

## APPENDIX B: FUNCTIONAL ANALYSIS RECORDS

### DRILLS

**ACC #: 10249**

Tool Type: Drill

**MACROSCOPIC:** reworked Early Side Notched point. Hafted drill? Tip is broken off. Edges look quite sharp. Some step fracturing along both margins. A bit of microflaking, step fracturing concentrated near tip of margin B

**STEREOSCOPIC:** a bit of edge rounding margin B, but otherwise edges look pretty untouched. Have a look at haft element for haft wear – quite a bit of crushing and rounding in the notches.

**INCIDENT LIGHT:** no polish detected.

**ACC #: 10459**

Tool Type: Drill

Zone/Level:

TCA:

Photo Log #: 061, 062

**MACROSCOPIC:** the slightly recurvate appearance of the blade suggests some resharpener. Both margins exhibit substantial evidence for microflaking and step fracturing/crushing. Indentations (break in the margin) right near the tip suggest resharpener of the tip end. Some edge rounding of the L and R margins?

**STEREOSCOPIC:** confirms observations made at the macroscopic level. Some of the crushing/step fracturing along the margins of the tool has been nearly obliterated by significant edge rounding. These areas should be good candidates for use wear as I could see some luster in these areas without even looking through the incident light microscope! Examination of the very tip end shows a relatively sharp tip margin, seeming to confirm the observation that it may have been resharpener recently. There is a little bit of rounding visible on the tip, and a few microflakes, so the tool may have been used a bit more after this resharpener episode.

**INCIDENT LIGHT:** material is quite lustrous on its own. There is a number written on one face, with nail polish coating the ink. Nail polish is thick-looking, smooth, lustrous, and iridescent, so watch out for suspicious-looking “polish!”

As predicted, no polish located distally from the tip where it appears to have been resharpener. But, proximally from the break in the margin outline, see continuous but poorly developed bright, highly pitted polish all along the margins where the step-fracturing and margin rounding

was noted. One patch of what appears to be nail polish on the edge (smooth, very bright, somewhat iridescent) – doesn't look like the bright but rougher polish seen elsewhere along the edges. A few striations noted perpendicular to the long axis of the tool.

INTERPRETATIONS: crushing along both sides of margins as well as direction of striations suggests drilling/rotational action; material unknown, but appears to be hard.

**ACC #: 10561**

Tool Type: Drill

MACROSCOPIC: tip fragment. See secondary flaking (shaping), but not a lot of evidence of microflaking, crushing – i.e. not much edge damage. There is some step fracturing/crushing on the R margin of the face with the number written on it (check photos). Tip is blunted and rounded off. See possible microflaking on the tip.

STEREOSCOPIC: edge rounding noted along the margin with the step fracturing. Stereo observation confirms observations noted at macroscopic level. The tip has step fractures/crushing underlying the rounding of the tip (i.e. damage to the tip in the form of step fracturing was followed by even more use/damage that rounded off those flake scars).

INCIDENT LIGHT: Relatively bright but pitted polish noted primarily along the margin with the crushing (more on the side with the numbers; some on the other face, but it is less developed). None on the opposite margin. A bit on the tip, but not as pronounced as that seen on the one edge. This polish accompanies significant edge rounding along this one margin. Polish has not penetrated very far onto the surface of the tool – restricted to the very margins of the tool.

INTERPRETATIONS: bone?

**ACC #: 10779**

Tool Type: Drill

MACROSCOPIC: tip end only, with extensive microflaking and crushing (step fracturing) along both faces of both margins.

STEREOSCOPIC: tip is red and lustrous – potential for polish??

INCIDENT LIGHT: nothing except a small smear of bright but extremely pitted and poorly linked polish on the very tip end, where the lustrous area was noted. It is uninformative, though. No striations.

INTERPRETATIONS: unknown, but crushing on both faces of both margins suggests rotational action

**ACC #: 10884**

Tool Type: Drill

MACROSCOPIC: tip only. Step fracturing visible along both faces of both margins. These edges are quite rounded.

STEREOSCOPIC: edges and tip are so rounded/ground down that the flake scars from previous step fracture removals are almost invisible now – can just see the remnants of these scars in a few spots.

INCIDENT LIGHT: distal portion of the tool is covered with striations that run perpendicular to the long axis of the tip. Surprisingly (i.e. given the very spectacular degree of edge rounding), there is almost no polish visible. The polish that was identified on this tool is very dull, diffuse, poorly-linked and generic (i.e. uninformative).

INTERPRETATIONS: working hard substance, rotational motion?

**ACC #: 11141**

Tool Type: Drill

MACROSCOPIC: tip fragment with pronounced edge rounding visible near very distal end. Also some step fracturing/crushing apparent along the margins.

STEREOSCOPIC: confirms above observations. Rounding is extremely pronounced, but is restricted to the very tip end (only about the distal-most third of the tool). Proximally from this point, the edge margins still quite sharp.

INCIDENT LIGHT: no polish detected. Material is quite coarse-grained in appearance near the tip end. Doesn't appear to have been particularly susceptible to polish formation, despite significant abrasion.

INTERPRETATIONS: working hard material

**ACC #: 13838**

Tool Type: Drill

MACROSCOPIC: break near proximal end. Step fracturing/crushing noted along both faces of both margins. Tip squared off with microchipping visible.

STEREOSCOPIC: crushing appears quite pronounced/severe and continuous along both faces of both margins. Tip does have microflakes removed, and a bit of crushing/step fracturing noted. Edge rounding accompanies the marginal step fracturing in some spots.

INCIDENT LIGHT: distal tip end is covered in bright but pitted (rough-looking) polish. This same bright/rough polish extends a little way down the L and R margins (both faces), but is restricted primarily to the high points of the microtopography (seems to suggest that whatever was being worked, it was not being penetrated very deeply). At the very tip end, striations run in all directions (with most running parallel to the long axis of the tool), but on the rest of the tool, striations run perpendicular to the long axis of the tool. At higher magnification, a sort of “greasy” appearance to the polish (200 x).

INTERPRETATIONS: bright but pitted plus lots of striations = bone?

**ACC #: 14556**

Tool Type: Drill

MACROSCOPIC: microflaking visible along both faces of margin B (left margin of tip) and margin C (R margin of tip) down to where the material flaw meets the edge. \*Margin A is broken edge facet.

STEREOSCOPIC: in addition to microflaking, see micro-crushing (step fracturing within the microflakes) and edge rounding. The tip is broken off, but looks like use continued because it is quite rounded and there are a couple of step fractures on the break facet.

INCIDENT LIGHT: no polish detected. Material was very coarse-grained in appearance.

INTERPRETATIONS: rotational action, hard substance

**ACC #: 15433**

Tool Type: Drill

MACROSCOPIC: broken along one margin (A), but on the “dorsal” (obverse) surface of that break, see substantial crushing (step fracturing). Margin B shows some step fracturing/crushing along the edge at the tip end. Strange patina all over the “ventral” (reverse) surface.

STEREOSCOPIC: edge rounding accompanying the areas of crushing. Tip appears fairly rounded off, as well. Otherwise, confirms macro observations.

INCIDENT LIGHT: extremely bright, but still somewhat poorly-linked, polish along both margins, both faces, especially near tip end. Diminishes the further you get from the tip.

INTERPRETATIONS: more bone polish?

**ACC #: 17061**

Tool Type: Drill

MACROSCOPIC: tip of drill refit (with 17062). A bit of rounding and step fracturing visible near distal end. Damage (break) to tip.

STEREOSCOPIC: rounding near distal end of both margins. Other than that, edges appear relatively sharp – step fracturing associated with manufacture?

INCIDENT LIGHT: no polish detected. Material is bright white, which may account partly for difficulty in viewing any polish on the surface. Also a bit coarse grained in appearance. Still, pronounced edge rounding visible near tip.

**ACC #: 17062**

Tool Type: Drill

MACROSCOPIC: proximal portion of drill refit with 17061. The haft end, if it was hafted. Tip snapped off. Reddening at base of the tool (heating, perhaps from friction?). Examine surface, margins and base for evidence of haft wear.

STEREOSCOPIC: crushing/step fracturing visible especially half way down the “haft” element. Edge rounding accompanies these fractures. Basal margin, where it is reddened, is rounded off as well.

INCIDENT LIGHT: patches of generic weak polish along both margins, especially between the base and about half way up the “haft.” Same weak polish on the base as well, although it is a bit brighter and more developed – this is in the area of reddening on the base.

Performed longitudinal and transverse transects across surface of tool. This same generic polish was seen on the high points of the tool topography – fairly extensive in some spots. Seen on both faces. Possible wear from rubbing in the haft?

INTERPRETATIONS: proximal end of tool with haft wear

**ACC #: 17125**

Tool Type: Drill

MACROSCOPIC: crushing and microflaking along both faces of both margins. Tip is broken off. Fairly significant degree of flaking (secondary and microflaking/step fracturing) on ventral surface of tip.

STEREOSCOPIC: in addition to microflaking/crushing, there is significant edge rounding, as well as rounding off of the arisses close to the edges of the tool. I think I can see some smears of nail polish on the surface of the tool – be careful!

INCIDENT LIGHT: very diffuse and entirely uninformative polish along the edge margin – the ridge along the edge. No striations visible. Can’t say anything about the polish.

INTERPRETATIONS: working hard substance, rotational motion?

**ACC #: 17995**

Tool Type: Drill

MACROSCOPIC: tip fragment. Don’t see much evidence of microflaking or crushing, or edge rounding.

STEREOSCOPIC: confirms above observations. Edges still look fairly sharp – no evidence of crushing, rounding. A few step fractures, but these look like they may be related more to manufacturing rather than use. The tip does appear quite rounded off, so may represent the best area for incident light observation.

INCIDENT LIGHT: no polish observed.

INTERPRETATIONS: unknown

**ACC #: 18000**

Tool Type: Drill

MACROSCOPIC: tip fragment. Too much thermal damage to allow use wear analysis. potlid scars along margins and on surface.

STEREOSCOPIC:

INCIDENT LIGHT:

INTERPRETATIONS: unknown

**ACC #: 18010**

Tool Type: Drill

MACROSCOPIC: tip fragment with very distal point broken off. Not much evidence for use so far. Edges look quite sharp with very little evidence for microflaking. A little bit of step fracturing on margin A, right near the tip (dorsal and ventral).

STEREOSCOPIC: edges all look pretty sharp, and the step fracturing looks related to production rather than use.

INCIDENT LIGHT:

INTERPRETATIONS: unknown

## SCRAPERS

### **ACC #: 10222**

Tool Type: SCR (Side)

**MACROSCOPIC:** secondary flaking proximal-dorsal and proximal-ventral (bulb thinning for hafting). Some secondary flaking L ventral, mid-way up the edge of the tool, also L dorsal. Edge angle is very acute.

**STEREOSCOPIC:** microflaking all around circumference of distal portion of tool, dorsal. A little bit of microflaking on the ventral surface as well, but more sporadically distributed than on dorsal margin. Most of the microflaking ends in feather terminations, but some show step fractures.

**INCIDENT LIGHT:** no polish noted except for some generic weak polish at the juncture between blade of tool and where I interpret haft would have been (distal extent of ventral bulb thinning). Also some striations in this region that are perpendicular to long axis of tool.

**INTERPRETATIONS:**

### **ACC #: 10294**

Tool Type: SCR (End)

**MACROSCOPIC:** distal fragment. Secondary flaking only along distal margin – fairly steep. No other evidence for secondary flaking or anything that looks like use damage.

**STEREOSCOPIC:** step fractures along the working edge, and can see smaller feather-terminated microflakes in the area of secondary flaking. Edge appears fairly sharp – minimal edge rounding.

**INCIDENT LIGHT:** patches of bright but pitted polish along the working edge. Not continuous – quite sporadic. See striations running perpendicular to working edge.

**INTERPRETATIONS:**

### **ACC #: 10296**

Tool Type: SCR (End)

MACROSCOPIC: complete humpbacked specimen. Secondary flaking along distal margin, as well as some on L margin. R margin is crushed (lots of step fracturing).

STEREOSCOPIC: lots of microflaking along distal margin. Mostly feather terminations, but some step fracturing at the most convex “peak” of the distal edge. Lots of step fracturing along L and R margins.

INCIDENT LIGHT: no polish detected.

INTERPRETATIONS:

**ACC #: 10325**

Tool Type: SCR (Side)

MACROSCOPIC: break at distal end. Substantial reduction along L margin; a little less along R margin. See step fracturing (and microflaking) along L margin, especially from proximal up to a little past the midpoint. R margin see secondary flaking and some microflaking, but much less step fracturing.

STEREOSCOPIC: L edge fairly sharp looking, except at proximal end. R edge fairly sharp. Confirms presence of microflaking and step fracturing observed above.

INCIDENT LIGHT: LOTS of striations running perpendicular to the working edge along R margin. L margin patch of bright but rough-looking polish just above where the specimen “nips in” near the base. The polish is formed on rounded-off peaks of the microtopography and is accompanied by multiple striations running perpendicular to the working edge. This polish extends away from just the immediate edge of the tool, up toward the surface of the tool also. Another similar patch a little over half way up the edge (from prox to dist). It is less pronounced, being restricted primarily to the very high points of the ridges between flake scars. See edge rounding and striations in this spot as well.

INTERPRETATIONS: working a hard material (such as bone or wood, though I’m not certain which. Some looks like bone polish – rougher, more striations – while there are some other spots that look wood-like – more undulating.) The high proportion of striations suggests bone, if you follow Keeley’s observations.

**ACC #: 10326**

Tool Type: SCR (End)

**MACROSCOPIC:** complete, but very “stumpy” specimen. Trianguloid in outline with somewhat pointed distal margin. Flaked all over the dorsal surface. Secondary flaking seen primarily along the distal margin. Flaking beyond the secondary dorsal flaking to shape the tool is minimal along the L and R margins (i.e. not the same as that seen along the distal margin). A little bit of secondary flaking on the ventral surface near the bulb, but it doesn’t look extensive enough (or really located in the right position) to be considered bulbar thinning.

**STEREOSCOPIC:** step fracturing and microflaking seen along the L and R margins, but the edges are fairly sharp, suggesting to me that this is a function of manufacture, rather than of use. Distal margin also exhibits some step fracturing, but the flake scar ridges, as well as the bit margin, exhibit some abrasion/rounding. This rounding is especially apparent at the “peak” on the distal margin. The L and R portions of the distal margin are less rounded. Almost looks like this may have been one last attempt to get some use out of this kind of exhausted specimen – not used again long enough to wear the edge down completely, just at the most prominent part of the edge.

**INCIDENT LIGHT:** some patches of generic weak polish along distal margin. Right at the “peak” of the working edge, see some small patches of rounded-off, dull, pitted looking polish, especially on the high points (e.g. the arrises). See some striations running perpendicular to the working edge.

**INTERPRETATIONS:**

**ACC #: 10359**

Tool Type: SCR (Side)

**MACROSCOPIC:** secondary flaking along L margin and along R distal margin (dorsal), R ventral margin near midpoint, and R proximal margin (dorsal). Step fracturing near tip end especially.

**STEREOSCOPIC:** minimal microflaking visible along L dorsal margin. More microflaking seen along R margin (dorsal and ventral, coinciding with areas of secondary flaking). Edges are all quite sharp, except at distal end where there is some minimal edge rounding, as well as abrasion of the flake scar ridges.

**INCIDENT LIGHT:** at midpoint of L margin, at the peak of the convexity of that margin, see some generic weak polish accompanied by striations that run perpendicular to the working edge. At the tip end, L margin, see similar weak polish and striations running at a bit of an angle, but

mostly perpendicular, to the L margin. Some generic weak polish on ventral surface as well, especially at tip, and to about half way down the tool from tip. A few perpendicular striations also visible.

R margin: no polish noted. A few striations perpendicular to working edge, but not as many as on L margin.

INTERPRETATIONS:

**ACC #: 10387**

Tool Type: SCR (End)

MACROSCOPIC: complete specimen with secondary flaking applied along L, R and distal margins. The piece is very parallel-sided. Distal end quite flat and steep.

STEREOSCOPIC: edges are pretty covered with concretions from the cave, so it is difficult to make out certain features. Lateral edge margins appear fairly “sharp” (not much abrasion/rounding). Distal end step fracturing and really no edge rounding.

INCIDENT LIGHT: material is quite coarse-grained. Looks just generally “sugary”. No polish detected.

INTERPRETATIONS:

**ACC #: 13859**

Tool Type: SCR (End)

MACROSCOPIC: complete specimen, trianguloid, with a slightly pointed distal margin. (Made on tan chert – check photos!!!) Flaked all over dorsal surface, with secondary flaking applied to distal margin. Distal margin is relatively convex still, but is pretty steep. “Notches” along the L and R margins where haft element may have been. Microflaking along R margin and distal margin. Can also see some step fracturing along distal.

STEREOSCOPIC: L and R margins are quite sharp. Distal margin is highly abraded/rounded off.

INCIDENT LIGHT: dull, pitted polish all along the distal margin. Can see just how abraded the bit end is! Arrises are rounded off completely. Right at the “peak” of the distal edge, the polish is extensive, even up onto the face of the bit, and is accompanied by striations running

perpendicular to the working edge. This same dull, pitted polish is visible on the ventral surface, right at the edge margin. Can see that the edge abrasion wrapped around the bit onto the ventral surface. This band of polish that runs most of the way along the ventral-distal margin is rife with striations running perpendicular to the working edge.

INTERPRETATIONS:

**ACC #: 10912**

Tool Type: SCR (Ovoid)

MACROSCOPIC: break along R margin, distal end. A fair bit of step fracturing along proximal end of R margin. A little bit on L margin, but mostly smaller microflakes seen. Microflaking becomes discontinuous near distal end of L margin.

STEREOSCOPIC: confirms above observations. Very little edge rounding visible – edges all appear quite “sharp.”

INCIDENT LIGHT: no wear traces detected.

INTERPRETATIONS:

**ACC #: 11408**

Tool Type: SCR (End)

MACROSCOPIC: complete specimen with break in outline morphology where I presume haft element was located. Distal margin is moderately convex and edge angle is quite steep. secondary flaking applied to distal margin as well as to R and L margins. On L and R margins, secondary flaking is really restricted right to the edge – flakes are small and do not intrude onto surface of tool at all, but clearly were applied to create desired outline shape. All flaking is restricted to dorsal surface.

STEREOSCOPIC: lots of step fracturing L and R proximal margins (i.e. in region of haft). Some microflaking seen along distal margin, but it is fairly sporadic. All edge margins, including distal, are quite sharp. (Not sure how much wear I’ll see along distal!)

INCIDENT LIGHT: not much polish discernible, but one patch about a quarter of the way along the distal margin, from the L margin (i.e. about half way between L margin and the highest “peak” of the edge) see a patch of fairly weak polish on a high point (flake scar ridge). Ridge is

abraded/worn down and see striations that run perpendicular to bit margin. No other polish detected.

INTERPRETATIONS:

**ACC #: 11427**

Tool Type: SCR (End)

**MACROSCOPIC:** complete specimen, very narrow. Secondary flaking along distal margin, R dorsal margin, a little on L dorsal margin, lots on L ventral margin (including bulb thinning). A little bit of step fracturing on the “peak” of the distal margin. Some microflaking along the L and R margins, especially near distal end.

**STEREOSCOPIC:** L and R margins quite sharp. Distal margin exhibits fairly significant abrasion/rounding. Microflaking on L and R margins appears related to manufacture, rather than use – ridges and edge quite sharp still (no abrasion – compared to distal end). Even see abrasion of some of the arrises up away from tool margin, heading toward surface of the tool.

**INCIDENT LIGHT:** small patches of dull, pitted polish in spots along the distal margin, away from the “peak” (following high points of microtopography), leaving silvery looking “ribbons” of dull polish close to the distal tool margin. At the peak, see a larger patch of this same dull, pitted polish extending away from the very margin of the tool, along a major flake scar ridge. Broad striations running perpendicular to bit margin. This dull, pitted polish, with broad striations, extends onto the ventral surface of the edge margin as well.

On the dorsal surface, close to the proximal end, see generic weak polish in the region of the major flake scar ridge that runs down the long axis of the tool. Weak, pitted polish with a few striations that run perpendicular to the long axis of the tool. This might be evidence for movement in a haft.

INTERPRETATIONS:

**ACC #: 11430**

Tool Type: SCR (End)

**MACROSCOPIC:** complete specimen, flaked all over the dorsal surface to shape the tool. Secondary flaking applied to the distal margin and fairly sporadically along the L and R margins (mostly near the proximal haft end). Distal margin is quite steep. Break in the lateral edge morphology where I assume the haft element ended.

**STEREOSCOPIC:** in the region of the supposed haft element, see micro-step fracturing suggestive of crushing from movement in the haft. L and R margins are fairly sharp, whereas the distal margin shows significant abrasion/edge rounding. A bit of micro-step fracturing along the distal margin, but arrises are ground down.

**INCIDENT LIGHT:** just to the right of the most prominent part of the distal margin (i.e., right of highest point of bit convexity) see a high point (flake scar ridge?) that is highly abraded and exhibits very dull, rough-looking (i.e. quite pitted) polish. Also see some broad, shallow striations in this area of polish formation, running perpendicular to the working edge margin. Same dull (but brighter), pitted polish seen on the very flat part of the working edge, to the L of the “peak”. In this area, see poorly-linked patches of polish just on the very highest points of the microtopography.

Ventral surface, right along the working edge margin, see a continuous band of dull, pitted polish with striations running perpendicular to the working edge.

Dorsal surface, near proximal end (actually about mid-way, where max extent of haft element was likely to be) see some possible generic weak polish on the high point of the main dorsal ridge, as well as some striations that run perpendicular to the long axis of the tool. Possible haft wear?

**INTERPRETATIONS:**

**ACC #: 11438**

Tool Type: SCR (End)

**MACROSCOPIC:** relatively complete specimen with all-over dorsal flaking to shape the tool. More refined secondary flaking along distal end. L margin shows microflaking and a lot of step fracturing, but looks related to manufacture, rather than to use. R margin also exhibits a lot of step fracturing. Bulb thinning (ventral-proximal). Distal end is quite steeply flaked with some micro-step fracturing visible along margin.

**STEREOSCOPIC:** confirms presence of micro-step fracturing along distal margin. Distal margin is highly abraded/rounded. L and R margins are very sharp in areas of step fracturing, except near proximal end where edges are really rounded off/ground. This is likely a function of hafting the tool.

**INCIDENT LIGHT:** all along the distal margin see patches of bright but rough-looking polish accompanied by striations that run perpendicular to the working edge. Polish found mostly along the margin on the high points of the microtopography, but near the “peak” (the most convex spot

on the working edge), the polish actually extends up onto the surface of the bit. A really bright patch to the R of the “peak”. This patch appears abraded, full of striations and quite bright. At 200x the bright patches are incredibly bright, but are restricted to the very highest points of the microtopography.

Bright but pitted polish extends onto the ventral surface of the bit, just a little (right in the area of the edge rounding). See striations in this marginal polish as well.

#### INTERPRETATIONS:

##### **ACC #: 11494**

Tool Type: SCR (End)

**MACROSCOPIC:** complete, stemmed specimen. Has been heat treated. Flaked all over dorsal surface to create proper outline and cross section. Also flaked on the ventral surface in the stem region, and right along the tool margins near the blade shoulders. Secondary flaking on all margins.

**STEREOSCOPIC:** L and R edges are fairly sharp. Distal margin exhibits a bit of edge rounding, and substantial step fracturing. Also some microflaking along distal margin – arrises appear slightly rounded off right at bit edge.

**INCIDENT LIGHT:** a few striations running perpendicular to working edge. Really no polish detectable except for a thin band of generic weak polish along rounded ventral distal edge margin. This possible polish seen primarily at the “peak” of the distal margin – fades a little bit to the L and R of the “peak.”

#### INTERPRETATIONS:

##### **ACC #: 11514**

Tool Type: SCR (Ovoid)

**MACROSCOPIC:** break along R distal margin. Step fracturing on L margin. Microflaking along R proximal margin. Higher edge angle distal and L distal. R proximal a much sharper edge angle.

**STEREOSCOPIC:** feather terminated microflaking continuous along R proximal. L margin see a lot of step fracturing/crushing accompanied by edge rounding. Even a few spots where the material looks a bit lustrous – potential for polish.

INCIDENT LIGHT: no polish detected R proximal margin – microflaking a result of production rather than use? Along L distal margin, in the area of the step fracturing, see continuous but poorly linked rough-looking polish. It is dull and pitted in appearance, and seems to be restricted to the high points of the microtopography. This polish is seen on the dorsal surface, extending a fair way up onto the surface of the tool; it is also present, although more restricted, on the ventral surface (restricted to very edge margin, and only seen in a few patches).

INTERPRETATIONS: working softer material (extent of polish, plus the appearance of the polish)? Step fracturing may be related to production (creating steeper working edge) rather than working harder material.

**ACC #: 11518**

Tool Type: SCR (Side)

MACROSCOPIC: thermal damage to both dorsal (distal) and ventral (proximal). Moderate edge angle L side; even more acute R side. L side has been shaped through secondary retouch; R side shows evidence for use, but less reduction. Microflakes visible along R side; microflakes and step fractures/crushing along L side. Step fracturing primarily at distal end of L side.

STEREOSCOPIC: confirms above observations. Minimal edge rounding noted; some at the pointed distal end.

INCIDENT LIGHT: not much evidence for polish, except a stretch of the L margin, beginning about a quarter of the way up from proximal end. A fairly good-sized patch of very bright, but still pitted, polish, with smaller patches of similar (though a little duller) polish in spots distally along the L margin. The larger bright patch is accompanied by striations that run perpendicular to the edge. These spots are distributed all along the L margin (where we see the slightly steeper, but still moderate, edge angle). These spots are bright but a bit pitted.

INTERPRETATIONS:

**ACC #: 11557**

Tool Type: SCR (End)

MACROSCOPIC: specimen is complete. Shallow notches near the base (hafting?). secondary flaking along distal margin (working edge), as well as some along R margin and a bit L proximal. Can see microflaking all along L and R margins. Some larger flakes and microflakes

seen (very sporadically) along ventral surface L and R margins as well. Working edge angle is moderately steep, but bit is still quite convex.

**STEREOSCOPIC:** extremely pronounced edge rounding noted at the “peak” of the distal (working) edge (i.e. at its most convex point). No microflakes seen at this “peak” because edge is completely abraded. Some microflaking and step fracturing to the L and R of the “peak.” L and R edge margins show microflaking, as well as some crushing in area of suspected haft element. Edges are comparatively sharp, though, suggesting damage related to manufacturing (or possibly haft wear) rather than to heavy use of the edges.

**INCIDENT LIGHT:** most of the working edge, especially at the “peak” is covered with dull, rough-looking (i.e. pitted) polish (dry hide). The flake scar ridges are all abraded, rounded-off. Striations running perpendicular to the working edge. On the ventral surface, see significant rounding of the bit edge, accompanied by more dull, pitted polish extending just a bit onto the ventral surface (just where the edge is rounded off). No polish seen elsewhere on the tool. Was hoping for some haft polish, but didn’t see anything I could identify for sure.

**INTERPRETATIONS:**

**ACC #: 11566**

Tool Type: SCR (End)

**MACROSCOPIC:** relatively complete except for some thermal damage to the proximal end, and to part of distal end. Secondary flaking to shape L and R margins. Distal end is relatively flat (i.e. not very convex). Edge angle is moderately steep, but not completely flat yet.

**STEREOSCOPIC:** lots of step fracturing along working edge. Also microflaking (feather terminated) all along the working edge. Edge is moderately rounded in a few areas, but not too abraded.

**INCIDENT LIGHT:** a few patches of dull and pitted polish along the bit edge. There are a couple of flat, bright looking patches, too, but these are sporadic enough that it is difficult to tell if it is some sort of polish trace, or part of the material itself. Saw a couple of striations running perpendicular to the working edge.

**INTERPRETATIONS:**

**ACC #: 13648**

Tool Type: SCR (End)

**MACROSCOPIC:** nearly complete, except for some damage to tip end. Very small end scraper with nearly flat (i.e. not convex) bit end and very steep working edge. Secondary flaking (fairly steep) applied along L and R and distal margins to shape tool and refine the edge.

**STEREOSCOPIC:** pronounced edge rounding and step fracturing, as well as some feather-terminated microflaking, noted all along bit end, dorsal margin. Lateral margins appear sharper, suggesting no use of these margins. Can see edge abrasion stretching onto ventral surface.

**INCIDENT LIGHT:** lots of striations running perpendicular to the working edge. At peak of the edge, dorsal surface, large patch of dull, pitted polish extending a fair way up onto the surface of the working edge. Striations seen in this area of polish, as well as in the areas covered with step fractures where polish development was not very advanced. Same dull, pitted polish seen on the ventral surface, close to the bit margin, restricted to the abraded working edge. Striations within these patches of polish as well.

**INTERPRETATIONS:**

**ACC #: 13658**

Tool Type: SCR (End)

**MACROSCOPIC:** complete thumbnail end scraper with secondary flaking all around the margins of the tool (L, R and distal), but not onto tool surface. Distal end is moderately convex and end angle is moderately steep. A bit of step fracturing visible along distal margin.

**STEREOSCOPIC:** L and R margins quite sharp, with some microflaking and step fracturing (related to manufacture). Distal margin exhibits extreme edge rounding!

**INCIDENT LIGHT:** very pitted, dull polish all along distal margin, extending past just the working edge margin, up onto the face of the bit. A few somewhat indistinct striations seen running perpendicular to working edge margin.

This dull, pitted polish is more distinct on the ventral surface of the bit edge (which is severely rounded off). Also see many more striations from this angle – running perpendicular to working edge. Along this edge, even in areas where the polish is less distinct, the striations are easily visible. One really spectacular patch right at the high point of the edge margin (i.e. the “peak”).

INTERPRETATIONS:

ACC #: 13698

Tool Type: SCR (Ovoid)

MACROSCOPIC: edge collapse and longitudinal fracture along R proximal margin. Edge angle fairly low. Secondary flaking and microflaking all around circumference of tool. A few areas with a little step fracturing, but most of the microflaking appears to have feather terminations.

STEREOSCOPIC: confirms lots of feather terminated microflakes, as well as some micro-step fractures. Edge rounding visible along distal margin, and edge margins closer to distal end (esp. L distal). Otherwise, edges relatively sharp looking.

INCIDENT LIGHT: rough-looking polish along distal margin (dorsal and ventral – more restricted to edge on ventral surface). Most polish hits just the high points of the microtopography. Some of this same rough (poorly-linked, but relatively bright) polish down the L margin especially (dorsal, primarily) and a bit on R margin. No striations visible.

INTERPRETATIONS:

**ACC #: 13742**

Tool Type: SCR (Side)

MACROSCOPIC: reduction + microflaking and step fracturing L margin only. The reduction/secondary flaking is fairly minimal – not a lot of effort devoted to shaping. The edge angle is moderately steep. A bit of step fracturing within the larger reduction flakes.

STEREOSCOPIC: can see micro-step fracturing as well as micro flaking with feather terminations. Microflaking is fairly continuous. Edges are relatively sharp – little evidence of rounding.

INCIDENT LIGHT: material looks quite coarse grained under the microscope. Doesn't appear to lend itself well to polish formation, or perhaps this tool wasn't used very hard. The secondary flake scars are so "fresh" looking (very little rounding of the flake scar ridges, for example) that it almost looks like this tool wasn't used for very long. There is virtually no evidence of polish formation except for a couple of patches of generic weak polish that has formed on the very highest ridges of the micro-topography.

INTERPRETATIONS:

**ACC #: 13850**

Tool Type: SCR (Ovoid)

MACROSCOPIC: fairly acute edge angles all around. See only minimal step fracturing along L proximal margin. Elsewhere see feather-terminated microflaking.

STEREOSCOPIC: confirms observations above. Microflaking is continuous, observed around entire circumference of piece.

INCIDENT LIGHT: R margin see patches (somewhat discontinuous – or at least it is restricted to prominent features along the edge or on the microtopography) of dull, somewhat greasy-looking polish. It is poorly linked. Same along L margin, especially closer to pointed end. There are a few brighter patches along the L margin. Polish and striations restricted to dorsal surface.

INTERPRETATIONS:

**ACC #: 13852**

Tool Type: SCR (Ovoid)

MACROSCOPIC: longitudinal break removed one half of this tool. Steep edge angle around distal and R margin. See step fracturing along these margins, as well as some evidence for microflaking.

STEREOSCOPIC: microflaking discontinuous along the distal margin, but fairly continuous along R margin. Edge rounding along R margin as well; distal margin much sharper.

INCIDENT LIGHT: along R margin, striations perpendicular to working edge. Ventral surface of R margin, about half way down, see striations perpendicular/diagonal to working edge, as well as some (possible) weak polish development. R margin dorsal, about 1/3 way down the edge from distal margin, see some dull, rough-looking, poorly developed (possible) polish that extends a little but up onto tool surface from the very edge.

INTERPRETATIONS:

**ACC #: 13903**

Tool Type: SCR (End)

**MACROSCOPIC:** distal fragment with flat and steep working edge. Secondary flaking on the working edge, L and R margins, and extending across entire dorsal surface. This piece was intensively shaped. Microflaking visible on dorsal surface of working edge, and also sporadically on ventral surface. Secondary flaking of L and R margins designed to shape the margin, not to alter the edge angle (unlike working edge, with much finer flaking designed to rejuvenate dulled edge).

**STEREOSCOPIC:** fine microflaking along dorsal and ventral margins of working edge – though more sporadic on ventral. Also see some mild edge rounding. Microflakes terminate primarily with feather terminations, but also see some step fractures as well.

**INCIDENT LIGHT:** at the midpoint of the working edge (most convex point of this fairly flat edge) see patches of somewhat dull, pitted (rough-looking) polish that is quite extensive in a fairly limited area of the working edge (i.e. it extends up onto the surface of the working edge). The polish is most pronounced on the higher points of the microtopography. Within this one patch of polish are a few striations running perpendicular to the working edge. This same polish is seen in a more limited band along much of the rest of the working edge margin. Same on the ventral surface – a sort of silvery ribbon of polish running along the abraded ventral surface, very close to the bit edge.

**INTERPRETATIONS:**

**ACC #: 13907**

Tool Type: SCR (Side)

**MACROSCOPIC:** distal fragment with secondary flaking along both L and R margins. Margins are moderately steep to slightly more acute. Impact damage at tip on ventral surface.

**STEREOSCOPIC:** microflaking all along L and R margins. L margin see a fair bit of step fracturing, but also some feather terminations. R margin mostly feather terminated microflakes. A bit of edge abrasion visible as well on both margins.

**INCIDENT LIGHT:** not much noted along L margin. R margin dorsal shows many patches of bright but rough (pitted) polish on the high points of microtopography. These patches look worn down (i.e. abraded) and in some we see striations (including some very wide, distinct grooves) running perpendicular to the long axis of the tool. These patches of polish and other wear are scattered in a discontinuous but consistent manner down the whole R margin.

**INTERPRETATIONS:**

**ACC #: 13912**

Tool Type: SCR (Ovoid)

MACROSCOPIC: creamy colored chert, with heat reddening on the dorsal surface. Microflaking visible around the entire circumference of the tool. Edges quite steep. Possible graver spur on one end. Step fracturing around circumference as well.

STEREOSCOPIC: confirms presence of microflaking, continuous around entire circumference. A couple of spots of edge rounding (near the base/"graver spur") but otherwise, edges relatively sharp. Crushing/step fracturing is quite pronounced.

INCIDENT LIGHT: no polish detected.

INTERPRETATIONS: whatever material was being worked may have been hard enough to remove microflakes (see crushing, microflaking along edges) fast enough that there wasn't time for polish to begin to form – removed used portions as tool was being used? Edge angle steep enough that this item probably was not used as a hide scraper.

**ACC #: 17111**

Tool Type: SCR (Side)

MACROSCOPIC: secondary flaking all along L margin and L distal tip. See some microflaking as well. R margin, sporadic flaking dorsal and ventral surface – not purposeful flaking, but use related. L margin is fairly steeply flaked. Secondary flaking on ventral surface at proximal end – bulb thinning for hafting?

STEREOSCOPIC: microflaking along L margin, including tip. These flake scars often show step fracturing. Very little microflaking on R margin, dorsal or ventral, except at proximal end in the area of the bulb thinning.

INCIDENT LIGHT: no polish detected. No striations seen.

INTERPRETATIONS:

**ACC #: 17879**

Tool Type: SCR (End)

MACROSCOPIC: complete specimen with shallow notches near base (hafting?). Secondary flaking along distal margin. A little bit along L margin, but not much secondary flaking along R margin. Can see evidence for microflaking around much of the circumference of the tool.

STEREOSCOPIC: confirms presence of microflaking along distal margin. Also see a bit of edge rounding, but not too severe. Material is quite coarse-grained, making it a bit difficult to pick out certain features.

INCIDENT LIGHT: material too coarse grained. No polish detected.

INTERPRETATIONS:

### **GRAVERS/PERFORATORS**

**ACC #: 10411**

Tool Type: Graver/Perforator

MACROSCOPIC: step fracturing along L and R margins of protuberance. A bit of rounding visible on tip of protuberance. See a couple of small flakes and some microflaking and step fracturing along R margin, especially around the midpoint of the edge.

STEREOSCOPIC: Confirmed heavy step fracturing on the tip. Also the surface of the tip protuberance is quite abraded – all the arisses between flakes are all rounded off. Microflaking all along the R margin of the tool.

INCIDENT LIGHT: very generic weak polish all over the tip – it is a bit brighter than surrounding material. Nothing really to write home about. Beginning a bit below the “shoulder” between the “tip” and the straight tool margins, see incredibly bright, domed, smooth polish back from the edge (R margin) and on the ariss along L margin. Also bright, pitted polish along much of the length of the arisses (R and L). Appears to be variously developed wood polish, perhaps from hafting.

R margin at midpoint: patches of bright but pitted wood polish on the ventral surface. Another patch of the mounded, bright, smooth polish closer to the “shoulder” along R margin.

**\*IT WAS FINGERNAIL POLISH!!!**

**ACC #: 11547**

Tool Type: Graver/Perforator

**MACROSCOPIC:** secondary flaking and microflaking visible along L and R margin. Secondary flaking and step fracturing on the L half of the pointed distal margin – step fracturing at the steepest part of the pointed margin. R-distal margin is broken, so hard to see what is going on.

**STEREOSCOPIC:** confirmed patterns of microflaking and step fracturing noted above. Some microflaking on R-distal margin along edge of point where the margin isn't broken. Tip is flat and even exhibits a bit of reddening (heating?). All damage restricted to dorsal surface, except at very distal tip where there is some microflaking on the ventral surface as well.

**INCIDENT LIGHT:** L margin some bright-ish patches of polish toward proximal end (hafting?). Distal (pointed) margin has less polish than I was hoping for! The point is covered with dull, rough looking polish on the dorsal surface. A little bit of the same kind of polish on the ventral surface near the tip as well. R margin shows dull polish with striations perpendicular to the long axis of the R margin – near the distal end.

**INTERPRETATIONS:**

**ACC #: 15297**

Tool Type: Graver/Perforator

**MACROSCOPIC:** very minimal damage noted along the “point.” The few small flakes removed indicate some sort of alteration into this shape, but I don't hold out a lot of hope for wear patterns on this piece. Small flakes may be associated with manufacture rather than with use.

**STEREOSCOPIC:** a very little bit of microflaking and step fracturing noted along the two edges of the pointed margin. Not much edge rounding seen – a little bit right at the tip of the point. All the damage is restricted to the dorsal face – not on ventral surface.

**INCIDENT LIGHT:** there is a bit of generic polish along the R-dorsal margin of the pointed edge. A few small patches of brighter (but rough, poorly-linked) polish on the R side of the tip end, but it is so limited in size that it is difficult to assign it to a particular worked medium. Don't see many (or any) striations – a few marks that might be, at the tip, oriented parallel to the long axis of the pointed margin.

**INTERPRETATIONS:**

**ACC #: 10364**

Tool Type: Graver/Perforator

MACROSCOPIC: step fracturing on dorsal surface of the “notches” on either side of both L and R protuberances/tips. Also some feather-terminated microflakes along L margin. L protuberance is quite “pointy” (looks like it hasn’t been damaged much). R protuberance is a little bit blunted.

STEREOSCOPIC: confirmed stereoscopic observations. R protuberance appears more heavily used (step fracturing, plus tip breakage and rounding). The L protuberance does not appear to be quite as heavily damaged – some step terminations on L margin, but these may be related to creating the steep edge. Along R margin of the L protuberance, mostly feather terminations – minimal step fracturing. Does not appear to be much edge rounding.

INCIDENT LIGHT: along L margin, straight portion with feather terminated microflakes, about half way along the edge there are striations perpendicular to working edge. Nothing else notable, except maybe a little bit of generic weak along the margin of the proximal “notch” on the R side (i.e. “below” the protuberance).

INTERPRETATIONS:

**ACC #: 10908**

Tool Type: Graver/Perforator

MACROSCOPIC: secondary flaking along the pointed proximal margin as well as along the convex distal margin (on dorsal surface). Also an area of secondary flaking on margin A between the L margin of the “point” and the start of the convex margin (ventral surface). Can see step fracturing (crushing) along both margins of the “point.”

STEREOSCOPIC: confirmed patterns noted in macroscopic examination. Microflaking noted along edges around almost the entire circumference of the tool. Pronounced edge rounding along the convex edge (scraper?). Apart from the bit of secondary flaking along the ventral margin on the L side, there is no damage to the ventral surface of the L or R margins. There is damage, though, on the ventral surface of the tip of the point (the proximal portion, seen above).

INCIDENT LIGHT: Pointed portion L margin – at the most concave portion, a little bit of bright but weak and pitted polish, as well as striations running perpendicular to the edge. Approaching the point from this spot begin to see more patches of bright but weak polish. At the tip, L margin, along edges and onto surface of tool, polish becomes brighter but still rough looking. In a few spots it is more solidly linked – less pitted. Striations perpendicular to the edge, and some edge rounding apparent. This is all on the dorsal surface. On the ventral surface see same bright but rough polish right at the very tip end – not extending very far onto tool surface. Not much polish along the R dorsal margin of the “point.” A bit of what could be considered “generic” polish right along the edge toward the distal end, and it gets brighter right at the point/spur.

L margin between the “point” margin and the convex distal margin: a few polish ribbons along dorsal edge. Dull, rough polish on ventral surface, covering the secondary flaking + microflaking; a couple of brighter patches of still rough polish. A couple of possible “striations” perpendicular to the working edge. A little bit of edge rounding close to the distal end.

Distal convex surface: pronounced edge rounding (especially at the most convex portion) coupled with bright polish visible on ventral surface. Generic polish along almost all of the working edge, dorsal surface. It is relatively dull and rough looking, except toward the most convex “peak” of that margin, where the polish, which is quite extensive, has a sort of “greasy” look to it. There are patches of striations along the margin – especially near the L corner of the margin and at the convex “peak” – that are perpendicular to the working edge, indicating use in a transverse (scraping) motion.

INTERPRETATIONS: graver point plus scraper – appears a scraper that was broken and reworked into a graver. Wear along the convex distal end suggests hide scraping. Crushing and lack of polish on the “graver spur” suggests working a harder material – one that produced edge crushing, but removed flakes before polish had a chance to develop.

**ACC #: 10918**

Tool Type: Graver/Perforator

MACROSCOPIC: secondary flaking all along L dorsal margin. I think I can see some microflaking along this margin as well. The tip of the protuberance along L margin is red – could it be heated from friction?

STEREOSCOPIC: confirmed presence of microflaking along L margin. Microflaking is stepped close to the “point.” There is damage to the ventral surface of the protuberance “tip” – step fracture; otherwise, all damage is restricted to dorsal surface. Rounding of the tip.

INCIDENT LIGHT: weak polish noted along L distal margin (from the smaller peak distal to the main protuberance. It is a bit more pronounced right at the peak, then becomes a bit more diffuse distally. This polish is dull and poorly linked, appearing in patches on the higher points of the microtopography. Very little of this polish appears below (i.e. toward the proximal end from) the “graver spur.”

Polish visible on dorsal and ventral surfaces of the graver spur. It is not very bright polish, though – fairly weak, but a little more pronounced than on the straight margin. It is still not very bright polish, and isn’t well-linked, being broken up by the “valleys” of successive step fractures (i.e. polish seems restricted to the peaks of the microtopography). I wonder if more developed polish was prevented b/c of working hard material that caused production of step fractures that kept removing flakes with any build-up of polish.

INTERPRETATIONS:

**ACC #: 11429**

Tool Type: Graver/Perforator

MACROSCOPIC: a little step fracturing visible between the “horns” and down the L margin of the L protuberance, but other than that, I don’t see much apparent damage.

STEREOSCOPIC: some step fractures also visible on the tips of the tips – like mini “impact fractures.” A bit of edge rounding on the tips, too. See some rounding on the ventral surface as well as on the dorsal surface.

INCIDENT LIGHT: saw almost nothing, except a bit of rough, pitted polish on the little peak between the horns (dorsal surface). There are a couple of striations apparent, perpendicular to the working edge, in the same area as the polish.

INTERPRETATIONS:

**ACC #: 11569**

Tool Type: Graver/Perforator

MACROSCOPIC: along margin B (L-distal margin, with graver “spur”), see steep secondary flaking and step fracturing. See step fracturing on the tip as well. Margin C (R margin) fairly steep secondary flaking along with some step fracturing close to the edge margin.

STEREOSCOPIC: lots of microscopic step fracturing along margin B; feathered microflaking along margin C. All damage restricted to the dorsal surface.

INCIDENT LIGHT: no polish noted along the graver margin at all. Some patches of potential polish along margin C. These patches are distributed very sporadically and are not very bright – dull, rough-looking. Most of these patches are located around the mid-point of the margin. There is a bit of weak polish along the margin of the ventral surface as well, but it is not well-developed either.

INTERPRETATIONS: can’t say much about the nature of the worked material except that, based on the step fracturing along the graver margin, I expect it was something hard. Along the straight “scraper” margin we may be dealing with a softer substance, based on the presence of less step fracturing a more microflakes with feather terminations (also underdeveloped polish).

**ACC #: 14627**

Tool Type: Graver/Perforator

**MACROSCOPIC:** secondary flaking and step fracturing visible along both margins of the protuberance on L dorsal-distal margin.

**STEREOSCOPIC:** confirms step fracturing observed macroscopically, but also see some microflaking and apparent abrasion of the “tip” of the protuberance. Damage is restricted to dorsal surface.

**INCIDENT LIGHT:** no polish visible, but I suspect the lack of polish is related to the nature of the material. This particular piece is quite coarse grained at high magnifications and looks “harder” than some specimens that have exhibited polish.

**INTERPRETATIONS:**

**ACC #: 15210**

Tool Type: Graver/Perforator

**MACROSCOPIC:** microflaking visible on both margins, both faces of tip.

**STEREOSCOPIC:** mostly feather terminations on the microflakes. Dorsal face, left side, some step fractures. The tip looks broken/worn down.

**INCIDENT LIGHT:** Rough looking, pitted but bright weak polish on the tip of the tip. Nothing else noted.

**INTERPRETATIONS:**

**ACC #: 15387**

Tool Type: Graver/Perforator

MACROSCOPIC: Large specimen: apart from the shaping of the point, there really is not much damage that I can see macroscopically on the tool. Perhaps a very little bit of step fracturing along the margins of the tip.

Small specimen: a little bit of step fracturing and microflaking visible along the L margin. Also along R tip margin. Color change as a result of heating visible at base of specimen.

STEREOSCOPIC: Large specimen: looks pretty “clean” – i.e. not a lot of damage that appears to be the result of heavy use. This looks like a fairly expedient tool – wouldn’t be surprised if very little wear appeared on it. Remove from consideration for incident light investigation.

Small specimen: step fracturing and edge rounding seen all over the tip of the specimen.

INCIDENT LIGHT: Small specimen: nothing visible, except a bit of very generic, poorly linked polish on the very tip of the tip.

INTERPRETATIONS:

## UNIFACES

**ACC #: 10374**

Tool Type: Uniface

MACROSCOPIC: L margin, sporadic step fracturing along the edge. R margin, more patterned step fracturing plus microflaking apparent. Distal end has some breaks, but also a few patches of microflaking + step fracturing. I think the R margin looks the most promising for finding any use wear.

STEREOSCOPIC: microflaking + step fracturing looks a little more like it might be use related near distal end of L margin (proximal doesn’t look like use related). Microflaking is continuous along R margin – especially in areas of heaviest step fracturing. Also looks like there might be a bit of edge rounding.

INCIDENT LIGHT: this material – unaltered surface – looked incredibly bright under the microscope. If there is any polish along the margins, it is indistinguishable from the natural look of the material. There are a couple of small spots that might have been a bit brighter, but I do not feel confident in assigning them to any particular polish-forming agent.

INTERPRETATIONS: it is quite possible that this is a portion of an end scraper, and the “damage” along the sides is related to manufacturing, or possibly hafting. I saw no indication of the L or R margin of this tool being used in any particular motion or in contact with any particular material type that would allow it to be classified as a “side scraper.”

**ACC #: 10380**

Tool Type: Uniface

MACROSCOPIC: broken at distal end; flaking applied to margins A and B (L and R lateral margins, respectively). About half way down margin B see some edge crushing (successive step fractures)

STEREOSCOPIC: microflaking restricted to dorsal surface; also see some edge rounding

INCIDENT LIGHT: no polish detected

**ACC #: 11032**

Tool Type: UNF

MACROSCOPIC: distal fragment with bifacial secondary flaking along both L and R margins. Broken (?) flat facet distal L margin.

STEREOSCOPIC: significant step fracturing, microflaking and edge rounding along all margins.

INCIDENT LIGHT: R margin about a third of the way down from the tip, striations running perpendicular to long axis of tool. No polish detected. Perhaps being used to work a hard enough material that flakes were being taken off before polish could develop?

INTERPRETATIONS: could this actually be a drill fragment rather than a scraper?

**ACC #: 11350**

Tool Type: Uniface

MACROSCOPIC: looks to be a fair bit of microflaking and step fracturing in the “notch” on the R margin. Edge angle along there is quite steep. Slightly less patterned flaking along the rest of the margin. Not much except some secondary flaking along L margin. Distal is broken.

STEREOSCOPIC: the notch appears to be the only area with real evidence of potential use. The microflaking along the proximal portion of R margin is very unpatterned and is likely related to manufacturing rather than use. The L margin exhibits even more sporadic microflaking, no crushing, no rounding. Again, not used I expect.

INCIDENT LIGHT: a few patches of quite indistinct polish along the notch. Can only be described as “generic weak” polish. It is found mainly along the very margin of the tool, extending slightly onto the dorsal surface. It is rough in appearance, but distinctly brighter than the natural surface topography. It is not well linked, occurring in patches across the surface.

**ACC #: 11403**

Tool Type: Uniface

MACROSCOPIC: microflaking along both faces of all of L margin. Also some microflaking along distal portion of R margin. The distal margin, the “notch” shaped portion, exhibits some microflaking as well as some step fracturing.

STEREOSCOPIC: almost looks like some areas of polish visible along all these margins in the area of the microflaking. The microflaking along L margin is continuous and well patterned, whereas the microflaking along R margin is much less patterned -- more sporadic. A couple of microflakes on the ventral surface, but not as prevalent as along L margin. Edge rounding especially apparent in the “notch.” Microflaking and step fracturing in the “notch” is restricted to the dorsal surface.

INCIDENT LIGHT: significant polish development all along L margin, both faces. This polish is continuous, dull (with a few brighter patches), poorly linked/pitted in appearance and is restricted to the very edge of the tool. Very few striations noted, except a few that were perpendicular to the working edge. Along R margin, the same type of polish noted – dull, pitted, somewhat poorly linked but continuous. The polish is restricted to the distal portion of the tool on the R margin, as the margin is broken near the proximal end. Polish is seen on both faces. Striations noted on ventral surface on the “horn” – they are diagonal to the working edge. Not much polish along the incurvate distal margin, except on the two “horns” of the notch. This polish looks very much like the polish seen along the edge – a bit dull, pitted, not well-linked. In addition, on the L “horn” see striations diagonal to the working edge. This is restricted to the dorsal face – very little evidence for polish in the “notch” on the ventral face.

INTERPRETATIONS: The presence of microflaking along both faces of the L margin suggests use in a longitudinal (cutting) motion. Position of microflaking/step fracturing in the “notch” suggests more of a transverse (scraping) motion.

**ACC #: 11415**

Tool Type: UNF

MACROSCOPIC: unflaked facet at distal end, but otherwise microflaking visible all around circumference of the tool. Step fracturing especially along the R margin. Some on L side, but appears related to manufacturing the steep edge angle, not use-related. On R margin, step fracturing located closer to edge margin.

STEREOSCOPIC: micro crushing (step fracturing) visible along both margins (L and R). Some moderate edge rounding visible along both margins as well.

INCIDENT LIGHT: about half way down R dorsal margin, striations running perpendicular to the edge. In about the same location on the L dorsal margin, perpendicular striations and a patch of weak polish right along the edge. Distal L dorsal margin, extensive but weakly formed polish along the margin and up onto the surface of the tool a bit. There are a couple of patches that are better-linked; the polish in these patches is dull and a bit rough in appearance.

Ventral surface, L side, a few patches that are very slightly brighter than the surrounding material right on the edge at the distal end of the tool. It is hard to say if these are even generic weak polish or not. About half way down, there is very dull polish restricted to a fine line along the edge of the tool, and there are pronounced striations in this location as well (perhaps evidence of hafting wear???).

**ACC #: 13691**

Tool Type: Uniface

MACROSCOPIC: margin A (left), margin B (distal R – all broken), margin C (proximal R). Margin C shows secondary flaking, and some microflaking, but I think it may be related to manufacture rather than to use. The microflaking is sporadic/discontinuous, and is not accompanied by any (or much) apparent edge rounding. Margin A, on the other hand, exhibits secondary flaking and continuous, extensive microflaking in addition to some edge rounding – esp. at the distal end.

STEREOSCOPIC: margin A, distal end see some step + feather terminations on the microflakes, which are restricted to the dorsal surface. These microflake scars are continuous and extensive.

Also see edge rounding and rounding of surface arris topography. Toward the proximal end, microflaking becomes less prominent.

INCIDENT LIGHT: margin A near the distal end (from about half way “up” the specimen) is the only area that exhibits any polish. It is discontinuous, quite diffuse, and very dull in appearance. Found primarily on the dorsal surface, although a very little bit sneaks over on to the ventral surface. There are no striations accompanying the polish, but the presence of microflakes on only the dorsal surface, and the comparative paucity of polish on the ventral surface lead me to believe this piece may have been used in a transverse (“scraping”) action.

INTERPRETATIONS: wear traces are inconclusive – very diffuse and hard to say what the work action and worked material may have been. But use of a single edge, by the looks of things, and possibly for a single purpose, given the uniformity of the wear.

**ACC #: 13743**

Tool Type: Uniface

MACROSCOPIC: margin A (left), margin B (distal R), margin C (proximal R). Secondary flaking along margins A, B and C. Extreme crushing of edges B and C. Some step fracturing along margin A, but not as pronounced as B or C.

STEREOSCOPIC: step fracturing, but not much additional microflaking along margin A. B and C exhibit extensive step fracturing (very steep edge) as well as some microflaking. In all cases, damage is restricted to the dorsal surface.

INCIDENT LIGHT: no polish to speak of along B or C, except in very localized areas. This polish is quite indistinct. Dull, diffuse polish is found all along margin A. It is rough in appearance, not well formed, poorly linked. No striations, no pitting.

**ACC #: 13744**

Tool Type: Uniface

MACROSCOPIC: step fracturing along the thick margin A (left margin) – on the ventral and dorsal portions of this margin. Microflaking along entire margin B (R margin), dorsal surface. Was the thick margin being used for something, or is the damage just manufacturing-related?

STEREOSCOPIC: the step fracturing on the dorsal edge of margin A is associated with microflaking, whereas the step fracturing on the ventral surface shows no microflaking, just the fractures. The microflaking along margin B is extensive and continuous.

INCIDENT LIGHT: Continuous polish – dull, and a bit rough-looking – all along dorsal face of margin B. There are a couple of flat, bright patches that almost look like they could be bone polish, but they are in extremely specific and limited spots, so I expect it is just a part of the material itself. The high point shows much brighter, but rough-looking polish. It is very much brighter than anything seen along margin B. There was a bit of diffuse, generic polish noted on the dorsal edge of margin A where the step fracturing was noted – another little bright patch that looks like bone polish, but is probably just a feature of the raw material.

**ACC #: 13886**

Tool Type: Uniface

MACROSCOPIC: (margin A = L lateral; B = top/distal; C = R lateral; D = bottom/proximal) microflaking visible along ventral surface of A; also microflaking and crushing along dorsal surface of B; extensive crushing as well as microflaking along C

STEREOSCOPIC: microflaking along A is quite discontinuous; fairly continuous along B and is accompanied by some crushing and edge rounding. Along C we see pronounced crushing/step fracturing, but microflakes are a bit less visible.

INCIDENT LIGHT: ventral surface of B see striations running essentially perpendicular to the edge of the tool (in the little “nick” along that edge in the middle). Diffuse, but continuous, non-specific polish in the same area as the striations. Fairly bright polish along C at proximal end – hafting?

INTERPRETATIONS: used in a transverse (scraping?) motion, but worked material is uncertain.

**ACC #: 13909**

Tool Type: Uniface

MACROSCOPIC: can see step fracturing/microflaking along L and R margin, but none noted on distal margin. More step fracturing on L margin; a bit more limited on R margin.

STEREOSCOPIC: microflaking along L and R margins. More along L margin, accompanying more pronounced step fracturing. A little bit of edge rounding at distal end of L margin. A few microflakes removed from ventral surface of L margin (only a very small number), none along R margin.

INCIDENT LIGHT: no polish detected. The material is quite lustrous so it may be that the polish is difficult to distinguish from the natural look of the material, but it really doesn't appear that the piece was used much. The microflaking may be related to production more than use.

## INTENTIONALLY MODIFIED FLAKES

### **ACC #: 10224**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** medial-lateral flake fragment with secondary flaking applied along the one intact edge. Edge is straight, and edge angle is relatively moderate.

**STEREOSCOPIC:** microflaking, including micro-step fracturing, along the used margin. Margin is abraded and this abrasion wore down some of the microflake scars. Can see a spot of Sharpie at the one end of the tool!

**INCIDENT LIGHT:** this specimen looked like it had good potential for polish formation, but none was detected. No striations either. I can see the edge is rounded-off, but no polish accompanying the abrasion.

### **ACC #: 10234**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** complete flake with pyramidal-shaped dorsal surface. Secondary flaking applied at distal end. Edge angle is moderate. Margin is straight.

**STEREOSCOPIC:** a few micro-step fractures, but not much other microflaking. Edge margin is quite sharp. A lot of patina on the surface of this tool; may make it difficult to detect polish.

**INCIDENT LIGHT:** no polish, but near L margin of the distal end, a patch of striations running transverse to working edge.

### **ACC #: 10395**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** angular flake fragment (triangular in x-section) with secondary flaking applied to only one margin. Flaking is coarse and edge is fairly steep. Lots of step fracturing.

**STEREOSCOPIC:** edge is covered with micro-step fracturing. Some edge rounding is apparent in the areas with the heaviest crushing, but otherwise relatively sharp. Material is coarse grained – may not show polish well.

**INCIDENT LIGHT:** no polish, but a few striations running perpendicular to working edge.

**ACC #: 10433**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** this is an interesting piece because the shape of the flake looks like an asymmetrical knife blade. Straight (L?) margin is broken, with an impact fracture visible. The R (?) margin has secondary flaking applied and is straight to slightly excurvate. This piece has an incurvate proximal margin that appears to resemble a stem on a knife. Modified edge angle is moderate.

**STEREOSCOPIC:** quite a bit of micro-step fracturing visible along worked margin. Also some feather-terminated microflakes mixed in. Edge damage is restricted to the dorsal surface, except near very tip end where a few feather-terminated microflakes were observed on the ventral margin. Edge margin is relatively sharp.

**INCIDENT LIGHT:** about a third of the way down from the tip (just past the little “notch” in the margin) there is a patch of generic weak polish with some longitudinal striations. About half way down, a patch of dull, almost greasy-looking rough polish with some more longitudinal striations. A little further down from this second patch, another few spots of generic weak polish on high points. One of these contains transverse striations. Closer to the proximal end, a couple of patches of dull, pitted polish that appear very abraded. See striations running in all directions around these patches.

**ACC #: 11297**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** distal flake fragment with secondary flaking applied along R ventral margin. Appears quite coarsely flaked with some step fracturing visible near the very edge margin. Edge is slightly concave.

**STEREOSCOPIC:** almost no microflaking visible. All the damage appears to be macroscopic. Remove from consideration for ILM.

**ACC #: 11352**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** distal flake fragment that exhibits significant thermal damage. Secondary flaking applied along L margin, which is convex and relatively acute.

**STEREOSCOPIC:** can see step fracturing on dorsal and ventral surfaces, as well as some moderate edge rounding, especially toward the distal end of the margin.

**INCIDENT LIGHT:** toward distal end of L margin a small patch of dull, rough-looking polish on a high point of the microtopography. Seems to have worn down/abraded this peak. A few other similar patches seen at distal end when examining the ventral surface. No striations detected.

**ACC #: 11398**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** distal fragment with secondary flaking applied to L lateral and distal ends. Edge angle of L lateral relatively moderate; the small part of the distal that is flaked is steeper. L margin is a little serrated; distal worked portion is slightly concave.

**STEREOSCOPIC:** L lateral margin shows significant micro-step fracturing (also seen at the macroscopic level) that extends onto both dorsal and ventral faces. Edge margin is quite sharp. Distal end exhibits feather terminated microflaking and moderate edge rounding.

**INCIDENT LIGHT:** no polish detected along the L lateral margin. A patch of bright but rough polish noted on the distal end, right at the juncture with the L margin. Within this patch of polish, see many fine striations running transverse to the distal end. A few other transverse striations seen further from this patch of polish on the distal end.

**ACC #: 11414**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: angular flake fragment, but I can't determine the orientation. Secondary flaking applied along the only intact margin. This piece was produced on a cobble decortication flake. Worked edge is convex and edge angle is moderate (or slightly acute).

STEREOSCOPIC: microflaking (feather terminated and step fracturing) along the worked edge, especially at the wider flake end. Edge is quite sharp.

INCIDENT LIGHT: no wear traces detected.

**ACC #: 11491**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: large flake fragment with secondary modification applied along the L dorsal and R ventral margins. There is additional damage noted on the L ventral surface. I'm not sure the modification along the R margin looks related to function. L margin is relatively acute, mildly serrated, generally straight.

STEREOSCOPIC: sporadic microflaking noted along the L margin. Micro-step fracturing around the mid-point. Edge is relatively sharp, with only a bit of edge rounding noted in the crushed area around the midpoint.

INCIDENT LIGHT: about a third of the way up from the proximal end, on the ventral surface, a patch of generic weak polish, with broad striations that run transverse to the working edge.

**ACC #: 11498**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: medial flake fragment with secondary flaking applied along L margin. Edge angle is quite steep. Edge protuberance at proximal end, then the rest of the edge is relatively straight. Other margins are broken.

STEREOSCOPIC: a lot of micro-step fracturing visible along the worked margin. Edge is relatively sharp.

INCIDENT LIGHT: micro-step fracturing is quite pronounced. No polish detected.

**ACC #: 11502**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: damaged flake – damage to distal end, including a large step fracture (like an impact fracture) and thermal damage. But broken end was reworked – secondary flaking along the broken distal margin. Also secondary flaking along the L and R lateral margins. L lateral margin: moderate edge angle. R lateral margin: acute edge angle. Distal margin: acute edge angle. L margin: lots of step fractures. R and distal margins: more feather terminations.

STEREOSCOPIC: L margin: near proximal end, more feather-terminated microflaking; near distal end, more micro-step fracturing. Moderate edge rounding seen all along the L margin. Some edge damage extends onto the ventral surface.

R margin: minimal microflaking (feather-terminated, mostly) along this margin. Some damage on ventral surface as well as dorsal. Edge is relatively sharp.

Distal margin: quite a lot of thermal damage. May not be good use wear candidate.

INCIDENT LIGHT: L margin: not much polish detected except a few, sporadically located patches of generic weak polish and one patch, near the proximal end, of dull and rough-looking (just generally abraded in appearance) polish that contained a few transverse striations.

No polish detected elsewhere.

**ACC #: 11541**

Tool Type: RFL

MACROSCOPIC: margin A = left. Margin B = distal. Margin C = right. No damage at all noted along A. A very little bit of microflaking/step fracturing noted along margin B at the R- and L-hand ends of dorsal surface. Margin C, see a little bit of microflaking in the secondary flaking on ventral surface, near distal margin, especially.

STEREOSCOPIC: confirms presence of microflaking/step fracturing in the locations mentioned above. Also see edge rounding associated with these areas of microflaking. No other edge damage noted.

INCIDENT LIGHT: no polish detected – at least nothing that can be assigned to a polish forming mechanism.

**ACC #: 11565**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: distal flake fragment (from biface core) with secondary flaking applied to the L margin. This edge is relatively straight and the edge angle is fairly acute.

STEREOSCOPIC: feather terminated microflaking all along the entire worked edge. The edge appears fairly sharp.

INCIDENT LIGHT: one small patch of generic weak polish right on a “peak” along the edge at the midpoint. No other wear traces detected.

**ACC #: 11571**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: distal flake fragment (possibly blade or blade-like) with thermal damage. Secondary flaking seen along the intact portion of the distal end. Worked edge exhibits quite a bit of step fracturing. Edge angle acute-moderate.

STEREOSCOPIC: microflaking (feather terminated) all along the worked portion of the edge. Edge is quite sharp. Edge damage restricted to the dorsal surface.

INCIDENT LIGHT: sporadic patches of generic weak polish all along the edge. A few faint striations running perpendicular to the working edge.

**ACC #: 13702**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: distal flake fragment with intentional flaking along L margin. See some thermal damage, but none that seems to impact the used margin. Edge angle is quite moderate.

STEREOSCOPIC: a bit of micro step fracturing visible, but not much regular feather terminated microflaking. Edge is mostly sharp with a couple of spots of moderate rounding noted. Damage is restricted to the dorsal surface.

INCIDENT LIGHT: material is very rough-looking (coarse-grained) and “speckled” (black and white). One very small patch of smoothed, bright polish about a third of the way from the distal

end. It's relatively bright and looks a bit "built-up." Other than this one patch, though, no polish detected.

**ACC #: 13723**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** cortical flake fragment with intentional flaking along the distal (?) margin. Proximal and L margins broken. The R margin appears to have been used but not modified intentionally. Heavy macroscopic step fracturing all along the modified edge.

**STEREOSCOPIC:** not much microflaking, except a bit of micro-step fracturing. The edge looks fairly "sharp." I'm not optimistic about seeing much polish – wouldn't be surprised if the step fracturing removed any incipient polish as it was forming.

On L margin, a bit of microflaking (feather terminations).

**INCIDENT LIGHT:** one good striation perpendicular to the distal (working) edge about a third of the way from L margin. Some generic weak polish running in a very thin ribbon along the very margin of the tool. One patch where this polish actually extends up onto the surface of the edge (right where the striation was seen). Another slightly larger patch of very rough-looking, poorly linked polish less than 1 cm in from the utilized but not modified edge.

Band of rough-looking polish right along the margin of the L edge.

On the ventral surface of the distal, near the junction with the L edge, there is one very distinct and definitive patch of polish. It is very flat and dull with striations running many different directions, but primarily transverse to the working edge (i.e. perpendicular to the working edge). It does not have the domed appearance of wood or plant polish and therefore may represent highly developed hide polish.

**ACC #: 13734**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** large cortical flake with flaking applied to R distal-dorsal (A) and L-distal-ventral margins (B).

**STEREOSCOPIC:** lots of microflaking and step fracturing along A. Microflaking extends onto ventral surface. Also, pronounced edge rounding. B shows more step fracturing compared to regular microflaking, as well as more moderate edge rounding. A couple of microflakes on dorsal surface, but not as noticeable as A.

**INCIDENT LIGHT:** B no polish noted, but a few striations perpendicular to working edge. Several patches of polish on high points of the microtopography. Two of these are close to the “peak” on the distal margin. This polish is bright and relatively smooth-looking (at 200x), and is full of fine striations (i.e. narrow). These patches, at 200x, also have a very rounded-off abraded look to them. Another patch of rougher-looking, striated polish closer to the R end of the distal margin. There are spots in it that look smoother and abraded, like those mentioned above, but other parts look more pitted (like dry hide).

**ACC #: 13759**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** triangular shaped piece, broken at the distal end. Intentional flaking mostly along R margin, but a little bit along L margin as well. Note that there appears to be some nail polish on the ventral surface!!! Most of the flaking is restricted to the dorsal surface, although there is a little bit on the ventral surface of the R margin – likely spontaneous rather than intentional.

**STEREOSCOPIC:** a fair bit of microflaking along the R margin. Much of it exhibits feather terminations, but there is also a fair bit of step fracturing, especially close to the proximal end, and toward the distal end. Not much edge rounding, except at midpoint of the edge, where the flaking is seen on both faces.

L margin – not a lot of microflaking, and edge is relatively sharp looking except for an area of some edge rounding at the proximal end of the area of secondary flaking.

**INCIDENT LIGHT:** on R margin, a few striations perpendicular to the working edge near the proximal end. Past the “chunk” out of the midpoint (i.e. toward the distal end), there is a distinct patch of dull, pitted polish that is rife with striations running perpendicular to the working edge. Very classic “dry hide” polish. More of these same patches of polish and striations located along the remainder of the R margin (i.e. toward the distal end). On the ventral surface, see a thin, bright, silvery ribbon of abraded-looking polish (with some pits and striations in it) all along the crest of the R margin.

This same polish, although less developed, seen along the L margin, especially in the area of the edge abrasion that was noted above. Polish is dull, pitted, and we see a few striations running perpendicular to the working edge.

**ACC #: 13919**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: flaking along the L margin, as well as a bit of damage observed on the distal margin. R margin is broken.

STEREOSCOPIC: lots of step fracturing along worked margin – some macro, but a lot of micro as well. Some feather-terminated microflakes noted as well but not as prevalent as the step fractures. Not much edge rounding noted, except in a couple of the highest points. Microflaking is restricted to the dorsal surface.

INCIDENT LIGHT: no polish detected.

**ACC #: 13924**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: intentional flaking restricted to the distal margin of cortical flake (this looks like a flake taken off a cobble.). Material was heated. Potlid on the ventral surface. Some flakes removed from ventral surface as well, but they are sporadically located – likely spontaneous retouch rather than intentional modification.

STEREOSCOPIC: lots of microflaking (mostly feather-terminated, although a couple of step fractures were noted as well). Most microflaking restricted to dorsal surface, although there is a little bit on the ventral surface as well, mostly around the mid-point. There is some very mild edge rounding

INCIDENT LIGHT: striations seen running perpendicular to working edge. Patches of generic weak polish in patches all along dorsal surface. This polish is seen right along the very margin, but also up onto the surface of the edge in a few spots. See some faint patches of this same polish on the ventral surface.

INTERPRETATIONS: polish dorsal and ventral, plus the flaking dorsal and ventral suggests cutting, but the striations perpendicular to the working edge suggest a scraping motion. Perhaps a multifunctional tool?

**ACC #: 14633**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** small, strange flake (possibly biface core?) with intentional modification along distal-ventral margin and proximal L margin (although this might be related to modifying the original core, rather than modifying the flake post-detachment). Edge angle of distal margin is relatively steep; same for flaking at proximal end. The proximal flaking terminates in step fractures, while the distal flaking is primarily feather-terminated.

**STEREOSCOPIC:** microflaking visible all along distal margin, even outside the extent of the intentional secondary flaking. Most of this is feather terminated, although there are a few step fractures visible as well. Edge margin appears relatively sharp. Most of the damage is restricted to the ventral surface, although there are some microflakes on the L-proximal-distal margin – mostly feather-terminated microflakes.

Microflaking along the proximal L margin as well.

**INCIDENT LIGHT:** no polish detected.

**ACC #: 14646**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** flake fragment – but hard to tell orientation (possibly distal?). Only one worked margin; the others are broken. Flaking is continuous (possibly a scraper fragment, but hard to say without the rest of the piece). Edge angle is fairly low, except toward the far R and L ends of the worked margin, where the edge is a bit steeper. Also see some (micro)step fracturing in these steeper areas.

**STEREOSCOPIC:** see a fair bit of micro-step fracturing all along the worked edge. Much of this microflaking appears to have been abraded somewhat, although the overall look of the edge margin is fairly sharp. In addition to micro-step fracturing, also see microflaking with feather terminations. Most of the edge damage is restricted to the dorsal surface, although I see a couple of microflakes removed from the ventral surface along the straight part of the worked margin.

**INCIDENT LIGHT:** material is very coarse grained at high magnifications. No polish was detected.

**ACC #: 14842**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** medial flake fragment with intentionally applied secondary flaking along both L and R margins. (Calling thinner end – also narrower end – the proximal.) L margin mostly feather terminations. R margin many step fractures.

**STEREOSCOPIC:** L margin some microflaking visible within the larger flake scars. Also see very pronounced edge rounding near proximal end break. Remainder of edge is relatively sharp looking. On ventral surface of L margin, a lot of microflaking and micro-step fracturing visible. R margin see areas of microflaking and micro-step fracturing all along the edge. Edge looks fairly sharp.

**INCIDENT LIGHT:** the only polish detected was seen on the L margin near the proximal end where the heavy edge abrasion was seen. It is non-diagnostic, though, and can only be described as “generic weak.” This polish was seen only on the very highest points of the microtopography – quite poorly linked, but bright enough where visible.

**ACC #: 15132**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** long, narrow, blade-like flake with secondary flaking applied to L ventral margin, which is incurvate. Edge angle is acute. Edge is somewhat serrated. Some minor edge damage on the dorsal surface as well.

**STEREOSCOPIC:** fairly minimal microflaking visible. A few feather-terminated microflakes, and a little bit of step fracturing, but otherwise not much. The edge appears quite sharp, suggesting to me that I may not see much with the ILM.

**INCIDENT LIGHT:** no polish or striations detected.

**ACC #: 15282**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** complete specimen, not very long. Expands from the proximal end. Secondary modification applied to the distal margin. Edge angle is moderate. Some damage to the ventral surface of this distal margin as well. Distal margin appears somewhat serrated.

**STEREOSCOPIC:** microflaking (feather terminated) along L end of distal margin. Micro-step fracturing near middle and right end. Edge margin is relatively sharp. Quite a lot of crushing near the midpoint. This material appears quite lustrous. May be difficult to see polish.

**INCIDENT LIGHT:** no polish detected along dorsal surface of distal margin. Some striations running in all directions. On the ventral surface, near the R margin of the tool, one patch of flat, dull, and somewhat pitted polish (?). No other traces.

**ACC #: 15289**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** blade-like flake with intentional modification at the distal end. Flakes are very small and edge angle is not very steep. The distal end of this flake curves ventrally, making it look a bit like the working edge of an end scraper.

**STEREOSCOPIC:** mostly feather-terminated microflakes, with only a couple of micro-step fractures detected. The edge exhibits fairly pronounced abrasion. Edge damage is restricted to the dorsal surface.

**INCIDENT LIGHT:** rough, pitted, but bright polish seen all along the flaked distal end, on the dorsal surface, and sneaking over onto the ventral surface where the edge margin is rounded off. This edge also exhibits striations that run perpendicular to the working edge (i.e. transverse to the tool).

**INTERPRETATIONS:** hide scraping?

**ACC #: 15321**

Tool Type: RFL (intentionally modified flake)

**MACROSCOPIC:** flake fragment, but I can't tell the orientation. Secondary modification at end opposite to the major heat break. Edge is quite steep and thick, and may actually represent a chunk of a biface, rather than a modified flake, but it is very hard to tell.

STEREOSCOPIC: a lot of step fracturing, including macro and micro. Edge is relatively sharp. I'm not sure there will be any polish.

INCIDENT LIGHT: as expected, no polish or striations detected.  
Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: distal flake fragment with significant thermal damage. Secondary flaking applied to L and R margins. Edge angles of both worked margins are quite moderate (R is more acute than L).

STEREOSCOPIC: both L and R margins covered with micro-step fractures. Edges are relatively sharp (i.e. not abraded).

INCIDENT LIGHT: no polish detected.

**ACC #: 15362**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: angular flake fragment with intentional modification along only intact lateral margin. Breaks are thermal in origin. Flaking terminates in step fractures. Edge angle is fairly acute.

STEREOSCOPIC: microflaking seen within the larger secondary flake scars, all along the worked edge. The edge appears quite sharp. Edge damage is restricted to the dorsal surface.

INCIDENT LIGHT: no polish detected.

**ACC #: 15375**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: angular flake fragment (thermal breaks) with intentionally applied secondary flaking along R margin. Edge angle is relatively steep; edge somewhat "serrated"

STEREOSCOPIC: significant microflaking all along the worked edge. Much of this is micro-step fracturing. Edge appears relatively sharp.

INCIDENT LIGHT: material is very lustrous and very coarse-grained at high magnifications, making polish detection nearly impossible. No polish or striations visible.

**ACC #: 15401**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: medial flake fragment with thermal breaks. Secondary flaking applied to R margin, which is very steep. Many step fractures.

STEREOSCOPIC: lots of micro-step fracturing all along the edge. Edge margin is quite sharp. Can also see more thermal damage – cracking in a lot of spots. Not sure I expect to find much with the ILM.

INCIDENT LIGHT: no polish detected.

**ACC #: 18007**

Tool Type: RFL (intentionally modified flake)

MACROSCOPIC: flaking restricted to L margin, around the rounded midpoint. See intentional flaking to shape the edge, as well as some microflaking.

STEREOSCOPIC: see microflaking (feather) as well as some incredibly tiny step fractures in a few isolated locations right along the tool margin. Microflaking restricted to the dorsal surface. No edge rounding noted.

INCIDENT LIGHT: no polish detected.

## **UNINTENTIONALLY MODIFIED FLAKES**

**ACC #: 10239**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: flake is blade-like in appearance, but not true blade. Looks more like biface flake. Long, narrow flake with edge damage noted along R margin. R margin is straight and serrated. Damage noted on both dorsal and ventral surfaces.

STEREOSCOPIC: microflake scars are deep but all feather-terminated. They are distributed a bit sporadically on both dorsal and ventral margins.

INCIDENT LIGHT: no polish noted on dorsal surface, but striations oriented transversely to the working edge.

Some isolated incredibly bright patches on both the dorsal and ventral surfaces near the proximal end. These are most likely metal smears from “shovel retouch.”

INTERPRETATIONS:

**ACC #: 10421**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: thick distal flake fragment with significant crushing noted along the L margin. Edge is straight and thick, and the flaking angle is quite steep.

STEREOSCOPIC: larger flake scars contain smaller microflake scars right at the edge of the working margin. Toward the proximal portion of this edge (near the break), see a series of finer, feather-terminated microflakes. Damage is restricted to the dorsal surface. Edge appears somewhat blunted because the flaking angle is so steep. It’s not actually rounded off; it just doesn’t appear terribly sharp.

INCIDENT LIGHT: patches of generic weak polish noted along much of the length of this tool. These patches are brighter than the surrounding material, but still appear relatively “rough” (pitted-looking). One patch, located right at the midpoint of this edge, is relatively bright (brighter than the rest), but is still fairly rough. At the very distal end of the working margin, up on the surface away from the immediate edge, is a patch of extremely bright but rough polish. It is a little less pitted than the rest of the patches, but it is still not really identifiable to any particular work action. No striations associated with this patch, and only a couple elsewhere on the tool (transverse).

On the ventral surface, right at the proximal end (near the break), see abraded-looking area with rough-looking polish and transverse striations.

## INTERPRETATIONS:

### **ACC #: 10533**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** this may be a utilized blade, but it is fragmentary so difficult to determine. It is a large, relatively narrow flake with evidence for use along both L and R margins. L margin it is restricted to the distal half of the margin. Most of the use along the R margin is near the distal end, but there is a bit of sporadic microflaking near proximal end. L margin is slightly convex. R margin is slightly concave at proximal end, slightly convex at distal end.

**STEREOSCOPIC:** L margin: microflaking is continuous but not very intense (not a lot of flakes). Edge margin is relatively steep. Flakes are mostly feather-terminated, although there are a couple of step-terminated microflakes as well. Flaking is restricted to the dorsal surface.

R margin: flaking is continuous and more pronounced than on L margin. A fair bit of micro-step fracturing, but also feather-terminated. The margin is very steep. Microflaking restricted to the dorsal margin, except for a couple of isolated microflakes on the ventral surface, but these may be non-intentional forms of damage.

**INCIDENT LIGHT:** L margin: close to the distal end, patch of polish that is relatively poorly linked, except for a few flat, smooth, bright patches. This area of polish also contains striations that run transverse to the working edge. It is bright, but rough-looking (except for the small smooth patches). Other than that one patch, though, no other wear traces noted.

R margin: no polish or striations detected along this margin. The material looks coarser on this edge.

## INTERPRETATIONS:

### **ACC #: 10621**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** small, thin, biface flake with edge damage noted along R dorsal margin. This margin is straight to slightly undulating and fairly thin, but flaking appears to be relatively steep. Damage appears to be restricted to the dorsal surface.

STEREOSCOPIC: flaking is continuous and quite steep. There are a couple of spots that look like breaks rather than areas of flaking. A lot of the microflaking appears to exhibit step terminations.

INCIDENT LIGHT: material was extremely lustrous, so I don't think any of the bright patches I saw were actually polish. But I did note several scattered patches of striations along the dorsal margin (especially near the distal portion of the edge). These striations ran mostly transverse to the working edge, although there were a few spots where the orientation was more oblique.

INTERPRETATIONS:

**ACC #: 10691**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: complete "pointed-looking" flake with edge damage noted along R-distal margin on dorsal surface. Edge is convex overall and is moderately thin. Flaking angle does not appear to be too steep.

STEREOSCOPIC: microflaking is fine (small), continuous and almost exclusively feather-terminated. A few step terminated flakes. Most of the damage is restricted to the dorsal surface, although there are a very few microflakes also located on the ventral surface of this margin.

INCIDENT LIGHT: no polish noted, except for the possibility of some extremely weak generic-weak polish right along the very distal-dorsal part of the worked margin. One small patch of transverse striations on the ventral surface, and a possible patch of oblique-longitudinal striations on the dorsal surface (but it was in a region of some concretions, so it was hard to tell for sure). All-in-all, not very informative!

INTERPRETATIONS:

**ACC #: 10707**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: elongated flake with parallel dorsal flake scars – looks blade-like. Edge damage noted along R proximal margin. This worked edge is straight to somewhat undulating. Flake scars are large, but not large enough to be classified as purposeful flaking; they are continuous and edge is relatively steep.

STEREOSCOPIC: larger flake scars contain much finer microflake scars, located right along the edge margin of the tool. Larger flake scars are feather-terminated, but many of the smaller microflake scars exhibit step terminations – makes the very edge margin appear somewhat crushed. Edge is not rounded, but appears somewhat blunted thanks to the steep flaking angle.

INCIDENT LIGHT: all the “breaks” from the microflakes still appear quite fresh – like material was being removed faster than any polish could develop. No polish or striations noted.

INTERPRETATIONS:

**ACC #: 10788**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: thick flake fragment with edge damage noted along L distal-ventral and distal-ventral margin. Margin is straight (although outline is broken – i.e. L margin meets distal margin at an obtuse angle). This edge is moderately thin and flaking angle appears quite moderate as well.

STEREOSCOPIC: microflaking is relatively continuous. Microflakes are fairly evenly divided between those with feather and those with step terminations. Edge appears relatively “sharp” – i.e. very little rounding.

INCIDENT LIGHT: distal margin, at the little “peak” near the right margin, a brighter patch that showed smoothed/abraded looking polish and some striations running slightly oblique to the working edge. Other than this one patch, though, no wear traces noted.

INTERPRETATIONS:

ADDITIONAL COMMENTS:

**ACC #: 11454**

Tool Type: UFL

MACROSCOPIC: flaking and microflaking along margin A (distal) and all of margin B; also multiple step fractures (crushing?) in some zones, especially along margin B. Microflakes appear

in discontinuous patches along dorsal and ventral surface of A; appear to be restricted to dorsal surface of B.

**STEREOSCOPIC:** microflaking is discontinuous along A, with flakes appearing in patches on both dorsal and ventral surface. Along B, microflakes are restricted to the dorsal surface and are distributed much more continuously. Significant “crushing” (multiple step fractures) along B

**INCIDENT LIGHT:** a few patches of very diffuse, non-specific polish along margin B (distal). These appear on the very apex of the edge, and on a couple of high points. Cannot offer interpretation of polish type.

**ACC #:11542**

Tool Type: UFL (unintentionally modified)

**MACROSCOPIC:** triangular distal flake fragment with microflaking visible along both L and R margins. L margin there are some larger flakes that may have been removed intentionally, but the remainder of the flaking is unintentional microflaking. Along R margin, looks like continuous, fine microflaking. There is a “notch” on the R margin, although it does not appear to have been intentionally produced (just looks like the edge got broken). L margin is straight; R margin is straight except for the “notch.”

**STEREOSCOPIC:** L margin: microflaking is fine and continuous. Almost entirely feather-terminated flake scars. Edge angle is quite moderate (and edge is very thin).

R margin: edge angle is significantly steeper than on L margin. Flake scars are deep; more step terminations noted. The notch definitely does not appear to have been purposefully produced.

**INCIDENT LIGHT:** no polish or striations detected on either margin.

**ACC #: 11586**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** piece is almost “humpbacked”, being much thicker at the proximal end. Quite continuous flaking visible along the L margin. These flakes are a little larger than what we might think of as “microflaking,” but still do not really have the appearance of purposeful retouch of

the working edge. The few larger scars are quite sporadically located and it really doesn't appear as though any of this flaking was applied to alter the edge. Working edge is slightly convex. Edge angle is moderate.

**STEREOSCOPIC:** only evidence of edge damage is along that L margin. See lots of microflaking (quite continuous) along with some step fracturing, especially near the proximal end. A couple of larger flake scars near the distal end (they look fresher – no rounding of the scar margins, unlike elsewhere along the edge.)

**INCIDENT LIGHT:** striations running perpendicular (transverse) to the working edge, in the region near the step fracturing at the proximal end (about a third of the way along the length of the tool edge). A small patch of smooth, dull polish nearer to the distal end of the tool edge – at the point of maximum convexity, before the edge begins to straighten out. This patch is in from the very edge of the tool and is relatively small. Quite dull-looking; appears to have smoothed the surface.

A little peak, about half way along the tool edge. At this point, looking at the specimen edge-on, see some edge rounding, accompanied by dull, rough-looking polish and transverse striations. Same closer to the proximal end (near the patch of step-fracturing).

**ACC #: 13664**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** large, thick flake with mostly cortical dorsal surface. Edge damage noted along one portion of ventral surface of distal margin (the portion near the right flake margin, if looking at the tool from the dorsal surface). Used edge is straight, relatively thin, with continuous microflaking visible.

**STEREOSCOPIC:** microflaking actually extends onto R margin, ventral, as well. Most of the microflaking is feather-terminated, but a few step terminations were noted as well. In addition to the damage noted on the ventral surface, there are a few microflake scars on the dorsal surface along the distal margin, as well as the slightly concave R margin (esp. near the proximal end of the flake). Microflaking on the dorsal surface is sporadic.

**INCIDENT LIGHT:** distal-ventral margin – a few scattered patches of possible generic-weak polish that is dull and poorly linked. In one of these patches, a little past the half-way point, toward the L (from dorsal) margin, detected a patch of multidirectional striations.

R margin, ventral surface, an elongated patch of generic weak polish runs along very edge of tool margin.

**ACC #: 13667**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** small, triangular flake with edge damage noted along R and distal margins. R margin is straight; distal margin is undulating. Edges are not very thin; edge angles relatively steep. Edge damage along R margin is finer-looking – perhaps more definitely related to use. Damage along distal margin is coarser-looking and may be related to production rather than use.

**STEREOSCOPIC:** R margin: a fairly even mix of feather and step terminations. Flaking is varied in size. Looks relatively coarse close-up, even though it is finer-looking than the flaking seen along distal margin. A few microflakes seen on ventral surface, but most are restricted to dorsal surface.

Distal margin: flaking is extremely coarse and almost entirely step-terminated. Flake scars are deep and a bit sporadic. Flake scars on both dorsal and ventral surfaces (although ventral flake scars are more restricted in distribution).

**INCIDENT LIGHT:** material appears relatively coarse-grained at high magnifications. No polish detected.

**ACC #: 13758**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** large flake fragment with evidence of use on multiple margins. L-dorsal margin appears to have a bit of intentional modification as well as some microflaking suggestive of use. The R-dorsal margin exhibits only what appears to be use-related modification (all microflakes, quite continuous, no apparent attempts to modify the margin), and distal-ventral margin exhibits some marginal microflaking in the area of a larger flake removal. All edges are straight and moderately acute.

**STEREOSCOPIC:** L margin, where we see larger flake removals, also exhibits microflaking, including a lot of micro-step terminated flakes. This microflaking is continuous. See some edge rounding – looks ground down. It is difficult to tell if this damage is related to use or to production.

R margin: no larger intentional flaking, but a lot of microflaking extending all along the edge. This microflaking includes a lot of step-terminated microflakes (lots of crushing apparent), including a couple of flakes on the distal-ventral surface. Edge appears to be a bit rounded off in

spots, but the material is almost crumbly-looking at this higher magnification, so it is not smooth and rounded, but a bit lumpy.

Distal-ventral margin: the microflaking is located within what appears to be a larger unintentional flake scar – a break. The edge is so sharp that I'm suspicious that this doesn't represent use wear but instead is just spontaneous flaking as a result of non-use-related damage.

INCIDENT LIGHT: L margin: nothing of note, except 3 possible transverse striations (although I'm not sure I really feel confident in calling them striations).

R margin: near the distal end, at the break in the margin outline, there is a patch that shows edge rounding and what may be very weak polish accompanied by several transverse striations. This patch of polish is even more distinct where you "turn the corner" and straighten out on the main part of the R margin (i.e. proximally from the previously mentioned patch of polish). Many more transverse striations in this region of edge rounding. The polish is very poorly developed and poorly linked, and looks more like grinding down/edge rounding than any sort of brightly visible polish. Another very faint patch just past the slight concavity in the margin beyond this previously mentioned patch.

No wear detected on distal margin.

**ACC #: 13760**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: flake fragment with evidence for utilization along the R margin (micro and more macro-flaking). This flaking is continuous along the R margin. There are some very small flakes removed from the L margin as well, but these are quite discontinuous and likely represent incidental damage not related to use. R margin is straight to very slightly concave, and angle is quite acute.

STEREOSCOPIC: the flakes on the L margin do not appear to be use-related. They look, instead, like small breaks along a very thin margin.

R margin: continuous microflaking, almost all feather terminated, with only a few step terminations noted. Flake scar sizes are variable, from ones that are better called "macro-flakes" to very small marginal flakes. This flaking appears almost exclusively on the dorsal surface, but a couple of microflakes were noted on the ventral surface right at the distal end. Edge margin appears quite sharp.

INCIDENT LIGHT: material appeared very coarse grained at high magnifications. No polish or striations were detected.

**ACC #: 13765**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** short, wide, thick flake with cortical platform. Evidence of use (macroscopically-visible microflaking) along the distal margin. Edge is straight and edge angle is quite acute.

**STEREOSCOPIC:** microflaking seen relatively continuously (except along the leftmost quarter of the edge) along the edge. Microflakes exhibit both feather and step terminations. Edge appears quite rounded in several spots – can even see rounding off of the margins of the microflake scars.

Edge damage is restricted to the dorsal surface.

**INCIDENT LIGHT:** all along the edge there is evidence of generic-weak polish. It is poorly-linked and relatively dull and rough in appearance. Toward the middle and right-hand end of the distal margin this polish is restricted to the very highest points of the edge margin, creating a thin, silvery band when examined edge-on.

At the left-hand end of the distal margin, though, the edge rounding and accompanying polish is more pronounced, having produced a broad, flat-ish surface. Here we see very poorly-linked but extensive generic-weak polish accompanied by a few sparsely distributed transverse striations.

**ACC #: 13791**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** large decortication flake (most of dorsal surface covered in cortex) with some edge damage along the distal-right end. There is also a tiny bit of damage noted on the L margin, but this is in association with a relatively large but isolated flake scar that appears to have been spontaneously removed (i.e. doesn't appear to be purposeful). Working edge morphology: straight and moderate angle. Can see some larger flake scars and probable evidence of microflaking within them.

**STEREOSCOPIC:** microflaking is relatively continuous along the used portion of the distal end. See small flake scars within the larger flake scars noted at the macroscopic level, as well as microflaking that continues between these larger scars.

A few flake scars noted on the ventral surface, but most of this damage is restricted to the dorsal surface.

No evidence of edge rounding – edge appears quite “sharp.”

INCIDENT LIGHT: no polish or striations detected.

**ACC #: 13899**

Tool Type: UFL

MACROSCOPIC: fairly minimal evidence for edge damage. Some microflaking apparent along margin A near distal end. Other than that one spot, though, no evidence for any potential use-related damage – only manufacturing.

STEREOSCOPIC: microflaking along much of margin A, but nowhere else on specimen. There is step fracturing along margin B, but it appears to be related to manufacturing (attempts to thin the specimen) and not to use.

INCIDENT LIGHT: no polish detected.

**ACC #: 14602**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: medial flake fragment with edge damage noted along both L and R margins. Both margins are straight and fairly thin. Flaking angle is difficult to assess macroscopically because the flakes are so small.

STEREOSCOPIC: L margin: flaking near proximal end is quite steep and looks more like incidental breaks rather than use-related flaking. Distally from this area of flaking is less steep, somewhat sporadic, fairly fine where it exists. Some successive step fracturing in spots (crushing). Some edge rounding noted. Majority of flaking is seen on the dorsal surface, although some was noted on the ventral surface as well.

R margin: flaking on both dorsal and ventral surfaces. This microflaking is quite fine and is continuous, though restricted. Edge appears very mildly rounded.

INCIDENT LIGHT: L and R margins: patches of polish and continuous polish ribbons along both dorsal and ventral surfaces. Polish is quite continuous on both margins, both faces. Striations running in all directions. Edge rounding noted in several spots.

INTERPRETATIONS: not heavy use on a hard material. Perhaps butchering, slicing. Short, multidirectional striations – whittling or general cutting? Could be wood. Probably not bone. One patch of polish (nicely rounded and looks like it flows over) that is pretty characteristic of wood. Possibly general-use tool?

**ACC #: 14622**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: lateral fragment with damage all along the intact edge. Damage is fine and continuous. Edge is not very thin, is convex, and edge angle appears relatively steep.

STEREOSCOPIC: microflaking is fine, continuous, fairly steep and mostly feather terminated. A few micro-step fractures. Edge margin is relatively sharp. Some of the microflakes are fairly deep, contributing to steepness of working edge. Microflaking is restricted to the dorsal surface.

INCIDENT LIGHT: material is very coarse grained and “sparkly” at high magnifications. No polish or striations were detected.

**ACC #: 14602**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: medial flake fragment with edge damage noted along both L and R margins. Both margins are straight and fairly thin. Flaking angle is difficult to assess macroscopically because the flakes are so small.

STEREOSCOPIC: L margin: flaking near proximal end is quite steep and looks more like incidental breaks rather than use-related flaking. Distally from this area of flaking is less steep, somewhat sporadic, fairly fine where it exists. Some successive step fracturing in spots

(crushing). Some edge rounding noted. Majority of flaking is seen on the dorsal surface, although some was noted on the ventral surface as well.

R margin: flaking on both dorsal and ventral surfaces. This microflaking is quite fine and is continuous, though restricted. Edge appears very mildly rounded.

INCIDENT LIGHT: L and R margins: patches of polish and continuous polish ribbons along both dorsal and ventral surfaces. Polish is quite continuous on both margins, both faces. Striations running in all directions. Edge rounding noted in several spots.

INTERPRETATIONS: not heavy use on a hard material. Perhaps butchering, slicing. Short, multidirectional striations – whittling or general cutting? Could be wood. Probably not bone. One patch of polish (nicely rounded and looks like it flows over) that is pretty characteristic of wood. Possibly general-use tool?

**ACC #: 14622**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: lateral fragment with damage all along the intact edge. Damage is fine and continuous. Edge is not very thin, is convex, and edge angle appears relatively steep.

STEREOSCOPIC: microflaking is fine, continuous, fairly steep and mostly feather terminated. A few micro-step fractures. Edge margin is relatively sharp. Some of the microflakes are fairly deep, contributing to steepness of working edge. Microflaking is restricted to the dorsal surface.

INCIDENT LIGHT: material is very coarse grained and “sparkly” at high magnifications. No polish or striations were detected.

**ACC #: 14686**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: small, biface-derived (?) flake with edge damage noted along L ventral and R dorsal margins. L margin consists of 2 straight edge portions that meet at an obtuse angle near the midpoint of the edge length. R margin is continuous and mildly concave. Neither edge appears very thin, and flaking angle is relatively steep. Damage appears continuous along both margins.

STEREOSCOPIC: L margin: flaking appears continuous. It is very steep, and mostly feather-terminated (although a few step terminations as well). Some edge rounding is visible.

R margin: flaking is continuous, steep, and exhibits step terminations for the most part. A bit of edge rounding is visible.

INCIDENT LIGHT: this particular material was very coarse grained in appearance at 100x and 200x. I detected no striations or polish formation.

**ACC #: 14699**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: blade-like flake (I think it looks like a biface flake, although the platform is missing) with proximal damage. Edge damage noted along R dorsal margin. There is also some flaking noted (not microflaking, but larger secondary flaking) along L ventral margin, although it is sporadic and does not appear to be associated with use.

R margin is mildly concave and is fairly thin and flaking angle appears moderate.

STEREOSCOPIC: microflaking along the R dorsal margin is coarse-looking. Microflake scars are deep and often end in step terminations (edge crushing). Flaking is relatively continuous.

Dorsal surface of this flake is covered with concretions from the cave flowstone, but I think I'll be able to examine just the edge margin with some success.

INCIDENT LIGHT: a couple of transverse striations noted, as well as a couple of sporadically located brighter patches that may be generic weak polish. Nothing too prominent, though.

**ACC #: 14701**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** small, thin, narrow blade-like flake with edge damage noted along R ventral margin. This margin is straight and thin, but the flaking angle is pretty steep. Edge damage appears continuous and fairly fine.

**STEREOSCOPIC:** steep, continuous microflaking with many step terminations (edge crushing). Edge appears only moderately rounded in a few spots; otherwise fairly “sharp” in appearance.

A little bit of extremely fine microflaking along R proximal-dorsal margin. Edge here is also very sharp and is straight.

**ACC #: 14966**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** expanding biface flake with edge damage noted along R distal-ventral margin. This used edge is mildly concave, not very thin, and flaking angle is quite steep. This piece exhibits thermal alteration and is reddened in the area of the use wear.

**STEREOSCOPIC:** microflaking is continuous and includes both feather and step-terminated flakes. Fine step-terminated microflakes right along very edge. Edge appears fairly sharp. Microflaking is very steep.

**INCIDENT LIGHT:** material appeared quite lustrous on its own. No polish or striations detected.

**ACC #: 15023**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** proximal flake fragment with damage noted along R ventral margin. Used margin is straight, moderately thin, and flaking angle appears quite moderate. Dorsal surface is covered in flowstone.

**STEREOSCOPIC:** microflaking consists of fine, shallow, almost exclusively feather-terminated flakes. These are continuous and appear to be restricted to the ventral surface. Appears to be some mild edge rounding.

INCIDENT LIGHT: there is a protuberance along the worked edge, a little over half way along from the proximal end. On this protuberance (edge and surface) see very many fine, longitudinal striations, along with patches of smooth, relatively bright, but somewhat pitted polish, rife with striations. Same wear patterns visible on both sides of the protuberance (i.e. proximal and distal).

On the other face of this protuberance (i.e. dorsal face, which is covered in flow-stone) see ribbon of polish and some edge rounding, and I believe a small patch of what looks like the same “bone polish” with striations seen on the ventral surface.

Another small, less pronounced patch of striations and similar looking polish toward the proximal end of the tool. It looks much like the patch described above, but just not as good.

INTERPRETATIONS: Bone? The pitting is reminiscent of Keeley’s description of apatite crystals from bone appearing in bone polish. The edge collapse (signaled by the presence of “sugary” looking patches along the edge margin) suggests a harder material.

**ACC #: 15099**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: distal flake fragment, pointed at distal end, with edge damage noted along both faces of L margin and sporadically along the R ventral margin (as well as a couple of flakes removed from R dorsal margin). L margin is convex and exhibits a moderate angle. R margin is fairly thick and is straight.

STEREOSCOPIC: L margin: microflaking is coarse and somewhat sporadic, although it does stretch along most of the edge, and is bifacial. Edge margin appears rounded off when observed edge-on.

R margin: flaking is more of the “macro” variety, is very coarse, and is quite sporadic. I don’t think it’s related to use.

INCIDENT LIGHT: patches of generic-weak polish scattered along the L margin. But more visible than any polish is the step fracturing that is seen all along dorsal-distal. On L ventral margin, a patch of more prominent polish. It is dull-looking, and at 200x just looks abraded – surface topography smoothed off. Within this patch, a few striations running oblique to the edge. This patch of polish was actually located away from the immediate edge margin, onto the surface of the tool (though not far onto the surface). Near break at the proximal end, another similar patch of dull-looking, abraded polish. No striations detected in this one.

**ACC #: 15124**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: lateral flake fragment with damage noted along the remaining intact edge. Edge is thin, slightly convex, and flaking angle appears relatively moderate. Damage appears continuous along the margin.

STEREOSCOPIC: microflaking is continuous, variable in size, and consists of larger feather-terminated flakes that extend toward the dorsal tool surface, with smaller step-terminated flakes near the edge. Very mild edge rounding noted.

INCIDENT LIGHT: a few transverse striations. About half way along the margin, on the straight portion (prior to the major break in edge outline), there is a small patch of dull, flat-looking polish that is poorly linked.

**ACC #: 15131**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: biface flake with edge damage noted along R margin. Damage is continuous, but restricted to a relatively small portion of the edge. The edge is somewhat thin, but the flaking is steep. Edge is straight.

STEREOSCOPIC: microflake scars are deep and steep, and are located continuously along this one patch of the R margin. Flake scars appear to be feather-terminated for the most part, but they are fairly invasive (deep). Edge damage restricted to dorsal surface.

INCIDENT LIGHT: no polish or striations detected.

**ACC #: 15133**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: complete flake with edge damage detected on L ventral margin. L margin is relatively straight, not overly thin, and edge angle is moderate.

STEREOSCOPIC: microflaking is continuous along only a portion of the edge. Flake scar sizes are variable. Most are feather-terminated. Edge is severely abraded/rounded. The microflaking is restricted to the ventral surface (except for a very few step-terminated microflakes seen on the dorsal surface, but these are very sporadically located).

Severe edge rounding also noted on the R margin, but this is not accompanied by any microflaking. R margin is concave.

INCIDENT LIGHT: material appears very coarse-grained at these high magnifications; polish development is minimal. On the L dorsal margin, at the highest “peak” along that edge, there is a very small patch that is flat (dull) and smooth (well-linked). It is the only indication of any polish on this tool.

**ACC #: 15164**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: distal flake fragment with edge damage noted along R dorsal and L ventral margins. Margins are essentially straight. R margin is fairly thin and angle appears to be relatively acute. L margin has slightly steeper flake scarring (almost looks like it might have been incidental, not related to use).

STEREOSCOPIC: R margin exhibits fairly continuous flaking that includes some feather-terminated flake scars and a lot of step-terminated. Flakes appear relatively uniform in size. Edge is fairly sharp, but does exhibit a few more rounded-off areas as well.

L margin looks more like unintentional breakage rather than use, but I will check it under the ILM. Sharp, angular breaks; steep flaking angle; only a small portion of the edge is affected.

INCIDENT LIGHT: R margin shows very little polish, except near the distal end (which is a bit rounded off). Right at the very distal end of this margin there is a patch of generic weak polish that is noted edge-on and also extends onto the surface of the working edge. This patch is only slightly brighter than the surrounding stone and is poorly linked, but at 200x appears a bit abraded. Slightly proximally from this patch there is one very small patch of flat-looking polish (it is quite bright white in appearance, but is no lustrous. Also “flat” in the topographic sense).

L margin: very angular and does not appear to be use-related.

**ACC #: 15199**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: distal flake fragment, very pointed at distal end. Edge damage noted along both L ventral and R dorsal margins. L margin is undulating; R margin is straight. Both edges are somewhat “thick” and edge angles are moderate.

STEREOSCOPIC: L margin, ventral surface, is covered in variably sized microflake scars. Larger, coarser ones (very often step-terminated) that created relatively steep edge angle, with smaller, finer ones (mostly feather-terminated) right along the very edge of the margin. Larger scars are relatively deep; smaller scars are quite shallow. A few step-terminated microflake scars at proximal end of L dorsal. One potlid noted on L dorsal-distal end.

R margin, dorsal surface, shows somewhat sporadic microflaking, almost all step-terminated (looks very crushed, as the edge angle is relatively steep).

INCIDENT LIGHT: a few short striations running oblique to the working edge on the L ventral margin.

**ACC #: 15250**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: proximal fragment of very large flake with edge damage noted along L margin, dorsal and ventral surfaces. Edge damage is more continuous on ventral surface but is also apparent on dorsal. Working edge is mildly concave and is relatively thin.

STEREOSCOPIC: microflaking visible all along ventral surface (continuous). Flake scar sizes quite variable. Most of the scars exhibit feather terminations, although there are many hinge and step terminations as well.

Along dorsal surface, microflaking is more sporadic. See many more step fractures as well as angular breaks.

Edge is relatively sharp (not very much rounding off).

INCIDENT LIGHT: no polish or striations detected.

**ACC #: 15261**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: flake fragment. Can't tell orientation. Radial break. Edge damage along the only intact edge. Edge is undulating, not overly thin, and has moderate angle.

STEREOSCOPIC: microflaking is continuous, varied in size, mostly feather-terminated. Restricted to dorsal surface.

INCIDENT LIGHT: no polish detected, but several striations noted along the length of the working edge, oriented transversely to the edge.

**ACC #: 15302**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: wide, short flake with edge damage along wide, straight distal margin. Distal portion of tool has flat, weathered appearance and L margin appears cortical. Distal margin is thick and has relatively steep flaking angle. Edge damage appears continuous along entire distal margin.

STEREOSCOPIC: microflaking is fine, continuous, consistent in size (quite small), and almost all feather-terminated (a very few step fractures). Majority of microflaking on the dorsal surface, although a few sporadic microflakes removed from ventral surface as well.

INCIDENT LIGHT: right at the midpoint of the used edge, there is a small patch of dull polish visible. It appears abraded, smoothed at 200x.

**ACC #: 15327**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: biface (?) flake with apparent use along slightly concave L margin. Flake scars are visible macroscopically, but they are relatively small and do not appear to have been purposefully applied. The edge is quite thin and the edge angle is very acute. Flaking appears quite continuous along this tool margin.

STEREOSCOPIC: at higher magnification, the edge angle actually appears steeper (i.e. the angle produced by the microflake scars). Primarily feather-terminated microflake scars (only a couple of step fractures). Edge damage restricted to the dorsal surface (except for 1 microflake scar right near the distal end on the ventral surface).

INCIDENT LIGHT: material is very coarse-grained. No polish or striations were detected.

**ACC #: 15364**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** appears to have been a fragment of a biface flake, missing its very proximal end (platform is gone, but otherwise looks relatively complete). Very fine flaking (microflaking) noted along the L, R, and distal margins. This flaking appears quite continuous. L margin is straight, except there is a break in the outline morphology where the margin angles in toward the distal margin; R and distal margins are more variable/undulating. Edges are very thin.

**STEREOSCOPIC:** despite the thin edges, the angle of the microflaking along all margins is relatively steep. Flaking is more continuous along the R and distal margins than the L, which is a bit more sporadic. L margin see flaking both on the dorsal and ventral surfaces; R margin, flaking is restricted to dorsal surface; distal margin, flaking restricted to dorsal surface.

**INCIDENT LIGHT:** L margin: several isolated patches of possible generic-weak polish. Near the break in the margin outline, just a little proximally from it, a larger patch of polish that extends into a long ribbon of generic-weak polish that is rife with striations. Most of these striations run transverse to the working edge, but there are also some that run diagonally to the edge margin. The polish in this locale is dull-looking and poorly formed (not well-linked). Microtopography just appears to be mildly worn down, but not significantly. At the terminus of the L margin, almost to where it meets the distal margin, see another patch of generic-weak polish, restricted to a ridge. At 200x can see the abrasive appearance of this polish, but it still is not well linked. It is a bit brighter than the other patches of polish noted, but still fairly dull in appearance. It runs long this ridge, making a sort of silvery ribbon. (This is all on the dorsal surface.) Edge-on, not much of note, except some transverse striations close to the point where they were seen on the surface of the used margin.

No other notable wear traces on either the R or distal margins.

**ACC #: 15384**

Tool Type: UFL (unintentionally modified)

**MACROSCOPIC:** flake fragment with radial break. Continuous microflaking along R margin. R margin is straight and edge angle is moderate.

**STEREOSCOPIC:** microflaking restricted to the dorsal surface. It is continuous and fairly fine (i.e. small scars). Much of the microflaking is step-terminated, although there are some feather-terminated flakes as well. Edge is relatively sharp. Edge looks quite crushed in a few spots.

**INCIDENT LIGHT:** about a third of the way up from the distal end of the R margin there is a small patch of polish that is very flat, smooth, but not very bright (no luster). Another patch a

little bit proximally up from this first patch (and closer to edge margin). This second patch exhibits multiple striations running longitudinally to the working edge.

**ACC #: 15408**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** large, square-ish flake with apparent use damage along distal margin. Used margin is straight to slightly convex and is moderately acute. Quite continuous microflaking is visible along the distal margin, and near the distal-right corner.

**STEREOSCOPIC:** the microflaking is continuous and restricted to the dorsal margin. The majority of the microflakes are step-terminated. There is one damage-free stretch along the margin (toward the R-hand end), but then flaking continues from that point to the juncture with the R margin. Edge margin is relatively sharp.

**INCIDENT LIGHT:** really no polish detected. A few spots that looked like generic-weak, but I think this was just the nature of the raw material. May have noted a few transverse striations, but even these were quite indistinct.

**ACC #: 15364**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** appears to have been a fragment of a biface flake, missing its very proximal end (platform is gone, but otherwise looks relatively complete). Very fine flaking (microflaking) noted along the L, R, and distal margins. This flaking appears quite continuous. L margin is straight, except there is a break in the outline morphology where the margin angles in toward the distal margin; R and distal margins are more variable/undulating. Edges are very thin.

**STEREOSCOPIC:** despite the thin edges, the angle of the microflaking along all margins is relatively steep. Flaking is more continuous along the R and distal margins than the L, which is a bit more sporadic. L margin see flaking both on the dorsal and ventral surfaces; R margin, flaking is restricted to dorsal surface; distal margin, flaking restricted to dorsal surface.

**INCIDENT LIGHT:** L margin: several isolated patches of possible generic-weak polish. Near the break in the margin outline, just a little proximally from it, a larger patch of polish that extends into a long ribbon of generic-weak polish that is rife with striations. Most of these striations run transverse to the working edge, but there are also some that run diagonally to the edge margin. The polish in this locale is dull-looking and poorly formed (not well-linked).

Microtopography just appears to be mildly worn down, but not significantly. At the terminus of the L margin, almost to where it meets the distal margin, see another patch of generic-weak polish, restricted to a ridge. At 200x can see the abrasive appearance of this polish, but it still is not well linked. It is a bit brighter than the other patches of polish noted, but still fairly dull in appearance. It runs long this ridge, making a sort of silvery ribbon. (This is all on the dorsal surface.) Edge-on, not much of note, except some transverse striations close to the point where they were seen on the surface of the used margin.

No other notable wear traces on either the R or distal margins.

**ACC #: 15384**

Tool Type: UFL (unintentionally modified)

**MACROSCOPIC:** flake fragment with radial break. Continuous microflaking along R margin. R margin is straight and edge angle is moderate.

**STEREOSCOPIC:** microflaking restricted to the dorsal surface. It is continuous and fairly fine (i.e. small scars). Much of the microflaking is step-terminated, although there are some feather-terminated flakes as well. Edge is relatively sharp. Edge looks quite crushed in a few spots.

**INCIDENT LIGHT:** about a third of the way up from the distal end of the R margin there is a small patch of polish that is very flat, smooth, but not very bright (no luster). Another patch a little bit proximally up from this first patch (and closer to edge margin). This second patch exhibits multiple striations running longitudinally to the working edge.

**ACC #: 15408**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** large, square-ish flake with apparent use damage along distal margin. Used margin is straight to slightly convex and is moderately acute. Quite continuous microflaking is visible along the distal margin, and near the distal-right corner.

**STEREOSCOPIC:** the microflaking is continuous and restricted to the dorsal margin. The majority of the microflakes are step-terminated. There is one damage-free stretch along the margin (toward the R-hand end), but then flaking continues from that point to the juncture with the R margin. Edge margin is relatively sharp.

INCIDENT LIGHT: really no polish detected. A few spots that looked like generic-weak, but I think this was just the nature of the raw material. May have noted a few transverse striations, but even these were quite indistinct.

**ACC #: 17097**

Tool Type: UFL (unintentionally modified)

MACROSCOPIC: very thick flake with microflaking along entire R and distal margins. Edge is convex and edge angle is moderately steep.

STEREOSCOPIC: microflaking extends onto ventral surface in several spots along the R/distal margins. Most of the microflaking has step terminations. Edge is somewhat sharp along the distal part of the margin but exhibits fairly substantial rounding along the R margin.

INCIDENT LIGHT: despite what looked like great wear potential, no polish or striations detected on this specimen; just a lot of edge crushing.

**ACC #: 17116**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: large flake fragment with quite a lot of shiny, dark red cortical patina (not heated). Along the only straight, intact margin (the others are all broken and angular), substantial edge damage, but the flakes do not appear to have been applied purposefully. Edge angle is moderate, flaking is continuous, and it appears that there is a lot of crushing/step fracturing.

STEREOSCOPIC: whole utilized margin is covered with relatively large, continuous, very sharp-edged step fractures. Also some smaller and superimposed step fractures right along the edge margin (crushing along the edge). A few microflake scars on the ventral surface of the tool as well, but these are distributed quite unevenly.

INCIDENT LIGHT: difficult to determine flake orientation, but if we orient it so that the straight, worked margin is considered the “distal” end, then there is one small but bright patch of polish on the L end of the “distal” margin. This patch is quite lustrous, appears fairly abraded, and is moderately well-linked. No other polish noted along this margin, and no striations detected, either.

Midpoint of ventral surface, a patch of bright and moderately linked polish containing striations that run transverse to the working edge. Another patch seen on the L (from dorsal perspective) end of this margin (i.e. corresponding to the polish patch noted on the dorsal surface), a very

distinct, but small, patch of polish that is quite well-linked, bright, and smoothed (looks quite abraded, mounded). This patch of polish contains transverse striations.

**ACC #: 17129**

Tool Type: UFL

**MACROSCOPIC:** L margin has secondary flaking, modified into a fairly acute edge angle. R margin has evidence for use, but no secondary flaking (i.e. purposeful reduction). R margin exhibits microflaking. I don't see much evidence for use of the modified L margin.

**STEREOSCOPIC:** No evidence for use of L margin. R margin shows microflaking plus significant abrasion of the working edge. Microflaking is primarily seen on the dorsal surface, although there is some noted on the ventral surface as well.

**INCIDENT LIGHT:** relatively bright, but poorly formed and poorly linked polish along the R margin. Polish is restricted to the high points of the microtopography, generally following the crest of the edge. It is fairly continuous in spots, but not well-linked (i.e. it is ubiquitous in spots, but not a continuous "smear" of polish; rather a whole bunch of slightly interlinked little areas).

**INTERPRETATIONS:** presence of microflakes on both faces suggests cutting action, and the non-specific nature of the polish suggests a softer material such as meat.

**ACC #: 17148**

Tool Type: UFL (unintentionally modified flake)

**MACROSCOPIC:** very substantial (thick for its size) flake, complete, with edge damage noted along R dorsal margin. This margin has a basically straight outline, although there is a break in the outline morphology – two straight portions that meet at a fairly obtuse angle. Edge is not too thin (also not really thick); edge angle is fairly steep. Damage appears continuous.

**STEREOSCOPIC:** flaking is continuous and steep, and variable in size. Right along the very edge margin we see very small flakes, but larger ones are visible along the edge as well. Larger flakes, which stretch farther onto the surface of the tool from the margin, tend to exhibit feather terminations, while the smaller scars, restricted to the very edge margin, exhibit mostly step terminations (crushing right along the edge). Edge appears quite blunted because of the steepness of the microflaking (it's not rounded/abraded, nor is it sharp/thin looking; very squared-off). Edge damage is restricted to the dorsal surface.

INCIDENT LIGHT: approximately 1/5 of the way up from the proximal end of the worked portion, there are a couple of relatively smooth patches of polish. These patches are small, but they are bright and not too pitted. One shows fine striations running transverse to the working edge.

INTERPRETATIONS:

ADDITIONAL COMMENTS: labeled as a “scraper” on the bag. Large dorsal flake scar on the left side of the flake is very deep and makes a nice “thumb rest” when gripping the flake. This “thumb rest” is opposite the worked margin. Perhaps part of the appeal of this particular flake?

**ACC #: 17617**

Tool Type: Utilized Flake

MACROSCOPIC: beginning to think this may not actually be a graver. The “point” appears almost to be the result of a fortuitous break. I don’t see anything that resembles purposeful secondary flaking. There is some damage apparent along the R margin of the flake. Perhaps a Modified flake instead?

STEREOSCOPIC: macroscopic observations confirmed. Nothing that looks like purposeful secondary flaking in the “graver” portion of the tool (distal end). But there is microflaking apparent along the R-dorsal margin. None along ventral. Feather terminations – no step fracturing.

INCIDENT LIGHT: extensive weak polish all along the R dorsal margins, close to, but not exclusively restricted to, the edge. A few patches of smoother, brighter polish, but for the most part it is continuous along the edge and is rough in texture (quite pitted) and very dull-looking (just brighter than the surrounding material). A very thin line of the same weak polish along R ventral margin – but restricted to the crest of the edge. It appears as a thin, silvery looking ribbon on the higher points of the microtopography. (On L margin, near distal end (where the margin pokes out a little bit, just below the break), there is fairly bright polish apparent on the squared-off-looking protrusion. Really no striations noted – a few parallel to the edge on the squared-off protrusion, but other than that I didn’t note any.

**ACC #: 17662**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: large, angular flake (or possible core tool/biface frag...it’s very hard to tell) with edge damage noted along L margin (the short, non-cortical margin). This edge is relatively

straight. Flaking along this margin has produced a somewhat serrated appearance and is restricted to what I am calling the dorsal surface.

STEREOSCOPIC: microflaking is fairly invasive (accounting for the “serration) and is continuous. Quite a lot of micro-step fracturing. Edge margin is quite rounded in some spots.

INCIDENT LIGHT: this particular piece of material appeared quite granular at high magnifications (100x, 200x). While the successive nature of the micro-flake scars was apparent, no polish or striations were visible.

INTERPRETATIONS:

ADDITIONAL COMMENTS: This damage may be associated with manufacture, rather than use, if it is a biface. Again, very hard to tell based on the nature of the flake/core. I think I see a bulb of percussion on the “ventral” surface, and there is a platform apparent, so I am going to stick with calling it a flake; but there are other flake removals visible on the ventral surface.

**ACC #: 17996**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: large, rounded flake with thick L margin (lots of breaks), and microflaking visible along R margin. Microflaking is continuous along the margin. Margin is convex overall (although it is more like a straight margin with a break in the outline morphology – 2 straight portions meeting at a “point”). Edge is relatively thin, but actual edge angle appears moderate (i.e. angle of the flake scars).

STEREOSCOPIC: edge angle actually appears fairly steep at higher magnification (25 x). Microflaking is continuous and is dominated by step terminations (although some feather-terminated as well). Microflaking is restricted to the dorsal surface. Edge margin looks a bit rounded off.

INCIDENT LIGHT: very coarse grained material. No polish or striations detected.

**ACC #: 18003**

Tool Type: UFL (unintentionally modified flake)

MACROSCOPIC: broad, short, thick flake with edge damage noted along distal R-ventral margin. This damage is limited but continuous. Margin is thick and convex, and flaking angle is relatively steep.

**STEREOSCOPIC:** microflaking is continuous and variable in size. Most microflakes exhibit step terminations – edge appears “crushed”. Edge is “blunt” – not rounded, but not sharp. The flaking angle is so steep that the edge is quite squared-off.

**INCIDENT LIGHT:** no polish detected. Almost looks like ongoing step fracturing may have removed portions of the edge that might have exhibited polish before any was able to develop. A few striations noted running transverse to the working edge.

## **BLADE SCRAPERS**

### **ACC #: 10354**

Tool Type: BSCR (blade scraper)

**MACROSCOPIC:** distal end of end scraper made on a blade. While this piece retains fairly little of the L and R margins, they do not appear to have received secondary modification (i.e. appears non-formal). Distal (i.e. bit) end has been modified with secondary flaking. It is not very thick, not very steep, and not very convex. Edge modification is restricted to dorsal surface of the bit.

**STEREOSCOPIC:** L margin: fine, steep, feather-terminated microflaking all along this margin. Margin is sharp. The flakes are quite intrusive – created the steep edge.

R margin: didn't see much microflaking, but a little bit of edge rounding is visible near the proximal end.

Distal margin: quite a lot of crushing (micro-step fracturing). Edge remains fairly sharp.

**INCIDENT LIGHT:** no polish along either L or R margins. Distal margin, though, shows continuous bright polish ribbon along most of the edge (especially pronounced around the midpoint of the edge). Polish is bright but rough. Can also see it up onto the surface of the edge. Near R end of the distal margin, there is a very bright, smooth patch of polish. Polish along the edge has a very abraded appearance, and the width of the polish ribbon indicates edge rounding. Within the polish ribbon, see several striations running perpendicular to the working edge.

### **ACC #: 10907**

Tool Type: BSCR

**MACROSCOPIC:** end (?) scraper made on a blade. I think this may be a distal fragment that has been reworked slightly after the distal end broke off, because there is some secondary flaking

applied to the proximal (broken) margin. Secondary flaking applied all around what I expect was the original distal margin. This margin is highly convex, relatively thick (compared to the main portion of the blade), and is very steep. The secondarily flaked proximal margin is undulating, moderately thick, with moderate edge angle. This proximal portion exhibits additional damage to the ventral surface (use related?). On the distal margin, in addition to the secondary flaking, see very fine feather-terminated microflaking as well as some micro-step fracturing (crushing). Damage restricted to dorsal surface of the distal margin.

**STEREOSCOPIC:** all of the worked margins exhibit successive step fracturing (crushing), and for the most part the margins are fairly sharp. There are a couple of spots, though, where some abrasion/edge rounding is visible. Edge rounding is most pronounced along the convex portion of what appears to be the original working edge (prior to breakage and possible reworking).

**INCIDENT LIGHT:** along the flat portion of the “distal margin” many striations running transverse to the edge. Faint polish ribbon visible edge-on. It is more pronounced in the flat portion. Polish is bright but rough. Nothing visible along reworked broken margin.

**ACC #: 11504**

Tool Type: BSCR (blade scraper)

**MACROSCOPIC:** end scraper made on a blade, with damage to proximal end and to L lateral-ventral margin. On L ventral margin, “impact fracture” – i.e. longitudinal fracture ending in hinge termination. This specimen contracts toward proximal end but has received no intentional modification to produce this outline morphology. There is some edge damage visible along both L and R margins, but this damage is sporadic and unpatterned, so probably not related to use. Distal margin has been intentionally modified and is moderately thick, quite convex, and exhibits a very moderate edge angle. In addition to the intentional flaking on this margin, also see fine edge damage right along the margin that is likely related to use. On the ventral surface, a single flake removed right at the “peak” of the convex bit.

**STEREOSCOPIC:** L margin: some microflaking near distal margin on the ventral surface. Mostly feather-terminated and quite steep. Coincides with some larger breaks on the distal end of the margin.

R margin: some microflaking toward distal end on ventral surface. It is fairly steep and largely step-terminated, with a few feather-terminated microflakes also visible.

Distal margin: micro-step fracturing all along the distal margin. Margin exhibits very light edge rounding. Right at the midpoint (“peak”) of the margin, see a few small flakes removed from the ventral surface. These are probably too large to be considered “microflakes”. They are step-terminated.

INCIDENT LIGHT: no polish detected on the specimen. There was one very bright, very smooth patch near the midpoint of the distal margin, but upon closer inspection it exhibited the flat, plastic look of a nail polish smear (and it came as no surprise that there was a label on the ventral surface that had been coated with nail polish). A few transverse striations noted on the dorsal surface of the distal end. No evidence for haft wear.

INTERPRETATIONS: very convex margin, not very steep bit, fairly thin edge with no evidence for abrasion of the edge. Suggests either that this tool had not been used, or that it had been used only minimally and/or recently resharpened.

**ACC #: 11549**

Tool Type: BSCR (blade scraper)

MACROSCOPIC: distal fragment of a scraper made on a blade. This piece has thermal damage on the ventral surface, and what appears to be a broken R margin. Secondary modification applied to both L margin and distal margin, suggesting a more formal tool, although modification is restricted to margins. L margin is straight, thin, and flaking angle is moderately steep; distal margin is very slightly convex, moderately thick, and flaking angle is steep. Very fine microflaking also visible on distal margin. Edge damage restricted to dorsal surface.

STEREOSCOPIC: L margin: quite a lot of microflaking along the dorsal face of this margin. Mostly feather-terminated but with some patches of crushing (micro-step) fracturing as well. Edge margin does not appear rounded at all.

Distal margin: I anticipate some good polish on this margin because I think I can see a polish ribbon even stereoscopically! The very edge margin appears to have been rounded off. Edge

damage appears to be restricted to the dorsal surface and includes very fine microflaking (some of which was rounded off/abraded) right along the very edge margin. – mostly feather-terminated.

INCIDENT LIGHT: L margin: no polish or striations detected.

Distal margin: at the most convex portion of this tool, right at the midpoint of the bit, classic hide polish! It is rough, pitted, very abraded (surface looks rounded). Striations transverse to working edge. This polish becomes less intense toward the L and R ends of the margin, except on the very highest points of the microtopography where there has been some significant abrasion. Edge-on, see thick, bright, rough polish ribbon with transverse striations. This polish ribbon extends onto the ventral surface.

INTERPRETATIONS: well-used hide scraper.

**ACC #: 11568**

Tool Type: BSCR (blade scraper)

MACROSCOPIC: very classic-looking Paleoindian trianguloid end scraper with corner spurs (likely a function of resharpening, not graver spurs), made on a blade. This piece contracts fairly dramatically toward proximal end (bit end is very wide by comparison to proximal end). L margin has been modified (secondary flaking), but almost no modification to the R margin, except for a little bit at the distal end. Distal (bit) end is wide, fairly thick (compared to thickness of the rest of the tool), very mildly convex (almost flat), and exhibits a steep working edge. In addition to the steep flaking on the bit end, also see edge damage (micro-step fracturing). Damage appears to be restricted to the dorsal surface. A little bit of “chattering” on the L-ventral margin.

STEREOSCOPIC: L margin: a fair bit of crushing, especially from midpoint to distal end. Right along the very distal edge margin, a few feather-terminated microflakes, but otherwise

successive step fracturing. Around the midpoint of distal, some edge rounding visible – including abrasion of some flake scar ridges.

INCIDENT LIGHT: very little polish along the distal margin, except for a faint polish ribbon right near the midpoint (“peak”). Also a little bit of rough, dull polish that extends onto the surface of the working edge. In this same area, a few short striations running transverse to the bit.

**ACC #: 11574**

Tool Type: BSCR (blade scraper)

MACROSCOPIC: end scraper made on a blade that is missing its proximal end. Minimal, and fairly fine, secondary flaking applied to L and R margins. It is more continuous and purposeful-looking on the R margin. Distal margin has been modified as well with coarse, steep flaking applied, and flaking on the ventral surface as well. Distal end appears to have been a bit thick; modification to thin the distal end into an appropriate scraper bit configuration? L and R margins are thin and straight with moderate flaking angles. Distal end is thick, steep, and exhibits both intentional flaking and step fracturing/microflaking, likely from use.

STEREOSCOPIC: L margin: fine, feather-terminated microflaking on dorsal surface near proximal end. Edge is sharp.

R margin: continuous micro-step fracturing along dorsal surface. Edge is sharp.

Distal end: very little micro-flaking on this margin, except near the peak of the bit where we see some crushing. Flaking angle is very steep, making the edge appear quite blunt. Otherwise sharp margin.

INCIDENT LIGHT: R margin: a few patches of dull, rough, pitted polish with striations running parallel to the working edge. Edge-on, fairly bright polish ribbon. Appears abraded, but I don’t see any striations.

**ACC #: 11575**

Tool Type: BSCR (blade scraper)

MACROSCOPIC: probable hafted end scraper made on a blade. Specimen is complete and exhibits modification of the L and R margins, the proximal end, and the distal margin. Modification is restricted to the margins, and except for a bit of proximal thinning, does not extend onto the surface of the tool. The tool exhibits a formal morphology, having been modified to have a convex bit and lateral margins that converge toward the proximal end. The base is

straight. A bit of crushing is evident along the proximal portion of the lateral margins, especially the R margin. The distal end, the presumed working edge or “bit,” is moderately steep, convex, and exhibits significant step-fracturing/crushing along the very edge margin. All damage is restricted to the dorsal surface.

STEREOSCOPIC: L and R margins: purposeful modification, but very little in the way of microscopic edge damage, except for a couple of micro-step fractures that are probably a result of the manufacturing process. A little bit of extra crushing near the proximal end (hafting?).

Distal margin: a fair bit of micro-step fracturing visible along distal margin. A little bit of edge rounding is noticeable – right along the crest of the edge margin, but also up onto the surface of the bit in a few spots (see abrasion of flake scar ridges). Damage appears restricted to the dorsal surface.

INCIDENT LIGHT: distal margin: especially near the midpoint, the most convex portion of the edge, see patches of dull, rough, pitted polish on the surface of the bit (dorsal face). These patches of polish also contain transverse striations. Edge-on, right at this most convex portion of the distal margin, as well as extending somewhat onto the ventral surface, see a wide polish ribbon that exhibits the same dull, rough, pitted appearance as that noted on the surface of the bit. See transverse striations crossing the edge of the tool.

Dorsal surface, near proximal end, I examined the main flake scar ridge that runs down the center of the tool. Here I saw substantial abrasion of this ridge and a continuous, and often quite smooth, polish ribbon. Also noted striations running in multiple directions. Possible bone polish? Striations indicating movement in the haft?

INTERPRETATIONS: hide scraping with a hafted implement!

**ACC #: 13750**

Tool Type: BSCR (blade scraper)

MACROSCOPIC: fragment of a blade scraper, missing proximal end. The blade was modified only marginally (most of dorsal is just one flat flake scar). L and R margins are thick, with moderate to steep edge angles (L is steeper than R), and contract toward the base. Crushing seen toward the proximal portions of both L and R margins (hafting?), but not near distal. Distal margin is quite convex, with a gentle “peak” in the middle. Distal margin is not as thick as L and R margins, and edge angle is quite moderate. See both intentional flaking and fine edge damage along distal margin (L half). R half of distal margin, damage to ventral surface removed some of the bit margin. Apart from two large flakes removed from ventral surface of distal margin, edge damage is restricted to dorsal surface.

STEREOSCOPIC: significant crushing all around the edge of this tool – L and R margins as well as distal. The distal end shows a fair bit of crushing and very little edge rounding, except in a spot close to the “peak” of this margin. Damage appears to be restricted to the dorsal surface.

INCIDENT LIGHT: distal margin, L side, near the “peak,” a patch of dull, rough-looking polish containing transverse striations. In this same spot, edge on, see rounding of the margin and the same dull, rough polish and transverse striations.

INTERPRETATIONS: characteristic hide polish!

**ACC #: 15342**

Tool Type: BSCR (blade scraper)

MACROSCOPIC: medial fragment of a side scraper made on a blade. Modification applied to both L and R margins. Both margins are straight, relatively thick, and exhibit relatively steep margins. Flaking includes larger, intentionally applied, mostly step-terminated flakes, as well as possible use-related, step-terminated microflaking. Damage is restricted to dorsal margins.

STEREOSCOPIC: L margin(? the longer one): quite a bit of micro-step fracturing along this margin. Damage appears to be restricted to the dorsal surface. Edge exhibits no evidence of rounding – appears a bit blunted in a few spots, but not abraded.

R margin (shorter margin): micro-step fracturing along this margin on the dorsal surface. Edge does not exhibit much evidence for edge rounding.

INCIDENT LIGHT: L margin: crushing (sugary textured damage), but no polish or striations detected.

R margin: same

Dorsal surface: patches of bright, rough polish containing multidirectional striations. See these along flake scar ridges. Looks like possible bone polish – bright, rough but with smoothed, abraded-looking formerly high portions of the microtopography.

INTERPRETATIONS: haft end of a broken blade tool.

**ACC #: 17113**

Tool Type: BSCR (blade scraper)

**MACROSCOPIC:** large blade modified into probable side scraper. It is an “amorphous” tool, not formal. In other words the edge modification has not been applied to create a rigid, pre-determined outline morphology, but more likely to alter the edge angle to an appropriate working edge angle. L margin exhibits fine, intentional flaking, while R margin exhibits edge damage more consistent with use damage. L and R margins are relatively thin (R margin is thinner than L). Edge angle on L margin is slightly steeper than on R margin, but it is still fairly acute. L margin is convex; R margin comprises 2 segments that meet at a right angle.

**STEREOSCOPIC:** microflaking visible along all modified margins and includes both feather and step terminated flakes. Mostly feather terminated along the L margin, but a lot of crushing along R margin. See minimal edge rounding along all worked margins. Damage is restricted to dorsal surface.

**INCIDENT LIGHT:** L margin: patches of bright, pitted polish all along the margin, as well as some patches, closer to the distal end, of very bright better-linked polish with very smoothed areas in it. This brighter patch looks like bone polish and contains multidirectional striations. Edge-on, at the midpoint, a relatively wide, very bright and somewhat rough-looking polish ribbon containing multidirectional striations. This ribbon becomes fainter toward the proximal end. Continues toward the distal end, but it is a bit more sporadic in its appearance (thin, thick, fairly rough and pitted, brighter and a bit duller).

R margin: really no polish of note along R margin, except for a couple of patches that might be deemed “generic-weak.”

**ACC #: 17992**

Tool Type: BSCR

**MACROSCOPIC:** purposeful secondary flaking applied to curved margin (A) and to straight, right margin (B). In addition to this flaking, I can see microflake scars – many step fractures right along the edge, inside the 2° flake scars.

**STEREOSCOPIC:** margin A see primarily step terminations on the microflakes, which are restricted to the dorsal surface of the tool, although some microflakes exhibit feather terminations as well. Margin B see many more feather terminations; microflake scars are again restricted to the dorsal surface, except at the distal end where A meets B – see a few scars on the ventral surface. Edge rounding is apparent in spots along both margins, as well as smoothing of some of the dorsal topography – e.g. flake scar arrises are rounded off.

**INCIDENT LIGHT:** margin A (especially on the “high points” in plan view) see extensive dull, rough and pitted polish, accompanied by striations that are perpendicular to the edge. The polish is continuous, stretching along the entire convex working edge, which also exhibits edge rounding. Margin B see continuous but less distinct polish all along the straight margin – especially on the dorsal surface. The same polish is apparent on the ventral surface near the distal

portion (where A and B meet) where we see the microflaking on both faces. This polish is dull and a bit “greasy” in appearance. No striations are visible.

INTERPRETATIONS: margin A – transverse work action (i.e. “scraping”) and polish formation that is consistent with working dry hides. I am inclined to interpret margin B as a cutting edge – the presence of feather terminations on the flake scars, in addition to the presence of microflakes on both faces indicate a longitudinal motion on a relatively soft substance. The somewhat diffuse and greasy polish along margin B may be indicative of cutting a soft substance like meat. Multi-functional tool cutting-scraping tool?

ADDITIONAL COMMENTS: margin A is very steep; margin B is much more acute-angled, also lending support to the scraping + cutting edges interpretation.

**ACC #: 18004**

Tool Type: BSCR (End)

MACROSCOPIC: mostly complete but with minor damage to the proximal end of the tool. Bit end is highly convex, and even is pointed in the middle. Edge angle is moderate (suggesting it’s not at the end of its use life yet). Secondary flaking on the bit end, as well as down the R margin (to shape?). L margin shows damage (microflakes visible).

STEREOSCOPIC: microflaking continuous along the working edge (feather terminations). Also continuous (feather terminations) along L margin – accompanied by edge rounding. R margin shows step fracturing in the region of the secondary flaking, but the edge appears sharp – i.e. no edge rounding.

INCIDENT LIGHT: no polish detected.

## **BLADE TOOLS**

**ACC #: 10336**

Tool Type: RBLD (retouched blade)

MACROSCOPIC: marginally modified blade, relatively complete, with slight damage to proximal end. The piece does not retain a bulb; was reshaped to have an almost pointed proximal end. Piece is quite extensively modified, but only along margins (no dorsal surface modification). Modification applied to L and R margins (and, somewhat incidentally, to proximal, as the piece was tapered toward proximal end) and distal margin. L margin is straight to very slightly convex.

R margin is distinctly convex. Distal margin exhibits possible graver spur, and is otherwise relatively straight.

None of the edges is very thin. L margin exhibits moderate edge angle. R margin exhibits steeper edge angle. Distal margin is quite steep, especially around the graver spur. Crushing noted along all margins. Edge damage restricted to dorsal surface.

STEREOSCOPIC: L margin: microflaking visible along the L margin, both feather- and step-terminated. Edge is quite sharp; damage is restricted to dorsal surface.

Distal end: a fair bit of micro-step fracturing visible along the portion of the L margin of the graver spur and along the remainder of the distal margin. Damage restricted to dorsal surface.

R margin: along the midpoint (most convex portion of the edge) see lots of micro-step fracturing, but it has been abraded. Edge exhibits moderate rounding. Damage is restricted to the dorsal surface.

INCIDENT LIGHT: L margin: very faint polish ribbon near proximal end, but no other polish. No striations.

R margin: generic polish and more extensive polish ribbon along most of the R margin (especially along the most convex portion). Transverse striations visible within abraded edge margin?

Distal margin: no polish detected, but lots of crushing.

**ACC #: 10337**

Tool Type: UBLD (utilized blade)

MACROSCOPIC: blade fragment with damage to distal end. Edge damage noted along R margin, which is straight and exhibits a moderate edge angle. This margin exhibits continuous flaking, both larger (possibly purposeful) flakes and smaller (likely incidental damage) flakes. The larger flakes are located sporadically along the margin, making me wonder if they were not removed intentionally, but also through use. Edge appears to be dulled, even at the macroscopic level.

STEREOSCOPIC: microflaking is continuous along R margin. It is steep, and consists of both feather-terminated and step-terminated microflakes. It almost looks like the smaller microflake scars are feather-terminated, whereas the larger ones are step-terminated, but the smaller ones have also received significant abrasion, so it is difficult to determine their morphology. Microflaking extends onto the ventral surface. Edge appears sinuous and highly abraded – the very crest of the edge has been rounded off.

INCIDENT LIGHT: material is fairly lustrous. No polish detected, just a lot of crushing.

**ACC #: 10345**

Tool Type: RBLD (retouched blade)

MACROSCOPIC: relatively complete blade with slight damage to the distal end. This specimen expands from the proximal end and shows purposeful modification to the entire L margin and the R proximal. L margin is relatively thin and exhibits a moderate edge angle. R margin same, but I think it looks more like it was shaped, not used. Flaking along L margin is quite fine. Can't tell if there is additional edge damage – need to examine stereoscopically. Fairly substantial ventral curvature.

STEREOSCOPIC: L margin: in addition to the very finely applied secondary modification, can see fairly continuous and very fine microflaking along the L margin. This microflaking consists of feather- and step-terminated examples, as well as some more angular looking breaks along the margin. The edge appears quite sharp, and most of the damage is restricted to the dorsal surface (although there are a couple of step-terminated microflakes visible on the ventral surface, near the midpoint).

R margin: microflaking especially near proximal and distal ends of this margin. Near proximal, microflaking tends to exhibit mostly feather terminations (a few step-terminated as well), whereas we see more step-terminated microflakes toward the distal end. A bit of edge rounding visible along most of the margin.

INCIDENT LIGHT: L margin: metal smears in many spots along L margin! No definitive polish noted, but many striations, running in multiple directions, all along the edge. Possible patch of generic weak polish on a flake scar ridge approximately half way along the edge. On the ventral surface, a few patches of bright, rough-looking polish near midpoint. Some of these patches also exhibit striations, mostly longitudinal.

R margin: at the proximal end, not much in the way of developed polish; just a few patches that might be called “generic-weak” polish near the proximal end. Striations running in multiple directions on the dorsal surface. Near midpoint, a couple of patches of slightly brighter, but still indistinct, polish. It is bright, but rough. Edge-on, see faint, poorly linked polish ribbons appear in this same region. This polish ribbon becomes more distinct toward the distal end, but it is still undifferentiated polish.

INTERPRETATIONS: multi-use cutting/scraping implement. Soft materials. Multidirectional striations suggest multiple use motions (cutting and scraping/whittling).

**ACC #: 10350**

Tool Type: UBLD (utilized blade)

MACROSCOPIC: proximal blade fragment with possible edge damage along L margin. The piece is broken in spots along the edge and I can see potlids. It is difficult to tell if the damage I am seeing along this margin is related to use, or to production. Stereoscopic examination should help to clarify. The edge that appears to have some potential use damage is convex and moderately thick, and exhibits somewhat sporadic microflaking as well as some micro-step fracturing/crushing. Some of this crushing appears on both the dorsal and ventral surfaces.

STEREOSCOPIC: L margin, distal portion, exhibits significant crushing, both macro and micro. Edge appears somewhat rounded off, but this is only because the crushing extends from the dorsal surface onto the ventral. I'm not sure it's rounded-off/abraded from other use factors. A little bit of micro-crushing visible along R margin, but it is sporadic.

INCIDENT LIGHT: hints of a very rough-looking polish ribbon along proximal portion of edge, but otherwise no polish or striations detected.

**ACC #: 10356**

Tool Type: RBLD (retouched blade)

MACROSCOPIC: large, leaf-shaped blade with beautifully executed parallel-oblique marginal flaking applied. Larger flakes removed from L margin, smaller from R margin. Edge damage (probable microflaking) noted along R margin near distal end, and possibly along the L distal margin (needs to be confirmed through stereo examination). Fairly extreme ventral curvature, diffuse bulb. L margin is very slightly convex; R margin is relatively straight with slight serration of the margin. Both edges have fairly acute-to-moderate edge angles.

STEREOSCOPIC: No use related edge damage visible along either margin. A few small flakes removed, but these appear to be incidental damage, and not use-related.

**ACC #: 10361**

Tool Type: RBLD (retouched blade)

**MACROSCOPIC:** proximal fragment of a blade with secondary modification applied to R margin. In addition to the larger purposefully applied flaking, see crushing along the edge margin. R margin is straight and fairly thick; flaking angle is steep. Appears that edge damage is restricted to the dorsal surface.

**STEREOSCOPIC:** edge exhibits substantial crushing (micro-step fracturing). Edge is quite sharp except in a couple of spots where the crushing is steep enough that it has created a blunted edge.

**INCIDENT LIGHT:** no polish or striations detected.

**INTERPRETATIONS:** this is a proximal fragment – may not be the utilized portion.

**ACC #: 10362**

Tool Type: RBLD (retouched blade)

**MACROSCOPIC:** complete blade with intentional modification of L, R and distal margins. L and R margins are straight and possess fairly acute-to-moderate edge angles. Distal end is concave, with protuberances on L and R corners. These may be either graver spurs, or edges of a spokeshave. The distal margin is quite steep and I can see both intentional modification and micro-step fracturing. Micro-step fracturing also visible on the outer margins of the “graver spurs.”

**STEREOSCOPIC:** L and R margins: crushing/micro-step fracturing visible along both margins. Some edge rounding visible on L margin, but none on R margin. Damage restricted to dorsal surface.

Distal margin: quite a lot of crushing visible – lots of micro-step fracturing. No edge rounding; damage restricted to dorsal surface.

**INCIDENT LIGHT:** L margin: near proximal end a patch of generic weak polish with some striations running perpendicular to working edge. Edge-on, see abrasion and generic polish toward proximal end. R margin: fewer patches of the generic weak polish, and another patch of bright, smooth polish about half way along the edge. This patch of smooth polish, though, is very isolated, nothing else like it; it may be a smear of nail polish, but it doesn't look quite “plastic” enough.

Distal margin: no polish, but substantial crushing visible. Sugary look to the edge, indicating crushing.

**INTERPRETATIONS:** proximal end exhibiting haft wear? Working hard material with the distal end.

**ACC #: 10536**

Tool Type: RBLD (retouched blade)

**MACROSCOPIC:** distal blade fragment with modification to L and distal margins, and possible use-related damage to R margin (both margins are straight). Distal margin has been modified into what appears to be a graver spur/perforator (pointed). L margin is moderately thin, as is R margin; distal margin is thicker. Edge angle of L margin is moderate; distal margin is fairly steep.

**STEREOSCOPIC:** L margin: fine, continuous microflaking visible along this whole margin. Mostly feather-terminated, but a few larger step-terminated microflakes as well. Except for a couple of small microflakes on the ventral surface at the distal end of the L margin, see damage only on the dorsal face. Moderate edge rounding visible, along with apparent abrasion of the ridges between flake scars.

Distal margin: microflaking visible along distal margin. Most of this flaking is micro-step fracturing (crushing) along this possible graver spur. Crushing is especially pronounced on the R side of the protuberance, which seems to have received a fair bit of intentional modification as well. Flaking noted on the ventral surface of the tip. Edge rounding, especially on the R margin of the protuberance.

R margin: extremely fine, abraded-looking microflaking along the R margin. Margin is broken near the midpoint and flaking is not visible here, but otherwise continuous. Microflaking is restricted to the dorsal surface. See some micro-step fracturing, but otherwise appears mostly feather-terminated (although it is a little difficult to discern because of the abrasion).

**INCIDENT LIGHT:** even the unmodified material is quite lustrous, making interpretation of possible patches of polish a bit challenging. Along L margin, see fairly continuous bright patches, but I think these are likely just a function of the nature of the material. A couple of patches along L margin that appear bright but a bit rough (like they've been sandpapered), containing multidirectional striations. On the ventral surface of the L margin, see a fairly continuous polish ribbon that is bright but rough in texture. Within this ribbon see some striations running transverse to the working edge.

On the distal end, see only sugary texture from the crushing. No polish or striations visible.

R margin, very patchy bright spots (again, this may be a characteristic of the material rather than an indication of use). A very diffuse polish ribbon running along the proximal portion of this margin (disappears toward distal). This polish ribbon is visible on the ventral surface.

**ACC #: 10555**

Tool Type: RBLD (retouched blade)

MACROSCOPIC: short, thick blade with intentional modification along L and R margins. L margin is “serrated” – large notches. R margin is straight. L margin is fairly steep; R margin has a more moderate edge angle. R margin appears to have some edge damage (micro-step fracturing). L margin shows a little bit of edge damage, but minimal by comparison to R edge.

STEREOSCOPIC: L margin: very little microflaking, but a fair bit of edge rounding visible along midpoint of the edge (on the margin of the middle large protuberance). The material is very coarse-grained in appearance, though, and I don’t anticipate much polish.

R margin: quite a bit of micro-step fracturing along the edge. Edge is fairly sharp. Damage restricted to dorsal face of both L and R margins.

INCIDENT LIGHT: L margin: really no polish visible, not even in the region of edge rounding. Can see a lot of crushing, though.

R margin: continuous generic polish and pronounced abrasion along the edge. Polish seen edge-on (very rounded edge), and up onto the surface. Polish is a bit rough and fairly dull in appearance.

**ACC #: 10748**

Tool Type: UBLD (utilized blade)

MACROSCOPIC: complete blade made on heat-treated, pink chert. Evidence for minimal edge damage along L, R and distal margins. This edge damage consists only of fine “chattering” or microflaking along the very edge margin. While not very invasive, this microflaking is continuous. All affected edges are quite thin. L and R margins are straight to slightly concave; distal margin is convex.

STEREOSCOPIC: L margin: fine feather and step-terminated microflaking along both dorsal and ventral faces of this margin. Fairly continuous microflaking, and it seems to be accompanied in some regions by some edge rounding.

R margin: microflaking looks a bit steeper and more angular, although there are some areas where we see microflaking on dorsal and ventral surfaces that looks a bit more use-related. Still, I think much of what we’re seeing on the R margin is the angular flaking that is the result of incidental damage.

INCIDENT LIGHT: surprisingly, no polish noted on the more intensively microflaked L margin. On R margin, though, saw continuous polish ribbon and several patches of very generic polish. No striations, undifferentiated polish.

INTERPRETATIONS: cutting implement (based on bifacial microflaking)? The polish suggests softer material.

**ACC #: 10943**

Tool Type: RBLD (retouched blade)

MACROSCOPIC: medial blade fragment with intentional modification along L and R margins (although it's difficult to figure which is which margin). Along L (?) margin see what appears to be edge damage that may be related to use. No comparable damage along R (?) margin. This R margin is relatively thick and steep, and is straight.

STEREOSCOPIC: L margin: shows a lot of micro-crushing (successive micro-step fractures). Edge is blunted in a few spots (thanks to the steep edge angle created by the crushing), but otherwise edge margin is quite sharp. Damage is restricted to dorsal surface.

R margin: micro-step fracturing (crushing) visible on both the dorsal and ventral surfaces (more on dorsal). Edge margin is mostly straight, but a little bit of rounding visible in a few spots.

INCIDENT LIGHT: material is extremely coarse-grained in appearance. No polish or striations visible, but plenty of "sugary-looking" material in the areas of intensive crushing.

**ACC #: 11400**

Tool Type: BLD (retouched)

MACROSCOPIC: long, narrow medial blade fragment with intentional modification along L and R margins and microflaking visible right along very edge margin. Most of the modification is along the R(?) margin. Cortex and edge crushing/collapse along L margin, except near proximal (?) end. Both L and R margins are straight. Edge angles appear moderate.

STEREOSCOPIC: while the larger purposefully applied flakes are mostly feather terminated, the microflaking is primarily step-terminated. Also, the non-cortical portion of the L margin does not appear to have been utilized. All the flaking is large, with step-terminations that are likely related to production rather than use. A little bit of edge rounding noted along R margin.

INCIDENT LIGHT: all along the edge there are isolated patches of dull, rough polish that contain striations running transverse to the working edge. Also polish ribbons that seem to accompany somewhat rounded edge margins.

Rounding, dull polish and transverse striations also visible on the ventral surface, near the narrow end.

INTERPRETATIONS: hide polish?

**ACC #: 11511**

Tool Type: RBLD (retouched blade)

MACROSCOPIC: medial blade fragment with intentional modification applied to L margin, and incidental, likely use-related modification visible along R margin. L margin is steep, with a lot of step fracturing/crushing visible, while R margin possesses a much more moderate edge angle and exhibits more feather-terminated flaking, along with a few examples of step-terminated flakes and microflakes. L and R margins are both straight.

STEREOSCOPIC: L margin: within the larger, intentionally produced flake scars along this margin, see microchipping that is also step-terminated (i.e. crushing of the edge). The edge appears blunt (not sharp, but not actually rounded-off/abraded) because of the steep flaking angle. There is a little bit of edge rounding noted, but it is minimal. Most of this damage is restricted to the dorsal surface, although a couple of step-terminated microflakes were noted on the ventral surface as well.

R margin: a combination of step and hinge terminated flake scars (larger, for the most part) and some feather terminated (many of the smaller flakes). There are some step-terminated microflake scars right along the very edge margin. Edge appears relatively sharp. Damage restricted to dorsal surface.

INCIDENT LIGHT: L margin: many transverse striations. No polish detected.

R margin: a few patches of very generic-looking polish along the dorsal surface. One patch of more pronounced polish that is dull and quite abraded in appearance (near the distal end of this margin). A few transverse striations. On the ventral surface, polish is continuous and bright but rough. See continuous polish ribbon that has a very abraded appearance (can see rounding of the edge).

INTERPRETATIONS: R margin looks like maybe hide polish?

**ACC #: 11516**

Tool Type: RBLD (retouched blade)

**MACROSCOPIC:** proximal blade fragment modified into unifacially worked retouched blade. A very small bit of edge damage is noted along the L margin, but this is sporadic, unpatterned, and I expect is incidental. R margin exhibits intentional modification as well as marginal microflaking. R margin is thick, moderately steep, and straight. Damage appears to be restricted to the dorsal surface. A fair bit of step fracturing along the R margin.

**STEREOSCOPIC:** L margin: very little microflaking, except for a few sort of angular looking “chunks” out of the edge. But can see a fair bit of edge rounding all along the entire L edge. A couple of microflakes removed from the ventral surface, but mostly dorsal damage.

R margin: quite a bit of step fracturing, both macro and micro. Also some feather-terminated microflakes. Edge is quite sharp – no rounding/abrasion apparent. Edge damage restricted to dorsal face.

**INCIDENT LIGHT:** see generic-weak polish along both L and R margins, although it is more continuous along L margin. This polish is rough, pitted, and appears quite dull. A few striations seen running transverse to the tool margin. On the R margin, polish is seen in little ribbons – apparently associated with very minor edge abrasion, as well as the wearing-down of some of the flake scar ridges.

**ACC #: 11545**

Tool Type: RBLD (retouched blade)

**MACROSCOPIC:** very large, thick, complete blade with secondary modification applied along both the L and R margins – not entirety of either margin, but majority of the lengths of both margins. Blade exhibits hinge termination. Both L and R margins are very thick, very steep, and exhibit large secondary flake scars, along with finer microflaking/edge damage. On R margin, this edge modification/damage is restricted to dorsal surface, while microflaking appears on both the dorsal and ventral surfaces of the L margin. I think there is a bit of edge rounding visible macroscopically on the L margin. L margin is straight to very slightly concave; R margin is straight to very slightly recurvate.

**STEREOSCOPIC:** L margin: crushing visible along entire L edge. This crushing is evident as successive micro-step fractures on both the dorsal and ventral faces of the margin. Some edge rounding is also apparent – abraded, rounded-off flake scar margins and edge margin. Most of the edge rounding is restricted to the proximal portion of the margin.

R margin: most of the edge modification consists of larger step-terminated flakes; less microflaking than seen along the L margin. Damage is restricted to the dorsal surface. Edge margin remains quite sharp – doesn't look like it was really utilized.

INCIDENT LIGHT: L margin: a couple of possible striations running transverse to working edge, but no polish noted.

R margin: on a small protuberance a little over a third of the way up from proximal end, a patch of bright, but rough-looking polish, and a few striations running transverse to working edge. Intermittent patches of generic weak polish along this margin. A few patches that appear relatively smooth (looks almost abraded). Edge-on, see continuous polish ribbons.

**ACC #: 11552**

Tool Type: UBLD (utilized blade)

MACROSCOPIC: complete blade, but with odd shape from manufacture, I think. Edge damage noted along L margin, as well as a bit on R-distal margin. Some apparent microflakes removed from proximal margin, but these are so sporadic that I feel safe in saying they are just incidental damage – not use-related. Some microflaking observed on ventral surface of R margin and a little bit on L margin.

L margin is convex, overall, even though it is a bit angular. The edge is somewhat thin, but the flaking angle is fairly steep.

R margin is also slightly convex, overall. It is thin and the flaking angle is steep.

STEREOSCOPIC: L margin: most of the larger microflake scars are feather terminated, but some of the very small ones right along the edge margin exhibit step terminations. Edge does not appear to be very abraded, but instead is somewhat blunt in appearance, thanks to the steep flaking angle. Almost all microflaking restricted to the dorsal surface.

R margin: much of the microflaking observed at the macroscopic level appears to be from incidental damage/breakage, rather than use. The flake scars are very steep and intrusive – angular breaks rather than nicely-formed flake scars. There is one patch, in the middle of the distal portion of the R margin, that might be use-related. It is a patch of successive step fractures (crushing) that could be related either to production or to use on some hard substance.

INCIDENT LIGHT: L margin, both dorsal and ventral, see patches all along the edge (not necessarily continuous, but there are many of them) of dull, poorly-linked polish. It is weak and not well-formed – somewhat “generic weak”. It is a bit dull-looking and I didn't note any striations. The microchipping as well as the polish are seen on both dorsal and ventral faces, suggesting a cutting rather than scraping motion. Edge-on, see continuous polish ribbon.

R margin: nothing of note except for a distinct patch of crushing (“sugary” texture) at the distal end of the dorsal margin.

INTERPRETATIONS: cutting soft substance (e.g., meat)

ADDITIONAL COMMENTS: on the L margin, ventral surface, at the protuberance that marks the major break in morphology of this margin, a patch of fingernail polish.

**ACC #: 11561**

Tool Type: RBLD (retouched blade)

MACROSCOPIC: relatively complete blade with only minor damage to the distal end. This relatively large specimen exhibits fairly finely applied intentional modification along the L margin, as well as a little intentional modification to the R-distal margin. A bit of “chattering” is visible along the R-proximal margin, but it is difficult to determine whether this is related to use, or if it is just incidental damage. The L margin is moderately thick, exhibits a very moderate edge angle, and is very slightly convex. In addition to the finely applied secondary modification, also see fine microflaking along most of the L margin. Damage appears to be restricted to the dorsal surface.

STEREOSCOPIC: toward the proximal end on both the L and R margins, see evidence of crushing (successive micro-step fractures) that were subsequently abraded. These abraded fractures are more apparent on the L margin (purposefully modified) than on the R margin (where we see incidental “chattering”). The remainder of L margin is covered with fine feather and step-terminated microflakes that do not show the same degree of abrasion. Damage is restricted to the dorsal surface

INCIDENT LIGHT: L margin: near proximal end, where abrasion was noted at the stereoscopic level, see frequent patches of generic polish on the surface of the edge (i.e. not right along the crest of the edge margin), accompanied by many short striations running transverse to the edge of the tool. Edge-on, though, see no such polish, but instead see the sugary look that indicates microscopic crushing. Distally from this area, there is very little polish visible, except right nearest the distal end, where polish ribbons were visible edge-on. (No polish up on the surface of the working edge).

R margin: only a few small patches of the same generic polish noted at the proximal end of the R margin.

Examined the surface of the tool at the proximal end, and ran a transect across the dorsal face. Pronounced patches of generic polish and short, transverse striations visible on the main ariss between dorsal flake scars.

INTERPRETATIONS: wear is suggestive of hafting. The generic nature of the polish and lack of striations on the L-distal worked margin make it impossible to assess the nature of use, but I think I can safely say this piece was hafted.

**ACC #: 11563**

Tool Type: RBLD (retouched blade)

MACROSCOPIC: blade fragment with distal end missing and significant thermal damage to dorsal-distal surface and ventral surface (various). This piece has been altered so that it narrows toward the proximal end (perhaps a hafting modification?) through application of secondary modification along both the L and R margins. Remaining dorsal flake scars suggest this piece may have been flaked over much of the dorsal surface (highly modified). Much of the secondary flaking along the L margin has been obliterated through heat damage. Flaking along R margin remains largely intact. It is quite steep, and many of the larger flake scars are step-terminated. See both larger intentional flake scars and much smaller (likely incidental) scars along both L and R margins, but especially along R. Is this scarring related to use of the tool bit, hafting, or production? L and R margins are straight and expand from the proximal end. Edge angle quite steep.

STEREOSCOPIC: quite a lot of micro-step fracturing along both L and R margins (crushing of the edge), along with the larger step-fracturing visible at the macroscopic level. Because of the crushing and steep edge angles, the edge margin appears quite blunt in many spots (i.e. not acute and sharp, but not rounded, either; very squared-off). Along L margin, though, see several patches of edge rounding near the proximal end; distal end appears much sharper. R margin does not show similar edge rounding, instead being either crushed and blunt, or acute and sharp.

INCIDENT LIGHT: much of the tool margin exhibits a very sugary texture, a result of the edge crushing that was noted macroscopically and stereoscopically (the successive micro-step fractures).

L margin: on the edge, at the level of the proximal extent of the thermal break, see a couple of possible striations running oblique to the working edge. No associated polish in this region, though. A bit past the half-way point, another patch of striations; these are multidirectional, and much more convincing. This patch is about where I noted the presence of edge rounding (see above). On a small protuberance near the distal end of the edge, a small patch of very bright, relatively smooth polish (a couple of little pits in it). This patch is quite restricted and is located close to an area of thermal damage, so I'm a little suspicious of it, but it has the appearance of bone (?) polish, or possibly wood (?).

R margin: very little wear, except for a patch almost directly across from the patch of possible bone/wood polish described above. It has a similar appearance to this patch of polish. I wonder if

this is related to hafting (it is located at a point on the tool where there are projections on both the L and R margins – possibly a juncture between haft and bit?). It is impossible to investigate this possibility further as the dorsal surface, where we might expect to see additional wear, has been removed through thermal damage. Thermal damage to corresponding locations on ventral surface.

Ventral surface: I saw some patches of what appeared to be bright polish proximally from the above-mentioned patches of possible bone/wood polish. But the yellowish tinge and somewhat “flat” (i.e. non-lustrous) appearance of these patches suggests to me that they are smears of nail polish from the label applied to the ventral surface of the tool.

INTERPRETATIONS: this specimen may very well have been a scraper made on a blade, but there is so much damage to the specimen that I am going to classify it more generally. This specimen could easily have been an end scraper, but with distal portion missing it is impossible to say for certain. If it was an end scraper, we might expect to have seen the majority of use-wear on the distal (bit) end, and possibly on the proximal end of the tool, if it was a hafted specimen.

**ACC #: 11570**

Tool Type: BLD (utilized)

MACROSCOPIC: medial blade fragment with edge damage along L margin. L margin is straight, microflaking is continuous, and edge angle appears relatively steep.

STEREOSCOPIC: fine microflaking right along the margin, larger microflake scars that are slightly more intrusive. A fairly even mix of feather and step-terminated flake scars. Edge margin is relatively sharp – no rounding.

INCIDENT LIGHT: material is very coarse-grained at high magnifications. No polish or striations visible.

**ACC #: 11577?**

Tool Type: BLD (retouched)

MACROSCOPIC: distal flake fragment. Buffalo River chert. Intentional modification along all margins (L, R, distal). L margin is straight to slightly convex; distal end is relatively straight; R margin is straight. Edge angle is moderate.

STEREOSCOPIC: microflaking all around the circumference of the tool. It is almost all step-terminated. Also a fair bit of edge rounding visible along all margins. R distal margin, a patch that appears to have been heated – possibly through friction from use?

INCIDENT LIGHT: little of note. On R margin, one small patch of generic-weak polish, and one that looks a little like bone polish with many longitudinal striations. Another very small patch that has the appearance of wood polish. But none of these patches is extensive enough to make any sort of definitive assessment.

**ACC #: 13874**

Tool Type: RBLD (retouched blade)

MACROSCOPIC: medial blade fragment, with modification applied to both L and R margins. L margin is not very thick, but appears fairly sturdy, with moderate edge angle. R margin is a bit thinner and edge angle is a little more acute than on L margin. L margin is straight; R margin is slightly “serrated” in appearance. In addition to the intentional flaking, also see likely use-related microflaking along both margins. Edge damage is restricted to dorsal surface.

STEREOSCOPIC: L margin: in addition to the larger step-terminated flaking along the margin, see very fine microflaking (step and feather terminated) right along very edge margin. Edge rounding also visible along this margin. Damage is restricted to the dorsal surface.

R margin: a lot of micro-step fracturing and more angular microflaking along this margin. Edge is relatively sharp, and damage is restricted to the dorsal surface.

INCIDENT LIGHT: L margin: several patches of smoothed, abraded-looking polish. Polish is smooth and rounded, not overly bright, somewhat mounded. Several of these polish patches were seen up away from the immediate edge margin. Striations running in several directions. Intermittent polish ribbons edge-on; these ribbons are rough-looking, abraded, not as smooth as the patches seen up on the surface of the edge.

R margin: no polish noted along R margin, but some striations running transverse to the edge.

**ACC #: 13901**

Tool Type: BLD

MACROSCOPIC: flaking and some step fracturing along both faces of margin B. Also see edge rounding along margin B. Nothing apart from secondary flaking related to manufacture along margin A.

STEREOSCOPIC: no microflaking noted along margin A, but a lot along B. The edge rounding is quite pronounced. Microflakes along B are smoothed over by the edge rounding.

INCIDENT LIGHT: only a very little bit of polish noted along margin B (none along margin A). This polish can only be described as “generic weak polish.” It is very diffuse and poorly linked. Not very bright, either. It is impossible to assign it to any polish-forming substance in particular.

**ACC #: 13925**

Tool Type: UBLD (utilized blade)

MACROSCOPIC: long, extremely narrow blade with evidence for edge damage along L and R margins. L margin is straight to very slightly convex; R margin is straight to slightly concave. L margin, majority of the microflaking appears to be restricted to dorsal surface, while microflaking is observed on both dorsal and ventral faces of R margin. Both L and R margins are moderately thin and flaking angles are moderate to mildly acute.

STEREOSCOPIC: L margin: some microflaking noted from midpoint toward distal end. Much of the microflaking is step-terminated. The scars are mostly seen on the dorsal surface, although there are a few on the ventral surface as well. Most of the L margin appears fairly sharp at 25x, but in the area of the microflaking, there is a bit of edge rounding visible.

R margin: microflaking seen especially along middle portion of this margin (i.e. not right at the proximal or distal end, but in the middle, most concave portion of the edge). Microflaking is seen on both dorsal and ventral surfaces. It is restricted to the very edge margin and appears to be mostly step-terminated on the dorsal surface; a bit more feather terminated microflaking on the ventral surface. Edge rounding noted along this whole utilized portion.

INCIDENT LIGHT: L margin: all along the edge, patches of generic-weak polish. It is brighter than the surrounding material, but not by much. Some areas exhibit a sort of abraded look. This polish is poorly linked and not completely continuous (although it is seen along much of the edge margin). Edge-on, see a fairly continuous polish ribbon. A few striations noted, some longitudinal, others transverse to somewhat oblique. Toward the distal end of the L margin the polish becomes more pronounced and better-linked. It is still dull-looking and somewhat pitted,

but it is less ephemeral. There is even a patch that appears brighter and “flatter” (i.e. the microtopography is flattened). All of this more pronounced polish is noted in the region where I recognized more edge rounding at the stereoscopic level.

Similar polish is noted on the ventral surface of the L margin. It is more pronounced at the distal end, disappearing almost entirely toward the proximal end. No really pronounced patches as were noted on the dorsal surface. Just bright, but poorly-linked patches of “generic-weak” polish. No striations noted.

R margin: on the dorsal surface, continuous bright, but somewhat “greasy-looking” polish ribbons and patches running along almost the entire edge. Many of the “ribbons” appear to be patches of polish that formed on the high points of the micro-step fractures, lending a sort of “streaky” appearance to the marginal polish. Toward the proximal end of the tool, see less extensive polish (i.e. restricted to the edge margin, rather than extending farther onto the edge) that produced a more typical polish ribbon close to the edge margin. In some areas, larger patches of this same bright but somewhat pitted and greasy polish were visible that also contained striations – many running parallel to the tool edge (longitudinal), but also a few that run perpendicular to the edge (transverse).

Edge-on you can really see these polish ribbons nicely. The entire edge margin is covered by a continuous ribbon. Again, see both longitudinal and transverse striations within these ribbons.

On the ventral surface, patches of polish are also visible along the R margin, but these are duller and rougher in appearance than their dorsal counterparts. Many of these examples of polish exhibit a rather abraded, worn-down appearance. I detected striations running parallel to the working edge (longitudinal), as well as a patch of striations (contained within a very dull, greasy looking spot of polish) that were criss-crossing one another, running in multiple directions.

INTERPRETATIONS: the crushing suggests use on a harder substance, but the nature of the polish indicates softer materials (greasy = meat or fresh hide? Dull = dry hide?). Perhaps a multipurpose tool that was used originally for some sort of scraping/whittling of a harder material, then ended its life being used for cutting/scraping softer substances. The multidirectional nature of the striations suggests a combination of cutting and scraping/whittling motions.

**ACC #: 13942**

Tool Type: RBLD (retouched blade)

MACROSCOPIC: fragment of a blade; appears to be missing part of proximal end. No evidence for intact bulb or platform, but it also looks like the proximal end may have been modified subsequent to flake removal. This specimen exhibits secondary flaking along the L margin, as well as a bit of secondary modification along the R-proximal and the right-hand portion of the

distal margin. L margin is thick, relatively steep and straight to slightly convex. See both larger, intentionally applied flaking and fine microflaking along the entire L margin. Modified portion of R margin is thinner, exhibits a more moderate flaking angle, and is straight. The right-hand end of the distal margin is not very thick, but is very steep and is convex. This modified distal margin is covered in successive step-fractures (i.e. a fair bit of crushing). Edge damage appears to be restricted to the dorsal surface.

STEREOSCOPIC: along L margin, see successive step fractures, but these flake scars are all large. No microflaking along L margin – just large flakes from manufacture. Edge is quite sharp in appearance.

Same along the R margin – not any microflaking visible, sharp margin, probably related to manufacturing rather than use.

Distal end: see micro-step fracturing as well as larger step fractures. Edge is still fairly sharp (no rounded edges).

Damage is restricted to dorsal surface in all cases.

INCIDENT LIGHT: L and R margins, patches of generic weak polish and generic polish ribbons, along with striations that run transverse to the edge. No polish or striations noted on the distal margin. Polish on L and R margins is faint, but continuous; undifferentiated.

**ACC #: 15270**

Tool Type: UBLD (utilized blade)

MACROSCOPIC: fragment (proximal or medial? If proximal, then prox end has been modified to remove platform) of relatively small blade. Thermal damage noted on dorsal and ventral surfaces. This piece is small and exhibits four(?) dorsal scars that are narrow and parallel, suggesting that this flake may have been derived from a blade core that was fairly late in its use life. Purposeful modification along L margin; some edge damage along R margin, but with accompanying thermal damage it is difficult to assess whether these flakes were intentionally produced or were produced through use. L and R margins are both relatively steep and thick, with the left being both thicker and steeper. L margin is straight (the one concave portion is the result of thermal damage to ventral); R margin is also straight. For the most part, edge damage seems restricted to the dorsal surface, although a few microflakes were noted on the L ventral surface.

STEREOSCOPIC: will assume it is a proximal fragment. L margin: quite a bit of micro-step fracturing at proximal and distal ends (mid-point of margin is heat fractured). Edge rounding accompanies these areas of step-fracturing. Edge damage on dorsal and ventral faces near proximal; just dorsal near distal.

R margin: feather and step-terminated microflakes visible. Edge appears much sharper (little or no edge rounding). Edge damage seen all over dorsal, but also a fair bit on ventral face.

INCIDENT LIGHT: L margin: a few sporadic patches of generic-weak polish. A few striations running transverse to working edge, especially near proximal end. The polish is quite undifferentiated/non-descript.

R margin: no polish or striations visible.

**ACC #: 17082**

Tool Type: RBLD (retouched blade)

MACROSCOPIC: medial blade fragment with intentional modification applied along both L and R margins. Edge damage is bifacial on the longer of the two margins; restricted to dorsal surface on the shorter margin. Both margins are thick, straight, and edge angles are moderately steep.

STEREOSCOPIC: longer margin: see slightly larger micro-step fracturing that extends farther up onto the edge, and finer feather-terminated microflaking that is restricted right to the very edge margin. Damage is bifacial – see lots of step fractures on ventral face as well. Minimal edge rounding visible.

Shorter margin: micro-step fracturing and a little bit of edge rounding, but without the fine, feather-terminated microflakes seen on the longer edge. Damage restricted to the dorsal surface.

INCIDENT LIGHT: longer margin: sugary look to the entire edge (crushing); no polish or striations visible.

Shorter margin: no polish. A couple of possible striations running transverse to the edge.

**ACC #: 17115**

Tool Type: UBLD (utilized blade)

MACROSCOPIC: complete blade with edge damage noted along R margin. R margin is slightly convex, of moderate thickness, and edge angle is moderate as well. R margin shows fairly continuous micro-step fracturing.

**STEREOSCOPIC:** sporadic microflaking visible along the very edge margin – quite a lot of micro-step fracturing, but also some feather-terminated microflaking. Toward the distal end, this microflaking spills over onto the ventral surface as well as the dorsal. A little bit of edge rounding noted toward the distal end as well.

**INCIDENT LIGHT:** most of the material is quite coarse-grained, so polish does not show up well. A few isolated patches of bright but rough polish toward the proximal end. These can only be called “generic weak polish.” Toward the proximal end, though, there is an area of finer material that does show the polish patterns better. See a distinct, bright polish ribbon. At higher magnifications, this patch of polish appears dull, smooth, with striations running transverse to the working edge. This patch of polish is very abraded in appearance. See polish on the ventral surface as well, but it is brighter and also smooth, and exhibits some longitudinal striations.

**ACC #: 17131**

Tool Type: UBLD (utilized blade)

**MACROSCOPIC:** blade fragment, with damage to both proximal and distal ends. Edge damage noted along R margin, which is convex. R margin is thin, but edge angle is steep.

**STEREOSCOPIC:** near the proximal end, microflaking is quite sporadic and, in many cases, very angular, suggesting it is not use-related. Around the midpoint of the R margin, its most convex point, we see both step and feather-terminated microflaking – step extends up onto surface of the worked/working edge, while the feather terminated microflakes seem to be restricted to the very edge margin. Along this most convex portion of the working edge, see a fair bit of edge rounding. Damage appears to be restricted to the dorsal surface.

**INCIDENT LIGHT:** along the most convex portion of the margin, especially in the region of the couple of little protuberances, see several patches of very distinctive polish. The edge rounding is minimal – edge isn’t feathered, but it is also not completely abraded as you might expect to see from working something like dry hide. Instead, there is some minor abrasion/rounding right along the edge. Up onto the surface of the working edge, away from the very margin, see patches of smooth, pitted, very bright polish in several locations. These patches also contain striations (very fine, “scratches”) that run perpendicular to the working edge.

Patches of somewhat indistinct-looking polish as well as some smooth-pitted polish and some bright but rough-looking polish. Within these polish patches, see striations, mostly running perpendicular to the working edge, but also some running obliquely or more longitudinally.

Edge-on, see this same minimal edge rounding. Nice, fairly wide, pitted polish ribbon, with transverse striations visible.

On ventral surface, a little less wear, but still some. Polish ribbon running right along the edge (clearly the edge is rounded off). This ribbon is fairly dull and rough. Toward the distal end of this margin, the polish ribbon becomes narrower, more distinct, a bit brighter and slightly less pitted. A few patches where this rough-looking polish becomes more extensive.

INTERPRETATIONS: patches of soft meat/hide polish and likely bone polish = butchering implement? Very mild edge rounding – i.e. not what you would expect from use on hard materials, or for extended contact with something like dry hide.

**ACC #: 18005**

Tool Type: UBLD (utilized blade)

MACROSCOPIC: possible blade with cortex over most of dorsal surface. One longitudinal flake scar on L half of tool, with evidence of edge damage along this margin. There is one area along this margin where it appears secondary flaking was applied intentionally, but the remaining edge damage appears to be use-related. This margin is moderately thick, edge angle is moderate, margin is essentially straight. See much step-fracturing along this margin.

STEREOSCOPIC: quite a bit of successive step fracturing (larger and micro) – crushing. Edge is relatively sharp, except for the concave portion toward the distal end of the blade, where there is some edge rounding and abrasion of the flake scars. Damage is restricted to the dorsal surface, except in the concave, abraded portion, where we see a few step-terminated microflakes removed from the ventral surface as well.

INCIDENT LIGHT: no polish or striations detected.