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Deeply buried intact sediments yielding cultural deposits within the North Saskatchewan River valley in the city of Edmonton, Alberta

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ABSTRACT

This paper examines the assumption that urban development has significantly impacted or essentially destroyed archaeological deposits within, and adjacent to, the North Saskatchewan River valley in the city of Edmonton in central Alberta. Recent archaeological studies across Rossdale Flats, Walterdale Flats, and Victoria Flats have established that undisturbed sediments are present and can yield significant archaeological deposits of both precontact and fur trade age, despite decades of extensive urban development.

KEYWORDS

North Saskatchewan River valley, Edmonton, Rossdale, urban development impacts, fur trade, Middle Precontact, Late Precontact

1. Introduction

A common assumption held by archaeologists, proponents, planners, regulators, and the general public is that urban development has disturbed archaeological deposits within major cities, often to the point that essentially nothing of interpretive value remains. This obliteration of archaeological deposits has been assumed by many for major urban centres across Alberta, and the terraces and river valley of the North Saskatchewan River within the city of Edmonton are no exception. However, a growing body of recent archaeological studies is demonstrating that there are undisturbed sediments across the North Saskatchewan River floodplain and terraces within the city limits, even in areas that have undergone decades of urban development. Moreover, these deeply buried undisturbed sediments can, and have, yielded

significant archaeological deposits relating to both precontact and post-contact occupations. We first provide a brief background of several key archaeological studies in Edmonton's North Saskatchewan River valley before presenting in more detail three recent case studies of archaeological work associated with cultural resource management projects in the city. The archaeological results from all these studies demonstrate that urban spaces can contain significant archaeological resources that should be thoughtfully managed despite decades of adjacent or overlying disturbance.

An early study that challenged the assumption of total archaeological destruction in well-developed, urban Edmonton environments is at FjPi-63, the Rossdale site,

which is on a floodplain of the North Saskatchewan River immediately south of Edmonton's downtown core. This site is the location of a 19th century fur trade post and an associated Fur Trade Period cemetery. Since the early 20th century, the site has been used for water treatment, power generation, and transportation infrastructure resulting in extensive disturbance to sediments containing cultural resources. However, earlier and more recent archaeological studies covering areas on the Rossdale Flats (e.g., Permits 04-158, 05-161, 07-124, 09-030, 12-046, 16-002, 18-001) have clearly indicated that intact deposits with palaeosols, tephra (Mazama), and archaeological deposits lie beneath layers of 20th century fill at this key locale along the North Saskatchewan River. One of the best examples demonstrating the presence of these intact archaeological deposits is the work conducted by Saxberg (2014) under Permit 12-046. This work included archaeological monitoring of projects associated with the decommissioning of the Rossdale Generation Station, as well as Historical Resources Impact Assessment studies and mitigative excavations in advance of the construction of a new laboratory for the existing Rossdale Water Treatment Plant. Mitigative excavations in the area slated for construction of the new lab building resulted in identification of eight historic trenches (interpreted as the outer stockade, various building walls, and garden fences associated with the fur trade occupation) and the recovery of square nails, clay pipe fragments, glass, gunflints, musket balls, bone buttons, a ground stone pipe body, and butchered bone from a variety of animals (Saxberg 2014).

In view of references made in historic journals, the building techniques characterized by the historic trenches identified during Permit 12-046 excavations, and the dating of historic artifacts recovered from within the historic trench fill, Saxberg (2014) suggested that all the fur trade structural remains discovered on the Rossdale site to date are likely affiliated with Edmonton House/Fort Augustus IV (1812/13 to 1830) or later (with the garden fences dating to a later time during occupation of Fort Edmonton V). Even though extensive disturbance has occurred within the Rossdale site area from underground utilities, from the building and operation of the generating station, from the early construction and use of a coal spur, a large water basin, and even a racetrack at one point, these archaeological studies confirm that undisturbed *in situ* deposits relating to the fur trade occupation of the Rossdale Flats area still exist. Moreover, the identification of significant footer trenches for palisade structures in the course of the Permit 12-046 mitigative excavations has provided indications of the plausible locations of structures associated with Edmonton House/Fort Augustus IV, which in turn will allow the prediction of the possible locations of

additional features or structures associated with the fur trade occupation of the Rossdale Flats area.

Archaeological studies across Rossdale Flats have also identified cultural material much older than the fur trade remains associated with Edmonton House/Fort Augustus IV. Recent archaeological monitoring associated with the Walterdale Bridge Replacement Project (Permit 16-002) within the boundaries of FjPi-63 led to the discovery of intact cultural deposits next to a utility vault under the former alignment of 105 Street (Spicer and Eldridge 2017). The deposit consists of Fur Trade Period and Precontact Period components. Fur trade material includes lithic artifacts, butchered animal bone, and glass flakes (fragments of olive black glass) consistent with wine bottles commonly manufactured between 1750-1850 CE. The precontact component consists of quartzite and petrified wood artifacts and butchered animal bone. The bone material from this component likely represents the lower limb portions of a single bison. Bone samples submitted for radiocarbon analysis indicate that this component dates to 4000 ± 30 (Beta 441872) and 4070 ± 30 (Beta 4421873) or 4431-4569 calibrated years BP.

Archaeological monitoring of exposures related to expansion of the Rossdale Substation (Permit 18-005) identified deeply buried intact river sediments interspersed with well-developed palaeosols and possibly Mazama Tephra. Bone, associated with cultural material from the fifth palaeosol beneath the ash layer (at 4 metres below surface), yielded a radiocarbon age of 8882 ± 41 BP (D-AMS 031856), or 9,790-10,190 calibrated years BP. A charcoal sample collected from the fourth palaeosol beneath Mazama Tephra returned an uncalibrated radiocarbon date of 8824 ± 43 (D-AMS 031855), or 9,710-10,150 calibrated years BP (Burford and Dow 2019). These dates represent some of the earliest evidence for human occupation within the North Saskatchewan River valley and point to the fact that the river has been relatively stable within the valley in this particular locale for approximately 10,000 years (see Rains and Welch 1988).

Recent archaeological monitoring of several drainage rehabilitation projects within the Rossdale neighbourhood across the Rossdale Flats (Permit 17-127) resulted in the identification of eight new archaeological sites yielding butchered, burned, or calcined bone and lithic material within intact deposits representing relict landform surfaces. One of the key findings of this archaeological assessment calls into question the assumption that work of this type (i.e., excavations to repair existing utility infrastructure within urban environments) occurs entirely within disturbed deposits and so does not result in any additional new disturbance.

In fact, intact floodplain sediments were identified in almost all excavations subjected to monitoring under this archaeological assessment (Spicer 2018). And while the majority of these types of urban projects are generally only providing small glimpses of the archaeological record, they nevertheless enable archaeologists to see areas and sediment profiles typically not available using standard archaeological techniques within heavily urbanized environments.

On the south side of the North Saskatchewan River, intact Precontact and Fur Trade Period cultural deposits have been recorded on the Walterdale Flats. Under permit 14-002, a significant early 19th century fur trade site was identified and recorded as FjPj-114 as a result of archaeological monitoring for the arch assembly area for the Walterdale replacement bridge (Eldridge and Spicer 2015). This site consists of two features; cultural material recovered from these features included fragments of clay pipes, glass trade beads, musket shot, a copper alloy finger ring, and hand forged square nails. A diverse faunal assemblage was also present, particularly within a stratified pit feature.

As a result of archaeological monitoring associated with daylighting operations to expose buried utilities on Walterdale Flats (Permit 17-002), an intact deposit of butchered bison bone was identified three metres below surface (BS) and recorded as FjPj-118 (Spicer and Eldridge 2018). The bone is within intact floodplain deposits beneath a 1.5 metre blanket of construction fill including a power duct line and high pressure gas pipeline. A significant portion of this faunal assemblage is culturally modified, with impact fractures and evidence of burning. In addition, several of these elements were recovered in an apparent arranged position.

Opposite the Rossdale Flats (on the south side of the North Saskatchewan River) lies Queen Elizabeth Park, established by the city of Strathcona in 1907. In 2017, during redevelopment of Queen Elizabeth Park, a chance find of bone and fire-broken rock in the wall of a hydrovac trench led to the identification of site FjPi-171, situated along an upper terrace bench of the North Saskatchewan River valley. Subsequent archaeological excavations under Permit 17-078 identified three cultural components: an upper historic scatter that may be linked to early settlement in the general area; a Late Middle Precontact campsite with a basin-shaped hearth, evidence of food processing and lithic reduction activities, and an uncalibrated radiocarbon date obtained from hearth charcoal (2730+/-30 BP, Beta 476973); and the isolated find of an Early Precontact Alberta projectile point (Munro 2018). These studies demonstrate that urban development does not necessarily destroy all archaeological materials, and that floodplains and terraces along the North Saskatchewan Riv-

er were important locales, not only for early historic activities and occupation, but also for precontact peoples, showing a long continuity of use of this portion of the river valley.

2. Edmonton case studies

The following three cultural resource sites were identified, recorded, and mitigated as a component of *Historical Resources Act (HRA)* clearance conditions related to the Walterdale Bridge Replacement Project (FjPj-108 and FjPi-63; Spicer and Eldridge 2013; Spicer 2019) and the Groat Road Bridges Rehabilitation and Interchange Project (FjPj-116; Spicer and Eldridge 2016; Spicer et al. 2017) within the city of Edmonton (Figure 1). All three of these sites are within the North Saskatchewan River valley in locations that have been subjected to repeated historic and contemporary disturbance since the turn of the last century. These disturbances are related to bridge, road, and utility facility construction, which have included both grading and deep trench, piling, and foundation construction. Compounding these disturbance factors, repeated layers of historic contemporary fill have been added to the natural terrace surfaces in excess of 1.5 metres in depth in some instances.

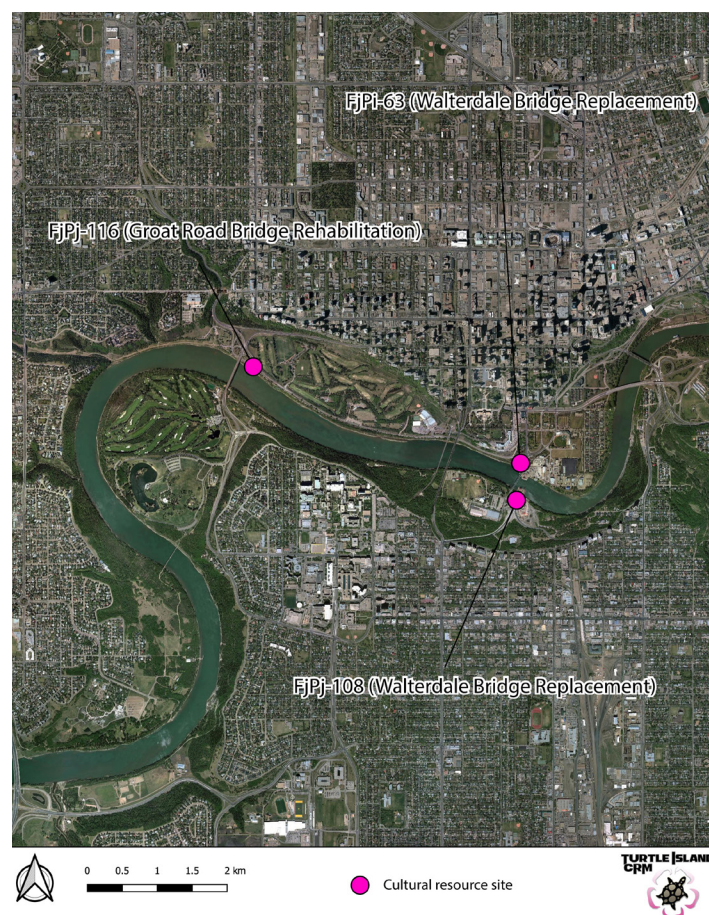


Figure 1. Location of cultural resource sites (Edmonton, Alberta).

In combination, both 20th century urban development and the depth of overburden deposits have obscured the presence of intact floodplain deposits in the North Saskatchewan River valley in central Edmonton. As noted above, cultural resource management work and related regulatory conditions for *HRA* approval have often been influenced by a convention that these areas have been previously disturbed by development and therefore developments within them pose little or no impact to historical resource sites. However, consulting archaeological work in Edmonton’s North Saskatchewan River valley conducted by private consulting archaeologists, referenced above, contradict this convention and illustrate the diversity and complexity of sites present in these locations and their potential for archaeological research and interpretation.

2.1 FjPj-108

Site FjPj-108 was initially identified at a depth of 195 centimetres BS within preserved floodplain deposits in a backhoe test excavated as part of an archaeological assessment associated with the Walterdale Bridge Replacement Project on the south side of the river (Spicer and Eldridge 2013). The site consisted of a lens of reddened soil, ash, and charcoal in association with quartzite artifacts including two lithic cores and a hammer stone, and was interpreted as representing a hearth, around which the production of stone tools took place.

The location of FjPj-108 has been subjected to repeated disturbance for over 100 years: most recently road and bridge construction, the construction of a sports facility, landscaping earthworks, and the installation of buried utility facilities. In combination, these disturbance factors created the impression in the minds of many who were involved in this project that the area was devoid of any historical resource potential.

2.1.1 Site stratigraphy

The stratigraphy at FjPj-108 includes a cap of contemporary overburden, varying between 60 and 100 centimetres in depth, and consisting of clay and gravel mixed with industrial debris including concrete, asphalt, and fragments of ferrous metal (Figure 2). Beneath the overburden at 90 to 200 centimetres BS is a complex deposition of flood silts and clays. The absence of gravel or occasional stones, in combination with a sequence of sorted silt, sand, and clay, indicate that these sediments were deposited through repeated flooding of the North Saskatchewan River. These deposits were often separated by thin layers of charred organic material,

likely the result of wildfires (Figure 3). Burnt tree stumps were identified beneath the modern overburden, revealing that the land surface at FjPj-108 was forested during the historic period. Beneath this interleaving of fluvial sediments, a thick deposit of massive sand to over 10 metres BS was present.



Figure 2. Historic/contemporary fill and intact flood plain deposits at FjPj-108.

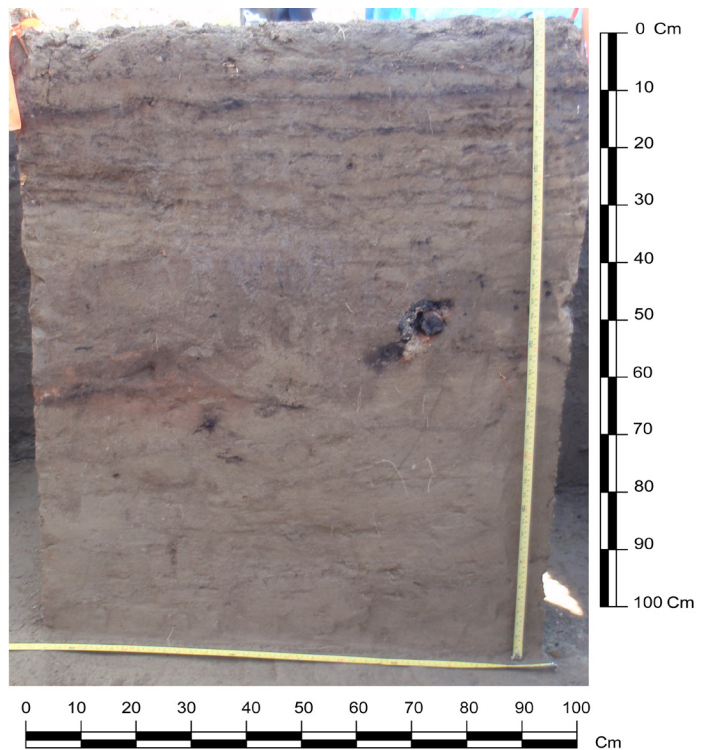


Figure 3. Soil profile at FjPj-108 (N98/E105 east wall - actual).

Within this sedimentary environment, three cultural components are present. The first component (Component 1) was found between 95 and 110 centimetres BS, following the mechanical removal of the upper 100 centimetres of contemporary overburden (Figure 4), and consisted of historic fill and debris. The second component (Component 2) was located between 140 and 160 centimetres BS, and the third component (Component 3) was found at depths between 170 and 200 centimetres BS. These latter two components represent Precontact Period occupations found within the intact silt/clay matrix of the floodplain. The third component is located in uniform flood silts and clay directly above a layer of sand topped by isolated fragments and concentrations of charcoal. Archaeological research and interpretive potential were highest for this component and were the focus of mitigative excavations (Figure 5).



Figure 4. Over burden stripping at FjPj-108 1.



Figure 5. Excavations in progress at FjPj-108.

2.1.2 Mitigative excavations

Thirty square metres of mitigative excavations at site FjPj-108, carried out in two stages, yielded lithic artifacts ($n=2,407$), bone ($n=1,315$), and fire-broken and heated rock ($n=116$). The bulk of this cultural material was recovered from the lower most part of the component between 195 and 210 centimetres BS in association with three cultural features. Lithic artifacts include quartzite, chert, chalcedony, and petrified wood. The assemblage consists of artifact types associated with primary, secondary and final reduction stages including small pressure flakes likely related to final shaping and/or re-sharpening the edges of bifacial tools. Two stones, one with abraded surfaces, were also recovered from this component and are interpreted as part of the stone reduction tool kit. One of these is characterized by batter marks on the distal end and may have been used as a hammer or pressure flaker (Figure 6).



Figure 6. Hammer stone/pressure flaker (Cat. #FjPj-108:179).

Bone from this component included mostly calcined and burnt fragments, the bulk of which were recovered from within one of the identified features. Fire-broken rock, including several heated but otherwise unmodified stones, were recovered primarily from a single concentration.

A total of 16 tools related to primary lithic production, such as bipolar, multi-directional, and unidirectional cores, and hammerstones, were recovered from the component. The three hammerstones are quartzite cobbles showing signs of battering on at least one surface. A single bifacially reduced stone tool, interpreted as a wedge, was also recovered.

Cultural material related to this component was concentrated around three well-defined cultural features (Figures 7 and 8). Feature 1 is a lens of ash and charcoal and was initially identified as a surface hearth. It was made up of a thin lens of hearth debris with poorly defined margins. The second feature (Feature 2) is a concentration of fire-broken rock fragments, heated and unmodified rocks, animal bone, and lithic artifacts. A bison rib fragment was located within the accumulated heat-altered rocks that yielded a radiocarbon date of 1400 ± 30 (Beta - 330170) calibrated to $1500 \pm$

30 BP. The feature likely represents a store of rocks heated in the fire and subsequently transferred to vessels containing water. Once heated in this manner, water brought to the site could be used for activities such as cooking and rendering fat. Given that the rock concentration included heated but not broken rocks, the boiling of water (and repeated use of stored rocks) was likely not a primary activity at the site. The third feature identified within Component 3 was a defined surface hearth (Feature 3). The feature was morphologically different from Feature 1 in that it had well defined edges and a bowl-shaped profile, characteristic of a surface hearth

partially contained within an excavated pit. Within this bowl, a myriad of lithic debris and faunal remains, including a large volume of burnt and calcined bone, had built up. The fill from Feature 3 was collected and water screened, which contributed to the extremely high recovery of cultural material from the hearth. Hearth material includes: micro-debitage, faunal remains, and charred plant remains including seeds. These seeds were submitted to the Quaternary Environments Laboratory at the Royal Alberta Museum for analysis and identification (Beaudoin 2013).

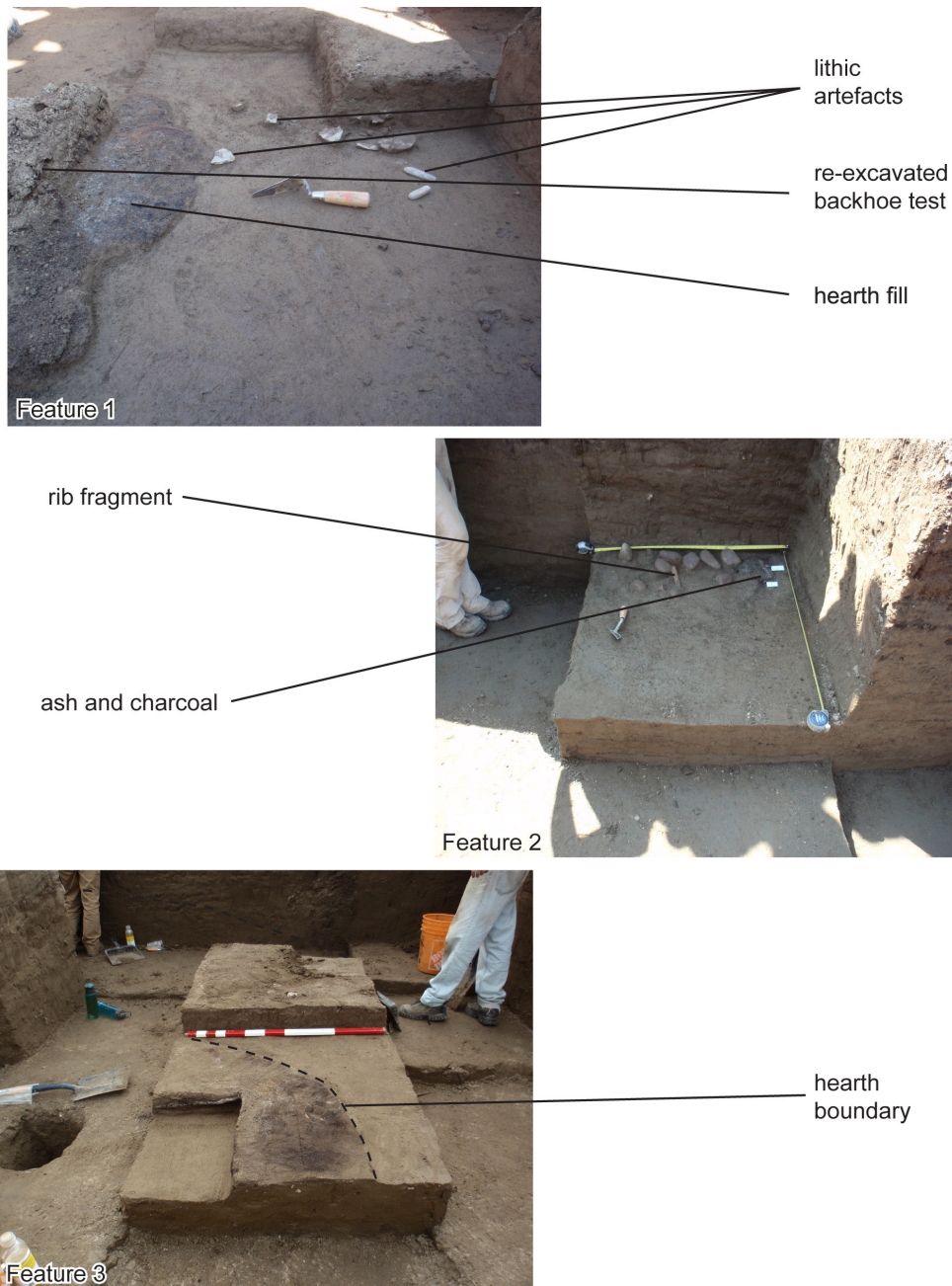


Figure 7. Cultural features at FjPj-108 (actual).

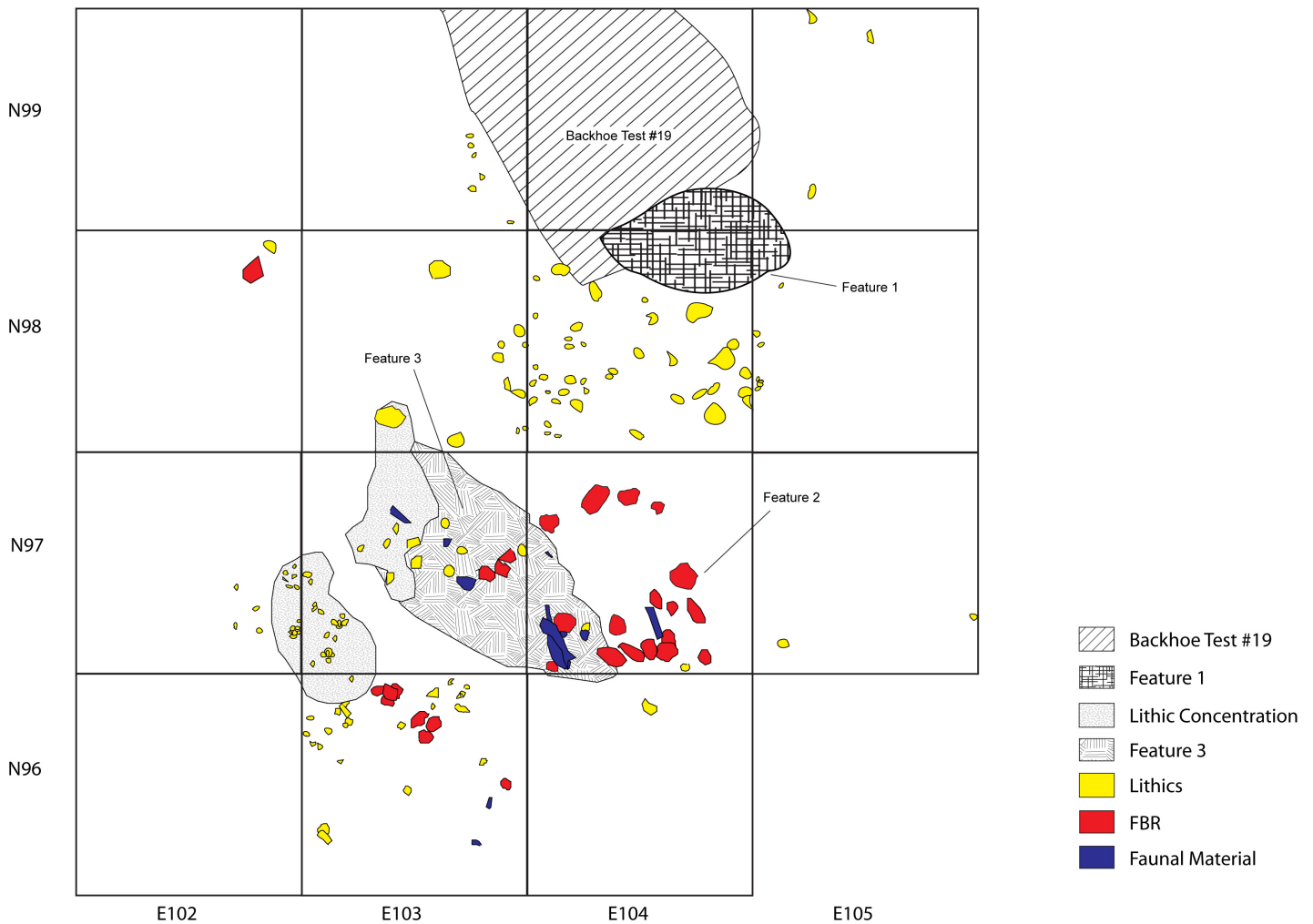


Figure 8. Cultural features at FjPj-108 (schematic).

In situ carbonized seeds from the hearth fill included kinnikinnick, bunchberry, pin cherry, and choke cherry. Historically, kinnikinnick (derived from a Cree word meaning to mix) was widely used either as an additive to tobacco or smoked alone (Turner et al. 1990). The berries are also edible and are reported ethnographically to have been widely used as an additive to grease and dried meat (pemmican) or mixed with whitefish eggs (Johnson et al. 1995; Kuhnlein and Turner 1991; Turner et al. 1990). The sweet and fleshy fruit of bunchberry was widely collected and eaten by many Indigenous peoples. The fruit ripens from late July through September and in some places is very plentiful. Some people simply ate them raw as a snack while others gathered bunchberry in quantity for storage. Pin and choke cherry produce a tart yet delicious fruit widely collected by Indigenous people in late summer throughout western Canada. Choke and pin cherry fruit are widely reported as traditional medicines for the treatment of throat ailments, coughs, and colds. Ethnographically, choke cherry was one of the most common and

important food plants utilized by Indigenous people living within its range (Kuhnlein and Turner 1991:161). Given that these species are commonly referenced in ethnographic sources, similar use of these species in Late Precontact times is likely. Evidence of plant use by the people occupying FjPj-108 around 1500 years ago increases the interpretive value of the site.

The faunal assemblage recovered from the component encompassed a broad spectrum of identified taxa including: bison (n=3), duck (n=7), frog or toad (n=29), goose or swan (n=1), snowshoe hare (n=38), and fish (n=1). Taxa identifications were undertaken with the benefit of the University of Alberta's zooarchaeology comparative collection (Miller 2013). The faunal assemblage is also highly fragmented and a large volume was either burnt (n=323) or calcined (n=259), with three displaying cut marks. Like the other artifacts, the burnt and calcined bone was concentrated around the three features.

2.2 FjPj-116

In association with the Groat Road Bridges Rehabilitation and Interchange Project, archaeological work was carried out in the North Saskatchewan River valley along the western area of Edmonton’s Victoria Flats under Permits 16-126 and 17-026 (Spicer and Eldridge 2016; Spicer et al. 2017). Geotechnical samples established the presence of deeply buried intact floodplain sediments beneath historic contemporary overburden at this locale. Precontact cultural material, including animal bone and lithic artifacts, was identified in three of the six backhoe tests excavated and recorded as FjPj-116. In two of the three tests, this material was associated with a palaeosol at 120-130 centimetres BS. Although the majority opinion was that the identification of intact deposits had to be in error due to the extensive disturbance from urban development at this location, having City of Edmonton managers present during testing to observe intact floodplain sediments and cultural material within them, was instrumental in addressing this concern.

2.2.1 Site stratigraphy

Similar to the pattern observed at FjPj-108, the stratigraphy recorded at FjPj-116 is a complex series of layered anthropogenic deposits extending to approximately 80 centimetres BS. Beneath this overburden, deposits of flood silt, clay and sand, impacted by rodent burrowing, were observed 80-140 centimetres BS. The demarcation between the two is well defined and readily identifiable. The historic/contemporary overburden includes a mixture of unsorted gravel and high plastic clay typically used as a substructure for contemporary road grades. At the bottom of this sequence, a layer of unsorted gravel and coarse sand with orange/ brown staining is present (Figure 9). This material lies directly above a hard compacted dark brown to black organic clay layer that marks the natural terrace surface. This sediment is interpreted as the result of cultivation during the 19th and early 20th centuries.

Flood deposits beneath the plow zone are typical of the lower terraces on the North Saskatchewan River in central Edmonton. At FjPj-116, this included discontinuous layers of organic-rich soil. In some cases, these represent preserved land surfaces (palaeosols) while in others, they are the result of in-filled rodent burrows. Shovel testing within the floor of select excavation units showed the continuation of this pattern to at least 210-220 centimetres BS. More well-defined palaeosols were observed at 165 centimetres and 175 centimetres BS. This matrix contained the bulk of the Precontact Period artifacts recovered from Component 2 at FjPj-116. The majority of artifacts were recovered from 25-35 centimetres below the exposed terrace surface. Of relevance to

site stratigraphy, a Late Period side-notched point was recovered from the plow zone and a Middle Precontact Period Hanna projectile point was recovered from this flood deposit, as was a projectile point base and a Late Period Pelican Lake/Bracken projectile point (Peck 2011), abandoned midway through manufacture (Figure 10). The vertical range at which the Precontact Period material was recovered, in combination with the recovery of Late Period and Hanna style projectile points above the Late Pelican Lake/Bracken projectile points, indicate that some of the artifacts within the flood deposit have been affected by displacement. The distribution of cultural material at FjPj-116 is shown in Figure 10.



Figure 9. Removal of historic/contemporary overburden at FjPj-116.

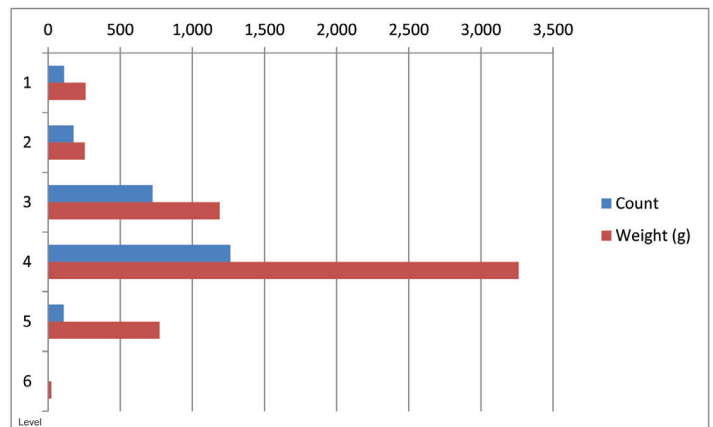


Figure 10. Cultural material totals from FjPj-116 by level (all excavations).

Below the silt/clay flood deposits, a sandy layer was identified. No artifacts were recovered from within this layer indicating that it marks the bottom extent of the culture bearing deposit. A radiocarbon date obtained from bone collected directly above this layer (48 centimetres BS) returned

a radiocarbon date of 4,299-4,142 +/-30 BP calibrated to 3,820 +/-30 BP (Beta 468221) consistent with the temporal range expected for McKean Complex points (4,200-3,500 BP) (Peck 2011:199). This pattern, in which artifact distribution terminates with the emergence of a sand-rich silty flood deposit, was also observed at FjPj-108 and FjPi-63. This sandy deposit likely represents a higher energy flood event overlaid with a series of low energy inundation events. This sediment has subsequently been affected by a spectrum of bioturbation factors including rodent activity, vegetation, and the freeze/thaw cycle resulting in the vertical displacement of artifacts. A stratigraphic profile at FjPj-116 is provided in Figure 11.

The Late Pelican Lake/Bracken projectile points are in direct association with the bulk of the cultural deposit (25-35 centimetres below the natural terrace surface) and the depth of a radiocarbon date, 2,342-4,142 +/-30 BP calibrated to 2,380 +/-30 BP (Beta 468220), is consistent with the range expected for this point type (2,800-2,200 BP) (Peck 2011:256). Although the cultural material recovered from the site is largely a homogeneous assemblage of grey and brown quartzite flakes, a unique occurrence of black, grey, and brown fragments of ignimbrite (n=12; 74.8 grams) was recovered from a single unit 20-35 centimetres BS. It is likely that bioturbation has extended these artifacts vertically while maintaining the horizontal integrity of the site.

2.2.2 Mitigative excavations

Mitigative excavations of 20 square metres to a depth of 140 centimetres BS were completed at the site under permit 17-026. As with the work carried at FjPj-108, historic/

contemporary fill deposits at site FjPj-116 were removed by machine and excavation units were dug into the exposed surface directly above the level of the natural floodplain (Figure 12). The site consists of four occupations represented by two components. Component 1 is a scatter of historic and precontact cultural material. Diagnostic artifacts (cartridge casings) supported by historic records, date the component to 1902-1904 CE. Two Precontact Period projectile points, including a Late Period side-notched point and a Hanna point, were also recovered from Component 1, and both were interpreted as recovered from a disturbed context.

Component 2 at FjPj-116, the focus of this section, is a Precontact Period campsite with an emphasis on the reduction of lithic tools. Diagnostic artifacts, including Late Pelican Lake/Bracken projectile points were recovered from this component (Figure 13). As a result of the mitigative work, FjPj-116 is considered to have significant research potential. However, given that excavations were limited to a median between east, and westbound lanes of River Valley Road, the extent of the site could not be established.



Figure 11. Soil profile at FjPj-116 (N100/E91 north wall - actual).



Figure 12. Mitigative excavations in progress at FjPj-116.



Figure 13. Projectile points recovered from FjPj-116.

Lithic debitage recovered from Component 2 (n=1,908) included flake fragments, complete flakes, and shatter. Raw material was dominated by quartzite in both count (n=1,889; 98.5%) and weight (3,759.7 grams; 97.9%). Quartzite lithic artifacts include flakes 8.0-17.9 millimetres (n=903) and 18.0-35.8 millimetres (n=787) in maximum dimension. Neither small nor large quartzite artifacts dominate the assemblage. Cortex was absent from 79.7% of these artifacts (n=1,505) indicating that mid-range stages of lithic reduction are well represented at the site: particularly, the initial production of bifaces and long intact flakes, possibly blanks intended for further processing. This interpretation is supported by the presence of bifacial reduction flakes (n=33), which account for 86.8% by count and 95% by weight of the identifiable reduction lithic artifact types. The majority of lithic raw material in this assemblage is quartzite, which is likely locally sourced from the North Saskatchewan River valley. Cobbles of quartzite are readily available from exposed areas of Empress Formation gravels (Whitaker and Christiansen 1972).

Faunal remains (n=178) recovered from this component include mostly small unidentifiable fragments (n=131). Identifiable elements include limb (n=21), rib (n=12), vertebra (n=4), mandible (n=2), sesamoids (n=4), tooth fragments (n=2), a terminal phalange, and a skull fragment. These elements are ungulate and likely represent bison (*Bison bison*), elk or moose (*Cervidae/Alces*). The assemblage also contains burnt and calcined fragments of bone (n=8).

A single fragment of antler was recovered in excavation unit N99/E91 (Figure 14). The item exhibits angular fracture scars. One of these fractures, located on the dorsal side of the artifact, has a pronounced rounded and polished edge suggesting use. Surface features on the fragment closely match those of elk antler (*Cervus canadensis*).



Figure 14. Fragment of antler recovered from FjPj-116 Component 2.

The cultural material associated with this component was represented by a single dense concentration. Quartzite lithic material was recovered in highest density by both weight and count from excavation unit N99-100/E91-93. Excavation unit N100/E99 was largely disturbed by a utility pole borehole and associated trench, likely as a result of an associated power hookup. The depth of the utility pole and associated trench is significant as this disturbance extends through the cultural deposit represented by Component 2.

Defined spatial patterns within this concentration were not observed. However, flake size patterns are apparent. A greater density of lithic artifacts larger than 35 millimetres in maximum dimension was found in excavation units N99-100/E91 (Figure 15). Patterning related to lithic reduction strategy is also detectable: bifacial reduction flakes (BRF) are recorded in greatest quantity in excavation units N100/E91-92 (n=24) (Figure 16). Flakes of this type are indicative of the purposeful thinning of broad bifacial tools (such as a knife). This assemblage indicates on-site production and maintenance of bifacial tools. In combination with the ungulate bone and fire-broken rock, it is likely that a butchering and processing area related to FjPj-116 is located nearby.

Faunal material in the form of butchered ungulate bone was recovered from two concentrations. One was associated with hind foot elements (sesamoid, phalanges) and was found between 30-48 centimetres below the natural terrace surface. The McKean Complex (Hanna) Period radiocarbon date was obtained from a terminal phalange recovered from 48 centimetres BS. Another concentration included mostly unidentifiable scrap (n=88), but limb (n=21), vertebra (n=4) and one rib fragment were identified. The Late Pelican Lake/Bracken Period radiocarbon date was obtained from a fragment of ungulate limb recovered from 35 centimetres BS. Bone fragments recovered from level 4 (34-39 centimetres BS) represent the bulk of this assemblage (n=91) and are related to the lower depth from which the majority of the lithic assemblage was recovered. While the results of the radiocarbon analysis confirm bone from the two areas of faunal concentration are not contemporaneous, they are indistinguishable in terms of identifiable elements and depth recovered.

The assemblage from Component 2 at FjPj-116 included a large number of quartzite lithic artifacts recovered from a defined area. Lithic debitage was distributed in a single concentration around the original backhoe test that resulted in the identification of the site. These lithic artifacts are predominately flakes middle range in size, with cortex generally absent. Some are bifacial reduction flakes suggesting the

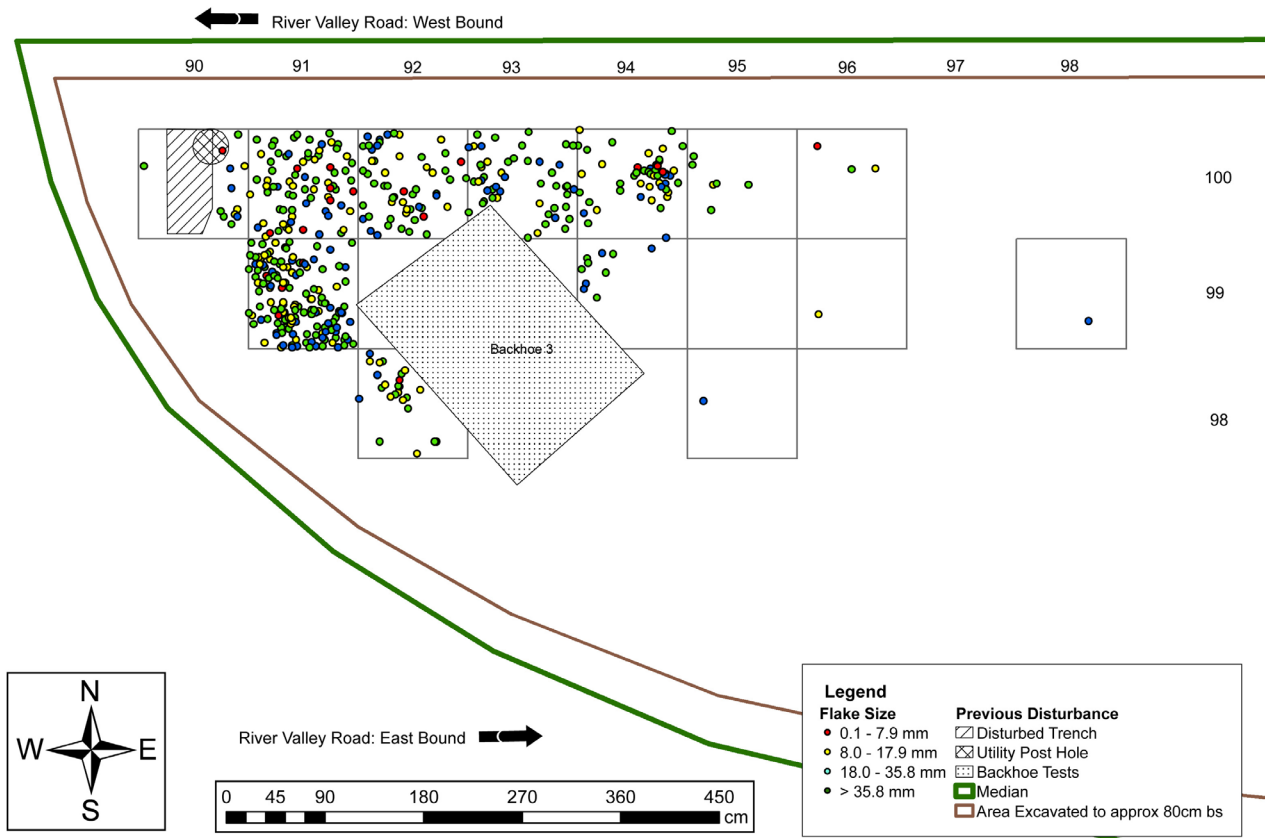


Figure 15. Distribution of lithic artifacts, Component 2 (size).

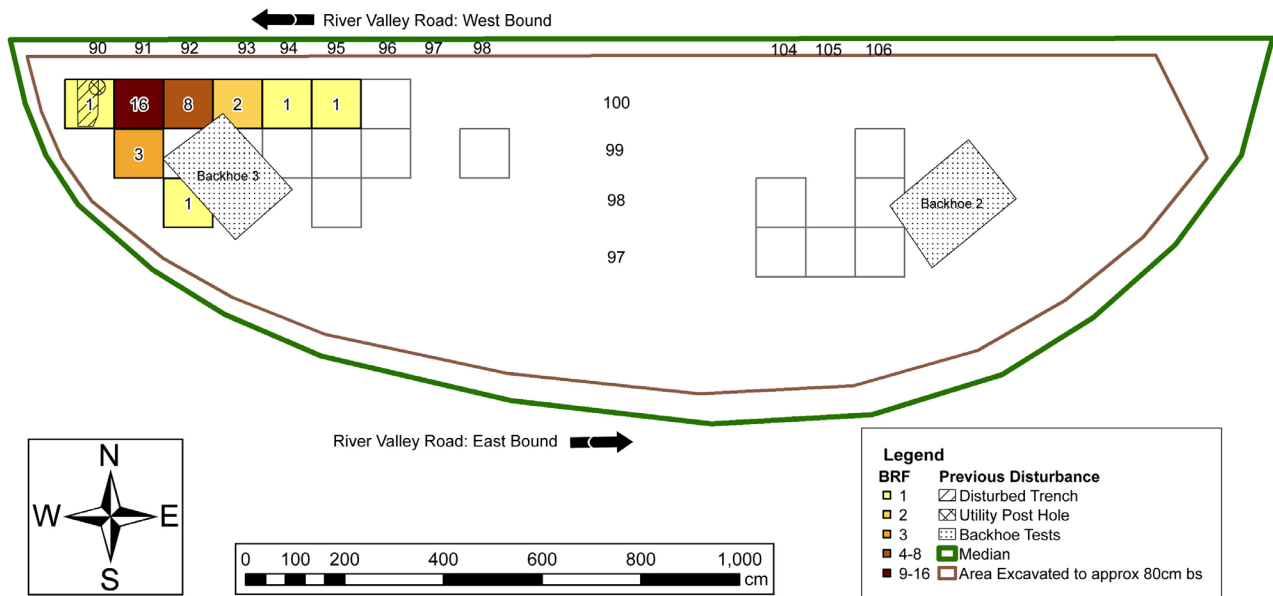


Figure 16. Distribution of bifacial reduction flakes (BRFs), Component 2 (count).

production of thin broad bifacial tools. Although this material is distributed vertically between 18-45 centimetres below the natural terrace surface, and the variety and placement of projectile point styles confirm that artifacts were displaced at the site, the bulk of the assemblage was recovered from

25-35 centimetres BS. This range corresponds to the projectile point base and Bracken age radiocarbon date. As a result, the majority of the precontact cultural material associated with FjPj-116 Component 2 is likely from a Late Pelican Lake/Bracken Period occupation.

2.3 FjPi-63

Under permit 18-001 (Spicer 2019), archaeological monitoring of the Walterdale Bridge Replacement Project was completed. This work was in association with landscaping for the construction of a pedestrian access stair and shared use path (SUP), immediately west of the north abutment of the new Walterdale Bridge. As a result of this work, an intact cultural deposit was identified within the boundaries of site FjPi-63 in close proximity to the one previously recorded under 105 Street (Spicer and Eldridge 2017). This newly identified deposit has mid-19th century Fur Trade and Late Precontact Period components. The Fur Trade Period component is the focus of this example.

2.3.1 Site stratigraphy

The sediment stratigraphy at this portion of FjPi-63 is a complex series of layered anthropogenic deposits extending to approximately 160 centimetres BS. As observed at FjPj-108 and FjPj-116, these deposits are primarily densely packed high plastic clay and gravel. Beneath this overburden, is a mottled orange and black sand deposit approximately 10 centimetres in thickness. This layer is readily identifiable and marks the beginning of intact sediment at this portion of the site.

Fur Trade Period material is from an intact layer of coarse grey/brown uniform sand (Component 1). Beneath this coarse sand, floodplain terrace deposits typical of the Rossdale Flats are present, within which is what appears to be an intact chernozemic soil sequence. At the top of this sequence is a charcoal layer containing choke cherry seeds. Beaked hazelnut shell fragments (n=5) were also recovered here (Figure 17). The choke cherry seeds and associated charcoal lens are a reliable marker demarcating the coarse grey/brown sand (fur trade, Component 1) from flood deposits that yielded the Precontact Period artifacts (Component 2).



Figure 17. Cherry seeds and hazelnut shell (FjPi-63).

Throughout the excavation area, cultural material from both components was recovered either in mixed context and/or in close association. While artifact types such as lithic flakes and hand forged nails can be separated by component

regardless of context, faunal material does not lend itself as easily to such separation. Although artifact mixing and contemporary disturbance is present at this location of FjPi-63, the distinct sediment associated with each component supports the interpretation that the bulk of the cultural material was recovered intact. Figure 18 is a stratigraphic profile of the excavations at the site.



Figure 18. Stratigraphic profile (N100/E102, south wall - actual).

2.3.2 Preliminary archaeological monitoring

Monitoring in this location in 2017 (Spicer and Eldridge 2018) identified ceramic fragments, axe cut bone, fish scales, and historic period glass, in association with a dark organic sandy soil. This material was overlain with packed clay and gravel and underlain with mixed clay that was clearly disturbed and redeposited. These artifacts were significant as they were of the type associated with other Fur Trade Period cultural deposits recorded in the area (Eldridge and Spicer 2015, Spicer and Eldridge 2018). Based upon these observations, the presence of an intact fur trade cultural deposit was highly probable. As construction excavations progressed, intact sediment, overlain by approximately 1-1.5 metre of layered construction fill, was observed immediately west of the bridge abutment. The presence of intact sediment provided evidence that an intact cultural layer, dating to the nineteenth century, would possibly be impacted by the excavation work.

Consistent with observations made in January, 2018, a defined land surface characterized by a dark brown to black sandy soil matrix was revealed in this area in May of 2018. Additional excavations located at the alignment of the access stairs were carried out in June, 2018. As a result of the sandy unstable soil, excavations were necessary in order to install a fill base of high plastic clay suitable to hold foundation posts for the access stairs (Figure 19). The sloped embankment above the SUP had also been subject to additional grading which exposed more of the preserved terrace surface. At the intersection of this buried land surface and the access stair excavation, fragments of calcined bone were observed, triggering a shovel testing program (Figure 20).

As a result of this shovel testing program, additional bone fragments, lithic artifacts, and fire-broken rock were recovered from the preserved surface adjacent to the clay-filled excavation. An expedited excavation block, approximately 30 by 60 centimetres, was dug and screened; additional cultural material was recovered. Faunal material included fish vertebra consistent with those previously recovered from disturbed sediments. Additional calcined bone fragments

were recovered. Fur Trade Period artifacts were collected including a glass trade bead, a copper alloy percussion cap, and two fragments of clay pipe stem. Of particular significance to the Fur Trade Period component was a calcined bone concentration in association with a defined orange, black, and grey soil stain interpreted as a surface hearth. Based upon the sediment in which it was preserved, the hearth feature is associated with the fur trade component (Figure 21).



Figure 19. Packed clay foundation fill at access stairs.



Figure 20. Shovel testing program west of access stairs.



Figure 21. Fur Trade Period surface hearth (excavation sequence 1-4).

2.3.3 Mitigative excavation

Following the preliminary testing program and salvage excavations, eighteen square metres of excavation were completed immediately west of the access stair (Spicer 2019). As was the case at FjPj-108 and FjPj-116, this included removal of historic/contemporary overburden to the level of the preserved terrace surface (Figure 22). Based upon diagnostic artifacts, Component 1, the Fur Trade Period component, dates to the middle part of the 19th century (1830-1850 CE). Component 2 dates to the Late Precontact Period, based on radiocarbon dating (676 +/-30 BP; Beta - 508668 calibrated to 600-676 years BP). Given the nature of the cultural material and the excellent state of preservation of the Fur Trade Period component, the interpretive and research potential of this deposit has both local and regional significance.

Component 1 is a concentration of Fur Trade Period artifacts associated with a surface hearth. Fur trade artifacts are dominated by well-preserved faunal material. Many elements exhibit cut marks and other evidence of processing. Other artifacts from this component, typical of a mid-19th century Fur Trade Period camp, include hand forged nails, clay tobacco pipe fragments, gun flints, and glass trade beads. Several artifacts are diagnostic to 1830-1850 CE, dating the component to the period of Fort Edmonton V (1830-1915 CE). This Hudson's Bay Company (HBC) trading facility was located directly above the location of this deposit within the present Alberta Legislative grounds (FjPj-4).



Figure 22. Overburden stripping and excavation sequence (access stairs).

Faunal material (n=771) is largely unidentified mammal and ungulate. Bovidae and Cervidae (n=21) are present, the latter identified by antler fragments. Other identified taxa include Osteichythes, Aves, Felidae, Mollusca, and Rodentia. Identified species included beaver, lynx, and bison. Unionidae shell fragments are likely freshwater clam while Salmonifore vertebrae are likely lake whitefish. Two Aves long bones are identified as Anatidae and may be swan, goose, or duck. Cultural modification was also identified on elements within this assemblage (n=51). Cut marks, derived from metal tools, were identified on thirteen of these fragments. One of these elements is a lynx mandible (Figure 23), and the other a beaver femur (Figure 24).



Figure 23. Lynx mandible with cut mark.

Other artifact types typical of 19th century Fur Trade Period sites in the area of Rosedale and Walterdale Flats (Pyszczyk 1992; Saxberg 2014; Saxberg et al. 2001, 2003; Eldridge and Spicer 2015; Spicer and Eldridge 2016, 2017) include fragments of ceramic tobacco pipe stem, square wrought iron nails, other wrought iron nail fragments, gun flints, tableware, and fragments of a glass bottle, trade bead, ceramic vessel, bone button, and ceramic tobacco pipe bowl (n=61).

The ceramic tobacco pipe bowl is of particular significance, as maker's marks are visible (Figure 25). This artifact was refit with stem fragments recovered from the site and includes an intact spur upon which the initials 'I' and 'F' are imprinted, which are attributed to the John Ford firm of London (Higgins 2004:252, Fig. A2.1 Nos.8, Pearce 2007:3-4). Clay tobacco pipes featuring the initials IF raised on a heel spur on an otherwise plain pipe bowl were common and have a wide distribution in western Canada and the Pacific Northwest, generally on HBC sites dating to the period 1820-1850 CE (Caywood 1955; Walker 1970; Pfeiffer 1981:231, Fig.5:N; Pfeiffer 1982:65-66, Fig.23C; Ross 1976:804).

One of the pipe stem fragments exhibits use in the form of an abraded groove around the circumference of the stem. One end of this fragment has been ground to a smooth taper. The ground edge is consistent with a prepared re-tooled mouth piece and the abraded area a result of holding the pipe with the teeth. These attributes are typical indicators of habitual tobacco smoking (Karklins 1981:245; Akerhagen 1998; Wacke 2014:68 and 78).

Two glass beads were also recovered from the site (Figure 26). One, a translucent blue spherical wound type, found during salvage excavations, is commonly referred to as a



Figure 24. Beaver femur with cut mark.

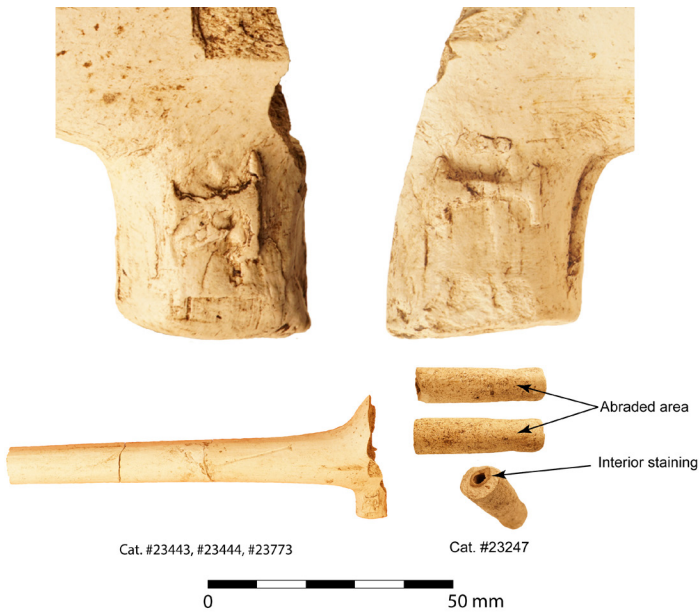


Figure 25. Clay tobacco pipe bowl fragment ('T' 'F' makers mark).



Figure 26. Glass trade beads from FjPi-63 (Component 1).

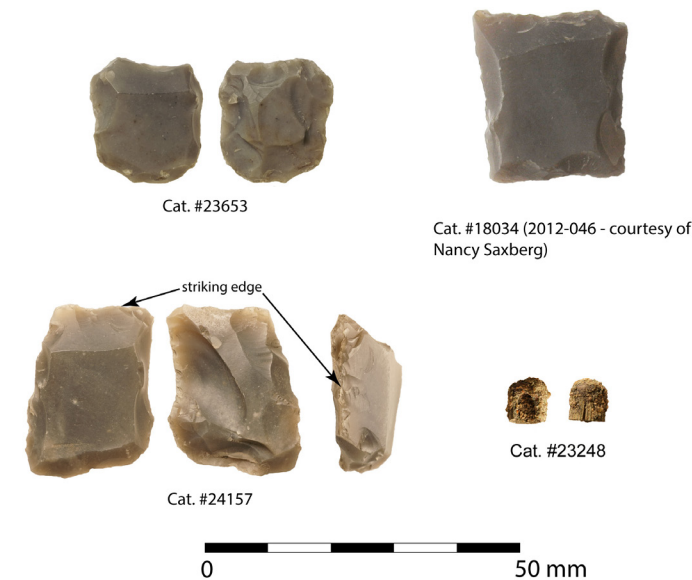


Figure 27. Gun flints and percussion cap from FjPi-63 (Component 1).

Canton bead (Ross 1990). The other glass trade bead is translucent, amber in colour, and faceted with six sides. Beads of these types are common at Fort Vancouver (Ross 1990:62, Plate 1:g and 63). The HBC Fort Vancouver facility was in operation between 1828 and 1860 CE. J.P. Sturgis and Company, a Canton fur merchant, was a supplier of blue glass beads to the HBC at Fort Vancouver in 1828 (Ross 1990:31). Beads of this type were produced in large quantities by Chinese manufactures and were in significant demand from Indigenous populations. Translucent faceted beads, identical to the FjPi-63 example, were found at Fort Vancouver and attributed to the period after 1840 CE (Ross 1990:59). Both of the bead types recovered from this component can be associated with the Northwest Pacific fur trade and the Fort Vancouver facility at the mouth of the Columbia River, particularly for the period 1830-50 CE.

Other Fur Trade Period items (n=19) were also well represented in the assemblage associated with the hearth feature. These included square wrought iron nails, a burnt pipe stem fragment, and a tableware fragment. Gun flint and gun flint fragments (n=6) were recovered in association with the hearth, many of which exhibit evidence of burning, likely the result of disposal in the surface hearth. The necessary maintenance of these weapons and steady requirements for new powder and shot established an effective means of dependency between hunters, traders, and European suppliers. Artifacts related to firearms, including gun flints and the percussion cap, help date the site (Figure 27). The two complete flints in the assemblage are extensively reworked. These artifacts are exhausted and were likely abandoned at the site, presumably having been replaced from the stores of Fort Edmonton V. These gun flints exhibit advanced wear, particularly on the striking edge, and their shape stands in sharp contrast to that of unused gun flints. A gun flint subjected to less use was recovered from Fort Edmonton IV (Saxberg 2014 - Plate C2) and provides a comparative example.

The trade of flintlock, black powder muzzle, loading firearms was common throughout the 19th century (Gooding 2003:81-84). The copper alloy percussion cap, however, was introduced in 1820, and consists of a single use primer enclosed within a copper alloy cylinder. This ignition system enabled muzzle loading firearms to fire reliably in any weather condition and replaced the clamped flint, pan, and frizzen of the flintlock (Gooding 1962). This technology was not widespread until after 1840 CE. In combination with the glass trade beads and John Ford clay tobacco pipe fragments, the presence of the percussion cap further supports a mid-19th century occupation for this component at FjPi-63.

Artifacts recovered *in situ* from Component 1 are most dense nearest the surface hearth (Figure 28). Wrought iron nails, although more widely dispersed, were most concentrated in close proximity to the hearth. This pattern suggests that wood used as fuel for the surface hearth contained nails and was salvaged. The distribution of faunal material is more complex but with defined patterns. Cervidae elements were concentrated in the northwest part of the excavation block suggesting that antler was worked there. Fish vertebrae were recovered from the southeastern part of the excavation block; bird elements were also recovered from this area.

Faunal material exhibiting cut marks were recovered from two concentrations. One, associated with lynx and beaver, was identified in the southeast part of the excavation area suggesting the butchering of fur bearing animals. Another area is located in close association with the antler. Based on element size, large ungulate, such as elk or moose, had been butchered in this area. Antler fragments suggest an autumn or early winter occupation when fully developed antler would have been available. This interpretation is further

supported by the presence of fur bearing animals that are typically harvested in winter when fur is most dense.

Component 1 of FjPi-63 is a Fur Trade Period camp with butchered animal bone and trade items associated with a surface hearth. The majority of the faunal material is unidentifiable scrap and limb. The positive identification of Cervidae was made possible by the recovery of antler fragments, at least one of which was worked. Fur bearing animals, including lynx and beaver, were also identified in this component indicating the procurement of animals for fur and food.

Beaver and lynx were species in high demand by the HBC traders (Binnema and Ens 2016:114, 37,142; Coues 1897:221, 245, 259). The processing of fur bearing animals is not expected for those visiting the area for trade; presumably in these cases only prepared hides would be brought to Fort Edmonton. This pattern would be expected however for workers regularly engaged at the post who trapped in the absence of regular work activities or to catch up on accumulated debt (Binnema and Ens 2016:23 and 131).

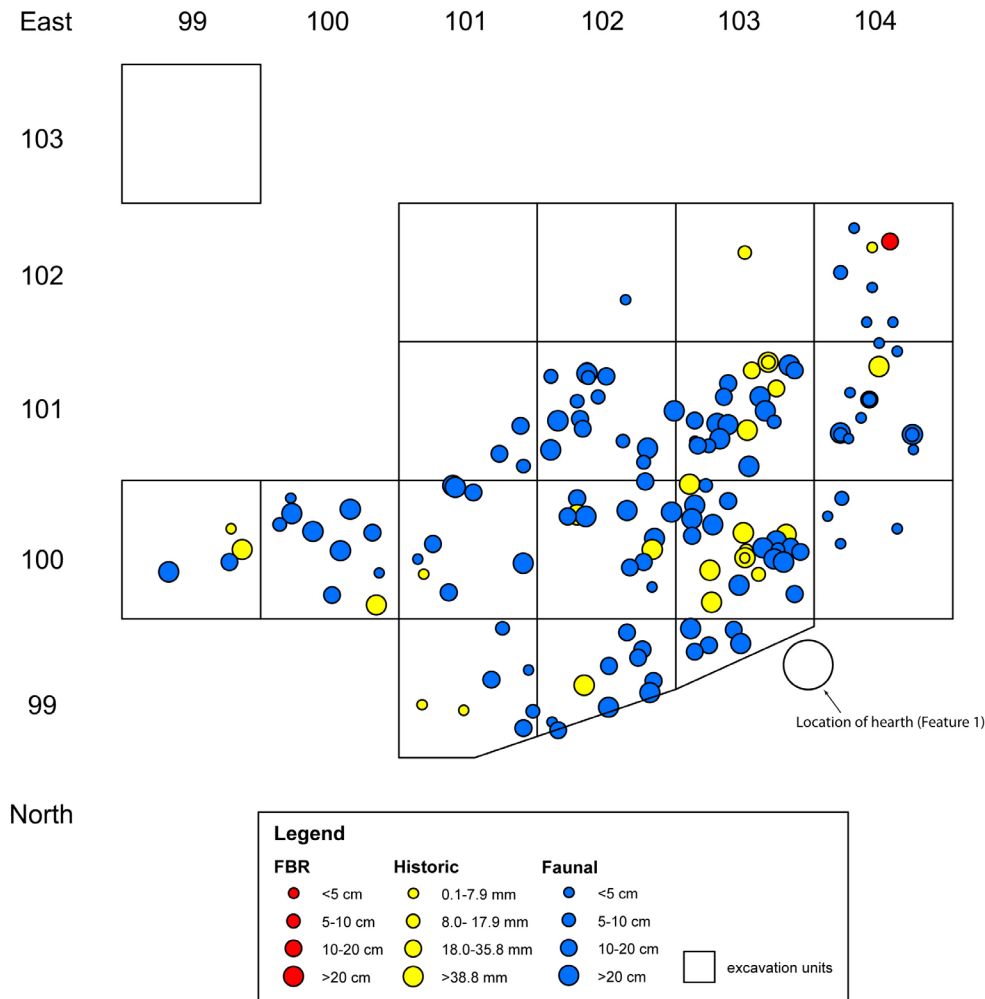


Figure 28. Distribution of all *in situ* artifacts (Component 1).

The presence of fish vertebrae at the site is also significant (Figure 29). To stabilize food resources and encourage the independence of the Fort Edmonton facility, whitefish fisheries were established at several of the lakes in proximity to Fort Edmonton (Binnema and Ens 2016:68,114, 127, and 205). Post workers were commonly employed setting nets to acquire fish as this resource was more economical than pemmican (Binnema and Ens 2016:131, 203).

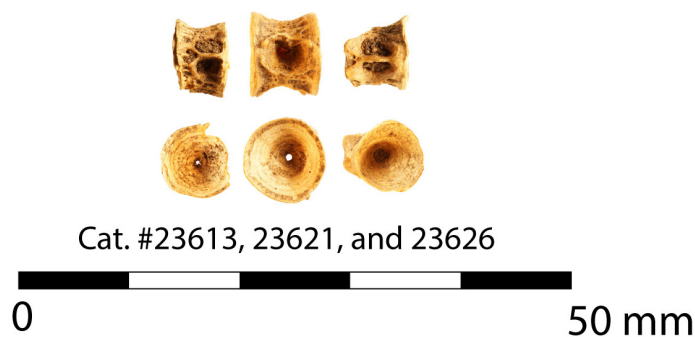


Figure 29. Fish vertebrae (Salmoniformes) recovered from FjPi-63.

In his 1823 to 1824 general report for the Saskatchewan District, John Rowand, newly appointed Chief Factor at Fort Edmonton wrote:

“The means of subsistence the District affords is often precarious, and has been untill last Winter, attended with great expenses. The quantity of Fish (twenty thousand in number) saved Edmonton from incurring heavy expenses, into which otherwise it would have unavoidable fallen - Tho a large number of wood animals had been killed at Edmonton yet no expenses were incurred providing them, further than the employment of a Portion of our People in dragging them to the Fort, and when it was considered that a sufficient number of animals had been procured for the use of the Winter and Summer People, the Hunters were then sent to hunt furs and succeeded in Killing same to a considerable Amount so that instead of their being expensive to us we can produce documents to show that Profit has been made Upon them. - It would however always be advisable to pay every attention to the Fishery at the Lake in the neighbourhood of Edmonton as the Dependence upon Buffaloe is very precarious the number of People depending upon them for their subsistence are daily in chase of them and consequently driving them from one Plain to another to an enormous distance from the Fort” (Binnema and Ens 2016:249-250).

This description provides insight into the management of Fort Edmonton and is in uncanny alignment with the fur

trade assemblage representing Component 1. Fish vertebrae at FjPi-63 confirm the use of this resource. Butchered ungulate bone, including Cervidae, is consistent with the wood animals described by Rowand that were dragged to Fort Edmonton. Perhaps the exhausted and abandoned gun flints represent the aftermath of procuring game for the fort inhabitants. Also consistent with Rowand’s annual report is the presence of butchered fur-bearing animals at the site. This pattern is likely associated with a resident population preparing furs at Fort Edmonton.

Based on the cultural material recovered at this locality within FjPi-63, this component likely represents a mid-19th century camp used by HBC contract staff, in the period 1830-1850 CE, living beneath Fort Edmonton V on the Rossdale Flats. Component 1 at this part of FjPi-63 accords well with John Rowand’s description of subsistence strategies at Fort Edmonton and offers excellent interpretive potential of both local and regional significance.

3. Summary

The discovery of deeply buried sites in urban settings with high interpretive potential is not unique to Edmonton. The identification of several precontact and historic sites under urbanized areas and parking lots within the city of Calgary provides further proof that urban development does not always completely destroy the archaeological record. For example, in the late 1960s, the Mona Lisa site (EgPm-3) was identified in deep deposits during construction of the basement of the Mount Royal Village shopping complex, on an alluvial terrace south of the Bow River valley near the foot of the hillslope to Mount Royal uplands (Wilson 1980). As many as four deeply buried cultural horizons were detected, both above and below Mazama Tephra, with many representing *in situ* bison kills associated with early Middle Precontact Period occupations (Wilson 1980). Another Calgary site includes the Safeway site (EgPm-334), a Middle Precontact campsite located beneath a parking lot and historic fill within the downtown core, along the lower terrace of the Bow River. The site yielded hearths, a stone arc, and a stone circle, and reflects the precontact Indigenous pattern of establishing large seasonal camps on protected terrace flats in valley bottoms (Vivian and Drever 2009).

The preservation of these cultural deposits can be attributed to three major factors: 1. these deposits have been deeply buried by fluvial sediments unreached by cultivation or urban development, 2. during early urban development, landforms in these areas were often partially covered with thick layers of fill prior to development, 3. these locations are areas of late 19th and early 20th century development when

construction practices did not include large scale terraforming and surface grading, which are both routine components of contemporary development.

Although many urban archaeological assessments only provide small glimpses of the archaeological record, these studies have established that intact archaeological resources, with significant research and interpretive potential, remain preserved under Alberta's urban landscapes. These findings provide valuable information to inform both future planning and archaeological exploration. We need to continue to take advantage of the assessments of urban developments, as they offer substantial and valuable evidence of Alberta's archaeological resources.

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