Archaeological Excavations at the Little John Site (KdVo-6), Southwest Yukon Territory, Canada - 2012

Submitted to
White River First Nation
Yukon Heritage Branch
Archaeological Survey of Canada
Yukon Research Centre of Yukon College

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Figure 1. Some of the 2012 Field Crew at the Little John Site.

Fieldworkers included:

- Credit Undergraduate students in ANTH 225-226: Kendra Vaughn, University Pennsylvania, Alina Aquino, University California, Geoffrey Homel, Simon Fraser University, Keith Saunders, University of Calgary, Rachelle Mathews, University of New Mexico.
- Graduate and Undergraduate Research Students with approval of their committees: Michael Grooms (PhD program, Dept of Anthropology, U of New Mexico, Supervisor Dr. E James Dixon), Nicolena Virga (M.A. program, Department of Anthropology, U of Southern California – Fullerton, Supervisor Dr. Steven James), Jordan Handley (Senior Undergraduate Thesis, Simon Fraser University, Supervisor Dr. Rudy Reimer Yumks), Laurianne Bourgenon (PhD Department of Anthropology, University of Montreal, Supervisor Dr. Ariane Burke).

- Research Interns / Volunteers: Mark Young (UBC) STEP Research Assistant, Anne Marie Lapointe (University of Montreal), Dianna Marion (Missisauga, ON).
- White River First Nation Youth: Chelsea Johnny, Dellamae Sam, Eldred Johnny, Eddie Johnny, Tamika Johnny, and cultural experts David and Ruth Johnny.
- Youth participants in a new Art and Archaeology initiative in collaboration with the Northern Cultural Expressions Society, Whitehorse, led by Naomi Crey.
- Dr. David Yesner, University of Alaska, Anchorage.

The generosity and support extended by the inhabitants of the borderlands is greatly appreciated. In particular Chief David Johnny of the White River First Nation, Elders Darlene Northway, Martha Sam, Ada Gallen, Jenny Sanford, Joseph Tommy Johnny, and Danny Thomas, as well as Ruth Johnny, Marilyn Sanford, Angela and Robert Lee Demit all provided meaningful instruction in the Dineh Way and provided gifts of the land and their time to their Noogli visitors. Sid Vandermeer, Jr. facilitated administrative relations with the White River First Nation.

Ts'inni Cho.

Norman Alexander Easton / Ts'ogot Gaay

Figure 2. N. A. Easton at Little John with handiwork of the Art and Archaeology Kids.

Cover Photo: Naomi Crey of the Northern Cultural Expressions Society leads the hand game between students and youth participants in the Art and Archaeology initiative.

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SUMMARY OF ACTIVITIES

Figure 3. View to the Southeast from the Little John Site with Wiki Peak in the Background.

With the permission and support of the White River First Nation, archaeological and ethnographic research was undertaken under the direction of Norman Alexander Easton of Yukon College between 5th of June and 6th of August at the Little John site (KdVo-6) and in the region about Beaver Creek, Yukon Territory (Easton 2012a, Printed Appendix 1).

Major Results of this fieldwork included:

- Training in archaeology and ethnography of eight credit and intern / volunteer students from Outside, four graduate students, and five local native youth.
- Excavation of 25 one meter units: 9 on the West Lobe, 11 on the hilltop in the vicinity of the cabin, and 5 in the East Lobe; 13 of these were new units, while the remainder completed unexcavated sediments from previous seasons. Table 1 and Figures 4 and 5 summarize the location of these units. Unit Field Books related to these excavations are presented in Digital Appendix 1.

- 26 Unit Wall Profiles were documented, summarized in Table 2 and presented in the Printed Appendix 2.

Table 1. 2012 Excavation Units at KdVo6.

Unit No.	Notes
S3W23	New unit expanded on 2011 test pit hearth feature
S3W22	New unit expanded on 2011 test pit hearth feature
S4W23	New unit expanded on 2011 test pit hearth feature
S13W21	Continuing unit from previous field season
S14W22	New unit
S15W21	New unit
S15W23	New unit
S16W23	New unit
S17W21	New unit
N3W8	New unit
N3W9	New unit
N4W8	Continuing unit from previous field season
N4W9	New unit
N4W13	Continuing unit from previous field season; **redesignated: 2010 N2W10 is 2012 N4W13**
N5W3	Continuing unit from previous field season
N5W8 / W9	Completed unit from previous field season
N5W12	Continuing unit from previous field season; **redesignated: 2010 N3W9 is 2012 N5W12**
N17W16	New unit expanded on 2011 test pit
N18W16	New unit expanded on 2011 test pit
N17/N8W17	Units cleared to surface – not excavated
N18W9	Continuing unit from previous field season
N19W7/W8	Continuing unit from previous field season
N19W9	Continuing unit from previous field season
N20W7	New unit excavated in SE quad for OSL sampling

- Recovery of 792 additional artifacts from the Little John site, summarized in Tables 3 and 4 below; these were catalogued into 444 unique catalogue numbers. Filemaker Files with and without photographs, and an Excel File providing provenience, metric, and qualitative data related to all recovered artifacts are presented in Digital Appendix 2, while a summary description of selected artifacts is presented below in this report.
- Recovery of 26 additional faunal samples summarized in Table 5 below. Full descriptions of recovered fauna are presented in Printed Appendix 3 and Digital Appendix 3, while a summary discussion of selected fauna is presented below in this report.

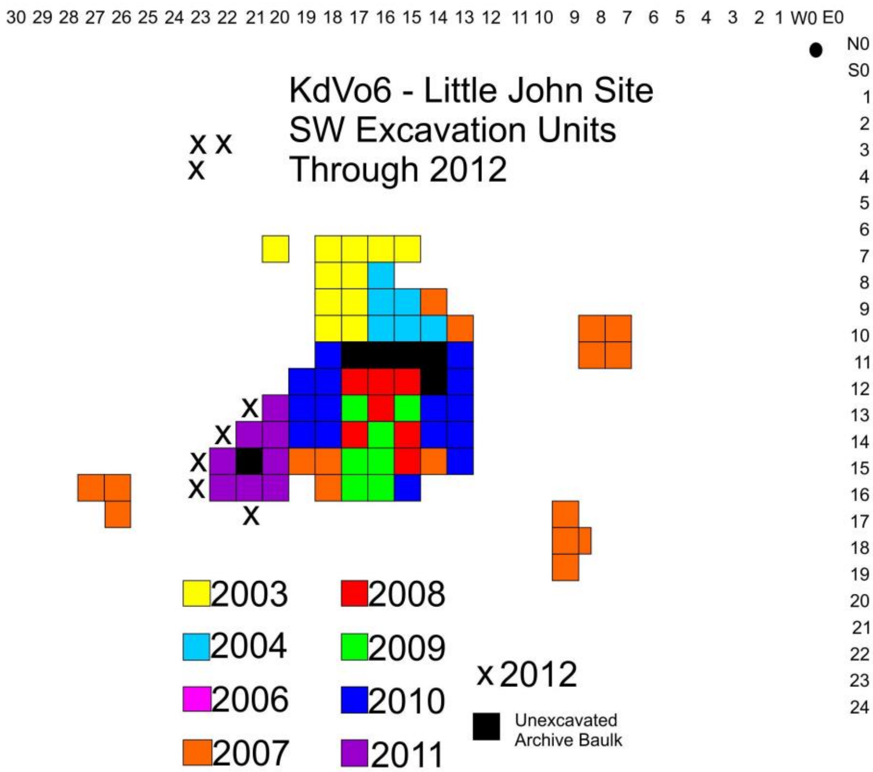

Figure 4. Excavated Units, KdVo6, West Lobe, 2003-2012

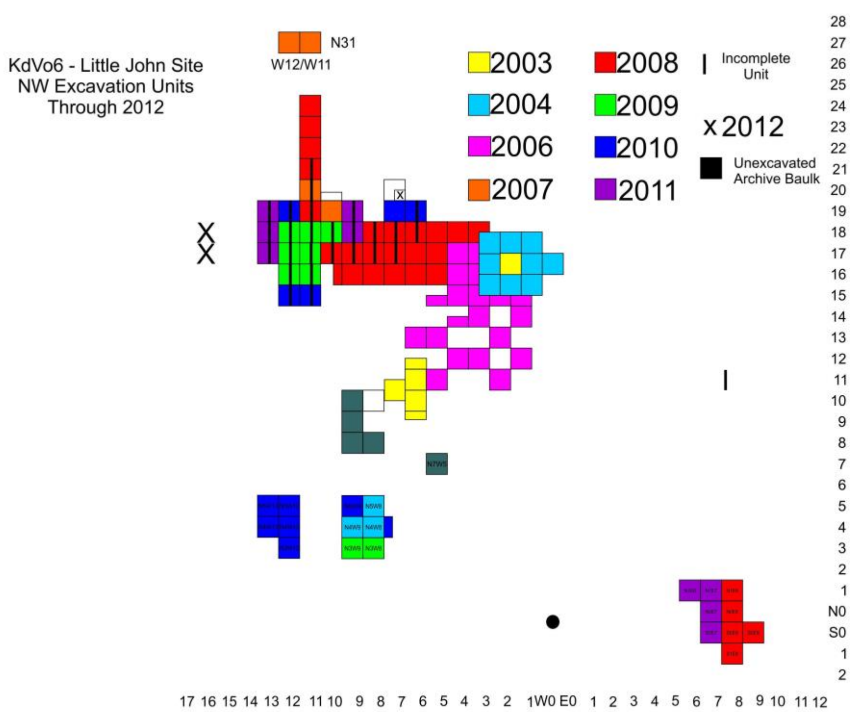

Figure 5. Excavated Units, KdVo6, East Lobe, 2003-2013

- Identification and mapping of 14 archaeological features, summarized in Table 6. Copies of these field maps are presented in Printed Appendix 4 and Digital Appendix 4, while a summary discussion of these features is presented below in this report.
- Recovery of 17 potential radiocarbon samples.
- Additional boardwalk infrastructure was added to the Little John site with the support of material supplied by Joe Young of Young's Timber, Tok, AK.

Table 2. Completed Unit Profile Inventory, KdVo6-2012

Date	Profile #	Unit	Wall	Levels	Comments
7 June	P2012-01	S13W21	North	O/A – C	MY/ p. 14 unit book
7 June	P2012-02	S13W21	West	O/A – C	MY/ p. 14 unit book
19 June	P2012-03	N5W5	West	O/A – C	MY/
19 June	P2012-04	N2W4	West	O/A – C	MY
19 June	P2012-05	S17W21	East	O/A – C	JH/NB
19 June	P2012-06	S17W21	West	O/A – C	JH/NB
19 June	P2012-07	S17W21	South	O/A – C	JH/NB
20 June	P2012-08	S16W23	West	O/A – C	KS/DM p. 25 unit book
22 June	P2012-09	S15W22	West	O/A – C	AA / p. 25 unit book
22 June	P2012-10	S15W22	North	O/A – C	GH / p. 24 unit book
20 June	P2012-11	S16W23	South	O/A – C	KS/DM p. 25 unit book
29 June	P2012-12	N3W9	South	O/A – C	AA/NS
29 June	P2012-13	S14W22	West	O/A – C	RM/KV p. 27 unit book
29 June	P2012-14	S14W22	North	O/A – C	RM/KV p. 27 unit book
29 June	P2012-15	N3W9	East	O/A – C	NB
05 July	P2013-16	N18W16	South	O/A – C	KS
11 July	P2012-17	N4W13	West	O/A – C	DM
06 July	P2012-18	N4W9	West	O/A – C	GH
29 July	P2012-19	S4W23	South	O/A – C	KS
29 July	P2012-20	S4W23	West	O/A – C	MY
29 July	P2012-21	S4W23	East	O/A – C	MY
29 July	P2012-22	S3W23	West	O/A – C	KS
29 July	P2012-23	S3W23	North	O/A – C	MY pp. 42-42 unit book
29 July	P2012-24	S3W22	North	O/A – C	KS p. 20 unit book
29 July	P2012-25	S3W22	East	O/A – C	MY
29 July	P2012-26	S3W22	South	O/A – C	MY south wall of NE Quad, 25 cm long baulk profile

- While not part of this report, the primary field crew also assisted Robert Sattler, Archaeologist at the Tanana Chief's Conference of Fairbanks, Alaska in survey and excavations at the David Site at Calico Bluff on the Yukon River, south of Eagle, Alaska.

Figure 6. Excavations at the David Site, Yukon River, Alaska.

- Also reported on separately are two days of field survey August 2nd and 3rd in the area about the mouth of Coffee Creek on the Yukon River (Easton 2012b, PA 5 / DA 5). Undertaken at request of WRFN this no-impact pedestrian survey of the riverfront area was in search of historic features related to WRFN membership occupation of the area in the late 19th and 20th centuries. No conclusive remains were identified.

Table 3. Summary of Recovered Artifacts, KdVo-6-2012 (n = 792).

Type	Count	Lithic %
Biface	5	1.1
Blade	5	1.1
Scraper	1	0.2
Burin w Notches	1	0.2
Microblade	14	3.0
Burin Spall	1	0.2
Modified Cobble/Pebble	13	2.8
Modified Flake	14	3.0
Flake Core	3	0.7
Microblade Core	1	0.2
Microblade Core Tablet	1	0.2
Debitage	402	87.2
SUBTOTAL LITHICS	461	99.9
Cobbles/Pebbles	121	
Fire Altered	81	
Historic	2	
Ochre	103	
Other	24	
Total	792	

Table 4. Summary of Artifacts by Level and Type, KdVo6-2012.

Summary Level Summary Type	OA	B1	Ash	B2	NW B/Hearth	B2 L	WL L	P2	P3	Totals
Biface				4				1		5
Blade				4		1				5
Scraper				1						1
Burin w Notches				1						1
Microblade				11		3				14
Burin Spall						1				1
Modified Cobble				1	12					13
Modified Flake				13		1				14
Flake Core	1			2						3
Microblade Core						1				1
Microblade Core Tablet				1						1
Debitage		19	37	256	9	62	16	2	1	402
Cobbles/Pebbles		1			113				7	121
Fire Altered				5	73	3				81
Historic	2									2
Ochre	25	31		34		7	6			103
Other			24							24
Totals	28	51	61	333	207	78	22	3	8	792

Figure 7. Bison Bone and Edge Modified Flake in situ, KdVo6 N18W13 SE, Bottom of Paleosol Complex.

Table 5. Summary of Recovered Fauna, KdVo6-2012.

Common Name	A	B1 / Ash	B2	P1	L b P1	PC1 - P2	PC2 - P3	Grand Total
Steppe bison	0	0	0	0	7	1	1	9
Hare	0	1	0	0	0	0	0	1
Large Mammal	0	0	0	1	0	6	0	7
Small Mammal	1	0	2	0	0	5	0	8
Indeterminate	0	0	0	0	1	0	0	1
Grand Total	1	1	2	1	8	12	1	26

Table 6. 2012 Feature Inventory, KdVo6.

Date	Feature #	Unit / Quad	Level	Dbs	Comments
13 June	F2012-01	S16W23	O/A	9.5	p. 5 unit book
13 June	F2012-02	S14W22	O/A	8.0	p. 3 unit book
17 June	F2012-03	S15W23	O/A	8.0	p. 5 unit book
17 June	F2012-04	S16W23	B2	19 – 23	Flakes, FAR
24 June	F2012-05	S15W21	B1 top	2.0	Historic wood
27 June	F2012-06	N18W16 / N17W16	B - Top of L below O/A	15.0	Hearth Feature w/ associated pebbles and cobbles
02 July	F2012-07	N18W16	B - Top of L below O/A	20 – 25	Continues F2012-06 into 2nd level of hearth feature w/ pebbles and cobbles
03 July	F2012-08	S4W23	B2	39 – 48	Hearth outline in B2 and charcoal sample locations of Samples 2012-04: a, b, c
03 July	F2012-09	N5W9	B1	2 – 6	Birch bark and Historic wood feature
03 July	F2012-10	N4W9	B1	1.5 – 15	Birch bark and Historic wood feature, continued from F2012-09
09 July	F2012-11	N5W2	B1	5 – 10	Hearth feature with FAR – links with F2010-15
10 July	F2012-12	N5W2	B1		Hearth feature with FAR – links with F2010-15
06 July	F2012-13	S3W22	B2		Bowl-like depression in Loess from B2 in NE Quad
06 July	F2012	S4W23 / S3W23	B2	17 – 25	Hearth feature exposed

- From 2 – 5 July we hosted 9 Youth and 4 counselors engaged in the Northern Cultural Expressions Society's summer cultural program for native youth in foster care. We used a combination of field camp activities (excavation, artifact cataloguing, and cooking) a variety of art activities (beading, bark and wood working, painting, storytelling), and local Elder interaction as vectors of therapy for the children (see Easton 2012c, PA 6 / DA 6).

- Six public presentations related to the project were delivered in the past year including a paper presented to the Alaska Anthropological Association meetings in Seattle, WA (Easton et al. 2012; DA 7), a paper presented to the 3rd International Glacier Archeology Conference in Whitehorse (Yesner et al. 2012; DA 8), a poster presented to the Alaska Anthropology Association meetings in Anchorage (Grooms and Easton 2013; PA 7, DA9;) and a paper and two posters at the Canadian Archaeological Conference in Whistler, BC (Easton et al. 2013 – PA 8, DA 10, Easton 2013a – DA 10, and 2013b – PA 9, DA 12).
- No peer-reviewed publications were generated in the past year relating to this permitted activity, although a major monograph on traditional land use in collaboration with Dr. Dorothy Kennedy and Randy Bouchard of Victoria, B.C. was completed and submitted to the White River First Nation (Easton, Kennedy, and Bouchard 2013); this monograph is currently restricted but has been submitted to the Yukon and Federal Governments in support of the WRFN's northern boundary claim.
- In addition, Jordan Handley of Simon Fraser University completed her Seniors Honours Thesis on lithic material sourcing in collaboration with Dr. Rudy Reimer of that institution (Handley, 2013; PA 10, DA 13).
- Michael Grooms (PhD candidate, University of New Mexico, Dr. E. James Dixon, Superivor) continued his data collection on the geomorphology of Little John, including samples for Optically Stimulated Themoluminesence dating of the loess levels at the site; he anticipates returning to the site for at least two weeks this summer. He completed several initial analytical papers in support of this work, one on initial soils analysis at Little John is appended (PA 11, DA 14).
- Laurianne Bourgenon (PhD candidate, University of Montreal, Adriane Burke, Supervisor), spent three weeks at the site in support of her comparative research with the Bluefish Cave fauna, and will be returning for three additional weeks in 2013.
- Nicolena Virga (M.A.candidate, Department of Anthropology, U of Southern California – Fullerton, Supervisor Dr. Steven James), continued her work with us for nearly four weeks during which we also worked on materials collected at Montague Harbour in support of her thesis.

REGIONAL CONTEXT OF THE AREA OF STUDY

GLACIAL HISTORY AND PALEOECOLOGY OF THE STUDY REGION

Pleistocene glacial advances in the Mirror Creek and adjacent Tanana valleys were thin piedmont glaciers extending from the Nutzotin – Wrangell – St. Elias Mountain chain, which rise about forty kilometers to the southwest of the site. The Little John site lies at the edge of the maximum extent of the Mirror Creek glacial advance (corresponding to the central Yukon's Reid and North American Illinoian glacial events), variously dated to the Late Illinoian – MIS 6, c. 14,000 BP (Bostock 1965; Krinsley 1965) or the Early Wisconsin – MIS 4, c. 70,000 BP (Denton 1974; Hughes et al. 1989).

However the Late Wisconsin advance of glacial ice, identified locally as the McCauley glacial advance (corresponding to the central Yukon's McConnell and the North American Wisconsin glacial periods), ended at McCauley Ridge, some fifty kilometers to the southeast, and began a rapid recession at about 13500 BP; by 11000 BP the region was ice-free to at least the White River, some 150 kilometers to the southeast (Rampton 1971).

Thus, the Little John Site lies within the ice free lands of Beringia. Paleontological data compliments the geological evidence. This includes a dated fragment of ivory from a scatter of this material found eroding from the hillside across the highway from the Little John site, which has been AMS dated to 38160 +/- 310 RCYBP; presumably it is from *Mammuthus*, although we have not undertaken any DNA analysis to confirm this.

Figure 8(a/b). Ivory Locality across the highway from Little John and detail of Recovered Fragments.

However, combined with the recovery of additional Pleistocene fauna in the area representing specimens of *Bison*, *Equus*, *Mammuthus*, *Rangifer*, and possibly *Saiga*, including an *Equus lambei* specimen, recovered about two km from the site, which has been radiocarbon dated to 20660 +/- 100 RCYBP (Beta 70102; MacIntosh 1997:84), these non-cultural fauna confirm that the area about the Little John site supported a range of mega-fauna during the mid to late Wisconsin glacial period from at least 38,000 years ago.

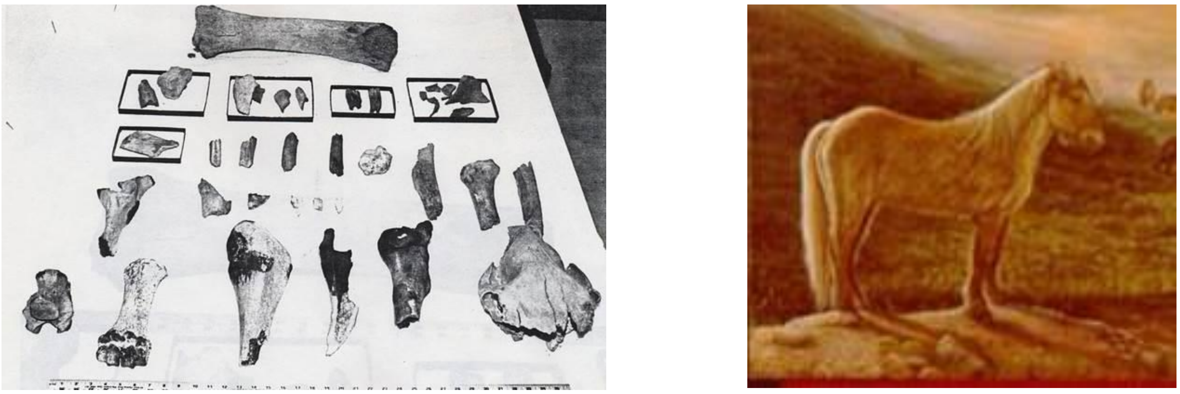

Figure 9. Pleistocene Fauna collected at Little Scottie Creek Bridge; *Equus lambei* dated to 20,660 rcybp (Greg Hare; Yukon Heritage Branch).

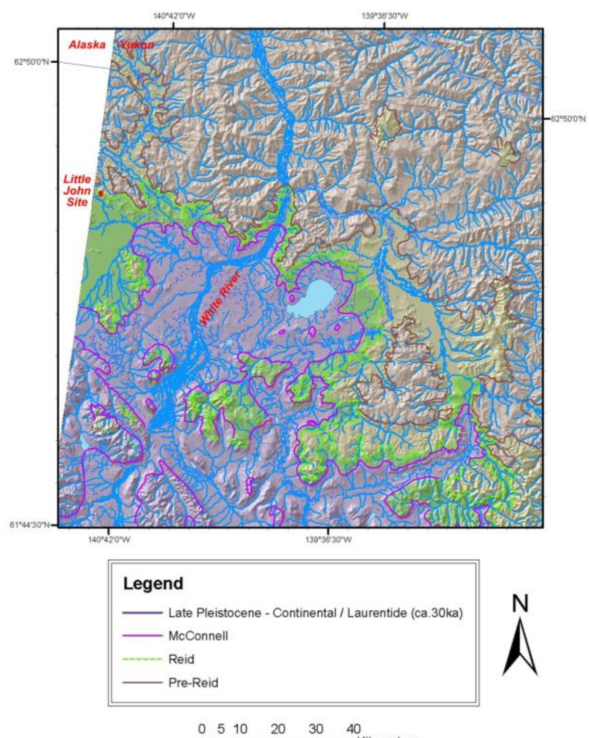

Figure 10. Pleistocene Glacial Limits of the Southwest Yukon (prepared by the Yukon Geological Survey based on most recent fieldwork in the region).

Several palaeo-ecological studies have been carried out in the region, which allow us to reconstruct the local post-glacial environmental history of the past 13,000 years or so. Rampton (1971b) analyzed sediments from Antifreeze Pond, just south of Beaver Creek, while MacIntosh (1997) examined sediments from "Daylight Coming Out" Lake (Upper Tanana = *Yikahh Männ'*) just north of Beaver Creek and the uppermost lake on the Little Scottie Creek drainage, and "Island" Lake (Upper Tanana = *Cha'atx̲aa Männ'*), which lies just over the Alaska border and drains into Big Scottie Creek via Desper Creek. The results of these two studies were in general agreement, differing slightly in some aspects of dating and environmental indicators. In combination they present us with the following palaeo-environmental reconstruction:

Herb-Tundra Steppe Zone

The late glacial environment of between 13,500 to 11,000 years ago was dominated by grasses (*Gramineae*), sage (*Artemisia spp.)*, willow (*Salix spp.*) and sedges (*Cyperaceae*), equivalent to that of the predominantly herbaceous tundra steppe zone proposed for much of eastern Beringia at the end of the Wisconsin glaciation.[1] MacIntosh estimates minimum July temperatures of five degrees Celsius.

Birch Rise

The period between 11,000 and 8,000 years ago is marked by a significant (up to seventy-five percent of the pollen record) increase in birch (*Betula spp.* - predominantly dwarf birch - *Betula pumila* var. *glandulifera*), with a slow decline in the levels of *Artemisia*. These data suggest a continuing warming climate to at least a minimum mean July temperature of nine degrees Celsius. A rise in aquatic plants and algae is also noticeable in the pollen record, suggesting increased moisture and precipitation, as well as a general reduction in erosion and accompanying stabilization of the landscape.

Spruce Rise

This is a relatively short period, which is marked by the first appearance of spruce (*Picea spp.*) in the region. It is also one which different localities present different time depths. Rampton's estimates for Antifreeze Pond place the onset of spruce at about 8,700 years ago; MacIntosh's data from *Yihkah Männ'* place it at between 7,400 and 8,400 years ago. Birch and willows retain the high values of the previous period however, while other taxa are

[1] There is not unanimous agreement on Wisconsinan Beringian environments, but I follow the position set out by Guthrie (1990) on the matter, which argues for a productive "mammoth steppe".

greatly reduced. The presence of spruce suggests a minimum mean July temperature of thirteen degrees Celsius.

Spruce Zone

After about 7,500 years ago, spruce becomes predominant within the pollen record in the region, with an accompanying dramatic decrease in the presence of birch and willow. Sphagnum pollen also rises noticeably, with a corresponding decrease in aquatic species. These data suggest at least maintenance of minimum mean July temperatures of thirteen degrees Celsius.

Alder Zone

A rise in alder (*Alnus spp.*) is found at about 5,400 years ago at *Yihkah Männ'*, and 5,600 at Antifreeze Pond; both suggest an increase in relative moisture in the region at about this time to about present levels. Both Rampton and MacIntosh interpret their data as indicating the onset of an environment generally similar to that of today, with the exception of a gradual rise in mean annual July temperatures to its contemporary level of about twelve degrees Celsius.

It was during this last period that the region experienced the ash fall from two major volcanic eruptions near Mounts Churchill / Bona, near the headwaters of the White River. The figure below shows the limits of the two ash falls.

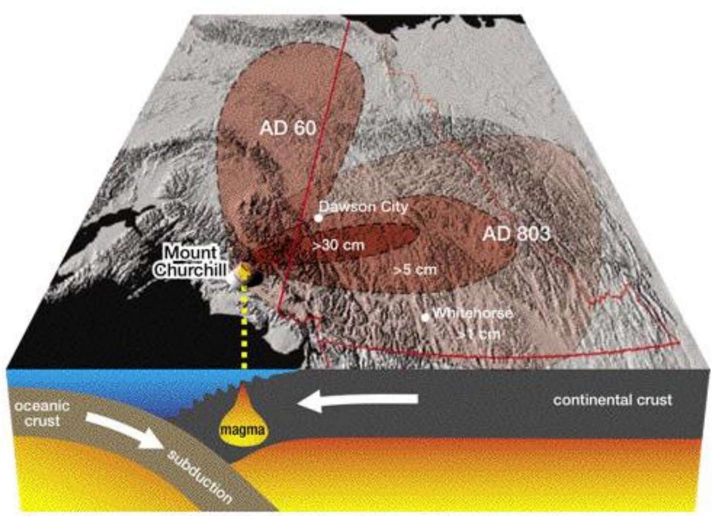

Figure 11. Distribution of the White River Ash fall, c. 1,900 and 1,250 years ago.
(from Smith et al. 2004:28)

The first, smaller eruption occurred at about 1,900 years ago; the majority of ash was deposited northward from the eruption. The second, larger, eruption occurred at about 1,250 years ago; the ash fall from this eruption was carried eastward to beyond the Yukon - Northwest Territory border (Lerbekmo et al. 1975); more recent analysis of peat deposits has extended its distribution as far east as the shores of Great Slave Lake, 1300 km from the source. This expanded distribution encompasses about 540,00 km^2, representing a tephra volume of 27 km^2 (Robinson 2001). The effect of these ash falls must have been significant for both the environment and the humans living in the region (Workman 1974). Moodie and Catchpole (1992), and others (Derry 1975, Ives 1990, 2003, Matson and Magne 2007), suggest that this may have been the impetus for the migration of the Athapaskan speaking ancestors of the Navaho and Apachean peoples into the American southwest desert lands. Ives (2003:267) notes that

> the clear recognition of two separate White River events enhances the tie between Athapaskan language history and volcanic history. The north lobe White River event (ca. 1900 B.P.) corresponds in time with the intermontane and coastal migrations of the Pacific Coast Athapaskans that Krauss and Golla (1981) felt took place before 1,500 B.P., while the east lobe event corresponds with the divergence of Canadian and Apachean Athapaskans after about 1,200 B.P. It seems unlikely that these two episodes of languag divergence, in their correspondence with two volcanic events of stupendous ecological moment, would arise purely as a matter of coincidence.

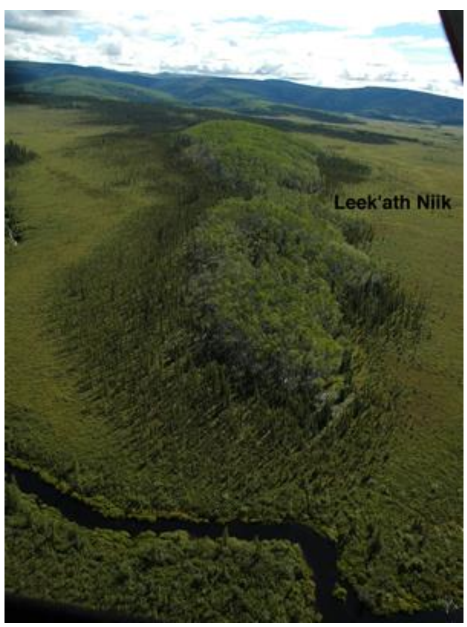

Figure 12. Leek'ath Niik Village, Middle Scottie Creek.

Interestingly, Easton was told by several Upper Tanana Elders that the traditional village site of *Leek'ath Niik* / muddy water creek /, which lies on the eastern side of the middle Scottie Creek valley, was the location to which their ancestors retreated at the time of the eruption and subsequent ash fall - a time referred to in their oral history as the year of two winters.

After the last eruption about 1,200 years ago the region's environment has been relatively stable, although fluvial erosion and redeposition of sediments, as well as localized mass wasting of hillsides, continued.

CONTEMPORARY ENVIRONMENTAL ECOLOGY OF THE STUDY REGION

From a contemporary perspective, Oswald and Senyk's (1977) categorization of the eco-regions of the Yukon place the southwest Yukon and the adjacent Upper Tanana valley within the eastern portion of their "Wellesley Lake Eco-Region" (pp. 42-45; see also Smith et al. 2004).

The surface of the valley floors are characterized by extensive meandering streams across boggy, largely permafrost muskeg. Though technically discontinuous, permafrost is extensive and can reach as deep as thirty meters (Rampton 1980). Frozen ground features include fen polygons, stone nets, felsenmeer, solifluction lobes and stripes, and rock rivers.[2] Loess (wind blown) sediments and volcanic ash deposits, both of which can reach over 50 cm in depth, are also found throughout the region (Oswald and Senyk 1977).

Today the ground is covered with sphagnum mosses, sedges, blueberry, bearberry, Labrador tea, and is dotted with remnant oxbows and a plethora of small lakes ringed with willows. Black spruce bowers and scattered growth of dwarf birch, alder, and willow crowd any rise in the valley landscape, which are often elevated frost mounds, shading ground patches of cranberry and wild rose. The surrounding hillsides support alternating patches of white and black

[2] All of these surficial features are directly related to permafrost conditions:

- Fen polygons are peatlands with slowly moving water above or below the surface, commonly supporting grasses, sedges, cottongrass, bulrushes, and reeds, on patterned ground, roughly polygonal in shape.
- Stone nets are characterized by fine-grained soils in the centre and coarse-grained, stony materials found on the rim of patterned ground intermediate between sorted circles and sorted polygons.
- Felsenmeers are chaotic assemblages of fractured rocks resulting from intensive frost shattering of jointed bedrock.
- Solifluction lobes and stripes are two forms of surficial sediment deposits which have resulted from the slow, gravitational downslope movement of saturated, unfrozen sediments moving as a viscous mass over a surface of frozen material (Oswald and Senyk 1977).

spruce, birch, alder, aspen, and poplar trees and a wide variety of shrubs, up to their low summits. Due to the near surface presence of permafrost, north-facing hillsides are predominantly black spruce. Many of these plants were and continue to be used by *Dineh* of the region (see Easton 2004b).

Despite the abundance of water in the region, the humidity is low. This is because the lowland bogs are more a function of the low relief and summer solar thaw of the fifty or so centimeters of soil above the permafrost than of precipitation, which averages only about 30cm per year. Seasonal variation in temperatures is extreme, ranging from -57 degrees Celsius or greater in the winter to the low 30s in the summer. The mean low temperature is -31 degrees Celsius in January, the mean high temperature is 12 degrees Celsius in July, and the annual mean temperature is -6 degrees Celsius. (The lowest recorded temperature for North America was recorded at nearby Snag, Yukon on 3 February 1947 of -62.8 degrees Celsius (-81 degrees Fahrenheit). Cloud coverage is relatively high, averaging overcast for 27% and broken for 30% of the year (Wahl et al. 1987).

The low mean temperatures combined with the low solar values associated with the high cloud cover, result in long winters with lakes and streams frozen from October to mid-May (Hosley 1981a). And while the depth of snow is never very deep, it can come as early as September and remain on the ground until May. As a result, the seasons of spring and fall are short, while the difference between winter and summer might best be summed up as frozen or wet.

In the present, the basin supports a wide range of fish species, large and small mammals, and is an important component of the interior western continental flyway; in Alaska the lower Chisana River basin is completely within the Tetlin National Wildlife Refuge, while the upper portion lies in Wrangell-St.Elias National Park and Preserve.

Dominant large mammals include moose (*Alces alces*), black and brown (grizzly) bear (*Ursus americanus* and *Ursus arctos*), mountain sheep (*Ovis dalli*), and caribou *(Rangifer tarandus*) of the Chisana and Forty-Mile C aribou Herds.

Furbearers include wolf (*Canis lupus*), lynx (*Lynx canadensis*), wolverine (*Gulo gulo*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethica*), otter (*Lontra canadensis*), and the snowshoe hare (*Lepus americanus*).

Pre-eminent among the fish species are whitefish (*Coregonus sp.*), grayling (*Thymallus arcticus*), pike (*Esox lucius*), sucker (*Catostomus spp.*), and lingcod [burbot] (*Lota lota*). Salmon is also available to the region from fishing localities on the White and Yukon Rivers, as well as through reciprocity with relatives living in the Copper River watershed and in the Dawson region (see Friend, et al. 2007, for a comprehensive survey of traditional and contemporary subsistence fishing in the upper Tanana River basin).

Like the plants, most all animals were integrated into Upper Tanana culture. All retain an important social and spiritual relationship to people - the *Dineh* culturally categorize animals as non-human persons with cognitive and moral purpose - and many were important components of the aboriginal technology and subsistence systems (see Nadasdy 2007; Easton 2008b).

REGIONAL ARCHAELOGICAL SEQUENCES

The ancient Beringian environment which prevailed in the Borderlands during the last glacial maximum, some 27,000 to 12,000 years ago during the late Pleistocene geological epoch, and the general environmental changes which occurred in the region over the past 11,000 years of the subsequent Holocene epoch was presented above. There is widespread agreement on the presence of human societies occupying eastern Beringia during the final millennia of the Pleistocene and the early Holocene Epochs. Currently there are two regional schemes that prevail in our understanding. The first is one that was developed to account for the prehistory of glaciated Yukon; the second is one that was developed to account for the prehistory of unglaciated eastern Beringia (central Alaska and western Yukon). In order to provide a larger context to the material recovered from the Little John site, I present first the northwestern Canadian (glaciated Yukon) archaeological sequence,[3] followed by a presentation of the eastern Alaskan sequence, and then a comparative discussion of both archaeological sequences, which relates one to the other. Finally, I discuss specific archaeological sites within the local area of the Borderlands to contextualize the Little John site in a regional perspective.

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[3] I am leaving aside discussion of the proposed early (20,000 years +) cultural tradition based on a bone tool technology proposed by Jaques Cinq-Mars, and Richard Morlan (Cinq-Mars and Morlan 1982) for unglaciated northeastern Beringia in the Old Crow River Basin of northern Yukon. The archaeological evidence for this early culture is equivocal at best and not generally accepted by the majority of archaeologists, including myself. The demonstrable late Pleistocene – early Holocene (circa 11,000 years ago) microblade and burin component of the Blue Fish Caves assemblage in the Old Crow basin is variously assigned to the Paleo-Arctic, Denali, Beringian, or Dyuktai archaeological traditions which are discussed below (c.f. Fagan 1987:122-127; Dixon 1999:58-61).

From the pan-regional perspective of Northwestern North America, it is clear that there must be some technological and cultural relationship between the Alaskan and Yukon sequences. Indeed, the Little John site, along with others in the Borderlands area, are well placed geographically and chronologically to provide the archaeological data to link the two separate sequences, which to date have been geographically separated by hundreds of kilometers and nationalist driven definitions.[4]

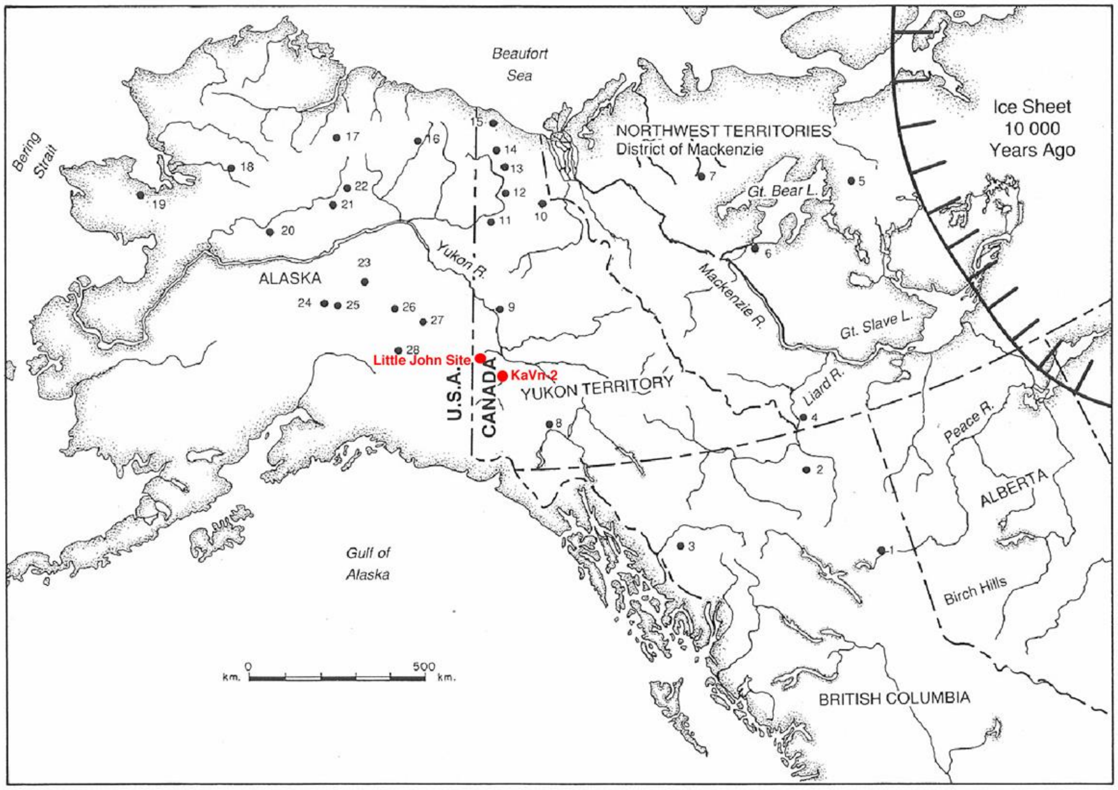
The map below shows the general location of most western subarctic archaeological sites of the late Pleistocene and early Holocene (from as early as 14,000 years ago at the Swan Point [next to # 26, Broken Mammoth] and Little John sites to about 8,000 years ago). Based on current knowledge, the archaeological sequence for the glaciated Yukon first proposed by Workman (1978) has been refined by the recognition of a non-microblade Northern Cordilleran Tradition in the early Holocene (Clark 1983), a mid-Holocene "Annie Lake" technological complex of small, deeply concave-based lanceolate points (Greer 1993; Hare 1995), and the combining of Workman's Aishihik and Bennett Lake phases into a Late Prehistoric period. Each of these archaeological cultures are discussed in more detail below.

Northern Cordilleran Tradition

Lasting from at least 10,000 years ago to about 7,000 years ago, this tradition is characterized by large straight and round-based lanceolate point forms, large blades and flakes, and transverse notched burins. Significantly the assemblage lacks microblade technology (Clark 1983). The climate at this time shifted from the colder and dryer climate associated with the terminal glacial period to increasing warming throughout (from a mean July temperature of 5.5 to 7.2 degrees Celsius to 7.2 to 9.9 degrees Celsius), while the vegetation seems to have been dominated by shrub tundra. Representative site components of this tradition include the basal levels of the Canyon (JfVg-1) and Annie Lake (JcUr-3) sites, and the Moosehide (LaVk-2) site.

[4] Interestingly, Carlson (2007) goes even further, linking the early Borderlands archaeological culture with that of the early Northwest Coast.

The Northwestern Canadian (Central Southwest Yukon) Archaeological Sequence



Map 4. Ancient Sites in the Northwestern Area, 11 500 to 7 000 Years Ago The sites shown belong to Clovis Palaeo-Indian, Palaeo-Arctic, and early Northern Cordilleran peoples. Microblade people of the Palaeo-Arctic tradition became established in Alaska around 10 700 years ago, and expanded eastwards, probably absorbing or displacing earlier inhabitants of the Cordilleran region.

1 Charlie Lake Cave, P-I
2 Pink Mountain, P-I
3 Mount Edziza, obsidian source
4 Fisherman Lake & Pointed Mountain, NC, P-A, HR
5 Acasta Lake, NC
6 Franklin Tanks, Gt. Bear R., HR
7 Airport, NC
8 Canyon Creek, NC
9 Dawson placer mines, P-I & Moosehide
10 Rock River sites, NC
11 Bluefish Caves, P-I, P-A
12 Old Crow River Flats, P-I
13 Dog Creek, P-I
14 Kikavichik Ridge, P-I
15 Engigstiack, NC, HR
16 Putu, P-I
17 Mesa, NC
18 Onion Portage, P-A, HR
19 Trail Creek Caves, P-A
20 Batza Téna, obsidian source, P-I
21 Island, P-I, P-A
22 Girls' Hill, P-I
23 Campus, HR
24 Walker Road, P-I
25 Dry Creek, P-A
26 Broken Mammoth, P-A, NC
27 Healy Lake sites, NC, P-A
28 Tangle Lakes, P-A

Abbreviations
P-I: Palaeo-Indian
P-A: Palaeo-Arctic
NC: Northern Cordilleran group
HR: Siginificant in history of research

Figure 13. Late Pleistocene - Early Holocene Archaeological Sites of the Western Subarctic
(from Clark 1991a)

As discussed by Hare (1995), two possible sources for this tradition have been proposed. The first, following Clark (1983, 1992) is derived from populations of the Cordillera geophysical region, themselves derivative from late Paleoindian Plano peoples of the northern prairies, which co-existed with microblade making populations entering the Yukon from the northwest. However, Hare (1995:131) suggests that,

> "given the broad morphological similarities between blades from Annie Lake and those for the 11,000 BP Nenana Complex (discussed below and Goebel et al. 1991) and the apparent dissimilarities with the Early prehistoric period, Clovis-like blades of northern Alberta (see Le Blanc and Wright 1990), it is unlikely that the Northern Cordilleran Tradition is derived from southern-based Plano influences. Instead, it is probable that the roots of Northern Cordilleran are to be found in the indigenous northwestern Paleoindian tradition"

– which I take to mean the northern Brooks Range assemblages such as those found at Mesa (Kunz et al. 2003), Putu, Bedwell and Hilltop sites, and Spein Mountain in the lower Kuskokwim River basin (Ackerman 2001), collectively grouped within the Mesa complex (Kunz and Reanier 1994; see also Hoffecker 2011).

Little Arm Phase or Northwest Microblade Tradition

Lasting from about 7,000 to 8,000 years ago to about 4,500 to 5,000 years ago, this tradition is characterized by composite tool production using small blades or microblades, multiple gravers and burins, round-based projectile points, and a variety of end and side scrapers (Workman 1978). The Little Arm site (JiVs-1) on Kluane Lake is the type site of this regional phase and sites of this type and period are found everywhere throughout the southwest Yukon, many of which might also include some notched points (although Workman, 1978, would disagree with including such sites on that basis). The climate during this time continued to become warmer than today's average temperatures, while the vegetation shifted from shrub tundra to a spruce forest ecosystem.

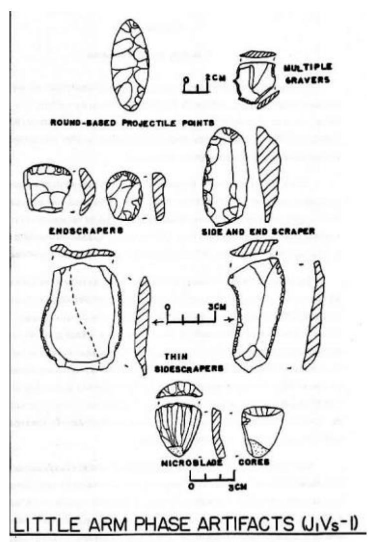


Figure 14. Little Arm Phase Artifacts

(from Workman 1978)

The Northwest Microblade Tradition (NWMt) as proposed by MacNeish (1964) included both wedge-shaped microblade cores and side notched points. It was seen by some as attempting to embrace far too many regional phases over too great a geographic area (from the Mackenzie River basin to Fairbanks) to have any great utility. More recently, its use has been resurrected by some in the Canadian northwest as representative of a merging of microblade technology diffused from Alaskan (and ultimately east Asian) origins and combined with the developing indigenous Yukon-Northwest Territories-based Northern Cordilleran tradition (Wright 1995; Clark et al. 1999). Clark et al. (1999:175) suggests that:

> The genesis of the Northwest Microblade Tradition, at least its microblade industry and possibly also its burins, lies in the spread of Denali culture to the Yukon about 7,000 or 8,000 years ago [after deglaciation] and its further, later, spread into the District of Mackenzie and adjacent areas of British Columbia and Alberta . . . . [that] resulted in considerable heterogeneity. . . . The Northwest Microblade Tradition should be viewed as a frontier culture [in the Cordillera] vis-à-vis the Denali focal region.

Annie Lake Complex

Lasting from about 6,900 to about 2,900 years ago, this complex is characterized by projectile points - called Annie Lake Points - which are relatively small (3.5 to 4.25 cm), basally thinned (or "deeply concaved lanceolate" in Greer's (1993) morphological description), and additional lithics which are “characterized by thin, well made tools of high quality raw materials, with a debitage suggesting extensive curation and maintenance of tools (Hare 1995:132).

Figure 15. Annie Lake Points

(N. A. Easton)

To date these points have been exclusively located in the Southern Lakes region around Whitehorse, Yukon. The Annie Lake Complex is found stratigraphically above microblade-bearing horizons of the NWMt and below Taye Lake Phase or Northern Archaic Tradition horizons. Temporally, however, it lies astride both the preceding and following tradition, leading Hare (1995:121-2) to suggest that it may represent “a small colonizing population . . . or, and perhaps more likely, the Annie Lake complex represents diffusion of early Northern Archaic traits into an indigenous microlithic tradition.”

Taye Lake Phase or Northern Archaic Tradition or Middle Prehistoric Period

Lasting from about 4,500 to 5,000 years ago to about 1,250 years ago, this archaeological culture is characterized by the introduction of a variety of side-notched and stemmed spear and atlatl points (Anderson 1968a, 1968b; Workman 1978), a range of scraper forms, net weights, and a notable increase in the recovery of bone artifacts of a variety of functions (although this last attribute may be a function of preservation, and the percentages of bone artifacts within the entire assemblage is less than that found in the subsequent Late Prehistoric period). At some sites microblades are found as well (c.f. Clark et al. 1999). A cooling and moister climate begins this period, with a neo-glacial period at about 2,600 years ago, followed by a drier climate at its terminus. Vegetation was similar to that of today.

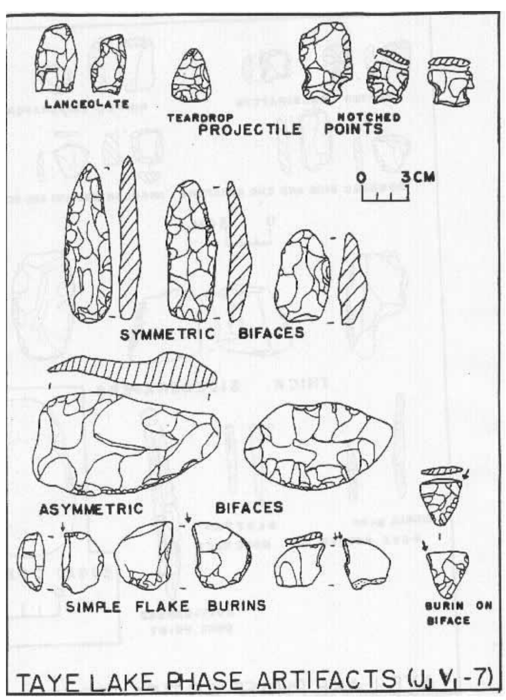


Figure 16. Taye Lake Phase Artifacts - Points, Bifaces, and Burins

(from Workman (1978)

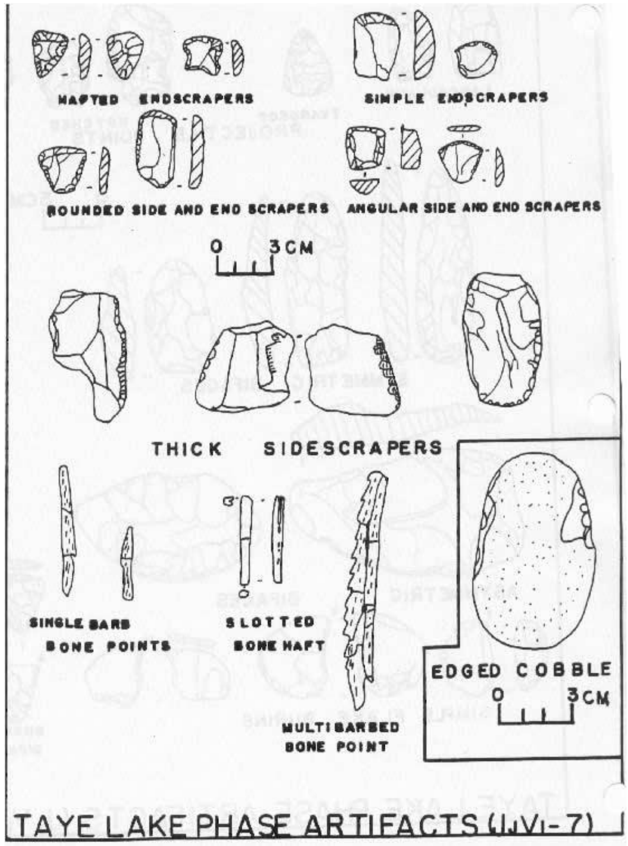


Figure 17. Taye Lake Phase Artifacts - Scrapers, Bone Points, and Net Weight.
(from Workman (1978)

Both Anderson and Workman noted that the lithic artifacts at this time become increasingly crude in their workmanship, with little retouch flaking and dominated by poor, coarse-grained materials. This fact, combined with the general expansion in the size and diversity of the overall toolkit, is interpreted to represent a population that has adapted and expanded its comfortable adaptation to the boreal forest landscape to include a wider variety of subsistence technology and resources, perhaps with an increased emphasis on bone technology and a reduction in lithic technology.

Aishihik Phase - Late Prehistoric Period

Lasting from about 1,250 to about 200 years ago, this archaeological culture (Workman 1978) is essentially Northern Archaic, but differentiated from the Taye Lake phase by its presence above the White River Volcanic ash fall - Taye Lake material is below the ash. It is characterized by increased use (or perhaps only archaeological recovery) of bone and antler tools, native copper implements, and small-stemmed projectile points (Kavik or Klo-kut points[5]). While initially cooling and moist, the climate became warmer at the end of this period and the vegetation was not significantly different from today.

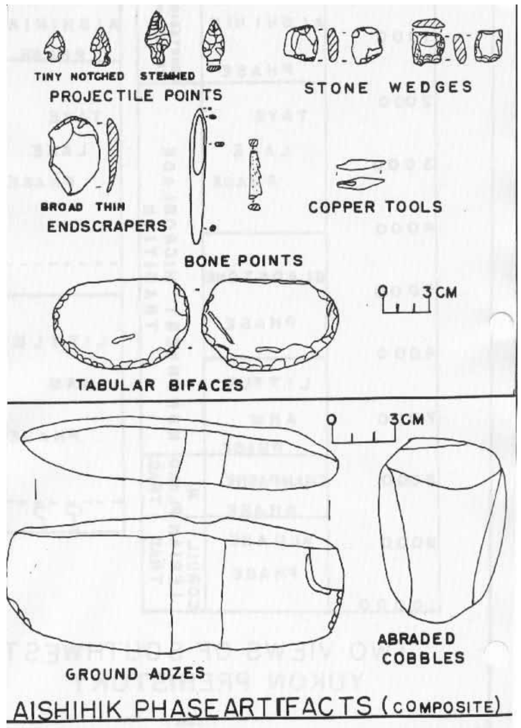


Figure 18. Aishihik Phase Artifacts.

(from Workman 1978)

Interestingly, recent dating of a large number of well-preserved atlatl darts and bow arrows found in melting ice patches in the southwest Yukon has revealed that the bow and arrow is exclusively an Aishihik Phase technology in the southwest Yukon (Farnell et al. 2005; Hare et al. 2004). Such a correlation between the second White River Volcanic ash fall and the introduction of the new bow and arrow technology replacing the longstanding atlatl is suggestive of a brief period of rapid population displacement and replacement, although undoubtedly of the same Athapaskan language family.

Bennett Lake Phase - Late Prehistoric

Lasting from about 200 years ago to this century, this archaeological culture (Workman 1978) is characterized by the introduction of European trade goods and their integration into aboriginal technology, and is prior to the full encapsulation and transformation of aboriginal technology into its modern form. Expedient lithic tools such as simple cobble scrapers (Upper Tanana = *thi-*

[5] These stemmed points may have tapered or shouldered bases; see Campbell 1968, Morlan 1972, Shinkwin 1978.

chos), choppers, bipolar flakes, scrapers made from bottle glass and strips of metal, fish-hooks made from nails, and bunting arrow points made from spent cartridges are common at sites such as those at Dawson-Tr'ochëk (Hammer 2001), Fort Selkirk (Easton and Gotthardt 1987, Gotthardt and Easton 1988), and the Scottie Creek valley (Easton 2002b).

Discussion of Southwest Yukon Sequence

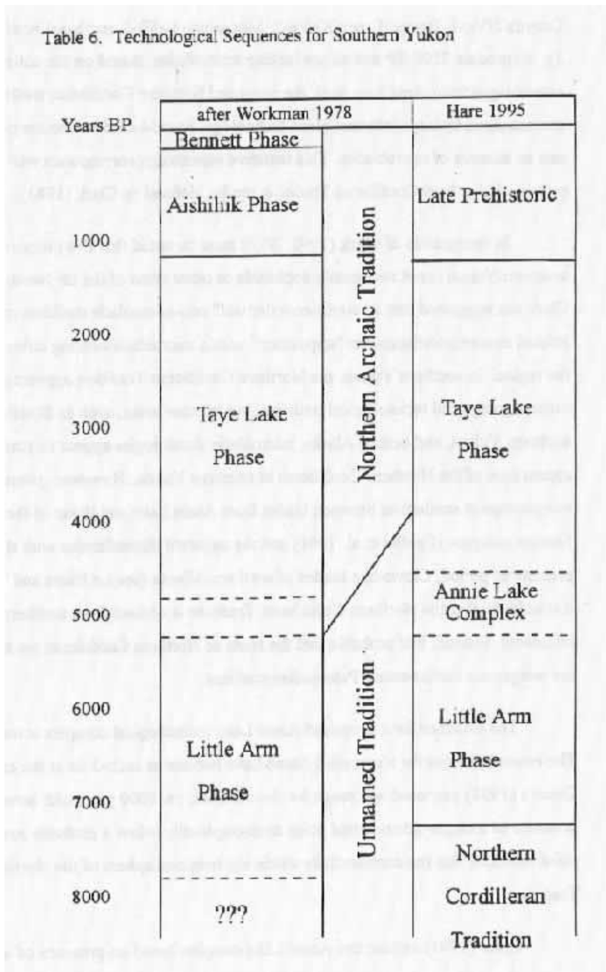


Figure 19. Technological Sequences for Southwest Yukon

(from Hare 1995)

The figure above presents a summary of the technological sequence of the southwest Yukon discussed in the previous section. There is no doubt that there is direct historic continuity between the contemporary inhabitants of the southwest Yukon and the people of the Bennett Lake phase. Similarly there is a direct connection between the people of the Bennett Lake phase and the preceding Aishihik, since the only defining difference is the introduction of European trade goods. This connection is reflected in contemporary archaeologists' movement away from the use of these phase names towards a more regional and generalized Late Prehistoric categorization with clear affiliations to modern Athapaskan groups (c.f. Greer 1983; Gotthardt 1990; Hare 1995:125).

The relationship between the Late Prehistoric period and the preceding periods is summed by Hare (1995:17):

> As outlined by Workman, most researchers agree that the Northern Archaic and Northwest Microblade traditions gradually evolved into the Late Prehistoric Athapaskan Tradition and while there was considerable regional variability there is evidence for continuity in terms of technology, settlement and subsistence patterns.

In years past, some archaeologists had suggested that the changes in technology between the Microblade and Northern Archaic periods reflected the migration of new culture-bearing people into the region (see especially Anderson 1968 and Workman 1978).

However, many archaeologists now favor models of population continuity in this period as well and suggest the possibility that the principal factor in these changes has been necessary adaptations to changes in the environment or the result of indigenous populations adapting diffused technological elements of neighbouring cultures (see, for example, Clark and Morlan 1982; Morrison 1987; Clark 1992; Hare 1995:16-17). Furthermore, Hare and Hammer (1997) have shown that the temporal range of microblades within the Yukon has more components outside the proposed range of the Northwest Microblade tradition than within it (see also Clark et al. 1999). Thus, for example, Morrison (1987) prefers the use of the term *Middle Prehistoric period* over that of the *Northern Archaic Tradition* in the Mackenzie and eastern cordilleran regions, while Clark and Morlan (1982:36) view the Northern Archaic as the later *phase* of the Northwest Microblade Tradition.

In other words, it can be argued that the changes in material culture in the archaeological record do not imply a physical replacement of the people in a region. Consider our own material culture changes from the introduction of new technology - the archaeological remains of my family or any of my neighbours 35 years ago would not have included a personal computer, diskettes, cd-roms, or videotapes. Today they do. To suggest, based on material remains alone, that the differences between the material remains of then and today reflects *the replacement of one resident population with another* is clearly wrong in this instance. It could be wrong in prehistory as well, and increasing numbers of archaeologists are considering this fact.

The notion of a Northern Cordilleran Tradition was first proposed by Clark (1983) in order to account for the presence of non-microblade archaeological components underlying microblade-bearing deposits throughout the Yukon. The application of this tradition is now generally accepted to account for early Holocene sites characterized by large straight and round-based lanceolate point forms, large blades and flakes, and transverse notched burins, but which lack microblades. However, even this tradition is increasingly regarded as having direct continuity with the subsequent Northwest Microblade Tradition (Wright 1995; Clark et al. 1999).

The Archaeological Sequence of Eastern Beringia (Central Alaska and Northwest Yukon)

For some years the archaeological sequence of F. H. West and his collaborators (West 1996c) dominated the prehistory of Alaska; this generally agreed with the Yukon sequence of technology but favors earlier dates, based on sites within unglaciated eastern Beringia, and a slightly different terminology. The principal exception to this generalization is that the earliest components are variously classified as belonging to the Chindadn / Nenana Complex, the Denali Complex, or the Eastern Beringian Tradition. More recently Holmes (2008) and Hoeffecker (2008) have proposed new complexes or phases for the late Pleistocene technologies of interior Alaska.

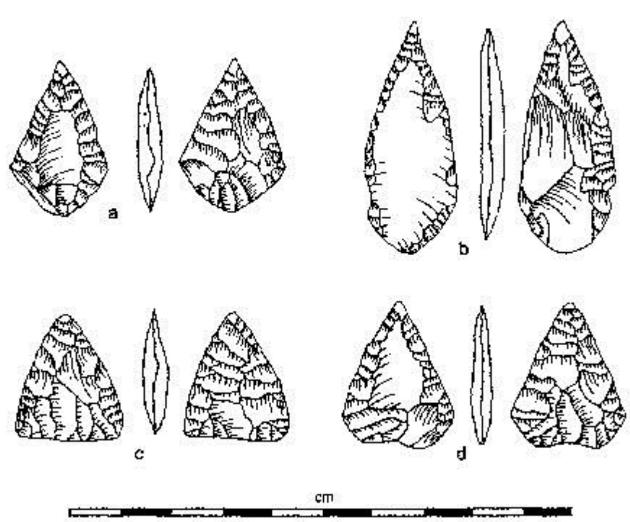


Figure 20. Chindadn ("Ancestor") points from Healy Lake.

(from West 1996c)

Chindadn Complex / Nenana Complex and Swan Point Dyuktai

The relationship between the Chindadn and Nenana complexes is currently under debate. Many of the sites in this period share similar sedimentary contexts. Located on buried paleosols below wind-blown glacial silts (loess sediments), some of these sites have exceptional organic preservation of bone, antler, and mammoth ivory, the latter presumably scavenged from earlier Pleistocene deposits exposed along river banks, which has revealed in some detail the diet of these culture carriers (Dilley 1998). Besides the expected remains of larger game – bison, elk, and sheep - their diet clearly included significant proportions of small mammals, migratory waterfowl and their eggs, and fish (Yesner et al. 1992, Yesner 1996, Yesner et al. 2011).

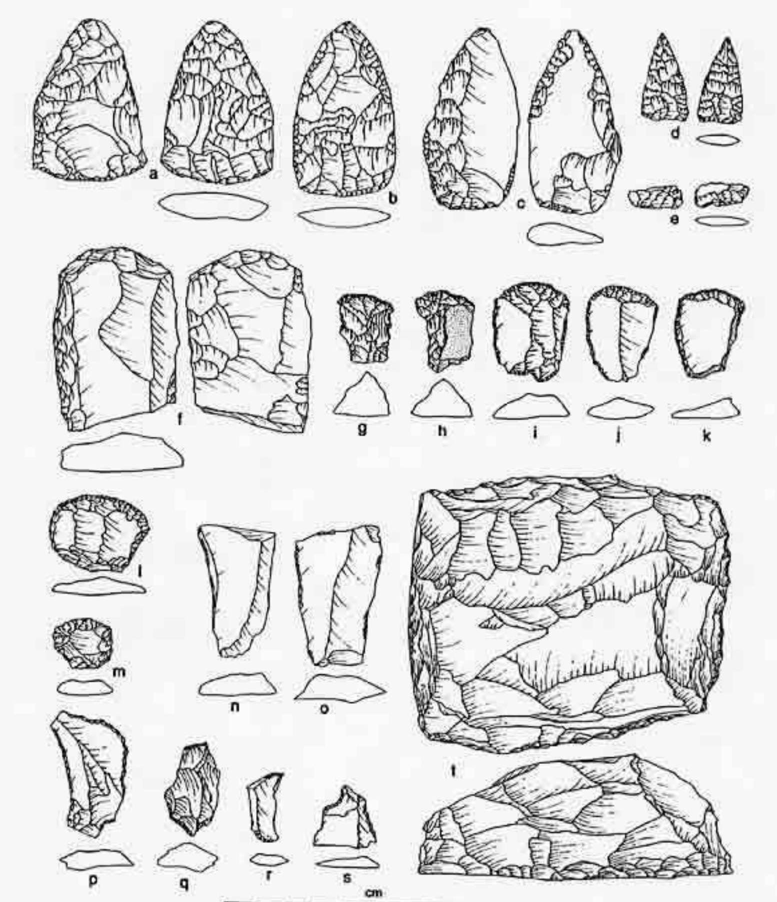


Figure 7-8 Component I of the Dry Creek site (Nenana complex): bifaces (*a–e*); side scraper (*f*); end scrapers (*g–m*); bilaterally retouched blades (*n, o*); retouched flakes (*p–s*); quadrilateral uniface or plane (*t*).

Figure 21. Dry Creek, Component I, Nenana Complex

(from West 1996c)

The Dry Creek, Walker Road, and Moose Creek sites in the Nenana valley provided the basis for the construction of the Nenana complex (Powers and Hoffecker 1989; Hoeffecker, et al.

1993). Dated to between 13 and 13.6 thousand years ago in the Nenana valley,[6] it is characterized by an emphasis on bifacial technology on blades and flakes, triangular and tear-dropped shaped (Chindadn) projectile points and / or knives (Cook 1969, 1996; Holmes 2001), straight and concave-based lanceolate projectile points, perforators (including bone needles), endscrapers and sidescrapers, but is lacking microblades.

The Nenana complex appellation was subsequently extended to include a series of site components along the Tanana River proper, including Healy Lake, Broken Mammoth, and Swan Point (Goebel and Slobodin 1999; Hamilton and Goebel 1999). In earlier reports on Little John, I and my collaborators have also designated the Western lobe loess stratum component at the Little John site, which includes Chindadn bifaces, straight-based lanceolate projectile points or knives, large bifaces, bifacial blade and flake technology, endscrapers, and burins, but lacking microblade technology, as a Nenana assemblage (Easton 2007c; Easton and MacKay 2008).

Based on geographical, temporal, and technological differences, Holmes (2001) has for some time argued that we should recognize these late Pleistocene Nenana valley and Tanana valley components as separate complexes – the Nenana complex for the former and Chindadn complex for the latter. Geographically their separation is of enough distance to warrant this. Temporally the dated Chindadn complex components in the Tanana valley are all younger than those in the Nenana valley: Cultural Zone 3 at Broken Mammoth is dated to between 12.6 and 12 thousand calendar years ago (Yesner et al. 1992; Yesner 1996), Cultural Zone 3 at Swan Point is dated to between 12.5 and 11.5 thousand calendar years ago (Holmes et al. 1996; Holmes 2008), and the basal levels of Healy Lake are dated to between 9.1 and 13.3 thousand calendar years ago, with an average of c. 11 thousand calendar years ago (Cook 1969, 1996).

Technologically, all three assemblages of these Chindadn complex components at all three sites contain Chindadn bifaces along with some evidence of microblade technology:

> microblades are found in small numbers at Swan Point CZ3 (34) and 44 are reported for Broken Mammoth (Krasinski 2005:46); however no microblade cores have been recovered from CZ 3 at either site. The presence of microblades negates inclusion of the Broken Mammoth and Swan Point CZ 3 assemblages in the Nenana complex. . . . Assignment of CZ 3 to the Chindadn complex is a better fit and has precedence over the Nenana complex, especially in the Tanana Valley. I place this group of components

[6] Dry Creek, Component I is dated at 11,120 +/- 85 radiocarbon years – 13,025 +/- calibrated calendar years (Hoffecker et al. 1996). The Nenana component at Walker Road has several dates averaging 11,208 +/- 92 radiocarbon years – 13,100 calibrated calendar years (Goebel et al. 1996; Goebel 2008). The Nenana component at Moose Creek is dated between 11,730 +/- 250 radiocarbon years – 13,681 +/- 316 calibrated calendar years (Hoffecker 1996) - and 11,190 +/- 60 – 13,091 +/- 117 calibrated calendar years (Pearson 1999).

> (Healy Lake Chindadn, Broken Mammoth CZ 3, and Swan Point CZ 3) in the EBt [East Beringian tradition] Phase II, and it may be possible to include the Nenana complex as well (Holmes 2008:6).

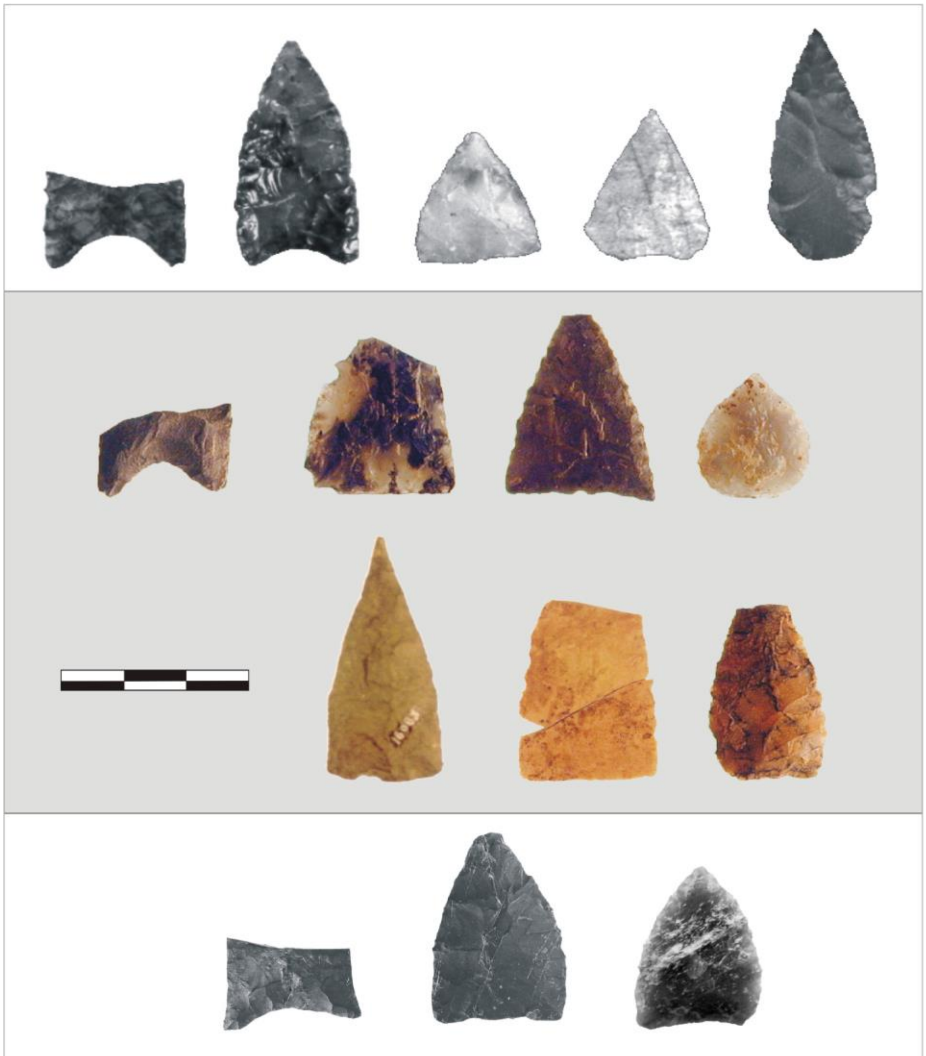


Figure 22. Chindadn Bifaces of the Tanana Valley: Top - Healy Lake Chindadn, Middle - Swan Point CZ 3, Bottom - Broken Mammoth CZ 3

(Holmes 2008)

Holmes' identification of a Phase II, which includes both Chindadn and Nenana complexes, within an "East Beringian tradition" is made in order to account for the earlier, distinct occupation at Swan Point at c. 14,000 calendar years ago, that is characterized by what he calls the Dyuktai microblade production technique, which "is based on preparing a biface (or less common, a blade or flake) preform, producing a platform by removing spalls from the lateral edge, and then detaching microblades" (Holmes 2008:5). He sees this form of microblade production as directly derivative from the Dyuktai and Yubetsu traditions of eastern Siberia, northern China, northern Korea, and Northern Japan and distinctively different from the “Campus” or “Denali” microblade production technique.

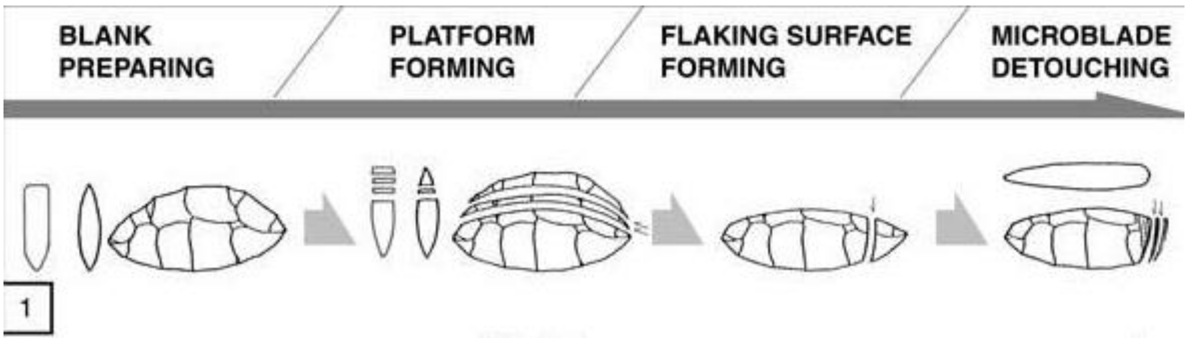


Figure 23. Yubetsu Microblade Core Production on a Biface

(from Nakazawa 2005)

> The best way to distinguish between the two techniques is to compare the core platforms. Dyuktai core platforms were created and maintained by spall removal along the entire core length. Campus core platforms were created by extensive retouch followed by core tablet removal, and maintained by subsequent platform retouching necessary to detach another core tablet. The core tablets often hinged out so that some of the platform preparation trimming scars were retained. I see this as a significant difference between Beringian microblade technology, based on the Dyuktai technique, and the later Alaskan technologies of the American Paleoarctic tradition and Denali Complex, which may have been influenced by Dyuktai culture, but became an Alaskan prodigy (Holmes 2008:5).

In addition to the practice of Dyuktai microblade core preparation technique, Holmes’ notes that the 14 thousand year old Swan Point Cultural Zone 4 includes transverse and dihedral burins, hammer stones, possible anvil stones, utilized flakes, and, “as minor elements”, blades and blade-like flakes. No complete formed bifaces, other than those prepared for microblade production, have yet been recovered from Swan Point CZ 4, though several biface fragments and thinning flakes indicate “thin biface production . . . but the finished form of these . . . is unknown” (Holmes 2008:6). A summary of Holmes’ schema is presented in the figure below (see also Holmes 2011).

Based on these arguments and the evidence from Swan Point I am now inclined to agree with Holmes that the Tanana valley components should be separated from the Nenana complex and designated as belonging to the separate Chindadn complex, which would include its expression at Little John as well. Some implications of this shift in terminology is explored further in Easton et al. (2011).

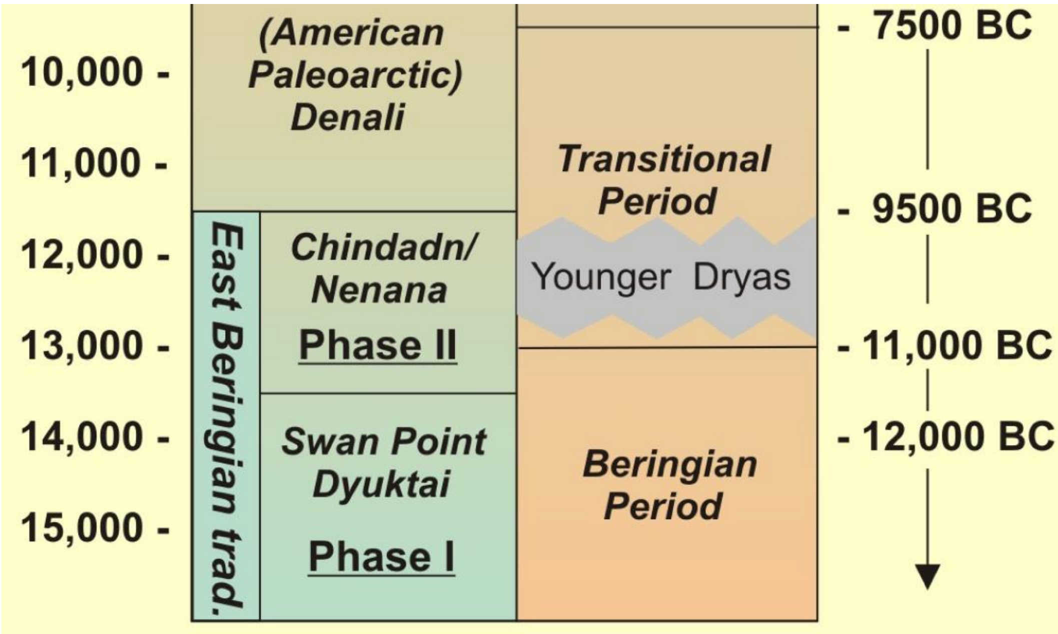


Figure 24. Late Pleistocene - Early Holocene Culture History of Interior Alaska Proposed by Holmes (2008)

(from Holmes 2008)

Denali Complex (American Paleo-Arctic Tradition / Beringian Tradition)

This archaeological culture is found from about 11,000 years ago to about 9,500 years ago and is characterized by the presence of microblades, wedge-shaped microblade cores, and burins. The American Paleoarctic Tradition was originally defined by Anderson (1970a, 1970b) on the basis of excavations at the Akmak and Onion Portage sites near the Brooks Range. It has subsequently been applied to a great number of assemblages within a wide variety of environmental contexts (maritime, transitional, interior, montane, northern, central, and coastal Alaska and Yukon). West (1981, 1996) subsumes these assemblages into an even wider Beringian Tradition that extends geographically into eastern Siberia / western Beringia, and would include the Nenana complex assemblages as well, on the basis that the lack of microblades is explained by site function – they are not found where they are not used.

350 *Part 2* ARCHAEOLOGICAL EVIDENCE: EASTERN BERINGIA

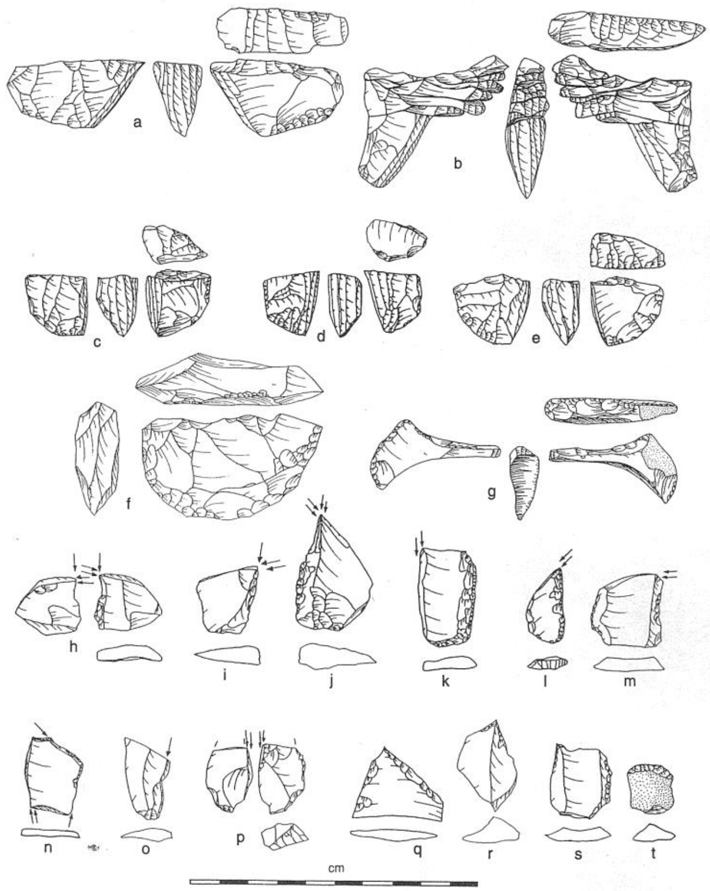


Figure 7–9 Component II of the Dry Creek site (Denali complex): wedge-shaped microblade cores (*a–e*, *b* with attaching core parts); wedge-shaped core preform (*f*); wedge-shaped core tablet (*g*); dihedral burins (*h–j*); angle burin (*k*); transverse burins (*l*, *m*); burins-on-a-snap (*n–p*); retouched flakes (*q–s*); end scraper (*t*).

Figure 25. Microblade Technology from Component II (Denali Complex), Dry Creek Site.

(from West 1996c)

The presence of wedge-shaped microblade cores (one of a number of alternative core forms from which microblades can be struck) is the common element, which unifies the designation. Some archaeologists (e.g. Dixon 1999, and myself), find the inclusion of such a variety of assemblages to reduce the utility of both constructs to little more than some indication of relationship between them; a more useful construct for the Tanana River valley is West's earlier defined Denali complex.

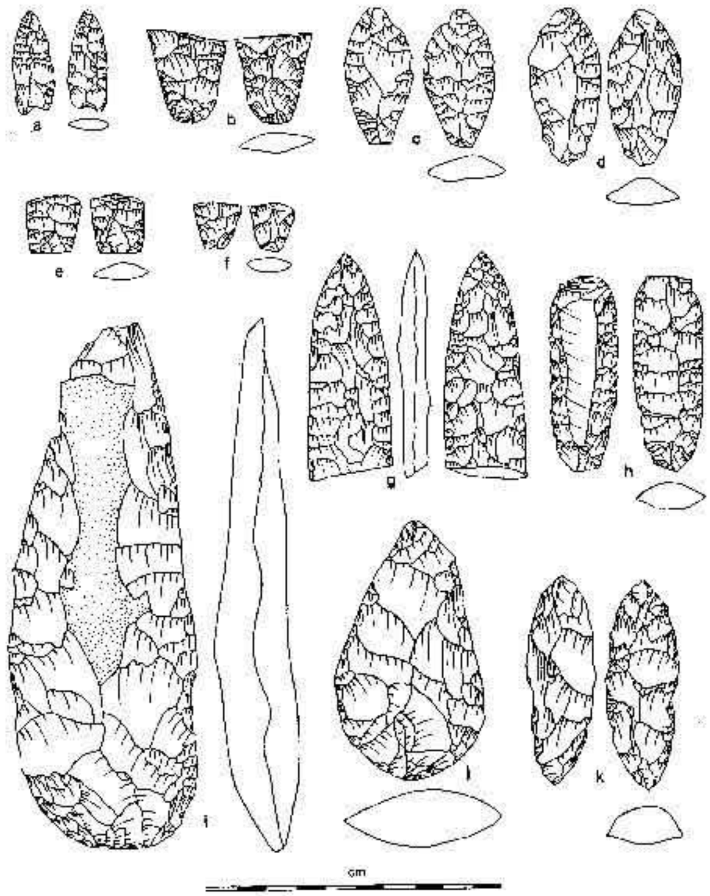


Figure 7-10 Bifaces from Component II of the Dry Creek site: complete projectile point and base fragments (*a, b, e, f*); biface knives and preforms (*c, d, g–k*).

Figure 26. Bifaces from Component II (Denali Complex), Dry Creek site.

(from West 1996c)

Northern Archaic Tradition

I have described this archaeological culture earlier. It is found from about 6,000 years ago to about 1,500 years ago in Alaska and is characterized by the appearance of small, side-notched projectile points, as well as high numbers of end-scrapers, and the presence of notched pebbles, presumably used for net weights.

Late Denali Complex

The presence of wedge-shaped "Denali" microblade cores at the Campus site, as well as other undated sites in the Tanana valley (Nelson 1935, 1937; West 1975), which have been subsequently radiocarbon dated to the late Holocene, led to the notion of a "Late Denali complex," circa 3,500 to 1,500 years ago (West 1967, 1975; Moberly 1991). It is characterized by the presence (reappearance?) of microblades and burins, in components which otherwise are similar to the Northern Archaic (i.e., containing side-notched points, etc.).

The Campus site has been excavated on eight occasions between 1933 and 1995 (University of Alaska 1934, Rainey 1939, Moberly 1991, Pearson and Powers 2001). The initial recovery of wedge-shaped microblade cores at this site led Nels C. Nelson of the American Museum of Natural History, who examined the collection in 1935, to note: "the cores and the small endscrapers . . . are identical in several respects with . . . specimens found in the Gobi desert [and] furnish the first clear evidence we have of early migration to the American continent. . . . possibly 7,000 to 10,000 years ago" (Nelson 1935:356).

Athapaskan Tradition

This archaeological culture is found from about 1,500 years ago to about 150 years ago and is characterized by a shift to the introduction of copper technology, stemmed projectile points, and the increased use of bone and antler arrowheads (although it is likely that this is a largely a function of better preservation of more recent organic material).

Euroamerican Tradition

This archaeological culture began about 150 years ago and is characterized by the introduction of European manufactured goods and materials

Comparative Discussion of the Interior Southeastern Beringian Archaeological Sequence

As can be seen, there are several direct correspondences to be made between the Alaskan and Yukon chronologies. For all intents and purposes the Euroamerican Tradition is equivalent to the Bennett Lake Phase and the Athapaskan Tradition to the Aishihik Phase. In combination, both of these Alaskan traditions are equivalent to the Yukon’s Late Prehistoric Tradition. There is also a direct correspondence between the two regions' Northern Archaic Traditions.

The presence of a microblade bearing Late Denali Complex within the time of the Northern Archaic has correspondence as well. Recent analyses of the temporal range of microblade technology in the Yukon have suggested that in many local areas this method has persisted up until quite recent times (Hare and Hammer 1997; Clark et al. 1999). Grouping together both microblade and non-microblade sites with the more embracing Middle Prehistoric Period, or altering our definition of the Northern Archaic to include the presence of microblades, may be called for.

The distinguishing feature between the Denali Complex (c. 11,000 to 9,500 years ago) and the Northwest Microblade Tradition (c. 7-8,000 to 4,500-5,000 years ago) is time. Yet most researchers agree that the latter represents the migration of this technology eastward over space through this time.

Finally, there does seem to be some correspondence between the Nenana Complex and Clark's Northern Cordilleran Tradition with their emphasis on bifacially worked tools, the presence of blades, and the lack of microblades. However, we can also see distinctive differences including the presence of Chindadn type and basally thinned points in the Nenana Complex and their absence in the Northern Cordilleran Tradition.

Recent comparisons of the components associated with the Nenana and Denali Complexes has led some to suggest that these may all belong to a single over-arching tradition, which West has named the (Eastern) Beringian Tradition. West has put the case most strongly:

> There is no unique Nenana artifact. Every Nenana artifact form can be duplicated in Denali. The absence of microblades surely has simpler explanations than . . . calling upon another culture - and one without antecedents at that. This certainly suggests that Nenana is, at best, a Denali variant (West 2000:4, quoted in Heffner 2002:26).

Resolution of this question may well hinge on archaeological evidence within the Borderlands region. Heffner's (2002) excavation and analysis of the KaVn-2 site, not far south of Beaver Creek, brought to light an early component dated between 10,670 and 10,130 radiocarbon years before present, which was occupied within a few hundred years of deglaciation in the area. Heffner argues that the, "assemblage can be seen as intermediary between the Nenana Complex or Northern Cordilleran Tradition and the

Denali Complex or American Paleo-Arctic Tradition" (Heffner 2002:119). He goes on to argue that this fact lends support to the Eastern Beringian Tradition as the most appropriate cultural historical classification for early sites in interior northwestern North America. As noted earlier, the Eastern Beringian Tradition posits that the Nenana and Denali Complexes of Central Alaska, and by extension the Northern Cordilleran Tradition and American Paleo-Arctic Traditions as well, are technologically related and that assemblage differences in early archaeological sites can be better explained by site location, site function, and site seasonality (Heffner 2002:120).

At this point, based on the emergent evidence from the Little John and Swan Point sites, we take an alternative view which maintains the separation of the Denali and Nenana / Chindadn complexes along the lines proposed by Holmes (2008, 2011). Indeed, we have most recently proposed the separation of the Nenana and Chindadn complexes based on geographical and chronological distance, suggesting that the former be restricted to sites within the Nenana valley while the latter be applied to the late Pleistocene, non-microblade assemblages of the Tanana valley proper (Easton et al. 2011).

Two important new additions to the Late Pleistocene archaeology of the region were recently published that bear on our work at Little John. The first is the publication of a multi-authored assessment and examination of the implications the hypothesized genealogical relationship between the Siberian Yeniseian language Family as represented by the Ket language and the Na-Dene language Phylum, which consists of the Athapaskan, Eyak, Tsimshian languages. The emergent consensus among linguists is that if not proven the hypothesis put forward by Edward Vayda (2010a and 2010b) is certainly robust and the best (if not only) evidence of a shared linguistic heritage between an New World and Old World population. The archaeological implications of this possibility is explored by Potter (2010) and critiqued by Dummond (2010).

Finally, Potter, et al. (2001) reports on the recovery of cremated juvenile human remains within a burial pit - hearth feature within a house structure at the Upward Sun River site on the south bank of the Tanana River near Big Delta Junction in Alaska. The remains are dated to c. 11.5 thousand calendar years and the house feature is evidenced by post holes around a semi-subterranean concavity feature. Besides its inherent importance in its own right, we can note the identification of concentrations of wood within the Loess below Paleosol Complex levels (P5 and P6) at Little John that may represent an occupational feature.

Archaeological Sites within the Borderlands Region

Prior to the initiation of the Scottie Creek Culture History Project by Easton in the mid-1990s, the Borderlands area had received limited archaeological attention.

Johnson first conducted survey efforts in the area in 1944 and 1948, after the construction of the Alaska Highway, but he did not record any archaeological sites in our area of interest (Johnson 1946, Johnson and Raup 1964). A number of archaeological survey efforts passed through the area during environmental impact assessments for the Foothills natural gas pipeline project in the late 1970s and early 1980s and they are summarized in Damp and Van Dyke (1982). Only one site was recorded within our area of concern. Tests at KaVn-1 recovered a small collection of debitage flakes. Walde (1991) conducted survey along the Alaska Highway right-of-way in 1991 from the border to the White River, returning to undertake mitigation excavation at Borden sites KaVn-2, KbVo-1, KbVo-2, and KdVo-3 (Walde 1994). Easton conducted some survey in the area of Beaver Creek in 1994 (Easton 2002a). In 1999, Ty Heffner revisited KaVn-2 to complete the excavation and analysis of this site, as well as survey a number of localities around Tchawsahmon Lake (Heffner 2000, 2002). Easton has conducted additional surveys of the middle reach of Scottie Creek in 2001 and 2002 (Easton 2002), and the northern Mirror Creek drainage in 2003, 2004, 2006, and 2007 (Easton 2007c, Easton, this report). Just across the border in Alaska, a series of site surveys of historic native settlements and graveyards has been undertaken by the Bureau of Indian Affairs (BIA) on the upper Chisana and Nabesna Rivers. While several of these sites are presumed to hold additional evidence of prehistoric occupation, limited subsurface excavation undertaken in the course of the surveys did not uncover any artifacts and so do not bear directly on this current discussion (BIA 1993a, 1993b, 1995a, 1995b, 1996a, 1996b). William Sheppard undertook archaeological survey work at several localities in Alaska recovering middle and late Holocene components along lower Scottie Creek, Deadman

Lake, and in the Tok Juntion area (Sheppard 1999 and 2001, Sheppard et al. 1991)[7]. Bob Satler and Tom Gillespie of the Tanana Chiefs Conference, and Easton conducted limited archaeological survey of several sites in the area about Northway and Tok, Alaska in 2006; two sites were discovered near the border, one of which, at the mouth of Mirror Creek where it meets the Chisana River, bears a similar stratigraphic profile to that found at the Little John site and consequently may be related, although no artifacts were recovered in the single test pit excavated there (Gillespie 2006). In collaboration with Tanana Chiefs Conference and Northway Village Inc. and Northway Village Council, Easton undertook testing at a number of sites in the Northway region in 2009, identifying occupations along the shores of Deadman and Hidden Lakes (Easton 2009).

Table 2, below, presents summary information on most of the archaeological sites recorded to date on the Canadian side of the border eastward to about the White River along the Highway corridor. These sites reveal a culture history pattern similar to that of the regional archaeological sequences to the west and east of the study area.

In addition to archaeological remains related to the prehistoric occupation of humans, the Mirror Creek, Little Scottie Creek, and Big Scottie Creek basins have been the location of the recovery of Pleistocene-age paleontological remains, including mammoth, bison, caribou, horse, saiga, and unidentified feline spp. Several associated fragments of *Equus lambei* recovered during highway reconstruction in 1996 have been dated to 20,660 +/- 100 BP. Three juvenile mammoth tusks were found close to each other in the middle Little Scottie Creek basin (MacIntosh 1997, Easton n.d.). Both the horse and juvenile mammoth tusks were recovered less than two km from the Little John site.

[7] Bill Sheppard passed on in 2006; I am currently working on analyzing the last of his collections held at Northern Land Use Planning, Fairbanks at the request of Ken Pratt.

Table 7. Canadian Archaeological Sites of the Yukon - Alaska Borderlands.	
KaVn-1	S of Sanpete Creek and E of Ak. Hwy, S of a knob located between creek bottom and Horsecamp Hill. Original find was two dark silicified siltstone-like flakes on surface. Test pits yielded 53 blue-grey flakes of various sizes. As no prehistoric sites had been previously recorded in this region of S. Yukon, the site is considered inherently valuable.
KaVn-2	Moose Lake. On a sand ridge on E side of Ak. Hwy at NW base of Horsecamp Hill overlooking Moose Lake. Archaeological site excavated during Alaska Highway realignment. The basal component is dated to be about 10,400 years BP, making this the oldest known site in southwest Yukon, the second oldest in the territory (Walde 1991, 1994; Heffner 2002)
KbVo-1	Km 1918.550, N side of Ak. Hwy on a knoll on the top of a ridge at the edge of the highway cutbank, overlooking Enger Lakes to SE. Scatter of lithic debitage, artifacts and burnt bone. Second excavation uncovered unformed tools projectile points, microblade core fragment, hide scrapers, hammerstone and eight pieces of copper. Dated at approx. 1800 years before present.
KbVo-2	N side of Ak. Hwy, km 1918.5, on top of ridge at edge of the highway cutbank overlooking Enger Lake. Initial test pits included obsidian flakes, basalt flakes and burned bone fragments. 1993 investigation included lithics and faunal material.
KbVo-3	About 320 m east of KbVo-2 on n side of Ak. Hwy. Large burnt mammal bones collected.
KcVo-1	*Taatsan Tôh* / Raven's Nest - Red Hill. On W side of Ak. Hwy, N of Beaver Creek, km 1983. Historic lookout site of the WRFN. Five lithic scatters identified; subsurface testing recovered material related to Late Prehistoric, Northern Archaic, and microblades possibly related with Workman's Little Arm phase / NWMt.
KcVo-2	*Owl's Skull Lookout* - hunting lookout northwest of middle Snag Creek. Late Prehistoric and Northern Archaic occupations indicated by debitage above the White River Ash and microblades within the B2 below the ash. Associated AMS radiocarbon date of 1770 +/- 40 BP (2 Sigma Cal BP 1810 – 1570; Beta 245517). The presence of blade technology suggests an earlier occupation as well.
KcVo-3	*Taatsan* - Raven village - Traditional village site on the upper reach of Snag Creek near the international border, containing Historic, Late Prehistoric / Archaic components, based on limited testing in 2006. A similar stratigraphy with that of KdVo-6 suggests that earlier components may be present.
KdVo-1	Along Little Scottie Creek trail, ca. 1 km east of Ak. Hwy, on E side of Sourdough Hill. Prehistoric scatter.
KdVo-2	East side of Ak. Hwy, km 1949.3, approx. 150 m east of highway on the north shore of a small lake. Probably a prehistoric campsite.
KdVo-3	S side of Ak. Hwy, km 1950 at an YTG rock quarrying location. Near Mirror Creek. Prehistoric scatter of tools and bones. Dated at 810 +/- 80 BP.
KdVo-5	*Nii-ii* / [to] Look Away From – Sourdough village - Hunting Lookout associated with nearby traditional village site. Late Prehistoric and Northern Archaic occupations reported by Easton (2002a) and MacKay (2004).
KdVo-6	Large multi-component site containing stratified components of the Historic, Later Prehistoric, Northern Archaic, Denali / NWMt, and Nenana complex. Strata sequence ranges from several cc to over a m across the site. An undiagnostic component associated with culturally altered bones of a variety of taxa is dated to 8,900 BP and is presumed be related to the Denali component (This Report and Easton, et al. 2004, 2005).
KdVo-7	Small multi-component hunting lookout on the Mirror Creek plain 2 km to the south of KdVo-6. Side-notched points of the Northern Archaic and round-based lanceloate point within loess similar to the Nenana stratum at KdVo-6 (Easton, et al. 2004).
KdVo-8	*Thee Tsaa K'eet* / Rock Cache Place - a hunting lookout and cache on the southeast point of Starvation Mountain, overlooking lower Big Scottie Creek. Limited test units recovered obsidian point fragment characteristic of the Northern Archaic culture.
KdV0-9	*Taiy Ch'ii* / Little Point of Hill Village - on the southwest edge of Starvation Mountain.

	Historic features include cabins, foundations, gravesites, and assorted late 19th and 20th century detritus. Burial site of *Gaandiniklion*, maternal grandmother of Bessie John.
KdVo-10	Alaska Highway Military Dump - Mile 1212. Historic dump related to the building of the Alaska Highway, c. 1942-1944.
KeVo-1	*Naagat Káiy* / Fox Den village. Traditional village site on middle reach of Scottie Creek containing Historic, Late Prehistoric, Archaic, Denali components, and possibly an earlier occupation within buried paleosols located in test pits 80 cm + below surface (Easton 2002b).
KeVo-2	Contemporary trapline cabin of Mr. Joseph Tommy Johnny and traditional campsite of his great-grandfather, *Tsay Suul*. Early Historic remains include musket balls and beads, and undiagnostic, presumably Late Prehistoric flakes and debitage (Easton 2002b).
KeVo-3	*Ta' ah* - Historic hunting lookout containing modified flakes, hammerstone, and flake core (Easton 2002b); associated AMS radiocarbon date of 2220 +/- 50 BP (2 Sigma Cal BP 2340 – 2120; Beta 245514).
KeVo-4	Historic hunting lookout containing microblades and flakes (Easton 2002b).
KeVo-5	*Rupe Sha* / Rupe’s Cabin - location of William (Bill) Rupe's cabin and trade post on upper Big Scottie Creek, on the west side of Paper Lake. The cabin remains can be seen from the air.
KeVo-6	*Kelt’unduun Mann’* - Paper or Pepper Lake Village - large village on the east side of the lake by the same name; occupied into the middle of the 20th century. Untested for prehistoric remains.
Table data adapted, with modification and additions from additional fieldwork by Easton, from Dobrowolsky (1997).	

Having set the larger archaeological context of the region, we now turn to a detailed discussion of our work at the Little John site in 2012.

2012 INVESTIGATIONS AT THE LITTLE JOHN SITE (KdVo-6)

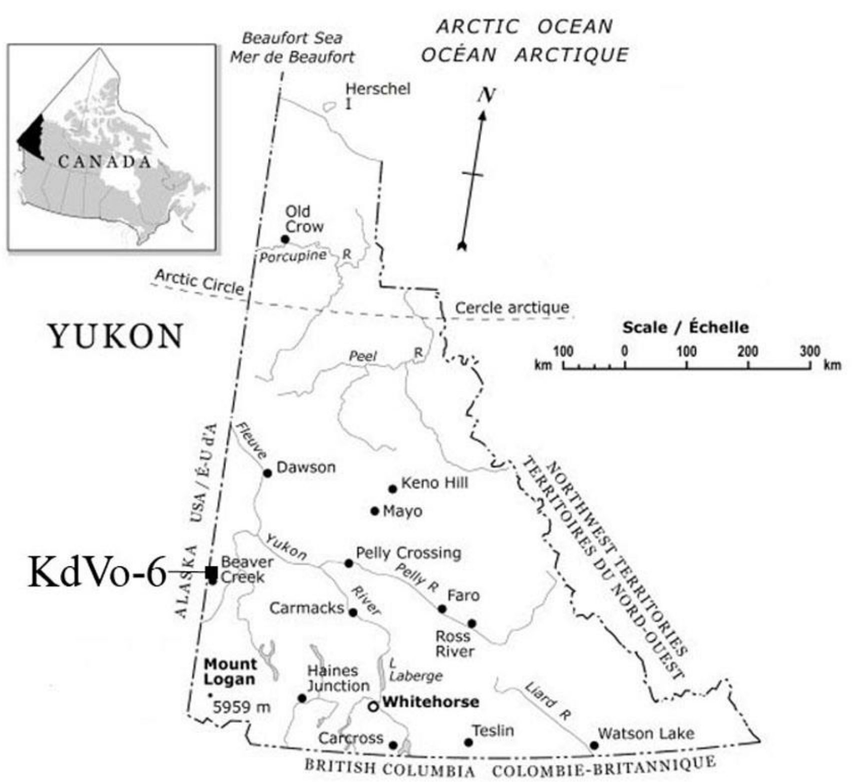


Figure 27. General Location of the Little John Site, Yukon Territory, Canada

LOCATION OF THE LITTLE JOHN SITE

The Little John site is located just off the Alaska Highway, twelve kilometers north of the village of Beaver Creek, Yukon, about two kilometers due East from the international border with Alaska. It occupies most of the higher surface of a knoll overlooking the upper reach of Mirror Creek, known as *Cheejil Niik* / Grayling Creek / in the local Upper Tanana Athapaskan language. It overlooks the basin of the creek below from the north and lies within the most western extension of the Tanana River drainage; Snag Creek crosses the valley about seven kilometers east of the site, marking the watershed division between the Tanana and Yukon River drainage basins.

Figure 28. Aerial view of the Little John Site from the South.
KdVo-6 on left, KdVo-7 on right. Mirror Creek can be seen in the foreground, the Alaska Highway running across the centre, and Little Scottie Creek valley behind.

Figure 29. Aerial view of the Little John site from the West.

Figure 30. Aerial view of the Little John site from the Southwest

HISTORY AND METHODS OF INVESTIGATIONS AT THE LITTLE JOHN SITE

Although the Little John site lies within the Alaska Highway corridor its archaeological deposits were not discovered until 2002, during regional survey efforts associated with Easton's long term Scottie Creek Culture History Project. In that year, plans to work further up the Scottie Creek valley were delayed and several test pits were dug at the location on the recommendation of Upper Tanana Elder Joseph Tommy Johnny.[8] The results of these tests indicated mid-holocene (Northern Archaic) to historic occupation of the site. In 2003, an additional 61 test pits were dug across the hillside and 22 m^2 of the site were excavated by natural levels by the Yukon College Field School in Subarctic Archaeology and Ethnography.[9] Thirteen of these units were in the West lobe, four in the Rockfall lobe, one in the East lobe, and the remainder scattered along the periphery of the site. These efforts recovered Chindadn - Nenana complex artifacts from the West lobe,

[8] Directed by Easton, crew members consisted of Glen MacKay, Ken Hermanson, Duncan Armitage, and Joseph Tommy Johnny.
[9] Directed by Easton, crew members consisted of Glen MacKay, Ken Hermanson, Christopher Baker, Jolene Johnny, Terrance Sam, Peter Schnurr, Nicole Schiffart, Michael Nieman, Mellissa Winters, Eldred Johnny, and Vance Hutchinson.

underlying a microblade bearing horizon, identified the presence of a paleosol containing fauna and artifacts in the East lobe, expanded the assemblage related to the mid-holocene Northern Archaic, and identified a military presence on the site, likely during the building of the Alaska highway.

Figures 4 and 5 (p. 10, above) shows the location of excavation units on the site through 2012. Easton (2007a:14-18) provides details on test and excavation units prior to 2007. In 2004, nine m^2 were excavated contiguous to the first unit in the East lobe, while an additional six m^2 were excavated in the West lobe; a five meter trench was also begun in the Permafrost lobe of the site.[10] In 2006, with support of the White River First Nation and the Tanana Chief's Conference, 14 m^2 were excavated in the East lobe.[11] In 2007 forty-nine m^2 units were exposed;[12] twenty-two of these remained to be fully excavated.

In 2008 nine of these units were completed to basal regolith and all were profiled and twenty-seven new units were excavated, including eight new 1 m units completed in the SW site quadrant, fourteen new 1 m units excavated to the Loess below Paleosol stratum in the NW site quadrant, and five new 1 m units completed in the NE and SE site quadrants. Due to the age and nature of the Loess below Paleosol stratum it was decided to stop excavation of the majority of units at this level in order to undertake wide area excavation in 2009. Finally, in 2008 an eight-meter trench was mechanically exposed in the Swale lobe in the far NW of the site that exposed a buried Paleosol dating to the Wisconsin Interstadial, c. 44,000 years old (Easton et al. 2009). The exposed strata were profiled and column sampled for further detailed analysis (sediment, pollen, etc.) at a later date when resources permit.

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[10] Directed by Easton, crew members consisted of Glen MacKay, Arthur McMaster, Paul Nadasdy, Eldred Johnny, and Joseph Graham.

[11] Directed by Easton, crew members consisted of Patricia Young, Camille Sanford, Glen MacKay, Eldred Johnny, Derrick Peters, David Johnny jr., Nicolas Sam, Peter Schnurr, Kathy Lowe, and Patrick Johnny.

[12] Directed by Easton and David Yesner, participants included Patricia Young and Camille Sanford of Tetlin Village, Nicolas Sam of Northway, Jordan Vandermeer, Eldred Johnny, and Derrick Peters of White River First Nation, Arthur McMaster of Yukon College, Joseph Easton, and members of the University of Alaska Anchorage - Yukon College Field School in Archaeology: Dan Stone, Lorraine Alfen, Kris Crossen, Kay Toye, Katie Herrera, Jessica Jayne, Susan Savage, Kenzie Olman, Douglas Blevins, Jessie Petersen, Nicki Dwyer, Adriana Campany, Dio Glentis, Merideth Wismer, Adam Bathe, Sam Hutchinson, and Rita Eagle.

In 2009 sixteen units were excavated. Seven of these were in the West Lobe, two at the apex of the hill near the cabin, and seven in the East Lobe (Easton 2010).[13]

In 2010 thirty-two units were either fully or partially excavated. Fifteen of these were in the West Lobe, eight at the apex of the hill near the cabin, and nine in the East Lobe. Most of the East Lobe units were excavated to the loess deposits just below the main paleosol complex with a view towards undertaking an area excavation of these loess sediments in 2011 (Easton 2011).[14]

In 2011 eight new one meter units were excavated on the West Lobe, as well as four on the hilltop to the east of the cabin. We continued excavation of thirteen units initiated previously in 2009 and 2010 in the East Lobe Pleistocene sediments. We also dug a series of 25 cm square tests in the Northwestern quadrant of the site that were profiled and sampled in support of Michael Grooms continued geomorphological studies of the site.[15]

In 2012 twenty-three one meter units were worked (see Table 1): eight on the West Lobe, nine on the hilltop in the vicinity of the cabin, and six in the East Lobe; fourteen of these were new units, while the remainder completed unexcavated sediments from previous seasons.[16]

All excavation units were excavated by trowel within unit quadrants by the natural layers identified in the site stratigraphy. Completed excavation units had at least one side profiled; many excavation units had two or more profiled (see Table 2). Recovered artifacts and fauna were recorded by three-dimensional provenience to the surface of the unit, unless they were recovered in the excavation screen, in which case

[13] Directed by Easton, crew members consisted of Camille Sanford (Tetlin Village and University of Alaska Anchorage), Katie Hannigan Toye (Arizona), Emily Youatt (Reed College), Jessica Pepe (Tulane University), Ian MacDonald (Yukon College and Champagne Aishihik First Nation), Phillip Sabelli (Boston), Annalisa Heppner (U of Tennessee), Karen and Bob Rogers (Washington State), Joseph Easton (Burnaby, B.C.), Keith Jacob (Australia), Chelsea Johnny, Eddie Johnny, and Trudy Brown (Beaver Creek, Yukon), Margo MacKay, Kat Cronk, and Kate Menzel (Anchorage), Jim Guy (Victoria), Kate Crosmer (Lycoming College), and Dr. David Yesner and Danny Yesner

[14] Directed by Easton, crewmembers in 2010 included John Grieve, Amy Krull, MacKenzie Erskine, Sarah Huq, Christopher MacMillan, Pawel Wojtowicz, Robert Hoskins, Alyssa Money, Gladis Rubio, Michael Grooms, Nicolena Virga, Robert Power, Margo MacKay, Brooke Nall, Owen Marcotte, Nick Jarmain, Vance Hutchinson, and David Yesner.

[15] Directed by Easton, crewmembers in 2011 included Julie Thomas, Katie Fittingoff, Ally Zeiger, Jordan Handley, Tia Marie Ray, Sarah Rickett, Pawel Wojowitz, Michael Grooms, Nicolena Virga, Mark Young, Josesph Easton, Hillary Wong, Margo acKay, Nick Jarmain, Peter and Lucy Schnurr, Chelsea Johnny, Trudy Brown, Eldred Johnny, Eddie Johnny, Tamika Johnny, and David Yesner.

[16] Directed by Easton, crewmembers in 2012 are listed at the beginning of this report.

their provenience was recorded by natural level and unit quadrant. The Digital Appendices provide catalogues of recovered artifacts and fauna. Photographs of representative strata, features, and artifacts *in situ* were regularly taken. A representative selection of these photographs is presented in this report and digital copies of additional photos are provided in the Digital Appendix. Finally, representative sediment samples and potential radiocarbon samples were collected and archived for future analysis when resources permit.

Subsequent to field recovery, artifacts and faunal remains have been curated at the Faculty of Liberal Arts at Yukon College and catalogued by unique site numbers, along with recovery provenience and additional descriptive characteristics. Formed artifacts and modified flakes have received metric and character (form, raw material, flake or modification location, among others) descriptions, using the categories established by the Yukon Heritage Branch artifact database forms which use the FileMaker computer program. Major formed artifacts have been photographed and/or drawn. Unmodified flakes and manuports have also been described more basically; smaller, unmodified flakes are often described by lot, for example. The Electronic Appendix provide a full listing of these derived data.

In addition to basic cataloguing, faunal material has been identified to genus and species to the extent possible through comparison with known skeletal remains held by a variety of sources, including Dr. David Yesner of the Department of Anthropology, University of Alaska - Anchorage, the Yukon Heritage Branch, standard published skeletal guides, and consultations with colleagues.[17] Vance Hutchinson, a biological anthropologist in Whitehorse, has also undertaken microscopic examination of the faunal material with a view identifying cutmarks or other signs of cultural modification. Laurianne Bougeon began her own analysis of the entire fauna collection in 2012 and hopes to complete this in 2013. An Electronic and Print Appendix provides a photographic catalogue of collected fauna.

Detailed distributional analysis of several representative units has been undertaken, while more limited distributional analysis of recovered artifacts has been

[17] These colleagues have included Vance Hutchinson, David Yesner, Scott Gilbert, David Mossop, Greg Hare, Susan Crockford, Paul Mateus, and Grant Zazula.

undertaken across the site, based on recovered level, raw material, and artifact type. A first draft of an ARCVIEW GIS representation of the artifact and faunal distribution at the Little John site was begun in 2010 and is continuing under Michael Grooms. A detailed analysis of Obsidian Sources in the Little John collection through 2006 was undertaken by Natalia Slobodin and Jeff Speakman and presented in our 2007 report (Easton 2007a); additional analysis of subsequently collected obsidian has been undertaken by Jeff Raisic and will be summarized in an upcoming publication. The general trends identified in our 2007 report are sustained; i.e. c. 90% of obsidian at Little John comes from the Wiki Peak source.

A series of conference and published presentations of work at the Little John site has allowed for broader public education and more focused peer review of the excavations to date. These have included an eight-part series in the Yukon News covering the 2003 excavations (Easton 2003), presentations at meetings of the Alaska Anthropology Association, the Arctic Sciences Conference of the American Association for the Advancement of Science, the University of Alaska Fairbanks - Yukon College Symposium on the History of Alaska-Yukon Communications, a major symposium on Beringia at the Society for American Archaeology meeting, and the 2012 Glacier Archaeology Conference held in Whitehorse last year (Easton, et al. 2004, Easton 2005, Easton, et al. 2007, Hutchinson, et al. 2007, Easton and Hyslop 2008, Easton, et al. 2008a, Easton et al. 2008b, Yesner et al. 2008a, Easton et al. 2012, Yesner et al. 2012, Easton et al. 2013, Easton 2013a). Archaeological publications include the journal *Current Research in the Pleistocene* (Easton, et al. 2007b, Easton et al. 2009), an invited contribution to a volume on projectile point sequences in the North American northwest edited by Roy Carlson and Martin Magne (Easton and MacKay 2008), and a new volume on lithic industries of Beringia edited by Ted Goebels (Easton, et al. 2011, Yesner et al. 2011). Ethnographic publications arising from research on the borderland include an ethnohistorical account of the government survey of the Yukon - Alaska border (Easton 2007b), an essay documenting contemporary hunter-gatherer values embedded in the *Dineh* Way (Easton 2007c), a multi-disciplinary study of the contemporary subsistence fishery in the Upper Tanana River Watershed (Friend, et al. 2007; Friend, Holton, and Easton 2007), and an examination of contemporary conflicts between *Dineh* and Game

Management views of animals (Easton 2008). Based on her fieldwork participation in 2009 and subsequent field interviews in January 2010, Emily Youatt and Easton presented a paper on contemporary Borderland *Dineh* Identity at the 2010 meetings of the Alaska Anthropology Association. Ms. Youatt also completed and successfully defended her honours thesis on the topic at Reed College, Oregon in May of 2011. A short public interpretation poster was prepared by Easton for the White River First Nation for distribution in 2008. Over the past year Jordan Handley has completed her Undergraduate Thesis this spring examining pXRF characteristics of non-vitreous artifacts from Little John under the supervision of Dr. Rudy Reimer Yumks (Handley 2013).

As a result of this exposure, the significance of the Little John site is being recognized within the discipline. A description of results through 2005 is included in the most recent summary of Beringian prehistory (Hoeffecker and Elias 2007). Collaborative field schools were held with the University of Alaska Anchorage and Yukon College in 2007 and 2008, and Dr. David Yesner has continued to collaborate with us in the analysis of fauna remains and interpretation of the site..

Financial and In-Kind support of continued fieldwork and analysis of our Yukon Alaska borderlands research in 2012 was received from the White River First Nation, the School of Liberal Arts, Yukon College, and myself.

Research plans for 2013 include continued excavations at the Little John site and additional archaeological survey in the region as opportunity allows.

GENERAL STRATIGRAPHY AT THE LITTLE JOHN SITE

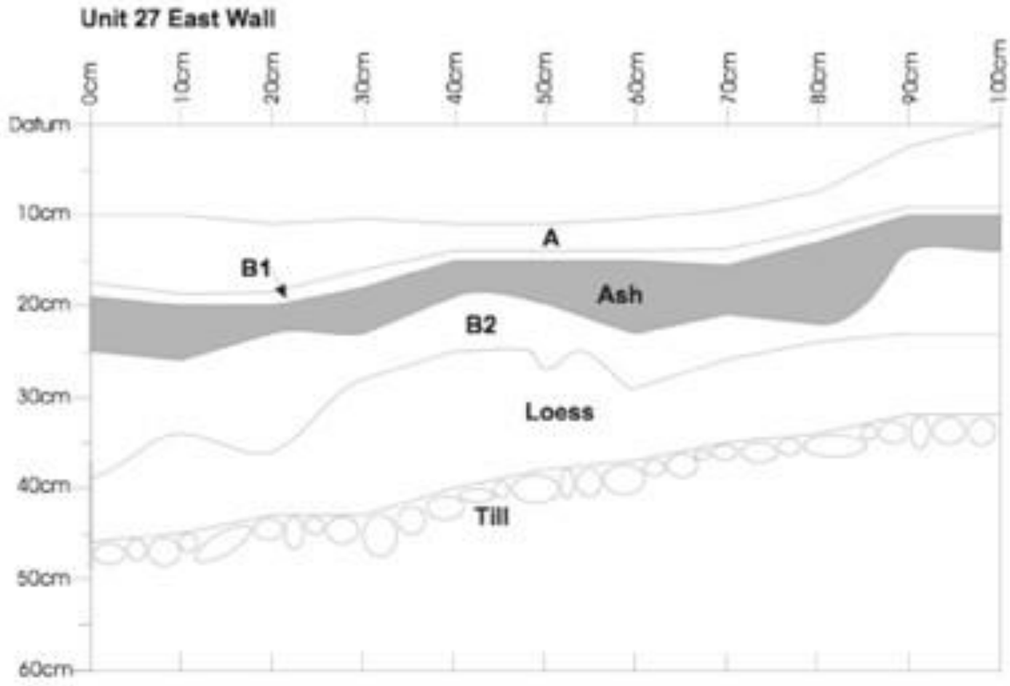

Figure 31. Representative Stratigraphic Profile, West Lobe.

In general terms the geological stratigraphy of the site consists of a basal regolith comprised of a volcanic dyke (Reger, pers. com 2009), overlaid with sparse glacial till representing a glacial maximum known locally as the Mirror Creek glacial advance, variously dated to the Late Illinoian - MIS 6, c. 140000 BP (Bostock, 1965; Krinsley, 1965) or the Early Wisconsin – MIS 4, c. 70000 BP (Denton 1974; Hughes et al., 1989). Above this are found loess sediments laid down during the Younger Dryas Climatic Event (Reger pers. com. 2009) varying in thickness from a few to over sixty centimeters, and then ten to twenty centimeters of Brunisols typical of the boreal forest in the region. In most areas this B horizon is intersected by a volcanic ash layer of up to several centimeters which radio-carbon dates suggest is a tephra deposit of the second White River volcanic eruption, c. 1200 BP (West and Donaldson 2002; Lerbekmo and Westgate, 1975). A thin (1 – 2 cm) O/A horizon caps the sequence.

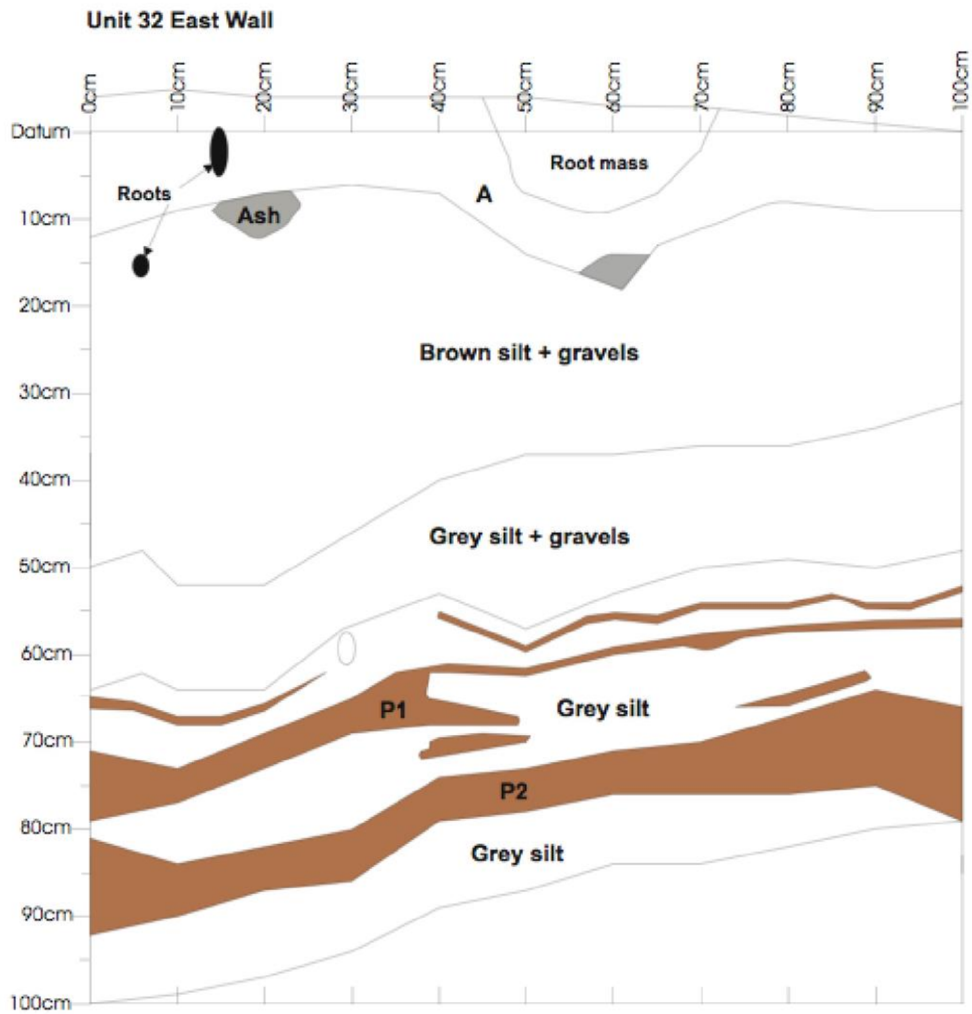

Figure 32. Representative Stratigraphic Profile, East Lobe.

The discontinuous depth of these strata is accounted for by the undulating topography of the site, which ranges from over meter deep basins to eroding hillsides. The stratigraphy is also complicated by the action of both ancient and contemporary permafrost, solifluction, and what seems to be a mass wasting event (probably a series of colluvial deposits originating from the higher ground to the North) over a portion of the site (Reger pers. com. 2009). Because of this differentiation in depth and nature of strata we have divided the site into five zones or lobes (see Figure, below).

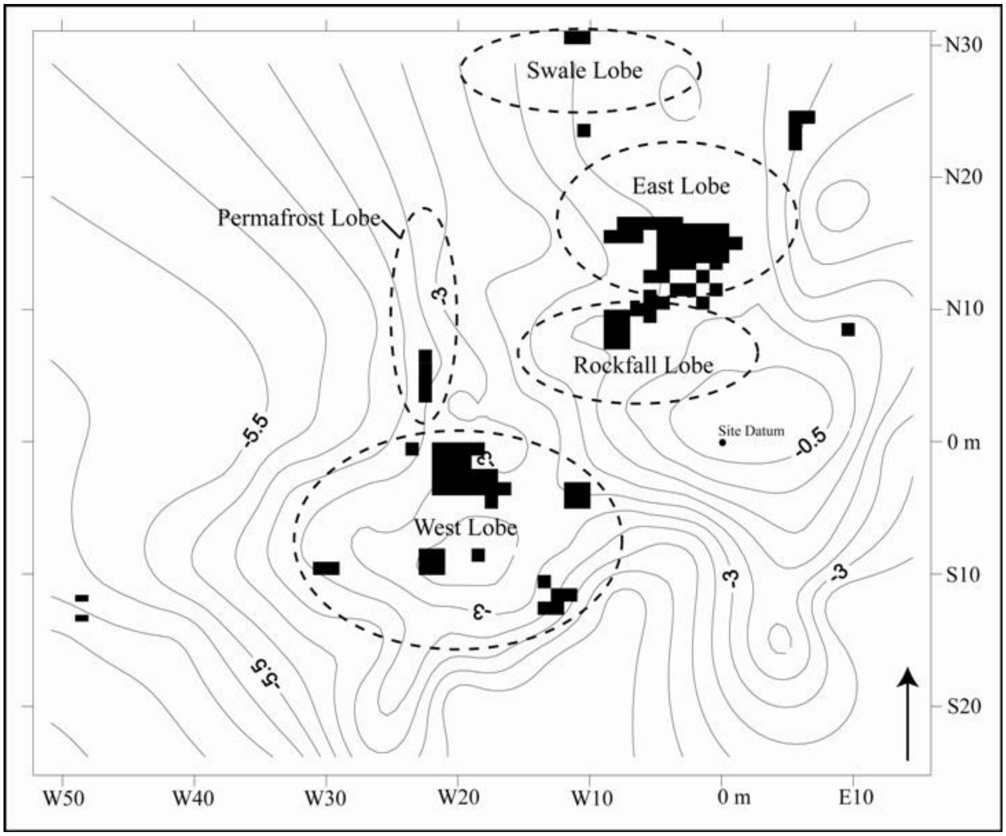

Figure 33. Stratigraphic "Zones" of KdVo-6.

The West Lobe, where the strata are most shallow, occupies the southwestern hillside on which deposits range from five to thirty centimeters. The Permafrost Lobe, where frozen ground is encountered mere centimeters from the surface, occupies the north-facing slope of the knoll. The Rockfall lobe, where large boulders lie through the brunisol and loess deposits, runs roughly through the centre of the site on a north – south axis. The East Lobe, a large basin that troughs east from the site, and which contains the deep sedimentary deposits of one hundred centimeters and more and series of paleosol strata near the bottom of the sequence. Capped by forty to sixty centimeters of loess below the B horizon, this paleosol complex contains a well preserved, culturally deposited faunal assemblage, in direct association with lithic artifacts. Test excavations in 2007 revealed that the basal bedrock dips sharply North of the East lobe into what I now designate as the Swale lobe; Unit N31W11 was excavated to a depth of nearly 5 meters through loess before it was abandoned due to safety concerns.

In 2008 a mechanical excavator run by Walter Dyke of Beaver Creek exposed a trench through this area, revealing massive loess deposition above organic paleosols subsequently dated to between 42,000 and greater than 46,000 years old, representing a depositional episode during the last Wisconsin Interstadial or perhaps earlier (Easton et al. 2008).

Figure 34. The Road Trench from the South and Detail of Paleosol complex at the North end of the Road Trench

Figure 35. Detail of organic paleosol below massive loess, north end of Road Trench.

Excavations in 2009 in the East Lobe revealed an apparent trend for greater separation of the paleosol complex into increasingly distinct strata as we exposed Units to the North and West of our previous excavations, a trend that continued in our excavations in 2010. This is well illustrated in the exposure of the West Wall of Unit N17W11, shown below. Previous AMS dates on bones within these strata have provided a series of dates between 10 to 12 thousand calendar years. Three new dates were processed over the past year and will be reported on below.

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Figure 36. Unit N17W11 SW showing separation of Paleosol Complex strata; associated Calendar date on carbon from beneath the bone = 11,390 – 11,230 at 2 sigma.

Similar to our work in 2008 and 2009, as we moved further North in our East Lobe area excavation in 2010 we encountered increasing macro-organic detritus in the lower Paleosol and Loess below Paleosol strata, characterized by wood flakes, fleks, and slivers and chunks of carbonized wood. An example of this is seen in Unit N18W11, illustrated below. We suspect, although cannot demonstrate, this higher macro organic content is a function of the level's proximity to the permafrost. In any event, samples of materials encountered were taken as potential AMS dating and identification of wood species when resources allow.

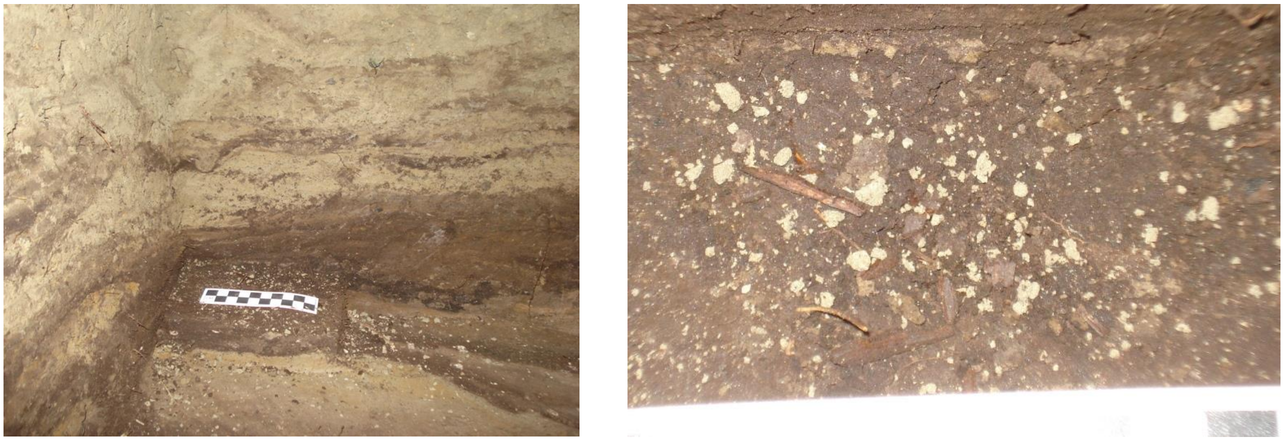


Figure 37. Wood Fragments in N18 W11. L: SW Corner of Unit. R: Detail of Wood Fragments.

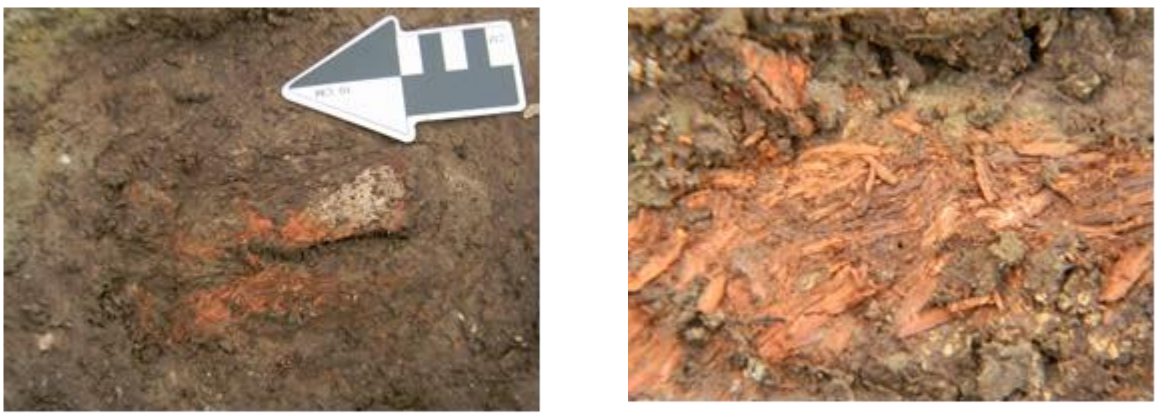


Figure 38. Wood feature, Unit N18W13, 92 cm Below Unit Datum, c. 12,840 Calendar Years

Excavations in 2011 in the Eastern Lobe continued through lower paleosol complex levels and into the Loess below Paleosol stratum to a variety of depths in the 11 square meter area excavation we have been working down over the past two field seasons. Within this Loess below Paleosol stratum we have identified at least two further paleosol strata of mercurial integrity tentatively labeled P5 and P6. In addition the P5 stratum holds a patchwork of decaying wood features, one of which was AMS radiocarbon dated to 10,840 +/- 50 which has a single intercept on the calibration curve at 12,840, with a 2 sigma probability between 12880 - 12810; significantly this date turns out to be very close to date on a wapiti inominate from the same level (RC age = 10,960 +/- 30 / Cal BP 12,885 +/- 91 – see following sections on radiocarbon chronology and features below.

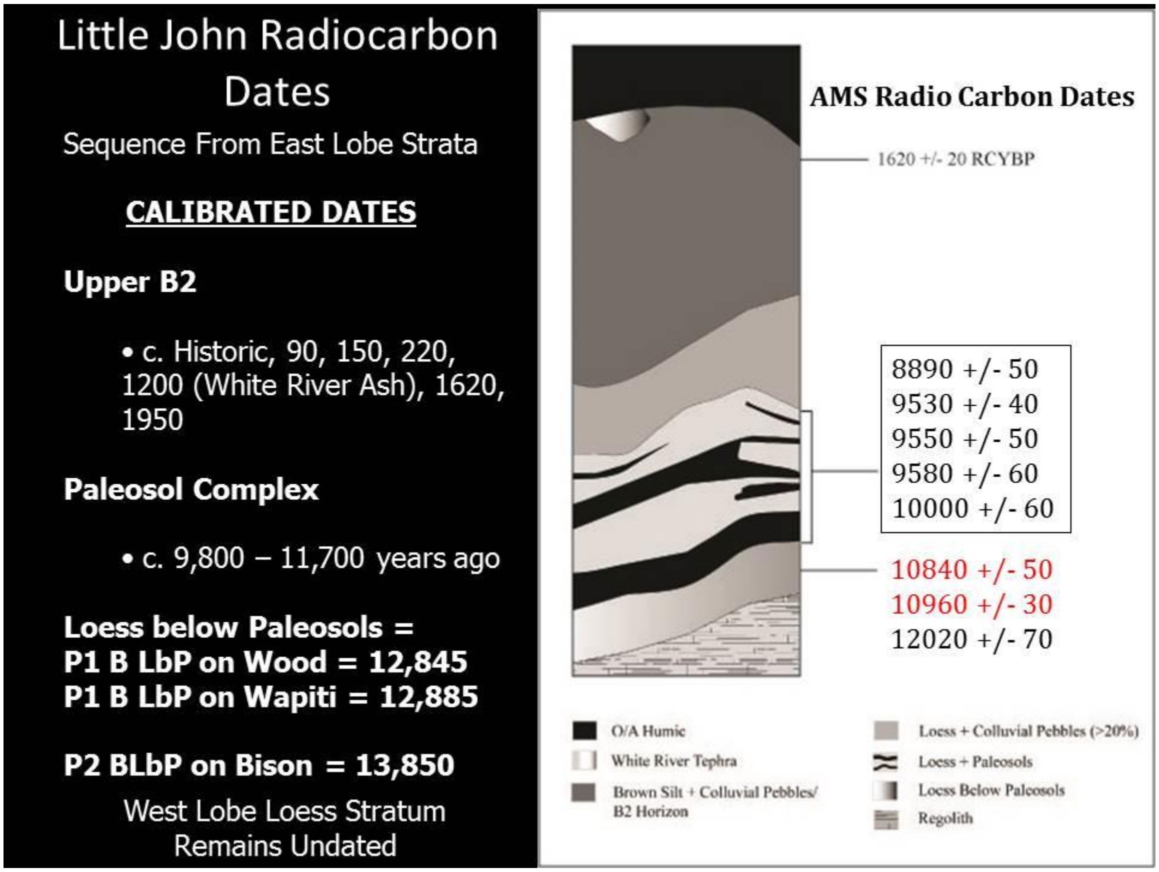


Figure 39. Selected Radiocarbon Dates at KdVo-6.

RADIOCARBON DATES AT KdVo-6

At present there are 16 AMS radiocarbon dates that relate to the Little John site that have been returned on 16 samples submitted to the Beta-Analytic laboratory in Florida; one bone sample had insufficient collagen to allow dating. The Figure above shows the accumulated dates from the East Lobe, while the Table below summarizes all AMS dates that range from the most recent past through the Holocene to the terminal Pleistocene, and further to what seems to be a Wisconsin Glacial Period Interstadial.

Most significantly a radio carbon sample on a vertebrae from *Bison spp*. recovered from the loess below the paleosol horizons in the East lobe has returned a date of 12020 +/- 70 radio carbon years, which calibrates to a calendrical date of between 14050 - 13720 years ago. Another sample from a *Cervus spp*. proximal innominate fragment from this same level was dated in 2010 and returned a date of 10960 +/- 30 radiocarbon years, which calibrates to a calendrical date of 12, 885 +/- 91 and is statistically the same date as obtained on the *Betula spp*. wood sample analyzed in 2011 dated to 12,840 +/- 50 . Thus, the East lobe of the Little John site may contain one of the oldest human occupations known in Eastern Beringia (the lowest level at the Swan Point site has been dated by multiple radio carbon dates to circa 14,100) and certainly one of the oldest prehistoric sites in contemporary Canadian geography.

Figure 40. Culturally modified Bison spp. verterbrae remains in situ, loess below paleosol stratum, dated to 12020 radiocarbon years or c. 14,000 calendar years before present.

Finally, we have also analyzed a fragment of ivory from a scatter of this material found eroding from the hillside across the highway from the Little John site, which produced a date of 38160 +/- 310 RCYBP (Beta 231794); we presume it is from *Mammuthus*. Combined with the recovery of additional Pleistocene fauna in the area representing specimens of *Bison*, *Equus*, *Mammuthus*, *Rangifer*, and possibly *Saiga*, including an *Equus lambei* specimen, recovered about two km from the site, which has been radiocarbon dated to 20660 +/- 100 RCYBP (Beta 70102; MacIntosh 1997:84), these fauna confirm that the area about the Little John site was capable of supporting a range of mega-fauna during the mid to late Wisconsin glacial period from at least 38,000 years ago. Subsequently, it is clear that this region holds considerable potential for the recovery of additional paleontological remains related to the Beringian prehistory of the Yukon.

Figure 41. Proximal Innominate (illium) of Wapitti dated to 10960 +/_ 30 RCYBP - 12885 +/- 91 Cal YBP from Loess below Paleosol, N13W02 – Fa 2006-41 (n.b. number in photo is field number).

Table 8. Radio Carbon Dates from the Little John Site

Lab #	14 C age	Calibrated 2 ∂	Level	Unit	DBS cm	Material	13C/12C	Comments
Beta 181485	130.44 +/- 0.86 pMC	N/A	B2 - L		15-20	Wood		material was living in last 50 years
Beta 182798	8890 +/- 50	10190 – 9865 and 9855 – 9780	Paleosol	U20SE	67	Bone collagen, rangifer?	-19.7 o/oo	AMS 9/26/03
Beta 182799	1740 +/- 40	1725 – 1545	B2	U5NE	11.5	Charred material	-25.6 o/oo	AMS – below ash date 2nd (c. 1200 BP) WR tephra on site
Beta 217279	9530 +/- 40	11090 – 10930 and 10880 – 10690	Paleosol	U 32	70	Bone collagen, rangifer	- 19.8 o/oo	AMS 6/30/06
Beta 218235	9550 +/- 50	11120 – 10690	Paleosol	31	54.5	Bone collagen, Swan femur	-19.1 o/oo	AMS 8/03/06
Beta 231794	38160 +/- 310	No Calibration	surface	n/a	0	Bone collagen, ivory prob. mammuthus?	-21.2 o/oo	fragment from hillside across road from KdVo6
Beta 231795	1620 +/- 40	1600 - 1410	B2	N14W4		Charred material	-27.6 o/oo	AMS
Beta 241522	9580 +/- 60	11170 - 10700	Paleosol	N16W8	98	Bone collagen, bison radius	-20.3 o/oo	AMS
Beta 241523	12020 +/- 70	14050 - 13720	Loess below Pale0sol	N17W4	85	Bone collagen, bison vertebra	-19.1 o/oo	AMS date similar to Component 1, Swan Point
Beta 241525	10000 +/- 60	11760 - 11250	Paleosol	N17W7	84	Bone collagen, wapiti phalanx	-20.4 o/oo	AMS
Beta 245515	250 +/- 40	2340 – 2120	B2	S19W9		Charred material	-23.0 o/oo	AMS assoc. w/ foliate and dimunitive points
Beta 245516	100 +/40	20th Century	B2	S16W18		Charred material	-24.4 o/oo	AMS
Beta 245518	1950 +/- 40	1990 – 1820	B2	N9W8		Charred material	-25.0 o/oo	AMS
Beta 246741	42480 +/- 1460	n/a	Swale Paleosol	Swale	250	Wood	-26.7 o/oo	AMS
Beta 246711	>46,000	n/a	Swale Paleosol	Swale	280	Wood	-28.0 o/oo	AMS
Fa06-141	10960 +/- 30	12703 – 13067	Loess below Paleosol	N13W02	52.5	Bone collagen, wapiti inominate	- 19.7 o/oo	AMS
Beta 303043	10840 +/- 50	12880 – 12810	Loess below Paleosol	N18W13	92	Wood fragments, Betula spp.	-27.7 o/oo	AMS

SUMMARY OF RECOVERED FAUNA FROM THE LITTLE JOHN SITE, 2012

Only 26 faunal elements or bone fragment lots were recovered and catalogued from excavations at KdVo6 in 2012. Most of these consist of fragmented lots that are unidentifiable beyond Large or Small Mammal or Indeterminate Genera (n= 16/26 or 61.5%). Only a small number of Bison bones (9/26 or 34.6%) and a single Hare bone (3.8%) were identified to species.

Table 9. Summary of Recovered Fauna by Level, KdVo6-2012

Common Name	A	B1 / Ash	B2	P1	L b P1	PC1 - P2	PC2 - P3	Grand Total
Steppe bison	0	0	0	0	7	1	1	9
Hare	0	1	0	0	0	0	0	1
Large Mammal	0	0	0	1	0	6	0	7
Small Mammal	1	0	2	0	0	5	0	8
Indeterminate	0	0	0	0	1	0	0	1
Grand Total	1	1	2	1	8	12	1	26

Fauna from the upper levels (O/A n= 1; B1/Ash n = 1; B2 n= 2) account for 15.4% of fauna recovered in 2012. Fauna from the Paleosol Complex and intersecting Loess strata made up the rest of the recovered fauna in 2012 (n = 22 or 84.6%).

Recovered fauna from 2012 is detailed in the attached faunal databases in both Filemaker (with photographs) and Excel formats. An analytical summary of recovered fauna through 2009 is presented in Yesner et al. (2011), while the entire faunal assemblage has received an initial analysis in terms of its taphonomic distribution and demonstration of site integrity within a periglacial sedimentary context (Yesner et al. 2012). Additional analysis of this material continues with the collaboration of Vance Hutchinson and David Yesner. In the summer of 2012 Laurianne Bourgeon, a PhD student in taphonomy at the University of Montreal joined us at Little John in order to assess the possibility of using the Little John fauna collection in the context of her thesis work. We are pleased to note that she will be undertaking additional examination of the Little John fauna in the summer of 2013.

As seen in the Table below, similar to previous years' collections, all of the identifiable elements of recovered Bison remains are of limbs, indicating transport of these elements to the site from the location at which the specimen(s) were killed.

Table 10. Skeletal Elements of Recovered Fauna, KdVo6 2012.

Level	Common Name	Gross Element	No.	Specific Element	Element Section	Side
B1 / Ash	Hare	Limb	1	Distal Femur	Distal	L
L b P1	Steppe bison	Indeterminate	1		Indeterminate	
L b P1	Steppe bison	Limb	1		Medial	
L b P1	Steppe bison	Hindlimb	1	TIbia	Medial	R
L b P1	Steppe bison	Indeterminate	1		Medial	
L b P1	Steppe bison	Indeterminate	1		Medial	
L b P1	Steppe Bison	Limb	1	femur?	Medial	
L b P1	Steppe Bison	Limb	1		Medial	
PC1 - P2	Steppe bison	Limb	1	sesamoid	Distal	
PC2 - P3	Steppe bison	Forelimb	1	Radius Ulna	Distal	R
L b P1	Indeterminate	Indeterminate	1		Indeterminate	
P1	Large Mammal	Indeterminate	1		Indeterminate	
PC1 - P2	Large Mammal	Indeterminate	1		Indeterminate	
PC1 - P2	Large Mammal	Indeterminate	1		Indeterminate	
PC1 - P2	Large Mammal	Indeterminate	1		Indeterminate	
PC1 - P2	Large Mammal	Indeterminate	1		Indeterminate	
PC1 - P2	Large Mammal	Indeterminate	1		Indeterminate	
PC1 - P2	Large Mammal	Indeterminate	1		Indeterminate	
A	Small Mammal	Indeterminate	31		Indeterminate	
B2	Small Mammal	Limb	2			
B2	Small Mammal	Pelvic	5	Ischium	Indeterminate	
PC1 - P2	Small Mammal	Indeterminate	1		Indeterminate	
PC1 - P2	Small Mammal	Limb	1		Indeterminate	
PC1 - P2	Small Mammal	Indeterminate	1		Indeterminate	
PC1 - P2	Small Mammal	Indeterminate	1		Indeterminate	
PC1 - P2	Small Mammal	Indeterminate	2		Indeterminate	

As illustrated in the Figure below the majority of the faunal remains recovered from the upper levels (A/O, B1, Ash, B2) are heavily fragmented, many of which are calcined. This is similar to specimens retrieved from these levels in previous years.

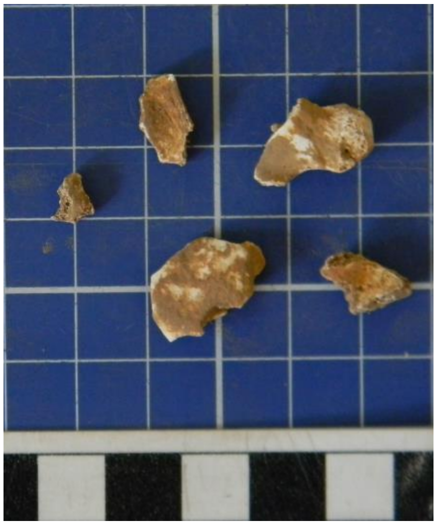
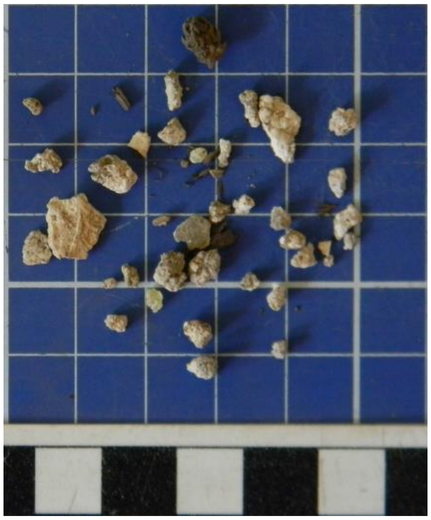
 

Figure 42. Examples of Fauna Remains from Upper Levels, KdVo6-2012. L: Fa12-03; R: Fa12-04; Calcined Small Mammal Fragments

In the Northwest Quadrant of the site (East Lobe), thirteen faunal specimens were collected from the Paleosol Complex between 50 and 67 cm below unit surface in Unit N17 W16; two of these are certainly Bison, while another six, identified only as Large Mammal, are probably Bison as well based on their general robusticity. Another five specimens from this level in this unit are fragmented small mammal remains.

Figure 43. Examples of Bison Bone Fragments from the Lower Levels at KdVo6-20112, N17W16. L Fa 2012:14, Sesamoid, R Fa2012:17, Radius/Ulna

A total of nine faunal specimens were collected from the Loess below the main identifiable paleosol in Unit N20 W07 at depths between 76 to 87 cm below unit surface. They were encountered during the excavation of the Eastern Quadrants of this unit to expose loess sediments suitable for OSL sampling by Michael Grooms. In comparison with fauna from the Paleosol Complex proper the loess specimens are all more degraded and less mineralized (compare specimens from the Figure above and the Figure below).

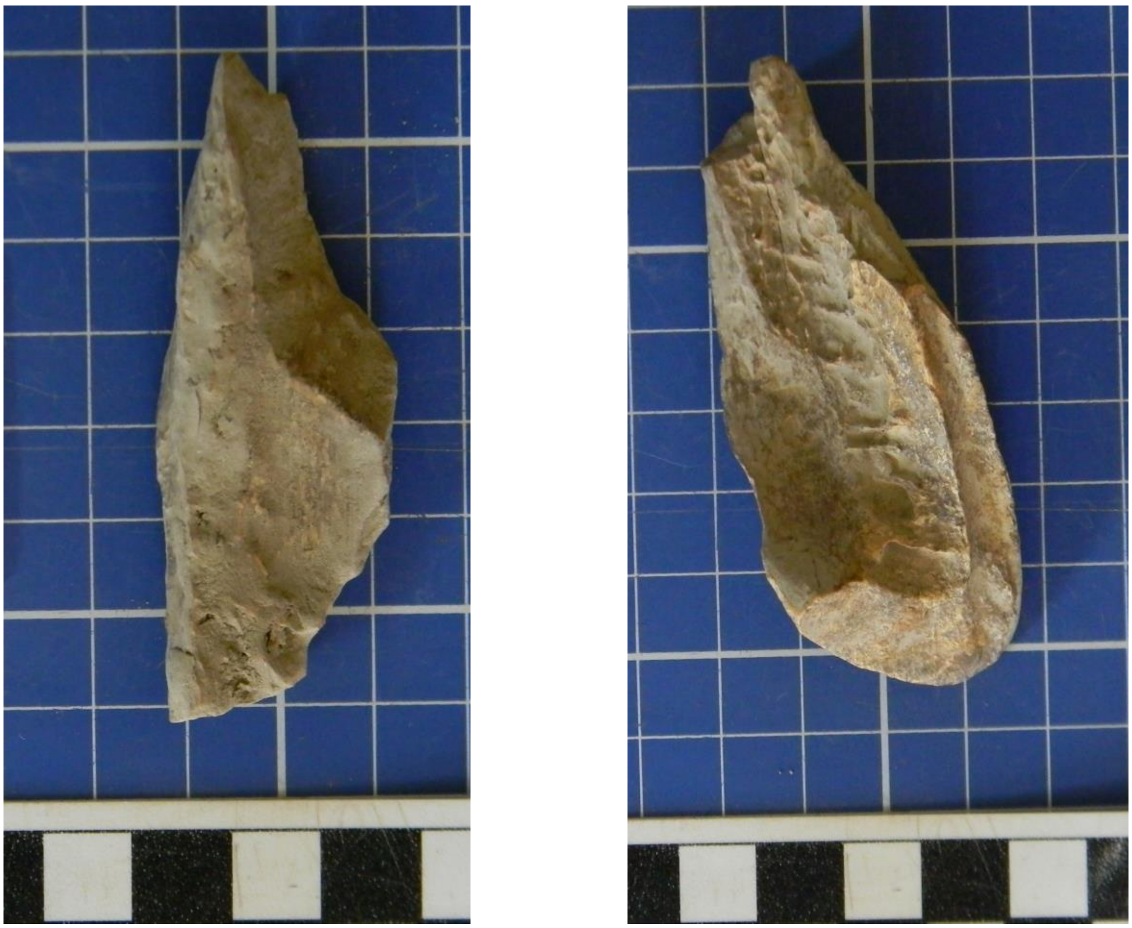


Figure 44. Fragmented Bison Remains from Loess below Paleosol in N20W7 in 2012. L Fa2012-21 R Fa2012-25. Note lighter colour compared to previous figure.

SUMMARY OF FEATURES FROM THE LITTLE JOHN SITE, 2012

Fourteen archaeological features were recorded in the course of excavations in 2012 documented in the Table below. Following this we provide examples of several of these features; a full log and photographs of recorded features is provided in the print and electronic appendices.

Table 11. KdVo6 20012 Recorded Archaeological Feature

Date	Feature #	Unit / Quad	Level	Dbs	Comments
13 June	F2012-01	S16W23	O/A	9.5	p. 5 unit book
13 June	F2012-02	S14W22	O/A	8.0	p. 3 unit book
17 June	F2012-03	S15W23	O/A	8.0	p. 5 unit book
17 June	F2012-04	S16W23	B2	19 – 23	Flakes, FAR
24 June	F2012-05	S15W21	B1 top	2.0	Historic wood
27 June	F2012-06	N18W16 / N17W16	B - Top of L below O/A	15.0	Hearth Feature w/ associated pebbles and cobbles
02 July	**F2012-07**	N18W16	B - Top of L below O/A	20 – 25	Continues F2012-06 into 2nd level of hearth feature w/ pebbles and cobbles
03 July	**F2012-08**	S4W23	B2	39 – 48	Hearth outline in B2 and charcoal sample locations of Samples 2012-04: a, b, c
03 July	F2012-09	N5W9	B1	2 – 6	Birch bark and Historic wood feature
03 July	**F2012-10**	N4W9	B1	1.5 – 15	Birch bark and Historic wood feature, continued from F2012-09
09 July	F2012-11	N5W12	B1	5 – 10	Hearth feature with FAR – links with F2010-15
10 July	F2012-12	N5W12	B1		Hearth feature with FAR – links with F2010-15
06 July	**F2012-13**	S3W22	B2		Bowl-like depression in Loess from B2 in NE Quad
06 July	F2012-14	S4W23 / S3W23	B2	17 – 25	Hearth feature exposed

Feature 2012-06 and **2012-07** are located in the continguous Units N17 W16 and N18 W16 and consists of a hearth feature and associated cobbles and pebbles in the B horizon 15 to 25 cm below the units' surface. A number of the cobbles and the pebbles seem to be aligned tightly against each other. Many of them bear greasy stains from possible use as boiling stones, while others are clearly burnt. Seen in profile from the

North the feature trends into a pit-like feature towards the west and clearly extends further west into the next units.

Figure 45. N17W16 / N18W17 Feature 2012-06 & 07, Top of Feature in B2

Figure 46. N18W16 Feature 2012-07. R – Base of Hearth, L – Profile in South Wall.

Figure 47. Selected Fire Altered Cobbles and Pebbles from Feature 2012-06/07.

Feature 2012-08 is the initial exposure of a hearth feature in S4W22 in the B2 stratum; the hearth continues northward into S3W22, the base of which was mapped as **Feature 2012-14**. Three charcoal samples were collected from F2012-08 but none have been submitted for analysis to date. As noted in the Table below, numerous flakes of obsidian, basalt, and chert, three microblades, and a burin were found within and next to this feature.

Figure 48. Feature 2012-08 & 14, B2 Hearth Feature, S4W22.

Figure 49. Chert Burin with Notches associated with F2012-08.

Figure 50. Microblade fragments associated with F2012-08 & 14.

Table 12. Recovered Artifacts Associated With B2 Hearth Feature 2012-08 & 14.

Artefact Number	Label	Type	Unit	Level	DBS cm	Raw Material	Colour	Total
3889	burin with notches	Burin	S3W22	B2 Mid	32	chert	green/grey	1
3925	flake - sharpening	Debitage	S3W23	B2		obsidian	grey with	1
3887	flake - fragment	Debitage	S3W22	B2 Mid		obsidian	black	1
3888	flake - sharpening	Debitage	S3W22	B2 Mid	31	obsidian	black	1
3890	flake - sharpening	Debitage	S3W22	B2 Mid		basalt - coarse	dark grey	
3891	flake - sharpening	Debitage	S3W22	B2 Mid	24	obsidian	lt. grey with black bands	1
3895	flake - sharpening	Debitage	S3W22	B2 Mid	25	obsidian	black/grey banded	1
3885	flake	Debitage	S3W22	Top Ash		chert	black	1
3903	flake	Debitage	S3W23	Ash	30	obsidian	black/grey banded	1
3921	flake	Debitage	S3W23	ash		basalt - fine	dark grey	1
3905	flake	Debitage	S3W23	B2		basalt - coarse	grey	2
3946	flake	Debitage	S3W23	B2		basalt - fine	dark grey	1
3923	flake - broken	Debitage	S3W23	B2		obsidian	black	1
3932	flake - broken	Debitage	S3W23	B2		obsidian	lt. black with grey bands	1
3922	flake - sharpening	Debitage	S3W23	B2		obsidian	lt. grey with black bands	1
3926	flake - sharpening	Debitage	S3W23	B2		obsidian	lt. grey with black bands	1
3927	flake - sharpening	Debitage	S3W23	B2		chert	dark green	1
3930	Shatter	Debitage	S3W23	B2		obsidian	black	1
3907	flake	Debitage	S3W23	B2 Mid		chert	light grey	1
3909	flake	Debitage	S3W23	B2 Mid	39	basalt - fine	dark grey	1
3912	flake - sharpening	Debitage	S3W23	B2 Mid	40	obsidian	grey banded	1
3913	Shatter	Debitage	S3W23	B2 Mid		chert	light grey	1
3908	flake	Debitage	S3W23	B2 Top	47	basalt - fine	dark grey	1
3928	flake - sharpening	Debitage	S3W23	B2 Top		obsidian	lt. grey with black bands	1
3906	flake	Debitage	S3W33	B2 Mid	36	basalt - fine	dark grey	1
3950	flake	Debitage	S4W23	ash	13	basalt - fine	dark grey	1
3951	flake	Debitage	S4W23	ash		basalt - fine	dark grey	1
3952	flake	Debitage	S4W23	ash	37	basalt - coarse	dark grey	1
3959	flake	Debitage	S4W23	B2 Mid		basalt - fine	dark grey	1
3960	flake	Debitage	S4W23	B2 Mid		basalt - coarse	dark grey	1
3954	flake	Debitage	S4W23	B2 Top		basalt - coarse	dark grey	2
3956	flake	Debitage	S4W23	B2 Top		basalt - fine	dark grey	3
3958	flake - broken	Debitage	S4W23	B2 Top		basalt - fine	dark grey	1
3957	Shatter	Debitage	S4W23	B2 Top	32	basalt - fine	dark grey	1
3924	microblade	Microblade	S3W23	B2		chert	black	1
3929	microblade	Microblade	S3W23	B2	26.5	chert	dark green	1
3961	microblade	Microblade	S4W23	B2 Mid		basalt - fine	dark grey	1
3914	Ochre	Ochre	S3W23	B2		Ochre (hematite)	red	1

Features 2012-09 and **2012-10** comprise a single larger feature in Units N04 W09 and N05 W09 consisting of preserved birch bark and decayed wood.

Figure 51. Feature 2012-09, N4W9. Birch bark and wood at top of B1 stratum.

Feature 2012-11 and **2012-12** is a hearth feature with fire altered rock in Unit N05 W12 and that links with a previously recorded **Feature 2010-15**.

Figure 52. Feature 2012-11 in N5W12, B2 Hearth Excavation Sequence.

SUMMARY DESCRIPTION OF SELECTED LITHIC ARTIFACTS FROM THE LITTLE JOHN SITE, 2012

This section provides summary descriptions of a selection of the major formed artifacts recovered at the Little John site in 2012.

Table 13. Summary of Recovered Artifacts by Type and Stratum, KdVo6-2012

Summary Level Summary Type	OA	B1	Ash	B2	NW B/Hearth	B2 L	WL L	P2	P3	Totals
Biface				4				1		5
Blade				4		1				5
Scraper				1						1
Burin w Notches				1						1
Microblade				11		3				14
Burin Spall						1				1
Modified Cobble				1	12					13
Modified Flake				13		1				14
Flake Core	1			2						3
Microblade Core						1				1
Microblade Core Tablet				1						1
Debitage		19	37	256	9	62	16	2	1	402
Cobbles/Pebbles		1			113				7	121
Fire Altered				5	73	3				81
Historic	2									2
Ochre	25	31		34		7	6			103
Other			24							24
Totals	28	51	61	333	207	78	22	3	8	792

Bifaces

Table 14. Raw Material and Metric Attributes of Bifaces, KdVo6-2012

ART #	Artifact Type	Unit	Dbs	Sum Level	Raw Material	Leng Mm	Width Mm	Thick mm	Gm
3638	biface - straight-based lanceolate point, proximal fragment	S17 W21	23	B2	rhyolite	24.75	25.66	9.05	4.40
3680	biface - side-notched point assymetrical, tip missing	S15 W23	17	B2	basalt - coarse	42.49	30.37	5.69	5.10
3681	biface - side-notched point, tip missing	S15 W23	17	B2	basalt - coarse	35.49	25.24	4.68	2.60
3832	biface - distal fragment	N4 W8	19	B2	basalt - coarse	35.56	28.87	8.07	3.70
4057	biface - point, contracting medial fragment	N17 W16	63	P2	chert	27.20	23.19	7.01	3.20

Five formed biface fragments, presumably used as projectile points or knives, were recovered during excavations at Little John in 2012. Their distribution is summarized in the Table above, while photographs and general descriptions follow.

KdVo6: 3638 is the proximal portion of a straight based lanceolate point made on andesite or rhyolite. The flaking pattern is irregular. The medial edges are both expanding, although with a slight asymmetry; the "straight" base is also slightly asymmetrical. It was recovered in the B2 stratum of Unit S17W21 at a depth of 23 cm, and associated with a broken retouched blade, assorted flakes, and a large manuport.

Figure 53. KdVo6:3638 Proximal Biface Fragment.

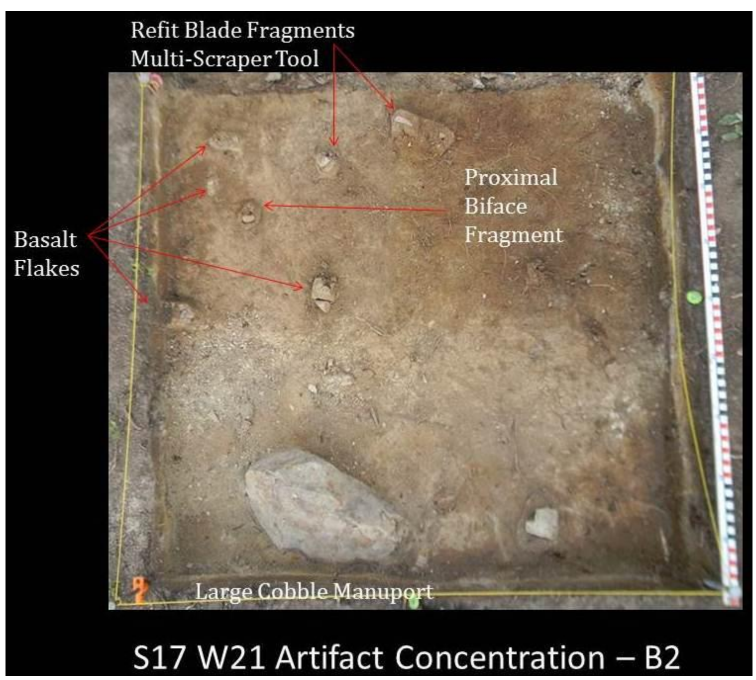


Figure 54. KdVo6 S17 W21 B2 Artifacts *in situ*.

KdVo6:3680 and **KdVo6:3681** are nearly complete side notched points, missing their distal points. Both are from Unit S15 W23 from within the B2 stratum at 17 cm below unit datum about 3 cm from each other. Both are made on coarse basaltic material. Both bear irregular flaking and retouch. Artifact 3680 seems to have been made on a flake and is asymmetrical in both notching and its medial expansion along the right margin. Besides assorted flakes, associated artifacts include an obsidian flake core (3695) and a split cobble (3671) made on similar material at the same depth and a combination end and side scraper (3723), although the scraper was recovered at 5 cm below the points at 21 cm below unit datum and made on a much finer basalt.

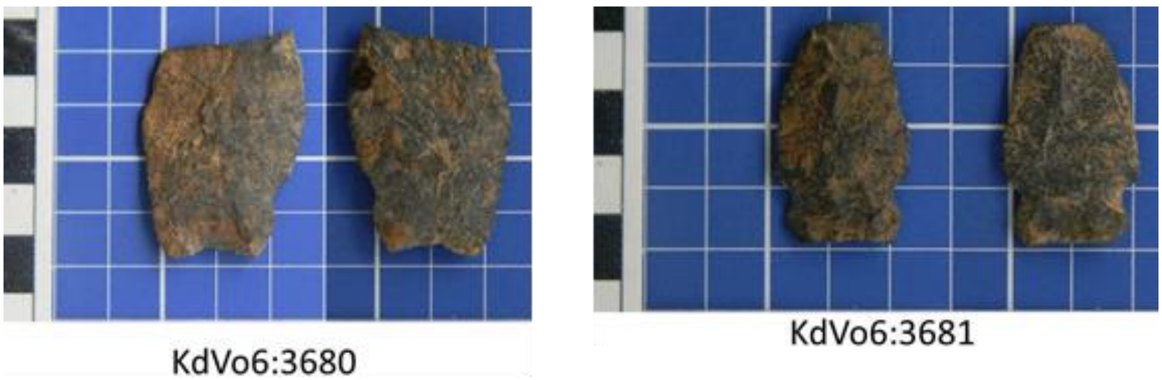


Figure 55. KdVo6:3680 & 3681, Side-notched Points, S15W23.

Figure 56. KdVo6:3680 & 3681, Side-notched Points *in situ*, S15W23.

KdVo6:3832 is a bifacial point fragment – the distal end of a unknown shape or the proximal end of a leaf-shaped bipoint - made on coarse basaltic material that was recovered in top of the B2 stratum of Unit N4W8 at 19 cm below unit datum and below a relatively thick ash layer. Besides flakes and debitage, a Core Tablet (3831), and four Microblade fragments (3825, 3833, 3836, 3839) were found within the B2 stratum, although their association with the point fragment is less clear due to tree roots running through the unit.

Figure 57. KdVo6:3832, Biface Point Fragment, N4W8, B2 Stratum.

Figure 58. KdVo6:3832 Biface Fragment in situ, N4W8, B2 Stratum.

KdVo6:4057 is a medial biface fragment made on grey chert and found in the Second Paleosol of the Paleosol Complex in Unit N17W16 at 63 cm below unit datum.It is collaterally flaked and lenticular in cross-section.

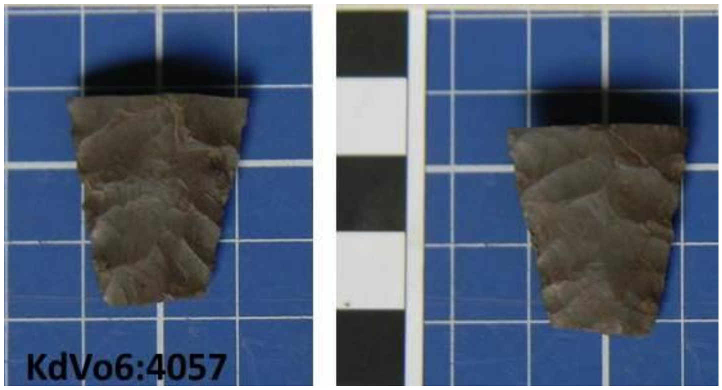


Figure 59. KdVo6:4057 Medial Biface Fragment, N17W16, P2 of PC.

The level consisted of a largely black, greasy, humic sediment that we have been interpreting as hearth features. Twelve bone fragments (Fa-1205 thru Fa-1216) were recovered from this unit and level between 60 and 62.5 cm bud. One of the bones is a Bison Sesamoid; 6 others are “large mammal” fragments and possibly bison as well, while the remaining 5 are “unidentified small mammal” fragments. Sediment and carbon samples were taken from the unit for further analysis and dating as resources allow.

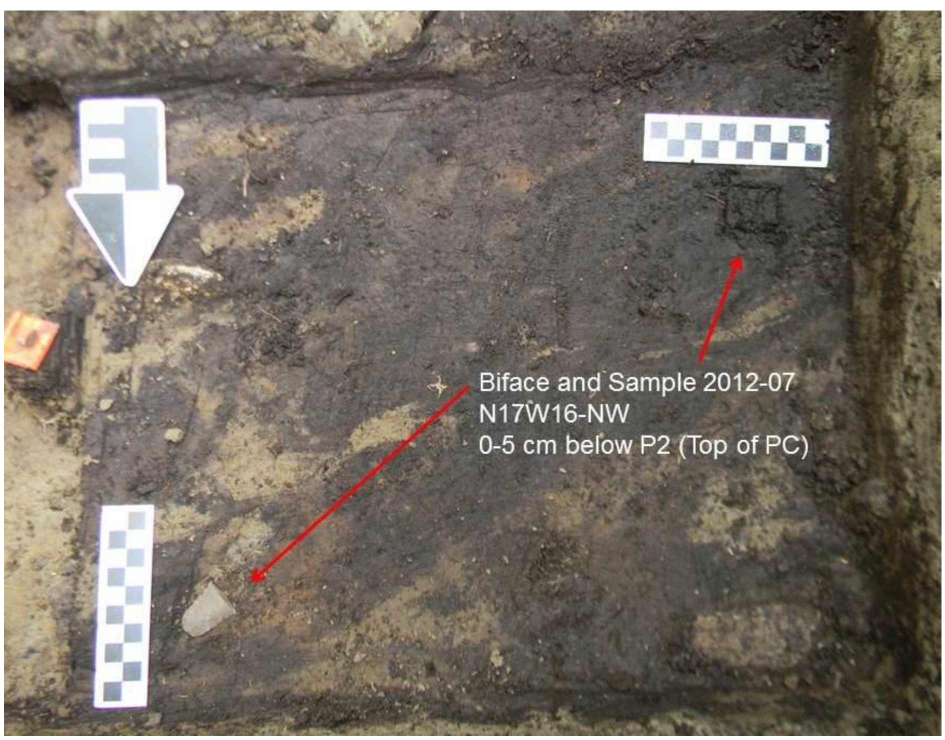


Figure 60. Unit N17W16, Level P2 (PC 62 cm bs), with Biface Fragment *in situ*.

Figure 61. KdVo6:4057 *in situ*, from South and Above.

Large Blades

Table 15. Raw Material and Metric Attributes of Blade Technology, KdVo6-2012.

Art #	Type	Unit	DBS cm	Level	Raw Material	Modification	Len mm	Wid mm	Thick mm	Wgt Gm	Segment
3631	Blade	S17 W21	20.5	B2	basalt – fine, dark grey	EM both margins	22.68	17.37	5.87	1.30	proximal
3632	Blade	S17 W21	17	B2	basalt – fine, dark grey	EM all margins	42.35	18.83	4.68	2.20	distal
3667	Blade	S15 W23		B2 Top	basalt – coarse, dark grey	EM both margins	42.42	19.86	5.86	2.60	complete
3785	Blade	S14 W22	10	B2	basalt – fine, dark grey	EM both margins	8.86	11.06	2.43	1.10	proximal
3965	Blade	S4 W23		B2 Base	basalt – fine, dark grey	EM left margin	34.44	11.77	7.15	1.10	proximal
EM = Edge Modified by retouch and / or use											

One complete Blade and four Blade fragments were recovered at KdVo6 in 2012. The table above provides metric and other attributes of these specimens. All were found in the West Lobe on or near the lower promontory. All were from the B2 stratum and all were edge modified.

KdVo6:3631 and **KdVo6:3632** are proximal and distal blade fragments that refit to form a complete broken blade with 3 arrises; both were recovered from Unit S17W21 about 10 cm from each other in the same B2 level. The blade is edge modified along both margins and at the tip, more heavily along the right margin which has at least 4 dorsal retouch scars.

Figure 62. KdVo6: 3631 & 3632, Complete Blade Refit, S17W21-B2.

Figure 63. KdVo6:3667, Complete Blade, S15W23, Upper B2.

KdVo6:3667 is a complete blade with a single ariss made on a coarser basaltic (perhaps andesite although it's cleavage suggests not) recovered from Unit S15W23 in the upper B2 stratum. It is edge modified along both lateral margins. It of the same material and unit / level as the two side notched bifaces (3080 & 3081) described earlier and split cobble (3671) described below. An obsidian flake core (3695) was found in association as well and a combination end and side scraper (3723) was recovered 5 cm below at 21 cm below unit datum

Figure 64. KdVo6:3785, Blade Fragment, S14W22, B2.

KdVo6:3785 is a proximal blade fragment with two parallel arrises made on fine grained basalt in two refitting pieces recovered from Unit S14W22 in the B2 stratum. It has been snapped on the left margin to form a concavity and is broken medially. Both the straight right margin and the concave left margin bear edge modification. Numerous flakes of the same material are found in association but no other artifacts.

KdVo6:3965 is a proximal blade fragment made on dark grey fine basalt. With 3 medial and one lateral arris and distinctively curved when viewed from the right side. It was found in Unit S4W23 at the base of the B2 stratum. The left margin curves into the distal point and it is along this curvature that the piece is edge modified. The extreme tip of the blade is broken off, perhaps by its use as a piercing tool. Two jasper microblades, described below, and a small amount of debitage was found in association at this level in the unit.

Figure 65. KdVo6:3965, Proximal Blade Fragment, S4W23 - base of B2.

Scraper Technology

A single formed Scraper artifact was recovered at KdVo6 in 2012. **KdVo6:3723** is a complete scraper measuring 48.41 mm long, 38.45 mm wide, 8.92 mm thick, and 10.40 grams in weight. It is made on a dark grey basaltic (probably andesite) thick flake with hinge fracture scars on the dorsal surface. It is unifacially retouched steeply along the left margin and bifacially retouched along the distal margin to form an acute scraping or cutting edge.

Figure 66. KdVo6:3723, End and Side Scraper on Andesite, S15W23 - B2.

Burin Technology

Figure 67. KdVo6:3889, Burin with Notches and Spur, S3W22 - B2

KdVo6:3889 is a Burin made on green/grey chert with two notches on the right margin and another notch on the left margin, and a spur on the extreme right proximal corner. Two flake scars lie along the right distal margin. There is short retouch along the left, right, and distal ventral margins, which is heavier inside the notches. There is a potlid fracture on the dorsal surface. The artifact measures 15.06 mm long, 23.97 mm wide, 4.18 mm thick, and weighs 1.10 grams. It was recovered from Unit S3W22 in the middle B2 stratum at 32 cm below unit datum.

KdVo6:3660 is a possible Primary Burin Spall struck from the edge of a biface that measures 22.79 mm long, 6.33 mm wide, 5.95 mm thick, and weighs 0.40 grams. The entire right margin is edge modified by use.

Figure 68. KdVo6:3660, Primary Burin Spall(?), S13W21 - base of B2.

We also note that a microblade (**KdVo6:3825**) fully described in the next section may also be considered to be burinated and used for a graving tool based on its spalled left margin and retouched distal end.

Microblade Technology

Table 16. Raw Material and Metric Attributes of Microblade Technology, KdVo6-2012

Art #	Summary Type	Unit	DBS cm	Level	Raw Material	Location of Modification	Leng mm	Wid mm	Thick mm	Gm	Segment
3654	Microblade	S13 W21		B2 Mid	obsidian. black	both lateral margins, EM	7.58	7.08	2.37	0.10	medial
3664	Microblade	S15 W23		B2 Top	basalt – fine, black	both lateral margins, EM	9.54	7.78	1.63	0.10	proximal
3825	Microblade	N4 W8	15	B2 Top	chert, dark brown	left lateral, EM	7.18	4.93	1.12	0.10	complete
3833	Microblade	N4 W8		B2 Top	chert, light grey		16.00	4.74	2.82	0.10	proximal
3836	Microblade	N4 W8		B2	basalt – fine, black		7.93	7.84	1.07	0.10	medial
3839	Microblade	N4 W8		B2 Mid	basalt – fine, dark grey	right lateral, EM	11.78	4.11	1.42	0.10	proximal
3853	Microblade	S15 W21		B2 Top	chert, black	right lateral, EM	11.92	7.72	1.51	0.10	proximal
3860	Microblade	S15 W21		B2 Base	chert, black		7.77	10.0 3	2.39	0.10	proximal
3877	Microblade	N3 W9	8	B2	obsidian, black		12.51	8.63	1.83	0.10	proximal
3924	Microblade	S3 W23		B2	chert, black		19.49	6.59	2.24	0.10	complete
3929	Microblade	S3 W23	26.5	B2	chert, brown	both lateral margins, EM	21.18	11.4 9	3.19	0.50	proximal
3961	Microblade	S4 W23		B2 Mid	basalt – fine, dark grey		17.59	8.31	1.17	0.10	medial
3969	Microblade	S4 W23		B2 Base	jasper, red/brown		22.69	4.85	4.48	0.10	complete
3970	Microblade	S4 W23		B2 Base	jasper, red/brown	right lateral EM	15.83	6.28	2.92	0.20	medial
3911	Microblade Core	S3 W23	49	B2 / Loess	chert, black	dorsal flake facets	32.11	20.7 4	11.01	7.00	complete
3831	Microblade Core Tablet	N4 W8	19	B2	chert, black	all margins flake facets	23.90	11.0 6	5.40		complete
EM = Edge Modified by Retouch and/or Use											

Twelve Microblades, two Microblades or possible Flake Spalls, one Core Tablet, and one Microblade Core were recovered at KdVo6 in 2012. They were all recovered from the B2 stratum at a variety of depths. Five microblades and the core tablet were recovered from the crest of the hill in Units N4W8 and N3W9, while the remaining nine microblades and the microblade core were from down below in the South West – West Lobe units, as detailed in the table above. Six of the microblades showed signs of edge retouch or use. Raw material consisted of obsidian, chert, basalt, and jasper.

Chert Microblades

Figure 69. Chert Microblade Fragments, N3W9 and N3W8, B2.

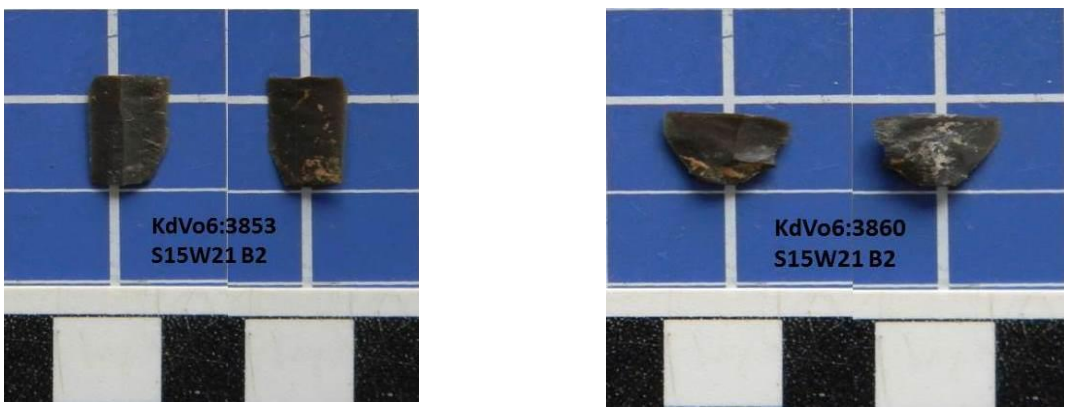


Figure 70. Chert Microblade Fragments from S15W21, B2

Figure 71. Chert Microblade Fragments from S3W23, B2

Two chert microblade fragments were recovered from the upper B2 stratum in Unit N3W8. **KdVo6:3825** is a proximal microblade fragment with two arrises made on black chert; it is retouched on the distal margin and spalled along the left margin, perhaps to form a graving edge. **KdVo6:3833** is a proximal microblade fragment with two arrises made on grey chert.

Two black chert proximal microblade fragments were recovered from Unit S15W21. **KdVo6:3853** is from the upper B2 and bears edge modification along the right lateral margin. **KdVo6:3860** is from the lower B2 with no modification. Both bear a single arris.

Two proximal microblade fragments were recovered from Unit S3W23 in the B2 stratum. Both bear a single arris. **KdVo6:3924** is made on black chert and has a small potlid fracture on its dorsal surface. **KdVo6:3929** is made on brown chert with heavy edge modification along the right lateral margin and light modification on the left. At 1.14 cm the piece might be considered a bladelet rather than a microblade.

Obsidian Microblades

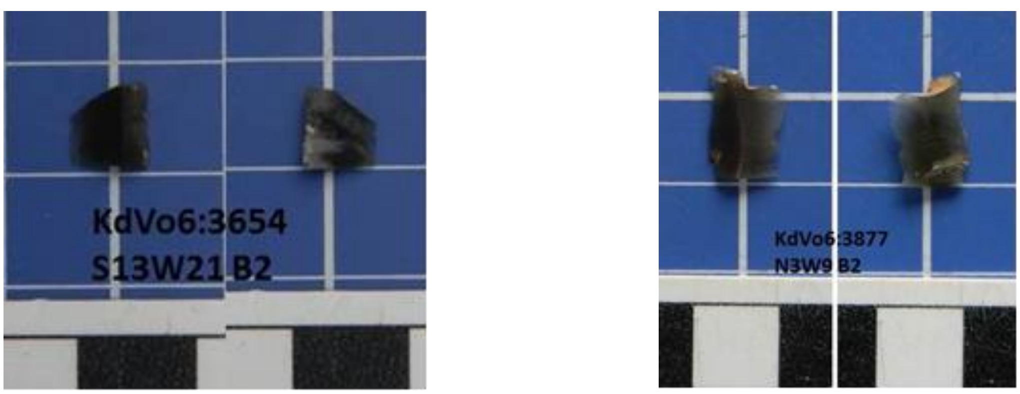


Figure 72. Obsidian Microblade Fragments, S13W21 and N3W9, B2

KdVo6:3654 is a small medial microblade fragment with a single arris made on obsidian with edge modification along both lateral margins recovered from Unit S13W21 in the mid-B2. **KdVo6:3877** is a proximal microblade fragment with a single arris made on obsidian with edge modification along both lateral margins recovered from the upper B2 in Unit N3W9.

Jasper Microblades

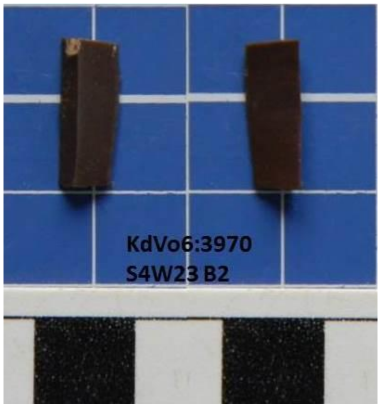
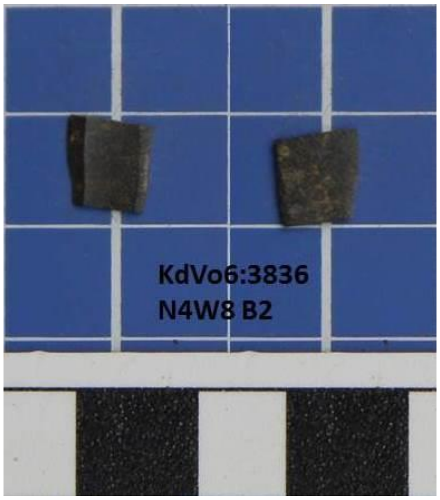


Figure 73. Jasper Microblade Fragments, S4W23, B2.

KdVo6:3970 is a medial microblade fragment on jasper. It has a single arris and is edge modified along the right lateral margin. **KdVo6:3969** is a complete microblade on jasper with a potlid or frost fracture on its ventral surface; it is sharply curved at the distal end. Both were recovered from Unit S4W23 at the base of the B2 stratum.

Basalt Microblades



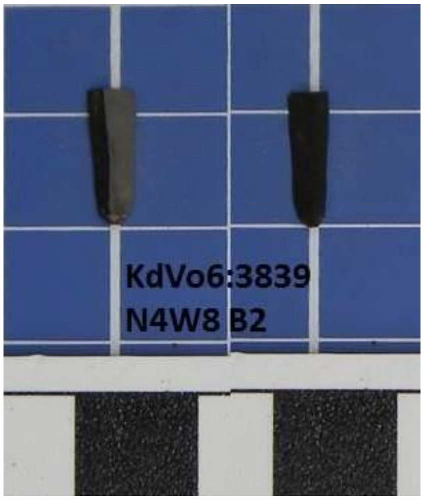


Figure 74. Basalt Microblades, N4W8, B2.

KdVo6:3836 is a thin basalt medial microblade fragment with two arrises with a shallow channel between them. **KdVo6:3839** is a basalt proximal blade fragment with a single arris; it's triangular shape suggests it may be a spall rather than a microblade. Both were recovered in the B2 stratum of Unit N4W8.

Figure 75. Basalt Microblades, S4W23 and S15W23, B2.

KdVo6:3961 is a basalt medial microblade fragment with two arrises and edge modification on the right margin recovered from the B2 stratum of Unit S4W23.

KdVo6:3664 is a basalt proximal microblade fragment with edge retouch on the right margin and edge modification on the left margin recovered from the upper B2 in Unit S15W23.

Microblade Core Technology

Figure 76. KdVo6:3911, Chert Microblade Core, S3W23 - base of B2.

KdVo6:3911 is a Microblade Core made on black chert recovered from Unit S3W23 at a depth of 49 cm below Unit Datum. It is 32.11 mm long, 20.74 mm wide, and 11.01 mm thick, and weighs 7.0 grams. The artifact was vertically inclined *in situ*, with its proximal end resting at the interface between the B2 and Loess strata and the body of the core extending at an angle of about 45 degrees into the B2 stratum, suggesting cryogenic movement by frost pull / frost push processes (Davis 2001:143-147) from the B2/Loess interface. The core has 13 arrises bordering 11 blade flake scars which terminate on either side at a ventral flake scar which may represent the ventral surface of the original core or, more likely, the result of splitting of the original (conical?) core while attempting to remove a bladelet from the nearly exhausted core. Curiously, the distal end of the core is beveled at a 45 degree angle to the core's vertical axis, and is well worn and polished; it may represent the original cortex, although remnant flake scars suggest otherwise.

Figure 77. KdVo6:3911, Microblade Core in situ, S3W23 - B2/L.

Figure 78. KdVo6:3911, Microblade Core, Distal and Proximal Ends.

Figure 79. KdVo6:3831, Microblade Core Tablet, N4W8 - B2.

KdVo6:3831 is a Microblade Core Tablet made on black / dark grey chert found in Unit N4W8 at a depth of 19 cm below Unit Datum in the B2 stratum. It is not the same material as the microblade core described above. There are four, perhaps five, blade facets bordered by short arrises around the curved distal margin.

Figure 80. KdVo6:3831, Core Tablet Blade Facets, Proximal and Left Margins.

Edge Modified – Retouched – Utilized Flakes and Flake Cores

This class of artifact is ubiquitous throughout the site through all levels, although the fifteen specimens collected in 2012 all came from the B2 stratum. They usually consist of larger secondary waste flakes produced in the manufacture of more formal tools that have been subsequently utilized, producing characteristic irregular flake scars along one or more edges during their expedient use as slicing, cutting, or scraping implements. Less often they exhibit deliberate secondary modification in the form of semi - to regular retouch along one or more edges to facilitate more specific use, although the two categories of edge modification cross-grade into each other making it sometimes difficult to determine whether the modification was the product of utilization or deliberate retouching. Thirteen definitive Edge Modified Flakes and three Flake Cores recovered in 2012 at KdVo6 are summarized in the table below and several examples are presented.

Table 17. Raw Material and Metric Attributes of Modified Flakes, KdVo6-2012.

Artefact #	Type	Unit	DBS cm	Level	Raw Mat	Type/Loc Of Mod	L Mm	W Mm	T Mm	Wgt gr
3657	MF – D	S13W21	7	B2-M	BaCGy	EM D	23.55	19.39	2.36	0.7
3663	MF – C	S17W21		B2	BaFGy	EM LM	26.47	27.36	2.97	1.8
3665	MF – C	S15W23	19	B2-T	BaCGy	EM RM D	92.34	59.08	6.92	23.2
3678	MF – C	S15W23		B2	ChB	EM BM	16.05	13.36	2.00	0.3
3815	MF – C	N3W8	13	B2-B	BaFB	EM BM	37.60	15.68	3.02	0.9
3713	MF – C	N4W8	19	B2-T	ChGy	RT LM	18.49	29.01	3.09	
3857	MF – P	S15W21		B2-M	ChGy	EM RM	17.95	15.40	3.33	0.4
3695	FC – C	S15W23	17	B2	ObB	FC BM	15.67	17.80	5.02	0.7
4032	FC – B	N18W16	18	B2	BaCGy	FC AM	41.56	27.13	15.48	101.1
4069	FC – C	N17W16		B2	BaGy	FC AM	64.12	22.16	10.78	9.2
3636	MF – C	S17W21		B2	ChGy	EM LM	16.30	9.39	4.33	0.3
3674	MF – C	S15W23		ash	ChGy	EM BM	24.23	20.09	6.27	1.6
3707	MF – D	S15W23		B2	BaCGy	EM RM D	41.02	40.00	7.16	6.9
3710	MF – B	S15W23		B2	JaRd	EM RM D	12.37	8.62	1.57	0.1
3724	MF – C	S16W23		B2-T	ChGy	EM RL D	12.37	10.90	3.51	0.2
3749	MF – C	S16W23	26	B2	BaGy	EM AM	36.66	40.14	4.70	4.6
Type Codes – MF = Modified (retouched/utilized) Flake / FC = Flake Core / C= Complete / D = Distal / P = Proximal / B = Broken										
Level Codes – T = Top / M = Middle / B = Bottom										
Raw Material (Raw Mat) Codes – Ba = Basaltic / Ch = Chert / Ob = Obsidian / Ja = Jasper / C = Coarse / F = Fine / Gy = Grey / B – Black / Rd = Red										
Type / Location of Modification (Type/Loc Mod) Codes – EM = edge modified/utilized / FC = Flake Core / D = Distal / LM = Left Margin / RM = Right Margin / BM = Both Margins / AM = All Margins										

Figure 81. Left: KdVo6:3657, EM Flake with a Spur, Distal Margin, S13W21 - B2; Right: KdVo6:3713, Steeply Retouched Flake, Left Margin, N4W8 - B2

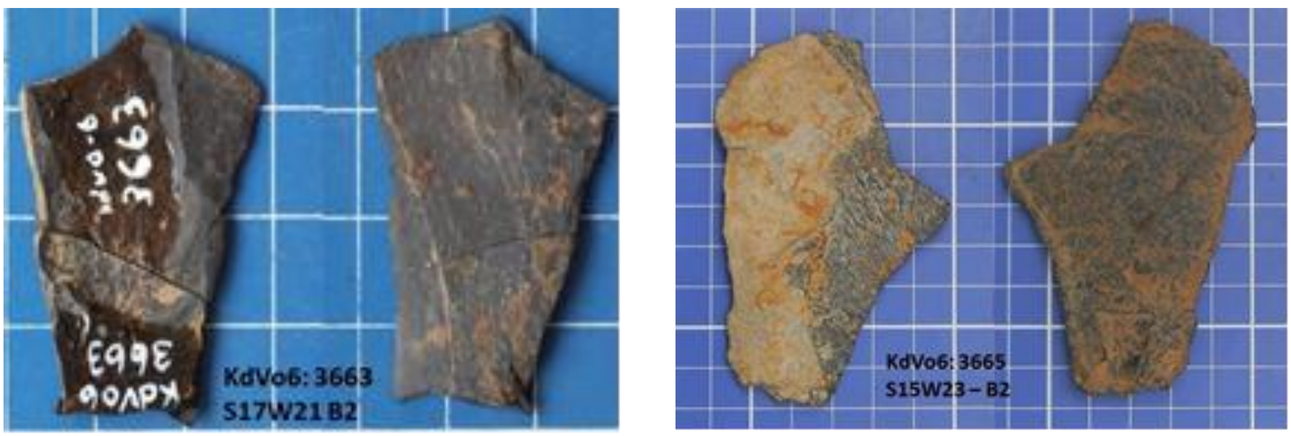


Figure 82. Left: KdVo6:3663, EM Flake, Left Margin, S17W21 - B2; Right: KdVo6:3665, Large EM Cortical Flake, Right and Distal Margins, S15W23 _ B2.

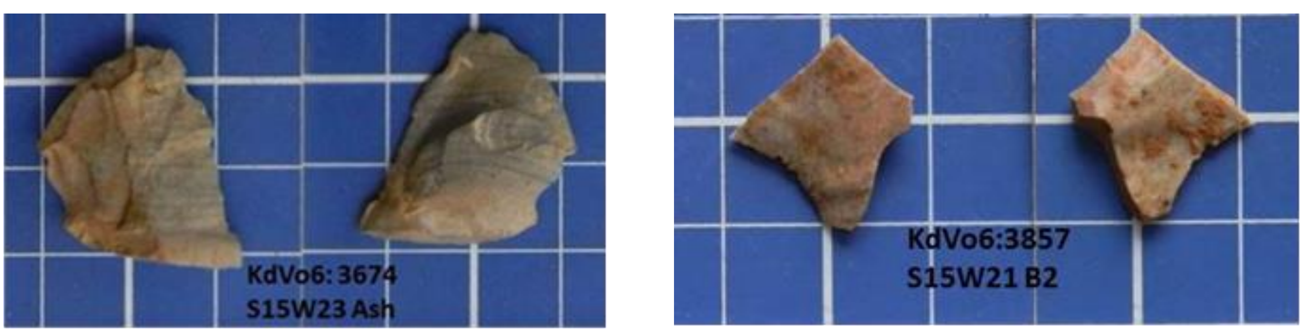


Figure 83. Left: KdVo6:3674 EM Flake, Left and Right Margins; Right: KdVo6:3857 EM Flake, Right Margin.

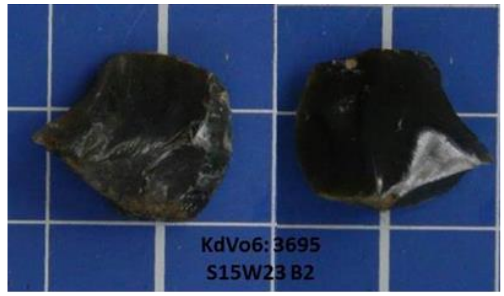


Figure 84. Left: KdVo6:3749, EM Flake, All Margins; Right: KdVo6:3695 Obsidian Flake Core.

Figure 85. Left: KdVo6:4032, Basalt Flake Core; Right: KdVo6:4069 Basalt Flake Core.

Modified Pebble / Cobble Artifacts – Hammer Stones / Choppers / Split Pebbles / Anvils / Scraper Planes

Thirteen Modified Cobble artifacts were recovered at the Little John site in 2012. Their full morphology is described in the inventories (including photographs) in the accompanying Filemaker and Excel inventories. The table below provides a summary of their provenience and metrics and several examples are presented below. This class of artifact is generally ubiquitous across the Little John site, consisting of cortical pebbles and cobbles with battered or punctated surfaces, presumably used for shaping or flaking other stone and breaking bone for marrow extraction or producing bone slivers for further working into a variety of tools (Hammer Stones, n = 7), split cobbles and pebbles for chopping wood and bone and other expedient cutting or scraping use (n = 4), and flat-sided or split cobbles for use as a stable anvil base for preparing stone or breaking bone or planing wood and bone (n = 1).

Hammer Stones are recognized on the basis of morphological characteristics of a crushed and / or punctate surface along the margin or one surface and a size and shape to be held comfortably in the hand; seven are identified in the 2012 collection. Split Cobble Tools might be used as a Chopper or as a primary hide scraping tool (the *Thii Cho*); five were collected in 2012.. Split Pebbles are generally produced by Bipolar Percussion, resulting in a sharp cutting edge along the circumference of the artifact and percussive crushing at either end; none were identified in 2012. Anvils are large dense cobbles with one flat surface that can be buried level with the ground surface and serve as a stable solid platform for percussive flaking of other stones or breaking bones. Scraper planes are large cobbles split to produce a flat surface with steep unifacial retouch along one or more margins in order to provide a planning edge to flatten wood or bone;. The strength of their designation as artifacts is further supported by their close association with unequivocal artifacts, flake debitage, spirally fractured bone, or other features (Andrefsky 2005, Kooyman 2000, Odell 2003).

These artifacts are common throughout all Paleolithic assemblages, but are generally found at higher rates within Late Prehistoric and mid-Holocene assemblages that are thought to have used higher percentages of bone projectiles within their tool kit (Workman 1978). They are often found in clusters that can be described as work station features. At the Little John site they are found through all levels although all that were collected in 2012 came from the B2 stratum.

Figure 86. Split Cobble Technology from KdVo6, 2012. L: Split Cobble Chopper / Scraper. R: Possible Edge Modified Scraper Plane.

Figure 87. Modified Cobbles from KdVo6, 2012. Battered "Hammerstones".

Table 18. Metric Summary of Modified Cobble Artifacts, KdVo6-2012.

Art #	Sum Type	Unit	DBS cm	Level	Loc of Mod	Type of Mod	Tot	Length mm	Width mm	Thick mm	Wgt gm	% Cortex
3671	Split Cobble/ Pebble	S15 W23	20	B2 Top	right lateral	utilized	1	97.14	498.00	20.24	68.8	50
3978	Split Cobble/ Pebble	N18 W16	5	B2 F2012-06-07	right lateral	edge retouch / utilized	1	95.15	41.45	26.81	86.6	25
4029	Split Cobble/ Pebble	N18 W16	23	B2 F2012-06-07	None	-	1	56.66	51.30	18.16	29.7	25
4024	Split Cobble/ Pebble	N18 W16	28	B2 F2012-06-07	None	-	2	63.92	44.97	21.06	43.6-20.6	50
4044	Split Cobble/ Pebble	N17 W16	18	B2 F2012-06-07	None	-	1	44.18	28.12	24.87	33.3	75
3987	Cobbles	N18 W16	13	B2 F2012-06-07	distal	battered / punctated	1	77.35	39.59	23.13	70.5	100
3996	Cobbles	N18 W16	16	B2 F2012-06-07	all margins	battered / punctated	1	70.95	54.71	28.22	93.1	75
4008	Cobbles	N18 W16	23	B2 F2012-06-07	indeter minate	battered / punctated	1	75.34	72.85	47.75	237.9	75
4014	Cobbles	N18 W16	28	B2 F2012 06-07	distal	battered / punctated	1	84.16	54.81	48.59	213.8	75
4017	Cobbles	N18 W16	23	B2 F2012-06-07	indeter minate	battered / punctated	1	52.48	44.28	27.83	61.5	100
4019	Cobbles	N18 W16	23.5	B2 F2012-06-07	indeter minate	battered / punctated	1	40.37	34.77	16.22	20.5	75
4031	Cobbles	N18 W16	25	B2 F2012-06-07	right distal	battered / punctated	1	70.75	61.06	40.55	185.7	100
	Total Modified Cobbles						**13**					

Debitage

This class of artifact contains all apparent lithic debris generated in the course of manufacture, use, and discard of formal and informal stone tools. In general they are usually the most prevalent lithic form found on Paleolithic sites; at KdVo6 debitage made up about 86% of collected lithics in 2012. Analysis of debitage type, raw material, and distribution can contribute to our understanding of site use, inter-site relationships, external procurement and trade relationships, and prehistoric technological organization (Andrefsky 2001, 2005). Here we provide only an initial summary of debitage collected in 2012; a fuller treatment awaits detailed future analysis.

Table 19. Debitage Distribution by Flake Type and Level, KdVo6 2012

Level / Flake Type	B1	Ash	B2	B2 L	WL L	NW B Hearth	P2	P3	Grand Total	%
complete	5	9	61	28	3	1	1		109	27.0
biface thinning	2	2	19	1	1			1	26	6.5
broken	2	18	54	6	4				84	20.8
cortical	3		4	1	1				9	2.2
fragment	4	2	19	3	1	1	1		31	7.7
sharpening		1	24	9	1				35	8.8
flakes - lot	2	2	61	4	4				73	18.1
shatter	1	2	14	10	1	1			29	7.2
spall		1				6			7	1.73
Grand Total	19	37	256	62	16	9	2	1	402	100.03
%	4.7	9.2	63.8	15.4	4.0	2.2	0.5	0.25	100.05	
Period / Approximate Date	Late Prehistoric c. 1,900 – 150 ybp		Middle Prehistoric c. 3,000 – 2,000 ybp	Early Holocene c. 10,000 ybp	Late Pleistocene c. 12,000 – 10,000 ybp	Late Holocene	Late Pleistocene 9,000 – 11,000 ybp	Earlier Pleistocene 13,000 – 12,000 ybp	Percentile Errors Due to Rounding	

The table above presents the distribution of debitage collected in 2012 by Flake Type categories through stratigraphic levels at KdVo6. Debitage type generally reflects the stage of lithic manufacture being practiced; high levels of Cortical flakes suggest earlier stages, high levels of thinning and sharpening flakes suggest late stage of manufacture and artifact maintenance. Biface thinning and Sharpening Flakes account for 6.5 and 8.8 percent of debitage collected in 2012 respectively, or 15.3 percent combined, while only 2.2 percent of Debitage consists of Cortical Flakes.

Table 20. Debitage Distribution by Flake Raw Material Type and Level, KdVo6 2012

Level RM Color	B1	Ash	B2	B2 L	WL L	NW B Hearth	P2	P3	Grand Total	%	Type Tot/%
BaB		1	8	1					10	2.6	
BaCoB	3		9		2	1			15	3.8	
BaCoGy	4	7	61	13		1			87	22.0	
BaFiB	1	4	33	5	1				44	11.2	
BaFiGy	8	15	57	12	7				99	25.3	
BaGy		4	7		1	1		1	14	3.6	Ba 269 / 68.6
CB	2		5	2			1		10	2.8	
CBr		1							1	0.3	
CDGr			4	3					7	1.8	
CDGy			2	3					5	1.3	
CGr				1					1	0.3	
CGy	1		14		2				17	4.3	
CLGy		1	10	1			1		13	3.3	
CW			4	1					5	1.3	C 60 / 15.3
Grn				2					2	0.5	Grn 1 / 0.5
JOr			3						3	0.8	
JRd			7						7	1.8	
JRdBr			1						1	0.3	J 11 / 2.8
ObB		1	13	6	2				22	5.61	
ObDGy			3	1					4	1.0	
ObGyB		3	10	9	1				23	5.9	
QbLGy			1						1	0.3	O 50 / 12.8
Grand Total	19	37	251	61	16	3	2	1	391*	100.11	100
* Data consists of identified material only											
Raw Material Codes - Ba = Basaltic / C = Chert / Grn = Greenstone / J = Jasper / Ob = Obsidian											
Texture Codes - Co = Coarse / Fi = Fine											
Colour Codes - D= Dark / L = Light / B = Black / Br = Brown / Gr = Green / Gy = Grey / GyB = Banded Grey and Black / Or = Orange / Rd = Red / W = White											

Numerical and Percentile distribution through Levels will generally reflect intensity of use through time within the excavated units. Using the Period / Date correlations with Levels presented in the Table above the highest intensity of use is during the Middle Prehistoric period prior to the White River Ash fall c. 1,900 years ago, followed by the Early Holocene occupation represented by materials recovered at the interface between the bottom of the B2 and top of the

Loess strata in the West Lobe of the site. However, we must bear in mind that recovery bias based on intra-site location can effect these numbers and will make more sense when integrated with the larger debitage database from previous field seasons.

Raw Material type and distribution may contribute to our understanding of inter- and intra-site relationships. The Raw Material Type of 391 pieces of debitage are compiled in the Table above. Unsurprisingly, Basaltics make up 69% of this sample, while various coloured Cherts comprise about 18%, and Obsidian about 13%. Obsidian samples are being analyzed by XRF technology to identify their volcanic source by Jeff Rasic and will be reported on when completed.

Hearth / Boiling Stones – Fire Altered Rock

Figure 88. KdVo6:4033, Lot of Pebbles and Cobbles in Association with Hearth Feature 2012-06/07.

As described above, a major hearth feature (F2012-06 and F2012-07) was encountered in N17W16 and N18W16 and this feature accounts for the majority of catalogued artifacts of this category (113 of 121 / 93%), which are summarized in the table below. These are large pebble to cobble sized stones, mostly basaltics, transported to and concentrated at the Feature. Most (109 / 90%) bear some cortex, and 87% (n=105 of 121) bear 50% or more cortex. It is assumed that these stones were used as heat traps in the hearth and as boiling stones, although distinguishing one from the other, or whether they were used for both, is impossible to say. A smaller collection of Fire Altered Rock was also collected and is summarized in the table below.

Table 21. Catalogued Cobbles and Pebbles Associated with Features and Artifacts

Art #	Sum Type	Unit	DBS cm	Level	Total	Length mm	Width mm	Thick mm	Wgt gm	% Cortex
4023	C/P	N18W16	29	B2 F2012-06-07	1	131.76	58.70	23.14	144.5	0
4027	C/P	N18W16	26	B2 F2012-06-07	1	88.44	38.97	34.65	101.3	25
4013	C/P	N18W16	28	B2 F2012-06-07	3	97.14	59.12	22.16	74.8-13.9	0
4033	C/P	N17W16	15 - 25	B2 F2012-06-07	8	56.47	34.01	22.14	39.6-3.5	100
4056	C/P	N17W16	13 - 24	B2 F2012-06-07	28	74.44	41.94	35.46	98.1-5.7	75
4025	C/P	N18W16	28	B2 F2012-06-07	1	68.65	28.26	14.89	27.7	100
3982	C/P	N18W16	13	B2 F2012-06-07	1	134.04	60.42	34.20	303.7	75
3983	C/P	N18W16	15	B2 F2012-06-07	2	84.47	37.24	22.54	40.7-32.2	75
3984	C/P	N18W16	11	B2 F2012-06-07	1	80.46	72.24	35.07	232	75
3985	C/P	N18W16	16	B2 F2012-06-07	1	77.24	41.82	27.13	71.1	100
3986	C/P	N18W16	13	B2 F2012-06-07	1	99.62	71.21	44.87	242.2	100
3988	C/P	N18W16	15	B2 F2012-06-07	1	53.72	52.02	10.13	24.3	50
3989	C/P	N18W16	15	B2 F2012-06-07	1	46.48	38.39	29.74	31.8	100
3990	C/P	N18W16	13	B2 F2012-06-07	2	63.97	38.86	29.77	65.3-28.4	100
3991	C/P	N18W16	13	B2 F2012-06-07	1	66.59	31.42	27.95	77.5	75
3992	C/P	N18W16	12	B2 F2012-06-07	1	101.77	87.43	45.16	360.4	100
3993	C/P	N18W16	22	B2 F2012-06-07	2	72.71	23.95	32.80	46.7-24.1	100
3994	C/P	N18W16	16	B2 F2012-06-07	1	53.33	42.85	31.70	63.3	100
3995	C/P	N18W16	15	B2 F2012-06-07	1	55.30	31.12	8.00	10.3	75
3999	C/P	N18W16	16.5	B2 F2012-06-07	1	46.34	37.55	19.66	26.5	25
4002	C/P	N18W16	15	B2 F2012-06-07	2	101.13	55.42	31.21	153.2-9.6	75
4005	C/P	N18W16	14	B2 F2012-06-07	5	30.07	25.89	10.71	5.6-19.99	100
4006	C/P	N18W16	18	B2 F2012-06-07	1	39.39	24.42	12.62	8	75
4009	C/P	N18W16	16	B2 F2012-06-07	1	65.16	54.88	30.50	86	75
4010	C/P	N18W16	16	B2 F2012-06-07	1	88.18	68.44	39.22	221.4	75
4011	C/P	N18W16	22	B2 F2012-06-07	2	95.82	37.08	22.08	66.9-13.7	75
4016	C/P	N18W16	25	B2 F2012-06-07	1	80.98	53.34	35.84	114.1	75
4018	C/P	N18W16	23	B2 F2012-06-07	1	55.63	39.65	18.70	38.2	75
4020	C/P	N18W16	27.5	B2 F2012-06-07	1	66.23	55.89	29.87	104.9	100
4021	C/P	N18W16	27.5	B2 F2012-06-07	1	65.14	67.33	36.16	143.8	75
4022	C/P	N18W16	29	B2 F2012-06-07	1	79.08	60.22	58.37	253.1	100
4026	C/P	N18W16	25	B2 F2012-06-07	1	61.36	49.63	25.97	55.5	50
4028	C/P	N18W16	28	B2 F2012-06-07	1	65.55	51.29	9.77	27.4	0
4030	C/P	N18W16	28	B2 F2012-06-07	5	59.76	37.45	11.33	18.7-5.4	0
4034	C/P	N17W16	15 - 25	B2 F2012-06-07	2	81.61	72.61	21.80	135-58.4	75
4035	C/P	N17W16	24	B2 F2012-06-07	1	54.48	41.04	36.44	77.5	100
4036	C/P	N17W16	20	B2 F2012-06-07	3	87.36	43.96	24.36	89.1-21.5	75
4037	C/P	N17W16	15	B2 F2012-06-07	1	64.07	43.49	35.91	80.5	75
4038	C/P	N17W16	17	B2 F2012-06-07	2	45.21	30.61	21.21	29.2-22.8	100

4039	C/P	N17W16	23	B2 F2012-06-07	2	56.43	43.34	24.13	39.1-10.8	100
4040	C/P	N17W16	23	B2 F2012-06-07	1	41.13	34.33	21.73	29.6	25
4041	C/P	N17W16	22	B2 F2012-06-07	1	49.02	38.40	21.86	30.5	25
4042	C/P	N17W16	22	B2 F2012-06-07	2	33.33	22.60	20.31	13.8-5.2	100
4043	C/P	N17W16	21	B2 F2012-06-07	1	85.59	62.74	54.52	206.2	100
4045	C/P	N17W16	21	B2 F2012-06-07	1	109.82	56.23	52.54	419.6	75
4046	C/P	N17W16	18	B2 F2012-06-07	1	39.65	32.77	13.39	17.8	100
4047	C/P	N17W16	18	B2 F2012-06-07	1	26.23	22.97	15.74	9	100
4048	C/P	N17W16	18	B2 F2012-06-07	1	92.70	47.87	24.12	99.7	0
4049	C/P	N17W16	18	B2 F2012-06-07	2	40.99	34.01	23.13	37-9	75
4050	C/P	N17W16	21	B2 F2012-06-07	1	121.45	81.81	80.77	835.8	100
4051	C/P	N17W16		B2 F2012-06-07	4	55.88	33.02	31.20	60.2-18.6	100
4052	C/P	N17W16	24	B2 F2012-06-07	1	89.76	83.25	59.89	411.8	75
4054	C/P	N17W16	23	B2 F2012-06-07	1	112.16	105.3	89.49	972.5	100
4055	C/P	N17W16	24	B2 F2012-06-07	1	134.83	84.99	59.04	502.6	25
Subtotal Feature F2012-06-07					**113**					
4061	C/P	N17W16	74	P3	1	64.35	40.06	26.40	66.1	75
4062	C/P	N17W16	67	P3	1	64.80	52.48	40.93	110.1	75
4063	C/P	N17W16	67	P3	1	44.11	39.04	21.81	33.2	100
4064	C/P	N17W16	71	P3	1	86.58	35.76	23.34	81.9	0
4065	C/P	N17W16	72	P3	1	62.19	49.22	25.46	75.2	75
4066	C/P	N17W16	72	P3	1	63.79	36.14	20.78	39.7	75
4060	C/P	N17W16	70	P3	1	186.90	103.0	53.00	1220.4	75
3863	C/P	N5W8		B1-Top	1	98.98	56.73	68.11	260.4	100
Total Cobble / Pebbles Catalogued					**121**					

Table 22. Catalogued Fire Altered Rock.

Art #	Sum Type	Unit	DBS cm	Level	Total	Leng mm	Thick mm	Width mm	Wgt gm	% Cortex
4068	FAR	N17W16	15 - 25	B2 F2012-06-07	60	40.32	25.11	9.81	5.5	0
3979	FAR	N18W16		B2 F2012-06-07	1	16.02	11.22	3.04	0.5	0
3997	FAR	N18W16	16	B2 F2012-06-07	1	63.76	39.58	17.78	41.3	50
3998	FAR	N18W16	16.5	B2 F2012-06-07	1	86.50	56.21	51.52	196.8	75
4000	FAR	N18W16	18	B2 F2012-06-07	2	39.89	25.97	15.57	10.4-18.4	75
4001	FAR	N18W16	20.5	B2 F2012-06-07	3	56.97	37.58	19.60	38.7-58.9	75
4003	FAR	N18W16	23	B2 F2012-06-07	1	64.43	39.72	25.03	47.3	0
4004	FAR	N18W16	16	B2 F2012-06-07	2	42.58	34.42	19.33	15.3-16.3	25
4012	FAR	N18W16	22	B2 F2012-06-07	1	69.29	58.47	26.55	111.6	25
4015	FAR	N18W16	19	B2 F2012-06-07	1	79.61	73.25	25.40	189.1	50
Total FAR from Feature 2012-06-07					**73**					
3683	FAR	S15W23		B2	1	14.90	10.00	2.94	0.3	0
3715	FAR	S15W23	25	B2	1	16.23	18.52	3.13	0.7	0
3719	FAR	S15W23		B2 Base	3	6.04	4.63	1.39	0.2	0
3856	FAR	S15W21		B2 Top	2	11.06	9.67	3.60	3	25
3868	FAR	N5W8	1	B2 Top	1	31.94	9.01	9.58	1.7	75
Total Catalogued Fire Altered Rock					**81**					

Historic Remains

Figure 89. Historic Remains from KdVo6, 2012.

Only two historic artifacts were collected at KdVo6 in 2012; both were recovered in the O/A stratum on the high point of the site. **KdVo6:3804** is a leather strap with metal eyes from N3W8, likely the shoestring eyelets from a boot. **KdVo6:3875** is a Beer Bottle cap bearing the red and blue maple leaf logo of the Molson Canadian lager brand from Unit N3W9.

CONCLUDING REMARKS

The 2012 field excavations at the Little John site have provided us with a considerable amount of new data related to later Holocene occupations in the site as reflected in the majority of collected artifacts and recorded features; 678 of 792 (85.6%) artifacts came from the B2 stratum or above. These included a variety of formed formal tools, including side-notched and straight based projectile points and microblade technology. Extension of excavations further to the west of the main East lobe has confirmed that the paleosol sediment structures containing late Pleistocene cultural materials, as evidenced by bone and a proximal straight based lanceolate biface fragment, continues across the slope and we plan to extend our area excavations into this section of the site in the coming years.

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