

DRESDEN FALLS ARCHAIC SITE (Site 25.45):

2018 TESTING OF GPR RESULTS

End of Fieldwork and Initial Laboratory Work Report-revised May 11, 2019

**Arthur Spiess, Leith Smith and John Mosher
Maine Historic Preservation Commission**



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SUMMARY

A former potato field that had seen significant surface collection, the 14 acre Dresden Falls Archaic site (Figure 1) is a large Archaic habitation and workshop site with components dating between 9000 and about 4500 years ago. The site is now owned by The Archaeological Conservancy (TAC) and managed as their Dresden Preserve. Limited testing (less the 0.05% of site area) at the time of acquisition, conducted by the Maine Historic Preservation Commission (MHPC) and Friends of Merrymeeting Bay (FOMB), encountered sub-plowzone features of modest size (garbage pits, fire hearth bases, possible post holes). Previous testing had also encountered architectural and domestic artifacts from a localized historic Colonial occupation on the site that is apparently shown as buildings on a circa-1772 in-shore British navigation chart. (The Colonial material overlays a corner of the Archaic site, with stone tool debris and Colonial artifacts present in the same testpits.)

Attempting to increase the area coverage and our potential understanding of the site substantially, geoarchaeologists with the University of Maine had completed two areas of **ground-penetrating radar (GPR)** survey in 2017, funded by FOMB. The GPR survey focused on 200 square meters in the area of the suspected Colonial structure and 1000 square meters in the densest portion of the Archaic occupation. Interpretation of the GPR data by U. Maine had indicated the probable presence of shallow, sub-plowzone features in both areas. Computer processing indicated rectangular or straight-line features in the area of the Colonial occupation (*upper terrace*), and several substantial (3 or 4 m diameter) round features in the dense Archaic occupation (*lower terrace*). We hoped these Archaic features would be compacted round structure floors of some kind, and the rectangular feature in the area of Colonial occupation might be a structure (house or farm outbuilding).

With a great deal of volunteer labor help from Friends of Merrymeeting Bay and Maine Archaeological Society volunteers, ground-truth testing of the GPR results was accomplished in October 2018, with instructive but disappointing results. On the **upper terrace**, the GPR-interpreted rectilinear features in the Colonial occupation area turned out to be linear, 19th/20th century plow scars. On the **lower terrace**, excavation of an 6 x 2 m block intersecting half of one of the large, GPR- interpreted round features in the dense Archaic occupation area encountered what we designated as 14 smaller sub-plowzone features, including sheet midden and localized small pits. These smaller features can not be reconciled with the 3-4 m round GPR “features.”

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Although the failure to confirm the GPR-features was disappointing, the 2018 excavation and follow-up laboratory work greatly will advance our understanding of the site. On the **upper terrace**, testing with conventional 1 x 1 m hand-dug test units along the tree line about 30 m away from the GPR area located Colonial structural remains, including possibly post-in-ground construction, a stone fireplace pavement, and architectural artifact fragments appropriate to the Revolutionary War period and earlier (designated new historic site ME 129-017). Thus, we have located and confirmed the presence of one of the structures shown on the circa 1772 navigation chart, and may learn enough to say something about its initial date and method of construction (in the early to mid-1700s). Stone tool manufacture debris, providing evidence of Native American occupation, was present in many of the upper terrace testpits as well.



Figure 1. Looking west, aerial view of the Dresden Falls Archaic site under excavation, October 10, 2018. Point of View Helicopter Services.

On the lower terrace, screening of the plowzone recovered a large sample of fragmentary stone artifacts, including many pieces (of river cobbles?) that will inform us about stone tool material procurement and stone tool production. The 14 features that were identified below the plowzone yielded charcoal, calcined food bone remains, and stone artifact fragments. We transported 30 or more gallons of Archaic feature fill to the MHPC lab for fine mesh floatation processing, which is ongoing. Preliminary results include 10,000s of bone fragments, mostly fish bone. In addition, feature form and content (boiling stones?) will help us understand some of the activities that took place on the site.

It appears that GPR is quite sensitive to sub-plowzone features at this site, including easily “picking up” the plowzone base represented by the deeper remnant plow scars (about 25 to 30 cm deep). We will use our excavation data to work with the GPR team to fine-tune their interpretation of features in fine, silty/sandy soils with shallow (< 1 m) archaeological features such as occur on this site. In the meantime laboratory work will add substantially to our knowledge of the Archaic occupation, and we have located a new Colonial domestic/farm site that was apparently occupied at the time of the American Revolution, but beginning in the mid- to late 1700s (18th century), and continuing to the early or mid-1800s (19th century).

PROJECT FUNDING AND GOALS

The Dresden Falls Archaic site is owned by The Archaeological Conservancy (TAC), and managed as the Dresden Preserve. TAC is a nationwide land trust, owning and protecting more than 600 archaeological sites. TAC is based in Albuquerque, NM, with an eastern regional office in Frederick, MD. Biological and natural values of the property are further protected by conservation easements held by Friends of Merrymeeting Bay, and archaeological values are protected under Maine law by preservation agreements held by The Maine Historic Preservation Commission. TAC allows archaeological research that will contribute to understanding and managing their archaeological properties, based on peer review and their approval of a specific research proposal for each case. Appendix A of this document is the research narrative of the proposal to TAC that was approved (email, Andy Stout to Spiess) on August 30, 2018.

The project was funded jointly by Friends of Merrymeeting Bay (with a grant from the Merrymeeting Bay Trust), and funds provided by the Historic Preservation Fund through the Maine Historic Preservation Commission.

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Based on the 2017 GPR work and further analysis of the artifacts uncovered during preliminary site testing fieldwork in 2008 and 2010, at least two additional areas of potential significance of the site were identified (see Appendix A for details). The goals of this 2018 GPR testing project were to 1) confirm the previously suspected but unconfirmed presence of the archaeological remains of a structure present in the early 1770s and 2) investigate the possibility of preserved Archaic house/structure floors, buried below the modern plowzone, on the lower terrace in the area of intense Archaic occupation and explore Archaic domestic structure content and organization. Both (1) and (2) had been strongly indicated by the GPR 2017 interpretation results.

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The project funded one week of archaeological testing for each topic/area: (1) targeted, localized excavation to test the probability of a circa 1770s structure on the upper terrace, and (2) targeted testing of a portion of one of the large basin-shaped features in the Archaic area of the site, as well as time for relevant laboratory processing of recovered artifacts and samples, limited conservation (historic iron), charcoal identification, faunal analysis, lithic identification, and radiocarbon dating (for the Archaic occupation).

Even though the GPR results were NOT confirmed, the 2018 testing provided evidence that contributes directly to the understanding of site significance. Subsequent to determination that the upper terrace GPR indication of an historic structure was false, a well-designed archaeological testing strategy did locate archaeological remains of a mid-18th century Euroamerican settler's domestic structure. On the lower terrace, the GPR indication of a possible large, basin-shaped Archaic house floor was falsified by archaeological testing. Encountering 14 smaller features in an 8 square meter excavation area, and subsequent analysis of the material from the plowzone and from the features, will clarify and improve understanding of the Archaic occupation.

All of this information will support a National Register nomination for the site to be prepared in the near future. Had Nomination of the site proceeded without testing the GPR results, substantial mis-information would have been included.



GROUND PENETRATING RADAR (GPR) AND PROJECT BACKGROUND

Prior to the 2018 fieldwork, archaeological testing on the site had been supplemented by two rounds of ground penetrating radar survey (GPR), in 2013 and 2017 (Heller and Kelley 2013; Heller et al. 2018). (The 2013 work also included magnetometer survey.) The 2018 archaeological testing reported herein was expressly designed to test the 2017 GPR findings. A summary of those findings, and the proposed testing strategy for 2018, are contained in Appendix A (Dresden Falls Archaic Site Additional Significance Testing Proposal, June 2018). We do not repeat that information here. This section contains more background on GPR in general and its recent application in Maine archaeology. Appendix B contains the survey measurements and geometry involved with matching the 2018 test excavation areas with the 2017 GPR grid.

For the record, professional archaeologists had through 2017 excavated about 25 square meters and examined about another dozen square meters of area along the walls of a powerline trench, approximating 40 square meters of underground testing (Spiess 2010, 2012). This is on a site that covers more than 12 acres; so about 0.05% of the site area have been tested by subsurface archaeological excavation. Discussions among Ed Friedman of Friends of Merrymeeting Bay, Maine Historic Preservation Commission staff, and The Archaeological Conservancy had concluded that the next step before further excavation should be ground-penetrating radar, or some other type of remote sensing, to get a better idea of what might be present in the site.

In May, 2013, Andy Heller and Alice Kelley completed a GPR and magnetometer survey of a 10 x 20 block near the garage, in an area of known dense Archaic archaeological remains. We had laid out the GPR blocks to include the power line trench and the area where Spiess had recorded two pit features in the trench wall, one with a 6000 B.P. radiocarbon date. This was a “test of concept” job to see if the GPR could “see” these features. In fact, the GPR did seem to “pick up” the trench wall and the pit features, and some other pit features as well (Heller and Kelley 2013). At least the linear powerline trench wall and pits features could be seen visually on the GPR graphic at the grid locations where we knew them to be.

Friends of Merrymeeting Bay hired Alice Kelley, Andy Heller and Jacque Miller from U. Maine to come back in 2017 and do GPR work over much larger areas, including one area northwest of the garage that incorporated two 2008 MHPC testpits with features and Neville point base. the second area was on the upper portion of the site to incorporate the concentration of 18th century historic artifacts and possible foundation rock. The purpose was specifically to provide information that would then be tested by subsurface archaeological excavation.

In the last two years Spiess has been working closely with Alice Kelley and Jacque Miller on a project using GPR on coastal shell midden archaeological sites (Miller 2018). The purpose was

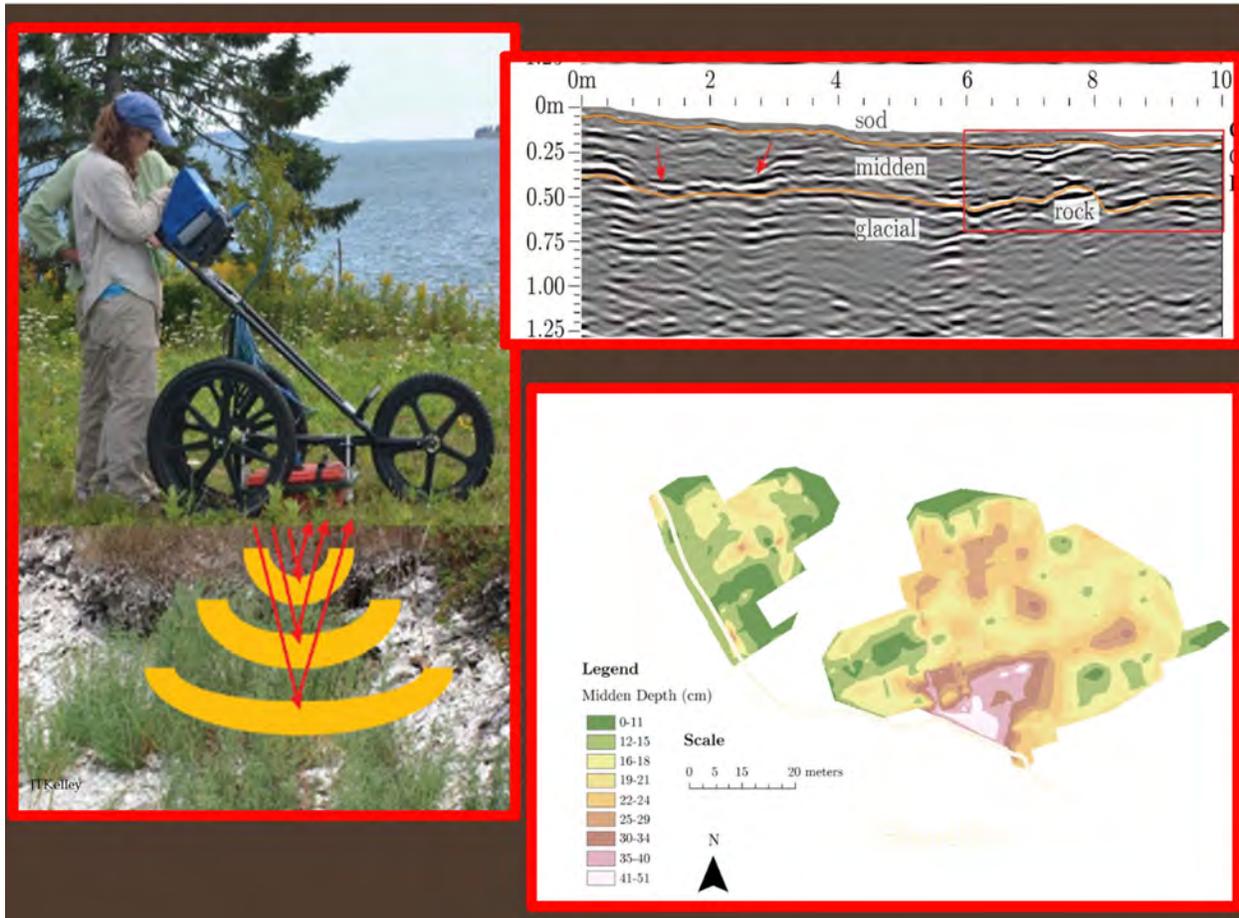


Figure 2. Application of GPR to Maine coastal shell middens. From Miller 2018.

to see if GPR could efficiently and accurately map the depth and complexity of shell middens ranging from about 50 cm thick to 2 m thick (Figure 2). This was not the first time GPR has been used on a shell midden in Maine, but the first time that it was purposefully used to provide useful management information such as a contour map of depth and complexity (Figure 2, lower right). In all cases the GPR incorporated previously dug archaeological test areas, so the known archaeological stratigraphy could be compared with the GPR results. GPR was successful at determining the depth of shell middens and providing a cost effective site-wide map of shell midden depth.

Ground penetrating radar does in fact “see” below the ground surface, but with lots of “ifs and buts.” Radar waves, which are electro-magnetic, are transmitted into the ground more or less down and at slight angles. The GPR unit is a plastic box with electronics, transmitter and receiver, powered by a battery. The radar waves pass through most material in the ground and return or bounce off of differences in density or really noticeable differences in materials. And they will light



Figure 3. Andy Heller, Alice Kelley, Jacque Miller running GPR unit over upper terrace location on the Dresden Falls Archaic site, 2017.

up the radar display if going over a piece of metal. Iron nails or spikes set at the corners of squares will show up as really bright dots on the radar plot and obscure nearby data. So one lays out a grid with plastic or wooden pegs and string. It turns out that water content in the soil is a huge factor in radar return, so two different qualities of sediment with different capacity for holding water will show up well on radar. We suspect that is why feature fill in a silty site such as Dresden Falls shows up. Rocks show up well, if they are big enough. Hence, historic building foundations show up. A dry layer of Mya shell over a dry layer of oyster shell does not show up. But a layer of Mya shell over a sub-midden wetter silty clay subsoil shows up really well.

The unit is called an “antenna.” The antenna is mounted on some sort of sled that allows the antenna to run right over the ground. The antenna has to be more or less in contact with the ground, which means that vegetation has to be low and pliant. Grass such as a mowed lawn or field works. The sled arrangement that U. Maine uses looks a bit like a baby carriage, or a high-wheeled lawnmower. GPR antennas come in several frequencies. The higher the frequency the smaller the objects that can be resolved, but the less the distance of penetration into the ground. The antenna

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used by U. Maine most commonly is we think 500 megahertz, and it seems to have a practical limit of about 2 meters and can see “rocks” and cobbles of about football size. If one wanted to do industrial archaeology looking at concrete or stone walls meters deep, a different antenna would be used. The antenna used on most archaeological sites will not resolve individual fire-cracked rocks, or spear points, or pot sherds.

GPR transmits a radar frequency radio wave into the ground. The antenna picks up signal returns and sorts them by their return time and signal strength. Resolution is increased if the interval between GPR runs is decreased. The best resolution on 1 to 2 m deep shell middens or silty archaeological sites is done at 0.5 m or 1 m intervals (Miller 2018). And the machine likes to be run in straight lines. So, running the machine resembles pushing a lawnmower back and forth. The operator has to pay attention to a screen set on the handlebars of the machine. The GPR is computerized – an integral computer does basic interpretation of the incoming data. The GPR operator has to punch in start and stop points on a run, tied to a grid, and keep an eye on the quality of the data. One can see some really obvious things on the computer screen in the field, but most of the information comes from computer processing of the data afterwards. For example, running over a bit of the Whaleback oyster shell midden on the Damariscotta, Jacque Miller remarked while looking at the screen “Wow, there’s a wall.” The GPR had run over one foundation wall of the factory building that had been used to grind up the oyster shells in the 1880s. But sites such as shell middens, or the Dresden Falls site, don’t show their details until the data are processed (Miller 2018).

The output of this process, even after initial computer processing, is a black white and gray or colored pattern (see Appendix A, Figures 4, 5, and 6). The experienced GPR data person then tunes out lots of interference, increases or decreases contrast, and can come up with two dimensional maps set for a specific depth (time slices), or 3-D images that are like contour maps with some internal detail. There is skill and artistry involved, as well as science.

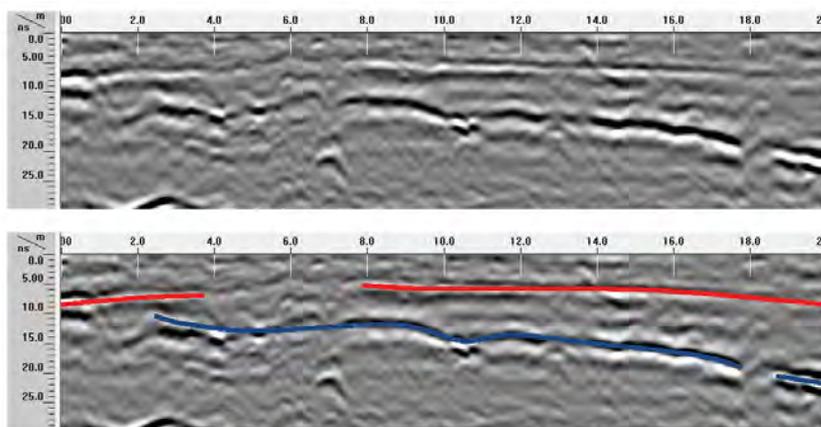


Figure 1: Stratigraphic boundaries are clearly expressed in the GPR data. The upper boundary (red line) shows the base of the plow zone. The lower boundary (blue line) indicates the upper surface of the underlying glacial till. Radargram represents data collected approximately 1m south of the north boundary of Survey Block 1 (east is to the right).

Figure 4. 2013 GPR data from the Dresden Falls site interpreted as the base of the plowzone (red) and silt/outwash interface with underlying till (blue).

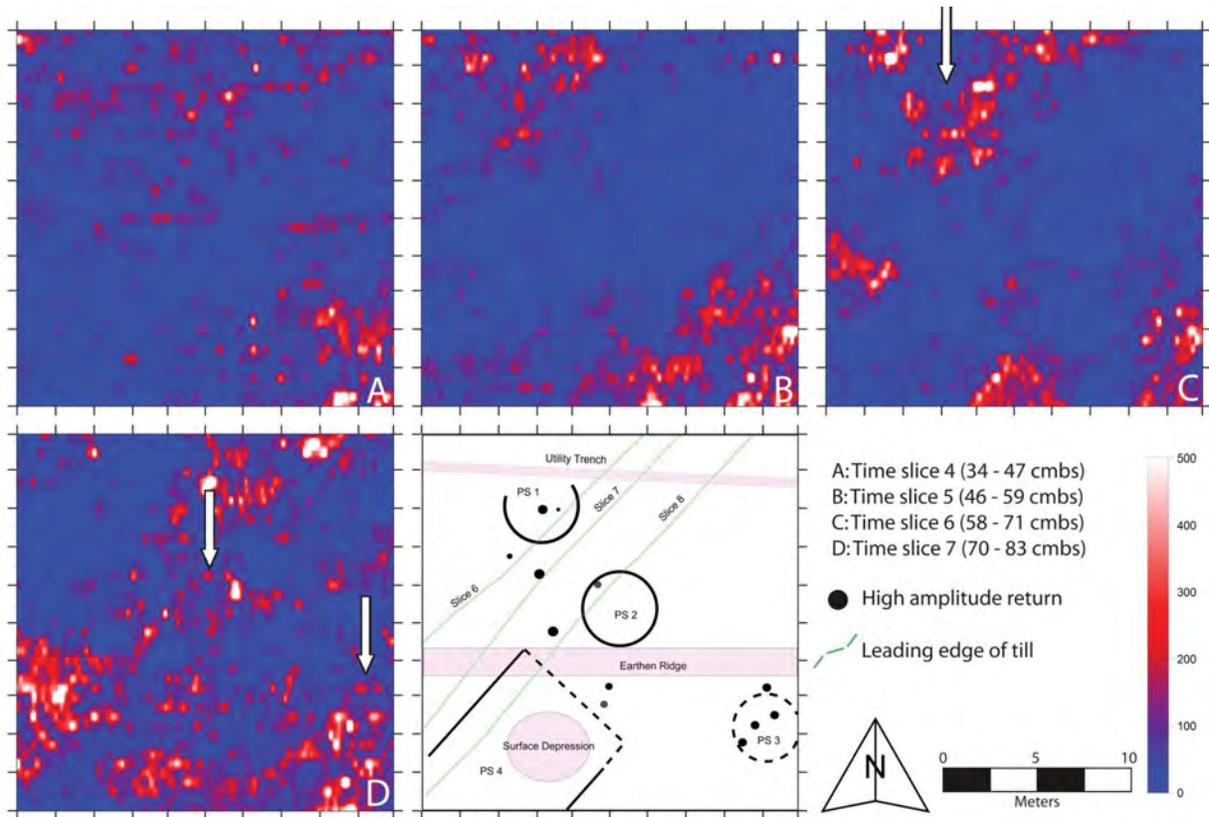


Figure 5: Processed time slices of Survey Block 1 from 34 - 83 cmbs. Note the circular anomalies evident in the upper left of time slice 6 (C) and the center and lower right of time slice 7 (D). Circular anomalies appear as broken high amplitude reflections (red and white).

Figure 5. Time slices (different depths) of 2013 GPR data interpreted as showing circular features and the linear (upper right to lower left) power line trench. (From Heller and Kelley 2013, Figure 5).

The GPR work in 2013 was successful in differentiating the plowzone from undisturbed underlying archaeological site. In addition, the vertical view picked up what may be a boundary between overlying silty matrix and underlying till or other material (Figure 4). In the area of the powerline trench and the pit features seen in the wall of the powerline trench in 2008, horizontal views of various “time slices” or depths of GPR return showed what appears to be the margin of the trench and circular features that match the location of the pits seen in the trench wall (Figure 5).

Interpretation of 2013 GPR vertical data in a couple of locations appeared to detect basin-shaped boundaries in the soil within a reasonable depth that might be archaeological. They were interpreted as possible house floors (Figure 6, next page). Similar interpretations were applied to the 2017 data (see Appendix A). After the 2018 ground truth excavation testing, we suspect that these GPR features are not archaeological, but record some sort of soil moisture variation, perhaps a boundary between better-drained sand and moisture retentive silty fine sand.

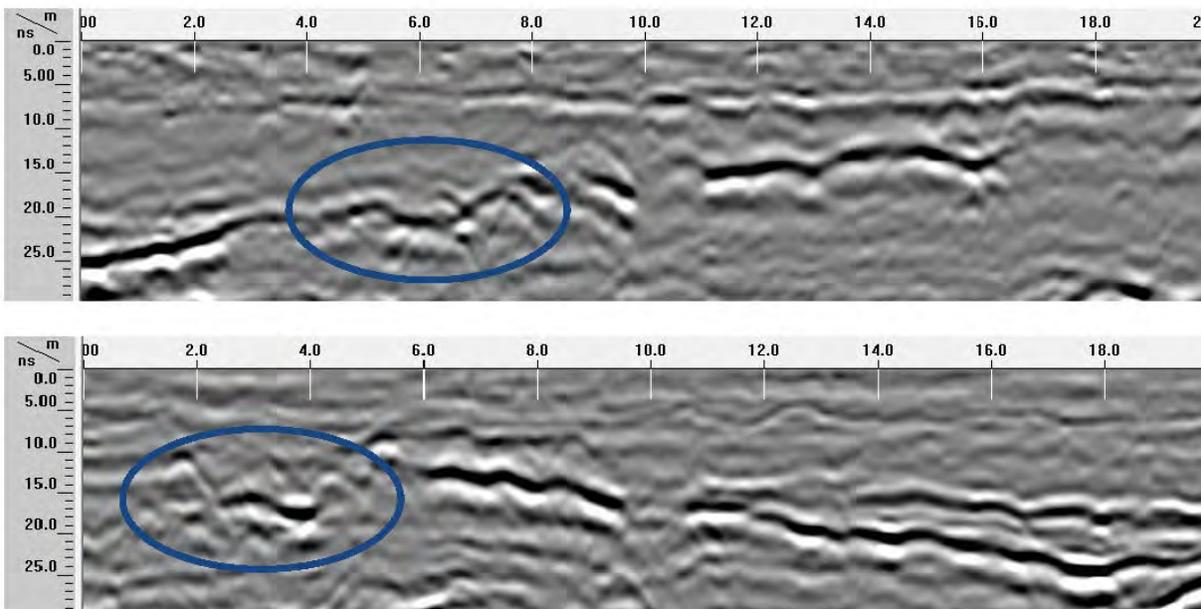


Figure 7: Anomalies appear similar in GPR data. Transect 10 (top) and Transect 123 (bottom) both exhibit an anomaly (PS1 and PS 5 respectively) interpreted as possible subterranean house floors (circled).

Figure 6. Anomalies interpreted as possible features. (Heller and Kelley 2013, Figure 7).

2018 FIELDWORK PERSONNEL, DATES, CONDITIONS, AND METHODS

Project fieldwork commenced on September 27, 2018, relocating the upper and lower terrace 2017 GPR grid points, and “laying out” archaeological excavation squares using tape and Brunton compass. The field had been recently mowed, and access to the ground surface was easy. The upper excavation area was stripped of sod on September 28th, and shovel-screening of the plowzone commenced with a volunteer crew. The first full day of excavation, October 1, involved rain and an attempt to work under tarps strung up with the help of tripods and poles. The Project fieldwork ended with a partial day on November 9, 2018 to recover bucket auger core samples from the lower terrace excavation area, followed by backfilling. Excavation was accomplished during mostly good fall weather, with minor interruptions and rescheduling for rain. Tarps over the excavation units helped minimize dealing with mud. Frost was becoming an impediment to morning work by the end of the excavation.

Dates of excavation with combined professional and volunteer crews include September 28, October 1, 3, 4, 5, 9, 10, 11, 12, and 19. Maine Historic Preservation crew included: Bill Burgess,

Megan Theriault, Eric Lahti, Rachael (Kannegaard) Newbert, John Mosher, Leith Smith and Arthur Spiess. Ed Friedman (Friends of Merrymeeting Bay chair) was present and working the vast majority of the time in the field. Tom Walling (FOMB) provided a valuable service by scheduling volunteers and keeping us informed about who would be on-site.



Figure 7. Shovelling and screening the plowzone, upper terrace.

Volunteers from FOMB and

the Maine Archaeological Society included: Doug Watts, Steve Eagles, Nate Gray, Kathy Bridge, Susan Chase, Kathy Goddu, Bob Weggler, Terri Blen Parker, Sandra Smith, Dina Blodgett, Jamie Wise, Kent Cooper, Ann Wilder, Anita Wingert, Eric Zeise, Richard Matel-Galatis, Orman Hines, John (Ned) Baxter, Jay Hasch, Bob Hasch, and Dianna Dietrich. Professional visitors included Dr. Alice Kelley, Dr. Paula Work (Maine State Museum), Dr. Arthur Anderson (University of New England) and Annie Anderson.

Excavation Methods

One meter squares were “named” or designated by the coordinates of the southwest corner of the square. Within each square four 50 x 50 cm quadrants are designated as northwest (NW), northeast (NE), southwest (SW) and southeast (SE).

Excavation began by “stripping” the sod using sharpened square shovels. The shovels were used to “cut” along grid lines, then inserted to “cut” the bottom of the sod about 2 to 3 inches below the ground surface. The base of each sod strip was inspected for adherent stone flakes, sometimes discovered if the shovel “clinked” against an object during sod removal. Sod was rolled up, usually in strips 50 cm or so wide, and restacked on a tarp off the excavation area. For the lower terrace excavation, much of the “sod” was sphagnum moss, which generally broke apart in smaller blocks. At the end of the excavation, after backfilling was complete, the sod (or sphagnum blocks) were replaced on the excavation units. Based on previous experience at this site, the sod will re-grow and provide secure ground cover in two years or so.



Figure 8. Flaked stone screened from lower terrace plowzone.

Plowzone was removed in 50 x 50 cm quadrants using sharpened, square shovels to a depth of 15 cm below surface (estimated by eye), and placed in buckets (Figure 7). Mostly this involved “shaving” the soil in one or two centimeter layers. For the most part, the silty sand soil was easy to remove and retained straight vertical walls. (Sphagnum moss “roots” or subsurface growth is particularly resistant to cutting with a shovel.) The plowzone on the site is a slightly reddish medium brown color. At between 15 and 20 cm

depth below surface, excavators took care to look for a change in soil color, either to a darker (charcoal enriched) color marking an underlying “feature” or to a lighter brown/buff sterile silty fine sand subsoil. Trowel excavation was used to approach this plowzone/feature/subsoil “interface.”

Excavated plowzone was screened through 1/4" (6 mm) mesh hardware cloth. One field provenience card was made for each quadrant for the plowzone, and all material from one quadrant was bagged in a field bag with the provenience card. (The provenience card was protected by being double-bagged between the inner bag and an outer bag, or otherwise protected from moisture.)

Calcined bone or other delicate or unusual objects were often placed in a small plastic baggie, then included in the bag with stone fragments. Charcoal from the plowzone was not saved on the screen, except as learning experience. (Usually one screener worked on one quadrant.) Volunteers did most of the screening, with help from an experienced crew member before “cleaning” the screen. Screening the plowzone recovered larger pieces of calcined bone, stone flaking debris (Figure 8), occasional fire-cracked or reddened rock, and historic artifacts (nails, glass, ceramics). Volunteers quickly learned the visual range of objects to be recovered, and “bagged” anything of possible interest for later laboratory washing and inspection. Experienced volunteers, and those volunteers who wished to do so, were encouraged to shovel the plowzone, but only experienced volunteers or professional crew handled the “interface” removal and feature fill excavation.

Provenience for material recovered from the plowzone, or objects recovered from screening excavated dirt from “outside” of designated features below the plowzone is therefore 50 x 50 cm in horizontal resolution.

Unless it was clearly sterile subsoil (which was screened through 1/4" mesh), soil from below the plowzone was screened through 1/8" mesh (3 mm) hardware cloth. Screening through 1/8" mesh was considerably slower, especially when the soil was wet. Once we reached the plowzone/subplowzone "interface" in both the upper terrace and lower terrace excavations, we appeared to be encountering darker "feature" soils commonly, or mottled soil of mixed darker and lighter soils. After excavation was substantially complete, we could see in the lower terrace excavation that the upper portion of many prehistoric features had been "smeared" or moved slightly horizontally by the deepest plow cuts. Thus, much of the "interface" between plowzone and clearly visible, differentiable features was feature material, perhaps mixed with abutting features. On the upper terrace excavation, the base of the plowzone and the "interface" quickly defined as deeper plow scars with sterile subsoil between. These plow scars were excavated by trowel and screened with 1/4 ' mesh, once we realized what they were.

On the lower terrace, and in the squares with possible prehistoric or historic features dug along the treeline, some of the fill from well-defined features was picked up by trowel and "bagged" in gallon zip-lock bags, labeled by feature number (and sometimes by sub-feature vertical or horizontal provenience). Gallon bags of feature fill, about 50 in number, were transported to the Historic Preservation Commission archaeology laboratory in Augusta where they have been processed by water flotation on 1 mm mesh. (Laboratory methods and results will be included in the final report.)



Figure 9. Feature excavation, lower terrace GPR grid. E. Lahti in yellow jacket.

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Spiess and Smith kept hand-written daily excavation notes for the lower and upper terrace work respectively. They included survey and general information, and a feature log. While working on the interface and sub-plowzone features, especially on the lower terrace, individual professional crew kept notes that focused on one square or one feature.

The excavation was documented by digital photography. Spiess and Smith kept photographic logs, and many squares and features were designated by in-photo sign boards or numbers (white plastic). Several Historic Preservation crew (Burgess, Theriault), and Ed Friedman (FOMB) took excavation photos and/or photos of crew and volunteers at work that have been added to the excavation records. In addition, Ed Friedman flew his two-seat helicopter to the site on October 10, landed on the upper terrace, and took Bill Burgess as a passenger and photographer on an aerial photography flight (see Figure 1).

At the close of excavation, the upper terrace block excavation was backfilled (and the sod put back). Individual 1x1 m squares along the upper terrace tree line were also backfilled, in a few cases with plastic lining over features. The lower terrace block excavation was back-filled with sheet plastic hanging on the west wall. Chaining pins and/or wire-flags were pushed in flush with the ground at GPR grid points B4 C4 C3 and C2. In addition, a 10" nail (spike) was pushed into the square corner at N9E10 (the SW corner of the excavation block). All other survey pins and flags were recovered and removed.

Multiple Site Grids in Use

There are now multiple site “grids” that have been used for horizontal control of GPR and archaeological “space” on the site. Vertical control has been localized “below surface,” measured from the base of grass/top of the sod along an excavation wall, and/or from the top of the sod on a designated square corner (grid point). There is no “overall” vertical site datum.

Details and inter-relationship of the various site grids with the overall site grid, and GPS satellite measurements will be provided in the final report on the 2018 work. The overall site grid is aligned to magnetic north, with an on-site datum designated N300E200, marked by rebar driven into the ground and wooden stakes, near the southern edge of the upper terrace. Various “points” on the landscape (power poles, garage corner) have been “shot in” with a laser transit relative to the overall site grid, and the datum and other points have been recorded by GPS (satellite) to an accuracy of about 1 meter.

The 2013 GPR grid was “laid out” to approximate magnetic north-south, and grid points were subsequently recorded relative to the overall site grid by laser transit. The upper and lower 2017 GPR grids were “laid out” using tapes with grid corner points at 10 m intervals designated by letter/number (e.g. D1, E1, D3). For the 2017 upper terrace GPR grid, a selection of designated

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points were measured by tape and Brunton compass relative to the (nearby) overall site grid point (at N300E200). The east-west baseline of the upper terrace GPR grid runs 298-118 mag.

A selection of designated points on the 2017 lower terrace GPR grid were measured by tape and Brunton compass from the corners of the (nearby) garage. The locations of two of the 2008 1x1 m square test units were clearly visible within the lower GPR grid as slightly sunken areas of vegetation (see Appendix A). We deliberately located the 2017 lower terrace GPR grid to incorporate these two squares, because we had encountered feature bases below the plowzone in 2008 and thus had expectations of similar preservation across the GPR grid. The lower terrace 2017 GPR grid east-west baseline runs 299 -119 mag.

In 2018, key points on the 2017 upper and lower terrace GPR grids were reconstructed using the 2017 data (see Appendix B for notes). For 2018 excavation, a local metric grid, parallel with the 2017 GPR grid, was imposed across a section of the upper and lower GPR grid respectively. GPR grid point E2 was assigned arbitrary 2018 upper terrace grid location N0E0, and N10E0 was assigned to GPR point D2, making the E0 line parallel with and overlaying the E2-D2 GPR line. We selected a 3 x 5 m area (N3E0 to N8E3) for the 2018 excavation, because it cut through the middle of the GPR-reconstructed rectangular feature.

The upper terrace 2018 excavation of N3E0 to N8E3 quickly proved that the GPR feature was related to plow scars. Then, a program of testing to find evidence of an 18th century structure was initiated by digging 1x1 m squares near the treeline. The 1x1 m square locations were recorded by extending the upper terrace 2018 excavation grid. These squares fell between N40 and N48 and between W54 and E65 on the 2018 upper terrace grid. These locations will be converted to the overall site grid for the final report.

Work on the lower terrace GPR area began by “laying out” a 3 m x 6 m area that intersected multiple “features” identified in the 2017 GPR interpretation. In particular, the west wall of our excavation block was “laid out” over the C3-A3 line of the GPR grid (parallel AND overlaying it to within 1 cm we hoped), designed to intersect 3 meter diameter GPR “Feature 1” by splitting it N-S. The 2017 GPR grid point B3 was arbitrarily assigned 2018 lower terrace excavation grid location N10E10. The 2017 GPR grid point C4 is therefore 2018 lower terrace excavation grid location N0E0. We stripped the sod off N9E10 to N15E13, and eventually excavated the 3x4 m area N9E10 to N13E12 including sub-plowzone features therein.

THE UPPER TERRACE GPR AND HISTORIC SITE SEARCH

A 2017 re-examination of the Houdlette upper field historic artifacts from 2010 had confirmed the presence of 18th-century artifacts on the upper terrace. Based on the diagnostic materials present, including domestic (bottle glass, creamware, stoneware, and pearlware) and architectural (hand-forged nails, daub, mortar, and brick) refuse, suggests this area may have been the location of some type of residence. In this section we discuss the historic background information relevant to possible eighteenth-century and later structures on the upper terrace (based on maps and deed research), and then present a narrative of the upper terrace archaeological testing. Although the GPR work was not directly relevant, we did locate archaeological structural and artifact remains that locate a mid-late eighteenth century structure.

Discussion of Map Documented Structures (MDS)

Please see Appendix A for recent site ownership and conservation acquisition information. Three historic maps are available for the site, including the 1776 Des Barres Map, the 1857 Lincoln County Map, and the 1899 Riverchart. A Map Documented Structure (MDS) includes any object referenced on a historic map or atlas, even if that structure lacks a name or reference information. The 1776 map indicates that four structures of unknown type were present near Goodwin's Point and the project area. The MDS lack additional information, such as owner information or structure type, so that there is no obvious record of the type of land use in the 18th century. The Lincoln County Map does not record any MDS on or adjacent to the site area in 1857, suggesting there was a break in land use during the early to middle 19th century. Despite the lack of MDS, the family name 'Houdlette' appears for the first time on the 1857 map, presumably for the family residence, but it was located well north of the project area.

The 1899 map shows two structures in the Houdlette portion (upper terrace) of the site. The first MDS is located adjacent to the Kennebec River and was possibly an ice house. The second MDS was located north of an historic dirt road (still partially present today as a field road), at the edge of the vegetation. The foundation of this unknown structure is still visible along the northern edge of the agricultural field. It is possible that this structure was one of the MDS present on the 1776 map and simply wasn't recorded in 1857, or it is possible that it is a later structure. Both 18th and 19th period artifacts are lightly scattered south of this MDS.

Chain of Title of the Archaeological Conservancy Property

The present Town of Dresden was originally known as Frankfurt and was the first township organized for settlement by the Proprietors of the Kennebec Purchase in 1752. Settlement was initiated by the arrival of a group of 46 French Huguenots and Germans in the fall of that year, Lots of varying sizes were laid out and awarded to the Proprietors and the new settlers with the focus of settlement being the shores of the Eastern River and the peninsula lying between the Eastern and Kennebec Rivers. What greatly encouraged settlement was construction of Fort Shirley in 1752 on the east side of the Kennebec River, just up river from Fort Richmond. Among the first settlers was Charles Estienne Houdlette, his wife Mary Cavalier. Their 5 year old son at the time, Louis Houdlette, is the father of many subsequent generations of Dresden Houdlettes. Another name that comes to be associated with the project area is Samuel Goodwin, who served as an agent in the Kennebec region for the Plymouth Company. Frankfurt became part of Pownalborough in 1760. The chain of title as presented is keyed to a reconstruction of Plymouth Company grants as presented by Allen (1931:197) (Figures 10 and 11).

July 6, 1753, 1/245

At a meeting of the Plimouth Proprietors in Boston, July 6, 1753 they granted to Amos Paris of a New Plantation called Franckfort a parcel of land containing about 40 acres lying within ye neck of land between the Kennebec River and Eastern River and consisting of 2 twenty-acre lots adjoining together at each end, one called No. 14 and the other No. 42. Also another lot 1 ¼ mile back of Eastern River called Lot 6 containing 60 acres. The lots are drawn on a plan by Captain John North, June 1753.

April 8, 1760, 2/28 (Plymouth Grants)

Kennebec Proprietors conveyed to Amos Paris of Pownalborough a lot containing about 30 acres lying upon the Kennebec River. Lot is bounded by the Kennebec River on the west, a road 8 poles wide on the east, a road 8 poles wide on the north and Lot 11 on the south. The lot is 128 poles long west to east and 40 poles north to south. The lot was granted in consideration of Paris having built a house not less than 18 ft square and he declared fit for tillage 5 acres on the premises, and in consideration also that he or some person for him shall work upon the ministerial lot, 2 days yearly for 10 years. May 8, 1760. The lot is noted to be on the plan of the Plantation of Frankfurt now Powanaborough, by Jonas Jones, Dec. 20, 1759.

1757

Amos Paris paid to William Bowdoin £4.15.6 to pay off a mortgage debt (Allen 1931:208).

December 23, 1761, 1/249

Amos Paris and his wife Margaret Paris conveyed for L99 to Abiel Lovejoy a lot containing approximately 70 acres measuring 296 poles west to east and 40 poles north to south. It is bounded by the Kennebec River on the west and consists of Lots 10, 14 and 42.

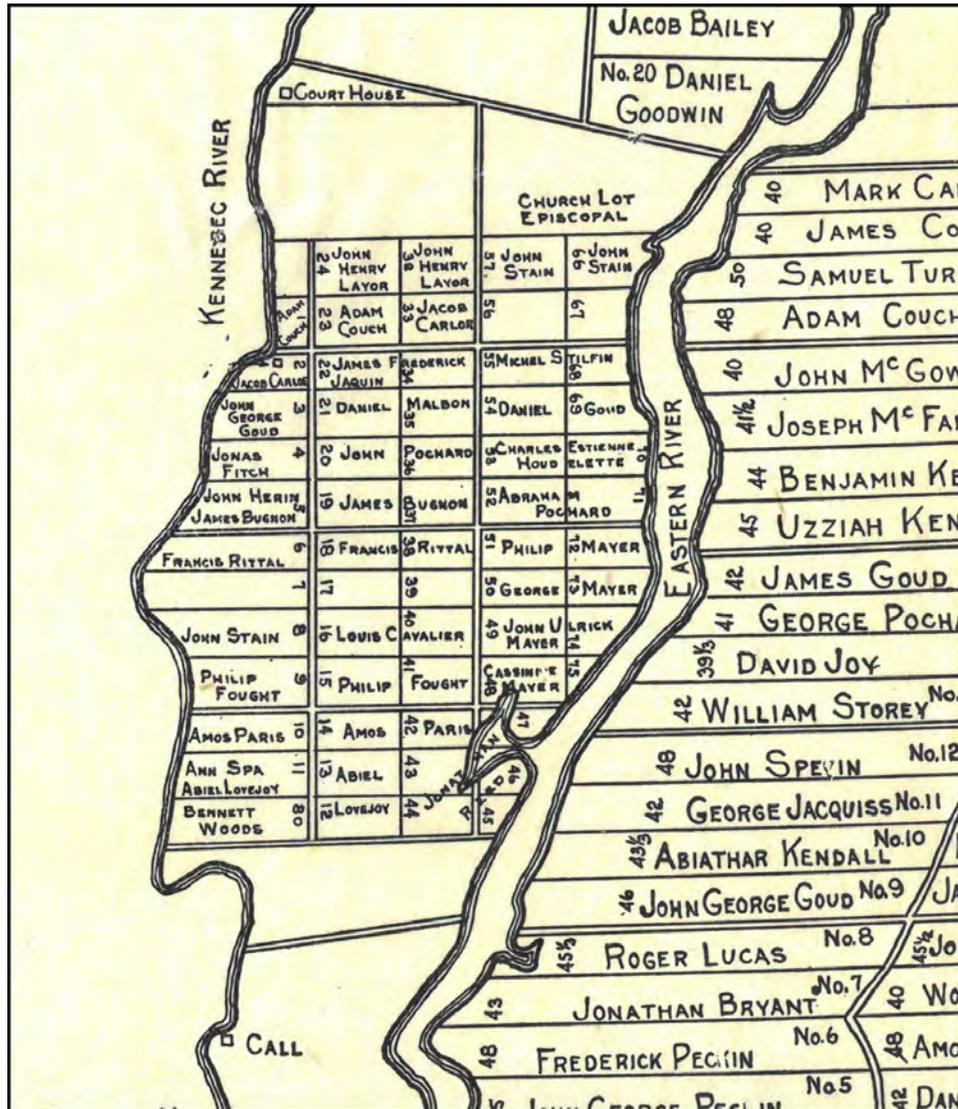


Figure 10. Detail of lot plan surveyed for Frankfort Plantation. Lot 10 (Amos Paris) is the site area.

January 17, 1777, 12/111

Abiel Lovejoy of Vassalborough and his wife Polley conveyed for L666.13.4 to Nathaniel Brown of Charlestown, leather breeches maker, three lots numbered 80, 11 and 10 containing 105 acres. The parcel is bounded on the west by the Kennebec River and the landing near the narrows, on the east by a road 8 poles wide, on the north by a road 8 poles wide and on the south by a road. The parcel length is 128 poles east/west and 120 poles north to south. Also conveyed were 4 20-acre lots 42, 14, 13 and 12. Buildings were also present and included.

November 5, 1778, 13/26

Nathaniel Brown conveyed to Jonathan Reed Lot 42. By this time Reed also owned Lots 43 and 44.

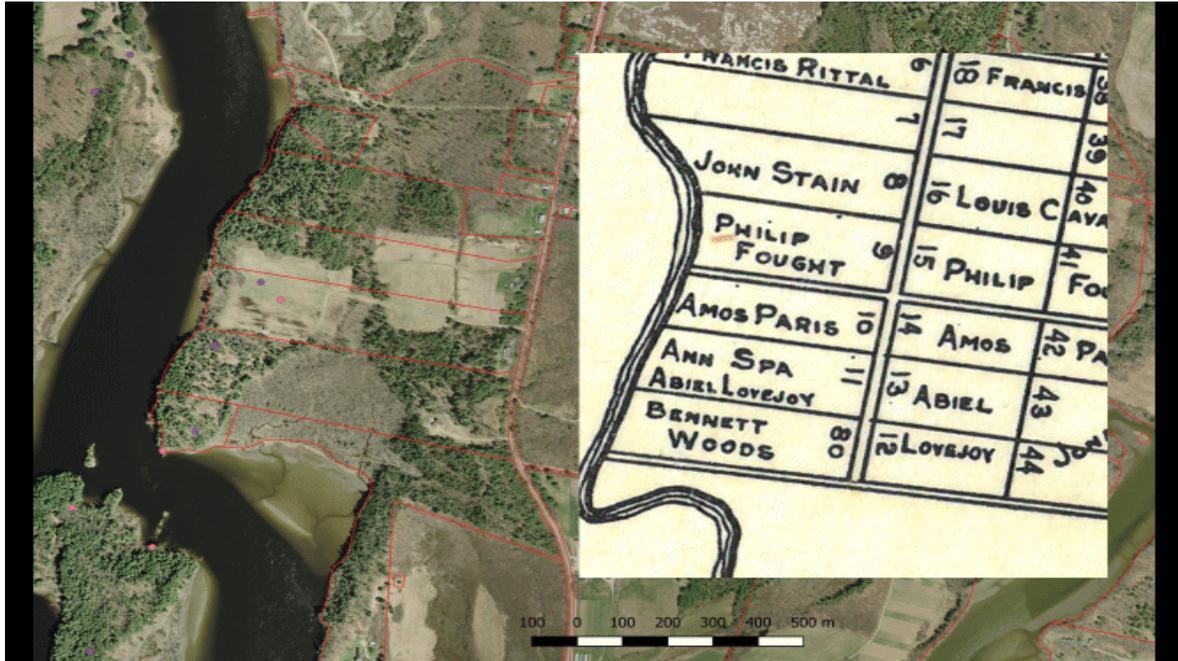


Figure 11. Satellite image of project area with lot lines in red and historic lot plan to right.

March 20, 1782, 15/109 (Warranty Deed)

Nathaniel Brown conveyed to Ezra Taylor a message and tract of land containing 160 acres. The land is on either side of the county road, bounded west by the Kennebec River and the landing by the narrows, east on land of Jonathan Reed, north by the cross road and south by a road. The western portion is 128 poles long east to west. Land with all the buildings and whatever be standing. Also convey one dwelling house now standing in the county road now occupied by Patrick Murphy, tenant at will. Although not referred to, this consisted former lots 80, 11, 10, 12, 13 and 14.

January 19, 1785, 17/179 (Quitclaim Deed)

Ezra Taylor conveys for L400 to Nathaniel Brown a message and tract of land containing 160 acres using the same description as above with the exception that the dwelling in the county road was formerly occupied by a tenant, Asa Densmore. Thus, Brown bought the property back from Taylor.

January 20, 1785, 17/180

Nathaniel Brown of Pownalborough conveyed for L500 to Peter LeMercier a message and tract of land consisting of the same 160 acre parcel described above.

March 20, 1793, 30/21

Polly LeMercier as executor of the estate of her late husband, Peter, who lived upon the land, conveyed to Samuel Twycross Goodwin (highest bidder) the same 160 acre parcel this time described by abutters. It was on either side of the county road and bounded west by the Kennebec River, to the east by land of Capt. Jonathan Reed, to the north by land of Widow Bailey (west of the county road, and to the south by land of Stephen Gale (west of the county road). Polly reserved her right of dower during her natural life.

Dresden Falls Archaic Site (Site 25.45): 2018 Testing of GPR Results: End of Fieldwork Report

March 25, 1793, 30/22

Samuel T. Goodwin conveyed to Jonathan Reed for L125 the land on the east side of the County Road consisting of 60 acres representing former lots 12, 13 and 14.

February 20, 1826 147/180

Samuel Goodwin II, Benjamin Goodwin II, Edward Goodwin II, Ann Frances Goodwin and Randolph Goodwin (all children of Samuel T. Goodwin) convey to John Goodwin the farm belonging to and now occupied by Samuel T. Goodwin containing about 100 acres bounded westerly by Kennebec River, also the Paris lot on the east side of the Eastern River.

April 1, 1836 165/426

Samuel Goodwin II, son and guardian of Samuel T. Goodwin who has been adjudged non-compos-mentos & a lunatic person, is selling the real estate of Samuel T. Goodwin to pay off his debts. Samuel Goodwin II conveyed for \$900.00 to John Goodwin a 90 acre parcel with buildings bounded by the county road on the east, Kennebec River on the west, Houdlette Lot on the north and Land of Warren and Moses Call on the south.

August 16, 1861 223/450

John Goodwin mortgages a property to Alfred Reed and Benjamin Grover for \$1080.50. Parcel is bounded by the county road on the east, the Kennebec River on the west, a town way on the north and on the south a town way above the Narrows and the landing place. Parcel consists of 140 acres and was formerly known as the homestead of Samuel T. Goodwin. Mortgage was discharged.

November 15, 1890 288/245

Flora E. Goodwin, Ellen F. Goodwin, Henry W. Goodwin, Marion C. (wife of Henry W.) conveyed the 150 acre parcel for \$3000.00 to Warren R. Houdlette. Parcel is listed as the homestead estate of John Goodwin (deceased).

April 17, 1918 349/269, 349/522, 414/444

Warren R. Houdlette died and left 150 acre parcel to his four children consisting of Melville P., Alfred D., Marion Hall and Harold A. Houdlette. The three siblings conveyed to Melville P. and his mother, Lillian Houdlette Morton also conveyed to him.

May 13, 1957 531/183

Melville P. Houdlette mortgages for \$1500.00 the 150 acre parcel to Depositors Trust Company. Parcel is listed as being in Cedar Grove.

1961

Melville P. Houdlette died in 1961 and left to his two sons, Philip M. and Richard C. Houdlette the 150 acre parcel bounded by the county road on the east, Kennebec River on the west, Heirs of Edward E. Houdlette on the north and Jackson Reed on the south. All parcel bounds are ½ mile in length. (Probate Docket #122, 1961).

May 6, 1964 597/147

Philip M. and Richard C. Houdlette conveyed to their mother (widow), Winifred G. Houdlette the 150 acre parcel.

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May 6, 1964 595/77

Winifred G. Houdlette (widow) conveyed to Philip M. Houdlette and Winifred G. Houdlette (herself) the 150 acre parcel. In this conveyance Winifred is giving the parcel back to her one son, Philip M. Houdlette.

March 12, 1987 1383/189

Winifred G. Houdlette conveyed to son, Philip M. Houdlette so he becomes sole owner of the 150 acre parcel

July 22, 1999 2480/334

Philip M. Houdlette via Gloria Houdlette (executor) conveyed to nephew Douglas M. Houdlette and other nephews and nieces the same 150 acre parcel listed as the homestead farm of John Goodwin.

Table. List of property owners/occupants by year.

Owner/Occupant	Years of Ownership	Description	Acreeage	Years Present
Amos Paris	1753-1761	Built house, cleared 5 ac	40	8
Amos Paris	1760-1761	awarded	30	1
Abiel Lovejoy	1761-1777	Buildings	70	16
Nathaniel Brown	1777-1782	Messuage & land	105	5
Ezra Taylor	1782-1785	Messuage & land	160	3
Nathaniel Brown	1785	Messuage & land	160	1 day
Peter LeMercier	1785-1793	Messuage & land	160	8
Samuel T. Goodwin	1793-1826	Farm	160	33
John Goodwin	1826-1890	Farm	100	64
Warren R. Houdlette	1890-1918	J.Goodwin homestead	150	28
Melville P. Houdlette	1918-1961			
Philip&Richard Houdlette	1961-1964			
Winnifred G. Houdlette	1964-1987			
Philip M. Houdlette	1987-1999			

Upper Terrace Archaeological Testing 2019 Narrative and site ME 129-017

Investigation of the GPR anomalies began with establishment of a 3 x 7 m grid over the area of the predicted structure foundation. A block of 6 units between N03 and N05, and E0 and E03 was opened first (Figure 12). The sod was removed, followed by shovel shaving of the plow zone which was dark grayish brown sandy clay loam. A low density of artifacts was found in the plowzone soil, consisting of fragmented brick, window glass, bottle glass, creamware, whiteware and white salt glazed stoneware ceramics, calcined mammal bone, a Kineo rhyolite preform, stone flakes and shatter (Figure 13). A few fieldstones were present as well. Plow scars appeared toward the bottom of the plow zone at a depth of 22 to 23 cm below surface (bs), and these were oriented from northeast to southwest. Unit N04/E0 produced a small area of mottled orange soil with some charcoal flecks that was determined to be a non-cultural remnant B-horizon. Once the plow scars were defined and documented, shovel skimming continued to remove the remaining plow zone soil within the plow scars to search for underlying features (Figure 14). No features were found (below the plowzone).



Figure 12. Upper terrace block excavation (facing north), in rainy conditions.

Figure 13. Artifacts from the block excavation plow zone: ceramics, stone lithics, tobacco pipe, window and bottle glass, wrought spike.



Figure 14. Series of plow scars (dark soil) at the base of the plow zone in the block excavation. These plow scars align with straight “feature” lines on the GPR interpretation.

Dresden Falls Archaic Site (Site 25.45): 2018 Testing of GPR Results: End of Fieldwork Report

Units between N06 and N07 were not excavated, nor were N07/E0 and N08/E0. The remaining units north of N07 were opened and treated in the same way by shovel skimming the plow zone, revealing the plow scars and excavating the remaining plow zone soil from within the scars. This exercise showed that the orange-brown B-horizon is largely missing from this area except in a few locations as remnants. The B2 or C-horizon consists of olive gray clay that the more recent plowing intruded into by 1 to 3 cm. Two episodes of plowing in the same direction could be discerned. A small darkened circular stain was present between N07/E02 and N08/E02, and another in N08/E02. Removal of the fill showed the first to be 2 to 3 cm in depth, while the second was 5 cm in depth and dish-shaped in remnant B-horizon. Neither feature appeared to be of cultural origin. Artifacts from these northerly units included a very low density of fragmented brick, nails, glass, calcined bone and quartz and rhyolite flakes.

As the N0-N8 block units were being completed a separate 1x1 m unit at N07/E04 was laid out to examine the area where a separate GPR anomaly had been identified. Excavation revealed the same 23 cm of dark grayish brown sandy clay loam plow zone, at the bottom of which were plow scars. Troweling of the transition revealed two small pieces of tin-glazed earthenware and a few tiny brick flecks. A deeper plow scar that extended to a depth of 30 cm was present along the south unit wall. Other than the plow scars there was no sign of the GPR-detected anomaly.

The absence of identifiable post-contact period features in the area of the upper terrace block prompted us to shift testing strategy to individual units close to the north edge of the Archaeological Conservancy property. An earlier walkover of this area had identified stone walls and a possible barn ramp along the woods line. The grid from the area of block testing was extended northward, and a series of 1 x 1 m units was laid out (Figure 15, next page).

Unit N40/E08 was located immediately east of what was interpreted to be a stone-lined ramp rising northward to a former barn. The upper soil here consisted of dark grayish brown sandy silt that contained hand forged and cut nails, fragmented brick, lead glazed redware, creamware and pearlware ceramics, calcined bone and quartz and rhyolite flakes. The B-horizon was reached at 20 to 22 cm bs with no evidence of plowing, and consisted of dark yellowish brown silty sand containing a scatter of quartz and rhyolite flakes including a Kineo preform fragment and one ovoid and spatulated flake, likely of Susquehanna tradition age (about 3500 years). The soil transitioned at 30 cm to very dark orangy brown silty sand representing a B₂-horizon, which contained additional quartz and rhyolite flakes. Excavation ceased at a depth of 60 cm with no evidence of the C-horizon clay that we had encountered in the field to the south. This soil profile supports the contention that the plowed field to the south has experienced considerable soil loss including much of the B soil horizon.

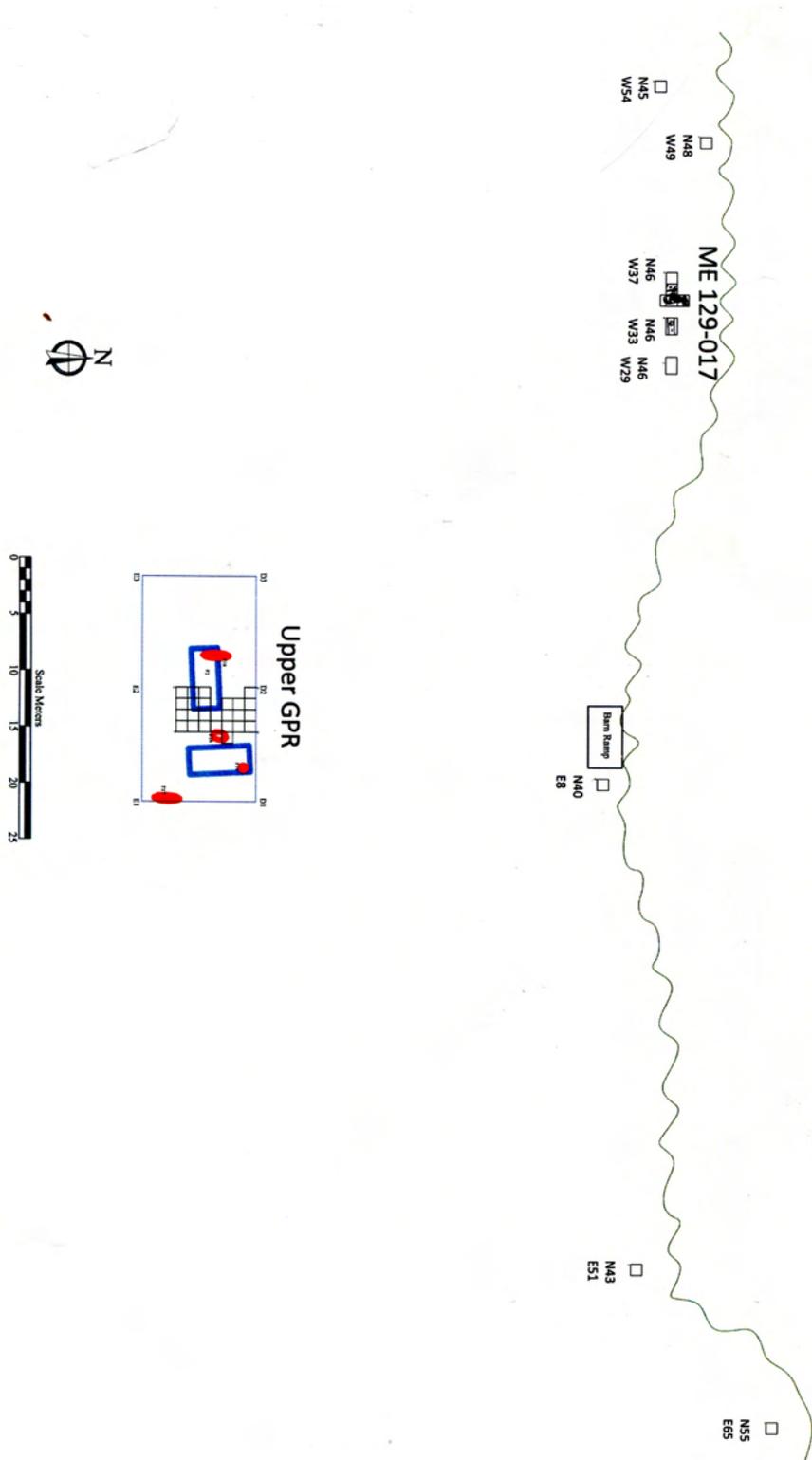


Figure 15. Upper terrace GPR excavation block, and subsequent test square locations, with historic house foundation features located (ME 129-017).

Dresden Falls Archaic Site (Site 25.45): 2018 Testing of GPR Results: End of Fieldwork Report

We excavated Unit N43/E51 in the area of highest elevation in the upper field to search for evidence of occupation and features that would indicate the past presence of structures southeast of the barn site (see Figure 7). The plow zone here consisted of 25 cm of dark brown silty sand that contained window glass, 3 wrought nails, brick, quartz flakes, and ceramics consisting of cream-ware, whiteware and lead glazed redware. The B-horizon consisted of 5 cm of orangy brown silty fine and medium sand that contained two pieces of quartz shatter and a flake. Two plow scars oriented NE to SW as in the larger block excavation were encountered at 30 cm. These cut into the olive gray subsoil where excavation ceased. No other features were observed.

Unit N55/E65 was located 2.5 m south of the woods line and east of the barn site on high ground. The purpose of the unit was to further test this elevated area regarding the likelihood of structures being present. A medium brown silty medium sand plow zone was present to 25 cm bs and contained fragmented brick, window glass, burned wood, lead glazed redware and flakes and shatter of quartz and a banded rhyolite flake. Two plow scars were encountered at the base of the B-horizon, and these were oriented in an EW direction parallel to the woods line. Clearing the soil from the plow scars revealed no additional features. A rounded stone was present in the northeast corner of the unit at the base of the plow zone which was a pale yellowish brown silty sand. Excavation ceased at 32 cm bs.

Thus, believing that the greatest likelihood for historic features lay west of the barn ramp, a series of test units were laid out along the N46 grid line west of W28 (Figure 16). Unit N46/W33 was the first to be opened and revealed a plow zone of 25 cm of dark brown, silty fine to medium



sand with pebbles. Artifacts included fragmented brick, wrought, cut and wire nails, window glass, lighter cream ware, chrome colored whiteware, American gray stoneware as well as rhyolite and quartz flakes. At the base of the plow zone was orangy brown silty sand B-horizon with

Figure 16. Excavation units west of the barn ramp (facing west).



Figure 16. Round post mold and overlying rectangular feature in east half of N46, just north of the north arrow.



Figure 17. View of irregular post hole and mold containing stones at its base.

a wide EW-oriented plow scar running across the unit. Also present was a piece of ledgestone at the interface in the southern third of the unit and additional fragmented stone in the southwest quadrant. Excavation of the plow scar soil revealed a rectangular stain of dark medium brown silty sand with some charcoal that extended into the east wall. The stain was approximately 40 cm long (EW) by about 25 cm wide. Excavation of the darker feature soil showed it to be only 3 to 4 cm deep with well-defined vertical walls. Removal of the upper feature fill revealed an underlying feature consisting of a round post mold (Figure 16). Combined, this complex feature was labeled Feature 1.

Excavation ceased in N46/W33 so that the west half of N46/W32 could be opened to follow the rectangular feature fill eastward. This west half consisted of 25 cm of plow zone containing fragmented brick, a wrought nail, lead glazed redware

and quartz and rhyolite flakes. The rectangular feature, designated Feature 1, extended 10 cm into this half unit. Its soil was excavated with the same vertical walls defining a rectangular space approximately 20 in (50 cm) long by 10 in (25 cm) long and approximately 1.5 in (3-4 cm deep).

Scraping the post mold surface revealed a well-defined post hole and mold to be present at the west end of and under the rectangular feature. The mold showed a round post approximately 8 in (20 cm) in diameter, and a surrounding post hole that extended a maximum of 3 in (7 cm) out from the post. The post mold was bisected and its southeast half excavated to a depth of 22 in (56 cm) below surface where an assortment of small stones was encountered (Figure 17). The stones stopped



Figure 18. Artifacts from units west of the barn ramp. Pearlware ceramics, bottle glass and wrought nails (left), creamware ceramics, cut nails and window glass (center), lead glazed redware, stoneware and brick fragments (right)

at a depth of 24 in (61 cm). This feature is interpreted to have consisted of a short 8-inch diameter post approximately 7 inches in length that was topped with a rectangular block of wood that likely served as a spacer to support a timber sill. Stones had been placed in the bottom of the hole to provide drainage.

With the discovery of a well-defined post location, additional units were laid out to the west and east in hopes of encountering more post locations (and thus better defining the building). Unit N46/W29 was laid out in hopes of encountering another post hole 12 feet to the east. Dark grayish brown plow zone was removed to a depth of 28 cm and then scraped down to reveal a plow scar running E-W across the north side of the unit, and another along the south side. The north scar was very shallow, while the south scar extended to 33 cm bs. Artifacts encountered in the plow zone included fragmented brick, window glass, cut nail, bottle glass, lead glazed redware, whiteware, hand painted polychrome pearlware, fire cracked rock, and stone flakes and shatter. A feature consisting of mottled soil with gray ash and a small amount of charcoal appeared along the west wall at the top of the Ap-B-horizon interface.

Due to this presence the unit was expanded 50 cm westward in hopes of revealing the rest of the feature. The half unit was the east half of N46/W30. With the plow zone removed the feature was defined by discolored soil and ash and charcoal that was at the surface of and within the B-

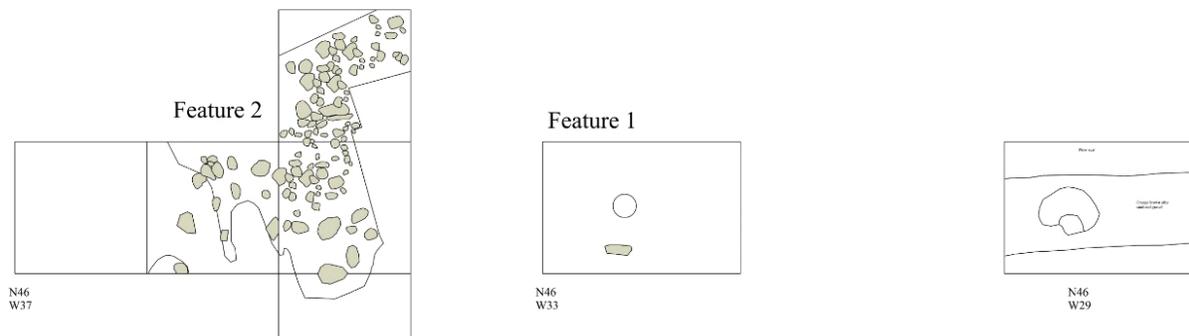


Figure 19. Excavation units and location of post Feature 1 and field stone Feature 2 (1x1m and 1x1.5m units).

horizon. The feature was interpreted to be a non-cultural small burned tree trunk. Artifacts in the plow zone included fragmented brick, wrought nail, a piece of green shell edged pearlware plate and stone flakes, shatter and a quartz thumbnail scraper (Figure 18). The unit was then completed by taking down the west half of N46/W30 in hopes that a post hole may be present 8 feet east of Feature 1. Removal of the plow zone revealed a continuation of the two plow scars, but no other cultural features were present.

Unit N46/W35 was opened to search for another post feature approximately 10 feet west of Feature 1. Removal of the plow zone encountered what appeared to be a deposit of cobblestones between 15 and 20 cm bs. As the stones were cleared off, other units were opened to the north and west to determine the nature of the feature, designated Feature 2, and its edges (Figures 19 and 20). The feature was present in much of units N46/W35 and N47/W35, and in the northeastern half of N46/W36. The feature consists of one to two courses of field stones that sit on the surface of a pale olive brown B-horizon at a depth of 27 cm. The stones form a general L-shape, the edges of which are well defined in N47/W35 and N46/W35, but more poorly defined in N46/W36. Some stones appeared to have been shifted westward from plowing. Artifacts from the overlying plowzone included fragmented brick, wrought and cut nails, window glass, creamware and pearlware ceramics and stone flakes and shatter.

Time constraints did not allow for further exposure of the feature, but observations suggest it represents the foundation of a chimney, potentially with the firebox facing slightly southeast. If this interpretation is correct, the western firebox wall is wide enough at approximately 32 inches that it could have contained an oven. The overall length of this west wall is approximately 6 ½ feet. The

rear firebox wall measures approximately 20 inches in width. The question of whether this feature could be a central chimney with two back-to-back fireboxes could not be answered with limited excavation.

A possible post mold, defined by a circular area of dark medium brown silty sand containing some charcoal and a stone, was encountered in the southwest quadrant of N46/W36 and extending into the unit's south wall. Time constraints prevented further investigation of this feature.

Two more units were opened further west of Feature 2 to search for evidence of historic occupation toward the northwest corner of the field that is closer to the river. Unit N48/W49, approximately a meter south of the woods line, revealed dark brown sandy clay loam plow zone with a higher density of pebbles and stones compared to other units. Artifacts included a quartz steep edged scraper, fragmented brick, window glass, cut nails and lead glazed redware. A remnant yellowish brown B-horizon was encountered at a depth of 18 cm. Cleaning of the interface revealed the presence of a number of larger stones as well as a plow scar along the south unit wall. Continued excavation to 28 cm bs showed the B2 horizon to consist of mottled olive yellowish brown silty fine sand with pebbles and small cobbles. Three larger fieldstones were present in the northeast quadrant, but these appear to be natural.

Unit N45/W54 further west revealed a dark olive brown fine sandy silt plow zone that extended to 15 cm. Below this was light olive brown silty fine sand containing several larger stones as well as a possible fire-cracked-rock. No features were identified. Artifacts in the plow zone included fragmented brick, nail, piece of slate, bottle glass, and pearlware and whiteware ceramics.



Figure 20. Eastern portion of Feature 2 interpreted to be a chimney foundation.

Upper Terrace Testing Summary

Native American stone tool making debris is wide-spread and at generally low density on the upper terrace. We encountered one feature that *may* be prehistoric in about 30 square meters of testing the upper terrace, compared with 14 features in eight square meters of testing on the lower terrace. Nonetheless, it is unusual to have Archaic material spread this far “uphill” and away from the river. Laboratory work comparing the lithic debris from the upper and lower terrace will investigate further.

Archaeological “ground truth” testing of the upper GPR area, specifically focused on what the GPR indicated might be an historic house feature with rectangular ground plan, located only plowzone and prominent plow scars. We had, however, encountered enough architectural debris (window glass, hand-wrought nails) to indicate the presence of a probable eighteenth-century structure on the upper terrace. Leith Smith’s testing program using 1x1 m squares near the tree line at the north property boundary succeeded in finding feature and artifact evidence of a probable eighteenth-century domestic structure (house).

THE LOWER TERRACE GPR TEST

As stated above, we began work on the lower terrace GPR area by “laying out” a 3 m x 6 m area that intersected multiple “features” identified in the 2017 GPR interpretation. In particular, the west wall of our excavation block was “laid out” over the C3-A3 line of the GPR grid (parallel *and* overlaying it to within 1 cm, we hoped), designed to intersect 3 meter diameter GPR “Feature 1” by splitting it N-S. We stripped the sod off the 3 x 6 m area, and in the process touched our 2008 1x1 m testpit 8 with the northeast corner of the 2018 excavation block. The western edge of the 2008 1 x 1 m testpit 8 is approximately parallel with the 2018 grid. The SW corner of 2008 testpit 8 is located at N13.75E12.90 on this grid (Figure 21).

We excavated to the interface between the base of the plowzone and initial feature soil appearance (about 20 cm depth) in a 2 x 4 m block (grid N9E10 to N13E2), and two additional squares (square N13E10 and square N12E12. These last two squares were subsequently backfilled without further excavation. In the 2 x 4 m block, we excavated by trowel through the plowzone/subsoil interface until darker soil feature outlines became clear. Once the feature array on the 2 x 4 m block became clear (about 25 cm below surface), we assigned 14 individual feature numbers. The boundaries between Features 3, 4, 5, and 6 were not clear at the 25 cm depth level, so feature boundaries among these four are arbitrary (along square boundary margins).

Excavation continued by removing feature fill (bagging or screening through 1/8" mesh), or cleaning up surrounding sterile subsoil. We excavated the feature fill (colored soil) from the

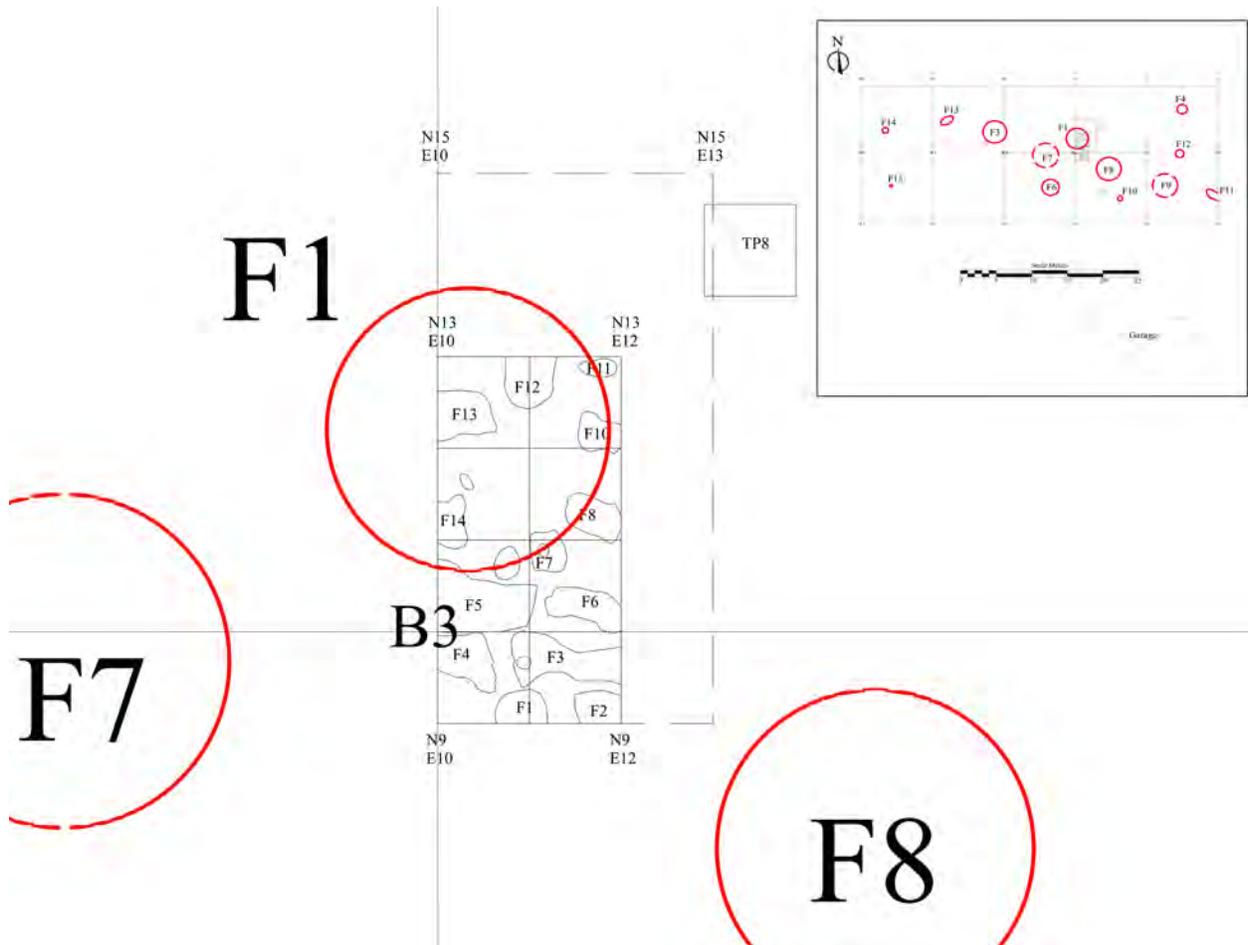


Figure 21. Lower terrace GPR “features” (red) and the 2018 archaeological test block excavation. Note testpit 8 on the northeast corner of the grid (from 2008).

majority of the features, exposing the shape of the feature by “stopping” excavation when the soil color changed to lighter, sterile soil. In a couple of cases we “sectioned” the feature by digging half of it, recording the cross section, then finishing. We did not excavate feature fill below the upper level (25 cm) for features 8, 10, or 12. They were left intact upon backfilling. Feature fill content recovered in the laboratory will be covered in the final report. Our fieldwork approach allowed us to characterize many of the features by shape, depth, and density of content. And in a few cases we encountered pebbles or rocks near the bases of the features. The next section provides brief descriptions of individual features.

Lower Terrace GPR Area Feature Log

Feature 1. N9E10 and N9E11. A dark charcoal stain of approximately 30 cm diameter touching the east edge of N9E10, with a medium brown soil tail extending 20 x 30 cm to NW. Meg Theriault bisected on the E11 line and N9.20 line. As excavation proceeded, soil getting darker in the NW



Figure 22. Feature 1 after excavation. South excavation block wall to the right. Note Features 3 and 12 marked with white plastic numbers.

quadrant (more charcoal content). Darkest (core) feature fill soil was bagged in two levels (Figure 22). Photo looking south. Used 1/8" mesh to screen SE quad fill. Base of pit 20 cm below the PZ base. Charred wood or fibrous woody material was preserved near the feature base with visible wood fibers trending NW-SE.

Feature 2 N9E11 SE quad. Medium dark stain at interface. Oblong 50 x 30 cm N-S. One FCR pebble in SE corner. Diffuse boundary. Might merge with Feature 3.

Feature 3. Linear medium-brown stain running ESE-WNW across N half of N9E11 and into NE corner of N9E10. Some of this feature (at the 25 cm level) turned out to be plow scar "smear" of feature fill. Features 2, 3, 4, 5, and 6 are NOT separated by distinct boundaries within the 5 cm below the interface.

Feature 4 at 30 cm. Medium brown, multilobed, fills NW quad of square N9E10. Merges with Feature 5 to the north. Very small calcined bone and charcoal flecks in the fill.

Feature 5. N10E10. Probably continuation of Feature 3 but separate designation for different square. Medium brown with darker patches and lump charcoal at the plowzone base. Possibly plow scar defined (truncated) to N and S. 1/12/2018 Eric Lahti taking out 3 cm layer. Bone is too small to survive 1/8" mesh so bagging lots of feature fill.

Feature 6. Linear ESE-WNW indistinct boundaries. Medium brown with darker patch to NW. Subsoil patches (buff colored) within Feature 3, 5, 6 complex seem to subdivide it at 25 to 30 cm depth.

Feature 7. Medium brown stain in NW corner of N10E11. Impacted by plow scar along N wall of N10E11. Extends into N11E11 SW as turned over plow material (possibly inverted). Possibly darker (charcoal enriched) fill around a quartz "core" (large cobble, possibly flaked) in NW q of N10E11. Diffuse border to S, N and W.

Feature 8. Dark brown/black charcoal stain. SE quad of N11E11. Oblong ellipse 50 cm E-W by 30 cm N-S. Visible lump charcoal in the matrix. Also a quartz flake. May extend west into



Figure 23. Lower terrace excavation block looking south, near the end of excavation.

Feature 7. North and South boundaries are fairly distinct.

Feature 9. N10E10 in NE quad, with northern extension into N11E10. Medium brown, margins are diffuse to semi-distinct. Elliptical stain 40 cm NS by 30 cm EW. Lump charcoal exposed at interface, top of feature. Feature 10. Very light brown stain with diffuse borders. NE quad of N11E11 and SE quad of N12E11. Slightly darker area and stained subsoil makes coloration variable. Darker lobe to SW.

Feature 11. NE corner of N12E11, Medium-dark brown 30 cm with darker black/charcoal infused 15 to 20 cm diameter “core”. Margins fairly distinct.

Feature 12. NE corner of N12E10 and NW quad of N12E11. Medium-light brown stain with diffuse boundaries. Shaped like a “boot” with toes to left (west).

Feature 13. Light to medium brown stain. Diffuse borders N and SE. About 50 cm diameter. Goes into west wall at about 45 to 50 cm width. Slightly darker “core” about 25 cm diameter



Figure 24. Cobbles near the bottom of Feature 14, looking west.

abutting west wall. Top of feature defined at 27 cm depth below surface.

Feature 14. N11E10 SW corner extending to the wall. Dark brown/black core along the west wall. Distinct south boundary. Diffuse north and east boundary. 55 cm N-S length along the wall. Densest black 15 cm E-W. Entire feature width is 30 cm E-W.

Comments on Features

We will address the feature descriptions and observed patterns in form and content in more detail in the final report, of course. By the time fieldwork ended, we had noticed several patterns and have the following observations (Figure 23).

First, smaller features that might be designated as “post holes” are rare to non-existent at the depth we had to dig (about 25 to 30 cm) to differentiate the effects of plow “smearing” of feature fill from intact feature fill. If posthole features had been present in this area, they had presumably

been destroyed by plowing. Therefore, reconstruction of dwellings from post hole patterns is not possible.

What is recognizable as distinct feature fill must have been the lower portions of excavated (pit) features. Much of the feature fill was medium-brown in color, and flecked with charcoal and small pieces of calcined bone (that appeared as white spots during trowelling). Multiple features, most notably Feature 1, contained smaller areas of darker, black deposits that were heavily laden with charcoal (both in discrete, visible pieces and as material that was too fine to see with the naked eye). These darker “cores” within the feature fill tended to be deeper in the features and/or toward the center of the feature discoloration. Generally it did not appear that the feature pits had been filled in with layers of material, at least that retained layering we could see (such as alternating layers of charcoal and other material which produce a horizontally-stripped pattern). The darker charcoal-rich “cores” of the features, and the bases of the pit features, tend to be 30 to 40 cm in diameter and roughly 50 cm below the ground surface.

Isolated water-worn stones about the size of a softball, or groups of smaller water-worn pebbles (Figure 24), and in one case a larger quartz cobble, appeared in the bottom of multiple features. Fire-cracked or fire-reddened rock was present in small or medium quantity in the feature fill, but are not concentrated or necessarily associated just with the darker charcoal-infused soils.

Our interpretation may change as we go through the material from these features, but these features do not seem to be fire hearths with stone lining, or fire hearths that were used to heat large volumes of rock for stone boiling. The charcoal-infused cores might be “in situ” remnants of fires that had been built to heat a pit feature, then covered with some soil for cooking, perhaps baking or perhaps heating a skin-lined pit. The river cobbles might have been used as part of a heating or cooking method, but the ones remaining in the bases of the pit features do not seem to have been dropped repeatedly into water or otherwise quenched with water (not crazed or fire-cracked). After use with a fire, the pits seem to have been filled in with earth that included charcoal flecks and burned bone, gradually rather than filled by discrete basket-loads of garbage or hearth-cleaning. In any case, reconstructing the use of these features requires further thought.

West Wall Profile and Bucket Auger Test

Toward the end of the excavation, we concluded that we were not finding features that could match the large, three meter diameter pattern detected on the GPR reconstruction. The bases of the multiple smaller features we had encountered reached 40 to 50 cm into the ground, but were surrounded by what appeared to be sterile, undisturbed silty fine sand (natural) deposits. In an attempt to test for a deeper feature “hiding” under what seemed like sterile, natural deposits, we excavated (and partially screened) the west quadrants of the western squares, creating a 50 cm wide

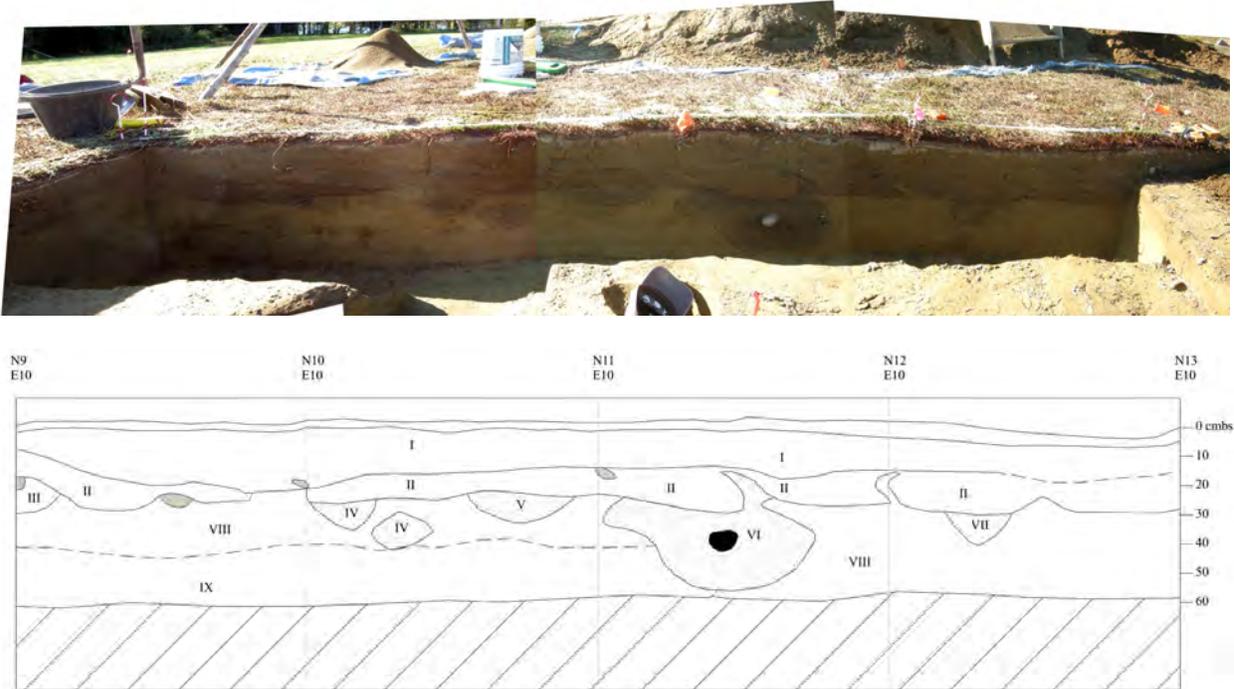


Figure 24. West wall of lower excavation unit. Composite photograph above drawn profile. I is plowzone. VI is Feature 14.

trench along the west wall of the excavation excavated to 60 cm depth. Outside of the features we had “seen” there was no sign of cultural material or disturbance, and the 60 cm floor of the trench was sterile and undisturbed. Since this trench and our west wall had cut through the GPR “feature,” we concluded that the GPR feature was not present as it had been reconstructed from the GPR data.

The exposed west excavation wall did allow us to better visualize multiple aspects of the block excavation and features (Figure 24). The base of the plowzone is clear and abrupt, except where the plow had “clipped” the upper portion of a darker-soil feature. As can be seen in the west wall, sometimes the plow “turned over” the upper feature fill and smeared it laterally. The feature bases below the plowzone are generally small (30 cm diameter in horizontal dimension) and conical or round bottomed. One larger feature (Feature 14 extension into the west wall) appears to have straight or expanding sides, but the upper feature “constriction” might also be a result of the plow disturbance throwing soil laterally toward the south. The deepest feature base (.e.g. Feature 14) is at 50 cm below the surface, approximately.

In an effort to further test whether a cultural feature or disturbance might somehow be buried deeper than the 60 cm deep floor of the west wall “trench,” we returned to the site on November 9, 2018 and recovered 70 cm of bucket auger samples, beginning at the base of the trench. The bucket

auger recovered material in 10 cm increments, beginning at 60 cm, and ending at 130 to 134 cm depth below the ground surface. The depth between 60 and 130 cm below surface is characterized by sedimentary layers with varying content of fine sand and silt. The variation in silt content may be enough to cause moisture retention differences great enough to show up as layers in the GPR. (Grain size measurements will be presented in the final report.) At 134 cm depth, the bucket auger hit a “refusal” layer with gravel, which must be coarser glacial outwash. All sediment was screened (in the lab). There was no cultural material in the bucket auger samples. We conclude that the feature bases at 40 to 50 cm depth below surface are the deepest cultural materials within this excavation block.

PRELIMINARY THOUGHTS ON RECONCILING GPR AND FEATURES AT THE DRESDEN FALLS ARCHAIC SITE

Ground penetrating radar clearly has the “resolution” to record “features” at the 20 to 50 cm depth level within the generally silty, mostly stone-free deposits on the Dresden Falls Archaic site. In fact, on the upper terrace, the GPR delineated SW to NE trending linear features. They turned out to be the deepest bases of plow scars. GPR appears to be “sensitive” to changes in moisture content, and it seems as if the difference in organic matter between the plowzone and sterile subsoil may play a role in plowscar visibility.

On the lower terrace test area, GPR should be able to detect the difference between pit feature fill (with higher charcoal and organic matter content) and surrounding subsoil. The GPR may also pick up changes in silt/clay/sand content – with depth below 40 to 50 cm (perhaps as shown in the 2013 GPR test east of the garage).

The primary problem using the GPR appears to be the size (scale) of the features that are present (generally small, with widths under 50 cm), and the processing of the GPR data that created “features” with dimension of several meters across. The GPR interpreted F1 (GPR Feature 1) on the lower terrace appears (Figure 25) to incorporate five

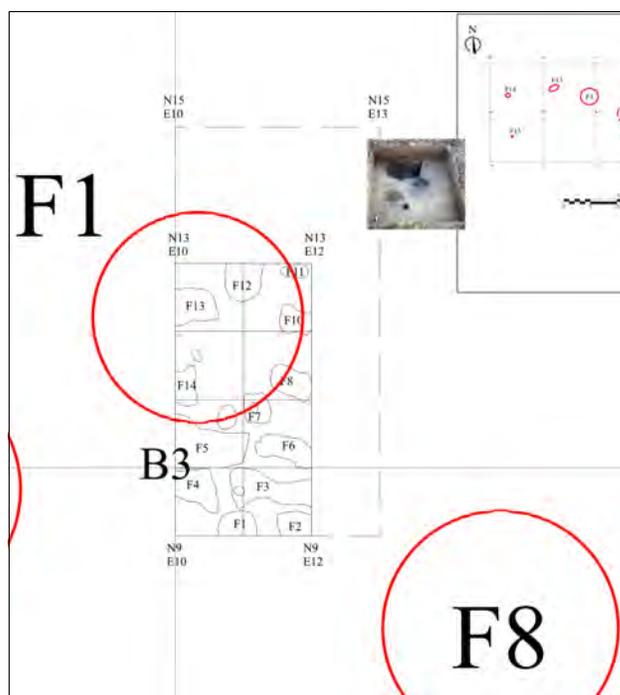


Figure 25. GPR interpretation of the area around the lower terrace excavation block (red circles) overlaid on 2018 excavation block feature pattern. In addition, features within 2008 testpit are shown by inset photo in approximate position.

Dresden Falls Archaic Site (Site 25.45): 2018 Testing of GPR Results: End of Fieldwork Report

separate smaller features into about 40% of its circumference. (Basic geometry states that a circle can be fit through any three points – hitting five is perhaps not coincidental.) As far as we can tell, the five archaeological features that fall on the GPR F1 circumference are probably not related to a house pattern. Moreover, the F1 circumference missed some features within it, and the GPR processing failed to pick up any pattern with the features (Features 1-6) in the southern portion of the excavation block.

Considering our 2008 1x1 m testpit 8 with the northeast corner of the 2018 excavation block, it appears that generally small feature size and dense feature packing of the rest of the 2018 excavation block can be extrapolated at least as far as the 2008 Tp8. That 1x1 m excavation unit had several sub-plowzone features with 30 to 50 cm maximum horizontal dimensions, none of which showed up on the 2017 GPR either. The problem must lie somewhere in the processing and interpretation of the GPR data.

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APPENDIX A
DRESDEN FALLS ARCHAIC SITE
ADDITIONAL SIGNIFICANCE TESTING PROPOSAL
to The Archaeological Conservancy

Arthur Spiess, Senior Archaeologist, Maine Historic Preservation Commission
June 2018

Archaeological Background

The Dresden Falls Archaic site property (total 18.5 acres) was acquired as two separate acquisitions (Lang property 14.2; Houdlette property 4.3) partially funded by the Land for Maine's Future Fund (and Friends of Merrymeeting Bay). LMF funding for acquisition requires an assertion of archaeological significance. To date the site has not been listed in the National Register.

The assertion of archaeological significance for the site acquisition was based on information derived from the on-site archaeological record (Criterion D of the NR): confirmed prehistoric Archaic occupations and the probable presence of a circa 1772 A.D. historic Euro-American occupation based on a map and preliminary archaeological testing.

The LMF initial acquisition archaeological significance assertion was based on three sources of information prior to the acquisition, all focused on the Archaic (prehistoric) site potential. First, avocational surface collections of stone tools (primarily Richard Doyle, Jr.) and his notes on horizontal patterning of the material on site, indicated intense occupation during a poorly known time period (Early and Middle Archaic, early Late Archaic, 9000 to 4500 years ago). Possibly the site is the largest of that time period surviving intact (not eroded by lake levels) in Maine. Second, Spiess examined a small trench excavation across 70 m of the densest part of the site, recorded trash/charcoal pit features in the trench walls, recovered calcined bone subsistence remains (mostly fish), and obtained a charcoal radiocarbon date of 6130 years from one pit. Third, a week of testing by MHPC professional crew (August, 2008) excavated seventeen 1 x 1 m squares at 5/10 m intervals. That work confirmed the southern site boundary in one spot, confirmed a shallow plowzone across the site (about 20 cm), and encountered multiple features (pits, post holes) below the plowzone with diagnostic Middle Archaic stone tools and calcined bone. We concluded the site could contribute to subsistence and culture history research significance themes for the Early and Middle Archaic context.

Prior to acquisition of the Houdlette property (4 acre upper terrace field), archaeological testing was accomplished in 2010 in a single day by volunteer Friends of Merrymeeting Bay crew with Spiess directing the work. A single transect of 25 (twenty-five) 50x50 cm testpits yielded prehistoric, 20th century, and suspected 18th century material. A small slab stone and soil stain in

one testpit was interpreted as a possible historic foundation indicator, perhaps for an outbuilding or building on a lightly-supported sill. The 18th century material was a surprise. This information was added to a revised statement of significance in the April 2011 second LMF application.

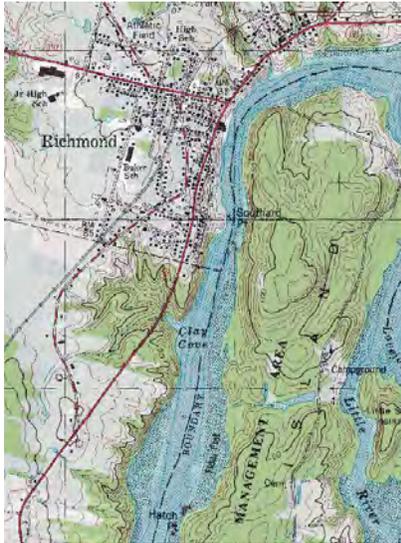
To date the Dresden Falls Archaic site has been tested by the excavation of 17 m² in 2008, and 6 m² in 2010. The total site area of 18.5 acres is roughly equivalent to 7.5 hectares, or 75,000 square meters. Archaeological testing on the site thus far is about 0.02% (0.0002) of site area.



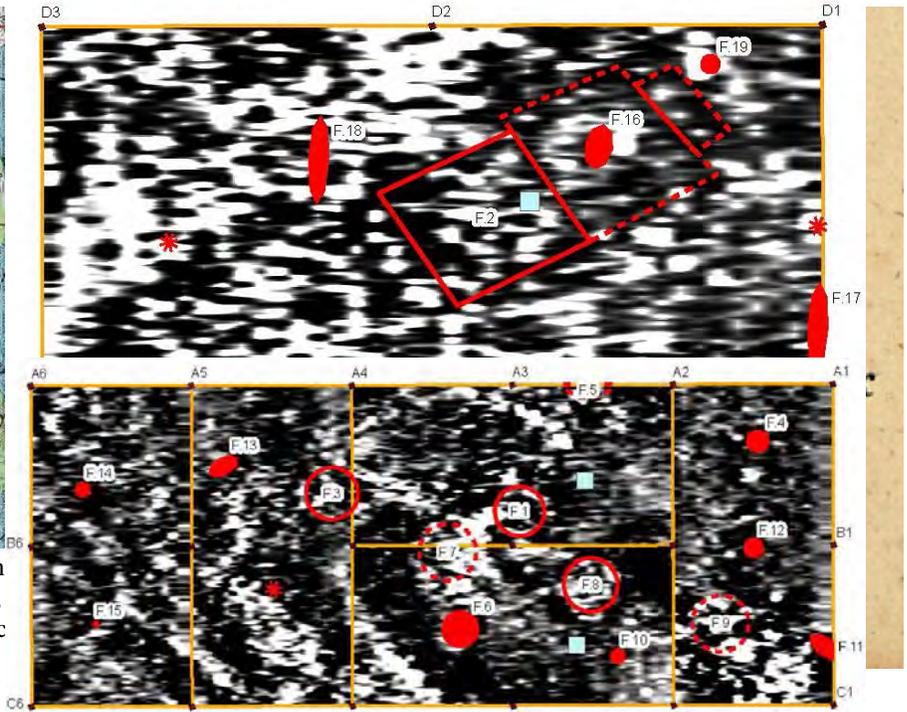
Aerial view of the Dresden Falls Archaic site, with access road to the east (right) and garage at the south tree line. 2013 ground penetrating radar (GPR) survey area outlined in black. Lower terrace (south, lower on photo) and upper terrace (north, upper part of photo) GPR survey areas outlined in yellow/orange. From Heller et al. 2018.

Recent Ground Penetrating Radar

Archaeological testing has been supplemented by two rounds of ground penetrating radar work, in 2013 and 2017 (Heller and Kelley 2013; Heller et al. 2018, reports previously supplied to TAC). The GPR grids covered three areas: a 20 x 40 m area, and a 20 x50 m area on the lower terrace (intense prehistoric Archaic period occupation area), and a 10x20 m area of the upper terrace to overlap the densest area of 18th century artifact finds. GPR testing in the area of dense Archaic use was first designed to intersect the powerline trench and circa 6000 year radiocarbon dated garbage pit feature, as a test of GPR resolution. That feature was relocated on the GPR. The 2010 and 2013 Archaic area GPR located multiple probable “small” features, such as the garbage pit. It also (surprisingly) indicated the presence of much larger subsurface prehistoric features, interpreted as 3 to 4 m diameter, slightly concave (½ m) basin-shaped areas of possibly compact soil. There are at least four such features indicated within the GPR-mapped area. Without “ground truth” testing, our best guess is that these are Archaic age house floors, slightly excavated or compacted into the



Dresden Falls Archaic site (red rectan topographic map showing Richmond, and the eastern shore of the Kennebec



subsoil and subsequently filled over by flood deposits or slope wash.

GPR data with interpretation. The Dresden Falls site has a new well terrace prehistoric structures below. Image from Helms et al. 2018 more of the structures at the red arrow may be on the Dresden Falls property.

The 2017 GPR grid on the upper terrace did locate what appears to be an historic age foundation feature: a shallowly buried feature rectangular in shape and approximately 5 x 7 m (10 x 24 feet) in dimension, plus other possible features. In 2017, re-examination of the Houdlette upper field historic artifacts at Maine Historic Preservation Commission confirmed the presence of 18th century artifacts: hand-forged nails, daub (clay fireplace lining), pearlware, and a tobacco pipe, all concentrated in the western portion of the upper terrace field.

The GPR and 2017 collections analysis indicated two (or more) topics of archaeological significance for the Dresden Falls Archaic site not suspected during the LMF acquisitions. We note the National Register nomination for the property, not yet written, would benefit by exploration of both of these topics.

First, and most obvious, is the previously (prior to 2010) unsuspected presence of the archaeological remains of a structure present in the early 1770s and is likely indicated on the deBarre navigation chart published circa 1778-80 (various editions, survey data taken about 1772). Archaeological architectural debris (nails and daub at a minimum) complements the GPR finding of a probably rectangular feature of the correct size for an 18th century domestic or farm structure on the upper terrace (former Houdlette property).

Second, the possibility of preserved Archaic house/ structure floors, buried below the modern plowzone, on the lower terrace in the area of intense Archaic occupation adds the possibility of exploring Archaic domestic structure content and organization. The Sandy Hill site on the Mashantucket Pequot Foxwoods property in Connecticut, has yielded semi-subterranean (convex) house floors dating around 8000 years (Dan Forrest, PhD. thesis, U. Conn). This is the only other site in New England, to our knowledge, preserving possible structure remains older than 4000 years. If confirmed, these house floor features would add a new research significance theme to the NR eligibility of the site: settlement pattern (internal structure, possibly multi-structure site pattern), and provide additional comparative information (i.e., additional to stone tool types) to examination of Archaic lifestyle pattern similarities or differences between northern and southern New England. There is a large, speculative literature on southerly origins and connections of Maine/Maritimes Middle Archaic culture traits, to which this line of research may be relevant.

Proposed Scope of Work

This proposal calls for one week of archaeological testing for each topic/area: (1) targeted, localized excavation to test the probability of a circa 1770s structure on the upper terrace, and (2) targeted testing of a portion of one of the large basin-shaped features in the Archaic area of the site. Thus, two weeks of field work are proposed. We also include enough time in the budget(s) for relevant laboratory processing of recovered artifacts and samples, limited conservation (historic iron), charcoal identification, faunal analysis, lithic identification, and radiocarbon dating (for the Archaic occupation, 10 dates).

To make certain that we encounter (expose) one or more of the large prehistoric features, we may screen and remove plowzone from an area of 10 x 10 m. Our preferred target location would be an area intersecting one or more of the large circular features F1, F7, and F8, and smaller feature F6. We will attempt to cross-section either Feature F1 or F8 if it can be identified below the plowzone. F8 falls between two 1x1 m squares excavated in 2008, making it relatively easy to resume screening of the plowzone with a visual guide to plowzone depth. (*Please see the figures on pp. 7-8*).

The upper terrace presumed historic archaeological feature complex as identified by GPR occupies an area of approximately 5 x 7 meters. Stripping the plowzone of up to 25 square meters (5 x 5, or smaller areas totalling 4 x 6 m) would be the starting strategy. Followup excavation of 1x1 or 1x2 m units within or adjacent to confirmed historic features would follow. We would excavate only enough area below the plowzone to confirm construction and identification of the historic feature (presumably a foundation) and provide enough information for National Register nomination.

Excavation will be accomplished by the professional Maine Historic Preservation Commission crew of Archaeology Technicians (n=5), with in-field direction by Dr. Arthur Spiess (prehistoric, senior archaeologist) and Dr. Leith Smith (historic archaeologist). Vitae are available on request. Spiess has been leading archaeological excavations in Maine for 40 years. Smith has been employed at the Commission for over 15 years, with extensive experience on 18th century sites (including Fort Richmond, circa 1740 to 1760, about 2 miles from the Dresden Falls site).

The professional crew will be supplemented during fieldwork by a limited number of volunteers through Friends of Merrymeeting Bay (FOMB). *This is not a field school where students and volunteers will be allowed to excavate features below the plowzone.* All sub-plowzone feature excavation and feature sample recovery will be performed by professional/experienced crew. Volunteers will help with screening, and will help excavate and screen plowzone soils. The professional/experienced to volunteer ratio will be held at 1:1 volunteers to professional/experienced crew for the excavation of sub-plowzone features. Fieldwork with a larger volunteer/professional ratio may begin by shoveling and screening the plowzone. (FOMB volunteers have worked successfully either directly with MHPC staff or former MHPC archaeologist Leon Cranmer on 11 archaeological surveys since 2003.)

Excavation strategy will be to “open up” an area overlapping historic or prehistoric possible “features” interpreted on GPR by removal of the plowzone. The plowzone may be removed with shovels and will be screened through 6 mm mesh. (We know how deep the plowzone is from prior testing.) Subsequent plowzone/subsoil interface exposure and subplowzone feature excavation will be accomplished using trowels, 6 mm and 3 mm mesh screen, and with bagging of frequent feature fill samples (measured in multiple liters) for flotation processing on 1 mm mesh in the laboratory. Horizontal control will be maintained by using the metric grid in place on the site, excavating in quads (of 50 cm squares) and (of course) visible feature boundaries below the plowzone. Recording of the excavation will be by notes, digital photographs, and possibly drone photos.

Based on existing information, the Archaic occupation will yield stone tools, fire-burned rock, calcined (burned) faunal bone, and charred plant material. In-house Commission laboratory expertise exists for analysis of the lithic material (including use wear) and faunal bone. External expertise will be contracted for charcoal/charred plant remains analysis and radiocarbon dates. We may also attempt to recover pollen, phytoliths or other samples requiring external laboratory help.

The historic occupation will yield iron and other metal, ceramic, glass, burned clay (daub), lithic (flint) and possibly other materials. In-house expertise exists to process and identify this material, including iron conservation. It is possible that external expertise may be contracted for specialty studies. (For example, a garden area identified at Fort Richmond yielded pollen that identified several crops grown by the garrison.)

A Note on the Budgets

Friends of Merrymeeting Bay has raised \$30,000.00 from private, charitable sources. Maine Historic Preservation Commission staff have budgeted about \$17,300.00 of HPF survey funds. Final approval is pending oversight Commission vote on the budget in July. This funding is sufficient to pay for up to six (6) Commission staff for two weeks of field work. (Arthur Spiess will join the crew without charge to these budgets, using a different funding source.)

These budgets are also sufficient to pay for Commission staff time for laboratory processing of the recovered materials, and limited external analyses by non-Commission specialists. Note *the FOMB budget contains \$6000.00 specifically set aside for 10 radiocarbon dates* (assumed to be on charcoal and/or calcined bone from the prehistoric features).

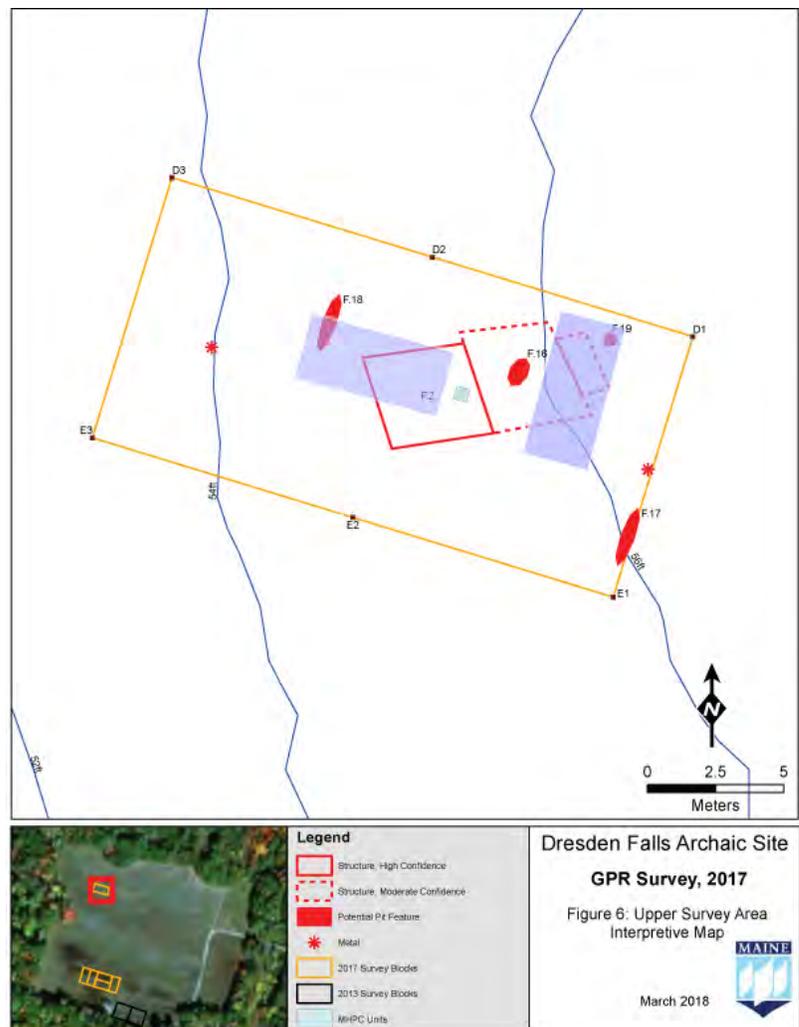
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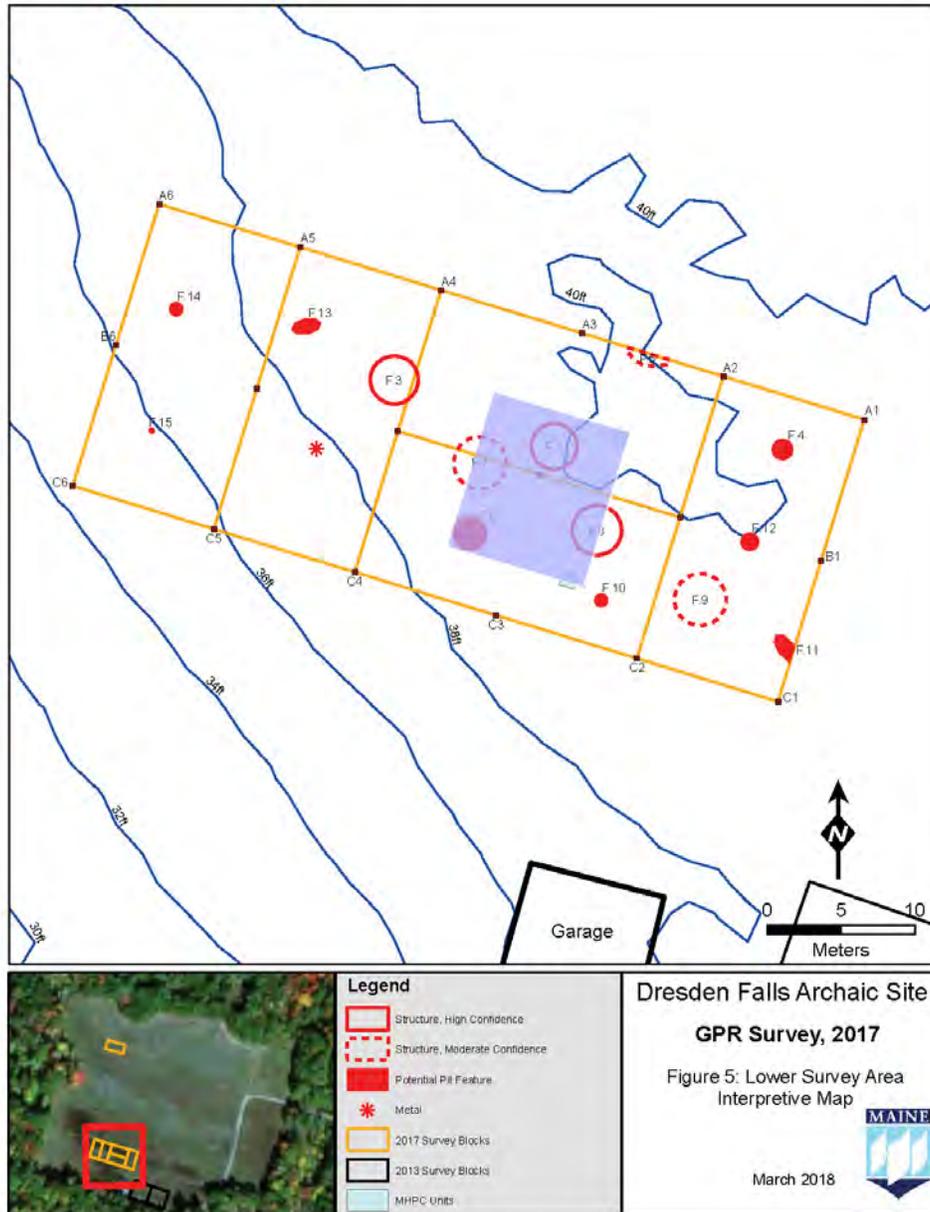
The Commission is committed to the following products from this work:

- 1) a preliminary report within one year with appropriate catalogues, artifact identifications, and preliminary interpretations of features based on visual information (if lab reports are not in hand). Specialty reports available at the time will be included. One focus of the preliminary report will be a comparison of the GPR interpretation with the “ground truth” developed from excavation; and
- 2) a draft National Register nomination (time frame of two years) for presentation to the Maine Historic Preservation Commission and then the National Register of Historic Places; and
- 3) a final report with appendices, regional comparisons, etc.; and
- 4) academic/professional publications, and popular accounts for North American Archaeologist, for example.

It may also be possible to acquire video footage of the excavation (volunteer basis), and to produce various public education products with video, beyond the written reports.

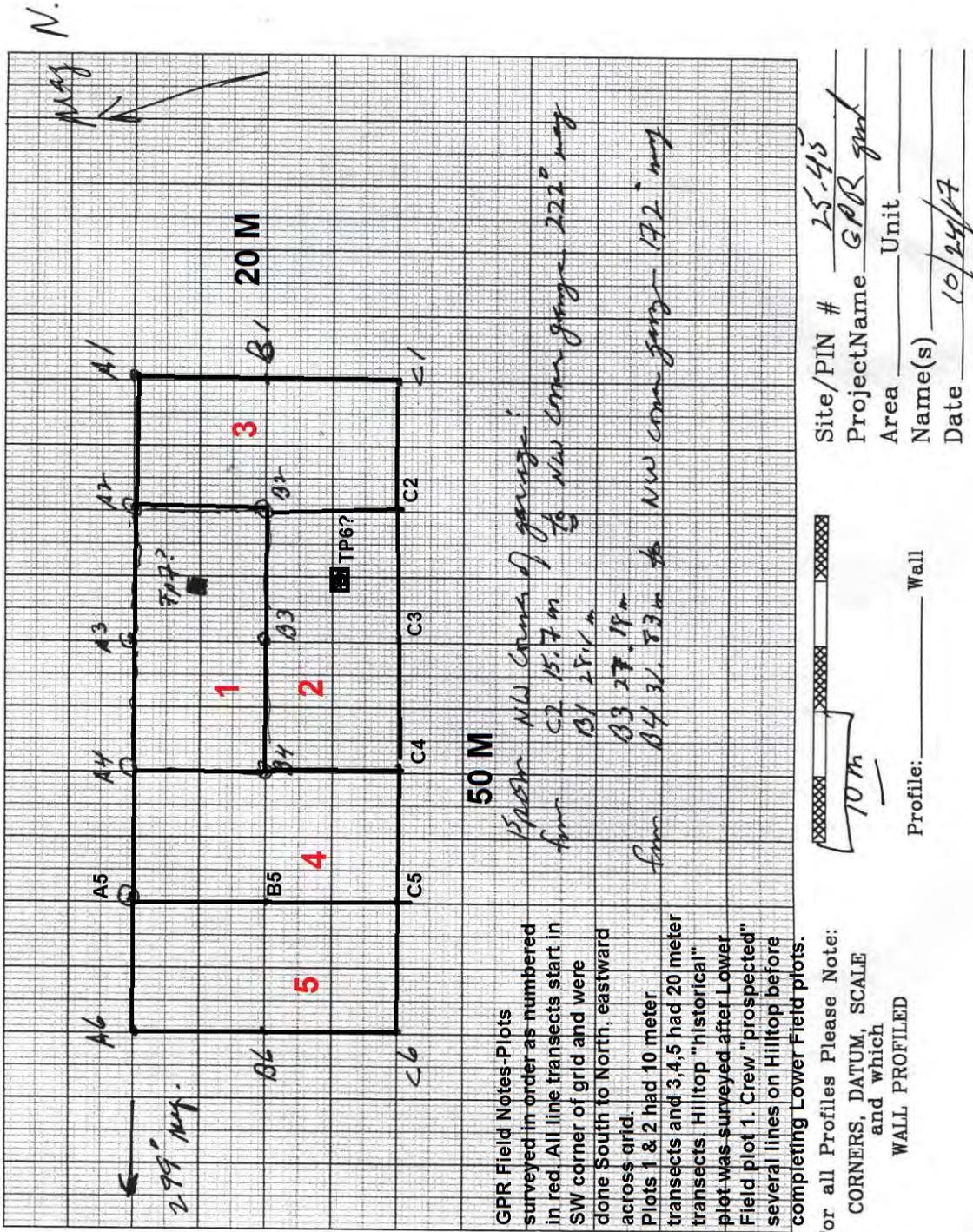
Figure (right). Upper terrace 2018 GPR interpretation of possible historic structure, base figure from Heller et al 2018. **Blue shaded rectangles are representations of two possible 3 x 5 m areas for plowzone removal to allow exposure of possible underlying historic features.**





Lower terrace 2018 GPR interpretation of possible prehistoric features, base figure from Heller et al 2018. **Blue shaded rectangle is representations of possible 10 x 10 m area for plowzone removal to allow exposure of possible underlying prehistoric features.**

APPENDIX B
FIELD MEASUREMENTS AND SURVEY GRAPHICS
RECONSTRUCTING THE GPR GRIDS AND
LOCATING 2018 ARCHAEOLOGICAL TESTING



GPR Field Notes-Plots
 surveyed in order as numbered
 in red. All line transects start in
 SW corner of grid and were
 done South to North, eastward
 across grid.
 Plots 1 & 2 had 10 meter
 transects and 3,4,5 had 20 meter
 transects. Hilltop "historical"
 plot was surveyed after Lower
 Field plot 1. Crew "prospected"
 several lines on Hilltop before
 completing Lower Field plots.

For all Profiles Please Note:
 CORNERS, DATUM, SCALE
 and which
 WALL PROFILED

Plots NW corner of garage:
 C2 15.7 m to NW corner garage 222° mag
 B1 15.1 m
 B3 27.19 m
 B4 31.83 m to NW corner garage 192° mag

TP6?

TP6?

