

PRELIMINARY RESULTS FROM SOURGRASS SITE TESTING: THE PREHISTORIC COMPONENT

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ABSTRACT

CAL-718, located near Sourgrass on the North Fork of the Stanislaus River, is a large prehistoric habitation site which encompasses approximately 25 acres. This site contains ground stone and stationary milling features, extensive midden deposits, and a unique flaked lithic assemblage. Preliminary results suggest occupation during middle and late periods. The flaked lithic assemblage is characterized by an abundance of non-obsidian material and by the presence of some non-local obsidian. This paper will present results from test excavations which address the research domains of cultural chronology, procurement patterns, and site use patterns.

INTRODUCTION

Archaeological site CAL-718 is a large prehistoric habitation site located at approximately 4000 feet elevation along the North Fork of the Stanislaus River, across from present day Sourgrass Campground. The site measures approximately 700 m NE/SW parallel to the river, and 200 m NW/SE. Topography of the site is characterized by a series of flat, stepped benches paralleling the river, with alternating small sandy beaches and abrupt granite walls along the river, all located within a deeply incised river canyon. Vegetation on site is sierran mixed conifer (Allen 1988), with ponderosa pine, incense cedar, black oak, alder, scrub oak, willow, bracken fern, gooseberry, bear clover, lupine, soaproot, iris, and various other forbs and grasses. The site lies within the ethnographic use areas of both the Miwok and Washo (Downs 1966; Kroeber 1925; Levy 1978).

Originally noted by surveyor Flemming Amyx on May 7, 1857 as an "old indian village", and subsequently found on an 1877 GLO plat map, this site was first recorded by Balen and Colston (1976), and was rerecorded by Napton and Greathouse (1978). Between February and early May of 1991, CAL-

718 was intensively surveyed as part of a proposed campground construction project. An updated site record was completed which reflects all observed surface manifestations of the site.

During the surface inventory phase of the investigation, 15 stationary milling features, containing a total of 98 cups, and 31 pieces of associated ground stone were recorded. One milling station, Feature 10, contains 18 cups with 15 pestles *in situ*. Additionally, 2 distinct midden concentrations, 1 heavily disturbed prior to 1976, 1 depression possibly representing structural remains, and localized concentrations of chert, obsidian, basalt, and quartz flaked lithic material were recorded.

Prior to excavation, the Miwok and Washo tribal councils were contacted in writing and by telephone, in an effort to identify and address specific concerns and/or questions connected with this site. A presentation of research questions and proposed field work was made to the Tuolumne Miwok Tribal Council. Members of both tribes were invited to observe the field work, and would be called upon discovery of any human burial.

A research design defining specific questions concerning eligibility for inclusion to the National Register of Historic Places, and proposed methods of data collection to answer them was completed by Forest Archaeologist Charla Meachum Francis.

For 2 weeks during the month of August, 1991, site CAL-718 was tested for eligibility. Subsurface investigations consisted of 51 1 m x 50 cm x 10 cm surface transect units (STUs), 44 25 cm x 25 cm x 50 cm shovel tests (STs), 6 1 m x 1 m excavation units (EUs), and 1 50 cm x 4 m trench with a maximum depth of 60 cm. A total of 11.4 cubic m of matrix were excavated and screened. A combination of STUs and STs was employed in order to identify vertical and horizontal artifact distribution. STUs and STs led not only to overall site boundary definition, but also to the definition of 4 separate midden concentrations, only 2 of which were observed during site recordation. The midden concentrations were "connected" by a very low density flaked lithic scatter. Five of the 6 EUs were placed in identified midden areas, while the sixth EU was placed in the vicinity of Features 10 and 11, an apparently undisturbed portion of the site. Trench 1 was excavated through a previously disturbed section of midden in an attempt to identify what type of objects were removed during vandalism.

Cultural material collected will be discussed by midden locus.

LOCUS 1

Locus 1, located on a bench approximately 60 m above the North Fork of the Stanislaus River, was identified through excavation of STUs. Midden covers approximately 490 sq m on this locus. Excavation of a single EU revealed a midden depth of 35 cm. A total volume of 0.9 cu m of soil was excavated from within the boundary of this locus - EU 3, the 1m x 1m unit, was excavated to a depth of 80 cm, while STUs 3 and 4 were excavated to depths of 10 cm each.

Tools

Two obsidian Edge Modified Pieces (EMPs) were recovered from this locus; both

pieces are flake fragments which have been visually sourced as Bodie Hills Obsidian. The only formal tool recovered from this locus is a Queens obsidian Desert Side Notch (DSN) point tang fragment, which exhibits a hydration band of 1.6 microns.

Debitage

Ninety-two obsidian, 33 cryptocrystalline silicate (CCS), and 6 quartz pieces of debitage, totaling 131, were collected from Locus 1. Sixty-one of these pieces are typeable flakes. Sixty percent of the typeable flakes are pressure/edge preparation flakes, while 40% are thinning flakes, primarily 6-12 mm interior thinning flakes. A single obsidian secondary decortication flake was also collected.

A uniform distribution of pressure/ edge preparation and thinning flakes indicates that both middle and final phase biface reduction was occurring throughout the use period of this locus. A lack of biface thinning flakes, cortical material, and notching flakes was also noted. Different material types were also uniformly distributed throughout the depth of this locus. Another explanation for the uniform vertical distribution of pressure/edge preparation and thinning flakes is the possibility of mixed stratigraphy common to central Sierra sites.

A look at flake type and size by material type shows that both obsidian and CCS, the dominant material types, were arriving at Locus 1 in some reduced form, as is indicated by the lack of large and cortical pieces. While obsidian is present primarily as pressure/edge preparation flakes, the majority of CCS falls into the interior thinning flake category.

Ground Stone

No stationary milling features are located within the boundaries of Locus 1. Feature 1, located approximately 40 m from EU 3, and directly adjacent to the river, contains 5 cups, and a healthy population of soaproot. Depths of Feature 1 mortar cups range from 2.5 to 9 cm.

Faunal

The faunal component of Locus 1 is comprised entirely of small, fragmented

pieces. Twelve pieces of bone, 2 burned, and 1 shell fragment - possibly snail - also burned, were collected. Seven of these fragments are from the 70-80 cm level of EU 3, and may represent a single fractured bone piece. None of the pieces are identifiable.

Conclusion

CCS accounts for about a quarter of the debitage from Locus 1. The CCS component also appears to have been arriving at this locus in a less reduced state, as is indicated by the higher percentage of thinning flakes versus pressure/edge preparation flakes. Although the sample is small, the quantity and state of reduction of CCS on this locus may suggest that the inhabitants were readily using more local material sources, out of necessity or preference.

Based on hydration results from a single DSN fragment, it appears that Locus 1 was used at least during late period times, between approximately A.D. 450 and 1850. Hunting was practiced to some degree as is indicated by the presence of a projectile point fragment, and nearby milling stations indicate the exploitation of acorns as a food source.

LOCUS 2

Locus 2, the most obvious and largest midden concentration on site, was the location of most of the test excavation completed on this site. Locus 2 is located several benches above the river, a horizontal distance of approximately 20 m. This locus is mostly forested, with the only "open" area being an unmaintained foot trail which roughly parallels the river throughout the entire site. Locus 2 is also the location of past vandalism, which is exhibited by obvious backdirt mounds, void of large vegetation. Vandalism has left significant portions of this locus disturbed. This vandalism was photodocumented in the 1976 site record; it does not appear that further uncontrolled digging has occurred since the 1976 documentation. Midden covers about 5,550 sq m at this locus, and reaches a depth of 50 cm. A total of 2.55 cubic m of soil matrix was excavated and subsequently screened at Locus 2. Excavation included 2 STUs, 7 STs, 2

EUs, and 1 4 m x 50 cm trench which was excavated through the above mentioned vandal's backdirt pile.

Tools

Locus 2 contained the highest density of both formal and informal tools on site. Informal tools, or EMPs, total 16. Forty-four percent are chert, 31% are obsidian; 3 of the 5 obsidian pieces are Bodie Hills obsidian while 1 may be from the Queen/ Hicks source, and 1 is an unsourced, grainy, semi-translucent piece. One of the chert pieces exhibits modification in the form of a beak, or graver.

Twenty-one, or approximately half of the tools recovered from Locus 2 fall into the biface category. Eight of these biface and biface fragments exhibit no characteristics which might indicate function; 7 of these are chert, and 1 is Bodie Hills obsidian with a hydration rim of 2.4 microns. The majority of these bifaces exhibit manufacture breaks.

Eight of the bifaces may be tentatively considered projectile point tang fragments. Six of the 8 are CCS; the remaining 2 were visually sourced as Bodie Hills obsidian. Five of the 8 exhibit probable manufacture breaks. Four of the 8 tangs - 2 CCS and 2 Bodie Hills obsidian - may be classified as DSN tangs.

Two CCS biface fragments which may represent projectile point bases were also noted, although point type could not be determined for these pieces; both appear to have terminated in manufacture breaks.

Three of the bifaces collected fall into the category of probable drill fragments. All are CCS, and 2 appear to be sections of drill tips. The third is the base of a drill.

One projectile point and 4 projectile point fragments were collected from Locus 2. Of these 5, 4 are DSNs - 1 complete CCS DSN, 1 CCS DSN base which has been heat altered, 1 Bodie Hills obsidian DSN base with a hydration rim of 1.1 microns which exhibits a remnant flake scar, and 1 visually sourced Bodie Hills obsidian DSN tang. The fifth fragment is an untypeable piece exhib-

iting small size, parallel flake scars, and was sourced as Bodie Hills obsidian with a hydration rim of 1.9 microns. This last fragment was the only piece collected which clearly exhibited a use break.

A single CCS drill was collected from Trench 1; the tip of the drill exhibits a trapezoidal cross section.

Three cores were collected from Locus 2; 1 is quartz, 1 is basalt, and 1 is CCS. All 3 exhibit a multi-directional, random pattern of flake removal.

Debitage

A total of 1,461 pieces of debitage was collected from Locus 2. Seven hundred and seventy-four are CCS, 530 are obsidian, 90 are quartz, 47 are quartzite, 9 are basalt, 8 are miscellaneous igneous, 1 is granite, 1 is metasedimentary, and 1 is welded tuff. Seven hundred and eight, or 48% of the debitage collected from this locus, are typeable flakes. Fifty-four percent of the typeable flakes are pressure/edge preparation flakes, while 46% are thinning flakes, mostly 6-12 mm interior thinning flakes. Four percent of the typeable flakes are decortication flakes. Five notching flakes were also noted.

The distribution of pressure/edge preparation flakes, thinning flakes, and cortical flakes throughout the vertical profile of Locus 2 is uniform. The distribution of material types by depth is also relatively uniform. A column sample of obsidian from EU 1 was submitted for X-ray fluorescence analysis as well as obsidian hydration analysis in an attempt to assign geochemical sources, and to assign relative age to the obsidian component of Locus 2. Eighteen specimens were submitted for both analyses. Sixteen of the 18 were assigned to the Bodie Hills obsidian source, and exhibit hydration band measurements ranging from 2.0 to 3.9 microns. One Bodie Hills specimen exhibits diffuse hydration, and 1 exhibits no visible band of hydration. The remaining 2 specimens are from unknown sources, and have hydration bands of 2.8 and 4.1 microns. An examination of Bodie Hills hydration band measurements by depth reveals a decided lack of stratification, which may also explain the apparent uniform distribution of flake types

and material types by depth on this locus.

A look at flake type and size by material type shows that of the obsidian flakes collected from Locus 2, 66% are pressure/ edge preparation flakes, while 31% are thinning flakes, and only 3% are cortical flakes. Two of the notching flakes are also obsidian. This distribution of flake types indicates that all phases of obsidian biface reduction were occurring at Locus 2 to some extent. Thinning flakes account for 53% of the CCS material recovered, while pressure/ edge preparation flakes make up 47% of the CCS material. The majority of CCS thinning flakes fall into the 6-12 mm interior thinning flake category. Four percent of the CCS flakes are cortical pieces. As with the obsidian component, this distribution indicates use of Locus 2 for all phases of biface reduction, to some degree. The remaining material types present at Locus 2 occur in quantities too small for meaningful interpretation.

Ground Stone

Bedrock milling Feature 12, containing 2 cups which are 2.5 and 5 cm deep, with 5 associated pieces of ground stone, is located within the boundaries of Locus 2. Additionally, 8 manos, 1 incomplete metate, and 34 pieces of miscellaneous ground stone as well as 22 possible smoothing pebbles, were collected from excavations at Locus 2. The majority of these pieces are granite; 2 are manufactured from metamorphic material. Much of the ground stone material recovered from Locus 2 is fire fractured.

Faunal

A total of 333 pieces of faunal material was collected from Locus 2; 66% of it is unmodified, 34% is burned, and 2 pieces appear to be polished. All pieces are small and fragmentary in nature, thus unidentifiable.

Conclusion

The abundance of non-obsidian material - primarily CCS - at Locus 2, along with the generally less reduced form of this component clearly indicates a dependence on more locally available lithic materials.

Based on hydration results, as well as the presence of several temporally diagnos-

tic projectile points, Locus 2 appears to have been used during middle and late phase times, between approximately A.D. 450 and 1850. The abundance of DSN fragments and the lack of other types of points might indicate a more intense use of the area for hunting between A.D. 1200 and 1850. Sixty-four percent of the tools collected from Locus 2 are CCS, 26% are obsidian, while the remaining 10% are quartz, basalt, and welded tuff EMPs. It is interesting to note that although the overall majority of tools are CCS, the DSN fragments are equally divided between CCS and Bodie Hills obsidian, possibly indicating a greater use of non-obsidian during middle phase times, with an increased use of obsidian in late phase times.

The presence of cortical material as well as 3 cores at Locus 2 indicates that early stage biface reduction was occurring here, unlike other areas of the site. Middle and final phases of biface reduction activities are also well represented at Locus 2. The abundance of non-obsidian material, as well as 3 non-obsidian cores, suggests a high degree of dependence on local materials.

Locus 2 exhibits a much higher proportion of ground stone than any other locus on the site. The ground stone collected from Locus 2 also differs in type - it's primarily portable milling equipment as opposed to stationary bedrock mills and pestles located on other loci of the site. This could indicate a different food processing technology involving edible materials other than acorn, which could be temporally sensitive. The presence of fire fractured ground stone fragments in the midden deposit might be the result of ground stone pieces being used as cooking stones.

Even though the faunal material is unidentifiable and fragmentary in nature, the amount collected in the midden area indicates use of animals presumably as a food source. The 2 pieces which exhibit possible polishing may indicate use of faunal material for purposes other than as a food source.

LOCUS 3

Locus 3 occupies the first and second

benches above the North Fork of the Stanislaus River, which lies approximately 10 horizontal meters away. This locus, identified and defined through subsurface excavations, is located partially within a forested area, and partially on an open, bear clover covered flat. The lower locus area which sits on the first bench above the river is exposed granite bedrock. During site recordation, a possible structural depression was observed at this locus; subsequent excavation of an STU and an ST failed to confirm this observation. The depression is apparently natural; no cultural material was recovered from subsurface testing of this feature. Midden covers approximately 1880 sq m, and reaches a depth of 40 cm. A total volume of 1.025 cu m of soil matrix was examined for cultural remains at Locus 3; 3 STUs, 2 STs, and 1 EU were excavated.

Tools

One EMP, 2 biface fragments, and 1 incomplete projectile point were collected from Locus 3. The EMP, a large heat altered CCS flake, has been modified to fashion a peaked edge of the flake into a beak, or graver. One quartz biface fragment is a lateral edge which is thick, and exhibits large and medium sized flake scars. One opaque obsidian biface fragment is also a lateral edge, which exhibits small and medium size flake scars. The obsidian biface fragment appears to have been broken during manufacture rather than during use. One incomplete CCS Rose Spring Corner Notch (RSCN) projectile point was also collected from Locus 3. This point exhibits numerous flake scars terminated in step fractures, and is riddled with impurities in the rock. This point also exhibits a fracture indicative of break during manufacture rather than use.

Debitage

A total of 162 pieces of debitage was recovered from Locus 3; 82, or approximately half are typeable flakes. Of the typeable flakes, 50% are CCS, 38% are obsidian, 6% are quartz, 5% are miscellaneous igneous, and 1% is metavolcanic. Fifty-two percent of the flakes are thinning flakes, while 48% are pressure/edge preparation flakes; a single CCS cortical flake was also collected.

The distribution of flake types by depth

suggests a uniform production of thinning flakes; while the distribution of pressure/edge preparation flakes is generally uniform, there is a slight increase in this flake type in the upper 20 cm of this locus. A column sample of obsidian was submitted for geochemical sourcing as well as obsidian hydration, in order to assign origin as well as relative dates to the obsidian debitage. Ten specimens were submitted. Sources identified are Bodie Hills, Queen/Hicks(?), Napa Valley(?), and Pine Grove(?). [The latter three sources are probably, not positive identifications. For the purposes of this presentation, it is assumed that these specimens are from the probable sources.] Bodie Hills obsidian hydration readings range from 3.0 to 4.8 microns, Queen/Hicks ranged from 1.2 to 2.1 microns, Napa Valley ranged from 1.5 to 7.0 microns, and the single Pine Grove specimen exhibits a band of 4.6 microns. Hydration results indicate mixed stratification on Locus 3.

A look at flake type and size by depth shows a lack of both obsidian and CCS cortical and large size flakes. This may indicate that both material types were arriving at this locus in some reduced form, and that middle and final phase biface reduction were the primary flaked lithic activities taking place at Locus 3.

The majority of CCS material from Locus 3 is evenly divided between pressure/edge preparation flakes and thinning flakes, with a single specimen exhibiting cortex. Obsidian appears primarily in the form of pressure/edge preparation flakes. The remaining material types which account for 12% of the debitage material collected from Locus 3 are mostly thinning flakes.

Ground Stone

Features 6, 7, and 14, bedrock milling stations containing 12 cups with 3 pieces of associated ground stone, are located within the boundaries of Locus 3. Cup depths range from 2 to 11 cm. Bedrock milling features 4 and 5 lie within 15 m of Locus 3, and contain 23 cups ranging in depth from 0.5 to 16 cm, with no associated ground stone. The wide range of depths for mortar cups at Locus 3 may be the result of processing a variety of food materials; locally

abundant acorns were undoubtedly one of these food items. STU 33, located within 10 m of both Features 6, and 7, yielded 2 metate fragments (1 burned), 1 mano, and 1 miscellaneous ground stone fragment. This unit is located immediately adjacent to a locally used trail and may represent a modern collection of ground stone from the immediate vicinity.

Faunal

A single, unmodified and unidentifiable faunal fragment was recovered from this locus.

Conclusion

As at Locus 2, the abundance and form of non-obsidian material at Locus 3 suggests a degree of dependence on locally available lithic materials.

Based on a single projectile point, and supported by hydration results, it appears that Locus 3 was used during middle and possibly late period times between approximately A.D. 450 and 1850. As indicated by the presence of the RSCN projectile point, hunting was probably practiced to some extent; milling stations indicate the processing of acorns and possibly other food materials.

LOCUS 4

Locus 4, the easternmost portion of the site, consists of a midden area identified during site recordation and defined through subsurface testing. This locus is situated on a small, gently sloping bench approximately 20 m above the river, and is open, with decomposing granite and solid granite outcrops. Portions of a historic era water conveyance system, associated with the remains of a dam which Marvin (1992) has discussed, are visible from this locus. Midden covers approximately 706 sq m at this locus, and is visible eroding out of the slope below Feature 9. Excavation revealed a midden depth of 10 cm. A total volume of 0.425 cu m of soil matrix was excavated at this locus. Excavation included 2 STUs and 1 EU. No tools were collected from Locus 4.

Debitage

Twenty-three obsidian, 17 CCS, and 4

quartz pieces of debitage were collected from Locus 4. Of these 44 pieces, 55% are typeable flakes. Sixty-seven percent of the typeable flakes are pressure/edge preparation flakes, while 33% are thinning flakes. Any conclusions drawn on the distribution of flake type or material type by depth would be presumptuous due to the very limited sample size. A lack of cortical material and large flakes may be the result of importing material in a reduced form.

A look at flake type and size by material type reveals once again that obsidian occurs primarily as pressure/edge preparation flakes. CCS occurs with equal frequency as pressure/edge preparation flakes and as thinning flakes.

Ground Stone

Feature 9, a bedrock milling station containing 10 cups and 2 pieces of associated ground stone, lies within the boundary of Locus 4. Cup depths on Feature 9 range from 1 to 10 cm. Feature 8, a bedrock milling station located 25 m southeast of Locus 4, contains 3 cups and 5 pieces of associated ground stone, and cup depths range from 1 to 2 cm. The presence of oak trees in the vicinity of this locus might indicate the use of these milling stations for the processing of acorns.

Faunal

A total of 43 small, unidentifiable bone fragments were collected from EU 4 on Locus 4; 11 of these pieces have been burned. No concentration or pattern was noted during excavation.

Conclusion

No temporal assignation may be made for the use of Locus 4 based on current data. Due to the small sample size, all that can be concluded is that flaked lithic material was being processed apparently in middle and final phase biface reduction, and that food - presumably acorn - was being processed at milling stations associated with Locus 4.

CULTURAL SEQUENCES

Test excavations at CAL-718 have added data which will help in our understanding of

prehistoric use of the North Fork of the Stanislaus River drainage area. Cultural sequences considered during analysis of the Sourgrass collection include the Yosemite sequence, the New Melones sequence, and the Mokelumne sequence. Consideration of these sequences focuses on the ca. A.D. 450-1850 time span, as these dates are represented at CAL-718.

Both the Yosemite sequence defined by Bennyhoff (1956), and the New Melones sequence defined by Moratto et al. (1988), indicate less intensive use during the Tamarack and Redbud phases, respectively. These phases date to between A.D. 450-1250 and A.D. 600-1300 respectively. Both phases are characterized by a lower frequency of permanent and semi-permanent village sites, and a majority of Rose Spring and/or Eastgate series projectile points. Additionally, Moratto et al. (1988) note an increase in non-obsidian flaked lithic material, and a variety of portable milling equipment in Redbud phase sites. Bennyhoff notes bedrock mortars and cobble pestles as the primary milling implements of Tamarack phase sites. Similarities between CAL-718 and Tamarack phase sites include the presence of 1 Rose Spring Corner Notch point, and the presence of stationary milling features and pestles. Similarities between CAL-718 and Redbud phase sites include again, the Rose Spring Corner Notch point, the expanded use of non-obsidian material for flaked lithic tools, and the presence of a variety of portable milling equipment on Locus 2. CAL-718 however, is a village site, which appears to have been heavily used during the Tamarack/Redbud phase times, which is incongruous with characteristics of these phases.

Bennyhoff's Mariposa phase (A.D. 1250-1850), and Moratto's Horseshoe Bend phase (A.D. 1300-1848) represent the period immediately prior to European contact. Desert Side Notch (DSN) and Cottonwood series points, the use of steatite, shell beads, pictographs, and extensive use of bedrock milling stations, as well as an overall increase in settlement intensity characterizes these phases. Locus 2 of CAL-718 yielded DSN points, and bedrock milling stations were located throughout the site. Loci 1 and 2 both

yielded DSN fragments; both loci also contain well developed midden deposits indicative of intensive use.

The Mokelumne River sequence, defined by Cleland (1988), contains the Mokelumne phase which dates to between A.D. 450 and 1200, and is characterized by Rose Spring/Eastgate series points, an increased utilization of local quartz, a decrease in the frequency of Bodie Hills obsidian, the presence of bedrock milling features, small saucer and square-saddle Olivella shell beads, permanent and semi-permanent village sites, and an increase in settlement intensity. CAL-718 contains several of these characteristics - 1 Rose Spring series point, and although primarily CCS and not quartz, local non-obsidian material dominated the flaked lithic assemblage. Obsidian collected is primarily from the Bodie Hills source. Fifteen bedrock milling stations were also recorded on this village site. Due to the dearth of material positively identifiable as pre A.D. 450, it appears that this site was sporadically used, or not used at all prior to about A.D. 450, which could indicate a possible expansion or pioneering of this site as a new area due to increased settlement intensity in the middle elevation areas. Cleland and others suggest that this increased settlement intensity at mid-elevation sites, along with the corresponding reduced settlement intensity at lower elevations during this time, may be explained by changes in the environment. Climatic changes which shifted the biotic communities up in elevation would explain the decline in population at lower elevations, and the increase in population at mid-elevations.

The Amador phase of the Mokelumne River sequence dates to A.D. 1200-1800, and is characterized by DSN and Cottonwood series points, an increase in the use of Bodie Hills obsidian, continued use of local chert and quartz, use of bedrock milling stations, and the settlement of permanent and semi-permanent villages. Locus 2 of CAL-718 appears to be representative of this phase, as does Locus 1; other loci might also contain components of this phase. Locus 2 yielded 1 DSN point and 3 DSN fragments, of which 50% are Bodie Hills obsidian, a higher frequency of obsidian tools than other loci of

the site. However, CCS is still the dominant material type in the debitage collection. Bedrock mortars are present on Locus 2, as is a well developed midden deposit, indicating habitational use.

CAL-718 appears to fit reasonably well into Cleland's Mokelumne River sequence. Loci 1 and 4 exhibit slightly higher percentages of obsidian than CCS or other local material, which may contribute to the assignment of these loci to the Amador phase. A single Queens obsidian DSN fragment from Locus 1 which exhibits a hydration band of 1.6 microns also indicates use during Amador phase times. Locus 3 contains slightly more CCS than obsidian in its flaked lithic assemblage; the use of local non-obsidian material along with the presence of a single CCS Rose Spring series point indicates use during Mokelumne phase times. This is supported by data from a obsidian hydration sample from EU 6. Locus 3 may or may not contain an Amador phase component; the column sample failed to identify the presence of this phase at Locus 3.

Locus 2 contains slightly more CCS than obsidian; hydration column samples from EU 1 show a range of Bodie Hills obsidian from 2.0 and 3.9 microns, with 1 specimen exhibiting diffuse hydration, and 1 specimen exhibiting no visible hydration band. Temporally diagnostic artifacts collected from Locus 2 are confined to points and point fragments of the DSN series, with an increase in the frequency of obsidian tools (Bodie Hills obsidian) over other site loci, which is a characteristic of the Amador phase. The predominance of non-obsidian debitage, as well as the range of hydration results from Bodie Hills obsidian may indicate use of this locus during Mokelumne phase times as well.

Slightly problematic is the presence of portable milling equipment at Locus 2, as well as hydration results from the EU 1 column sample which identifies only very early Amador phase use of Bodie Hills obsidian.

Further excavation at mid-elevation sites in the Mokelumne and Stanislaus river drainages will add to the pool of information upon which we draw conclusions about cul-

tural sequences. Undoubtedly, the Moke-lumne sequence will be more clearly defined as a result of further investigations in this area. Future work at CAL-718, to be completed prior to campground construction, will help define use of this site, and I believe, more firmly place it within the Moke-lumne River cultural sequence.

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