Appendix I: ARTIFACTS AND FAUNA

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ARTIFACT DESCRIPTIONS

Patricia Ormerod

This section provides descriptions, definitions and photographs of the stone, bone and antler, and historic artifact classes recovered in the excavations and from surface collections. Artifact types and acronyms follow the classification used in the original Eagle Lake Archaeological Project report (Matson et al. 1980). The acronyms are used in tables in the main volume, in tables in this appendix and in the artifact database. This classification serves as the basis of the intersite comparisons basic to the research reported in Chapter 4. All objects were re-examined, reclassified, and measured for this report.

Length, width, thickness and weight data are reported for all artifact types. When metric data are tabled, the mean and range are reported and the inter-quartile range (IQR) is also reported for types with more than 10 members. Tabled data for maximum length and maximum width are based only on specimens that are complete in that dimension unless stated otherwise. Thickness data are based on all specimens including fragments. Weights are based on specimens that are complete in both length and width unless stated otherwise. All dimensions in this appendix are given in millimetres (mm) and weights are in grams (g). Where individual artifact measurements are tabulated, "completeness" (C) is also indicated.

Lithic raw material types are described as granite, chert, obsidian, and fine-grained or coarse-grained basalt. Bakewell and Irving (1994) have reported that petrographic definitions without geochemical analyses can result in confusion in the classification and sourcing of stone; we suspect they would classify the Eagle Lake area "basalts" as "dacites".

Artifact numbers used in this report are those on the artifacts and, therefore, may include the temporary site numbers assigned in the field rather than Borden site numbers. Table I-1 provides a cross reference of temporary site numbers, Borden site numbers, and site names. Although many artifacts have been previously illustrated, both in publications (various Matson and Magne, Magne 1985; Matson and Pokotylo 1998; Pokotylo and Mitchell 1998) and in 'Grey Literature' research reports (Matson et al. 1980; Magne and Matson 1984), all artifact illustrations were re-photographed for the current volume.

Where appropriate, references are made to Paull's (1984) residue analysis, which is reported in more detail in Magne and Matson (1984). Paull used the Sudan IV test for fats and the Hemastix test for hemoglobin. Only loci that looked like they might be dried blood were tested.

We found that the most detailed and useful artifact classification for stylistic and temporal comparisons with the Eagle Lake project assemblages was Stryd's 1973 dissertation, which included a detailed analysis of several large collections dating to the last half of the Plateau Pithouse Tradition (PPT) in the Lillooet region of B.C.

Table I-1 Field Assigned Site Numbers, Borden Site Numbers and Site Names (For lithic artifacts described in "Artifact Description" and labelled on Figures and Tables.)

Field Assigned Site Numbers	Borden Site Number	Site Name
(n.a.)	EkSa 13	Shields Site
ELP 1:1	EkSa 17	
ELP 16:1	EkSb 5	
ELP 19:1	EkSa 27	
ELP 20:1	EkSa 28	
ELP 22:1	EkSb 6	
ELP 26:2	EkSa 31	
ELP 27:1	EkSa 32	Boyd Site
ELP 32:1	EkSa 36	Bear Lake Site
ELP 44:2, G20:2	EkSb 13	
ELP 44:3, G20:3	EkSb 14	
ELP 44:4, G20:4	EkSb 15	
ELP G2:4	EkSa 130	
ELP G5:1	EkSb 21	
ELP G7:1	EkSb 24	
CR 1	EjSa 11	
CR 3	EjSa 10	
CR 9	EkSa 115	
CR 12	EjSa 13	
CR 28	EkSa 98	
CR 32	EkSa 39	
CR 40	EkSa 89	
CR 50	EkSa 118	
CR 64	EkSa 34	
CR 73	EkSa 35	
CR 89	EkSa 55	
CR 92	EkSa 33	Brittany Creek Site
CR 98	EkSa 62	
T84-27	EkSb 37	Fish Trap Lake Site
ElRw 4	ElRw 4	Quiggly Holes/ Bidwell Creek Site
ELP G2:04	Offsite	

Flaked Lithic Assemblage
Bifaces

1. Side-notched Points and Multi-notched Side-notched Points

Side-Notched Points SNPT n = 55

The side-notched point assemblage includes 49 fine-grained basalt and 6 obsidian specimens.

Table I-2 Side-Notched Points: Metric Data

	# of Specimens	Range	IQR	Mean
Length	13	16.7-32.5	18.8-27.4	22.5
Width	27	10.2-20.2	11.8-14.8	13.5
Thickness	55	1.6- 6.6	2.7-3.6	3.2
Weight	11	0.43-2.39	0.55-1.25	1.10

The simple or single side-notched points and fragments (Figure I- 1, a-a' [Figure 42 in the main volume]) are equivalent to Stryd's Side-Notched Arrow Points (Stryd 1973:330-332, Plate 24 a-t) and Sanger's Group 10 Side-Notched Points with small, narrow notches (Sanger 1970:42-44) which are commonly referred to as Kamloops side-notched points (Richards and Rousseau 1987; Pokotylo and Mitchell 1998). Blades are triangular with straight (rarely convex) lateral blade margins, side notches are (usually) bifacial, narrow, and shallow, and bases are generally straight, although some are concave. Kamloops side-notched points were strongly associated with the Kamloops "Phase" components (Stryd 1973:332) of the Kamloops Horizon (1200 -200 BP) as defined by Richards and Rousseau (1987). They first occur about 1200 years ago and are used to define the beginning of the Kamloops culture. Small, side-notched arrow points are found over much of western North America in the last 1000 years.

The dimensions and weights of Eagle Lake area side-notched points are similar to those recorded by Stryd (1973) and Matson et al. (1984). Stryd noted that up to 30 % of the Kamloops side-notched points, primarily the smaller specimens, were created by bifacial marginal retouch on a unifacial primary flake (Stryd 1973:331). This reduction process was apparent in only 3 of the Eagle Lake Project side-notched point assemblage (Figure I-1, s-u). One point (Figure I-1, v), exhibits the bilateral basal flaring and rapidly expanding stem described by Stryd (Stryd 1973:331, Fig 24 q-t) but has no evidence of "the beginning of small side notches" that he found on three of the four Lillooet area specimens.

EkSa 36:3072 (Figure I-1, y) was tested by Paull (1984) for fat and blood residues at two loci and both came up positive. This finding is in agreement with the traditional interpretation that these bifaces are arrow points.

Two specimens have a single side notche only (Figure I-1, w-x): the one from the Bear Lake site (EkSa 36) (Figure I-1, w) is thin with unifacial flaking along both lateral margins and one deep side-notch. It was recovered in two pieces (blade and base) which had snapped apart from the inside centre of the notch, so we can assume it broke during manufacture. The other single side-notched point (Figure I-1, x) is flaked on alternate faces and was intact when

found.

A detailed, multivariate analysis of the variation within this point class is provided in the discussion in Chapter 4 where subtle variations within this class are shown to correspond with ethnic origin.

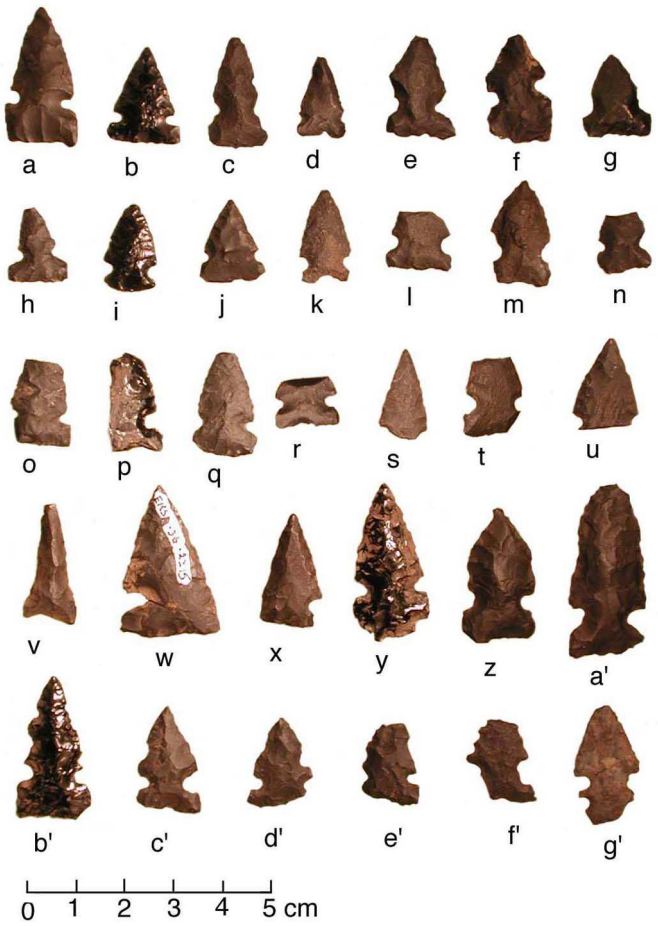

Figure I-1. Side-notched and Multi-notched Points

Side-notched Points (SNPT):

a. ELP 32:1122	b. ELP 19-1:454	c. CR 98:8	d. T84-27:491	e. ELP 19-1:163
f. CR 73:40	g. CR 9:1	h. ELP 19-1:641	i. CR 98:7	j. ELP 19-1:24
k. EkSa 33:3895	l. CR 98:1	m. ElRw4:1677	n. CR 92:1892	o. ELP 19-1:8
p. EkSa 13:4092	q. ELP 19-1:1461	r. ELP 19-1:244	s. CR 1:2	t. ELP 19-1:175
u. EkSa 33:3047	v. T84-27:2119	w. EkSa 36:4981/2215		x. ElRw 4:1357
y. EkSa 36:3072	z. CR 92:1868	a'. CR 32:1		

Multi-notched Points (MNPT):

b'. EkSa 13:1058	c'. ElRw 4:1356	d'. ELP 19-1:1493	e'. CR 28:2	f'. CR 92:2194
g'. ElRw 4:1675				

Table I-3 Single-side Notched Points: Metric Data

Artifact No.	Length	Complete	Width	Complete	Thickness	Weight
EkSa 36:4981/2215	31.2	Y	20.2	Y	3.2	1.45
ElRw 4:1357	23.0	Y	12.2	Y	3.8	1.00

Large side-notched points (Figure I-1, y-a') include one of obsidian from the Bear Lake site (EkSa 36) that has a convex base with a spur. A specimen from the Brittany Creek site (EkSa 33) (Figure I-1, z) has an elongated, asymmetrical tip and crushing on one lateral margin: it may have been used as a drill.

Table I-4 Large Side-notched Points: Metric Data

Artifact No.	Length	Complete	Width	Complete	Thickness	Weight
ELP 32:3072	32.5	Y	15.7	Y	5.4	2.10
CR 32:1	35.3	N	17.0	Y	6.6	3.41
CR 92:1868	27.4	Y	15.3	Y	6.2	2.39

Multi-notched Points MNPT n = 6

Five multi-notched side-notched points from the Eagle Lake Project area are fine-grained basalt, one, from the Shields site (EkSa 13), is obsidian (Figure I-1, b'); and all are bifacially flaked (Figure I-1, b'-g'). Stryd (1973:331-32) placed the multi-notched point within the Kamloops culture but Richards and Rousseau (1987:43-44) believe the multi-notched variant of the Kamloops side-notched point type dates between ca. 400 and 100 B.P. This kind of point is associated with PPT and not with Athapaskan assemblages.

Five specimens exhibit multiple notches on the blade and one has multiple notches on the stem only (Figure I-1, g'). In all cases, the notches are asymmetrical, occurring only (or in larger numbers) on one lateral margin. The point with stem notches (Figure I-1, g') and one specimen with blade notching (Figure I-1, f') exhibit "small, narrow notches" as described by Stryd (1973:331, Fig 24, i) for the single specimen in the Lillooet assemblage. The other four specimens have broad, shallow notches. The two specimens from the Bidwell Creek/Quiggly Holes site (ElRw 4) were recovered during excavation, not on the surface. The sizes reported here are similar to those given by Matson et al. (1983:163) for the Mouth of the Chilcotin (MOC).

Table I-5 Multi-notched Points: Metric Data

Artifact No.	Length	Complete	Width	Complete	Thickness	Weight
EkSa 13:1058	29.1	Y	15.4	Y	4.3	1.44
EkSa 33:2194	16.4	N	12.6	N	3.1	0.68
ElRw 4:1356	21.3	Y	13.5	Y	3.1	0.69
ElRw 4:1675	24.4	N	13.3	N	3.7	1.01
ELP 19-1:1499	17.9	Y	14.0	N	2.8	0.58

2. Kavik Points KAPT n = 4

The Kavik point (Campbell 1968), also referred to as Klo-kut (Shinkwin 1979: 117, 154; Morlan 1973:480, Campbell 1968:41), is a small, stemmed point with triangular blade, maximum width at the shoulders, and a well-defined stem that can be straight or contracting. The specimens from the Kavik site, described as crudely finished chert and chalcedony, had pointed bases and sharp, unground edges (Campbell 1968:37). The Kavik point style is associated with northern Athapaskan culture (Campbell 1968:39-41) and is relatively recent

(Campbell 1968:40; Boudreau 1974:11).

The size range of the four Kavik points recovered in the Eagle Lake Project area is most similar to the assemblage of five "Klo-kut-like points" from the Dixthada site (Shinkwin 1979:117) although in form both assemblages are like the slightly larger points from the Klo-kut site (Morlan 1973:241-249). The Eagle Lake points are fine-grained basalt (Figure I-2, a-d; [Figure 43 in the main volume]). Only items "a" (ELP 32-1:188; the Bear Lake site) and "d" (EkSa 33:1007) in Figure I-2 fully fit the description of Kavik or Klo-kut points. The other two points have both notches and tapering stems that might be considered to be combinations of Kamloops and Kavik point attributes. Nothing like them was found in PPT descriptive material, indicating that they are not typical of the Plateau Pithouse Tradition, and thus they are tentatively included along with more typical Kavik points in this report.

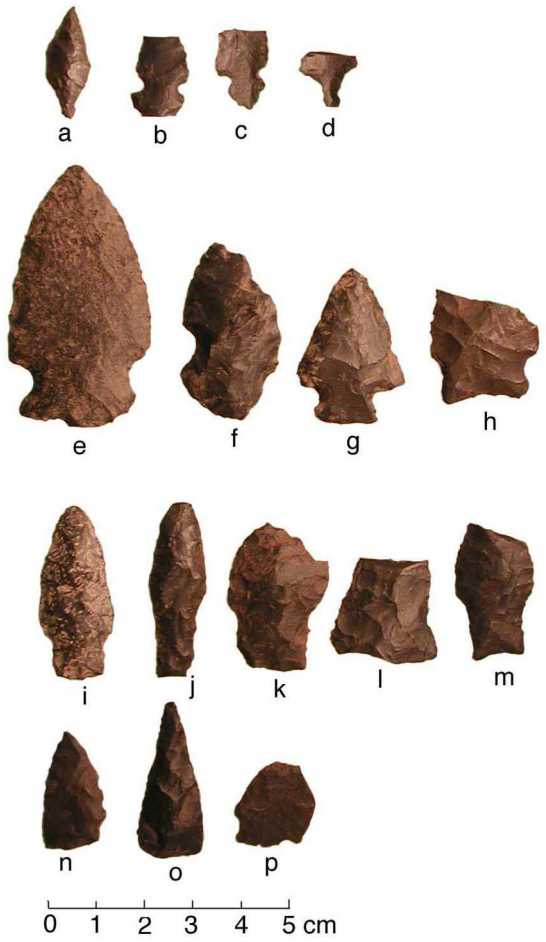

Figure I-2. Kavik, Corner-notched, Stemmed and Miscellaneous Points

Kavik Points (KAPT):	a. ELP 32-1:188	b. EkSa 33:2650	c. CR 73:39	d. CR 92:1007
Corner-Notched Points (CNPT):	e. EkSa 32:6200	f. EkSa 13:1474	g. EkSa 32:5712	h. CR 89:1
Stemmed Points (STPT):	i. EkSa 32:1046	j. ElRw 4:1358	k. EkSa 13:2418	l. CR 40:128
	m. ELP 27 OS:8			
Miscellaneous Points (MIPT):	n. EkSa 33:2477	o. EkSa 33:3330	p. CR 92:20	

Table I-6 Kavik Points: Metric Data

Artifact No.	Length	C	Width	C	Thickness	Weight
CR 73:39	16.5	N	11.0	N	2.5	0.50
ELP 32-1:188	22.8	Y	9.1	Y	3.0	0.47
EkSa 33:1007	11.5	N	12.2	N	2.4	0.28
EkSa 33:2650	16.6	N	11.0	N	3.1	0.68

3. Corner-notched Points CNPT n = 4

Two complete corner-notched points and two base fragments, all fine-grained basalt, were recovered in the Eagle Lake Project area (Figure I-2, e-h). The fragment of a corner-notched point (Figure I-2, f) recovered from the Shields site (EkSa 13) is almost identical in size and shape to the largest complete point (Figure I-2, e) from the Boyd site (EkSa 32). The small, complete corner-notched point (Figure I-2, g), also from the excavation at the Boyd site (EkSa 32), is very fine-grained basalt with unifacial thinning of the base.

These three points appear to fit Type A Corner-Notched Atlatl Points as described by Stryd for the Lillooet area of the British Columbia Plateau (Stryd 1973:338-39, Fig 26 a-h). Stryd reports (1973:339) that 12 of the 23 Type A points he recovered were from Kamloops "Phase" components and most of the rest were from the equivalent of Richards and Rousseau's (1987) Plateau Horizon (2400 -1200 BP). This distribution indicates they are probably not atlatl points and are, in any event, associated with the last half of the Plateau Pithouse Tradition (PPT).

The presence of these two corner-notched points (and the stemmed points described below) and the lack of Kamloops points at the Boyd site were interpreted in the field as indicating that a good Kamloops component was not present at the Boyd site. Since one of the main reasons for excavating the Boyd site was to obtain a terminal date for the Eagle Lake PPT occupation, this inference ended excavation there and led to the excavation of the Shields site. The identification of this point type as common in the Kamloops culture invalidates this interpretation, as did the resulting Kamloops-age radiocarbon date obtained from the Boyd site. Furthermore, the third example of this point type was from another late PPT component at the Shields site.

Paull (1984) tested EkSa 32:6200 (Figure I-2, e) in three loci for blood and one for fat. One test was positive for fat and negative for blood and two were positive for blood, as expected for projectile points.

The fourth corner-notched point fragment from the Eagle Lake area was collected on the surface of EkSa 55 (Figure I-2, h). It is similar to Sanger's Group 3 Projectile Points (1970:38, 105, Fig 20 k-p), attributed to the Lower Middle Period (5000 BP to 4000 BP), however, it has no evidence of basal grinding.

Table I-7 Corner-notched Points: Metric Data

Artifact No.	Length	C	Width	C	Thickness	Weight
EkSa 32:6200	54.1	Y	29.5	Y	8.2	12.69
EkSa 32:5712	32.6	Y	22.8	Y	5.3	3.39
EkSa 13:1474	35.6	N	22.4	N	8.6	5.74
CR 89:1	28.6	N	24.9	Y	4.7	2.57

4. Stemmed Points STPT n = 5

The five stemmed points recovered in the Eagle Lake Project area are all fine-grained basalt (Figure I-2, i-m). Three (Figure I-2, i-k), including one each from the Shields (EkSa 13, k) and Boyd (EkSa 32, i) sites, are relatively thick, with neck and stem of nearly equal width. Only the specimen from the Bidwell Creek site (ElRw 4) (Figure I-2, j) tapers slightly from neck to base; one edge is worn to a polish. The other two specimens (Figure I-2, l-m), including one from the Boyd site (EkSa 32), have unifacial or bifacial thinning of blade and stem: the thinned base of the Boyd site specimen (Figure I-2, m) is concave.

The stemmed points recovered in the Eagle Lake Project area are similar in shape to Stryd's Stemmed Atlatl Points (1973:327-28) but are smaller and fall within the general size (but not thickness) parameters of his Stemmed Arrow Points (1973:325). Stryd reports that both these types are found in Kamloops components. In terms of size, all the points here appear to be shorter than any of the atlatl points reported by Stryd, and the widest one (22.8 mm) from Eagle Lake does not quite match the narrowest (23.4 mm) reported by Stryd; only one from Eagle Lake is as thick as any from Lillooet. Thus these points appear to be significantly smaller than Stryd's Stemmed Atlatl Points.

One example from the surface of the Boyd site (Figure I-2, m) might be better compared with Sanger's (1970:44) Group 12 "Single Basal Notch" class that includes a variety of outlines and is found in the pre-PPT component of the Lochnore Creek site (EdRk 7). Figure 22, "d" in Sanger shows a very similar object to the Boyd site point. With this exception, the stemmed point class from the Eagle Lake Project area appears to date to the last half of the PPT.

Paull (1984) tested EkSa 32:1046 (Figure I-2, i) for blood at one loci and it was positive.

Table I-8 Stemmed Points: Metric Data

Artifact No.	Length	C	Width	C	Thickness	Weight
EkSa 32:1046	36.3	Y	15.6	Y	6.7	3.66
EkSa 13:2418	30.9	N	21.0	N	8.0	4.72
ElRw 4:1358	37.0	N	12.0	Y	5.5	2.46
ELP 27:OS:8	28.6	N	16.8	Y	5.0	2.30
CR 40:128	21.7	N	22.8	N	6.4	3.26

5. Miscellaneous Points MIPT n = 3

Two unnotched points and one fragment, all fine-grained basalt, were recovered from the Brittany Creek site (EkSa 33) (Figure I-2, n-p). The two complete specimens (Figure I-2, n-o), although dissimilar, both fall into Stryd's Unnotched Arrow Point Type that is affiliated with the Kamloops culture (1973:323-24, Fig 22 a-g). Both may be arrow point preforms.

The fragment (Figure I-2, p) may also be a preform, in this case for a small corner-notched point with squared shoulders and an expanding stem. Similar points are described by Stryd 1973:334-35, Fig 24) as Corner Notched Arrow Points Type C and are primarily affiliated with the Kamloops Horizon.

Table I-9 Miscellaneous Points: Metric Data

Artifact No.	Length	C	Width	C	Thickness	Weight
EkSa 33:208	19.5	N	15.6	N	2.8	1.04
EkSa 33:2477	24.3	Y	13.1	N	4.1	1.17
EkSa 33:3330	32.3	Y	13.8	Y	5.0	1.86

6. Point Fragments

Fragments of Small Points PTFRs n = 13

Fragments of small, bifacially flaked points (Figure I-3, a-o) include thirteen tip fragments (Figure I-3, a-m), one medial fragment (Figure I-3, n) and one medial fragment with base (Figure I-3, o). Eleven tip fragments are from small, triangular, symmetrical points (Figure I-3, a-k): three are obsidian; the remainder are fine-grained basalt. Two tip fragments (Figure I-3, l-m), both from the surface of the Brittany Creek site (EkSa 33), are slightly asymmetrical: one, (m), is fine-grained basalt, the other, (l), is chert. The medial/base fragment (Figure I-3, o), also from the Brittany Creek site, is probabably from a side-notched point.

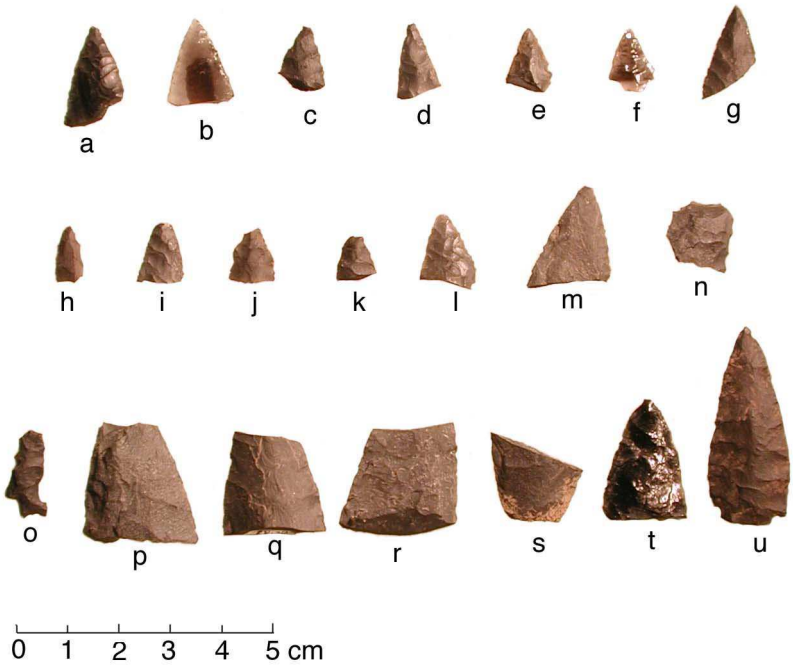

Figure I-3. Point Fragments

Fragments of Small Points (PTFRs):

a. CR 92:2284 b. EkSa 33:3483 c. ELP 19-1:158 d. ELP 32:1242 e. CR 92:590
f. T84-27:1270 g. ELP 19-1:252 h. T84-27:2013 i. ELP 19-1:880 j. T84-27:1017
k. ElRw 4:1959 l. EkSa 33:3378 m. EkSa 33:3422 n. CR 92:1199 o. EkSa 33:2863

Frament of Large points (PTFRl):

p. CR 28:44 q. CR 28:47 r. ELP 16-1:25 s. ELP 26 OS:1 t. ELP 14 OS:1
u. EkSa 32:6208

Fragments of Large Points PTFRl n = 6

Fragments of large points include four medial fragments (Figure I-3, p-s) and two tip fragments (Figure I-3, t-u). The four medial fragments are fine-grained basalt and were surface collected (Figure I-3, p-q). One tip fragment of obsidian (Figure I-3, t) was on the surface of ELP Quad 14. The other fragment, of fine-grained basalt (Figure I-3, u), complete except for the missing base, is from the excavation at the Boyd site (EkSa 32). Its blade is similar to Stryd's Notched Atlatl Point Type A affiliated with the Kamloops culture (1973:336-37, Fig 25 g). It has a bilaterally symmetrical blade with maximum width at the shoulders and shallow, semi-circular notches.

The largest number of point fragments recovered at one site is seven, collected on the surface at the Brittany Creek site (EkSa 33) (Figure I-3, b,l,m,o). The Fish Trap Lake site (EkSb 37) and ELP Quad 19:1 (EkSa 27) each yielded three specimens, Figure I-3, f, h, j and Figure I-3, c, g, i, respectively, and the Bear Lake site (EkSa 36) (Figure I-3, d) and the Bidwell Creek/Quiggly Holes site (ElRw 4) (Figure I-3, k) each yielded one fragment.

7. Large Formed Bifaces

Complete Large Formed Bifaces LFBI n = 4

The complete, large formed bifaces include an igneous *tci-tho* from the Bear Lake site (EkSa 36) (Figure I-4, a), two bifaces of basalt with attributes similar to the *tci-tho* (Figure I-4, b-c), and a large, basalt, stemmed biface, also from the Bear Lake site (EkSa 36) (Figure I-4, d).

The *tci-tho*, sometimes defined as a bifacially retouched scraping tool, is a distinctive Athapaskan artifact class (Dumond 1978:55, Wilmeth 1978, Clark 1975:68-69) that includes cortex spalls. On the specimen (Figure I-4, a) from the Bear Lake (EkSa 36) excavation, one lateral margin exhibits bifacial retouch whereas the other lateral margin has been worn to a rounded contour. Both faces, from the worn edge to the midpoint, are smoothed and reddish, possibly the result of animal residues. Paull (1984) tested this object at three loci for blood and fat, and at one of the loci for Lignin. One loci was negative for blood and fat, one positive for all three, and one positive for blood and negative for fat. Thus the inference that these objects are used in hide processing appears to be supported by these tests.

The biface from ELP Quad 16 (EkSb 5) (Figure I-4, b) is coarse-grained basalt. Although all flaked margins show evidence of fine polish from use, polish predominates on the tip and the thinnest margin, suggesting the specimen is homologous to the *tci-tho* described above.

The other fine-grained basalt specimen, recovered at CR 64 (EkSa 34), (Figure I-4, c), is asymmetrical and resembles a "miscellaneous" biface described by Sanger (1970:73-74, Fig 31-p) but is more crudely made. The curved edge exhibits finer, discontinuous, unifacial retouch or use-wear which suggests a function similar to the *tci-tho*.

The stemmed biface from the Bear Lake site (Figure I-4, d) is beautifully made and has a slightly steeper angle on the lateral margin with the deeper shoulder notch. The specimen was recovered in seven pieces, six from Unit 55 and one from Unit 58. Only the very tip of the blade is missing. Compared to the PPT bifaces reported by Stryd (1973) and Sanger (1970), this specimen is very large, and has a unique shape. It is probably not mere coincidence that this shape is the same as seen in the Kavik point as it is from the prehistoric component (Layer Bf) at the Bear Lake site.

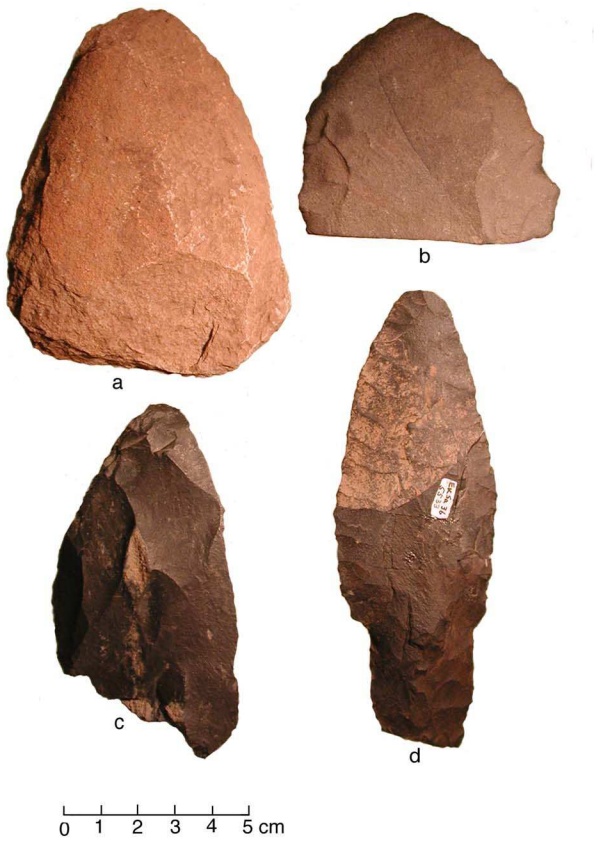

Figure I- 4 Large Formed Bifaces (LFBI): a. EkSa 36:2802 b. ELP 16-1:24 c. CR 64 OS:1 d. EkSa 36:4971

Table I-10 Large Formed Bifaces (*tci-tho*-like): Metric Data

Artifact No.	Length	C	Width	C	Thickness	Weight
ELP 32:2802	97.1	Y	75.5	Y	22.7	181.30
CR 64:OS:1	94.4	N	59.7	Y	17.1	62.9
ELP 16-1:24	58.8	Y	69.1	Y	21.0	93.17
ELP 36:4971, 4972, 4973, 4974, 4975, 5533	122.8	Y	44.4	Y	13.4	60.76

Large Formed Biface Fragments LFBF n = 5

Five large biface fragments were recovered (Figure I-5, a-e). Two, one from the Boyd site (EkSa 32) (Figure I-5, a), and one from the Bear Lake site (EkSa 36) (Figure I-5, b), are morphologically similar to the proximal ends of the *tci-tho*- like bifaces described above. Two smaller fragments (Figure I-5, c-d), both from the Bear Lake site (EkSa 36), also exhibit similar flaking patterns. EkSa 36:3004 (Figure I-5, c) was tested by Paull (1984) at three loci for blood and fat residues. One loci was negative for both, one positive for both and one positive for blood but negative for fat, indicating probable use for flesh or hide processing. EkSa 36:3984 (Figure I-5, b) was also tested by Paull at four loci for blood and three of these were positive, indicating that these specks were blood.

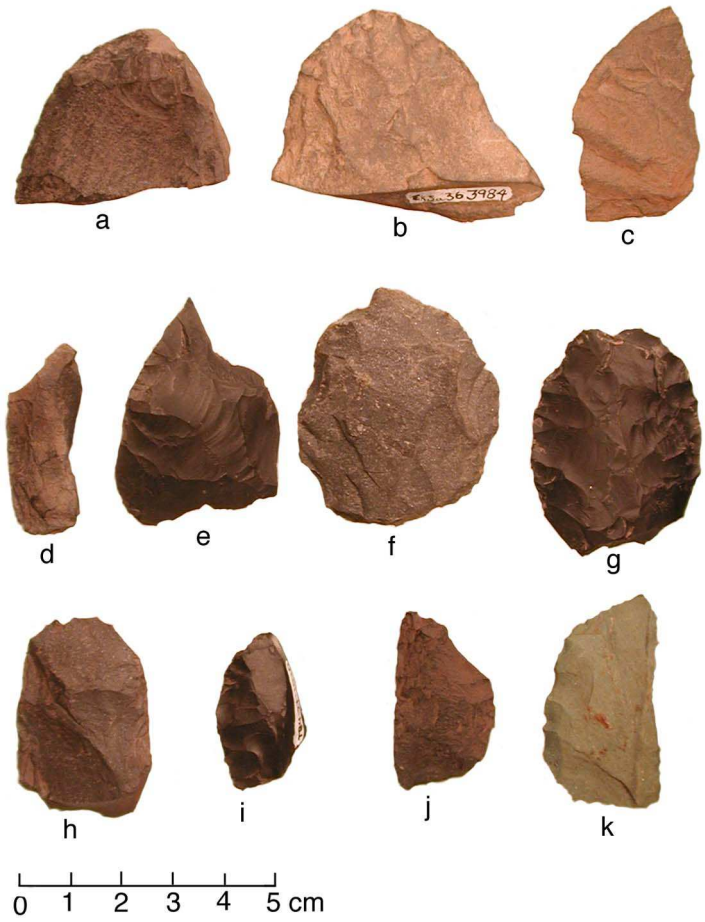

Figure I- 5 Large Formed Biface Fragments and Small Oval Formed Bifaces
Large Formed Biface Fragments (LFBF): a. EkSa 32:5830 b. EkSa 36:3984 c. EkSa 36:3004
d. EkSa 36:4402 e. CR 28:5
Small Formed Bifaces, Oval (SFBI): f. CR 40:1 g. EkSa 13:4337 h. EkSa 13:1889 i. T84-27:1070
j. EkSa 33:3325 k. ELP 44-3:200

One biface fragment from CR 28 (EkSa 98) (Figure I-5, e) is very fine-grained basalt with an unusual form: one face exhibits a long, concave flake scar (probably a hinged flake removal from an attempt to thin the other lateral margin). The intact lateral margin exhibits unifacial use-wear.

8. Small Formed Bifaces SFBI n = 43

Twelve complete small formed bifaces and 30 fragments were recovered in the Eagle Lake Project area and four forms were noted: Oval (Figure I-5, f-k); Leaf-shaped/Ovate (Figure I-6, a-h); Triangular (Figure I-6, i-n); and Miscellaneous (Figure I-6, o). Fragments were assigned to these types where possible; the remaining fragments (not illustrated) are described (following Stryd 1973:348) as: End sections; Medial sections; and Unclassifiable fragments.

Table I-11 Complete Small Formed Bifaces All Forms: Metric Data

	# of Specimens	Range	Mean
Length	5	32.4 - 50.7	42.0
Width	11	9.9 - 38.4	22.5
Thickness	12	3.9 - 17.2	8.6

Oval Small Formed Bifaces n = 5

Three complete small, oval bifaces of fine-grained basalt (Figure I-5, f-h), including two from the Shields site (EkSa 13), and two fragments of basalt (Figure I-5, i-j) were recovered in the Eagle Lake Project area. Cortex is visible on four of the basalt specimens: both complete specimens from the Shields site (EkSa 13) (Figure I-5, g-h), the complete specimen from CR 40 (Figure I-5, f), and one fragment (Figure I-5, i) from T84-27. One small biface of green stone (Figure I-5, k) also has some cortex remaining. The Eagle Lake area small, oval bifaces are comparable to Stryd's Biface Type Group E (1973:231-32, 348) and as Stryd suggested may be blanks for secondary flaking to produce various tools.

Leaf-Shaped/Ovate Small Formed Bifaces n = 8

Eight small bifaces recovered in the Eagle Lake area (Figure I-6, a-h) are similar to Sanger's Leaf-shaped Biface Group 5 (1970:73, Fig 31-m,n) and Stryd's Ovate Bifaces Group A (1973:345-346, Fig 27a,b and Fig 28 a-d). The five complete specimens (Figure I-6, a-e) and three end fragments (Figure I-6, f-h) are basalt, have an ovate form, and are lenticular in section. The two complete bases, both from the Shields site (EkSa 13; Figure I-5, g, h), have asymmetrical notching at the proximal end and evidence of retouch on the edges. Four medial fragments, described below but not illustrated, may also be from leaf-shaped bifaces.

Triangular Small Formed Bifaces n = 11

Eleven small biface specimens (Figure I-6, i-m) are similar to Sanger's Triangular Biface Group 3 (1970:73, Fig 31, f-i), although one (Figure I-6, i) has an elongated form and wear attributes similar to Stryd's Triangular Perforator (1973:Fig 28r). This specimen, from CR 98 (EkSa 62), is obsidian with a thick cross-section and a flat ventral face. The lateral margins exhibit fine retouch / grinding which may be similar to what Stryd refers to as "characteristic . . . light use modification of the lateral shaft margins" (1973:350). However, unlike Stryd's examples, wear is not at the tip of the Eagle Lake specimen, but is equally distributed along both lateral margins from the tip to the mid-point.

The remaining triangular small formed bifaces are represented by one "complete" specimen (Figure I-6, j) and nine distal end (tip) fragments, one of obsidian (Figure I-6, k) and eight of basalt (Figure I-6, l-m). Although some of these specimens are lenticular in cross-section all are thinner than the possible perforator described above (Figure I-6, i). Lateral margins are primarily slightly convex and only one specimen, from Brittany Creek (EkSa 33) (Figure I-6, l), has straight margins. No intact bases were recovered.

Miscellaneous Small Formed Biface n = 1

A small, crescent-shaped, basalt biface with continuous flaking on both margins, no polish or use wear, and with both ends snapped off was recovered during excavations at the Bear Lake site (EkSa 36) (Figure I-6, n). The crescent-shape lateral margin was bifacially

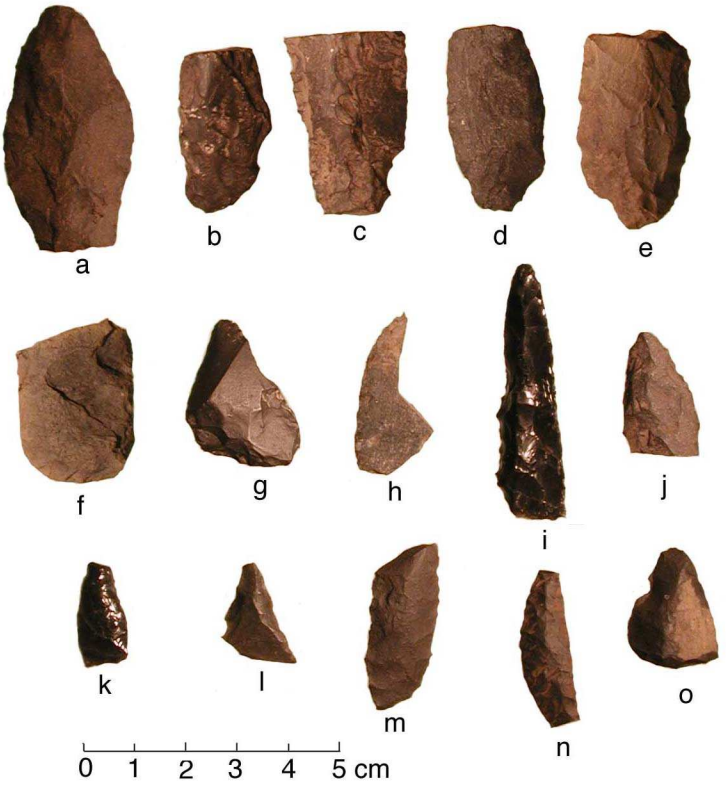

Figure I-6. Small Formed Bifaces (SFBI)
Ovate, complete: a. ELP 19-1:980 b. CR 50:1 c. EkSa 33:3205 d. EkSa 13:1385 e. EkSa 13:2419
Ovate fragments: f. EkSa 33:4348 g. EkSa 13:4339 h. EkSa 36:4355
Triangular complete: i. CR 98:5 j. EkSa 32:6295
Triangular fragments: k. ELP 19-1:96 l. CR 92:1425 m. EkSa 33:3489
Miscellaneous Small Formed Bifaces: n. EkSa 36:4841 o. CR 92:1906

flaked to produce a steep, sharp edge. Neither Sanger (1970) nor Stryd (1973) illustrate artifacts of this type.

Medial Fragments of Small Formed Bifaces n = 5

Five medial biface fragments were recovered in the Eagle Lake Project area although none were recovered from the Bear Lake (EkSa 36), Shields (EkSa 13), or Boyd (EkSa 32) sites. All are from either oval or ovate (leaf-shaped) small bifaces and all have lenticular cross-sections with one of obsidian thicker than the four basalt specimens.

End Fragments of Small Formed Bifaces n = 5

Five basalt end fragments, probably from triangular Kamloops side-notched points, include four thin proximal ends and one thicker fragment from the Brittany Creek site (EkSa 33) (Figure I-6, o). This specimen is possibly a distal end (tip) and has some cortex and fine continuous, unifacial flaking on all four margins. The notch visible on one lateral margin appears to have been an unintentional by-product of a flake removal. The other four proximal end fragments have flat ends and straight lateral margins.

Unclassifiable Fragments of Small Formed Bifaces n = 6

Six unclassifiable fragments of bifaces were recovered: one, from the Brittany Creek site (EkSa 33), is obsidian; all others are basalt.

Retouched Flake Tools

9. Formed Scrapers FOSC n = 12

Following Stryd's formed scraper typology based on the primary location of retouch (1973:352-361), two types of scrapers were recovered from the Eagle Lake Project area: Continuous Scrapers (n = 6) (Figure I-7, a-c, f, h, j) and End Scrapers (n = 6) (Figure I-7, d-e, g, i, k-l). All were made from flakes and have marginal retouch of relatively uniform height forming an angle of 45 degrees or steeper with the ventral face. No spurred scrapers were recovered in the Eagle Lake Project area.

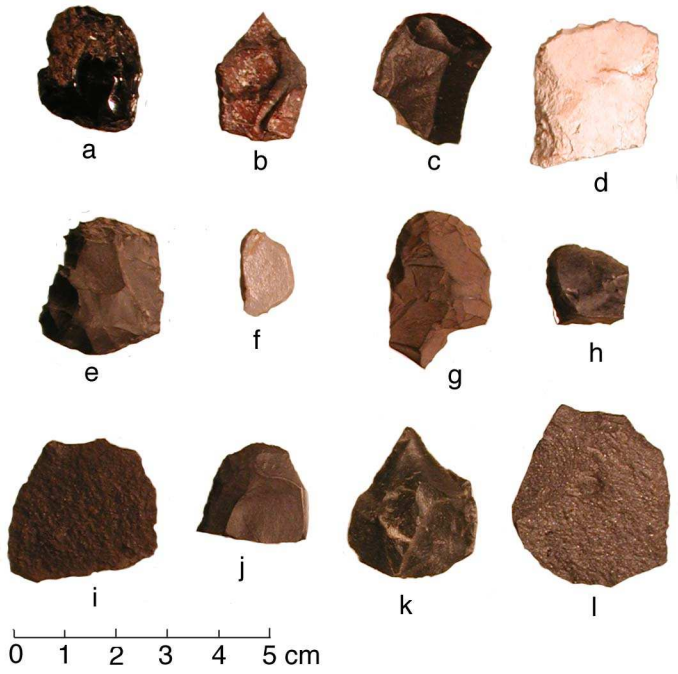

Plate 7 Formed Scrapers (FOSC)
a. EkSa 13:5431 b. EkSa 13:2169 c. EkSa 13:5257 d. EkSa 13:1391 e. EkSa 13:1564
f. EkSa 32:2099 g. EkSa 32:2513 h. CR 92:564 i. CR 92:826 j. CR 40:49
k. CR 40:2 l. EkSa 33:4390

Continuous Scrapers

The six continuous scrapers have unbroken retouch around the edge, exclusive of the striking platform, and all retouched edges exhibit use wear. All are made of fine-grained material: chert, obsidian, or fine-grained basalt. Only one specimen (from the Boyd site, EkSa 32) has cortex on the ventral face (Figure I-7, f). Three continuous scrapers were recovered at the Shields site (EkSa 13) (Figure I-7, a-c) including the only specimen with a complete oval outline (Figure I-7, a). Another specimen from the Shields site (Figure I-7, c)

has unifacial retouch on alternating faces: the dorsal face on two edges and the ventral face on the third edge.

The "incomplete" continuous scraper specimens have oval distal ends, however, as noted by Stryd, the proximal ends are missing, perhaps by intent "to facilitate hafting" or by accidental breakage (1973:360, Fig 30-u).

Table I-12 Continuous Scrapers: Metric Data

Artifact No.	Length	C	Width	C	Thickness	Weight	Material
EkSa 13:5431	23.8	Y	20.0	Y	7.9	4.02	Obsidian
EkSa 13:2169	24.6	N	18.3	Y	5.2	2.03	Chert
EkSa 13:5257	24.2	N	20.5	Y	5.6	3.33	FG Basalt
EkSa 32:2099	17.0	N	10.7	Y	4.0	0.80	Chert
EkSa 33:564	15.9	N	15.1	N	4.7	1.48	Obsidian
CR 40:49	19.7	N	21.8	N	3.5	1.93	FG Basalt

End Scrapers

End scrapers have one rounded end produced by retouch (Magne 1985:168), the primary working edge is located transverse to the long axis of the tool and the lateral edges exhibit less intense use-wear (Stryd 1973:353). All end scrapers recovered in the Eagle Lake Project area are based on flakes. Two end scrapers were recovered at the Shields site (EkSa 13) (Figure I-7, d-e) and one, of chert, has cortex (Figure I-7, d). One was recovered at the Boyd site (EkSa 32) (Figure I-7, g). All end scrapers have unifacial retouch on the dorsal face (Figure I-7, d, e, g, i, k, l) and are similar to Stryd's Convex End Scraper Types (1973:354-55, Fig 30 a-n) which he notes are similar to Sanger's Formed Uniface Groups 1, 2, 3, and 4 (round to oval unifaces, stemmed or tanged unifaces, and round to oval thick unifaces respectively) (Sanger 1970:78, Fig 33 a-h).

Table I-13 End Scrapers: Metric Data

Artifact No.	Length	C	Width	C	Thickness	Weight	Material
EkSa 13:1391	30.1	N	23.8	Y	8.0	3.98	Chert
EkSa 13:1564	23.4	Y	26.8	Y	8.4	5.15	FG Basalt
EkSa 32:2513	30.7	Y	22.8	N	7.0	4.17	FG Basalt
EkSa 33:826	28.7	Y	27.3	Y	5.4	5.89	CG Basalt
CR 40:2	28.1	N	24.7	Y	5.7	3.96	FG Basalt
EkSa 33:4390	34.4	N	29.7	N	4.3	6.52	CG Basalt

10. Spurred Scrapers n = 0

No spurred scrapers were recovered in the Eagle Lake Project area.

11. Bifacially Retouched Flakes n = 81

Like Sanger's Non-formed Biface Type (1970:76), the bifacially retouched flakes from the Eagle Lake Project area have little deliberate shaping, are primarily basalt [over 90%] (obsidian n = 7, chert n = 1), and many specimens are pieces of larger artifacts. Sanger's

bifaces were recovered in largest quantities in the Upper Middle Period (3500 -2000 BP) but were present, in decreased quantities, in the Late Period (1500 -500 BP) (1970:76, 105). They are similar to Stryd's Retouched Flakes (both unifacial and bifacial) which he describes as "Flakes of irregular form with limited marginal retouch..[that]..display either unifacial or bifacial retouch ... usually... restricted to one edge or part of one edge. Characterized by little or no wear, these flakes probably served as short use all-purpose cutting and scraping implements" (1973:365).

Both Sanger and Stryd note that, given the fragmentary nature of the specimens, measurements have little meaning, although Sanger reports that lengths range from 10 to almost 70 mm with the majority in the 20 to 40 mm range (1970:76). The Eagle Lake area specimens are reported as two sub-sets: large (complete length greater than or equal to 35 mm), and small (complete length less than 35 mm) with length measured as the maximum dimension from the striking platform of the flake to the distal end.

Large Bifacially Retouched Flakes BIREl n = 17

All large bifacially retouched flakes are basalt (fine-grained basalt n = 10, coarse-grained n = 7) (Figure I-8, a-f). Six specimens are complete (Figure I-8, a, d-f), including one from the Boyd site (EkSa 32) excavation (Figure I-8, a) and one of fine-grained basalt with continuous retouch on the end and lateral margins (Figure I-8, d). With the exception of the Boyd site specimen and two from the Bidwell Creek (ElRw 4, Figure I-8, b) excavation, all specimens were recovered on the surface (Table I-14).

Table I-14 Large Bifacially Retouched Flakes: Metric Data

	# of Specimens	Range	IQR	Mean
Length	11	38.5-79.6	45.9-57.5	56.9
Width	8	23.3-58.7	32.1-37.0	37.4
Thickness	17	6.0-15.5	8.8-12.7	10.5
Weight	6	8.36-70.57	6.57-32.23	27.81

Small Bifacially Retouched Flakes BIREs n = 64

The small bifacially retouched flakes (Figure I-9, a-p) are basalt with the exception of seven obsidian specimens and one of chert (Figure I-9, k). Fifteen specimens are complete (Figure I-9, f,h, j,l,o-p) and five of these have cortex (Figure I-9, f,l). Six fragments also have cortex. Nine specimens were recovered from the excavation at the Shields site (EkSa 13) (Figure I-9, a-b) including one of obsidian; five at the Boyd site (EkSa 32) (Figure I-9, c-f), including one of obsidian ; and six at the Bear Lake site (EkSa 36) (Figure I-9, g-h), again with one of obsidian. Thirteen were recovered at ELP Quad 19:1 (EkSa 27) (Figure I-9, m-p) including a specimen with a worn end that may have been used as a scraper (Figure I-9, n).

Table I-15 Small Bifacially Retouched Flakes: Metric Data

	# of Specimens	Range	IQR	Mean
Length	28	18.6-34.2	21.9-31.5	26.9
Width	33	8.5-55.9	12.3-23.7	20.7
Thickness	64	1.9-14.3	3.4-6.7	5.37
Weight	15	0.54-9.23	1.41-4.92	3. 72

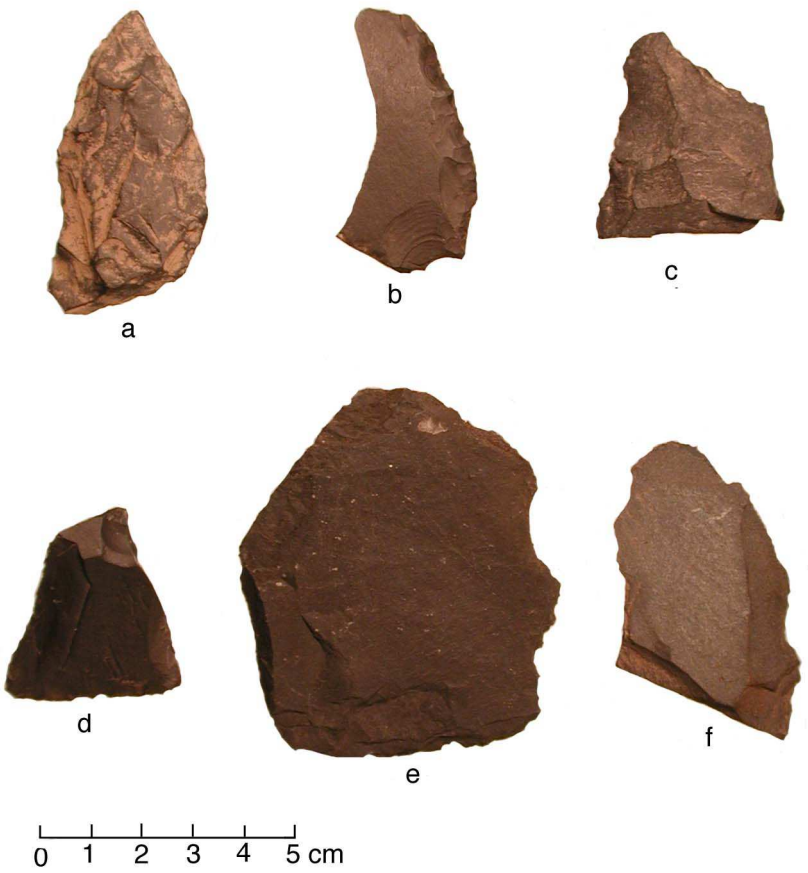

Figure I-8. Large Bifacially Retouched Flakes (BIREl):
a. EkSa 32:2097 b. ElRw 4:1355 c. ELP 20 OS:1 d. CR 12:1 e. EkSa 33:3386 f. ELP 44-3:196

12. Unifacially Retouched Flakes

Like Sanger's Non-formed Unifaces (1970:80) and Stryd's Unifacially Retouched Flakes (1973:366), the specimens from the Eagle Lake Project area exhibit no deliberate shaping and many are fragmentary. For the Eagle Lake Project assemblage, this type is defined as having retouch along a single edge only and is, therefore, similar to Sanger's Group 1 to Group 6 Non-formed Unifaces (1970:80-81). (See also multiple-edged unifaces and sinuous, multiple-edge unifaces described below for other types of non-formed unifaces.) Large unifacially retouched flakes have maximum length of complete specimens equal to or greater than 44 mm (Figure I-10, a-c) and small specimens have maximum length of complete specimens less than 44 mm (Figure I-10, d-k).

Fifteen (of sixteen) large specimens have cortex, whereas only seven (of 60) small specimens do. Large unifacially retouched flakes are primarily basalt with two each of chert (Figure I-10, b) and igneous material (Figure I-10, c). The 60 small unifacially retouched flakes are also primarily basalt, with four of chert (Figure I-10, j) and nine of obsidian (Figure I-10, f-g). No large, unifacially retouched flakes were recovered in the Bear Lake site (EkSa 36) excavation, although eight small ones were (Figure I-10, d-e). The Shields site (EkSa 13)

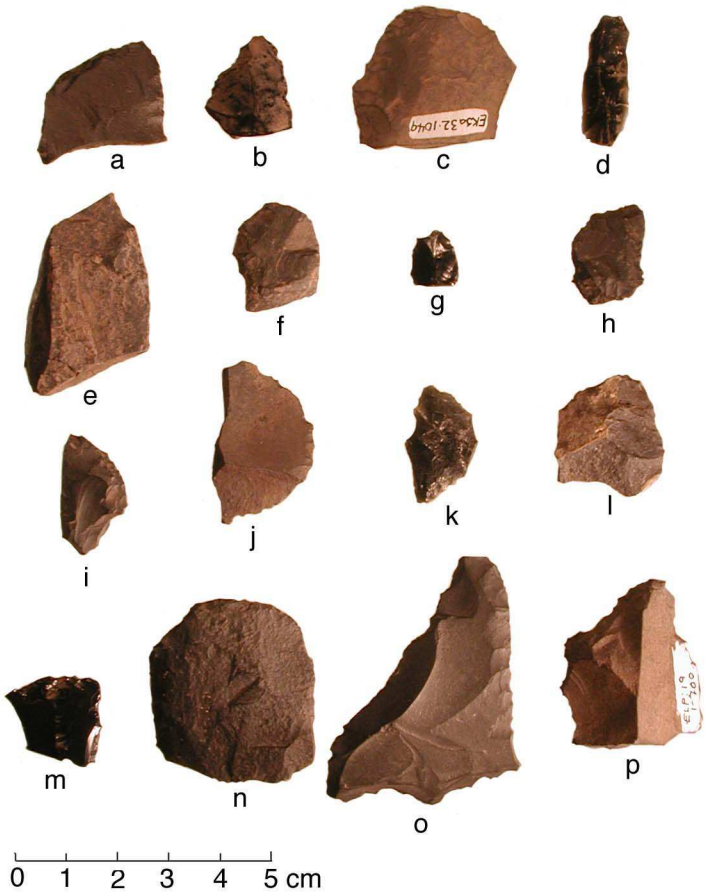

Plate 9 Small Bifacially Retouched Flakes (BIREs)

a. EkSa 13:1422 b. EkSa 13:3959 c. EkSa 32:1049 d. EkSa 32:1054 e. EkSa 32:1068
f. EkSa 32:6287 g. ELP 32:104 h. ELP 32:184 i. ElRw 4:1347 j. ElRw 4:1680
k. EkSa 33:3236 l. EkSa 33:3522 m. ELP 19-1:159 n. ELP 19-1:660 o. ELP 19-1:318
p. ELP 19-1:700

yielded five large (Figure I-10, b) and twelve small unifaces (Figure I-10, f-i), and two large and eight small unifaces (Figure I-10, j) were recovered at the Boyd site (EkSa 36).

13. Utilized Flakes UTIL n = 43

Utilized flakes are chipped stone flakes with macroscopic use-wear polish, striations, and irregularly spaced or continuous flake scars along at least one edge (Ludowicz 1980:98-101). The specimens from the Eagle Lake Project area are primarily basalt (Figure I-11, j) but include six flakes of obsidian, two chert, and one of quartz (Figure I-11, a). Sixteen are complete flakes with utilization; the remainder are fragments of utilized flakes. Flake size varies considerably: weight of the twelve complete basalt flakes ranges from 0.22 grams (Figure I-11, d) to 146.45 grams. One quartz complete flake is 42.87 grams and three obsidian complete flakes range from 0.50 to 2.65 grams.

The assemblage has been separated into thirty-five small (Figure I-11, c-i), seven medium size (Figure I-11, a-b, j-k) and one large size utilized flake. Small flakes have a maximum

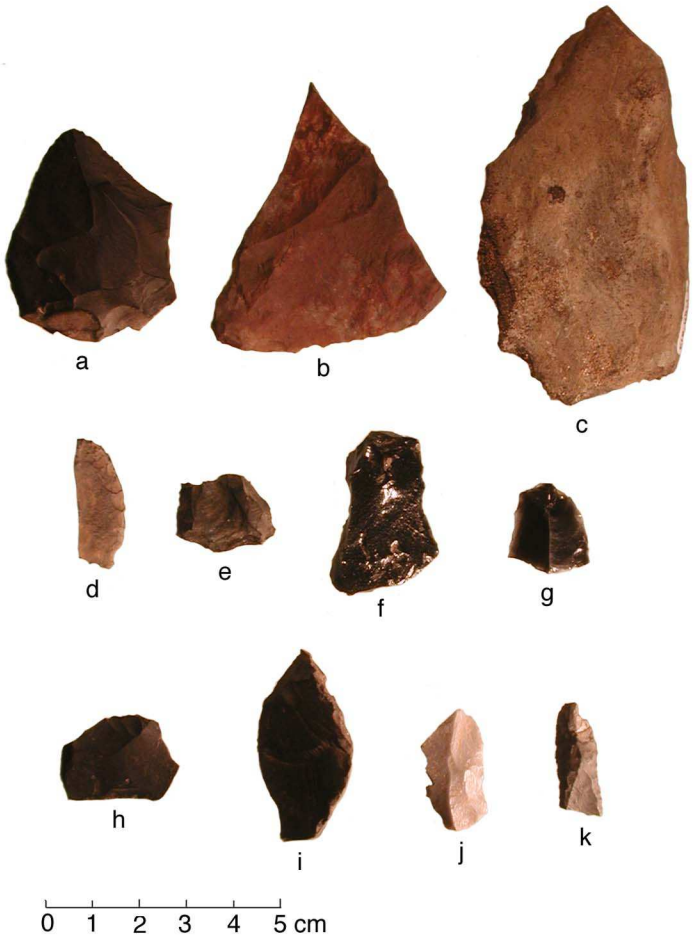

Figure I-10. Unifacially Retouched Flakes
Large (UNREl): a. T84-27:1 b. EkSa 13:3038 c. ELP G5-1:5
Small (UNREs): d. EkSa 36:4478 e. EkSa 36:5934 f. EkSa 13:5351
g. EkSa 13:3720 h. EkSa 13:1575 i. EkSa 13:1386 j. EkSa 32:1053 k. CR 92:131

length of less than 40 mm, medium flakes have maximum lengths between 40 and 100 mm, and the large utilized flake has a maximum length over 100 mm.

Table I-16 Utilized Flakes: Metric Data

	# of Specimens	Range	IQR	Mean
Length	22	10.5-112.2	15.7-27.2	29.5
Width	25	8.4-63.1	11.7-23.1	21.2
Thickness	43	1.2-21.9	2.9-6.4	5.6
Weight	17	0.22-146.56	0.65-3.17	13.6
Weight*	16	0.22-42.87	0.65-2.65	5.24

* not including the largest flake

Small amounts of cortex remain on eight of the thirty-five small utilized flakes, often on the striking platform or one lateral margin. Cortex remains on all medium size flakes (n = 7)

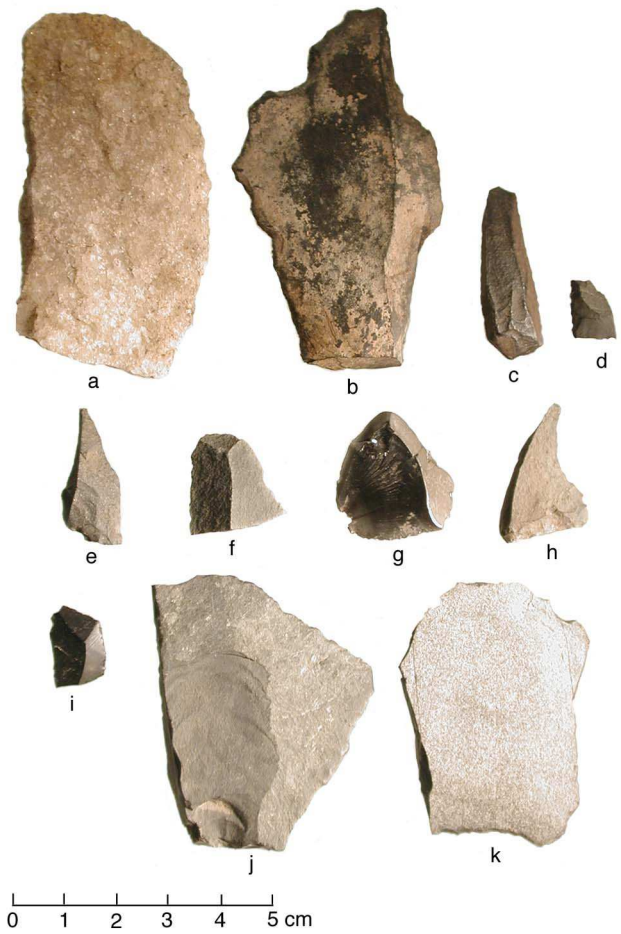

Figure I-11 Utilized Flakes (UTIL)

Medium:	a. CR 73:84	b. ElRw 4:1877	j. ELP 19-1:1172	k. ELP 19-1:612
Small:	c. ElRw 4:2030	d. T84-27:1431	e. EkSa 32:5737	f. EkSa 33:3181
	g. EkSa 33:3494	h. EkSa 33:4330	i. EkSa 33:4393	

and includes four with full dorsal cortex (Figure I-11, a, k), two with platform cortex (Figure I-11, b, j), and one of fine-grained basalt with cortex on the distal end (CR 64:48, not illustrated) that may be a utilized core rejuvenation flake. The single large specimen also has a small amount of cortex on the dorsal surface (~ 5%).

Most utilized flakes were collected on the surface although eighteen were recovered during excavation at various sites including the Boyd site (EkSa 32) (Figure I-11, e). However, none were recovered at either the Shields (EkSa 13) or Bear Lake (EkSa 36) sites. The surface of the Brittany Creek site (EkSa 33, CR 92) yielded fifteen utilized flakes (Figure I-11, f-i) including four of obsidian and two of chert in addition to the fine-grained and coarse-grained basalt specimens. Most of the specimens from this site are small, weighing less than four grams, but include a fragment of a coarse-grained basalt utilized flake weighing 18.8 grams and a complete, fine-grained basalt utilized flake weighing 146.46 grams. Two flakes with utilization on two edges were recovered at ELP Quad 19:1 (EkSa 27) (Figure I-11, j-k). One (Figure I-11, j) has utilization flaking on the ventral side only on both edges (and a large flake

removed on the ventral face to facilitate holding). The other (Figure I-11, k) has use-wear flaking on the dorsal side (which also has full cortex).

14. Multiple-edged Unifaces MUUT n = 21

Multiple edged unifaces have continuous retouch (or alternate edge retouch) on more than one edge and retouched edges are relatively straight. If edges are S-curved, the unifaces fall into the next category, Sinuous Multiple-Edged Unifaces. Multiple-edged Unifaces, Sinuous Multiple-Edged Unifaces, Gravers, and Perforators all typically have multiple working edges and points, and are usually made on thin flakes of fine-grained basalt or obsidian. In these characteristics they fit what Judge (1973:108-110) called "Utility Flakes" in his analysis of PaleoIndian assemblages. If these objects lack graving or perforating tips they fall into the two multiple-edged uniface classes; most Gravers and Perforators also have multiple unifacial retouched edges.

Multiple-edged Unifaces were recovered only from excavations at the Shields (EkSa 13) (n = 13) (Figure I-12, a-g), Boyd (EkSa 32) (n = 7) (Figure I-12, h-k), and Bear Lake (EkSa 36)

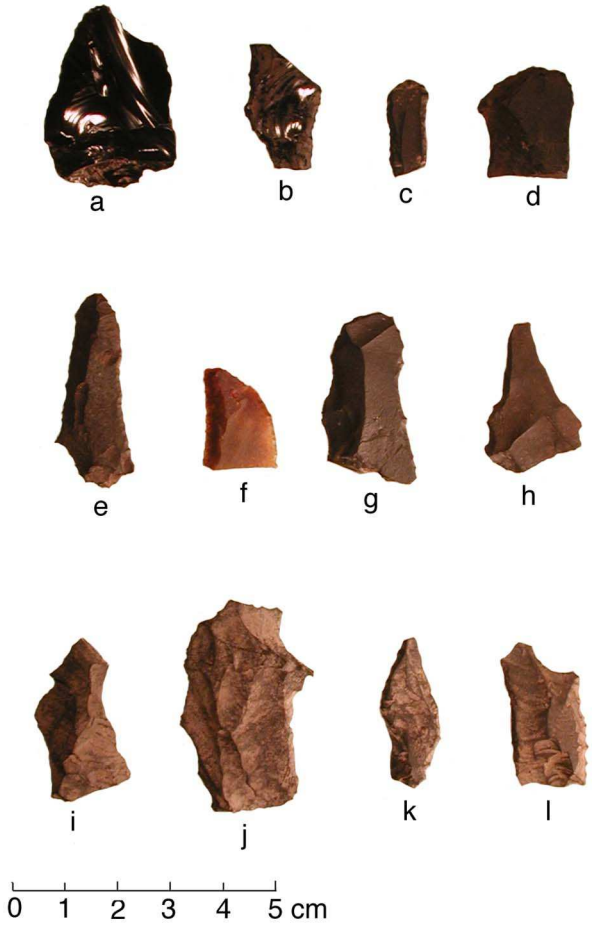

Figure I-12 Multiple-edged Unifaces (MUUT)
a. EkSa 13:3965 b. EkSa 13:3964 c. EkSa 13:4611 d. EkSa 13:2763 e. EkSa 13:2348
f. EkSa 13:5411 g. EkSa 13:5414 h. EkSa 32:1028 i. EkSa 32:2550 j. EkSa 32:1042
k. EkSa 32:1047 l. EkSa 36:4474

(n = 1) (Figure I-12, l) sites. Two specimens, both from the Boyd site (EkSa 32), exhibit alternating retouch (dorsal on one edge, ventral on the other) (Figure I-12, h, k). Materials are predominantly fine-grained basalt, with two obsidian unifaces recovered at the Shields site (EkSa 13) (Figure I-12, a-b). The concentration on the PPT housepit sites indicates they may have value in indicating ethnicity, a subject investigated in Chapter 4.

Table I-17 Multiple-edged Unifaces: Metric Data

	# of Specimens	Range	IQR	Mean
Length	9	19.8-41.4	27.7-34.9	30.7
Width	17	8.2-26.4	15.5-20.0	18.4
Thickness	21	2.0-6.3	3.0-4.1	3.5
Weight	8	0.79-3.77	1.47-2.30	2.00

15. Sinuous, Multiple-edged Unifaces SINU n = 8

Sinuous, multiple-edged unifaces are a variant of multiple-edged unifaces (continuous retouch on more than one edge) that exhibit a pronounced sinuous outline (incurvate-excurvate) (Figure I-13, a-h). Like the multiple-edged unifaces, sinuous edged unifaces may have retouch (or use wear) on alternating faces. Sinuous edged specimens were recovered only at the Shields (EkSa 13) and Boyd (EkSa 32) sites. All are basalt and all are complete flakes, except one (Figure I-13, e). The Shields site (EkSa 13) specimens (Figure I-13, a-d) are larger than those recovered at the Boyd site (EkSa 32) (Figure I-13, e-h). As with the Multiple-edged Unifaces, these may also be indicative of ethnicity, and are discussed in Chapter 4.

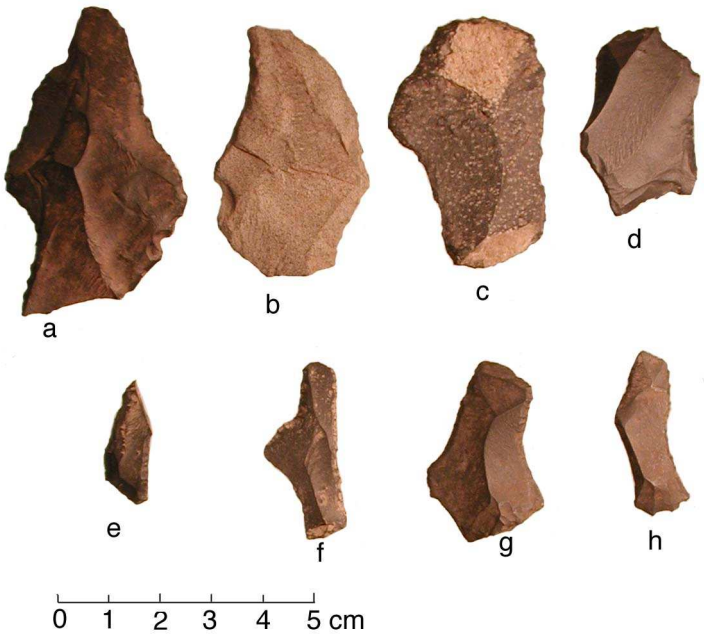

Figure I-13 Sinuous, Multiple-edged Unifaces (SINU)
a. EkSa 13:1054 b. EkSa 13:1888 c. EkSa 13:2063 d. EkSa 13:3950 e. EkSa 32:2095
f. EkSa 32:2096 g. EkSa 32:2510 h. EkSa 32:6197

Table I-18 Sinuous, Multiple-edged Unifaces: Metric Data by Site

	Boyd Site n = 4		Shields Site n = 4	
	Range	Mean	Range	Mean
Length	32.0-35.7	34.0	37.1-57.6	47.8
Width	13.7-24.4	18.6	26.0-35.5	31.1
Thickness	3.0-5.6	4.0	5.2-6.0	5.5
Weight	1.08-3.01	1.79	3.54-8.43	6.88

16. Gravers GRAV n = 31

Gravers are flakes that have a pronounced projection, referred to as a shaft and tip (Stryd 1973:361-364) or a spur (Sanger 1970:83-84), and must have use-wear on the tip (Stryd

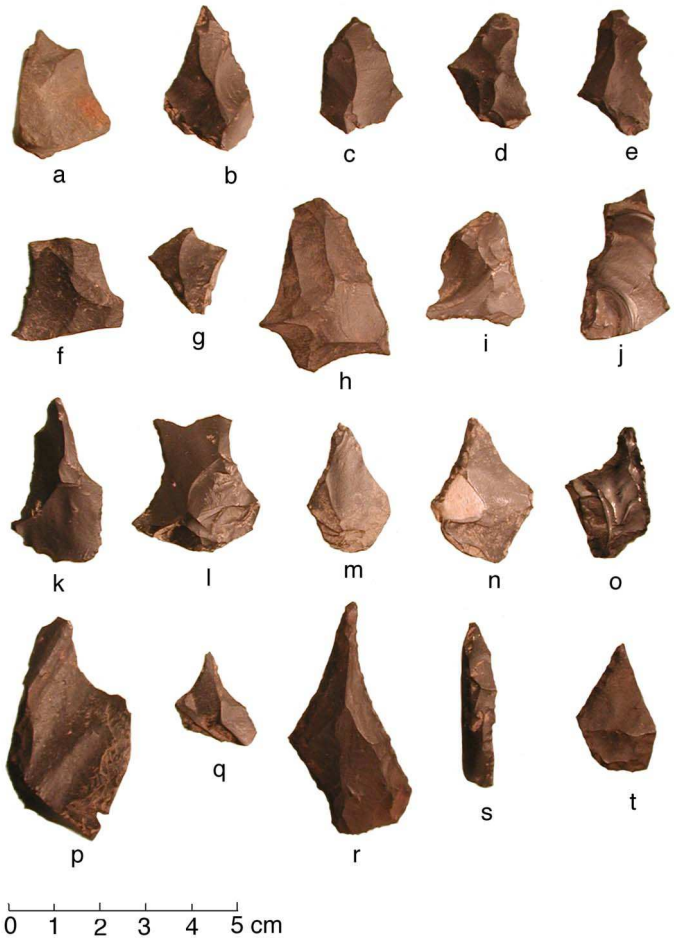

Figure I-14 Gravers, Alternating Perforators, Non-alternating Perforators
Gravers (GRAV): a. T84-27:14 b. EkSa 36:4978 c. EkSa 13:2347 d. EkSa 13:4327 e. EkSa 13:4686 f. EkSa 13:5685 g. EkSa 32:5708 h. EkSa 32:6202 i. EkSa 32:6204 j. EkSa 32:2512
Alternating Perforators (PERFa): k. EkSa 13:3205 l. EkSa 13:4793 m. EkSa 32:1056 n. EkSa 32:1057 o. ELP 19-1:324
Non-alternating Perforators (PERFn): p. EkSa 36:1059 q. EkSa 13:2357 r. EkSa 13:3039 s. EkSa 32:2519 t. EkSa 32:6199

1973:361-364). Stryd distinguishes between "sharp" gravers with sharp tips blunted through use (1973:361-364,Fig 31, a-g), and "rounded" gravers with rounded, unifacially retouched shaft tips (Stryd 1973:361-364, Fig 31, h-m). The gravers collected in the Eagle Lake Project area (Figure I-14, a-j) are all "sharp" gravers with blunted tips, all are basalt, and all, except one, were recovered in excavations. The surface-collected specimen is from the Fish Trap Lake site (T84:27, EkSb 37) (Figure I-14, a). Eighteen gravers were recovered at the Shields site (EkSa 13) (Figure I-14, c-f) and two specimens (Figure I-14, d-e) are almost identical. Eleven are from the Boyd site (EkSa 32) (Figure I-14, g-j): one specimen (Figure I-14, h) has more than one graving tip. Only one, a somewhat dubious member of this class, was recovered from the Bear Lake site (EkSa 36) (Figure I-14, b). As with the previous two flake tool classes, these may also have value in identifying ethnicity, as discussed in Chapter 5. Although each specimen has the defining attributes of gravers, many have use-wear and retouch on lateral margins as well, which indicates that the tools were used for more than one type of function. Bone and antler artifacts recovered at the Shields site (EkSa 13), including leister points, harpoon points and decorated fragments, may have been produced using gravers.

Table I-19 Gravers: Metric Data

	# of Specimens	Range	IQR	Mean
Length	17	19.3-38.0	24.3-29.2	26.9
Width	25	14.0-28.5	17.9-21.8	19.8
Thickness	31	2.4-19.2	3.4-4.1	4.3
Weight	12	1.03-4.72	1.27-1.88	1.79

17. Perforators PERF n = 19

Sanger grouped perforators and drills together (1970:84, Fig 34 i-l) as only eight were recovered in his study. Sanger's perforators and drills share a number of characteristics: elongated points on bifacially chipped flakes, usually basalt, and a length range of 19 mm to 63 mm. Sanger distinguished drills by the presence of wear polish in a pattern created by rotary action; those without wear polish were categorized as perforators. In the Eagle Lake Project area, perforators were recovered that are similar to Sanger's type (Figure I-14, k-t) and have the attributes defined by Stryd as well (1973:350-52): a long, sharply tipped shaft that is generally unifacially flaked (although some have alternate and bifacial retouch), plano-convex shaft cross-sections, light use modification of the lateral shaft margins with most wear at the tip, and (commonly) broken tips. Only ELP Quad 19:1 (EkSa 27) yielded obsidian perforators.

The majority of specimens from the Shields (EkSa 13), Boyd (EkSa 32), and Bear Lake (EkSa 36) sites are very fine-grained basalt. No clearly bifacially retouched "drills" were recovered. The Shields site (EkSa 13) yielded ten perforators; one is chert and the others are fine-grained basalt. At the Boyd site (EkSa 32) six perforators, all fine-grained basalt, were recovered and only one perforator, a crude specimen of large size (Figure I-14, p), was recovered from the Bear Lake site (EkSa 36). Two perforator fragments were recovered at ELP Quad 19:1 (EkSa 27).

The Eagle Lake Project area perforators are separated into types based on the location of retouch. Alternating perforators (Figure I-14, k-o) exhibit unifacial retouch on alternate faces and non-alternating perforators (Figure I-14, p-t) exhibit unifacial retouch on one face only. Reference is also made, where applicable, to butt modifications as defined by Stryd: oval (1973: Fig 28-s), irregular, triangular or unclassifiable (1973:351-2).

Alternating Perforators PERFa n = 8

Alternating perforators exhibit unifacial retouch on alternate faces (Figure I-14, k-o). Only one specimen is obsidian (Figure I-14, o); it is from ELP Quad 19:1 (EkSa 27) and the butt was unclassifiable. All other alternating perforators are basalt and are from excavations at the Shields site (EkSa 13) (n = 4) (Figure I-14, k-l) and Boyd site (EkSa 32) (n = 3) (Figure I-14, m-n). The specimens from the Shields site include one oval butt perforator (Figure I-14, k), one triangular perforator, and four irregular butt perforators that have incorporated the irregular shape to create a haft or handle on one lateral edge (Figure I-14, l). The three alternating perforators from the Boyd site are all oval butt specimens.

Table I-20 Alternating Perforators: Metric Data

	# of Specimens	Range	Mean
Length	5	28.1-45.5	32.9
Width	7	18.0-32.7	23.1
Thickness	8	3.5-8.3	4.8
Weight	5	1.59-6.94	3.32

Non-Alternating Perforators PERFn n = 11

Non-alternating perforators from the Eagle Lake Project area (Figure I-14, p-t) are all fine-grained basalt with two exceptions: an obsidian perforator from the surface of ELP Quad 19:1 (EkSa 27) that is fragmentary and unclassifiable and a large, oval butt perforator of chert from the Shields site (EkSa 13). Five other non-alternating perforators recovered at the Shields site include one triangular butt perforator and four irregular butt perforators that range from the smallest recovered in the Eagle Lake Project area (Figure I-14, q) to large ones including one (Figure I- 14, r) with a unique, long shaft. At the Boyd site (EkSa 32), three non-alternating perforators were recovered: one triangular (Figure I-14, s), one with an oval butt (Figure I-14, t) and one unclassifiable fragment (missing both base and tip) that is similar to the oval butt perforator. Only one large, non-alternating perforator was recovered at the Bear Lake site (EkSa 36) (Figure I-14, p): it has an irregular butt similar to those described by Stryd (1973:352).

Table I-21 Non-Alternating Perforators: Metric Data

	# of Specimens	Range	Mean
Length	4	20.3-50.8	34.8
Width	8	8.2-42.9	24.6
Thickness	11	3.1-9.6	5.4
Weigh	4	0.61-6.02	3.51

18. Drills DRIL n = 0

No drills of lithic manufacture, with wear indicating rotary motion (Stryd 1973:349), were recovered in the Eagle Lake Project area.

Bipolar Reduction Lithic Assemblage

The original report on the 1979 Eagle Lake Archaeological Project described fifty-two bipolar cores and wedges (Ludowicz 1980:101-105). With specimens from later field seasons added, the number of artifacts created by bipolar flaking techniques has increased to one hundred and sixty, classified as pièces esquillées, wedges, and bipolar cores and fragments.

Bipolar reduction involves striking the raw material from above while it rests on an anvil, therefore, the resulting fracture has evidence of forces coming from opposite directions. Artifacts created using bipolar techniques exhibit battering and negative bulb scars on opposite ends (Ludowicz 1980:101) and a double wedge shape (Loy and Powell 1977:58).

Sanger noted evidence of bipolar flaking in the Lochnore-Nesikep assemblages, however, believing the artifacts were the detritus of lithic manufacture, he combined what others had referred to as pièces esquillées and wedges into one group of "bipolar flaked artifacts" (1970:84). For the Eagle Lake assemblage analysis we follow Macdonald (1968), Stryd (1973), and Magne (1985) in interpreting bipolar artifacts as implements.

The large quantity of bipolar artifacts found during the Eagle Lake Archaeological Project probably results from the use of small pebbles of fine-grained basalt and obsidian as the raw material for lithic manufacture. Both of these raw materials are usually available as small pebbles, the fine-grained basalt locally, and obsidian from Obsidian Creek, north of Anahim Lake.

19. Pièces Esquillées PEEQ n = 86

The Eagle Lake Project area pièces esquillées (Figure I-15) are similar to those described by Stryd (1973:369, Fig 31, s-v) and Magne (1985:168). They are small, utilized artifacts with a rectanguloid shape and all four edges about equal in length (Stryd 1973; Magne 1985:168). They exhibit paired crushed margins (usually the lateral margins) and bipolar flake scars (not extending across the entire face) where irregular bipolar flakes were driven from both faces at the crushed margins (Stryd 1973 after MacDonald 1968:85-90; Magne 1985:168). Stryd's assemblage amounted to only thirteen specimens, all of them basalt. In the Eagle Lake Project area most of the eighty-six specimens recovered are basalt, except for ten obsidian pièces esquillées collected on the surface, six from the Brittany Creek site (EkSa 33) (Figure I-15, m) and four at ELP Quad 19:1 (EkSa 27) (Figure I-15, n-o). The Eagle Lake area specimens are somewhat smaller than those described by Stryd: he reported a maximum length of 51 mm, and illustrates one of approximately 42 mm and another of 40 mm, of the four illustrated (out of the total of 13). In contrast, the longest Eagle Lake area specimen is 37.2 mm in length from platform to flake termination (Figure I-15, a) in a sample of 86. The smallest complete pièce esquillée, with a length of 16.1 mm, was recovered at the Shields site (EkSa 13) (Figure I-15, f).

Thirty-three pièces esquillées, all fine grained basalt, were recovered at the excavated sites: four at the Bear Lake site (EkSa 36) (Figure I-15, b), one at Quiggly Holes/Bidwell

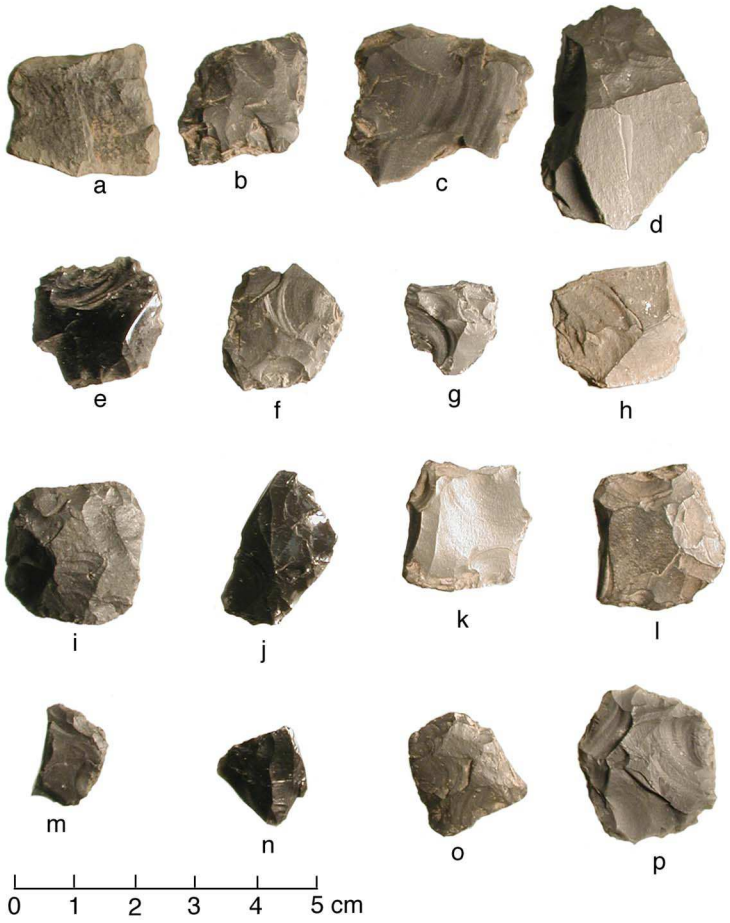

Figure I-15 Pièces Esquillées (PEEQ)

a. CR 40:48	b. ELP 32:1428	c. ElRw 4:1678	d. T84-27:4	e. T84-27:2073
f. EkSa 13:1585	g. EkSa 13:4783	h. EkSa 13:4334	i. EkSa 32:1064	j. EkSa 32:1444
k. EkSa 33:1301	l. EkSa 33:3208	m. EkSa 33:4323	n. ELP 19-1:79	o. ELP 19-1:1245
p. ELP 44/G20:228				

Creek (ElRw 4) (Figure I-15, c), eight at the Fish Trap Lake site (T84:27/ EkSb 37) (Figure I-15, d-e), fourteen at the Shields site (EkSa 13) (Figure I-15, f-h), and six at the Boyd site (EkSa 32) (Figure I-15, i-j). The largest collection of pièces esquillées from a single site, numbering thirty-two, is a surface collection from the Brittany Creek site (EkSa 33); these are primarily fine-grained basalt (Figure I-15, m), however, six obsidian specimens were also recovered (Figure I-15, k-l). Only one other site yielded obsidian pièces esquillées; four were recovered at ELP Quad 19:1 (EkSa 27) (Figure I-15, n) along with ten fine-grained basalt specimens (Figure I-15, o). Surface collections at four other sites in the Eagle Lake area ranged from one to five specimens, including five from Grassland Quadrat 20/ ELP Quadrat 44 (Figure I-15, p).

Thirty-four of the eighty-six pièces esquillées are complete. All specimens illustrated in Figure I-15 are complete except "c" and "k" and represent the size range and all sites where pièces esquillées were recovered, except CR 1 (EjSa 11) which yielded one fragment.

Table I-22 Pièces Esquillées: Metric Data

	# of Specimens	Range	IQR	Mean
Length	52	11.2-37.2	18.9-24.9	21.7
Width	55	11.4-33.9	15.1-21.3	18.7
Thickness	86	2.6-10.6	4.2-6.4	5.42
Weight	34	0.72-7.06	1.59-3.26	2.4

20. Bipolar Wedges WEDG n = 60

Bipolar wedges exhibit two lines of bipolar reduction, perpendicular to each other, resulting in flaking and crushing on all four margins (Figure I-16, a-o). These characteristics are well illustrated on a specimen from the Shields site (EkSa 13) (Figure I-16, g). Materials recovered in the Eagle Lake project area include thirteen obsidian (Figure I-16, b, i, m); five

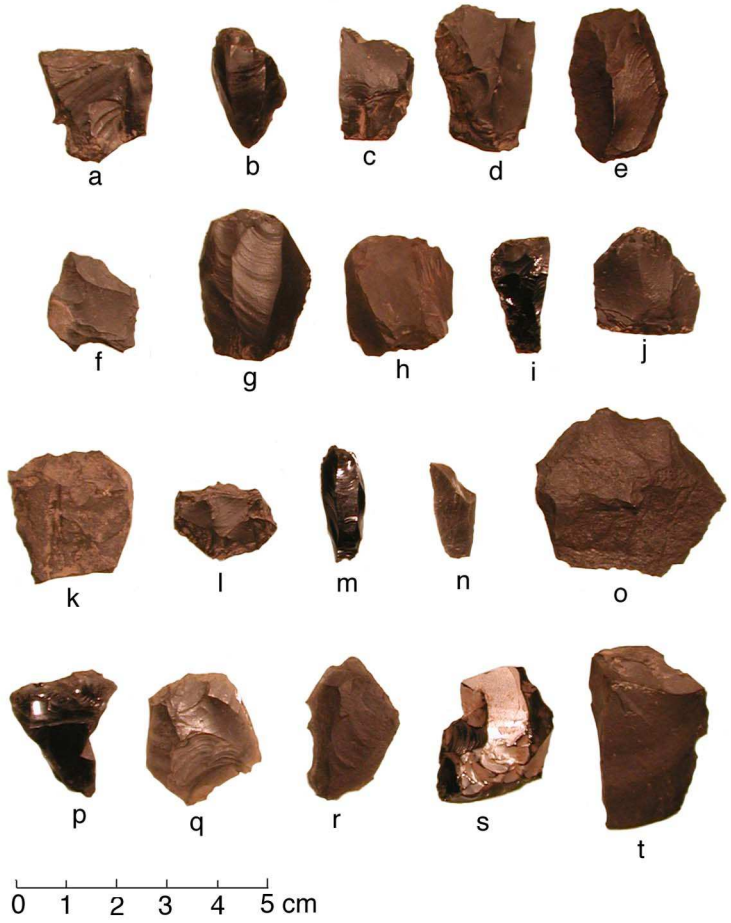

Figure I-16 Bipolar Wedges and Cores

Wedges (WEDG): a. ELP 32:129 b. ELP 32:160 c. ELP 32:1058 d. ElRw 4:1302
e. ElRw 4:1360 f. T84-27:352 g. EkSa 13:2167 h. EkSa 13:2849 i. EkSa 13:3178
j. EkSa 13:4087 k. EkSa 32:5826 l. EkSa 32:6301 m. EkSa 33:3437 n. EkSa 33: 3808
o. EkSa 33:4302

Bipolar Cores (BICO) and Bipolar Core Fragments (BICOf): p. EkSa 33:2411 q. EkSa 33:3621
r. EkSa 33:3745 s. ELP 19-1:161 t. ELP 26 OS:2

coarse grained basalt (Figure I-16, o); and one chert specimen (Figure I-16, n) in addition to the forty-one specimens of fine-grained basalt. Cortex remains on four specimens: one each from the Bear Lake site (EkSa 36) (Figure I-16,a), the Fish Trap Lake site (EkSb 37) (Figure I-16, f), and the Shields (EkSa 13) and Brittany Creek (EkSa 33) sites.

Bipolar wedges have a distribution similar to the pièces esquillées: the Brittany Creek site (EkSa 33) yielded the largest number with twenty-one specimens, the Shields site (EkSa 13) had eleven, the Boyd site (EkSa 32) had nine, Bear Lake (EkSa 36) had eight, and Fish Trap Lake (EkSb 37) and Bidwell Creek site (ElRw 4) each yielded four. Three other specimens were recovered at three surface sites in the Eagle Lake Project area.

The specimens from the Bear Lake (EkSa 36) (Figure I-16, a-c) and Boyd (EkSa 32) (Figure I-16, k-l) sites are more "blocky" than the thinner, wedge-shaped specimens from most other sites. Specimens from the Brittany Creek site (EkSa 33) also include many blocky wedge fragments of basalt and obsidian (Figure I-16, o). The finest examples of bipolar wedges were recovered at the Shields site (EkSa 13) (Figure I-16, g-j) and include one of obsidian.

Table I-23 Bipolar Wedges: Metric Data

	# of Specimens	Range	IQR	Mean
Length	32	12.1-43.1	19.7-29.1	23.8
Width	33	6.2-32.8	12.3-21.4	17.4
Thickness	60	3.3-17.5	5.9-10.0	7.5
Weight	25	0.24-18.80	1.37-2.99	3.33

21. Bipolar Cores & Fragments BICO and BICOf n = 14

Bipolar cores have cortex and, like pièces esquillées, exhibit crushing and negative flake scars on opposite ends as a result of the core being held on an anvil while being struck from the top (Figure I-16, p-t). The core may have been inverted 180 degrees and struck again from the opposite end, however, there is no evidence of crushing along the sides of the core, and the resulting shape is a long and narrow core (Ludowicz 1980:103). Bipolar cores may be an early stage in the production of pièces esquillées or, if rotated 90 degrees and struck again, bipolar wedges.

As with the other artifacts of bipolar flaking, the largest number of cores was recovered on the surface of the Brittany Creek site (EkSa 33) (n = 10, Figure I-16, p-r) including the only examples of coarse-grained basalt (2) and chert (1) (Figure I-16, q) in addition to three obsidian (Figure I-16, p) and four fine-grained basalt specimens (Figure I-16, r). No bipolar cores were recovered at the Bear Lake (EkSa 36), Shields (EkSa 13), or Boyd (EkSa 32) sites. Three specimens were recovered on the surface at other sites: ELP Quad 19:1 (EkSa 27) yielded two bipolar cores, both obsidian (Figure I-16, s), and the Fish Trap Lake site (EkSb 37) and ELP Quad 26 (EkSa 31) (Figure I-16, t) each yielded one fine-grained basalt specimen.

Table I-24 Bipolar Cores and Fragments

	# of Specimens	Range	Mean
Length	13	12.9-36.7	25.2
Width	10	8.9-28.1	20.0
Thickness	14	4.8-13.0	7.8
Weight	11	0.46-10.23	4.39

Cobble-based Lithic Assemblage

22. Cortex Spall Tools SPTO n = 11

Cortex spall tools are large, generally flat flakes derived from cobbles, with water-worn cortex on the dorsal surface and naturally sharp edges that may show evidence of utilization or limited retouch (Sanger 1970:88-89; Matson et al. 1980). Spall flakes, often from granular basalt and other dense igneous cobbles, may exhibit retouch to provide a haft end and a blunted scraping end, although generally only one end will be worked (Magne 1985:168). Polish is common at the scraping end of the tool (Magne 1985:169). Stryd noted that in the assemblage of sixty-eight retouched spalls he described, all but one exhibited unifacial dorsal retouch; the one exception was bifacially retouched (1973:366-67). He also noted that retouch is primarily at the transverse edge, but also occurs on the lateral edges, and occasionally on the entire margin except for the bulb area.

The modest collection of eleven cortex spall tools from the Eagle Lake Project area includes three (one from the Shields site (EkSa 13), one from ELP Quad 19:1 (EkSa 27), and one from a grassland quadrat) with no retouch but with use-wear, similar to those described by Sanger (1970:88-89) and specimens from the Mouth of the Chilcotin (Matson et al. 1983:25).

Specimens with retouch include the variations described by Stryd: six exhibit unifacial retouch ranging from limited flaking of the transverse edge (all specimens from the Brittany Creek site, EkSa 33), to much flaking of either the transverse edge (one specimen at the Bear Lake site (EkSa 36) (Figure I- 17, a) or both the transverse and lateral edges (ELP G2:2). Two cortex spall tools with bifacial flaking were also recovered (Figure I-17, b-c), including one (Figure I-17, b) with bifacial retouch on all edges except at the bulb. The other bifacially flaked specimen is unique (Figure I-17, c): it is the only one of fine-grained basalt and appears to be a thin cobble, with cortex on both faces, that has been shaped by bifacial flaking to create a rounded end and incurvate sides, perhaps for hafting. The other, curved end exhibits extreme polish and the lateral edges exhibit use-wear flaking. This artifact was likely hafted as a hide scraper as illustrated by Teit (1900; Fig. 1).

All but one of the eleven cortex spall tools were recovered on the surface, including one from the surface of the Bear Lake site (Figure I-17, a). The specimen recovered during excavation was at the Shields site (EkSa 13). The only fine-grained basalt specimen is from a grassland quadrat (Figure I-17, c). All other specimens are either coarse-grained basalt or igneous material. Most sites yielded only one specimen, however, the Brittany Creek site (CR 92/EkSa 33) yielded four, (two each of coarse-grained basalt and igneous material) and ELP Quad 19:1 (EkSa 27) yielded two of coarse-grained basalt (Figure I-17, b).

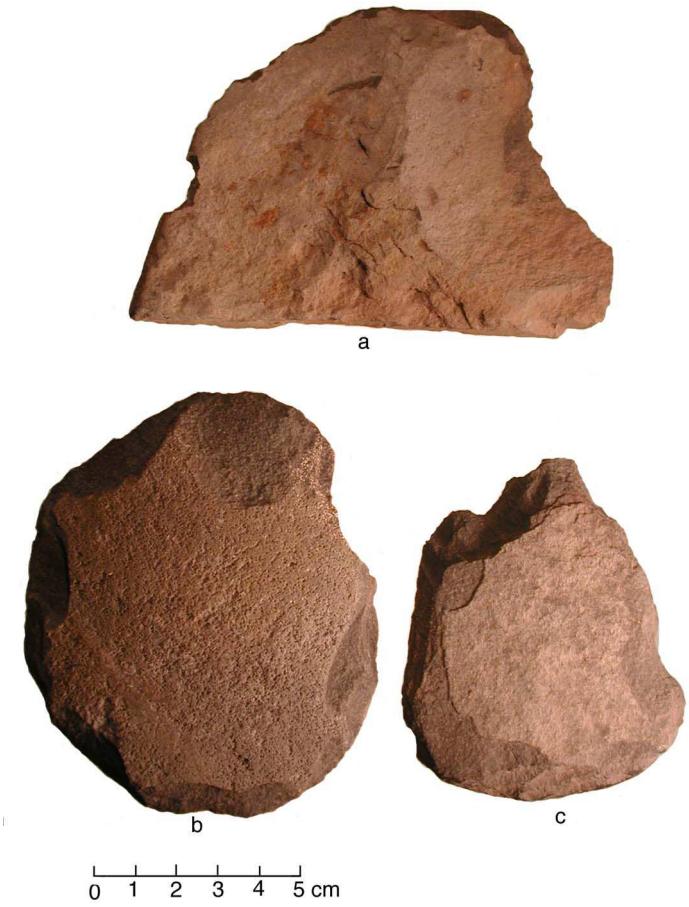

Figure I-17 Cortex Spall Tools (SPTO)
a. ELP 32-1:275 b. ELP 19-1:1549 c. ELP 44-3:250

Table I-25 Cortex Spall Tools

	# of Specimens	Range	Mean
Length	9	80.0-151.5	100.3
Width	8	58.1-95.7	76.3
Thickness	10	7.6-26.7	16.5
Weight	8	72.89-318.00	154.94

23. Core Tools and Fragments CORE n = 12

Core tools are cobbles with flake scars but with no prepared platforms (Matson 1976:131). Core tools and fragments (not illustrated) were collected only at the Brittany Creek site (EkSa 33) and all are from the surface. All specimens are coarse-grained basalt except one of igneous material. Two cores exhibit evidence of retouch and may have served as choppers: EkSa 33:3940 has large, coarse flakes removed bifacially to create a steep edge (opposite the rounded cortex-covered edge) and finer bifacial retouch of the steepened edge to sharpen it. The other retouched core tool (EkSa 33:4245) exhibits unifacial retouch on one sharp, steep edge and also retains cortex cover.

Table I-26 Core Tools

	# of Specimens	Range	Mean
Length	9	66.5-257.6	98.6
Width	9	43.9-116.9	74.8
Thickness	12	16.9-83.7	39.6
Weight	8	57.83-1320.0	390.33

24. Hammerstones (HAST) n = 3

Hammerstones are unshaped, round to oval cobbles with indications of use in the form of pitting or roughening, usually confined to limited and specific areas, but some show wear all over one or both ends (Sanger 1970:89). Sanger's hammerstones vary widely in weight, ranging from 29 grams to 3,305 grams. Stryd described hammerstones with pitted ends in three forms: oval, elliptical, and triangular (1973:380-81).

In the Eagle Lake Project area, only three hammerstones were recovered. Two oval shaped, igneous cobbles were recovered: one from ELP Quadrat 26 (EkSa 31) has extensive pitting on one end and one from the Bear Lake site (EkSa 36) has extensive pitting on one end and the adjacent lateral margin. The specimen from the Brittany Creek site (EkSa 33) is unusual (Figure I-18, a). It is also igneous rock but has a natural wedge shape at one end. At the other end, large bifacial flakes have been removed to create a similar, but alternate, wedge shape. Both ends are worn from use, forming two sinuous edges. Although this might be classified as a cobble tool (see below), its shape varies from Sanger's definition of cobble choppers as it is not a rounded cobble.

Table I-27 Hammerstones: Metric Data

Artifact	Length	C	Width	C	Thickness	Weight
EkSa 33:3192	81.4	Y	47.6	Y	26.1	173.46
EkSa 36:1720	160.0	N	86.9	Y	64.9	1393.6
ELP 26-3:20	106.3	N	70.8	Y	47.4	559.39

25. Polished Cobble POCO n = 1

One cobble recovered from hearth Feature H at the Bear Lake site (EkSa 36) has an unusual but natural outline resembling a hatchet-shape (not illustrated). The basalt cobble is 128.0 mm long, 67.6 mm wide and 27.4 mm thick, exhibits polish on both ends and on the curved lateral margin, and weighs 332.16 grams.

26. Pecked Cobble Tool PCOB n = 1

One cobble tool, recovered on the surface of the Brittany Creek site (EkSa 33, not illustrated), is unique. It is a flat, round, porous igneous cobble that is worn around the entire margin. One surface exhibits polish and is pecked at the centre. It is 137.0 mm long, 128.6 mm wide, and 20.7 mm thick and weighs 680.50 grams and is possibly an anvil stone.

27. Cobble Tools COBL n = 3

Cobble tools are unifacially flaked implements (with rare specimens having bifacial flaking) based on rounded cobbles that may have served as chopping tools or as scrapers (Matson 1976:141). Flaking is generally crude, often with only three or four large flakes removed to form an edge and materials vary widely, although basalts are common (Sanger 1970:84-87).

Two artifacts, both from the Bear Lake site (EkSa 36), are similar to Sanger's cobble choppers (1970:84): they are based on flat, round cobbles of igneous material crudely flaked with three or four large flakes removed. One is unifacially flaked to form a sharp edge on the transverse edge with the greatest curvature. The other (Figure I-18, b) is unlike those described by Sanger. It is bifacially flaked on both ends. Based on the presence of extensive use-wear on the edge opposite the flaking it may have been used for scraping.

One flat, round basalt cobble was recovered from the Shields site (EkSa 13). It exhibits two large flake removals at the broader end and has extensive use wear including pitting, striations and large, unifacial flake removals on one lateral margin.

Figure I-18. Hammerstones and Cobble Tools
Hammerstone (HAST): a. EkSa 33:3192
Cobble Tool (COBL): b. ELP 32:1558

Table I-28 Cobble Tools

Artifact	Length	C	Width	C	Thickness	Weight
ELP 32-1:1467	136.3	Y	97.6	Y	34.6	754.90
ELP 32-1:1558	154.0	Y	100.3	Y	33.0	738.80
EkSa 13:4039	169.0	Y	107.6	Y	46.9	1299.4

28. Cobble with Use-wear UCOB n = 1

One flat, round, igneous cobble was recovered from the Shields site (EkSa 13) that exhibits use-wear but no flaking (not illustrated). It is worn smooth along one margin and along one adjacent face but also exhibits pecking along the same margin, indicating possible use as a grinding stone. The specimen is 86.2 mm long, 78.2 mm wide, 38.5 mm thick and weighs 417.59 grams.

29. Large Flake Tools LFLT n = 13

Large flake tools, unlike the large formed bifaces, generally exhibit unifacial flaking (Figure I-19). They are based on two flake shapes derived from cobbles: one is oblong,

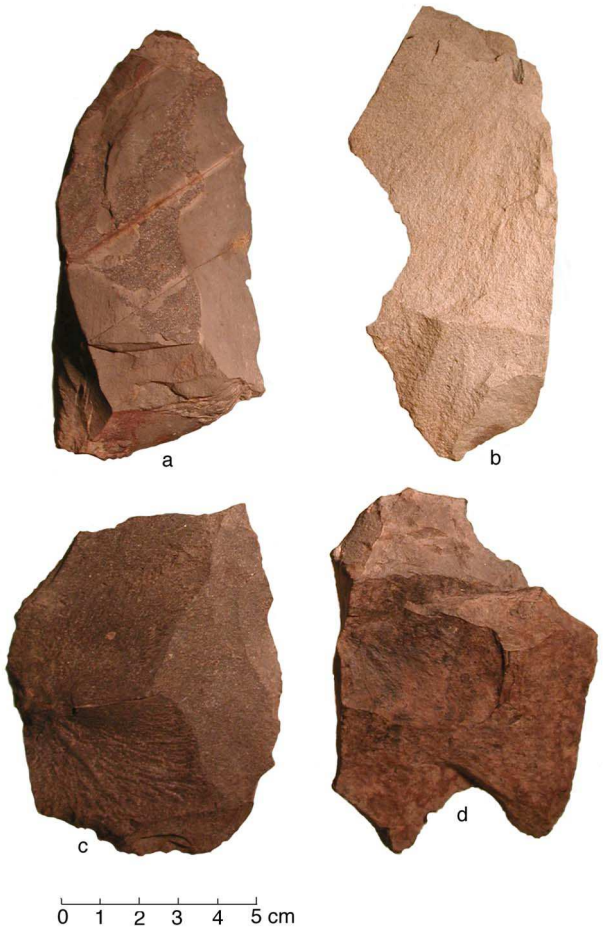

Figure I-19 Large Flake Tools (LFLT)
a. EkSa 13:4330 b. ELP 44-4:264 c. EkSa 13:5430 d. EkSa 13:3962

triangular and blocky (Figure I-19, a-b); the other has a half-moon or ulu shape and is flatter (Figure I-19, c-d). Many specimens of both types have cortex that often becomes the hand-held part of the tool. All have been shaped to create a sharp working edge and a hafting area, usually by unifacial flaking, but occasionally by bifacial flaking (Figure I-19, c). Two specimens, one from the Bear Lake site (EkSa 36) and one from the Fish Trap Lake site (EkSb 37) (not illustrated) exhibit alternate edge flaking. The flat, ulu-shaped flakes generally have unifacial flake removals to create a sharp working edge and, along the opposite edge, a dulled edge for ease of holding. Use-wear flaking is generally unifacial, but on two specimens is bifacial (Figure I-19, a). All tools exhibit use-wear on the sharpened edge in the form of macroscopic polish, crushing, and small, discontinuous flake removals. Three large flake tools have a unique sinuous edge with use wear: one is a flat flake type (Figure I-19, d), and two are of the blocky type (Figure I-19, b).

The greatest number of specimens, six, was recovered in the Shields site (EkSa 13) excavation (Figure I-19, a, c-d), including one specimen of fine-grained basalt (Figure I-19, d) with extensive use-wear (in the form of crushing and small, unifacial flake removals) on one lateral margin and on the sinuous edge.

One blocky, large flake tool of granite with alternate unifacial retouch was recovered at the Bear Lake site (EkSa 36). Three blocky specimens were recovered on the surface of Grassland Quadrat 20; all are coarse-grained basalt. One exhibits bifacial flaking on all edges. The tool has use-wear on more than one edge, as if the tool was rotated, but one edge has the most extensive (and bifacial) evidence of use. Another specimen from Grassland Quadrat 20 (Figure I-19, b) is bifacially shaped at the platform end and has a sinuous, naturally steep edge with unifacial use-wear flaking.

One large flake tool was also recovered at each of the following sites: at Fish Trap Lake (EkSb 37) a flat, curved specimen of fine-grained basalt; at ELP Quadrat 19:1 (EkSa 27) a blocky specimen of coarse-grained basalt; and at ELP Quadrat 22 (EkSb 6) a blocky specimen of fine-grained basalt. Use-wear flaking and patination indicate this tool was used, discarded and reused more recently. Both usages are evident on the curved edge, but earlier use-wear flaking includes the opposite, slightly sinuous edge.

Table I-29 Large Flake Tools: Metric Data

	# of Specimens	Range	Mean
Length	10	71.8-131.1	101.7
Width	11	49.8-84.7	62.4
Thickness	13	15.0-44.7	23.8
Weigh	9	77.71-292.94	159.42

Microblade Assemblage

30. Microblades MIBL n = 4

Microblades are relatively thin, narrow flakes with straight, parallel sides (and ridges) and relatively constant thickness/width ratio (Sanger 1970:60). Striking platforms have flat, unfacetted surfaces and the ventral side may be a smooth, straight line or may be crescent

shaped (Sanger 1970:62). Obsidian microblades were recovered in the Eagle Lake project area at two sites: three at the Boyd site (EkSa 32) (Figure I-20, a-c) and one on the surface of the Brittany Creek site (CR 92/EkSa 33) (Figure I-20, d). Only one (Figure I-20, a) is complete and it is 18.3 mm long. The fragmentary specimen from the Brittany Creek site is a little wider and thicker than the microblades from the Boyd site.

Table I-30 Microblades: Metric Data

Artifact	Length	C	Width	C	Thickness	Weight
EkSa 32:2091	18.3	Y	4.6	Y	1.5	0.12
EkSa 32:2941	10.3	N	4.4	Y	0.9	0.05
EkSa 32:6133	6.2	N	3.6	Y	0.4	0.01
EkSa 33:2766	8.4	N	6.0	Y	1.9	0.11

31. Microblade Cores MICO n = 0

No microblade cores were recovered in the Eagle Lake Project area.

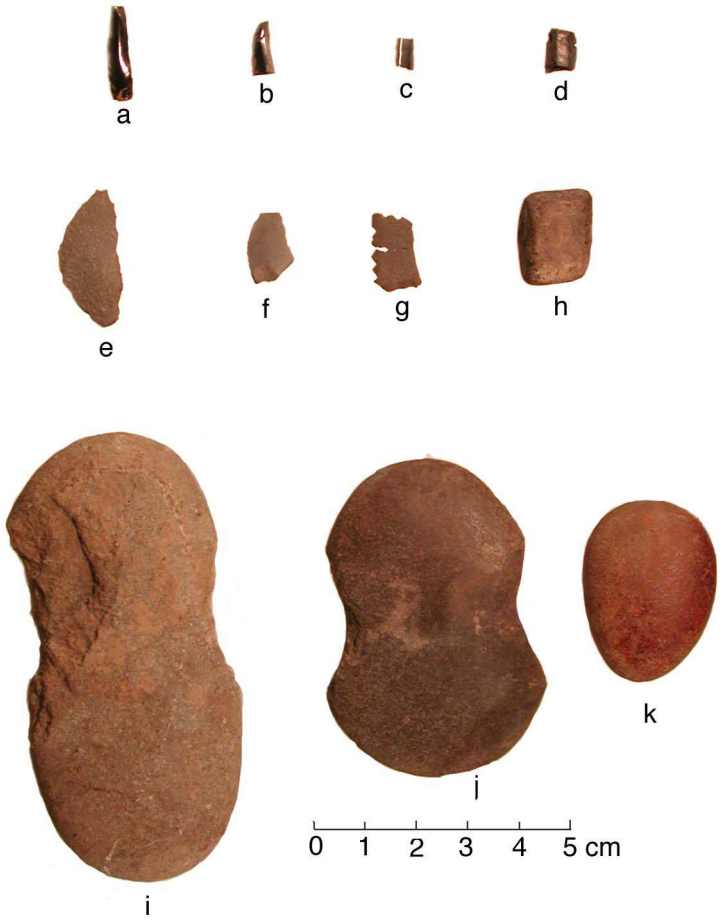

Figure I-20. Microblade and Ground Stone Assemblages
Microblades (MIBL): a. EkSa 32:2091 b. EkSa 32:2941 c. EkSa 32:6133 d. EkSa 33:2766
Adze flakes (ADZEf): e. CR 73:61 f. CR 73:109 Notched Slate (NOSL): g. CR 73:113
Polished Pebble (POLP): h. CR 73:100 Waisted Stones (WAST): i. CR 73:83 j. CR 73:41
Pebble with Ochre (OCHP): k. CR 73:38

Bone and Antler Assemblage

32. Incised Bone INCB n = 11

In the Eagle Lake Project area incised or decorated bone fragments and one incised tooth were recovered at three excavated sites: six fragments at the Bear Lake site (EkSa 36) (Figure I-21, a-c, g-i), one fragment at the Shields site (EkSa 13) (Figure I-21, d), and two fragments at a housepit site CR 73 (EkSa 35) (Figure I-21, e,f). In all, seven specimens show clear evidence of incising and one worn fragment may have been incised. The decorative patterns created by the incised lines are similar to those reported by Sanger (1970:92-95) and Stryd (1973: Fig 40, k-l) for beads and pendants. One fragment from the Bear Lake site (EkSa 36) was whittled, rather than incised (Figure I-21, a), and one from the Shields site (EkSa 13) was decorated with notches (Figure I-21, d). An incised tooth (Figure I-21, c) was recovered at the Bear Lake site (EkSa 36).

One specimen from CR 73 (EkSa 35) (Figure I-21, f) is a flat rectangle (with an outline similar to the neck of a bottle, with three parallel lines carved onto the upper lip of one edge

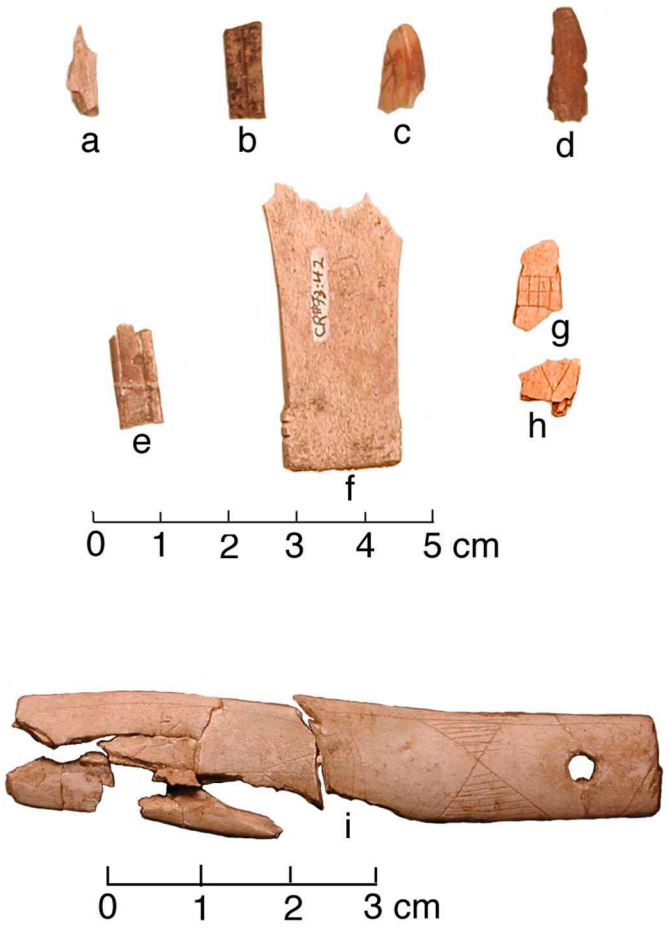

Figure I- 21. Incised and Decorated Bone (INCB)
a. EkSa 36:6010 (whittled) b. EkSa 36:5787 (grooved/incised) c. EkSa 36:1948 (incised tooth)
d. EkSa 13:5717 (decorated bone) e. CR 73:46 f. CR 73:42 g. EkSa 36:6011a
h. EkSa 36:6011b i. EkSa 36:1902

and two lines on the opposite edge). In form it is similar to the "sap scraper" (Stryd 1973:392; Pl 35), "gaming pieces" (Morlan 1973:Pl 19), cut antler rectangles (Campbell 1968:40) and incised bone objects (Shinkwin 1979:115, Pl 31) that form part of the "rather distinctive Kavik artifact type" (Campbell 1968:40). Stryd's inference of sap scrapers is based on morphological similarity to ethnographic specimens (Stryd 1973:392; Teit 1909a, Fig. 235c; 1909b: Fig. 275). One other bone specimen (Figure I-21, e) recovered from CR 73 (EkSa 35), is small and fire-blackened, 15.0 mm long, 6.0 mm wide, and 3.0 mm thick. It has one deep, longitudinal groove incised on one face.

One incised bone specimen from the Bear Lake site (EkSa 36, Figure I-21, i) was recovered in seven fragments from the historic component and has been reassembled. All fragments are soot-blackened on some areas. Figure I-23, k illustrates this fully reconstructed with front, back, and side views (Figure I-23 is repeated as Figure 45 in the main volume). The re-assembled specimen (Figure I-21, i, Figure I-23, k) is both perforated and incised and measures 96.5 mm long; the width varies from 11.5 to 14.0 mm, and thickness is 3.0 mm. It has a circular perforation at the narrower end and one face has diagonal lines intersecting to create a series of "diamond shapes" that are filled-in with incised lines running parallel to the length of the bone. Figure I-21, i shows the assembled front view.

The whittled specimen (Figure I-21, a) of bone from the Bear Lake site (EkSa 36) is a small, rounded fragment (15.0 mm long, 5.0 mm wide, and 4.0 mm thick) that is whittled on one end to taper but not to a point. The incised tooth from the Bear Lake site, EkSa 36, (Figure I-21, c; Figure I-23, j) is hollow and incised with one curved line with two diagonal lines within its curve. The tooth is 14.0 mm long, 6.0 mm wide, and 3.0 mm thick and, as reported in the faunal analysis, is either a porcupine or beaver incisor.

33. Bone Fish Spear Points (Leister Prongs) BPNT n = 6

Fragments of bone leister prongs were recovered at only one site, the Shields site (EkSa 13), and represent at least five points (Figure I-22, a-e; Figure I-23, a-h). Leisters are fish spears with two flexible, barbed side prongs designed to pierce and retrieve fish from above. They were used from platforms, holes in the ice, or from canoes, especially at night with torchlight (Rostlund 1952:105-112, 293-295; Teit 1900:252). Specimens from the Shields site are unilaterally barbed and many show evidence of burning. One unique point (Figure I-22, a) exhibits two unilateral barbs and 4 notches (not unilateral) and has a design of incised dots spiralling around the shaft. Three of the other specimens exhibit extended barbs (with the larger part of the barb extending beyond the lateral edge of the point) (Figure I-22, b-d) and one has two enclosed barbs (with the larger part of the barb within the lateral edge of the point) (Figure I-22, e). One specimen with nine extended barbs (Figure I-22, b), recovered in fragments, has been re-assembled and, although there may be fragments missing, the length of all four sections is 316.5 mm. The tip is straight and exhibits facets on six sides coming to a point. Another point with very similar attributes was also recovered. The proximal end tapers below three small notches, one pointing up, one down and one perpendicular to the lateral edge of the shaft. The points are similar to the unilaterally barbed points reported by Stryd (1973: Fig. 41, a-d) and, like the points reported by Morlan (1973: 278-287) at the Klo-kut site, they are variable in form and size. They do not have the "lenticular" barbs reported by Campbell (1968) for the Kavik site.

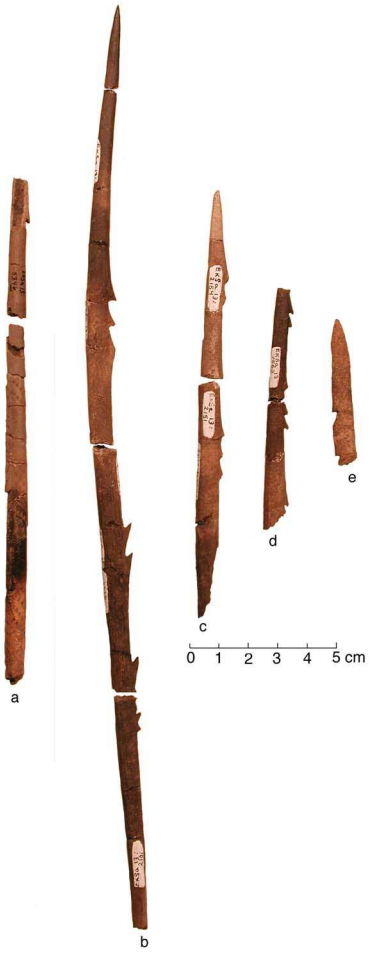

Figure I-22 Bone Fish Spear Points (Leister Prongs) (BPNT)
a. EkSa 13:5346 b. EkSa 13:2161, 2141, 2144, 2143, 2149, 2155, 2148, 2153, 2158, 2159, 2156, 2145, 2146
c. EkSa 13:2142, 2152, 2151, 2162, 2154 d. EkSa 13:2166, 2157, 1563 e. EkSa 13:3605

Table I-31 Bone Points: Metric Data

Artifact #	Figure I- #	Length	C	Width	C	Thickness	Weight
EkSa 13: 5346	22-a	172.0	N	7.0	Y	6.0 - 5.0	6.79
EkSa 13: 2161 et al., 2143 et al.	22-b	316.5	N	5.0 -12.0	Y	5.0 - 6.5	13.40
EkSa 13: 2151 et al., 2154, 2150	22-c	173.3	N	5.8 -10.0	Y	4.5 - 6.0	5.36
EkSa 13:1563 et al.	22-d	83.0	N	9.0	Y	5.0	2.64
EkSa 13:3605	22-e	51.5	N	8.0	Y	3.5	1.51

The six bone point tips, including the two mentioned above, all vary in method of manufacture. One tip (Figure I-22, c) has five facets, creating a flat-sided tip rather than a rounded one. The tip of the specimen with enclosed barbs (Figure I-22, e) is bifacially ground to produce a flattened point with rounded tip. Two point fragments were also recovered.

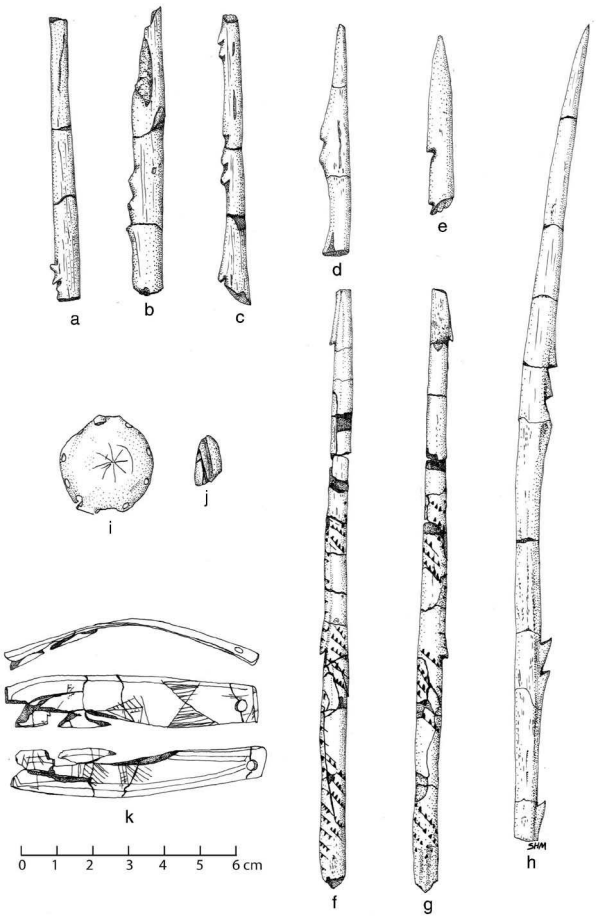

Figure I-23. Illustrations of decorated artifacts from Bear Lake and Shields sites.
(Repeated in the main volume as Figure 45)
Leister Prongs: a. EkSa 13:2156 b. EkSa 13:2162 c. EkSa 13:2166 d. EkSa 13:2142 e. EkSa 13:3605 f, g. EkSa 13:5346 h. EkSa 13:2143
Horse Hardware: i. EkSa 36:5837 Incised Tooth: j. EkSa 36:1948 Decorated bone: k. EkSa 36:1902

34. Harpoon points and fragments TPNT n = 3

Three fragments of bone or antler harpoons were recovered at the Shields site (EkSa 13), including two composite toggling channelled valves (Figure I-24, a-b). EkSa 13:5347 is the best example (Figure I-24, b). EkSa 13:2274 (Figure I-24, a) is only a "likely" example that may be the broken tip of some other object. Figure I-24, c (EkSa 13:3203 [Figure 44 in main text]) is the base of a harpoon with bilateral line guards, such as found on "Marpole-Style" unilaterally barbed harpoons (Matson and Coupland 1995:205). Composite toggling harpoons were fastened with a line around the middle of the valve (below the bulge in Figure I-24, b) and "toggled" or turned when the fish pulled the harpoon off the shaft. Figure I-24, c would not "toggle". The missing upper part of Figure I-24, c would have barbs and the line would have been tied between them and the line guards which are the two protuberances visible. Harpoons used for freshwater fishing had heads that detached from the harpoon

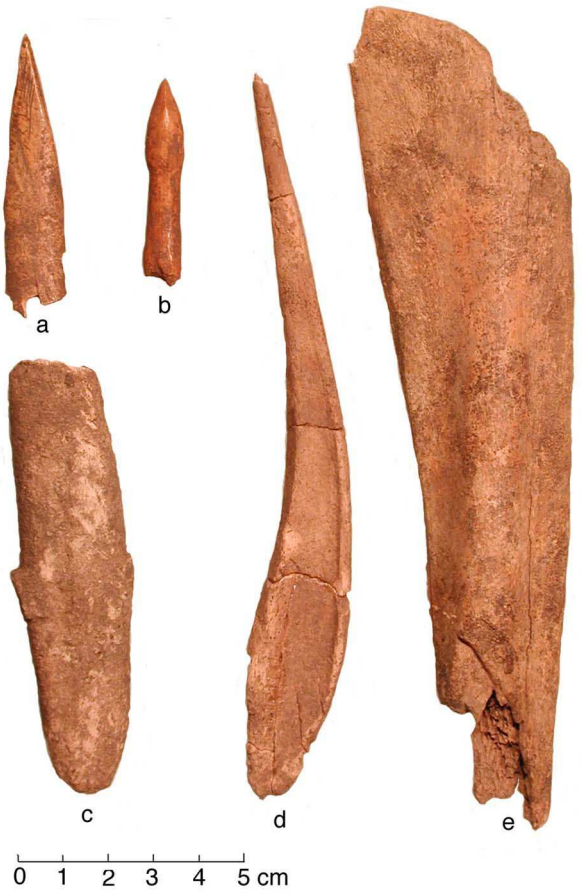

Figure I-24. Bone and Antler: Harpoon Points, Awls, and Beamers.
Harpoon Points (TPNT): a. EkSa 13:2274 b. EkSa 13:5747 c. EkSa 13:3203
Bone Awl (BAWLT): d. EkSa 13:5713
Scapula Beamer(BEAM): e. EkSa 13:3260

shafts but were attached by a line so that fish could be retrieved (Rostlund 1952:105). The current use of "gaffs" at Henry's Crossing continues this technology for salmon fishing today (Burnard-Hogarth, Chapter 2, main text).

Table I-32 Harpoon points and Fragments: Metric Data

Artifact Number	Figure #	Length	C	Width	C	Thickness	Weight
EkSa 13: 2274	24-a	61.1	N	13.2	Y	5.8	3.42
EkSa 13:5347	24-b	45.1	N	8.5	Y	5.0	1.43
EkSa 13: 3203	24-c	96.9	N	27.2	Y	8.9	14.21

35. Bone Awl BAWL n = 1

One bone awl with broken tip and use-wear polish but no modification was recovered at the Shields site (EkSa 13) (Figure I-24, d). It is 160 mm long, 21.5 mm at the widest part, 7.1 mm thick, and weighs 12.32 grams.

36. Scapula Beamer BEAM n = 3

Three scapula beamers were recovered at the Shields site (EkSa 13) (Figure I- 24, e) that are similar to the unornamented beamers which functioned as hide scrapers reported by Morlan at the Klo-kut site (Morlan 1973:305-307). Stryd (1973:391-2) also reports six such items made from deer scapulas. All specimens from the Shields site are very worn, broken at the working edge and distal end, and two are broken along the lateral margin. Lengths (incomplete) range from 16.0 to 20.5 mm, widths (incomplete) range from 26.0 to 44.4 mm, and thickness ranges from 3.8 to 17.5 mm.

Paull (1984) tested EkSa 13:3260 (Figure I-24, e) at four loci for blood and fat and at one of those four for fat and lignin. All of the loci looked like blood specks and three were positive for blood and fat. The fourth loci was negative for these and starch but positive for lignin. Whether the blood and starch are the result of the function of the tool or because the object is bone is unclear.

CR 73 / EkSa 35 Assemblage Unique Items

The following artifact types were recovered only at EkSa 35 (CR 73), a housepit site, near Brittany Creek, that has been truncated by the Chilko River. The site is about three hundred and fifty years old (SFU 15: 360+/-80 BP). In addition to the waisted stones, adze flakes, notched slate, polished pebbles and pebble with ochre described below (Figure I-20, e-k), the excavation also yielded two specimens of incised bone, one Kavik point, one side-notched point, one utilized flake of quartz, and one small, bifacially retouched flake of obsidian (previously described).

37. Waisted Stone WAST n = 3

Three flat, oval cobbles exhibit bifacial flaking at the mid-section to create a waist and have the appearance of crushing but not polish at the waist. Two complete specimens (Figure I-20, i-j) and one smaller size fragment were recovered and these may be net-sinkers. On one granite specimen (Figure I-20, i) large, coarse, flakes are removed from both edges to create the waist; the flake removals are unifacial on one edge and bifacial on the other. The other complete specimen (Figure I-20, j) is fine-grained basalt and exhibits bifacial flaking of both edges to create the waist.

Table I -33 Waisted Stones: Metric Data

Artifact	Figure	Length	C	Width	C	Thickness	Weight
CR 73:41	20-j	62.7	Y	43.3	Y	13.5	60.30
CR 73:83	20-i	87.9	Y	41.6	Y	16.0	96.56
CR 73:108	-	21.2	N	20.5	N	8.7	5.16

38. Adze Flake ADZEf n = 2

At CR 73 (EkSa 35) two fine-grained greenstone flakes with ground and polished dorsal surfaces were recovered during the excavation and have been identified as adze flakes (Figure

I-20, e-f). In his report on the Lochnore-Nesikep area, Sanger reported fragments of nephrite celts with grinding, bevelling and grooving (1970:89).

Table I-34 Adze Flakes: Metric Data

Artifact	Length	C	Width	C	Thickness	Weight
CR 73:6 1	26.1	N	12.0	Y	2.5	0.86
CR 73:109	13.7	Y	9.0	Y	2.1	0.14

39. Polished Pebble POLP n = 2

Two small, highly polished pebbles of fine green stone were recovered during the excavation of the CR 73 (EkSa 35) housepit. One is ovoid in shape (Figure I-20, h); the other is triangular.

Table I-35 Polished Pebbles: Metric Data

Artifact	Length	C	Width	C	Thickness	Weight
CR 73:37	30.1	Y	13.5	Y	6.8	3.42
CR 73:100	19.0	Y	14.8	Y	7.0	3.61

40. Pebble with Ochre OCHP n = 1

One rounded igneous pebble with ochre on one end was recovered in the excavation of CR 73 (EkSa 35) (Figure I-20, k). The pebble is 35.9 mm long, 26.5 mm wide, 14.8 mm thick and weighs 21.02 grams.

41. Notched/Incised Slate NOSL n = 1

One fragment of slate was recovered in two pieces on the surface of CR 73 (EkSa 35) (Figure I-20, g). It exhibits a continuous zig-zag pattern incised into the edges.

Historic Artifact Assemblage

42. Historic Artifacts: Bear Lake Site (EkSa 36) HIST

The following details on the historic artifacts from the Bear Lake site (EkSa 36) are largely taken from the report prepared by Rod Heitzmann (2001). All artifacts date to the mid-nineteenth century (the historic lodge has bark ring tree-ring dates of AD 1851 and AD 1877) and relate to clothing and personal items, cooking and food, guns, horse tack, and hardware. Most items exhibit considerable wear or damage.

Clothing and Personal Artifacts n = 13

Clothing and personal items consist of one religious medal, five buttons, and seven beads. The religious medal is a round, thin, silver-plated medal 15.4 mm in diameter with a broken cast metal hoop for attachment at one end (Figure I-25, a [Figure 46 in main text]). It

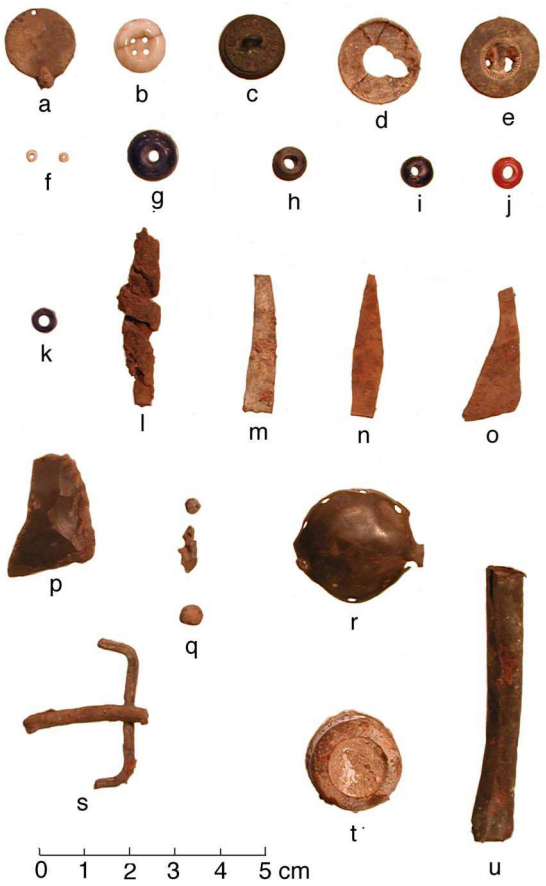

Figure I-25. Historic Artifact Assemblage(HIST)
Religous Medal: a. EkSa 36:1895
Buttons: b. EkSa 36:1890 c. EkSa 36:1960 d. EkSa 36:1918 e. EkSa 36:1944
Beads: f. EkSa 36 1961 & 3008 g. EkSa 36:2777 i. EkSa 36:3964 j. EkSa 36: 1790 k. ELP 32-1:159
Misc. Metal: l. EkSa 36:3975 m. EkSa 36:1893 n. EkSa 36:1994 o. EkSa 36:1932
Gun Related: p. EkSa 36:3006 (Gun Flint) q. EkSa 36:1885, 1886, 1887 (Lead Sprue)
Horse Related: r. EkSa 36:5837 (Round Brass) s. EkSa 36:1902 & 1904 (Buckle)
Other: t. EkSa 36:1897 (Threaded Gray metal) u. CR 28:40 (Rolled copper tube)

appears that when the hoop broke, a small hole was drilled close to the rim at the opposite edge. Corrosion has effaced the image and the inscription around the margin, however, the image appears to represent Christ with an upraised hand across the chest (The Sacred Heart symbol).

The five buttons represent four types: two are white glass, typically used on shirts or underwear (Figure I-25, b); one three-part metal button has a cast eagle on the front and a single loop on the back for attachment, a style commonly used for coats (Figure I-25, c); one metal button back may be from a cloth-covered button likely used for a coat (Figure I-25, d); and one flat, two-part button with copper face and iron back was common on pants and dresses (Figure I-25, e). The three-part metal button (Figure I-25, c) consists of a front, back and a single loop. The obverse of the front is cast with an eagle, facing left; the reverse is impressed "SCOVILLS & . . . ", identifying this button as having been produced after 1840 when the Scovill Manufacturing Company of Waterbury, Connecticut became known as

Scovills & Company. Buttons with this label were probably made between 1840 and 1850.

The seven glass beads include two white drawn seed beads (Figure I-25, f) usually used on moccasins or clothing, and five larger beads including three dark blue wire wound beads: one large (11.1 mm in diameter) and two medium size (7.4 and 7.9 mm in diameter) (Figure I-25, g-i); one red wire wound bead of medium size (7.1 mm diameter) (Figure I-25, j); and one dark blue, drawn, faceted, hexagonal bead (5.9 mm diameter) (Figure I-25, k).

Cooking and Food Related Artifacts n = 63

Most of the artifacts in this category are fragmentary. Cooking implement fragments include parts of a minimum of four thin walled, tinned iron vessels. Fragments of two tinned iron pots were recovered: one pot had an outward rolled rim and handle lug, the other had an inward rolled rim. The crimped rim for a container with slip-on lid was also recovered. Other kitchen related items include a can key and strip from a sealed food container (Figure I-25, l), 43 strips of metal from tin cans, cut into varying lengths and widths, possibly for other uses such as tinkling cones or repairing other metal objects (Figure I-25, m-o), and several pieces of a wider, circular metal band, possibly used to secure stove pipes.

Gun Related Artifacts n = 4

One fragment of a gunflint (Figure I-25, p) is likely from a British source dating from the nineteenth century. Three droplets of lead sprue (Figure I-25, q) are possibly the result of the manufacture of lead balls or shot. One unidentifiable gun part, consisting of a threaded base of grey metal, was also recovered.

Horse Tack and Related Artifacts n = 4

Two artifacts may be decorations from horse tack or saddles: one is a fragment of an oval-shaped leather cut-out with stitching around the outer rim and two large holes on opposite sides near the rim, likely for the attachment of leather tassels or strips. The other is a round, dome-shaped brass decorative piece with an etched star on the face (Figure I-25, r, Figure I-23, i). It has folded-over tangs and small holes along the lower edge for attachment to leather saddles or harness. A third artifact, of rectangular cross-section grey metal, was recovered in two pieces and is probably a buckle from a horse harness or pack (Figure I-25, s).

Hardware Related Artifacts n = 4

One common machine-made nail with square cross-section and length of 32 mm was recovered (not illustrated). These nails were commonly used in the mid-to-late nineteenth century as wood fasteners. Three segments of chain links were recovered: two are from heavy iron chain link and one is from a light gauge iron chain link.

Unidentified Artifacts n = 1

One unidentified artifact (Figure I-25, t) is the base of a round, threaded grey metal object with a diameter of 22 mm. It has a circular, 14.2 mm diameter hole in the base and the other end has been cut. Its function is unknown.

43. Historic Artifacts: Other Sites HIST

One rolled copper tube (Figure I-25, u) was recovered at CR 28 (EkSa 98). Made from a flattened piece of copper coiled to form a tube, it measures 61.7 mm in length and 8.9 mm in maximum diameter. The method of manufacture is not like two "rolled copper tubes" from sites in southwest Yukon (Workman 1978: 347; Pl 15) or one copper tube, identified as possibly a bead, from the Dixthada site (Shinkwin 1979:104, Pl 28), all of which have long sides meeting and hammered together. However, it may have functioned similarly as a bead or tinkler for attachment to clothing (Workman 1978:347).

OBSIDIAN SOURCE ANALYSES

Martin Magne

On the basis of macroscopic characteristics and relative proximity of the source, we can be fairly certain that most of the obsidian lithics collected and excavated at Eagle Lake were obtained from Anahim Lake and vicinity, notably the Obsidian Creek source (Nelson and Will 1976). This obsidian is most often opaque black in colour, develops a silvery hydration cortex, and is found as small cobbles that are very often reduced with bipolar techniques. In the course of our excavations at the Shields site (EkSa 13), and during our examination of materials from Chinlac (Borden 1952), we noticed some pieces of obsidian which did not fit our notions of what Obsidian Creek materials should look like, and thought it best to have source analyses done to verify their origin.

From Chinlac we noticed a black with red streaked obsidian microblade core fragment, which looks like Glass Buttes, Oregon obsidian. In obsidian, colour is no clue at all to source (Carlson, personal communication 1983). This piece, apparently not noticed by Borden, was catalogued in 1952 as a "lamellar flake" (CH: 729), and was found in the turf level of House III at Chinlac. The artifact itself is unusual since no microblades were found at Chinlac.

From the Shields site (EkSa 13) we excavated several flakes of green, slightly bubbly obsidian from House 2 in Layer B3. And from House 5 were excavated several flakes of blue-grey obsidian from Layer B2. We had no good idea of where these materials could be from, and Mt. Edziza was considered a good possibility, if only because we knew obsidian from there to be quite varied in colour.

The three samples were submitted to Dorothy Godfrey-Smith of Simon Fraser University for source analysis. The method employed was X-ray fluorescence, which is a non-destructive and accurate method of determining obsidian source locations when known reference samples are at hand. The method is detailed in Nelson, D'Auria and Bennett (1975), and the same procedure was employed by Godfrey-Smith with the exception that the analyses were run for 10 minutes rather than 5 minutes. A total of 15 elements were characterized in the analyses.

Somewhat surprising results were obtained in that they did not fit our preconceived notions at all. The Chinlac microblade core is derived from Anahim 1, that is to say, Obsidian Creek. The green obsidian flakes from the Shields site, Housepit 2 are from Ilgachuz #1, and the blue-green flakes from Housepit 5 are from Ilgachuz #3, which are both sources with unknown precise locations somewhere in Ilgachuz Mountains north of Anahim Lake (see Apland 1979).

Thus we can say that obsidian at Eagle Lake was obtained from three source locations: Obsidian Creek, which was sourced for the Chinlac microcore only, but is highly probable for most of the Eagle Lake materials, and Ilgachuz #1 and #3, which were sourced for Shields site materials. It is possible indeed that some of the black obsidian from Eagle Lake was obtained from other sources, since some from a site at Alexis Creek was sourced to Mt. Edziza (Bussey 1983; Godfrey-Smith 1984).

FAUNAL ANALYSIS

Linda Roberts and Martin Magne

The analyses of mammal and fish remains from three excavated sites in the Eagle Lake region were undertaken to reveal faunal subsistence patterns in prehistoric and historic times. Different subsistence practices may result from changes in local fauna or be brought about by the fur trade and introduction of European goods such as guns and metal implements as well as different cultural practices. PPT and Athapaskan occupants of the region may have utilized salmon, lake fish, and land mammals differently. Elk (*Cervus elaphus*) disappeared from the area prior to 1900 and the growth of moose populations in the area is relatively recent. Although McT. Cowan and Guiguet (n.d.:378) state "Prior to 1920 there were virtually no moose south of the Hazelton-Prince George line" Spalding (1990) points to historical evidence that prior to 1840, moose was present south of that line, although probably not as far south as Eagle Lake. So moose probably ought to be absent from all collections, and elk should be present at the Shields and Boyd sites, but perhaps not in the historic component at Bear Lake. Fish remains pose an interesting problem, since the Chilcotin subsistence round, to the degree that it is known, stresses the importance of lakefish such as trout, whitefish, suckers and kokanee. Thus we might expect more of these present in the Bear Lake site than in the PPT assemblages. Regardless of what is reported ethnographically, the empirical archaeological record will become the more accurate record of late precontact of faunal resource use patterns of which this report is an initial stage.

Although changes in subsistence patterns through time were expected to be revealed mainly through comparison of the remains between the Bear Lake, and the Shields and Boyd sites, significant differences might be observable within the sites. For the protohistoric period at Anahim Lake, Stewart (1978) found substantial numbers of Caribou remains, but Stewart (1978:24) and Wilmeth (1978:143) only modest evidence for moose (one worked antler specimen and an ulna and acetabulum). Stewart presents convincing evidence that Caribou habitat changed dramatically in the historic period because of increasing population and that these habitat changes were favorable for deer and moose (Stewart 1978:51-52). Investigation of such changes is most feasible at the Bear Lake site, where two hearths were excavated, each from a different component of the site. The remains were examined, analyzed and largely interpreted by Roberts, with Magne providing the research orientation and final interpretations.

Research Methods

The faunal bone from the three sites was identified as closely as possible to genus and species. Anatomical portion was noted even if specific identification was not possible. A description of the piece stating condition (charred, calcined, not burned, weathered, proportion of fragment remaining, fusion/ non-fusion, butchering, carnivore chewing marks, staining, cut marks, deliberate shaping, etc.) was also included. The decorated and shaped artifacts were removed from the analyses and are described in the artifact section of the larger report, however cut and butchered bone remains are included in this faunal section.

All of the excavated bone was included, with the exception of 1/2 of the remains excavated from the Feature J cachepit (or about 1/4 of the entire pit) from the Bear Lake site, and the remains which are included in floatation samples taken from all sites. The remaining portion of Feature J has been stored at UBC as an example of the articulated salmon vertebrae feature.

All of the classifiable bone was counted and weighed. To reduce the time involved, much of the unclassifiable bone (class uncertain) was not counted, and was only weighed. The analysis maintained tabulations of the bone from individual units, levels, layers and sub-layers, and was later condensed to the units desired for analysis. Total bone frequencies (NISP) for the three sites, sorted by identifiable class, are shown in Table I-36.

Bear Lake Site (EkSa 36) Fauna

The principal questions which formed the framework of the analysis at the Bear Lake site have to do with the differences between historic and prehistoric components, whether the various features identified as such were correctly assigned, and functional differences between the different historical features. The specific questions are as follows:

1. Are there significant differences in the remains from hearth Features G (historic) and I (prehistoric)? Does Feature G evidence more fur-bearing mammals? Are there elk in Feature I and moose in Feature G? Is there evidence of utilization of different elements of animals?

2. Are the Feature I Separate materials most similar to Feature I or Feature G? Can they be interpreted as the result of disturbance of Feature I, or as the result of periodic cleaning out of Feature G?

3. What species and elements are present in Feature A? Could these represent materials discarded from one of the hearth features?

4. Is Feature G best interpreted as the result of continuous usage, or of varying seasonal usage?

5. What are the differences between the hearth remains and those found in the floor area of Feature B?

6. What salmon elements are present in the historic Feature J cache? Are salmon head parts present, indicating local processing of salmon? Are salmon elements found elsewhere at the site? Does Feature J contain other fish or mammal elements?

7. What species and elements are present in Feature H? How do these compare with remains from Feature B? Is there any indication of the function of Feature H?

8. Does the definite precontact layer (Bf) contain faunal remains that are markedly different from the contact period occupation?

FAUNAL CLASS	BearLake	SITE Shields	Boyd
Large mammal	1	27	
Medium-large mammal	337	1814	87
Medium mammal	169	4	1
Small-medium mammal	81	17	3
Small mammal	6	15	1
Mammal	97		
Osteichthyes	1770	3471	19
Class Uncertain	380+	331+	16+
Artiodactyl	10	22	
Cervidae	148	17	5
Cervus elaphus		8	
Odocoileus hemionus	8	5	11
Medium carnivore	9		
Canis latrans	2		1
Ursus americanus		1	
Martes sp.	3		
Martes pennanti	1		
Mustela vison	1		
Gulo gulo	1		
Mustela sp.	3		
Lynx sp.	77		
Large carnivore		1	
Leporidae	1	59	5
Marmota caligata		4	
Tamiasciurus hudsonicus		1	
Castor canadensis	1	3	1
Beaver/porcupine	3	5	
Ondatra zibethicus		10	
Rodentia	4	1	
Small rodent	2	1	
Mustelidae	1		
Catostomus sp.		462	
Salmoninae sp .	216	17	
Onchorynchus sp.	2		
Gavia immer		5	
Anas sp.	2		
Bucephala sp.	3		
Dendragopus sp.		2	
Avies	9	11	
Mollusca	1	5	
TOTALS	3347+	6321+	150+
TOTAL = 9818+			

Table I-36. Faunal class frequencies for the Bear Lake, Shields, and Boyd sites.

For purposes of the analysis, we grouped the different proveniences into nine sets, grouped into three loose groups, prehistoric assemblages, the Eagle Lake Phase fauna (Lithic Scatter, Feature I, Feature A, Layer Bf), historic assemblages, the Lulua Phase fauna (Feature G, H, J, B, Feature B Outside) and unclear (Feature I separate). "Feature B" did not include inclosed features and the last two were defined as Feature B Outside (units extending beyond the historic lodge walls, not including features) and Feature I Separate (units adjacent to Feature I with FCR and bone, which appear to represent disturbance of Fea. I upon construction of the historic lodge in 1877). Feature D, the roasting pit, contained no faunal remains.

There were a total of 3347 pieces of bone from this site as well as an uncounted amount of unclassifiable bone (Table I-37). The total weight of the bone was 1,498. 3 grams.

Very generally this site has more bone which is charred and calcined in proportion to unburned bone than the other two sites. Bear Lake is notable for its variety of animals. The deer remains are represented mostly by antler fragments, and no moose or elk are present. There are more carnivores and mustelids than at the other sites, and there are no sucker fish but instead abundant salmon vertebrae. More cut bone (15 pieces) are present than at the other sites. Following is a brief description of each of the nine areas noted above, and a comparison of the areas where appropriate.

Historic faunal assemblages

Feature G (Hearth in Historic Lodge, Feature B)

Hearth Feature G contained 756+ bones that weighed 463. 3 grams. Most of the bone was either charred or calcined, however 141+ pieces were unburned. This feature is characterized by a comparatively large variety of animals, including several members of the Mustelid family and lynx (*Lynx sp.*). There are some deer (*Cervidae*) and a large amount of bone identifiable to small through medium-large mammal. Fish are well represented and include some salmon. A few birds, including one of the diving ducks (*Bucephala sp.*) are present. There is also evidence of butchering marks. Both fisher (*Martes pennanti*) and wolverine (*Gulo gulo*) are represented by one element each. There were a few pieces of bone that could be identified only to *Martes sp*. or *Mustela sp*. The lynx remains are all foot bones (front and rear), except for two fore-arm (ulna) fragments, one of which is shaped into a pointed awl and is shown in the artifact photos. The medium carnivore identifications are likely lynx but fragmentation due to calcination is too great for more positive identification. These fur-bearers demonstrate an intensive involvement in the fur trade in the 1870s.

The beaver/porcupine identifications are based on incisor fragments. No further identification to either animal is present at this location, and note that one (untallied here) beaver/porcupine incisor is incised with lines, as described by the ethnographers for gambling die (see artifact descriptions). The rodentia identification (a phalanx) is likely a mouse- sized animal.

The cervid/artiodactyl identifications are based on eight metapodial fragments, two phalanges, one sesamoid, one antler fragment and one mandibular condyle.

The fish (*Osteichthyes*) are represented by skull, vertebrae, rib and fin (ray) fragments. A few vertebrae and one skull (articular) are sub-Family *Salmoninae*. Both the articular and 21 of the 22 vertebrae were large (ca. 2-4 kg or 5 - 9 lb.) fish. There is one tiny *Salmoninae* vertebra which could have been from a trout or kokanee or another small salmon species.

	BEAR LAKE SITE AREA OR FEATURE								
FAUNAL CLASS	Lithic Scatter	Fea.A	Fea.G	Fea.I	Fea.H	Fea.B	Fea.B Out	Fea.I Sep	Fea.J
Large Mammal									
Medium-large mammal		1	95	75	2	17	78	59	10
Medium mammal			129	4	1	6	8	19	2
Small-medium mammal	1		42	7	2	3		26	
Small mammal			6						
Mammal	6	11	27		6	47			
Osteichthyes		1	261	18	21	173	6	172	1118
Class uncertain	49+	12+	94+	3+	13+	149+	24+	31+	5+
Artiodactyl			2	3			1	4	
Cervidae			12	18		109	3	6	
Cervus elaphus									
Odocoileus hemionus				8					
Mustelidae			1						
Ursus americanus									
Martes sp.			3						
Martes pennanti			1						
Mustela vison						1			
Gulo gulo			1						
Mustela sp.			3						
Lynx sp.			39	9		6	4	19	
Medium carnivore			6			1	1	1	
Leporidae					1				
Marmota caligata									
Castor canadensis				1					
Beaver/porcupine			3						
Rodentia			1			3			
Small rodent				1					
Catostomus sp.									
Salmoninae sp.			23	1		16		23	153
Onchorynchus sp.								2	
Bucephala sp.			3						
Avies			4	1	2		1	1	
Mollusca		1							
TOTALS	56+	26+	756+	150+	48+	533+	126+	364+	1288+
TOTAL = 3347+									

Table I-37. Faunal class frequencies for Bear Lake site surface and excavated features.

There is one uncommon small fish which is potentially identifiable, but could not be identified due to lack of a suitable comparative specimen.

Cut marks and/or evidence of butchering are present on one deer phalanx as superficial slashes at the distal end on one side. Two fish bones are cut and chopped, which is a feature common on historic sites. One medium- large mammal, one medium mammal and one class uncertain have slight cuts to their exterior surfaces. One class uncertain had two parallel lines across its surface that may have been decorative, but are not like the other decorated items from the site.

One interesting item in Feature G is a sockeye salmon otolith that was found by E. Carrie in a flotation sample from the feature. This is the only otolith found even though 10 flotation samples were examined by Carrie with this element in mind. Otoliths are elements of fish ears which are valuable because they can be identified to species, used to age the individual, estimate its size, and if sectioned exhibit growth lines much like clam shells that can be read for seasonality information. The otolith is burned and fragile, and although it is mounted for sectioning, personnel at the Canada Fisheries scale and otolith laboratory in Vancouver (E. Yole) expressed the opinion that it would not take well to sectioning. The individual is confidently estimated at four years of age.

Figure I-26 is a photograph of the medial surface of the otolith (from the left side of a skull, and Figure I-27 is a photograph of the medial surface of left and right modern sockeye otoliths, collected from salmon heads at Adams River.

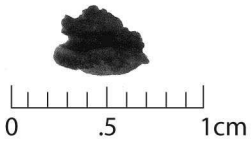

Figure I-26. Bear Lake Otolith

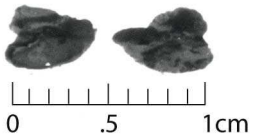

Figure I-27. Adams River Sockeye Otolith

Feature B (Historic Lodge, not including Features G, I, J)

Feature B has 533+ pieces of bone weighing 137. 8 grams. Just over half of the bone by count is charred or calcined. This area of the site contains a moderate amount of mammal bone. The fish are abundant and there are several Salmoninae present. The apparent abundance of cervid is due to a mass of antler chips, 108 of such from Unit 39. There is only one other deer identification of an accessory phalange. There is no avian bone.

The lynx here are represented by two right tibiae fragments (which fit together), one left and one right fibulae, one carpal and one phalanx. Several pieces of bone are cut. The one *Mustela vison* (American mink) skull and mandible have cuts around the eyes as if from skinning out the skull. There were also cuts to the right and left occipital condyles as if from decapitating and cuts to the inferior borders of each mandible, as if from skinning. One medium mammal right rib is cleaved diagonally at the neck, one medium-large mammal extremity shaft fragment has a superficial cut, and one medium-large mammal piece is shaped very roughly to a "V".

Feature H (Second Historic Lodge)

Feature H contains 48+ bones weighing 23. 2 grams. All of the bone is charred or calcined except a few pieces. There is one specific identification to Leporidae. The rest of the material consists of small to large mammals, a few fish fragments, two bird fragments and some class uncertain. One bone from Feature H had superficial hatching on its exterior surface.

Feature J (Cache Pit within Feature B)

Feature J is a cachepit containing almost entirely fish bone. The total count is 1288+ bones weighing 53. 2 grams, which could be multiplied by about four to represent the entire feature. Almost all of this bone is not burned, including one mammal, 1117 fish, and 153 Salmoninae.

Of the fish, only one tooth was found burned. The remaining charred/calcined material is either mammal or class uncertain, all of which are very tiny pieces as if they are accidental, and these are perhaps sweepings from the floor of the lodge. The anatomical portions of fish which make up this cache are almost all ribs and rays (1000 by count). There are a few small skull pieces (n = 16) which are in poor condition and are not identifiable to species. All of the Salmoninae identifications (153) are based on vertebrae from medium to large fish, which given the location are probably sockeye and Chinook salmon.

Prehistoric (Eagle Lake Phase) Assemblages

Lithic Scatter

The 56+ pieces of bone weigh 3. 7 grams and all are charred and/or calcined. Fragments were identified as mammal or class uncertain.

Feature A (Burned Rock Midden)

The 26+ pieces of bone weigh 6. 3 grams and all are charred and/or calcined but for three pieces. As well as some mammal identifications, there are also one unburned fish vertebra and one unburned clam-type (Pelecypod) fragment. The shell fragment is thick enough for it to likely be a marine shell.

Feature I (Prehistoric Hearth in Unit 54)

Feature I contained 150+ pieces of bone that weigh 475. 0 grams. Most of the bone is charred and calcined, however, 24 pieces are not burned. Feature I is characterized by a substantial weight of medium-large mammal bone and Cervid/*Odocoileus sp*. material. A few lynx bones are present as are a trace of *Canis sp*. (dog/coyote size) and beaver (*Castor canadensis*). Very few fish bones are present and only one identification was made to Salmoninae. Only one bird bone is present.

The cervid/artiodactyl bones are all sesamoids, accessory phalanges, metapodials and distal phalanges fragments. The more specific *Odocoileus sp*. identifications are based on nearly complete proximal, middle, and distal phalanges and two distal epiphyses from metapodials.

The nine pieces of lynx are represented by eight foot bones (phalanges, metapodials and calcaneus) and one scapula fragment. One rib fragment from a small-medium mammal is cut through the dorsal end at the head. This kind of cut/cleaving is usually in association with historic material, and its association with Layer B2f, above the intact Feature I, is likely indicative of its association with the historic occupation.

Feature I Separate (Units 30, 31, 42, 44, 52)

Feature I Separate has a total of 364 bones weighing 252. 6 grams. Less than half of the number is charred/calcined bone, with 199 pieces being unburned. This area of the site is characterized by a substantial weight of medium-large mammal, a small amount of deer and only one carnivore, a lynx. There is an abundance of fish fragments. Salmoninae were

comprised of 22 vertebrae and one skull piece. The two *Onchorynchus sp*. identifications are both skull pieces. Only one bird identification was made. The deer identifications are based on accessory phalanges, sesamoids, phalanges, and antler fragments. The lynx is represented by one left radius fragment, one left ulna fragment, and three left tibiae (which all fit together). The rest of the bones are foot bones from front and rear paws. There is one medium-large mammal fragment of a femur with superficial hatchings near the *linea aspera*.

It should be noted here that the Feature I/Feature I Separate and Feature B Outside areas of the site have perhaps not been split into entirely satisfactory analytical units. The problem is the disturbance of the prehistoric component by the southeast end of the historic lodge, and which layers are mixed or not. This would require looking at the faunal remains by layers as well as excavation unit and/or feature. This issue is investigated by the "Precontact Layer Bf" section below.

Feature B Outside (Units 55, 58 through 62)

Feature B Outside contained 126+ bones weighing 83. 2 grams. All of the bone except for three pieces is either charred or calcined. None of the bone appears to have been cut. There is a moderate amount of medium-large mammal bone and a very small amount of fish, deer, lynx, and bird. More than 1/2 of the bone by weight is class uncertain. The material in these units in the layers above Bf appear to represent discard from the historic Feature B occupation and is likely not disturbed precontact material.

Precontact Layer Bf (Units 52,54,55,58,59,61,62)

These units are definitely outside of the Feature B lodge. The faunal remains found within Layer Bf, which is the layer inferred to be contemporaneous with Feature I are tabulated separately in Table I-37. Only a total of 166 pieces of bone are from this provenience. Their frequency profile differs significantly from that represented by historic Features G and B added together. The main difference is that the precontact layer has proportionately far more medium-large mammal (58% vs 10%), which is likely mostly deer. Fish in general (Osteichthyes) are more common in the historic occupation (37% vs 0.04%), which may indicate a difference in season of occupation, a shift in resource use, or both. Salmon are identified in the historic occupation but not in Layer Bf. Both occupations contain lynx, though far higher frequencies in the historic occupation, but only the precontact layer contains a certain identification of beaver.

Comparison of Bear Lake Site Areas and Features

Lithic Scatter / Feature A

These two areas are very similar by virtue of the paucity of material contained within them and by the generally calcined nature of the bone. Feature A differs in that it contains one fish and one Pelecypod fragment and that a tiny amount of bone was unburned.

Feature I / Feature I Separate

These areas appear to be sufficiently different to keep them as two separate areas. There is a lot more fish, salmoninae and lynx in Feature I Separate than in Feature I. Feature I has much more deer than does Feature I Separate. One final noticeable difference is that there is proportionately far more charred/calcined bone in Feature I than in Feature I separate.

Feature I / Feature G (Prehistoric and Historic Hearths)

These two areas yield very nearly the same amount of material by weight, even though Feature G is almost four times the size of the excavated portion of Feature I. By count (excluding class uncertain), however, there are almost four times as many pieces in Feature G. In general, Feature G has more fish, Salmoninae, lynx, and a greater variety of Mustelids. Each area has roughly the same proportion by count of unburned bone. Furthermore, Feature I has quite a bit more deer bone, and Feature G contains the bulk of the cut/butchered bone.

General

In all Feature I Separate appears to be more closely related to Feature G in both the kinds of remains and their condition, while Feature I itself is similar to Feature B Outside, and there are too few remains preserved in Feature A, Feature H, and the lithic scatter to allow good comparisons. The material from Feature I Separate is also similar to the Feature B (inside) material in variety and ca. 50/50 burned/unburned ratio. Feature I is prehistoric as indicated by the radiocarbon date, lithics present, and some, but, fewer, fur-bearers were exploited in this earlier Eagle Lake Phase occupation, fish were less important, and deer more important. Feature I Separate appears to be the result of historic house- cleaning. Note that neither moose nor elk were recovered from any Bear Lake site collection.

The most reliable precontact Eagle Lake Phase data are from the Layer Bf and Feature I tabulations, although the combined unit tabulations (Feature I, Feature B Outside, Feature I Separate) differ from Bf mainly in having proportionally far more fish, including salmon. Feature B Outside and Feature I Separate are thus likely the mixed remains of the two occupations. If we compare the most abundant faunal remains found in Feature B with the Layer Bf and Feature B Outside and Feature I Separate combined tabulations, as shown in Figure I-28 (which is also reproduced as Figure 41 in the main text), Feature B is much more

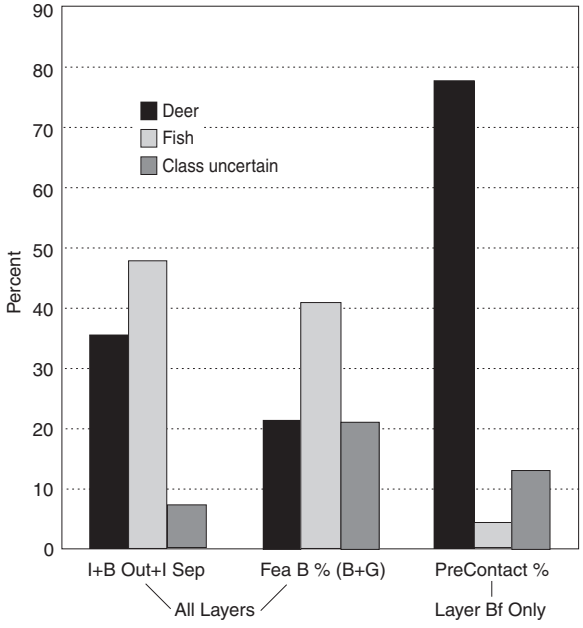

Figure I-28. Comparison of Historic and Prehistoric Bear Lake Fauna. (In this tabulation it is assumed that both medium mammal and Artiodactyl are deer.)

similar to the combined tabulations than with Layer Bf with the latter having much more deer.

In terms of precontact Eagle Lake to historic Lulua Phase differences, both occupations trapped fur-bearing mammals, with an apparent shift to lynx and mustelids in contact times. There appears to have been a shift as well from hunting deer in the precontact occupation to fishing in contact times.

Plateau Pithouse Tradition Sites.

The general questions for the Shields and Boyd sites has to do with any differences from the Bear Lake components, and similarities with other PPT assemblages. Specific questions are:

1. Are there significantly different distributions of types of faunal remains between the two major analytic strata, Layer A, surface, and Layers B+?

2. Are there different distributions of remains between the housepits? Did House 2 at the Shields site serve a different function from Houses 1 and 5?

3. Are the species and elements common to all the pithouses?

4. Are lake fish represented to any degree, what is their proportion to salmon, and can kokanee be identified?

5. Are moose or elk present?

6. What are the major differences and similarities of the remains between the Boyd and the Shields? And between these and the Bear Lake site?

In addition, originally we asked "Are there faunal remains in Feature A at the Boyd site that exhibit different species and/or elements than those from the housepits?" but not enough remains were recovered to investigate this question.

The Shields Site (EkSa 13)

The Shields site had three housepits (Houses 1, 2, 5) excavated by 10, 1 m x 1 m units to depths approaching 1 m. The housepits are treated here as single component occupations, with the exception that the surface and layer A materials are analyzed separately. The reasons for this are that we often saw bald eagles in the trees at and around the site consuming fish, leaving small accumulations at the trees bases, cattle bones occur in many places in the forest fringe around the lake, and because contemporary camps were located nearby.

Housepit 2 contained a possible hearth feature, and deposits here were not as deep as Houses 1 and 5. House 2 may not be an actual house but is perhaps a processing feature of some sort. The site is also located near to Eagle Lake, and as is the Boyd site, so the relative emphasis on lake fish versus river fish is an important question. Furthermore the artifact assemblage at the Shields site includes several antler points, which are possibly leisters. These artifacts are absent at the Boyd site, and perhaps different emphases in faunal remains could shed some light on the function of these implements. It was expected at the time of analysis

that the Shields site faunal remains would more closely resemble the Boyd site materials on the basis of geographical locational similarities and cultural (PPT) similarities, although they may be closer in age to the prehistoric Eagle Lake Phase component at Bear Lake.

In general, the surface and Layer A portions of the site have only some medium-large mammal bone, a trace of deer and a concentration of sucker fish (Table I-38). Layer B and below, on the other hand, have the greatest amount of medium-large mammal bone of any site. It is the only site with any of the following: elk, bear, marmot, muskrat and loon. It has none of the Mustelid and Carnivore type of identifications present at the Bear Lake site. At the Shields site there is much rabbit bone, plenty of sucker fish and few Salmoninae. Cut marks are present on nine bones. The top and lower layers of each of the three housepits are discussed separately below.

SHIELDS SITE HOUSES: UPPER / LOWER LAYERS

FAUNAL CLASS	HOUSE 1	HOUSE 2	HOUSE 5
Large mammal	/ 10	3 / 11	/ 3
Medium-large mammal	8 / 803	12 / 855	/ 136
Medium mammal	/ 2	/ 2	
Small-medium mammal	/ 14	/ 3	
Small mammal	/ 11	/ 4	
Osteichthyes	1170 / 647	1502 / 1179	1 / 25
Class Uncertain	7+/ 150+	51+/ 114+	/ 9+
Artiodactyl	/ 9	1 / 8	/ 4
Cervidae	/ 10	/ 5	/ 2
Cervus elaphus	/ 8		
Odocoileus hemionus	1 / 1	/ 3	
Ursus americanus	/ 1		
Large carnivore	/ 1		
Leporidae	/ 54	3 / 2	
Marmota caligat	/ 1	/ 3	
Tamiasciurus hudsonicus	1 /		
Castor canadensis	/ 3		
Beaver/porcupine		/ 5	
Ondatra zibethicus	/ 1	/ 9	
Rodentia	/ 1		
Small rodent	/ 1		
Catostomus sp.	11 / 60	232 / 157	2 /
Salmoninae sp.	/ 11	/ 6	
Gavia immer	/ 1	/ 4	
Anas sp.		/ 2	
Dendragopus sp.		1 / 1	
Avies	/ 2	/ 5	/ 4
Mollusca	/ 3	/ 1	/ 1
TOTALS	145+/ 1805+	1805+/ 2379+	3 / 184+
TOTAL = 6321+			

Table I-38. Faunal class frequencies for Shield Sites houses by major layers.

Shields House 1: Surface and Layer A

In these upper layers, House 1 is represented by 145 bones weighing 20. 8 grams. More than 1/2 of this weight is due to the abundance of fish remains. There is a trace of mammal bone and one deer phalanx, and one squirrel femur which is likely intrusive. Sucker fish are abundant and should be either Longnose sucker (*Catostomus catostomus*) or Largescale sucker (*Catostomus macrocheilus*). Nearly all of the bone (n = 130) by count remained unburned.

Shields House 1: Layer B and Below

This part of House 1 contains 1805+ pieces of bone weighing 945. 2 grams. The large mammal bone is likely elk, as there are a few elk remains that were positively identified in this assemblage. There is an abundance of medium-large mammal bone, a large amount of rabbit (n = 46), and many fish remains. Both suckers and Salmoninae are present. Just over 1/2 of the bone by count was not burned.

The 20 deer elements are represented by a variety of bones. There were four antlers, one petrous tympanic, five teeth, one ulna, one calcaneus, one sesamoid, and six phalangeal elements. The positively identified elk material is represented by one right mandible fragment and seven lower incisors. One bear is represented by one phalanx, and the large carnivore identification is likely bear, but the piece (a second phalanx) is too incomplete to allow positive identification.

Most of the larger body parts of the abundant rabbit are represented. No tiny bones such as carpals, tarsals and phalanges were noted, and there are probably at least three rabbits represented. Only traces of marmot, beaver, and loon were observed. A single muskrat element was identified.

There are three mollusc fragments of the bivalved sort represented. Only one of these is thick enough to be considered a marine shell. The sucker are represented in the identifications by skull pieces only, unlike the surface/Layer A remains. Vertebrae are present that could be from suckers, but identification of these parts was not possible. All of the Salmoninae identifications are from vertebrae. Of these, nine pieces are from medium-large fish, however two pieces are tiny and could be from trout or kokanee.

There are three bones with cut marks. One large mammal bone like an innominate or scapula is cut or cleaved so that its general shape is very nearly square. This kind of cleaving is usually found in association with historic material, and is very unusual here except for the relatively high amount of worked bone and antler found at the site. A second large mammal bone, likely a femur, had superficial hatchings near the area of the supraconylid fossa. The third bone was a medium-large mammal tooth with very fine cuts across the enamel surface in a way not due to natural wear.

Shields House 2: Surface and Layer A

This portion of the house has 1805 bones weighing 251. 4 grams. Although more mammal bone is present here than in the same area of House 1, here too the majority of the bones are fish. Over 4/5 of the weight of the bone is comprised of fish, both Salmoninae and suckers. There is one artiodactyl rib, 2 leporidae thoracic vertebrae, one rabbit humerus and one grouse (*Dendragapus sp*.) ulna. The surface/Layer A of House 2 is similar to that of House 1 in that nearly all of the bone by count remained unburned, including all of the fish and sucker remains. None of the bone is cut or butchered.

Shields House 2: Layer B and Below

In this portion of the house are contained a total of 2379+ pieces of bone that weigh 1129. 8 grams. The majority of the bone is medium-large mammal, fish and class uncertain. The distribution and variety is very similar to the lower layers of House 1, except for the scarcity of rabbits. Also, many more fish are present in these layers at House 2 than at House 1. Just less than 1/2 of the bone has remained unburned, and in comparison to House 1, some of the sucker and other fish bone is burned.

There is a trace of rabbit and several pieces each of marmot, beaver or porcupine, and muskrat (n=9). There were a few loon and duck bones and one grouse. One bivalve Pelecypod is present and it has a very thin shell. Again the sucker identifications are based on skull fragments though several vertebrae are present which could suit that size of fish. The few Salmoninae identifications are all made from vertebrae from medium-large fishes. Although elk is not specifically identified from this housepit, it is likely that the large mammal bone is from a large cervid.

Six bones had cut marks. Of these, four medium-large bone fragments have very narrow grooves or striations across their surface. One fish bone is cut through the bone in a way typical of historic associations. One class uncertain bone is marked with striations and was calcined.

Shields House 5: Surface and Layer A

This area of House 5 contains very little fauna. One bone was identifiable to fish and the other two to sucker. Their total weight is 2. 7 grams, and none of these are burned.

Shields House 5: Layer B and Below

This part of House 5 has much less bone that the other two housepits at this site. There are a total of 184 pieces of bone weighing 211. 5 grams. There is some medium-large mammal and some deer. The fish are very few and there are no identifications to sucker or Salmoninae. There are a few bird fragments. One very heavy shelled pelecypod fragment suggests by its mere thickness that it must be from a marine bivalve. The Artiodactyl/ Cervid identifications are based on five phalanges and one accessory phalanx and none could be positively identified as to species. None of the materials have cut marks.

General Discussion

House 5 appears to be quite different from housepits 1 and 2, lacking the variety and abundance of mammal and fish bone. Overall, House 2 does not seem to be a special purpose feature area. As was expected, elk are present at this site, but unfortunately no definite identifications of kokanee are possible. In comparison to the Bear Lake site, the Shields site lacks the fur-bearers, contains an abundance of suckers and less cut bone. There appears to have been a heavy reliance on fish from the lake at this site, and the high proportion of unburned bone in the top layers indicates that these may be intrusive, but the possibility that some were originally located on the roof of the house cannot be ruled out.

The Boyd Site (EkSa 32)

The Boyd site of five housepits depressions of which Houses 1 and 2 each had two 1 m x 1 m units excavated. There is a firecracked rock feature (Feature A) near the surface of House 2 that was likely deposited at a time considerably later than the original structure. As at the Shields site, the stratigraphy was not always very distinctive (although it was more distinct than the Shields site), and the only differentiation maintained here is that between surface and Layer A, combined together, and the lower Layer B strata.

Only four 1 m x 1 m units were excavated at the Boyd site, and as a result the raw frequencies and weights of bone classes are considerably less than those at the Shields and Bear Lake sites. The surface/Layer A zone is marked by a proportionately high incidence of deer bone, and there is very little other bone from which to draw interpretations. The Layer B and below zone also has very little bone, and most is medium-large mammal or class uncertain. Cut marks are present on four bones. The frequencies of bone classes by site area are shown in Table I-39.

Boyd House 1: Surface and Layer A

The top layers of House 1 have 24 bones weighing 108. 3 grams. There is some medium-large mammal bone and a few deer identifications. Only one small fish bone is present. By count just over 1/2 of this bone is unburned, though by weight nearly all is unburned.

The deer is represented by fragments of a left and right mandible, a right hyoid and one lumbar vertebra. There are also some medium-large mammal identifications of rib fragments

BOYD SITE HOUSES: UPPER / LOWER LAYERS

FAUNAL CLASS	HOUSE 1	HOUSE 2
Medium-large mammal	11 / 16	10 / 50
Medium mammal	/ 1	
Small-medium mammal	/ 2	
Small mammal	/ 1	
Osteichthyes	1 / 18	
Class Uncertain	8 / 4+	3+/ 1+
Cervidae	2 / 1	2 /
Cervus elaphus		
Odocoileus hemionus	2 /	9 /
Canis latrans	/ 1	
Leporidae	/ 3	/ 2
Castor canadensis		/ 1
TOTALS	24 / 47+	24+/ 55+
TOTAL = 150+		

Table I-39. Faunal class frequencies for Boyd Site houses by major layers.

that could belong to a deer. Cut marks are present on the deer lumbar vertebra which is cleaved or cut off both on anterior and posterior surfaces, through the articular process and a portion of the body. This kind of cutting would be expected to have an historic association.

Boyd House 1: Layer B and Below

Here there are a total of 47 bones weighing 37. 4 grams. There are very few medium-large mammal bones and a trace of smaller mammals. There are several fish, a trace of deer, *Canis sp*., and rabbit. There are no identifications of sucker fish, Salmoninae, birds or molluscs.

Less than 20% of the bones were unburned in this context, and there were no cut marks observed on the bones. The identification to deer is based on one antler fragment, that to *Canis sp*. on one talus, and the three rabbit bones are one each of a humerus, ulna and tibia.

Boyd House 2: Surface and Layer A

This portion of the site is very much like that of House 1. There are 24+ bones weighing 382. 5 grams. There are more deer remains present here than at House 1, and there are no fish. Nearly all of the bone is unburned.

The deer remains are represented by parts other than foot bones. The fragments include three left scapulae, one left innominate, two left femora, one left humerus, two vertebrae, one right mandible, and one right occipital condyle. There are at least two *Odocoileus hemionus* individuals represented, based on the presence of two left glenoid cavities from the scapulae. At least two deer elements have cut marks. One left scapula has cut marks to both the dorsal and ventral surfaces. One right mandible is cut deeply at a break in the mid-body of a mandible below M2. This particular cut looks as if it were from a steel knife. One medium-large mammal rib has superficial and deep cuts to the ventral surface in a series of hatchings perpendicular to the length of the rib.

Boyd House 2: Layer B and Below

This zone of House 2 contains 55+ bones weighing 100. 6 grams. There are more medium-large mammal bones than at House 1 of this site, and there are no fish or deer remains. There is a trace of rabbit and beaver. All of the bone is either charred or calcined. The two rabbit bones are a scapula and a maxilla, and the one beaver bone is a phalanx. None of the bone has any cut marks.

Comparison of Bear Lake, Shields, and Boyd Sites Fauna

It appears that our suspicions about the surface and Layer A zones of the two housepit sites were justified. The proportion of unburned bone in the upper layers at both sites is high. The Shields site top layers contain many unburned fish, while at the Boyd site these contain many deer remains. The incidence of "historic-like" cut bone is almost exclusive to the top layers at both sites and the historic Lulua Phase component at Bear Lake.

The question about the presence of moose and elk is answered in a way that provides support for our previous archaeological interpretations. No moose is present anywhere, supporting the statements by McT. Cowan and Guiguet (n.d.), Spalding (1990) and our interpretations. Elk was securely identified only at the Shields site. We would not expect elk in the historic Lulua component at the Bear Lake site and it is not present there. No elk

remains were identified at Anahim Lake.

The Shields site Layers B and below exhibit many more fish than the Boyd site, have many suckers and some salmon while the Boyd site has none, and also contain elk, muskrat, beaver, various birds, bear, molluscs, and many more rabbits. Overall, the fauna are much more varied at the Shields site than at the Boyd site, but of course, the sample is larger as well.

In relation to the Bear Lake site, the Shields site is more similar to the Boyd site, but the Bear Lake site fauna is more varied than either. Indications are of an increasing diversification of the subsistence resource base through time in the region. In the historic Lulua Phase at the Bear Lake site, lynx and Mustelids appear to replace muskrat, marmot, rabbit, and beaver as sources of furs. The marmot may indicate exploitation of alpine areas as marmot skins were an important pre-contact trade valuable (Teit 1909b:783).

One of the most useful results of the faunal analysis is the apparent composition of "Layer I Separate" and its relationship to the hearth Features G and I at the Bear Lake site. The complex, though relatively shallow, soil strata have been difficult to interpret, but by means of the faunal associations we can state with some confidence that much of Feature I Separate is derived from the interior of the historic Lulua Phase Feature B lodge structure, since its fauna are much more similar to that area than to the earlier, precontact Eagle Lake Phase Feature I hearth fauna (Figure I-28). Similarly Feature B Outside layers above Layer Bf appear to originate from inside Feature B.

The precontact Eagle Lake Phase occupation is represented by Feature A, the lithic scatter, Feature I, and Layer Bf fauna. Although these are relatively low in frequency, there are some clues to changing faunal use patterns, namely there appears to have been a shift in fur bearers acquired (beaver earlier, lynx and mustelids later) and in principal subsistence fauna (deer, earlier, fish, later).

In summary then, the PPT period is characterized by a near balance between mammal and fish acquisition. There is also a wide variety of terrestrial and aquatic animals, suggesting quite a full use of the resources available. During the precontact Chilcotin period (Eagle Lake Phase) there is an emphasis on mammal acquisition, marked by a lack of species variety, and it appears more land based than the PPT period. Fish acquisition is less at this time than at any other time. By the historic Chilcotin period (Lulua Phase), fish acquisition became proportionately more frequent than either of the two preceding periods, although this is largely attributable to the presence of Feature J, the cachepit in this component. Whereas the PPT occupational period took many suckers, none are present in the historic Chilcotin period. This may be, though, the result of difference in duration of occupation of winter dwelling sites between the two ethnic groups, as large numbers of suckers were taken in the spring, long after the Chilcotin would have abandoned their winter dwellings, but conceivably while the PPT winter village was still occupied. In comparison with the prehistoric Chilcotin period there is an increase during the historic component in the variety of mammals, with an emphasis on fur bearing mammals, including a change in the species of fur bearers that were taken.

As with the Bear Lake fauna, Stewart noted Chilcotin usage of a wide variety of small mammals at Anahim Lake. In addition, the Eagle Lake region's overall pattern of increased fish usage through time was noted by Stewart (1978:53) for the Anahim Lake sites, all of which were within circa 100m of Anahim Lake. Although no salmon are present in those sites, trout and suckers make up a large proportion of the fish remains (Anahim Lake does

not have significant salmon resources). In contrast to our findings, Stewart reported numerous Caribou remains and no certain deer or Elk. Finally Stewart found significant changes in the treatment of fur-bearing mammals in the historic period, with decreasing use of hares, increasing use of muskrats, as well as changes in butchering patterns through time consistent with the introduction of the historic fur trade.

NOTES ON CAMBIUM-STRIPPED LODGEPOLE PINE

Martin Magne

Apart from occasional references in the ethnographic literature, I first became aware of the practice of removing cambium from coniferous trees through the report by Anne Eldridge (1982), who described living spruce and pine trees bearing evidence of cambium removal in the Liard River-Lower Post region of northern B.C. On a casual trip to Eagle Lake in the winter of 1982, several such trees were noted on the east end of Eagle Lake near to where the UBC archaeological field school posted camp, and I decided to make an effort to obtain data from these features in the future.

Data were obtained on 24 stripped (or culturally-modified) trees in the Eagle Lake region in 1983, not including some 20 trees observed in Quadrats G1 and G6, but are found in five other locations. One stripped tree was observed at Quadrat 19:1 near the Chilko River, three in a small ravine on the east end of Eagle Lake, three at Canoe Crossing at site EkSa 5, three

Figure I-29. A typical cambium-stripped lodgepole pine tree (1983).

Figure I-30. Close-up of cut marks on cambium-stripped tree (1983).

near the Bear Lake site, and 12 at about the midpoint of the east end of Eagle Lake at a location which will be called Henry's Camp. Another two were recorded at site EhRv 2 in the Taseko Lakes region (Magne 1984), and many more are present there.

Given the activities of porcupines, bears, birds, disease and other factors, how do we know that these trees have been modified by humans? The most telling characteristic is the presence of cut marks on the inner bark, and often on the outer bark, of the trees. The cut marks are most often at breast height, usually form an upside down "V" at the top of the cut, are often cut around small branches on the tree, and often terminate the strip at the bottom of the cut (Figures I-29 and I-30). Two trees were observed in the small ravine area that had been stripped starting at a height of 4.5 meters above the ground. This is unusual, most strips starting at about 1 meter to 1.5 meters above ground level.

Several variables were recorded for each tree, including cardinal orientation of the strip, length of the strip, width of the strip, elevation above ground of top of strip, elevation of bottom of strip, tree diameter, and number of visible cut marks. Two 3/8 inch increment cores were taken of each tree: one from the strip through the center, and another from the opposite side, through the outer bark to the center. It was intended to mount, sand and read

these cores to provide age of the tree, age at stripping and thus age of the stripping activity, but this was not done. Marion Parker took one-inch diameter cores from the three trees near the Bear Lake site, to attempt seasonality readings from the changes in growth due to the trauma of the stripping, but this does not appear feasible due to the changes in growth as the tree attempts to heal.

All of the recorded trees are lodgepole pine (*Pinus contorta*), although one stripped trembling aspen was observed on the east side of Eagle Lake. Apart from the two exceptional examples noted above, the strips are between 40 cm and 140 cm in length, and between 8 cm and 17 cm in width (Maximum dimensions). Tree diameters (at a point half-way down the strips) range from 14 cm to 35 cm, and there is slight bimodality here, with a group of trees between 14 and 17 cm in diameter, only two between 17 and 23 cm in diameter, and 16 trees between 24 and 35 cm in diameter. Eleven of the 24 trees have strips oriented due north, another five are oriented northeast, two are oriented east, six are oriented southwest through west to northwest, and the two tall-stripped trees (which are each only 14 cm in diameter) are stripped completely around their circumference, almost like barber-pole designs. Thus the preferred orientation of the strips is north to northeast, with again slight bimodality, centering on west (Figure I-31).

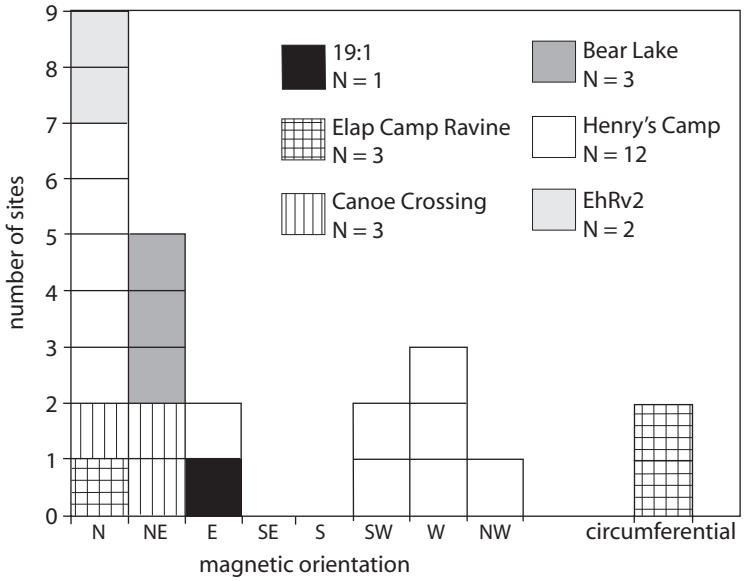

Figure I-31. Histogram of orientations of stripped areas on lodgepole pine trees.

A total of 92 cut marks were observed on the trees, with 50 of these occurring on north facing strips, 20 on northeast facing strips, and the circumferentially-stripped trees totalled about 20 visible cuts. There does not seem to be any association of cut mark orientation with the width or length of the strips.

At present, it is not known during what season the stripping takes place, nor precisely why it takes place, although Lane (1953:43) clearly places it in the late winter/early spring "starvation" period, and Teit (1909b:781) notes that lodgepole pine cambium was "much relished". As noted above, some informant testimony has been obtained indicating that cambium is sometimes given to children. Obviously, the mere presence of the trees limits the

time depth of a possible in-depth study, and it is unlikely that physical evidence of trees older than about 80 years could be obtained. Furthermore, recent pine-beetle infestations of pine forests of the interior are currently destroying nearly all pine trees, so the information will not be around for much longer than say 5 to 10 years. The only age information apart from that provided by Parker, was obtained from a standing but wind-broken tree at Henry's Camp. This tree was cut, the rings counted, and an age of 11 or 12 years was obtained for the cut, the tree being about 22 years at the time of the stripping. This matched informants' testimony that the site had been occupied about 10 years ago, when the cambium had been fed to children.

Informal experimentation informed us that the lodgepole cambium is quite sweet in late spring, and loses its quality through the summer. Young trees appear to have sweeter cambium than older ones, though both of these observations cannot be taken as conclusive. One can only speculate at present that the reason for north-northeast preference for cut orientation is also related to the quality of the cambium.

Although the information obtained was not conclusive, preliminary investigation of the stripped trees at Eagle Lake showed that yet another aspect of traditional subsistence practices can be studied in the region. Future research should attempt to more precisely date the specimens, obtain a larger sample, and interview informants for their knowledge of the practice. This should be related to other subsistence practices, since on their own the trees have actually not much to offer.

In 1984 I had written that any future work should take place within the next five years before the trees are completely destroyed by the current pine beetle infestation. Since that time not only have culturally-modified trees (CMTs) studies become a mainstay of British Columbian archaeology but spreading beetle-kill has destroyed many of these trees. Visits to Eagle Lake in 2000 and 2001 to locate the trees recorded above resulted in failure, although some other CMTs informally located in the 1980s were found. From the state of these I conclude that the recorded trees have died, fallen, and their bark has fallen off.

Concurrently, however, studies of CMTs have become a standard archaeological practice in CRM archaeology which in interior B.C. is largely driven by the forest industry. Although most of the studies remain exercises in inventory, their potential to contribute to greater anthropological knowledge is best exemplified by Prince (2001). In a study of CMTs in the Nechako Plateau (west of Prince George, B.C.), Prince was able to demonstrate strong relationships between cambium usage and salmon availability. His research indicates that pine cambium was more important to northern interior B.C. diet than is commonly believed.

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