Fluted Bifaces (Clovis and Clovis-Like)

The following data represents numerous Paleo projectiles from the Great Basin that show similarities to Clovis points and in some cases demonstrate diagnostic technological attributes consistent with Clovis from other regions across the Americas.

Information contained here include text from other sources of documentation, including in some cases Mike Rondeau's analysis as part of his CalFLUTED project, results of obsidian X-ray Fluorescence Spectroscopy measurements for obsidian source determination and hydration layer measurements as part of assessments of coarse age-determination and relative dating for comparative analysis.

This section attempts to combine all this information and document as a library to make available to any interested reader. Separate entries from time to time will provide additional commentary on specific topics of interest.

06/18/2025: Initial Entry
07/06/2025 Update: Added 8 artifacts (CL-057 thru CL-064)
07/30/2025 Update: Added specific Coso sources for CL-005, -006, -007, -008, -010 and -019 based on email from Craig Skinner. Also added comment on CL-044 (unknown China Lake).
10/26/2025 Added CL-065 (with X-ray source results), CL-066 and CL-067. Updated CL-054 with X-ray source results

CL-001

L = 42.63 mm
W = 20.88 mm
T = 6.55 mm
W/T = 3.19

Basal Width = 20.88 mm
Concavity Depth = 4.5 mm
Conc. Depth / Basal Width = 0.216

CL-001

From Rondeau CalFLUTED Report #128 Part 1

CL-001 Concave Base Point This complete specimen (Appendix A, Fig. 10b) has a slight basal ear tip missing. It is black, weathered obsidian. The tip is asymmetrical, indicating repair of the blade. The point has also been rebased as indicated by the invasive end thinning flake scars that overlap the lateral flake scars. This specimen exhibits its maximum width at the base as the ears diverge away from each other to proximal.

The point measures 42.63x20.88x6.55x4.50x20.88 mm in length, width, thickness, basal depth and basal width. It has a weight of 5.4 g. Edge grinding is present on the lateral margins proximal of the reflaked blade margins. No grinding is present on the proximal edge. There is a deep concave base with pronounced basal ears. The lateral margins diverge away from each other in the proximal direction as is typical of a projectile point blade element that has been rebased. The basal cross-section is concave-convex and just distal of the proximal margin, the cross-section is concave-concave, but does not extend far enough to distal to create vertical grooves similar to those produced by fluting.

Face 1 has the short basal ear to the left and the blade element skewed to the left, but lacks an artifact label. There are horizontal scratches at intervals on the blade segment. Three small pressure end thinning scars come from the basal margin. Due to weathering it is unclear if there are scratches on the basal segment. Only limited microflaking was observed due to weathering. Even so, microflake step scars are more common than the scalar.

The right lateral margin shows small to medium pressure flake scars in a roughly parallel, horizontal configuration. Because of weathering, only a limited presence was found of pressure edge retouch and microflaking. For the left edge, the skewed blade segment has small to medium sized pressure scars while the basal portion is beveled by edge retouch in a generally parallel, horizontal configuration. This beveling moved the lateral margin in closer to the center of the point. There is microflaking at the margin, but weathering precludes further description.

Face 2 has the artifact label, the short ear and the skewed blade to the right side. The three end thinning flake scars are of medium pressure size. Two provide a somewhat multi-flute-like appearance. There is some basal scratching that runs at a diagonal from proximal left to distal right. However, weathering and the label preclude a complete study of this feature. At the proximal edge there is a limited presence of microflaking with the scalar scars more common than the step.

The right lateral margin of the blade portion has small pressure scars in a parallel, horizontal configuration. The basal segment of the right lateral margin shows only small to tiny edge retouch scars that are weathered. The left side has small to medium pressure scars running at a diagonal from distal left to proximal right with a presence of microflake step scars. The left-hand basal margin segment shows small to tiny edge retouch in a generally parallel, horizontal formation with an overlay of microflake step scars at the edge.

CL-002

L = 40.85 mm
W = 22.99 mm
T = 6.80 mm
W/T = 3.38

Basal Width = 20.98 mm
Concavity Depth = 6.59 mm
Conc. Depth / Basal Width = 0.314

CL-002

From Rondeau CalFLUTED Report #128 Part 1

CL-002 Concave Base Point This essentially whole point (Appendix A, Fig. 10c) has a slight tip segment missing and an edge damage scar near the tip on the left lateral margin (F1 view). It is dark and light gray banded, opaque obsidian with limited translucency at the edges. The asymmetrical tip indicates that the blade element has been repaired. It has also been rebased as evidenced by the steep edge retouch on the proximal margin of F1. The specimen measures 40.85x22.99x6.80x6.59x20.98 mm in length, width, thickness, basal depth and basal width with a weight of 5.3 g.

There is light margin grinding on the right-hand basal edge (F1 view), but only the suggestion of a trace on the opposite lateral margin and none on the basal edge. The concave base is deep with pronounced ears. The lateral margins tend to diverge away from each other in the distal direction. The basal cross-section is plano-concave.

Face 1 lacks an artifact label, shows an edge damage scar along the left lateral margin with the tip skewed to the left side. There may be a remnant of a medium sized, pressure, end thinning flake scar, but this remains unclear. Small pressure edge retouch scars produced a steep proximal margin with a trace of microflaking at the edge.

The right lateral margin has small to medium pressure scars in a generally parallel, horizontal pattern. The left-hand side shows small pressure scars in a generally parallel, horizontal configuration, but this data is limited by an edge damage scar. There is also limited evidence of microflaking at the edge.

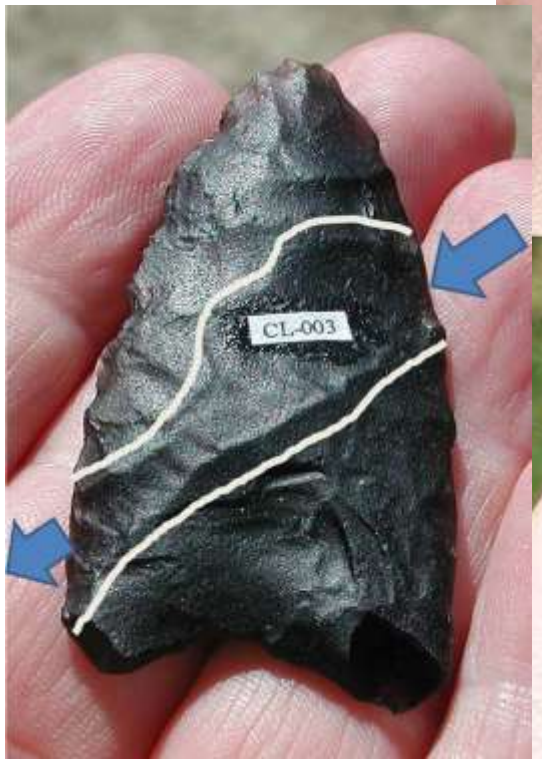
Face 2 has the artifact label and its tip skewed to the right, but lacks edge damage scars. There are two flake scars from proximal. One is a large pressure end thinning flake scar although less likely, might be a remnant of an older flute scar. This scar ends in a feather termination. Its length, as measured from the concave base, is 16.32 mm with a surviving width of 7.68 mm. The medium sized pressure end thinning scar overlaps the proximal portion of the larger scar. Along the basal edge there is limited, small sized pressure edge retouch. Microflake step scars are also present at the margin edge.

The right lateral margin has small, linear pressure scars in an irregular pattern mainly on the blade element. There is an overlay of microflaking at the edge. Scalar microflake scars are more common than the step. The left edge shows small pressure scars in an irregular pattern on the blade element. The rest of the left-hand margin exhibits small to tiny edge retouch scars in a parallel, horizontal configuration with an overlay of microflake step scars.

CL-003

L = 54.92 mm
W = 27.27 mm
T = 7.82 mm
W/T = 3.49

Basal Width = 27.10 mm
Concavity Depth = 4.87 mm
Conc. Depth / Basal Width = 0.18



CL-003

From Rondeau CalFLUTED Report #128 Part 1
CL-003 Fluted Point
This relatively whole projectile point (Appendix A, Fig. 8b, 9b) has both basal ear tips and a slight amount of the blade tip missing. The damaged point tip and one basal ear indicate that the damage is relatively recent. The point is black obsidian with a cloudy gray translucency and a trace of banding. The tip has been reflaked. The artifact represents a rebased blade element from a previous biface. It shows notable weathering. Maximum width and thickness occur in the same general location proximal of the midpoint of its length, but distal of the flute scar terminations. This specimen has dimensions of 54.92x27.27 x7.82x4.87x27.10 mm in length, width, thickness, basal depth and basal width. It weighs 11.5 g.
Weathering precludes any identification of margin grinding although the lateral margins appear to be more rounded than the blade edges. However, this could also be due to repair of the blade margins after some weathering had occurred. The concave base has slightly excurvate lateral margin and a bi-concave cross-section. The flute scars on opposite faces diverge away from each other in the distal direction when viewed in long section.
Face 1 shows the longer flute scar, but lacks an artifact label and evidence of recent damage to the basal ears. The single flute scar ends partly in a hinge termination, partly in a step termination and is partly terminated by a pressure flake scar from the right lateral margin. The flute has current measurements of 16.64x14.32 mm in length and width. Intentional flute scratching was not visible due to weathering. There are two small pressure sized ridge removal scars, one along each lateral margin of the flute. Limited evidence of microflake step scars is present along the proximal edge.
While weathering limits the observations, three lateral scars from the right margin were found that overlap the flute scar. None from the left side overlap. Possibly one scar from the right, although weathering makes this uncertain, may have been truncated by the channel scar. Another, from the left lateral margin, is truncated by the flute. The right side shows generally diagonal, parallel pressure flake scars ranging from small through medium to large in size. They run from distal right to proximal left. There is a trace of microflaking, but a determination of its extent is precluded by the weathering. There is also limited, recent edge damage to the right-hand margin. The left edge has small to medium pressure flake scars in an irregular pattern with limited evidence at the edge of microflaking due to its weathered condition. There is also evidence of older, weathered edge damage.
Face 2 has the label, the shorter flute and recent damage evident on the right-hand basal ear. A weathered step termination is indicated for the channel scar. It has dimensions of 13.25x16.63 mm in length and width. There is a small to medium pressure sized ridge removal scar along the right side of the flute. Weathering precluded any identification of flute scratching. What may be one or two tiny, ridge removal-like scars are present along the left lateral margin of the channel scar. Weathering allowed the identification of only a trace of microflaking along the proximal margin.
No lateral flake scars from either margin were identified that overlapped or were truncated by the flute scar in large part due to weathering. In spite of the weathering small, medium and possibly large sized pressure scars from the right lateral margin were identified. They may be arranged in an irregular pattern. The largest of these scars might also be a small percussion scar running at a diagonal from distal right to proximal left. It appears to be an overshot scar. However, due to weathering, it is unclear if the narrowest, proximal scar portion on the left side is or is not part of the larger scar to distal right. Either way, this segment came from the right lateral margin and appears to come very close to the left side. A final caveat regards the two small pressure scars from the right lateral margin, both of which may have erased evidence of the overshot reaching the left lateral margin. The distal most of the two clearly shows its origin from the left margin and truncates the overshot. Both scars are badly weathered, but appear to show microscopic remnants of their step terminations. The diagonal overshot comes within 4.06 mm of the left edge, making it reasonably certain that it once was an overshot. There may be two or more small to tiny pressure scars from the left lateral margin, but weathering makes this uncertain.

CL-004

L = 56.97 mm
W = 20.41 mm
T = 7.88 mm
W/T = 2.59

Basal Width = 19.17 mm
Concavity Depth = 4.75 mm
Conc. Depth / Basal Width = 0.248

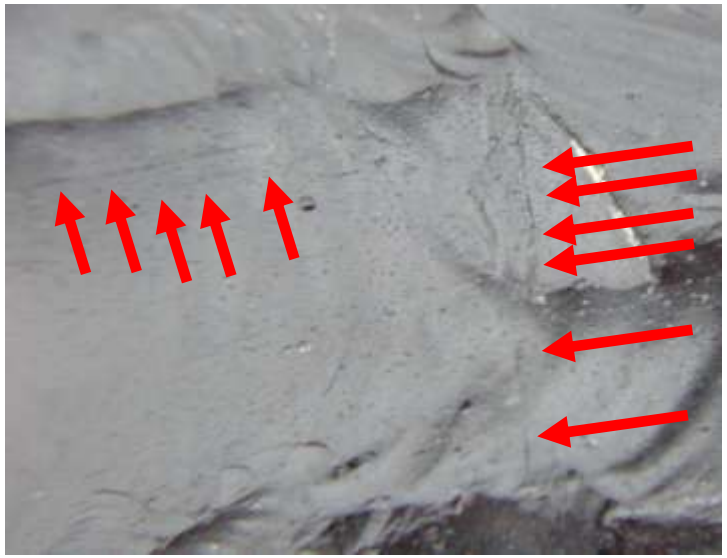
CL-004

From Rondeau CalFLUTED Report #128 Part 1
CL-004 Concave Base Point (Rondeau, CalFLUTED Research Report #128 commentary)
This nearly complete point (Appendix A, Fig. 10a) has a slight portion of the point tip and a basal ear tip missing. It is a mottled orange and black chert with a muddy green cast. The tip has been reflaked. This is evidenced by reversed and somewhat irregular shoulders indicative of repair of the blade while still in the haft. The steep edge retouch along the basal margin on both faces argues that this piece has also been rebased. It has measurements of 56.97x20.41x7.88x4.75x19.17 mm in length, width, thickness, basal depth and basal width. It weighs 8.8 g. The point is too weathered to tell if the lateral margins or basal edge had edge grinding. It has a deep concave base with pronounced basal ears. The lateral margins of the base are incurvate. The cross-section is lenticular.
Face 1 lacks a label, has the narrower end thinning flake scars and the reversed shoulder to the left and a margin projection on the right. There are two pressure end thinning scars, one of medium size and one small. There is microflaking along the basal margin with step scars more common than the scalar. The right lateral margin shows small pressure scars in a parallel, horizontal pattern and limited microflaking with about equal numbers of step and scalar scars. The left side has small pressure scars in a generally parallel, horizontal format. There is limited microflaking with the step scars more common than the scalar.
Face 2 has a label, a shell shaped end thinning scar, the shoulder to the right and edge projection to the left side. This end thinning scar is 8.64x15.59 mm in length and width. It may contribute to the shape of the concave base, but the label makes this unclear. Along the basal edge there is microflake step scars, but the label glue makes their extent unclear. The right lateral margin shows small to tiny pressure edge retouch scars in roughly a parallel, horizontal pattern with an overlay of microflake scars. The step form out numbers the scalar scar type. The left edge has small pressure scars running at a diagonal from distal left to proximal right on the blade element. To proximal of the left-hand edge projection there are small to tiny pressure scars in an irregular pattern along the edge with a limited presence of microflake step scars.

CL-005

L = 39.59 mm
W = 29.06 mm
T = 8.30 mm
W/T = 3.50

Basal Width = 22.79 mm
Concavity Depth = 10.32 mm
Conc. Depth / Basal Width = 0.453



CL-005

CL-005

CL-005

From Rondeau CalFLUTED Report #128 Part 1

CL-005 Fluted Point

This point fragment has most of its blade missing (Appendix A, Fig. 8g, 9g). It is black obsidian with the thinner portions showing a cloudy gray translucency. Geochemical characterization of this specimen placed the obsidian as having come from the Coso Volcanic Field (Shackley 2009). The transverse break is probably a bending fracture form F2. Although the break surface is weathered, this fracture is suggested by a partial lip surviving on the F1 break margin. The fragment measures 39.59x29.06x8.30x10.32 x22.79 in length, width, thickness, basal depth and basal width. It has a weight of 5.7 g. Both lateral margins and the interior curve of one basal ear show margin grinding. It has a very deep concave base with notably long basal ears. The basal margin does not quite approach an inverted V morphology. The basal margins diverge away from each other in the distal direction. The base has a bi-concave basal margin. The flute scars on opposite faces diverge away from each other in the distal direction for about 80% of their length. The proximal 20% run parallel to each other when viewed in long-section.

Face 1 has the wider flute scar and the longer basal ear to the left, but lacks an artifact label. The long flute scar ends partly in a step termination and is partly truncated by a damage scar from proximal. The channel scar has current dimensions of 31.84x16.78 mm in length and width. No flute scratching is in evidence. There is a small remnant of a prefluting guide scar to each side of the flute. The basal margin has a trace of microflake step scars and weathered edge damage. 10 The lateral scars from the right-hand margin include three that overlap the flute and two others that are truncated by it. The left side has one that overlaps and two truncated by the flute. The right-hand edge shows small pressure scars in a parallel, horizontal configuration with an overlay of microflaking. Microflake step scars are more common than the scalar type. The left side has small pressure scars in an irregular pattern with a trace of microflaking as well as recent and older edge damage.

Face 2 shows the label, the narrower flute and the longer basal ear to the right. The single flute scar is truncated by the transverse break. It has surviving measurements of 28.45x14.46 mm in length and width. No flute scratching was observed, but the label obscures the flute surface. There appears to be a ridge removal scar to each side of the flute, but weathering obscures the details. The proximal margin only shows recent and older edge damage scars. One lateral scar from each side overlaps the channel scar. Two from each lateral margin are truncated by the flute scar. The right margin exhibits generally parallel, horizontal pressure scars in the small size range, old edge damage and just a trace of microflaking at the edge. The left-hand side has small to tiny pressure edge retouch scars that range from a parallel, horizontal configuration to one that is slightly diagonal, running from proximal left to distal right. There is a trace of microflaking in spite of the weathering along with a limited presence of recent edge damage.

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-005	Coso Volc. Field, CA	247	6	48	117	40	0	621	299	9077	64	33	28

CL-006

L = 23.84 mm
W = 28.09 mm
T = 5.71 mm
W/T = 4.92

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

Obsidian Hydration Measurement:
<u>11.6+/-0.1 µm</u>
Willamette Analytics Report 2025-14, 6/10/2025

CL-006

From Rondeau CalFLUTED Report #128 Part 1

CL-006 Fluted Point

This base fragment has both ears missing (Appendix A, Fig. 8i, 9i). This obsidian is black with a cloudy gray translucency that is geochemically sourced to the Coso Volcanic Field (Shackley 2009). That the base has been reflaked from the lateral margins is suggested by the numerous lateral pressure flake scars that are invasive onto the flute scars of both faces. The transverse break is a bending fracture from F2. The specimen has dimensions of 23.84x28.09x5.71 mm in length, width and thickness. Basal depth and width could not be measured. It weighs 4.5 g. Both lateral margins and the basal edge exhibit margin grinding. The concave base has lateral margins that diverge slightly away from each other in the distal direction and a biconcave basal cross-section. The flute scars on opposite faces diverge away from each other in the distal direction when viewed in long-section.

Face 1 has the flute scar that runs at a diagonal from proximal left to distal right and the longer basal ear stub on the left side. F1 lacks an artifact label. The single flute scar is truncated by the transverse break margin and two pressure flake scars from the left lateral margin. Its current measurements are 20.17x16.17 mm in length and width. The channel scar shows random scratches, but no intentional flute scratching. There is a small sized pressure retouch scar that acts as a ridge removal scar on each proximal segment of the two lateral flute scar margins. The basal margin has microflake scar sized scalar edge damage with an overlay of edge grinding. Seven lateral pressure flake scars from the right-hand margin and two from the left overlap the flute. None from either side are truncated by the channel scar. The right margin shows small pressure scars that run diagonal from proximal right to distal left with a limited overlay of microflaking associated with the edge grinding. There are more microflake scalar scars than step scars. The left edge has small to medium sized pressure scars in roughly a parallel, horizontal distribution with a microflake overlay. Microflake scalar scars are more common than the step. There may also be a trace of evidence for earlier edge crushing. The microflaking is clearly associated with the edge grinding.

Face 2 exhibits the label, a vertical flute scar that partially forks at its distal end and the longer basal ear stub on the right side. The flute is truncated by the transverse break margin leaving flute dimensions of 20.10x14.25 mm in length and width. No flute scratching is in evidence, but the label obscures the flute surface. There are two remnants of prefluting guide scars, one to each side of the channel scar. A remnant of a fluting platform isolation scar is also adjacent to the proximal right portion of the flute. The proximal edge shows microflake step scars associated with the margin grinding. Two lateral pressure flakes from each side overlap onto the flute scar. None from either show evidence of having been truncated by the channel scar, but the two guide scar remnants may have erased such details. The right lateral margin has small pressure scars in a roughly parallel, horizontal pattern with a microflake overlay, scalar scars being more common than the step type. The left side has small to tiny pressure edge retouch scars in a generally parallel, horizontal configuration with an overlay of microflaking that shows about the same number of step and scalar scars. This microflaking is associated with the edge grinding which overlaps onto the F1 margin surface.

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-006	Coso Volc. Field, CA	268	9	56	135	47	32	641	270	9122	60	37	41

CL-007

L = 29.51 mm
W = 32.16 mm
T = 6.48 mm
W/T = 4.96

Basal Width = 30.39 mm
Concavity Depth = 8.53 mm
Conc. Depth / Basal Width = 0.281

CL-007

From Rondeau CalFLUTED Report #128 Part 1

CL-007 Fluted Point

This base fragment has both ear tips missing (Appendix A, Fig. 8f, 9f). The Coso Volcanic Field has been determined to be the source of this obsidian (Shackley 2009) which is black and shows a cloudy gray translucency. This piece has been rebased as indicated by the F1 flute scar overrunning a pressure scar from the left-hand basal ear. The point is notably weathered. The snap surface of the transverse break is weathered, but suggests a possible twisting fracture from F2 right (F1 view). The fragment measures 29.51x32.16x6.48x8.53x30.39 mm in length, width, thickness, basal depth and basal width with a weight of 6.9 g. The specimen is too weathered to tell if the lateral margins or proximal edge were ground. The fragment has a deep concave base with pronounced basal ears. It has a biconcave basal cross-section, but these vertical concavities on both faces become narrow and shallow as the flute scars diminish in width and depth to distal. Further, only about the proximal 60% of the flutes on opposite faces diverge away from each other in the distal direction when viewed in long-section. The distal 40% of their lengths run parallel to one another.

Face 1 shows the longer basal ear to the left and a slight languette scar (Lenoir 1975) from the transverse break margin. F1 also lacks an artifact label. The single flute ends in 12 a step termination with a length measurement of 18.86 mm and at least 21.45 mm of width. F1 is too weathered for flute scratches to have survived. There is a possible remnant of a prefluting guide scar to the left side of the channel scar, but weathering prevents certainty. A trace of older, weathered edge damage is present along the basal margin. This specimen is too weathered to allow identification of lateral flake scars overlapping or having been truncated by the channel scar. Both lateral margins appear to have small pressure flake scars in generally parallel, horizontal patterns, but weathering obscures most details. The left edge also shows a trace overlay of microflake step scars.

Face 2 has the label, the longer ear to the right side and clearly shows guide scars. The lone flute scar appears to end in several small hinge terminations, but weathering somewhat obscures these features. The flute measures 20.79x15.69 mm in length and width. Weathering precludes flute scratching identification. There are two prefluting guide scars, one to each side of the flute. Due to weathering the evidence is limited along the basal margin with small to tiny pressure edge retouch and an overlay of microflake step scars, some of which might be edge damage. No lateral scars from either edge overlap the channel scar. One scar from the right margin, but none from the left, perhaps due to the guide scar, is truncated by the flute. The right side shows weathered, but small pressure flake scars in a parallel, horizontal pattern with a trace of microflaking at the margin edge. The left-hand side shows small, weathered pressure scars in a generally parallel, horizontal order with a trace of microflaking at the edge.

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-007	Coso Volc. Field, CA	337	5	64	118	73	0	640	272	9350	79	43	46

CL-008

L = 17.92 mm
W =28.67 mm
T = 6.03 mm
W/T = 4.76

Basal Width = 24.92 mm
Concavity Depth = 1.8 mm
Conc. Depth / Basal Width = 0.072

Obsidian Hydration Measurement:
12.9+/-0.1 µm
Willamette Analytics Report 2025-14, 6/10/2025

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-008	Coso Volc. Field, CA	206	17	44	155	33	0	783	276	10141	66	29	31

Joshua Ridge – 07/30/2025

CL-008

From Rondeau CalFLUTED Report #128 Part 1
CL-008 Fluted Point

This base fragment (Appendix A, Fig. 8j, 9j) evidences basal repair with pressure end thinning on F1 overlapping the groove created by an earlier flute scar. There is a small remnant of that flute to distal of the pressure scars that retains intentional flute scratching. Also, there may be an earlier flute scar remnant to distal right of the obvious flute scar on F2. This obsidian is black with cloudy gray translucency at the margins with several inclusions. It has been sourced to the Coso Volcanic Field (Shackley 2009). The transverse break is a bending fracture. The fracture originates at the F2 flute scar. The specimen measures 17.92x 28.67x6.03x1.8x24.92 mm in length, width, thickness, basal depth and basal width. It has a weight of 3.7 g. There is edge grinding on both lateral edges and the proximal margin. The concave base is very shallow with ears that are little more than basal corners. The lateral margins expand away from each other in the distal direction. It has a bi-concave basal crosssection. The end thinning flake scars from proximal on opposite faces diverge away from each other in the distal direction.

Face 1 shows a series of pressure end thinning scars and a languette scar (Lenoir 1975) coming off of the transverse break surface, but lacks an artifact label. There is a small remnant of a single flute scar to distal of the central pressure flake scar that requires 13 magnification to confirm. The flute scratching is difficult to observe even at 16X without light at the proper angle. The scratching runs proximal left to distal right. There are five small to medium sized pressure end thinning flake scars. They show some random, nonintentional scratches. Some are nearly horizontal with their arc bowing to distal. A nonprojectile use of this point in the haft is thought to have caused this arcing scratch pattern. The lateral flake scar pattern from the right-hand edge exhibits a limited presence of small pressure scars in a parallel, horizontal pattern. The left side shows small to medium sized pressure scars in an irregular configuration with limited microflaking at the margin edge. There are about equal numbers of microflake scars and step scars. These scars are associated with the edge grinding.

Face 2 shows the label, a definite flute scar and lacks a languette scar. The flute is truncated by the transverse break. Its surviving dimensions are 16.70x13.52 mm in length and width. No flute scratching is in evidence, but the label and associated glue obscure its surface. There is a large guide scar to the right of the flute and the small remnant of another to the left side. The tiny remnant of an earlier flute may be present to distal right of the definite channel scar, but this possibility remains equivocal. The basal edge has microflake scalar scars associated with the margin grinding. Two lateral scars from the left-hand side overlap the flute, but none from the right do so. Likewise, none from the right are truncated by the channel scar, but this may be due mainly to the large, prefluting guide scar having erased such evidence. One lateral scar from the left is truncated by the flute. The right edge shows a limited number of small to medium pressure scars in an irregular pattern with a limited overlay of microflake step scars associated with the edge grinding. The left-hand margin exhibits small to tiny pressure scars in an irregular configuration with an overlay of microflake step scars also associated with margin grinding.

> Additional discussion is offered on four specimens from Inyo County. The first specimen, CL-008 is a fluted point that exhibits bowed scratches that arc towards distal. Such scratching is indicative of the point rocking in the half during a knife-like use (Rondeau 2004b, 2012b; Rondeau and Nelson 2013b)

CL-009

L = 27.75 mm
W = 29.06 mm
T = 6.13 mm
W/T = 4.74

Basal Width = 26.83 mm
Concavity Depth = 11.5 mm
Conc. Depth / Basal Width = 0.429

CL-009

From Rondeau CalFLUTED Report #128 Part 1
CL-009 Fluted Point

This obsidian base fragment (Appendix A, Fig. 8h, 9h) has slight damage on one basal ear tip. This weathered specimen is banded gray and charcoal gray with cloudy translucent banding when held to the light. The base has been rejuvenated by the steep pressure reflaking of the left lateral margin along both faces and the pressure end thinning on top of what was once the F2 flute scar. The weathered transverse break surface appears to be a bending fracture from F2. The fragment measures 27.75x29.06x6.13x 11.5x26.83 mm in length, width, thickness, basal depth and basal width. It weighs 4.7 g. The lateral margins and proximal edge are too weathered to identify edge grinding. The concave base is deep with long basal ears and a bi-concave cross-section. The left lateral margin (F1 view) is excurvate due to its reflaking while the right-hand edge runs straight and appears to diverge away from the central axis of the piece to distal. The flute scars on opposite faces appear to have diverged away from each other to distal when viewed in long-section, but the end thinning on F2 and the shortness, due to rebasing, of the flute scar on F1 make this less than certain.

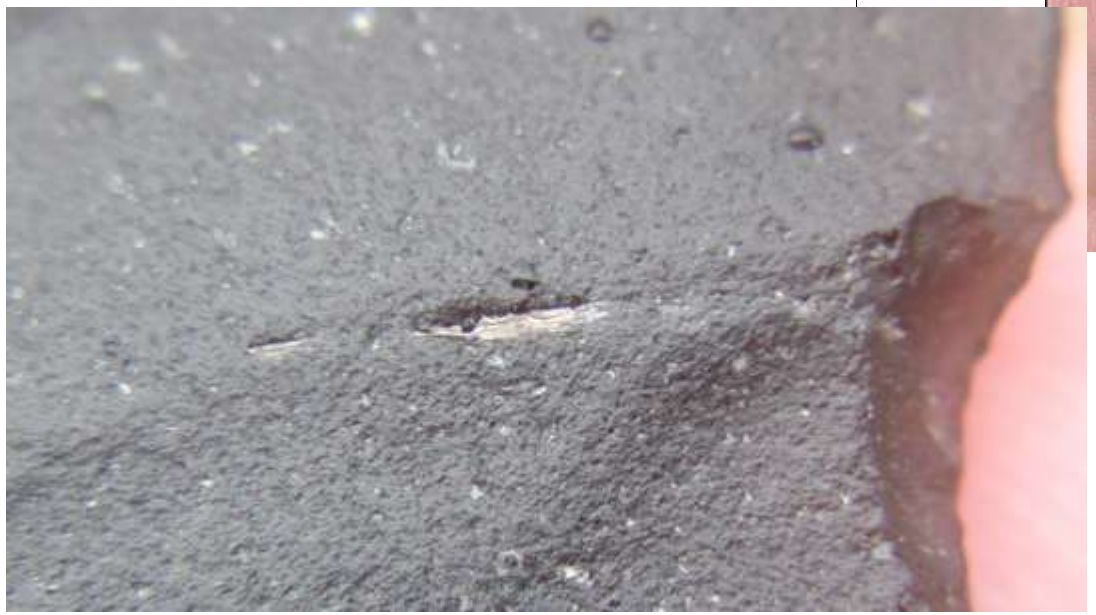
Face 1 lacks the artifact label, but has a flute scar and shows the wider basal ear to the left. The single flute scar is truncated by the transverse break margin, but weathering slightly obscures this observation. The flute measures 16.57x9.84 mm in length and width. Weathering precludes any identification of intentional flute scratching. There are two medium sized pressure, end thinning flake scars on the left half of the base. The proximal margin shows a limited amount of microflake sized edge damage. The right lateral margin may have one lateral scar that overlaps the flute, but weathering precludes certainty. No scars appear to overlap the channel scar from the left side. None from either side were identified as having been truncated by the flute, but weathering again plays a role. The right margin has small pressure scars possibly in a roughly parallel, horizontal configuration, but weathering prevents a definite determination. There is a limited microflaking overly of step scars that can be identified in spite of the eroded surface. The left side shows small pressure scars in a parallel, horizontal pattern with a trace overlay of microflaking. Scalar shaped microflake scars are more common than the step variety.

Face 2 has the artifact label and the wider ear to the right, but lacks a flute scar. Four medium pressure sized end thinning scars have erased the flute, but not the central groove that it created. Two of the four scars have a somewhat multi-flute appearance, but are off center to the left and are clearly part of a thinning sequence that includes, at the least, one scar to their right. The basal margin shows microflake sized edge damage mainly of the step scar type. The right lateral margin has a limited number of small pressure flake scars in a parallel, horizontal relationship. The left side has small to tiny pressure scars in a parallel, horizontal pattern with a microflake scar overlay that is very typical of microflaking associated with edge grinding, but as noted before, the edges are too weathered to identify such grinding.

CL-010

L = 39.23 mm
W = 35.67 mm
T = 8.91 mm
W/T = 4.00

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =



NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-010	Coso Volc. Field, CA	238	7	44	113	38	0	661	258	8913	66	37	32

Sugarloaf Mountain – 07/30/2025

CL-010

From Rondeau CalFLUTED Report #128 Part 1
CL-010 Fluted Point (Rondeau, CalFLUTED Research Report #128 commentary)

This base fragment (Appendix A, Fig. 8a, 9a) has both ears and the basal margin damaged. This obsidian is black with a cloudy gray translucency and came from the Coso Volcanic Field (Shackley 2009). The specimen is heavily weathered. The transverse break is a bending fracture from F2. Even though the break surface is weathered there is a positive bulb of force-like feature on that surface at its intersection with the F2 flute scar. The fragment has dimensions of 39.23x35.67x8.91 mm in length, width and thickness. Basal depth and width could not be measured. It has a weight of 14.5 g. Weathering precludes identification of margin grinding on any of the edges although the rounding of the lateral margins seems more pronounced than other weathered edges. The concave base seems to have been shallow, but this remains unclear due to edge damage. The lateral margins diverge away from each other in the distal direction. It has a biconcave basal cross-section. The flute scars on opposite faces diverge away from each other in the distal direction for the proximal three quarters of their length. The distal fourth shows the flute scars running parallel to each other when viewed in long-section.

Face 1 has no artifact label, but shows two large flute scars beside each other and has the distal most break corner to the right side. The left-hand flute scar is truncated by the transverse break. The scar measures 35.64x22.62 mm in length and width. The right channel scar ends in a step termination with dimensions of 26.34x13.22. Weathering precludes flute scratching identification. There is a central ridge removal flake scar of medium pressure size. Weathering and edge damage preclude any observation of proximal margin details. Weathering precludes certainty, but the left lateral margin may have had as many as five lateral scars that overlap onto a flute and the right side suggests three more. No scars from either margin were identified as having been truncated by the channel scars. Weathering appears to be a factor. The left-hand side shows small to medium sized pressure scars in a generally parallel, horizontal pattern, but weathering somewhat obscures this and the overlay of microflake sized, step scar edge damage. The right lateral margin is mostly edge damaged with step scars ranging in size from microflake to small pressure. There might be a surviving trace of medium sized pressure flake scars in a generally parallel, horizontal configuration, but this remains uncertain.

Face 2 shows an artifact label, a single flute scar and the distal most break corner to the left. The single flute is truncated by the transverse break margin. It has surviving dimensions of 36.28x16.51 mm in length and width. No flute scratching was observed due to weathering. There is one small sized pressure end thinning flake scar towards the left margin of the flute. It might have been a ridge removal scar, but again weathering precludes certainty. The basal margin shows highly weathered edge damage. Two lateral flake scars from the left edge, but none from the right overlap the flute scar. One other from the left and two from the right are truncated by the channel scar. The left-hand margin shows medium sized percussion scars in a generally parallel, horizontal arrangement with a limited overlay of small pressure sized scars also in a parallel, horizontal configuration. At the edge there is an overlay of weathered, microflake scar sized facets. The right margin has small to medium sized percussion scars in an irregular formation with an overlay of small pressure sized scars, several of which are clearly edge damage. At the margin edge there is microflake step scars, but the identified number is limited by weathering.

CL-011

L = 37.73 mm
W = 26.86 mm
T = 10.80 mm
W/T = 2.49

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-012

L = 29.96 mm
W = 27.37 mm
T = 9.48 mm
W/T = 2.89

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-013

L = 37.67 mm
W = 27.40 mm
T = 6.76 mm
W/T = 4.05

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-014

L = 37.34 mm
W = 23.62 mm
T = 7.87 mm
W/T = 3.00

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-014	Fish Springs, Inyo Co., CA	218	17	32	101	41	0	949	711	9030	59	NM	NM

CL-015

L = 35.60 mm
W = 28.65 mm
T = 5.84 mm
W/T = 4.91

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-016

L = 29.63 mm
W = 33.75 mm
T = 7.52 mm
W/T = 4.49

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-016

From Rondeau CalFLUTED Report #128 Part 1

CL-016 Fluted Point

This medial point fragment (Appendix A, Fig. 8c, 9c) is black obsidian that is translucent when held to the light with fine black and gray banding. That the blade of this specimen had been repaired before its final breakage is indicated by several lines of evidence. First, there are pressure flakes overlapping the flute on F1 from reflaking of the blade element. On F2 the distal segment of the left margin shows repair of the tip into a more blunt distal end than suggested by the F1 flake scars. Reflaking of the base may be indicated by the flute scars on opposite faces, both of which are off center in relation to the final lateral margins. Further, the two flutes are not aligned with each other. Aligned fluted scars are typical for nearly all fluted points, possibly suggesting that at least one of these may be a later reflaking of the base during repair. F2 shows remnants of an older and a later flute scar with both flutes having their own flute scratching. The older remnant is to distal of the later flute and at a higher elevation. This indicates refluting. However, both scars are off center to the left. With the older scar off center as well, it is unclear if this argues against the interpretation that the unaligned flute scars on opposite faces indicate refabrication of the base. Breakage that turned this specimen into a medial fragment are of several kinds. The damage to distal is represented by margin damage scars on opposite edges of opposite faces, both showing a detaching force that ran from distal right to proximal left. This pattern indicates that the point rotated during breakage from left to right (distal end to the top of the page) with the fulcrum near what was then the point tip. The proximal break is transverse and the result of a bending fracture form F2 that appears to have initiated at several points on the F2 surface. The surviving dimensions of this fragment are 29.63x 33.75x7.52 mm in length, width and thickness with a weight of 7.8 g. No basal measurements were possible. Heavy edge grinding is present on both lateral margins. The fragment has a slight, asymmetrical bi-concave cross-section. The flute scar remnants appear to run parallel to each other when viewed in long-section, but the specimen is too broad and thick to signal a Folsom point.

Face 1 has no artifact label, a distal damage peak off center to the left and the larger distal edge damage scar along the right-hand margin. The single flute scar remnant is off center to the left side. The flute is truncated by pressure flake scars from both lateral margins further to distal. This channel scar remnant has current measurements of 18.15x16.99 mm in length and width. The intentional flute scratching runs at a slight diagonal from proximal left to distal right of vertical. The flute is truncated from proximal by a wide languette scar (Lenoir 1975) from the transverse break surface. No other flake scars from proximal are present. Four pressure flake scars from the right lateral margin and three from the left overlap the flute. None from either margin are truncated by the channel scar. The right side shows a very limited edge margin segment with two small to medium sized pressure flake scars in a parallel, horizontal pairing with an overlay of microflake step scars associated with the margin grinding. The left side has medium sized pressure flaking that runs parallel and at a diagonal from distal left to proximal right. There is a limited overlay of microflake step scars associated with the margin grinding.

Face 2 has the label, the distal breakage peak to the right and the small distal damage scar that runs from just proximal of the tip at a diagonal from distal right to proximal left. There are remnants of two flute scars, but both are off center to the left with their own flute scratching. The earlier flute scar measures 120.36x12.11 mm in length and width with flute scratches that run at a diagonal from proximal right to distal left. At least two scratching strokes were involved as one set runs closer to vertical than the other. This channel scar is truncated to proximal by the transverse break margin. It is truncated distally by two damage scars, one from each side of the breakage tip, and by a small portion of the left-hand break margin. The proximal remnant of a later channel is on top of what appears to have been, on this fragment, the proximal right quadrant of the earlier flute. This later scar has surviving dimensions of 12.59x11.82 mm in length and width. It is truncated to proximal by the transverse break and terminates to distal in a shallow step termination that runs at a diagonal from proximal left to distal right. Several scratching strokes may be involved in making the nearly vertical scratches that are only at a slight diagonal from proximal right to distal left. At least one other stroke is indicated by a patch of scratches that run at more of a diagonal from proximal right to distal left. Two weathered flake scars from each lateral margin overlap the earlier flute scar. No evidence of lateral scars having been truncated by the first channel scar has survived the weathering. Weathering and the artifact label make any relationships between the second flute and lateral flake scars unclear.

Fluted point CL-016 shows extensive breakage, remnant flute scars, repair of damage by reflaking and subsequent additional damage. This fragment is quite similar to the fluted point fragment 553-83 in Rondeau (2014b, Fig. 11).

CL-017

L = 24.98 mm
W = 30.48 mm
T = 8.64 mm
W/T = 3.53

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-018

L = 22.36 mm
W = 25.40 mm
T = 5.59 mm
W/T = 4.55

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-018

From Rondeau CalFLUTED Report #128 Part 1
CL-018 Fluted Point

This base fragment has an ear missing (Appendix A, Fig. 10d). This obsidian piece is dark gray with black and gray translucent banding when held to the light. It is sourced to the Coso Volcanic Field (Shackley 2009). The transverse break surface is too weathered to allow the identification of a fracture type. Existing dimensions of the artifact are 21.85x25.41x5.29x7.56 mm in length, width, thickness and basal depth. Basal width could not be measured. It weighs 3.1 g. It is too weathered to identify edge grinding. The deep concave base has a very pronounced, surviving basal ear. The lateral margins of the base diverge slightly away from each other in the distal direction. The basal cross-section is bi-concave. There is a tiny notch in the concave base margin associated with the F2 flute scar. The concave base form is quite inverted V-like. The flute scars on opposite faces diverge away from each other in the distal direction when viewed in long-section.

Face 1 has no label, but the missing ear is to the right and the proximal segment of the flute scar is a broad, negative bulb of force. The single flute scar is truncated by the transverse break margin. The flute has surviving dimensions of 15.58x16.49 mm in length and width. It is too weathered to allow for the identification of intentional flute scratching. Weathering has removed all evidence of lesser flake scars along the proximal margin. Weathering allows the identification of only one lateral pressure scar from the right lateral margin that overlaps the flute. Another lateral scar from the left side also overlaps the flute. Perhaps due to weathering, none from the right were found that were truncated by the channel scar although one from the left side is present. The right margin exhibits small pressure scars in a roughly parallel, horizontal orientation. Weathering precludes the identification of any finer detail along the margin. The left side presents small to tiny pressure scars in a roughly parallel, horizontal configuration. Weathering obscures any finer flaking details although some edge damage might have been present at the margin edge.

Face 2 shows the artifact label and the surviving basal ear to the right side. The single flute scar ends partly in a step termination with weathering preventing a complete observation. The flute scar measures at least 12.91 mm in length with a width of 16.21 mm. Weathering and the label preclude identification of any flute scratching. Three pressure end thinning flake scars are present to the left of the flute. They run at a diagonal from proximal right to distal left and may have helped to shape the concave base. One of these may have also served as a ridge removal scar. The basal margin is too weathered to present edge flaking details. Again weathering may be a limiting factor as only one lateral scar from the right edge and none from the left were found to overlap the flute scar. One lateral scar from the right side and none from the left were found truncated by the channel scar. One end thinning scar may have also precluded identifying lateral flake scar relationships from the left-hand margin. The right side has small pressure scars in a generally parallel, horizontal fashion, but weathering prevents observation of any additional details.

Left margin data is limited due to weathering and the end thinning scar, but tiny pressure edge retouch scars are observed with a limited overlay of, at the least, microflake step scars.

CL-019

L = 21.59 mm
W = 25.65 mm
T = 5.84 mm
W/T = 4.39

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-019	Coso Volc. Field, CA	266	9	54	13	52	0	678	273	9411	63	36	39

West Sugarloaf – 07/30/2025

CL-020

L = 23.94 mm
W = 26.92 mm
T = 6.35 mm
W/T = 4.24

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-021

L = 27.30 mm
W = 24.89 mm
T = 6.35 mm
W/T = 3.92

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-022

L = 23.78 mm
W = 22.86 mm
T = 6.60 mm
W/T = 3.46

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-023

L = 24.31 mm
W = 27.43 mm
T = 4.06 mm
W/T = 6.75

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-024

L = 18.82 mm
W = 29.97 mm
T = 5.84 mm
W/T = 5.13

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-025

L = 20.53 mm
W = 24.13 mm
T = 6.35 mm
W/T = 3.80

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-026

L = 14.21 mm
W = 22.35 mm
T = 4.57 mm
W/T = 4.89

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-027

L = 25.02 mm
W = 32.77 mm
T = 6.86 mm
W/T = 4.78

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-028

L = 20.44 mm
W = 16.76 mm
T = 6.10 mm
W/T = 2.75

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-029

L = 31.44 mm
W = 20.57 mm
T = 6.60 mm
W/T = 3.12

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-030

L = 35.13 mm
W = 25.43 mm
T = 6.99 mm
W/T = 3.64

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-031

L = 52.2 mm
W = 33.42 mm
T = 11.00 mm
W/T = 3.04

Basal Width = 25.63 mm
Concavity Depth = 0 mm
Conc. Depth / Basal Width = 0

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-031	Coso (West Sugarloaf)	272	14	54	136	48	40	499	274	11923	62	Classic Coso pattern - Rb and Zr confirm the subsource

CL-031

From Rondeau CalFLUTED Report #128 Part 1
CL-031 Unfinished Fluted Biface with Overshot Scar

This complete biface (Appendix A, Fig. 10e) is black obsidian with translucent, cloudy gray streaks at the margins when held to the light. It is weathered with a general outline morphology that is Clovis-like with a straight base, maximum width just distal of the center point of its length and thickness at the center point. The perpendicular surface that forms the basal margin appears to be the weathered striking platform of the flake blank from which the biface was made. The nearly centered "bump out" just distal of the basal margin on F1 is part of the platform morphology as it signals the past presence of a bulb of force. That positive blub was subsequently flaked over in a not very successful attempt to remove its thickness. This artifact measures 52.20x33.42x11.00x0.0x25.63 mm in length, width, thickness, basal depth and basal width. It weighs 18.0 g. There may be a trace of platform preparation style margin grinding on both lateral margins, but weathering precludes certain identification. The basal surface margins show no grinding. The straight base has excurvate lateral margins and a plano-convex cross-section. This cross-section morphology is also indicative of the original flake blank.

Face 1 has the large overshot scar, a bite out of the left lateral margin and lacks an artifact label. There are no flake scars coming from the proximal direction. The left lateral margin shows a limited number of small pressure flake scars running parallel to each other at a diagonal from distal left to proximal right with an overlay at the margin of microflaking. There are more microflake step scars and the scalar variety. The right side has the large percussion, overshot scar that once covered over half of the F1 surface. Several medium sized percussion and small pressure flake scars form an irregular pattern. There is extensive edge crushing at the margin with stacked step terminations.

Face 2 has the artifact label, lacks an overshot scar and shows flake scars from the basal margin. To the left side of F2 is part of an early stage flute scar that it truncated to distal by a pressure flake scar from the right lateral margin and by the remnant of a percussion scar from the left side. The flute has surviving dimensions of 31.95x20.06 mm in length and width. There are four small to medium pressure, end thinning flake scars from the basal edge. At the least, the left most of these scars overlaps the channel scar. At the proximal margin there is a limited presence of microflake step scars, but they are still more common than the scalar. Two scars from the right side overlap the flute, the previously noted pressure scar and what appears to be either a very small percussion or edge damage scar. The previously mentioned percussion scar remnant from the left also overlaps the channel scar. No scars from the right, but one from the left side is truncated by the flute. The right side shows an irregular pattern of small to medium, pressure sized scars with one small to tiny scar that may represent edge damage. A medium sized percussion, overface scar nearly becomes an overshot from the right margin. It runs at a diagonal from near the tip (distal right) to proximal left. The left lateral margin shows portions of several small to medium percussion scars. No flaking pattern is suggested. At the margin there is some microflaking with the step form more common than the feather terminated scalar scars.

CL-032

L = 22.45 mm
W = 31.35 mm
T = 8.32 mm
W/T = 3.77

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-033

L = 21.9 mm
W = 26.44 mm
T = 5.14 mm
W/T = 5.14

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-034

L = 22.46 mm
W = 26.07 mm
T = 5.85 mm
W/T = 4.46

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-035

L = 24.27 mm
W = 38.13 mm
T = 6.70 mm
W/T = 5.68

Basal Width = 34.28 mm
Concavity Depth = 5.00 mm
Conc. Depth / Basal Width = 0.146

CL-035

From Rondeau CalFLUTED Report #128 Part 1

RA-18 (Unlabeled CL-A-Jasper) Fluted Point

This chert base fragment (Appendix A, Fig. 8d, 9d) is mottled light orange and pale yellow with a mottled translucency when held to the light. The base has been reflaked. It is weathered, but not badly. The transverse break began as a bending fracture from F1 that may have ended in a twisting fracture. The surviving dimensions of this fragmentare 24.27x38.18x6.70x5.00x34.28 mm in length, width, thickness, basal depth and basal width. It weighs 6.3 g. There is margin grinding on the two lateral edges, but only lightly on the proximal edge. The concave base is shallow with lateral margins that tend to expanded away from each other in the distal direction although when the piece was longer, the edges may have been excurvate. It has a bi-concave basal cross-section.

Face 1 has the distal most corner break to the right side and lacks a flute scar. Two medium and one small pressure sized, end thinning flake scars appear to have erased the distal most portion of the flute scar as some of its morphological groove is retained. There is no other surviving evidence of the flute scar. The small pressure scar is centered between the two large scars and may have removed a slight center ridge, not unlike those found on some multi-flute projectile points. The basal margin shows about equal amounts of microflake step and scalar scars mostly associated with the margin grinding, although some along the left-hand half of the basal edge appear to be edge damage. The right lateral margin shows small and large pressure scars in an irregular configuration with an overlay of microflaking. There are more step microflake scars than scalar. These microflake scars are associated with the edge grinding. There are a limited number of medium pressure scars from the left edge in a roughly parallel, horizontal pattern with an overlay of microflaking associated with the margin grinding. Scalar scars are more prevalent than the step type.

Face 2 has the distal most break corner to the left and shows a remnant of a flute scar. The flute remnant is distal of the pressure flake scars. It has a surviving width of 15.19 mm. At a minimum, the past length of the flute, as measured from the proximal edge, is 16.47 mm. It ends partly in a step termination with the rest truncated by a languette scar (Lenoir 1975) coming off of the transverse break surface. No flute scratches are present. Five small pressure retouch scars helped shape the concave base and clearly removed a proximal portion of the channel scar. The basal margin shows microflake scars with the scalar form more common than the step. No lateral flake scars from either margin overlap the flute. Due to the languette scar and pressure flaking none are visible from the left-hand edge. That pressure flaking appears to preclude identifying any overlapping scars from the right side as well. Also no truncated lateral scars are identified that come from the right, but one from the left is truncated. The right margin shows a limited number of small to medium pressure scars in an irregular pattern. The left side has small to tiny (including microflake scar size) pressure scars in a generally parallel, horizontal configuration.

CL-036

L = 18.48 mm
W = 34.14 mm
T = 6.37 mm
W/T = 5.36

Basal Width = 33.04 mm
Concavity Depth = 2.80 mm
Conc. Depth / Basal Width = 0.085

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-036	Queen/Saline Valley 1 (Queen Impostor)	173	26	28	129	33	20	803	535	10898	63	Can't tell the two apart with Fe:Mn peak ratios

CL-036

From Rondeau CalFLUTED Report #128 Part 1

RA-19 (Unlabeled CL-B-Obsidian) Fluted Point

This obsidian base fragment (Appendix A, Fig. 8e, 9e) is black and very translucent with a purple-gray tint when held to the light. It is heavily weathered. Weathering and the fact that half the transverse break surface has been lost, precludes the identification of a fracture type. The piece measures 18.48x34.14x6.37x2.80x33.04 mm in length, width, thickness, basal depth and basal width. It has a weight of 4.5 g. Weathering prevents any identification of edge grinding. The concave base is shallow with lateral margins that diverge slightly away from each other in the distal direction. Its cross-section is bi-concave. The flute scars on opposite faces diverge away from each other in the distal direction when viewed in long-section.

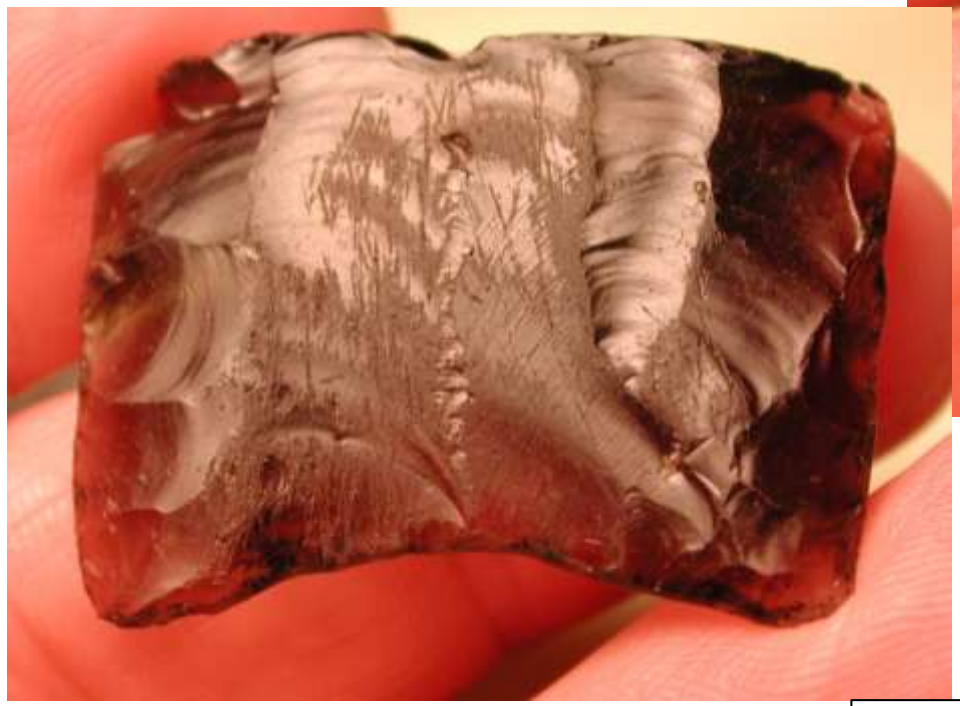
Face 1 has the distal most break corner to the right. The single flute scar is truncated by the transverse break. Surviving measures for the flute scar are a weathered 12.46x14.13 mm in length and width. No flute scratching is identified due to the weathering. A remnant of a prefluting guide scar appears probable to the right of the flute in spite of the eroded condition of F1. Another might be present to the left, but remains uncertain. Weathering has eroded away flake scar details along the basal margin, lateral flake scar relationships to the channel scar as well as any details of lateral flake scar patterns.

Face 2 shows the distal most break corner and the missing break surface segment to the left side along with a secondary percussion-like scar overlying the earlier flute scar. The channel scar is truncated by the transverse break margin. The flute scar has current measurements of 15.11x18.54 mm in length and width with the length measurement taken from the proximal margin. The secondary, percussion-like scar overlies most of the flute and may have been a refluting event. Regardless, it represents a rebasing event as it is oriented at a much steeper angle than the flute remnant. It ends in several weathered step terminations. No flute scratching is present due to weathering. What appears to possibly be, in spite of the weathering, are small to medium pressure sized, ridge removal scars, one to each side of the flute. One lateral flake scar from the right side overlaps the channel scar, but none do so from the left, probably due to weathering. No lateral flake scars from either margin were observed to be truncated by the flute scar. The left lateral margin shows weathered facets that suggest small pressure scars in a generally parallel, horizontal pattern with a possible microflake overlay. Due to extensive weathering, no scar pattern information for the right-hand margin has survived.

CL-037

L = 23.88 mm
W = 32.77 mm
T = 5.84 mm
W/T = 5.6

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =



Obsidian Hydration Measurement:
<u>11.6+/-0.1 µm</u>
Willamette Analytics Report 2025-14, 6/10/2025

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-037	Silver Peak	193	72	7	99	15	148	873	402	11035	37	AKA Fish Lake Valley; MZ's similar to South Warners but Ba, Ti, Mn clinch the source

CL-038

L = 16.51 mm
W = 24.13 mm
T = 4.83 mm
W/T = 5.00

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-038	Bodie Hills	195	110	14	104	15	731	932	438	10836	48	Nice fit

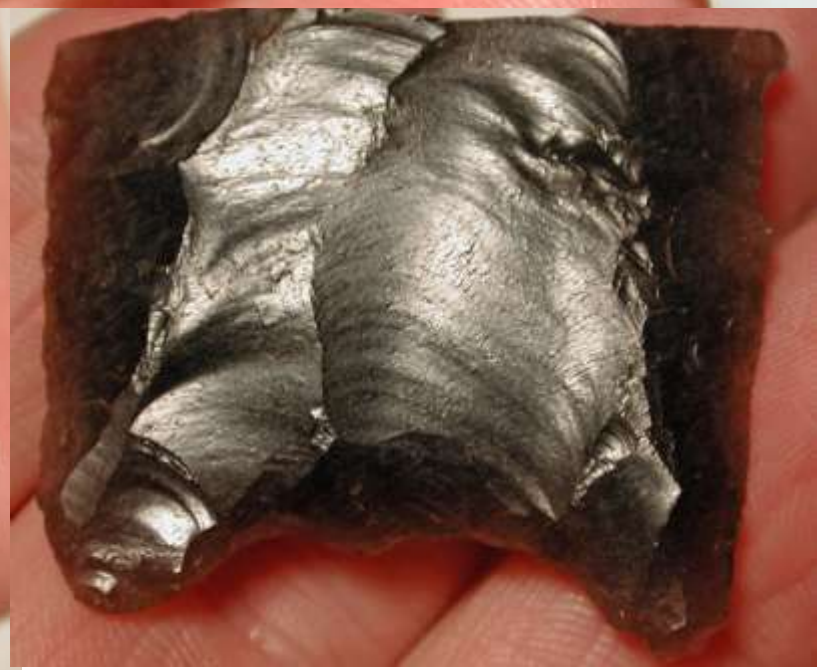
CL-039

L = 33.86 mm
W = 23.77 mm
T = 7.23 mm
W/T = 3.29

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-039	Garfield Hills, Mineral Co., NV	181	72	20	100	17	290	979	456	8796	48	NM	NM

CL-040



L = 33.41 mm
W = 39.25 mm
T = 8.58 mm
W/T = 4.575

Basal Width = 26.82 mm
Concavity Depth = 4.11 mm
Conc. Depth / Basal Width = 0.153

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-040	Queen/Saline Valley 1 (Queen Impostor)	175	28	26	130	39	49	834	543	11139	70	Can't tell the two apart with Fe:Mn peak ratios

CL-041

L = 42.74 mm
W = 27.50 mm
T = 7.67 mm
W/T = 3.59
Basal Width = 17.74 mm
Concavity Depth = 3.36 mm
Conc. Depth / Basal Width = 0.189

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-041	Unknown FGV	155	207	13	124	12	36	1097	398	11831	156	FGV - no match with anything in the NWROSL or Berkeley database

CL-042

L = 29.2 mm
W = 33.0 mm
T = 7.37 mm
W/T = 4.48

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-042	Double H Whitehorse BS/PP/FM	190	9	74	445	18	19	845	293	15309	197	Ti suggests BS/PP/FM as best choice but close; Double H-Whitehorse is single quite variable source

CL-043

L = 30.5 mm
W = 29.2 mm
T = 6.60 mm
W/T = 4.42

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-043	Queen/Saline Valley 1 (Queen Impostor)	173	23	22	127	34	36	667	540	10780	89	Can't tell the two apart with Fe:Mn peak ratios

CL-044

L = 26.49 mm
W = 27.16 mm
T = 6.08 mm
W/T = 4.47
Basal Width = 18.85 mm
Concavity Depth = 5.4 mm
Conc. Depth / Basal Width = 0.286

07/30/2025 – C. Skinner – this is still unknown. 13 known artifacts from this source share the same visually distinctive appearance, and all come from the China Lake area.

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-044	China Lake Unknown A	105	88	14	50	16	584	710	418	10307	311	California unknown probably located in China Lake region; milky color is key visual characteristic

CL-045

L = 41.15 mm
W = 33.02 mm
T = 7.11 mm
W/T = 4.64

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-045	Tempiute Mountain	199	132	36	163	28	720	765	437	12635	194	Nice fit; formerly known as Butte Valley Unknown B in early Nevada XRF studies

CL-046

L = 30.48 mm
W = 34.54 mm
T = 8.13 mm
W/T = 4.25

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-046	Tempiute Mountain	198	131	34	162	26	715	803	432	12627	138	Nice fit; formerly known as Butte Valley Unknown B in early Nevada XRF studies

CL-047

L = 27.18 mm
W = 19.05 mm
T = 5.97 mm
W/T = 3.19

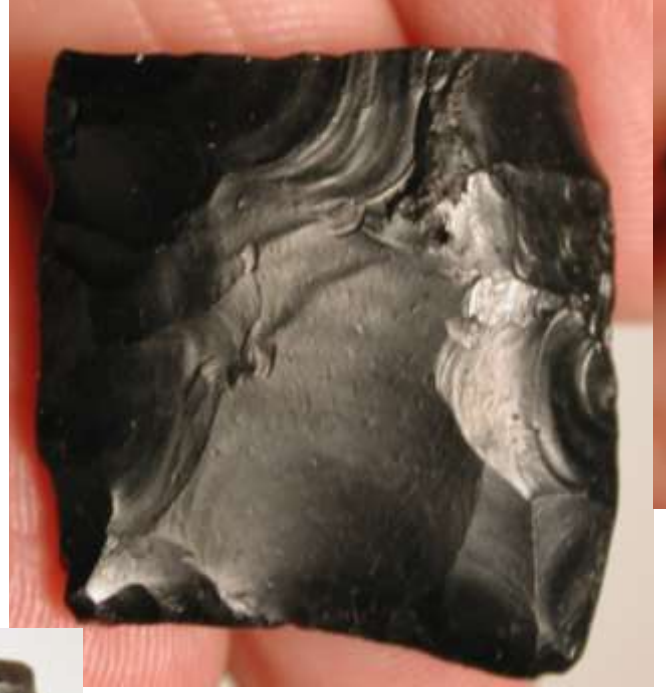
Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

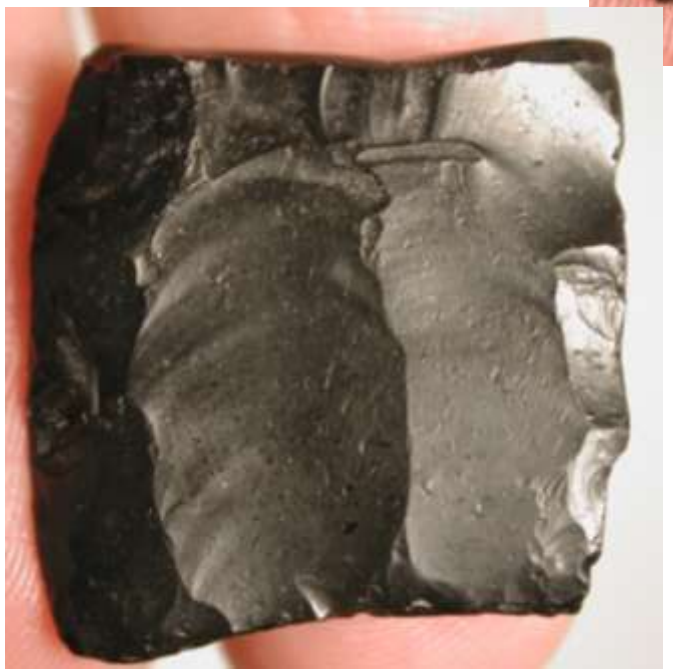
NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-047	Tempiute Mountain	201	136	32	164	28	668	1031	455	12743	85	Nice fit; formerly known as Butte Valley Unknown B in early Nevada XRF studies

CL-048

L = 23.88 mm
W = 22.35 mm
T = 5.33 mm
W/T = 4.19

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =





NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-048	Tempiute Mountain	204	135	35	166	31	677	838	446	12852	84	Nice fit; formerly known as Butte Valley Unknown B in early Nevada XRF studies

CL-049

L = 35.56 mm
W = 24.64 mm
T = 5.15 mm
W/T = 4.79

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-049	Tempiute Mountain	194	132	33	161	30	742	698	399	12281	140	Nice fit; formerly known as Butte Valley Unknown B in early Nevada XRF studies

CL-050

L = 44.20 mm
W = 31.75 mm
T = 7.37 mm
W/T = 4.31

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th	COMMENTS
CL-050	Obsidian Butte	146	102	25	215	8	747	NM	NM	NM	NM	NM	NM	Obsidian Butte, Variety 5 (Unknown C)

CL-051

L = 22.55 mm
W = 23.50 mm
T = 4.55 mm
W/T = 5.17

Basal Width = mm
Concavity Depth = mm
Conc. Depth / Basal Width =

CL-052

(PF-001)

L = 56.47 mm
W = 64.03 mm
T = 15.45 mm
W/T = 4.14

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-052	Coso (West Sugarloaf)	245	17	51	145	40	33	627	258	12203	63	Classic Coso pattern - Rb and Zr confirm the subsource

CL-052 (PF-001)

CL-052 Unfinished Fluted Biface (Rondeau, CalFLUTED Research Report #128 commentary)

This obsidian base fragment (Appendix A, Fig. 6a, 7a) is black with narrow black and gray banding with limited gray translucency at the margins. This fragment appears to be approximately one third of the original length. The transverse break is a bending fracture from F1. The fragment measures 56.47x64.03x15.45 mm in length, width and thickness with a weight of 66.4 g. No edge grinding is present on the specimen. The convex base has excurvate lateral margins that show edge damage. The cross-section is concave-convex. A fluting nipple is evident to the left of the flute scar on F1 and is more apparent due to its shaping scars on F2. There is also basal margin beveling on the left-hand two thirds of that edge (F2 view).

Face 1 has the only flute scar and the artifact label. This broad scar is truncated by the transverse break margin. The scar has current dimensions of 55.41x43.67 mm in length and width. There is no flute scratching. Along the right margin of the flute there is a medium sized pressure, pre-fluting guide scar from proximal. To the left of the channel scar there is a tiny scar remnant of what may have been a platform isolation scar. There are no other flake scars along the basal margin as those details were removed by the margin beveling on F2. Also, the flute removed an additional F1 segment of the margin. The right lateral margin shows two flake scars in the large pressure to small percussion size range that overlap the flute scar. No scars from the left side overlap the channel scar. Two medium sized pressure scars and one small percussion scar from the right side are truncated by the flute as is a medium percussion scar from the left-hand margin. The right lateral margin is largely damaged so that no flaking pattern from that edge has survived. Even so, there are two remnants of percussion scars from the left margin that come close to the right-hand edge, nearly becoming overshot flake scars. To proximal of those two scars, between the central segment of the flute scar and the edge damage is a small flake scar remnant that might be a portion of the ventral surface of the original flake blank, but this remains uncertain. The left lateral edge shows a series of medium sized percussion scars whose orientation rotates around that excurvate edge. There is a discontinuous overlay along the edge of some small pressure sized scars with deep step terminations typical of percussion. In addition, there is a discontinuous overlay at the very edge of microflake scars with the scalar form out numbering the step scars. Both overlay sets suggest some percussion style buffing of that margin with a hammer to lower that edge towards F2.

Face 2 lacks the flute scar and artifact label, but shows a clearly defined fluting nipple and a corner flute-like scar, but of a size too small for such an assignment. The medium sized pressure scars beveling the left-hand two thirds of the F2 basal margin were mentioned previously. These six whole or partial, medium sized pressure scars contributed to the beveling construction of a fluting platform for the fluting of F1. The flute removal on F1 removed the proximal portion of these scars. The left lateral margin shows two medium percussion sized, overface flake scars. These two scars cross F2 at a diagonal from distal left to proximal right. The ridge edge lacks a flaking pattern with one medium and one small percussion scar.

The unfinished fluted biface CL-052 exhibits a convex base and a very broad flute scar similar to the biface fragment of chert (90-7655) from the Skyrocket site in California (Rondeau and Pryor 2013, Fig. 3). This concave base form is common across North America for unfinished Clovis bifaces (see Kilby 2008).

CL-053

(PF-002)

Obsidian Hydration Measurement:
7.7+/-0.1 µm
Willamette Analytics Report 2025-14, 6/10/2025

L = 76.96 mm (max)
W = 39.88 mm (max)
T = 10.92 mm (max)

This biface fragment exhibits a long axis split (Appendix A, Fig. 6b, 7b). It is black and gray banded obsidian that is relatively opaque with a cloudy, gray translucency only at the thin edges when held to the light. The split surface indicates that it was a twisting fracture from the distal tip that originated on F1. The piece measures 77.47x41.46x11.44 mm in length, width and thickness. Basal depth and width could not be measured. It weighs 36.6 g. The surviving lateral margin and the basal edge both show margin grinding as platform preparation for further flaking. The biface may have been ovoid before breakage. A basal cross-section could not be determined.

Face 1 has the artifact label, the ventral surface remnant from the original flake blank along the right-hand margin, a hinge termination in the central portion of its face and is missing the left biface margin. It also exhibits a corner flute scar from the right basal corner. This scar measures 59.36x32.88 mm in length and width. It is truncated by the remnant of a percussion scar from distal and to a lesser degree by the long-axis break margin. There is also a remnant of a percussion flake scar from proximal that might have been a more typically oriented, early stage flute scar. While the left lateral margin is missing, there are terminal segments of three large percussion sized, overface flake scars from the left. The right-hand margin shows only pressure edge retouch with an overlay of microflaking mainly on the ventral surface remnant and a percussion scar from distal. The microflake scars show more with step terminations than are of the scalar form. The rest of the lateral margin presents the previously discussed corner flute.

Face 2 lacks an artifact label and the right lateral biface edge. Three pressure end thinning flake scars are present. The only other basal flaking was the tiny pressure edge retouch to microflake scar sized beveling along the proximal margin. The surviving lateral margin has small, medium and large sized pressure flake scar and small to medium sized percussion scars, all in an irregular pattern.

Another unfinished fluted biface (CL-053) does not exhibit a typical flute scar that runs vertical from the base. Rather, what is herein termed a “corner flute” is present on the specimen. This feature is a large percussion biface thinning flake scar from one basal corner of the biface that runs at a diagonal from proximal towards the other lateral margin. That this is a significant Clovis style biface attribute is evidenced by their much more common presence on unfinished bifaces in the Simon Cache than are more vertical flute scars. For an example on a large obsidian biface fragment see Rondeau (2010d, Fig. 5).

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-053	Coso (West Sugarloaf)	232	18	45	151	41	22	476	262	12020	57	Classic Coso pattern - Rb and Zr confirm the subsource

CL-054

L = 30.77 mm
W = 19.29 mm
T = 5.22 mm
W/T = 3.695

Basal Width = 16.54 mm
Concavity Depth = 4.25 mm
Conc. Depth / Basal Width = 0.257

Catalog No.	Trace Element Concentrations								Geochemical Source
	Rb	Sr	Y	Zr	Nb	Ba	Ti	Fe2O3(t)	
CL-054	285	11	60	161	50	71	545	0.840	Coso (West Sugarloaf)
±	0.9	0.3	0.8	0.9	0.9	4.2	3	0.001	

CL-055

L = 27.84 mm
W = 21.45 mm
T = 6.88 mm
W/T = 3.118

Basal Width = 17.4 mm
Concavity Depth = 5.82 mm
Conc. Depth / Basal Width = 0.334

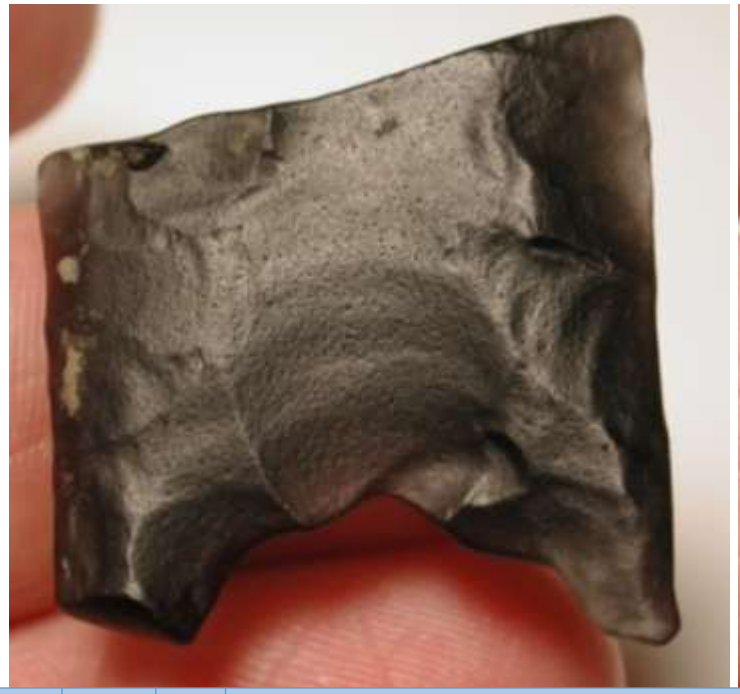
CL-056

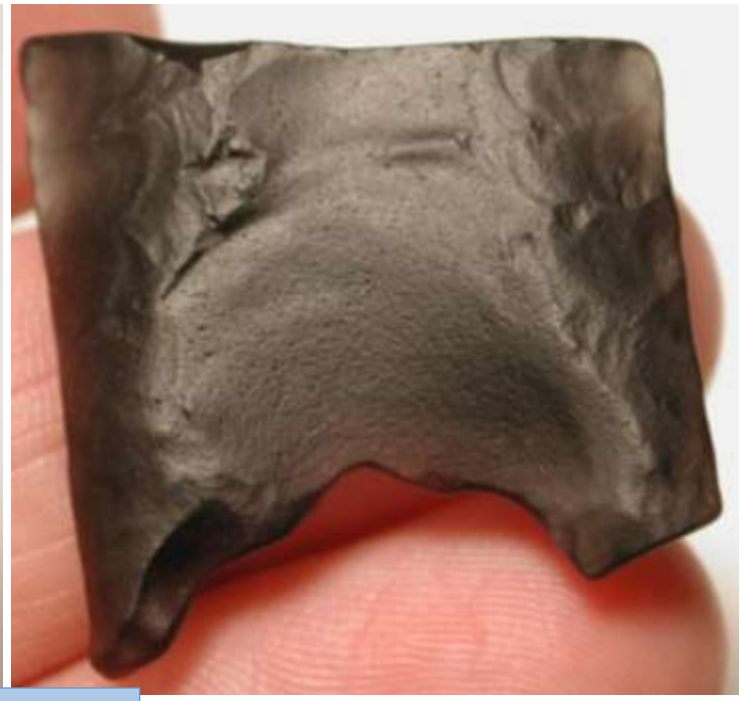
L = 19.15 mm
W = 30.25 mm
T = 5.85 mm
W/T = 5.171

Basal Width = n/a mm
Concavity Depth = n/a mm
Conc. Depth / Basal Width = n/a

CL-057

L = 29.21 mm
W = 27.94 mm
T = 5.84 mm
W/T = 4.78





NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-057	Coso (W. Sugarloaf)	273	15	58	144	54	7	416	278	12235	138	Classic Coso pattern - Rb and Zr confirm the subsource

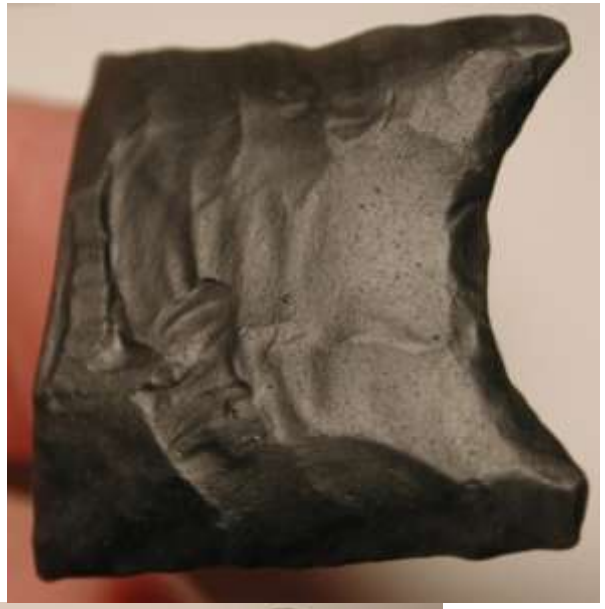
CL-058

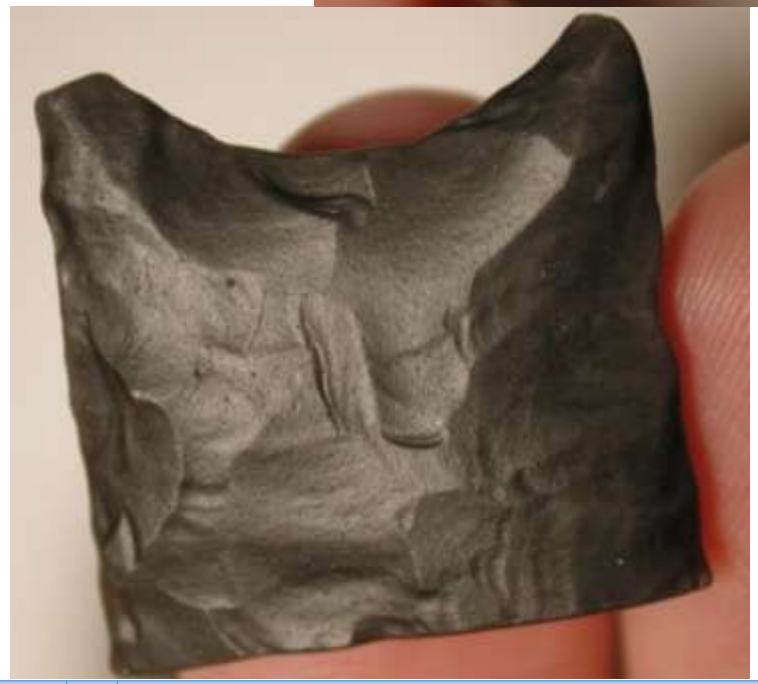
L = 20.57 mm
W = 26.42 mm
T = 6.10 mm
W/T = 4.33

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-058	Coso (W. Cactus)	337	12	72	125	74	0	500	287	12031	88	Elevated Rb and Nb confirm

CL-059

L = 24.13 mm
W = 24.38 mm
T = 5.08 mm
W/T = 4.80





NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-059	Coso (Sugarloaf Mtn)	238	10	49	114	40	0	377	262	11280	61	Classic Coso pattern - Rb and Zr confirm the subsource

CL-060

L = 25.65 mm
W = 23.62 mm
T = 7.11 mm
W/T = 3.32

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	COMMENTS
CL-060	Coso (W. Cactus)	320	11	69	125	71	0	344	258	11469	75	Elevated Rb and Nb confirm

CL-061

L = 27.43 mm
W = 29.72 mm
T = 5.59 mm
W/T = 5.32

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-061	Tempiute Mtn B, Lincoln Co., NV	194	131	30	161	28	682	1051	450	11245	75	NM	NM

CL-062

L = 21.08 mm
W = 26.67 mm
T = 5.84 mm
W/T = 4.57

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-062	Montezuma Range, Esmeralda Co., NV	347	9	47	106	44	0	881	541	9762	62	NM	NM

CL-063

L = 38.1 mm
W = 32.77 mm
T = 7.37 mm
W/T = 4.45

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-063	Tempiute Mtn B, Lincoln Co., NV	181	120	35	159	30	828	1043	397	10363	65	NM	NM

CL-064

L = 20.07 mm
W = 33.27 mm
T = 6.60 mm
W/T = 5.04

NAME	SOURCE	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe	Zn	Pb	Th
CL-064	Tempiute Mtn B, Lincoln Co., NV	191	131	30	159	30	761	998	409	10775	80	NM	NM

CL-065

L = 29.04 mm
W = 32.06 mm
T = 8.15 mm
W/T = 3.93

Basal Width = 26.22 mm
Concavity Depth = 5.86 mm
Conc Depth/BW = 0.223

Catalog No.		Trace Element Concentrations								Geochemical Source
		Rb	Sr	Y	Zr	Nb	Ba	Ti	Fe2O3(t)	
CL-065		191	25	24	150	39	87	657	0.360	Queen
	±	0.8	0.4	0.7	0.9	1.0	5.3	3	0.001	

CL-066

L = 42.22 mm
W = 32.69 mm
T = 8.40 mm
W/T = 3.89

CL-067

L = 16.14 mm
W = 27.42 mm
T = 4.33 mm
W/T = 6.33

Basal Width = 21.13 mm
Concavity Depth = 5.46
Conc Depth/BW = 0.258

Possible flute scratching atypical for non-obsidian