARCHAEOLOGY OF GREAT LAKES NATIVE AMERICAN MAPLE SUGAR PRODUCTION IN THE RESERVATION ERA

Matthew M. Thomas

## ABSTRACT

*As a little addressed topic, the archaeological remains of late 19<sup>th</sup> and early 20<sup>th</sup> century Native American maple sugar making have often gone unnoticed by archaeologists. This paper presents the initial results of a study of Native American maple sugaring in the Late Historic reservation era of the western Great Lakes, spanning the years 1860-1950. Specific focus is placed on the Lac du Flambeau Ojibwe community of north central Wisconsin where recent efforts to document and interpret the archaeological record of maple sugaring have recorded the remains of over two dozen historic sugarbushes. The cultural significance and context of maple sugaring is explored alongside a profile of the material remains of Native American maple sugaring from three periods of the reservation era.*

Native Americans and Euro-Americans throughout the eastern United States and northern plains have been making maple sugar for hundreds of years. Glimpses of the history of sugaring are commonly found in the cultural and historical museums of the upper Midwest and Great Lakes with displays of birch bark containers for collecting maple sap, wooden yokes, sugar molds, spoons and sugar troughs. Likewise, ethnologists and ethnohistorians such as Frances Densmore (1974, 1979), Huron Smith (1932) Felix Keesing (1987) and George Quimby (1962, 1966) have provided similar accounts of Ojibwe<sup>1</sup> maple sugaring. What is common among nearly all scholarly presentations of Native American sugaring is the late

19<sup>th</sup> century "snapshot" image of an unchanging practice.

This study examines Native American maple sugaring in the reservation era between 1860 and 1950. The information presented here is an initial report of a project to document the archaeological evidence of Native American maple sugaring in the Lac du Flambeau Ojibwe community of Wisconsin (Thomas 1999). Moreover, this project sought to establish a historic and cultural context for Native American maple sugaring in the western Great Lakes and delineate the material remains and landscape features of Native American maple sugaring.

The reservation era of 1860 to 1950 marks a period of rapid change for Native Americans in the western Great Lakes. As interactions with Euro-Americans, missionaries, and government agents increased, Native communities repeatedly faced challenges to their well-established social structures, economic patterns, and traditional and religious values and beliefs. Native technology and material culture were likewise not immune. Like most traditional activities, maple sugaring evolved and where possible, was adapted to take advantage of new materials and technology. But the process of making maple sugar and the resulting material remains and landscape features record more than technological innovations and adaptations. These sites reflect the broader patterns of change in reservation communities, families, and landscapes.

Located in north central Wisconsin, at the intersection of Vilas, Iron, and Oneida counties

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Matthew M. Thomas, Department of Landscape Architecture, 1 Agriculture Hall, 1450 Linden Drive, University of Wisconsin-Madison, Madison, WI 53706

(Figure 1), the Lac du Flambeau Reservation was established with the signing of the Treaty of La Pointe in 1854. As the final land cession treaty of the Lake Superior Ojibwe Indians in Wisconsin, the Treaty of 1854 reserved four parcels of land for the Ojibwe within the State of Wisconsin with the expectation that all of the Ojibwe Indians in the state would resettle on one of these reservations. At the time of this treaty, the Lac du Flambeau District consisted of six related communities from Lac du Flambeau, Trout Lake, Turtle Portage, Wisconsin River, Pelican Lake, and Lac Vieux Desert (Bokern 1987). With the exception of Pelican Lake and Lac Vieux Desert, the communities of the Lac du Flambeau District relocated to the new reservation. With resettlement on the reservation and cession of the lands around it, Lac du Flambeau residents began to adjust to the requirements of reservation life. Although the movements and seasonal activities of the Lac du Flambeau Ojibwe became restrained, the reservation residents were not immediately prevented from occupying and exploiting the lands around the reservation. As a result, a number of sugarbushes are located near but outside the reservation boundaries.

Between 1860 and 1890 the first wave of change came to the reservation as the surrounding non-Indian population gradually increased, the forests were cut, and the land was sold. In 1889 the Milwaukee, Lake Shore, and Western Railroad built a line across the reservation; and in 1893 Cushway, Herrick, and Stearns built the first sawmill in the center of the reservation, leading the second wave of change in the Lac du Flambeau community (Guthrie and Goc 1995). As the forests of the reservation were cut, the new town of Lac du Flambeau sprung up around the sawmill. Soon after, tourists found the reservation an "unspoiled" playground. Reservation economics became dependent on cash income, and it was no longer possible to support one's self or one's family simply from the land. Lac du Flambeau Ojibwe were faced with rapid change, which brought both challenge and destruction, as well as opportunity. Throughout this period, traditional seasonal activities such as wild rice gathering and making maple sugar continued to be carried out in the woods and lakes on and around the reservation.

### IMPORTANCE OF MAPLE SUGAR TO GREAT LAKES INDIANS

The significance of the archaeological remains of Native American maple sugaring sites can be found in an examination of the historical and contemporary importance placed in sugaring. At the most utilitarian level, maple sugar was made for personal consumption, gift giving and feasting, trade, and to be sold for cash. However, maple sugar and sugaring is more than simply a commodity or trade good. The making of maple sugar has a deep history in the culture, tradition, and language of the people of the Lac du Flambeau community. The origins of maple sugar have been told and re-told for hundreds of years. Native American communities throughout the northeast and Great Lakes have preserved a rich oral history describing and teaching how maple sugar came to be. Where opportunity arose to capture these stories, folklorists, anthropologists, and historians recorded, translated, and transcribed what they heard. Examples can be found in the works of Barnouw (1977:90-91), Hoffman (1896:173-175), Levi (1978:28-30) Lookaround (1949:326-327), Pendergast (1982:28-33), Ritzenthaler and Ritzenthaler (1983:132) and Taylor (1976:79). Another aspect of the cultural importance of sugaring within the Native American community is its appearance in traditional songs and dances. For example, Densmore recorded an Ojibwe song about maple sugar in the early part of the 20<sup>th</sup> century whose words translate in English to "maple sugar is the only thing that satisfies me" (Densmore 1913:231). The languages of many North American Indian tribes contain a rich vocabulary that names and describes the articles, products, and processes of making maple sugar. That maple sugar plays an important role in the language and economic cycle can be seen in the Ojibwe naming of the month of March as Iskigamizige Giizis, the month of the Sap Boiling Moon.

Prior to the restrictions of reservation life, maple sugar and its gathering were critical elements in the subsistence cycle of Native American people in the Great Lakes. Like wild rice, maple sugar could be produced in large quantities in a fairly short amount of time, creating a storable, as well as portable surplus to be used throughout the year. This was important in the interior lakes

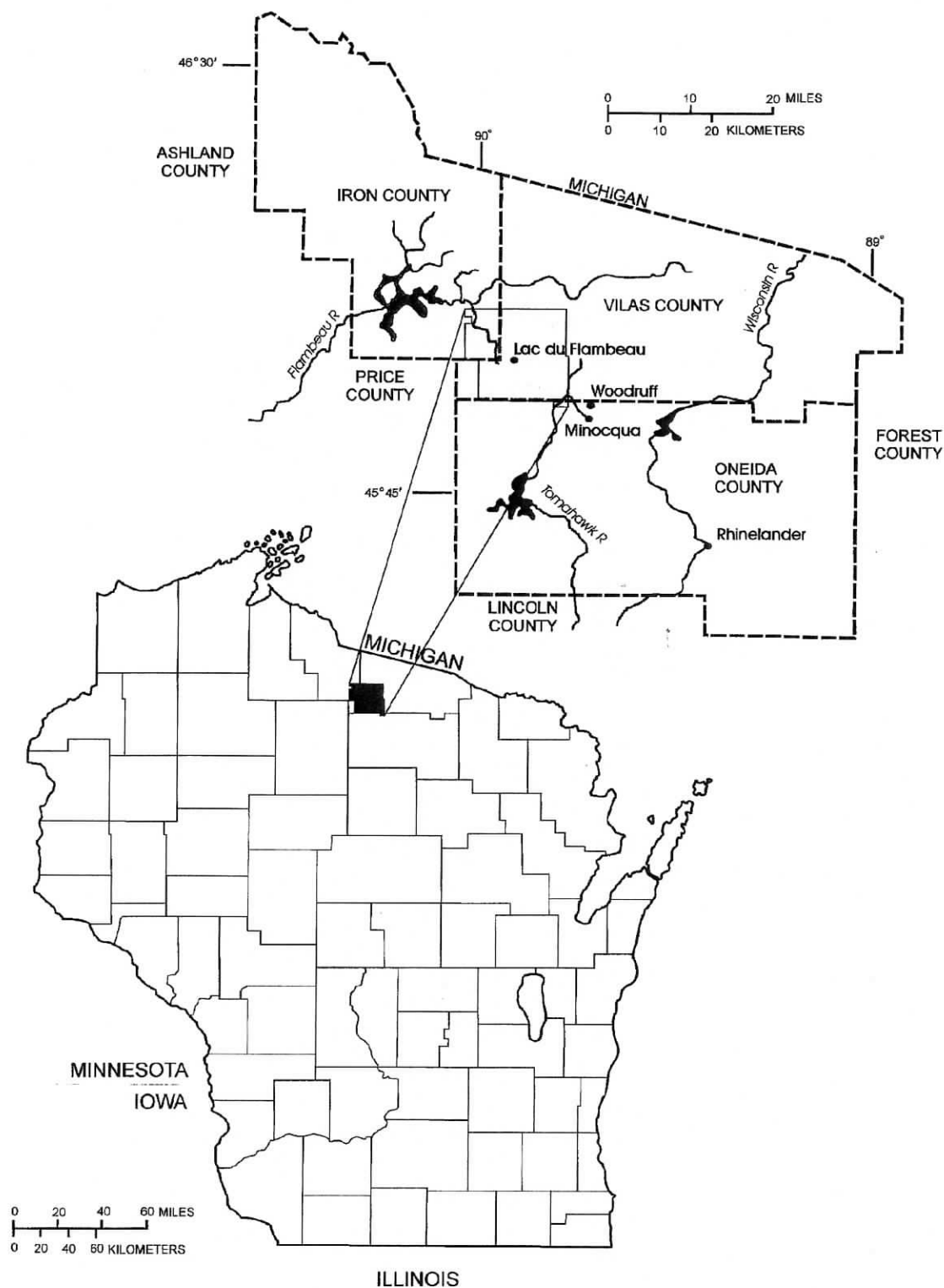


Figure 1. Location of the Lac du Flambeau Reservation within the State of Wisconsin (based on map by Batten and Lidwin 1996).

region of Wisconsin where attempting to grow crops could be difficult and unpredictable (Cleland 1983). The consumption of maple sugar and syrup in the diet of Native America has been well documented by ethnologists and ethnobotanists. A survey of the ethnobotanical literature found over 30 tribal groups in North America used the maple tree for food, beverages, medicine, and building and craft materials; 25 of these tribal groups reportedly made sugar or syrup (Thomas 1999:51-53, Appendix E).

No annual records exist for the year-to-year production levels of maple sugar and syrup within the Lac du Flambeau community although a general picture emerges from references in the Indian Agent's Annual Report to the Commissioner of Indian Affairs. In 1868, Indian Agent Asaph Whittlesey, stationed at La Pointe, reported that within the entire agency, which included the reservations at Lac du Flambeau, Bad River, Lac Courte Oreilles, Red Cliff, Fond du Lac, Grand Portage and Bois Fort, 107,270 pounds of maple sugar were made (1868:378-379). In 1874, Indians in the La Pointe agency made 405 gallons of syrup and 212,000 pounds of maple sugar, while 275 gallons of syrup and 188,000 pounds of sugar were made in 1879 (Baird 1879:163).

Writing specifically about the Lac du Flambeau community, Indian Agent Mercer reported in 1896 that "the maple-sugar industry was comparatively a failure this year, the output being only about 8,000 pounds, where with a favorable season it would have been nearer 40,000" (Mercer 1896:332). Indian agents continued to report sizable yields into the early part of the twentieth century. A figure of 200 individuals making 10,000 pounds of sugar for a value of \$1000 is given by the Indian Agent in his 1912 report (Lac du Flambeau Agency Annual Report 1906-1916, National Archives Record Group 75; 1912). Another source for sugaring statistics is the Lac du Flambeau Industrial Survey of 1922 (Bureau of Indian Affairs 1922), in which representatives of the Bureau of Indian Affairs (BIA) visited the homes of most tribal members and families. The BIA recorded information on the conditions of homes, the health of the family, and the family's subsistence pursuits and industry. The report indicated that 63 of the 132 families visited made maple sugar and syrup.

For all but one family, sugaring was described under the activities of the wife, widow, or mother. Specific references in the report to actual amounts of sugar produced by each family ranged from 350 to 50 pounds.

In nearly all nineteenth and twentieth century accounts of Native American maple sugaring, three themes are repeatedly encountered (for examples see Kegg 1991; Eastman 1971). First, making maple sugar was hard work for which there was seldom any rest. Second, the vast majority of work in the sugarbush was carried out and directed by women. Third, in spite of the great amount of work involved, the atmosphere in the sugarbush was jovial and festive. Carrying and pushing heavy sap through the melting snows of spring was back-breaking work and many long nights were spent tending the fire and boiling that day's sap before a new batch was gathered the next day. Each family had its own sugarbush or a portion of a sugarbush that they returned to each year (Densmore 1974:308; 1979:123). The female head of household was considered the proprietor of that sugarbush, the director of the sugaring activities, the owner of the storage and boiling lodges, as well as the owner of the sugaring utensils (Lookaround 1949).

## HISTORY OF RESEARCH

### The Origins Debate

Prominent in the study of Native American maple sugaring has been the debate over the origins of maple sugar, specifically whether it was made by Native Americans prior to the arrival of Europeans and European technology. Early entries in the debate supporting a pre-contact origin are found in the works of Henshaw (1890) and Chamberlain (1891). Later works by Barbeau (1946) and Nearing and Nearing (1970) further argued for a native origin for maple sugar. Suggesting that there was a lack of early written accounts, Keesing (1987:21-22) presented one of the first arguments against the Native American origin for maple sugar. Two important reviews of the early references to maple sugar and syrup were published by Schuette and Schuette (1935) and Schuette and Ihde (1946). The debate began to



heat up with Darrel D. Henning's 1965 Master's thesis, in which he argues that the idea and technology necessary to produce maple sugar was introduced to Native Americans by the French and English. James Pendergast (1982:8; 1974) brought the debate to the archaeological community in 1974 with the suggestion "that a small St. Lawrence Iroquoian archaeological site in eastern Ontario may have been a prehistoric maple sugar camp". Pendergast (1982:8; 1974) followed this suggestion with an expanded argument in favor of a pre-contact origin based on a contextual analysis of written sources and Native American oral traditions.

In an effort to suggest what archaeological evidence might be found at a prehistoric Late Woodland Native American maple sugaring site, Margaret Holman (1984) presented a predictive model based on eighteenth and nineteenth century ethnohistorical accounts. Using a series of environmental variables to statistically compare known historic sugaring sites with pre-contact Late Woodland sites that may have been sugaring sites, Holman reasoned that some of the archaeological sites were located in environmental situations that would support arguments in favor of sugaring as a possible site activity. In addition, Holman and Egan (1985) argued, on the basis of a series of replicative experiments, that it was technologically possible to make maple sugar with prehistoric technology in contrast to arguments that maple sugar could not be produced without the aid of metal kettles (Yarnell 1964:78).

In contradiction to Holman's premise that maple sugar production was a prehistoric activity and archaeologists only need to be more creative in their methods of site identification, Carol I. Mason (1985) has argued that such an activity was simply not carried out by Native Americans prior to the arrival of Europeans and their material culture. Mason argues:

It is not that the record from the sixteenth and seventeenth centuries is sparse in its mention of maple sugaring among Indians, but that maple sugaring as a process is not mentioned at all. There are simply no *unambiguous* [emphasis Mason's] descriptions of the process from the literature left by the earliest observers (1985:149).

Mason stressed a more vigorous use of ethno-historic accounts as the source of information and description in visualizing what the archaeological remains of a prehistoric sugaring camp may look like. As a result of Mason's criticisms, a series of back and forth articles were published by Mason and Holman, including comments by Munson (Holman 1986, 1993; Mason 1986, 1987, 1990a, 1990b, 1993; Munson 1989, 1993). Most recently Mason and Holman have come together to review the current state of the debate (Mason and Holman 2000).

As Mason has pointed out, the importance of this debate "is far more than a quibble over whether or not Indians 'discovered' maple sugar. Archaeologists need to know the answer to this question if they are to reconstruct patterns of adaptation to the past, especially for Late Woodland complexes in the Great Lakes region" (1986:306, 1990b).

While the issues surrounding the origins of maple sugar are part of a fascinating debate, the ultimate answer matters little to the focus of this study. However, the information it presents may aid in expanding the understanding of the material correlates of early maple sugar production. This study is specifically interested in historic Native American sugaring sites dating from the 1860s to the 1950s. As might be expected, there remains a strong relationship between sugaring sites from the 17<sup>th</sup>, 18<sup>th</sup>, and early 19<sup>th</sup> centuries and those of the reservation era.

### Previous Investigations

The archaeological remains of Native American maple sugaring have been reported from a number of sites across the western Great Lakes. In at least three cases, researchers have excavated what they argue to be the remains of a prehistoric maple sugar camp. These include the Sugarbush Site in eastern Ontario (Pendergast 1974), the McAlpin Site in Lower Michigan (Lovis 1978) and the Eagle Island Site in Lower Michigan (Holman 1984).

In contrast to the prehistoric record, historic Native American sugaring sites are better represented in the literature and site records of the

western Great Lakes. The most widely cited publication on the archaeological remains of a historic Native American sugaring camp is an article by Michael Loftus published in *The Wisconsin Archaeologist* in 1977. Loftus described the remains of an Ojibwe sugaring camp in St. Louis County, Minnesota, where he recorded the remnants of a pine log storage structure alongside related wood, birch bark and metal sugaring artifacts scattered in and around the structure. Charles E. Brown reported numerous locations of maple sugaring camps in his comprehensive notes and atlas for the state of Wisconsin; however, most of these locations have never been field verified using modern survey methods. The majority of past efforts at identification, recording and evaluation of the archaeological remains of historic Native American maple sugaring sites have occurred in the northern, forested portions of Wisconsin, Michigan, and Minnesota. As a result of the requirements of federal and state historic preservation statutes and regulations, the most direct efforts at sugarbush identification and field verification have occurred on federal and tribal lands.

Nearly 200 historic sugaring sites have been reported from the western Great Lakes, approximately 100 of which have been field verified (Thomas 1999:17-26). To date, archaeological investigations of Native American maple sugaring sites have largely been limited to the recording of surface artifacts and features. The few notable exceptions include the excavation of a stone and earth boiling arch at 47Ir-27 in Iron County, Wisconsin (Murray 1991:219-232), and limited test excavations, shovel testing, and metal detecting at three sites (FS 09-10-05-358, 09-10-04-020, 09-07-06-017) on the Hiawatha and Ottawa National Forests in the Upper Peninsula of Michigan (Dunham and Brantsner 1995; Dunham, Hambacher, and Brantsner 1994; Troy Ferone, personal communication 2000). Reservation era sugaring sites have been recorded from a number of Indian communities including the Forest County Potawatomi (Berg 1996, 2000), the Mole Lake Ojibwe (Salzer and Birmingham 1978), the Lac Vieux Desert Ojibwe (Martin 1992), the Lac Courte Oreilles Ojibwe (Cassell and Woolley 1997; Will Gilmore, personal communication 2000), the Mille Lacs Ojibwe (Mather 1999), the White Earth Ojibwe (Thomas and Mather 2000), and the Leech Lake Ojibwe

(David Kluth, personal communication 1998; William Yourd, personal communication 1998).

#### MAPLE SUGARING SITES ON THE LAC DU FLAMBEAU RESERVATION

Prior to the establishment of the Lac du Flambeau Reservation, each of the many smaller Ojibwe communities that combined to form the Lac du Flambeau Band operated sugarbushes near their villages throughout northern Wisconsin. In the vicinity of Lac du Flambeau, sugarbushes are reported in the 1864 and 1865 Government Land Office notes and maps for locations southwest of Pike Lake and along the west side of Squirrel Lake. Mercer Lake, near the present town of Mercer, northwest of the reservation, was once the home of the Turtle Portage Band that later became a part of the Lac du Flambeau Ojibwe. Mercer Lake is reported to have been previously named Sugar Camp Lake. In addition, the Springstead area, north of the reservation, is reported to have been the location of late 19th century Lac du Flambeau sugarbushes (Goc 1989; Techtmann 1993), and the town and lake of Sugar Camp in Oneida County were named for a past Ojibwe maple sugar camp in the area (Bokern 1987).

In contrast to these locations, the 1864 and 1865 Government Land Office surveyors did not note any sugarbushes within the future boundary of the Lac du Flambeau reservation. It may be that the areas that are sugarbushes on the reservation today were not heavily exploited in the pre-reservation era. Rather, prior to reservation settlement, sugaring likely took place in more opportune locations that were closer to pre-reservation villages, in better stands of sugar maple where competition was minimal. With the establishment of the reservation and steadily growing population of non-Indian landowners surrounding the reservation, it became more and more difficult to make maple sugar at the traditional locations. As a result, a large number of sugarbushes were established in two general areas of the reservation. The greatest density of sugaring camps is in the north central portion of the reservation around the Upper, Middle, and Lower Sugarbush Lakes. This area is essentially one continuous sugarbush, being divided only by natural breaks in the landscape such as

wetlands and lakes. The other primary sugaring district is located in the east central portion of the reservation between Fence Lake and White Sand Lake. In addition to these two clusters of sugar camps, there are a number of scattered camps in the more remote northwestern quarter and the west central region of the reservation.

Contrary to many site locational models for both post-contact and pre-contact archaeological sites in the region, the proximity to water has not proven to be a controlling factor in the placement of a sugarbush. In fact, water transport is virtually impossible during the period that sugaring generally takes place, with the ice on the rivers and lakes breaking up during the spring thaw. As might be expected, the dominant variable is the presence of a substantial stand of maple trees at the time of occupation that were of an age and density that would make tapping and sap gathering practical and efficient. An additionally important factor, particularly in twentieth century sites, is the nearness to a terrestrial transportation feature. Every single sugarbush site at Lac du Flambeau is either adjacent to or dissected by a gravel or paved road, forest two-track, or old railroad grade. In some cases it is possible that the locations of the sugarbushes were the reasons that roads were initially built into these areas. Others appear to have taken advantage of the nearby transportation network.

Twenty-one sugarbush sites have been reported within the boundary of the Lac du Flambeau Reservation. Four additional sites have been recorded or noted on nearby lands within two miles of the reservation. Located on Tribal, allotted, state, and fee lands, these sites range in size from three acres up to 25 acres. The extent of the artifact scatter and exploited maple trees varies between sugarbushes. In some cases, the only indicators of maple sugaring were the remaining stand of basally scarred trees. In other cases, the surface of the sugarbush was littered with sap collection containers and contained multiple boiling camps. While the artifacts and features recorded in the sugarbushes at Lac du Flambeau are relics and are no longer in use, many of the actual sugarbushes or stands of maples continue to be tapped each spring to make maple syrup and sugar.

## MATERIAL REMAINS

The most basic and relevant source of information in assembling a profile of the material remains and landscape features of reservation era maple sugaring has been the archaeological record. Additional sources include ethnographic and historic accounts (Densmore 1974, 1979; Hilger 1992) and oral histories (Kegg 1991, Roufs n.d.), historic photograph analysis, museum collections, and historic literature including catalogs and industry publications (see Cook 1887; Fox and Hubbard 1905; Vidler 1979).

### Tree Tapping

Moving the maple sap from the tree to a collection container requires the use of a tap or spile. The earliest method of tapping maple trees was to use an axe to cut a "V-shaped" gash low on the tree, with an additional cut below the V. The sap flowed freely from the V-shaped gash onto a tap that was inserted into the lower cut. The tap was a long (ca. 15 to 30 cm), thin and narrow piece of wood such as cedar that directed the sap away from the cut in the tree and into the collection container below on the ground (See Figure 2). Although it is not common for wood artifacts to be preserved in archaeological sites in the Great Lakes region, taps of this sort have been reported from sites by Loftus (1977) and Wheeler (1985) in Minnesota. A cache of over 15 cedar long taps was recorded on the Lac du Flambeau Reservation at site LDF-089 (Thomas 1999) (note: the Lac du Flambeau Tribal Historic Preservation Office, which has assumed the duties of the SHPO within the reservation boundary, has chosen to use its own site numbering system beginning with LDF, followed by a three digit number). Long slat taps and the axe slash method were used in conjunction with both birch bark and metal sap collection containers. Following the technological changes in the commercial sugaring industry, Native American sugar makers shifted to a round or tubular tap that was inserted into a hole (ca. 3 to 4" in diameter) drilled into the bark of the maple rather than through an axe cut. These taps were initially carved from wood such as sumac with an easily removed pith. The wood tubular taps were replaced by commercially produced and home made metal taps that were inserted into drill holes and designed with hooks to hang the sap collection





Figure 2. Historic photograph of tapping and collecting maple sap in the Mille Lacs Indian community in Minnesota ca. 1925. (MHS Cat. E97.32M/r22).

container right on the tap, off the ground. Some commercial tap-can combinations also came with lids to cover the tap and collection can. Manufactured metal taps were recorded at a number of mid to late 20<sup>th</sup> century Lac du Flambeau sugaring sites, having been stored as a group in a metal can, pail, or the remains of a barrel. In some instances, metal taps were left in the tree, and the bark has since grown around them.

### Sap Collection

Without question the most common artifact in the Lac du Flambeau sugarbush sites was the sap collection container. Not surprising, some sugarbushes had taps on hundreds of trees, requiring a very large supply of containers to collect the sap. The earliest sap collection containers were made from a single folded sheet of birch bark with a single stitch of basswood fiber at either end (see Figure 2). Such containers were the dominant mode of sap collection in the eighteenth, nineteenth, and early twentieth centuries. It is this item that is most readily associated with Native

American maple sugaring in the Great Lakes region. Commonly, these birch bark containers were made in a variety of sizes that made it easy to store them in nested stacks. Birch bark containers of this sort were recorded from the remains of two storage structures at Lac du Flambeau. One structure (Figure 3) contained over 200 such containers. Metal collection containers began to replace birch bark collection containers at Lac du Flambeau in the 1880s. Construction of the railroad in 1889 and the commencement of logging on the reservation led to the introduction of canned foods and the resulting empty canisters. Re-used, machine-made metal food cans were initially used in the same way as birch bark or wood trough containers, being placed on the ground at the base of the tree to catch the sap as it dripped off the end of a long wooden tap. Metal canisters that were re-used for sap collection nearly always had the top cleanly cut off (see Figure 4). Frequently the bottom of the can was bulged or ballooned out. Because these early examples were placed on the ground at the base of the tree, these cans had no hanging holes punched



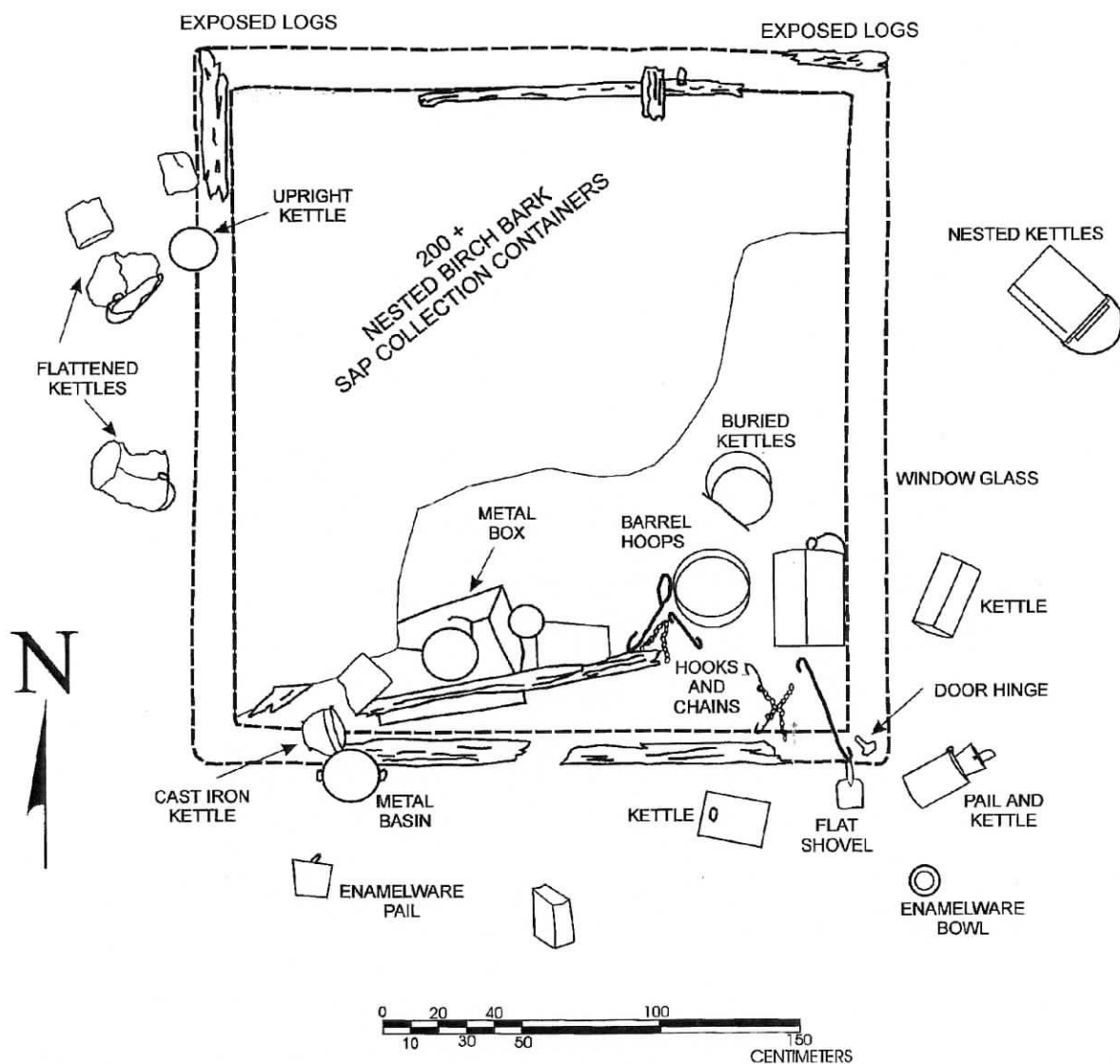


Figure 3. Plan view of the remains of storage structure in sugarbush at LDF-081.

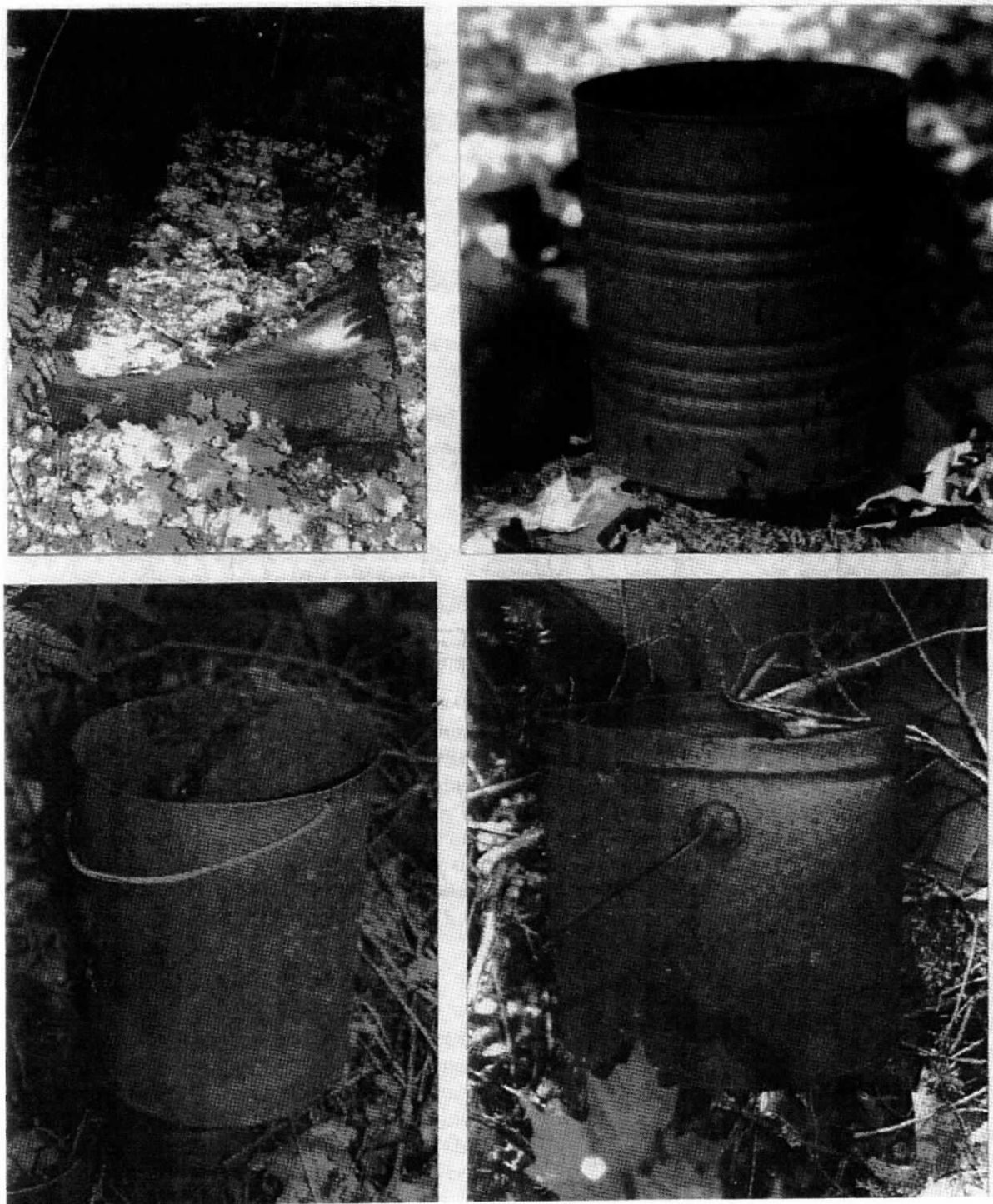


Figure 4. Maple sugaring artifacts: upper left, flat pan at LDF-055; upper right, roll-form can at LDF-085; lower left, sanitary can with added bail at LDF-095; lower right, external friction seal can at LDF-095. (Photographs courtesy of Lac du Flambeau Tribal Historic Preservation Office).

near the rim. Later in time, as commercial metal taps and wooden taps with wire hooks came into use, the re-used metal cans exhibit a hanging hole just below the upper rim (see Figure 4). These holes appear as round holes, made with a nail or punch, a triangle, made with a church-key can opener, or a slash, made with a knife. Some cans also have an attached bail from which the can was suspended from the tap.

The earliest metal cans available on the reservation were the hole in the cap cans, which were manufactured between the 1820s and 1930s but were generally not used after the early 1900s (Rock 1980, 1984). Hole in the cap cans found in sugaring sites had smooth sides and were almost always of the Number 10 size and had the bottom (opposite the hole in the cap) cleanly cut off. Hole in the cap cans were almost always set on the ground at the base of the tree with only a couple of examples observed with hanging holes.

First introduced around 1900, the sanitary can followed the hole in the cap can (see Figure 4) (Rock 1998:17-18). Sanitary cans had smooth sides with double seam sides and double seam ends (Rock 1984). However, early forms of sanitary cans had stamped ends. In the Lac du Flambeau sugarbush sites, sanitary cans were usually of the No. 10 size, and could be found with or without hanging holes. Occasionally a sanitary can has a small wire loop or bail attached at the rim for hanging.

Similar to the sanitary can, roll form cans (see Figure 4), introduced in the 1920s, exhibit a series of concentric rings around the body, as opposed to the smooth sided sanitary can (Rock 1998:26). Many of the No. 10 size, two-quart, five-pound type roll form cans observed at Lac du Flambeau sugarbush sites were originally packed with coffee or food service/institutional food items.

A number of additional metal canisters were reused for sap collection such as multiple internal friction seal cans, commonly known as paint-style cans, which came with a ready made handle. According to Rock (1998:15) these cans were first available after 1906. Another form was the external friction seal can (see Figure 4), best known as lard or peanut butter cans. These cans also came with a ready made handle or bail and lids that fit

tightly over the mouth of the can. External friction seal cans were first manufactured in the 1870s but were commonly used between the 1890s and 1930s (Pulati 1973:114-120). In addition to these re-used food cans, other re-used metal containers have been recorded in the sugaring sites. Most notable among these are tall, cylindrical, square, or rectangular containers that originally contained antifreeze or motor oil. These containers appear to date to the more recent era of sugaring activities and always exhibited hanging holes at the rims. Such antifreeze cans have also been observed at other Native American sugaring sites in Minnesota (Yourd personal communication 1998) and Wisconsin (Berg 1996). In some instances, commercially manufactured pails and sap buckets were identified in the sugarbush sites (see Figure 5). These ranged from small galvanized .5 gallon pails with handles to two-gallon commercial sap collection buckets with open mouths, tapering bodies, and a pre-cut hanging hole. Containers of this sort were generally not found in large numbers at most Lac du Flambeau sugaring sites; however, one exception was at LDF-084, where nearly 100 nested pails were found in the abandoned storage area. Many of the sites at Lac du Flambeau were initially recognized by the presence of metal sap collection cans left at the base of trees, cached in groups in the sugarbush, or in large groups in the remains of the storage structure (Figure 6).

### Sap Gathering

Transport of sap through the sugarbush to the boiling or storage areas required larger containers. Large reinforced birch bark containers used in earlier times were replaced by large metal pails and re-used metal canisters. Often the re-used items were large rectangular box-like canisters with the top removed and a wire handle or bail attached. Moving the sap through the sugarbush was made easier with the use of wooden shoulder yokes and sleds. The remains of handmade metal sleds were recorded at three Lac du Flambeau sugarbushes (Thomas 1999).

### Sap Storage

After gathering the sap, it was often necessary to store it since during the day the trees generally produced sap quicker than the sap could be boiled



Figure 5. Maple sugaring artifacts: upper left, cedar taps in pail at LDF-089; upper right, nested pails and re-cycled cylindrical container at LDF-084; lower left, in situ barrel hoops and staves at LDF-089; lower right, nested kettles at LDF-081 (photographs courtesy of Lac du Flambeau Tribal Historic Preservation Office).





Figure 6. Photograph of typical scatter of maple sap collection cans within central camp area at LDF-091.

into syrup or sugar. Early accounts report that sap was stored in large elm or birch bark containers or hollowed out wooden logs. At Lac du Flambeau, wooden barrels were the preferred method of sap storage. Barrels have likely been available at Lac du Flambeau since 1863, when the first blacksmith was stationed there. It has not been verified, but it is presumed that Mr. Bradford, the first smith, was a skilled cooper as well (Webb 1863). With the arrival of the railroad in the late 1880s, followed by logging, wagon, and carriage roads, barrels would have been regularly brought into Lac du Flambeau. Barrel hoops were ubiquitous at Lac du Flambeau sugaring sites, and at two sites (LDF-095 and LDF-089) the remains of barrels were recorded with the staves still held in place within the barrel hoops (see Figure 6). In other sites, the hoops were tightly nested, falling into place on top of one another as the wood staves weathered away. Eyewitness accounts, oral histories, and historic photographs all indicate that the primary function of these barrels was to store sap. When the camp was closed up at the end of the season and items

were stored for the year, many of the more delicate and valuable items, such as taps, wood spoons, sugaring troughs, molds, and chains and hooks, were packed in the barrels. Other examples of sap storage containers included galvanized washtubs, and metal garbage cans with lids.

### Sap Boiling

Early forms of sap boiling are thought to be boiling in birch bark, earthenware ceramic containers, or wooden troughs with the addition of heated stones. Other accounts report using similar containers directly over an open flame. During the reservation era, sap boiling was carried out in metal containers. To drive off the water and concentrate the sap, two methods were employed: open air boiling and contained fire boiling. Open air boiling includes situations where a fire was built in a fire pit or ring open to the wind and elements, and the metal kettles were either set on the open fire or suspended over the fire (Figure 7). The most common boiling method at Lac du Flambeau sugaring sites was the open air process with

metal kettles hung over the fire. Suspended kettles was hung on long hooks or chains from a wooden superstructure of upright poles that supported one or more cross poles. A variety of hooks and chains were recorded at Lac du Flambeau sites, ranging from forged chains and hooks to long hooks made with thick metal wire or rods or .5 inch thick wire cable with a loop at one end and a hook at the other. The fallen remains of such a log superstructure were also recorded at another Lac du Flambeau sugarbush (LDF-099). At the center of the collapsed superstructure was an ash concentration from the boiling fire. The hooks and chains recorded at Lac du Flambeau sites are identical to those shown in Figures 7 and 8. Hung from the hooks and chains was a variety of large, open mouthed, heavy metal containers or kettles, generally having a strong, thick handle or bail. The kettles encountered at Lac du Flambeau included

a cauldron with a round bottom and a three legged cast iron kettle. The most common kettle at the Lac du Flambeau sites was a large flat-bottomed, straight-sided cylindrical container with a heavy metal handle and rolled-out rim (see Figure 6). Kettles varied in size and were often found nested inside one another. In terms of volume, these ranged from pots that would hold two to three gallons up to kettles that would hold 25 to 30 gallons. Although not encountered at any of the sites, families reportedly continue to use large (ca. 5 gallon), brass "treaty kettles", kept in the family since they were provided as annuity goods in the middle and late 1800s.

Contained fire boiling occurs when the fire is built in an arch, a structure similar to a fire box in which the fire is walled in by earth and rock, or brick, or is built into a trench, with the sap boiling



Figure 7. Historic photograph of open air boiling method with multiple kettles and wooden frame from the White Earth Reservation in Minnesota, ca. 1920. (MHS Cat. E97.32M/r28).



Figure 8. Historic photograph of open air boiling method in the Mille Lacs Indian community in Minnesota ca. 1930. Monroe Killy, photographer (MHS Cat. E97.32M/r25).

containers placed on top. Boiling arches mark a shift away from the open air, suspension system to the use of a large, shallow metal flat pan (see Figures 4 and 9). Arches more effectively controlled the fire and kept the wind, rain, and snow out. Arches are commonly found in the form of two parallel low walls or in a single "U-shape", or "double-U" form. Arches have also been found excavated into the ground, lined with rocks or metal sheeting. The shift to flat pans marks a technological evolution associated with a shift away from the manufacture of maple sugar to the making of maple syrup. Flat pans were first patented in the 1850s but did not come into regular use in non-Indian sugarbushes until the 1880s when they were mass produced and marketed by a number of sugaring equipment suppliers in the northeast (Lawrence and Martin 1993). Flat pans began to replace kettles in some Ojibwe sugarbushes in the

mid-twentieth century. At Lac du Flambeau, flat pans were not common, being recorded at only one sugarbush site (LDF-055)(see Figure 6). However, evidence for the use of flat pans can be inferred from sites that exhibit a boiling arch and lack evidence of any other boiling arrangement such as hooks, chains, kettles, or a hanging superstructure.

Commonly associated with the boiling process were metal shovels. Both flat tipped and pointed tipped metal shovel heads were recorded at many of the Lac du Flambeau sugarbush sites. Shovels were used to remove ash and charcoal from the fire pit or arch as well as to move snow or earth. Likewise, axe heads were occasionally observed in the sugarbush sites and were likely used not only to make gashes for tapping trees but also, with saw





Figure 9. Photograph of the use of a flat pan and boiling arch at Escanaba family sugarbush near Partridge Lake, in Vilas County, Wisconsin, ca. 1955 (photograph courtesy of George W. Brown, Jr. Ojibwe Museum and Cultural Center).

blades, to cut up the many cords of firewood needed to boil hundreds of gallons of sap.

In general, evidence of open air boiling and arch boiling were not found together in the same sugarbush; however, at one site (LDF-089), a number of hooks were recorded as well as an excellent example of a stone and earth boiling arch. This may represent different occupations of the same sugar camp, or it might represent a two stage boiling process in which the majority of the boiling was carried out on the platform of the arch but finished in the open-air process.

### **Making Syrup and Sugar**

The process of making maple syrup entails the continued boiling of the maple sap until a specific consistency, color, sugar content, temperature or taste is achieved. On average it takes 40 gallons of raw maple sap to make one gallon of syrup. Maple syrup was stored in recycled glass or metal containers. The most common syrup storage container

found at Lac du Flambeau sugaring sites was the clear glass Ball Mason jar. Fragments of such jars were recorded, as well as caches of six to eight intact jars. Also common and believed to have been used to store finished syrup were one-half and one gallon clear glass jugs with loop handles at their necks. Occasionally, fragments of ceramic jugs were also recorded.

Historically it was maple sugar instead of maple syrup that was the primary product made from maple sap. The boiling process could be continued to a stage where the syrup thickened to a waxy consistency similar to thick molasses. On average it takes eight gallons of finished syrup to make one pound of sugar. Sugar was often packed into wood or metal molds or birch bark cones to form sugar cakes. No sugar molds were recorded in Lac du Flambeau sites. To make granulated sugar, the thick liquid was poured into a wooden sugaring trough and continuously worked with a hand carved wooden sugaring spoon as it cooled and sugar



crystals formed. No sugaring troughs or sugaring spoons were recorded in the Lac du Flambeau sugaring sites; however, such items have been recovered from sugaring sites in Minnesota (Wheeler 1985; Loftus 1977). Granulated sugar was packed in a variety of storage containers ranging from large birch bark mukuks to miniature decorated mukuks and glass jars or metal tins and canisters.

As a liquid, maple syrup was difficult to store and did not preserve well through the year without airtight containers or refrigeration. For the seasonally mobile families, prior to the forced sedentism of the reservation era, it was not practical to transport heavy and bulky maple syrup. Maple sugar, on the other hand, was very portable and easy to store and cache. With settlement on the reservation and the resulting barriers to the seasonal round, a shift slowly began to occur in which more and more maple syrup was made at the expense of maple sugar. The Lac du Flambeau Ojibwe continued to make maple sugar into the 1930s and 1940s, but the added incentive of selling syrup to the growing numbers of townspeople and tourists in nearby Minocqua, Woodruff, Manitowish, and Mercer likely led to further reductions in the production of sugar.

## LANDSCAPE FEATURES

Common to many Lac du Flambeau sugarbush sites are a series of features, many of which are unique to the maple sugaring process. The landscape of sugaring is in itself a unique artifact that combines the natural features of a specialized and managed stand of trees, used over decades if not centuries, with the cultural remains of the many years of tapping, boiling, and sugar making.

### Basally Scarred Trees

The landscape of maple sugaring within which the above described material remains are found is comprised of a series of distinct features and less conventional artifacts. The most notable among these are the trees. The sugarbush itself, the stand of maple trees (*Acer saccharum*, *A. nigrum*, *A. saccharinum*, *A. rubrum*), is the most significant feature in a number of sugaring sites. The sugarbush is commonly the defining characteristic

of a sugarbush site, and in many cases define the actual boundary. Functioning as an artifact modified by the human hand, sugaring trees frequently exhibit evidence of tapping, including basal scarring (see Figure 10). Other signs of tapping include axe slashes, grown over metal taps still embedded in the bark, grown over drilled tap holes, and tapping scars observed in the cross-section of the stump of a cut maple. Basal scarring results from the repeated tapping of a tree with the axe slash method described above. This repeated trauma to the inner bark of the tree results in a significant growth of scar tissue around the base of the tree where taps have been placed year after year. Often times this scarring can nearly double the diameter of the base of the tree in comparison to the unaffected diameter at breast height (see Figure 10).

### Trails/Roads

All of the reservation era Lac du Flambeau sugarbushes were located along or adjacent to a land based transportation feature such as a paved or gravel road, two-track woods road, or old railroad grade.

### Central Camp

Most sugaring sites at Lac du Flambeau exhibited the remains of one or, in the case of very large sugarbushes, two or three central camp areas. These areas contain the greatest artifact density including such items as kettles, hooks, chains, shovels sap collection containers, and flat pans as well as the remains of storage structures and boiling features (for example see Figures 7 and 9). Also present in some central camp areas were a number of domestic and food related items such as small food cans, stove parts, and enamelware bowls and basins. As the name suggests, central camps were the area of greatest activity in the sugarbush and were usually centrally located and often adjacent to or near a road or trail.

### Cache Area

Small groups of sap collection containers were sometimes stored or cached out in the sugarbush close to the trees that were to be tapped. These groups of containers may have been stacked out in the open or placed under a small shelter of birch bark, tarpaper or plastic.



Figure 10. Photographs of basally scarred trees at LDF-091. Note the individual in photograph on right for scale (photograph courtesy of Lac du Flambeau Tribal Historic Preservation Office).

### Storage Structures

Within the central camp area at many sugarbush sites are the remains of a small square log building that was used to store the sugaring equipment in the off season until the next spring run of sap (Figure 11). During the sugaring season, these structures could serve as a shelter for those working in the sugarbush. Based on informant reports and the remains of these structures at Lac du Flambeau, these structures were constructed of small (ca. 4-5 inch in diameter) cedar logs with a front gabled roof of sawn planks and had an earth floor. A small entryway was found on one wall, and some structures contained one or two small glass windows. The most intact remains of such a structure were recorded at LDF-083 (Figure 12) where some of the walls of the structure are still standing. Former Lac du Flambeau sugar maker Gregg Guthrie recalls that this structure was totally

intact in the 1950s when he sugared at this site as a high school student. According to Mr. Guthrie, the structure was identical in appearance to the maple sugar storage structure in Figure 11, photographed at the Red Lake Reservation in 1946. These structures were generally about 15 feet (5 meters) square and stood 5 to 7 feet (1.75 to 2.25 meters) tall at the peak of the roof. The remains of other structures encountered in the Lac du Flambeau sugarbush sites include small domed or peaked sapling framed structures covered with birch bark or tar paper. The collapsed remains of one such small storage building at LDF-089 was covered with birch bark and contained numerous birch bark sap collection containers, a large metal kettle with a riveted patch, metal pails, and a pail full of cedar flat taps (see Figure 5). The remains of this feature were not dismantled in the course of these investigations (Thomas 1999), but it is believed that in its intact form, this feature resembled the

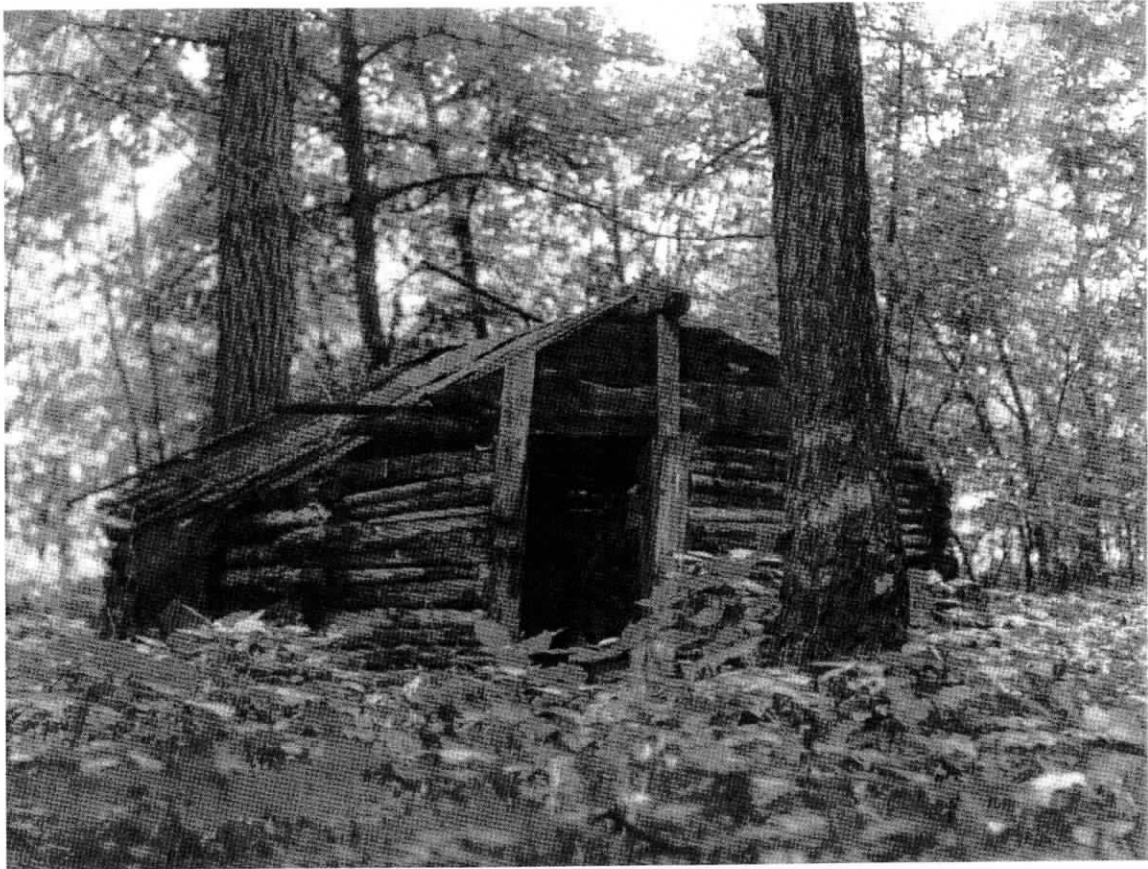


Figure 11. Historic photograph of standing log storage structure in a sugarbush on the Red Lake Reservation in Minnesota, 1946. Monroe Killy, photographer (MHS Cat. E97.32M/p17).

maple sugaring storage structure illustrated by Densmore (1974, plates 31 & 32). Other structures included the collapsed remains of a tarpaper covered wigwam complete with metal stove pipe (LDF-083).

### Boiling Features

The remains of open-air hearths over which kettles were hung from a boiling frame have been recorded as ash and charcoal rich surface features with little or no vegetation. Additional remains of open air boiling included pieces of a wooden support frame (for examples see Figures 7 and 8), postholes, support stones from the frame, and large pieces of sheet metal used to deflect wind from the fire.

The boiling arch is the feature most closely associated with the contained fire boiling method

(see Figure 9). As previously described, arches may take a variety of forms, but each contains at least two parallel walls either built up or dug out of the earth, within which the boiling fire was maintained and on top of which the boiling containers or flat pan full of sap were placed. Many arches were built of rock and earth and closed at one end forming a U-shape, or in the case of a double arch, it formed a double-U shape. Others were simply two parallel walls of rock and earth. Occasionally, the arch was constructed from brick and mortar or cinderblock with more angular and well-defined walls.

### DISCUSSION

Reservation era maple sugaring camps are among the youngest of archaeological sites in the Great Lakes region and appear to have very shal-

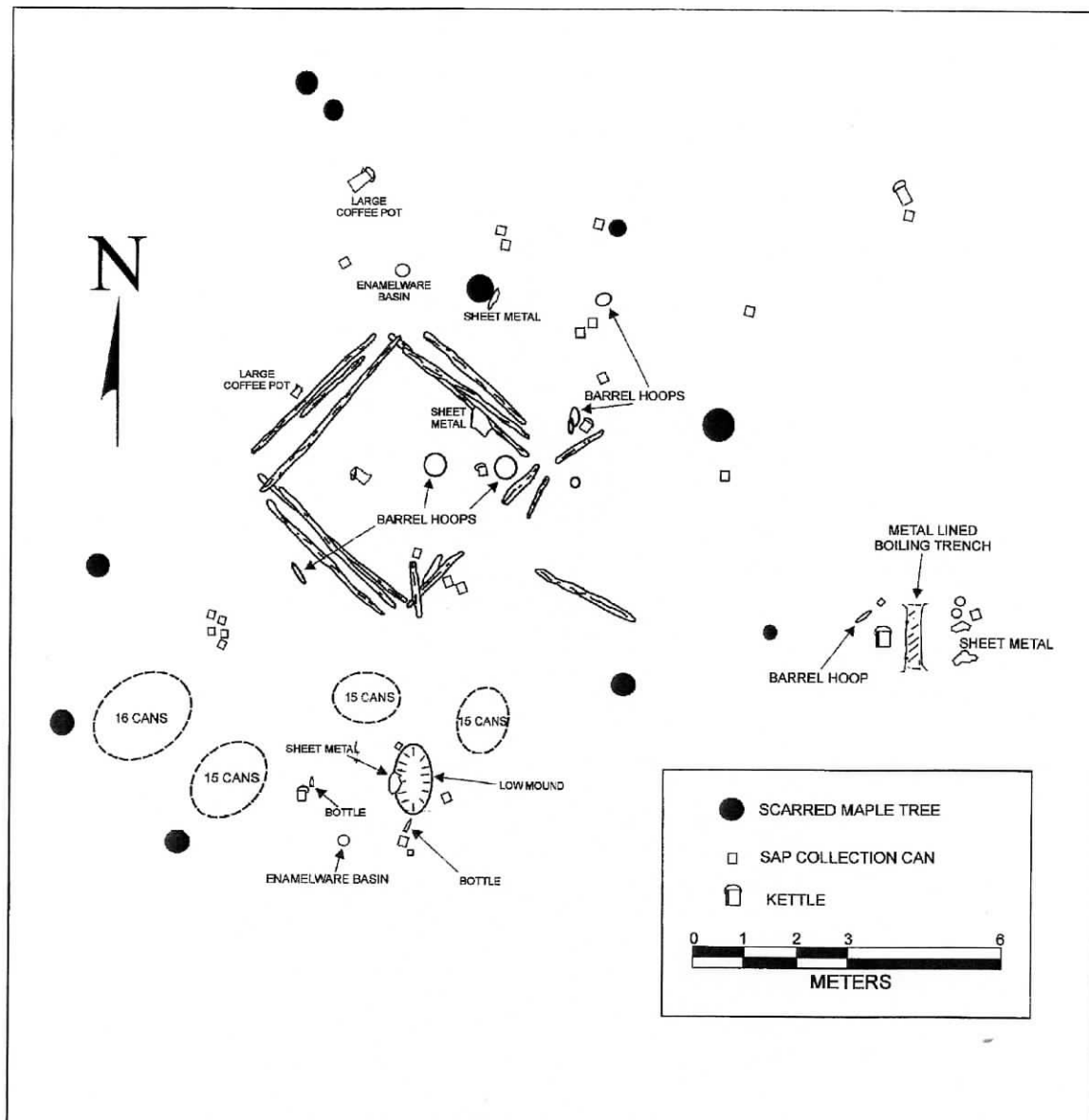


Figure 12. Plan view of the remains of storage structure, associated artifacts, and surface features in central camp area of LDF-083.



low subsoil deposits. Furthermore, for the two to four weeks in the spring when these sites were occupied, the ground was usually frozen and often snow covered, lending itself to the surficial deposition of artifacts. The sites noted in this article were all recorded from intensive surface surveys. The younger age of many of these sites and the occurrence of excellent surface visibility within the sugarbush has resulted in a focus on site survey and mapping investigations at the expense of test excavations. Subsurface testing may be conducted at some sites in the future; however, it is more likely that the next phase of archaeological investigation will include the dismantling of the above ground, collapsed remains of storage structures.

One of the most important features in the sugarbush camps was the storage structure. Similar to the storage structure illustrated in Figure 11. Today, it is the remains of these structures that contain the greatest number and variety of sugaring related artifacts. Like the structure reported by Loftus (1977) and those recorded at LDF-081 and LDF-083, these were the most permanent structures in the sugarbush, with each family's collection of sugaring equipment stored unmolested until spring. Storage structures such as these were important claim markers for that portion of the sugarbush. Upon abandonment, many of these log structures have nearly vanished due to the effects of the harsh weather of the north woods, yet their birch bark and metal contents largely remain where they were left, marking the outline and entryway to these buildings.

In a technological sense, late 19<sup>th</sup> and early 20<sup>th</sup> century Native American maple sugaring followed the changes in the non-Indian sugaring industry with a fifty-year time lag. Analysis of the archaeological remains from sites at Lac du Flambeau, alongside oral histories and historic photographs from other Great Lakes Ojibwe communities, suggests that Native American sugar makers gradually replaced "traditional" materials and techniques as advances in non-Indian sugaring technology became more widely known and worthy substitutes became more available. The use of the term "traditional" here refers to the general methods and tools of sugarmaking prior to reservation era, i.e. slashing the tree, use of hand-made wood and bark taps and collection containers, and the boiling

of the sap over an open fire, with the final product sugar granulated in a wood trough with a wood spoon or formed into cakes in a mold. In the late 19<sup>th</sup> and early 20<sup>th</sup> century the "traditional" methods largely remained the same, but the materials changed as western items were recycled and introduced to the sugarbush. It could be argued that what is viewed as "traditional" was of Native American invention (discounting metal kettles) and Native American manufacture and adaptation. The basic process of sugaring changed little, and the "traditional" acts of frugality, adaptability, and conservatism were practiced in using items that were easy to obtain, easy to modify, and did not change the general purpose or process of sugaring. The material remains of sugaring evolved from an assemblage dominated by wood and bark materials to one consisting of almost entirely metal. In this process, the re-used metal container takes on a meaning far beyond that historically attributed to such an ordinary item.

Within the Lac du Flambeau community, maple sugaring in the reservation era can be divided into three periods. Beginning with the re-settlement to the reservation in the 1860s, the period of 1860 – 1890 is marked by little overall change in the practice, product, and technology of sugaring. Maple sap was gathered from slashes in trees with wood slat taps and birch bark collection containers. Sap was boiled in kettles suspended over open-air fires. Nearly all of the product was maple sugar, and most of the sugar was for local consumption. Birch bark and wooden artifacts dominated the material assemblage with limited metal items in the forms of kettles, knives, axes, and other small or portable tools.

The period of 1890 – 1920 was marked by major changes in the material culture of the sugarbush as well as shifts in the technology and product of sugaring. With the growing settlement of non-Indians on and around the reservation and the increased presence of the Federal Government on the reservation, commercially produced metal cans, wooden barrels, hooks, chains, and various metal items prime for reuse were adapted for use in the sugarbush. At this time the non-Indian market for Lac du Flambeau maple sugar was at its peak in the fast growing communities of northern Wisconsin. However, this was not to last as the increas-

ingly available refined cane and beet sugar replaced maple sugar as the table sugar of choice. This trend was part of a national shift away from maple sugar. As a result, commercial maple sugar makers focused production on maple syrup. By the end of this period this shift to maple syrup was beginning in the Ojibwe sugarbush; however maple sugar never totally disappeared. Boiling was still carried out primarily in kettles, and sap was collected by tree slashes with collection containers resting on the ground. However, re-used metal cans began to replace the birch bark containers during this period.

The period of 1920 – 1950 saw the near disappearance of the use of birch bark sap collection containers and slash style taps in favor of metal cans and pails and commercially produced and hand made metal taps. Boiling was still carried out using the open-air method; however, the use of boiling arches and flat pans began. Maple syrup eventually became the primary end product. Sugar makers began driving to their sugar camps as the road network across the reservation and particularly into the bush was dramatically expanded.

In a cultural sense, the meaning of Native American maple sugaring followed a very different path from that of its non-Indian counterpart. While technological changes were being made in the Indian sugarbush, the reasons for and the product of Indian sugaring did not immediately change. However, other changes occurred in the sugarbush with the changing face of the reservation. For example, extensive construction of roads and highways through the reservation in the 1930s and 1940s facilitated changes in the access and material culture of the sugarbush. It became easier to come and go to the sugarbush with the use of wagons and later, automobiles. Likewise, it became easier to transport heavier and bulkier metal artifacts to and from the sugarbush, eliminating the need to camp in the sugarbush. Transfer of knowledge through storytelling and by children working and learning alongside adults diminished as less time was spent in the camps. Overall, the number of Native American sugarmakers and active sugarbushes has declined as well. Alongside such changes in access were changes in the gender roles of sugaring. Long an activity dominated by women,

men were becoming increasingly key figures in the sugarbush in the period spanning 1920 - 1950. Such changes were not unique to sugaring. Roles commonly defined by gender and age class in the Native American community were repeatedly being redefined with adjustments to the demands and restrictions of reservation life. How these changing roles are reflected in the archaeological record, in particular the sugarbush, is an important question for future research.

The history of archaeological investigations of maple sugaring, particularly Native American maple sugaring, is limited in comparison to the investigations of many other historical activities carried out in the Great Lakes region. Intensive archaeological investigations of historic Native American sites and communities are even less common. With the greater involvement of Native American communities in historic preservation in Wisconsin, Minnesota, and Michigan, more studies of this nature will be undertaken. The cultural significance of maple sugaring within Ojibwe communities throughout the western Great Lakes cannot be overstated.

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#### ENDNOTES

<sup>1</sup> The term Ojibwe used here is the preferred spelling of the Lac du Flambeau Tribal Historic Preservation Office and the George W. Brown Museum and Cultural Center of the Lac du Flambeau Tribe. The name Ojibwe is synonymous with such other names and spellings as Chippewa, Ojibwa, and Ojibway found throughout the western Great Lakes.

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