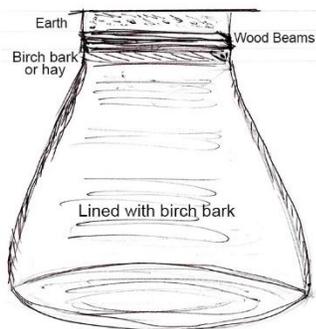


This story has its beginning on a spring day in the early 2000's when Kathryn Parker, an archaeologist and Burt Lake resident, happened to be out picking mushrooms on the University of Michigan property near the Biological Station. In the past, she had noticed periodic depressions in the soil, which she had attributed to earth damage caused by the roots of falling trees or to other natural causes. On this occasion, however, she noticed for the first time that these circular depressions seemed to be organized in cluster formations rather than the random configurations more likely to be present in the case of natural occurrences. The clustered appearance, in turn, suggested that they were actually man-made storage pits of the type that had been constructed by early Native American people elsewhere in the Great Lakes region. That supposition proved to be correct.

Subsequent archaeological exploration of University of Michigan property on Douglas and Burt Lakes as well as the area around the Gorge [also known locally as Big Springs or Sandy Springs], yielded evidence of widespread cache pit construction. Robert Vande Kopple, UMBS resident biologist, and a team of archaeologists and students located nearly 70 clusters of cache pits containing over a thousand individual cache pits. At that point, the questions became: 1) who built them; 2) when were they built; and 3) what did they contain? Later archaeological excavations provided some of the answers.

One major project, an archaeology field school led by Dr. Meghan Howey, focused on a lower shoreline terrace on Grapevine Point, which seemed a likely site for human habitation. Various test holes were dug according to an established grid of the area. They disclosed two separate residential sites. The first site, on the southern end of this lower terrace, produced evidence of a seasonal fishing camp that had been periodically revisited rather than being an established residential community. Radiocarbon testing indicated that that camp had been constructed and utilized between roughly 650 AD and 780 AD. The second site, farther to the north, was dated to a more recent time in the Late Woodland period, with probable dates of habitation between 1310 and 1430 AD. Included in the findings was evidence of a large residential structure with multiple hearths that had probably housed an extended family over a considerable period of time.



Also excavated were three of the nearby cache pits, which were believed to be associated with the large residence. Like most of the cache pits identified, these pits were empty. All that remained for the most part were the visible striations or layers in the excavated pit walls that hinted at the types of materials that had been stored there in the past. These pits varied in size from between roughly 5 feet to a bit more than 7 feet in diameter and demonstrated depths ranging from over 3 feet up to nearly 6 feet. Typically, such pits were probably lined with readily available material such as birch bark. Contained within might be food stuffs such as local plants and tubers, acorns, berries, possibly some corn, dried fish, and the dried

flesh of animals such as bears, deer, turtles, beaver, and the like. These foods would most likely have been placed in storage containers consisting of clay pottery; baskets made of reeds or thin water-softened wood strips; or boxes made of birch bark. Pouches might also have been used. Once filled, the storage pits would then be covered with a layer of protective material such as birch bark or wood and topped with the local sandy soil. Because of the excellent drainage available at these sites, which were located well above the water table, the food stored within the pits would be safe from pooling water and its attendant rot.

Last summer, I had found a strangely shaped stone object that appeared to be a tool of some sort, which was on the shoreline of the island near my dock. Efforts to identify the object led to contact with Kathryn Parker, who had made the initial discovery of the cache pits on Grapevine Point and who, along with Dr. Howey, had written about the excavation of the several locations on the Grapevine Point. She, in turn, introduced me to Robert Vande Kopple, the UMBS resident biologist, who had likewise been involved in these projects. After discovering that there was at least one cache pit located on Pells Island in an area owned by the University of Michigan, I had asked if the team would be interested in exploring some of the largely undeveloped, privately owned land in other locations on the island. When the island residents were approached, most agreed to invite Bob Vande Kopple and Kathryn Parker to walk their properties to identify any topographical evidence of cache pits. When those areas yielded evidence of five new sites, whose locations were plotted via GPS on a research map showing all the identified cache pit sites, the idea of exploring other locations on or near the Douglas Lake shoreline came to the fore. In time, when approached, all of the landholders on Bentley Point and those occupying land along the French/Young shoreline agreed, as did almost all of the shoreline residents in Manitou Shores. It was the intention that these three new locations would be explored during the fall of 2015 and that any newly-discovered cache pit areas would be charted on that map, as well.

Although a walking search of these three unexplored areas was originally planned, newer technology in the form of Lidar was utilized instead. Lidar projects laser lights towards specific target areas (in this case, the ground), digitally recording the information that bounces back from the land's surface. The beauty of this technology in archaeological settings is that scientists can manipulate the data received to eliminate above-ground objects such as overhanging tree branches or thick vegetation that might interfere, leaving a clearer picture of the underlying contours or patterns in the surface soil. In that way, the circular depressions typical of the cache pits could be more easily observed.

In this instance, the Lidar scanner was attached to an airplane that overflew a roughly rectangular area bounded by Levering Road and Brutus Road on the north and south and by I-75 and U.S. 31 on the east and west. The resultant data was forwarded to Dr. Meghan Howey, a former staff archaeologist at the Biological Station, who had worked on the earlier exploration of several cache pits and had participated in the search for dwelling sites, two of which were ultimately found on Grapevine Point at that time. One of her current colleagues, Franklin Sullivan, was able to manipulate the raw data in an attempt to isolate additional promising cache pit sites. Dr. Sullivan was able to identify eight groups of pits in upland regions further away from the shoreline in areas not expected to yield such findings. Included among them were two groupings on the north shore of Douglas Lake, located on either side of Dotski Road, an area that had never before been explored. When Bob Vande Kopple and Katie Parker personally walked these suggested sites, they found that each of them did contain multiple cache pits, just as the Lidar analysis had indicated. A similar result obtained with regard to the other six upland sites, where visual inspection revealed evidence of new groupings near West Burt Lake Road in an area between Burt and Douglas Lakes. One of the larger groupings contained roughly 50 cache pits.

However, two other suggested sites, each of which was located in a lowland swampy area, failed to produce any evidence of these pits, possibly because of the nature of the land's surface, which made it vulnerable to the impact of natural forces, such as wind.

In the hope of finding more sites along the northern shore of Douglas Lake, Bob Vande Kopple will be requesting additional Lidar information that might pinpoint other promising areas, which he then plans to personally explore in the future. In the meantime, he has created GPS maps of known sites in the surrounding areas of Douglas Lake and Burt Lake. These sites are pictured on each map as green circles.

As can be noted, most of the areas of cache pit creation identified thus far are concentrated in the area between the two lakes, many of which can be found around the Gorge and on the southern shore of Douglas Lake. The larger circles on these maps designate those clusters containing a greater number of pits, whereas the smaller circles, such as those located on Pell's Island, contain a fewer number of them. After the proposed additional exploration, an updated map will be created.

Several of the scientists mentioned earlier in this article, to include Meghan Howey, Franklin Sullivan, and Robert Vande Kopple, along with a few others, have collaborated on a case study published on September 1, 2016, outlining the recent Lidar investigation of the shorelines and upland areas around Douglas and Burt Lakes. That study can be found at <http://dx.doi.org/10.1371/journal.pone.0162062>.

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Cache pits on Pell's Island

