REPORT
RECENT INVESTIGATIONS AT DIFCHAHAK (*TIVCARAQ*), NOB-005, NORTON SOUND, ALASKA

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ABSTRACT

Difchahak (*Tivcaraq*) is a large Norton-aged site located in eastern Norton Sound. The previous research undertaken at the site, while limited in extent, suggests that—despite possessing over 150 large rectangular house depressions and covering an 8.4 ha area—it has a seemingly low artifact density. We returned to Difchahak to determine if we could identify concentrations of artifacts and faunal remains by investigating contexts at the site not previously tested. Here we report on the results of a program of shovel/auger testing and test units that targeted areas outside of the center of the house depressions. While little is present between the houses, the house berms appear to be highly profitable locations to investigate Norton houses in terms of locating middens, recovering artifacts, and identifying house-occupation sequences. The results of our testing suggest that the Norton peoples reoccupied the houses at the site multiple times in periods of 400–130 BC and AD 50–260. However, despite the investment in Difchahak's infrastructure and its reuse, there is still an unexpected dearth of artifacts compared to other Norton sites in the region.

INTRODUCTION

Difchahak or *Tivcaraq* (NOB-005) is a large Norton tradition site located approximately 5 km southeast of the Native village of Shaktoolik on the eastern coast of Norton Sound, Alaska (Fig. 1). It consists of over 150 deep house depressions (Harritt 2010:84) excavated into the sands and gravels of an 8.4-hectare area of a low, fossil beach ridge that parallels the shores of the sound. The sheer size and visibility of the site make it a local phenomenon, and its presence was commented upon in the late 1800s by Nelson (1983 [1899]:264) as several of his informants told him of a large village site located "a few miles south of Shaktoolik." *Tivcaraq* entered the archaeological literature as "Difchahak" through J. Louis Giddings's (1964:183–184) work in the region when he excavated in one house depression at the site while waiting for passage to Cape Denbigh in the late 1940s and early 1950s.

Based on the perimeter of his excavation, which is still visible today, Giddings opened an area of approximately 25 m^2. With few recovered artifacts (n = 16), Giddings (1964:138) included the site within his newly defined Norton culture. However, he never returned to work at the site; in part because of time constraints, but more likely due to the low artifact yield and his observation that most of the houses seemed to have "looter's pits" (Giddings 1964:184).

In 1968, Bruce Lutz (1972:407–408) visited Difchahak while working on his dissertation research at UNK-007, which is situated just east of the airport in Unalakleet.[1]

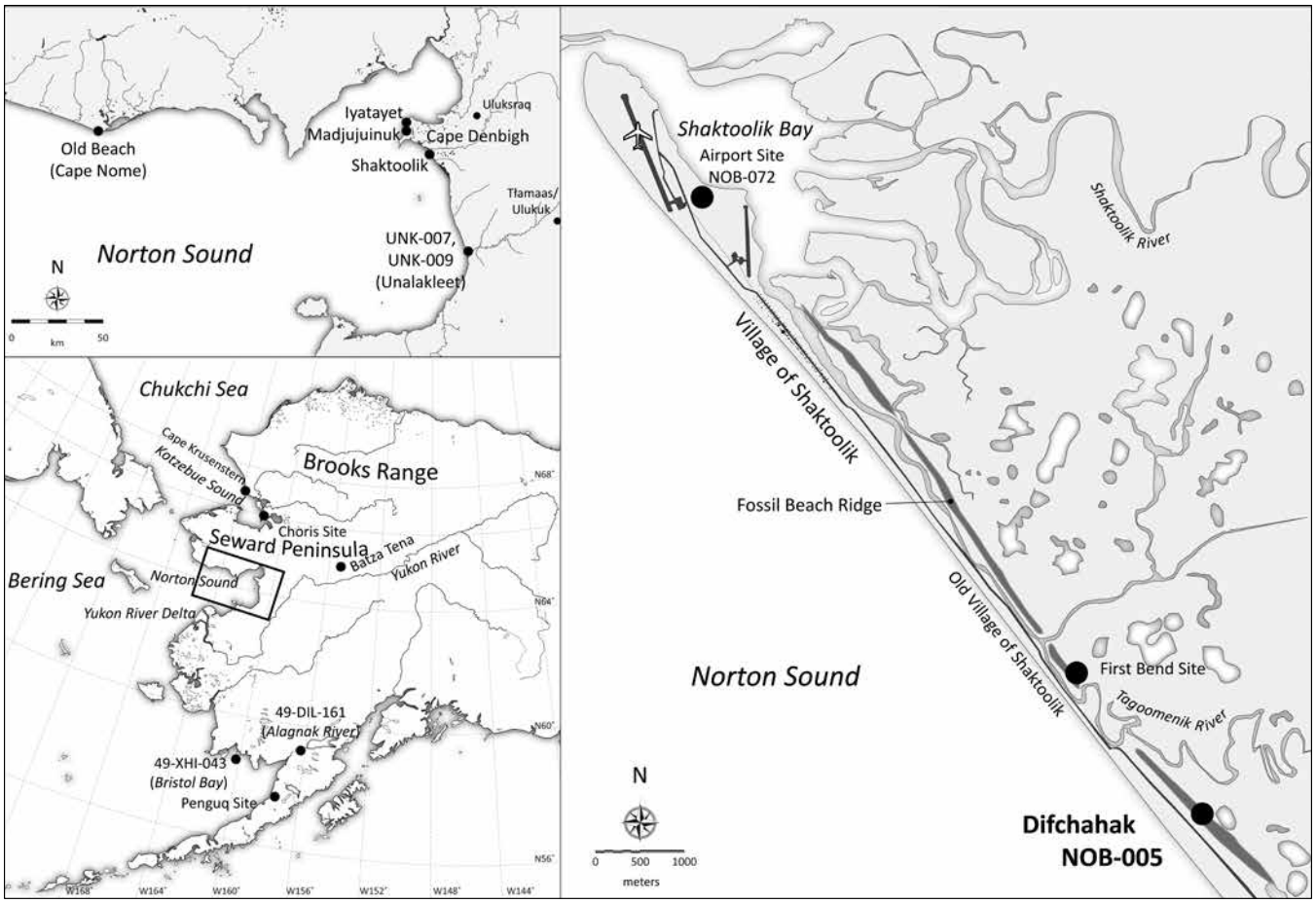

Figure 1. Location of Difchahak, archaeological sites, and locations discussed in the text.

He placed test units in two houses at Difchahak but was cryptic in reporting his findings. He noted that he recovered "very few artifacts," but what he did find led him "to believe these houses are Norton" (Lutz 1972:407–408). More than three decades passed until Roger Harritt (2010) returned and produced the first extensive map of the site in 2006. Harritt (2010:84) recorded 223 depressions (155 houses and 68 caches) and mapped their general shapes and sizes. He also tested four house depressions to obtain organic material for radiocarbon dating. Of the four dates he obtained (see Table 1), three indicated that their associated houses dated to between 530 and 120 BC and one dated to AD 110–330. These dates confirmed the site's Norton affiliation and contemporaneity with other sites in the local area (e.g., Iyatayet [*Ayatayat*; NOB-002], Madjujuinuk [*Macayuilnguq*; NOB-008) recorded by Giddings (1964). Harritt (2010:84) recorded finding only eight artifacts, one of which was a poorly preserved metatarsal (from an unreported species), constituting the only faunal "remain" reported for the site. Thus, taken as a whole, past investigations at Difchahak determined that it is Norton in age, comprised of numerous house depressions spread over an extensive area, but with seemingly low artifact density.

At the request of the then CEO of the Shaktoolik Native Corporation Fred Sagoonik, we renewed investigation at Difchahak in 2016 and returned in 2017. Our impetus for doing so was twofold. First, as an extension of work recently undertaken at the Shaktoolik Airport site (NOB-072) on the Shaktoolik Peninsula (Darwent et al. 2016) and Iyatayet on Cape Denbigh (Tremayne 2015; Tremayne et al. 2018), there is a need to investigate a 700-year gap in the regional culture-historical sequence between AD 400 and AD 1100. Difchahak is representative of the beginning of this interval. Second, Miszaniec, as part of his dissertation research on the development and intensification of precontact fishing economies in Norton Sound, was in search of samples from earlier contexts.

The problems with using Difchahak for either of these purposes was that very little investigation had been carried out at the site, and what had been undertaken suggested

Table 1. Radiocarbon dates from Difchahak calibrated using OxCal 4.3 (Bronk Ramsey 2009).

	Feature	Unit	Level	Material	RCYBP	Calibrated† Start	2 STD End
BETA-221678*	200	–	–	Charcoal	2360±40	731 BC	368 BC
UOC-5792	208	DU6	7	Caribou premolar	2277±37	403 BC	209 BC
UOC-5789	133	DU4	13	Charcoal	2253±26	394 BC	209 BC
UOC-3408	208	DU2	4	Charcoal	2242±34	393 BC	204 BC
UOC-3409	208	DU2	2	Charcoal	2233±27	386 BC	204 BC
UOC-5790	100	DU9	8	Charcoal	2229±26	382 BC	204 BC
UOC-3407	208	DU2	5	Charcoal	2217±27	370 BC	203 BC
UOC-3410	208	DU1	3	Charcoal	2211±27	366 BC	201 BC
UOC-5786	56	DU10	8	Charcoal	2203±26	362 BC	199 BC
BETA-221677*	147	–	–	Charcoal	2210±40	382 BC	184 BC
BETA-221676*	48	–	-	Charcoal	2130±40	355 BC	46 BC
UOC-5787	208	DU6	4B	Charcoal	2083±26	181 BC	41 BC
UOC 5788	7	DU8	9	Charcoal	1890±26	AD 58	AD 214
BETA-221675*	12	–	–	Charcoal	1810±40	AD 87	AD 332

* From Harritt (2010)

† Calibrated with IntCal 13 Calibration Curve (Reimer et al. 2013); calibrations are at 2 sigma of standard deviation.

very little in the way of artifacts present. Given the limited understanding of the site from previous work, our goals for the two seasons were to (1) identify areas with concentrations of artifacts and faunal remains, and (2) investigate the nature (i.e., context) of such concentrations if identified. Here, we report on the findings of our investigations in 2016 and 2017: we discuss the results of a limited auger and shovel testing program, detail the stratigraphy and new radiocarbon dates revealed by test excavations in five house depressions, and describe the recovered material culture and faunal remains. We then discuss the implications of the investigations toward our understanding of the timing of the occupation of Difchahak, the apparent dearth of artifacts at the site, and implications for Norton house architecture. Our excavations revealed that the five houses we tested were occupied/rebuilt between four and six times each. Building one house, let alone rebuilding it three to five times again, is a tremendous expenditure of energy; yet, despite this effort, the overall scarcity of artifacts in the tested houses suggests a less-than-expected intensity of occupation. We discuss the implications of this finding for the site's role in the broader Norton Sound during the Norton period.

BACKGROUND

THE NORTON TRADITION IN THE ARCHAEOLOGICAL RECORD

We adhere to Dumond's (1982; 2000) characterization of the Norton culture as being part of the larger Norton tradition, which also includes the earlier Choris and later Ipiutak cultures. Giddings (1964:137) initially defined the Norton "culture" from his work at Iyatayet. His original definition of Norton was vague, essentially equating it with artifacts that were not Denbigh or Nukleet. Workman (1982:103) refined the definition of the Norton by identifying three key cultural characteristics: (1) thin, well-made pottery with fiber or sand temper, either plain or decorated with check or linear stamping; (2) side blades for insetting into harpoons or other weapons; and (3) ground slate technology. He defined 13 other primary characteristics (Workman 1982:104–105), and assemblages with a relatively homogenous mixture of these characteristics have been identified from the Alaska Peninsula, the entirety of Alaska's Bering and Chukchi seacoasts, to the Yukon Territory in Canada (see Dumond 2016). Temporally, Norton tradition sites range from 800 BC to AD 1000, though sites later than AD 400 have been found south of the Yukon Delta (see Casperson 2017; Darwent and Darwent 2016; Dumond 2000; 2016).

Economically, Norton groups are characterized as marine-adapted hunter-fisher folk based on the ubiquitous presence of bi-notched stones—interpreted as net weights—in Norton assemblages and the occurrence of large village sites near outlets of major salmon rivers (Dumond 2000:4; 2016:401–402). Though organic artifacts tend to be rare in Norton sites, toggling harpoons have been recovered, which indicate the taking of sea mammals. Faunal remains from Iyatayet included caribou, canids, ducks and geese, ptarmigan, and fish; however, marine mammals dominated (*n* = 333, 87%)—consisting mainly of seals but also some beluga whale (Tremayne et al. 2018).

NORTON IN THE SOUND

Norton Sound is an inlet of the Bering Sea located on the southern margin of the Seward Peninsula and north of the Yukon River delta. The known culture-historical sequence of the coastal regions of the southern sound, initially proposed by Giddings (1964), extends back to 2310 ± 290 BC (Tremayne 2015; Tremayne et al. 2018). At this time, groups associated with the Denbigh Flint complex moved into the region to exploit sea-mammal resources (Tremayne 2015; Tremayne and Brown 2017; Tremayne and Rasic 2016). Based on the currently available evidence, Denbigh populations began to decline and eventually disappear around 1650 BC (Tremayne and Brown 2017:372–373). Modeled radiocarbon dates from Iyatayet suggest that this occurred locally by 1480 ± 150 BC (Tremayne et al. 2018:18–19). It is possible that the region remained unoccupied or sporadically used for approximately 1000 years (Tremayne et al. 2018), but an overall lack of archaeological research in the region might ultimately be responsible for this apparent gap in the record.

Currently, evidence is lacking for Norton tradition sites before 500 BC in Norton Sound. The earliest dates

Figure 2. Difchahak from the air looking northeast. In the background is the Tagoomenik River. Photo credit: Kelly Eldridge, 2018.

available for the tradition in the sound come from Iyatayet, where modeled dates place it at 430 ± 30 BC (Tremayne et al. 2018:18). Fifty kilometers to the south, Lutz (1972) estimated that Norton groups occupied UNK-007 near Unalakleet by 270 BC, and 210 km to the west on the northern side of Norton Sound John Bockstoce (1979) placed the Norton occupation of Old Beach at Cape Nome as beginning around 330 BC. Difchahak, UNK-007, and Old Beach are large village sites with over 100 depressions each, many of them houses. Norton occupations have also been identified at the Madjujuinuk, Gungnuk, and Bridge sites (UNK-009), but these sites, along with Iyatayet, are considerably smaller and may represent satellite localities.

There appear to have been two pulses of Norton occupation in the region. From excavations at Old Beach, Bockstoce (1979:36–39, 43) identified two Norton occupations: an early 330–80 BC period, followed by a later AD 180–310 period. Similarly, Lutz (1972) surmised that the initial occupation of UNK-007 near Unalakleet occurred 270 BC–AD 80 and was followed by a second occupation AD 150–550. After this latter date, southern Norton Sound appears to have been either abandoned or sparsely populated, based on the meager currently available evidence, until the archaeological culture known as Nukleet—a possible regional expression of Thule—appeared around AD 1100 (Darwent et al. 2016:12–13; Tremayne et al. 2018:7).

DIFCHAHAK SETTING

The vegetation covering Difchahak consists of dune grasses and lichen, with some willow and alders, and an occasional spruce tree, sometimes growing inside the depressions (Fig. 2). It sits on an inactive, older beach ridge, approximately 250 m from the coast of Norton Sound and 100 m from the modern beach ridge, consisting of "elongate, narrow mounds and ridges of well-sorted, well-stratified, medium sand to coarse gravel [that are] several meters thick" running parallel to the coast (DeRaps et al. 2017). The formation of this ridge predates Difchahak (~500 BC) but at this time we do not know how much earlier it formed nor how close it was to the coast at the time of its occupation. To the east, the ridge overlooks a lake and wetland area created through multiple formations and reformations of thaw lakes (DeRaps et al. 2017). Just to the north of the site flows the Tagoomenik River along the eastern side of the Shaktoolik spit into Shaktoolik Bay.

The Tagoomenik River is currently located 350 m from the site; however, aerial images show an abandoned channel in which the river would have abutted the northern end of the site in the past. We also believe that it may have directly emptied into the sound, or that the Shaktoolik Spit was significantly shorter at the time of Difchahak's occupation. The same beach ridge complex on which Difchahak rests runs in a parallel direction

Figure 3. House depressions at Difchahak, looking to the northwest. Lichen cover the berms of the house depressions, and alders, willows, and grasses grow inside. Photo credit: John Darwent, 2016.

to the Tagoomenik from approximately one kilometer northwest of the site—which can be considered the starting point of the spit—to Shaktoolik Bay on the opposite side of the modern village. From excavations at the Shaktoolik Airport site (Darwent et al. 2016), we know the modern configuration of the spit was partially in place by AD 100, but it is not clear when it started building. Based on Google Earth imagery and Harritt's (2010:83) map, we believe 170 houses and 73 caches remain. There is the potential for features to be present on the modern beach ridge to the west of the site, which has not been systematically surveyed. However, at this time, we do not believe that any such features could be coeval with those in Difchahak, and thus we do not consider them as part of the site.

METHODS

Due to its magnitude—both in area and the size of its house depressions (which can be over 12 m wide and 1.5 m deep) (Fig. 3)—Difchahak is a daunting site, and with a limited crew and time, we required a survey strategy that could identify areas that might have artifact concentrations. The one piece of knowledge we had from the previous investigators was that artifacts did not appear to be concentrated inside the house depressions. Thus,

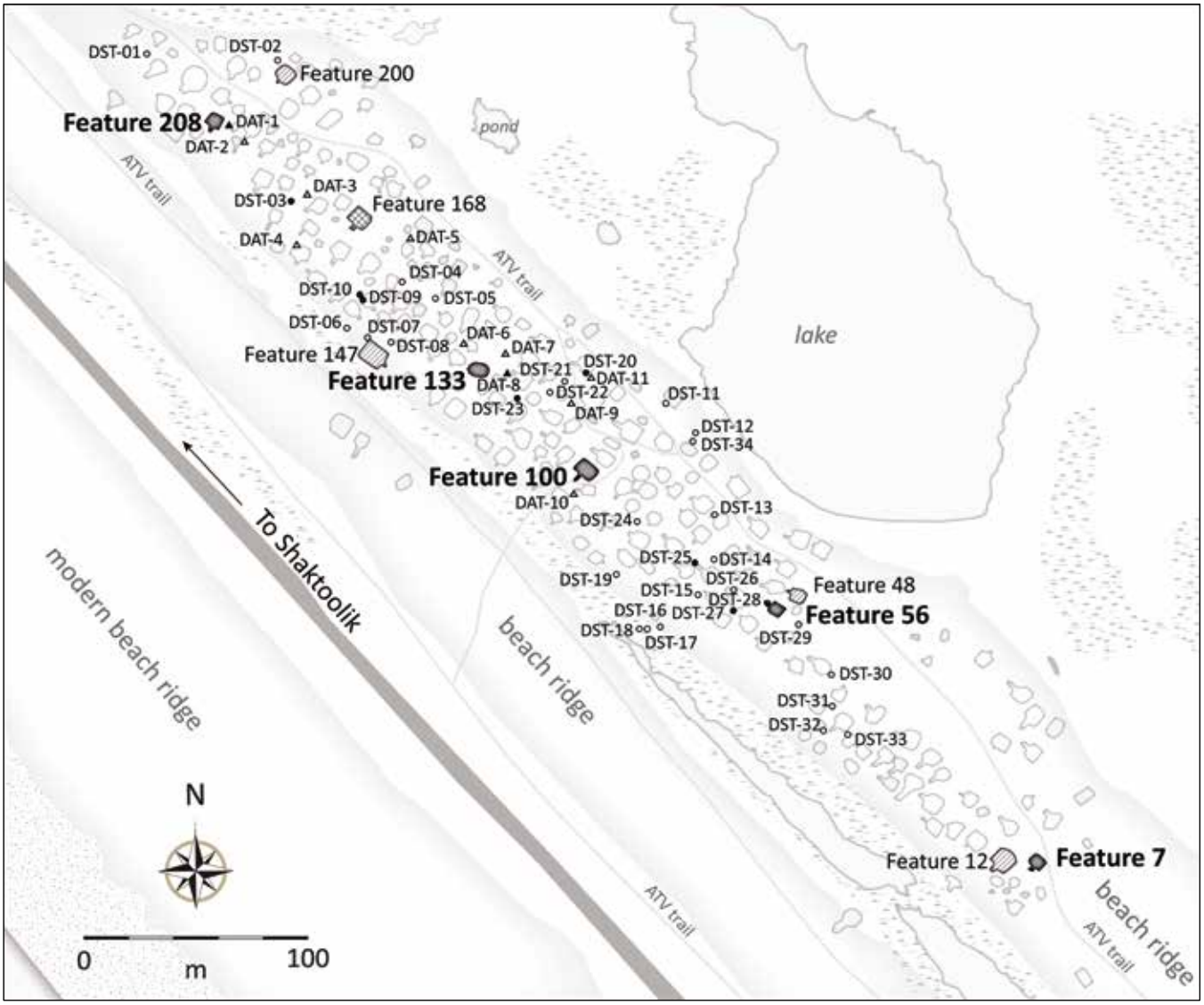

Figure 4. Location of house depressions and caches, previous investigations, auger and shovel test locations, and features excavated in 2016–2017. Map assembled from Google Earth imagery and house locations plotted by Harritt (2010:83, Fig. 2).

we devised a strategy of auger testing, shovel testing, and placing test units in locations not typically sampled (or at least not at Difchahak): entrance tunnels; in front, between, behind, and on the sides of houses; and flat spaces adjacent to, or in between, groups of houses. In addition to looking for artifact clusters, this strategy allowed us to search for midden deposits with faunal remains and minimize impacts to the houses themselves.

Because of the possibility of deeply buried features, we initially used an 8.9-cm (3.5-inch) bucket auger, screening all soils/gravels through 0.635 cm (¼-inch) mesh. Also, because many of the houses are over 1.5 m deep, it is clear that the original occupants moved a considerable amount of ground during the construction of their dwellings. Once we determined the depth of the deposits, we shifted to shovel testing to expose larger horizontal "windows." These tests were ~40 cm in diameter, excavated to ~50 cm below the surface, removed in 10 cm increments, and screened through 0.635-cm (¼-inch) mesh.

We opened 1 x 2-m test units based on criteria developed from the results of the auger and shovel testing. Excavation proceeded with trowels in 10-cm arbitrary levels with soils/gravels screened through 0.635 cm (¼-inch) mesh. Two exceptions to this were a 1 x 1-m unit opened in the first season and expansion of a 1 x 2-m unit to investigate a midden deposit. Details on these two exceptions follow. Formed artifacts were provenienced to three-point coordinates; "bulk" artifacts (e.g., pottery fragments, debitage, and bone) were collected by quadrant. All units were excavated to sterile, naturally deposited gravels.

EXCAVATION RESULTS

Fieldwork occurred in September 2016 and July 2017. During two weeks in September 2016, a crew of two people undertook the first phase of the research, with some assistance from local community students, focusing first on the bucket auger and shovel testing and then on the excavation of a 2 x 1-m and a 1 x 1-m unit. In 2017, we returned to excavate four 2 x 1-m test units and expand one of the units opened in 2016 with an additional three 1 x 1-m units. The 2017 crew consisted of two people, who worked three weeks with the assistance of a third member and a community member for one week.

AUGER AND SHOVEL TESTING

We excavated 11 auger tests in September 2016 (Supplementary Table 1; Fig. 4). These tests went to an average of 125 cm below surface (henceforth CMBS), with the deepest going to 180 CMBS. While each test had 5–20 cm of silty loam on top covered with vegetation, there were no consistencies in the profiles. Some columns consisted of alternating layers of sand and gravel, whereas others were primarily gravel. Because of the limited diameter of the auger holes, it was not possible to determine whether these layers were anything other than natural deposits. Excavation of the auger test was exceedingly difficult due to frequent wall collapse caused by loose gravels and sands.

Auger tests (Difchahak Auger Test or DAT-) 1 and 8 produced cultural material. DAT-1, situated on the berm of Feature 208, was the most-productive sample, yielding a chert biface (60–70 CMBS), a scraper (110–115 CMBS), and a piece of debitage (165–170 CMBS). Initially,

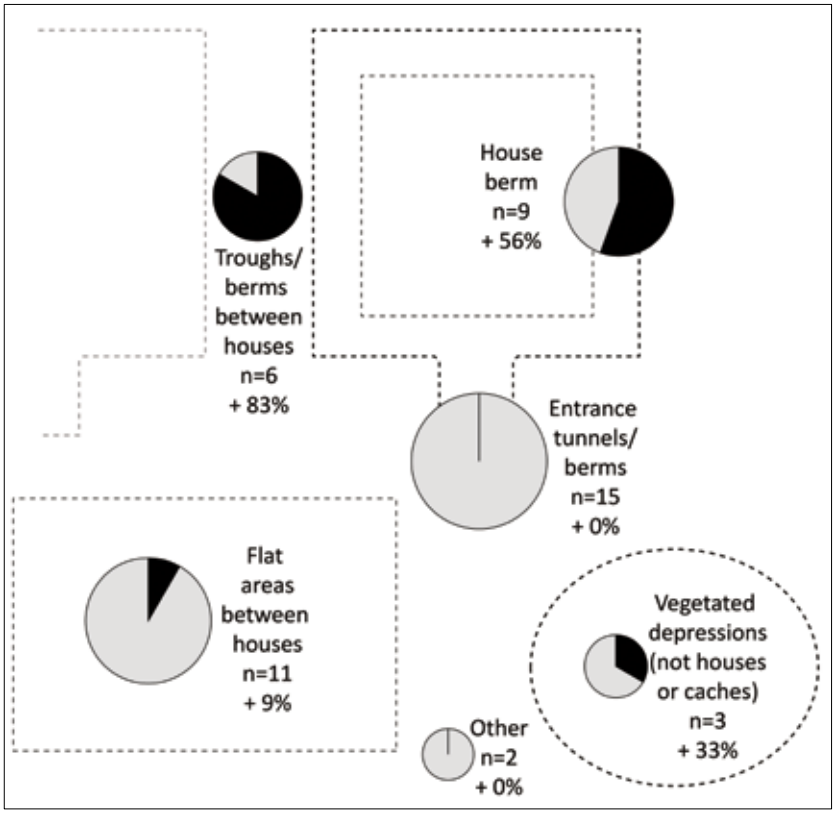

Figure 5. Schematic of the location of positive (black) and negative (gray) shovel tests in relation to house features.

we believed that deeply buried deposits could be present; however, further investigation revealed that the last two artifacts were recovered at these depths because they were knocked in from higher deposits. Similarly, DAT-8 produced a worked beach pebble recorded at 115 cmbs, but we believe that this artifact too was out of context due to wall collapse. Because of this displacement and the likely nonexistence of deeply buried deposits, we curtailed auger testing and shifted to shovel testing.

Thirty-four shovel tests were excavated in 2016, of which 10 (29%) had artifacts present, with most found in the first 25 cm of excavation (Supplementary Table 1). Artifacts consisted of pieces of chert debitage, slate artifacts, a piece of groundstone, and a Norton-style projectile point made of silicified siltstone.

We believe the results of the auger and shovel testing demonstrate the most productive locations for artifacts are in slight troughs or shared berms between houses (n = 6; 83% positive) followed by house berms (n = 9; 56% positive) (Fig. 5). One out of three tests placed in vegetated depressions (of unknown origin) was positive, as was one out of 11 tests placed in flat areas between houses. However, tests placed in or around the entrance of a house did not produce any cultural material, despite being the most tested location (four auger and 11 shovel tests).

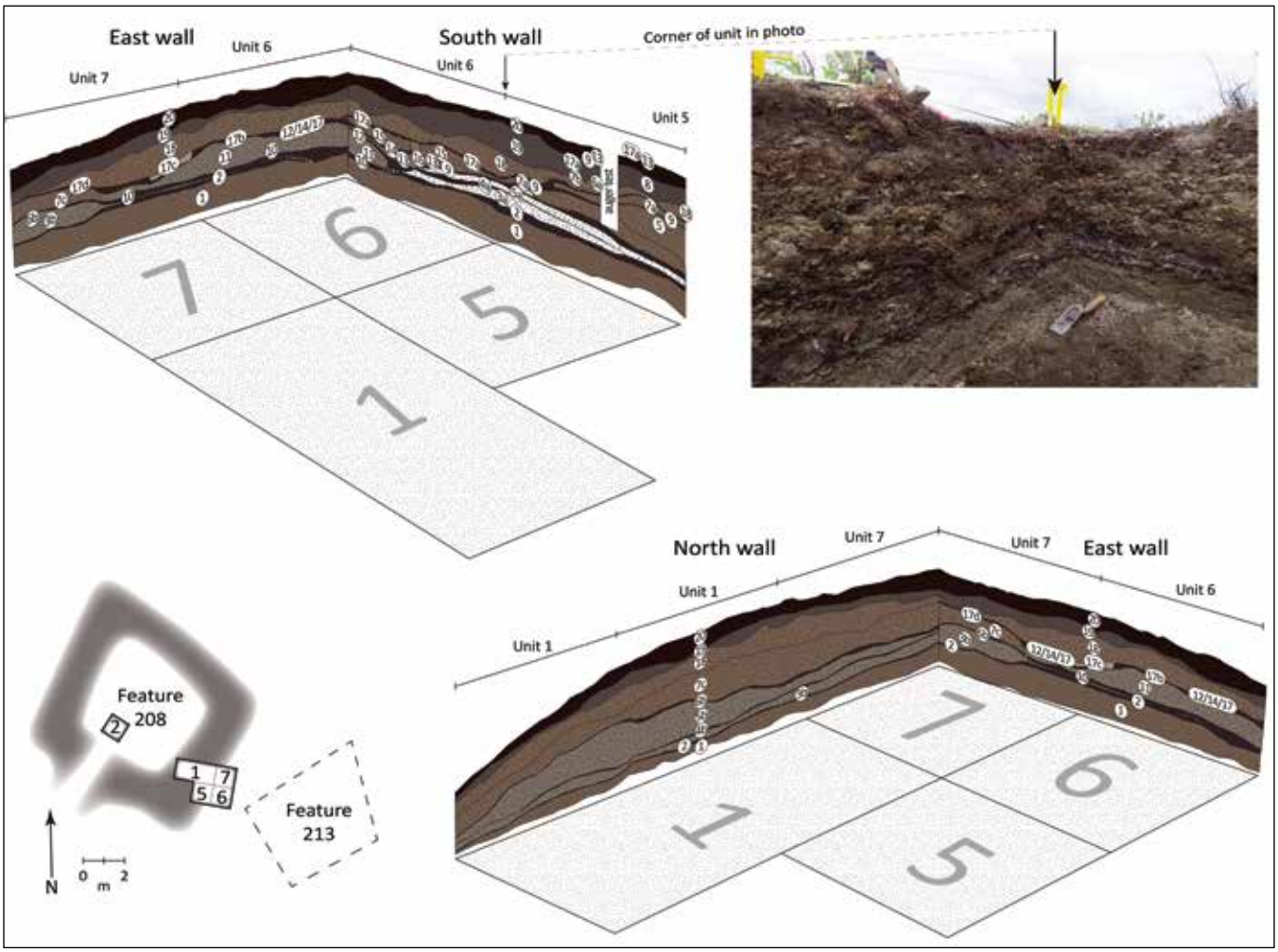

Figure 6. A three-dimensional diagram of the stratigraphic layers associated with the north, east, and south walls of the excavation block (DU1, 5, 6, 7) placed in the berm of Feature 208. Numbers correspond with strata discussed in Supplementary Table 2. The map in lower left corner depicts the location of the excavation block in the house depression, as well as the location of DU2 and a dashed outline of where Feature 213 sits. The photograph in the upper right corner shows the shell midden in the south and east walls of DU5 before the excavation of DU6. Photo credit: Jason Miszaniec, 2017.

UNIT EXCAVATIONS

The first auger test determined the location we chose to place this unit because it produced 11% of the reported artifacts for all shovel and auger tests. Because of its productivity and the results of the exploratory testing, we decided to open one 1 x 2-m unit in the berm of Feature 208 in 2016 and berms of four other houses in 2017.

Berms present challenges to excavation and interpretation. Depending on how a house was constructed, used, cleaned, reused, rebuilt, and abandoned, the stratigraphic layers in a berm can range from simple and straightforward in a sequence of development to convoluted and temporally mixed layers. Despite these latter issues, berms can also be useful providers of evidence concerning architecture, construction methods, and construction events (particularly in instances when looting or reworking disturbed the central area of a house).

Feature 208

Feature 208 is approximately 35 m southwest of Feature 200 tested by Harritt (2010:84) and 75 m northwest of Feature 168 excavated by Giddings (1964:183–184) (Fig. 4). It is a square house depression measuring ~8 x 8 m with what presumably is an entrance tunnel extending from its southeastern margin, and it is approximately 1.5 m deep. Initially, we placed a 2 x 1-m unit (Difchahak Unit 1 or DU1) in the western berm to explore the deposits revealed by DAT-1 in 2016. Also, we situated a 1 x 1-m unit in the house depression (DU2). In 2017, we expanded the excavation of DU1 to obtain a better sample of a buried midden, which included well-preserved faunal remains.

DU1 (and adjoining 1 x 1-m Units DU5, 6, 7)

DU1 was placed on the berm and inward slope of Feature 208's depression in 2016 (Fig. 6). Immediately, recovery of artifacts began in the first 10 cm and continued to 50 CMBS. The soils first consisted of sod and a dark, silty loam but transitioned to layers of brown sandy gravel. Occasionally, the layers of brown, sandy gravel were separated by a thin darker soil with charcoal flecks. At approximately 45 CMBS, the remnants of a buried soil were identified. This soil covered a mixture of lenses of sandy gravel and sand and further thin vestiges of other buried soils. These overlay a lens of shells with dark soil in the southern portion of the unit containing well-preserved faunal remains at 55 CMBS. The layer was ~5 cm in thickness in the unit wall and became thicker southward. Under the shell layer was another layer of gravel followed by yet another buried soil. After this soil, the matrix became sand with a little gravel, and no further artifacts were recovered. At 70 CMBS, one quadrant was excavated to 110 CMBS to determine whether further cultural layers were present; however, the sand and gravel encountered was sterile. We ceased excavation due to wall collapse.

While bone preservation throughout most of the unit was poor, the presence of a shell midden represented a rare opportunity to collect Norton-aged faunal remains. Using an auger to probe, we determined that the midden likely extended to at least three adjacent units to the east and the south, which we returned to further investigate in 2017.

The block has a series of 20 events represented by 29 strata (detailed in Fig. 6 and Supplementary Table 2). Although placed in the berm of Feature 208, it is evident that construction events associated with Feature 213 are intermingled in the profile. Artifacts recovered in the excavation block are listed in Supplementary Table 3.

Both the stratigraphy and the radiocarbon dates from the excavation block suggest that occupation of Feature 208 occurred multiple times with at least six rebuilding events/refurbishments or reoccupations. Radiocarbon dating of one caribou premolar and two charcoal samples produced dates of 2277 ± 37 RCYBP (UOC-5792), 2211 ± 27 RCYBP (UOC-3410), and 2083 ± 26 RCYBP (UOC-5787) respectively (Table 1). Based on the calibration of the earliest date, the initial occupation of the features could have occurred as early as 400 BC to around 200 BC. The middle date's calibration (366–201 BC) overlaps with this period as well. The latest date calibrates to 181–41 BC, which suggests a slightly later occupation.

If our proposed sequence of events is correct, there were as many as six occupations of Feature 208, and then Feature 213 was constructed. While there is firm evidence for one occupation of Feature 213, there was likely a second as well. After the presumable abandonment of Feature 213, it appears that Feature 208 was once again occupied.

DU2

We placed DU2 inside Feature 208 close to where an entrance tunnel may have joined with the house to determine how the interior depression deposits related to the berm deposits (both in terms of artifacts and radiocarbon dates). The unit was offset from the house center, as it was

evident there had been previous digging in the central area of the house.

Fifteen strata were identified in the unit (Supplementary Fig. 1, Supplementary Table 4) and, like those in the excavation block on the berm, indicate minimally four but possibly six occupations of the depression. However, an excavated pit situated more towards the center of the house obscures the unit stratigraphy. It is not clear when this disturbance occurred in the past.

Feature 7

Feature 7 is a relatively small rectangular house depression (compared to others on the site) situated on the other end of the site from Feature 208 (Fig. 4). It measures approximately 7.5 x 6.5 m, possesses an entrance tunnel that faces southwest, and is approximately 1.0 m deep. We chose to test this house to ascertain whether it was similar in age to Feature 12, which was excavated by Harritt (2010:85) and determined to have been occupied AD 87–332. Feature 7, though smaller, is proximate to Feature 12 and shares a similar tunnel orientation.

DU8

Based on the results of the auger and shovel testing, we placed DU8 in the northern side berm of Feature 7 in 2017 (Fig. 7 and Supplementary Table 5). This unit was excavated to a maximum depth of 85 CMBS, but it had to be stepped-in at its lower levels due to wall collapse. We identified 20 different stratigraphic units in the western wall profile of the unit, which indicates it was occupied/reoccupied minimally five times.

We obtained one radiocarbon sample from charcoal recovered from a burned area (Layer 12a) (the structure appears to have been burned down at least once), which dated to 1890 ± 26 RCYBP (UOC 5788; calibrated to AD 59–214). Thus, minimally this configuration of the house, which likely follows two previous occupations, dates to the same period as adjacent Feature 12 (AD 87–332). The "stepped-in" or "stairstep" shape of the floors (as opposed to smoothly sloped profiles) is reminiscent of the floor shapes identified by Bockstoce (1979:40–41) for houses from his later-period Norton houses at Old Beach.

Feature 56

Feature 56 is a large rectangular house that measures ~9.5 x 7 m and 1.25 m in depth. It has a short, northwest-ern-oriented entrance tunnel, which factored into its selection for excavation because Harritt (2010) tested Feature 48 that had a similar tunnel direction, located 20 m away.

DU10

Following our protocols derived from the auger and shovel testing, we situated DU10 in the center of the northeastern berm of Feature 56 (Supplementary Fig. 2 and Supplementary Table 6). We excavated it down to sterile gravels, which were 120 CMBS on the unit's eastern side but only 45 CMBS on the western end. Twenty-five different depositional events represented by 29 strata, which were created by a minimum of four occupations/reuses of the depression, were identified in the southern wall profile.

Pieces of burned timber from one of the lower occupation floors dated to 2203 ± 26 RCYBP (UOC-5786), which calibrates to 363–199 BC. The last occupation floor, however, has a stepped-in or staircase profile (similar to that noted in Feature 7), as opposed to a sloped profile, which suggests a later period of occupation before the feature's final abandonment.

Feature 100

We chose Feature 100 for investigation because of its central location, and because previous investigators had not tested in this area of the site. It is a rectangular house depression with an entrance tunnel facing southwest, like many others in its vicinity. It is approximately 1.75 m in depth, which makes it relatively deep compared to other houses; it is on the larger size as well, measuring ~10 x 8.5 m.

DU9

This unit was placed in the southwestern berm of the depression and excavated to sterile gravels (Fig. 8 and Supplementary Table 7). Because of the size and depth of the berm, we had to situate the unit "mid-slope," and thus the berm still rose considerably to the southwest of the excavation unit. The depth of excavation in the south of the unit was 115 CMBS and in the north 65 CMBS. We identified 28 strata in the west profile, which we believe represent a minimum of six occupations.

Feature 133

Feature 133 was chosen for investigation in 2017 because of its shape, which although semirectangular, was much more oval than most depressions from a ground-level view. No entry tunnel was visible from surface observations;

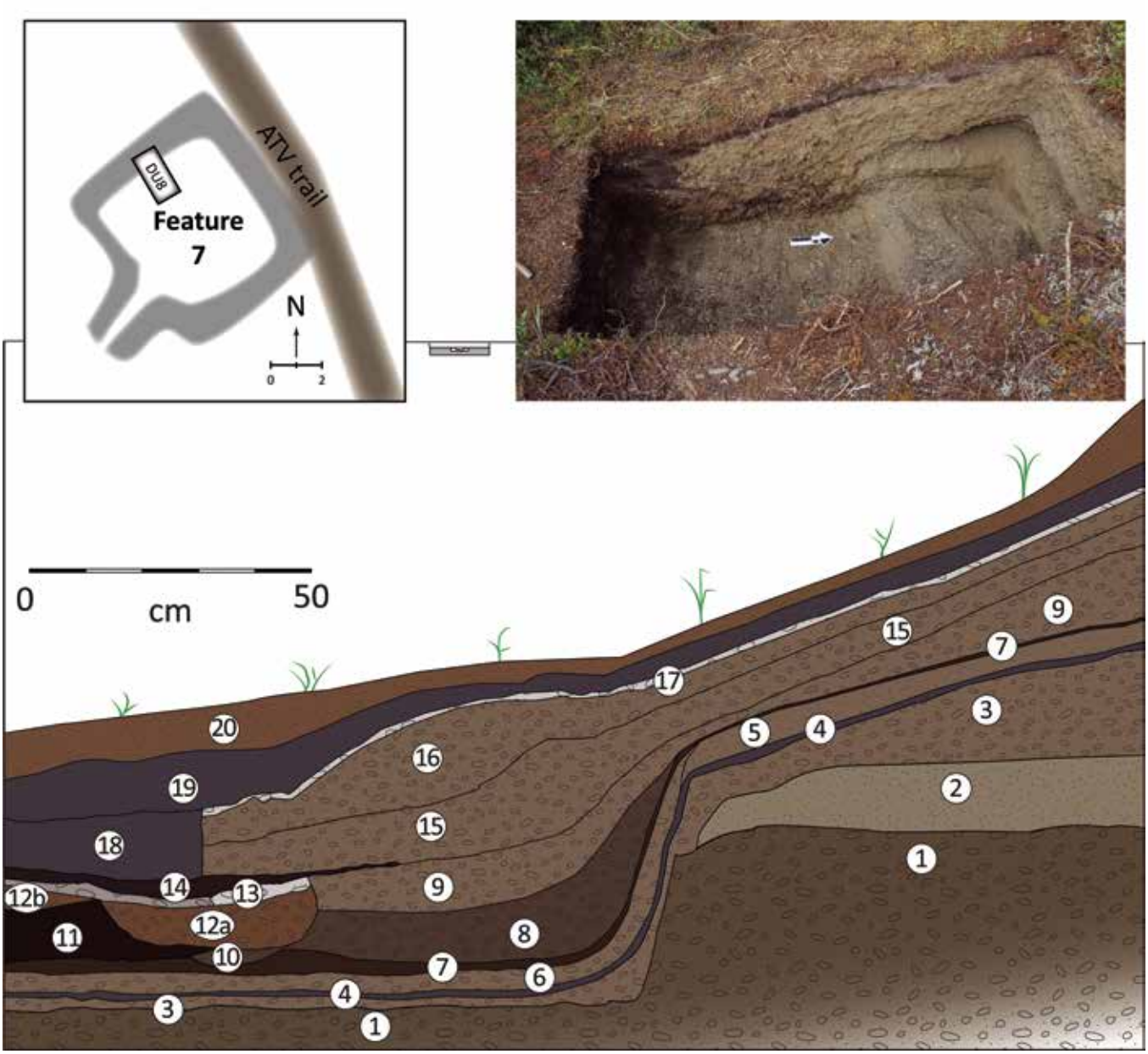

Figure 7. Profile and photograph of the western wall of DU8, located in Feature 7. Numbers correspond to strata discussed in Supplementary Table 5.

however, satellite imagery suggests that it might be on the southeastern margin of the house. The depression measures approximately 8.5 x 7 m and 1.5 m in depth.

DU4

DU4 is a 2 x 1-m unit we placed in the northeastern berm of the feature (Supplementary Fig. 3 and Supplementary Table 8). On the eastern side of the unit, excavation went down approximately 75 cmbs, comparted to 50 cmbs on the western side.

We noted the presence of 24 strata in the southern wall profile of DU4, which appear to have been the product of a minimum of five different occupations. A charcoal sample from the lowest floor radiocarbon dated to 2229 ± 26 rcybp (UOC-5790), which calibrates to 382–204 bc. However, like Feature 56, some of the upper floors have a stepped-in configuration, which might indicate a later reoccupation of the depression.

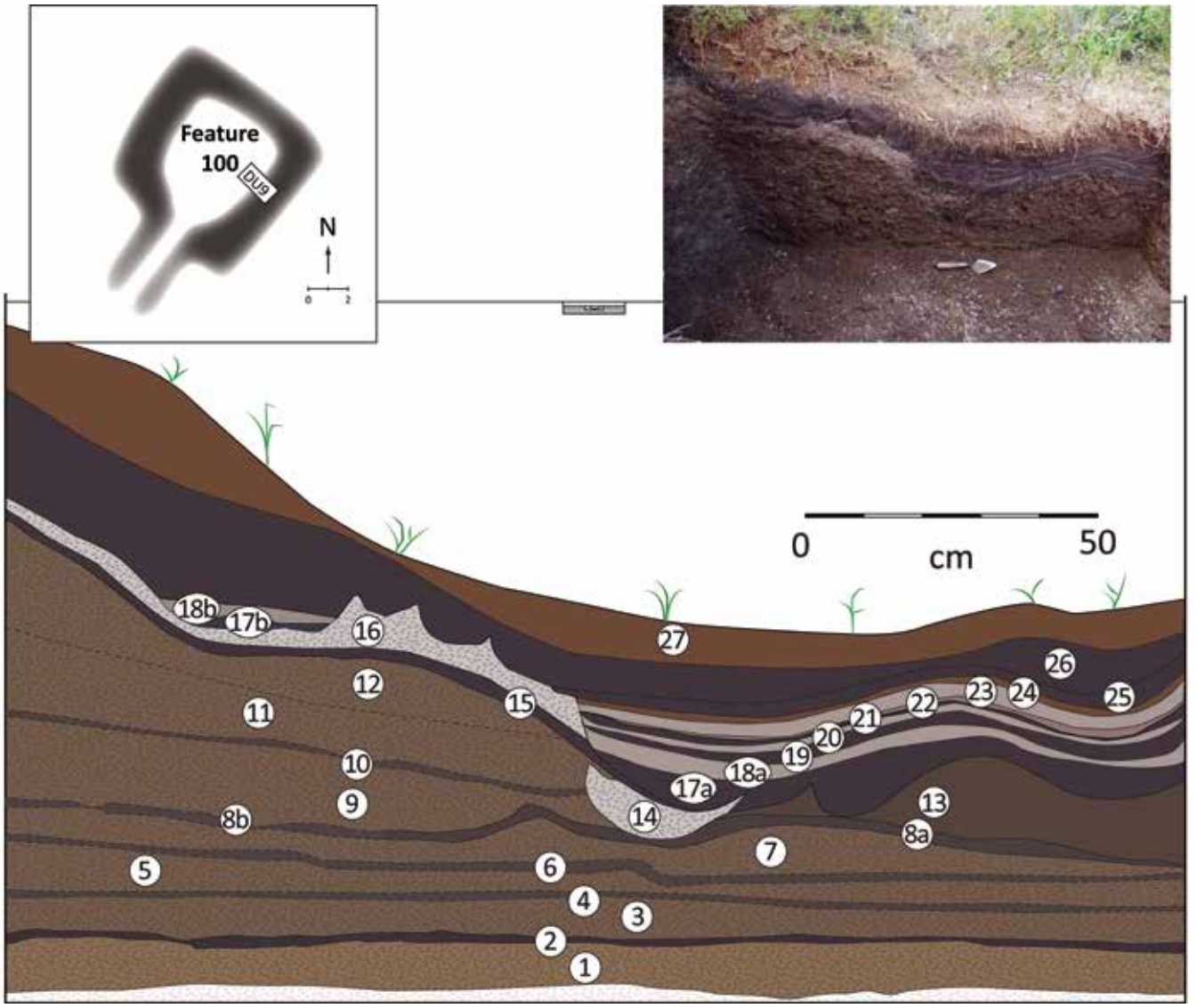

Figure 8. Profile and photograph of the southern wall of DU9, located in Feature 100. Numbers correspond to strata discussed in Supplementary Table 7.

RECOVERED ARTIFACTS

During the 2016–2017 investigations, we recovered 1366 cultural objects. Of these, 533 were small pottery fragments under 1.0 cm in size, most of which likely spalled off the larger pottery sherds. Therefore, a more realistic figure, which does not include these small ceramic spalls, is 833 artifacts. Except for four surface-collected pieces, recovery of the artifacts was from excavated or auger/shovel test contexts.

CERAMICS

There was variable preservation of pottery at the site. While we recovered some exceptionally well-preserved sherds, most were exfoliating and fragmenting. As a result, 533 pieces of the 687 ceramic objects can be described as pottery "spalls" or fragments under 1.0 cm in size. Of the 154 larger sherds, 148 are body sherds, and six are rim sherds (see Supplementary Table 3). The majority of these sherds are plain (n = 117), either being undecorated or from areas of vessels not typically stamped. The remaining sherds possess either check stamping (n = 14)

(e.g., Supplementary Fig. 4a, b, c) or linear stamping (*n* = 23) (e.g., Supplementary Fig. 4d, e, f) and classify into the Norton ware pottery types defined initially by Griffin and Wilmeth (1964:271–274) for the Norton tradition at Iyatayet.

LITHICS

The recovered lithic assemblage consisted of 679 objects: 344 tools and 335 pieces of debitage. We consider the assemblage to be entirely from the Norton tradition.

Raw Materials

Seventeen raw material types are represented in the assemblage (Table 2; Fig. 9); however, chert dominates (*n* = 381: 56%). Approximately two-thirds of this is gray-colored, fine-grained chert (*n* = 258). The other large portion of the chert was black-colored, fine-grained, and opaque. It resembles black chert from the Brooks Range to the north (Mull 1995; Rasic 2016). Both of these chert types are likely exotic to the area (Giddings 1964; Tremayne et al. 2018).

Beach pebbles—flat stones from local bedrock sources of greywacke, siltstone, and mudstone (Wilson et al. 2015) found along the river banks and shores of the Shaktoolik Peninsula—were the next most prevalent (*n* = 77), followed by silicified slate (*n* = 53), sandstone (*n* = 51), slate (*n* = 39), and basalt (*n* = 38). All of these materials were likely of local origin. In particular, basalt outcrops are known on Cape Denbigh (Giddings 1964:147), and local slate sources are known at *Tłamaas/Ulukuk* (Whaleback) Mountain on the Unalakleet River (BSNC 1984) and *Uluksraq* (Christmas or Bald) Mountain on the Ungalik River (Koutsky 1981:25).

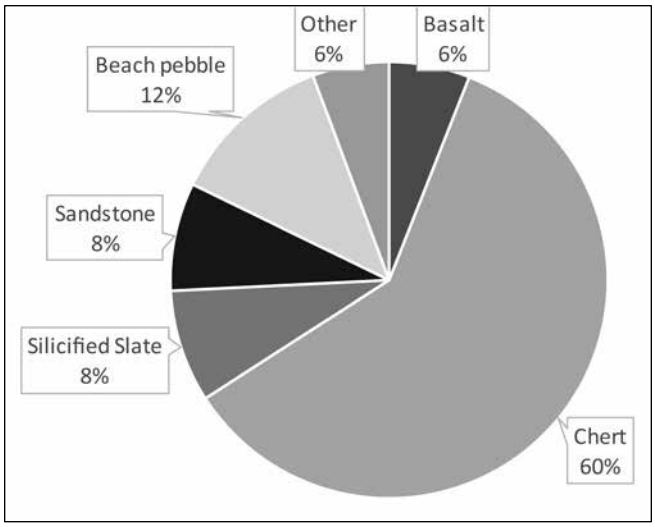

Figure 9. Percentage of raw material types for lithic artifacts recovered from Difchahak in 2016–2017.

Five obsidian objects were also recovered. We are currently undertaking X-ray fluorescence analysis to source these samples. The closest source of obsidian is from Batza Tena located 370 km to the northeast (Clark 1995; Rasic 2016); thus, the material was minimally brought this distance to the site.

TOOLS

The 344 tools were classified into a diverse range of 44 tool classes, which fall into three broad technological categories: flaked (*n* = 234), flaked-and-ground (*n* = 73), and groundstone tools (*n* = 37).

Flaked Stone Tools

Flaked-stone tools are tools shaped almost exclusively using reduction techniques exploiting conchoidal fracturing. We identified 23 different types of flaked-stone tools representing four categories: bifaces, flake tools, unifaces, and expedient tools. The first three of these categories are considered formed tools, which are tools flaked to a specific shape that substantially changes the form of the original blank (Tomka 2001).

Formed Tools

The 73 formed tools comprise 31% of the flaked-stone tools. Chert is most prevalent (*n* = 32; 43%), followed by basalt (*n* = 14; 20%) and silicified slate (*n* = 11; 15%).

Bifacial Tools

We recovered 39 bifacial tools of seven categories: 14 projectile points (Fig. 10a–k; for type comparisons, see Supplementary Data), six bifacial knives, six side blades (Fig. 10l–q), six ovate-shaped bifaces (e.g., Supplementary Fig. 5d), four bifacial end scrapers (Supplementary Fig. 5a–c, e), two bifacial choppers, and one bifacial scraper/knife. While chert was prevalent (*n* = 12; 31%), silicified siltstone (*n* = 10; 26%) and basalt (*n* = 9; 23%) were also well represented.

Unifacial Tools

Four tools—three scrapers and one discoidal core—classify as unifaces, where one face of the tool is extensively flaked and the other is unmodified.

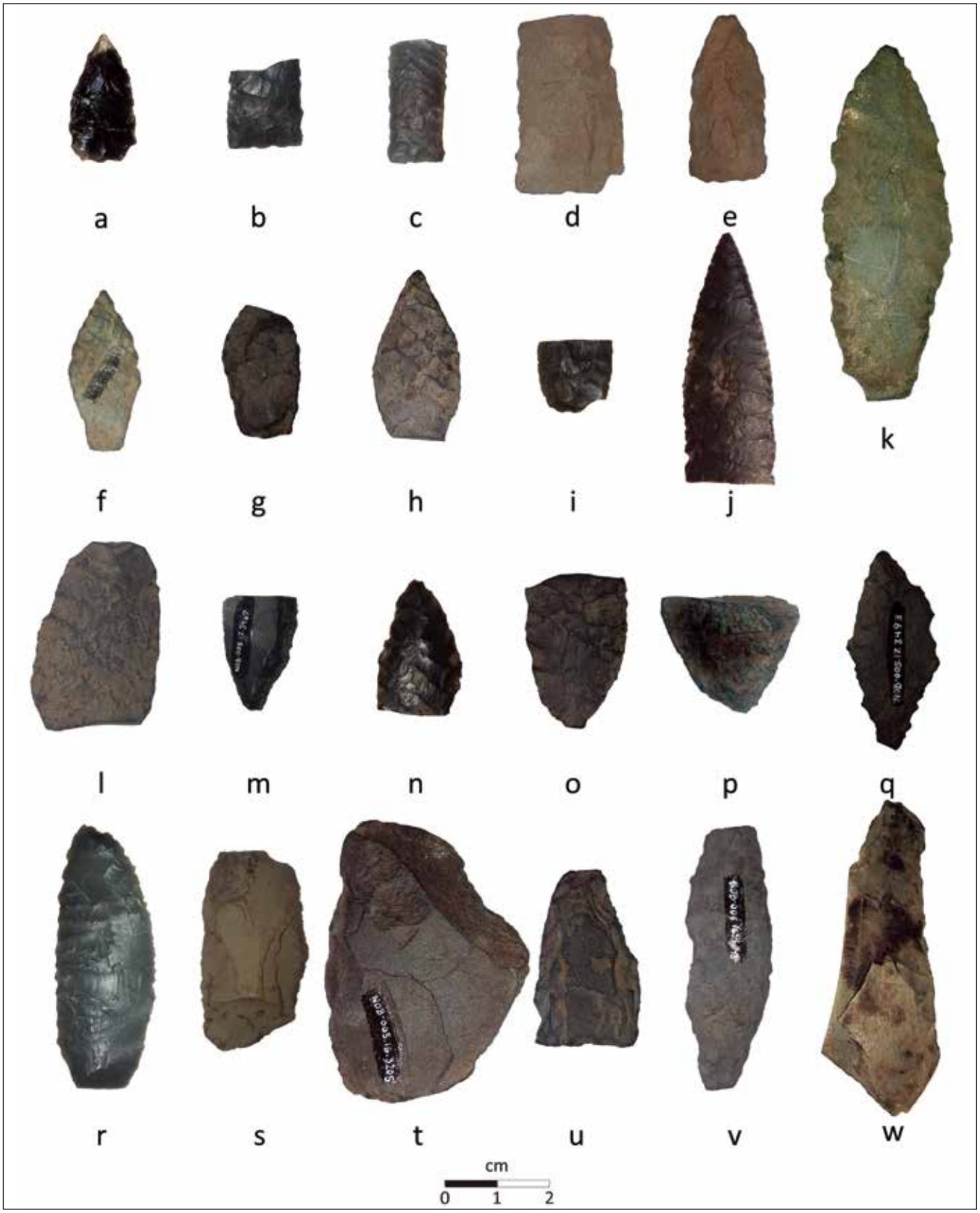

Figure 10. Selected bifacial tools: projectile points, a–i (a. 3527, b. 3587; c. 3060, d. 3529, e. 3456, f. 3046, g. 3591, h. 3522, i. 3522); lance points j, k (j. 3526, k. 3528); side blades, l–q (l. 3462, m. 3467, n. 3469, o. 3525, p. 3504, q. 3493); bifacial knives r–w (r. 3004, s. 3407, t. 3205, u. 3205, v. 3205, w. 3564).

Table 2. Lithic artifacts recovered during the 2016–2017 investigations at Difchahak.

	Basalt	Basalt, Vesicular	Beach Pebble	Chalcedony	Chert, Black	Chert, Brown	Chert, Gray	Chert, Green	Greenstone	Obsidian	Pumice	Quartzite	Sandstone	Schist	Silicified Siltstone	Silicified Slate	Slate	Unknown	Grand Total	Percent Tools
BIFACES																				
Chopper	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	0.6%
Ovate shape	1	–	–	–	1	1	1	–	–	–	–	–	–	–	–	1	1	–	6	1.7%
Knife	1	–	–	–	–	–	1	–	–	–	–	–	–	–	1	2	1	–	6	1.7%
Projectile point	3	–	–	–	1	–	5	–	–	1	–	–	–	–	–	4	–	–	14	4.1%
End scraper	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	4	1.2%
Scraper/knife	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	0.3%
Side blade	1	–	–	–	1	–	1	–	–	–	–	1	–	–	–	2	–	–	6	1.7%
Total bifaces	**9**	**–**	**2**	**–**	**3**	**1**	**8**	**–**	**–**	**1**	**–**	**1**	**–**	**–**	**1**	**10**	**3**	**–**	**39**	**11.3%**
FORMED FLAKE TOOLS																				
Bifacial scraper	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	0.3%
Burin–like tools	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	2	0.6%
End scraper	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	2	0.6%
Graver	1	–	2	–	2	–	1	–	–	–	–	–	–	–	–	–	1	–	7	2.0%
Knife	1	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	3	0.9%
Multielement tool	–	–	–	–	1	–	3	–	–	–	–	–	–	–	–	–	–	1	5	1. 5%
Perforator	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	0.3%
Scraper, nonspecific	1	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	3	0.9%
Side scraper	–	–	–	–	2	1	3	–	–	–	–	–	–	–	–	–	–	–	6	1.7%
Total flake tools	**4**	**–**	**2**	**1**	**7**	**1**	**12**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**1**	**1**	**1**	**30**	**8.7%**
UNIFACES																				
Scraper	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	1	3	0.9%
Discoidal core	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	0.3%
Total unifaces	**1**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**1**	**–**	**–**	**–**	**–**	**–**	**1**	**–**	**–**	**1**	**4**	**1.2%**
All formed tools	**14**	**–**	**4**	**1**	**10**	**2**	**20**	**–**	**1**	**1**	**–**	**1**	**–**	**–**	**2**	**11**	**4**	**2**	**73**	**21.2%**
	19.2%	**–**	**5.5%**	**1.4%**	**13.7%**	**2.7%**	**27.4%**	**–**	**1.4%**	**1.4%**	**–**	**1.4%**	**–**	**–**	**2.7%**	**15.1%**	**5.5%**	**2.7%**		
EXPEDIENT TOOLS																				
Retouched flake	–	–	–	–	4	–	5	–	–	–	–	–	–	–	–	1	1	1	12	3.5%
Retouched pebble	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	0.3%
Used flake	12	–	6	1	22	4	54	1	–	1	–	2	14	–	–	16	8	2	143	41.6%
Used pebble	–	–	2	–	–	–	1	–	–	–	–	–	–	–	1	–	–	1	5	1. 5%
Total expedient	**12**	**–**	**9**	**1**	**26**	**4**	**60**	**1**	**–**	**1**	**–**	**2**	**14**	**–**	**1**	**17**	**9**	**4**	**161**	**46.8%**
	7.5%	**–**	**5.5%**	**0.6%**	**16.2%**	**2.4%**	**37.2%**	**0.6%**	**–**	**0.6%**	**–**	**1.2%**	**8.7%**	**–**	**0.6%**	**10.6%**	**5.6%**	**2.5%**		
Total flaked	**27**	**–**	**13**	**2**	**36**	**6**	**80**	**1**	**1**	**2**	**–**	**3**	**14**	**–**	**3**	**28**	**13**	**5**	**234**	**68.3%**

Table 2 (continued)

	Basalt	Basalt, Vesicular	Beach Pebble	Chalcedony	Chert, Black	Chert, Brown	Chert, Gray	Chert, Green	Greenstone	Obsidian	Pumice	Quartzite	Sandstone	Schist	Silicified Siltstone	Silicified Slate	Slate	Unknown	Grand Total	Percent Tools
FLAKED AND GROUND																				
Adze	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	0.3%
Adze, reworked	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	0.3%
Blank	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	2	0.6%
Burin–like groover	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1	1	–	3	0.8%
Drill bit	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	0.3%
Knife	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	0.3%
Scraper	1	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	3	0.9%
Net weight	–	–	31	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	33	9.6%
Net weight, reused	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	0.6%
Notched stone	–	–	21	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	22	6.4%
Saw	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	0.3%
Slate blade	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	3	0.9%
Total flaked & ground	**2**	**–**	**56**	**–**	**–**	**–**	**1**	**–**	**–**	**–**	**–**	**–**	**3**	**–**	**–**	**3**	**7**	**1**	**73**	**21.2%**
GROUNDSTONE																				
Abrader	–	1	–	–	–	–	–	–	–	–	2	–	2	–	–	–	–	–	5	1.45%
Abrader, grooved	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	0.29%
Groundstone, misc.	–	1	–	–	–	–	–	–	–	–	1	–	11	1	1	–	2	1	18	5.23%
Graver	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	2	0.58%
Hammerstone	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	0.29%
Hearthstone	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	0.29%
Lamp fragment	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	0.29%
Mortar	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	0.29%
Shaft smoother	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	0.29%
Whetstone	–	–	–	–	–	–	–	–	–	–	–	–	6	–	–	–	–	–	6	1.74%
Total groundstone	**–**	**2**	**1**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**5**	**–**	**23**	**1**	**1**	**–**	**2**	**2**	**37**	**10.76%**
TOTAL TOOLS	**28**	**2**	**70**	**2**	**36**	**6**	**81**	**1**	**1**	**2**	**5**	**3**	**40**	**1**	**4**	**31**	**22**	**9**	**344**	
	8.1%	**0.5%**	**20.4%**	**0.6%**	**10.5%**	**1.7%**	**23.3%**	**0.3%**	**0.3%**	**0.6%**	**1.5%**	**0.9%**	**11.6%**	**0.3%**	**1.1%**	**9.0%**	**6.4%**	**2.6%**	**100**	
WASTE/DEBITAGE																				
Blade–like flake	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	3	
Debitage	10	–	7	–	68	9	175	2	–	3	–	3	11	–	1	20	17	4	330	
Tested cobble	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	2	
Total	**10**	**–**	**7**	**–**	**68**	**9**	**178**	**2**	**–**	**3**	**–**	**3**	**11**	**–**	**1**	**22**	**17**	**4**	**335**	
	3.0%	**–**	**2.1%**	**–**	**20.3%**	**2.7%**	**53.3%**	**0.6%**	**–**	**0.9%**	**–**	**0.9%**	**3.3%**	**–**	**0.3%**	**6.6%**	**5.1%**	**1.2%**		
TOTAL ASSEMBLAGE	**38**	**2**	**77**	**2**	**104**	**15**	**259**	**3**	**1**	**5**	**5**	**6**	**51**	**1**	**5**	**53**	**39**	**13**	**679**	
	5.6%	**0.3%**	**11.3%**	**0.3%**	**15.3%**	**2.2%**	**38.1%**	**0.4%**	**0.2%**	**0.7%**	**0.8%**	**0.9%**	**7.5%**	**0.2%**	**0.7%**	**7.8%**	**5.7%**	**1.9%**		
DEBITAGE TO TOOL RATIO	**0.4**	**0**	**0.1**	**0**	**1.9**	**1.5**	**2.3**	**2**	**0**	**1.5**	**0**	**1**	**0.3**	**0**	**0.5**	**0.7**	**0.8**	**0.4**	**0.97**	

Formed Flake Tools

Thirty of the recovered flaked-stone tools classified into 10 different types of formed flake tools—flakes that have had their margins intentionally retouched to preplanned shapes. These tools would have been for a variety of functions—cutting, graving, perforating, scraping—and consisted of one bifacial scraper (Fig. 11p), two burin-like tools (Fig. 11o), two end scrapers (Fig. 11d, e), seven gravers, three knives (Fig. 11l–n), five multi-element tools (multiple working edges) (Fig. 11r, v–x, aa, bb), one perforator (Fig. 11z), three scrapers (Fig. 11a–c), and six side scrapers (Fig. 11f–k).

Again, chert (*n* = 20; 65%) was the dominant material, followed distantly by basalt (*n* = 5; 16%).

Expedient Tools

At 46.8% of the assemblage, the 161 expedient tools make up the largest fraction of tools. Most of these are used flakes (*n* = 143) followed distantly by retouched flakes (*n* = 12) and used pebbles (*n* = 5) and a retouched pebble (*n* = 1). Like the formed tools, chert was the dominant material (*n* = 89) and made up 55% of the expedient tools. Silicified slate (*n* = 17; 11%), sandstone (*n* = 14; 9%), and basalt (*n* = 12; 7%) were the next most numerous materials.

Chipped-and-Ground Stone Tools

Chipped-and-ground stone tools are manufactured through both flaked stone (percussion exploiting the conchoidal fracture pattern) and groundstone techniques (grinding and pecking). Although often such tools are considered under the rubric of groundstone tools, we include them under their own class because it appears to be an intentional reduction strategy. To be classified as a chipped-and ground tool, clear evidence of flaking had to be present on the piece before grinding occurred. Slate tools are often shaped using percussion first, exploiting the less-than-optimal conchoidal properties of slate and then finished through grinding or abrasion (see discussion in Graesch 2007 for Northwest Coast slate knives). However, slate objects were not recovered in large numbers at the site, and most of the tools that classify as chipped and ground were made on locally available beach pebbles.

The most numerous chipped-and-ground tools were net weights (*n* = 34). These tools consisted of flat oval-shaped pebbles that had two notches chipped and ground into the opposite ends of the pebbles' long axis (Fig. 12a–l), as well as oval pebbles with a notch chipped and ground into one margin (Supplementary Fig. 6a–f). The pebbles used for blanks were markedly smaller than those used for net weights.

The remaining chipped and ground tools consisted of two adzes (one of which was reworked) (Supplementary Fig. 7 l, m), two blanks (Supplementary Fig. 7k), three burin-like gravers (Supplementary Fig. 7c–e), one rectangular slate knife (Supplementary Fig. 7i), three scrapers (Supplementary Fig. 7a, b), one saw, one drill bit (Supplementary Fig. 7f), and three slate blades (Supplementary Fig. 7g, h).

Groundstone Tools

Manufacture of groundstone tools occurred primarily through abrasion, though some use of percussion occurred as well. Most were made of abrasive stones, with sandstone (*n* = 23; 62%) dominating.

The majority of the groundstone pieces were fragmentary: possessing ground surfaces but no identifiable form. Thirteen were specifically for abrading: six whetstones, five abraders, one shaft smoother, and one grooved abrader. Also, we identified two groundstone gravers, a lamp fragment, a mortar fragment, one charred slab identified as a hearthstone, and one hammerstone.

Summary of Stone Tools

No one formed-tool type dominates the assemblage, and those that are present, along with the expedient tools, suggest that a multitude of different tasks were undertaken at the site. This diversity is what would be expected at a residential site (Binford 1980:10–12). It is of note, however, that the most common formed-tool type is net weights, which make up 10% of the tool assemblage. This prevalence indicates that net fishing (and maintenance of such equipment) was one of the major activities at or near the site, which is supported by the faunal assemblage discussed below.

DEBITAGE

Our test units at Difchahak produced less debitage (*n* = 335) than the total number of stone tools (*n* = 344) (Table 2). For the complete assemblage, this is a debitage-to-tool ratio of 0.97. If the groundstone tools are removed from the equation, the ratio changes to a slightly higher proportion of debitage (1.08). Regardless, this approximately one-to-one ratio indicates that there was minimal manufacturing

Figure 11. Selected flake tools: scrapers a–e (a. 3345, b. 3045, c. 3052, d. 3487. e. 3709); side scrapers f–k (f. 3539, g. 3019, h. 3523, i. 3826, j. 3833, k. 3873); flake knife l–n (l. 3006, m. 3662, n. 3400); burin-like flake tool/burinated biface o (3597); bifacial scraper p (3106); gravers q, s–u, y, cc (q. 3346, s. 3425, t. 3125 u. 3050, y. 3326, cc. 3207); multi-element tools r, v–x, aa, bb (r. 3197, v. 3259, w. 3197, x. 3825, aa. 3128, bb. 3872); perforator z (3872).

Figure 12. Selected chipped-and-ground net weights: a. 3351, b. 3003, c. 3001, d. 3002, e. 3577, f. 3464, g. 3512, h. 3406, i. 3000, j. 3059, k. 3343, and l. 3058.

of stone tools at the site—at least in the contexts of where the units were placed.

There are two potential implications of relative equivalence between waste and tools. First, it appears that the site's occupants brought a majority of the tools to the houses in complete or near-complete form, either from other sites or alternate knapping areas at Difchahak. This observation is especially the case for certain materials, illustrated by debitage-to-tool ratios: for all materials other than chert (and the limited obsidian specimens), there were more tools than debitage.

Second, the correspondence of the amount of debitage to the number of tools hints that there may have been considerable conservation of stone. This conservancy is evident when examining the use of chert. This material has the most debitage proportionally to tools—approximately two flakes to one tool (many of the latter are expediently used flakes and retouched flakes), which suggests there was a reuse of waste debitage. In essence, people were maximizing the use of the available cutting edge on the stone available to them at the time. It suggests that stone could have been in short supply at the time of year the houses were occupied, possibly the winter time when stone resources were under snow or frozen in the ground. Further analysis of the debitage is underway to characterize it in relation to the tools at the site and the Norton people's use of stone in the area, which will entail examining this issue.

FAUNA

The discovery of a shell midden under the berm of Feature 208 was a hoped-for but unexpected find. As with other Norton-age sites with preserved faunal remains (e.g., Iyatayet [Giddings 1964; Tremayne et al. 2018], XHI-043 and XHI-044 in Bristol Bay [Casperson 2017; Shaw 1986]), it appears that the presence of shellfish buffered soil acidity to facilitate preservation. While we did not find any traces of shell middens in our other testing around Difchahak, we do believe that additional middens must be present. Considering the number of houses and area covered by the site, the probability that we encountered the only midden at the site is exceedingly low.

Here, we present a summary of the results of the fauna analysis, which are discussed in more detail in Miszaniec et al. (2019). A total of 5287 specimens were recovered, representing a diverse range of animals (Latin taxonomic names and the number of identified specimens are listed in Table 3). Due to the high proportion of small-bodied taxa, Miszaniec et al. (2019) suggest that the Norton people at Difchahak engaged in mass capture of several seasonally available taxa, including salmon, mussels, saffron cod, ptarmigan, ducks, geese, and seal from the estuary and sea resources adjacent to the site.[2] The overall faunal assemblage suggests a primarily fall/winter occupation or possibly a fall/winter/spring occupation due to the occurrence of migratory waterfowl. The presence of salmon, which are typically captured in the summer while they spawn, may be a product of storage; this would be logical as multiple cache features were identified at the site (Harritt 2010:83–84).

One of the curious aspects of the midden was the low recovery of artifacts within it. Other than two pieces of ivory debitage, no other osseous debitage or formed tools of bone, antler, or ivory were recovered in the shell lenses where they should have been preserved. Similarly, we only recovered a few stone tools and lithic debitage within the midden contexts. Thus, we believe that the midden was not formed from house floor-cleaning and dumping events; rather, the occupants of the house directly deposited the faunal remains shortly after consumption.

DISCUSSION

TEMPORAL USE

The 2016–2017 radiocarbon dates confirm Harritt's (2010:86–87) original observation that there was both an early and a late period of occupancy at Difchahak. Currently, the radiocarbon assay stands at 14 dates for the site (Table 1) and, on a visual inspection alone, it is apparent that the dates fall into two different groups. Taking advantage of the phase analysis module (Buck et al. 1992), we explored the date ranges of the two phases using OXCAL 4.2 (Bronk Ramsay 2009) (Supplementary Table 9). The modeled estimate for the first period ranges from 393 BC to 134 BC (393 ± 63 BC [498–262 BC] to 134 ± 49 BC [229–11 BC]) and the second period extends from an estimated AD 53 to AD 258 (AD 53 ± 78 [BC 114–AD 53] to AD 258 ± 152 [AD 82–578]).

The two latest dates come from Features 7 and 12, both located on the southeastern end of the site. Because of their proximity and tunnel configuration, it is likely there was a relatively coeval occupation of these houses. More work is needed to determine whether this was the case with the adjacent houses in this area of the site. Because there are indications that Features 56, 100, and 133 have

Table 3. Number of identified specimens (NISP) and percentage of the total NISP of the faunal remains recovered during the 2016–2017 investigations at Difchahak.

Taxon	Common Name	NISP	%NISP
INVERTEBRATES			
Cirripedia	Barnacle	19	< 1
Gastropoda	Sea snail	2	< 1
Euspira pallida	Moon snail	9	< 1
Mactridae	Duck clam	12	< 1
Mactromeris polynyma	Arctic surfclam	2	< 1
Veneridae	Venus clam	4	< 1
Tellinidae	Tellin	11	< 1
Cardiidae	Cockle	11	< 1
Hiatella arctica	Arctic hiatella	13	< 1
Pharidae	Razor clam	2	< 1
Mytilus trossulus	Pacific blue mussel	1840	44
FISH			
Clupea pallasii	Pacific herring	1	< 1
Oncorhynchus spp.	Pacific salmon	780	19
Eleginus gracilis	Saffron cod	714	17
BIRDS			
Passeriformes	Songbird	1	< 1
Anatidae	Duck/Geese/Swan	10	< 1
Anserinae	Geese/Swan	11	< 1
Anatinae	Duck	29	1
Mergini/Aythyini	Diving or sea ducks	22	1
Lagopus sp.	Ptarmigan	335	8
Laridae	Gulls	21	1
Rissa tridactyla	Black-legged kittiwake	1	< 1
MAMMALS			
Spermophilus sp.	Ground squirrels	1	< 1
Canis sp.	Dog/Wolf	8	< 1
Vulpes sp.	Fox	1	< 1
Pinnipedia	Seal/Walrus	4	< 1
Odobenus rosmarus	Walrus	2	< 1
Phocidae	Seal	119	3
Phocidae (large)	Bearded/Ribbon seals	36	1
Erignathus barbatus	Bearded seal	10	< 1
Phocidae (small)	Harbor/Spotted/ Ringed seals	30	1
Pusa hispida	Ringed seal	2	< 1
Delphinapterus leucas	Beluga	5	< 1
Rangifer tarandus	Caribou	92	2
TOTAL		**4160**	
UNIDENTIFIED			
Unidentified invertebrate		7	
Unidentified bird		427	
Unidentified mammal (terrestrial)		15	
Unidentified mammal (marine)		5	
Unidentified mammal		386	
Bird/small mammal		159	
Unidentified ray-finned fish		100	
Unidentified vertebrate		28	
TOTAL		**5287**	

floor configurations consistent with what Bockstoce (1979:41) identified as being from the later period, there is a high likelihood that later occupation of the site was not confined to the southeast but instead extended across the entire site, and therefore was likely as intense as the earlier occupation.

The two periods at Difchahak overlap with Bockstoce's (1979:37–38, 43) dating of the Norton occupation at the Old Beach site on Cape Nome, which he placed in two phases of 330–80 BC and AD 180–310. Similarly, Lutz (1972:68–70) dated three Norton houses at UNK-007 near Unalakleet to 270 BC–AD 80 and a fourth to AD 150–550.

The similarity of the early dates associated with Features 56, 100, 133, 147, 200, and 208—which occur over an area that encompasses 75% of the site—suggests that Difchahak was a large village from its initial settlement. Although issues of determining contemporaneity among houses exist—and not all the house depressions would have been used at a single time—the fact that houses with early dates are widespread suggests that there was a high degree of occupancy of the depressions.

ARCHITECTURAL INFERENCES

Based on all of the excavation units we opened at Difchahak, it is clear that house depressions were repeatedly reoccupied. Of those tested in 2016–2017, Feature 56 was reoccupied at least four times, Features 7 and 133 at least five times, and Features 100 and 208 at least six times. All five of these houses seem to have undergone a similar life history. Fig. 13 depicts a model of this process. First, there was the construction of a large house followed by the construction of several smaller houses inside the initially excavated depression. While the first house might not have been as deep as the subsequent houses, it had considerably more floor area. For instance, Feature 100 is already a sizable house depression at approximately 10 x 8.5 m in floor area on the surface, but the results from DU9 indicate that the original floor was minimally 12 x 8.5 m, if not larger.

Conversely, the subsequent houses had significantly steeper internal walls. In the cases of Features 56, 100, and 133, the floors have a stepped-in appearance rather than a smoother curvature, which we have compared to Bockstoce's (1979:41) observations at Cape Nome between his early and late period floors. It is likely that the stepped-in floors at Difchahak were constructed in the later period

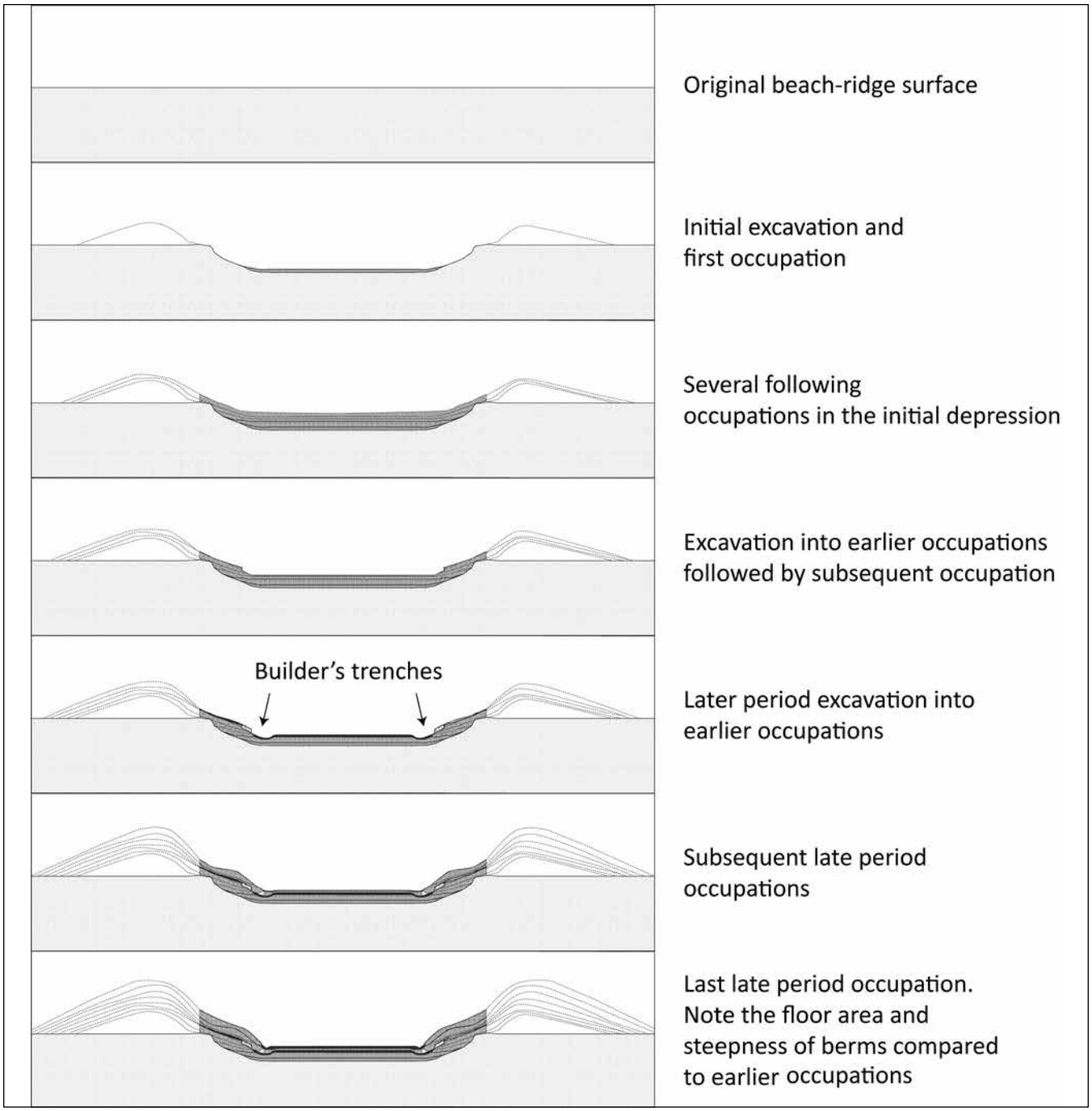

Figure 13. A hypothetical sequence of house development based on the profile from DU4 in Feature 133.

as well, as all the floors in House 7 are similar and later in time. Thus, while we know that Features 56, 100, and 133 have earlier radiocarbon dates associated with their lower floors, there is a high likelihood they were reoccupied in the later period. If this is the case, we believe that houses became smaller through time at Difchahak.

When viewing the house depressions on the surface, we see the last configuration of the use of that house depression, and these configurations could change over its multiple uses. Thus, there is a high likelihood that there were changes in the orientations of the entrance tunnels over time. Harritt (2010:85) noted a general difference in the tunnel orientation between the northwestern versus the southeastern end of the site; most likely this pattern represents tunnel orientations from the latest occupations of the site.

Another observation is that when evaluating the size of Norton houses, we cannot use the inner area of the house as a measure of its dimensions; instead, we should use the crest of the berm. Much like Bockstoce (1979:34) speculated for some of the houses at Old Beach (Houses 268 and 285), it is likely that there was some form of wooden bench constructed around the inner perimeter of the house surrounding a central plaza of sorts where a hearth would have been situated. Timbers were present in troughs in the floor, which could have served as foundations for this platform (as seen in DU9 and DU10). It would not physically make sense for "whole" houses to be sunk into such deep depressions. Bundy (2007) notes that deep subterranean houses would have required heavy wooden frames. Her excavations at the Alagnak River site showed that thick upright logs were placed at the edge of the floor and surrounded by smaller upright posts. At UNK-007, however, Lutz (1972) noted a lack of apparent benches within depressions and suggested that the berm was part of the living quarters. Similarly, Saltonstall et al. (2012) note, from excavations in late Norton houses at the Penguq site in Ugashik, the presence of sleeping platforms cut into the berms themselves—something we did not observe at Difchahak. Thus, taking into account that our "windows" into the floorplans at Difchahak are small, there is a need for future work with a greater area opened up in the houses to search for architectural features.

EMPTINESS AS AN ATTRIBUTE

Our excavations at Difchahak yielded considerably more artifacts than reported by Giddings (1964), Harritt (2010), and Lutz (1972). Our top-yielding unit, DU2, which was the only unit placed directly in the same contexts inside a house like the previous investigators, had 595 artifacts/m^3 in terms of excavation volume or 258 artifacts/m^3, not including small spalled ceramic fragments (Supplemental Table 3). Overall, though, our excavations produced 204 artifacts/m^3 or 122 artifacts/m^3 with ceramic fragments removed (Table 3). Quantifying both Harritt's (2010:84) findings with his unit descriptions and Giddings's (1964:184) finds by his excavation description and unbackfilled excavation scar in Feature 168, they recovered a meager 22.6 artifacts/m^3 and 2.1 m^3, respectively (Table 4). Undoubtedly, the difference between our results and theirs is a product of excavation methods and screening. However, for two of our units—DU8 and DU10—we only found 46 artifacts/m^3 and 15 artifacts/m^3, correspondingly. These recovery rates are comparable to both Harritt's and Giddings's; thus, there is a good probability that they selected houses with similarly low artifact densities, indicating the presence of numerous low-producing houses throughout the site.

The case that Difchahak is relatively "empty" becomes more evident when looking at artifact densities on a regional basis. At Iyatayet,[3] Tremayne et al. (2018) reported finding 7226 artifacts in an excavated area approximately 3.85 m^3 in volume (Andrew Tremayne, pers. comm., 16 April 2019), which is a density of 1877 artifacts/m^3 (Table 4). This figure is nine times greater than what we recovered at Difchahak, and it is even greater if considering our Difchahak sample without small ceramic fragments or on lithic artifacts alone. While Tremayne et al. (2018) employed 3.18 mm (⅛-inch) screens at Iyatayet,

Table 4. Artifact densities by excavation area and volume at Difchahak compared to Iyatayet and the newly identified First Bend site.

Investigator/location	All excavated artifacts	Excavated lithic artifacts	Area excavated	Volume excavated	Artifacts/m^2	Lithics/m^2	Artifacts/m^3	Lithics/m^3
Giddings Difchahak	16	14	25.0	7.50	0.6	0.6	2.1	1.9
Harritt Difchahak	7	4	2.0	0.31	3.5	2.0	22.6	12.9
2016–17 Difchahak	1337 (804)†	650	14	6.57	95.4 (57.4)	46.4	203.5 (122.3)	98.9
Iyatayet 2012–13	7226	6982	8	3.85	872.8	517.2	1876.9	1813.5
First Bend site	639	632	0.25	0.05	2556.0	2528.0	12,780.0	12,640.0

† Numbers in brackets are totals and calculations with small ceramic fragments removed at Difchahak from the 2016–17 season.

and we used 6.35 mm (¼-inch) screens, which does account for some of the disparity, there is still an order of magnitude of difference in the density of artifacts between the two coeval sites. Similarly, we tested another Norton-aged site discovered in 2017, located on the same beach ridge as Difchahak but closer to the village of Shaktoolik, that produced 639 artifacts in a 50 x 50-cm test, which calculates to an artifact density of 12,780 artifacts/m^3. This newly identified site, known as the First Bend site, is to be the focus of investigations in 2019. The 50 x 50-cm test was placed into a house (-like) depression not too dissimilar to those at Difchahak, and thus, as speculation, possibly this structure was some form of a lithic workshop or *karigi* (a men's house)—feature types not identified at Difchahak yet. Future work will shed light on this issue.

Thus, Difchahak is a conundrum because it is a high infrastructure/low artifact density site: the amount of effort needed to excavate large house depressions and build structures on them is at odds with the relatively short time the artifact density suggests for its occupation. We do not know of any experimental archaeology investigations that could allow us to estimate the amount of time and labor needed to excavate depressions, construct frameworks, and cover/roof houses the size of those at Difchahak. However, it would be difficult for anyone to argue that any effort expended building such a house was minimal. Given the amount of time and effort likely needed to excavate a house depression, it is not difficult to see why the depressions were reused so often.

The high infrastructure/low artifact density conundrum might apply possibly to Old Beach at Cape Nome and UNK-007 near Unalakleet as well. Unfortunately, due to differences in excavation recovery methods (e.g., use of screens), it is not possible to directly compare the density of artifacts at Difchahak to those at Old Beach and UNK-007 (or Giddings's [1964] work at Iyatayet for that matter). However, the reported number of artifacts recovered at the sites is low. Bockstoce (1979:56, Table 3) reported recovering 752 formed artifacts from his excavations at Old Beach—a number that seems high in comparison to the 183 formed artifacts we recovered at Difchahak, except when one considers that Bockstoce (1979:24–28) *completely* excavated 14 Norton period houses (at least 350 m^2 of excavation at ~25 m^2 per house). Similarly, Lutz (1972:352–354, Table 14 and 15) found 306 formed artifacts in the five houses he excavated at UNK-007 (452 artifacts if including the *karigi* he excavated), which he, with the exception of some balks, also excavated in their entirety (probably over 100 m^2 of excavation). Thus, at both of these sites, there was a considerable amount of excavation for very low rates of artifact recovery; hence, they are similar to Difchahak in this regard.

Scenarios for why there is a dearth of artifacts in the houses in Difchahak include the following:

1. It is possible that there still has been insufficient testing of the site to reveal artifact densities, as our investigations did not significantly increase the area excavated based on the overall 9.4 ha magnitude of the site. Ten of the 170 house depressions have been sampled (12 if one considers Lutz's [1972] testing), which constitutes almost a six percent sample of the houses. While there is plenty of room for error, the chances are good that if there were houses with large numbers of artifacts, one of the depressions would have produced them. We also did not discover any particular areas with dense artifact concentrations through our shovel and auger testing external to the houses.

   We know from Lutz's (1972; 1973) work that the Norton people had some form of men's house institution where many activities that generated larger quantities of artifacts from stone- and bone-tool manufacturing would have occurred. It is possible these structures exist at Difchahak, but we have not yet found them. Usually, such structures are partially identified by being significantly larger than other houses on a site; however, there are no such discernable features at Difchahak.
2. Poor preservation of organic material significantly could account for the reduced number of artifacts. In all the units, there was a significant deterioration of bone, with the midden being the exception, as it has excellent bone preservation. However, other than the presence of two pieces of ivory debitage, we recovered no osseous artifacts, which should have been preserved along with the rest of the bone. Furthermore, lithic artifacts and pottery were rare within the midden deposits. Thus, it would appear from the midden deposits that there was little in the way of osseous tool use or manufacture.
3. The presence of wooden platforms covering the outer perimeter of the inside of the house could explain the lack of artifacts in the floors because there would have been reduced direct deposition of objects onto the floors. Bockstoce (1979:34) suggests this might account for the low number of artifacts at the Old Beach site or some form of floor covering. However, as

is indicated by the midden deposits at Feature 208 at Difchahak, there does not appear to have been housecleaning or floor-cleaning events where lithic artifacts, pottery, and osseous artifacts were discarded with the faunal materials.

4. Another hypothesis is the occupation of the houses at Difchahak took place during a time of year when lithic materials were scarce. As discussed, there appears to be conservation of stone based on the low debitage-to-tool ratio. Due to a lack of access to stone and reduced travel related to weather (e.g., there is no evidence for dog traction available during the Norton period to assist in transporting stone on sleds), the winter and early springtime would be the most logical assumption for such shortages; with a shortage of stone, people produced fewer artifacts to conserve material. At the moment, this scenario is speculative until more work can be completed on Norton lithic systems.
5. Lastly, it is also possible that the occupations of Difchahak were so brief that there was insufficient time to accumulate larger quantities of artifacts. Possibly the house floors we encountered in the depression represent maybe one or two years/seasons of occupation before abandonment or rebuilding of the house.

Choosing which scenario or combination of scenarios is a matter for future research; however, we see the last three as being the most likely. One of the large issues in evaluating these scenarios, or hypotheses, is that we do not have a sense of how long a floor deposit took to develop, which in turn affects our ability to estimate the useful life of a house or a house depression over time.

ROLE OF DIFCHAHAK IN NORTON SOUND

We concur with Harritt's (2010:86–87) assessment that Difchahak was a hub of Norton activity, representing a local grouping of people amongst other similar-sized groups in Norton Sound, like those centered around Unalakleet at UNK-007 and Cape Nome at Old Beach. The location of these sites is in line with Dumond's (2000:4; 2016:401–402) summary of the location of Norton village sites, as all three are situated at the mouths of salmon-bearing rivers. We also believe that Difchahak was equally as important as these sites (i.e., not a satellite of either site). While UNK-007 and Old Beach have greater numbers of house depressions visible on the surface (200–300 each), both Lutz (1972:45–61) and Bockstoce (1979) point to these houses as having one occupation present. If we are correct in our assessment that the house depressions at Difchahak were occupied four to six times each, effectively Difchahak becomes a larger site than its 170 house depressions suggest. In theory, if an occupation is the equivalent of a house, Difchahak could be said to have 680 to 1020 houses (obviously assuming that not all of the house depressions at the site, or others like UNK-007, were occupied at one time). Although this reckoning is a gross oversimplification, it serves to demonstrate that we cannot automatically think of UNK-007 or Old Beach as being significantly larger/more significant than Difchahak.

In a continuation of his model, Harritt (2010:86–88) ties smaller sites in the vicinity of the larger village sites to the group. In the case of UNK-007, Harritt (2010:86–87) posits the Bridge Site (UNK-009), also near Unalakleet, as a satellite; for Difchahak, Iyatayet and possibly Madjujuinuk served the same role. We believe that Harritt is correct in linking these sites to particular groups or "nations," to use Burch's (1998) terminology, of Norton peoples. Because Old Beach and UNK-007 seem to share a similar dearth of artifacts, it appears that the low number of artifacts at these sites is a product of the seasonal subsistence/settlement system that the Norton peoples used to exploit the whole of Norton Sound.

A caveat to our agreement with Harritt (2010) is that Difchahak may be less of a hub and more of a link in a bracelet. That is, Difchahak was not the focal point of all Norton activity in the region, despite its size, and was a specific residential location on a seasonal round. Although there is evidence for storage at the site—which implies setting supplies aside for the winter—and a broad array of different tool types suggesting a diverse range of activities being undertaken at the site, the density of artifacts present at the site is not what would be expected at a residential base (as discussed by Binford 1980:10–12). Just the infrastructure is present. Using the bracelet analogy, other links or stations on the seasonal round would be sites such as Iyatayet and Madjujuinuk, where Norton groups would move to during the late winter, spring, and summer months, abandoning Difchahak until the winter or possibly for a brief stint during the summer for fishing when salmon spawned. At present, we offer this scenario as a hypothesis to explore. From our current knowledge, the Norton people were newcomers to Norton Sound, and as such, they might not have the classic form of logistical organization that modern ethnographic groups had of the area.

CONCLUSION

The auger and shovel testing program at Difchahak in 2016, while not extensive, points to the berm areas of the large house depressions covering the site as being the most profitable locations to investigate the nature of the features, if, as Giddings (1964:183–184) reported, "curiosity seekers" had "scratched" into most of the depressions at the site. Our one excavation unit inside Feature 208 (DU2) bore evidence of such disturbance but also suggested that there was not complete destruction of all the deposits. Placing units on the berms and slightly into floor areas (while avoiding areas of houses often targeted by looters), also provides insight into the complexity surrounding the use of the house depressions and, as evidenced by DU1 in Feature 208, has the potential to uncover midden with well-preserved faunal remains.

Excavation of the test units in the five house depressions revealed that each had a complex series of strata that indicate that each of the tested houses was occupied, rebuilt, or refurbished at least four to six times over its use-life. While these houses only comprise a small fraction of the known house depressions at the site, there is no reason not to expect that most of the remaining houses share a similar frequency of reuse.

Radiocarbon dating suggests that occupation of Difchahak's houses occurred first in a period between 393 BC and 134 BC and then a second period between AD 53 and AD 258. Early occupations were present in four of the houses (Features 56, 100, 133, and 208), whereas one house (Feature 7) was only occupied in the later period. Stratigraphic evidence in Features 56, 100, and 33 in the form of an alternate stepped-in floor profile—which is shared with the floor profiles in Feature 7—suggests that later occupations occurred in these houses as well. Because these features are widespread across the site, it could be that the early and late occupations were roughly equivalent in size.

Artifacts recovered from the excavations are of Norton manufacture and suggest that there was a diverse number of activities undertaken at the site. This conclusion conforms to expectations of an assemblage from a residential site. The most prevalent form of artifact, however, was net weights, which suggests that fishing was an important activity at the site. This inference is borne out by the faunal remains recovered from Feature 208 where salmon and cod were the second and third most abundant taxa (for more detailed analysis, see Miszaniec et al. 2019).

The density of artifacts in the 2016–2017 excavations was not as low as those found by previous investigators overall, though two of the five houses (Feature 7 and 56) had densities that were not much higher than those reported by Harritt (2010) and Giddings (1964). When comparing densities of artifacts to other sites in the local region, such as Iyatayet, the density of artifacts is quite low, especially considering the infrastructure investment in building the houses at Difchahak. This low artifact density/high infrastructure cost conundrum might apply to the other similarly large Norton sites of Old Beach and UNK-007. Several scenarios could explain the paucity of artifacts, including the presence of wooden platforms/floor coverings, the season of occupation, length of occupation, poor organic preservation, or sampling issues. We believe a combination of the first three scenarios is the most likely explanation at this time.

Finally, we believe that Harritt's (2010:86–88) characterization of Difchahak as a local locus best describes the role of the site in relation to other large Norton sites found in Norton Sound. Because of the multiple reuses of the house depressions, Difchahak was effectively the same size as both UNK-007 and Old Beach if depressions at these sites were not similarly reused, which was not reported by either Lutz (1972) or Bockstoce (1979). Future work comparing the findings at Difchahak to other sites in the local area will illuminate the role the site played in seasonal settlement patterns for the people that inhabited the region.

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ENDNOTES

1. UNK-007 was misidentified as Ungalaqliq by Lutz and others in the literature (Pratt 2012:97–98), and thus we will use its AHRS number throughout the paper.
2. The faunal totals listed here reflect the finds based on dry screening in the field and a column sample of soil processed through flotation in the lab. For more information on recovery, identification, and quantification methods, see Miszaniec et al. (2019).
3. Although Giddings (1964) did excavate a Norton dwelling at Iyatayet, in terms of geographical/geomorphic location, features present, and where artifacts were located in the site (the artifacts collected by Tremayne [2015] and Tremayne et al. [2018] were not from within houses), Difchahak and Iyatayet are very different sites.

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