Archaeological Excavations at the Little John Site (KdVo-6), Southwest Yukon Territory, Canada - 2014

Submitted to
White River First Nation
Yukon Heritage Branch
Archaeological Survey of Canada (14-21ASR)
Yukon Research Centre of Yukon College

Norman Alexander Easton
Anthropologist
School of Liberal Arts, Yukon College
Whitehorse, Yukon Territory, Canada

Scottie Creek Borderlands Culture History Research Project Manuscript 2015-01
Yukon Research Centre, Yukon College, Whitehorse, Yukon
(June 2015)

ACKNOWLEDGEMENTS

The 2014 activities of the Scottie Creek Borderlands Culture History Project were financially and logistically supported by the White River First Nation of Beaver Creek, Northway Village Council, School for Liberal Arts, Yukon College, the Yukon Student Training and Employment Program, and me. Due to low registrations the Yukon College field school was not held, however we did offer a ~~second~~ year hosting of the Northern Cultural Expressions Society summer cultural program for native youth at risk. We also hosted a film crew from the Aboriginal People's Television Networks' "Wild Archaeology", a television series on Canadian Archaeology scheduled for release in the winter of 2015-16. Our collaborating Elders and members of the White River First Nation and the Native Village of Northway continued to share their knowledge and experience with ourselves and our guests through daily visits and scheduled cultural activities. Several collaborating and interested scholars joined us to work on the site as well. Finally, considerable time was spent working with material previously collected, including completing a taphonomic review of fauna, initiating a full review of artifacts, developing a three dimensional map of the excavation strata and point provenience of finds, selecting sediment samples for geomorphological analyses, and refining the radio-carbon chronology of the site through 10 additional AMS dates with the support of Yukon College's new Research Fund.

Figure 1. Northern Cultural Expressions Society Summer Cultural Program Participants.

Fieldworkers included:

- Graduate Research Students developing thesis material based on the Little John site: Michael Grooms (PhD program, Department of Anthropology, University of New Mexico, Supervisor Dr. E James Dixon), Jordan Handley (M.A. program, Department of Anthropology, University of British Columbia Supervisor Dr. David Pokotylo), Nicolena Virga (M.A. program, Department of Anthropology, University of Southern California – Fullerton, Supervisor Dr. Steven James), and Lauriane Bourgeon (PhD program, Department of Anthropology, University of Montreal, Supervisor Dr. Ariane Burke).
- Research Interns / Visting Scholars: Greer Vanderbil, Simon Fraser University, Research Assistant, Mark Young, University of British Columbia, Joseph Easton, volunteer, Dr. Vance Hutchinson, Simon Fraser University, Dr. Blaine Maley, Marian University, Dr. Julie Esdale, Colorado State University, Dr. Jeff Rasic, University of Alaska – Fairbanks, Dr. Rudy Riemer Yumks, Simon Fraser University, and Dr. David Yesner, University of Alaska-Anchorage.
- White River First Nation Youth: Chelsea Johnny, Dellamae Sam, Eldred Johnny, Jolenda Johnny, Danika Pennell, Eddie Johnny, Tamika Johnny, Seth Sam, Blaine Chassé, Elder Mrs. Martha Sam, Cultural Experts David and Ruth Johnny, Roland Peters, Marilyn Sanford, and Angel Demit.
- Youth participants of the Northern Cultural Expressions Society summer healing program, led by Naomi Crey, Stefanie Yakinya, and Sean McDougall.
- Hosts and Crew of the Wild Archaeology film production team: Producer/Writer: Tracy German, Director: Ben Addelman, Director of Photography: Liam Maloney, 2nd Camera; Dustin Rivers, Sound Recordist: James MacDonald and Wild Archaeology Hosts: Jenifer Brousseau, Jacob Pratt, Rudy Reimer.

Figure 2. An Emerging Generation of White River First Nation Archaeologists – L to R: Blaine Chassé, Seth Sam, Tamika Johnny, Eddie Johnny.

Over the course of the winter students in Yukon College's Anthropology 103 and 221 assisted in the cataloguing and analysis of the 2014 lithic and fauna collections. In addition, a grant from the Yukon College Research Fund supported the work of Ukjese van Kampen as a research assistant who has made numerous contributions to the organization of our data. Volunteer work by Deborah Donnelly advanced our compilation of profile data in support of a three dimensional model of the Little John excavations.

The generosity and support extended by the inhabitants of the borderlands is greatly appreciated. In particular David and Ruth Johnny of the White River First Nation and Elder Mrs. Martha Sam of Northway provided us enormous support. Other community members were generous with their time and companionship, in particular Bessie and Wilfred Chassé, Patrick and Jackie Johnny, Eldred Johnny, Sid Vandermeer Sr., and Dwayne Broeren. Sid Vandermeer, Jr. facilitated administrative relations with the White River First Nation.

Ts'inni Cho.

Norman Alexander Easton / Ts'oogot Gaay

Figure 3. *Huskeeh* Mr. David Johnny and Norm Easton "on set" for an interview with "Wild Archaeology".

Cover Photo: Revised Welcome Sign to Beaver Creek Expressing Native Pride.

Unless otherwise indicated, all photos and illustrations are © N. A. Easton

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Excavations at the Little John Site (KdVo-6), Southwest Yukon Territory, Canada, 2014

SUMMARY OF ACTIVITIES

Figure 4. Whitefish Filets and Roe Smoking at Ten-Mile Village, July 2014.

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 20th of May and 1st of September, 2014 at the Little John site (KdVo-6) and in the region about Beaver Creek, Yukon Territory.

Our archaeological work in 2014 was limited by a small core field crew, however major results of this fieldwork included:

- Training in archaeology and ethnography of three graduate students, and five local native youth.

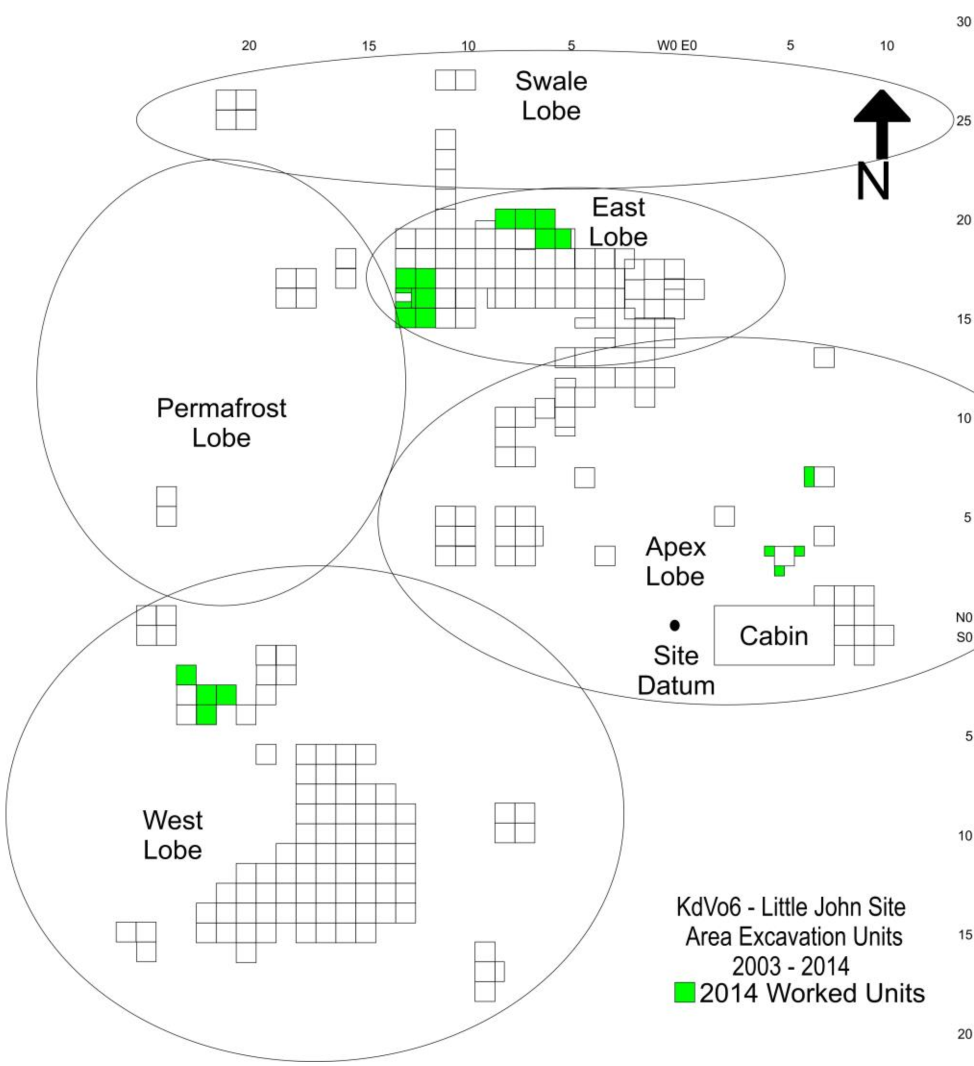
Table 1. Excavation Unit Summary, KdVo6, 2014

Site Lobe	Unit - Quad	Comments	Artifacts	Fauna	Profile / Feature
West	S02 W23 - All	Completion of Unit	B2 - 3 obsidian EMF, 3 Flakes (2 obsidian and 1 basalt), 1 CPA	0	
	S03 W21 - All	New Unit - completed	B2 - 14 Flakes (6 basalt, 4 obsidian, 2 black chert, 2 green chert)	0	
	S03 W22 - All	New Unit - completed	B2 - 1 brown chert Retouched Blade, 1 obsidian Flake, 3 basalt Flakes	0	
	S04 W22 - All	New Unit - completed	B2 – 1 obsidian, 2 basalt Flakes, 1 Hammerstone	0	
Apex	N02 E04 - NW	New Unit – 1 Quad by NCES	B2 - 3 EMF, 2 Flakes	0	
	N03 E03 - NE	New Unit – 1 Quad by NCES	B1 – Washer w/ Key	0	
	N03 E05 - NW	New Unit – 1 Quad by NCES	B2 Low – EMF, on grey chert, 2 joining pieces	0	
	N07 E05 - SE	New Unit – 1 Quad by NCES	B2 – Blade, 3 Flakes (one possible core tablet?), all on obsidian	0	
East	N15 W12 - All	Continued Unit – to top of LbPC2	0	1 bison tibia, 1 MM longbone	
	N15 W13 - All	New Unit – to top of LbPC2	PC2 - 1 basalt Flake	3 bison tibia, 1 LM scapula, 1 MM	
	N16 W12 - All	New Unit, slumped to East – to top of LbPC2	0	8 articulating bison tibia frag.	Fe2014-03
	N16 W13 – E, W, S portions	New Unit, slumped to N and E – to LbPC2	PC2 – 1 Flake LbPC2 – 1 Flake	1 squirrel longbone, 3 LM rib	
	N17 W12 - All	Continued Unit – SW Baulk	PC3 – 1 large Flake, no EM	1 bison metapoidal, 1 caribou rib	
	N17 W13 – S baulk	Continued Unit – S Baulk	PC1 – BTF PC3-P4 – 3 basalt Flakes LbPC3 – 1 retouched split greenstone pebble, 1 basalt EMF, 4 basalt Flakes	1 bison longbone, 1 MM tooth, 1 MM, 3 SM postcranial	
	N19 W05 - W	New Unit – to LbPC1	LbPC1 – 2 Flakes, basalt and black chert	12 fox teeth and mandible	Fe2014-02
	N19 W06 - E	New Unit, slumped to W – to LbPC1	PC1 – 1 basalt Flake	5 fox cranial, 1 wapiti metacarpal	Fe2014-02
	N20 W06 – All	New Unit, W slumped – to LbPC1	P1-PaPC distal Biface fragment on basalt	5 mammal	
	N20 W07 - All	New Unit, see N20W08 fieldbook	0	0	
	N20 W08 - All	New Unit	0	27 wapiti vertebra, 1 metacarpal, 1 rib	Fe2014-01

Table Notes: EMF = Edge Modified Flake. CPA = Cobble/Pebble in Association. BTF = Biface Thinning Flake. M = Unidentified Mammal (Large / Medium / Small). Unless otherwise noted, all bone are element fragments.

- Excavation of 14 square meters of deposits in 19 designated Excavation Units: 4 meters in 4 units on the West Lobe, 1 meter in 4 units on the hilltop (Apex Lobe) in the vicinity of the cabin, and 9 meters in 11 units in the East Lobe; 15 of these were new units, while 4 continued excavations in Units begun in previous seasons.
- Eight of the Units were excavated to basal non-cultural deposits and backfilled; nine of the units were excavated to or through the culture-bearing paleosols and will be investigated further in 2015. Table 1 above summarizes the location of these units and associated artifacts, fauna, and features. The Figure below shows the location of these units in relation to previous excavations at the site. Unit Field Books and excavation summaries related to each Unit excavations are presented in the printed and digital appendices to this report.

Figure 5. Excavated Units, KdVo6, 2014.



- Cataloguing of 70 additional artifacts from the Little John site, summarized in Tables 3 and 4 below; these were catalogued into 61 unique catalogue numbers (KdVo6:4325 through 4385 inclusive). Filemaker Files with and without photographs, and an Excel File providing provenience, metric, and qualitative data related to all recovered artifacts are presented in the Digital Appendix; an Excel table summary in the Print Appendix and a summary description of selected artifacts are presented below in this report.

Table 2. Summary of Artifacts by Type KdVo6-2014

Artifact Type	Total	% Total	% Lithic Tools	% Total Lithics
Biface	2	2.85	11.8	2.94
Blade	2	2.85	11.8	2.94
EMF	10	14.28	58.8	14.70
MCP-SP	3	4.28	17.6	4.41
Total Lithic Tools	**17**	**22.85**	**100**	**-**
Debitage	51	72.85		75.0
Total Lithics	**68**	**94.28**		**99.99**
Historic	2	2.85		
Total Catalogued	**70**	**100**		
EMF = Edge Modified Flake, MCP = Modified Cobble-Pebble. Percentages are rounded up one decimal.				

Table 3. Summary of Artifacts by Level and Type, KdVo6-2014

Level / Artifact Type	S	B1	Ash	B2	L	P1	PC 1 - P2	L b PC1	L b PC2	PC2 - P3	PC3 - P4	L b PC	Total
Biface	1					1							2
Blade				2									2
EMF				6	2							2	10
MCP-HS				1									1
MCP-SP												1	1
Flake			2	32	1		2	2	1	3	4	4	51
CPA				1									1
Historic		2											2
Total	1	2	2	42	3	1	2	2	1	3	4	7	70

- With the support of the Yukon College Research Fund, processing and return of an additional 11 AMS Radio Carbon dates. They are fully reported on in our discussion of dates at the site below.

- Recovery of 89 additional faunal elements summarized in the Table below. Full descriptions of recovered fauna are presented in Printed and Digital Appendices, while a summary discussion of selected fauna is presented below in this report.

Table 4. Summary of Recovered Fauna, KdVo6-2014

Level / Common Name	PC	PC1 - P2	L b PC1	PC2 - P3	PC3 - P4	L b PC	Species Total	Species Percent
Mammal			6				6	7%
Bison				15	2		17	20%
Wapiti		1		31			32	37%
Caribou					1		1	1%
Large Mammal				3		4	7	5%
Subtotal Large Mammals							**(63)**	**(70)**
Red Fox		17					17	20%
Med Mammal	3	1		1			5	6%
Subtotal Medium Mammals							**(22)**	**(26)**
Squirrel		1					1	1%
Small Mammal	3						3	3%
Subtotal Small Mammals							**(4)**	**(4)**
Level Totals	**7**	**20**	**6**	**50**	**3**	**4**	**89**	
Level Percents	**8%**	**23%**	**7%**	**54%**	**3%**	**5%**		**100%**
Wood Fragment	1						1	

- Continued taphonomic analysis of the Little John fauna by Lauriane Bourgeon, David Yesner, Vance Hutchinson, and Easton, the results of which are discussed more fully below.

Table 5. Feature Inventory, KdVo6 -2014

Feature #	Nature	Unit/Quad	Level	Depth BD cm	Date	Comments
Fe 2014-01	Wapiti Vertebrae	N20 W08	P2 (no PC)	88 - 94	26-28 July	Dated to c. 10.7 Cal BP
Fe 2014-02	Fox Cranial Elements	N19 W05/W06	P2 (no PC)	51 – 71	25 July	Reconstructed from fieldnotes
Fe 2014-03	Bison Tibia frags	N16 W12 N15 W13	PC2-P3	81 - 83	22 July	Multiple rejoining frags
Fe 2014-04	Hearth pit	N17 W12	PC2-P3	71 – 80	23 July	Hearth feature found in units to N and NE

- Identification and mapping of 4 archaeological features, summarized in the Table above. The three faunal features were all concentrations of bone of the same species and gross element, presumably from the same animal. A description and discussion of these features is presented below in this report.

- Recovery of 6 potential radiocarbon samples, detailed in the Table below

Table 6. Inventory of Collected Radiocarbon Samples, KdVo6 2014

RCS #	Unit	Level	Provenience	Nature	Comments
2014-01	N17 W13	LbPC3	E16 N20 Z 96	Charred material	Artifact #s 4375 - 4380
	N19 W05 SW	P1 – no PC	E22 N33 Z 51 bs	Carbon sample	assoc. w/ fauna
2014-02a	N20 W08 NW	P2 – no PC	Z c. 93 bs	Charcoal sample	Assoc. w/ Fe2014-01 wapiti vertebra
2014-02b	N20 W08 NW	P2 – no PC	Z c. 93 bs	Charcoal sample	Assoc. w/ Fe2014-01 wapiti vertebra
2014-03	N17 W12	PC2/P 3	Z 78 bsd	Carbon from baulk Fe2014-04	Hearth feature continuing from units to N and NE 23 July JH
2014-04	N16 W13 SW		E28 N22 E Z 96.5 bud	Carbon sample	JH
2014-05	N16 W13 SE		E04 N03 Z 71.5	Carbon sample	Rob

- Recovery of 14 sediment samples as detailed in the Table below.

Table 7. Inventory of Collected Sediment Samples, KdVo6 2014

Geo #	Unit	Level	Provenience	Nature	Comments
2014-01	N20 W06 SE	LbP1 a P2 no PC	E50 N21 Z 82 bsd	large chunk of calcium carbonate	23 July NVB
2014-02	N20 W08 NW	P2	Z 88 bd	matrix sample below Fa14-08	assoc. date on wapiti c. 10.7 Cal BP
2014-03	N16 W12 SW	PC2/P3	Z 83 bd	matrix adhering to Fa14-10-09	Bison tibia frag, 4 bagged samples removed in lab
2014-04	N16 W13 NE	PC2/P3	E49-42 N63-70 Z 71-72 bd	Paleosol assoc w Fa14-08	Currently unidentified – poss. MM innominate or scapula frag
2014-05	N16 W13 NE	L b PC2/P3	E49-42 N63-70 Z 73-74 bd	Loess assoc w Fa14-08	Currently unidentified – poss. M innominate or scapula frag
2014-06	N17 W12	PC2/P3	Z 71-80 bs	Bulk sample Fe2014-04	Hearth feature continuing from units to N and NE

- Hosting for one week 7 Youth and 3 counselors engaged in the Northern Cultural Expressions Society's summer cultural program for native youth at risk. We used a combination of field camp activities (excavation, artifact molding, cooking, camp maintenance, fishing, swimming, and taking in the spectacular view) a variety of art activities (beading, bark and wood working, painting, storytelling), and local Elder interaction as vectors of therapy for the children.

- Three conference presentations related to this project were delivered at the Society for American Archaeology meetings in April 2015. Hutchinson et al. (2015) reviewed the accumulated fauna and taphonomic analysis of the site, Grooms et al. (2015) discussed the ongoing geoarchaeological analyses of the site, while Easton et al. (2015) discussed the developing chronology of the site based on the radiocarbon dating record at Little John and other regional sites on the Yukon-Alaska borderlands. Work continued on three manuscripts for publication on the obsidian artifacts, PXRF analysis of basaltics, and a proposed chrono-stratigraphic interpretation of the Little John site.
- Jordan Handley completed her first year of a Masters program at the Department of Anthropology of the University of British Columbia under the supervision of Dr. David Pokotylo. Ms. Handley will be joining us for four to six weeks this summer to collect material related to her thesis topic, which will focus on a gendered analysis of the Little John site.
- Michael Grooms (PhD candidate, University of New Mexico, Dr. E. James Dixon, Supervisor) continued course work and training in geoarchaeology in support of his doctoral dissertation on the geomorphology of the Little John site. He currently preparing a National Science Foundation grant for analytical work this winter and will join us for three to four weeks this summer.
- Laurianne Bourgenon (PhD candidate, University of Montreal, Adriane Burke, Supervisor) contributed further to our taphonomic analyses of the Little John fauna collection and continues her dissertation work.
- Students in Yukon College's Anthropology 103 and 221 participated in cataloguing and analysis of the 2014 lithic and fauna collection.

Plans for the 2015 field season include continued analytical work and additional limited excavations of unfinished units and several new ones as resources allow, along with additional geophysical data collection in collaboration with the Geological Technology Program at Yukon College.

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 6(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.

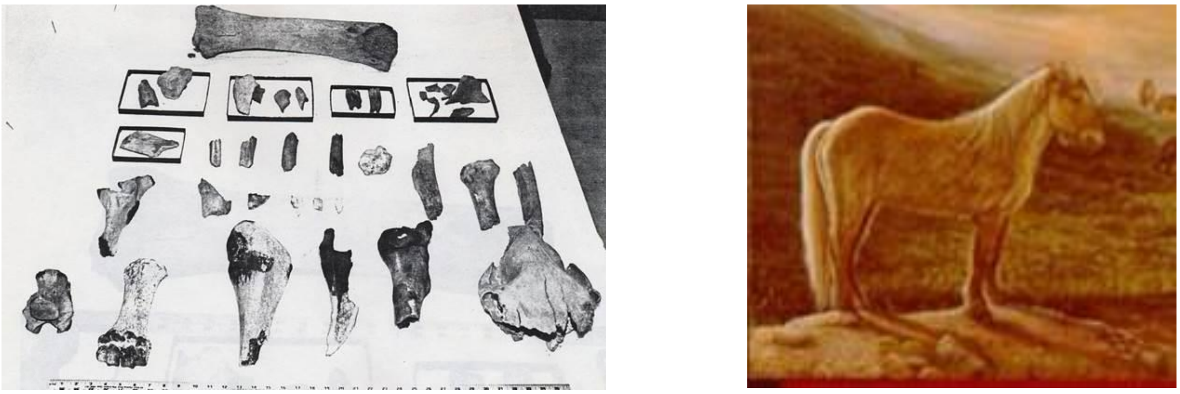


Figure 7. Pleistocene Fauna collected at Little Scottie Creek Bridge;
Equus lambei dated to 20,660 rcybp (Greg Hare; Yukon Heritage Branch).

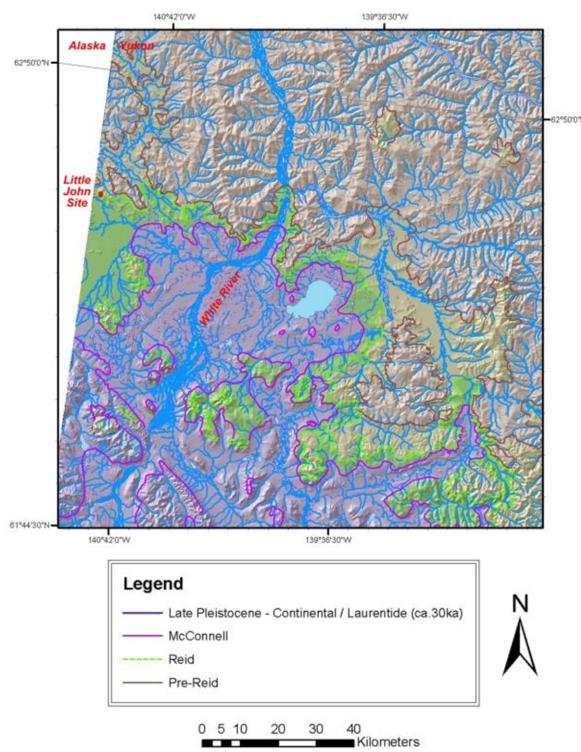


Figure 8. Pleistocene Glacial Limits of the Southwest Yukon (prepared by the Yukon Geological Survey based on most recent fieldwork in the region).

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

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

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.

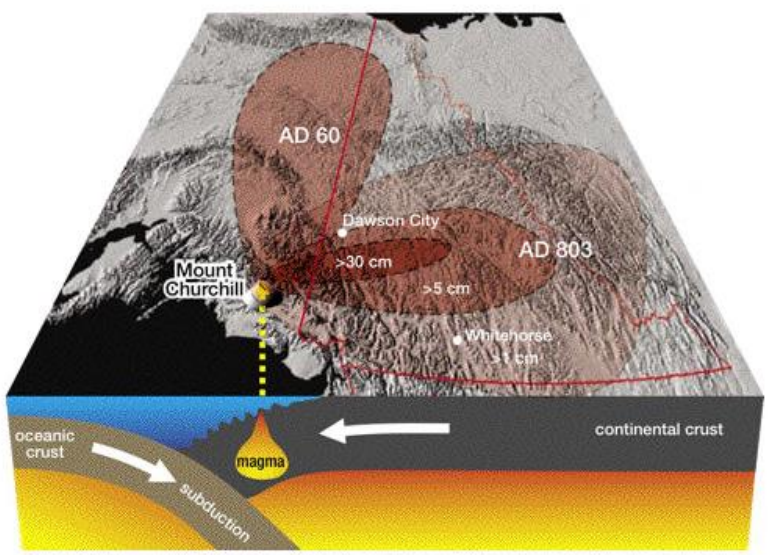


Figure 9. Distribution of the White River Ash fall, c. 1,900 and 1,250 years ago.
(from Smith et al. 2004:28)

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.

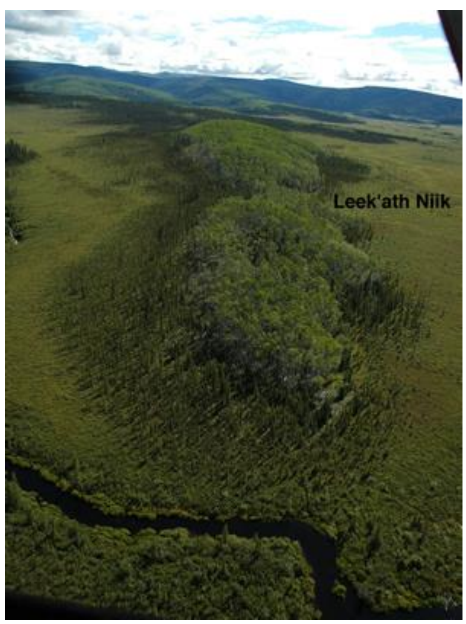


Figure 10. *Leek'ath Niik* Village, Middle Scottie Creek.

Interestingly, Easton was told by several Upper Tanana Elders that the traditional village site of *Łeek'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 (Easton n.d.).

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 spruce, birch, alder, aspen, and poplar trees and a wide variety of shrubs, up to their low

[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).

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 2008a).

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.

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.

[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).

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]

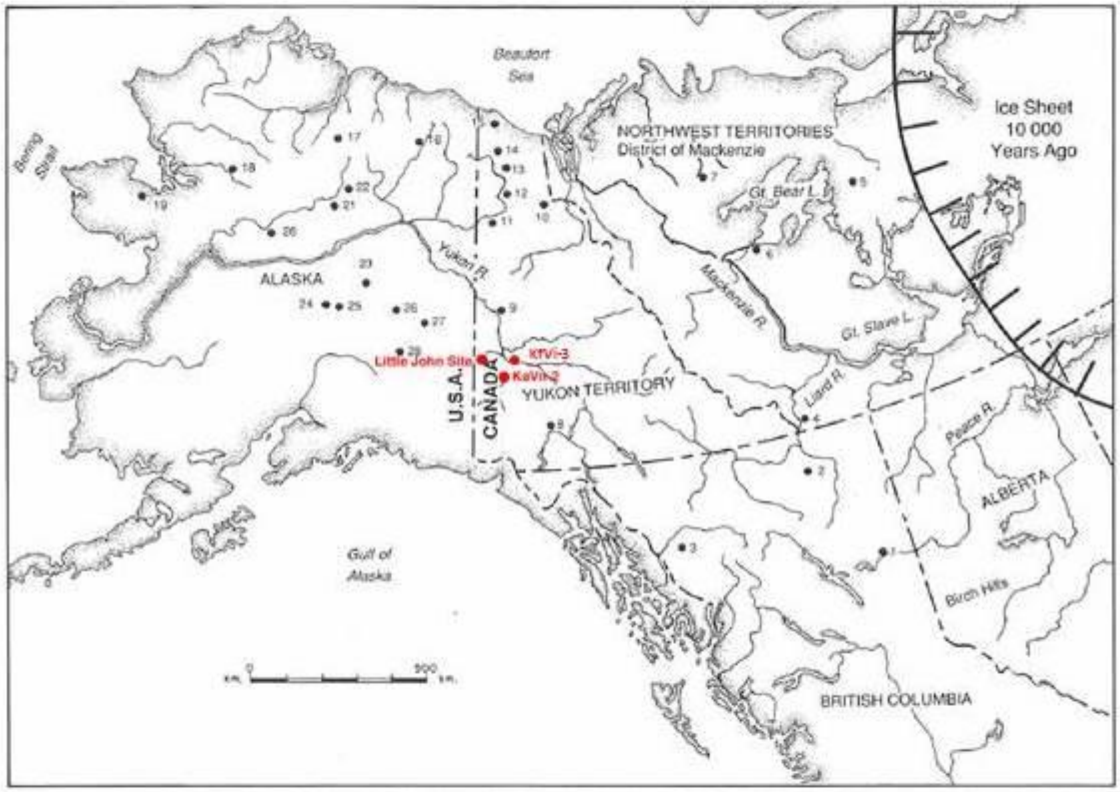
The map below shows the general location of most western subarctic archaeological sites of the late Pleistocene and early Holocene (from as early as 14,000 years ago at the Swan Point [next to # 26, Broken Mammoth] and Little John sites to about 8,000 years ago), and includes the approximate location of the newly announced 13,000 + year old site at the mouth of Britannia Creek (Guzman 2014). 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), and the combining of Workman's Aishihik and Bennett Lake phases into a Late Prehistoric period (Hare 1995). Each of these archaeological cultures is discussed in more detail below.

The Northwestern Canadian (Central Glaciated Southwest Yukon) Archaeological Sequence

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.



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 Englgstiack, 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 11. 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.

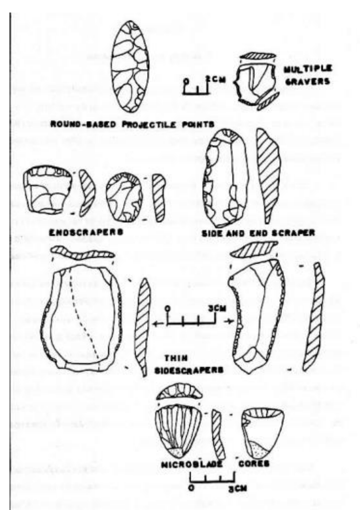


Figure 12. Little Arm Phase Artifacts

(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 13. 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.

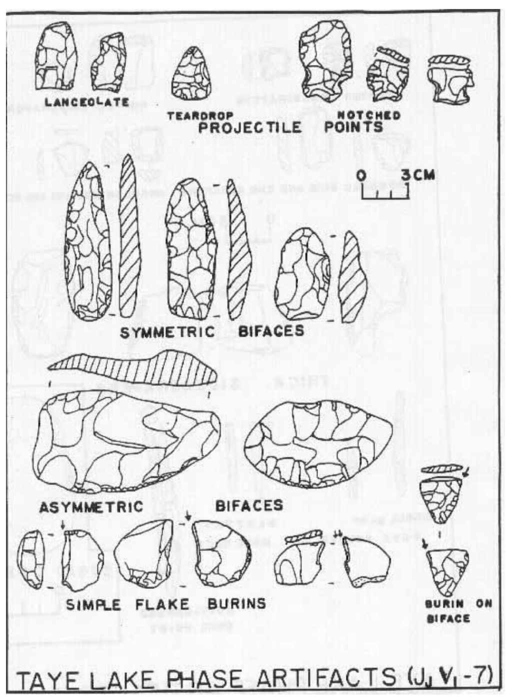


Figure 14. Taye Lake Phase Artifacts - Points, Bifaces, and Burins

(from Workman (1978)

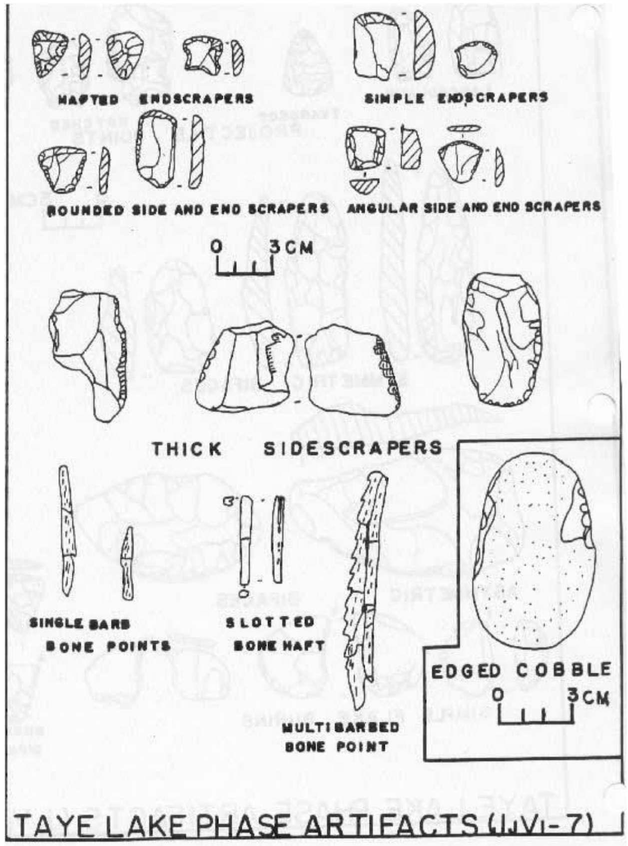


Figure 15. Taye Lake Phase Artifacts - Scrapers, Bone Points, and Net Weight.
(from Workman (1978)

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.

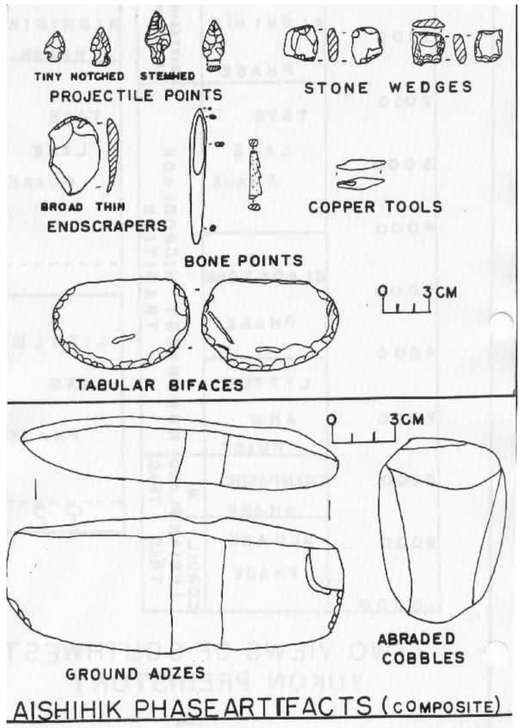


Figure 16. Aishihik Phase Artifacts.

(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

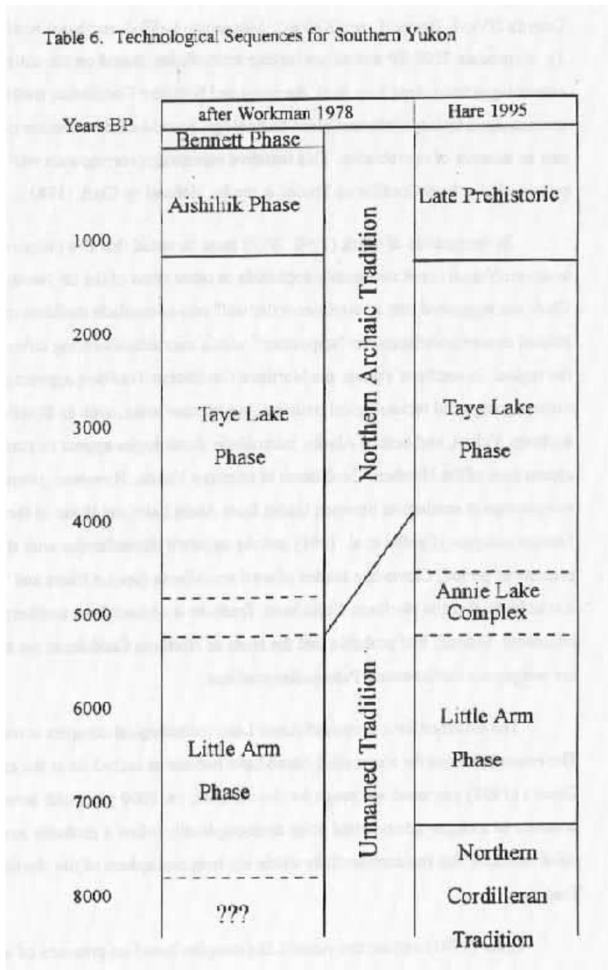


Figure 17. Technological Sequences for Southwest Yukon

(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 (Unglaciated 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.

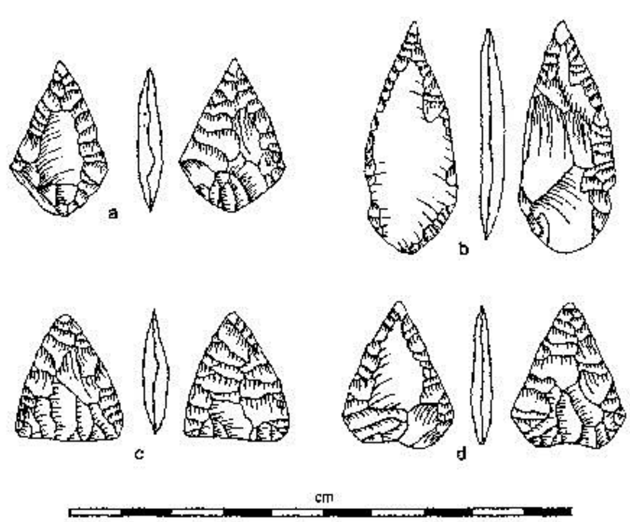


Figure 18. Chindadn ("Ancestor") points from Healy Lake.

(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, wapiti, 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).

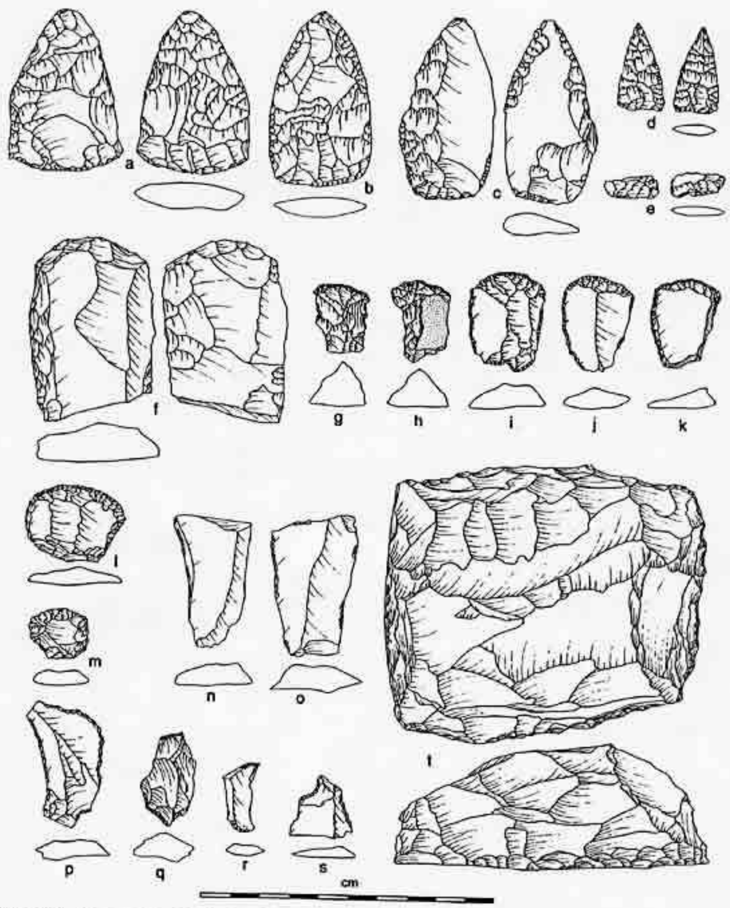


Figure 7-8 Component I of the Dry Creek site (Nenana complex): bifaces (*a–e*); side scraper (*f*); end scrapers (*g–m*); bilaterally retouched blades (*n, o*); retouched flakes (*p–s*); quadrilateral uniface or plane (*t*).

Figure 19. 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 ovate 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, 2011), 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. . . .

---

[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).

> 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 (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).

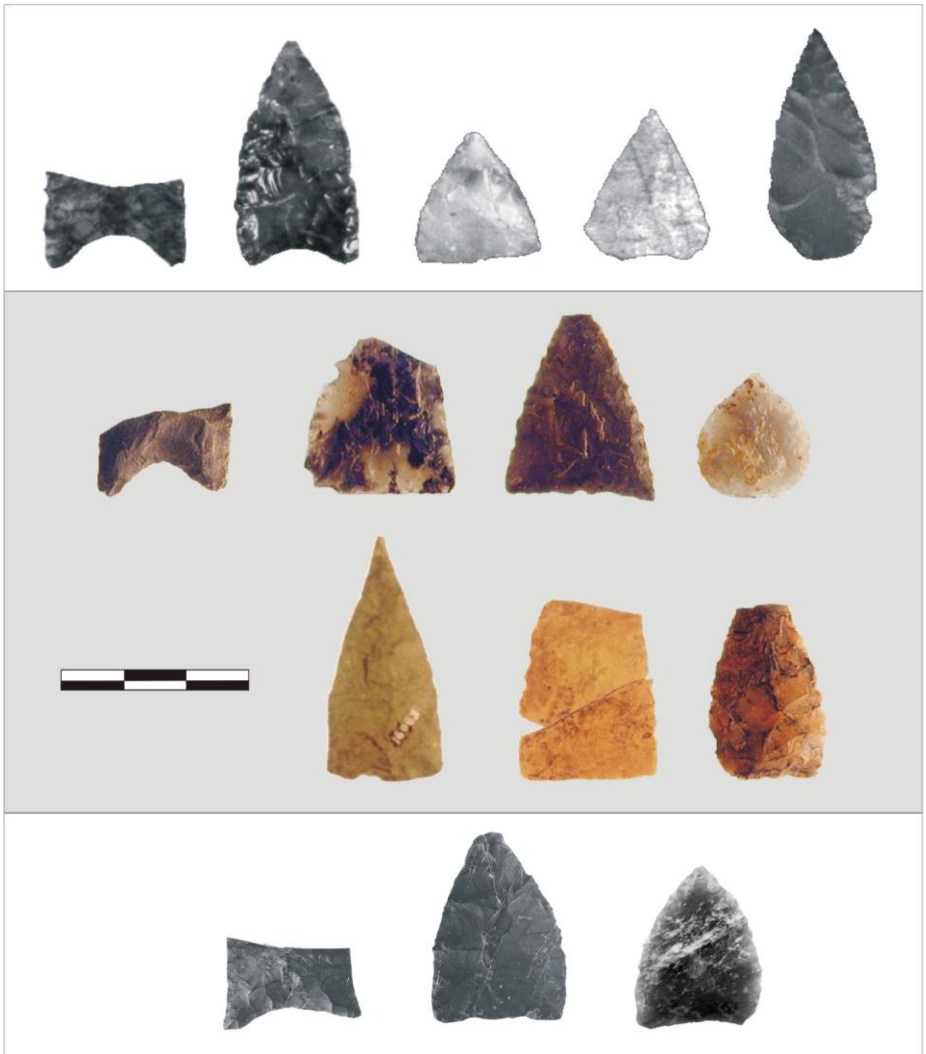


Figure 20. Chindadn Bifaces of the Tanana Valley: Top - Healy Lake Chindadn, Middle - Swan Point CZ 3, Bottom - Broken Mammoth CZ 3

(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.

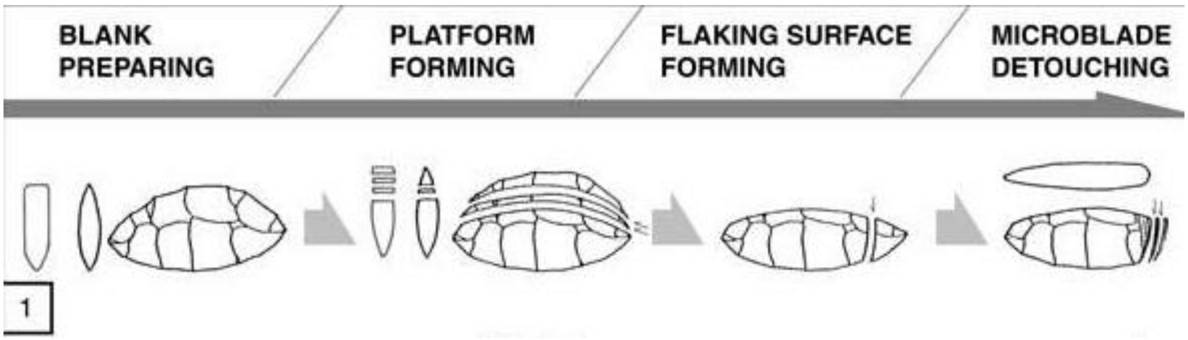


Figure 21. Yubetsu Microblade Core Production on a Biface
(from Nakazawa 2005)

> 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 Upper 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).

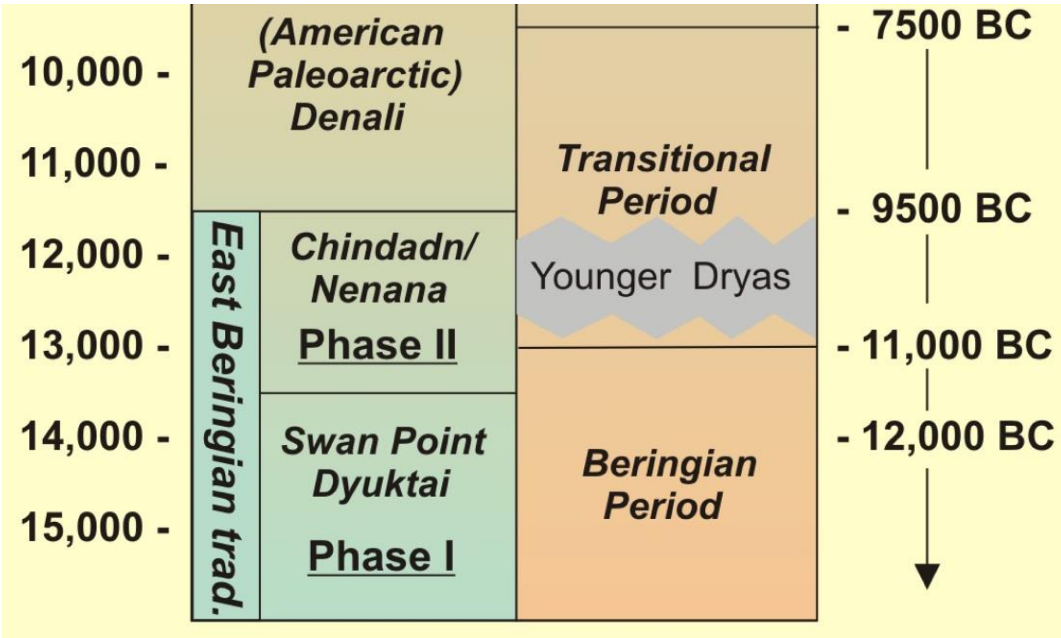


Figure 22. Late Pleistocene - Early Holocene Culture History of Interior Alaska Proposed by Holmes (2008)

(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 of northwest Alaska 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

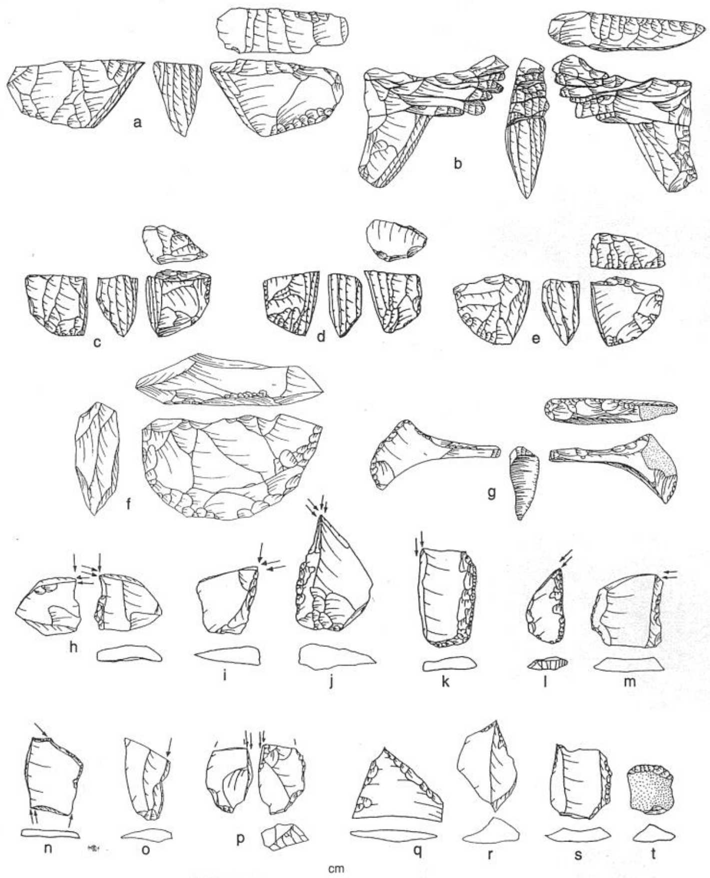


Figure 7–9 Component II of the Dry Creek site (Denali complex): wedge-shaped microblade cores (*a–e, b* with attaching core parts); wedge-shaped core preform (*f*); wedge-shaped core tablet (*g*); dihedral burins (*h–j*); angle burin (*k*); transverse burins (*l, m*); burins-on-a-snap (*n–p*); retouched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

Figure 23. 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.

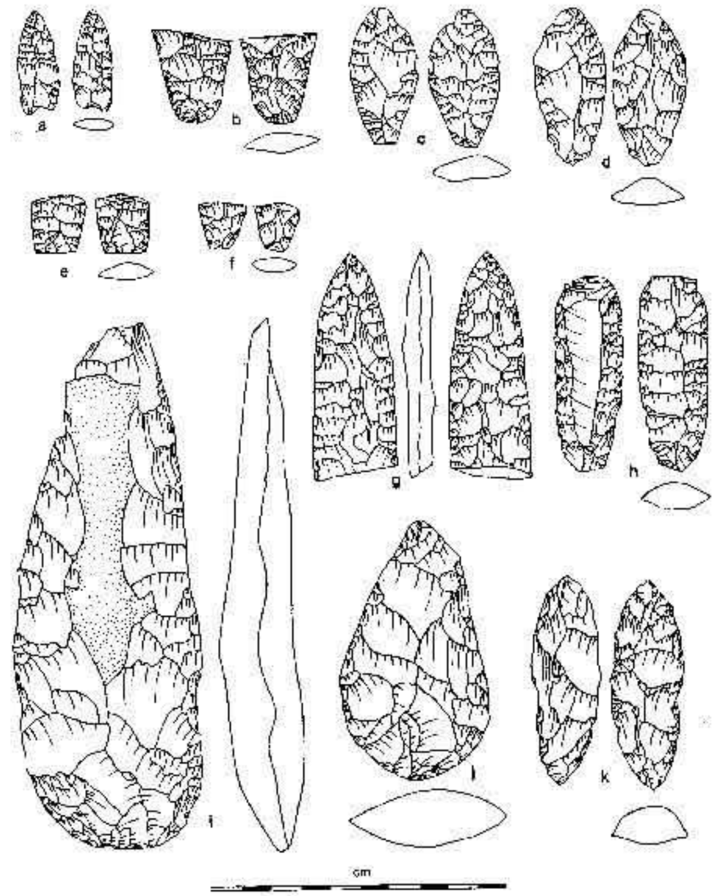


Figure 7-10 Bifaces from Component II of the Dry Creek site: complete projectile point and base fragments (*a, b, e, f*); biface knives and preforms (*c, d, g–k*).

Figure 24. Bifaces from Component II (Denali Complex), Dry Creek site.
(from West 1996c)

Northern Archaic Tradition

I have described the main features of this archaeological culture earlier. Esdale (2008) is the most recent comprehensive account of its expression in Alaska, noting that nearly 70% of dated Northern Archaic sites fall between 6,000 and 3,000 years ago in Alaska, but is expressed as recently as 500 years ago in some Late Holocene assemblages. Her review also reveals a close association between side notched and oblanceolate points, small end-scrapers, burins, and microblade technology during this period; interestingly, notched pebble net weights, commonly cited as a feature of the Northern Archaic, is found in only 4% of the examined assemblages.

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). Moberly’s (1991) analysis of the site concluded that the assemblage dated to c. 3,500 years ago, and represented a Late Denali complex. Pearson and Powers’ (2001) analysis of undisturbed strata provided them a date for the microblade component of c. 6,850 years ago, arguing that the site represents an early to mid-Holocene occupation of the Denali complex proper or early Northern Archaic that included microblade technology, rejecting the construct of a Late Denali complex as untenable. I am in agreement with them; there is no need for a Late Denali complex archaeological culture to account for continuity of microblade technology in the middle and late Holocene Northern Archaic.

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 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 is equivalent to the Aishihik Phase. In combination, these Alaskan traditions and Yukon phases fit within the the Yukon's Late Prehistoric Tradition. There is also a direct correspondence between the two regions' Northern Archaic Traditions.

I see no need for a "Late Denali Complex" within the time of the Northern Archaic. More 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), a fact subsequently demonstrated for Alaska as well (Esdale 2008). Grouping together both microblade and non-microblade sites with the more embracing Middle Prehistoric Period (Morrison 1987), or altering our definition of the Northern Archaic to include the presence of microblades (Esdale 2009), is 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 from Alaska into the Yukon and western Northwest Territories (MacNeish 1964, Clark, Gotthardt, and Hare 1999, Magne and Fedje 2008).

Finally, there does seem to be some correspondence between the Nenana and Chindadn complexes and Northern Cordilleran Tradition with their emphasis on bifacially worked tools, the presence of blades, and, in the case of the Nenana complex, the lack of microblades. However, we can also see distinctive differences including the presence of Chindadn type and basally thinned points in the Alaskan complexes and, in the case of the Chindadn complex the presence of microblades, and the absence of these artifact types 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, 55 kilometers southeast of the Little John site, brought to light an early component dated between 10,670 and 10,130 radiocarbon years before present (12,023 – 11,598 and 12,731 – 12,520 Cal YBP respectively), 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 themselves, 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 of the Tanana valley proper with Chindadn Points and associated technology (Easton et al. 2011).

Several important new additions to the Late Pleistocene archaeology of the region have been 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, and Tlingit 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 (perhaps only) evidence of a shared linguistic heritage between a New World and Old World population. The archaeological implications of this possibility is explored by Potter (2010) and critiqued by Dummond (2010).

The second is Potter, et al. (2001) and Potter (2014) who report on the recovery of cremated human remains of a single juvenile (c. 3-4 years of age) in a burial pit - hearth feature, overlying a second burial of two unburned interned infants (neo-natal – 6 months in age), within a house structure at the Upward Sun River site on the south bank of the Tanana River south of Big Delta Junction in Alaska. The human remains are dated to c. 11.5 thousand calendar years, just after the end of the Younger Dryas, and the house feature is evidenced by post holes around a semi-subterranean concavity feature. The lower burial includes grave goods in the form of bifaces and decorated antler rods. Besides its inherent importance in its own right, we can note the identification of concentrations of wood within the Pleistocene levels at Little John that may represent a similar occupational feature that full 3-dimensional mapping being undertaken by will clarify.

The third is the important discovery in 2013 within the White River First Nations Traditional Territory of 13,000 year plus cultural deposits at KfVi-3 on a terrace overlooking the confluence of Britannia Creek with the Yukon River about 110 kilometers East-North-East of the Little John site (Guzman 2014, Altimira Consulting 2014). We discuss its potential relationship with the Little John site later in this report.

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.

Frederick 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 beyond Duke Meadow immediately south of the Duke River crossing north of Burwash Village and thus outside of our area of interest, broadly defined as west of the White River (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, 3 kilometers southwest of the Little John site, 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, 2008b). In 2002 and 2003, Glen MacKay undertook additional excavations at the Nii-ii hunting lookout site (KdVo6) which formed the basis for his Master's Thesis at the University of Victoria under Dr. Quentin Mackie (MacKay 2008). 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 Hidden and Deadman Lakes; the latter included recovery of a complete projectile point in a Late Pleistocene stratigraphic context and bears further investigation and dating (Easton 2009).

Table 9, below, presents summary information on the principal archaeological sites recorded to date on the Canadian side of the border eastward to about the White River along the Highway corridor. With the exception of KaVn-2, these sites reveal a culture history pattern similar to that of the regional archaeological sequences to the east of our 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 an 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 et al. 2009). Both the horse and juvenile mammoth tusks were recovered less than two km from the Little John site.

Finally, we note the important discovery in 2013 within the White River First Nations Traditional Territory of 13,000 year plus cultural deposits at KfVi-3 on a terrace

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

overlooking the confluence of Britannia Creek with the Yukon River about 110 kilometers East-North-East of the Little John site (Guzman 2014, Altimira Consulting 2014). We look forward to a more detailed comparison with Little John when more details become available.

Table 8. 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 RCy BP, making this the third oldest known site in southwest Yukon (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); RC date 920 +/- 40 – 2 Sigma Cal BP 930 – 740; Beta 231793.
KdVo-6	Large multi-component site containing stratified components of the Historic, Later Prehistoric, Northern Archaic, Denali / NWMt, and Nenana complexes. Strata sequence ranges from several cc to c 2 m across the site. Basal cultural date RC 12020 +/- 70 on butchered Bison vertebrae – 2 Sigma Cal BP14050 – 13720 and multiple other dates; see this Report below for extended discussion.

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 (RC date of 2010 +/- 40 -2 Sigma Cal BP 2050 – 1880; Beta 173826), and possibly an earlier occupation within buried paleosols located in test pits 80 cm + below surface dated to RC 6210 +/- 70 – 2 Sigma Cal BP 7270 – 6900; Beta 173827 (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 2014.

2014 INVESTIGATIONS AT THE LITTLE JOHN SITE (KdVo-6)

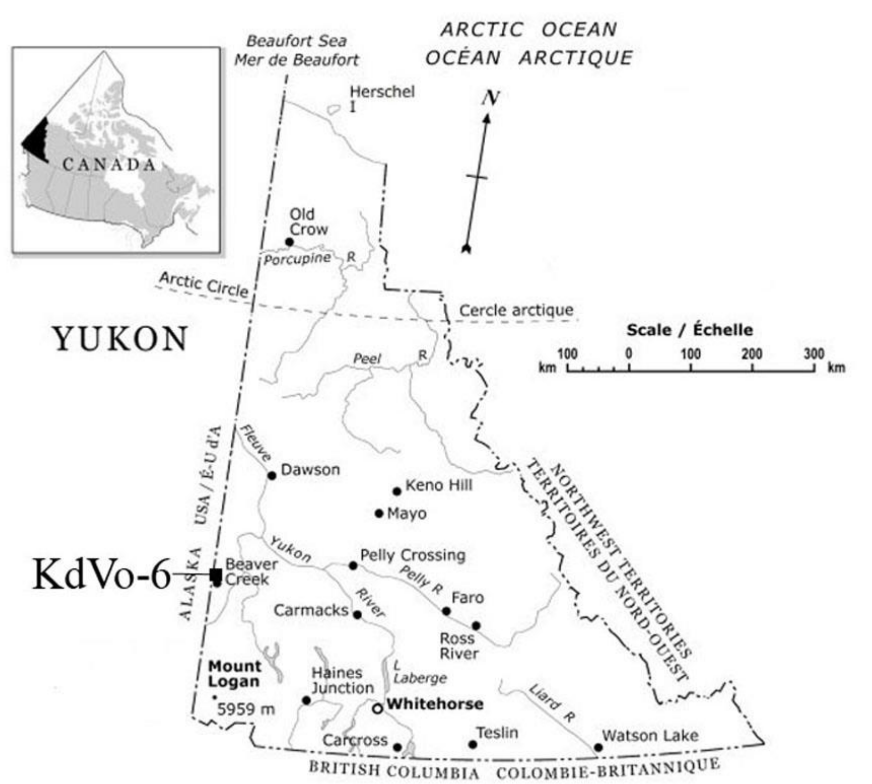


Figure 25. General Location of the Little John Site, Yukon Territory, Canada

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 26. 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 27. Aerial view of the Little John site from the West.

Figure 28. 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 complex artifacts from the West lobe, underlying

[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.

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.

Figure 5 (above) show the location of excavation units on the site through 2014. 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, in collaboration with Dr. David Yesner and the Department of Anthropology of the University of Alaska-Anchorage forty-nine m^2 units were exposed;[12] twenty-two of these remained to be fully excavated.

In 2008, again in collaboration with Yesner and the UA-Anchorage field school, 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.[13] 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

---

[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.
[13] Directed by Easton and Yesner, crew members consisted of Patrick Daley, Christopher Baker, Polly Hyslop and Nicolas Sam of Northway Village, AK, Camille Sanford of Tetlin Village, AK, Eldred Johnny and Jordan Vandermeer of White River First Nation, Yukon, Vance Hutchinson, Katie Herrera, and Amanda Janssens, Joseph Easton and Gary Pflugradt, and members of the University of Alaska Anchorage - Yukon College Field School in Archaeology: Elidh Lucas, Dan Stone, Lorraine Alfen, Mary Gladkowski, Brooke Nall, Joel Lennen, Brian Geyer, Caitlin Hanson, and Owen Marcotte.

lobe in the far NW of the site that exposed a buried two deeply buried Paleosols 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; it is expected they will be included in Michael Grooms' geoarchaeological analysis of the site currently in progress (Easton 2009a).

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 2009b, 2010).[14]

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).[15]

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 (Easton 2012a, 2012c, 2012d).[16]

In 2012 twenty-three one meter units were worked: 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

[14] 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

[15] 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.

[16] 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.

new units, while the remainder completed unexcavated sediments from previous seasons (Easton 2014a).[17]

In 2013, twenty-eight square meters were investigated: six on the West Lobe, eight on the hilltop in the vicinity of the cabin, and fourteen in the upper East Lobe. Twenty-three of these were new units, while the remainder continued excavations begun in previous seasons. Nineteen of the Units were excavated to basal non-cultural deposits and backfilled; nine of the units were excavated to or through the culture bearing paleosol complex levels and would be investigated further in 2014 (Easton 2014).[18]

In 2014, fourteen square meters were investigated: four meters in four units on the West Lobe, one meter in four units on the hilltop (Apex Lobe) in the vicinity of the cabin, and nine meters in eleven units in the East Lobe; fifteen of these were new units, while four continued excavations in Units begun in previous seasons.

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 in Summary above). Recovered artifacts and fauna were recorded by three-dimensional provenience to the surface datum of the unit, unless they were recovered in the excavation screen, in which case their provenience was recorded by natural level and unit quadrant. Unit Datums in turn were tied into the principal site Datum to facilitate a comprehensive site map of recovered finds. The Digital Appendices provide comprehensive catalogues of recovered artifacts and fauna, while this report provides a summary of their metrics, context, and description of selected samples. 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 in large and

[17] Directed by Easton, crewmembers in 2012 consisted of Kendra Vaughn, Alina Aquino, Geoffery Homel, Keith Saunders, Rachelle Mathews, Michael Grooms, Nicolena Virga, Jordan Handley, Laurianne Bourgenon, Mark Young, Anne Marie Lapointe, Dianna Marion, White River First Nation Youth: Chelsea Johnny, Eldred Johnny, Eddie Johnny, Tamika Johnny, and cultural experts David and Ruth Johnny, Youth participants from the Northern Cultural Expressions Society led by Naomi Crey, and Dr. David Yesner .

[18] Directed by Easton, crewmembers in 2013 consisted of Katherine Brown, Lisa Chatwin, Colin Christiansen, Sarah Elsworthy, Thomas Gregston, Jonathan Lee, Jamie Pope, Kalista Sherbanuk, Josh Varkel, Pawel Wojtowich, Amanda Wong, Michael Grooms, Nicolena Virga Berry, Laurianne Bourgeon, Brittany Tuffs, Timothy Allen, Daniel Frim, Chelsea Johnny, Dellamae Sam, Eddie Johnny, tmika Johnny, David Yesner, members of the Yukon Junior Rangers led by Norm Beebe, and participants of Northern Cultural Expressions Society summer culture program led by Naomi Crey.

small formats of all photos are provided in the Digital Appendix. Finally, representative sediment samples and potential radiocarbon samples were collected on a regular basis and archived for future analysis when resources permit; they are summarized in a set of Tables above.

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 and other material 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. All artifacts have been photographed and major formed artifacts are being drawn. Unmodified flakes and manuports have also been described more basically; smaller, unmodified flakes and fire altered rocks are often described by lot, for example. The Digital Appendices provide a full listing of these derived data, while summaries are provided in the artifact class descriptions below.

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.[19] Dr. 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 carried out her own analysis of about 90% of the fauna collection in 2012, 2013, and 2014; her initial analysis was included in our 2013 Report Appendix and is integrated into our discussion of Fauna below. A Digital Appendix and Print Appendix provide a photographic catalogue of collected fauna in 2014; a major analytical paper on the entire faunal collection is in preparation.

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

[19] Over the years these colleagues have included Vance Hutchinson, David Yesner, Scott Gilbert, David Mossop, Greg Hare, Susan Crockford, Paul Mateus, Grant Zazula, and Lauriane Bourgeon.

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 and Easton. 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 Rasic and will be summarized in an upcoming publication. The general trends identified in our 2007 report are sustained, i.e. 90% plus of obsidian at Little John are derived 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 Society for American Archaeology, 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 (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 2013a, Easton et al. 2013, Grooms and Easton 2013, Easton et al. 2014, Easton et al. 2015).

Jordan Handley completed her Undergraduate Honours Thesis at the Department of Archaeology at Simon Fraser University in 2013 examining pXRF characteristics of non-vitreous artifacts from Little John under the supervision of Dr. Rudy Reimer Yumks (Handley 2013). Ms. Handley has recently been accepted to the Master's program at the University of British Columbia under the direction of Dr. David Pokotylo, an established scholar in lithic technology and analysis, with whom she will be developing an analytical thesis aimed at engendering the Little John site and collection. Michael Grooms has recently advanced to candidacy in the Doctoral program at the Department of Anthropology at the University of New Mexico under the supervision of Dr. E. James

Dixon and continues analysis and research related to the geo-archaeological context of the Little John site. Lauriane Bourgeon of the Doctoral program at the University of Montreal continues to develop her dissertation focusing on the Blue Fish Caves fauna under the direction of Dr. Adrian Burke; following Dr. Burke's suggestion and our enthusiastic support, Ms. Bourgeon has examined about 90% of the Little John fauna to provide her with a known culturally derived comparative collection.

Archaeological publications generated as a result of ongoing analyses 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 and Ian Buvit (Easton, et al. 2011, Yesner et al. 2011). Several new papers for publication are anticipated in 2015.

Ethnographic publications arising from research on the borderland include an ethno-historical 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 2008a). 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 (Youatt and Easton 2010). Ms. Youatt also completed and successfully defended her Undergraduate Honours Thesis on the topic at Reed College, Oregon in May of 2011 (Youatt 2011). A large format public interpretation poster was prepared by Easton for the White River First Nation and the Beaver Creek Visitors Center in 2008 (Easton 2008c); additional interpretive posters are on display at Yukon College and the University of New Mexico.

The significance of the Little John site is now firmly entrenched within Beringian archaeology. A description of the site is included in the recent summaries and discussions of Beringian prehistory (Dixon 2013, Potter et al. 2013, Ives et al. 2013, 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 of that institution has continued to collaborate with us in the excavation, analysis, and interpretation of the site.

Financial and In-Kind support of continued fieldwork and analysis of our Yukon Alaska borderlands research in 2014 was received from the White River First Nation, the School of Liberal Arts, Yukon College, and myself.

Research plans for 2015 include continued limited excavations at the Little John site and additional archaeological survey in the region as opportunity allows. Since we will not delivering an Undergraduate training program in 2015 we intend to concentrate our efforts on ensuring graduate student participants will obtain the data sets they require in order to complete their individual theses and contribute to a series of jointly authored scholarly publications. Funding is being sought by Easton and Joel Cubley and Mary Samolczyk of Yukon College’s Geological Technology program to collect electrical resistivity and sediment cores across the site to build a 3D model of the geological structure of the site. Easton is also collaborating with Dr. Julie Esdale of US Army Group – Fort Wainwright, the Tanana Chiefs Conference, and Native Village Councils of Tanacross and Tetlin in a week-long archaeological survey and public interpretation of the Tok Overlook site, as well as continuing to work with Bob Sattler of the Tanana Chiefs Conference and Native Village Council of Northway on exploration of the archaeology of Village lands around Deadman Lake.

GENERAL STRATIGRAPHY AT THE LITTLE JOHN SITE

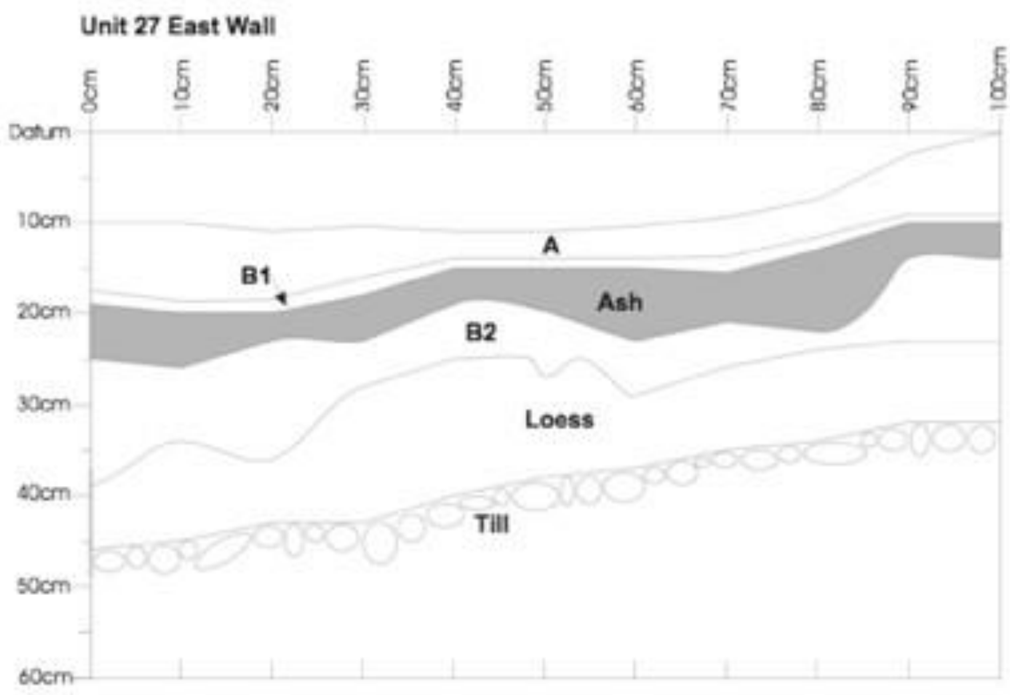


Figure 29. Representative Stratigraphic Profile, West Lobe.

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 post-glacial, principally during the Younger Dryas Climatic Event, circa 12.8 and 11.5 thousand years ago (Reger pers. com. 2009). These deposits vary in thickness from a few centimeters to a meter or more. Above this loess deposit are ten to twenty centimeters of Brunisols typical of the boreal forest in the region. In some 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.

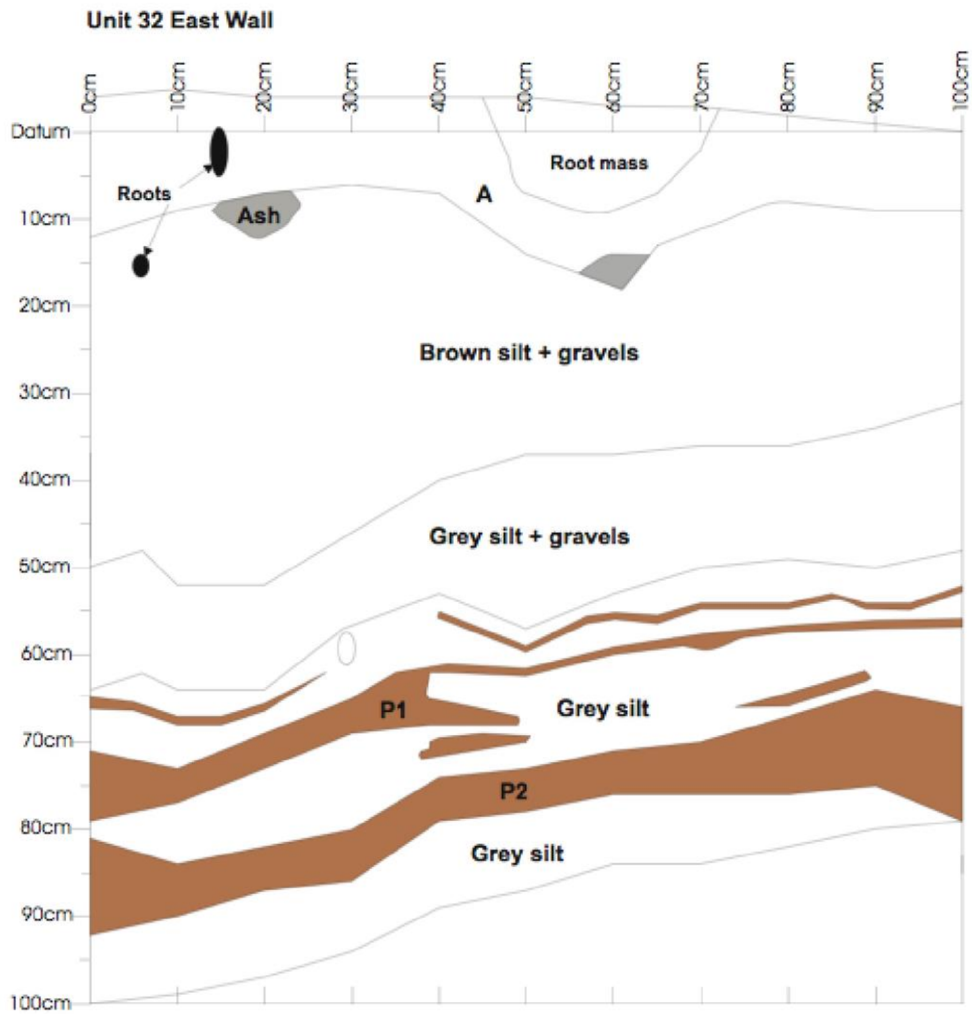


Figure 30. Representative Stratigraphic Profile, East Lobe.

The discontinuous depth of these strata is accounted for by the undulating topography of the site, which ranges from deep basins to eroding hillsides. Electrical resistivity measurements taken in the fall of 2013 by Dr. Joel Cubley and Mary Samolczyk of Yukon College indicate that the "Swale Lobe" may be capped by as much as 50 or 60 feet of sediment above bedrock. Discontinuous permafrost is also indicated in the three lines measured in 2013. We plan to collect additional data in 2015 in order to develop a more accurate 3-dimensional representation of sedimentary structures across the site. 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).

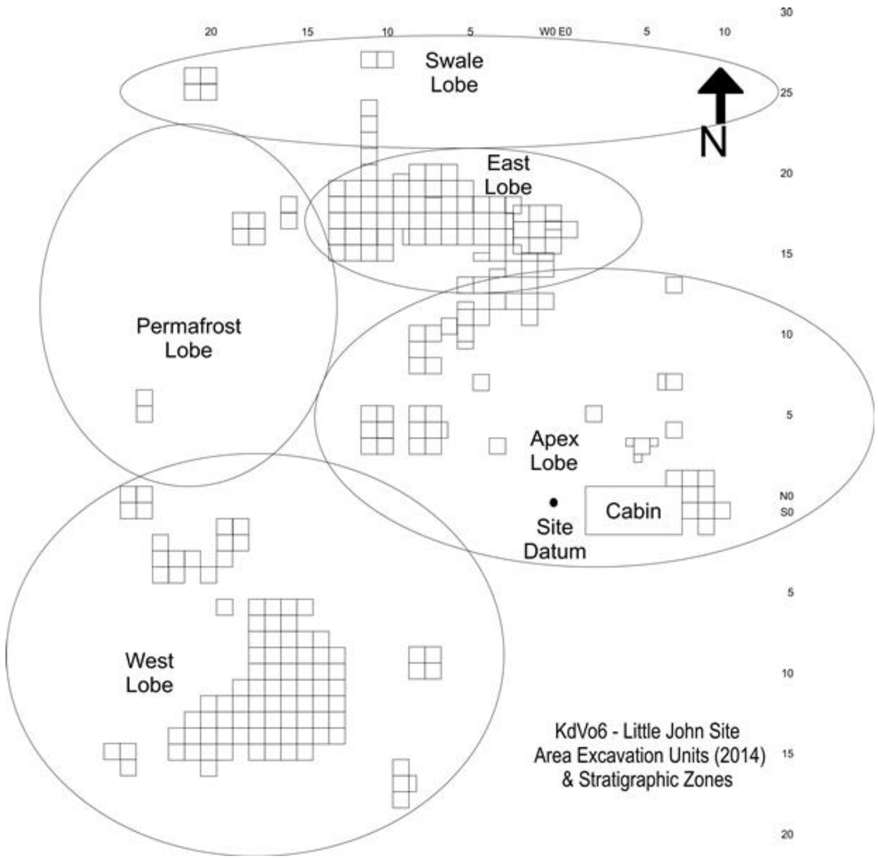


Figure 31. Stratigraphic "Zones" of KdVo-6.

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 Apex lobe consists of shallow (< 2cm) deposits at the highest point of the site with accumulating deposits to the north; large boulders and cobbles (which we have called the “rockfall lobe” in previous reports), representing frost cracked basal regolith, lie through the brunisol and loess deposits in this area. The East Lobe is a large basin that troughs east-west across the site, and 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 32. The Road Trench from the South and Detail of Wisconsin Interstadial Paleosol complex at the North end of the Road Trench

Figure 33. Detail of Wisconsin Interstadial 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 has continued in our excavations since. 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. A date on charcoal in contact with a Bison bone modified for use as a beamer or scraper returned a calibrated calendar date of 11,390 – 11,230 Cal BP at the 2 sigma level.

.

Figure 34. 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 allowed.

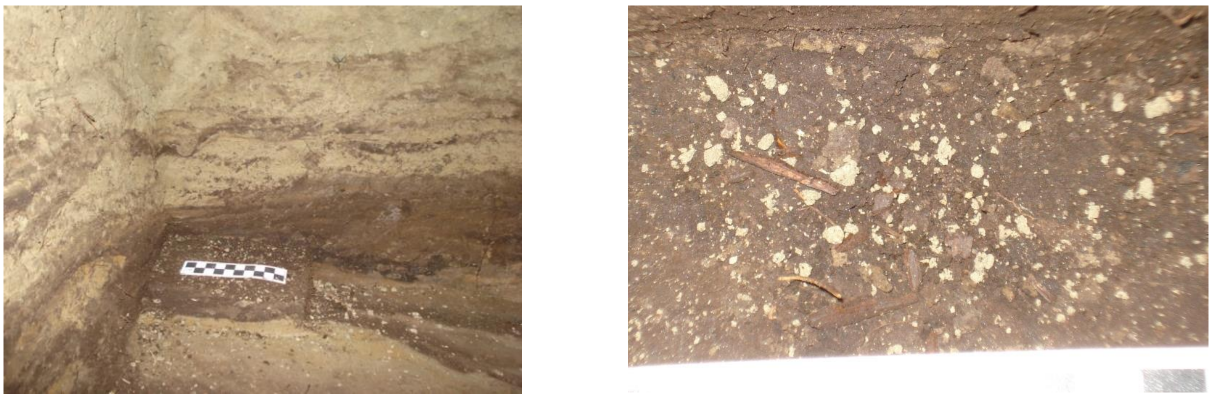


Figure 35. Wood Fragments in N18 W11. L: SW Corner of Unit. R: Detail of Wood Fragments.

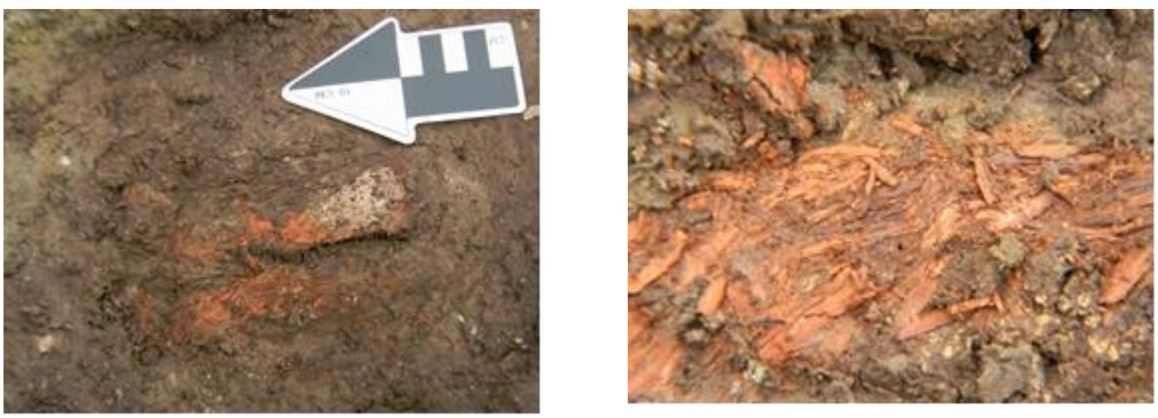


Figure 36. Wood feature, Unit N18W13, 92 cm Below Unit Datum, c. 12,840 Calendar Years

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 had been working down over the previous 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 additional 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 Cal BP; significantly this date turns out to be very close to a date on a wapiti inominate from the same level in Unit N13 W02 (UCI-88769: RC age = 10,960 +/- 30 / Cal BP 12,905 – 11,715 at 2 sigma).

Excavations in 2012 -2014 continued to expose paleosol strata containing organic wood remains, culturally modified bone, principally bison, concentrations of unmodified cobbles and pebbles that are being interpreted as cultural features distinct from clearly colluvially deposited sediments from the hillside north of the site, and a small but indisputable assemblage of culturally modified flakes, hammerstones, and formed tools. These features and remains are more fully described our 2012 permit report and below.

Figure 37. Feature 11-12, Bison Bone and Edge Modified Flake in situ, KdVo6 N18W13 SE, Bottom of Paleosol Complex – AMS Date on associated wood, 9560-9477 Cal BP (Beta 223239)

In the fall of 2013 Joel Cubley and Mary Samolczyk of Yukon College collected Electrical Resistivity measurements in order to determine the depth and nature of sedimentation over the basal bedrock of the knoll on which the site lies and pXRF data from the site in order to see if it is possible to recognize unique sedimentological signatures that may facilitate the linking of strata across the site. The latter will be combined with the work of Michael Grooms, who is examining the stratigraphy and chronology at the Little John site, Yukon Territory, in order to interpret depositional and environmental differences between the Late Pleistocene Chindadn (non-microblade) and

Denali (microblade) complexes, combined with sediment micromorphology, and OSL and AMS radiocarbon dating methods.

Figure 38. Measuring Electrical Resistivity and pXRF of KdVo-6 Sediments.

Initial electrical resistivity measurements along three transects have suggested that the East – Swale Lobe sections of the site may hold as much as 20 meters of sediment above the basal bedrock, intersected with two major permafrost facies; additional transects are planned to increase the resolution of this model. Dip and strike measurements and gross mineralogy confirms Dick Reger's earlier field observation that the bedrock of the Little John site is a lithological contact feature distinct from the exposed bedrock to the north of the site across the Alaska highway. Additional analysis of this basal morphology and exploration of the overlying sedimentary structures will be undertaken through 2014-15. Exploration of the non-cultural Pleistocene deposits of the site will increase our understanding of the Quaternary history of the Mirror, Snag, and Beaver Creek basins, a poorly understood sedimentary basin which has been subject to only reconnaissance investigation by Rampton in the 1970s.

RADIOCARBON DATES AT KDVO-6

Table 9. New Radio-Carbon Dates from KdVo-6, 2014-15.

Lab #	RCBP	Var	2 σ CALBP	Level	Unit	DBS CM	Material	Comments / Associations
Beta 387618 KdVo6 N15W1 8-B2	1780	30	1815 - 1615	B2	N15 W01	c. 8	Charred material	Large B2 hearth feature and artifacts
Beta 387614 KdVo6 Fa08-045	7200	30	8035 - 7960	P	N18 W07	97	Bone, swan	Fa08-045 long bone fragments
UOC 0642 KdVo6 S11-16	8972	43	10231 - 9923 2 intercepts	PC	N19 W11	100	Wood	wood sample 2011-16; bottom of PC Hearth Feature 2011-15
Beta 387616 KdVo6 Fa10-019	9370	30	10680 - 10515	PC3-P4	N16 W12	82.5	Bone, bison	Fa10-019 long bone fragment
UOC 0645 KdVo6 Fa14-03-04-01/02	9474	65	11083 - 10562 2 intercepts	P2	N20 W08	90	Bone, wapiti	Fa14-03-04-01/02, Wapiti
UOC 0644 KdVo6 Fa10-21	9502	59	11085 - 10587 2 intercepts	Loess at base of PC	N16 W12	85	Bone, caribou	Fa10-21 tibia fragment
Beta 406635 KdVo6 C14S 2014-01	9780	30	11240 - 11185	Loess at base of PC3-P4	N17 W13	102	Charred material	Artifact #s 4375 - 4380
UOC 0643 KdVo6 Fa06-133	10831	48	12793 - 12679	LbPC	N17 W04	78	Bone, caribou	Fa06-133 innominate with acetabulum, ischilium, mature
Beta 387613 KdVo6 Fa07-017	11140	40	13080 - 12970	PC	N17 W07	90	Bone, caribou astragulus	Fa07-017 astragulus
Beta 387617 KdVo6 Fa10-137	12400	40	14715 - 14210	LbPC3-P4	N16 W12	105 - 115	Bone, bison	Fa10-137 phalanx

New Dates from the Little John Site (2014-2015)

With generous support from the recently established Yukon College Research Fund, ten new radio-carbon dates were obtained over the past year that have contributed to the further refinement of the chronology of human occupation at the Little John site. The new dates range from 1,780 to 12,400 radiocarbon years (c. 1715 – 14,500 calibrated years before present). The new dates are summarized in the table above and their formal associated reports presented in the Print and Digital Appendices. Of the ten new dates, one is Late Holocene in age (1815-1615 cal. bp), two are Early Holocene in age (ranging from 7960 to 10231 calibrated years before present), four are post-Younger Dryas Late Pleistocene in age (ranging from 10515 to 11185 calibrated years before present), one is Younger Dryas Late Pleistocene in age (12793 – 12679 cal. bp), and one is Older Dryas Late Pleistocene in age (14715 – 14210).

Figure 39. KdVo6:Fa08-045, Swan long bone fragments, N18W07, P1, 8035-7960 Cal. BP

The entire suite of acceptable dates at the site now consists of 33 AMS measured dates ranging from the most recent past to the Wisconsin Interstadial (MIS 3) c. 42-44,000 years ago. The earliest date on a bison bone from within the Loess below the main Paleosol Complex at the site is dated the Older Dryas at c. 14,460 calibrated years before present, joining another date on bison from this stratum of c. 13,900 calibrated years before present at the onset of the Late Pleistocene Allerød Interstadial.

Placing the New Dates in Context

The Table below shows the 36 dates we have accumulated to date on material from the Little John site, along with nine other dates from nearby sites in Canada; for clarity the regional sites are highlighted in Blue font. The table also includes major climatic periods relevant to the dates.

Three of these dates we have rejected for a variety of reasons, and three are non-cultural dates of Wisconsin and Wisconsin Interstadial in age.

Of the rejected dates, one (Beta 1814885) is clearly of wood killed in the past 50 years. Another (Beta 245516) was on charred material from below what we have been interpreting as the White River tephra and too young to belong below the tephra – the date of 100 +/- 40 radio-carbon years also has five intercepts on the calibration curve ranging from 240 to 0 calendar years before present.[20] The third (Beta 245515) is similarly problematic. Retrieved from very shallow deposits on the southeast corner of the overlook in the southwest portion of the site, the sample returned a radio-carbon date of 250 +/- 40 years and four intercepts on the calibration curve ranging between 430 and 0 years before present and is impossible to relate with any confidence to the cultural materials from this level, which quite likely consist of mixed components.

Of the of the non-cultural Wisconsin dates we note that a fragment of ivory from a scatter of this material found eroding from the hillside across the highway from the Little John site 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 supporting a range of mega-fauna during the mid to late Wisconsin glacial period from at least 38,000 years ago. Two Wisconsin Interstadial dates have also been obtained on two buried peats at KdVo-6 at c. 2.6 and 2.8 meters below surface in Unit N39 W09 of 42,000 and greater than 46,000 years radio-carbon years old, representing a depositional episode during the last Wisconsin Interstadial and perhaps earlier (Easton 2009a: 51-58; Easton et al. 2008). 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.

Thus there are now thirty dates we consider applicable to the cultural occupation of the site, supporting human occupation of the site from the recent past to the terminal Pliestocene. A separate manuscript exploring the implications of these dates to our interpretation of the Little John site and relating them to other dates in the borderlands region and middle Tanana Valley is in development. The structure of this manuscript can be found in my discussions on radio-carbon dates in my permit report for 2013 and will not be repeated here.

[20] Work is currently underway to examine thin-sections of the Little John tephra in an attempt to determine whether it represents the first or second ash-fall.

Table 10. Radio Carbon Dates for Yukon Borderlands

Lab #	RCBP	2 S CALBP	Intercept BP	1 S CALBP	Level	Unit	DBS CM	Material	Comments / Associations
Beta 181485 KdVo-6 2003-20 - REJECTED	130.44 +/- 0.86 pMC				B2 - L			Wood	Rejected - Radiometric Result indicates material was living post 1950
Beta 245516 KdVo-6 07-05 REJECTED	100 +/- 40	280 - 180 and 150 - 10, 0 - 0	240, 240, 60, 40, 0	260 - 220 and 140 - 20 and 0	B2	S16W18	15	Charred material	AMS Rejected due to location below Ash - burned root?
Beta 245515 KdVo-6 07-04	250 +/- 40	430 - 370 and 320 - 270, 180 - 150 and 10 – 0 *436 – 350 [0.248423] & 333 – 267 [0.447658] & 215 – 145 [0.248423] & 17 – 1 [0.045231]*	300	310 - 280	B1	S19W9	19	Charred material	AMS / Rejected - small foliate and basally thinned bifaces (Art #s 1345, 1386, 1485-86); note shallow deposit on deflationary surface and multiple intercepts include BP 1 - 17, may NOT date artifacts
600 – 150 Little Ice Age Cooler									
KdVo-3 *Mirror Creek Rock Quarry*	**810 +/- 80**	**732 – 694 *920 – 652 [0.997185] & 577 – 574 [0.002815]***		**729 - 704**	**B**	**?**	**?**	**?**	**associated with tools, bone, and flakes at km 1950 AH (Walde 1994)**
Beta 231793 KdV0-5*Nii-ii* S07-01	**920 +/-40**	**930 – 740 *924 – 758 [0.980897] & 753 – 745 [0.019103]***	**900 and 870 and 800**	**920 - 780**	**B2**	**Unit B**	**c. 15**	**Charred material**	**AMS from charcoal, anomalous with WRA above – root burn?**
Second (East Lobe) White River Ash Fall – circa 1,250 years ago									
Beta 231795	1620 +/- 40	1600 to 1410 *1605 – 1578 [-.056006] & 1574- 1409 [0.943994]*	1530	1550 - 1510 and 1460 - 1430	B2	N14W4		Charred material	
1,450 – 1,200 Medieval Neoglacial									
Beta 182799 KdVo-6 2003-11	1740 +/- 40	1725 – 1545 *1774 – 1759 [0.012482] & 1738 – 1551 [0.987518]*	1685, 1660, 1625	1705 – 1585	B2	S10W17 (U5NE)	11.5	Charred material	AMS – below ash date 2nd (c. 1200 BP) WR tephra on site
Beta 245517 KcVo-2 07-10 *Owl's Skull*	**1770 +/- 40**	**1810 – 1570 *1815 – 1598 [0.97926] & 1583 – 1571 [0.02074]***	**1700**	**1720 - 1680 and 1670 - 1620**	**B2**	**Test Unit N2**	**17 - 18**	**Charred Material**	**AMS / blade core / biface (wedge?)**
Beta 387618 Kdvo-6 N15W1 B2	1780 +/- 30	1815 – 1615 [1.0]			B2	N15W1	8	Charred Material	Large B2 hearth feature and artifacts (e.g. KdVo6:3706 Spokeshave /Graver)
First (North Lobe) White River Ash Fall - circa 1900 years ago									
Beta 245518 KdVo-6 07-11	1950 +/- 40	**1990 – 1820** ***1989 – 1822 [1.0]***	1890	1940 - 1870	B2	N9W8	40 - 45	Charred material	AMS associated with medial biface fragment (Art # 2112)
Beta 173826 KeVo-1 *Fox Den*	**2010 +/- 40**	**2050 – 1880 *2102 – 2088 [0.01543] & 2061 – 1875***	**1960**	**2000 - 1900**	**B2**	**S7W20 (TR2 - TP3)**	**12.5**	**Charred material**	**Standard date / basally thinned point and assoc. tools**

		[0.98457]							
Beta 383732 KdVo-6 12-10	2100 +/-30	2150 – 1995 *2146 – 1996 [1.0]*	2105 2085 2065	2120 – 2035 2025 – 2005	B2	S03 W23	26.5	Charred Material	AMS from Fe2012-14 Hearth associated with microblade (3929)
Beta 355049 KdVo-6 12-06	2169 +/- 30	2300 - 2240 and 2180 - 2110 and 2080 – 2060 *2308 – 2219 [0.501639] & 2212 – 2105 [0.46917] & 2083 – 2065 [0.029192]*	2150	2300 - 2270 and 2160 - 2120	B	N17 W16	22.5	Wood fragments	AMS from large late prehistoric hearth F2012-6/7 in N17W16 and N18W16 in B level (no WRA present)
Beta 245514 KeVo-3-01 Ta'ah Naakeeg	**2220 +/- 50**	**2340 – 2120** ***2342 – 2124 [1.0]***	**2300, 2240 and 2180**	**2330 - 2150**	**B2**	**TPG-6**	**12**	**Charred Material**	**AMS from hearth feature / core and modified blade**
Beta 75867 KaVn-2	**4740 +/- 60**	**5592 - 5322** ***5589 – 5439 [0.664269] & 5419 – 5322 [0.335731]***		**5582 - 5504**	**CZ 2 B2 Top**		**7**	**Charcoal**	**Top bracket date on CZ 2 B2**
Beta 173827 KeVo-1 Fox Den	**6210 +/- 70**	**7270 – 6900** ***7269 – 6938 [1.0]***	**7170**	**7240 - 7000**	**P2**	**N-21-B3**	**32 - 34**	**Organic sediment - bulk**	**Standard analysis on sediment - dates 2nd paleosol below brunisols – No Current Cultural Association**
8,500 – 8000 Younger Younger Dryas Cooler Mesoglacial - Glacial advances									
Beta 387614 KdVo-6 Fa08-045	7200 +/- 30	8035 -7960 [1.0]			P	N18 W07	97	Bone collagen, Swan	Fa08-045, long bone shaft fragments
Beta 68509 KaVn-2	**7810 +/- 80**	**8979 - 8412** ***8973 – 8914 [0.042812] & 8897 – 8884 [0.008913] & 8865 – 8829 [0,030855] & 8791 – 8417 [0.917421]***		**8659 - 8506**	**CZ 2 B2 Bottom**		**12**	**Charcoal**	**Bottom bracket date on CZ 2 B2**
Beta 323239 KdVo-6	8560 +/- 40	9550 – 9490 *9581 – 9574 [0.007768] & 9560 – 9477 [0.992232]*	9540	9540 - 9530	LowerPC	N18 W13	75	Wood	AMS associated with Fa11-79 and Fa11-80 (bison long bones, spiral fracture) and edge modified flake, Fe11-12
Beta 355050 KdVo6 12-09	8860 +/- 40	10170 - 9760 and 9750 – 9750 *10164 – 9774 [1.0]*	10110, 10100, 9920	10150 - 10060 and 10040 - 9990 and 9960 - 9900	bottom of P2	N17W16	65	Charred material	AMS associated with medial biface fragment KdVo6:4057 N17W16 P2 Z=63
Beta 182798 KdVo6 2003 Fa03-01	8890 +/- 50	10190 – 9865 and 9855 – 9780 *10190 – 9883 [0.92972] & 9878 – 9861 [0.014936] & 9849 – 9785 [0.055792]*	10130, 10060, 9945	10160 – 9910	Lower Paleosol	N16 W01 (U20SE)	67	Bone collagen, caribou?	AMS / on long bone shaft fragment, Fa03-01

UOC 0642 KdVo-6 S2011-16	8972 +/- 43	10231 – 9923 [1.0]			Paleosol complex	N19 W11	100	Wood	AMS / wood sample 2011-16, bottom of PC hearth Fe2011-15
Beta 387616 KdVo-6 Fa10-19	9370 +/- 30	10680 – 10515 [1.0]			PC3-P4	N16 W12	82.5	Bone collagen, bison	AMS long bone fragment Fa10-19
UOC 0645 KdVo-6 Fa14-03-04-01/02	9474 +/- 65	11083 – 10562 [1.0]			N20 W08	N20 W08	90	Bone collagen, Wapiti	AMS conjoining vertebra fragments Fa14-03-04-02/02 from Fe2014-01
UOC 0644 KdVo-6 Fa10-21	9502 +/- 59	11085 – 10587 [1.0]			L at base of PC	N16 W12	85	Bone collagen, caribou	AMS on tibia fragment, Fa10-21
10,000 – 9000 Milankovitch Thermal Maximum Warmer, Moister - Spread of forests									
Beta 217279 KdVo-6 06-04	9530 +/- 40	11090 – 10930 and 10880 – 10690 *11083 – 10924 [0.475311] & 10884 – 10694 [0.524689]*	10750	11060 – 10950 and 10780 – 10720	Upper Paleosol	N17W2 (U 32)	70	Bone collagen, caribou	AMS 6/30/06 – assoc bipointed bifaces (KdVo6: 140/531 and 530a/530b)
Beta 218235 KdVo-6 Fa06-04	9550 +/- 50	11120 – 10690 *11100 – 10705 [1.0]*	11050, 10970, 10760	11080 – 10940 and 10870 – 10720	Paleosol	N15W3 (31)	54.5	Bone collagen, swan femur	AMS 8/03/06 - assoc bipointed bifaces (KdVo6: 140/531 and 530a/530b)
Beta 241522 KdVo-6 Fa07-17	9580 +/- 60	11170 – 10700 *11152 – 10723 [1.0]*	11070, 10960, 10860, 10840, 10810	11100 - 10750	Paleosol	N16W8	98	Bone collagen, bison radius	AMS 3/11/08
Beta 406635 KdVo-6 C14S 2014-01	9780 +/- 30	11240 – 11185 [1.0]			L at base of PC3-P4	N17 W13	102	Charred material	AMS associated with EMF, EMSP, BTF, F (KdVo6:4375 – 4380)
Beta 355051 KdVo-6 13-12	9790 +/- 50	11260 – 11170 *11275 – 11125 [1.0]*	11220	11240 - 11200	PC3-P4	N17W13	91 - 94	Charred Material	AMS on burned plant material below biface (4219) in SW corner wall
Beta 323238 KdVo-6 12-03	9860 +/- 40	11320 – 11210 *11341 – 11201 [1.0]*	11240	11260 - 11230	PC - PC2	N19W11	72	Charred Material	AMS / directly beneath burned squirrel mandible
Beta 323237 KdVo-6 12-02	9890 +/- 40	11390 - 11380 and 11350 – 11230 *11392 – 11371 [0.42831] & 11368 – 11220 [0.957169]*	11260	11300 – 11290 and 11290 - 11240	PC - PC2	N18W11	84	Charred Material	AMS / direct bone beamer and hearth
Beta 382328 KdVo-6 2014	9970 +/- 40	11610 – 11520 and 11510 – 11255 *11611 – 11518 [0.211787] 11509 – 11259 [0.788213]*	11390 and 11380 and 11355	11405 - 11290	LbPC3-P4	N17W13	101.5	Bone collagn, mammal	AMS on bone below biface (4219)
Beta 241525 KdVo-6 Fa 07-30	10000 +/- 60	11760 to 11250 *11749 – 11733 [0.011921] & 11723 – 11263 [0.988079]*			Paleosol	N17W7	84	Bone collagen, wapiti phalanx	AMS 3/11/08

Beta 382339 KdVo-6 12-04	10110 +/- 30	11915 – 11910 and 11825 – 11610 and 11520 – 11510 *11988 – 11860 [0.130662] & 11841 – 11602 [0.836095] & 11528 – 11498 [0.026633] & 11427 – 11413 [0.00661]*	11775	11770 – 11700 and 11670 - 11645	LbPC3-P4	N17W19	88.5	Bone collagen, bison, naviculo cuboid	AMS on sample from specimen (Fa2012-51)
Beta 75868 KaVn-2	**10130 +/- 50**	**12275 - 11343** ***12023 – 11598 [0.92966] & 11554 – 11475 [0.053856] & 11437 – 11408 [0.016878]***	**n/a**	**11947-11874**	**CZ 1**	**n/a**	**30**	**Charcoal**	**terminal date of CZ1**
Wk-7841 KaVn-2	**10670 +/- 80**	**12974 - 12338** ***12731 – 12520 [0.945038] & 12478 – 12428 [0.054962]***	**n/a**	**12694 – 12575**	**CZ 1**	**n/a**	**29**	**Charcoal**	**basal date of CZ 1**
UOC 0643 KdVo-6 Fa06-133	10831 +/- 48	12793 – 12679 [1.0]			LbPC	N17 W04	78	Bone collagen, caribou	AMS on innominate with acetabulum, ischium, mature Fa06-133
Beta 303043 KdVo-6 11-01	10840 +/- 50	12880 – 12810 *12801 – 12682 [1.0]*	12840	12880-12810	PC - PC3?	N18W13	92	Wood	AMS / wood below bison bone at 75 bs (see Beta 323239, above)
12,800 – 11,500 Younger Dryas Colder, Dryer - Artemesia									
UCI 88769 KdVo-6 Fa06-41	10960 +/- 30	12905 – 12715 *12905 – 12715 [1.0]*	n/a	12905-12715	LbP	N13W02	52.5	bone collagen, wapiti	AMS / Fa 2006-41 innominate bone with cutmarks
14,000 – 12,800 Allerod Warmer - Shrub tundra									
Beta 387613 KdVo-6 Fa07-17	11140 +/- 40	13080 – 12970 [1.0]			PC	N17 W07	90	Bone collagen, caribou	AMS on astragulus Fa07-17
Beta 241523 KdVo-6 Fa07-20	12020 +/- 70	14077 to 13730 *14077 – 13730 [1.0]*	13850	13990 -13770	LbP	N17W4	85	Bone collagen, bison	AMS / vertebra bone with cutmarks
Beta 387617 KdVo-6 Fa10-137	12400 +/- 40	14715 – 14210 [1.0]			LbPC3-P4	N16 W12	105 – 115	Bone collagen, Bison	AMS on phalange
14,200 – 14,000 Older Dryas Colder - Herb tundra									
Beta 231794 KdVo-6 Ivory	38160 +/- 310	*42768 – 41894 [1.0]*			surface		0	Bone collagen, mammuthus?	AMS ivory fragment from hillside across road from KdVo6, non-cultural
Beta 246741 KdVo-6 08-02	42480 +/- 1460	*48808 – 43236 [1.0]*	n/a	*47237 – 44434 [1.0]*	Swale Paleosol	N end of Trench	280	Wood	AMS dates Wisconsin Interstadial Paleosol, non-cultural

Beta 246711 KdVo-6 08-04	N/A	> 46000	n/a	n/a	Swale Paleosol	N end of Trench	250	Wood	AMS dates Wisconsin Interstadial Paleosol, non-cultural

Notes:

1. Table Notes: Primary Dates are those provided by Beta Analytic or UOC in their report on results. Italicized Dates are those generated by the CALIB 7.02 calibration program which is based on IntCal13 (Reimer et al. 2013). The entire results of this calibration is reported in an accompanying appendix. Square [ ] brackets enclose the statistical probability for different calibrations based on multiple intercepts at the 2 sigma confidence level on the calibration curve.
2. Dates for KaVn-2 are from Heffner (2002), while those for KdVo-3 are from Walde (1994), recalibrated using the above source.
3. All other dates in the table are derived from samples submitted by Easton. Except where noted they were derived from the Accelerated Mass Spectrometric technique.

Figure 40.BisonPhalange, from LbPC3-P4, N16W12, KdVo6 Fa10-137 c. 14.715 – 14210 CAL BP.

SUMMARY OF RECOVERED FAUNA FROM THE LITTLE JOHN SITE, 2014

Recovered fauna from 2014 is detailed in the accompanying faunal databases in both Filemaker (with photographs) and Excel formats and summarized below. An analytical summary of recovered fauna through 2009 is presented in Yesner et al. (2011), while the entire faunal assemblage through 2011 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). Laurianne Bourgeon, a PhD student in taphonomy at the University of Montreal undertook additional examination of the Little John fauna in the summers of 2012 and 2013; a summary of her initial results of analysis of fauna through to 2012 was presented in our 2013 report and in Bourgeon (2013) submitted with that report. Further faunal analysis continues in collaboration with Yesner, Hutchinson, and Bourgeon. The Table below provides a summary of the 89 fauna specimens recovered in 2014 by identified species or class and excavation level.

Table 11. Summary of Recovered Fauna by Level, KdVo6-2014

Level ________ Common Name	PC	PC1 - P2	L b PC1	PC2 - P3	PC3 - P4	L b PC	Species Total	Species Percent
Mammal			6	1			7	7.7%
Bison				15	2		17	18.9%
Wapiti		1		33			34	37.8%
Caribou					1		1	1.1%
Large Mammal						4	4	4.4%
Red Fox		17					17	18.9%
Med Mammal	3	1		1			5	5.5%
Squirrel		1					1	1.1%
Small Mammal	3						3	3.3%
Wood Fragment	1						1	1.1%
Level Total	7	20	6	50	3	4	90	
Level Percent	7.7%	22.2%	6.7%	55.5%	3.3%	4.4%		100%
		Early Holocene 9,400 – 10,100 ybp		**Late Pleistocene 10,700 – 11,700 ybp**		**Late Pleistocene + 12,000 ybp**		

Eighty-nine faunal elements and one wood fragment recovered in 2014 have been examined within 90 catalogue entries. Fauna from the Late Pleistocene Paleosol Complex and intersecting Loess strata made up the majority of recovered fauna in 2014 (n = 86 or

95.5%), while 4 Large Mammal elements were recovered from below the Paleosol Complex proper. No fauna was recovered from the upper Holocene levels in 2014.

As seen in the Table below, Vertebrae fragments made up a third (33.7%, n=30) of the faunal elements collected in 2014; all except 1 came from a single semi-articulated group in Unit N20 W08 representing a single individual Wapiti. At 22.5 percent (n=20), Limb fragments represent the second largest element count, but again 17 of the 20 fragments came from contiguous units (N15 W12/13, N16 W12, and N17W12/13), and eleven of these co-join to form the medial section of a single Bison tibia. The third highest skeletal element present in the 2014 collection, Identifiable Cranial and Dental elements at 18.0 percent (n=16) are similarly skewed towards a single individual Red Fox from Units N19 W05/06. Six Rib fragments from large mammals (6.7%), one Pelvic fragment from a small mammal, and sixteen unidentifiable Post-cranial fragments (18%) complete the inventory of skeletal elements recovered in 2014.

Table 12. Counts of Identified Faunal Elements by Species or Class, KdVo6-2014.

Common Name	Cranial	Dentition	Post Cranial	Vertebrae	Thoracic	Pelvic	Limb	Total	Species %
Bison							17	**17**	**19.1**
Wapiti				29	1		2	**32**	**36.0**
prob Wapiti			2					**2**	**2.2**
Caribou					1			**1**	**1.1**
Large Mammal					4			**4**	**4.5**
Med Mammal		2	3					**5**	**5.6**
Red Fox	2	11	4					**17**	**19.1**
Squirrel							1	**1**	**1.1**
Small Mammal			1	1		1		**3**	**3.4**
Mammal	1		6					**7**	**7.9**
Total	**3**	**13**	**16**	**30**	**6**	**1**	**20**	**89**	
Element %	**3.4**	**14.6**	**18.0**	**33.7**	**6.7**	**1.1**	**22.5**		**100**

As mentioned above, a series of three specimens were found in close association with refitting elements that allow us to confidently assign them to the same individual of the same species; they have been cross-referenced as Features Fe 2014-01, Fe 2014-02, and Fe 2014-03.

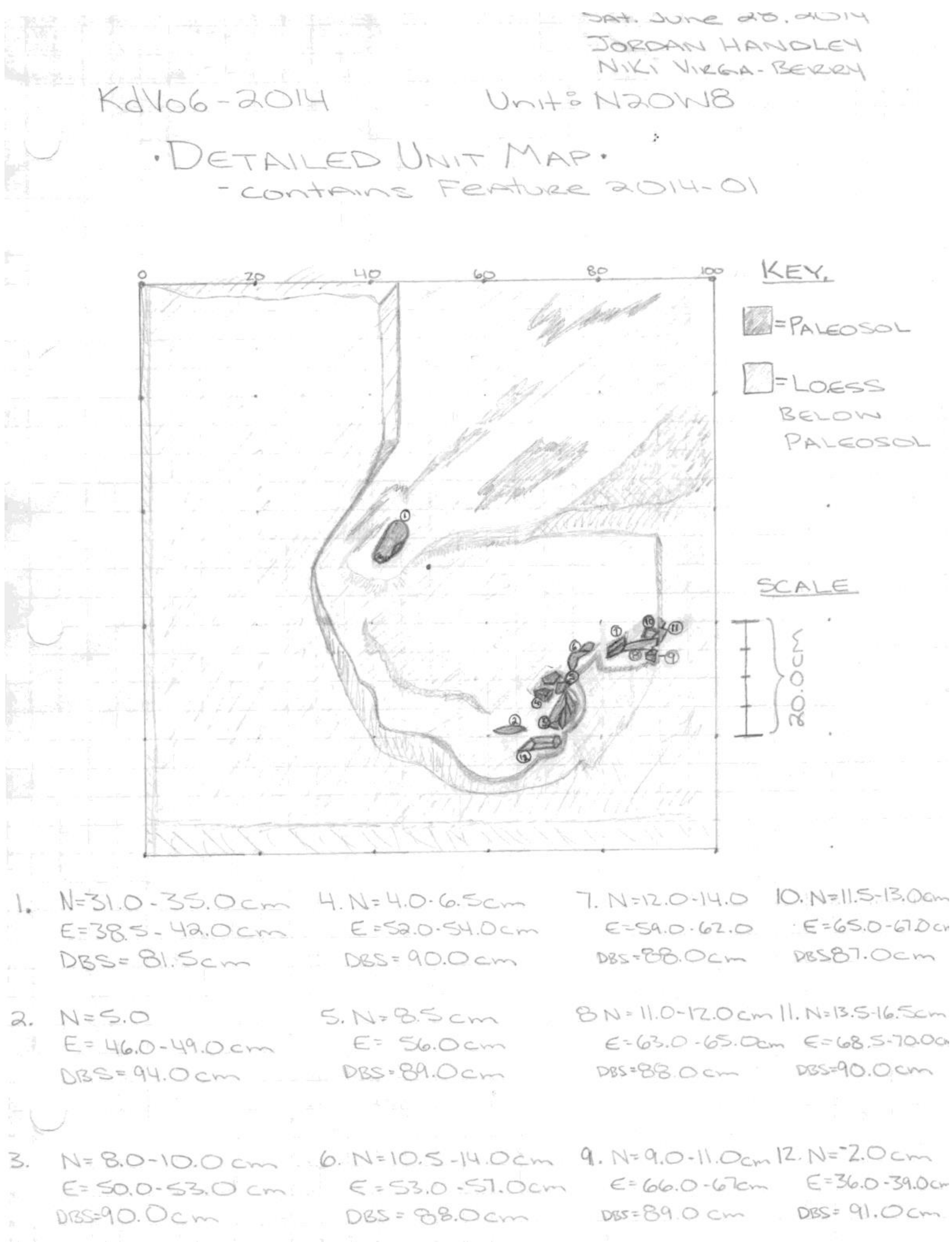


Figure 41. Provenience Map, KdVo6:Fe2014-01, Wapiti Vertebrae, P2, c. 88-94 cm BUD, N20W08

KdVo6:Fe 2014-01 is comprised of 29 semi-articulated Wapiti Vertebrae fragments, one metacarpal, and one rib fragment recovered from Unit N20 W08 from within the Second Paleosol encountered in the unit at depths between 88 and 94 cm below Unit Datum. The paleosols in this area of the site are not compacted into multiple strata, but more ephemeral, thinner, and separated by several centimeters of loess, so it is difficult to correlate this second paleosol with the more defined Paleosol Complex proper to the west. Fortunately we were able to obtain an AMS radio-carbon date on one of the elements. KdVo-6 Fa14-03-04-01/02 is a thoracic vertebra that returned a date of 9,474 +/- 65 radio-carbon years in age (UOC-0645), which has two intercepts on the calibration curve and lies somewhere between 11,083 and 10,562 calendar years at the two sigma level of significance. This date correlates well with those of the Paleosol Complex proper and undoubtedly relates to this occupation.

Figure 42. KdVo6:Fe2014-01, Wapiti Vertebrae Fragments in situ, P2, N20W08.

KdVo6:Fe2014-02 is comprised of 13 Cranial (including 11 Dental fragments) and four Post-Cranial skeletal elements assigned to a Red Fox recovered from Units N19 W05 and N19 W06 also from within the Second Paleosol encountered in the unit at depths between 51 and 71 cm below Unit Datum. We are awaiting a radio-carbon date on this specimen, but we expect it to be similar in age to the Wapiti specimen above.

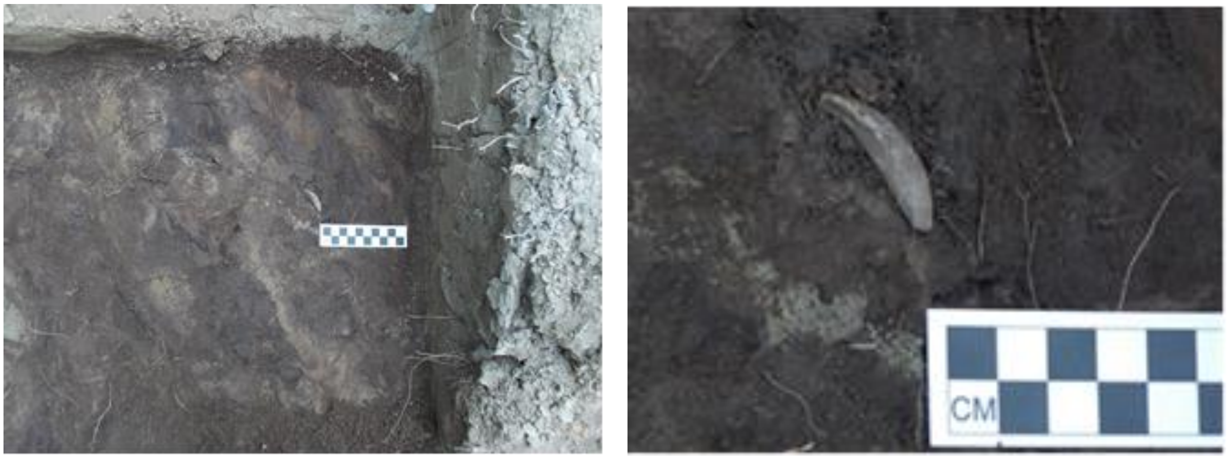


Figure 43. KdVo6:Fa15-02-03 in situ, Fox Canine, part of Fe2014-02, P2, N19W05.

KdVo6:Fe2014-03 is comprised of 11 medial fragments of a Bison Tibia, most of which refit together, from Units N16 W12 and N15 W13 recovered from within Paleosol Complex level 2 (P3) at between 81 and 83 cm below Unit Datum.

Figure 44. KdVo6:Fe2014-03, Bison Tibia Elements in situ, N16W12, Paleosol Complex, 81-83 cm below Unit Datum.

A full listing of Provenience, Species, and Element assignment is presented in the Table below.

Table 13. Provenience and Skeletal Elements of Recovered Fauna, KdVo6 2014.

Catalogue Number	Unit	Qu	Level	DBD	Type	Gross Element	Specific Element	Element Section	Pieces
Fa14-01	N17 W12	SW	PC3 - P4	96	Caribou	Thoracic	Rib	Medial	1
Fa14-02	N17 W12	SW	PC3 - P4	96	Bison	Limb	Metapoidal	Medial	1
Fa14-03-01	N20 W08	SW	PC2 - P3	81.5	Wapiti	Limb	Metacarpal	Distal	1
Fa14-03-03-01	N20 W08	SE	PC2 - P3	90	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-03-02	N20 W08	SE	PC2 - P3	90	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-03-03	N20 W08	SE	PC2 - P3	90	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-03-04	N20 W08	SE	PC2 - P3	90	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-04-01	N20 W08	SE	PC2 - P3	90	Wapiti	Vertebrae	Thoracic	Medial	2
Fa14-03-04-02	N20 W08	SE	PC2 - P3	90	Wapiti	Vertebrae	Thoracic	Medial	2
Fa14-03-05-01	N20 W08	SE	PC2 - P3	89	Wapiti	Vertebrae	Vertebrae	Lateral	1
Fa14-03-05-02	N20 W08	SE	PC2 - P3	89	Wapiti	Vertebrae	Sesamoid	Medial	1
Fa14-03-06-01	N20 W08	SE	PC2 - P3	88	Wapiti	Vertebrae	Vertebrae	Lateral	1
Fa14-03-06-02	N20 W08	SE	PC2 - P3	88	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-06-03	N20 W08	SE	PC2 - P3	88	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-07	N20 W08	SE	PC2 - P3	88	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-08-01	N20 W08	SE	PC2 - P3	88	Wapiti	Vertebrae	Vertebrae	Lateral	1
Fa14-03-08-02	N20 W08	SE	PC2 - P3	88	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-08-03	N20 W08	SE	PC2 - P3	88	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-08-04	N20 W08	SE	PC2 - P3	88	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-09-01	N20 W08	SE	PC2 - P3	89	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-09-02	N20 W08	NW	PC2 - P3	89	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-09-03	N20 W08	SE	PC2 - P3	89	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-10-01	N20 W08	SE	PC2 - P3	87	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-10-02	N20 W08	SE	PC2 - P3	87	Wapiti	Vertebrae	Vertebrae	Lateral	1
Fa14-03-10-03	N20 W08	SE	PC2 - P3	87	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-11-01	N20 W08	NW	PC2 - P3	91	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-11-02	N20 W08	SW	PC2 - P3	91	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-11-03	N20 W08	SW	PC2 - P3	91	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-12-01	N20 W08	SW	PC2 - P3	91	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-03-12-02	N20 W08	SW	PC2 - P3	91	Wapiti	Thoracic	Rib	Medial	1
Fa14-03-12-03	N20 W08	SW	PC2 - P3	91	Wapiti	Vertebrae	Vertebrae	Medial	1
Fa14-04	N15 W13	SW	PC1	78	MM	PC	Indeterminate	Medial	1
Fa14-05-01	N17 W13	SE	PC		SM	Pelvic	Illium	Proximal	1
Fa14-05-02	N17 W13	SE	PC		SM	PC	Indeterminate	Medial	1
Fa14-06-01	N17 W13	SW	PC		SM	Vertebrae	Vertebrae	Lateral	1
Fa14-06-02	N17 W13	SW	PC		MM	Dentition	PreMolar?	Buccal	2
Fa14-06-03	N17 W13	SW	PC		MM	PC	Indeterminate	Medial	1
Fa14-07-01	N16 W13	NW	L b PC		LM	Thoracic	Rib	Medial	1
Fa14-07-02	N16 W13	NW	L b PC		LM	Thoracic	Rib	Medial	1
Fa14-07-03	N16 W13	NW	L b PC		LM	Thoracic	Rib	Medial	1
Fa14-08	N15 W13		L b PC		LM	Thoracic	Scapula	Medial	1
Fa14-09-01	N15 W13	NE	PC2 - P3	81.5	Bison	Limb	Tibia	Medial	1
Fa14-09-02	N15 W13	NE	PC2 - P3	81.5	Bison	Limb	Tibia	Medial	1
Fa14-09-03	N15 W13	NE	PC2 - P3	81.5	Bison	Limb	Long Bone	Medial	1
Fa14-10-01	N16 W12	SW	PC2 - P3	83	Bison	Limb	Tibia	Medial	1
Fa14-10-02	N16 W12	SW	PC2 - P3	83	Bison	Limb	Tibia	Medial	3

Fa14-10-03	N16 W12	SW	PC2 - P3	83	Bison	Limb	Tibia	Medial	1
Fa14-10-04	N16 W12	SW	PC2 - P3	83	Bison	Limb	Tibia	Medial	2
Fa14-10-05	N15 W12	SW	PC2 - P3	83	Bison	Limb	Tibia	Medial	1
Fa14-10-06	N16 W12	NW	PC2 - P3	83	Bison	Limb	Tibia	Medial	1
Fa14-10-07	N16 W12	SW	PC2 - P3	83	Bison	Limb	Tibia	Medial	1
Fa14-10-08	N16 W12	SW	PC2 - P3	83	Bison	Limb	Tibia	Medial	1
Fa14-10-09	N16 W12	SW	PC2 - P3	83	Bison	Limb	Tibia	Medial	1
Fa14-11	N16 W13	SE	PC1 - P2	82	Squirrel	Limb	Calcaneus	Distal	1
Fa14-12	N15 W12	NW	PC2 - P3	77.5	MM	PC	Indeterminate	Medial	1
Fa14-13	N17 W13	SW	PC3 - P4	99	Bison	Limb	Long Bone	Medial	1
Fa14-14	N19 W06	SE	PC1 - P2	69	Red Fox	PC	Indeterminate	Medial	1
Fa14-15	N19 W06	SE	PC1 - P2	69	Red Fox	PC	Indeterminate	Medial	1
Fa14-15-01	N19 W05	SW	PC1 - P2	51	Red Fox	Dentition	Molar	Complete	1
Fa14-15-02-01	N19 W05	NW	PC1 - P2	51	Red Fox	Dentition	Maxillary Alveolar	Complete	1
Fa14-15-02-02	N19 W05	NW	PC1 - P2	51	Red Fox	Dentition	P4/Carnissial	Complete	1
Fa14-15-02-03	N19 W05	NW	PC1 - P2	51	Red Fox	Dentition	Carnissial	Complete	1
Fa14-15-02-04	N19 W05	NW	PC1 - P2	51	Red Fox	Dentition	Incisor? Maxillary?	Complete	1
Fa14-15-02-05	N19 W05	NW	PC1 - P2	51	Red Fox	Dentition	Carnissial enamel	Medial	1
Fa14-15-02-06	N19 W05	NW	PC1 - P2	51	Red Fox	Dentition	Maxillary	Complete	1
Fa14-15-02-07	N19 W05	NW	PC1 - P2	51	Red Fox	Cranial	Vomer?	Complete	1
Fa14-15-02-08	N19 W05	NW	PC1 - P2	51	Red Fox	PC	Indeterminate	Medial	1
Fa14-15-02-09	N19 W05	NW	PC1 - P2	51	Red Fox	PC	Indeterminate	Medial	1
Fa14-15-03	N19 W05	SW	PC1 - P2	51	Red Fox	Dentition	Maxillary	Complete	1
Fa14-15-04	N19 W05	SE	PC1 - P2	69	Red Fox	Dentition	Maxillary Alveolar	Complete	1
Fa14-15-05	N19 W06	SE	PC1 - P2	69	Red Fox	Dentition	M1	Complete	1
Fa14-15-06	N19 W06	SE	PC1 - P2	71	Red Fox	Dentition	M2	Complete	1
Fa14-15-07	N19 W06	SE	PC1 - P2	69	Red Fox	Cranial	Indeterminate	Medial	1
Fa14-16	N19 W06	SE	PC1 - P2	65	Wapiti	Limb	Metacarpal	Distal	1
Fa14-17	N20 W06	SE	L b PC	80	M	PC	Indeterminate	Medial	2
Fa14-18-01	N20 W06	SE	L b PC	80	M	PC	Indeterminate	Medial	1
Fa14-18-02	N20 W06	SE	L b PC	80	M	PC	Indeterminate	Medial	1
Fa14-19-01	N20 W06	NE	L b PC	80	M	Cranial	Mandible	Medial	1
Fa14-19-02	N20 W06	NE	L b PC	80	M	PC	Indeterminate	Medial	1
Fa14-20-01	N16 W13	NE	PC2 - P3	72	Wapiti?	PC	Pelvic?	Medial	1
Fa14-20-02	N16 W13	NE	PC2 - P3	72	Wapiti?	PC	Pelvic?	Medial	1
Fa14-21	N16 W13	NE	PC2		M	PC	Indeterminate	Medial	1

SUMMARY OF FEATURES FROM THE LITTLE JOHN SITE, 2014

Table 14. Inventory of Recorded Features and Associations, KdVo6 – 2014						
Feature #	**Nature**	**Unit/Quad**	**Level**	**Depth BD cm**	**Date**	**Comments**
Fe 2014-01	Wapiti Vertebrae	N20 W08	P2 (no PC)	88 - 94	26-28 July	Dated to c. 10.7 Cal BP
Fe 2014-02	Fox Cranial Elements	N19 W05/W06	P2 (no PC)	51 – 71	25 July	Reconstructed from fieldnotes
Fe 2014-03	Bison Tibia frags	N16 W12 N15 W13	PC2-P3	81 - 83	22 July	Multiple rejoining frags
Fe 2014-04	Hearth pit	N17 W12	PC2-P3	71 – 80	23 July	Hearth feature found in units to N and NE

Four archaeological features were recorded in the course of excavations in 2014; they are summarized in the Table above. We discussed and provided illustrations of the first three features in the preceding section describing recovered fauna. Here we provide a description of the final feature.

KdVo6:2014-04 is a Hearth Pit encountered in Unit N17 W12 in the PC2-P3 stratum at a depth between 71 and 80 cm below Unit Datum. The feature is in fact a continuation of a large hearth feature, representing multiple episodes of use over several hundreds of years encountered in adjacent units to the north and east. It is shown in profile in the figure below, along with an in situ shot of an large (L=46.25, W=30.27, T=5.32 mm) Biface Thinning Flake (KdVo6:4381) found near the base of the stratum.

Figure 45. KdVo6:Fe2014-04, Hearth Feature in Profile with Edge Modified Flake in situ at base, Paleosol Complex 3/P4, N17 W12.

SUMMARY DESCRIPTION OF SELECTED LITHIC ARTIFACTS FROM THE LITTLE JOHN SITE, 2014

Table 15. Summary of Recovered Artifacts and Percentile Distribution KdVo6 - 2014

Artifact Type	Total	% Total	% Lithic Tools	% Total Lithics
Biface	2	2.85	11.8	2.94
Blade	2	2.85	11.8	2.94
EMF	10	14.28	58.8	14.70
MCP	3	4.28	17.6	4.41
Total Lithic Tools	**17**	**24.26**	**100**	**-**
Debitage	51	72.85		75.00
Total Lithics	**68**	**94.28**		**99.99**
Historic	2	2.85		
Total Catalogued	**70**	**100**		

EMF = Edge Modified Flake
MCP = Modified Cobble or Pebble

This section provides summary descriptions of a selection of the major formed artifacts recovered at the Little John site in 2014. A total of 70 artefacts were recovered in 2014 and ordered into 61 unique catalogue numbers (KdVo6:4325 through 4385 inclusive).

As shown in the Table above, the majority of the recovered artifacts represent prehistoric aboriginal technology; Historic artifacts were only 3% (n = 2) of the assemblage. Lithic Tools made up 24% (n = 17) of the total, while associated Debitage related to the creation or curation of these tools accounted for nearly 73% (n = 51) of the assemblage.

The Table below provides a summary of recovered artifacts by type and stratum. With supporting new dates from the East Lobe we are now able to assign more precise chronological distinctions to the material recovered there. As the Table illustrates, we can now include the Loess above Paleosols and the first P1 stringer to the middle Holocene and the Northern Archaic tradition, circa 2,000 to 8,000 years ago.

Late Prehistoric material (post 1200 ybp) make up 5.71% (n = 4) of the assemblage, while Middle Prehistoric / Northern Archaic materials represent the largest component accounting for 67.14% (n = 47) of the 2014 assemblage.

In the East Lobe, 12 artifacts (17% of the total assemblage) were recovered from the Late Pleistocene Paleosol Complex; all of them were Flakes and, with the exception of one chert flake, all were struck from a basaltic objective piece. Seven artifacts were recovered from the Loess below Paleosol Complex stratum and consisted of 2 Edge Modified Flakes, 4 Flakes, 1 Hammerstone made on basaltic material, and 1 Split Pebble made on greenstone.

Table 16. Summary of Recovered Artifacts by Type and Stratum, KdVo6 - 2014

Level / Artifact Type	S	B1	A	B2	L	P1	PC 1/ P2	Lb PC1	Lb PC2	PC2/ P3	PC3 - P4	L b PC	Total
Biface	1					1							2
Blade				2									2
EMF				6	2							2	10
MCP-HS				2									2
MCP-SP												1	1
Flake			2	32	1		2	2	1	3	4	4	51
Historic		2											2
Totals	1	2	2	43	3	1	2	2	1	3	4	7	70
Percent		**5.71%**		**67.14%**			**5.71%**		**11.42%**			**10%**	**100%**
Period - Date (see Radiocarbon Dating)	**?**	**Late Holocene c. 1,900 – 150**		**Middle Holocene c. 2,000 – 8,000**			**Early Holocene c. 9,400 – 10,100**		**Late Pleistocene Post Younger Dryas c. 10,700 – 11,700**			**Late Pleistocene + 12,000**	

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 the Middle Holocene period prior to the White River Ash fall c. 1,900 years ago (67%), followed by the Late Pleistocene post-Younger Dryas period (11%). Combined the Late Pleistocene strata account for about 21 percent of the recovered artifacts in 2014, the Early Holocene 6 percent, and the Later Holocene about 73 percent. 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 entire artifact database from previous field seasons.

Raw Material Analysis - Visual Morphology of the 2014 Collection

A variety of lithic raw materials were used in the manufacture of the recovered artifacts. The Table below provides the distribution of lithic raw material by major stratigraphic levels present at the site from which the artifacts were recovered.

Considering the data in the Table below, Balsaltic material make up just over 57% (n = 40) of the artifacts; based on Jordan Handley's portable X-Ray Fluorescence analysis discussed in last year's report (Handley 2013, Handley et al. n.d.), it seems likely that the majority of this material will prove to be within the Andesite class of Basalts. Cherts make up 14.3% (n = 10) of the assemblage, Obsidian 21.4% (n = 15), while one piece of Greenstone accounts for 1.4% of the assemblage. Two Cobble artifacts (2.8%) are probably basaltic and dolomitic.

Table 17. Distribution of Raw Material of Total Lithics by Level, KdVo6 - 2014

Level / RM	**A**	**B1**	**Ash**	**B2**	**B2 L**	**L**	**P1**	**PC1 /P2**	**Lb PC1 /P2**	**PC2 /P3**	**Lb PC2 /P3**	**PC3 /P4**	**Lb PC**	**Total**	**%**
BaBl			1	10				1	1	2	1	4	5	25	**35.70**
BaGy	1			10			1	1		1			1	15	**21.42**
ChBl				2					1					3	**4.29**
ChBr				1										1	**1.43**
ChGr				2										2	**2.86**
ChGy				1	2									3	**4.29**
ChRd				1										1	**1.43**
CoBr				1										1	**1.43**
CoGy				1										1	**1.43**
GrGr													1	1	**1.43**
ObBl			1	12		1								14	**20.00**
ObGyBd				1										1	**1.43**
metal		2												2	**2.86**
Total	1	2	2	42	2	1	1	2	2	3	1	4	7	70	**100**
%	**1.4**	**2.9**	**2.9**	**60**	**2.9**	**1.4**	**1.4**	**2.9**	**2.9**	**4.3**	**1.4**	**5.7**	**10**		
Raw Material Codes: Ba = Basalt / Ch = Chert / Co = Cobble / Gr = Greenstone / Ob = Obsidian															
Colour Codes: Bl = Black / Gy = Grey / Gr = Green / Rd = Red / Br = Brown / GyBd = Grey Banded															

Table 18. Distribution of Raw Material by Artifact Type, KdVo6 - 2014

RM / Type	**BaBl**	**BaGy**	**ChBl**	**ChBr**	**ChGr**	**ChGy**	**ChRd**	**CoBr**	**CoGy**	**GrGr**	**ObBl**	**ObGyBd**	**Metal**	**Total**
Biface		2												2
Blade				1							1			2
EMF	1	2				3	1				2	1		10
Flake	23	11	3		2						11			51
MCP-SP										1				1
MCP-HS									1					1
CPA								1						1
Historic													2	2
Total	24	15	3	1	2	3	1	1	1	1	14	1	2	70

The majority of Balsaltic artifacts consisted of Debitage (n = 34 of 39 basaltic pieces). The remaining Basaltic assemblage consists of three Edge Modified Flakes and two Biface artifacts.

The Chert category accounts for 14.3% (n = 10) of the Total Lithics: five pieces of Flake debitage, four Edge Modified Flakes, and one Blade. The majority of the Chert material (n = 7), including the Blade, was located in the B2 stratum, while Edge Modified Flakes made on Grey Chert were recovered at the B2/Loess interfaced, and a single Black Chert Flake was found in the Loess between PC1/P2 and PC2/P3.

Fifteen of the recovered artifacts were of obsidian; 11 pieces were Debitage, 3 were Edge Modified Flakes, and 1 was a Blade from the B2 stratum, which contained a total of 13 obsidian artifacts. A single Edge Modified Flake made on Obsidian was recovered from the late Pleistocene loess of the West Lobe. The obsidian recovered in 2014 will be source analyzed by Jeff Rasic in 2015.

Bifaces

Table 19. Metric and Raw Material Attributes of Bifaces, KdVo6 - 2014

Artefact Number	Type	Unit	DBD cm	DBS cm	Sum Level	Sum RMC	Leng	Width	Thick	Wght
4383	point – chindadn?	N20 W06			P1 - P a PC	BaGy	19.84	18.38	3.91	1.3
4385	point	N25 E04	0	0	S	BaGy	39.71	20.42	6.35	5

Two formed Bifaces were recovered at Little John in 2014. Their location and metrics are summarized in the Table above, and photographs and general descriptions below.

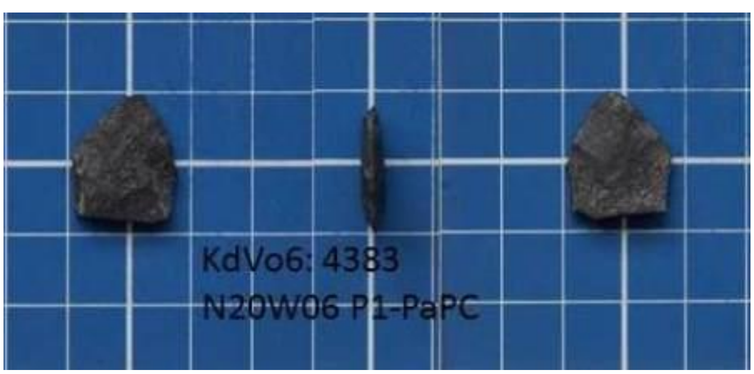


Figure 46. KdVo6:4383, Biface, N20W06, P1 – Paleosol above Paleosol Complex.

KdVo6: 4383 is a small and extremely thin pentagonal-shaped biface made on dark grey basalt or andesite recovered from Unit N20 W06 from the first paleosol stringer designated P1 – Paleosol above the Paleosol **Complex at a depth of . It bears** multiple invasive flake scars on both sides. It seems eroded. Assignment is either a small chindadn-like biface or, more likely, the tip of a larger biface.

Figure 47. KdVo6:4385, Biface, N25E04 - Surface.

KdVo6:4385 was found on the surface along the path between the major East Lobe excavations and the entrance to the site so the Unit designation of N25 E04 is approximate. This biface is truncated at one end (proximal?) along a single flake scar suggesting it was broken during late stage of manufacture. The shaping flake scars are covering and invasive, with a suggestion of pursuit of collateral technique. Both margins also bear extensive, regular, and straight retouch, although one margin is more deeply flaked, giving it a more serrated edge, suggesting that this might be the working edge of a cutting implement. Its surface provenience does not allow us to say much more at this point.

Large Blades

This class of artifacts consists of detached flakes struck from a prepared core in such a way as to produce roughly rectangular flakes with parallel or subparallel lateral edges and a length two times or more than its width, and with one or more roughly parallel arrises running from the proximal end to the distal end along the ventral surface (Andrefsky 2005).

Two Blade artifacts were recovered at KdVo-6 in 2014; one was a proximal fragment while the other was complete. Their location and metrics are summarized in the Table below, followed by photographs and general descriptions.

Table 20. Metric and Raw Material Attributes of Blade Technology, KdVo6 - 2014.

Artefact Number	Label	Unit	DBD cm	DBS cm	Sum Level	Sum RMC	Length	Width	Thick	Weight
4326	blade	N07 E05		20	B2	ObBl	20.01	14.24	4.16	0.99
4370	blade	S03 W22	8		B2	ChBr	46.1	15.63	8.06	4.4

Figure 48. KdVo6:4326, Blade Fragment, N07E05, B2.

KdVo6:4326 is a complete Blade flake made on obsidian recovered from Unit N07 E05 from within the B2 stratum at a depth of 20 cm below the surface. It bears a single arris on its dorsal surface along with inconsistent patina. The presence of a step fracture at the distal end suggests it broke from the objective core while being struck. This is supported by the absence of any evidence of retouch or use along the margin.

KdVo6:4370 is a larger Blade made on brown chert recovered from Unit S03 W22 in the West Lobe from within the B2 stratum at a depth of 8 cm below unit datum. It bears a single arris on its ventral surface with a feathered termination at the distal end, suggesting this is a complete blade. The ventral surface bears cortex along one entire facet and two, perhaps three steep flake scars at the distal end. It is also bears unifacial retouched along the left lateral edge of the ventral surface.

Figure 49. KdVo6:4370, Blade with Patina, S03W22, B2.

Figure 50. KdVo6:4370, Blade in situ, S03w22, B2.

Edge Modified – Retouched – Utilized Flakes

Edge Modified Flakes 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 created during their expedient use as slicing, cutting, or scraping implements. Less often they exhibit deliberate secondary modification in the form of semi-regular 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 (Andrefsky 2001).

This class of artifact is ubiquitous throughout the site through all levels. Nine specimens were collected in 2014: 6 came from the B2 (Mid Holocene), 1 from the B2/L (Early Holocene), 5 from the West Lobe Loess (Late Pleistocene), and 2 from the East Lobe Loess below the Paleosol Complex (Late Pleistocene – basal Little John). One specimen consists of two adjoining pieces, bring the total count to ten. Comprising 59% of Total Lithic Tools (n=10/17) and 14.3% of Total Lithics including debitage (n= 10/68), this artifact class is the highest among tool types and second highest among all lithics. Their location and metrics are summarized in the Table below, followed by photographs and general descriptions of a selection of this class of artifacts.

Table 21. Metric and Raw Material Attributes of Edge Modified Flakes, KdVo6 - 2014

Artefact Number	Sum Type	Seg	Unit	DBD cm	DBS cm	Sum Level	Sum RMC	L mm	W mm	T mm	Wt gm
4330	EMF	C	N02 E04		20	B2	BaGy	33.24	15.35	4.27	1.7
4331	EMF	C	N02 E04		20	B2	ChGy	20.65	14.71	1.71	0.4
4332	EMF	C	N02 E04		20	B2	ChRd	24.86	10.62	2.77	0.6
4335	EMF	B	N03 E05		40	B2 L	ChGy	50.30	22.62	4.71	4.3
4348	EMF	P	S02 W23	37		B2	ObGyBd	18.18	16.0	1.79	0.5
4351	EMF	C	S02 W23	36		B2	ObBl	13.99	10.46	1.46	0.3
4352	EMF	C	S02 W23	36		B2	ObBl	17.38	13.94	3.07	0.6
4380	EMF	C	N17 W13		106	L b PC	BaBl	21.65	9.59	2.04	0.3
4384	EMF	C	N18 W12			L b PC	BaGy	37.24	14.27	4.47	1.6

Seg=Segment C=Complete B=Broken P=Proximal. See Raw Material Distribution Table, above for RMC codes.

KdVo6:4380 and 4384 are two complete Edge Modified Flakes recovered from the Loess below Paleosol Complex stratum in Units N17 W13 and N18 W12 respectively. Both were struck from basaltic material. KdVo6:4380 is modified along the left lateral margin while KdVo6:4384 is modified at the distal end. Beyond describing these two Late Pleistocene artifacts there is little more of interest to remark on the small sample of edge modified flakes collected in 2014.

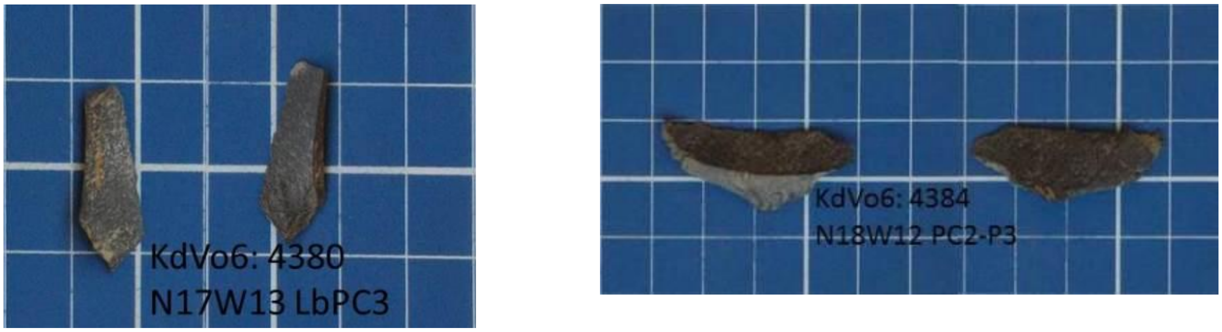


Figure 51. Left: KdVo6:4380, EM Flake, Left Margin, Both Margins, N17W13; Right: KdVo6:4385, EM Flake, Distal Margins, N18W12 - both Loess below Paleosol Complex.

Figure 52. KdVo6:4335, EM Flake, Both Margins, N03E05-B2/Loess

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

Only three Modified Cobble or Pebble artifacts were recovered at the Little John site in 2014, consisting of two Hammerstones and one Split Pebble. The table below provides a summary of their provenience and metrics and they are more fully described below.

This class of artifact is generally ubiquitous across the Little John site, consisting of cortical pebbles and cobbles with battered or punctate 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, split cobbles and pebbles for chopping wood and bone and other expedient cutting or scraping use, and flat-sided or split cobbles for use as a stable anvil base for preparing stone or breaking bone or planing wood and bone.

Table 22. Metric and Raw Material Attributes of Modified Cobbles and Pebbles, KdVo6 - 2014										
A #	**Sum Type**	**Unit**	**Lev**	**Typ/Loc Mod**	**L mm**	**W mm**	**T mm**	**Wt gm**	**RM**	**% Cortex**
4339	MCP-HS	S04W22	B2	BP BE	34.99	31	20.72	32.9	BaGy	75
4349	MCP-HS	S02W23	B2	BP BE	40.65	30.67	18.19	34.5	TnSd	100
4379	MCP-SP	N17W13	LbPC	UnD C LM	14.73	10.12	7.83	1.2	Gn	0
MCP=Modified Cobble/Pebble HS=Hammerstone SP=Split Pebble EM=Edge Modified BP=Battered Punctated BE=Both Ends UnD=Unifacial Dorsal C=Convex LM= Left Margin TnSd=Tan Sandstone Gn=Greenstone										

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; one is identified in the 2014 collection. Split Cobble Tools might be used as a Chopper or as a primary hide scraping tool (the Thii Cho); none were collected in 2014. 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; one was identified in 2014. 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. Scraper planes are large cobbles split to produce a flat surface at one end of which will be found steep unifacial retouch 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 only one Split Pebble was recovered this year, in general this class of artifact is well represented in the lower Late Pleistocene levels of the East Lobe. These strata in this area represent secondary processing and cooking of a variety of large and small mammal (as detailed in our earlier discussions on faunal remains from these levels in this report and elsewhere; c.f. Yesner, et al. 2001, Yesner et al. 2012).

KdVo6:4379 is an Edge Modified Split Pebble recovered in Unit N17 W13 from the Loess below the main Paleosol Complex strata at 106 cm below unit datum. Made on what we are designating greenstone, this small split pebble bears fairly steep unifacial retouch on the dorsal surface on the left lateral margin along a convex edge. It joins a small assemblage of similar small retouched split pebble artifacts detailed in previous reports.

Figure 53. KdVo6:4379, Edge Modified Split Pebble, N17W13 - LbPC.

The two artifacts designated as Hammer Stones recovered in 2014 were both from the B2 statum in the West Lobe.

Figure 54. KdVo6:4339, Hammer Stone, S04W22 – B2.

KdVo6:4339 is a small Hammer Stone of sandstone conglomerate recovered from Unit S04 W22 in the B2 stratum which is heavily battered at one end and punctated around the remaining margins and surface. Association with biface thinning flakes and debitage supports its cultural designation.

KdVo6:4349 is a larger Hammer Stone recovered from Unit S02 W23 from the B2 stratum at 39 cm below unit datum which bears a punctated surface on both sides of the artifact. Three edge modified flakes and 2 pieces of debitage were found in association in this unit as well, supporting its cultural designation.

Figure 55. KdVo6:4349, Hammer Stone, S02W23 – B2.

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 75% of collected lithics in 2014 (n=51/68). 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 2014; a fuller treatment awaits detailed future analysis.

The table below presents the distribution of 51 pieces of debitage collected in 2014 by Flake Type categories through stratigraphic levels at KdVo6. Debitage type generally reflects the stage of lithic manufacture being practiced; cortical flakes suggest earlier stages, large complete flakes middle stages, and high levels of thinning and sharpening flakes suggest late stage of manufacture and artifact maintenance.

Biface Thinning and Sharpening Flakes account for 27.5 (n=14) and 15.7 (n=8) percent of debitage collected in 2014 respectively, or 43.2 percent (n=22) combined, and Complete Flakes account for another 53 percent (n=27). Of the total 51 pieces of debitage only 7.8 percent (n=4) bear Cortex.

Table 23. Debitage Distribution by Flake Type and Level, KdVo6 2014

Label_______ Flake Type	Ash	B2	L	PC1 - P2	L b PC 1	PC2 - P3	L b PC 2	PC3 - P4	L b PC	Totals	Row %
complete	1	19 (1C)			2 (1C)	1	1	1	2	27	52.9
biface thinning	1	5 (1C)	1	1		1		3	2	14	27.5
sharpening		7				1				8	15.7
broken		1		1 (1C)						2	3.9
Totals	2	32	1	2	2	3	1	4	4	51	100
Column %	3.9	62.7	2.0	3.9	3.9	5.9	2.0	7.8	7.8	99.9	
Combined Column %	3.9	64.7		7.8		15.7			7.8		
Period - Appx. Date (see Radiocarbon Dating)	Late Holocene c. 1,900 – 150 ybp	Middle Holocene c. 3,000 – 8,000 ybp		Early Holocene 9,400 – 10,100 ybp		Late Pleistocene 10,700 – 11,700 ybp			Late Pleistocene + 12,000 ybp		

Historic Remains

Only one artifact from the historic period was recovered at the Little John site in 2014, consisting of a small “MasterLock” key for a padlock connected to a washer by a metal fishing line leader. It was found at the top of the B1 stratum in Unit N03 E03 and may be associated with the remains of the locker trunk and related historic materials found in N07 E06 in 2013?

Figure 56. KdVo6:4334, Masterlock Key on Washer, N03E03 – B1, 2014.

CONCLUDING REMARKS

The 2014 field excavations at the Little John site and associated analytical work over the past 18 months has further refined our understanding of this important site and simultaneously presented us with both new and continuing questions which we hope to address through subsequent field work and laboratory analysis.

In particular, new AMS radio-carbon dates obtained over the past year has resulted in an emergent pattern that suggests the chronological parameters of distinctive occupational periods at the Little John site. We discussed in detail these *Cultural Chronozones* in our 2013 report, suggesting four for the Late Pleistocene: one prior to the Younger Dryas during the Bolling-Allerod Interstadial, one at the onset of the Younger Dryas followed by abandonment of the site during the height of this cooling Stadial period, and a third beginning at the tail end of the Younger Dryas. The suggested fourth period of Late Pleistocene occupation might also simply be a continuation of the third, with their current separation a sampling artifact; our new dates seem to support this interpretation.

Within the Holocene proper we have suggestions of another four Cultural Chronozones. The oldest of these precedes the First White River Ash Fall of c. 1900 years ago, with new dates extending this period to about 8,000 years ago. The second begins immediately after the first eruption and lasts until just before the Second White

River Ash Fall of c. 1200 years ago. Our limited current dates relating to the Late Holocene are suggesting an 800 year period of abandonment of the site until the Late Prehistoric phase about 400 years ago, although I suspect that this hiatus is a sampling artifact. The final cultural period documented at the site is that of the Historic period of the last 150 years.

Six flakes (two edge modified) and an edge modified split pebble and four large mammal bones were recovered from the earliest Loess below Paleosol Complex strata, dated to between 13,000 and 14,400 years ago. Although the cultural materials from these early strata remain sparse they continue to grow with each subsequent year of excavation.

Work will continue at the Little John site in 2015 with a focus on detailed exploration of a small number of units in the East Lobe and extensive geophysical survey and analysis as we work to understand further the context and nature of one of the earliest camps of Canada’s First Peoples.

REFERENCES

Ackerman, R.E.
2001 Spein Mountain: A Mesa Complex Site in Southwestern Alaska. *Arctic Anthropology*, 38(2):81-97.

Alexander, H.L.
1987 *Putu: A Fluted Point Site in Alaska*. Department of Archaeology, Simon Fraser University Publication No. 17. SFU Press, Burnaby.

Altimara Consulting
2014 Western Copper And Gold Corporation Casino Project - Archaeological Resources Mitigation: Kdvi-1, Kevi-6, Kfvi-2, Kfvi-3, Kfvi-4, And Kfvi-5. Report submitted to the Yukon Heritage Resources Unit (Archaeological Sites Regulations Permit 13-06asr). Whitehorse, Yukon.

Anderson, D. D.
1968a A Stone Age Campsite at the Gateway to America. *Scientific American,* 218(6), 24-33.
1968b *Early Notched Point and Related Assemblages in the Western American Arctic*. Paper presented at the 67th Annual Meeting of the American Anthropological Association, Seattle, WA. Typesrcipt.
1970a *Akmak: An Early Archeological Assemblage from Onion Portage, Northwest Alaska*. Acta Arctica Fasc. 16.
1970b Microblade Traditions in Northwestern Alaska. *Arctic Anthropology,* 7(2), 2-16.

Andrefsky, W.
2001 *Lithic Debitage: Context, Form, Meaning*. University of Utah Press, Salt Lake City, Utah.
2005 *Lithics: Macroscopic Approaches to Analysis* (2nd Edition). Cambridge Manuals in Archaeology. Cambridge University Press, Cambridge.

Bever, M.R.
2001 Stone Tool Technology and the Mesa Complex: Developing a Framework of Alaska Paleoindian Prehistory. *Arctic Anthropology*, 38(2):98-118.
2006 Too Little, Too Late? The Radiocarbon Chronology of Alaska and the Peopling of the New World. *American Antiquity* 71:595-620.

Bigelow, N.H. and W.T. Powers
1994 New AMS dates from the Dry Creek Paleoindian Site, Central Alaska. *Current Research in the Pleistocene* 11:114-116.

Blackwelder, E.
1940 The Hardness of Ice. *American Journal of Science*. No. 238:61-62.

Bostock H. S.
1965 Notes on Glaciation in Central Yukon Territory. *Geological Survey of Canada, Paper 65-36*. Queen's Printer, Ottawa.

Bourgeon, L.
2013 Taphonomic Study of the Faunal Material of Little John Site (Yukon) – Preliminary Results. Unpublished report. July 2013.

Bunn, H. T. (1983), Comparative analysis of modern bone assemblages from a San hunter-gatherer camp in the Kalahari Desert, Botswana, and from a spotted hyena den near Nairobi, Kenya, in Animals and archaeology, 143-148.

Bureau of Indian Affairs [BIA].
1993a *Report of Investigation for Nach'etay Cheeg*. BLM AA-11784A. Ahtna, Inc. Anchorage: BIA ANCSA Office.
1993b *Report of Investigation for Chisana Native Graves*. Ahna, Inc. BLM AA-11715. Anchorage: BIA ANCSA Office.
1995a *Report of Investigation for Camp Creek*. BLM AA-10714H. Ahtna, Inc. Anchorage: BIA ANCSA Office.
1995b *Report of Investigation for Dit'aan Cheeg*. Ahtna, Inc. BLM AA-11783B. Anchorage: BIA ANCSA Office.
1996a *Report of Investigation for Tthiixaa' Cheeg*. BLM F-22390A. Ahtna, Inc. Anchorage: BIA ANCSA Office.
1996b *Report of Investigation for Nabesna Bar*. Ahtna Inc. BLM AA-10714I. Anchorage: BIA ANCSA Office.

Campbell, J. M.
1968 The Kavik Site of Anaktuvuk Pass, Arctic Alaska. Anthropological Papers of the University of Alaska 14:32-42. Fairbanks: UAF Press.

Carlson, C. C.
1979 The Early Component at the Bear Cove Site, BC. *Canadian Journal of Archaeology* 3:177-94.

Carlson, R.L.
1996a Introduction to Early Human Occupation in British Columbia. In *Early Human Occupation in British Columbia*, edited by R.L. Carlson and L. Dalla Bona, UBC Press, pp. 3-10.
1996b Early Namu. In *Early Human Occupation in British Columbia*, edited by R.L. Carlson and L. Dalla Bona, UBC Press, pp. 83-102.
2004 The Northwest Coast Pre-Microblade Horizon and the Nenana Complex. Paper Presented at the 31st Meeting of the Alaska Anthropological Association, Whitehorse.
2008 The Rise and Fall of Native Northwest Coast Cultures. *Journal of North Pacific Prehistory* Vol. II edited by Jim Cassidy. Pp: 93-121.

Cinq-Mars, J. & R. E. Morlan
1982 Ancient Beringians: Human Occupations in the Late Pleistocene of Alaska and the Yukon Territory. In D. M. Hopkins, J. V. Matthews Jr., C. E. Schweger, & S. B. Young (Eds.), *Paleoecology of Beringia*. New York: Academic Press.

Clark, D. W.
1983 Is There a Northern Cordilleran Tradition? *Canadian Journal of Archaeology,* 7, 23-48.
1991a *Western Subarctic Prehistory*. Ottawa: Canadian Museum of Civilization.
1991b The Northern (Alaska-Yukon) Fluted Points. In Robson Bonnichsen & Karen Turnmire (Eds.), *Clovis: Origins and Adaptations* (pp.35-48). Centre for the Study of the First Americans: Corvallis, OR.
1992 The Archaic in the Extreme Northwest of North America. *Revista de Arqueologia Americana,* 5, 74-99.

Clark, D. W., R. M. Gotthardt, & P. G. Hare
1999 *Microblade Complexes and Traditions in the Interior Northwest as Seen from the Kelly Creek Site, West-Central Yukon*. Whitehorse: Heritage Branch, Government of Yukon.

Clark, D. W. & R. E. Morlan
1982 Western Subarctic Prehistory: Twenty Years Later. *Canadian Journal of Archaeology*, 6, 79-83

Coffman, S.C. 2011 Archaeology at Teklanika West (HEA-001): An Upland Archaeological Site, Central Alaska. Masters Thesis. Department of Anthropology, University of Alaska – Fairbanks. Fairbanks, Alaska.

Coffman, S.C. and B. A. Potter
2011 Recent Excavations at Teklanika West: A Late Pleistocene Multicomponent Site in Denali National Park and Preserve, Central Alaska. *Current Research in the Pleistocene*. 28:29-32.

Coffman, S. C. and J. T Rasic
2013 Rhyolite Sourcing in Central Alaska – Preliminary Results. Poster presented to the Alaska Anthropology Association Annual Meeting, Fairbanks, Alaska.

Cook, J.P.
1969 Early Prehistory of Healy Lake, Alaska. Ph.D. dissertation. Department of Anthropology, University of Wisconsin - Madison.
1996 Healy Lake. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F.H. West, University of Chicago Press, pp. 323-327.

Cinq-Mars, J. and R. Gotthardt
1998 Extending the geographical and implicative ranges of the Nenana Complex. Notes on recent finds from Poulton Station, north-western Ogilvie Mountains, Yukon. Paper presented at the 1998 meetings of the Canadian Archaeological Association, Victoria, British Columbia.

Davis, Neil
2001 Permafrost: A Guide to Frozen Ground. Fairbanks: University of Alaska Press.

Denton, G. H.

1974 Quaternary Glaciations of the White River Valley, Alaska, with a Regional Synthesis for the Northern St. Elias Mountains, Alaska and Yukon Territory. Geological Society of America Bulletin Vol. 85:871-892.

Derry, D. E.
1975 Later Athapaskan Prehistory: a migration hypothesis. *The Western Canadian Journal of Anthropology*. 5(3-4):134-147.

Dilley, T. E.
1998 Late Quaternary Loess *Stratigraphy, Soils, and Environments of the Shaw Creek Flats Paleoindian Sites, Tanana Valley, Alaska*. Ph.D. Dissertation, Department of Geosciences, University of Arizona.

Dixon, E. J.
1999 *Bones, Boats, and Bison: Archeology and the First Colonization of Western North American Albu*. Albuquerque: University of New Mexico Press.
2013 Arrows and Atl Atls: A Guide to the Archaeology of Beringia. Washington, D.C.: National Parks Service.

Dobrowolsky, H.
1997 White River First Nation Land Use and Occupancy Study. Final Report to the White River First Nation, September 1997.

Dummond, D.
2010 The Dene Arrival in Alaska. In J. Kari and B.A. Potter (eds), The Dene-Yeniseian Connection. *Anthropological Papers of the University of Alaska*. Volume 5 New Series, Numbers 1-2, pp. 335-346.

Easton, N. A.
2002a *Final Report on Archaeological Investigations within the White River First Nation's Territory (1994 & 2001)*. Submitted to the White River First Nation, Yukon Heritage Branch, and Archaeological Survey of Canada (Archaeological Survey of Canada Permit # 94-4ASR [1994] and Yukon - Canada Archaeological Sites Regulation Permit # 01-15ASR [2001]).
2002b Final Report on Archaeological Investigations within the White River First Nation's Territory - 2002. Submitted to the White River First Nation and Yukon Heritage Branch.
2003 Eight Part Series on 2003 Field School in the Yukon News:"Unearthing Culture: A Field Guide", 9 June, p. 3; "Anthropology Students Get Their Hands Dirty", 20 June, p. 22; "Potlatch Serves as Initiation Ceremony for Student Anthropologists", 25 June, p. 20; "Ultimately, Archaeologists Have to Dig a Hole", 27 June, p. 25; "Tall Tales and Truth With Joseph Tommy Johnny", 9 July, p. 16-17, "Site Selection is a Science", 11 July, p. 20-21, "Students Travel in Recent Past", 8 Sept, p. 16, "The Present Sheds Light on the Past", 22 Sept, p. 10-11.
2004 Upper Tanana Plant Names and Cultural Notes Database. Research Manuscript. Northern Research Institute.

2005 "2004 Excavations at KdVo-6, a Nenana Complex Site of the Yukon - Alaska Borderlands." Paper delivered at the 32nd Annual General Meeting of the Alaska Anthropological Association. Anchorage, Alaska, 11 March 2005.
2007a "King George Got Diarrhea": The Yukon – Alaska Boundary Survey, Bill Rupe, and the Scottie Screek *Dineh. Alaska Journal of Anthropology*. Vol. 5, No. 1:95-118.
2007b The contributions of Richard Lee to the anthropological understanding of the really 'Real' western Subarctic Dineh culture in the twentieth century and the really 'Real' Richard Lee and me. *Before Farming* [online version] 2007/3 article 1.
2007c Excavations at the Little John Site (KdVo-6). Report to the White River First Nation, Yukon Heritage Branch, and Archaeological Survey of Canada. Whitehorse: Northern Research Institute.
2008a "It's Hard Enough to Control Yourself; It's Ridiculous to Think You Can Control Animals: Competing Views on the Bush in Contemporary Yukon." *The Northern Review*, No. 29 (Fall): 21-38.
2008b 2007 Archaeological Excavations at KdVo-6 and Regional Survey about Beaver Creek, Yukon Territory, Canada. Report to the White River First Nation, Yukon Heritage Branch, and Archaeological Survey of Canada. Whitehorse: Northern Research Institute.
2008c The Little John Site: 14,000 Years of Aboriginal Occupations in Southwest Yukon, Canada. Interpretive Poster. Whitehorse: Northern Research Institute.
2009a Archaeological Excavations at the Little John Site (KdVo6), Southwest Yukon Territory, Canada – 2008. Scottie Creek Culture History Project Research Manuscript 2009-01. Report to the White River First Nation, Yukon Heritage Branch, and Archaeological Survey of Canada. Whitehorse: Northern Research Institute.
2009b Scottie Creek Culture History Project – 2009 Field Summary. Scottie Creek Culture History Project Research Manuscript 2009-03. Whitehorse: Northern Research Institute.
2010 Archaeological Excavations at the Little John Site (KdVo6) Southwest Yukon Territory, Canada - 2009. Report to the White River First Nation, Yukon Heritage Branch, Archaeological Survey of Canada, and Northern Research Institute of Yukon College. Scottie Creek Culture History Project Research Manuscript 2010-01. Whitehorse: Northern Research Institute.
2011 Archaeological Excavations at the Little John Site (KdVo-6), Southwest Yukon Territory, Canada – 2010. Report to the White River First Nation, Yukon Heritage Branch, Archaeological Survey of Canada, and Northern Research Institute of Yukon College. Whitehorse: Northern Research Institute
2012 Archaeological Excavations at the Little John Site (KdVo-6), Southwest Yukon Territory, Canada – 2011. Report to the White River First Nation, Yukon Heritage Branch, Archaeological Survey of Canada, and Northern Research Institute of Yukon College. Scottie Creek Culture History Project Research Manuscript 2012-01. Whitehorse: Northern Research Institute.
2012a Yukon College Anthropology 225 Field Methods in Subarctic Archaeology and Anthropology 2012 Fieldwork Summary, 6 June – 9 August 2012. Report submitted to Yukon College, White River First Nation, and Yukon Heritage Branch.

2012b Report on a Pedestrian Survey in the Vicinity of the Confluence of Coffee Creek and the Yukon River, Yukon Territory, Canada – 1 – 3 August 2012. Report submitted to White River First Nation and Yukon Heritage Branch.

2012c Report on the 2012 Art and Archaeology Initiative - A Collaboration between Yukon College Field School in Archaeology, The Northern Cultural Expression Society and Members of the White River First Nation of Beaver Creek Yukon. Report submitted to the Northern Cultural Expression Society and Yukon College. 10 August 2012.

2013a The Biface Sequence from the Little John Site (KdVo-6), Yukon Territory, Canada: More of the Same But Different. A Symposium in Honor of Roy and Maureen Carlson. Paper delivered to the Canadian Archaeological Association Meetings, Whistler, B.C., 16 May 2013.

2013b Yukon College's Field School in Subarctic Archaeology and Ethnography: A Multi-Disciplinary Introduction to Anthropological Research for Undergraduates & First Nation Youth. Poster presented to the Canadian Archaeological Association Meetings, Whistler, B.C., 16 May 2013.

nd. Upper Tanana Fieldnotes. 1992 - 2014.

Easton, N. A., G. MacKay, C. Baker, K. Hermanson, and P. Schnurr.

2004. "Nenana in Canada - 2003 Excavation of a Multi-Component Site (KdVo-6) in the Mirror Creek Valley, Yukon Territory, Canada" Paper delivered at the 31st Annual General Meeting of the Alaska Anthropological Association. Whitehorse, Yukon, 10 April 2004.

Easton, N. A., G. MacKay, and P. B. Young.

2007 "Archaeological Survey and Excavations of the Yukon - Alaska Borderlands, 2006." Paper delivered at the 34th Annual General Meeting of the Alaska Anthropological Association. Fairbanks, Alaska, March 2007.

Easton, N. A., G. R. MacKay, P. Schnurr, P. B. Young, and C. Baker.

2007 The Little John Site (KdVo-6): A Late Glacial Multi-Component (Nenana - Denali Complex) Site in the Far Southwest of Yukon Territory, Canada. *Current Research in the Pleistocene*. Vol 24:82-84.

Easton, N. A. and G. MacKay.

2008 Early Bifacial Points from the Little John Site (KdVo-6), Yukon Territory, Canada. In R. L. Carlson and M.P.R. Magne (eds.), *Projectile Point Sequences in Northwestern North America*. Burnaby, B.C.: Simon Fraser University Press. Pp. 263-282.

Easton, N. A., D. R. Yesner, V. Hutchinson, P. Schnurr and C. Baker.

2009 Wisconsin Interstadial(?), Terminal-Pleistocene, and Early-Holocene Radiocarbon Dates from the Little John Site, Southwest Yukon Territory, Canada. *Current Research in the Pleistocene*. Vol. 26: 47-50.

Easton, N. A., G. R. MacKay, P.B. Young, P. Schnurr, and D. Yesner

2011 Chindadn In Canada? Emergent Evidence of the Pleistocene Transition in Southeast Beringia as Revealed by the Little John Site, Yukon. In Ted Goebel and

Ian Buvit (eds.), *From Yenisei to the Yukon: Explaining Lithic Variability in Late Pleistocene / Early Holocene Beringia*. College Station: Texas A&M University. Pp. 289 – 307.

Easton, N.A., M. Grooms, and J. Handley
2012 2011 Excavations at the Little John Site (KdVo6), Yukon Territory, Canada. Paper delivered to the 39th Annual Meetings of the Alaska Anthropological Association, Seattle, Washington, 1 March 2012.

Easton, N. A., M. Grooms, J. Handley, V. Hutchinson, and D.R. Yesner.
2013a Analytical Developments in Interpreting the Little John Site, 2013 Update. Poster presented to the Canadian Archaeological Association Meetings, Whistler, B.C., 16 May 2013.

Easton, N. A., D. Kennedy, and R. Bouchard.
2013 White River First Nation Traditional Territory: A Consideration of the Northern Boundary. Report to the White River First Nation.

Easton, N. A., M. Grooms, J. Cubley, M. Samolczyk, L. Bourgeon, J. Handley, N. Virga, V. Hutchinson, D. Yesner.
2013 Analytical Approaches to Interpreting the Little John Site (KdVo6), a Late Pleistocene Occupation in Yukon's Beringia. Poster presented at the Paleoamerican Odyssey Conference, Santa Fe, New Mexico. 18 October, 2013.

Easton, N. A., M. Grooms, J. Cubley, M. Samolczyk, L. Bourgeon, J. Handley, N. Virga, V. Hutchinson, D. Yesner.
2014 Excavations and Analysis of the Little John Site (KdVo-6), Yukon Territory, Canada, 2013. Paper presented to the Annual Meetings of the Alaska Anthropology Association, Fairbanks, AK, 6 March 2014.

Easton, N. A., V. Hutchinson, D. Yesner, A. Janssens, K. Herrera, L. Bourgeon
2014 An Electronic Database of Fauna from the Little John Site (KdVo-6). Research Database housed at Yukon College.

Easton, N. A., D. R. Yesner, V. Hutchinson, M. Grooms, and J. Handley.
2015 New Dates and a Proposed Chronology for the Little John Site (KdVo-6), a Multi-Component Site in Eastern Beringia, Yukon Territory, Canada. Paper presented to the Annual Meeting of the Society for American Archaeology, San Francisco, CA, 16 April 2015.

V. Hutchinson, N. A. Easton, D.R. Yesner, L. Bourgeon, B. Maley.
2015 Inter and Intra Site Patterns of the Late Pleistocene Fauna from the Little John Site (KdVo-6), a Multi-Component East Beringia Site in Yukon Territory, Canada. Paper presented to the Annual Meeting of the Society for American Archaeology, San Francisco, CA, 16 April 2015.

Grooms, M., N.A. Easton, M. Samolczk, and J. Cubley.
2015 Geoarchaeology at the Little John Site (KdVo-6), Yukon Territory, Canada. Poster presented to the Annual Meeting of the Society for American Archaeology, San Francisco, CA, 16 April 2015.

Esdale, J.A.
2008 A Current Synthesis of the Northern Archaic. *Arctic Anthropology*, 45(2):3-38.
2009 Lithic Production Sequences and Toolkit Variability: Examples from the Middle Holocene, Northwest Alaska. Ph.D. Dissertation. Department of Anthropology, Brown University. Providence, Rhode Island.

Fagan, B. M.
1987 *The Great Journey: The Peopling of Ancient America*. London: Thames & Hudson.

Farnell, R., P. G. Hare, E. Blake, V. Bowyer, C. Schweger, S. Greer, & R. Gotthardt.
2005. Multidisciplinary investigations of alpine ice patches in southwest Yukon, Canada: Paleoenvironmental and paleobiological investigations. *Arctic*, 57(3), 247-259.

Fedje, D.W., M.P.R. Magne, and T. Christensen
2005. Test Excavations at Raised Beach Sites in Southern Haida Gwaii and their significance to Northwest Coast archaeology. In *Haida Gwaii: Human history and environment from the time of Loon to the time of the Iron People*, edited by D. Fedje and R. Mathewes. UBC Press, pp. 204-241.

Friend, C., G. Holton and N. A. Easton
2007 "An American-Canadian Traditional Ecological Knowledge Study of the Upper Tanana River Fisheries." *Proceedings of Alaska Park Science Symposium 2006 - Park Science in Central Alaska: Crossing Boundaries in a Changing Environment*. Alaska Park Science. Vo. 6, Issue 2, (Dec) 2007: 78-82.

Friend, C. G. Holton, C. Brown, N. A. Easton, and M. Koskey
2007 Upper Tanana Subsistence Fisheries Traditional Ecological Knowledge Study, Final Report No. FIS 04-253. U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Management Program. Fairbanks, Alaska.

Giddings, J.L.
1956 The Burin Spall Artifact. *Arctic*, 9(4), 229-237.

Goebel, T. W.R. Powers and N. H. Bigelow.
1991. The Nenana Complex of Alaska and Clovis Origins. In *Clovis: Origins and Adaptations*, edited by R. Bonnichsen and K.L. Tunmire. Centre for Study of First Americans.

Goebel, T. and L. Pontti.
1992. The Chindadn Point: A New Type Fossil for the Beringian Paleolithic. Paper presented at the 21st Arctic Workshop, Fairbanks, Alaska.

Goebel, T. and N.H. Bigelow
1996. Panguingue Creek. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F.H. West. University of Chicago Press, pp. 366-370.

Goebel, T., W.R. Powers, N.H. Bigelow and A.S. Higgs
1996. Walker Road. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F.H. West. University of Chicago Press, pp. 356-362.

Goebel, T. & S. B. Slobodin.
1999. The Colonization of Western Beringia: Technology, Ecology, and Adaptations. In R. Bonnichsen and K. L. Turnmire (Eds.), *Ice Age People of North America: Environments, Origins, and Adaptation* (pp. 104-155). Centre for the Study of the First Americans, Corvallis: Oregon State University Press.

Greer, S. C.
1993. Annie Lake: A Southern Yukon Mid-Holocene Cultural Complex. *Canadian Journal of Archaeology*, 17, 26-42.

Grooms, M. and N. A. Easton
2013 Stratigraphy and Chronology at the Little John Site, Yukon Territory, Canada. Poster presentation to the 40th Annual Meetings of the Alaska Anthropology Association, Anchorage, AK, 15 March 2013.

Gotthardt, R.
1987. Selkirk Indian Band: Culture and Land Use Study. Mss. Selkirk Indian Band.
1990. The Archaeological Sequence in the Northern Cordillera: A Consideration of Typology and Traditions. Occasional Papers in Archaeology No. 1. Heritage Branch, Government of Yukon.

Grooms, M. and N. A. Easton
2012 Stratigraphy and Chronology at the Little John Site, Yukon Territory, Canada. Poster presentation to the Alaska Anthropology Association conference. Anchorage, AK.

Guzman, M.
2014 13,000 Years of Occupation at the Britannia Yukon Hill Site: Results of Exploratory Excavations at KfVi-3. Paper presented to the Alaska Anthropology Association Meetings, Fairbanks, Alaska, 8 March 2014.

Guthrie, R. D.
1990. *Frozen Fauna of the Mammoth Steppe*. Chicago: University of Chicago Press.

Hamilton, T.D and T. Goebel
1999. Late Pleistocene Peopling of Alaska. In *Ice Age Peoples of North America: Enivironments, Origins, and Adaptations of the First Americans*, edited by R. Bonnichsen and K.L. Turnmire. Centre for the Study of First Americans.

Hammer, T. J. and H. Dobrowolsky
2001 Tr'ochëk – the Archaeology and History of a Han Fish Camp. Dawson: Tr'ondëk Hwëchin.

Handley, J.D.
2013 An Exploratory pXRF Analysis of Non-Vitreous Igneous Artifacts At the Little John Site, Yukon Territory. Undergraduate Thesis for the Department of Archaeology, Simon Fraser University.

Handley, J. D., N. A. Easton, and R. Reimer.
2014 Elemental Analysis of Basaltic Materials from the Little John Site (KdVo6), Yukon Territory, Canada. Unpublished Mss.

Hare, P.G.
1995. *Holocene Occupations in the Southern Yukon: New Perspectives from the Annie Lake Site*. Whitehorse: Heritage Branch, Government of the Yukon.

Hare, P. G., S. Greer, R. Gotthardt, R. Farnell, V. Bowyer, C. Schweger, & D. Strand.
2004. Ethnographic and Archaeological Investigations of Alpine Ice Patches in Southwest Yukon, Canada. *Arctic*, 57(3), 260-272.

Hare, P. G. & T.J. Hammer.
1997. *New Data for a Late Persistence of Microblades in the Yukon*. Paper presented at the 24th Annual Meetings of the Alaska Anthropological Association, Whitehorse, Yukon.

Heffner, T..
2000. *Final Report for Permit #99-4ASR*. Submitted to White River First Nation and Yukon Heritage Branch.
2002. *KaVn-2: An Eastern Beringian Tradition Archaeological Site in West-Central Yukon Territory, Canada*. Whitehorse: Heritage Branch, Government of the Yukon.

Hoffecker, J.F.
1996. Moose Creek. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F.H. West. University of Chicago Press, pp. 363-365.
2011 Assemblage Variability in Beringia: The Mesa Factor. In Ted Goebel and Ian Buvit (eds.), *From Yenisei to the Yukon: Explaining Lithic Variability in Late Pleistocene / Early Holocene Beringia*. College Station: Texas A&M University. Pp. 165-178.

Hoffecker, J.F., W.R. Powers and T. Goebel
1993. The Colonization of Beringia and the Peopling of the New World. Science 259:46-53.

Hoffecker, J.F, W. R. Powers, and N. Bigelow
1996. Dry Creek. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F.H. West, University of Chicago Press, pp. 343-352.

Hoffecker, J.F. and S.A. Elias
2007. *Human Ecology of Beringia*. Columbia University Press.

Holmes, C.E.
1996. Broken Mammoth. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F.H. West, University of Chicago Press, pp. 312-318.
1998 New Data Pertaining to Swan Point, the Oldest Microblade Site Known in Alaska. *Current Research in the Pleistocene*, 15:21-22.
2001. Tanana River Valley Archaeology Circa 14,000 to 9000 BP. Arctic Anthropology 38(2): 154-170.
2008 The Taiga Period: Holocene Archaeology of the Northern Boreal Forest, Alaska. *Alaska Journal of Anthropology,* 6(1-2):68-81.
2011 The Beringian and Transitional Periods in Alaska: Technology of the East Beringian Tradition as Viewed from Swan Point. In Ted Goebel and Ian Buvit (eds.), *From Yenisei to the Yukon: Explaining Lithic Variability in Late Pleistocene / Early Holocene Beringia*. College Station: Texas A&M University. Pp. 179-191.

Holmes, C.E., R. VanderHoek, and T. E. Dilley
1996. Swan Point. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F.H. West, University of Chicago Press, pp. 319-323.

Hosley, E. H.
1981a. Environment and Culture in the Alaska Plateau. In June Helm (Ed.), *Handbook of the North American Indian, Vol. 6, Subarctic* (pp. 533-545).Washington: Smithsonian Institution.
1981b. Intercultural Relations and Cultural Change in the Alaska Plateau. In June Helm (Ed.), *Handbook of the North American Indian, Vol. 6, Subarctic* (pp. 546-555).Washington: Smithsonian Institution.

Hughes, O. L., N. W. Rutter and J. J. Clague
1989. Yukon Territory. In Chapter One of *Quaternary Geology of Canada and Greenland*, edited by R. J. Fulton. Geological Survey of Canada, Geology of Canada, No. 1:58-62.

Hutchinson, V., N.A. Easton, G. MacKay, P.B. Young
2007. Faunal Remains From the Little John Site (KdVo-6): An Early Holocene Assemblage from the Yukon - Alaska Borderlands. Paper presented to the Alaska Anthropology Association, Fairbanks, Alaska.

Ives, J. W.
1990 *A Theory of Northern Athapaskan Prehistory*. Calgary: University of Calgary Press.
2003 Alberta, Athapaskans and Apachean Origins. In J. W. Brink and J. F. Dormaar (Eds.), Archaeology in Alberta: A View from the New Millenium. Medicine Hat: Archaeological Society of Alberta, pp. 256-289.

Ives, J. W., D. Froese, K. Supernant, and G. Yanicki
2013 Vectors, Vestiges, and Valhallas – Rethinking the Corridor. In *Paleoamerican Odyssey*, edited by K. E. Graf, C. V. Ketron, and M. R. Waters. College Station: Center for the Study of the First Americans, pp. 149-169.

Johnson, F.
1946. An Archeological Survey Along the Alaska Highway, 1944. *American Antiquity*, 11, 183-186.

Johnson, F. & H. M. Raup.
1964. *Investigations in the Southwest Yukon: Geobotanical and Archeological Reconnaissance*. Arctic Institute of North America [Technical Paper No. 11].

Kari, J. and B. A. Potter
2010 The Dene-Yeniseian Connection. *Anthropological Papers of the University of Alaska. New Series, Vol. 5 (1-2)*. Fairbanks.

Krinsley, D. B.
1965. Pleistocene Geology of the Southwest Yukon Territory, Canada. *Journal of Glaciology* Vol. 5:385-397.

Kooyman, B. P.
2000 *Understanding Stone Tools and Archaeological Sites*. University of Calgary Press, Calgary.

Kunz, M.L., M. Bever, and C. Adkins
2003 The Mesa Site: Paleoindians above the Arctic Circle. BLM-Alaska Open File Report 86. http://www.blm.gov/pgdata/etc/medialib/blm/ak/aktest/ofr.Par.6519.File.dat/ofr86.pdf

Kunz, M.L. and R.E. Reanier
1994 Paleoindians in Beringia: Evidence from Arctic Alaska. Science 263:660-662.
1996 The Mesa Site, Iteriak Creek. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F.H. West. University of Chicago Press, pp. 497-504.

Leblanc R. J. & M. J. Wright.
1990. Microblade Technology in the Peace River Region of Northwestern Alberta. *Canadian Journal of Archeology*, 14, 1-11.

Lively, R.A.
1996. Chugwater. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F.H. West. University of Chicago Press, pp. 308-311.

Lerbekmo, J. F. and J. A. Westgate

1975. New Data on the Character and History of the White River Volcanic Eruption, Alaska. In *Quaternary Studies*, edited by R. P. Suggate and M. M. Cresswell, pp. 203-209.

Lewis, D. W. & D. McConchie.
1994a. *Practical Sedimentology*. Chapman and Hall, New York.
1994b. *Analytical Sedimentology*. Chapman and Hall, New York.

MacNeish, R. S.
1962 Recent Finds in the Yukon Territory of Canada. In Prehistoric Cultural Relations between the Arctic and Temperate Zones of North America. *Arctic Institute of North America Technical Paper No. 11*, 20-26.
1964. *Investigations in Southwest Yukon*. Robert S. Peabody Foundation for Archeological Excavations, Comparisons, and Speculations, Andover, MA: Phillips Academy.

Magne, M. P. R.
2012 Modelling Athapaskan Migrations. In From the Land of Ever Winter to the American Southwest: Athapaskan Migrations, Mobility, and Ethnogenesis, edited by D. J. Seymour. Salt Lake City: University of Utah Press, pp. 356-376.

Magne, M. P. R. and D. Fedje
2007 The Origin and Spread of Microblade Technology in Northern Asia and North America, ed. Y. V. Kuzmin, S. G. Keates, and C. Shen. Burnaby, British Columbia: Simon Fraser University Archaeology Press, pp. 171-188.

Matrix Research
2012 Heritage Resources Impact Assessment of the Kaminak Gold Coffee Project Conducted Under Permit 11-03ASR. Report submitted to Yukon Heritage Resources Unit, Whitehorse, Yukon.

Matson, R.G.
1996. The Old Cordilleran Component at the Glenrose Cannery Site. In *Early Human Occupation in British Columbia*, edited by R.L. Carlson and L. Dalla Bona, pp. 111-122.

Matson, R.G. and M.P.R. Magne
2007 Athapaskan Migrations: The Archaeology of Eagle Lake, British Columbia. Tucson: University of Arizona Press.

MacIntosh, G.
1997. Paleoecology of the Scottie Creek District, Beaver Creek, Yukon. Masters of Science Thesis. Department of Geology. University of Alaska – Fairbanks.

Mitchell, D. and D.L. Pokotylo
1996 Early Period Components at the Milliken Site. In *Early Human Occupation in British Columbia*, edited by R.L. Carlson and L. Dalla Bona, UBC Press, pp. 65-82.

Moberly, C.M.
1991 *The Campus Site: A Prehistoric Camp at Fairbanks, Alaska*. University of Alaska Press.

Moodie, D.W. & A. J. W. Catchpole.
1992 Northern Athapaskan Oral Traditions and the White River Volcano. *Ethnohistory*, 39, 2, 148-171.

Morlan, R.E.
1973 *The Later Prehistory of the Middle Porcupine Drainage, Northern Yukon Territory*. National Museum of Man Mercury Series, Archaeological Survey of Canada Paper No. 11. Ottawa: Queen's Printer.

Morlan R. & J. Cinq-Mars.
1982 Ancient Beringians: Human Occupation in the Late Pleistocene of Alaska and the Yukon Territory. In Hopkins D., J. Matthews, C. Schweger, & S. Young (Eds.), *Paleoecology of Beringia*, (pp. 353-381). New York: Academic Press.

Morrison, D. A.
1987 The Middle Prehistoric Period and the Archaic Concept in the Mackenzie Valley. *Canadian Journal of Archaeology,* 11, 49-74.

Nadasdy, P.
2007 The Gift in the Animal: The Ontology of Hunting and Human-Animal Sociality. American Ethnologist, 34, 1, 25-43.

Nakazawa, J.
2005 Refitted Material and Consideration of Lithic Reduction Sequence among Microblade Assemblages: A View from the Okushirataki-1 Site, Hokkaido, Northern Japan. Asian Perspectives, Vol. 49, No. 2: 332-347.

Odell, G. H.
2003 *Lithic Analysis*. Manuals in Archaeological Method, Theory, and Technique. Springer Press, New York.

Oswald, E. T. & J. P. Senyk.
1977 *Ecoregions of Yukon Territory*. Canadian Forest Service, Pacific Forestry Research Centre, Report BC-X-164. Vancouver: Fisheries and Environment Canada.

Outram, A. K. (2001), A new approach to identifying bone marrow and grease exploitation: why the "indeterminate" fragments should not be ignored, Journal of Archaeological Science, 28(4), 401-410.

Pearson, G.A.
1999. Early Occupations and Cultural Sequence at Moose Creek: A Late Pleistocene Site in Central Alaska. *Arctic* 52:332-345.

Pewe, T. L.
1975. Quaternary geology of Alaska: US Geological Survey Professional Paper 835.

Pewe, T. L. & R. D. Reger (eds.).
1983. Guidebook to permafrost and Quaternary geology along the Richardson and Glenn Highways between Fairbanks and Anchorage. Guidebook 1. Fourth International Permafrost Conference. Fairbanks. Alaska Division of Geological and Geophysical Surveys.

Potter, B.A.
2005. Site Structure and Organization in Central Alaska: Archaeological Investigations at Gerstle River. Ph.D. Thesis, Department of Anthropology, University of Alaska - Fairbanks.
2010 Archaeological Patterning in Northeast Asia and Northwest North America: An Examination of the Dene-Yeniseian Hypothesis. In J. Kari and B.A. Potter (eds), The Dene-Yeniseian Connection. *Anthropological Papers of the University of Alaska*. Volume 5 New Series, Numbers 1-2, pp. 138-167.

Potter, B.A., J.D. Irish, J.D. Reuther, C. Gelvin-Reymiller and V.T. Holliday
2011 A Terminal Pleistocene Child Cremation and Residential Structure from Eastern Beringia. Science. Vol. 331 (25 Feb): 1058-1062 and Supporting Online Materials.

Potter, B. A., C. E. Holmes, D. R. Yesner
2013 Technology and Economy among the Earliest Prehistoric Foragers in Interior Eastern Beringia. In *Paleoamerican Odyssey*, edited by K. E. Graf, C. V. Ketron, and M. R. Waters. College Station: Center for the Study of the First Americans, pp. 81-103.

Potter, B. A, J.D. Irish, J.D. Reuther, H. J McKinney
2015 New insights into Eastern Beringian mortuary behavior: A terminal Pleistocene double infant burial at Upward Sun River www.pnas.org/cgi/doi/10.1073/pnas.1413131111

Powers, W. R. and J. F. Hoffecker.
1989 Late Pleistocene Settlement in the Nenana Valley, Central Alaska. *American Antiquity* 54:263-87.

Rampton, V.
1971a Late Pleistocene Glaciations of the Snag-Klutlan Area, Yukon Territory. *Arctic* Vol. 24:277-300.
1971b Late Quaternary Vegetational and Climatic History of the Snag-Klutlan Area, Southwestern Yukon Territory, Canada. *Geological Survey of America*, *Bulletin* 82: 859-978.

Reimer PJ, Bard E, Bayliss A, Beck JW, Blackwell PG, Bronk Ramsey C, Buck CE, Cheng H, Edwards RL, Friedrich M, Grootes PM, Guilderson TP, Haflidason H, Hajdas

I, Hatté C, Heaton TJ, Hogg AG, Hughen KA, Kaiser KF, Kromer B, Manning SW, Niu M, Reimer RW, Richards DA, Scott EM, Southon JR, Turney CSM, van der Plicht J.
2013 IntCal13 and MARINE13 radiocarbon age calibration curves 0-50000 years calBP. *Radiocarbon* 55(4). DOI: 10.2458/azu_js_rc.55.16947

Reuther, J.D., N. Slobodina, J. Rasic, J.P. Cook, and R.J. Speakman.
2011 Gaining Momentum: Late Pleistocene and Early Holocene Obsidian Source Studies in Interior and Eastern Beringia. In Ted Goebel and Ian Buvit (eds.), *From Yenisei to the Yukon: Explaining Lithic Variability in Late Pleistocene / Early Holocene Beringia*. College Station: Texas A&M University. Pp.

Slobodina, N. S. and R.J. Speakman
2008. Source Determination of Obsidian Artifacts from KdVo-6, KeVo-1, and *Taatsaan* Sites. Manuscript Report submitted to N. A. Easton, Yukon College, Whitehorse.

Smith, C.A.S., J.C. Meikle & C.F. Roots. (Eds.).
2004 *Ecoregions of the Yukon Territory – Biophysical Properties of a Yukon Landscape.* [PARC Technical Bulletin]. Ottawa: Agriculture and Agri-Food Canada.

Stiner, M. C. et al. (1995), Differential burning, recrystallization, and fragmentation of archaeological bone, Journal of Archaeological Science, 22, 223-237.

Stryd, A.R. and M.K. Rousseau.
1996 The Early Prehistory of the Mid Fraser-Thompson River Area. In *Early Human Occupation in British Columbia*, edited by R.L. Carlson and L. Dalla Bona, UBC Press, pp. 177-204.

Shinkwin, A.D.
1979 *Dakah de nin's Village and the Dixthada Site: A Contribution to Northern Athapaskan Prehistory*. National Museum of Man Mercury Series, Archaeological Survey of Canada Paper No. 91. Ottawa: Queen's Printer.

Vajda, E.J.
2010a A Siberian Link with Na-Dene Languages. In J. Kari and B.A. Potter (eds), The Dene-Yeniseian Connection. *Anthropological Papers of the University of Alaska*. Volume 5 New Series, Numbers 1-2, pp. 138-167.
2010b Yeniseian, Na-Dene, and Historical Linguistics. In J. Kari and B.A. Potter (eds), The Dene-Yeniseian Connection. *Anthropological Papers of the University of Alaska*. Volume 5 New Series, Numbers 1-2, pp. 138-167.

Wahl, H. E., D. B. Fraser, R. C. Harvey, and J. B. Maxwell.
1987 Climate of the Yukon. Climatological Studies Number 40. Atmospheric Environment Service, Environment Canada. Ottawa: Canadian Government Publishing Centre.

Walde, K.
1991. *Archeological Assessment of the Shakwak Highway Upgrading Project, km 1910 to km 1969*. Whitehorse: Yukon Heritage Branch.
1994. *Archeological Salvage Program at KaVn-2, KbVo-1, KbVo-2, and KdVo-3, Alaska Highway, Shakwak Project, Segments 16A, 17A, and 18B, Beaver Creek Area, S.W. Yukon*. Whitehorse: Yukon Heritage Branch.

West, F.H.
1967 The Donnelly Ridge Site and the Definition of an Early Core and Blade Complex in Central Alaska. *American Antiquity* 32:360-382.
1981 *The Archeology of Beringia*. New York: Columbia University Press.
1996a The Archaeological Evidence. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F.H. West. University of Chicago Press, pp. 537-564.
1996b Teklanika West. In *American Beginnings: The Prehistory and Paleoecology of Beringia*, edited by F.H. West. University of Chicago Press, pp. 332-342.
1996c Editor. *American Beginnings: The Prehistory and Paleoecology of Beringia* Chicago: University of Chicago Press.

West, K.D. and J.A. Donaldson.
2002. Resedimentation of the late Holocene White River tephra, Yukon Territory and Alaska. In *Yukon Exploration and Geology*, edited by D.S. Edmond, L.H. Weston and L.L. Lewis. Exploration and Geological Service Division, Yukon Region, Indian and Northern Affairs, Canada, pp. 239-247.

Wisner, G.
2010 The Little John Site: Rewarding Archaeologists and Yukon Natives. Mammoth Trumpet, 25 (3):8-12.

Workman, W. B.
1974. First Dated Traces of Early Holocene Man in Southwest Yukon Territory, Canada. *Arctic Anthropology*, 11 (supplemental), 94-103.
1978. *Prehistory of the Aishihik – Kluane Area, Southwest Yukon Territory*. Ottawa: National Museums of Canada.

Wright, J. V.
1995. A History of the Native People of Canada. *Canadian Museum of Civilization Mercury Series, Archaeological Survey of Canada Paper, Volume I* (No. 152). Ottawa: Canadian Museum of Civilization.

Yesner, D. R.
1996. Human Adaptations at the Pleistocene – Holocene Boundary (circa 13,000 to 8,000 B.P.) in Eastern Beringia. In L. G. Straus, B. V. Eriksen, J. M. Erlandson, & D. R. Yesner (Eds.), *Humans at the End of the Ice Age: The Archaeology of the Pleistocene-Holocene Transition* (pp. 255-257). New York: Plenum Press.

Yesner, D.R., C.E. Holmes, and K.J. Crossen.

1992. Archaeology and Paleoecology of the Broken Mammoth Site, Central Tanana Valley, Interior Alaska. *Current Research in the Pleistocene* 9:53-57.

Yesner, D.R. and G. Pearson.
2002. Microblades and Migrations: Ethnic and Economic Models in the Peopling of the Americas. In *Thinking Small: Global Perspectives on Microlithization*, edited by Robert G. Elston and Steven L. Kuhn. Archaeological Papers of the American Anthropological Association No.12 , Pp. 133-161.

Yesner, D. R., K. J. Crossen, and Norm A. Easton
2008 "Permafrost is no excuse": Geoarchaeology and Zooarchaeology of the Little John Paleoindian Site, Alaska/Yukon Borderlands. In *Proceedings of the Ninth International Conference on Permafrost*, University of Alaska Fairbanks, Vol. 2, editied by D. L. Kane and K. M. Hinkel, pp. 1993–1996.Institute of Northern Engineering, University of Alaska Fairbanks, Fairbanks.

Yesner, D.R., K.Crossen, and N. A. Easton.
2011 Geoarchaeological And Zooarchaeological Correlates Of Eastern Beringian Lithic Assemblages: Insights from the Little John Site, Yukon. In Ted Goebel and Ian Buvit (eds.), *From the Yenisei to the Yukon: Interpreting Lithic Assemblage Variability in Late Pleistocene/Early Holocene Beringia.* Center for the Study of the First Americans, Texas A&M University Press, College Station, Texas. pp. 308 – 322.

Yesner, D. R., N.A. Easton, K.J. Crossen
2012 Effects of Permafrost and Other Cryological Phenomena on the Structure of Faunal Assemblages in Late Pleistocene - Early Holocene Beringian Sites. Paper presented to "Frozen Pasts" – 3rd International Glacial Archaeology Conference. Whitehorse, Yukon Territory, Canada, 4 June 2012.

Youatt, E.
2010 Becoming Native Again: Cultural Revitalization of the White River First Nation in the Yukon/Alaska Borderlands. Undergraduate Honours Thesis, Division of History and Social Sciences, Reed College.

Youatt, E. and N. A. Easton
2010 "The Reports of My Death Have Been Greatly Exaggerated" – Cultural Continuity of the Yukon – Alaska Borderland *Dineh*." Paper presented to the 37th Annual Meetings of the Alaska Anthropological Association, Anchorage, Alaska, 26 March 2010

Figure 57. Jordan Handley and Dr. Rudy Riemer applying portable XRF measurements.

Figure 58. 2013 Field Crew and NCES Art and Archaeology Participants.