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The Copper Creek Clovis Point from Hells Canyon, Northeastern Oregon

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Clovis points along the Snake River occur near the end of the anadromous fish runs at Auger Falls and on the upper Snake River plain between American Falls and Bannock Creek. However, before the discovery of the Copper Creek example described here, they were not known to occur in anadromous, high-energy, streamside locales as far downstream as Hells Canyon. The Copper Creek specimen is an impact-fractured Clovis point made from Gregory Creek obsidian, which outcrops 150 km. to the southwest. This source joins Timber Butte, Big Southern Butte, and the Walcott Tuff as the earliest obsidian sources exploited by Paleoindians along the middle Snake River.

In the late summer of 1984, a Forest Service cultural resources employee discovered an impact-fractured obsidian Clovis point near the mouth of Copper Creek, 419 km. (260.6 river miles) above the confluence of the Snake River with the Columbia (Fig. 1). She found the point on private, river-fronting property in extreme southeastern Wallowa County, Oregon. It was briefly mentioned in a locally distributed Forest Service report (Nisbet 1985) and placed on display at the Lewiston office of the Hells Canyon National Recreation Area before it was returned to its owner. The specimen has not previously been documented in the professional literature, however.

The timing and routes of the initial colonizers of North America are still poorly known and few well-dated Clovis sites exist. Therefore, even isolated finds of Early Paleoindian diagnostic artifacts hold great potential for understanding the initial colonization and early settlement of the interior Pacific Northwest. The distribution of fluted projectile points is particularly important for documenting the local appearance of the pan-continental Clovis horizon, dated around 11,200–10,800 ^{14}C yr. B.P. (Anderson and Gillem 2000; Hamilton and Buchanan 2007; Haynes 2002; but see Waters and Stafford 2007).

The Copper Creek Clovis point adds considerable antiquity to the prehistory of the Hells Canyon reach of the Snake River, and merits detailed technological analysis in its own right. The point also marks the earliest known exploitation of the Gregory Creek obsidian source in the upper Malheur basin of northeastern Oregon. Hells Canyon is an unlikely Clovis colonization route (e.g., Anderson and Gillem 2000:48–51). However, the Copper Creek Clovis point indicates that due either to range or population expansion, even such remote and rugged regions as this were occupied within no more than a few centuries of initial colonization.

CONTEXT

Copper Creek is a short, steep, spring-fed stream that drains a southeastern slope of Summit Ridge, the north-south oriented interfluve between the Snake and Imnaha rivers. It lies near the upstream or southern edge of the Hells Canyon reach of the Snake River.

The point was an isolated find discovered on the Snake River near the mouth of the creek on a mud flat exposed by low-pool levels of Hells Canyon reservoir in the late summer of 1984 (Fig. 2). Pool levels behind Hells Canyon Dam in August and September, 1984 ranged between 512.7–519.6 m. (1,682–1,686 ft.) above sea level. The discovery position lies near the toe of a large slump and landslide that extends from just south of Copper Creek upstream almost to the mouth of Ashby Creek (Fig. 3). The age of this slump and landslide feature is unknown, but a still more massive landslide scar at Big Bar 6.4 km. (4 miles) downstream predates the Bonneville flood at ca. 14,500 yr. B.P. (Vallier 1998:118–120). At the time the point was discarded the Ashby Creek slump may have extended further to the east, creating a local setting marked by islands in a braided stream.

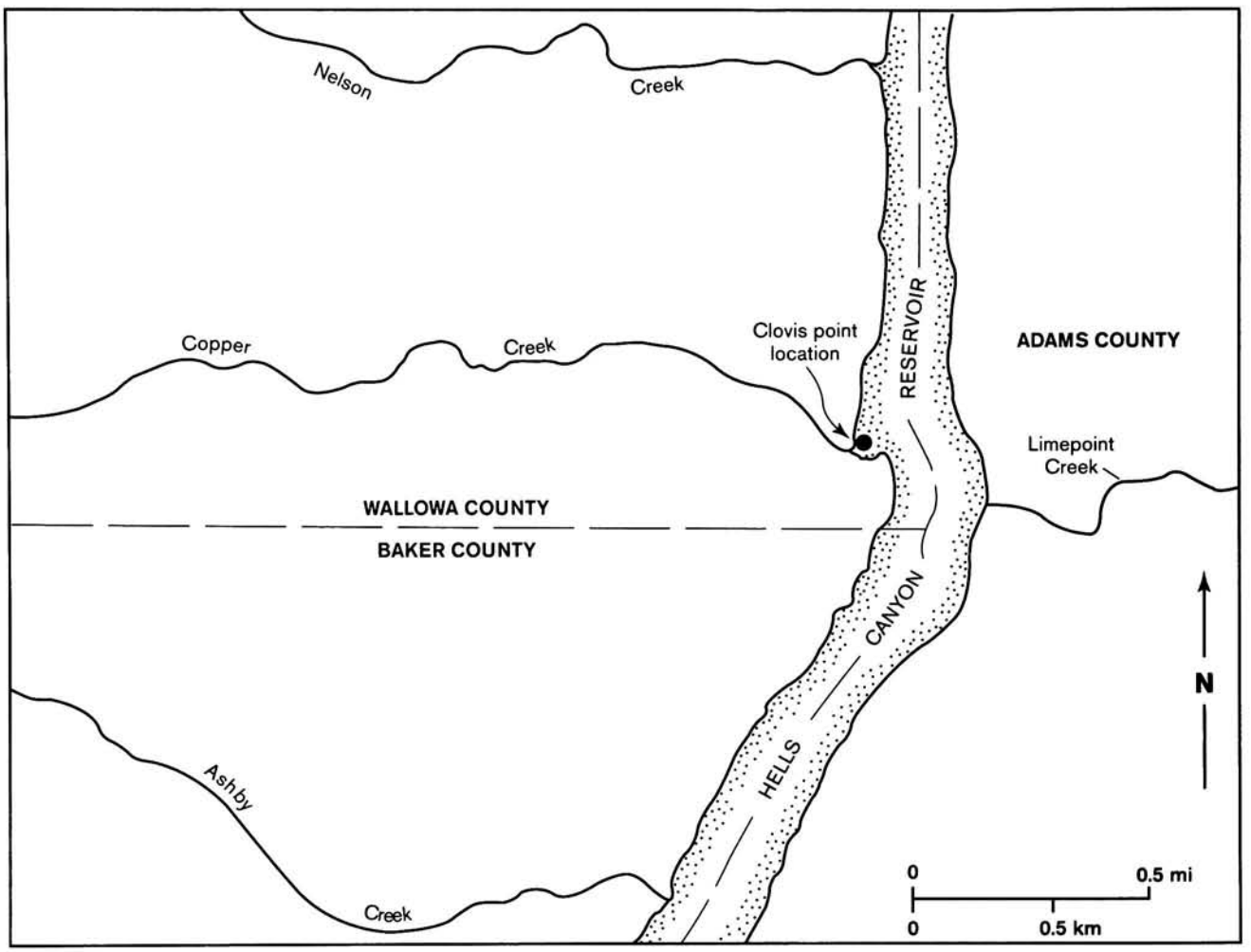

Figure 1. Map showing the location of Copper Creek and the Clovis find spot in upper Hells Canyon.

While the point was not found by a professional outfitted for archaeological field recording, its relationship to the Snake River, the mouth of Copper Creek, and the landslide slump is reasonably well understood in terms of distance and provenience. The mud flat where the point was found appears to be the context where it was lost or discarded. Microscopic analysis revealed no edge or arris rounding or pitting suggestive of alluvial transport.

POINT DESCRIPTION

This large Clovis point conforms closely in production technology and morphology to others found across the Pacific Northwest. The Clovis knapper prepared the preform for fluting by comedial and slightly transverse percussion and pressure thinning. The face with the longest flute was likely the first to be fluted, and the knapper removed two channel flakes. First, the stoneworker removed a long flute (39.6 mm.), ending in a step termination (Fig. 4, left). The opposite side was probably fluted next by the removal of a relatively short flute (21.4 mm.), which ended in a feather termination (Fig. 4, right). The first side was then fluted again by removal of a relatively short channel flake (18.9 mm.), and this second flute ended in a feather termination.

The knapper finished the point by selective marginal pressure flaking, removing flakes where needed to shape the preform, but not in a patterned sequence. This post-flute retouch did not remove the terminations of any of the channel flakes, but did invade the flute slightly on the second side that was fluted. No post-fluting retouch invaded the flute scar on the first side.

The lateral and basal margins exhibit pronounced intensity grinding (visible without magnification), which

Figure 2. Dixie Taylor of Homestead, Oregon, pointing to the approximate location where she discovered the point on private land during the low-water late summer of 1984.

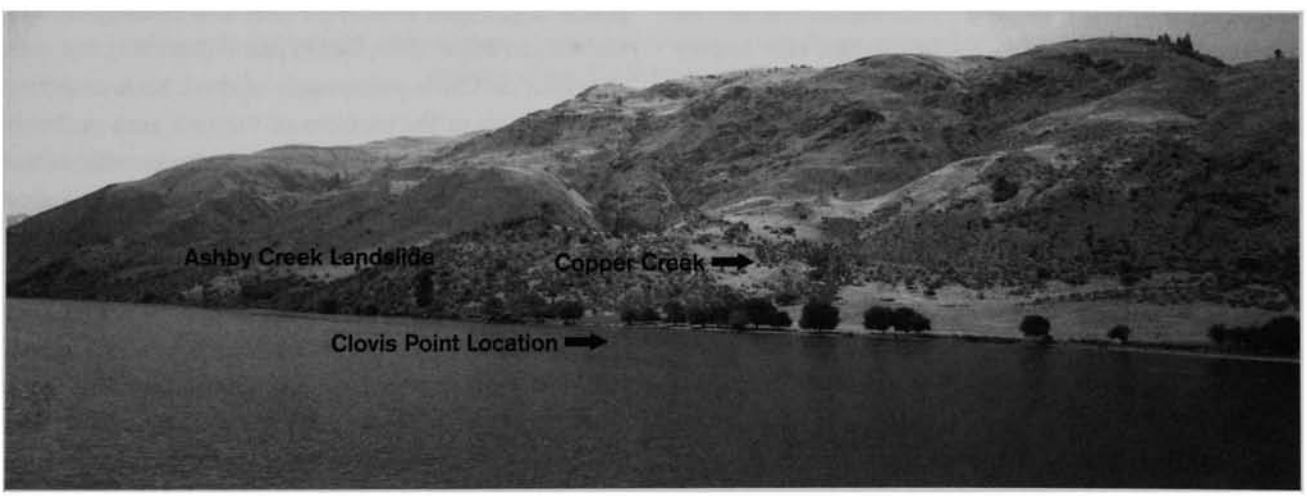

Figure 3. View looking west from the Idaho side of the Snake River to the Copper Creek point discovery location.

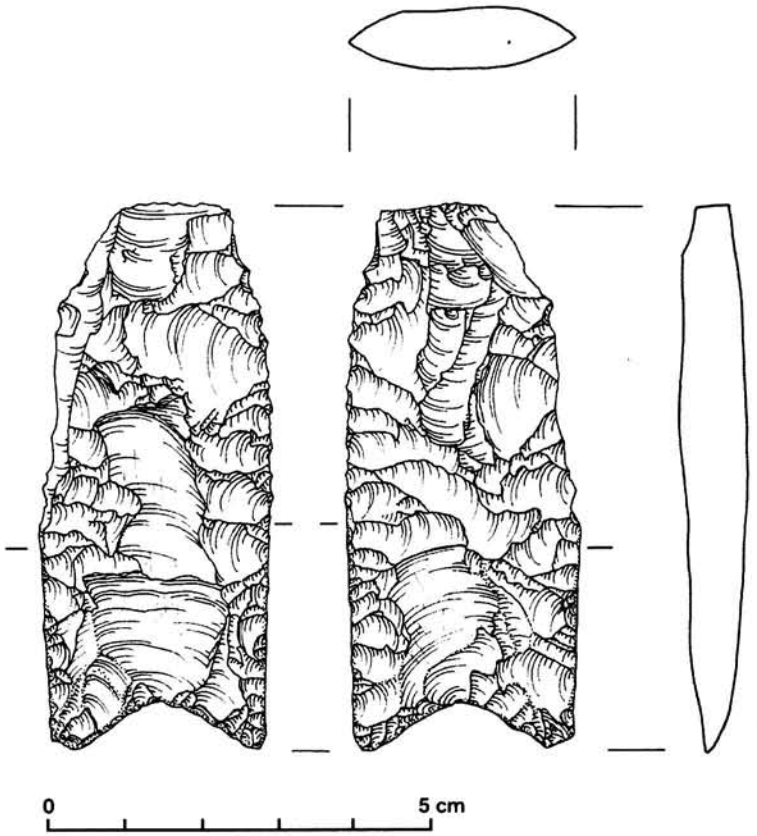

Figure 4. The Copper Creek Clovis point (tick marks indicate the extent of lateral grinding). Left image is A side (the first to be fluted) and right image is B side.

also created facets 0.9 mm. wide along both lateral edges. Grinding extends from the base for 30.75 mm. on one margin, and is truncated by an impact fracture on the opposite margin. The ground margins also display moderate intensity (visible under 10x magnification) striations that run perpendicular to the lateral edges, indicating that the tool maker rubbed the abrader back and forth, perpendicular to the long axis. In contrast, most edge-ground or polished fluted points that we have examined display edge-parallel striations (e.g., Reid et al. 2006; Root and Taylor 2003). Edge margin grinding is common on Clovis points, since it strengthens the haft area, minimizing breakage during impact (Titmus and Woods 1991).

Both faces display pronounced scratches (striations) in the flutes and on adjacent areas of the face, as shown in the line drawing (Fig. 4) and photograph (Fig. 5). The flute flake ridges (arrises) are also heavily ground. Marie Wormington (1957:61) first reported scratches in the flutes of obsidian Clovis points in her description of the Borax Lake collection. Subsequent studies indicated that such abrasion in the flute scars is common on obsidian Clovis points (e.g., Fagan 1988:394; Frison and Bradley 1999:19; Ozbun and Fagan 1996; Sutton and Wilke 1984), but does not occur on Clovis points made of chert. Such scratching and abrasion of the surfaces of the haft area probably roughens the smooth, glassy obsidian to provide better adhesion for the haft binding mastic (Fagan 1986; Sutton and Wilke 1984). Ozbun and Fagan (1996) produced similar scratches on obsidian with a chert biface.

The point was broken by a massive impact fracture. The tip of the point broke by a bend fracture that created a lip down one face of the point (Fig. 4, left). Two flakes on the opposite face also originate at the distal end and run toward the haft down the center of the point. A large impact burination runs down one edge and has removed part of the lateral grinding. All of the fractures and flaking were probably caused by impact. Such damage suggests that the point was used to kill large prey (deer size or larger), and that it may have been discarded at a

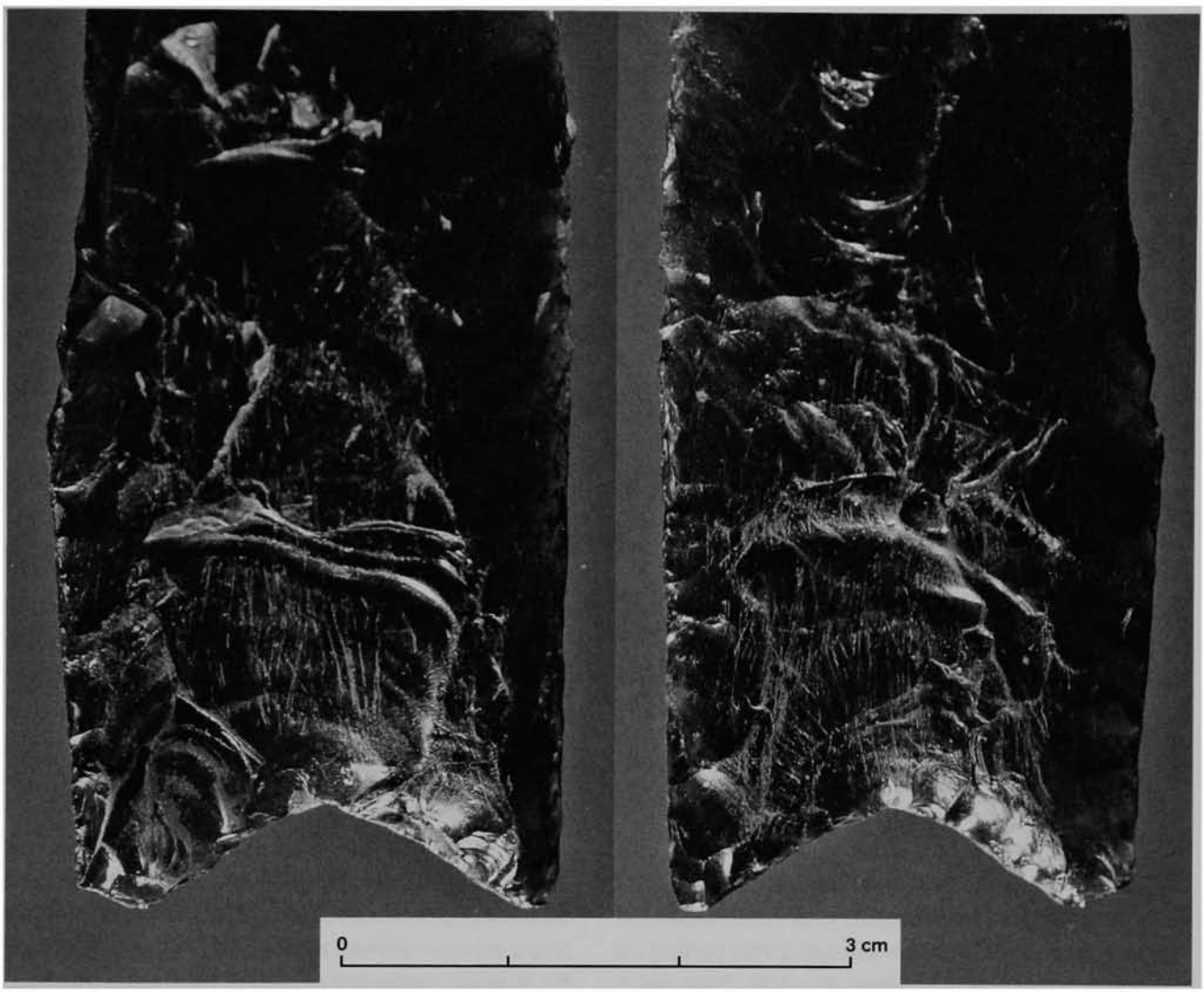

Figure 5. Photograph of the Copper Creek Clovis point showing the pronounced scratches (striations) and grinding in the flutes (magnification 2.3x).

camp following the hunt. Two other flakes were removed using the bend fracture as a platform following breakage. These may represent an attempt to refurbish the point, but one that was quickly abandoned.

Portions of the edges of the impact breakage display rounding at 25–40x, and there are unpatterned striations on the surface of the point visible at 25x. These are most likely from post-depositional weathering. There is no uniform edge rounding or surface abrasion, however, that would indicate fluvial transport. Therefore, the find location of the point is probably close to the location of discard or loss.

Point measurements—as defined by Morrow and Morrow (2002) and adapted from the Wilmsen and Roberts (1984) measurements for Folsom points—are as follows: total length 71.1 mm.; maximum width 31.1 mm.; interflute thickness 6.3 mm.; ridge thickness A 6.75 mm.; ridge thickness B 6.4 mm.; flute length, side A 39.6 mm.; flute length, side B 21.4 mm.; flute width, side A 17.8 mm.; flute width, side B 14.1 mm.; basal concavity 6.4 mm.; basal width 29.0 mm.; maximum thickness 10.0 mm.; haft length 30.75 mm.; and weight 24.3 g. (The "A" side was fluted first [Fig. 4, left] and the "B" side was fluted second [Fig. 4, right].) The ratio of the interflute thickness to maximum width is 0.20, and the ratio of the basal concavity to the basal width in 0.22. These ratios are within the ranges of other Western Clovis points (Morrow and Morrow 2002:Figure 8).

Table 1

QUANTITATIVE COMPOSITION ESTIMATES FOR THE COPPER CREEK CLOVIS POINT

Catalog Number	Trace Element Concentrations									Ratio	Obsidian Source (Chemical Type)
	Rb	Sr	Y	Zr	Nb	Ba	Ti	Mn	Fe_2O_3	Fe/Mn	
No #	69 ±4	142 ±3	20 ±3	59 ±4	9 ±3	2210 ±12	311 ±18	762 ±10	1.08 ±.02	13	Gregory Creek, OR
GC-L1A	74 ±4	151 ±3	23 ±3	65 ±4	12 ±3	2350 ±15	301 ±18	760 ±10	1.12 ±.02	13	Gregory Creek, OR
GC-L2A	76 ±4	146 ±3	24 ±3	58 ±4	12 ±3	2169 ±12	340 ±18	739 ±10	1.12 ±.02	14	Gregory Creek, OR
RGM-1 (measured)	150 ±4	111 ±3	24 ±3	223 ±4	8 ±3	804 ±10	1597 ±20	285 ±10	1.90 ±.02	62	
RGM-1 (recommended)	149	108	25	219	9	807	1600	279	1.86	nr	

Values in parts per million (ppm) except total iron [in weight %] and Fe/Mn intensity ratios; ± = x-ray counting uncertainty and regression fitting error at 120-360 seconds livetime.
nm = not measured. nr = not reported.

OBSIDIAN SOURCING

Non-destructive trace element analysis of the Copper Creek Clovis point was performed by one of us (REH) on a QuanX-EC™ (Thermo Electron Corporation) energy dispersive x-ray fluorescence (edxrf) spectrometer. Details of edxrf instrumentation, artifact-to-source (chemical type) attributions, measurement resolution limits for each element, comparative literature references, and calibration have been published elsewhere, so interested individuals should consult Hughes (1988, 1994, 2005) and Hughes and Pavesic (2005) for these technical particulars.

Edxrf data (Table 1) indicate that this Clovis point (listed as No # in Table 1) shares the trace element composition of geologic obsidians of the Gregory Creek chemical type (*sensu* Hughes 1998:103–104). Obsidian of this chemical type is distinct from other regional sources (e.g., those reported in Lyons et al. 2001: Table A-1) on the basis of low Rb and Zr, and high Ba concentrations. Gregory Creek obsidians were erupted about 150 km. southwest of the Copper Creek locality in northern Malheur County, Oregon.

DISCUSSION

The Copper Creek Clovis point extends the cultural chronology of Hells Canyon by at least 3,000 years and provides us with another rare glimpse of Paleoindian toolstone procurement in the interior Northwest. In addition, and more speculatively, with the recently recorded Clovis point from Lake Cascade on the North Fork of the Payette River (Petersen 1987), the location of its discovery at the confluence of Copper Creek and the Snake River highlights the potential significance of fish in the early Paleoindian diet. Finally, the recovery contexts for both the Copper Creek Clovis and the Lake Cascade Clovis points deserve comment.

The earliest documented sites in Hells Canyon are at Kirkwood Bar and Bernard Creek Rockshelter, with dates ranging between 6,800 and 7,200 ^{14}C yrs. B.P. Despite recent intensive surveys between Hells Canyon Dam and the Salmon confluence (Chatters 2001; Root and Reid 2001), and between the Salmon and Grande Ronde (Root 2003), no sites or isolated projectile points of the Western Stemmed tradition have so far been reported along the Snake River between the lower Weiser and the Lewiston Basin. Thus, the Copper Creek Clovis point greatly extends the archaeological chronology of the Hells Canyon reach of the Snake River.

Paleoindian points made from chemically distinctive obsidians serve as helpful colonization "tracers." Thus, the fact that six different obsidian sources occur within 50 km. of the Simon cache (10CM7) on Camas Prairie (Holmer 1997), 225 km. southeast of Copper Creek, with *none* of them represented among the 30 recovered artifacts, offers an intriguing contrast to Clovis points from Lake Cascade, Seagull Bay, and Copper Creek (Fig. 6). The Lake Cascade point has been sourced to Timber Butte, 50 km. to the south (Michels 1988), and

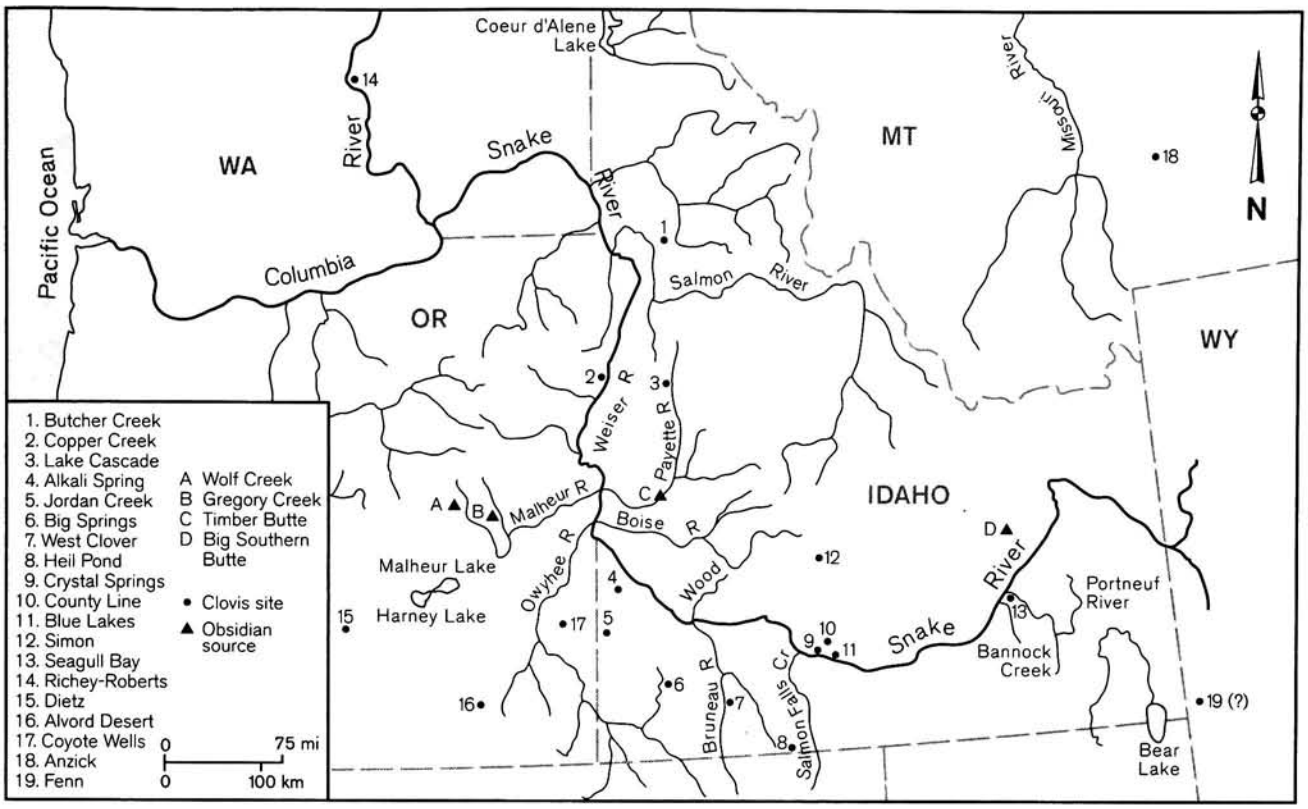

Figure 6. Map showing the Clovis landscape of southern Idaho. Clovis points 2 (Copper Creek), 3 (Lake Cascade), 9 (Crystal Springs), 10 (County Line), and 11 (Blue Lakes) occur at or near places that probably became major fisheries by 10,600 yr. B.P.

the two Seagull Bay specimens to Big Southern Butte, 65 km. to the north (Hughes 2006), and to the locally outcropping Walcott Tuff (Hughes 2008).

The Copper Creek specimen marks the earliest known use of Gregory Creek obsidian, also known as Jonesboro or Sugarloaf Butte obsidian (Nelson 1984:53). This obsidian has been recently identified in early contexts at both Marmes Rockshelter in the Palouse Canyon (Ozbun et al. 2004:206) and the Hetrick site on the lower Weiser (Rudolph 1995:6.85–6.88), but in both cases the projectile points were Cascade forms of mid-Holocene age. Gregory Creek now joins Timber Butte, Big Southern Butte, and the Walcott Tuff as obsidian sources used by Clovis pioneers in this region.

Thus, contrary to fracture toughness expectations raised by Nelson (1997:378), Clovis knappers along the Snake River Plain used at least four chemically distinguishable obsidians to manufacture fluted projectile points. These obsidian points conform closely to Western Clovis norms and served the same purposes as their chalcedony, chert, quartzite, and silicified wood counterparts. Indeed, if fracture toughness or resistance to breakage was a prime consideration for Clovis knappers, we might expect a bias in favor of the measurably tougher basaltic andesites and dacites widely exploited by their Western Stemmed successors in western Idaho and eastern Oregon. However, no Clovis points made from these sources have been reported in the region to date.

While we cannot be certain that the impact fracture on the Copper Creek Clovis point was caused by striking a large-boned mammal, the damage seems less likely to have been caused by impact with any of the smaller-boned species now known to have been part of the Clovis diet. In addition, the beach sands, silts, and clays (but not rocks) where the point was found should not have caused such an impact fracture if the projectile had missed its mark. The overall condition of the specimen and the context of discovery are consistent with the hypothesis that the point fractured on impact with a mammal as large as a deer or bighorn sheep (or perhaps larger), although we concede that the same observations that suggest the hypothesis cannot confirm it. Without being unduly

insistent about it, we suggest that a scenario recently offered for breakage patterns among Clovis points in the large-mammal bone bed at the Murray Springs site might accommodate the Copper Creek point: "Impact damage was predominant, probably resulting from high velocity casting of projectiles, and transverse snapping was secondary, presumably resulting from thrusting into a vigorously moving animal" (Hemmings 2007:123).

What, if anything, should we make of the riverine setting of the Copper Creek Clovis point? Until the late twentieth century the Hells Canyon reach of the Snake River hosted large runs of chinook, sockeye, and steelhead salmon. Lampreys ran at least as far as the Weiser River and white sturgeons were concentrated in the deeper pools between Hells Canyon and the head of anadromy at Shoshone Falls. Faunal remains from the Hetrick site on the lower Weiser confirm that salmonids were taken as early as 10,320 ±90 yrs. B.P. (Rudolph 1995). Stable carbon isotope evidence from the Buhl burial (10TF1019), near the Kanaka Rapids fishery, suggests that marine protein drew people to the Middle Snake River by 10,675 ±90 ^{14}C yr. B.P. (Green et al. 1998).

However, the late Pleistocene and early Holocene extent and timing of these runs in the Snake River basin are not well understood. The question of whether or not the riverine settings of the Copper Creek and Lake Cascade points, together with the Shoshone Falls clustering of the Crystal Springs and Blue Lake (Titmus 1988; Yohe and Woods 2002) and County Line (Reid and Root 2006) specimens (Fig. 6), carry implications for Clovis fishing cannot be addressed with our present data. We note here only that these Clovis points were recovered either beside anadromous streams or near places that soon became important fisheries.

Finally, the fact that both the Copper Creek Clovis and the Lake Cascade Clovis points were found in low-pool settings on reservoir margins reminds us again of the cursory nature of initial fieldwork along these impoundments. The mouth of Copper Creek was part of an 89-mile survey zone behind the Bureau of Reclamation's proposed "high" Hells Canyon Dam that was inspected by only two archaeologists for three weeks in the summer of 1950. The Lake Cascade reservoir received even less attention in the late 1940s. The discovery of surface-exposed Clovis points during late summer (August-September) in low-water reservoir settings has implications that are readily apparent for ongoing monitoring and proposed dam removal programs elsewhere in the lower Snake basin.

SUMMARY

The obsidian Clovis point recovered near the mouth of Copper Creek in 1984 extends the known cultural chronology of Hells Canyon from 7,200 ^{14}C yr. B.P. to between 11,500–10,500 ^{14}C yrs. B.P. (Haynes 2002: 93–96). The point displays heavy grinding around the haft margins. It fractured on impact and was discarded after a brief attempt at resharpening.

The specimen has been geochemically analyzed and matched to obsidian of the Gregory Creek chemical type, which outcrops north of Jonesboro in the upper Malheur basin about 150 km. southwest of the Copper Creek locality. Together with the recently recorded Lake Cascade Clovis point, the context of the Copper Creek discovery suggests that Clovis points may continue to be found near anadromous streams in reservoir settings during low-water or drawdown episodes.

ACKNOWLEDGMENTS

Dixie Taylor of Homestead, Oregon discovered the Copper Creek Clovis point. We are most grateful to her for loaning it to us for analysis and for providing locational information. We thank Lynn Gamble, John Fagan, and Mike Rondeau for helpful comments on an earlier draft. Sarah Moore drew the maps and illustrated the artifact.

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