ETSEL RIDGE ARCHAEOLOGICAL PROJECT: A MULTI-SITE APPROACH TO PREHISTORIC ADAPTATION IN THE MIDDLE EEL UPLANDS

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ABSTRACT

This paper presents the results of the Etsel Ridge Archaeological Project, the 1986 phase of an ongoing cooperative agreement between the Bureau of Land Management, Sonoma State University Anthropological Studies Center, and Santa Rosa Junior College. Data from this survey, together with data from earlier work in the area are synthesized from both surface and subsurface contexts and utilized to explicate chronology, adaptive patterns, and obsidian exchange. A tentative model of diachronic settlement and subsistence is proposed for the Etsel Ridge locality. Obsidian sourcing and hydration data from Etsel Ridge are compared to similar data from the adjacent Middle Eel lowlands. Both spatial and temporal variability in the use of Borax Lake obsidian are explored.

INTRODUCTION

The Etsel Ridge Archaeological Project (Huberland 1988) involved a large scale survey of approximately 3000 acres on Mendocino National Forest, Bureau of Land Management, and private property within a defined study area in the Middle Eel uplands southeast of Round Valley. The study area encompasses approximately 120 square miles centering on Etsel Ridge in the central North Coast Ranges. The Middle Fork of the Eel bounds the project to the west, the Black Butte River forms the northeastern project boundary, and the crest of the North Coast Ranges is just east of the project area (see Figure 1).

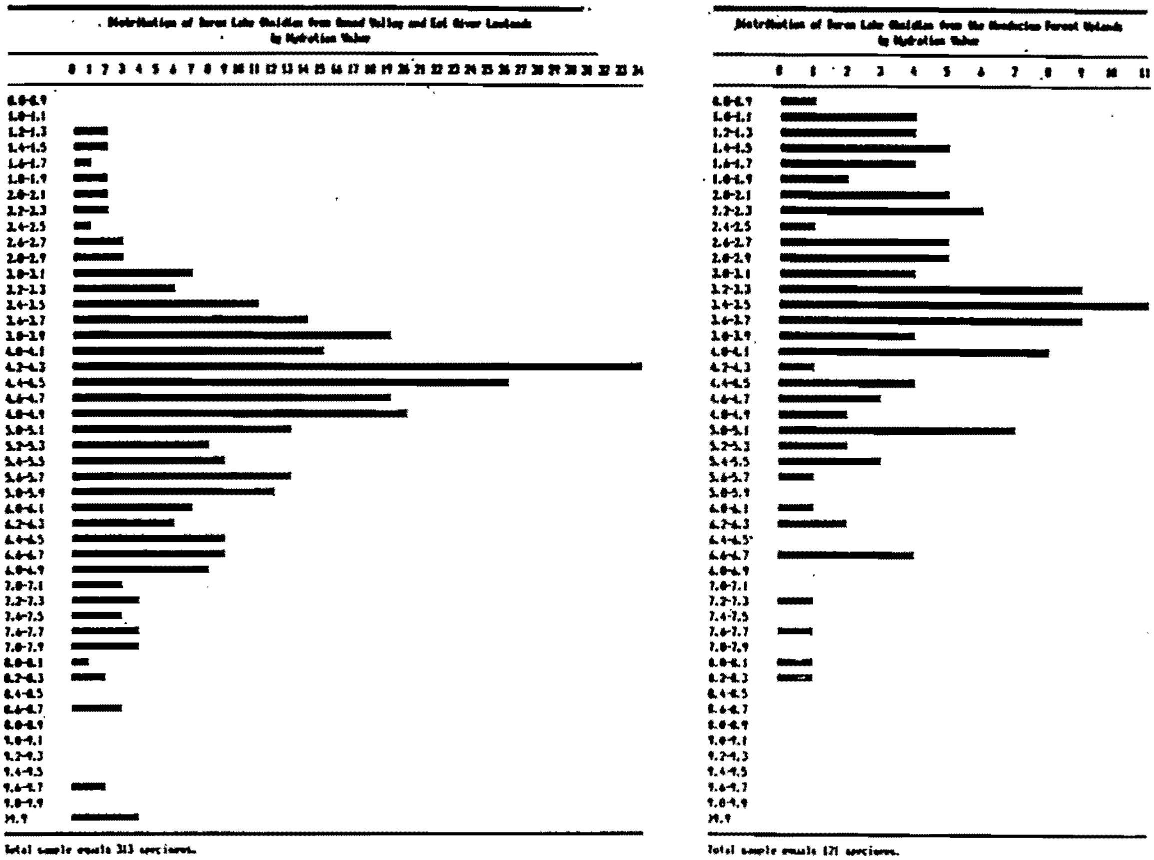
Elevations within the defined study area range from 400 meters (1180 feet) along major drainages to 2288 meters (6700 feet) atop Etsel Ridge. Etsel Ridge is an unusually broad, flat, and open ridgeline, with numerous springs and a mozaic of mixed conifer/oak woodland/open grassland vegetation, contrasting with the surrounding mountains which are steeper, with dense conifer stands.

The 1986 Etsel Ridge project was specifically designed as an intensive field survey aimed at covering a broad variety of environmental zones within a defined locality. Temporally diagnostic projectile points and obsidian were collected from the surface of sites to provide a data base for analysis. Previous location). Holson's work at MEN-320/643 indicated that this and other downstream sites yielded Borax Lake obsidian hydration measurements much larger than expected, judged by the types of projectile points found there. For example, at CA-MEN-268, an ethnographic village site, which had a predominance of small arrow points and radiocarbon dates circa A.D. 1500, Borax Lake obsidian hydration readings peaking between 3.9 and 7.9 microns did not correspond well with intensive late period use of the site (Holson 1986:254-255).

Subsequent to a later test excavation at CA-MEN-320/643, Eidsness (1986:109) stated that the normal curve formed by Borax Lake hydration measurments from that site suggested that a regularized exchange network involving Borax Lake obsidian developed, peaked, and then declined in later times. Figure 2 illustrates this phenomenon, with the two bar graphs depicting Borax Lake obsidian hydration samples from lowland (on the left) versus upland (on the right) sites in the Middle Eel area. Low micron measurments represent later time periods, while high measurements are associated with earlier temporal periods. The graph on the left, representing Borax Lake hydration mesaurements from the lowlands, shows a distinctive peak at around 4.3 microns, which drops off rapidly after 3.0 microns. This late period drop off in Borax Lake obsidian deposition at lowland sites, even those which were known to have been used during the late period, was one of the problems investigated during the current study.

Diachronic Settlement/Subsistence Patterns

Recent work on Pilot Ridge and South Fork Mountain in Six Rivers and Shasta-Trinity forests provided a model for diachronic settlement/subsistence patterns in the Etsel Ridge locality (Hildebrandt and Hayes 1983, 1984; Hayes and Hildebrandt 1985). Hildebrandt and Hayes proposed a three-period scheme of prehistoric subsistence and settlement based on optimal foraging theory and tied to evidence for Holocene climatic change. Their model included an early period, approximately 8000 to 2500 years B.P., characterized by a warmer, dryer climate, with prehistoric populations living in small groups and utilizing a mobile forager strategy. Around 2500 years B.P. the climate cooled and available moisture increased. Possibly in response to changing climatic conditions, prehistoric groups in the Pilot Ridge area may have adopted a collector strategy during this middle period, establishing semi-sedentary villages in lower elevations adjacent to stands of oak and anadromous fisheries. At the same time, use of the uplands became restricted to short term task-specific activities carried out by small groups. During the late period, circa 1500 to 500 years B.P., climate and settlement pattern shifts were minimal, with a slight increase in the generalized use of the uplands relative to the middle period (Hayes and Hildebrandt 1985:109).



Taken from Fredrickson, 1987, "The Use of Borax Lake Obsidian Through Time and Space", presented at the Society for California Archaeology 21st Annual Meeting, Fresno, California.

FIGURE 2. Borax Lake obsidian hydration histograms, Mendocino National Forest uplands and lowlands.

The Pilot Ridge three-tiered settlement/subsistence scheme provides an alternative to ethnographically-based land use models which have dominated previous studies of prehistoric adaptation in the North Coast Ranges uplands (cf. Jackson 1976; Stewart and Fredrickson 1979). Ethnographic patterns suggested that subsistence centered around large permanent village sites along the major drainages, with seasonal forays into the adjacent mountains for various resources. In contrast, the Pilot Ridge data suggests that in the 3000 years or more that Etsel Ridge has been utilized by aboriginal populations, adaptive strategies and settlement patterns may have changed. Although the ethnographically-based seasonal round models can provide insight into contact and late pre-contact site patterning, their applicability to prehistoric subsistence patterns is debatable.

Obsidian Exchange

Figure 1 depicts the locations of relevant obsidian sources. Obsidian collected during the Etsel Ridge survey includes 3 southern sources: Borax Lake, Mt. Konocti, and Napa; and 2 northern sources: Medicine Lake Highland, and Tuscan. Visual and X-Ray fluorescence sourcing results indicate that Borax Lake obsidian represents 87% of the sample, followed by Medicine Lake Highland (6%), Mt. Konocti (5%), and Napa (1%). Obsidian makes up no more than 10% of the flaked stone constituents at most Etsel Ridge sites; chert is the predominant lithic material.

Figure 1 also depicts the location of site CA-GLE-138, called the Great Blades Cache. The cache, discovered in 1972, consisted of 69 bifaces, all of Borax Lake obsidian. Work by Rick and Jackson (1985) provided 10 hydration readings, equally divided between 3.5 and 3.6 microns, indicating that all the blades were manufactured simultaneously, probably near the Borax Lake quarry, and later cached for trading purposes. They cross-dated the blades with similar artifacts from LAK-510 (White 1984), to circa 2500 to 2000 years B.P. They concluded that the manufacture and distribution of these types of bifaces was part of a regional formalized exchange system during the Upper Archaic period (Rick and Jackson 1985:60-78). The presence of such a cache suggests that Borax Lake obsidian may have been entering the Etsel Ridge Project area via the Coast Range crest, rather than through Round Valley, during the Upper Archaic.

RESULTS

Figure 3 depicts Borax Lake obsidian hydration measurements for 9 Etsel Ridge sites. Each asterisk is one obsidian flake, and the measurements go from latest to earliest time periods, top to bottom. Figure 4, to the right of Figure 3, combines the hydration measurements of all the sites sampled for the Etsel Ridge project.

	MEN-1633	MEN-970	MEN-973	MEN-791	MEN-888	MEN-760	MEN-900	MEN-954	MEN-981
0.5-0.6									
0.7-0.8									
0.9-1.0	***	*							
1.1-1.2	***		**	*					
1.3-1.4	*								
1.5-1.6	***		*						
1.7-1.8		*			*				
1.9-2.0	***		*						
2.1-2.2		*	**		*	**	**	*	
2.3-2.4	**	*		*	*	*	*		
2.5-2.6		*	*			*			**
2.7-2.8	*						*		*
2.9-3.0			**	*	*		***	***	
3.1-3.2			*******	**			*	**	
3.3-3.4			*****	*			****	**	
3.5-3.6							*		
3.7-3.8							****	***	
3.9-4.0					*		*		
4.1-4.2							*	**	
4.3-4.4				*					
4.5-4.6				*					
4.7-4.8				*					
4.9-5.0				*					
5.1-5.2	**								
5.3-5.4									
5.5-5.6									
5.7-5.8									
5.9-6.0									
6.1-6.2									
6.3-6.4									
6.5-6.6									
6.7-6.8									
6.9-7.0									
7.1-7.2									
7.3-7.4									
7.5-7.6									
7.7-7.8									
7.9-8.0									
8.1-8.2									
8.3-8.4									
8.5-8.6									
8.7-8.8									
8.9-9.0									
9.1-9.2									
9.3-9.4									
9.5-9.6									
9.7-9.8									

Total sample equals 98 specimens. Specimens are from both surface and subsurface contexts.

FIGURE 3. Borax Lake obsidian hydration measurements for Etsel Ridge sites (mesaurements in microns).

0.5-0.6	
0.7-0.8	
0.9-1.0	****
1.1-1.2	*******
1.3-1.4	*
1.5-1.6	*****
1.7-1.8	*****
1.9-2.0	****
2.1-2.2	************
2.3-2.4	********
2.5-2.6	*******
2.7-2.8	*****
2.9-3.0	************
3.1-3.2	**********
3.3-3.4	*************
3.5-3.6	******
3.7-3.8	*******
3.9-4.0	****
4.1-4.2	***
4.3-4.4	*
4.5-4.6	**
4.7-4.8	*
4.9-5.0	**
5.1-5.2	**
5.3-5.4	
5.5-5.6	
5.7-5.8	*
5.9-6.0	
6.1-6.2	*
6.3-6.4	
6.5-6.6	*
6.7-6.8	
6.9-7.0	
7.1-7.2	
7.3-7.4	
7.5-7.6	
7.7-7.8	
7.9-8.0	
8.1-8.2	*
8.3-8.4	
8.5-8.6	
8.7-8.8	
8.9-9.0	*
9.1-9.2	
9.3-9.4	
9.5-9.6	
9.7-9.8	

Total sample equals 126 specimen. Specimens are from both surface and subsurface contexts.

FIGURE 4. Borax Lake obsidian hydration histogram for the Etsel Ridge archaeological project locality (measurements in microns).

Keeping in mind that because most specimens were collected from surface contexts, the hydration results might be skewed towards later period overrepresentation, a pattern for Borax Lake obsidian use for the Etsel Ridge locality does emerge. The earliest period, spanning about 5.7 to 9.0 microns, is associated with sparse, sporadic obsidian use. Between 4.3 and 5.2 microns, obsidian use becomes slightly more intensive. Later time periods, represented by Borax Lake hydration measurements between 0.9 and 4.2 microns, exhibit sustained and intensive obsidian deposition.

Table 1, following, illustrates the association of artifacts and temporal periods with specific Borax Lake hydration clusters; these are the few upland sites which have been excavated within the immediate project area. Figure 5, below Table 1, combines the above data with hydration information suggested by the 25 obsidian points cut for the Etsel Ridge project.

The obsidian hydration and projectile point data from Etsel Ridge sites suggest two distinct occupational periods. The early period, called Etsel Ridge I, is marked by sparse use of the area, while the later period, Etsel Ridge II, evidenced intensive use by aboriginal populations. Etsel Ridge Period II is divided into two phases, with certain projectile point styles spanning both phases, and others dropping out or being introduced during the later, Phase B.

In terms of settlement and subsistence patterns, it appears that the few sites falling within the Etsel Ridge Period I (the early period) are all situated on major trending ridgetops, by the most dependable springs, and are all multi-activity sites, with flaked and ground stone and/or midden (refer to Table 2, Appendix 1).

Sites representative of Etsel Ridge Period II Phase A are twice as numerous as the early (Etsel Ridge Period I) sites. In terms of location, the Etsel Ridge Period II Phase A sites appear to be transitional between the earliest and latest Etsel Ridge sites. Like Period I sites, the Etsel Ridge Phase A sites are all still situated on ridgetops, above 1700 meters (5000 feet) elevation, but there appears to have been an increasing tendency through time to locate some sites away from an immediate water source, and along drainages rather than by springs.

TABLE 1

BORAX LAKE OBSIDIAN HYDRATION, PROJECTILE POINT DATA, AND HYPOTHESIZED TEMPORAL PERIODS FOR CA-MEN-900, -973, AND -1711

SITE	HYDRATION	PREDOMINANT POINT STYLES	HYPOTHESIZED TEMPORAL PERIOD
CA-MEN-1633	0.9 - 2.8	Gunther-barbed	Late
CA-MEN-973	1.1 - 3.3	Gunther, Corner-Notch, Lanceolate	Middle and Late
CA-MEN-900	2.1 - 4.0	Notched, Stemmed	Middle and Late
CA-MEN-1711	1.3 - 3.3	Lanceolate	Middle and Late
	4.5 - 6.7	Widestem	Early

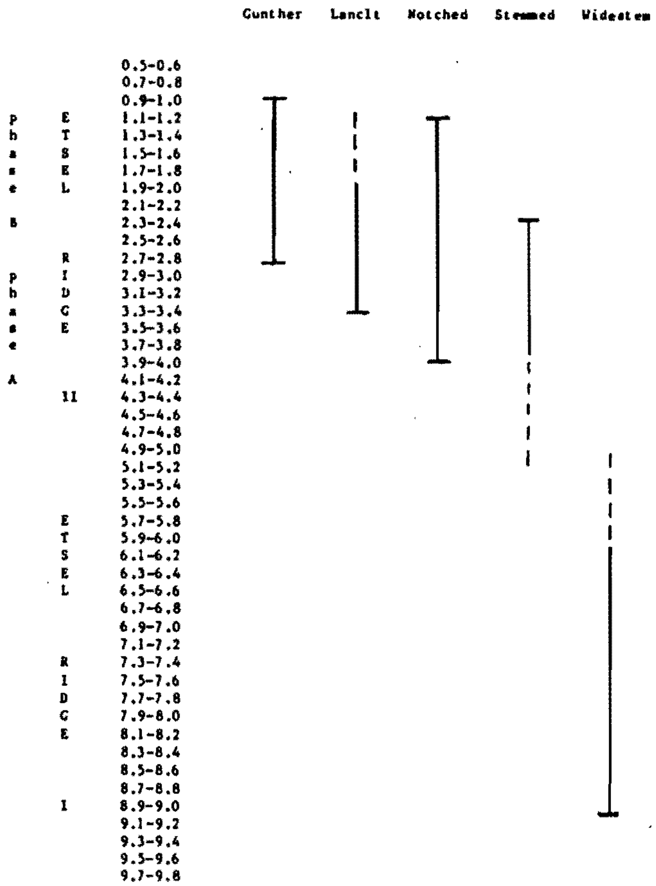


FIGURE 5. Temporal ranges of specific projectile point styles within the Etsel Ridge locality as suggested by Borax Lake obsidian hydration measurements.

Etsel Ridge Period II Phase B sites, marking the latest phase of aboriginal use of the area, are three times as numerous as Period I sites. Many of these latest sites are located on midslope benches rather than on ridgetops, and a high proportion of them are below 5000 feet in elevation. Unlike the early and transitional sites, a high proportion of the Etsel Ridge Period II Phase B sites are not multi-activity, being lithic scatters only.

Figure 6 depicts Borax lake obsidian hydration distributions from three localities: on the left are measurements from ten high elevation sites in a locality southeast of Etsel Ridge; in the center are the Etsel Ridge hydration measurements; and the curve to the right combines measurements from 5 sites in the Middle Eel lowlands just northwest of Etsel Ridge.

Several trends are suggested by the histograms depicted in Figure 6. First, while Borax Lake obsidian usage peaks at around 4.3 to 4.4 microns at Middle Eel lowlands sites, major deposition in the Etsel Ridge vicinity appears to take place much later in time. It is expected that obsidian from the lowland sites will hydrate at a faster rate than obsidian from the upland areas due to higher mean temperatures in the lowlands speeding the rate of hydration. Therefore, obsidian in the lowlands will have a greater hydration measurement than contemporaneous upland obsidian. Regardless of the different hydration rates between uplands and lowlands, however, the late period dropoff in Borax Lake obsidian suggested by the Middle Eel lowlands hydration curve is not paralleled in the Etsel Ridge hydration distribution, which suggests sustained obsidian deposition throughout the late period (Etsel Ridge II). Four alternative hypotheses are proposed to account for the apparent dichotomy between the use of Borax Lake obsidian at Eel River versus Etsel Ridge sites. The four hypotheses, discussed in detail below, suggest either: 1) a shift in settlement/ subsistence patterns; 2) changes in intergroup boundary relationships; 3) a shift in Borax Lake obsidian exchange routes; or 4) functionally related differences in obsidian deposition.

1) At around 5.2 microns (lowland hydration rate), changing adaptations, possibly associated with climatic shifts, resulted in increasing sedentism along the Eel River, possibly associated with the intensive use of anadromous fish. Decreased mobility of populations living along the river resulted in less frequent contacts with neighboring groups who had access to Borax Lake obsidian. This breakdown in exchange relationships resulted in a dropoff in Borax Lake obsidian after 4.2 microns in the riverine areas, while populations utilizing Etsel Ridge continued to have access to Borax Lake obsidian into the late period.

	S. FORK EEL/ BLACK BUTTE	ETSEL RIDGE	MIDDLE EEL LOWLANDS
0.5-0.6			
0.7-0.8			
0.9-1.0		****	
1.1-1.2	**	*******	*
1.3-1.4	***	*	**
1.5-1.6	***	*****	*
1.7-1.8	*	*****	*
1.9-2.0	**	****	*
2.1-2.2	**	************	***
2.3-2.4	***	********	**
2.5-2.6	***	*******	*
2.7-2.8	****	*****	**
2.9-3.0		************	******
3.1-3.2	***	**********	****
3.3-3.4	********	*************	*********
3.5-3.6	***	******	*************
3.7-3.8		*******	*******************
3.9-4.0	**	****	*********
4.1-4.2	***	***	***********************
4.3-4.4	*	*	***************************
4.5-4.6	*****	**	*******************
4.7-4.8	*	*	**********************
4.9-5.0	***	**	*****************
5.1-5.2	***	**	****************
5.3-5.4			*******
5.5-5.6			*************
5.7-5.8	*	*	***********
5.9-6.0			***********
6.1-6.2	**	*	******
6.3-6.4	*		***********
6.5-6.6		*	*********
6.7-6.8	*		****
6.9-7.0			*********
7.1-7.2			***
7.3-7.4			****
7.5-7.6			
7.7-7.8			*******
7.9-8.0			**
8.1-8.2		*	*
8.3-8.4			*
8.5-8.6			**
8.7-8.8			*
8.9-9.0		*	
9.1-9.2			
9.3-9.4			
9.5-9.6			*
9.7-9.8			*

Total sample equals 486 specimens. Specimens are from both surface and subsurface contexts.

FIGURE 6. Borax Lake obsidian hydration histograms for three localities within the Etsel Ridge project vicinity (measurements in microns).

2) Assuming that Borax Lake obsidian entered the Eel River and Round Valley areas via the Coast Range crest and Etsel Ridge, terminal middle and late period relationships between groups occupying the highland versus lowland areas were such that Eel River and Round Valley populations were cut off from the Borax Lake obsidian supply.

3) During the earliest periods of aboriginal use of the Middle Eel area, Borax Lake obsidian usually entered the Eel River lowlands and Round Valley through routes alternative to the crest-Etsel Ridge route (i.e., possibly through Round Valley). Subsequent to 4.2 microns, these alternative routes were cut off, and Borax Lake obsidian entered the Round Valley area only via Etsel Ridge.

4) Obsidian deposition, as a function of hunting or gathering related activities, only occurred in the areas where those particular activities took place. A shift towards sedentism along the Eel River during the late period resulted in a separation between habitation areas and hunting/gathering areas such that very little obsidian was utilized or deposited at riverine habitation sites. Large amounts of obsidian were deposited along Etsel Ridge where hunting, tool resharpening, and obsidian exchange activities took place.

CONCLUSIONS

A tentative chronological sequence is proposed for the Etsel Ridge locality based upon obsidian hydration and projectile point data from both surface and subsurface contexts. Two major occupational periods are suggested, the earlier marked by sparse use of the area, and the latter evidencing intensive use by aboriginal populations. Analysis of environmental and cultural aspects of Etsel Ridge sites indicates a shift in settlement and subsistence patterns through time. Early sites tend to be fewest, and are located on major trending ridges, while late sites are much more numerous and are located in a variety of environmental contexts, with many at elevations lower than early period sites. Additionally, a shift from multi-activity sites during the early period to both multi- and single-activity sites during the late period is observed. Temporal differences in the use of Borax Lake obsidian between highland and lowland Middle Eel localities are noted. Several hypotheses are proposed to account for this phenomenon, inlcuding data suggesting that the Coast Range crest may have provided a major exchange route for Borax Lake obsidian.

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APPENDIX I

ETSEL RIDGE SITE ATTRIBUTES AND HYPOTHESIZED TEMPORAL PERIODS

ETSEL RIDGE I
Early Sites

SITE	ELEVATION	LANDFORM	WATER	POINTS	MIDDEN	GROUND STONE	HYDRATION	ACTIVITIES	TEMPORAL COMPONENTS
CA-MEN-766	5700'	off ridgetop	spring on-site	widestem concave base	yes?	yes	2.1 to 2.6 (4)*	M**	M***
CA-MEN-791	5260'	off ridgetop	spring on-site	Gunther side-notched widestem	yes	yes	2.9 to 3.4 (4) 4.3 to 5.0 (4)	M	M
CA-MEN-954	5740'	off ridgetop	springs on-site	Gunther lanceolate corner-notched side-notched stemmed McKee uniface widestem	no?	yes	3.7 to 4.2 (5)	M	M
CA-MEN-1711	5850'	off ridgetop/ drainage	springs on-site	lanceolate widestem	no	yes	1.3 to 3.3 (3) 4.5 to 6.7 (6)	M	M

ETSEL RIDGE II-A
Transitional

SITE	ELEVATION	LANDFORM	WATER	POINTS	MIDDEN	GROUND STONE	HYDRATION	ACTIVITIES	TEMPORAL COMPONENTS
CA-MEN-766	5700'	off ridgetop	spring on-site	widestem concave base	yes?	yes	2.1 to 2.6 (4)	M	M
CA-MEN-900	5340'	saddle on ridgetop	none on-site	Gunther corner-notched side-notched stemmed	yes	yes	2.1 to 2.4 (3) 2.7 to 4.2 (16)	M	M
CA-MEN-950	5800'	off ridgetop	none on-site	lanceolate corner-notched side-notched stemmed	yes?	yes	1.5 to 6.5 (10)	M	S
CA-MEN-953	5300'	ridgetop	none on-site	lanceolate corner-notched side-notched concave base	no	yes	-----	M	S
CA-MEN-954	5740'	off ridgetop	springs on-site	Gunther lanceolate corner-notched stemmed McKee uniface widestem	no?	yes	3.7 to 4.2 (5) 4.5 to 6.7 (6)	M	M
CA-MEN-1659	5500'	midslope/ drainage off ridge	perennial drainage	lanceolate side-notched stemmed concave base	no?	yes	-----	M	S
CA-MEN-2108	5380'	ridgetop	none on-site	side-notched concave base	no?	yes	-----	M	M
CA-MEN-2123	5430'	bench/ off ridgetop	spring on-site	stemmed concave base	no?	yes	-----	M	S

*All hydration measurements are for Borax Lake obsidian samples unless noted otherwise.

**"M" refers to multi-activity sites, "S" to single-activity sites.

***"M" indicates that more than one temporal component is present; "S" denotes a single (temporal) component site.

ETSEL RIDGE II-B
Late Sites

SITE	ELEVATION	LANDFORM	WATER	POINTS	MIDDEN	GROUND STONE	HYDRATION	ACTIVITIES	TEMPORAL COMPONENTS
CA-MEN-791	5260'	off ridgetop	spring on-site	Gunther side-notched widestem	yes	yes	2.9 to 3.4 (4) 4.3 to 5.0 (4)	M	M
CA-MEN-854	4600'	ridgetop	?	Gunther	no	yes	-----	M	S
CA-MEN-861	5200'	off ridgetop	spring	Gunther	yes	yes	-----	M	S
CA-MEN-900	5340'	saddle on ridgetop	none on-site	Gunther corner-notched side-notched stemmed	yes	yes	2.1 to 2.4 (3) 2.7 to 4.2 (16)	M	M
CA-MEN-903	6440'	off ridgetop	spring	Gunther	no	no	-----	S	S
CA-MEN-916	6000'	ridgetop	none on-site	Gunther	no	yes	-----	M	S
CA-MEN-938	5400'	ridgetop	none on-site	Gunther others?	yes	yes	-----	M	M?
CA-MEN-954	5740'	off ridgetop	springs on-site	Gunther lanceolate corner-notched side-notched stemmed McKee uniface widestem	no?	yes	3.7 to 4.2 (5)	M	M
CA-MEN-970	5860'	ridgetop	spring on-site	Gunther lanceolate notched	no?	no?	-----	S	M
CA-MEN-973	4560'	midslope/ drainage	perennial drainage	Gunther lanceolate corner-notched	yes	yes?	1.1 to 2.6 (7) 2.9 to 3.4 (13)	M	M
CA-MEN-1633	4725'	midslope bench	spring nearby	Gunther	no	yes	0.9 to 2.8 (16)	M	S
CA-MEN-1658	5600'	bench below ridgetop	drainage nearby	Gunther	no	no	-----	S	S
CA-MEN-1711	5850'	off ridgetop/ drainage	springs on-site	lanceolate widestem	no	yes	1.3 to 3.3 (3) 4.5 to 6.7 (6)	M	M
CA-MEN-1755	4700'	ridgetop	seep nearby	Gunther lanceolate	no	yes	-----	S	S
CA-MEN-1756	4000'	ridgetop saddle	none on-site	Gunther	no	no	-----	S	S
CA-MEN-1764	3200'	midslope/ drainage	drainage adjacent	Gunther	no	no	-----	S	S
CA-MEN-1773	5160'	saddle on ridgetop	nearby	Gunther	no	yes	-----	M	S
CA-MEN-1777	5320'	bench off ridgetop	?	Gunther	no	no	-----	S	S
CA-MEN-1792	4300'	midslope/ drainage	drainage	Gunther	no	yes	-----	M	S
CA-MEN-1860	4840'	slope off ridge	spring	Gunther	no	yes?	-----	M?	S
CA-MEN-2105	4940'	saddle on ridge	spring/seep nearby	Gunther contract stem triangular	no	yes	-----	M	S
CA-MEN-2108	5380'	ridgetop	none on-site	side-notched concave base	no?	yes	-----	M	M
CA-MEN-2109	4200'	bench off ridgetop	spring on-site	Gunther-variant	no	no	1.7, MLH	S	S
CA-MEN-2115	4850'	midslope bench/ drainage	spring on-site	lanceolate corner-notched	yes	yes	-----	M	M
CA-MEN-2120	5250'	bench off ridgetop/ drainage	none on-site	Gunther-variant	no	yes	-----	M	S