Preliminary Report on 2018 Testing at Fort Belcher

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REMOTE SITE PROSPECTION AT FORT BELCHER

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Remote Site Prospection at Fort Belcher

Heritage Research Permit A2018NS046
Category B Heritage Research Permit

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Cover Photo: Low altitude UAV photograph of Fort Belcher, facing North.

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INTRODUCTION

The proposed archaeological testing was intended to enhance knowledge of heritage resources and history in Cobequid during the Seven Years War (1755/6-1763). Archaeological testing of the viability of GIS based methods of remote site prospection and field planning. This was achieved through an assessment of the viability of magnetic susceptibility, soil conductivity, visible and near infrared imagery, and photogrammetry and LiDAR derived elevation models individually and in combination with each other when applicable.

At Fort Belcher remote site prospection has yielded promising results from desk based excercises (**Figure 6**; **Figure 7**; **Figure 8**). During the 2018 field season at Fort Belcher geophysical survey using the Geonics EM38b (magnetic susceptibility and conductivity) and aerial survey (UAV photogrammetric model), followed by test excavation of some areas of interest were completed. All data collected contains high accuracy geospatial information used to facilitate comparisons of multiple datasets to identify the areas of interest at the coastal edge of the Fort Belcher knoll.

STUDY AREA

The Fort Belcher property at 420 Fort Belcher Rd. Lower Onslow, NS is now owned by Myrvin Ferguson. All archaeological investigations are confined to this property. Mr. Ferguson has given the applicant permission to conduct archaeological survey and excavation on his property.

PID: 20103537
Provincial Parcel Size: 150 acres

Figure 1: The lower section of the Chiganois River Valley. Displayed is the location of Fort Belcher at the mouth of the river. Map produced using LiDAR derived NIR reflectance intensity raster as a base map – accessed through GeoNOVA portal.

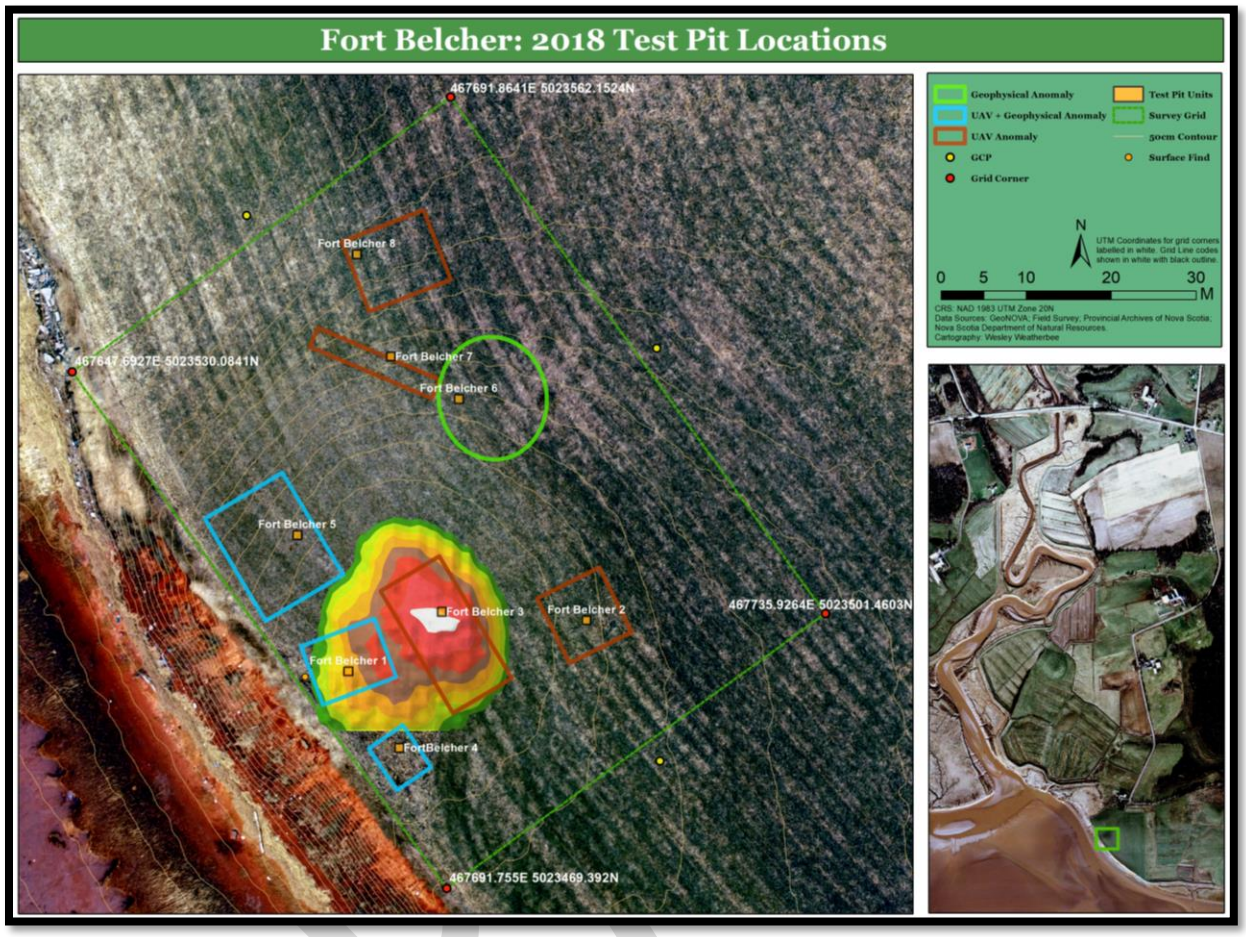

Figure 2: Project map showing excavation units, survey grid, surface finds, and ground control points.

SITE GEOGRAPHY

The location of Fort Belcher is the lower Chiganois River valley. The lower river valley is coastal consisting of low marshlands along estuaries cut deeply by the force of the Fundy tides (**Figure 3; Figure 4**), and gently rolling uplands that overlay a glacial till plain scattered across undivided Late Triassic siltstone bedrock (Webb, Duff, and Langille 1989, 1-4; Wicklund and Smith 1948, 31-32). At the Eastern junction of the Chiganois and Salmon Rivers is the location of Fort Belcher atop a knoll of Pugwash 82 (PWG82) type soil a well-drained, friable, coarse loamy soil of 80cm or more in depth which overlies a firm lower soil of a similar composition that is closer to being a fine sandy soil, the C-horizon (Wicklund and Smith 1948, 31-33). The B_1-horizon is expected to span from 20-30cm DBS, and the B_2-horizon between 30-45cm (Wicklund and Smith 1948, 32). The Pugwash soil type is commonly found on the"upper slopes and knolls that have good surface drainage," are non-rocky, and have little to no stone inclusions in the matrix (Webb, Duff, and Langille 1989, 67-70; Plate 16 – Lower Truro).

Figure 3: Aerial imagery at high-tide from Fort Belcher facing West to the Chiganois River. PGW82 type soils are in the bottom right of the photo, while ACA type soils are present under the vegetation in the right background.

The lowlands of the Fort Belcher area are composed of the Acadia (ACA) type soil a friable to firm, fine, silty loam enriched by marine sediments of 20-50cm in depth atop of the B-horizon. ACA soils are imperfectly drained without the installation of dykes and irrigation channels (Webb, Duff, and Langille 1989, 23-24). Further down the lowlands, approaching the shores of the Chiganois River (**Figure 4**) is the boundary of the ZSM soil type composed of fine, loamy soils deposited along the edges of salt-water estuaries and composed of marine sediment deposits (Webb, Duff, and Langille 1989, 86).

Figure 4: Photo taken of the Chiganois River at low tide in the morning, looking South toward Fort Belcher before the fog had lifted. The marine sediment deposits of the ZSM soil type are clearly visible along banks of the Chiganois River.

BACKGROUND HISTORY

After the expeditions to Cobequid in 1755, Lieutenant Governor Charles Lawrence is only beginning to grasp the importance of the Shubenacadie River as a travel corridor from Cobequid to Chebucto.[1] The focus of the British government was on the growth of their core settlements at Halifax and Annapolis. With the prompt expansion of Halifax into Dartmouth, leading to the scalping of settlers intruding beyond their government's borders, control of the Shubenacadie River began to be of importance to the colony for protection.[2] In a letter dated June 1st, 1754, Lawrence proposes:

"how useful a fort would be at the mouth of the Chibenacadie river, both to prevent the incursions of the Indians into these parts, and in a great measure to hinder the French Inhabitants from carrying their cattle to the French, which at present they do continually."[3]

The Lieutenant Governor seems to be suggesting the construction of what would become Fort Belcher and Fort Ellis. Across the Cobequid Bay from the mouth of the Shubenacadie River and just up-stream is Vil Nijeganiche where the French have been known to transport cattle to Louisbourg from. The cattle trail from Cobequid to Tatamagouche is marked by Lewis (1755) and served as a corridor for the transport of cattle to Louisbourg under the noses of the British.[4]

[1] Lawrence, Charles. "Halifax Executive Minutes of Council," April 18th, 1759. Provincial Archives of Nova Scotia. CO217/14-15, MFM# 13846. p 25-31.

[2] Ibid.

[3] Ibid. p 41-42.

[4] Thomas Lewis, *Isthmus of Chignecto - Map of a Part of Nova Scotia or Acadie* (Nova Scotia/Acadie, 1755).

Fort Belcher has recently become but a place name to most Nova Scotians, if the name is even known. However, situated on a knoll at the East shore of the mouth of the Chiganois River in Cobequid Bay once stood Fort Belcher. **Figure 5** depicts the location of Fort Belcher and surrounding landscape differentiating uplands from marshlands in King's Village. The map has no author or date attached to it; however, the map resembles Charles Morris' cartography, and during the year of 1761 Morris "was on an extended tour through northern Nova Scotia, surveying and mapping the townships of Cobequid, Chignecto, and the Saint John River" (Campbell, 2011: 25-27).

Figure 5: A map of King's Village in Onslow, Nova Scotia. The map is attributed to Charles Morris, thought to have been produced during his surveying tour in 1761. [5]

INHABITANTS

The owner of the Fort Belcher property while the fort still stood was Richard Upham. In 1761 Lieutenant-Governor Belcher gave the Upham family "liberty to occupy such part of the Barracks at Onslow, as shall be necessary for the use of you [Richard Upham] and your family" (Campbell, 2011: 28). Upham was the customs officer for Cobequid, making the Fort Belcher wharf Cobequid's principal landing site for ships (Campbell, 2011: 73). As Upham was also a trader with his own vessel, it is not out of the realm of possibility that Fort Belcher served as a pseudo-trading post during its time standing as well (Campbell, 2011: 50).

[5] Morris, Charles (?), *Plans of Colchester County Portfolio 16 - A Plan of King's Village in the Township of Onslow* (Onslow Township, Colchester County, Nova Scotia, n.d.), NSDNR.

ESTABLISHMENT

The initial idea of Fort Belcher seems to be part of the larger imperial plan to curb the influence of the French military in the region. The capture of Beausejour in 1755 and the Siege of Louisbourg in 1758 would put an end to the intended purpose of Fort Belcher, but the Seven Years War continued until 1763 (Willard 1755; Ostola n.d.). It seems that what became Fort Belcher was beginning to be constructed between 1756 and 1758 because had the British already captured Louisbourg, the chance of a threat from Louisbourg or Canada by way of Tatamagouche to Nijeganiche would be reduced.

In January 1759, Governor Charles Lawrence issued a proclamation that "forts are established in the neighborhood of the lands proposed to be settled."[6] The proclamation also states that these forts are to be "garrisoned by his majesty's troops" to protect the settlers "if here after there should be any need."[7] It is hard to say whether or not the forts were built at that time, implying a construction sometime in 1758 or if the forts were to be constructed on the announcement of grants within a new township. Though, Governor Lawrence seems to be restraining from spending more on defenses at the new settlements in a response to questions about their protection. In April of 1759, the question of if the inhabitants will be given arms and ammunition for defense is raised. In response, Governor Lawrence states that he "cannot promise anything … except arms for a small number" adding that the troops will be additional protection.[8]

After the landing of Richard Upham at Fort Belcher in 1761, he was commissioned as "Captain of a Company of His Majesty's Regim[t] of Militia" (Campbell 2011, 28). This allows us to see that until his death, Upham's business as a merchant, public official, and captain of a militia must have had some part to play in the upkeep and use of Fort Belcher.

The fort was in disrepair in 1767 when Captain William Owen visited Richard Upham's land on the 22nd of September.[9] On April 19th, 1771 Upham transferred the lands "on the East of the lands reserved for and on which the Barracks now stands being in King's Village, Onslow" to William Putnum, Upham's step-son.[10] The deed includes "three acres of pasturing land" on the marsh to the East of the fort and was purchased from Jacob Lynds.

A request to Lieutenant-Governor Richard Hughes regarding the purchase of Richard Upham's property in 1780 by Thomas Brown suggests that fort had been demolished or had completely fallen by this time.[11] Brown's request states that he "hath purchased the Estate of the Late Richard Upham Esq[r] and of the Inhabitants of Truro the lotts in the Kings Village which lands and Village surrounds the ground whereon Fort Belcher Stood".[12] The letter goes on to ask for "a License to Occupy said Fort Ground until it may be wanted for the Kings use" because "it would

[6] Lawrence, Charles. "Halifax Executive Minutes of Council," January 11th, 1759. Provincial Archives of Nova Scotia. RG #1, Vol. 188, MFM# 15288. Page 40-44.

[7] Ibid.

[8] Lawrence, Charles. "Halifax Executive Minutes of Council," April 18th, 1759. Provincial Archives of Nova Scotia. RG #1, Vol. 186, MFM# 15288. Page 56-57.

[9] William Owen, "Journal of Captain William Owen", PANS F100 OW2.

[10] Upham, Richard. "Richard Upham of Onslow in the County of Halifax, Esq. – The Doane Collection" May 5th, 1771. Provincial Archives of Nova Scotia. MG100, Vol. 135, No. 18-18k MFM# 15158.

[11] Thomas Brown and Charles Morris, "license to occupy Fort Belcher land in the township of Onslow. Also a petition for the said license", *Nova Scotia Archives - Nova Scotia Land Papers 1765-1800,* https://novascotia.ca/archives/landpapers/archives.asp?ID=62&Doc=memorial&Page=201100181/.

[12] Ibid.

be very expensive to your Memorialist [Thomas Brown] to fence his lands without including said Fort Lands".[13] These lands, were "about nine acres and an half" as stated by Morris, and can be seen as a dotted line in **Figure 5**.[14]

[13] Ibid.

[14] Ibid.

ARCHAEOLOGICAL RESEARCH

REMOTE SITE PROSPECTION

Much of the work involved in the verification of the physical location of Fort Belcher was achieved through GIS based methods. Freely available LiDAR data from GeoNOVA was used in conjunction with a detailed historical survey map (**Figure 5**) to create an overlay which ties the Fort Belcher and King's Village to the landscape (**Figure 6**) while the interpretation of UAV and geophysical survey results in GIS allowed for these results (**Figure 2; Figure 13; Figure 14**) to be used to inform the location of shovel test excavations.

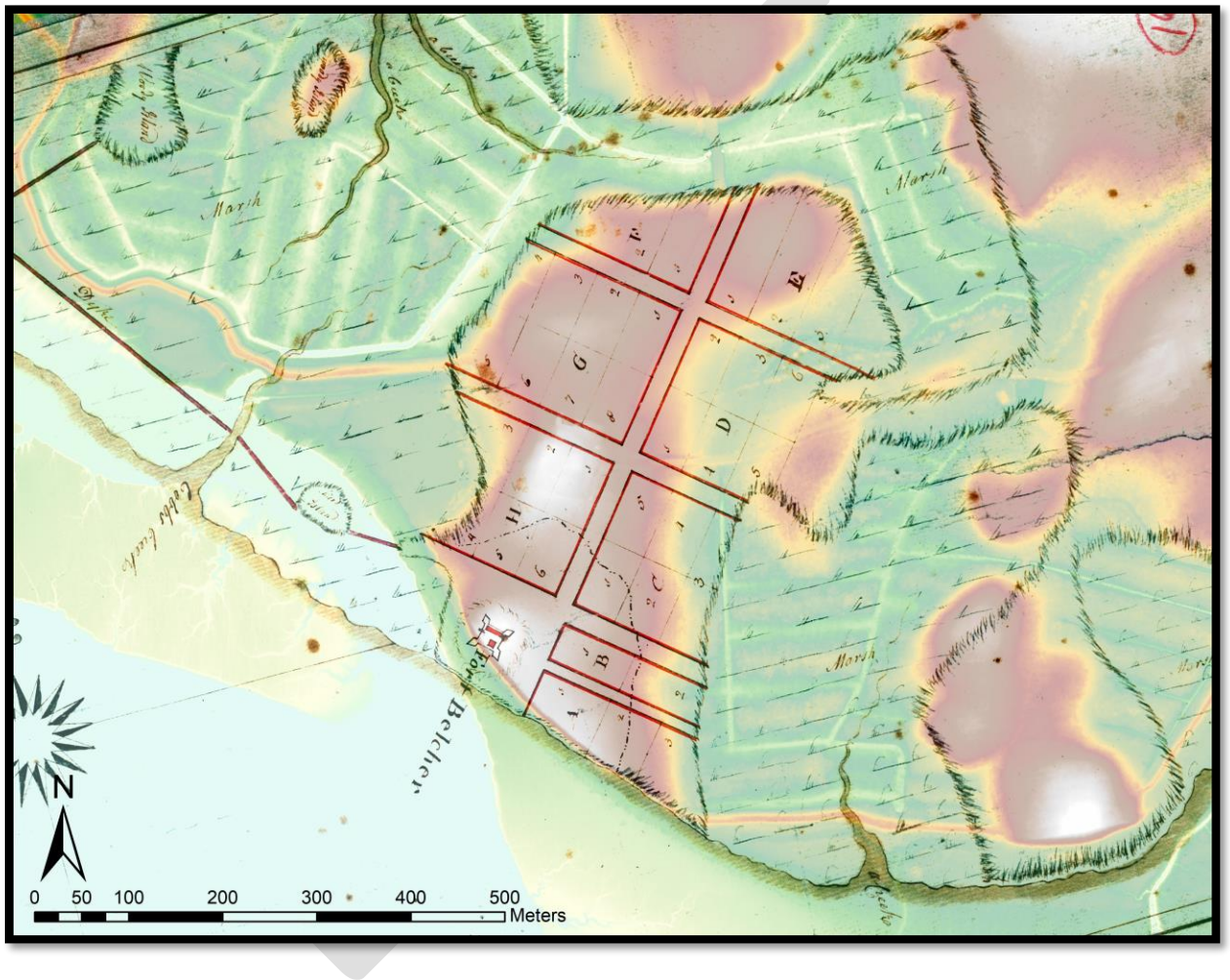

Figure 6: Detailed survey map of Fort Belcher and King's Village overlaid on LiDAR data obtained from GeoNOVA.

Figure 6 shows the map suspected to penned by Charles Morris in 1761 overlaid on a LiDAR derived DEM. The map has been scaled and rotated to account for the historical location of Magnetic North using the National Oceanic and Atmospheric Administration (NOAA) online tool for historical magnetic declination ("Historical Declination Viewer", 2018). The subjects surveyed by Morris, Fort Belcher and King's Village, are hypothesized to be the areas of highest accuracy as they are the subject of the map as well as holding economic and military value to the British colonies.

Charles Morris' surveying ability can be validated along side testing of the hypothesis that Morris' map retains a higher level of accuracy in the areas of Fort Belcher and King's Village due to their nature as subjects of survey and value to the British colonies. As mentioned above, the map in **Figure 6** overlays a map that has been correctly scaled using the conversion of 1 rod to 5.0292 metres (**Figure 7**) and has been rotated to 14 degrees West of North to correct for the historical location of Magnetic North for this location in 1761 ("Historical Declination Viewer", 2018).

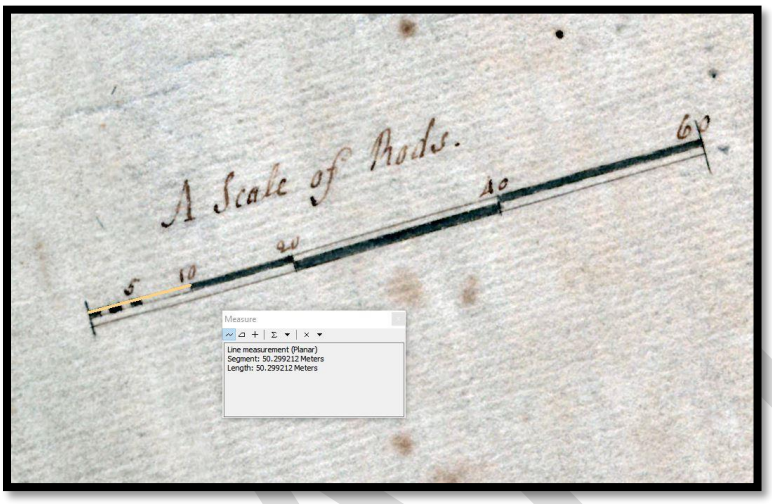

Figure 7: Screentshot of the scale on Morris' map, scaled and rotated, alongside a measured line in ArcMap.

After correcting the scale of the map, the lands of Fort Belcher can be identified as the dotted line by measuring the area of a polygon feature class that traces the dotted line. **Figure 8** shows the result of this exercise. In the case of Morris' map of Fort Belcher, the measured area of the feature class (**Figure 8** left, in red) is 9.49658 acres, while Morris stated in 1780 "about nine acres and an half"[15].

[15] Ibid.

Figure 8: Clipped section of Morris' map (Figure 4) after being scaled (left), and the same image with the fort lands highlighted in red.

This method, alongside LiDAR overlays (**Figure 6**) can be used to georeference historic survey maps and derive metrics from features on these maps. The following criteria can impact the confidence that can be given to the results:

1. The skill of the surveyor, and what tools were employed. i.e – Was the surveyor likely to have a transit or rangefinder at their disposal or were they limited to measuring by chains only?

2. The number of datums needed to map the landscape shown on the map. Was there a need for more than one survey datum? i.e. – Are all surveyed features in the map visible from one location on the ground? If there is a need for the surveyor to combine more than one survey on a map, the map should likely be georeferenced in sections. The size and placement of these sections can likely be informed by viewshed analysis.

3. The meaning or significance of the map to the intended recipient. i.e. – For a defensive structure and surrounding village, a well-done survey would have been necessary, while survey of an individual's woodlot may not necessitate the same treatment.

Though these are not the only criteria that can impact the confidence of results when georeferencing historic survey maps, it can serve as a shortlist of guiding principles for identifying the probability of obtaining an accurate result from this method.

The result of this exercise in remote archaeological site prospection have connected Charles Morris' description of the fort lands in 1780 at Fort Belcher to a real location on the landscape through a historic survey map and supported the hypothesis that the subjects of historical survey will be given more attention than peripheral features. The result of 9.49658 acres as an area from the measured polygon in **Figure 8** not only proves Charles Morris' skill as a surveyor, but that his son Charles Morris had access to this map when corresponding with Thomas Brown in 1780. Confidence in the results of these overlays is highly important to the collection of accurate metrics from historic surveys.

At Fort Belcher, a high level of confidence in the georeferencing of the subjects of the map allows for a better understanding of how erosional processes have impacted the site. **Figure 6** suggests that most of the erosion to

happen since the 1760s has been due to the movement of the Chiganois river. This is evidenced by rounding of the sharp corner on the western edge of the knoll of Fort Belcher being the area of highest erosion and the recession of the marsh at the eastern edge of the mouth of the Chiganois river due to erosion. It is thought that two anthropogenic phenomena, occurring after 1760, directly West of the Chiganois river have impacted the pattern of erosion visible at Fort Belcher. First, the placement of armour stone on the shoreline at Cove d'Eglise has likely restricted flow on the West side of the river, pushing outflow further to the East. Second, the intrusion of dykes into the Cobequid Bay by at least 500m beyond what Acadians had established at Mass House Village has undoubtedly increased the velocity of the waves directed at Fort Belcher. This is only one of the many novel ways that accurate and systematic georeferencing of historical survey maps can be used to help interpret the how humans have directly changed or have influenced changes in landscapes overtime.

FIELD METHODOLOGY

Fieldwork at Fort Belcher undertaken through Summer and Autumn of 2018 consisted of mapping, geophysical and UAV survey and shovel test excavations. The results of these experiments will be outlined in the following.

ANCHORING THE GRID

A Leica GS14 Smart Antenna RTK GNSS was used to anchor all grid corners and test pit locations as well as surface finds. Data from Fort Belcher were collected in NAD83 UTM Zone 20N with a vertical datum of CGVD28, though future data collection will use a vertical datum of CGVD2013. **Figure 9** shows an example of the data collector screen displaying the location of grid corners, test pits and ground control points overlaying a UAV derived orthomosaic of the site.

Figure 9: Screen of the Leica GS14 Smart Antenna RTK GNSS data collector while staking out shovel test locations at Fort Belcher.

SURVEY GRID

The geophysical survey grid (**Figure 10**) was laid out by first surveying the southern corner of the geophysical survey grid using the GNSS. A baseline was created running along the eroding edge of the study area using GIS and an orthomosaic generated from UAV imagery. The original baseline measured 60m and needed to be expanded to 75m to capture all anomalies noted in the UAV survey. The baseline was then projected from the eroding edge of the study area into the field to a total size of 75m x 55m, an area covering all anomalies noted in the UAV generated orthomosaic. The corner points of this grid were then surveyed on site using the GNSS.

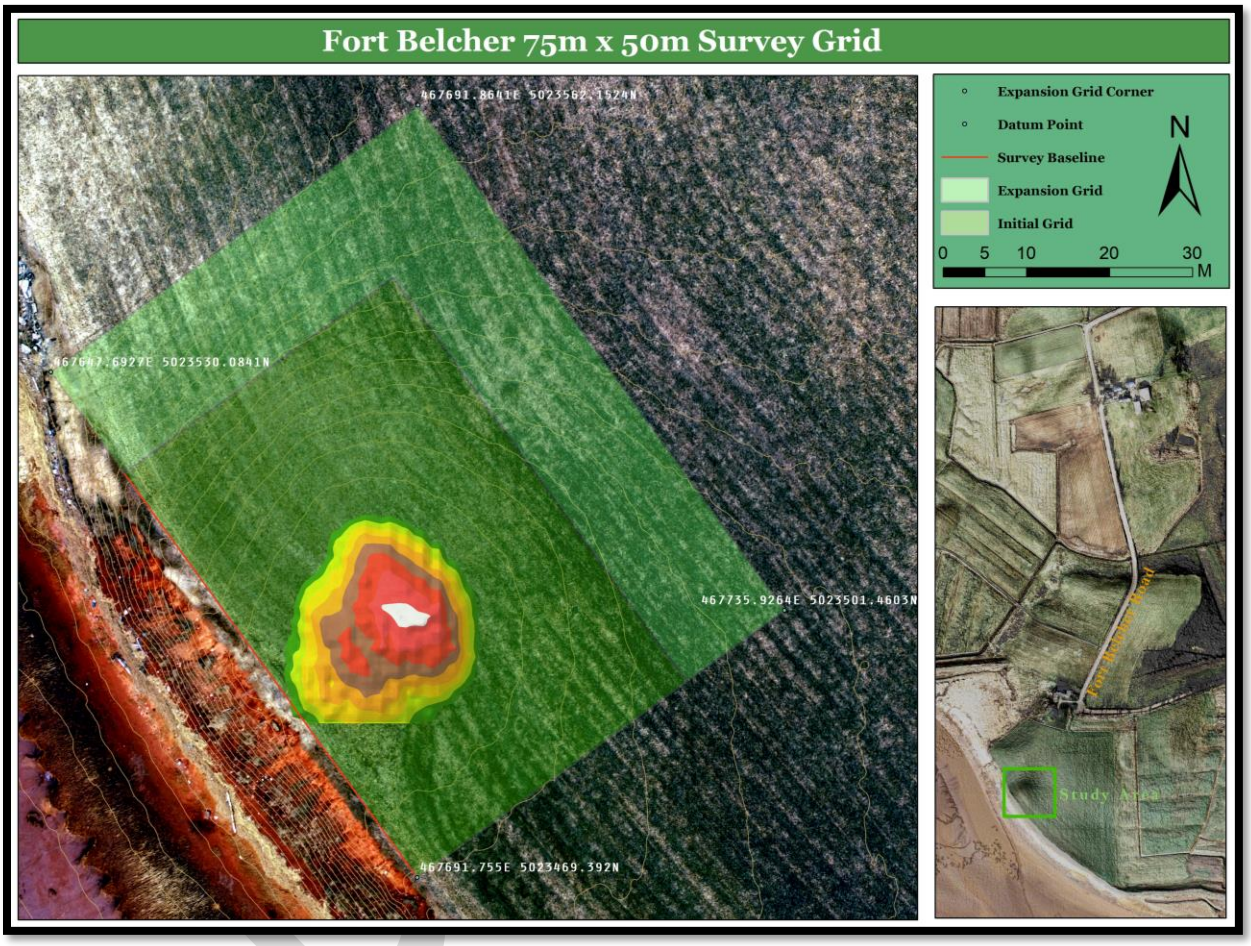

Figure 10: Geophysical survey grid showing the originally surveyed baseline, original grid and expansion grid. A LiDAR derived DEM is overlayed at the top of the hill, thought to be the height of land that Fort Belcher once stood, as noted in Figure 4.

TESTING GRID

The testing grid (**Figure 11**) was created through a combination of field survey using a Leica GS14 Smart Antenna RTK GNSS and desk-based GIS work. This combination allowed for the whole of the area within the geophysical survey grid to be indexed automatically into a computer-generated grid aligned to true North-South at a size of 1m x 1m. Using a true North-South aligned grid index allows for measurements taken of artifacts or features within an excavation unit to be easily converted to UTM coordinates for plotting in GIS when added to the UTM coordinates of the SW corner of the 1m x 1m grid square.

Each shovel test unit excavated is the SW quadrant of a 1m x 1m parent operation within the computer-generated grid index of the survey grid.

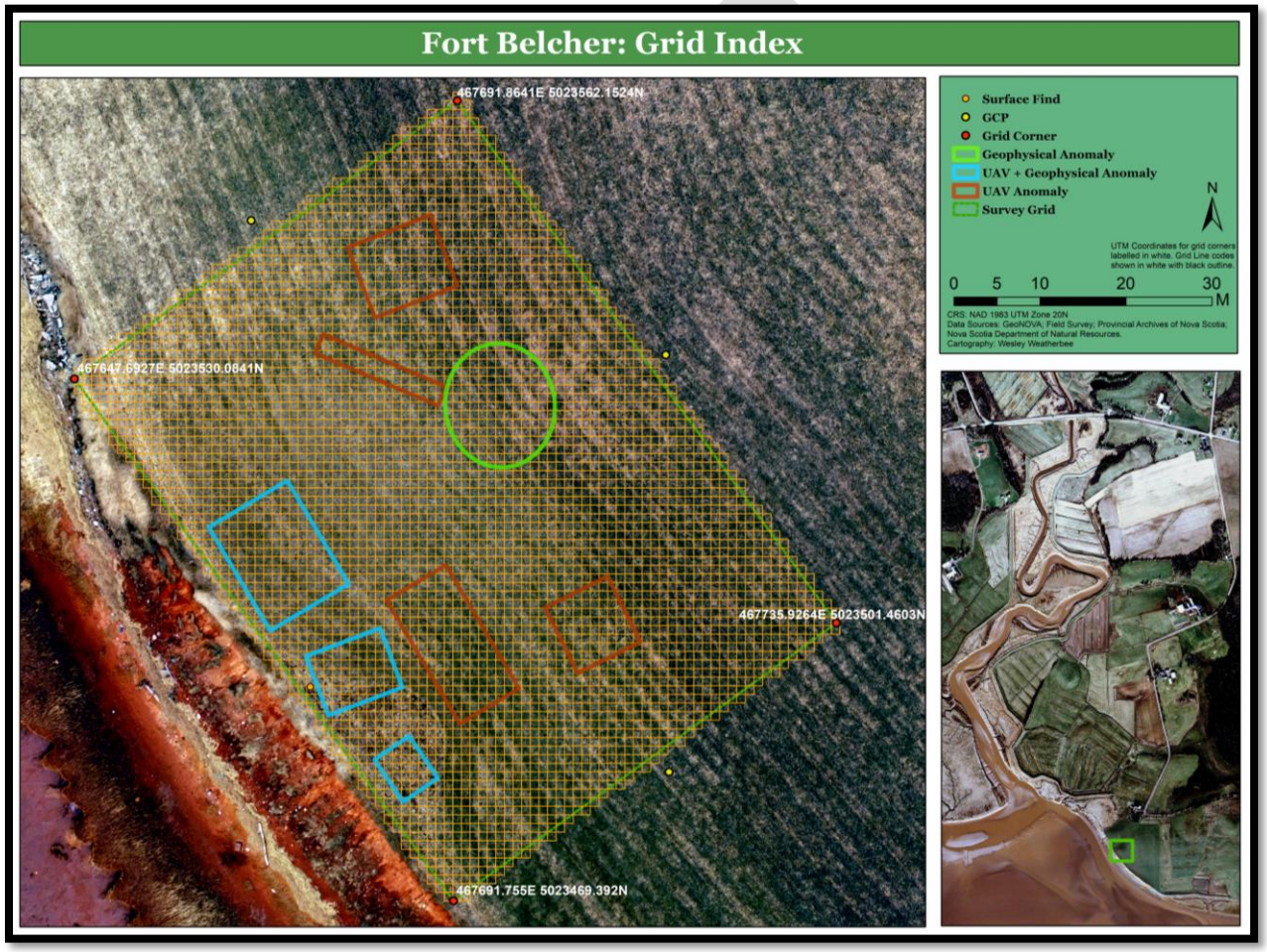

Figure 11: Testing grid created in ArcMap with anomalies overlayed. Anomalies are colour coded by method(s) of identification.

GRID IDENTIFICATION CONVENTIONS

As mentioned above, the testing grid is computer generated and encompasses the complete geophysical survey area. The computer-generated grid also automatically generates grid location IDs for each square, or in this case – possible excavation unit, within the grid. The result is a grid that is a maximum of 89m from East to West and 68m from North to South, which has an origin in the southwest.

Northings are designated with a letter or letter combination (e.g. A, B, C, … AA, AB, AC, etc.). Northings follow the letters of the English alphabet as they ascend from South to North, where A is the most southerly location, and in this particular grid, CP is the most northerly location in the grid.

Eastings are designated a number, and in this particular grid, the Eastings range from 0 to 89. Eastings increase as they move from West to East, where 1 is the most westerly location and 89 is the most easterly location in the grid.

This leads to the following grid identification conventions:

[Northing][Easting]

e.g: Z33 is the grid location ID of test excavation FB1 (**Figure 2**; **Figure 12**).

The following is a table of the test excavations in **Figure 2**, their corresponding grid location IDs, surveyed UTM coordinates for the SW corner of the test units, and a description of the anomaly they should intercept.

Unit	X	Y	Grid Location ID	Anomaly Description
FB1-SW	467679.6927	5023494.392	Z33-SW	Blockhouse Anomaly
FB2-SW	467707.6927	5023500.392	Q39-SW	Small Southern Anomaly
FB3-SW	467690.7136	5023501.384	AP27-SW	Small Rectangular Anomaly Northwest of Blockhouse Anomaly
FB4-SW	467685.7063	5023485.376	AF61-SW	Potential Cellar UAV Anomaly
FB5-SW	467673.7013	5023510.412	AG44-SW	Barracks UAV Anomaly
FB6-SW	467692.6984	5023526.398	BK38-SW	Linear Drain UAV Anomaly
FB7-SW	467684.6809	5023531.405	BF46-SW	Circular Geophysics Anomaly
FB8-SW	467680.6724	5023543.44	BW34-SW	Potential Downslope Cellar/Barn UAV Anomaly

Figure 12: List of planned test excavations at Fort Belcher in 2018. Anomaly descriptions are derived from historic cartography and interpretation of survey results.

SURVEY AND EXCAVATION

Two types of archaeological survey were undertaken at Fort Belcher in 2018. First, a UAV survey was undertaken to map the study area with a high spatial resolution. Second, a geophysical survey was undertaken using an EM38B, which records both the conductivity and magnetic susceptibility of the soil simultaneously.

Archaeological excavations undertaken at Fort Belcher in 2018 consist of 50cm x 50cm shovel test units.

EM38B SURVEY

The EM38B survey undertaken at Fort Belcher used a 1m transect interval beginning at the southern survey grid corner, moving northeast with each consecutive survey transect. The data was processed in DAT38W software from Geonics Limited (Geonics Limited, 2018). The following is a short discussion of the resulting data.

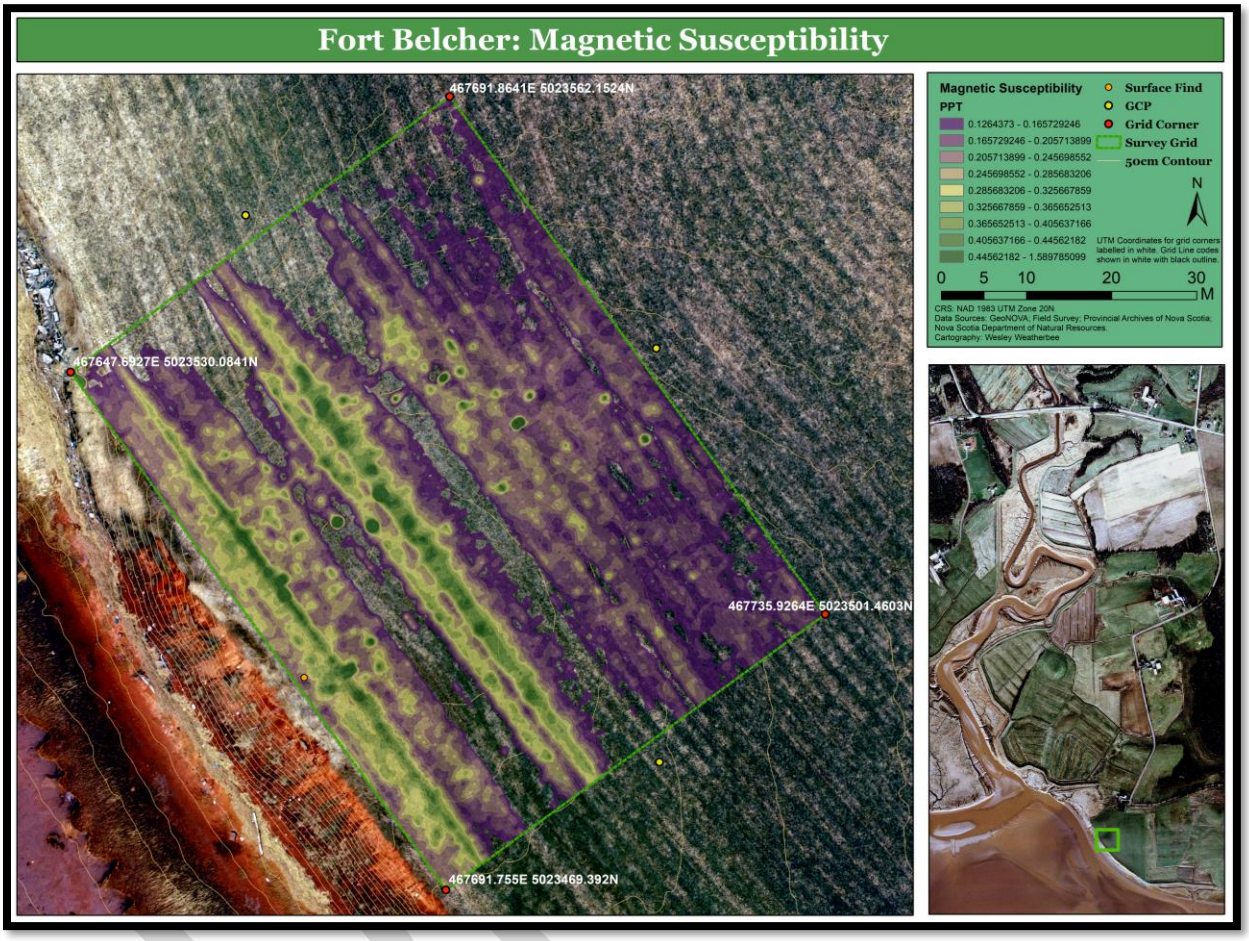

Figure 13: Magnetic susceptibility results from data collected with the EM38B overlaying collected UAV data and survey grid. Low data values below 0.10ppt were clipped from this map.

The magnetic susceptibility channel of the EM38B data revealed little in the way of discrete anomalous responses as would be expected from evidence of burning, stone architecture or metal objects. It is anticipated that something was interfering with the collected data, due the presence of linear highs and lows that lie parallel to the survey transects. It is suspected that an overlooked or unknown metal object is responsible for this interference.

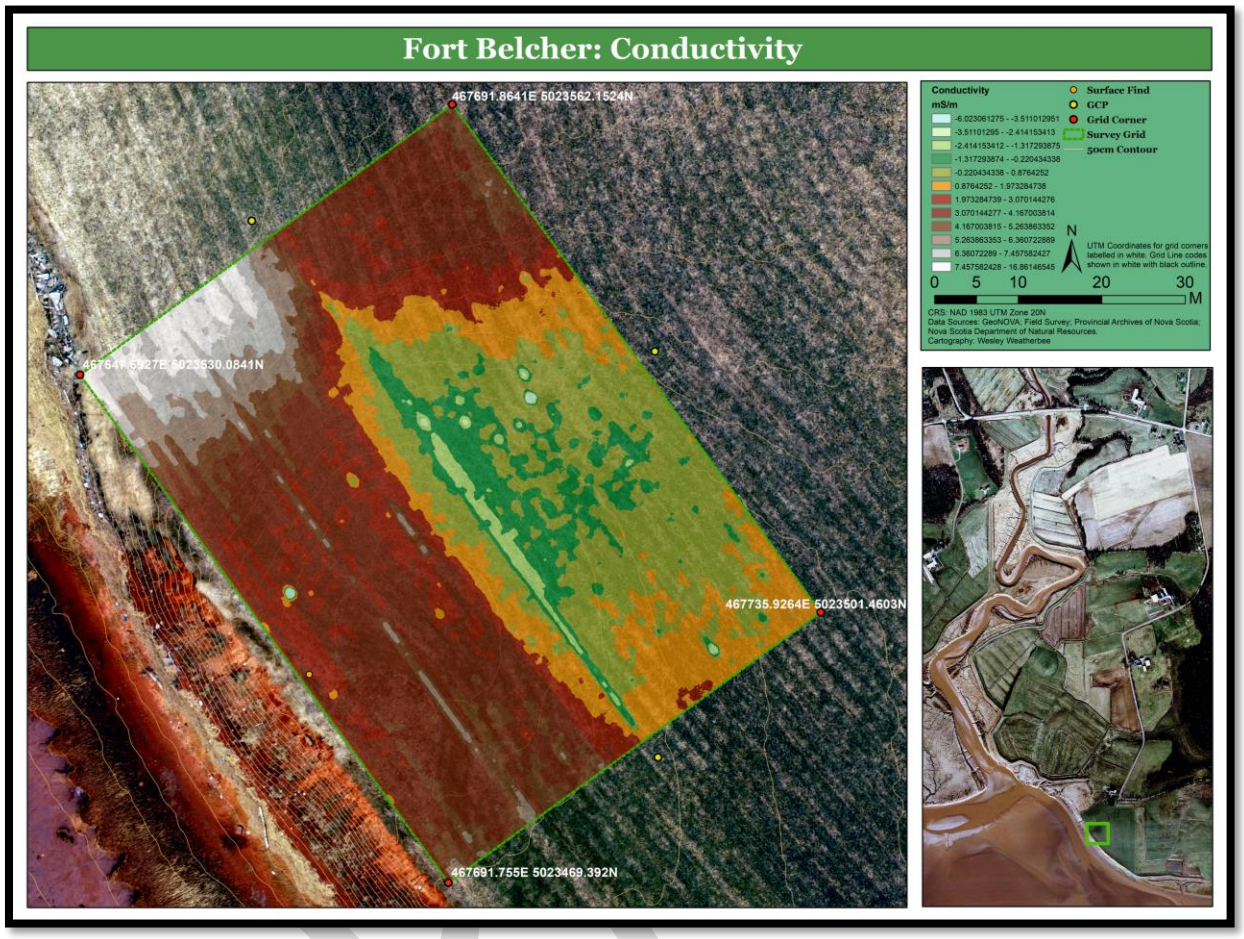

Figure 14: Soil conductivity results from data collected with the EM38B overlaying collected UAV data and survey grid.

Like the magnetic susceptibility data, the conductivity data does not reveal much in the way of signatures expected from intense cultural features; however, the same highs and lows visible in the magnetic susceptibility data are present in the conductivity data but at much smaller amplitudes.

Both channels of data collected by the EM38B at Fort Belcher in 2018 show signs of something interfering with the data collection. The source of this interference is unknown but is suspected to possibly be a metal object that stayed in close proximity to the instrument during the survey.

Nevertheless, the disturbed results are not completely useless. Subtle highs and lows were still present within the data and aligned well with some UAV anomalies. These were noted and guided the placement of test excavations in 2018, though another EM38B survey is expected to be undertaken in 2019 to refine and validate these initial results.

UAV SURVEY

UAV flights were performed twice at Fort Belcher at an altitude of 30m for mapping purposes. The flight pattern was a grid, and images collected retain approximately 80% overlap. The original flight predates the use of the GNSS and did not include ground control points (GCPs). A follow up flight covered a smaller area and used GNSS surveyed GCPs to accurately georeference the photogrammetry derived imagery; however, the second flight encountered an issue with the DJI Go app for iOS and was cut short. The results produced a second orthomosaic that covered the eroding bank and shoreline and approximately half of the survey grid. The produced orthomosaic was then used to correct accuracy of the original flight orthomosaic.

Figure 15: UAV survey and mapping of Fort Belcher.

TEST EXCAVATIONS

Two of eight proposed shovel test units were dug in 2018, shown in **Figure 12** as FB1-SW and FB2-SW. Both units produced artifacts, with a total of 12 objects recovered in FB1-SW and 19 from FB2-SW. Sediments were screened through 8mm wiremesh.

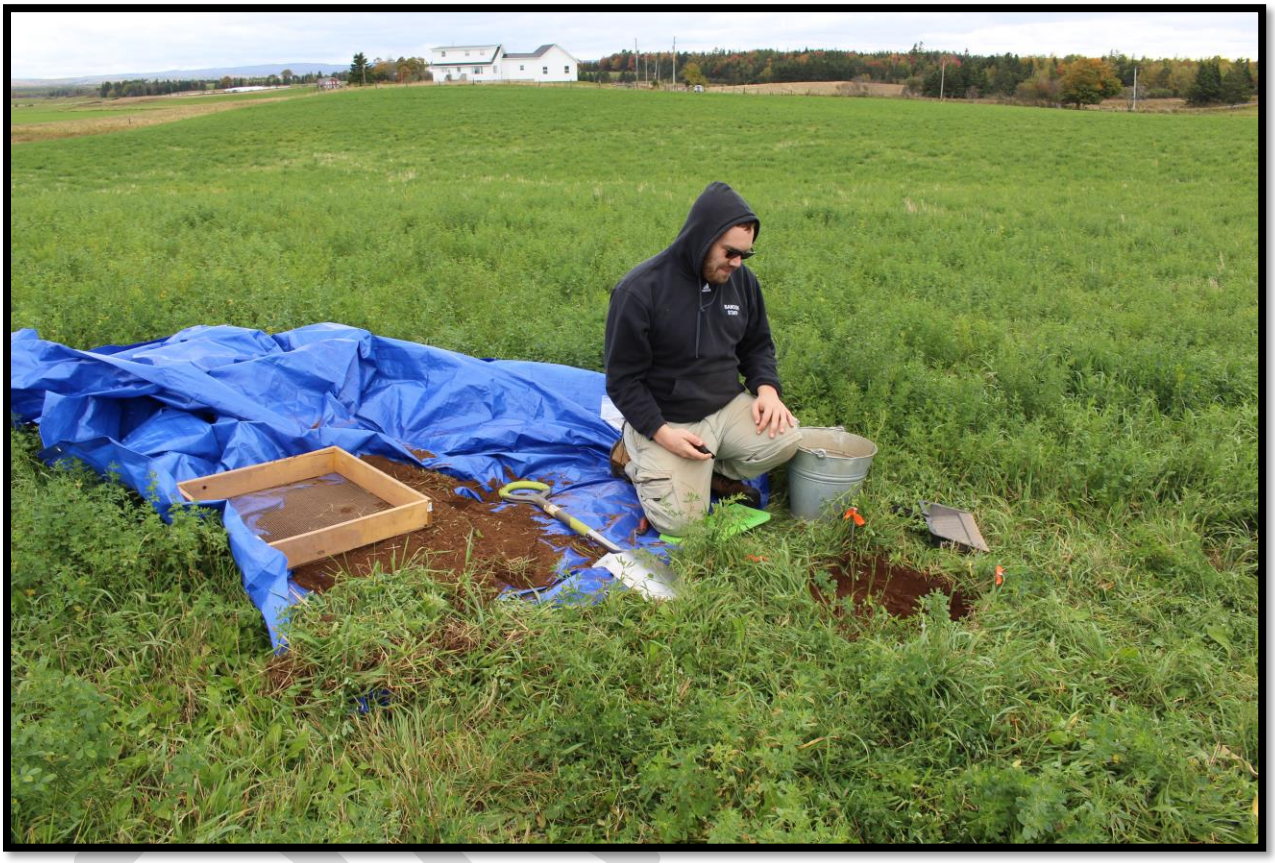

Figure 16: David Jones during excavation of shovel test unit FB2-SW.

FB1-SW

FB1-SW was placed approximately in the centre of what was referred to as the blockhouse anomaly (**Figure 11**). The blockhouse anomaly was named so due to the presence and spatial coincidence of a sub-rectangular anomaly identified in the UAV imagery, subtly elevated responses in the magnetic susceptibility data (to the East of the surface find in **Figure 13**), and the placement of the blockhouse as adjacent to the shoreline in Morris' map (**Figure 8**). A cluster of stones were present on the East edge of the South profile of FB1-SW, which impacted the ability of a shovel to excavate that corner while staying within the plotted unit. The stones in the unit had been heavily impacted by the 'ripper' (**Figure 17**; **Figure 18**). **Figure 18** shows an example of the shattering power of the deep ploughing 'ripper' through an example of a stone that has been struck by a blade, shattering the stone and pushing it 5cm into the compacted B-horizon allowing for topsoil to settle into the cavity created by this movement. This cluster of stones on the South could represent a localized middening of cobblestone in front of the barracks that once stood at Fort Belcher, or a later 19th century occupation at the site. Either of the previous interpretations require the field to have been heavily ploughed, which it likely has been in the past.

Figure 17: FB1-SW with upcast B-horizon from the 'ripper' present just below the centre line. North is left.

Figure 18: Plan view of FB1-SW showing the source of the upcast B-horizon visible in Figure 16.

Figure 19: South profile of FB1-SW. Two slight layers of alluvium are visible of the West profile noting the distinction between lot 2 and lot 3.

Lot 1 in FB1-SW was a very friable reddish-brown loam with plenty of small pebble inclusions. The upcast B-horizon in **Figure 17** was an orange sandy loam with no notable inclusions. Lot 2 was an orange sand with plenty of pebble inclusions, increasing in size from lot 1, and some stone inclusions on the south profile. Lot 3, separated from lot 2 by a very thin film of alluvium, was a highly compacted fine orange sand with plenty of pebble and stone inclusions throughout.

Artifacts recovered from this unit included brick fragments, cut nails, and a small piece of olive coloured glass.

FB2-SW

FB2-SW was placed on the southeastern edge of what was labelled as the cellar anomaly in the UAV imagery (**Figure 2**; **Figure 12**). The unit produced a datable TD pipe bowl fragment from the 18th century (**Figure 20**; **Figure 26**; Oswald, 1975: 135), fragments of calcined bone, a cut nail, brick fragments, melted glass, cinder, and charcoal. Also intriguing was the small piece of barbed wire found in the unit, suggesting a fence at the inland edge of the high point of the knoll in the recent past. The presence of barbed wire could suggest a restriction of ploughing to the less stony areas of the field by fencing an area in which ploughing was too tough in the earlier 20th century.

Figure 20: Location of the TD pipe bowl fragment (FB2-SW-1.8) in FB2-SW-1. North is up.

Lot 1 in FB2-SW was a fine, friable reddish-brown loam with a very slight sand component. The interface of lot 1 and lot 2 was marked with a non-continuous film of alluvium. Lot 2 was a very fine reddish-orange sand with infrequent inclusions of stone and degrading sandstone. Stoniness increased with an increase in depth.

Figure 21: Plan view of the top of lot 3 in FB2-SW. The excavation concluded at the top of lot 3, a more compacted and stonier expression of lot 2.

Figure 22: South profile of FB2-SW.

RESULTS & DISCUSSION

ARTIFACT DESCRIPTIONS

Artifact_ID	Type	Object	Material	Colour	Quantity
FB-SF-1	Domestic	Anglo American redware frag.	Coarse Red Earthenware	Salmon	1
FB-SF-2	Construction	Brick frag.	Brick	Orange	1
FB1-SW-1.1	Construction	Brick frag.	Brick	Orange	8
FB1-SW-1.2	Domestic	Glass shard	Glass	Olive	1
FB1-SW-1.3	Construction	Nail frag., cut	Iron	Rust	1
FB1-SW-2.1	Construction	Brick frag.	Brick	Orange	1
FB1-SW-2.2	Construction	Nail frag., cut	Iron	Rust	1
FB2-SW-1.1	Burning	Glass, melted	Glass	Black; Brown; White	1
FB2-SW-1.2	Construction	Brick frag.	Brick	Orange	10
FB2-SW-1.3	Construction	Nail, cut	Iron	Rust	1
FB2-SW-1.4	Agriculture	Barbed wire frag.	Iron	Rust	1
FB2-SW-1.5	Burning	Charcoal	Charred Wood	Black	1
FB2-SW-1.6	Burning	Cinder	Carbon	Black	1
FB2-SW-1.7	Domestic	Bone frag., calcined	Bone	White	2
FB2-SW-1.8	Smoking	TD Pipe Bowl frag.	Kaolin Clay	Tan	1
FB2-SW-1.9	Construction	Brick frag.	Brick	Orange	1

Figure 23: Complete list of the artifacts found during the archaeological testing at Fort Belcher in 2018.

ARTIFACT NAMING CONVENTIONS

Naming of artifacts follows the grid identification conventions outlined above, with the addition of the excavation quadrant being present after the unit number. All test units are considered the southwest quadrant of a 1m x 1m parent operation. Surface finds were designated a unit ID of FB, while test units are designated with the code FB and a number to represent differentiate each unit. This leads to a naming convention of:

[Unit ID]-[Quadrant/Surface Find]-[Lot].[Artifact Catalogue Number].

e.g: FB2-SW-1.8

FB-SF-1

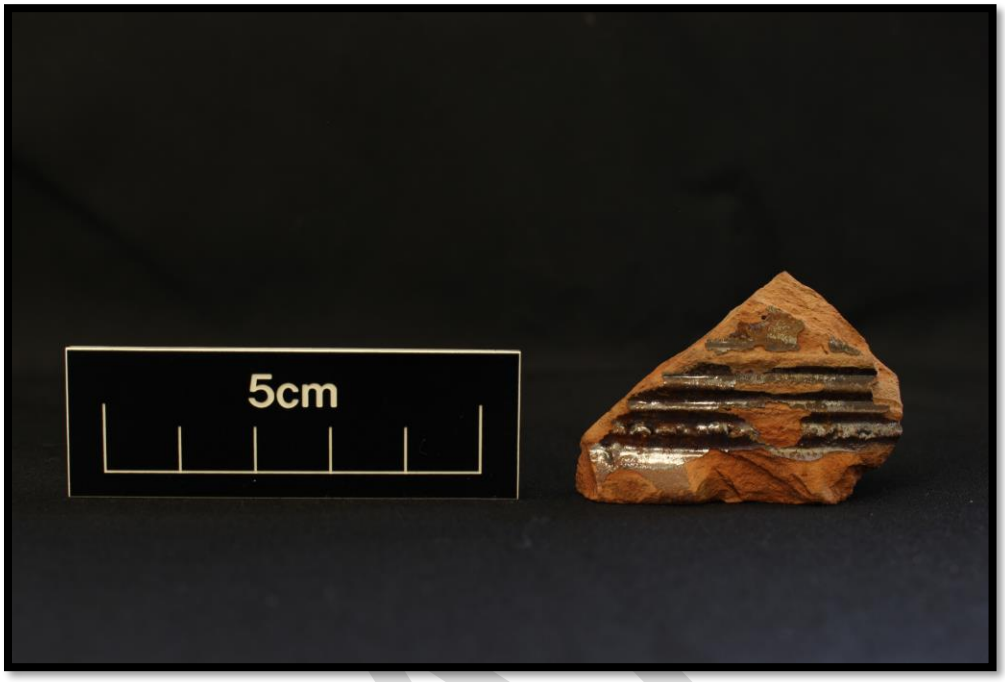

Figure 24: View of the exterior face of FB-SF-1.

FB-SF-1 is a base fragment from a slipped coarse red earthenware vessel, which has white slip present at the bottom of the interior (**Figure 25**) and some impressed banding decoration along with a small dotted relief pattern running parallel to and below the banding (**Figure 24**). The object was recovered at the summit of the knoll, just East of what was identified as the blockhouse anomaly (**Figure 11**; **Figure 12**) by David Jones while laying out the geophysical survey grid. Coarse red earthenware vessels are found in association with early colonial contexts as well as late 19th century and early 20th century deposits.

Figure 25: View of the interior face of FB-SF-1.

FB2-SW-1.8

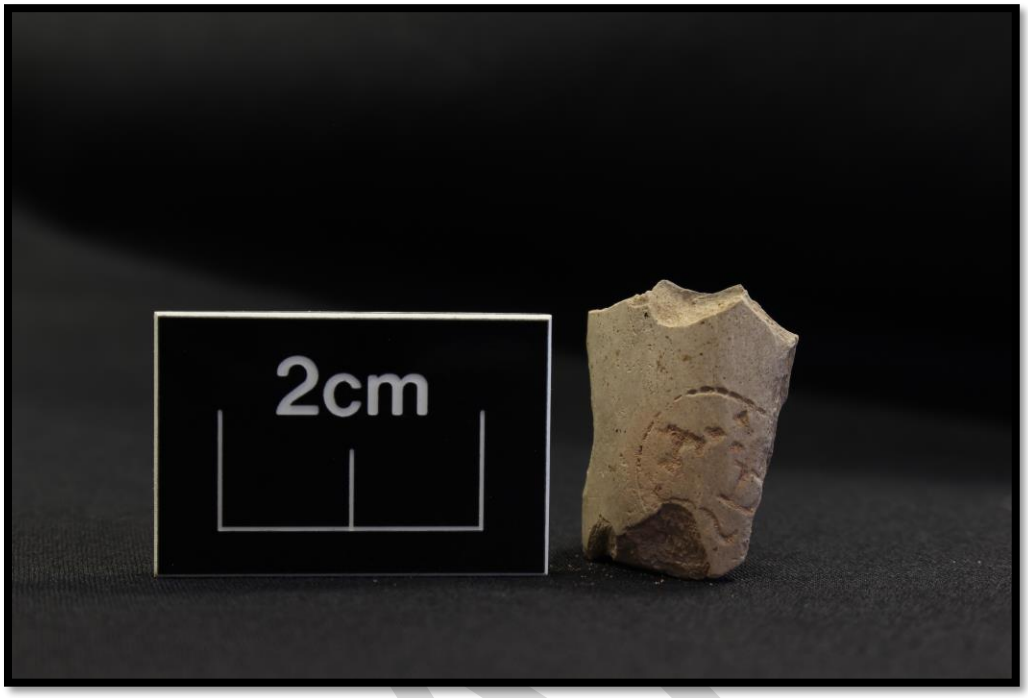

Figure 26: View of the cartouche present on FB2-1.8.

FB2-SW-1.8 is the rear section of a clay tobacco pipe bowl that holds the initials TD within the incuse cartouche. This design is traced to a London tobacco pipe maker Thomas Dormer who produced pipes between 1748 and 1770. This broad date range fits the Fort Belcher and Planter occupation of the landscape, though Thomas Dormer & Son produced a Hudson Bay Company rollout of pipes bound for North America between 1754 and 1756 (Oswald, 1975: 135). These pipes have been found throughout Nova Scotia, including at the French and Acadian sites of Louisbourg and Grand Pré (Atkinson & Oswald, 1980: 374). Thomas Lewis' map of 1755 produced during the Acadian deportation noted deserted houses east of the mouth of the Chiganois river, where Fort Belcher subsequently stood.[16] It is just as possible that this pipe bowl relates to the Acadians who deserted Cobequid for Isle St. Jean, Louisbourg or Canada before the deportation, or to the Cobequid expeditions from Fort Lawrence in summer of 1755 as it is for this pipe bowl fragment to relate to the occupation of Fort Belcher or King's Village.

[16] Lewis, Thomas. *Isthmus of Chignecto - Map of a Part of Nova Scotia or Acadie*. (Nova Scotia/Acadie, 1755), PANS V7|205-1755, O/S No. 8581.

INTERPRETATION

Archaeological excavation and survey at Fort Belcher in 2018 produced a better interpretation of the recent taphonomy of the site as well as a small quantity of 18th and 19th century material culture. Though the landscape has not been ploughed since at least the 1970s, it is thought that the field underwent thorough ploughing during the 19th and early 20th centuries and the current land owner has brought a "ripper" (farming machinery designed to "lift and shatter") through the field once since he has owned the property (Mervyn Ferguson, personal communication, 2018). It is possible however, that the area of the fort was fenced off in the early 20th century due to the presence of barbed wire in FB2, and Mr. Ferguson not recalling a fence near this location. Due to this, it is expected that much of the area is heavily disturbed by the "ripper" at a minimum, though a portion of the original fort footprint may be visible in the area of low vegetation at the summit of the knoll. Further testing will be undertaken in 2019, which will shed more light on the nature of the observed anomalies identified in 2018 surveys.

WORKS CITED:

Atkinson, D.R., and Adrian Oswald. "The Dating and Typology of Clay Pipes Bearing the Royal Arms." In *The Archaeology of the Clay Tobacco Pipe - III. Britain: The North and West*, edited by Peter Davey. BAR British Series 78, 1980. http://scpr.co/PDFs/Armorials/Atkinson%20and%20Oswald%20BAR%201980,%20pgs%20363%20to%20391.pdf.

Brown, Thomas and Charles Morris, "license to occupy Fort Belcher land in the township of Onslow. Also a petition for the said license", *Nova Scotia Archives - Nova Scotia Land Papers 1765-1800,* https://novascotia.ca/archives/landpapers/archives.asp?ID=62&Doc=memorial&Page=20110018l/.

Campbell, Carol. *Necessaries and Sufficiencies: Planter Society in Londonderry, Onslow and Truro Townships 1761-1780*. Sydney, N.S.: Cape Breton University Press, 2011.

Department of Natural Resources, "Geographic Information Systems - Hurricane Juan Imagery | Novascotia.Ca." 2003. https://novascotia.ca/natr/forestry/gis/juanimg.asp.

Geonics Limited. "Software for Geonics Instruments - Downloads." 2018. http://www.geonics.com/html/downloads.html.

Government of Canada, Natural Resources Canada. "Magnetic Declination Calculator." http://www.geomag.nrcan.gc.ca/calc/mdcal-en.php.

Government of Nova Scotia. n.d. "GeoNova: DataLocator - Elevation Explorer." https://nsgi.novascotia.ca/datalocator/elevation/.

Lawrence, Charles. "Halifax Executive Minutes of Council," January 11th, 1759. Provincial Archives of Nova Scotia. RG #1, Vol. 188, MFM# 15288. Page 40-44.

— "Halifax Executive Minutes of Council," April 18th, 1759. Provincial Archives of Nova Scotia. RG #1, Vol. 186, MFM# 15288. Page 56-57.

Lewis, Thomas. *Isthmus of Chignecto - Map of a Part of Nova Scotia or Acadie*. (Nova Scotia/Acadie, 1755), PANS V7|205-1755, O/S No. 8581.

Morris, Charles. *Plans of Colchester County Portfolio 16 - A Plan of King's Village in the Township of Onslow* (Onslow Township, Colchester County, Nova Scotia, n.d.), NSDNR.

NOAA - National Centres for Environmental Information, "Historical Declination Viewer." 2018. https://maps.ngdc.noaa.gov/viewers/historical_declination/.

Ostola, Larry. "The Seige of Louisbourg, 1758," n.d. http://www.militaryheritage.com/louisbg.htm.

Oswald, Adrian. "Clay Pipes for the Archaeologist," British Archaeology Reports. 1975.

Owen, William "Journal of Captain William Owen", PANS F100 OW2.

Upham, Richard. "Richard Upham of Onslow in the County of Halifax, Esq. – The Doane Collection" May 5th, 1771. Provincial Archives of Nova Scotia. MG100, Vol. 135, No. 18-18k MFM# 15158.

Webb, K.T., J.P. Duff, and D.R. Langille. 1989. "Soils of the Cobequid Shore Area of Nova Scotia." Nova Scotia Soil Survey 23. Agriculture Canada. http://sis.agr.gc.ca/cansis/publications/surveys/ns/ns23/ns23_report.pdf.

Wicklund, R.E., and G.R. Smith. "Soil Survey of Colchester County." Nova Scotia Soil Survey. Truro, N.S.: Nova Scotia Department of Agriculture, 1948.

Willard, Abijah. *Journal of Abijah Willard,: 1755.* St. John, N. B.: StJohn, NB, 1930.