Archaeological Excavations at the Little John Site (KdVo-6), Southwest Yukon Territory, Canada - 2011

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

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Scottie Creek Culture History Project Research Manuscript 2012-01
Northern Research Institute, Whitehorse, Yukon
(June 2012)

AKNOWLEDGEMENTS

The 2011 activities of the Scottie Creek Culture History Project were financially supported by the White River First Nation of Beaver Creek, School for Liberal Arts, Yukon College, credit and non-credit participants in Anthropology 225 – Field Methods in Subarctic Archaeology and Ethnography, The Northern Research Institute at Yukon College, Northway, Tetlin, and Tanacross Native Villages of Alaska, Tanana Chiefs Conference, Alaska, Westmark Hotel – Beaver Creek, 1202 Motor Inn of Beaver Creek, and me.

Fieldworkers included:

- Credit Undergraduate students in ANTH 225: Julie Thomas, Katie Fittingoff (NYU), Ally Zeiger (Haines, AK), Jordan Handley (Vancouver Island University), Tia Marie Ray (Harvard University), Sarah Rickett (Las Vegas), Pawel Wojowitz (Gdansk, Poland)
- Credit Graduate Students with approval of their committees: Michael Grooms (PhD program, Dept of Anthropology, U of New Mexico, Supervisor Dr. E James Dixon) and Nicolena Virga (M.A. program, Department of Anthropology, U of Southern California – Fullerton, Supervisor Dr. Steven James).
- Research Interns / Volunteers: Mark Young (UBC), Joseph Easton and Hillary Wong (Vancouver, B.C.), Margo MacKay (Anchorage, AK), Nick Jarmain (UNM), Peter and Lucy Schnurr
- White River First Nation Youth: Chelsea Johnny, Trudy Brown, Eldred Johnny, Eddie Johnny, Tamika Johnny
- Dr. David Yesner, University of Alaska, Anchorage.

Figure 1. The 2011 Field Crew at the Little John Site.

The generosity and support extended by the inhabitants of the borderlands is greatly appreciated. In particular Chief David Johnny of the White River First Nation, Elders Darlene Northway, Martha Sam, Ada Gallen, Jenny Sanford, Joseph Tommy Johnny, and Danny Thomas, as well as Ruth Johnny, Marilyn Sanford, Angela and Robert Lee Demit all provided meaningful instructions in the *Dineh Way* and provided gifts of the land and their time to their *Noogli* visitors. Sid Vandermeer, Jr. facilitated administrative relations with the White River First Nation, including providing office space for historical research conducted by Amanda Rose Solmes. Joe Young, of Tok, Alaska and proprietor of Young's Timber, once again provided us with milled lumber for further infrastructural improvements at the site.

Ts'inni Cho.

Norman Alexander Easton / Ts'ogot Gaay

Figure 2. E. James Dixon, N. A. Easton, Robert Sattler at the Tanana Chiefs Conference, Fairbanks

Cover Photo: East Lobe Excavation Unit on Arrival to the Little John Site, May 2011

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SUMMARY OF ACTIVITIES

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

With the permission and support of the White River First Nation, archaeological and ethnographic research was undertaken under the direction between 20th of May and 10 July, 2011 in the region about Beaver Creek, Yukon Territory.

Major Results of this fieldwork included:

- Training in archaeology and ethnography of 14 credit and intern / volunteer students from Outside, two graduate students, and five local native youth.
- Excavation of 8 new one meter units on the West Lobe, 4 on the hilltop to the east of the cabin, continued excavation of 13 units previously initiated in 2009 and 2010 in the East Lobe Pleistocene sediments, and a series of 25 cm square tests in the Northwestern quadrant of the site that were profiled and sampled in support of geomorphological studies.

- Recovery of 679 additional artifacts from the Little John site, summarized in Tables One and Two, below.
- Recovery of 568 additional faunal remains summarized in Table Four, below.
- Identification of 27 archaeological features, including several extensive decayed wood remains from the loess immediately below the main Paleosol Complex. Several samples of this wood have been analyzed; they have been identified as belonging to the *Betula spp*. and AMS radiocarbon dated to 10,840 +/- 50 which has a single intercept on the callibration curve at 12,840, with a 2 sigma probability between 12880 - 12810; significantly this date turns out to be very close to date on a wapiti inominate from the same level (RC age = 10,960 +/- 30 / Cal BP 12,885 +/- 91).
- Additional infrastructure (expansion of boardwalks and stairways) was added to the Little John site with the support of material supplied by Joe Young of Young's Timber, Tok, AK.
- While not part of this report, the primary field crew also participated in assisting Robert Sattler, Archaeologist at the Tanana Chief's Conference of Fairbanks, Alaska in survey and excavations at the David Site at Calico Bluff on the Yukon River, south of Eagle, Alaska, survey and excavations at the Linda's Point site at Healy Lake, Alaska, and additional laboratory analysis of the Sheppard Collection held at Northern Land Use Planning in Fairbanks, Alaska as we continued to assist in the organization of these materials recovered by William Sheppard in the Upper Tanana River drainage after his untimely death at the request of Ken Pratt of the Alaska State Archaeology Office.

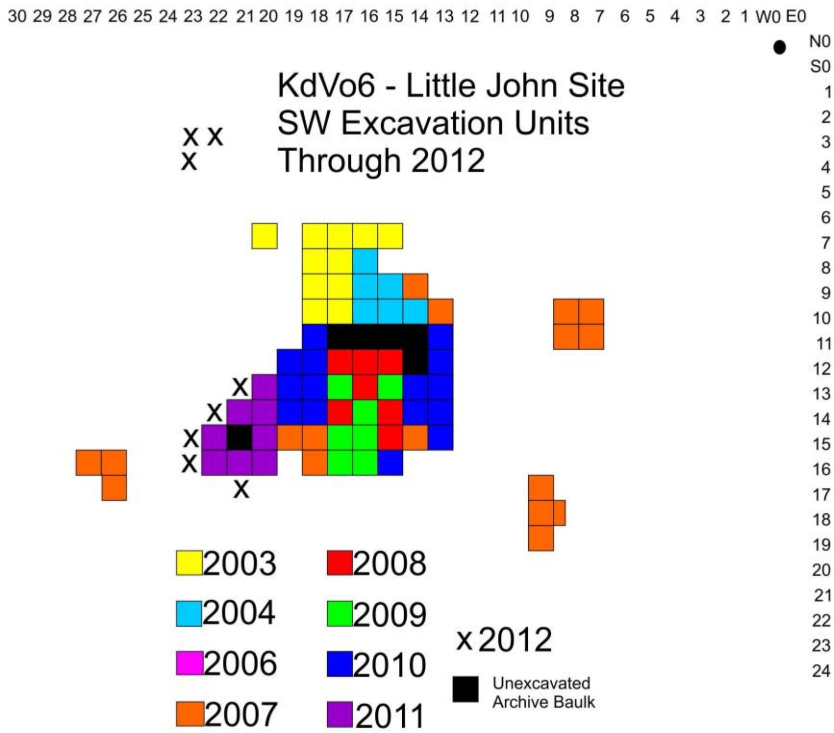


Figure 4. Excavated Units, KdVo6, West Lobe

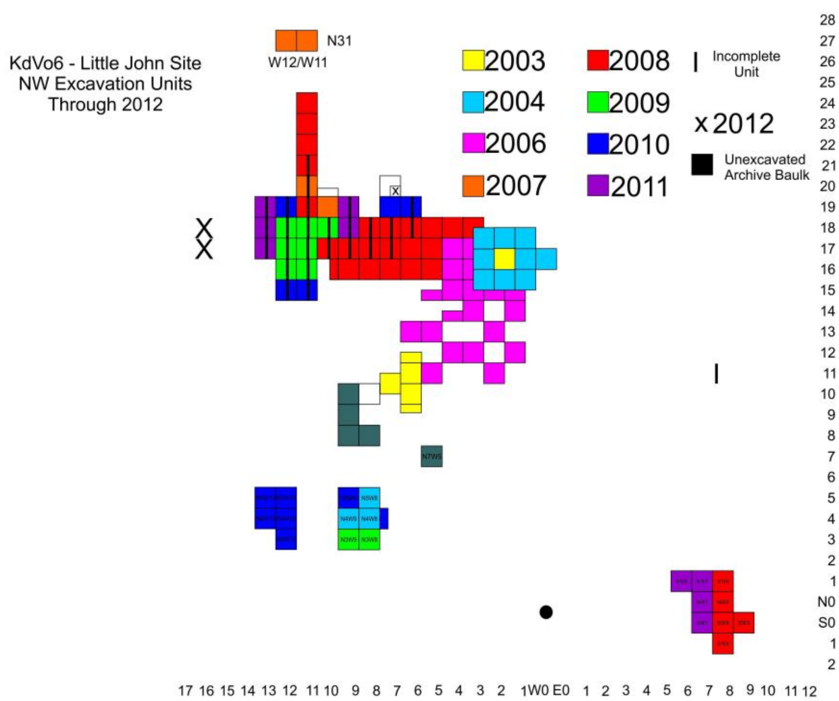


Figure 5. Excavated Units, KdVo6, East Lobe

Type	Count	Percent
Biface	6	0.88%
Blade	1	0.15%
Microblade	16	2.36%
Burin	1	0.15%
Scraper	5	0.74%
Core Tablet	2	0.29%
Core Fragment	3	0.44%
Modified Flake	10	1.47%
Modified Cobble/Pebble	6	0.88%
Debitage	517	76.14%
Hammerstone	8	1.18%
Cobbles/Pebble	43	6.33%
Fire Altered	33	4.86%
Historic	27	3.98%
Other	1	0.15%
Grand Total	**679**	**100.00%**

Table 1. Summary of 2011 Artifacts, KdVo-6 (n = 679)

Site	(All)
Site Quad	(All)
Unit	(All)

Summary Type	Level O / A	B1	Ash	B - No Ash	B2	WL Loess	EL Loess	PSC	LbPSC	PbL	C	Other	Total	%
Biface	0	1	1	1	3	0	0	0	0	0	0	0	6	0.88%
Microblade	0	0	3	0	13	0	0	0	0	0	0	0	16	0.15%
Blade	0	0	0	0	0	1	0	0	0	0	0	0	1	2.36%
Burin	0	0	0	0	1	0	0	0	0	0	0	0	1	0.15%
Scraper	0	0	0	0	5	0	0	0	0	0	0	0	5	0.74%
Core Tablet	0	0	0	0	2	0	0	0	0	0	0	0	2	0.29%
Core Fragment	0	0	0	0	3	0	0	0	0	0	0	0	3	0.44%
Modified Flake	0	0	0	3	3	1	0	2	1	0	0	0	10	1.47%
Modified Cobble/Pebble	0	0	0	0	0	0	0	3	3	0	0	0	6	0.88%
Debitage	1	21	28	11	363	68	2	10	5	3	1	4	517	76.14%
Hammerstone	0	1	0	0	2	0	0	2	2	0	0	1	8	1.18%
Cobbles/Pebble	2	4	0	1	0	2	0	22	11	0	0	1	43	6.33%
Fire Altered	0	0	12	0	13	4	0	2	2	0	0	0	33	4.86%
Historic	3	5	1	3	15	0	0	0	0	0	0	0	27	3.98%
Other	0	0	0	0	0	0	0	0	0	0	0	1	1	0.15%
Total	**6**	**32**	**45**	**19**	**423**	**76**	**2**	**41**	**24**	**3**	**1**	**7**	**679**	100.00%

Table 2. Summary of 2011 Artifacts by Level and Type, KdVo6

Summary Fauna	Level O / A	B2	PSC	LbPSC	PbL	Grand Total	Percentage
Bison	0	0	0	1	0	1	0.18%
Moose/ Caribou	0	0	0	1	0	1	0.18%
Caribou	0	0	2	0	0	2	0.35%
Elk	0	0	0	2	0	2	0.35%
Squirrel	1	77	0	0	0	78	13.73%
Indeterminate							
Mammal	0	2	12	4	23	41	7.22%
Small Mammal	0	320	15	4	1	340	59.86%
Med Mammal	0	0	14	8	8	30	5.28%
Large Mammal	0	0	4	7	1	12	2.11%
Indeterminate	0	1	16	1	43	61	10.74%
Grand Total	**1**	**400**	**63**	**28**	**76**	**568**	**100%**

Table 3. Summary of 2011 Recovered Fauna, KdVo6

Figure 6. Bison Bone and Edge Modified Flake in situ, KdVo6 N18W13 SE, Bottom of Paleosol Complex, Top of Loess below Paleosol Complex.

- Four public presentations related to the project were delivered in the past year at the Alaska Anthropological Association conference (2 papers), the 3rd International Glacial Archaeology Conference in Whitehorse, and among peers at Yukon College.
- No academic publications were generated in the past year relating to this permitted activity, although several are in continued development including one on obsidian sourcing in collaboration with Jeff Rasic of the University of the North, University of Alaska and another on ethnic boundaries and borders. A major contemporary land use

study was completed in collaboration with the Calico Group for White River First Nation and a major monograph on traditional land use in collaboration with Dorothy Kennedy and Randy Bouchard of Victoria, B.C. is in progress.

- Graduate student interest in working on the Little John collection continued to expand in the past year. We are currently awaiting response for a Post-Graduate fellowship related to the taphonomic and distributional analysis of Little John fauna. This year we are continuing to host PhD candidate Michael Grooms of University of New Mexico as he continues his data collection on the geomorphology of Little John, including Optically Stimulated Themoluminesence dating of the loess levels at the site. Jordan Handley of Simon Fraser University has returned in 2012 in support of her Seniors Honours Thesis on lithic material sourcing in collaboration with Dr. Rudy Reimer of that institution.

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 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. 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.

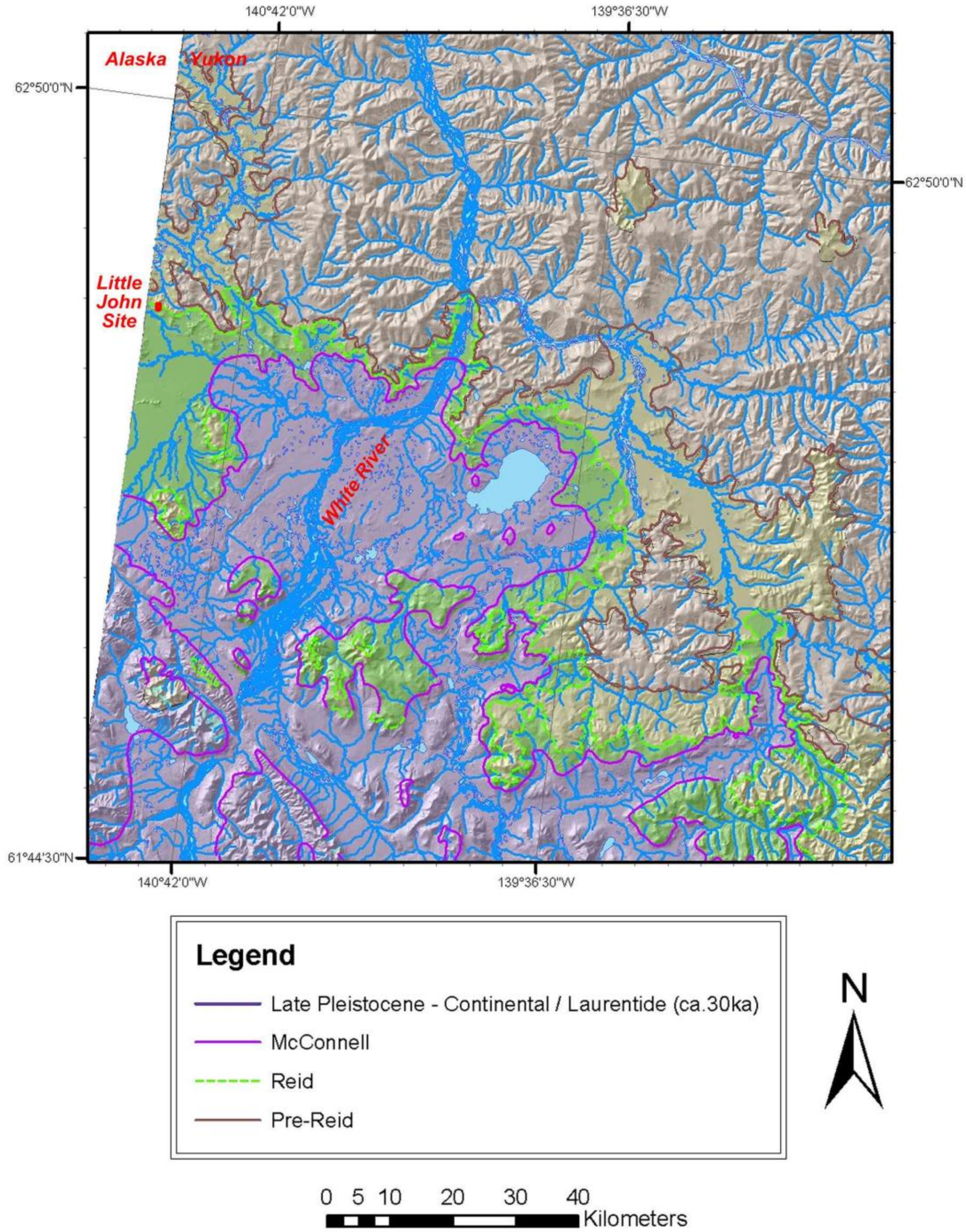


Figure 7. Pleistocene Glacial Limits of the Southwest Yukon (prepared by the Yukon Geological Survey based on most recent fieldwork in the region).

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'atx̠aa 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.

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.

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

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.

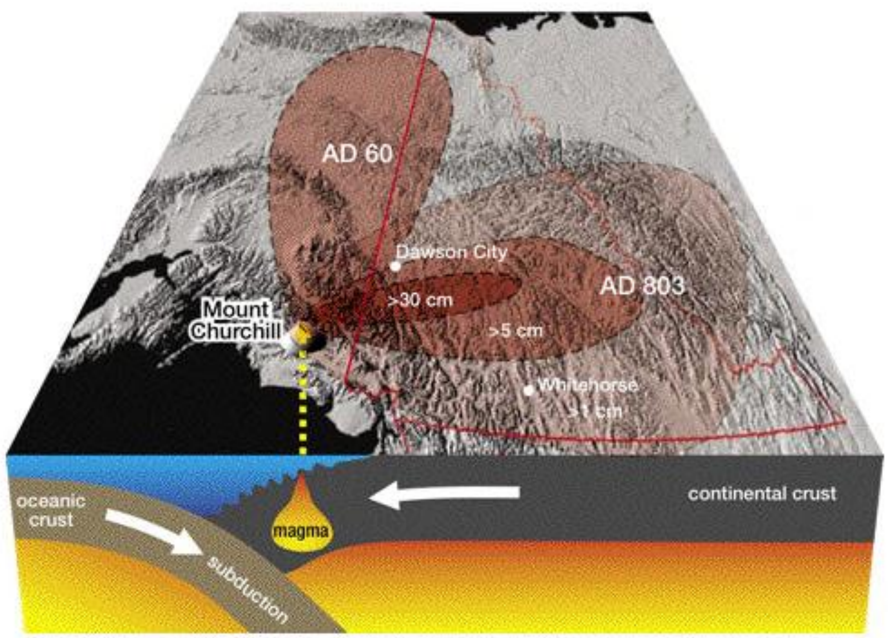


Figure 8. Distribution of the White River Ash fall, c. 1,900 and 1,250 years ago.
(from Smith et al. 2004:28)

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.

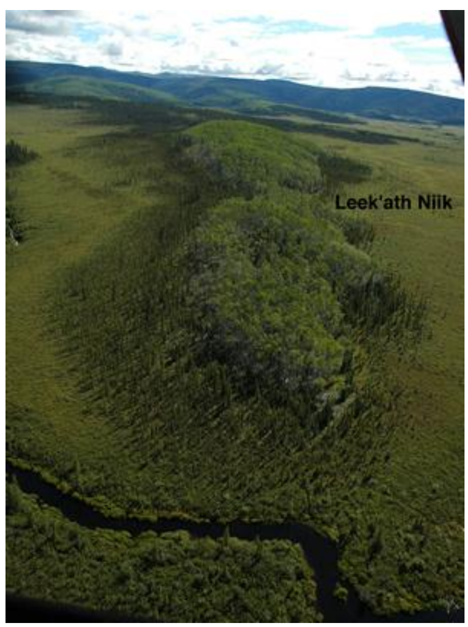


Figure 9. Leek'ath Niik Village, Middle Scottie Creek.

Interestingly, Easton was told by several Upper Tanana Elders that the traditional village site of *Leek'ath Niik* / muddy water creek /, which lies on the eastern side of the middle Scottie

Creek valley, was the location to which their ancestors retreated at the time of the eruption and subsequent ash fall - a time referred to in their oral history as the year of two winters.

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

CONTEMPORARY ENVIRONMENTAL ECOLOGY OF THE STUDY REGION

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

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

Today the ground is covered with sphagnum mosses, sedges, blueberry, bearberry, Labrador tea, and is dotted with remnant oxbows and a plethora of small lakes ringed with willows. Black spruce bowers and scattered growth of dwarf birch, alder, and willow crowd any rise in the valley landscape, which are often elevated frost mounds, shading ground patches of cranberry and wild rose. The surrounding hillsides support alternating patches of white and black spruce, birch, alder, aspen, and poplar trees and a wide variety of shrubs, up to their low summits. Due to the near surface presence of permafrost, north-facing hillsides are

[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).

predominantly black spruce. Many of these plants were and continue to be used by *Dineh* of the region (see Easton 2004b).

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

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

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

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

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

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

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

REGIONAL ARCHAELOGICAL SEQUENCES

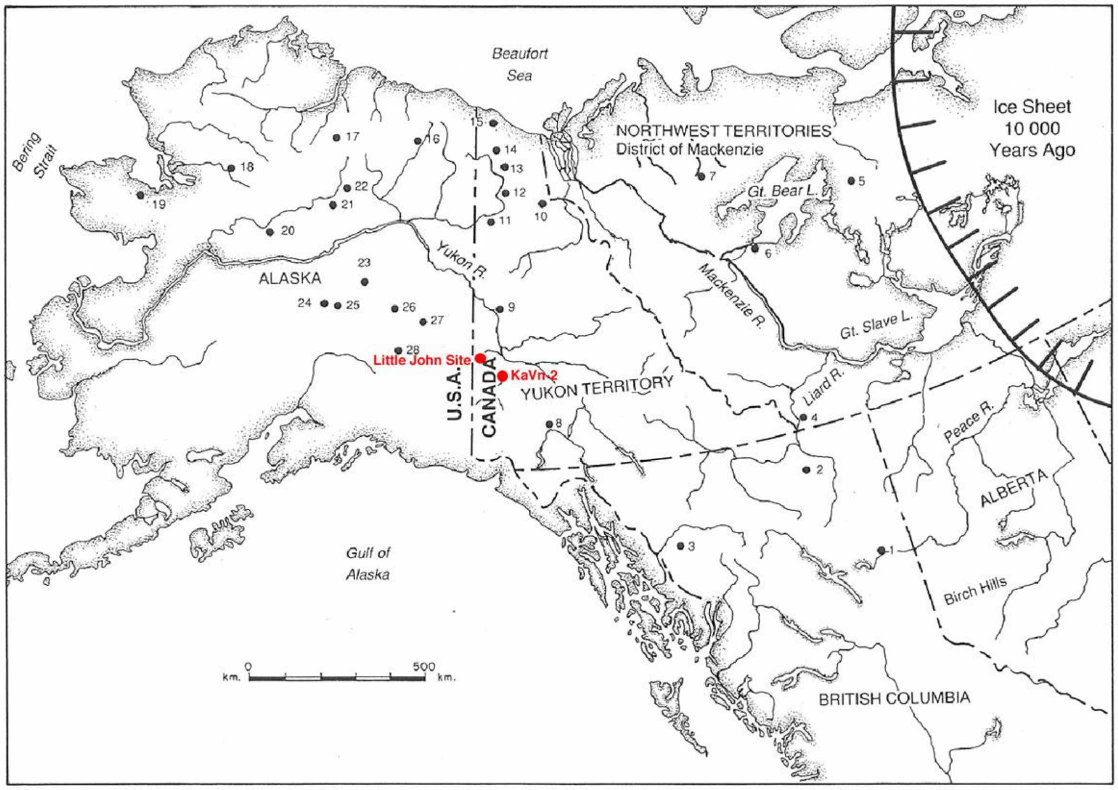
The ancient Beringian environment which prevailed in the Borderlands during the last glacial maximum, some 27,000 to 12,000 years ago during the late Pleistocene geological epoch, and the general environmental changes which occurred in the region over the past 11,000 years of the subsequent Holocene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

From the pan-regional perspective of Northwestern North America, it is clear that there must be some technological and cultural relationship between the Alaskan and Yukon sequences. Indeed, the Little John site, along with others in the Borderlands area, are well placed

[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).

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 Northwestern Canadian (Central Southwest Yukon) Archaeological Sequence



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

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

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

Figure 10. Late Pleistocene - Early Holocene Archaeological Sites of the Western Subarctic
(from Clark 1991a)

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

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

Northern Cordilleran Tradition

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

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.

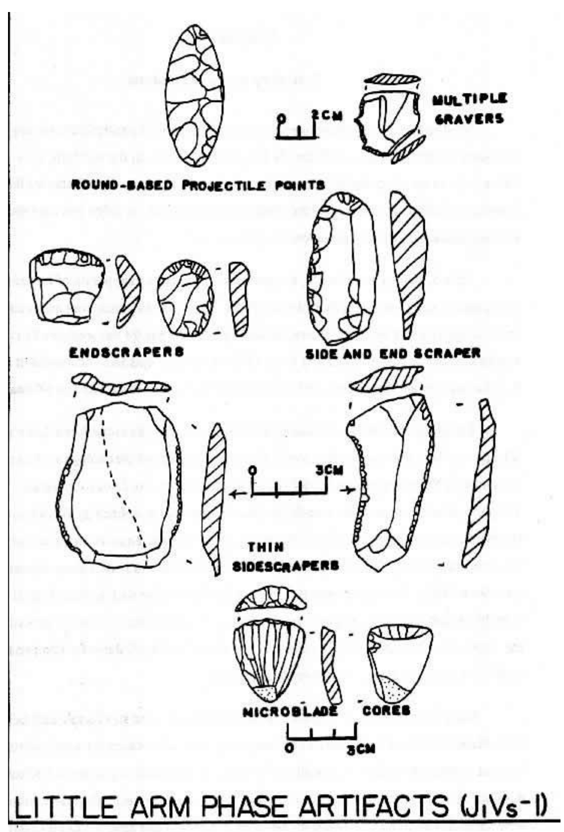


Figure 11. Little Arm Phase Artifacts

(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 12. 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.

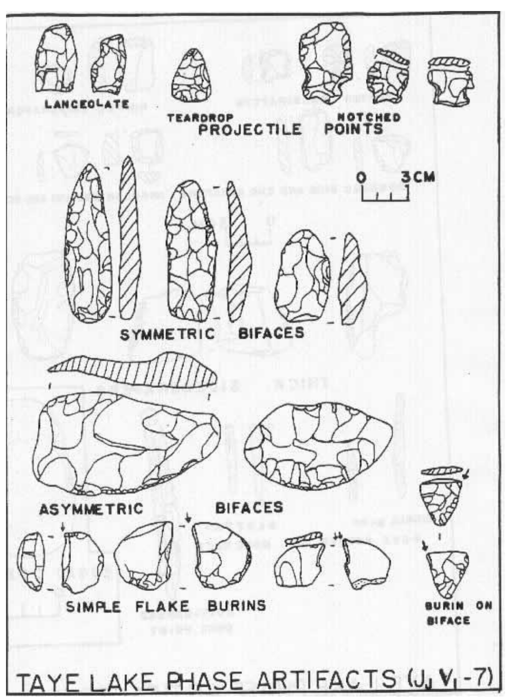


Figure 13. Taye Lake Phase Artifacts - Points, Bifaces, and Burins

(from Workman (1978)

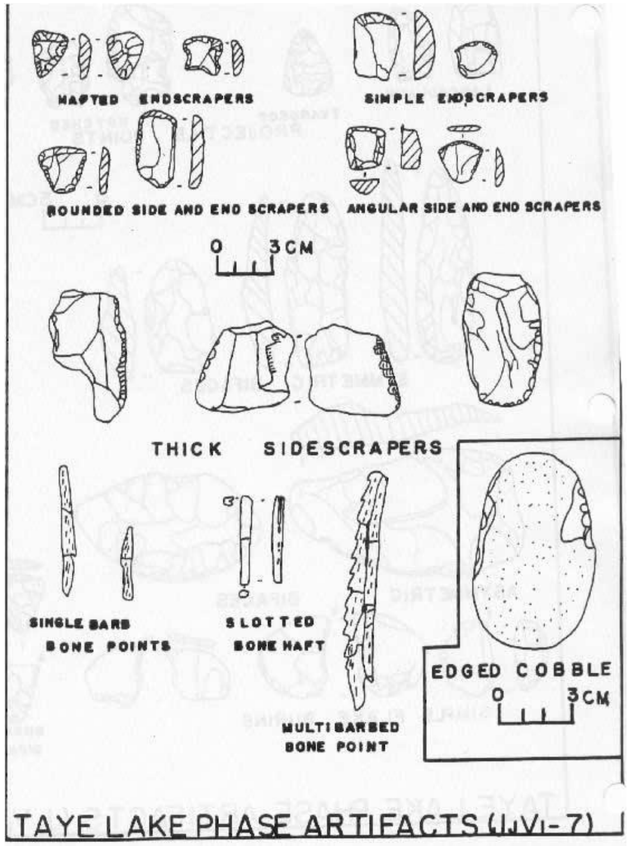


Figure 14. Taye Lake Phase Artifacts - Scrapers, Bone Points, and Net Weight.
(from Workman (1978)

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.

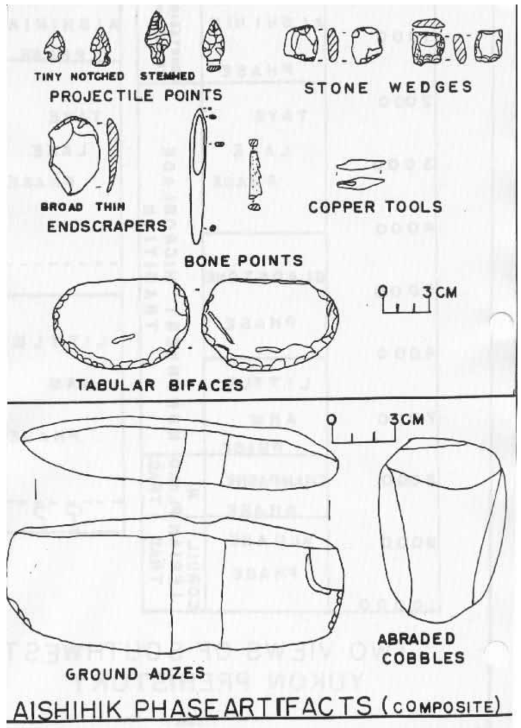


Figure 15. Aishihik Phase Artifacts.

(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

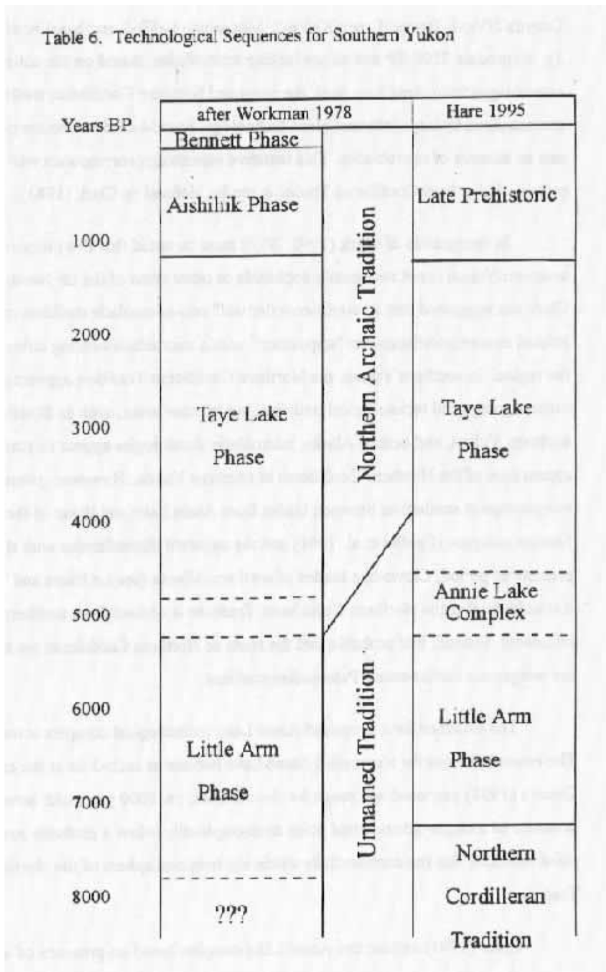


Figure 16. Technological Sequences for Southwest Yukon

(from Hare 1995)

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

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

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

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

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

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

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

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

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

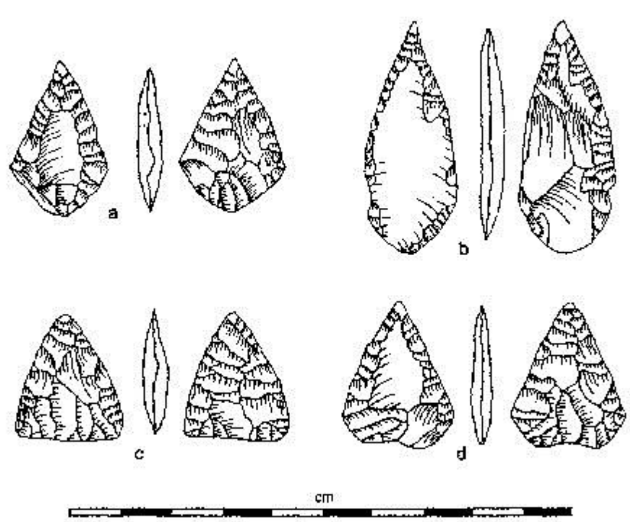


Figure 17. Chindadn ("Ancestor") points from Healy Lake.

(from West 1996c)

Chindadn Complex / Nenana Complex and Swan Point Dyuktai

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

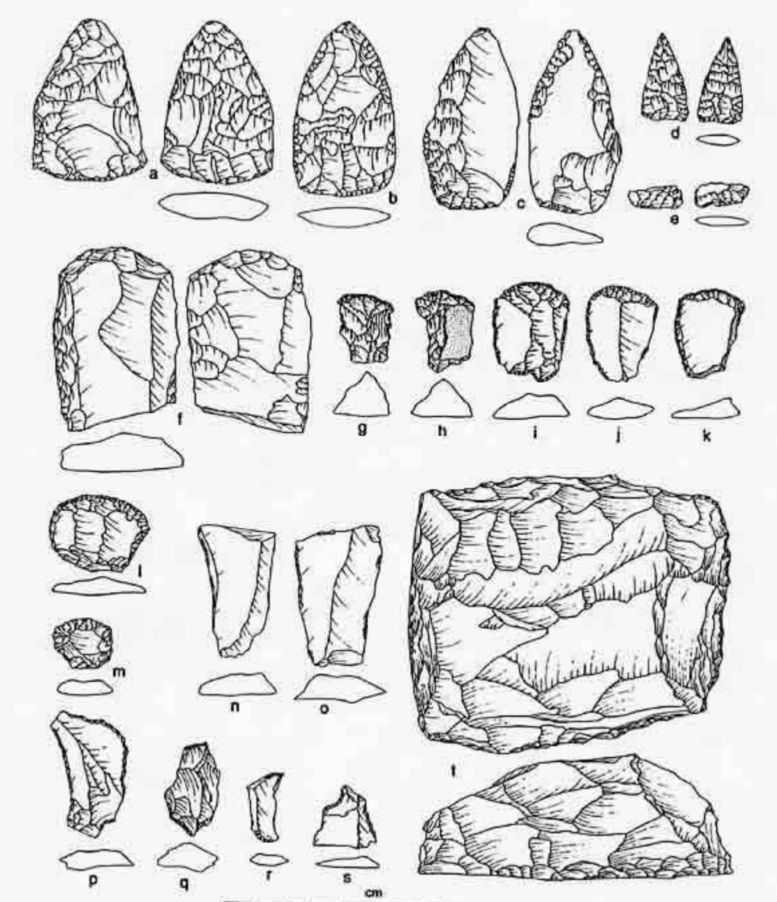


Figure 7–8 Component I of the Dry Creek site (Nenana complex): bifaces (*a–e*); side scraper (*f*); end scrapers (*g–m*); bilaterally retouched blades (*n*, *o*); retouched flakes (*p–s*); quadrilateral uniface or plane (*t*).

Figure 18. Dry Creek, Component I, Nenana Complex

(from West 1996c)

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

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

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

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

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

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

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

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

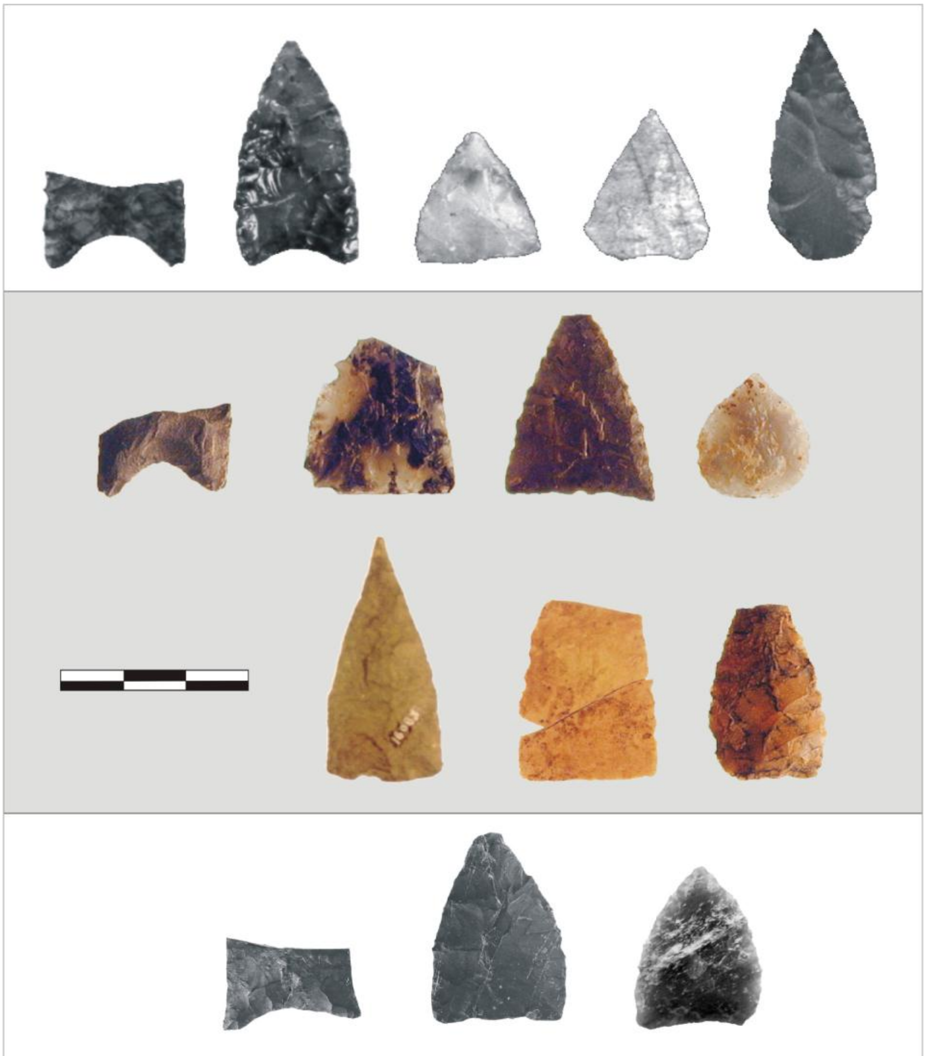


Figure 19. Chindadn Bifaces of the Tanana Valley: Top - Healy Lake Chindadn, Middle - Swan Point CZ 3, Bottom - Broken Mammoth CZ 3

(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.

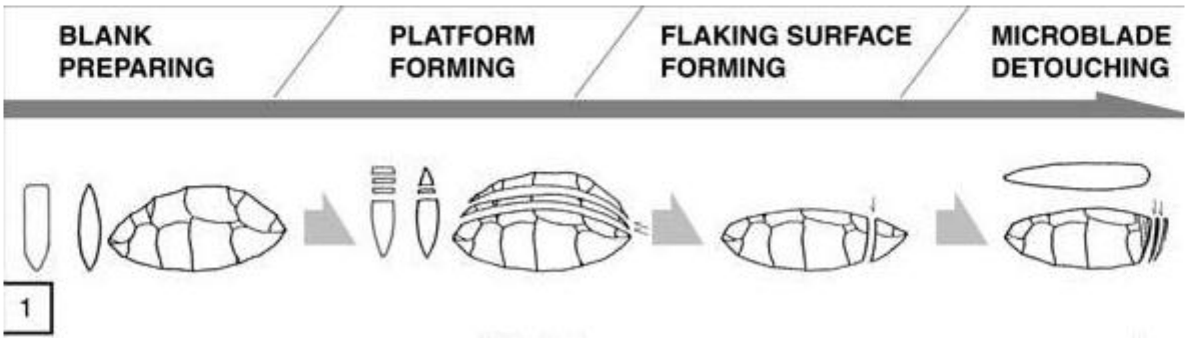


Figure 20. Yubetsu Microblade Core Production on a Biface
(from Nakazawa 2005)

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

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

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

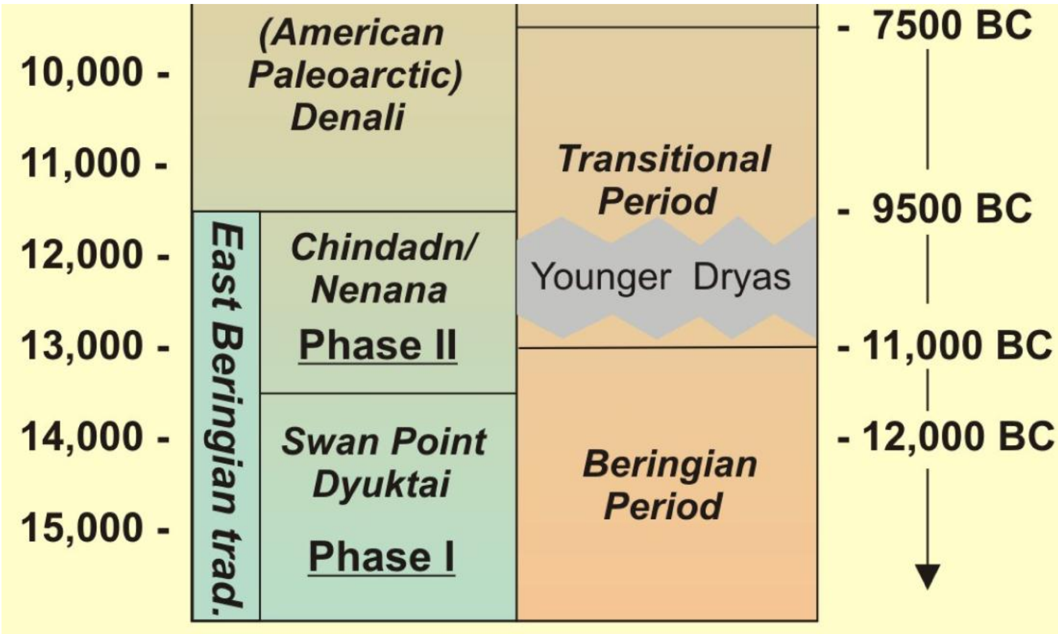


Figure 21. Late Pleistocene - Early Holocene Culture History of Interior Alaska Proposed by Holmes (2008)

(from Holmes 2008)

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

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

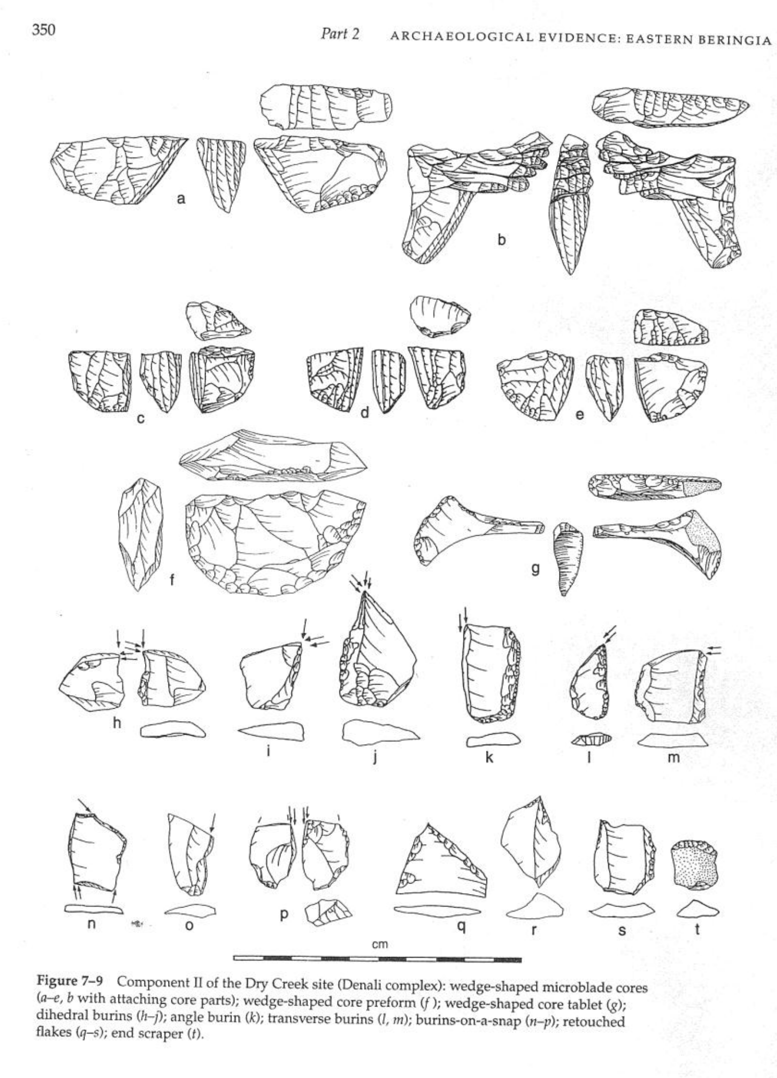


Figure 22. Microblade Technology from Component II (Denali Complex), Dry Creek Site.
(from West 1996c)

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.

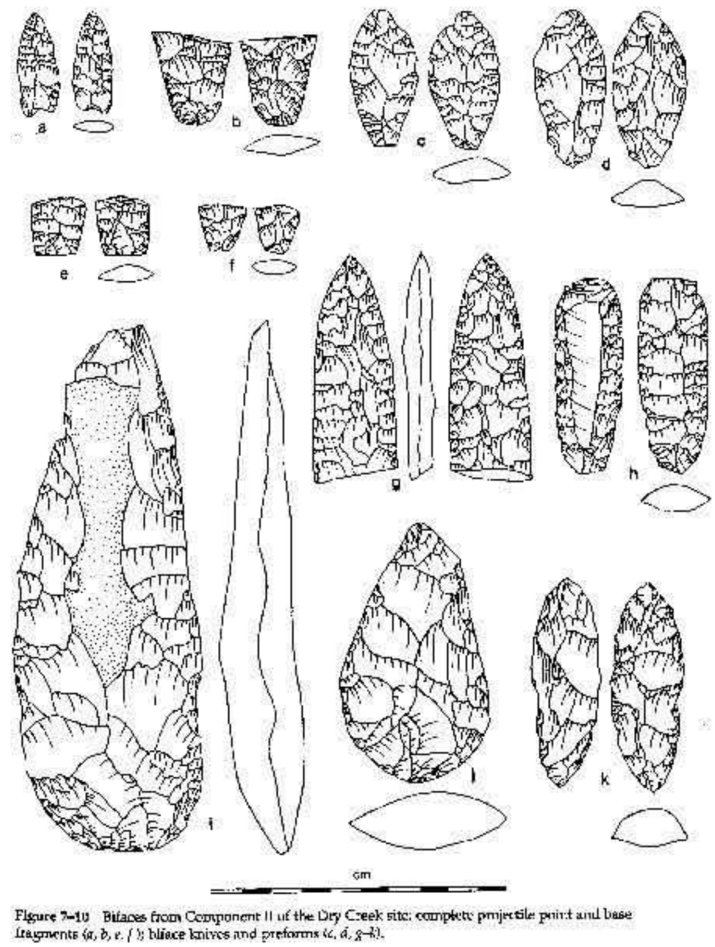


Figure 23. Bifaces from Component II (Denali Complex), Dry Creek site.
(from West 1996c)

Northern Archaic Tradition

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

Late Denali Complex

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

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

Athapaskan Tradition

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

Euroamerican Tradition

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

Comparative Discussion of the Interior Southeastern Beringian Archaeological Sequence

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

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

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

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

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

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

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

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

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

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

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

Archaeological Sites within the Borderlands Region

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

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

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

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

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

Table 4. Canadian Archaeological Sites of the Yukon - Alaska Borderlands.

KaVn-1	S of Sanpete Creek and E of Ak. Hwy, S of a knob located between creek bottom and Horsecamp Hill. Original find was two dark silicified siltstone-like flakes on surface. Test pits yielded 53 blue-grey flakes of various sizes. As no prehistoric sites had been previously recorded in this region of S. Yukon, the site is considered inherently valuable.
KaVn-2	Moose Lake. On a sand ridge on E side of Ak. Hwy at NW base of Horsecamp Hill overlooking Moose Lake. Archaeological site excavated during Alaska Highway realignment. The basal component is dated to be about 10,400 years BP, making this the oldest known site in southwest Yukon, the second oldest in the territory (Walde 1991,

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

	1994; Heffner 2002)
KbVo-1	Km 1918.550, N side of Ak. Hwy on a knoll on the top of a ridge at the edge of the highway cutbank, overlooking Enger Lakes to SE. Scatter of lithic debitage, artifacts and burnt bone. Second excavation uncovered unformed tools projectile points, microblade core fragment, hide scrapers, hammerstone and eight pieces of copper. Dated at approx. 1800 years before present.
KbVo-2	N side of Ak. Hwy, km 1918.5, on top of ridge at edge of the highway cutbank overlooking Enger Lake. Initial test pits included obsidian flakes, basalt flakes and burned bone fragments. 1993 investigation included lithics and faunal material.
KbVo-3	About 320 m east of KbVo-2 on n side of Ak. Hwy. Large burnt mammal bones collected.
KcVo-1	*Taatsan Tôh* / Raven's Nest - Red Hill. On W side of Ak. Hwy, N of Beaver Creek, km 1983. Historic lookout site of the WRFN. Five lithic scatters identified; subsurface testing recovered material related to Late Prehistoric, Northern Archaic, and microblades possibly related with Workman's Little Arm phase / NWMt.
KcVo-2	*Owl's Skull Lookout* - hunting lookout northwest of middle Snag Creek. Late Prehistoric and Northern Archaic occupations indicated by debitage above the White River Ash and microblades within the B2 below the ash. Associated AMS radiocarbon date of 1770 +/- 40 BP (2 Sigma Cal BP 1810 – 1570; Beta 245517). The presence of blade technology suggests an earlier occupation as well.
KcVo-3	*Taatsan* - Raven village - Traditional village site on the upper reach of Snag Creek near the international border, containing Historic, Late Prehistoric / Archaic components, based on limited testing in 2006. A similar stratigraphy with that of KdVo-6 suggests that earlier components may be present.
KdVo-1	Along Little Scottie Creek trail, ca. 1 km east of Ak. Hwy, on E side of Sourdough Hill. Prehistoric scatter.
KdVo-2	East side of Ak. Hwy, km 1949.3, approx. 150 m east of highway on the north shore of a small lake. Probably a prehistoric campsite.
KdVo-3	S side of Ak. Hwy, km 1950 at an YTG rock quarrying location. Near Mirror Creek. Prehistoric scatter of tools and bones. Dated at 810 +/- 80 BP.
KdVo-5	*Nii-ii* / [to] Look Away From – Sourdough village - Hunting Lookout associated with nearby traditional village site. Late Prehistoric and Northern Archaic occupations reported by Easton (2002a) and MacKay (2004).
KdVo-6	Large multi-component site containing stratified components of the Historic, Later Prehistoric, Northern Archaic, Denali / NWMt, and Nenana complex. Strata sequence ranges from several cc to over a m across the site. An undiagnostic component associated with culturally altered bones of a variety of taxa is dated to 8,900 BP and is presumed be related to the Denali component (This Report and Easton, et al. 2004, 2005).
KdVo-7	Small multi-component hunting lookout on the Mirror Creek plain 2 km to the south of KdVo-6. Side-notched points of the Northern Archaic and round-based lanceloate point within loess similar to the Nenana stratum at KdVo-6 (Easton, et al. 2004).
KdVo-8	*Thee Tsaa K'eet* / Rock Cache Place - a hunting lookout and cache on the southeast point of Starvation Mountain, overlooking lower Big Scottie Creek. Limited test units recovered obsidian point fragment characteristic of the Northern Archaic culture.
KdV0-9	*Taiy Ch'ii* / Little Point of Hill Village - on the southwest edge of Starvation Mountain. Historic features include cabins, foundations, gravesites, and assorted late 19th and 20th century detritus. Burial site of *Gaandiniklion*, maternal grandmother of Bessie John.
KdVo-10	Alaska Highway Military Dump - Mile 1212. Historic dump related to the building of the Alaska Highway, c. 1942-1944.
KeVo-1	*Naagat Káiy* / Fox Den village. Traditional village site on middle reach of Scottie Creek containing Historic, Late Prehistoric, Archaic, Denali components, and possibly an earlier occupation within buried paleosols located in test pits 80 cm + below surface (Easton 2002b).
KeVo-2	Contemporary trapline cabin of Mr. Joseph Tommy Johnny and traditional campsite of his great-grandfather, *Tsay Suul*. Early Historic remains include musket balls and beads, and undiagnostic, presumably Late Prehistoric flakes and debitage (Easton 2002b).

KeVo-3	*Ta' ah* - Historic hunting lookout containing modified flakes, hammerstone, and flake core (Easton 2002b); associated AMS radiocarbon date of 2220 +/- 50 BP (2 Sigma Cal BP 2340 – 2120; Beta 245514).
KeVo-4	Historic hunting lookout containing microblades and flakes (Easton 2002b).
KeVo-5	*Rupe Sha* / Rupe's Cabin - location of William (Bill) Rupe's cabin and trade post on upper Big Scottie Creek, on the west side of Paper Lake. The cabin remains can be seen from the air.
KeVo-6	*Kelt'unduun Mann'* - Paper or Pepper Lake Village - large village on the east side of the lake by the same name; occupied into the middle of the 20th century. Untested for prehistoric remains.
Table data adapted, with modification and additions from additional fieldwork by Easton, from Dobrowolsky (1997).	

Having set the larger archaeological context of the region, we now turn to a detailed discussion of our work at the Little John site in 2010.

2011 INVESTIGATIONS AT THE LITTLE JOHN SITE (KdVo-6)

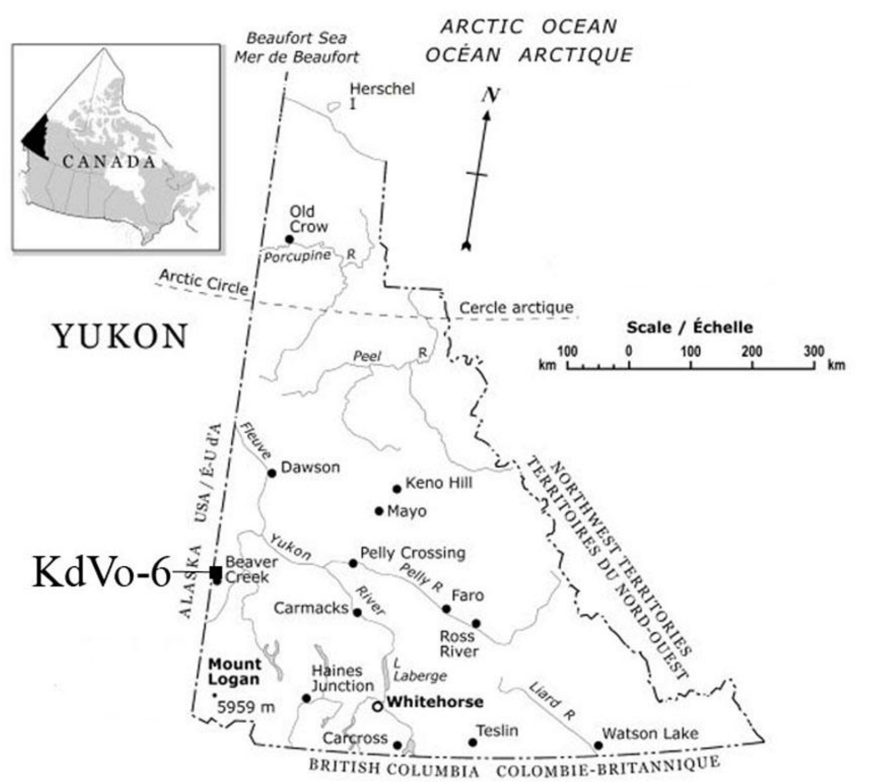


Figure 24. General Location of the Little John Site, Yukon Territory, Canada

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

Figure 27. 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 Nenana complex artifacts from the West lobe, underlying a

[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.

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.

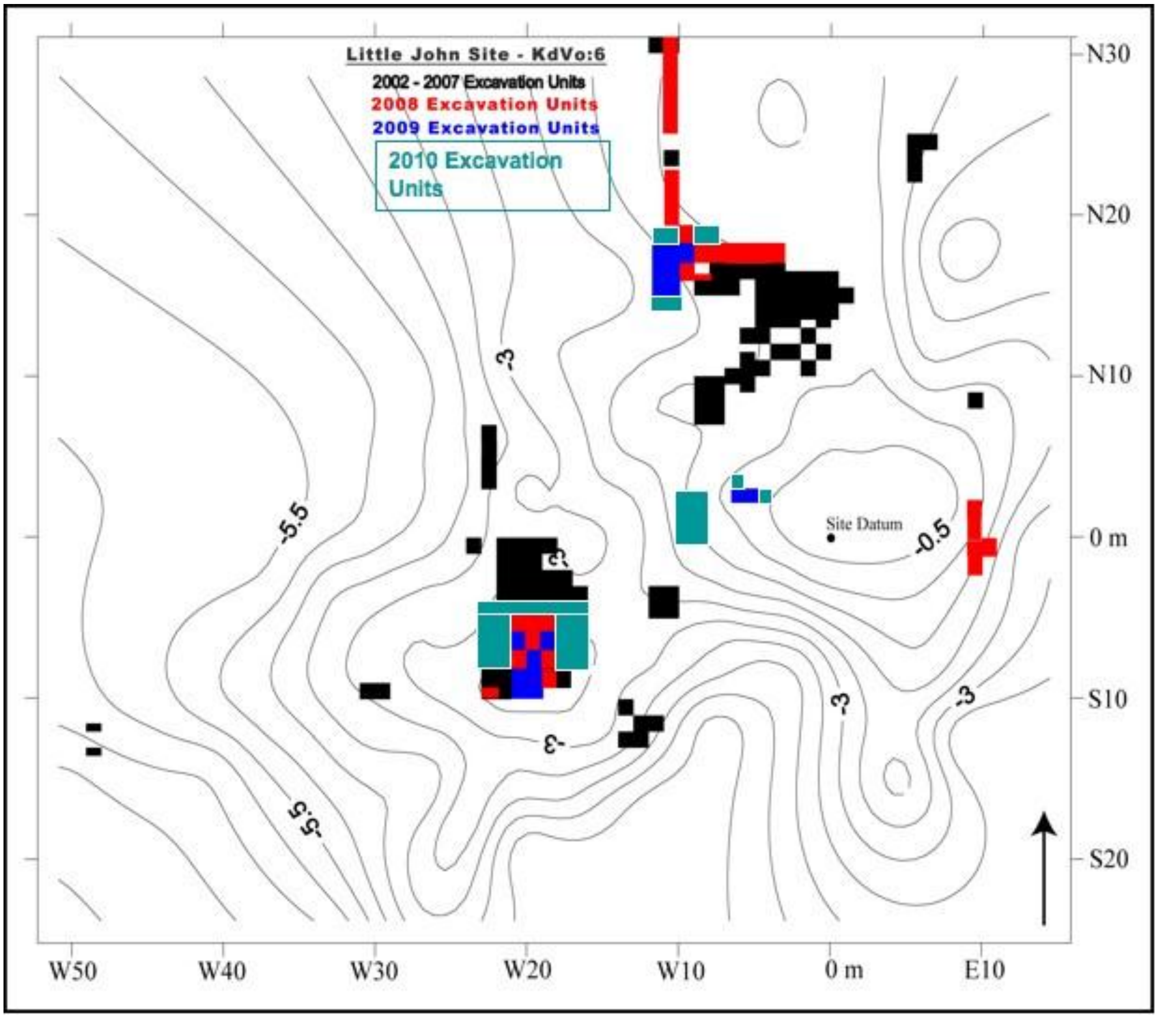


Figure 28. Location of Excavation Units at the Little John Site, 2002-2011

The Figure above shows the location of excavation units on the site through 2011. Easton (2007a:14-18) provides details on test and excavation units prior to 2007. In 2004, nine m^2 were excavated contiguous to the first unit in the East lobe, while an additional six m^2 were excavated in the West lobe; a five meter trench was also begun in the

Permafrost lobe of the site.[10] In 2006, with support of the White River First Nation and the Tanana Chief's Conference, 14 m^2 were excavated in the East lobe.[11] In 2007 forty-nine m^2 units were exposed;[12] twenty-two of these remained to be fully excavated.

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

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

In 2010 thirty-two units were either fully or partially excavated. Fifteen of these were in the West Lobe, eight at the apex of the hill near the cabin, and nine in the East Lobe. Most of the East Lobe units were excavated to the loess deposits just below the

[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, 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

main paleosol complex with a view towards undertaking an area excavation of these loess sediments in 2011 (Easton 2011).[14]

In 2011 eight new one meter units were excavated on the West Lobe, as well as four on the hilltop to the east of the cabin. We continued excavation of thirteen units initiated previously in 2009 and 2010 in the East Lobe Pleistocene sediments; most of these units will be excavated further in 2012. We also dug a series of 25 cm square tests in the Northwestern quadrant of the site that were profiled and sampled in support of Michael Grooms continued geomorphological studies of the site.[15]

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. Recovered artifacts and fauna were recorded by three-dimensional provenience to the surface of the unit, unless they were recovered in the excavation screen, in which case their provenience was recorded by natural level and unit quadrant. The Electronic Appendices provide catalogues of recovered artifacts and inventoried recovered fauna. Photographs of representative strata, features, and artifacts *in situ* were regularly taken. A representative selection of these photographs is presented in this report and digital copies of additional photos are provided in the Electronic Appendix. Finally, representative sediment samples and potential radiocarbon samples were collected and archived for future analysis when resources permit.

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

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

[15] Directed by Easton, crewmembers are listed in the acknowledgements of this report, above.

flakes are often described by lot, for example. The Electronic Appendices provide a full listing of these derived data.

In addition to basic cataloguing, faunal material has been identified to genus and species to the extent possible through comparison with known skeletal remains held by a variety of sources, including Dr. David Yesner of the Department of Anthropology, University of Alaska - Anchorage, the Yukon Heritage Branch, standard published skeletal guides, and consultations with colleagues.[16] 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. An Electronic Appendix provides a photographic catalogue of collected fauna and work is underway on a publication summarizing the cumulative results of our joint analyses.

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

A series of conference and published presentations of work at the Little John site has allowed for broader public education and more focused peer review of the excavations to date. These have included an eight-part series in the Yukon News covering the 2003 excavations (Easton 2003), presentations at meetings of the Alaska Anthropology Association, the Arctic Sciences Conference of the American Association for the Advancement of Science, the University of Alaska Fairbanks - Yukon College Symposium on the History of Alaska-Yukon Communications, and a major symposium on Beringia at the Society for American Archaeology meeting (Easton, et al. 2004,

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

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). Archaeological publications include the journal *Current Research in the Pleistocene* (Easton, et al. 2007b, Easton et al. 2009), an invited contribution to a volume on projectile point sequences in the North American northwest edited by Roy Carlson and Martin Magne (Easton and MacKay 2008), and a new volume on lithic industries of Beringia forthcoming from Texas A&M University Press (Easton, et al. 2011, Yesner et al. 2011). Ethnographic publications arising from research on the borderland include an ethnohistorical account of the government survey of the Yukon - Alaska border (Easton 2007b), an essay documenting contemporary hunter-gatherer values embedded in the *Dineh* Way (Easton 2007c), a multi-disciplinary study of the contemporary subsistence fishery in the Upper Tanana River Watershed (Friend, et al. 2007; Friend, Holton, and Easton 2007), and an examination of contemporary conflicts between *Dineh* and Game Management views of animals (Easton 2008). Based on her fieldwork participation in 2009 and subsequent field interviews in January 2010, Emily Youatt and Easton presented a paper on contemporary Borderland *Dineh* Identity at the 2010 meetings of the Alaska Anthropology Association. Ms. Youatt also completed and successfully defended her honours thesis on the topic at Reed College, Oregon in May of this year. A short public interpretation poster was prepared by Easton for the White River First Nation for distribution in 2008.

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

Financial and In-Kind support of continued fieldwork and analysis of our Yukon Alaska borderlands research in 2011 was received from the White River First Nation, the School of Liberal Arts, Yukon College, and myself.

Research plans for 2012 include continued excavations at the Little John site and additional archaeological survey in the region as opportunity allows

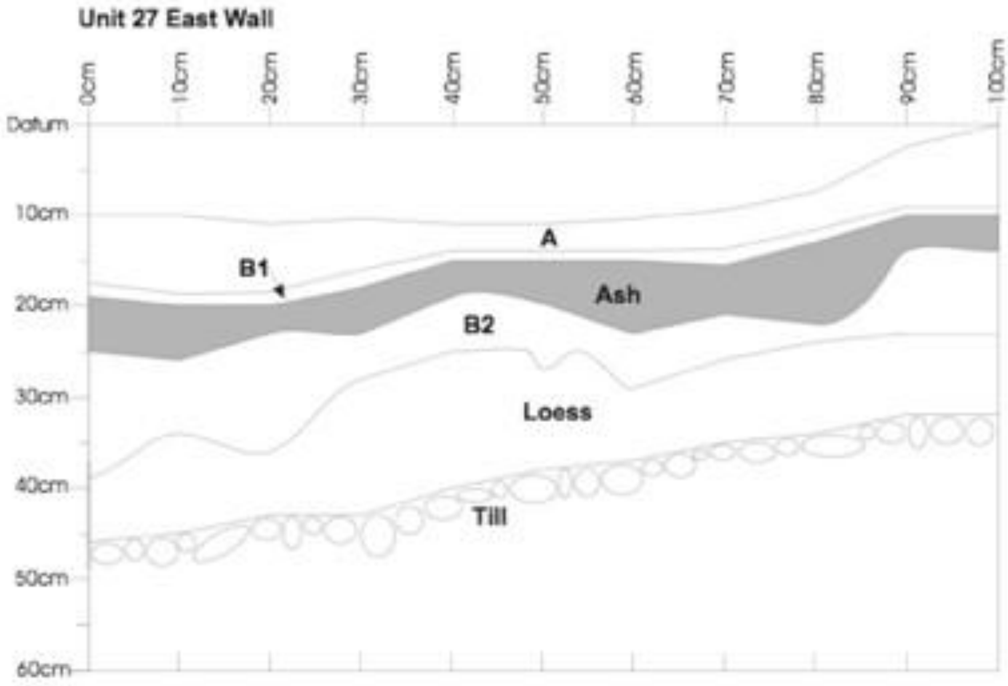


Figure 29. Representative Stratigraphic Profile, West Lobe.

GENERAL STRATIGRAPHY AT THE LITTLE JOHN SITE

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

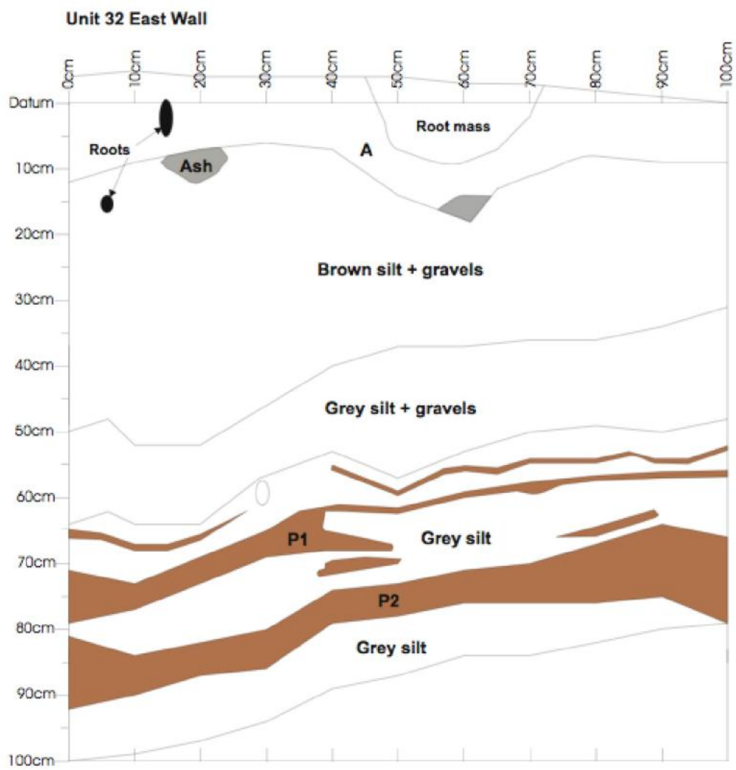


Figure 30. Representative Stratigraphic Profile, East Lobe.

The discontinuous depth of these strata is accounted for by the undulating topography of the site, which ranges from over meter deep basins to eroding hillsides. The stratigraphy is also complicated by the action of both ancient and contemporary permafrost, solifluction, and what seems to be a mass wasting event (probably a series of colluvial deposits originating from the higher ground to the North) over a portion of the site (Reger pers. com. 2009). Because of this differentiation in depth and nature of strata we have divided the site into five zones or lobes (see Fig. 30, below).

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

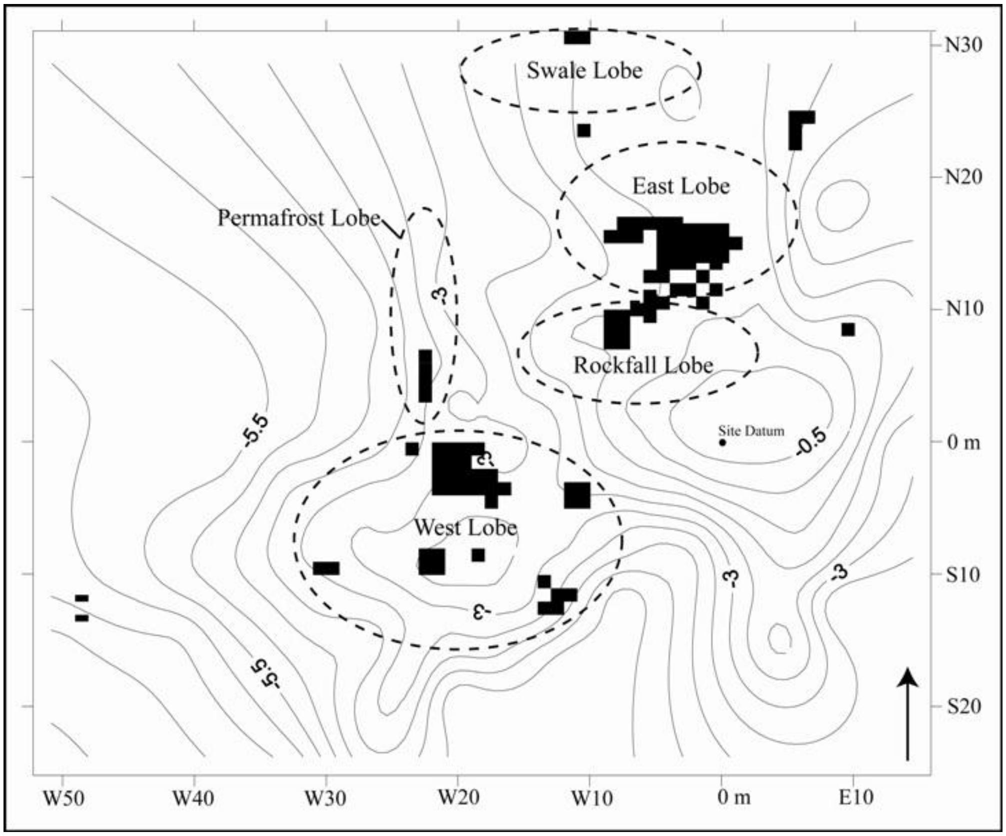


Figure 31. Stratigraphic "Zones" of KdVo-6.

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 Paleosol complex at the North end of the Road Trench.

Figure 33. Detail of organic paleosol below massive loess, north end of Road Trench.

Excavations in 2009 in the East Lobe revealed an apparent trend for greater separation of the paleosol complex into increasingly distinct strata as we exposed Units to the North and West of our previous excavations, a trend that continued in our excavations in 2010. This is well illustrated in the exposure of the West Wall of Unit N17W11, shown below. A lack of financial resources to date these strata separately prevents us from refining our chronology of these deposits beyond the 10 – 12 thousand calendar years established by previous AMS dates on bones within these strata, but the possibility to do so is emerging as we explore these deposits further.

Figure 34. Unit N17W11 SW showing separation of Paleosol Complex strata.

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

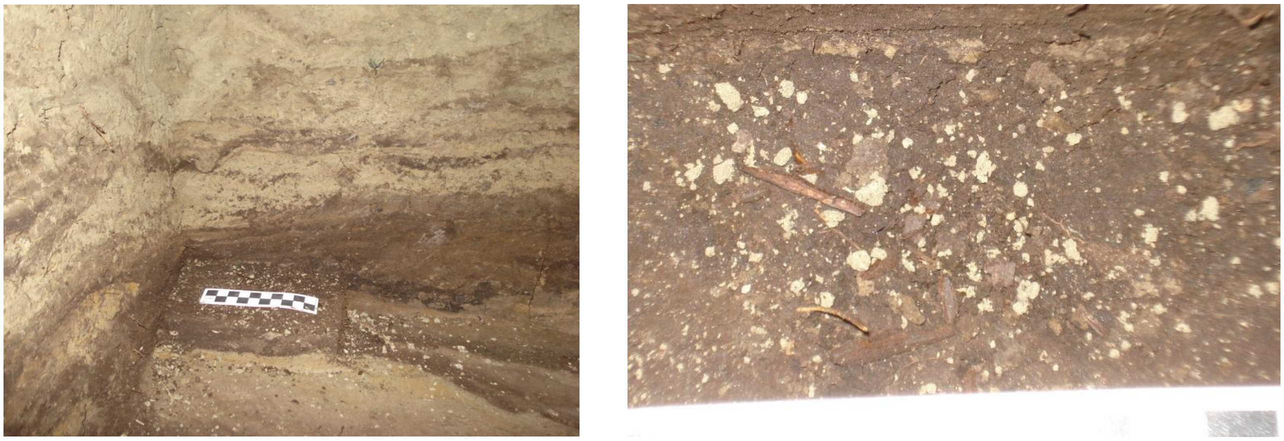


Figure 35. Wood Fragments in N18 W11. L: SW Corner of Unit. R: Detail of Wood Fragments.

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

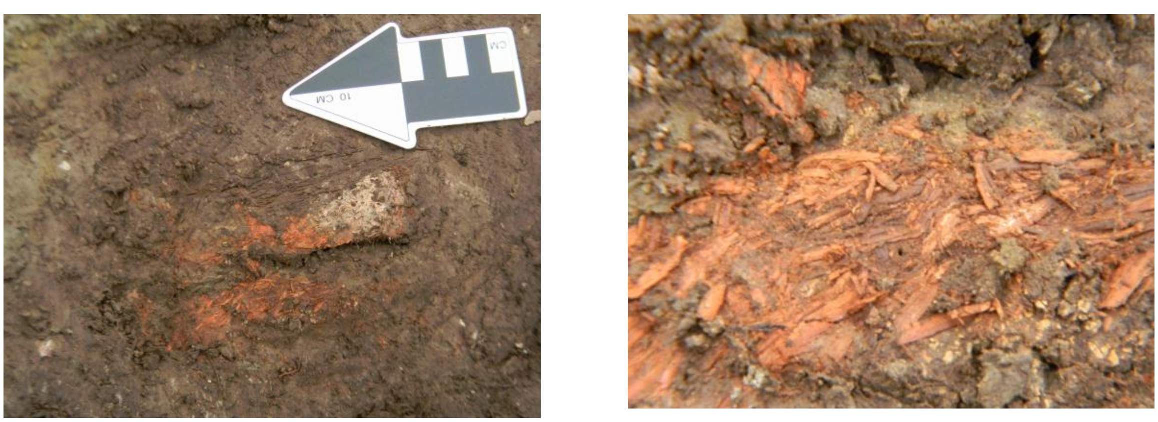


Figure 36. Wood feature, Unit N18W13, 92 cm Below Unit Datum, c. 12,840 Calendar Years

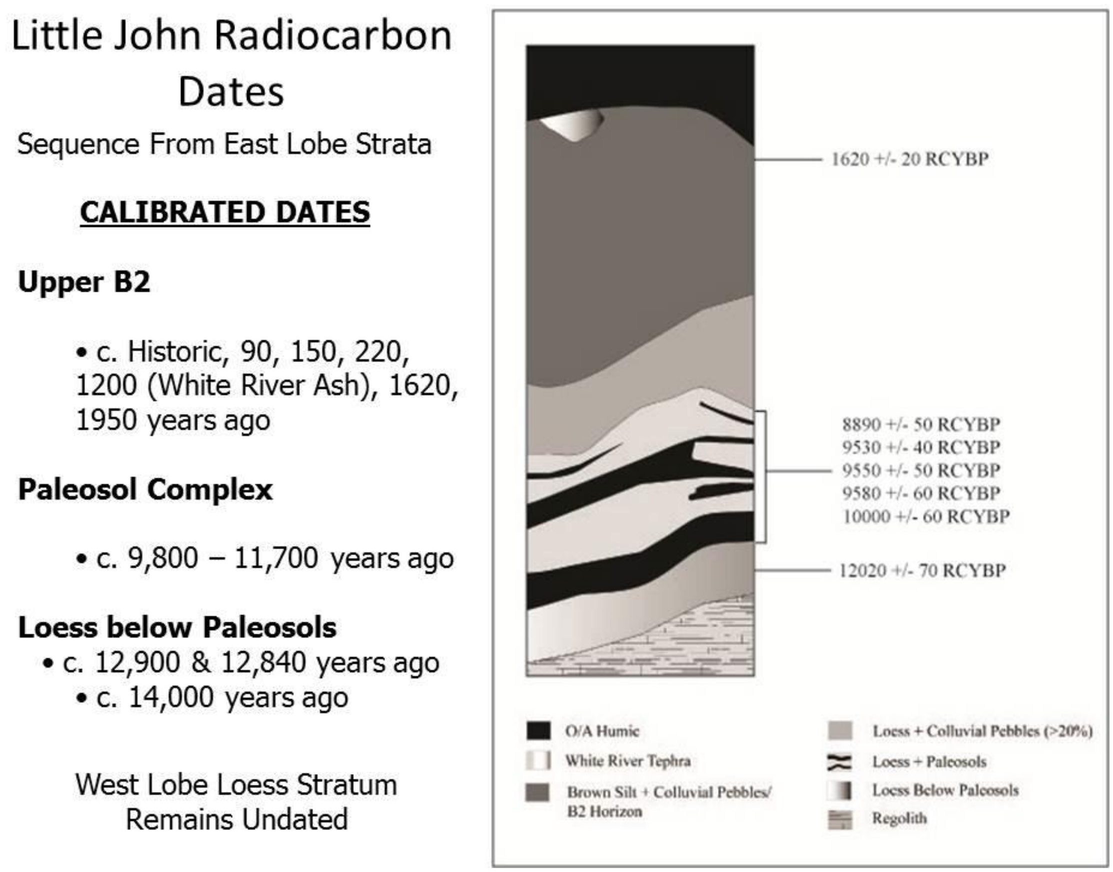


Figure 37. Selected Radiocarbon Dates at KdVo-6.

RADIOCARBON DATES AT KdVo-6

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

Figure 38. Culturally modified Bison spp. verterbrae remains in situ, loess below paleosol stratum, dated to 12020 radiocarbon years or c. 14,000 calendar years before present.

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

Figure 39. Proximal Innominate (illium) of Wapitti dated to 10960 +/_ 30 RCYBP - 12885 +/- 91 Cal YBP from Loess below Paleosol, N13W02 – Fa 2006-41 (n.b. number in photo is field number)..

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

Table 5. Radio Carbon Dates from the Little John Site

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

SUMMARY OF RECOVERED FAUNA

Five hundred and sixty-eight faunal elements were recovered during excavations at KdVo6 in 2011. As in years past, most of these consist of fragmented lots that are unidentifiable beyond large or small mammal or other Genera (85.21%), while only 14.79% are identifiable to lower levels of genus or species.

An analytical summary of recovered fauna through 2009 is presented in Yesner et al. (2011), while the entire faunal assemblage has received an initial analysis in terms of its taphonomic distribution and demonstration of site integrity within a periglacial sedimentary context (Yesner et al. 2012). Additional analysis of this material continues with the collaboration of Vance Hutchinson and David Yesner. Recovered fauna from 2011 is detailed in the attached faunal databases in both Filemaker (with photographs) and Excel formats. The following tables provide a summary of these data; note well that we expect that these data will change to some extent as further comparative identification is undertaken.

Summary / Fauna	Level O / A	B2	PSC	LbPSC	PbL	Grand Total	Percentage
Bison	0	0	0	1	0	1	0.18%
Moose/ Caribou	0	0	0	1	0	1	0.18%
Caribou	0	0	2	0	0	2	0.35%
Elk	0	0	0	2	0	2	0.35%
Squirrel	1	77	0	0	0	78	13.73%
Indeterminate							
Mammal	0	2	12	4	23	41	7.22%
Small Mammal	0	320	15	4	1	340	59.86%
Med Mammal	0	0	14	8	8	30	5.28%
Large Mammal	0	0	4	7	1	12	2.11%
Indeterminate	0	1	16	1	43	61	10.74%
Grand Total	**1**	**400**	**63**	**28**	**76**	**568**	**100%**

Table 6. Summary of Recovered Fauna by Level, KdVo6-2011

Fauna	Count	Percent
Bison	1	0.18%
Moose/ Caribou	1	0.18%
Caribou	2	0.35%
Elk	2	0.35%
Squirrel	78	13.73%
Indeterminate		
Mammal	41	7.22%
Small Mammal	340	59.86%
Med Mammal	30	5.28%
Large Mammal	12	2.11%
Indeterminate	61	10.74%
Grand Total	**568**	**100.00%**

Table 7. Count / Percentage of Recovered Fauna, All Units, KdVo6-2011

Fauna from the upper levels (O/A n= 1; B2 n=401) account for 70% of fauna recovered in 2011. Although they are highly fragmented and calcined, 78 of the elements could be identified as burned squirrel remains, while 320 elements are small mammal; the remaining elements recovered from these strata were only identifiable as Small Mammal (n=2) and Indeterminate (n=1).

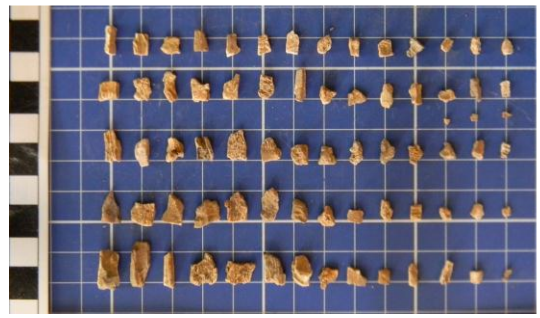


Figure 40. Examples of Fauna Remains from Upper Levels, KdVo6-2010. L: Fa11-03-02; R: Fa12-03-01; Squirrel and Small Mammal

In the Northwest Quadrant of the site (East Lobe), sixty-three faunal specimens were collected from the Paleosol Complex, twenty-eight specimens from the Loess Below Paleosol Complex, and a further seventy-six specimens were retrieved from the Paleosol below Loess level. Together these 167 specimens represent 29% of the total fauna recovered in 2011. Of these, one specimen have been definitely identified as Bison (LbPSC) and two as Caribou (all from the PSC), one either Moose or Caribou (LbPSC) two as Elk (LbPSC) and 100 Mammal specimens (PSC, LbPSC, PbL). The remaining sixty specimens are too fragmented to identify even to Order.

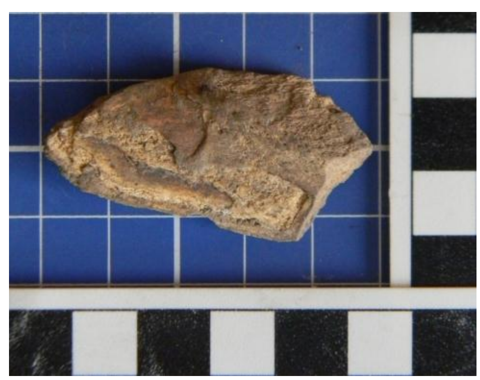


Figure 41. Examples of Fragmented Bone and Calcareous Concentrations from the Lower Levels at KdVo6-2011, N17W13. L from P1, R from P2

Faunal remains retrieved during our area excavations below the main Paleosol Complex in the East Lobe in the Northwest quadrant of the site varied in their preservation. Many, similar to previous years were highly degraded, with low density and a chalky white surface. Others, however, were found to be as well preserved as material recovered above in the main Paleosol Complex. Our initial review indicates that this difference is correlated with two factors – accompanying preservation of paleosols within the LbP and the degree to which the bone has been burnt. Confirmation of this taphonomic explanation requires further study of the remains when resources allow.

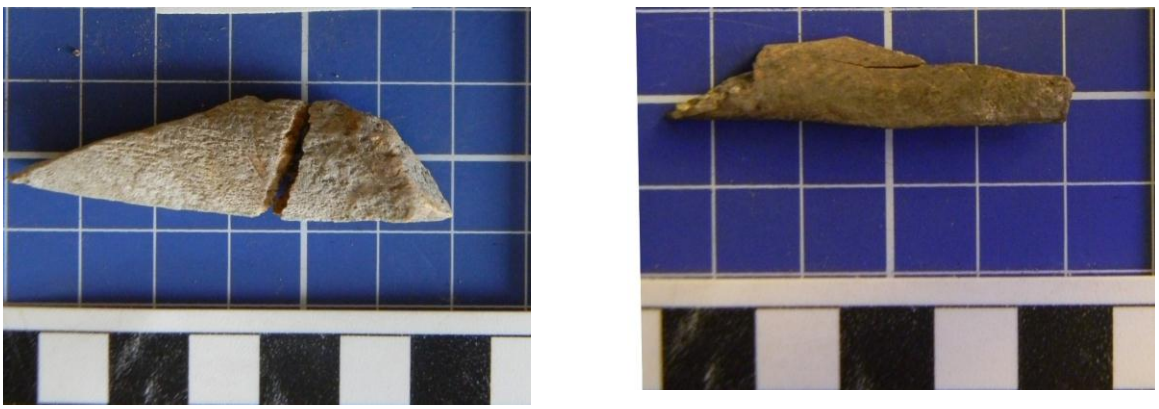


Figure 42. KdVo6: L Fa11-22, N16W11, LbP at 82 cm BD; R Fa11-57.1, N18W13, PbL (P5)

SUMMARY OF FEATURES FROM THE LITTLE JOHN SITE, 2011

Twenty-seven archaeological features were recorded in the course of excavations in 2011 documented in the Table below. Following this we provide examples of several of these features; a full log of recorded features is provided in the print and electronic appendices.

Feature Number	Unit	Level	Date	Comments
2011-01	S16 W21	O/A	9-Jun-11	Historic wood
2011-02	S15 W20	O/A	9-Jun-11	Historic planks
2011-03	S14 W21	O/A	10-Jun-11	Historic planks
2011-04	S16 W21	B1	11-Jun-11	Hearth feature
2011-05	S15 W20	Top B2	13-Jun-11	Level sheet with previous year, excavated fill on East wall
2011-06	S15 W22	O/A	13-Jun-11	Historic wood feature/planks
2011-07	S15 W22	Ash	17-Jun-11	Hearth feature
2011-08	N1 E7		20-Jun-11	Historic wood feature
2011-09	S16 W20	O/A	20-Jun-11	Historic wood feature/planks
2011-10	N2 E7	B1	24-Jun-11	Historic wooden feature/planks
2011-11	N19 W9/N18 W9	PSC/LbPSC	11-Jul-11	Bone and charcoal feature
2011-12	N18 W13	LbPSC	12-Jul-11	Bone feature
2011-13	N19 W9	LbPSC	13-Jul-11	Organic wooden feature
2011-14	N18 W13	Mid PSC	22-Jul-11	Hearth feature
2011-15	N19 W11	PSC/LbPSC	22-Jul-11	Hearth feature
2011-16	N17 W13	PSC 4	23-Jul-11	Wood feature, matting, organic deposits
2011-17	N19 W11	LbPSC	25-Jul-11	Ash(?) feature in Loess
2011-18	N18 W13	LbPSC	26-Jul-11	Hearth feature, SW quad
2011-19	S6 W18	B2	27-Jul-11	Heath feature, NW quad
2011-20	N19 W7	PbPSC (P5/6?)	28-Jul-11	Wood feature at 100cm dbs
2011-21	N19 W13	PbPSC (P5/6?)	28-Jul-11	Bottom of 3rd Paleosol below PSC, SE and SW quads
2011-22	N19 W11	PbLbPSC	1-Aug-11	Paleosol below Loess below Paleosol at 134cm dbd, NE quad
2011-23	N19 W9	P4	2-Aug-11	Unknown wood type feature at 95cm dbs, SE quad
2011-24	N19 W11	PSC Hearth	6-Aug-11	Squirrel mandible, wood, bone fragments, 5-10cm below top hearth Sampled S2011-24
2011-25	N17 W13	PSC	24-Aug-11	Mapping paleosol complex in arbitraty 5cm levels, NE and NW
2011-26	N17 W13	PSC	25-Aug-11	Woody fibre within palesol, 70-75 cm dbs, NW and NW quads
2011-27	N0 E6	Loess/C	26-Aug-11	Hearth feature(?) Sampled by feature quadrent

Table 8. KdVo6 20011 Recorded Archaeological Feature

Figure 43. KdVo6 Feature 2011-12 Fauna, Modified Flake, and Split Cobble Tool in Situ, N18W13, LbPC

Feature 2011-12 is comprised of two larger bone fragments (Fa11-79 and Fa11-80) identified as thoracic / rib elements from a large mammal at the bottom of the Paleosol Complex atop the Loess below in direct association with an edge modified Split Cobble tool and additional bone fragments in the southeast quadrant of Unit N18W13. The remainder of this unit will be excavated in 2012. A radiocarbon sample of wood carbon from this feature has been submitted for chronometric dating.

Figure 44. KdVo6, Feature 2011-19, S6W18 NW, B2 Hearth Feature

Feature 2011-19 is the eastern portion of a Hearth comprised of ash and charcoal and associated with flakes, pebbles, and a single microblade (KdVo6:3612) illustrated below in our discussion of artifacts. It was located in Unit S6W18 in the Northwest Quad well into the B2 stratum just above the Loess level.

Feature 2011-24 is a hearth feature in Unit N19W11-SW associated with a heavily burned, incomplete squirrel mandible, additional bone fragments, and preserved wood that is similar to the wood recovered from multiple units within the East lobe (N17W13, N19W9, N19W7). A radiocarbon sample of wood carbon has been submitted for chronometric dating.

Figure 45. Feature 2011-24 N19W11 SW PSC Hearth, Squirrel mandible, Wood, and Charcoal

Figure 46. Detail of Feature 2011-24

Figure 47. Feature 2011-02 S15 W20 O/A, Historic Wood Feature

Feature 2011-02 is an historic, decayed wooden plank feature from the O/A stratum of Unit S15W20 continuous with those extending into Units S16W21, S14W21 and S15W22 in 2011.

Figure 48. Feature 2011-14 N18 W13 NE Mid PSC, Hearth Feature

Feature 2011-14 is a portion of a Hearth located in the Northeast quadrant of Unit N18W13 in the middle of the Paleosol Complex (P3) comprised of wood carbon and greasy organic sediment typical of the hearth features at Little John.

SUMMARY DESCRIPTION OF SELECTED LITHIC ARTIFACTS FROM THE LITTLE JOHN SITE, 2011

This section provides summary descriptions of a selection of the major formed artifacts recovered at the Little John site in 2011; a fuller inventory is provided in the print and electronic appendices, while the tables below provide a summary of the total formed and unformed artifacts recovered at Little John in 2011.

Site	(All)
Site Quad	(All)
Unit	(All)

Summary **Type**	**Level** **O / A**	**B1**	**Ash**	**B - No Ash**	**B2**	**WL Loess**	**EL Loess**	**PSC**	**LbPSC**	**PbL**	**C**	**Other**	**Total**	**%**
Biface	0	1	1	1	3	0	0	0	0	0	0	0	6	0.88%
Microblade	0	0	3	0	13	0	0	0	0	0	0	0	16	0.15%
Blade	0	0	0	0	0	1	0	0	0	0	0	0	1	2.36%
Burin	0	0	0	0	1	0	0	0	0	0	0	0	1	0.15%
Scraper	0	0	0	0	5	0	0	0	0	0	0	0	5	0.74%
Core Tablet	0	0	0	0	2	0	0	0	0	0	0	0	2	0.29%
Core Fragment	0	0	0	0	3	0	0	0	0	0	0	0	3	0.44%
Modified Flake	0	0	0	3	3	1	0	2	1	0	0	0	10	1.47%
Modified Cobble/Pebble	0	0	0	0	0	0	0	3	3	0	0	0	6	0.88%
Debitage	1	21	28	11	363	68	2	10	5	3	1	4	517	76.14%
Hammerstone	0	1	0	0	2	0	0	2	2	0	0	1	8	1.18%
Cobbles/Pebble	2	4	0	1	0	2	0	22	11	0	0	1	43	6.33%
Fire Altered	0	0	12	0	13	4	0	2	2	0	0	0	33	4.86%
Historic	3	5	1	3	15	0	0	0	0	0	0	0	27	3.98%
Other	0	0	0	0	0	0	0	0	0	0	0	1	1	0.15%
Total	**6**	**32**	**45**	**19**	**423**	**76**	**2**	**41**	**24**	**3**	**1**	**7**	**679**	100.00%

Table 9. Summary of Recovered Artifacts by Type and Stratum, KdVo6-2011

Bifaces

Six formed bifaces or biface fragments, presumably used as projectile points or knives, were recovered during excavations at Little John in 2011. Their distribution is summarized in the Table below, while photographs and general descriptions follow.

Group Label Label	Bifaces (All)

Raw Material	Biface Metrics Weight (g)	Length (mm)	Width (mm)	Thickness (mm)	Cortex
basalt					
3250	15.6	56.22	24.97	8.12	0
3255	21.7	51.52	39.98	9.58	0
3402	4.6	25.51	24.79	7.04	0
chert					
3201	5	35.77	17.61	10.4	0
3206	0.1	8.66	11.86	1.1	0
3257	3	18.66	26.77	9.49	0

Table 10. Raw Material and Metric Characteristics of Bifaces, KdVo6-2011

Basalt Bifaces

KdVo6: 3250 is a medial lanceolate biface fragment recovered from a krotovina (animal burrow) within the B stratum of N1 E7. It is made on coarse-grained basalt and bears a collateral overshot flake pattern, less so on one side than the other.

Figure 49. KdVo6:3250, Medial Biface Fragment, N1E7 B.

KdVo6: 3255 is a proximal biface fragment recovered from the Unit S14W20 in the B2 horizon, at a depth of 7.5 cm below the surface. It is made on coarse-grained basalt, with invasive flaking on the surface and exhibits short sub parallel bifacial retouch along both margins.

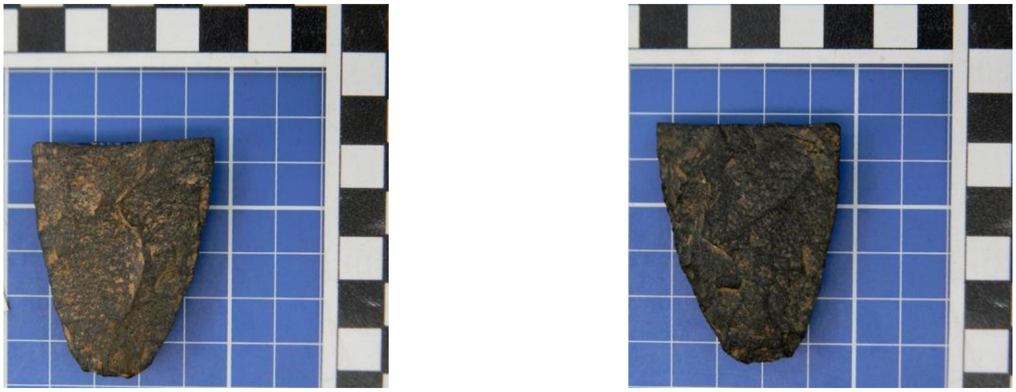


Figure 50. KdVo6:3255, Proximal Biface Fragment, S14W20, B2.

KdVo6: 3402 is a proximal biface fragment made on coarse-grained basalt found in Unit S16W21 in the B2 stratum. Broken across the medial axis, this fragment displays short bifacial retouch along its left margin and invasive irregular dorsal flake scars. It is also heavily burned on both surfaces.

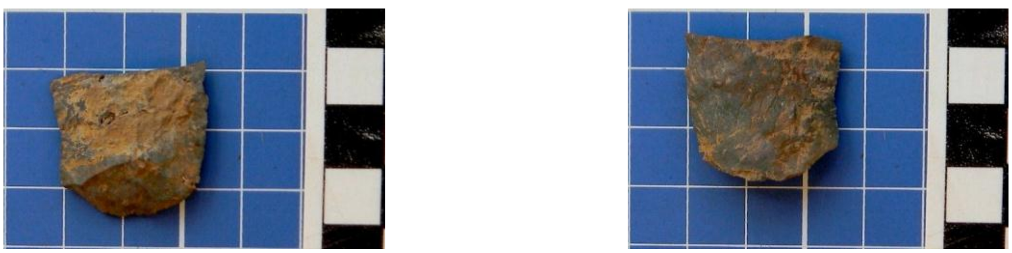


Figure 51. KdVo6:3402 Proximal Biface Fragment S16W21 B2

Chert Bifaces

KdVo6:3201 is a bifacially worked fragment of grey chert, recovered in Unit S16W20 from the top of the B2 horizon at a depth of 14 cm below surface. It is broken along the medial axis with short irregular invasive bifacial flaking.

Figure 52. KdVo6:3201, Bifacially Worked Fragment, S16W20, B2.

KdVo6: 3206 is spall fractured biface manufactured on black chert found in the B1 horizon of Unit S14W21. It is irregularly retouched along all margins, invasively flaked and frost fractured on one surface (right photo) and heat spalled on the other (left photo).

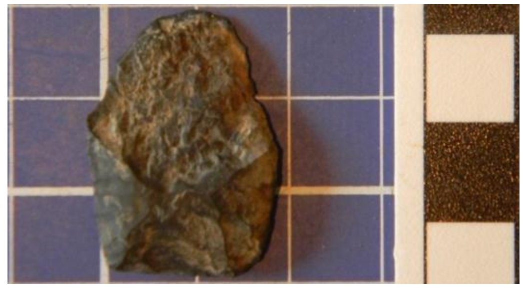


Figure 53. KdVo6: 3206, Spall Fractured Biface, S14W21, B1.

KdVo6:3257 is a bifacially worked fragment recovered from Unit S14W20 in the B2 stratum. It is made on black chert with invasive flake scars and short irregular bifacial retouch along the left margin.

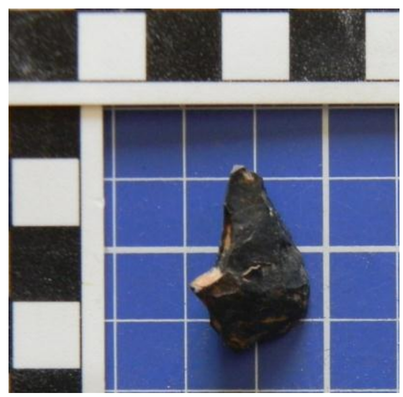


Figure 54. KdVo6:3257 , Bifacially Worked Chert Fragment, S14W20, B2 Stratum.

Microblade Technology

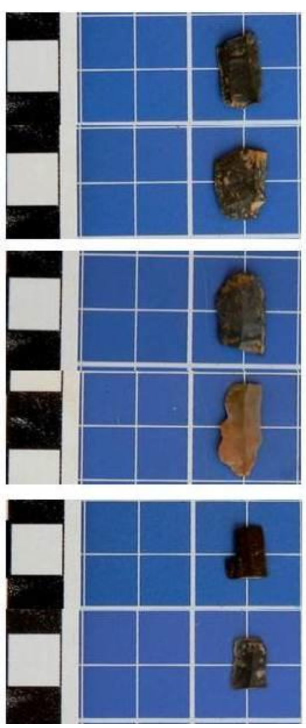
Eleven Microblades were recovered from the West Lobe Ash (n=2) and B2 (n=9) strata at KdVo-6 in 2011. The Table below provides a summary of their metric morphology. Three microblades were fashioned on obsidian while the remaining are on a variety of chert types including black chert (n=3), grey chert (n=2), light grey/orange chert (n=1) and brown chert (n=2). All eleven specimens came from the SW quadrant down below on the site's promontory overlooking Mirror Creek (West Lobe).

Group Label	Microblade
Label	(All)

Raw Material	**Microblade Metrics Weight (g)**	**Length (mm)**	**Width (mm)**	**Thickness (mm)**	**Cortex**
basalt					
3270	0.9	28.12	8.58	3.23	0
chert					
3217	0.2	12.07	8.82	1.58	0
3219	0.6	19.97	6.54	2.74	0
3325	0.2	14.87	7.46	2.04	0
3336	0.1	11.59	5.39	1.25	0
3338	0.3	13.83	7.87	1.86	0
3343	0.2	13	9.76	1.68	0
3356	0.1	9.75	7.99	1.67	0
3362	0.1	9.48	6.7	1.26	0
3379	0.4	15.49	10.14	2.42	0
3395	0.2	17.35	8	1.49	0
3488	0.1	21.37	4.55	1.23	0
3606	1	22.66	12.58	4.6	0
obsidian					
3355	0.5	27.29	8.74	2.91	0
3368	0.7	19.73	13.36	3.58	0
3612	0.1	13.55	5.25	1	0

Table 11. Raw Material and Metric Characteristics of Microblades, KdVo6-2011

Chert Microblades



KdVo6-3338: S15W20 B2

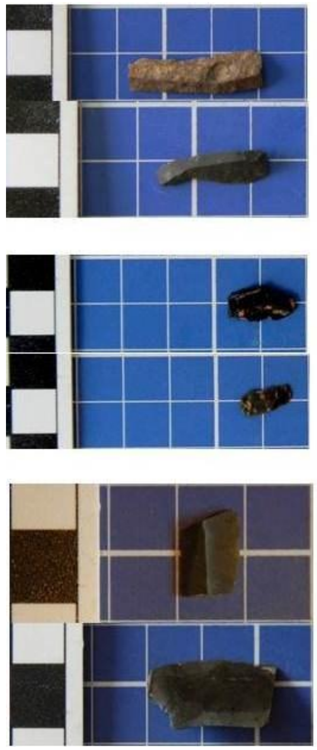
KdVo6-3343: S15W20 B2

KdVo6-3356: S16W21 Ash

KdVo6-3395: S16W21 B2

KdVo6-3379: S16W21 B2

KdVo6-3362: S16W21 B2



KdVo6-3270: S13W20 B2

KdVo6-3219: S16W20 B2

KdVo6-3325: S15W20 Ash

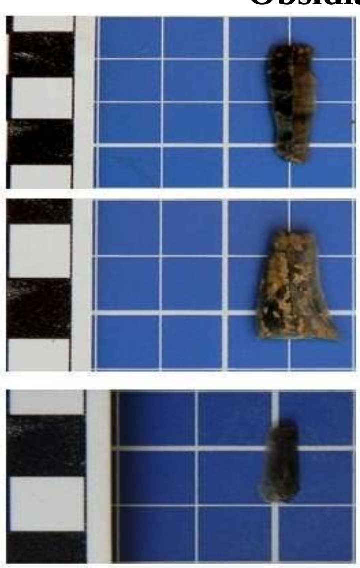
KdVo6-3336: S15W20 B2

KdVo6-3217: S16W20 B2

KdVo6-3606: S5W19 B2

Figure 55. KdVo6 2011 Chert Microblades

Obsidian Microblades



KdVo6-3355: S16W21 Ash

KdVo6-3368: S16W21 B2

KdVo6-3612: S6W18 B2

Figure 56. KdVo6 2011 Obsidian Microblades

Large Blades

A single Blade and a Blade-like flake were found during the Little John site's 2011 excavation season. The Blade (KdVo6:3451) is fashioned into a multi-edged Scraper and is described in the next section below. The Blade-like Flake (KdVo6:3474) is made on black chert and was recovered from Unit N0E6 at the top of the Loess stratum. Unifacial, stepped retouch is exhibited on both the right and left margins of the blade's dorsal surface. There is a single arris on the dorsal surface and all retouched margins display signs of use wear.

Group Label	Blades
Label	(All)

Raw Material	**Modified Flake Metrics Weight (g)**	**Length (mm)**	**Width (mm)**	**Thickness (mm)**	**Cortex**
chert					
3474	1.6	37.26	14.71	6.18	0

Table 12. Large Blade Raw Material and Metrics, KdVo6-2011

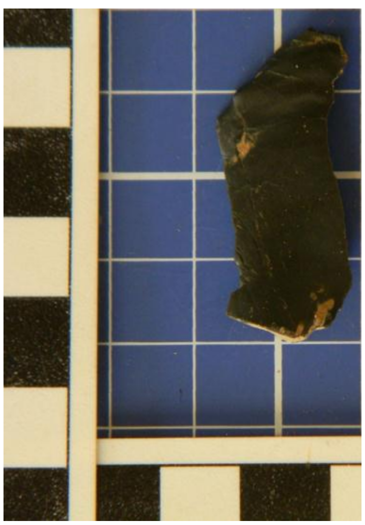
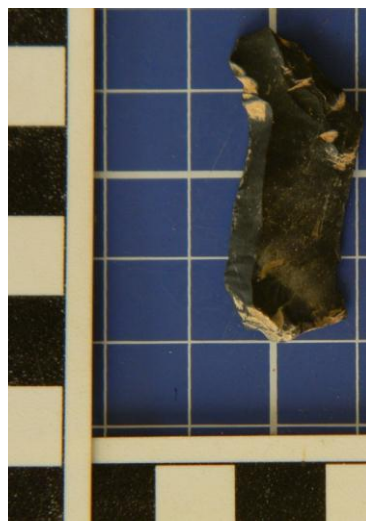



Figure 57. KdVo6:3474, Blade-Like Flake, N0E6, Loess Stratum

Scrapers and Burins

Five Scrapers, of which is burinated, and one Burin Spall were collected at Little John in 2011. They were all recovered from the Holocene B2 stratum. Their raw material and metric characteristics are summarized in the Tables below, followed by illustrations and descriptions of a selection.

Group Label Label	Scrapers (All)

Raw Material	Scraper Metrics Weight (g)	Length (mm)	Width (mm)	Thickness (mm)	Cortex
chert					
3259	18.8	9.49	38.43	10.25	0
3276	2.8	19.36	16.4	9.84	0
3599	3	28.89	27.28	5.38	0
obsidian					
3597	3.7	28.95	27.77	6.72	0
rhyolite					
3451	7.5	55.5	19.58	9.23	0

Table 13. Raw Material and Metric Characteristics of Scrapers, KdVo6-2011

Group Label Label	Burins (All)

Raw Material	Burin Metrics Weight (g)	Length (mm)	Width (mm)	Thickness (mm)	Cortex
obsidian					
3378	0.5	15.75	10.56	3.79	0

Table 14. Raw Material and Metric Characteristics of Burin Spall, KdVo6-2011

Figure 58. KdVo6:3451, Rhyolite Multi-edged Scraper on a Blade, Unit S16W22, Low B2

KdVo6:3451 is a tan coloured multi-edged Scraper formed on a andesite blade recovered from Unit S16W22 low in B2 stratum at 32 cm below datum. The distal end exhibits an ex-curvate edge with extensive flaking and has a steepness of 70 degrees. The right margin is also extensively flaked with a steepness of 60 degrees. Retouch is further exhibited on the left margin that has a steepness of 55 degrees. All modifications are unifacial on the dorsal surface.

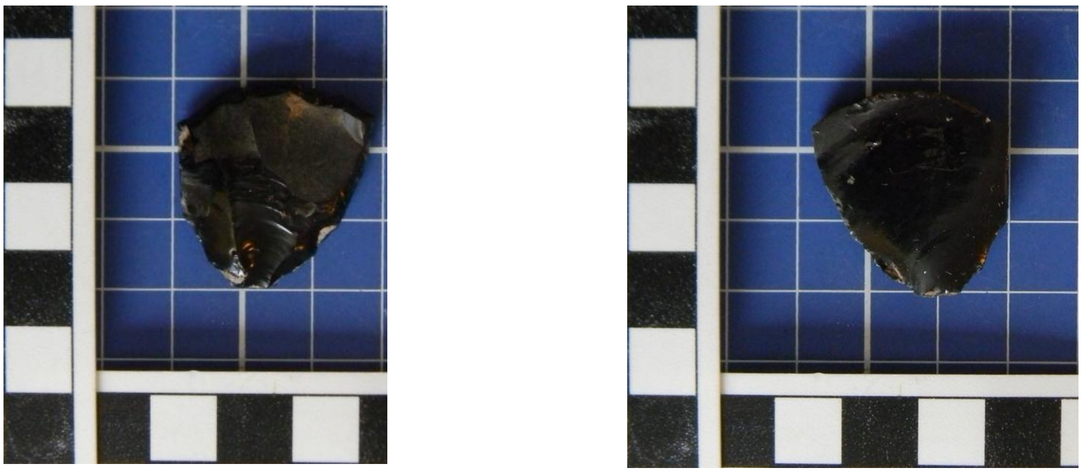


Figure 59. KdVo6:3597, Obsidian End/Side Scraper, Unit S0E4, Top of the B2

KdVo6:3597 is a Thumbnail End Scraper made on black obsidian found in the top B2 stratum of Unit S0E4. Its dorsal surface displays evidence of invasive flaking to form a concavity for gripping. Its distal and right margins have been bifacially retouched, to form steep 80 degree scraping edges.

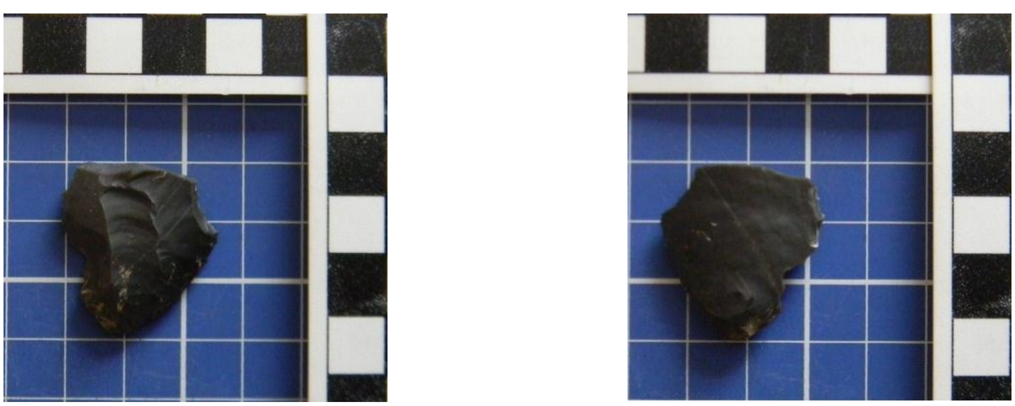


Figure 60. KdVo6:3599 Multi-tool on Black Chert, Unit S6W18, B2 Stratum

KdVo6:3599 is a combination Scraper / Burin / Notch formed on black chert and recovered from the B2 stratum of S6W18. Its right margin is notched at its distal end intersecting the broken medial section of the flake created by a burin blow. The left margin is retouched to form a 45 degree edge and is also notched near its distal end. Its left, right and distal margins are edge modified and exhibit use wear.

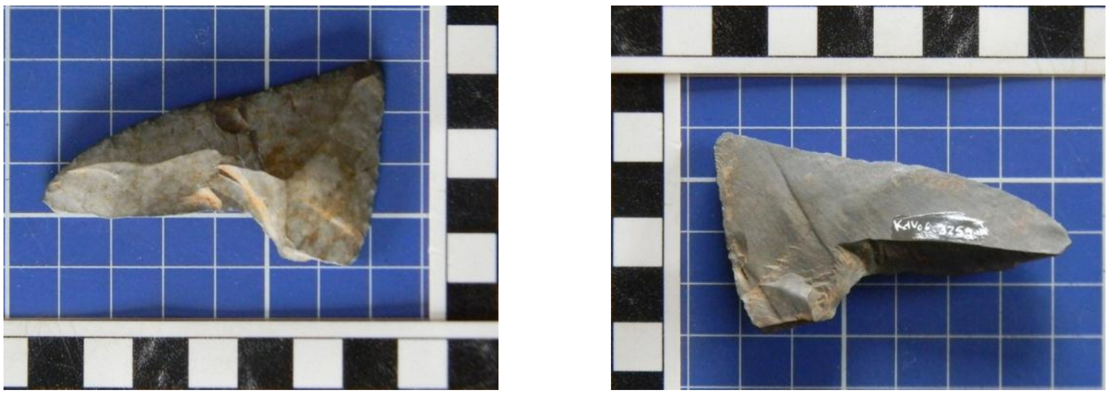


Figure 61. KdVo6:3259, Side / End Scraper on Grey Chert, Unit S14W20, B2 Stratum

KdVo6:3259 is a Side and End scraper manufactured on light grey chert found in the B2 stratum of unit S14W20. Its distal margin displays short unifacial retouch and has a steepness of 35 degrees, while its right margin exhibits bifacial edge modification and has a steepness of 30 degrees.

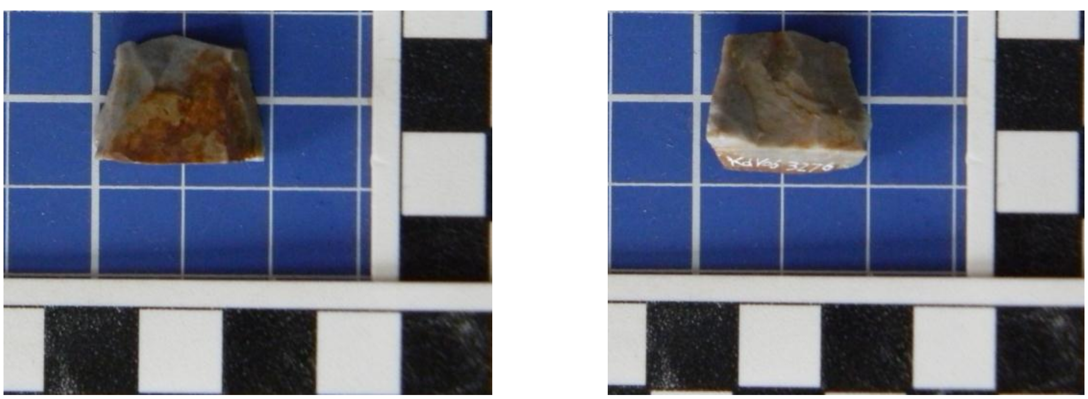


Figure 62. KdVo6:3276, Scraper on Grey Chert, Unit S13W20, B2 Stratum

KdVo6: 3276 is a plane scraper formed on blocky piece of grey chert shatter recovered from the B2 horizon of unit S13W20. Its right margin is finely retouched to form an edge with an angle of 22 degrees. Its dorsal surface is oxidized, suggesting that it was burned.

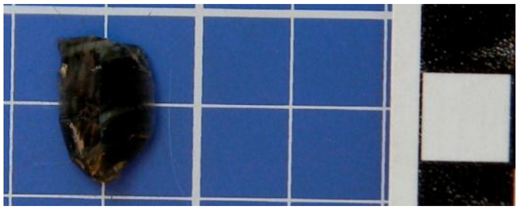



Figure 63. KdVo6: 3378, Obsidian Burin Spall Unit S16W21, B2 Stratum

KdVo6:3378 is a burin spall recovered from the B2 horizon of unit S16W21. It is formed on black and grey banded obsidian suggesting its source at Wiki Peak.

Edge Modified – Retouched – Utilized Flakes

Group Label	Modified Flake
Label	(All)

Raw Material	Modified Flake Metrics Weight (g)	Length (mm)	Width (mm)	Thickness (mm)	Cortex
basalt					
3476	32.5	58.87	37.93	14.8	0
3500	9.8	33.82	26.83	10.96	0.25
3520	9.3	49.8	25.68	9.75	0
chert					
3225	0.1	11.42	8.62	2.39	0
3258	1.6	39.06	19.82	3.4	0
3274	0.9	11.81	18.6	5.47	0
3515	1.9	23.81	16.04	5.27	0
obsidian					
3235	2.1	34.75	28.02	4.12	0
3241	0.1	9.51	3.2	1.39	0
3586	1.1	27.28	19.18	4.32	0

Table 15. KdVo6 2011, Material and Metric Attributes of Modified Flakes

This class of artifact is ubiquitous throughout the site through all levels. They usually consist of larger secondary waste flakes produced in the manufacture of more formal tools that have been subsequently utilized, producing characteristic irregular flake scars along one or more edges during their expedient use as slicing, cutting, or scraping implements. Less often they exhibit deliberate secondary modification in the form of semi - to regular retouch along one or more edges to facilitate more specific use, although the two categories of edge modification cross-grade into each other making it sometimes difficult to determine whether the modification was the product of utilization or deliberate retouching. Ten definitive Retouched Flakes (as opposed to Edge-Modified by perhaps other means such as utilization) recovered in 2011 are summarized in the table above; the remaining 517 pieces of flake debitage are described in the inventories (including photographs) in the accompanying Filemaker and Excel inventories.

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

A total of fifty-one of these artifact forms were recovered at the Little John site in 2011. Their full morphology are described in the inventories (including photographs) in the accompanying Filemaker and Excel inventories.

This class of artifact is ubiquitous across the Little John site, consisting of cortical pebbles and cobbles presumably used for shaping or flaking other stone and breaking bone for marrow extraction, producing bone slivers for further working into a variety of tools, and use as boiling stones in organic baskets to cook a variety of food, split cobbles and pebbles for chopping wood and bone and other expedient uses, that are often immediately discarded, flat-sided or split cobbles for use as a stable base for preparing stone or breaking bone, and planing wood and bone.

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. Split Cobble Tools might be used as a Chopper or as a primary hide scraping tool (the *Thii Cho*). 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. 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.

Historic Remains

A limited amount of historic remains (n=27) were recovered at the Little John site in 2011, the most common of which were braided nails (n=21). The remaining material consisted of a piece of cloth, a bottle cap, a punched hinge, a short length of chain commonly found on drain plugs, a crucifix with associated Christ-figure that had come off of the cross, and a whetstone.

Table 16. KdVo6: 3230 and 3244, Historic Remains

CONCLUDING REMARKS

The 2011 field excavations at the Little John site provided us with the opportunity to begin wide area excavations of the strata comprised of the Paleosol Complex and those below in a more rigorous fashion, allowing us to perceive more clearly additional preserved paleosols within the Loess below Paleosol horizon. Significantly, these lower levels also contain a relative abundance of decayed but still recognizable wood remains, some of which is definitively identified as belonging to *Betula spp*. and likely represents early colonization of the region by this species during the Birch Rise. The cultural affiliation of these organic remains is buttressed by their association with hearth features and culturally modified bones, although at the current extent of area exposure no clear patterning of their distribution is apparent to us. Work in 2012, which will continue to expose contiguous units to these levels, should assist us in this regard.

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