Assessment of 2013 Flood Damage to Historic Resources at Blackfoot Crossing Historical Park: Phase 2

by

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University of Calgary
January, 2017

Acknowledgements

The authors thank the students and staff of the 2015 University of Calgary Archaeological Survey class for their diligent work during a brief but very rainy field session. Students involved were: Karina Andersson, Robert Bird, Ashley Cameron, Amanda Dickson, Anthony Hawboldt, Alexa Lacroix, Amy Leedham, and Mikaela Radford. Margaret Patton provided valuable volunteer assistance and leadership during the field portion of the class.

Members of the 2016 University of Calgary Archaeology Field School assisted Archaeology 506 student Cameron Beaton in carrying out his subsurface testing survey program. Students involved were Amy Bastos, Susanne Goosney, Jennifer Levin, Laken McGrath, Alexandra McLean, and Cho Shing Yip. Robert Bird also assisted with the work.

Tatyanna Ewald, Margaret Patton, Alyssa Haggard, Kelsey Pennanen, Kai Hansen, Matthew Abtosway, Holly Fleming, Sarah Ebbern, and Lucy Gill all assisted with Shalcey Dowkes's soil sampling survey in the late fall of 2016.

Executive Summary

Phase 2 of an ongoing assessment of damage to historic resources at Blackfoot Crossing Historical Park (BCHP) was conducted by members of the Fall 2015 University of Calgary Archaeological Survey and Spring 2016 University of Calgary Archaeological Field School. Relevant results of a graduate student's soil testing program conducted during October and November of 2016 are also included in this report.

Surface inspection of areas to the west and north of the EePf–1 fortifications were carried out following installation of a new footbridge. This inspection revealed damage due to heavy equipment movement to two pit features and an associated mound. A deep heavy equipment tire tread that intruded deeply enough into the soil to potentially impact historic resources. Recovery of faunal materials near the newly installed bridge may suggest potential damage to historic resources in that area. Ongoing erosional damage due to natural causes and footpath use was noted at the historic dump site north of the bridge.

Subsurface testing was carried out in three iterations. The first was conducted during the late August of 2015 by University of Calgary Archaeology Survey course students, staff, and volunteers. The second round of subsurface testing was carried out by the University of Calgary Archaeology Field School during May and June of 2016 and a third by graduate student Shalcey Dowkes conducting a soil/phytolith sampling survey of the area.

A total of 190 subsurface tests were excavated. Buried historic resources were encountered to the north and west of the fortifications, some very near the contemporary surface and susceptible to damage by vehicular traffic. The presence of multiple surface features and buried historical resources outside the fortifications suggest that the site limits should be expanded considerably.

River edge inspections conducted during the fall of 2015 and the spring of 2016 revealed the presence of multiple historic resources, including hearths, at a variety of depths in the cutbank face. These resources are subject to ongoing erosion of the Bow River bank in this area.

<u>Recommendations</u>

- The full vertical extent of cultural deposits at BCHP remains to be explored. A program of deep testing throughout the property should be undertaken to support a full analysis of the scientific, cultural, historical, and educational significance of the resources in the park.

- Loss of cultural materials, including deeply buried features, to cutbank erosion is ongoing. Deep testing and salvage excavations should be conducted to assess the nature of cultural deposits in that area.
- Policies should be put in place to protect the fragile cultural and natural resources of BCHP. Specifically, vehicular traffic should be tightly controlled and restricted. Vehicular traffic should be banned completely during and following wet weather. The vehicle trail through the fortifications should be closed.
- A full listing of cultural, historical, and natural resources in the park should be made to facilitate planning for enhanced educational and visitor experiences.

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1 Introduction

The Cluny Fortified Village site (EePf–1) is located at Blackfoot Crossing Historical Park (BCHP) on the Siksika Nation (Figure 1). This National Historic Site is of great scientific, cultural, ethnic, educational, and interpretive significance. Potential damage to a site of such significance is a cause for great concern to all stakeholders and the effects of any event that could result in the loss of historic resources there must be examined.

The catastrophic flood of 2013 caused a great deal of damage and suffering on the Siksika First Nation. The first concern of all was to alleviate the immediate impacts on the people and their homes. The 2013 University of Calgary archaeological field school helped with that effort by sponsoring a pancake breakfast in nearby Strathmore to raise funds for the distressed. The task of rebuilding the affected communities and lives continues as governments and nongovernmental organizations extend their efforts onto the Nation.

For University of Calgary archaeologists, it became appropriate to consider the impact of the flood on historic resources at (BCHP), the locus of the University of Calgary archaeological field school and public archaeology program. Inspection of the Cluny Fortified Village site during the fall of 2013 revealed no damage to the site itself, although a layer of silt some six to eight cm in thickness was added to the surface. Further exploration of the BCHP property was encouraged by BCHP and by Alberta Culture. Consequently, Phase 1 of a reconnaissance and survey of cutbanks and land surfaces impacted by the 2013 Bow River flood was conducted within BCHP by the University of Calgary archaeological field school and public archaeology program during the spring of 2015. Phase 1 consisted entirely of a surface inspection of those areas of the cutbank accessible by foot and of selected areas within BCHP. Findings and recommendations of that work are reported in Walde et al. (2015).

Following the completion of Phase 1 of the Spring 2015 survey, a footbridge that had been destroyed by the 2013 flood was replaced during the summer of that year using heavy machinery. Impact on the areas near the fortifications used by the necessary heavy equipment operation needed to be assessed. It was also noted that erosion of the Bow River bank was continuing and the impact of that needed to be assessed.

Phase 2 of the reconnaissance and survey work involved more detailed work that included exhaustive surface inspection, controlled subsurface testing (SST), and reinspection of the Bow River cutbank. The work was conducted by the 2015 University of Calgary Archaeological Survey class and the 2016 University of Calgary Archaeological Field School. The results of that work are reported below.

2 Methods

2.1 Surface Inspection

An initial surface inspection of the area to the west and north of the EePf–1 fortifications was conducted by the 2015 University of Calgary Archaeology Field School (Walde et al. 2015). Traffic and construction activities conducted following the survey encouraged a second surface inspection of those areas.

Surface inspection was carried out by crew members walking at 2 metre intervals over the study area. Features and artifacts encountered were marked for later close inspection and recording. The locations of all features and small finds were recorded using handheld GPS units and detailed photographs were made of each location. Data including dimensions and depths of features were also recorded.

2.2 Cutbank Inspection

An initial cutbank inspection was carried out in the spring of 2015 by the University of Calgary Archaeology Field School (Walde et al. 2015). Continuing erosion encouraged two more inspections of the accessible cutbank exposure within Blackfoot Crossing Historical Park, one by the 2015 University of Calgary Archaeology Survey course students, staff, and volunteers and one by the 2016 University of Calgary Archaeology Field School.

The cutbank exposures were inspected by teams of two to three crew members. The locations of all features and artifacts observed were recorded using handheld GPS units and depths of burial and dimensions of all in situ features were noted. All features and artifacts observed were photographed. Cutbank finds and features recording forms are presented in digital Appendices 1 and 2.

Cutbank erosion is ongoing at BCHP and it is of some interest that new features and finds were encountered with repeated iterations of inspection while materials noted in earlier inspections were not found during later work. Loss of cultural materials due to cutbank erosion is an continuing phenomenon.

2.3 Subsurface Testing (SST)

Subsurface testing was carried out in three iterations. The first was conducted during the late August of 2015 by University of Calgary Archaeology Survey course students, staff, and volunteers. The second round of subsurface testing was carried out by the University of Calgary Archaeology Field School during May and June of 2016.

A third phase of subsurface testing was conducted by Shalcey Dowkes, a University of Calgary graduate student, during November of 2016. That subsurface survey was designed to obtain soil samples for phytolith analysis and was not conducted to search for archaeological materials. However, any archaeological materials encountered were collected and provenience recorded so the results of that work are included here.

2.3.1 2015/2016 Class Subsurface Testing Methods

The class subsurface testing programs were conducted using a 10 metre grid based on an arrangement of equilateral triangles (Figure 2). Such "hexagonal" grids have the advantage that they are more efficient for the intersection of circular and elongated targets of unknown orientation than rectangular or square arrays (Banning 2002:98). Experience also suggests that triangular grids are also more easily, quickly, and accurately established in the field than are rectangular arrangements.

Subsurface test excavations were conducted in 5 cm levels using shovels and all matrix was screened through 6 mm mesh. SSTs were excavated to a depth of 40 cm unless the top of the underlying gravel deposit was encountered above that level, in which case excavations ceased there.

Depth provenience of archaeological materials was recorded and soil associations were noted. Finds were bagged and taken to the University of Calgary Field School Laboratory for processing and cataloguing. SST excavation forms are presented in digital Appendices 3 and 4.

2.3.2 2016 Graduate Research Subsurface Testing Methods

The soil sample survey was conducted using a nonaligned stratified systematic sampling procedure during October and November of 2016 by a team led by Shalcey Dowkes (20160611). Strata in the form of 100 m quadrats were established on a map of the study area and locations for SSTs were randomly selected within each quadrat (Figure 2). Excavations were conducted using shovels but matrix was not screened as artifact recovery was not the aim of the field work. Depths of the tests varied considerably as each unit was excavated to the B soil horizon level, which varied between 5 and 50 cm below the present surface. Provenience of archaeological materials was recorded and finds were then bagged and taken to the University of Calgary Field School Laboratory for processing and cataloguing.

3 Results

3.1 Surface Inspection

Findspot 2015–009, a small mound located some 164 m southwest of the EePf–1 fortification ditch (Figure 3) was first inspected during the Spring 2015 survey (Walde et al. 2015). That feature was revisited during the Fall 2015 survey and subjected to more detailed measurement including total station survey. The roughly oval shaped mound is about 25 cm high, 3 m long west to east, and 2.5 m wide south to north. The mound appears to have been formed by earth taken from the depressions to its west and southwest.

A transect surface survey to identify damage caused by construction activity conducted in the area during the summer of 2015 was carried out to the west of the Cluny Fortified

Village Site during the field portion of the Survey class. Two damaged pit features (Forbis Features 16 and 19—easternmost and westernmost damage locations identified on Figure 2), an oil spill (southernmost damage location identified on Figure 2), and a deep heavy equipment tire mark depression (immediately to the southwest of Forbis Feature 16 on Figure 2) were identified in this area by the survey.

One pit feature damaged by heavy equipment traffic, likely during the 2015 late summer bridge construction activities is Forbis Feature 16 (Forbis 1977. The pit walls that once were slightly raised are now flat and tire tread marks are visible (Plate 2). This damaged pit is located near a deep heavy equipment tire impression located 1.5m to the north of the pit. None of this damage was present when the feature was inspected during the initial flood damage survey conducted during the spring of 2015 (Walde et al. 2015).

The second damaged pit is Forbis Feature 19. This pit is 2.15 meters east to west, and 2.36 meters north to south. Heavy equipment tire tread marks have cut into the pit on the east portion of the wall (Plate 1)), and the west portion of the wall was partially collapsed. This pit is associated with an earthen mound 4m to the east centre to centre (Findspot 13, Walde et al 2015). The mound measures 2.69 meters east to west and 2.91 meters north to south. This mound was visibly driven over by heavy equipment as its contour changed from its original configuration noted during the Spring Archaeological Field School 2015 and from previous observations at the site. The ground was likely wet when this damage was done given the pressure needed for the depth of the tire treads. Construction vehicles likely caused this damage during the 2015 summer bridge construction project.

The oil spill observed had dimensions of 2.1 meters by 2.5 meters and probably occurred during construction activities associated with the installation of the new bridge during the late summer of 2015.

The newly installed footbridge and its surrounding area were also surveyed for damage (outlined in yellow on Figure 2). Photographs were taken of the construction area around the new bridge (Plate 3). The recovery of bone fragments in the excavated area may suggest that historic resources were destroyed during construction. The historic dump (Walde et al. 2015) along the path to the north of the bridge was reassessed and recorded (Figure 2, Plate 4).

3.2 Cutbank Inspection

A survey of the accessible cutbank exposure within BCHP was conducted in three iterations. The first, completed by Dale Walde during the spring of 2015, has been described in Walde et al. (2015). The second and third iterations were conducted by two classes: The Fall 2015 Archaeological Survey course (201509) and the Spring 2016 Field

School under the immediate direction of Cameron Beaton (201606). A total of 27 feature and finds locations were noted (Figure 2).

Many of the in situ finds and features noted during the cutbank survey occur below the depths explored by the SST survey. Clearly, deep testing is required in those areas of the site where the gravel base is below 40 cm under the present surface. While positive SSTs do indicate the presence of cultural materials, they do not necessarily indicate the full vertical and horizontal extent of cultural deposits. Negative SSTs similarly did not explore the full vertical extent of deposits above the gravel base and the results of those tests cannot be taken to indicate the absence of cultural deposits, only their absence in the levels investigated.

3.2.1 Hearths

Two hearth features were noted during the 2015 Spring cutbank inspection and are described in Walde et al. (2015). The first hearth feature (20150519–003) was located 1 m below the present surface and was relocated during the 201606 survey (Findspot 201606–022). The second hearth feature (20150519–007) was located 1.1 m below the present surface and was relocated during the 201509 survey (Findspot 201509–001).

The 201606 cutbank inspection located three additional hearth features that were not visible during the 2015 surveys. 201606–002 (12U 369115.40 5626967.40), 201606–006 (12U 369106.80 5626966.70), and 201606–019 (12U 369011.80 5626947.50).

The hearth at Findspot 201606–002 was 5 cm thick and located at it base some 35 cm below the present surface (Plate 5).

The hearth at Findspot 201606–006 was 3 cm thick and located at its base some 12 cm below the present surface (Plate 6).

The hearth at Findspot 201606–019 was located 1.2 m below the present surface. The hearth feature was found immediately above a recent slump and was partially removed by that slump (Plate 7). A small fragment of mammal bone was noted in the hearth.

A 15 cm thick ash lens (Findspot 201606-022; 12 U 368985.10 5626938.3) was discovered at a basal depth of 1.17 m. A fragment of mammalian bone was noted in that deposit (Plate 8).

A 15 cm thick ash lens (Findspot 201606-023; 12 U 368972.20 5626937.70) was discovered at a basal depth of 1.05 m. A fragment of mammalian bone was noted in that deposit (Plate 9).

A 10 cm thick ash lens (Findspot 201606–26. 12U 368887.20 5626907.00) was found at its base some 60 cm below the present surface (Plate 10).

3.2.2 Soil Features

Two unique sedimentary features were also identified during the 201509 cutbank survey. A thin brown sedimentary deposit (Findspot 201509–002), approximately 1 centimeter thick, was identified at UTM: 12U 0368989 5626938, 1.8 meters below the surface on the cutbank face. This thin brown deposit continues for 2 meters to the North East.

A thin white sedimentary deposit (Feature 201509–003), approximately 0.5 centimeters thick, was identified at UTM: 0368998 5626937, 1.8 meters below the surface on the cutbank face. This thin white deposit continues for 2.2 meters to the North East (Plate 11).

A contemporary A Horizon and 3 buried A Horizons were observed at 12U 0369128 5626974 on the cutbank face.

3.2.3 Lithics

A piece of porcellanite shatter and an unidentifiable flaked tool fragment were noted in the cutbank talus at Findspot 201606–009 (12U 369105.70 5626964.90).

3.2.4 Faunal Remains

Two identifiable is situ faunal remains were identified and recorded during the 201509 cutbank survey. The first, a large bovid long bone (Findspot 201509–004) was found at UTM 12U 0369004 5626947. This specimen was located in situ 1.8 meters below the present surface.

The second specimen, a distal femur from a large bovid, (Findspot 201509–005) was encountered UTM 12U 0369005 5626946. This specimen was found in situ 2.1 meters below the present surface.

Several clusters of faunal remains were encountered out of context in the cutbank slump. The first was a bone cluster at Findspot 201509–010 (12U 0369107 5626972).

A large mammal bone fragment was identified in the slump at Findspot 201509–011 (12U 0369098).

A cluster of fragments mammal bone was found in the gravel alongside the cutbank at Findspot 201509–012 (12U 0369068 5626961).

Another cluster of fragmented mammal bone was identified alongside the cutbank at Findspot 201509–013 (12U 0369049 5626958).

An isolated large bovid tooth was noted in the cutbank slump material at Findspot 201606–003 immediately below the hearth at 201606-002.

Mammal bone fragments were also noted in the cutbank slump material at Findspots 201606–008, 009, 013, 018, and 025.

3.3 Subsurface Testing (Figure 2)

3.3.1 Soil Test Results

During Dowkes's soil test survey, 132 SSTs were made. Of these, two to the north of the fortifications at EePf–1 yielded cultural materials. SST 2016–137 produced spirally fractured faunal remains and a piece of firebroken rock while SST 2016–136 produced mammalian faunal remains and firebroken rock between 3 and 19 cm below the present surface.

3.3.2 2015–2016 Field School and Archaeological Survey Class SST Results

A total of 58 SSTs were excavated by students from the two University of Calgary classes. Thirteen of these yielded cultural materials (total=109). Finds included bone, burned bone, charcoal, flakes, shatter, firebroken rock, and First Nations ceramics (digital Appendix 5).

4 Resource Assessment and Discussion

Results of the reconnaissance and survey projects conducted during 2015–2016 indicate clearly that buried cultural components at BCHP extend well beyond the confines of the fortifications at EePf–1 (Figure 2) (see also Forbis 1977). Previous work (Walde et al. 2011) also demonstrates that important cultural resources extend beyond the confines of the park but those are beyond the scope of this report.

Assessment of damage due to construction and vehicular traffic indicates many of the cultural resources of BCHP are located at or very near the present ground surface and are extremely susceptible to damage caused by vehicular traffic, especially during and following wet weather.

While many cultural resources in the park are very shallowly buried others are located at some depth. The results of the cutbank survey reveal the presence of deeply buried cultural and palaeontological resources (see also Walde 2008 and Walde et al. 2015). The full vertical and horizontal extents of these resources remain to be explored but those resources located in proximity to the Bow River are at hazard from ongoing cutbank erosion (Plate 12).

Blackfoot Crossing Historical Park cultural resources are of very high significance on several criteria. The importance of the fortifications at EePf–1 have been recognized through their designation as a National Historic Site. However, it is now apparent that this site is more complex than initially suggested and is situated in an important cultural and natural landscape. The presence of multiple cultural components within and beyond the fortifications at EePf–1 extend its history considerably and heightens its already high value as an archaeological resource. The presence of fossil materials in the gravels below the cultural components adds further scientific value.

The educational and interpretive values of the cultural resources at the park have been considerably enhanced by the operation of the Interpretive Centre and its associated interpretive trails. These significance values were once low due to the isolation of EePf–1 but they are of much more importance now.

Recent recovery of artifacts assignable to ancestral Blackfoot peoples at the site enhances the ethic and cultural significance of EePf–1. The site had previously been thought to be solely and briefly occupied by a visiting First Nations group but it is now clear that the site was occupied for a longer period of time and that ancestral Blackfoot people also resided at the site.

On scientific, cultural, ethnic, historical, educational, and interpretive criteria, the resources at BCHP are of the highest significance.

5 Recommendations

- The full vertical extent of cultural deposits at BCHP remains to be explored. A program of deep testing throughout the property should be undertaken to support a full analysis of the scientific, cultural, historical, and educational significance of the resources in the park.
- Loss of cultural materials, including deeply buried features, to cutbank erosion is ongoing. Deep testing and salvage excavations should be conducted to assess the nature of cultural deposits in that area.
- Policies should be put in place to protect the fragile cultural and natural resources of BCHP. Specifically, vehicular traffic should be tightly controlled and restricted. Vehicular traffic should be banned completely during and following wet weather. The vehicle trail through the fortifications should be closed.
- The scientific and educational significance of the natural resources of the park should be studied and evaluated.
- A full listing of cultural, historical, and natural resources in the park should be made to facilitate planning for enhanced educational and visitor experiences.

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7 Figures

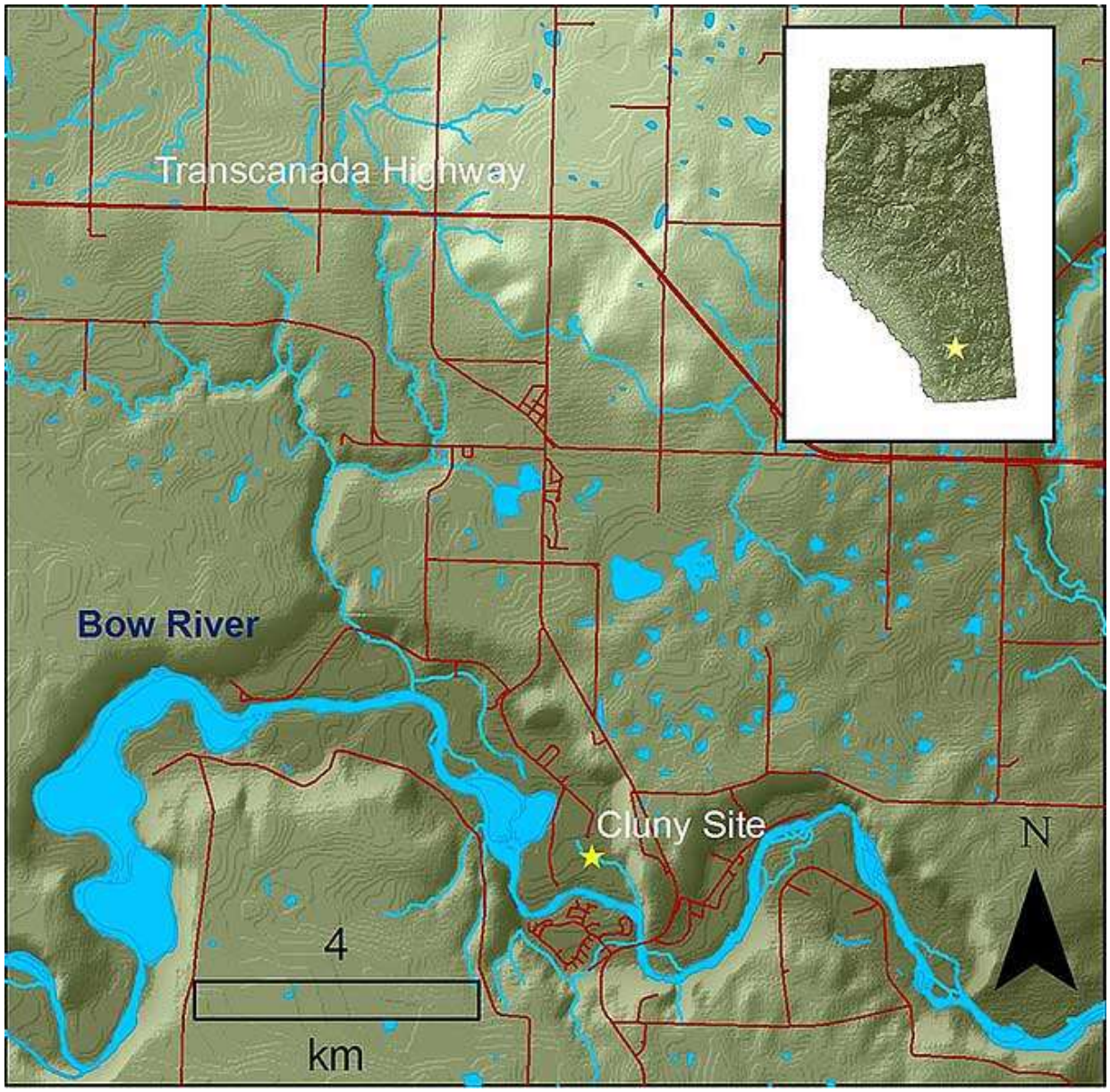

Figure 1. Site location.

Figure 2. 2015–2015 SST and feature and finds locations (North is at the top of the figure). Red symbols represent culturally sterile SST locations, yellow symbols indicate culturally productive SSTs, blue symbols show locations of cutbank features and finds from the Fall 2015 and Spring 2016 survey, while orange symbols display the locations of cutbank finds and features from the Spring 2015 survey. Large purple dots represent the surface features and findspots located during the Spring 2015 survey. Purple dots with enclosed crossed circles represent damaged Forbis pit features 16 and 19, while the red crossed circles represent other construction damage noted during the Fall 2015 survey. The new bridge construction area is outlined in yellow.

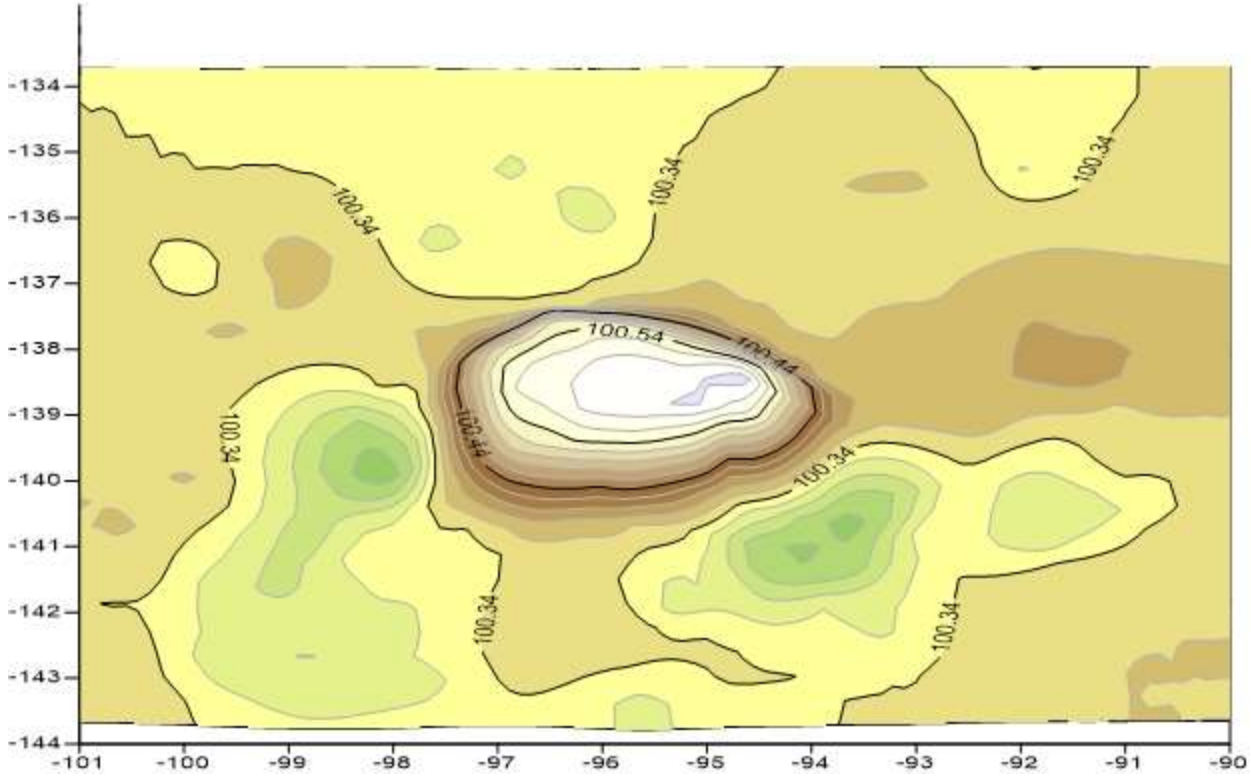

Figure 3. Three dimensional topographic representation of Findspot 2015–09. The roughly oval shaped mound is about 20 cm high, 3 m long west to east, and 2.5 m wide south to north. The mound appears to have been formed by earth taken from the depressions to its west and southwest.

8 Plates

Plate 1. Vehicle damage to Forbis Feature 19.

Plate 2. Close view of damage to Forbis Feature 16.

Plate 3. Footbridge construction damage to oxbow looking north. The historic dump site is immediately north of the bridge.

Plate 4. Historic dump detail.

Plate 5. Hearth in cutbank (201606–002).

Plate 6. Hearth in cutbank (201606–006).

Plate 7. Hearth in cutbank (201606–019). Note bone fragment in upper right corner of the hearth.

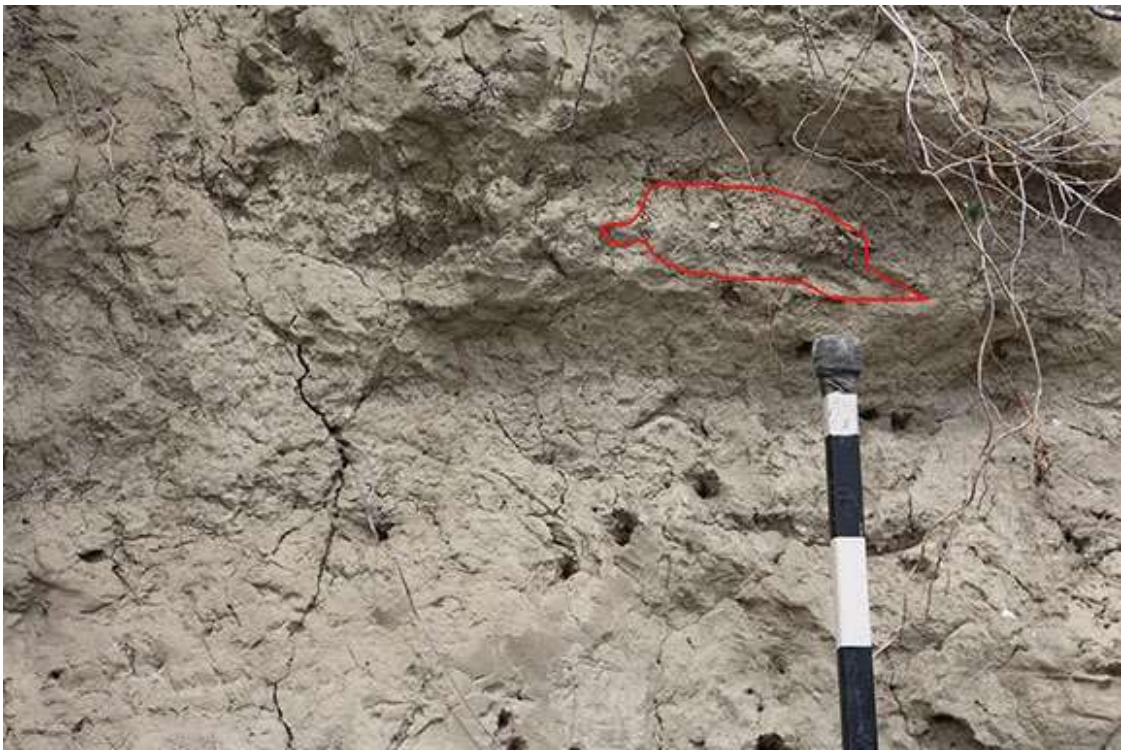

Plate 8. A 15 cm thick ash lens (201606-022) 1.17 cm below surface. A fragment of mammalian bone was noted in that deposit.

Plate 9. A 15 cm thick ash lens (201606-023) 1.05 m below surface.

Plate 10. A 10 cm thick ash lens (201606–26) 60 cm below surface.

Plate 11. A thin white sedimentary deposit (201509–003) 1.8 meters below the surface on the cutbank face. This thin white deposit continues for 2.2 meters to the northeast.

Plate 12. Ongoing cutbank erosion at BCHP.