LOWER SALMON RIVER CULTURAL CHRONOLOGY: A REVISED AND EXPANDED MODEL

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ABSTRACT

Results of recent excavations at six sites along the lower Salmon River Canyon of west-central Idaho shed new light on its culture history. Butler's original lower Salmon River Canyon cultural chronology is expanded and modified to account for new discoveries. A revised culture history model is presented here and includes six phases that span nearly 11,500 $^{14}$C years, including the Cooper's Ferry I (11,500-11,000 [?] BP), Cooper's Ferry II (11,000 [?] - 8400 BP), Craig Mountain (8400-3500 BP), Grave Creek (3500-2100 BP), Rocky Canyon (2100-600 BP), and Camas Prairie (600-150 BP) Phases. The implications of this revised model are wide ranging and address issues of techno-evolutionary development, adaptive diversity, and cultural chronology in the southern Plateau region.

Introduction

Although thirty-three years have passed since Butler wrote that archaeological work in Idaho was still in its pioneering stages (Butler 1968:16), detailed culture history models are still absent from significant portions of Idaho. Butler's statement continued to characterize the situation in 1996 when a cooperative project was initiated between the Department of Anthropology, University of Alberta and the Cottonwood Field Office, Bureau of Land Management, which sought to investigate the archaeology and geology of the lower Salmon River Canyon (LSRC) (Fig. 1). Although Butler himself had conducted excavations in the area proposed for study, the prehistory of the LSRC remained incomplete. New information from seven sites excavated in the canyon between 1997 and 2000 has provided a means of clarifying and expanding upon Butler's original model of culture history. In order to present a new model of LSRC culture history, Butler's model will be briefly reviewed in order to establish an historic context for local research; next, the results of recent investigations are summarized into a revised model of culture history; lastly, the implications of the cultural sequence presented are discussed as they have important implications for regional prehistory, and may help resolve long-standing debates on the early prehistory of the Pacific Northwest.
Previous Research

Old Cordilleran Culture

In 1961, Butler synthesized archaeological evidence of early Pacific Northwest occupation and formalized his earlier thoughts (Butler 1958, 1959) into a model that sought to explain the origin of human entry, cultural adaptation, and dispersal throughout the region. Under this model, peoples bearing a lithic technology of leaf-shaped lanceolate projectile points, i.e., "Lerma-like" (MacNeish 1959:5; Leonhardy and Rice 1970), edge-ground cobbles, and simple chopping, scraping, and cutting tools entered the Pacific Northwest along the Cordilleran mountain chain by 12,000 to 13,000 BP and spread throughout the region. Subsistence adaptations were generalized throughout the region, with an emphasis on local abundances of game and/or fish populations; however: "Extensive use of fish does not appear to have become a universal phenomenon in the culture; indeed, depending on the nature of the local ecology, the economy of the Old Cordilleran Culture remained essentially land-oriented for a considerable length of time" (Butler 1961:66).
For a time, this model was advanced as a means of explaining the origins of early archaeological cultures in the Far West and beyond. Butler argued that the occurrence of leaf-shaped lanceolate points with simple lithic technology and generalized hunter-gatherer-fisher subsistence adaptations seen from the Northwest Coast into Latin America was evidence of the rapid spread of the Old Cordilleran Culture in the New World. Later, where this cultural tradition came into contact with traditions from other regions, technological changes and additions were seen to alter the archaeological pattern somewhat. For example, the inclusion of Cold Springs side notched points is thought to represent evidence of interaction with Swanson's Bitterroot culture sphere of southeastern Idaho; modification and change is also cited as a result of contact with the Desert Culture complex (Butler 1961:70).

After the publication of his Old Cordilleran Culture model (Butler 1961), Butler sought out evidence to test his ideas at sites in the LSRC (Butler 1966:23). The discovery of a long record of cultural occupation at the Weis Rockshelter site beginning with leaf-shaped lanceolates was taken to support his model. In 1961-1962 and in 1964, Butler conducted excavations at the Cooper's Ferry site (10-IH-73), discovering cultural occupation containing large stemmed and lanceolate points in association with geologic deposits suspected as being late Pleistocene to early Holocene in age (Butler 1969). Two possible explanations were offered for the discovery of this early cultural component at Cooper's Ferry that could not be attributed to the Old Cordilleran Culture. First, the points were classified as Plains in origin and their presence in the Salmon River Canyon was seen as the result of a "momentary intrusion of Early Big Game Hunters" (Butler 1962:79) and that "... Cascade points were still the earliest type to be found in the region" (Butler 1969:35). Secondarily, in light of Richard Daugherty's (1956) work at the Lind Coulee site of eastern Washington, which produced what was interpreted at the time as one of the earliest cultural occupations in the Pacific Northwest, Butler's (1969:35) discovery of Lind Coulee points at Cooper's Ferry is explained as, "a co-tradition of the Old Cordilleran culture in the Pacific Northwest..."(Butler 1962:63-64).

In the face of a growing database that placed the Cascade type much later in time than he first hypothesized (Leonhardy and Rice 1970), Butler abandoned the use of the Old Cordilleran Culture by the late 1970s, where after he presents models of upper Snake and Salmon prehistory in a format that includes the classic Clovis-Folsom-Plano sequence of big game hunters as the basal cultural traditions (Butler 1978).

**Butler's Lower Salmon River Canyon Culture History Model**

Butler conducted archaeological excavations at five sites in the LSRC between 1961 and 1964, including Weis Rockshelter (10-IH-66), McLaughlin Flat (10-IH-67), Picture Cave (10-IH-69), Cooper's Ferry (10-IH-73), and Double House (10-IH-80). The results of this work were published in several reports and monographs (Butler 1962, 1966, 1968, 1969). Radiocarbon dates from Weis Rockshelter and Double House span the period 7340 ±140 BP to 4650 ±70 BP and 2040 ±190 BP to 1 ±57 BP, respectively. On the basis of this work, Butler (1968:98-100) developed a culture history model in the tradition of Willey and Phillips (1958), which included four cultural phases spanning 7400 years, briefly summarized below.
Craig Mountain Phase (7400-3500 BP)

Characteristic artifacts of this period include edge-ground cobbles, antler wedges, and leaf-shaped lanceolate points of the Cascade type (Butler 1966:Fig. 26, Butler 1968:Fig. 22; Leonhardy and Rice 1970). Subsistence patterns include "extensive" use of freshwater mussels and deer; limited evidence of possible bison hunting is provided by the discovery of teeth from two individuals in Weis Rockshelter (Butler 1968:100). Butler combined the undated finds from Cooper's Ferry into the Craig Mountain Phase, leading him to conclude that the assemblage represented, "a brief intrusion of early Big-game Hunters into the Clearwater Plateau just after the onset of the Altithermal conditions in the Columbia Basin" (Butler 1968:100).

Grave Creek Phase (3500-2100 BP)

Butler defines this phase primarily on an increase of Bitterroot Side-notched points (Butler 1966:Fig. 27) and a declining number of Cascade points, which are confined to the earlier part of this period. Milling stone technology also appears during this phase, while edge-ground cobbles decline in number.

Rocky Canyon Phase (2100-600 BP)

The appearance of semisubterranean housepit structures and smaller corner-notched points (Butler 1966:Fig. 27) are important additions to the archaeological record characterizing the Rocky Canyon Phase. Bitterroot side-notched points are seen in much reduced numbers than in previous phases. A variety of grinding and pounding stone tools, thought to be used for processing plant foods, increase during this time. Large game, including deer, elk, and mountain sheep was hunted, while the collection of river mussels appears to remain an important staple.

Camas Prairie Phase (600-150 BP?)

This last phase is correlated with ethnographic patterns of Nez Perce material culture and include "circular mat lodge and parallel-sided, round-ended community lodge" structures (Butler 1966:Fig. 28, 1968:99), hopper mortar bases (Butler 1966:Fig. 13), small basal or corner-notched points (Columbia Valley points [Butler 1966:Fig. 27]), Desert Side-Notched points, gaming implements, and antler wedges. Schwede (1966) cites ethnographic records of the Grave Creek-Rocky Canyon area as home to a band of Nez Perce named the Nipeheme, which was reportedly derived from the larger Clearwater River valley group.

Investigations During the Last 25 Years

Apart from the work of Butler, previous archaeological excavations conducted along the lower Salmon River have been restricted to small testing projects, which have provided little information to clarify or test Butler's culture history model. Oswald (1975) compiled information on a late prehistoric occupation at 10-IH-94 near Slate Creek. Excavations at Russel Bar (10-IH-58) by Markos et al. (1990) revealed a cultural component dated at 300 ±60 BP (Beta-34369) and 1330 ±100 BP (Beta-34370). Miss et al. (1990) conducted limited archaeological testing at Butcher Bar, producing two radiocarbon ages of
630 ±90 BP (Beta-33442) from site 10-IH-1908 and an age of 1400 ±90 BP (Beta-33443) from 10-IH-1957. Sappington et al. (1995) excavated a housepit site (10-IH-369) situated on a terrace immediately upstream of Island Bar, near the town of Riggins. The housepit feature was dated at 920 ±45 BP (Tx-8236), while bulk humates from a lower paleosol with cultural materials returned dates of 2395 ±73 (Tx-8273) and 3695 ±55 BP (Tx-8238). Davis et al. (1995) conducted archaeological excavations at 10-IH-42, which is contained along the length of Island Bar; no diagnostic artifacts were recovered, however, nor were any chronometric assays made. Most recently, Miss (2001) reports the results of excavations at a late prehistoric site (10-AM-413) along the Little Salmon River between Riggins and New Meadows, which revealed evidence of general occupation ranging from 870 ±40 (Beta-113174) to 830 ±50 BP (Beta-113176).

**Sites Investigated Between 1997 and 2000**

Seven sites were investigated during the 1997, 1999, and 2000 field seasons by the University of Alberta, including: Cooper's Ferry (10-IH-73), American Bar (10-IH-395), Bug Slope (10-IH-1220), McCulley Creek (10-IH-1160), Nipeheme Village (10-IH-1312), and Rock Creek Bridge (10-IH-2491). The Gill Gulch site (10-IH-1308) was tested by archaeologists from the Cottonwood, Idaho office of the Bureau of Land Management (BLM) in 1997 (Dickerson 1997), and also excavated by the University of Alberta in 2000. On the basis of results from these more recent archaeological investigations, new information is available to evaluate and revise Butler's (1968) culture history model. Of greatest importance is the discovery of late Pleistocene- and early Holocene-age cultural components, which are under represented in Butler's model.

**Revised Culture History Model**

Two new phases are proposed here, on the basis of recent dating of archaeological components from several sites along the lower Salmon River, in another case, the temporal boundary of one of Butler's original phases has been expanded to include new discoveries. The remainder of Butler's phases are unchanged, with additional supporting information added from the more recent investigations. Figures are provided to show artifacts associated with the different phases, and are intended to provide examples in addition to those reported by Butler (1962, 1969). Archaeological data from published (Davis and Sisson 1998) and unpublished sources (Davis and Schweger 2001; Davis, unpublished data) are used to define and expand these phases.

**Cooper's Ferry I Phase (11,500-11,000 [?] BP)**

Cultural evidence defining this early phase was recovered from the lower portion of the Cooper's Ferry site (10-IH-73) and represents a limited occupation by peoples bearing a stemmed point technology (Davis and Schweger 2001). Most notable is the discovery of four stemmed points, similar to the Lind Coulee type of eastern Washington (Daugherty 1956), within a pit cache that extended into the basal gravels of the site. Typologically, this phase is dominated by Lind Coulee projectile points (Fig. 2), but includes a complete and a mid-section fragment of two Haskett points found by Butler (1969:Fig. 6g, 6m). Other tools include bifaces and unifies made on thick flakes, multidirectional flake cores, and modified flakes used for expedient tasks. Lithic materials associated with this phase comes from sources found near the site today.
Fig. 2. Projectile points and fragments of the Cooper's Ferry I Phase. Scale divisions are in centimeters. Catalog numbers are positioned beneath each point.

Cooper's Ferry II Phase (11,000 (?)-8400 BP)

Assemblages attributed to this phase were encountered at Cooper's Ferry in the middle portion of the site, stratigraphically above the geologic units bearing Cooper's Ferry I Phase components. Cooper's Ferry II Phase assemblages include stemmed and lanceolate points (Fig. 3) comparable to Windust Phase styles from the lower Snake River Canyon (Leonhardy and Rice 1970; Rice 1972) and Clearwater River areas (Ames et al. 1981; Sanders 1982; Sappington 1994). This phase also includes scrapers made on large flakes (Fig. 3, Cat. 73/642), bifaces, many modified flakes with edge wear, and unlined hearth features associated with dense artifact concentrations. Hunter-gatherers appear to be using the riparian environment of the lower Salmon River more than in the previous period. This trend continues throughout the duration of the Cooper's Ferry II Phase as densely-occupied living surfaces, rising use of expedient and informal tools, and an increase in fish exploitation point to an intensification of site use and reduced resident mobility.
In the absence of radiocarbon dates directly associated with Cooper's Ferry II Phase assemblages in the LSRC, a relative age for the phase is provided through a comparison with other typologically-similar site components from the surrounding region. Points from this phase especially Fig. 3 (Cat.973/636) (Butler 1969:Fig. 6) are identical to types grouped under the Windust Phase of the lower Snake River Canyon, which are dated between ca. 11,000 and 9000 BP (Leonhardy and Rice 1970; D. G. Rice 1972). Square-based stemmed points were found at the Hatwai site near Lewiston, Idaho where they are dated between 9160 ±230 and 10,820 ±140 BP (Ames et al. 1981; Sanders 1982). Radiocarbon ages between 9730 ±60 and 10,320 ±90 BP bracket cultural occupation with stemmed Windust points at the Hetrick Site near Weiser in southern Idaho (Rudolph 1995). A stemmed point found in association with the Buhl Burial (Green et al. 1998), which is identical to that seen in the Hatwai I component of the
Hatwai Site (Ames et al. 1981; Sanders 1982), was dated to 10,675 ±95 BP. Stemmed points encountered at the McCulley Creek site (10-IH-1 160) along the LSRC were found below a radiocarbon age of 8760 ±70 BP (Beta-142166) (Davis, unpublished data). These points bear close resemblance to Windust points found in lower Snake River Canyon sites (H. S. Rice 1965; D. G. Rice 1972:Fig. 4c) and
the Paulina Lake site at Newberry Crater in Central Oregon — where they are dated between ca. 8500 and 10,000 BP (Connoly 2000).

Craig Mountain Phase (8400-3500 BP)

Cultural evidence found during 1997 excavations provides a basis for placing the lower boundary of the Craig Mountain Phase, as defined by Butler (1968), to ca. 8400 BP. Excavations at the American Bar and Cooper's Ferry sites revealed a record of intensifying settlement within and use of riparian environments, including the increased exploitation of river mussels and hunting of deer. Leaf-shaped points appear in both sites immediately before and by 8400 BP, and dominate the typological assemblage during the Craig Mountain Phase (Fig. 4). The record from Weis Rockshelter shows continuity in projectile point styles from 7400 to 3500 BP, suggesting a long technological tradition. Cold Springs Side-Notched points, found at Weis Rockshelter, have also been recovered at Gill Gulch in middle Holocene-age deposits (Fig. 4).

Grave Creek Phase (3500-2000 BP)

Cultural occupation intensifies on developing alluvial fans and on an ever-growing alluvial floodplain during this period. The increase in grinding and milling stone artifacts — possibly used for camas processing — may be related to ecological changes following increases in rainfall (Davis and Muehlenbachs 2001) and decreases in temperature and aridity (Davis et al. 2001) seen after 4000 BP. Cultural occupation of riverine sites like Nipeheme Village intensify, although appear to lack the presence of living structures and storage pits seen in sites throughout much of the lower Columbia River basin during this time. Projectile points from this phase appear as notched varieties comparable to those recovered by Butler (Fig. 5).

Fig. 5. Projectile points and fragments of the Grave Creek Phase. Scale divisions are in centimeters. Catalog numbers are positioned beneath each point.
Rocky Canyon Phase (2000-600 BP)

Cultural occupation intensifies further at most sites after 2000 BP, marked by the presence of organic-rich sediments, dense accumulations of food and tool processing debris, and the first appearance of house pits. This phase post-dates a period of channel erosion of the lower Salmon River, which resulted in the formation of the modern fluvial context (Davis 2001). As a result of this geologic change, many Rocky Canyon Phase sites are located on the lowest terraces.

Fig. 6. Projectile points and fragments of the Rocky Canyon Phase. Scale divisions are in centimeters. Catalog numbers are positioned beneath each point.
and active floodplain of the Salmon River. Tools indicative of salmon fishing also appear during this time, including net weights and bone tools possibly used in the construction and repair of nets. Production of ornamental items like mussel shell and mammal bone beads is also seen during this time. Representative projectile points are shown in Fig. 6.

Camas Prairie Phase (600-150 BP?)

Evidence collected in recent excavations supports Butler's definition of the Camas Prairie Phase (Fig. 7). Excavations at the Gill Gulch site recovered charcoal associated with a semicircular pithouse feature, which dated between 300 ±70 and 460 ±70 BP. The presence of ethnohistoric artifacts at the Nipeheme Village site, including a glass bead, suggest a terminal Holocene temporal context in the absence of direct radiocarbon dates.

![Projectile points and fragments of the Camas Prairie Phase. Scale divisions are in centimeters. Catalog numbers are positioned beneath each point.](image)

Discussion

Early Cultural Patterns

As in other areas of the Pacific Northwest, Butler's argument that a post-glacial migration of peoples bearing the Old Cordilleran Culture technology explained the early archaeological record of the Pacific Northwest is not supported by recent discoveries in the LSRC. As evidence of earlier stemmed point traditions were shown to have been a likely technological precursor to the development of leaf-shaped point styles (Leonhardy and Rice 1970), Butler's model was seen to have been dealt a fatal blow. Despite this, his idea that the earliest peoples may have used non-fluted lanceolate projectile points during the late Pleistocene may still stand—particularly when the timing of the earliest occupation of Cooper's Ferry is considered—although for different reasons than he originally suggested.

Butler's ideas of a trans-Cordilleran route of entry and dispersal in the Pacific Northwest is not likely either, particularly since the oldest sites are found in the southern Plateau area (Ames et al. 1998). On the other hand, his hypothesis that major river systems may have been used as major routes of entry
is still useful—particularly where a coastal migration route is considered (Fladmark 1979; Gruhn 1988, 1993). Explaining why sites dating older than 11,000 BP have not been found in greater numbers in the Pacific Northwest is difficult. Bryan's (1980) argument that catastrophic floods from glacial lake Missoula might have effectively destroyed or deeply buried early sites in large portions of the lower Columbia River drainage should be considered as a possibility, however, it cannot also be invoked to explain the absence of early upland sites.

The dating of a stratigraphic sequence of stemmed points from Cooper's Ferry beginning at 11,410 BP provides solid evidence for the antiquity and evolution of an early non-fluted technological tradition in the Pacific Northwest that is at least contemporaneous with the Plains Clovis tradition, and thus far predates western Clovis sites in the Pacific Northwest and the Great Basin. The stratigraphic sequence of projectile point types recovered at Cooper's Ferry reveals what may be a master sequence of technological evolution from one unfluted lanceolate point style to another. This record is inconsistent with models that expect the development of stemmed point types from earlier fluted forms (Carlson 1988; Willig and Aikens 1988) and instead supports the assertion of Ames et al. (1998:103) that, "There is little evidence of a cultural continuum from Clovis to later-dating cultural manifestations in [the southern Plateau] . . .," an idea suggested earlier by Bryan as well (1988). As a result, we should discourage the continued use of early "Big-Game Hunting" (Willey 1966:37) techno-evolutionary models from the Plains and surrounding areas and instead employ evidence from the Pacific Northwest in building more suitable regional models of early prehistory.

Cultural Presence During the Middle to Late Holocene

Cultural components dating to the middle Holocene have been elusive along the lower Salmon River, thus far. The reasons for this are likely related to middle Holocene erosional and deposition events corresponding to changes in Salmon River fluvial geomorphology (Davis 2001). As a result, less is known of how hunter-gatherers exploited riparian zones during this time period than of the preceding period. Geologic work conducted in the canyon has revealed a middle Holocene record of relative stable riparian vegetation in the face of rising temperatures and aridity (Davis 2001; Davis and Muehlenbachs 2001), which would have provided an attractive context for hunter-gatherer occupation.

Despite the difficulty of locating cultural occupations along the river, evidence from Weis Rockshelter clearly identifies a cultural presence throughout the middle Holocene period without significant changes in material culture. While the record from Weis Rockshelter proves that people maintained a continuous presence in the canyon, it is not entirely clear how they were using the local ecosystems, particularly the riparian zone, from this evidence.

Butler (1968:100) reported Cascade and Cold Springs Side-Notched points being present in Weis Rockshelter between ca. 7400 to 3500 BP, interpreting this as evidence that, "... for the duration of the Altithermal interval the Old Cordilleran Culture pattern continued unchanged in the Clearwater Plateau region." Ruebelmann (1978) criticized Butler's radiocarbon chronology and archaeological interpretation of Weis Rockshelter, citing the lack of consistency between his dating of artifact types with those seen to occur in the lower Snake River Canyon as evidence of error. Although more data are needed to clarify the middle Holocene period of LSRC prehistory, research has not produced any evidence that would contradict Butler's hypothesis of cultural stability, at least as reflected in point styles.

In his evaluation of late Holocene prehistory along the lower Snake River, Reid (1991:23) levels criticism at Butler's late Holocene cultural chronology on several points; the sum of which, "suggest that the Weis Rockshelter cultural sequence has outlived its utility, and should be retired from the pool of
chronologies applied to Hells Canyon and the Clearwater Plateau." This criticism should be addressed, as Butler's original cultural history model is partially employed in the revised cultural sequence presented here.

Through a comparison of radiocarbon dates from cumulative sediments at Weis Rockshelter, which contained a 1.0 m section spanning ca. 2700 BP, and Bernard Creek Rockshelter, which has a 1.5 m section separated by overlapping radiocarbon ages (Randolph and Dahlstrom), Reid hopes to illustrate an error in Butler's use of a normalized chronology at Weis Rockshelter. This criticism fails to take into account the contextual nature of formation processes at each site. Besides the fact that these depositional processes typically operate at different time scales, to expect that rates of sediment deposition should be the same or comparable at several sites within the same stretch of canyon is unreasonable.

Reid (1991:22) criticizes Butler's definition of phases because of the "disproportionate" artifact sample used. Specifically, 82 projectile points are used to define the Graves Creek phase, while only 13 artifacts (four of which are points) define the Rocky Mountain phase. This criticism is misplaced, perhaps, since Butler's cultural-historical work was one of the earliest in the region. To put it bluntly, Butler had to start somewhere. This critique might have been more effective during a time when more information was available from the surrounding area to evaluate Butler's model. Reid's attitude toward suitability in sample size for defining cultural phases is curious, particularly since he supports the use of the Clovis point type in the Snake River as representative of the earliest cultural phase (Reid and Gallison 1996:47, Fig. 19), even though it has yet to be found in a stratified sequence showing its relation to stemmed points, or chronometrically dated in the Plateau region.

Reid's use of Gaarder's (1967) conclusions to attack the Weis Rockshelter chronology seems to muddy the waters more than clarify the issue. In his study of the Eagle Creek site, located on the Camas Prairie, near Grangeville, Gaarder mentions the existence of unpublished radiocarbon dates from the Double House site—obtained, it seems through personal communication with Butler (Gaarder 1967:48)—that provide terminal dates for the Rocky Canyon phase at 355 ±38 BP (WSU-124), and the Camas Prairie Phase at, "approximately AD 1805-1810." Since the stratigraphic context of these dates is unclear, having, to this author's knowledge, never been formally reported by Butler, it is difficult to fully evaluate the meaning of Gaarder's statements. Reid (1991:22) uses this information as evidence that Butler's cultural chronology, "did not survive the first attempt to apply it outside Weis Rockshelter, even within the Rocky Canyon study area." While it is easy to agree that more work is needed to better establish the temporal and stylistic basis for defining the latest Holocene cultural phases in the LSRC, it is difficult to accept that Gaarder's (1967) paper represents a death-blow to Butler's original model.

Salmon Fishing and the Winter Village Pattern

Excavations at sites in the LSRC have revealed little or no direct evidence of salmon in the form of bones, scales, or other physical remains prior to 2000 BP. There are many factors that may restrict salmon remains from entering and/or remaining in the archaeological record including modes and location of processing, dietary choices and culinary behaviors, and disposal practices, to only name sources of cultural bias. Although skeletal remains of non-anadromous fishes are occasionally found in sites—most typically with the use of fine screening (< 1/8 in. mesh)—they are encountered in low quantities (e.g., it would be unusual to recover even 25% of the total vertebral remains of an single fish), suggesting that the operation of post-depositional factors further bias the visibility of fish remains in the archaeological record after they are caught by humans. Because of these potential taphonomic factors, faunal remains from anadromous fishes have proved difficult to find in LSRC sites. Since the remains of smaller non-anadromous species are encountered instead, recovery methods used in excavation are not
suspected.

Artifacts that can be directly related to salmon fishing appear only after 2000 BP. The construction of semi-subterranean pithouses first appear in the LSRC at the Double House site where their initial use is dated at 2040 ±190 BP. A single pithouse encountered at the American Bar site produced an age of 1370 ±40 BP; whereas the most intensive occupation of the Nipeheme Village site, with a material culture signal suggestive of a semi-sedentary settlement, is seen after ca. 1780 ±50 BP. Recent excavations at the Gill Gulch site (10-IH-1308) recovered evidence of a pithouse floor and a charred post; charcoal associated with this house feature returned ages between 300 ±70 BP (Beta-147093) and 460 ±70 BP (Davis, unpublished data). Sappington et al. (1995) report an age of 920 ±40 BP (Tx-8236) from the floor of pithouse at Island Bar (10-IH-395). Compared to river canyons in the surrounding region (Leonhardy and Rice 1970; Ames et al. 1981; Sappington 1994; Ames et al. 1998), the appearance of pithouses and their implication of a "winter village" pattern of seasonal occupation occurs later than expected in the LSRC. Part of the reason for this situation may lie in the small number of pithouses investigated to date in the canyon. Natural factors may also have come into play, however, including the changing character of the Salmon River channel and its effect on anadromous fish habitat throughout the Holocene (Davis 2001). More work is required to evaluate the role of natural systems in subsistence patterns of prehistoric inhabitants of the canyon, however.

Conclusions

Two new phases and temporal changes to another are proposed for a revised LSRC culture history model. Establishing a late Pleistocene age on early cultural occupation at the Cooper's Ferry site represents a significant addition to Plateau prehistory. The implications of a clarified early cultural chronology are wide-ranging and provides evidence of an evolutionary progression among non-fluted technological types across the late Pleistocene-early Holocene boundary. Butler's hypothesis of middle Holocene cultural continuity in the canyon cannot be refuted by more recent research in the LSRC and may eventually be supported after further consideration of new records of human-environmental interaction. The development of the winter village pattern and a subsistence economy involving intensive salmon fishing may not have occurred in the LSRC until after 2000 BP—much later than in surrounding river canyons and valleys. The reasons for this are suspected to be related to significant changes in Salmon River fluvial geomorphology and its effects on anadromous fish ecology. Although the revisions presented here are substantial on some levels, it is expected that future archaeological and geoarchaeological research will lead to even better models of LSRC prehistory.
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