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UNIVERSITY OF CALIFORNIA
ARCHAEOLOGICAL RESEARCH FACILITY

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Martin A. Baumhoff and Robert I. Orlins

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PREFACE

In Spring, 1974 the Corps of Engineers approached us about doing a very small archaeological reconnaisance in the Warm Springs Dam project. The situation had arisen in the following way. The Warm Springs Dam had been planned for many years by the Corps as a flood control project related to the annual or least biennial floods on the Russian River (the dam in on a tributary). In 1964 in accordance with then current practice the Corps of Engineers, through the National Park Service, contracted with A. E. Treganza of San Francisco State College for an archaeological survey. Not much time or money was allocated to this survey so that it was quite minimal - only a few days were devoted to it and only in areas adjacent to the road. A total of eleven sites was located and none was recommended for excavation.

In the years that followed a considerable national outcry on the subject of environmental degradation developed which resulted in several laws and executive orders relating, among other things, to preservation of archaeological resources, a subject long ignored by all levels of government and also by private enterprise. Locally the interest in environmental preservation manifested itself in concern for the damage that would result from building Warm Springs Dam. At that moment, in Spring, 1974, the particular concern was for archaeological site Son-600 which was thought by some to be the ethnographic village of Tako-ton, and therefore of interest to Pomo Indians now living on Dry Creek.

Col. James Lammie of the Corps of Engineers, desiring an evaluation of this situation, asked us to make a determination. A minor amount of excavation there suggested that whatever the ethnographic identity of the site might be, farming operations had so badly disturbed it, that its archaeological potential had virtually disappeared. This was reported to the Corps of Engineers.

In the meantime it had been determined that the original survey by Treganza was inadequate according to the standards mandated by recent changes in Federal rules. The Corps of Engineers therefore provided the money for a complete survey, and a contract by the National Park Service with the University of California was entered into and work was begun October 24, 1974 with a crew of 6 under the field direction of Orlins. The survey continued for two months, and luckily there was fine weather during most of that period. A total of 55 archaeological sites was recorded including 10 which had been found by Treganza in the original survey (one of the original 11 turned out not to be a site). The survey covered 85% of the project area (the other 15% was done later), and we now consider that although a few small sites may have been missed that virtually every surface site is now known. There may of course be subsurface archaeology that has not come to light particularly along Yorty Creek as discussed in the description of that group.

Having completed the survey, negotiations were begun in February, 1975 concerning the next phase of the project-testing and evaluation. Field work was begun in late May, 1975 with Orlins again field director and a crew of 10. Test excavations were performed into mid-July when the field crew dispersed,

and three persons returned to Davis to assist in completing the report. After excavations had beeen under way a short time, it became apparent that insufficient time had been allocated to preparation of the final report. This was therefore delayed, and as a consequence the Corps of Engineers became increasingly uneasy. They were required to appear in court, and while it would have been possible to obtain a postponement, the project had already been delayed more than a year and inflationary factors, particularly at that time, were increasing to the cost of the dam considerably. It is possible to argue that they should have begun thorough archaeological evaluation much earlier, and in fact it has been so argued, but on the whole we find it difficult to place blame in view of the fluctuating nature of the legal and regulatory requirements. In general we found the San Francisco Office of the Corps of Engineers very reasonable to deal with and not at all obstructive.

In any case because of the delay and because of internal confusion within the National Park Park Service, the contract between the University and the Service was terminated in February, 1976. At that time our draft report was in their hands, and they performed an act which they call "assembling" which so far as we can see consists of retyping, reproducing, and omitting certain portions. The Park Service gives the following statement "...any errors of omission or content are to be attributed to the contractor." These authors refuse to accept such responsibility since they did not even see the final copy until after it was issued.

It is instructive at this point to outline some of the difficulties faced in dealing with interlocking bureaucracies. About a half dozen different bureaus, depending on how you count them, were involved in this effort. The U.S. Army Corps of Engineers primary charge, as we understand it, is with flood control and inland waterways. In addition they are required to observe environmental regulations imposed by Congress and/or executive order. In our experience there are three ways they can do this in the case of archaeology: by hiring their own archaeologists; by contracting other individuals or organizations; or by working through Inter-Agency Archaeological Services, an agency of the National Park Service. Inter-Agency Archaeological Services have had a longish history but a rather uneven one because the level of professionalism has been uneven. As is the case, we suppose, with most governmental organizations the persons responsible have been better bureaucrats than professionals (archaeologists). Inter-Agency Archeological Services do not, or at least did not in this case, undertake the archaeological investigations themselves but contracted them to other organizations retaining for themselves more-or-less the position of overseer.

In the present case the contractor was the University of California and this is another level of bureaucracy we will deal with below. But first let us deal with a heirarchy tangential to this Federal maze. There exists in Washington something called the National Register of Historic Places. Nominally the function of this is to identify places important or unique historically or archaeologically which can then be preserved or otherwise dealt with appropriately. Perhaps more important is the provision that on Federal land such places must be dealt with appropriately. The office that deals with this seems also to be related to the Inter-Agency Archeological Services but only at a higher level than we dealt with on the project. Also

connected with this tangent is the Historic Preservation Office of the State of California. As we understand it the nominations for the National Register of Historic Places are (when Californian) first assessed by this office. Another function of the State organization is to pass judgement on all environmental impact reports even if they refer to Federal land. The legality of this seems questionable to us, but in any case it provides another level of interference.

Finally the contractor was the University of California, and it is in itself a formidable bureaucracy. One has innumerable difficulties here carrying out archaeological obligations, difficulties in the form of approval of contracts, accounting procedures, purchasing procedures, use of University vehicles and the like. These, however, are ones we deal with every day as members of the University. In the case of this project we came up against a particularly formidable obstacle in University hiring policy. There are two aspects of this, one having to do with racial and other kinds of illegal discrimination and the other relating to prior rights of University employees or students to University jobs (however funded). The first part hinges on what is called an affirmative action program undertaken in response to action by the Department of Health, Education and Welfare under anti-discriminatory legislation. The effect of the program is that in addition to eliminating discrimination it eliminates speed. This was most unfortunate in the present case since speed was all-important to the Corps of Engineers. It seemed most unfair to us that, from what we could observe, both the Corps of Engineers and the Inter-Agency Archeological Services could hire virtually anyone they wanted within days while the University, because of the action of yet another Federal agency, was hamstrung in the same activity. The University's own hiring policies also slowed us up at a time when speed was of the utmost importance.

The result of this concatination of agencies, Corps, Offices, Registers, Departments, and Campuses as well as laws, orders, policies, rules and programs, was to make it seem at times impossible to do archaeology at all. One spends full time dealing with these problems and no time doing archaeology or any other kind of scholarship. The difficulties of the situation are twofold. In the first place it is in the nature of bureaucracies to deal in abstract requirements and policies usually not related to the particular problem at hand---thus the well-known inflexibility of these institutions. But even if this were not the case, the objectives of these organizations is at best different from and at worst contradictory to the objectives of scholarship or science, namely to discover the nature of the world. Thus the Corps of Engineers is interested in flood control, not in how Pomo Culture came to be the way it was. The National Register is interested in registering things. Even the Inter-Agency Archeological Services, which one might imagine had some basic interest in the problem, seems more interested in purely formal requirements, whether or not they have anything to do with the particular issue.

We do not know how to deal with the difficulties mentioned here or even whether it is particularly useful to mention them. They are outlined here as a matter of personal and ethnographic interest rather than as a proposal for organizational reform or anything of the sort.

What follows is the result of the archaeological reconnaissance in the Warm Springs area. It is basically a descriptive report, necessary because so little descriptive archaeology for the North Coast Range has appeared in print.

Acknowledgements

A great many individuals contributed time and efforts to this project. The official field crew was the following: Peter Banks (Assistant Field Supervisor), David Devey, Joan Hellen (also photographer and artist), Elizabeth Honeysett, (also ecologist), William Lindenau, Donald McGeachy, Jane Melville, Scott Patterson, Pamela Roberts, Miriam Stafford, Sonia Tamex, Nancy Whitney (laboratory supervisor), and Terry Zontek. Terry Zontek and Jane Melville also did floatation studies. Nancy Whitney and Joan Hellen were most helpful in compiling material for the report.

Roderick MacDonald and Elizabeth Honeysett prepared an ecological survey for the project. Melva Orlins served as project secretary.

A good deal of time was contributed gratis by the following: Sari Fredrickson, Jonathan Borah, Thomas Clancy, Roxie Towe, Linda Bell, Randy Mason, and Andrew Devey. We think it fair to single out Sari Fredrickson and Linda Bell as having been especially generous with their time and effort.

Sonoma State College generally, David Fredrickson and David Peri in particular, made generous contributions to the project.

Our relations with the U.S. Government were not always friendly during this project so it is worthwhile noting that we felt and still feel that friendly and willing cooperation was given us by Mr. Garland Gordon of the Park Service and Dr. Richard Lerner of the Corps of Engineers. We are grateful to them both.

The Department of Anthropology of the University of California, Davis was most supportive throughout. We wish particularly to thank James West, D. L. True, Jeanie Anderson, Barbara Beckman, and Gayle Bacon.

INTRODUCTION

Geography

The area under consideration is in California's North Coast Range in Northern Sonoma County about 20 miles southwest of Lakeport on Clear Lake. It is in gently rolling to low mountainous country with elevation from about 400 to over 1000 ft. elevation. Mean annual rainfall here is over 50 inches and is quite variable, ranging from below 30 to over 100 inches per year. The bulk of the rainfall falls between the first of November and the last of March. The temperature is indicated by data from nearby Healdsburg where the mean annual temperature is 59° F, ranging from 40° in January to 70° in July and August. Overall the topographic and climatic conditions can be described as salubrious and pleasant.

It has always been our contention that the most important aspect of the environment for a hunting-gathering people like the Pomo is the native flora. This is true not only because they relied directly upon plants for their resources but also because the non-aquatic fauna upon which they also relied is itself intimately related to floral patterning. Fortunately this matter has been taken up in some detail in an ecological survey of the project area (MacDonald and Honeysett 1975). This report was prepared for the present project and is available for consultation. We rely upon that report in the following summary.

The vegetation is intimately related to soils and the above report relies upon that to divide the areas into four soil-vegetation types as follows:

1. Mixed Evergreen and oak forest soils. "These important timber soils supported a mixture of Doug-fir, Redwood, and hardwoods." This constitutes about 19,000 acres or 36% of the project area. The soils are in the Hugo, Josephine, Hugo-Josephine and Sites series. On soils of this category there seem to have been a considerable amount of redwood and Douglas fir growth and may therefore have supported some elk population. This is on the edge of the Roosevelt elk distribution (McCullough 1971:10) and this would have been the kind of country they would have preferred. The hardwoods included black oak, tan oak, and coast live oak, in that order. The first two figure importantly in the production of acorns for human use. Overall one would say that while this land was very important to the aboriginal inhabitants it was slightly less so than the next category.

2. Woodland - Grassland soils. Three soils also comprise about 36% of the total acerage. This actually seems to us to be two separate groups. The Laughlin and Suther series both have large areas of open grass (more than 50%) but also dense woodlands significant components of which are Oregon oak and black oak, both important acorn producers. The second sub-group consists of the Yorkville, Montara, and Sobrante series on which there are widely scattered small patches or individual trees. It would appear that no economically important tree crop occurs in the latter sub-groups unless it is the digger pine. Digger pines produce good crops of pine nuts but we have never heard that these were in any way important in the North Coast Range. Possibly there occur here also examples of lone standing oaks of relevant species (particularly valley oak). These might be important because such

trees far outproduce, tree for tree, individual trees found in groves.

We feel that the Group 2 soils have the most important nut production to be found in the area. In addition it is the most important feeding ground for deer. This therefore may be the most important land from the standpoint of aboriginal economics in the Warm Springs Project area.

3. Woodland-Chapparal Soil. This is the Los Gatos soils series comprising about 12,000 acres or 22% of the project area. We quote from MacDonald and Honeysett (1975:24). "80% Brush and hardwoods with sparse grass. Shallower soils support a diverse 'high' chaparral mixture. Small redwood clumps occur in ravines. A grass-woodland develops on the deepest phases." The oaks that occur here are mostly coast and interior live oak, both inferior in acorn production. The primary importance of this land must have been in producing deer feed. It was probably less important than either of the two preceeding.

4. Chaparral Soils. There are a little over 3,000 acres of these or 6% of the total and the comprise the Stonyford, Maymen, and Hennebe series. These dense chaparral areas were only important on their margins where important deer feed was found. They were probably the least important in the area.

The distribution of these soil-vegetation types is shown on maps with archaeological sites plotted on them accompanying each site groups below. The significance, if any, of the relationships shown there will be considered as the sites are described and discussed.

Besides vegetation it is important to consider location and abundance of game animals and fish. Deer and elk have both been discussed in connection with vegetation zones above. The other important question relates to the availability in aboriginal times of game fish in Dry Creek and Warm Springs Creek. There seems no doubt that there was a salmon run in Dry Creek in aboriginal times, at least we have been told this by Fish and Game people, but it seems very unlikely that it was a large one. Apparently silver salmon and steelhead trout both run up the Russian River (Baumhoff 1963:174) and a small part of these went up this tributary. In addition there must have been trout and other native freshwater fish. The fishery then may have been a significant element of native subsistance but probably not a major or definitive element.

These geographic factors in aboriginal life will be considered in the discussion of archaeological sites.

Archaeology

It is important that in addition to providing descriptive material we also outline our ideas of the broad outline of North Coast Range archaeology. For present purposes we present a cultural sequence which relies basically on that of Fredrickson (1973, 1974) but also incorporates additional typological features from the Borax Lake site (Harrington 1948; Meighan and Haynes 1968, 1970) and from the Willits site (Meighan 1955). Fredrickson's sequence gives a total of five periods for the chronology of the region summarized as follows:

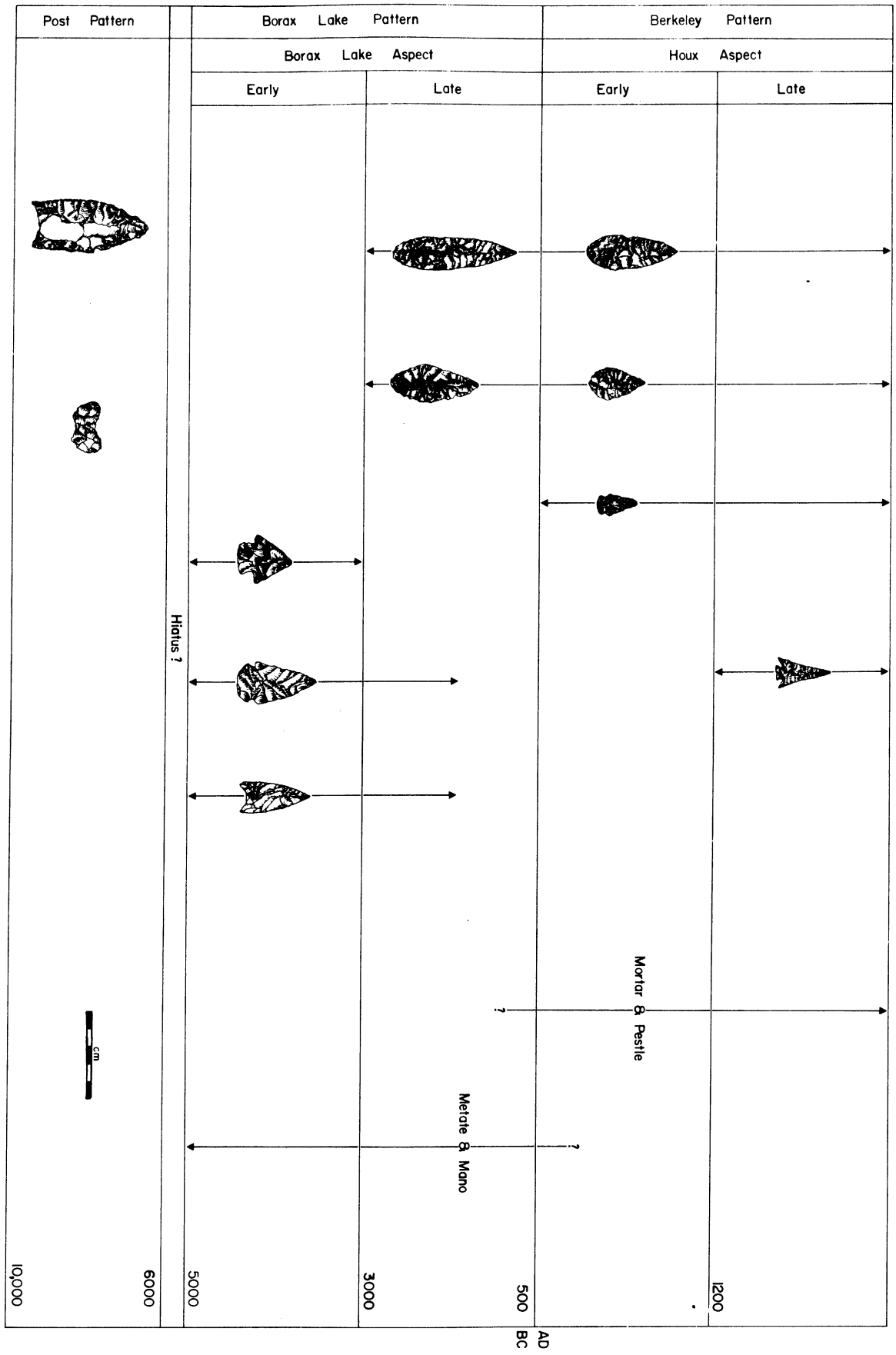


Figure 1. North Coast Range Chronology.

Post Pattern. This is thought to date from 10,000 to 6,000 BC. This complex is positively identified by Fredrickson only at the Borax Lake site. It has fluted points and crescent stones illustrated by Harrington (1948) and by Meighan and Haynes (1968). Only one component from Warm Springs is proposed as being from this period but there may be others undiscovered simply because we have not excavated sufficiently the deeper portions of some sites.

Early Borax Lake Pattern. This follows a possible haitus lasting from 6,000 to 5,000 BC. and persists until 3,000 BC. It is characterized according to Fredrickson, by the large, square stemmed Borax Lake point and by the use of milling stones. We have found none of the square stemmed points but we believe the large side-notch points and large concave based points also date from this period. At the Borax Lake site the concave base points occur with Borax Lake points (Meighan and Haynes 1970: Figure 4). Neither Fredrickson (1974:45) or Meighan and Haynes (1970: note 3) place the concave based points in early Borax Lake but into the next one. However Fredrickson notes the early obsidian hydration readings from Borax Lake and says "Lak-261 may well represent sampling error [i.e., concave base points may be early]" (Fredrickson 1973:198). In any case we tentatively include this concave based type in early Borax Lake Pattern though it may begin earlier in that period than square stemmed Borax Lake points. We place the large side notched points in the same because they are stratigraphically, equivalent at the Willits site (Meighan 1955: types 11 and 7).

Late Borax Lake. In this phase two new projectile point types are introduced. The mortar and pestle is also introduced although the handstone - milling stone complex persists. The time span of the phase is from 3000 to 500 BC. The two new projectile points are, we believe, variants of one another and are called here the Excelsior point and the leaf shaped point. Fredrickson (1973:199) says "The defining characteristics of the Excelsior point are a triangular, straight-edge body and a convex base which is frequently ogival in outline; that is, it resembles a pointed arch. A frequent but not necessary attribute of the Excelsior series point is the presence of a definite shoulder at the junction of the body and the base." These points probably would not have been recognized except for Fredrickson's excavation of the Houx site (Lak-261) where there were a great many of them (see Fredrickson 1973:201). At the Houx site these are all large points but in Warm Springs and also in Indian Valley all of them are smaller and become even more reduced later in time. That these are variants of a leaf shaped with curvate rather than straight sides seems obvious from the Willits site (compare Meigham 1955: Pl. 4B with Pl. 4C and D). These also are reduced in size later in time.

Early Houx Aspect. The time period here is roughly from 500 BC to A.D. 1200. In this phase grinding tools are mortar and pestle only. Smaller versions of the Excelsior and leaf shaped point continue. A small side notched point begins here; this may be simply a smaller version of earlier large side notched point but aside from the notch there is no great resemblance.

Late Houx Aspect. This runs from A.D. 1200 to historic times. Typological content of the early Houx Aspect continues but with the addition of Gunther barbed points. These were defined by Treganza (1958:13-16) and

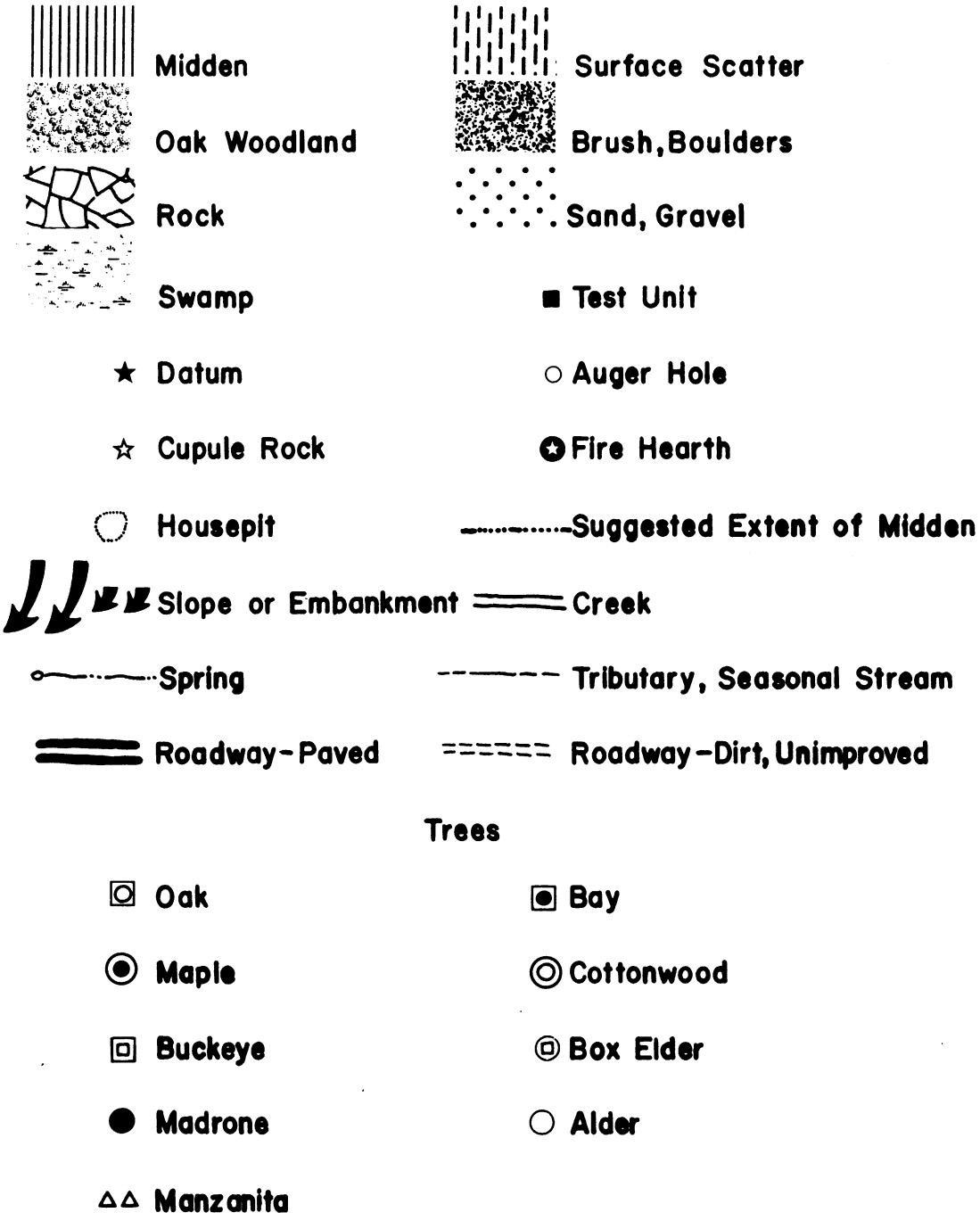


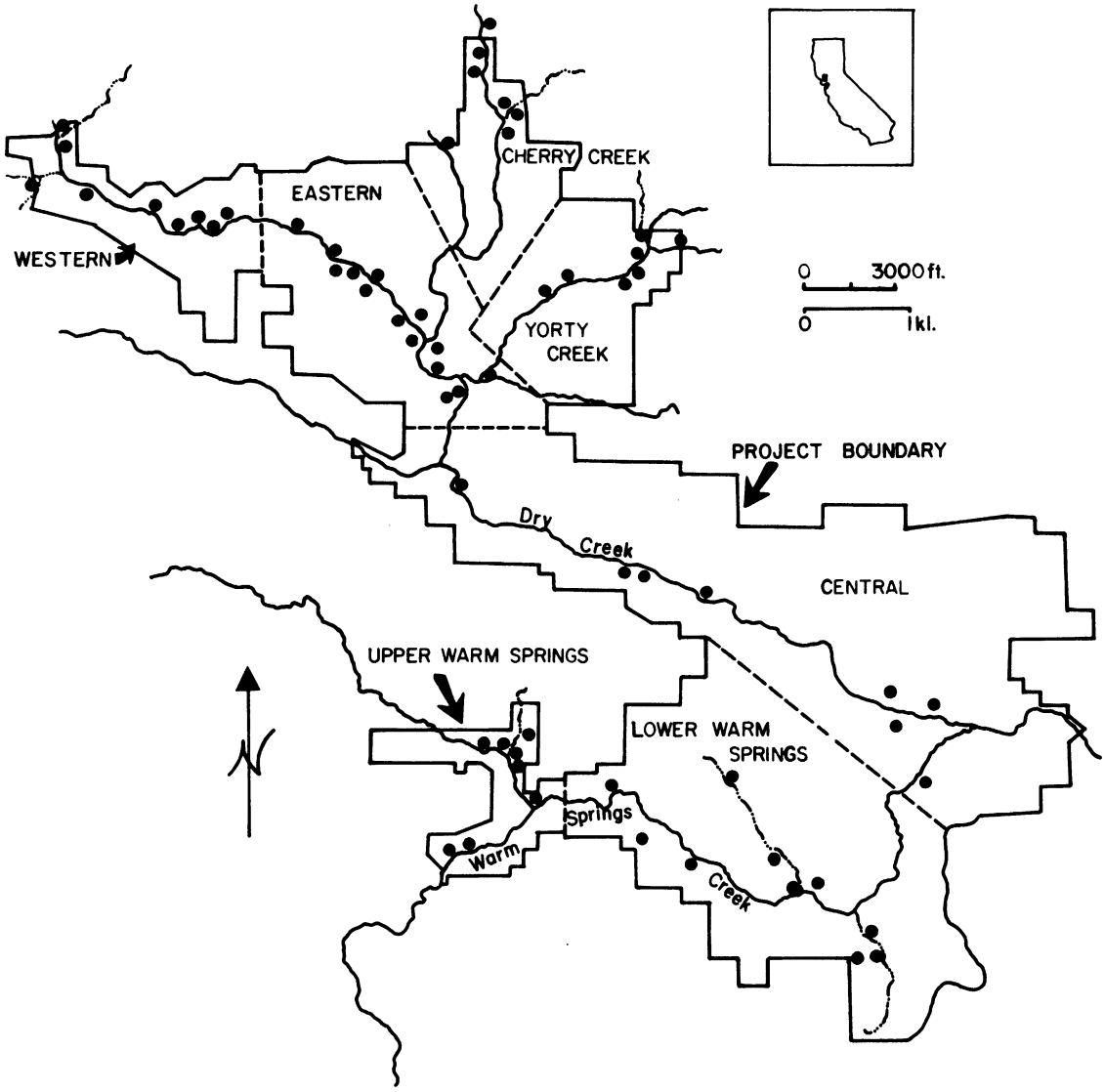
Figure 2. Legend for Site Maps.

seem always to be late in Northern California.

This outlines the basic sequence in the area and gives the primary types we will be using to determine the chronological placement components (Fig. 1). In determining what is or is not a component (a single phase within a site) we have had recourse to yet another device: the ratio of chert to obsidian chips within a 10 cm level of a one meter pit. Since the criterion is likely to be controversial we will attempt some justification here.

The testing of the sites in the Warm Springs project was done by digging one or, infrequently, two one meter pits (nine units were dug in Son-600 but that was a special case irrelevant to the present discussion). That meant that the time diagnostic artifacts occurred at the very low frequency for any one site - the greatest number of diagnostic projectile points is 6 from Son-547 and 2 or 3 is the usual number. If we had put, say, 10 units in each site we could make component divisions based upon diagnostic artifacts but this was impossible in the circumstances. Waste chips, however, come not singly but in 10's or 100's per level and we concluded that our best indicator of change was a change in the ratio of chert to obsidian chips - we discuss the inferences, other than that of change, that can be made from this in our concluding section. One of the dangers of using these ratios stems from the possibility of a single flint knapper working one or a few pieces of raw material in one place at one time thus greatly changing a culturally determined ratio locally. For that reason we accept as an indicator of cultural change a ratio which changes not just once but over several levels in the same direction.

We recognize that this method is imperfect but regard it as the best that can be done in the circumstances.



ARCHAEOLOGICAL SITE GROUPS
WARM SPRINGS DAM PROJECT

Map 1.

SITE DESCRIPTION

The foregoing geographic and archaeological information we will use in the following pages in the organization and analysis of archaeological data recovered in survey and testing in the Warm Springs Dam project area. For convenience of presentation the area is divided into 7 site groups for convenience of presentation (Map 1). In some ways the 4 northern groups stand as a unit as opposed to the two southern groups on Warm Springs Creek. From this point of view the Central Group is a no-mans-land -- almost no sites of significance occur in most of it while in the eastern part what were once probably important sites have been virtually destroyed by agriculture. Beginning with the Western Group we describe these in order down Dry Creek and up Warm Springs Creek. Twenty-one maps of individual sites are contained in the following descriptions. It is not possible to show many features on these maps other than symbolically. The symbols are explained in Figure 2.

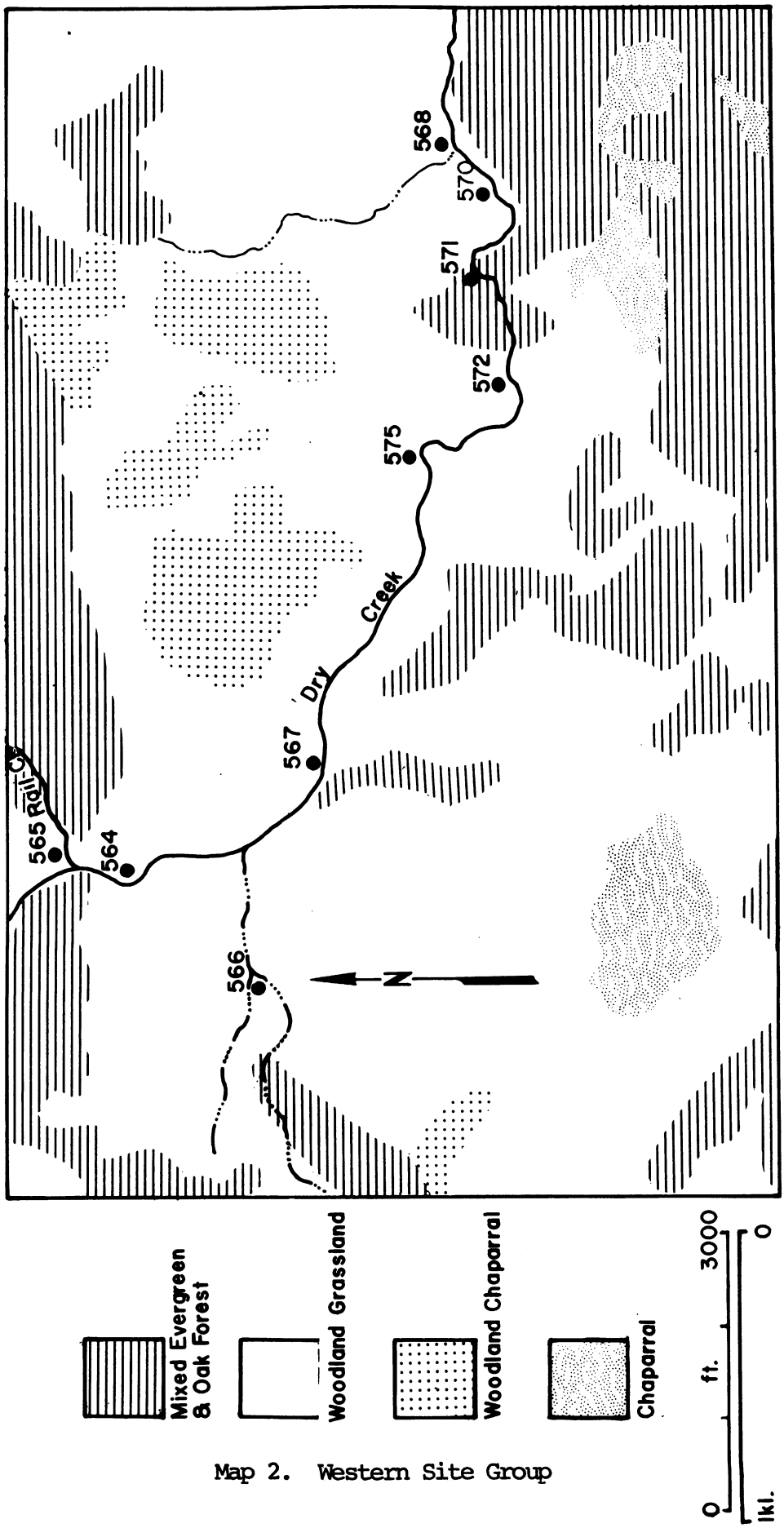
Western Site Group

Dry Creek northwest of the mouth of Warm Springs Creek flows through a broad flat valley nowadays well adapted to the cultivation of grapes. Above this the valley narrows progressively until in the Western Group the sides drop off on quite a steep slope with only a narrow terrace above flood level suitable for habitation. This means that there was very little land suitable for a large compact village - any large village would have to have been strung out along the terrace. It turns out that none of the sites has much area, all being small and evidently specialized. Thus we seem to have an area peripheral to the main activity centers but one which, as we shall see, was of considerable importance. All sites in this Group are on the north side of the creek (except Son-566 which is on a tributary). We see two possible reasons for this. One is the usual one that a north slope is warmer in the winter. The other relates to the phenomena of slumping or land slippage which is common along this section of the creek and occurs only on the south slope. The occupants of the valley may have avoided the south slope to prevent the slippage coming down on their villages or, alternatively, there may be villages now buried under the talus. It might be thought that the slippage is due to erosion produced subsequent to logging and in part this may be true but at least part of it is old (see discussion under site Son-593 in Eastern Group below). It would be desirable to auger the talus piles although it would be quite difficult and expensive.

The site descriptions of the Western Group begin with Son-265 on Rail Creek and proceed in order downstream.

Site Son-565 (Rail Creek)

This is a rather promising midden site and was recommended for excavation in the Phase I report. It turned out to be outside the project area, however, and was therefore not tested. It appears to have some importance as a large site rather far up in the drainage.



Map 2. Western Site Group

WESTERN GROUP ARCHAEOLOGICAL SITES AND VEGETATION TYPES

Site Son-564 (Slump)

Son-564 is located at the extreme western edge of both Dry Creek Canyon and the Project Area boundaries. It is adjacent to and just north of the bridge where Hot Springs Road crosses Dry Creek. The site is situated on the north bank of Dry Creek, on a second terrace, 10 m above the creek. Two other high terrace sites are located near Son-564, on the north bank of Dry Creek; Son-565 (midden) is 120 m north of this site, and Son-567 (midden) is 1 km south.

The site is in an open oak/woodland vegetation community on the edge of a promontory that has been intensively eroded by Dry Creek. Heavy slumping occurs on the bank of this promontory. The promontory faces east and is cut off from Hot Springs Road on the west by a modern wire fence.

During the survey phase this site was located and described as a midden site remnant. It was indicated at that time that most of the site had eroded by the destructive forces of Dry Creek. A test unit was placed in the center of the 20 m by 20 m midden area on the promontory. Only 20 cm were excavated in this unit. The excavations revealed that no midden now remains on this promontory.

Site Son-566 (Pock Rock)

Son-566 is one of four sites found in the extreme northwestern corner of the Project Area. Unlike the other three sites in this area, Son-566 is not situated directly on the banks of Dry Creek, but is located on an intermittent tributary of Dry Creek, about 350 m west of that creek.

The site is an open flat on the south bank of this intermittent stream, at the confluence of this stream and a second intermittent stream. The second stream forms the eastern boundary of Son-566, the primary intermittent stream the northern boundary, and the sloping hills form the southern and western limits of the site, completely enclosing the flat. This site measures 50 m by 60 m.

The flat has open grassland covered with bay/oak woodland vegetation on both sides of the intermittent streams. The streams themselves support common riparian plants, and are actively running nearly year-round. The soil of the site is black clayey silt with talus gravels and cobbles from the southern and western slopes surrounding the flat. The soil on the other banks of the intermittent streams are dark brown silty clay and contrast with the dark midden soil of the site. Very little historic or modern disturbance is evident on the terrace.

Son-566 is a midden site with an associated cupule rock. The cupule rock is located on the east central of the flat, near the second intermittent stream. It is a low, flat rock measuring 4.5 meters by 3 meters and bears scores of ground cupules. During surface reconnaisance in Phase I a concentration of chert and obsidian flakes, a grooved hammerstone, hopper mortar fragments, and fire-cracked rocks was found approximately 30 meters north and west of this cupule rock. These Unit I was placed one meter due east of datum in this concentration.

Unfortunately, excavation of this unit had just begun when it was found that this site is located just outside the Project Area boundaries on private property. Only three ten centimeter levels had been completed at that time and a fourth begun. Excavation immediately ceased and the fourth level was not finished.

From the three completed levels it was clear that a well-developed midden site existed at Son-566. Chert debitage dominates, with obsidian, animal bone and fire-cracked rock being present in moderate quantities. One chert projectile point pre-form was recovered from the midden component.

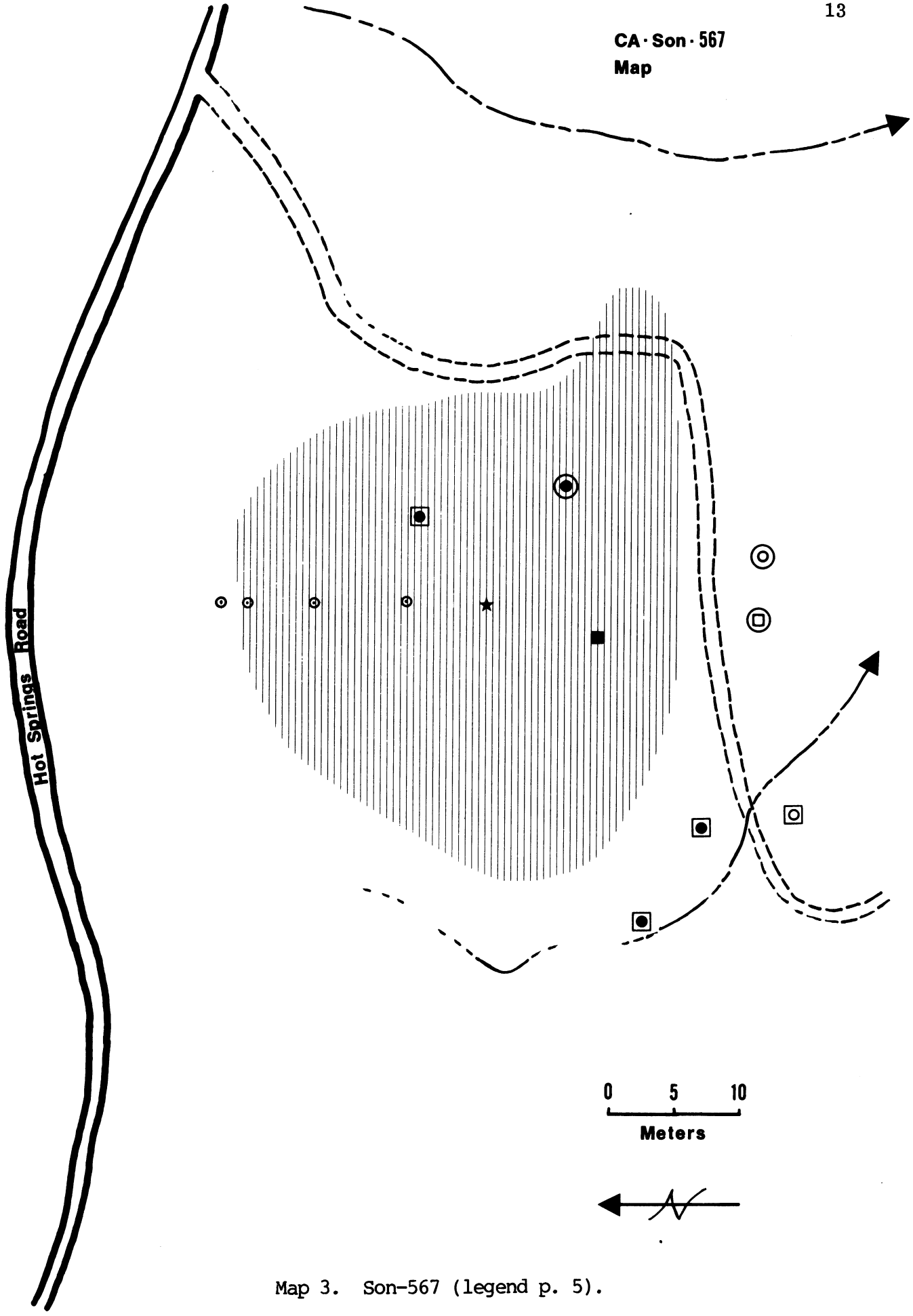
Site Son-566 (Pock Rock)

Level cm.	Proj. Pts.	Used Flakes	Cores	Debitage	Fired Rock	Animal Bone
0-10	1-c	4-c 1-o	1-c	83-c 44-o	8	2
10-20		2-c 3-o		28-c 18-o	23	1
20-30				50-c 18-o	35	1

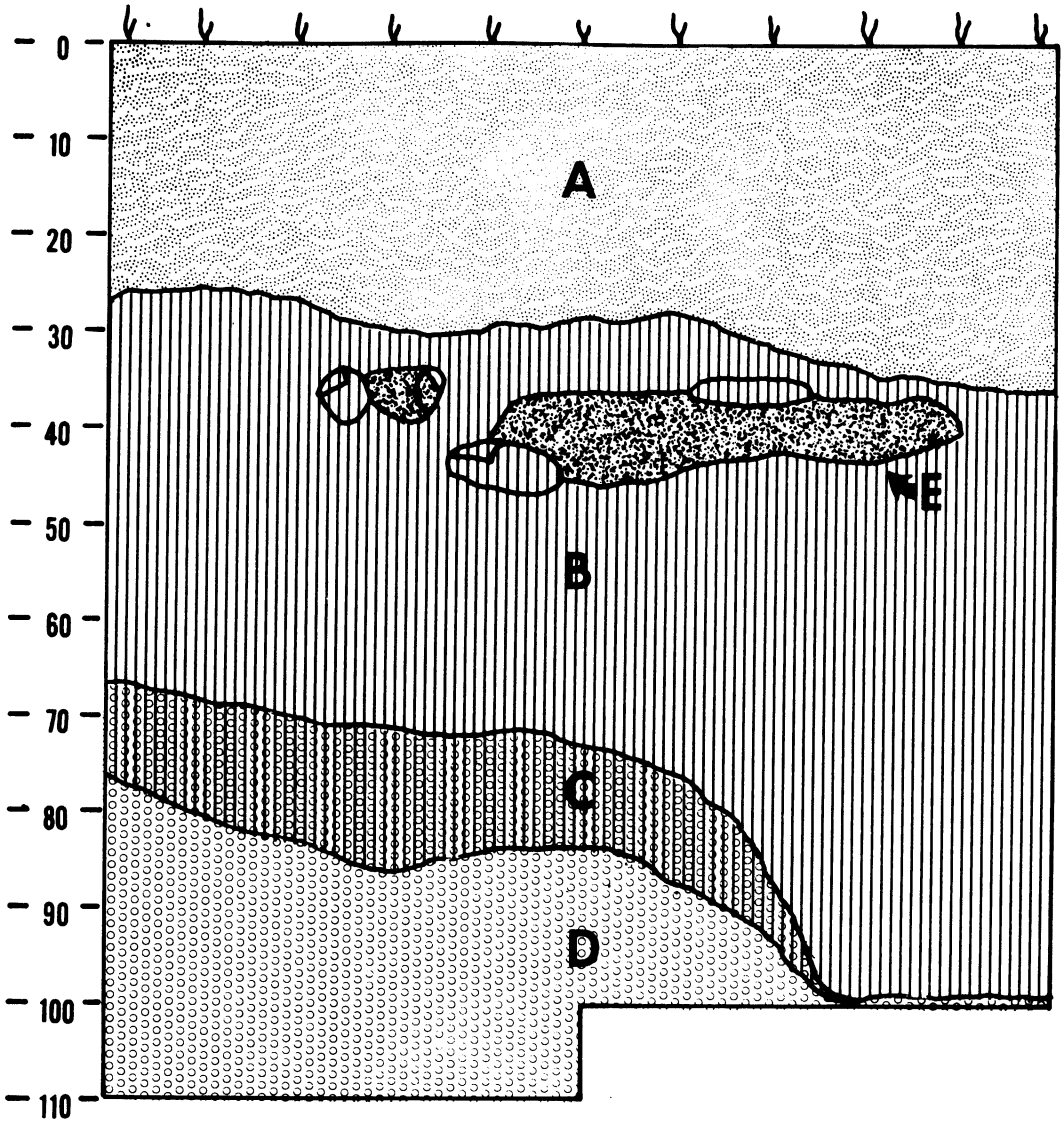
Site Son-567 (Homestead Pasture)

Son-567 is a midden site located on a second terrace on the north bank of Dry Creek, and 60 meters above the creek. It is approximately 30 meters south of Hot Springs Road between the road and Dry Creek. Its eastern and western boundaries are both formed by seasonal drainages which outline the circular flat 70 by 90 m. Two dirt roads extend south from Hot Springs road on either side of the eastern seasonal drainage. The western dirt road extends straight down towards the Dry Creek and ends at an old barn which is still standing. The road is parallel to a row of sheep stake fencing which turns east at the barn and surrounds a pasture. The second, eastern dirt road winds south from Hot Springs Road to Dry Creek and crosses the midden area of Son-567 at its southeastern corner. At this point a gate is located on the dirt road. The dirt drive then extends around the southern extent of the midden, crossing the road at its gate and continuing on to and through the western seasonal drainage.

The midden area has open grassland cover presently supporting volunteer hay and annual grasses of other types. The field encompassed by the site has had previous cultivation but seems to have lain fallow for a number of years. Evidence of burning to clear the meadow for cultivation can be found along the west side of the pasture where several stumps are located. A broadleaf maple and a bay tree are located directly on the site. Both intermittent streams support riparian vegetation including willows, cottonwoods, maples, grape, and a boxwood elder. Woodwardia and maiden-hair fern are thick in these drainages and soap root is in evidence in the immediate area.



Map 3. Son-567 (legend p. 5).



A. Midden; dry; very dark gray to black; silty loam with roots from annual grasses. Cultivation zone. Small gravels.

B. Midden; black; silty loam with small gravels. Friable. Fire-cracked rock.

C. Transitional zone. Dark grayish brown; sand with silt and gravels. Moderately compact.

D. Sub-midden; dark grayish brown to brown; sandy gravels; cobbles. Moderately compact.

E. Yellowish brown; ashy clay lens. Moderately compact.

Figure 3. Son-567 Profile.

Site Son-567 (Homestead Pasture)

Level cm.	Proj. Pts.	Bifaces	Reworked Biface	Scrapers	Retouch Flakes	Used Flakes	Cores	Debitage
0-10								19-c
				1-o				4-o
10-20	1-o					2-o		34-c
								8-o
20-30	2-c				1-c	3-c		54-c
						4-o		28-o
30-40						1-c		57-c
			1-o		1-o	2-o		26-o
40-50						3-c		41-c
	1-o				1-o	1-o		10-o
50-60						1-c	1-c	33-c
						1-o		8-o
60-70								17-c
	1-o					1-o		7-o
70-80								17-c
	1-o	1-o	1-o			3-o		8-o
80-90								7-c
					1-o			
90-100						1-c		2-c
Total	2-c				1-c	11-c	1-c	281-c
	4-o	1-o	2-o	1-o	5-o	12-o		99-o
Grand Total	6	1	2	1	4	23	1	380

Site Son-567 (Homestead Pasture)

Level cm.	Milling Stone	Bone Tool	Fired Rock	Animal Bone	Shell	Historic Objects (square nails)
0-10			1	4		3
10-20			86	15		3
20-30			80	41		5
30-40	1		110	87	x	1
40-50			56	75		
50-60			71	46	x	
60-70		1	40	32		
70-80			26	22		
80-90				8		
90-100				2		
Total	1	1	444	332		

The soil of the midden is dark grey brown to black sandy silt, and can easily be distinguished from the surrounding light brown silts. Augering of the pasture revealed that the midden covers most of the meadow area and extends under the dirt road and to the east of it. Test Unit 1 was placed in the darkest part of the midden, 11 meters south and 15° west of site datum, and 15 meters due west of the broadleaf maple tree on the site.

Excavation of this midden component showed a well-developed midden zone continuing to 80 cm. It consisted of black silty loam for the first 40 cm, at which point a shallow (5 cm) ashy, clay lens intruded into the midden (Feature 1). Below this level, the soil became more clayey but was still midden-like in quality and texture. A shallow sub-midden component follows for twenty centimeters and over-lies sterile soil. The last excavated level (100-110 cm) involved only the western half of the unit since it was dug into sterile soil.

Artifacts were spread evenly throughout the midden component. Three diagnostic projectile points were found, two at 20-30 cm, and one at the 70-80 cm level, (chert and obsidian), all representing a late time period. A fragmentary point at 60-70 cm may represent an earlier period. Four burins, a biface, a scraper, four retouched flakes and a core were also recovered. One sandstone millingstone was also recovered in the 30-40 cm level. One piece of incised bone was recovered. Chert debitage was continually found in greater quantities than obsidian and both were recovered in moderate amounts. A very large amount of fire-cracked rock and animal bone also came from this unit.

It is of interest that evidence of historic contact (square nails and a ceramic sherd) continued to the 40 cm level. Since the upper midden represents a very late component, this site is very important in terms of understanding late prehistoric-early historic contacts.

Site Son-575 (Loop)

Son-575 is located on the northwest bank of Dry Creek, on a loop of the creek, about 250 meters southwest of the west entrance to Hot Springs Ranch. Dry Creek Canyon here has very steep and precipitous slopes with this midden site situated on a primary terrace about 6.1 meters above Dry Creek.

Son-575 is near a deep pool in Dry Creek at the confluence of Dry Creek and an unnamed intermittent tributary. Originally the site was thought to be bisected by this tributary. However, augering indicated that the midden is limited to the downstream side (with respect to Dry Creek) and does not extend onto the other side of the intermittent stream. Erosion at the mouth of the intermittent stream is quite heavy forming very steep embankments with large boulders on their erosional banks.

The main promontory (west of the tributary) has sheep stake fencing along its northern border, and has a wire fence along the west which encloses the midden. The total extent of the midden encompasses as area measuring 6 by 10 m. The small promontory (east of the drainage) has sheep stake fencing along its southern edge.

Son-575 has open grassland cover dominated by oak/woodland vegetation. Oaks, bays, buckeyes and manzanitas border both the intermittent stream and a

Site Son-575 (Loop)

Level cm.	Proj. Pts.	Biface	Reworked Biface	Scraper	Retouch Flakes	Used Flakes	Debitage	Fired Rock	Animal Bone
0-10	2-o		1-c			6-c	32-c 15-o	3	
10-20		1-c	1-c	1-c	1-c	2-c	33-c 5-o	20	2
20-30			1-c		1-c		26-c 5-o	30	
30-40	1-c				2-c		8-c 6-o	20	
40-50							3-c		2
Total	1-c 2-o	1-c	3-c	1-c	5-c	8-c	102-c 31-o	73	4
Grand Total	3	1	3	1	5	8	133	73	4

steep sided ephemeral stream on the western boundary of the main terrace. The promontory also has oaks and buckeyes on the primary terrace. The large oak located on the easternmost edge of the promontory is presently covered by wild grape. Heavy slumping occurs along the steep cuts, especially on the banks of the site, the outside curve of this 'loop' in the creek. There is a large amount of sub-angular serpentine rocks naturally occuring in the area and Son-575 is covered with these rocks. Most of this site has been lost to stream erosion and at present only an edge of the original area of habitation remains.

Test Unit 1 was placed three meters south of the datum stake, on the darkest area of the midden and in the area of least rock coverage. Excavation of this unit revealed a shallow but well-developed midden, followed by a transitional zone and very shallow sub-midden component.

The midden (0-30 cm) contained two obsidian projectile points, one a side-notched point of the latest phase (Fig. 23a). Besides these tools, a knife, three reworked bifaces, a scraper and two retouched flakes, all of chert, were found. Fire-cracked rock was found in moderate quantities, reaching an apex in the 30 cm level. Very few pieces of burnt animal bone were recovered.

The next ten centimeters represent a transitional zone between the midden and sub-midden components. Mottling by clay patches riddled the dark brown, sandy, silty, midden soil, and at 40 cm the bottom of the unit was covered by an extensive root system. What is probably a late chert, straight based projectile point was found in this zone (Fig. 23b), as well as two retouched chert flakes. The amount of debitage, in general, greatly declined from the midden component.

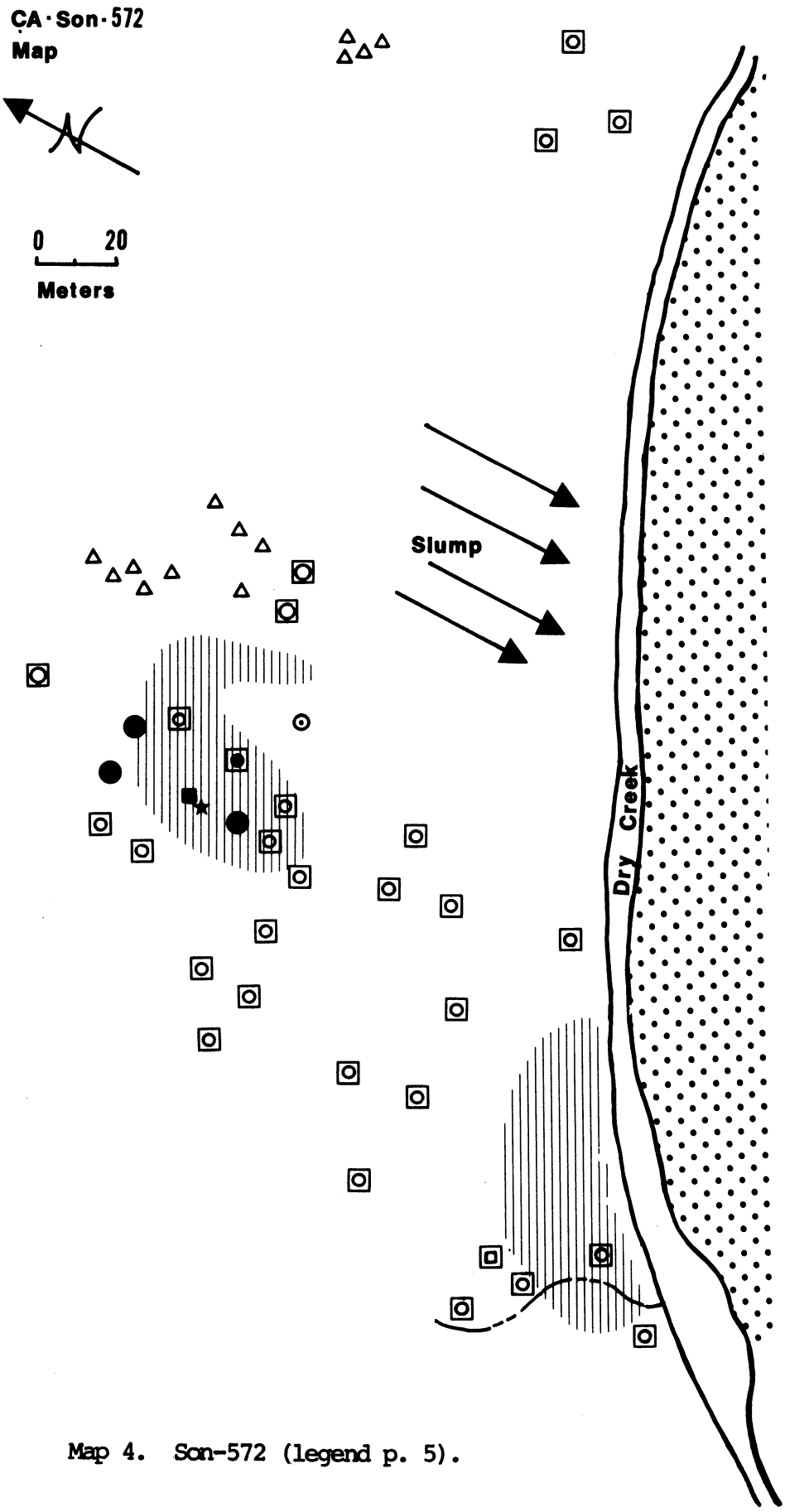
The mottling continues in the sub-midden component (40-50 cm), and seems to suggest some type of old disturbance. The major root system found in the transitional zone continues to expand with depth. At this point the soil has become mostly brown silty clay. Only three pieces of unutilized chert were found in this last excavated level.

The unit was augered in the center from the 50 cm to 140 cm level, and continued until auger refusal by roots at 140 cm. These 90 cm contained brown, sandy silt with charcoal flecks throughout. The last ten centimeters of augering contained charcoal lumps and small water-worn stream gravels in abundance.

Site Son-572 (Banded Rock Pool)

Son-572 is located about a mile and a half west of the east entrance to Hot Springs Road and 600 meters south of the west entrance to Hot Springs Ranch off Hot Springs Road. It is a second terrace site in a sloping area on the north bank of Dry Creek.

The site is 400 meters upstream from Son-571 and is geographically similar to that site. Both sites are located on second terraces on the north stream bank near a deep pool in Dry Creek. Both have first terrace extensions which seem to have been utilized as a grinding areas. The extension at Son-



Map 4. Son-572 (legend p. 5).

572 is located 80 meters upstream from the second terrace midden in an area of open grassland subject to heavy slumping, directly on the bank of Dry Creek and across from a deep pool in the creek. Surface finds from this lower area consisted of chert and obsidian flakes (75% chert; 25% obsidian), many fire-cracked rocks and a large (30 by 15 cm) hopper mortar fragment shaped with pecked cupules on the bottom surface. This surface scatter covers a 60 meter by 20 meter area, surrounded by sheep stake fencing.

The midden at Son-572, on the second terrace, is cut off from the slope to the creek by a modern wire fence which forms the southern boundary of this site. It is located in a deep basin and has sloping hills forming the northern, eastern and western boundaries of the midden area. This basin encompasses approximately 25 meters by 12 meters in areal extent.

Son-572 has open grassland cover (unlike the sheltered terrace at Son-571) with a few isolated oaks, bays and manzanitas in the basin. Scattered oak stands are found on the surrounding slopes. Tree cutting activities have slightly disturbed the surface of this site.

The basin is horse-shoe shaped and the midden seems to follow the contour of this area. The midden is very dark brown gravelly sand and can be visually distinguished from the surrounding alluvial sands. One auger hole was placed in the lighter sands in the center of this horse-shoe shaped midden area to see if buried midden could be distinguished. It was found that no midden occurred here and that the midden does accurately follow the countour of this basin.

Test Unit 1 was placed in the definite midden area 1 meter north and 1 meter east of the site datum stake. Excavation of this unit revealed a well-developed midden component extending to 130 cm. This component is followed by a shallow sub-midden zone which overlies sterile alluvium.

Stratigraphically, the midden appears to be one continuous deposit of cultural material. It consists of dark brown silt with small angular gravels, hundreds of madrone and oak tree roots, and larvae extending to 100 cm. At 60-70 cm there is an increase in the sand content of the soil an consequently a lightening of soil color. Gravels begin to decrease in quantity at this same level. No soil profile is given for this site since there is no sharp demarcation showing this change. The lithic debitage also shows a change in the midden component at about this level. The upper levels of the midden were dominated by obsidian debitage with moderate quantities of chert debitage and animal bone appearing. Large amounts of fire-cracked rock were also present indicating a well-formed midden deposit. However, chert completely dominates the debitage remains of the lower levels. Obsidian counts begin to decrease abruptly after their peak in the 50-60 cm. level. Correspondingly, chert flakes increase in quantity in the same point, reach their peak at 90-100 cm, and retain very high counts until the end of the midden component at 135 cm. Fire-cracked rock continues at high quantities until the end of the midden. Obsidian flakes and animal bone remains, on the other hand, were recovered in very small amounts from these lower levels.

The midden at Son-572 has two separate tool concentration corresponding

Site Son-572 (Banded Rock Pool)

Level cm.	Proj. Pts.	Bifaces	Reworked Biface	Scrapers	Retouch Flakes	Used Flakes	Cores	Debitage
0-10	1-c			1-c	2-c	5-c	1-c	16-c
	1-o	1-o	2-o	1-o	1-o	9-o		50-o
10-20		1-c		1-c	1-c	1-c		30-c
	2-o		1-o			2-o		45-o
20-30		1-c			1-c	2-c		23-c
			1-o			3-o		54-o
30-40		1-c			1-c	6-c		(56-c)*
			1-o		1-o	2-o		59-o
40-50						1-c		(1-c)*
						6-o		80-o
50-60						2-c	1-c	24-c
						2-o		85-o
60-70		1-c		1-c				35-c
						2-o		68-o
70-80	1-c	1-c				1-c	1-c	65-c
						2-o		58-o
80-90	1-c					3-c		82-c
		1-o						28-o
90-100		1-c		3-c		5-c		168-c
						1-c		17-o
100-110						3-c	1-c	120-c
								4-o
110-120		1-c		1-c		8-c	2-c	113-c
	1-o							
120-130	1-c	1-c				3-c		123-c
								3-o
130-140				1-c		1-c	1-c	76-c
Total	4-c	8-c		9-c	5-c	42-c	7-c	932-c
	3-o	2-o	5-o	1-o	2-o	29-o		551-o
Grand Total	7	10	5	10	7	71	7	1483

*Chert from 30-40 and 40-50 inadvertantly combined

Site Son-572 (Banded Rock Pool)

Level cm.	Milling Stone	Hammer Stone	Net Weight	Fired Rock	Animal Bone
0-10				7	1
10-20				134	9
20-30				100	9
30-40				98	7
40-50	1			65	9
50-60				70	4
60-70				100	5
70-80	1			97	7
80-90				76	9
90-100				77	2
100-110				57	1
110-120		1	1	58	-
120-130				92	1
130-140				24	2
Total	2	1	1	1075	66

to the two midden levels. Within the upper levels, two small, side-notched projectile points were found (obsidian and chert) which are diagnostic of the latest phase. Eleven reworked bifaces (7 obsidian), four bifaces, three scrapers, and one chert core were found with these and two other projectile point fragments within the first half meter of excavations. One millingstone fragment was also recovered in this concentration. The second tool concentration extends from 70 cm to the end of the midden component and also contained two diagnostic projectile points. Both points are large chert side notched points and correspond to Meighan's Mendocino Complex, Type 11, (Meighan, 1955), and thus to the Borax Lake aspect. These points are associated with six biface (five chert), two burins, five scrapers, and four cores, all of chert. Also, a millingstone, a basalt hammerstone, and a possible net weight came from the lower levels. these tool concentrations correlate nicely with the debitage change noted above, and suggest that at least two separate cultural components existed within the midden zone. We discuss the chronological implications in more detail in the group summary.

The shallow sub-midden zone at Son-572 is characterized by a great decrease in cultural material of all types. Both animal bone and fire-cracked rock disappeared in the lower levels of the midden and do not re-appear in this lower zone. Very few pieces of chert or obsidian debitage were recovered. This component overlies sterile soil.

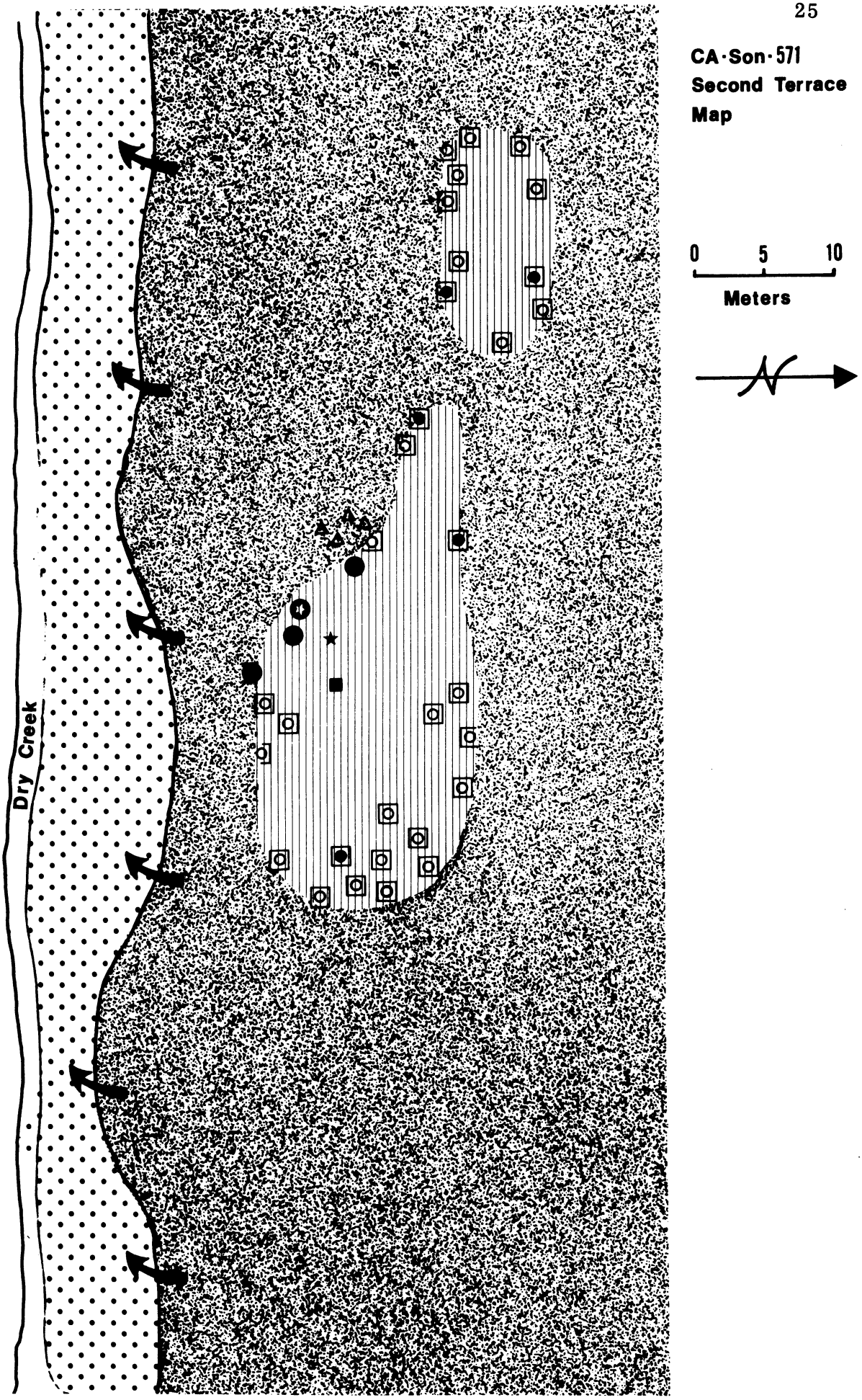
Site Son-571 (Poolside)

Son-571 is located approximately 1 mile west of the east entrance to Hot Springs Ranch off Hot Springs Road and approximately 250 meters south of that road. It is on a small secondary terrace on the north bank of Dry Creek in a deep canyon.

This terrace is approximately 12 meters above Dry Creek in a small flat clearing in an otherwise boulder-strewn wooded slope. The site is tightly delineated on the north, east and west by talus slope covered with large boulders. The southern boundary of this site is the steep cut bank above Dry Creek. Burnt logs are found on the site and many madrone, bay and oak trees completely shelter this small terrace. The entire terrace is covered with black midden and measures 35 m by 15 meters in its widest parts. Historic activity on this terrace is indicated by a possible firepit (ca. 5 m south and 1/2 m west of datum) and by sheep stake fencing which runs parallel to the creek, ca. 6 meters north of datum, bisecting the terrace. Surface finds on this terrace include an obsidian mid-section of a projectile point and an obsidian leaf-shaped point base fragment.

About a meter northwest of this second terrace is a very small clearing among the large boulders that fringe Son-571. This clearing has yellow-brown silty talus soil but contains a surface scatter of chert and obsidian debitage. Soap root, wild white and purple irises, and bunch grass cover this area. Mariposa lilies are also present in this small northern area and on the northern edge of the midden covered terrace. Poison oak is abundant among the boulders between these two open sections.

Approximately 20 meters east of and below this second terrace are the remnants of a first terrace. This lower area has two sections, a grassy slope and a clay/cobble area next to the gravel of Dry Creek. The



Map 5. Son-571, Second Terrace (legend p. 5).

Map 6. Son-571, First Terrace (legend p. 5).

clay/cobble zone has numerous ground stone tools still lying on the surface including milling stones and a maul. The northernmost section of this zone has the heaviest concentration of artifacts. These artifacts may have eroded out of the grassy slope or may have been lowered as soil from the area was washed away by Dry Creek. On the first terrace are madrones, oaks, bays, and two alders. The clay/cobble zone is located approximately 1 1/2 meters above Dry Creek. 20 meters south and 20 meters west of this zone, Dry Creek backs up against a rock spur on the opposing bank and forms a deep pool of water, after which this site was named.

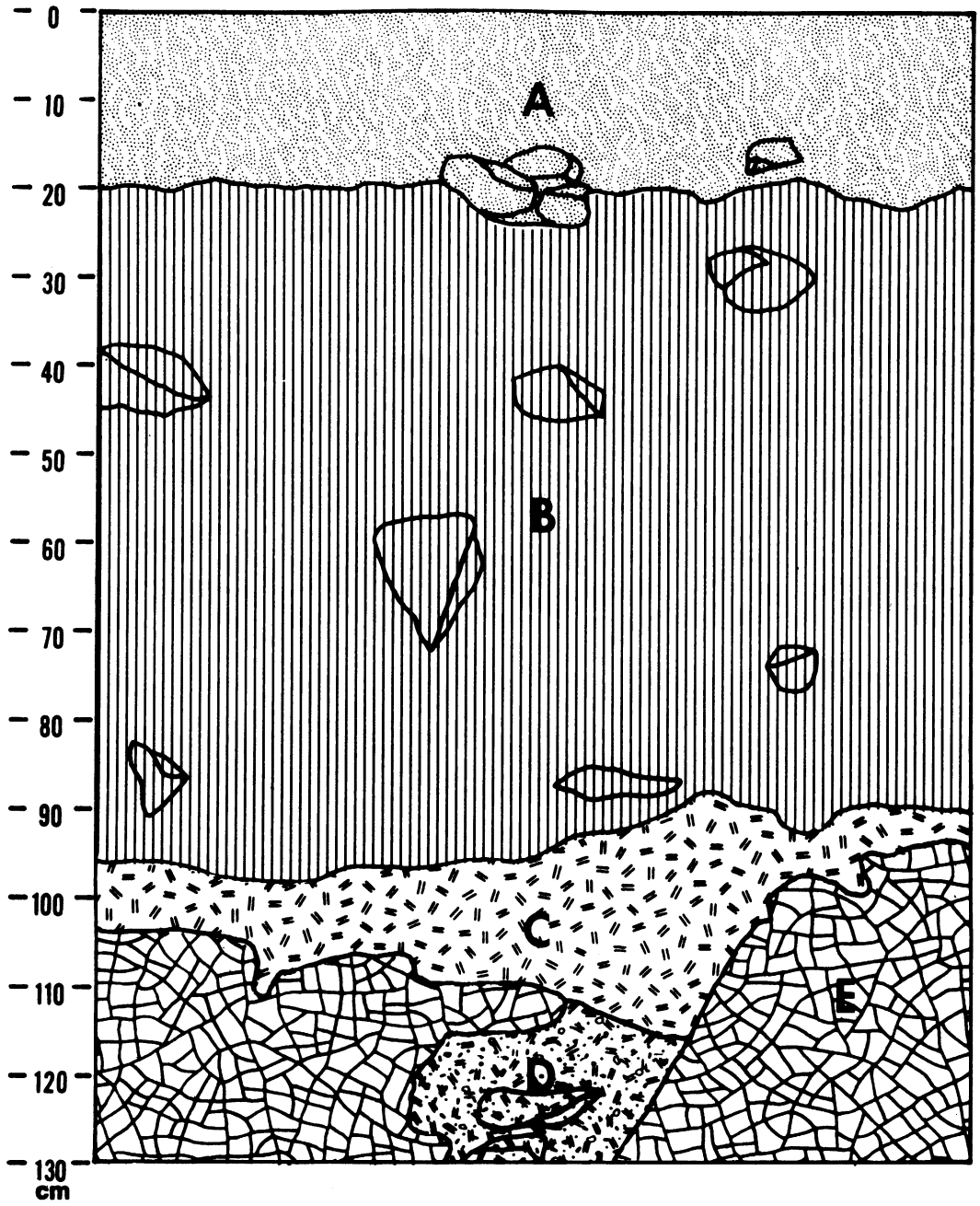
Test Unit 1 was placed 2.5 meters due east of the site datum in the center of the black midden on the second terrace. Excavation of this unit revealed a well-developed midden extending to approximately 85 cm. A transitional zone (85-110 cm) followed the midden component and was characterized by mottling due to increased clay content of the soil. Finally, a shallow sub-midden component extended to 130 cm.

The midden component was characterized by very black, greasy, slightly sandy, silty, loam. This component contained huge quantities of obsidian, unparalleled by any other site investigated. The lowest count of obsidian debitage in the entire 85 cm of midden was 364 pieces, and the peak was reached in 50-60 cm at 713 pieces. Chert debitage consistently remained under 40 pieces per level until obsidian began to decline (70-80 cm), at which point the chert count jumped to 64 pieces. Larger quantities of animal bone than recovered from the usual site were found at Son-571 (up to 71 burnt pieces per level), and animal bone count seem to rise and fall with obsidian. Unfortunately, the area of this site is so littered with angular rocks that difficulties were encountered in trying to separate out fire-cracked rock. Only unquestionable pieces were recorded in the level records. Thus, the quantities of fire-cracked rock recorded (unusually small for a midden site) may be misleading.

Twenty-one projectile point fragments were recovered from the midden component, three of which are complete. Two small, possibly late specimens were found in the 0-10 and 10-20 cm levels of the midden zone. The third complete point is a side notched chert projectile point we date in the Borax Lake aspect. This point was recovered from the 60-70 cm level, just at the point when the high obsidian counts are declining and chert debitage is increasing. A bowl mortar rim fragment was found with the late points; a possible handstone below the late points; and a definite handstone one level below the side notched projectile point.

It is important to note that preference for certain types of lithic material can be seen at Son-571. This site has a unusually high quantity of retouched flakes, (26 were recovered from the midden component), only four of which were chert. 20 reworked bifaces came from the midden zone and <u>all</u> of these were manufactured from obsidian and eleven bifaces (ten obsidian) were recovered. However, despite all of the obsidian debitage, retouched flakes, and tools, no obsidian cores were found. Four chert cores and two chert scrapers were recovered implying that chert was still preferred for the heavy-duty tools.

The transitional zone from Unit 1 was characterized by an increase in the clay content of the soil producing subtle mottling and lighter soil



A. Midden; dark brown to black; silty loam with sand. Root zone. Friable. Rock intrusion: mainly angular.

B. Greasy midden; black to very black; silty loam with sand. Very friable. Rock as in "A".

C. Transitional zone. Very dark grayish brown to dark brown; silt with sand and clay. Moderately friable. Rock as above.

D. Sub-midden; brown to dark yellowish brown; gravels with sand and clay mix. Compact. Rock as above.

E. Rock.

Figure 4. Son-571 Profile.

Site Son-571 (Poolside)

Level cms.	Proj. Pts.	Bifaces	Reworked Biface	Scrapers	Retouch Flakes	Used Flakes	Cores	Debitage
0-10	2-o	1-o	2-o			14-o 4-c		785-o 39-c
10-20	1-o	1-o	1-o	1-c		1-o	1-c	506-o 14-c
20-30	4-o				1-o	4-o		366-o 26-c
30-40	1-o 1-c	2-o	4-o		5-o 2-c	11-o		544-o 20-c
40-50		2-o	4-o		1-o	7-o 2-c	1-c	364-o 32-c
50-60	2-o		3-o	2-o	9-o	7-o	2-c	713-o 13-c
60-70	3-o 1-c	1-o	4-o	1-o	3-o	7-o 2-c		516-o 69-c
70-80	4-o	1-c	3-o	1-c	1-o	19-o 3-c		416-o 31-c
80-90		1-o	1-o		2-o	5-o		251-o 64-c
90-100	1-c		1-o		2-c	5-o		265-o 36-c
100-110	1-o		1-o			3-o 2-c		95-o 23-c
110-120						1-o		42-o 10-c
120-130								2-o 3-c
Totals	18-o 3-c	10-o 1-c	23-o	3-o 2-c	22-o 4-c	84-o 13-c	4-c	4865-o 380-c
Grand Total	22	11	23	5	26	97	4	5245

Site Son-571 (Poolside)

Level cm.	Hand Stones	Mortar	Fired Rock	Animal Bone
0-10			4	44
10-20		1	17	14
20-30			14	43
30-40	1		11	47
40-50			11	71
50-60			14	66
60-70			6	57
70-80	1		7	34
80-90			4	30
90-100			3	20
100-110			2	5
110-120			1	2
120-130			1	
Total	2	1	95	433

colors. With this clay increase large rock concentrations of cobbles and boulders began to fill the unit. The transitional component continued until approximately 110 cm when a definite stratigraphic change to a lighter soil color became apparent. Lithic material from this component included 2 undiagnostic obsidian projectile point fragments, 1 obsidian burin on a snapped biface, and two retouched pieces of chert. Animal bone, fire-cracked rock, and both obsidian and chert debitage counts declined.

The shallow sub-midden component at Son-571 consists of flakes only; no tools being apparent. Further, only two fire-cracked rocks and two pieces of burnt animal bone were recovered. It is highly probable that these pieces are only partially representative of the material from this component, since heavy rock concentrations prohibited excavations. Both the transitional and sub-midden zones were deposited on talus slope soil with boulders from a rock slide that may have been contemporaneous with the large boulder concentrations that now surround Son-571 on three sides.

It should be noted that a large quantity of obsidian fell through the 1/4" screen used to dry screen the site. Only small bits of charcoal were found in while excavating. This latter may correlate with the small number of fire-cracked rocks found in the midden or may be influenced by the fact that roots and rootlets continued to the 130 cm level.

Site Son-570 (Flat Iron)

Son-570 is a petroglyph site located 280 meters upstream from site Son-568. It consists of two large boulders 30 meters apart with hundreds of cupules in them. Detailed descriptions of these petroglyphs, as with most others in the project have not yet been made.

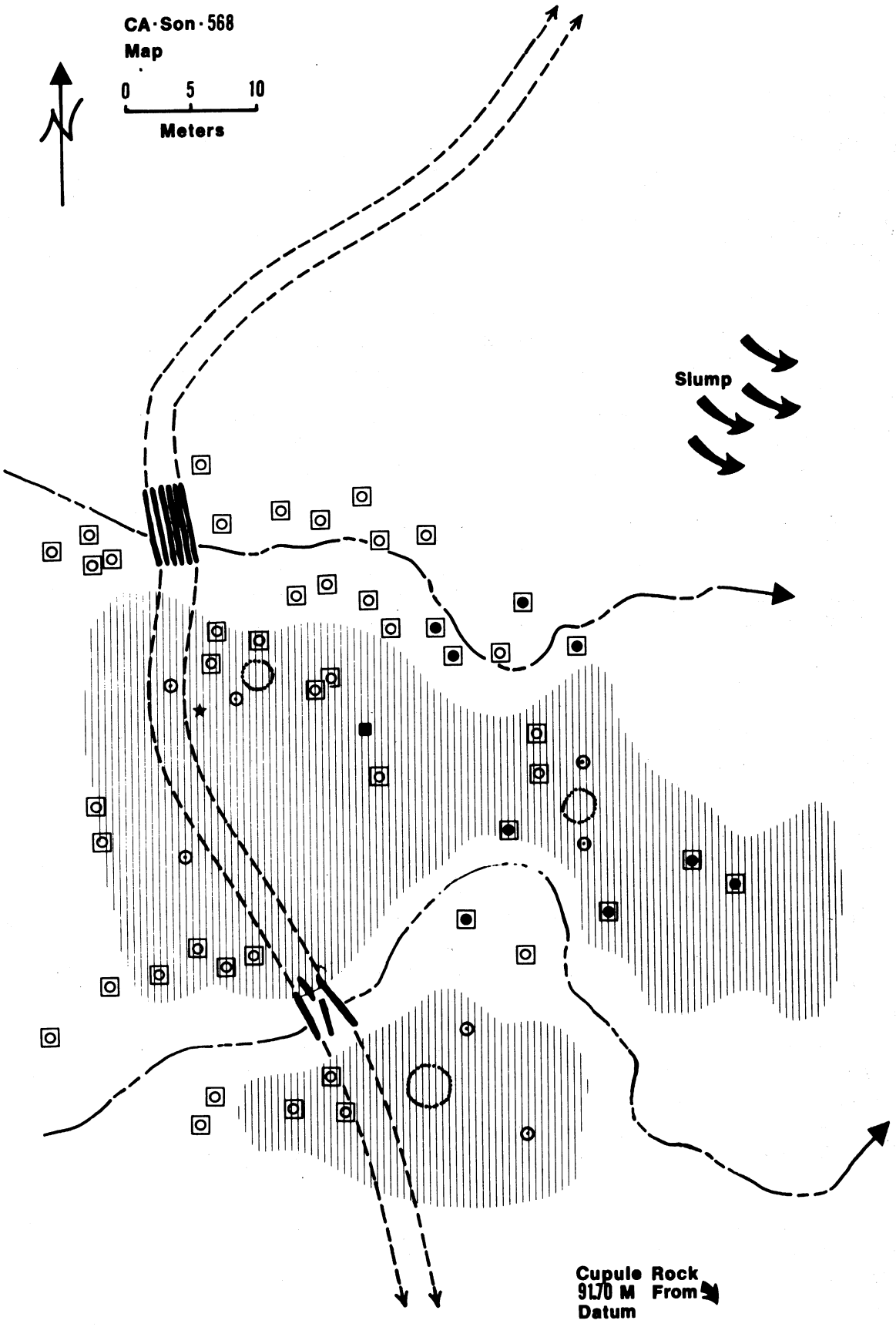
Site Son-568 (Smiley)

Son-568 is located on a first terrace on the north bank of Dry Creek, approximately 200 m south of the Hot Springs Road. It is 3/4 of a mile west of the east entrance to Hot Springs Ranch and approximately 200 m west of where Hot Springs Road climbs away from Dry Creek. Son-568 has three serpentine rocks with cupules apparently associated with the midden. They are located 91.70 m southeast from the Son-568 site datum.

Son-568 is a well-developed midden site bordered on the north by a seasonally intermittent stream. A second intermittent stream, 15-30 m south of the first, bisects the midden area of Son-568. The area of this site continues approximately 15 m south of the second intermittent stream on its first terrace. Both of these seasonal streams empty into Dry Creek, which is located 10 m to the west of the midden, down an abrupt cut bank.

This abrupt cut bank forms the eastern boundary of Son-568. The western section of the midden has been disturbed by an historical roadbed which runs the full extent of both first terraces and crossed the two intermittent streams by two wooden bridges. The north bridge that crosses the first intermittent stream is more or less intact. The south bridge across the southern, second intermittent stream has collapsed sections. The area of Son-568 passes under this old roadbed and at least 5 m west of it.

Son-568 has open grassland vegetation with oak/woodland cover. The site



Map 7. Son-568 (legend p. 5).

is heavily populated wih oaks and bay laurels, vegetation especially interesting because the species of oak present is black oak, which has not been noticed on other sites in the Project area. The small terrace between the two intermittent streams is completely enclosed by these oaks, screening it from the surrounding slopes and terraces. A large fallen oak lies across the western edge of this terrace and extends onto the historic roadbed. The midden is composed of black, silty, gravelly, alluvial sand. A series of seven auger holes was dug into the site. These test holes revealed that the darkest part of the midden is located within the highest contour, between the two intermittent streams, and between the steep cut bank and the old historic roadbed. The midden continues west of the roadbed, east beyond the 400' contour, and south of the second stream, but is slightly lighter in color and seems to be fanning out from the central area. Lithic material was recovered from the two auger holes near the site datum, just east and just west of the roadbed. Test Unit 1 was placed on the darkest part of the midden area, 13 meters east of the site datum stake.

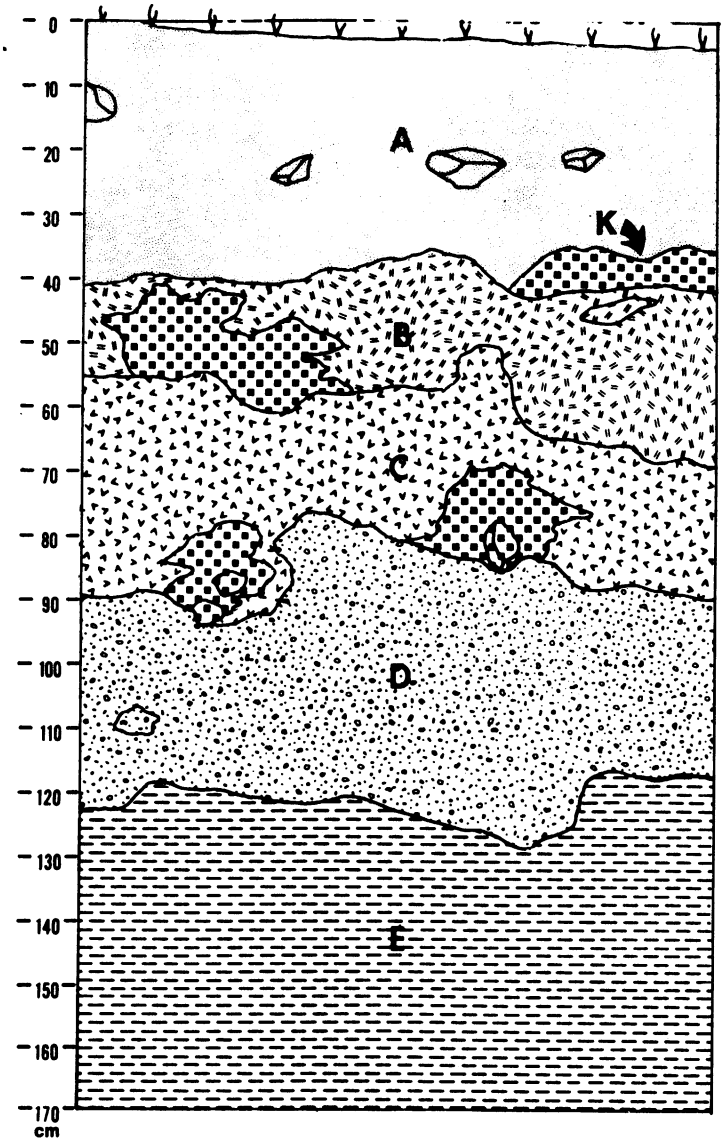
Excavation of Text Unit 1 revealed a well-developed midden, followed by four more components consisting of transitional, sub-midden, gravels and clay. The unit was excavated to 170 cm where the few flakes recovered were from a disturbed area.

These components should be described as stratigraphic changes and not cultural components. The 0-90 cm level is broken into three zones on the basis of rodent disturbance which produced increasing mottling and increased clay content in successively lower levels. The soil appears to get one chroma lighter approximately every 30 cm. However, the cultural layer continues to approximately 90-100 cm where it gives way to relatively sterile clay gravels.

The midden zone is characterized by a high artifactual content which remains without marked deviation in quantity, at least down to 110 or 120 cm Fire-cracked rock alone rapidly decreases from the top of the midden to its lowest points. Chert is by far the most common material found in the debitage, although numerous artifacts were made from obsidian as well. Of the ten projectile points recovered in the midden, two are diagnostic: a small obsidian Excelsior point (40-50 cm) and a red chert Gunther barbed projectile point (60-70 cm). Animal bone fragments consistently stayed below 20 pieces recovered per level. Two pestle fragments were found.

At a meter depth, animal bone remains and fire-cracked rock cease; utilized pieces of either chert or obsidian are rare, and only one actual tool were recovered in the full 70 cm excavated in the gravel zone. Debitage counts remain at less than 10 pieces per level. Stratigraphically, this zone is divided into two components. The first consists of clay with a high gravel content (perhaps suggesting stream flooding), and the lower component is relatively gravel-free. No diagnostic chipped or ground stone tools are found below 1 meter.

Test Unit 1 was dry screened until 30 cm when both dry and wet screening were introduced to facilitate sorting. At 90 cm the clay content of the soil began to increase rapidly and wet screening was solely employed.



A. Midden; very dark gray to black; silty loam with sand. Root zone. Friable to very friable. Fire cracked rock.

B. Transitional zone. Very dark gray; silt with sand and clay. Moderately compact.

C. Sub-Midden; very dark grayish brown to grayish brown; silty clay with sand. Decrease in amount of fire-cracked rock.

D. Dark brown clay with sand and gravels. No fire-cracked rock. Compact.

E. Brown to dark yellowish brown clay; sticky. Compact to very compact.

K. Krotovina and/or heavy disturbance.

Figure 5. Son-568 Profile.

Site Son-568 (Smiley)

Level cm.	Proj. Pts.	Bifaces	Reworked Bifaces	Retouch Flakes	Used Flakes	Cores	Debitage
0-10	1-c	1-c		1-c	3-c	1-c	60-c
	2-o						15-o
10-20				1-o	1-c		50-c
					1-o		16-o
20-30					2-c		41-c
	2-o		1-o		1-o		13-o
30-40	1-c				3-c	1-c	54-c
			1-o		1-o		17-o
40-50	1-c						63-c
	1-o				2-o		11-o
50-60					4-c		82-c
							16-o
60-70	1-c				2-c		50-c
				1-o			12-o
70-80		1-c		1-c	1-c		75-c
					1-o		11-o
80-90					2-o		47-c
							5-o
90-100					2-c		42-c
	1-o						4-o

Site Son-568 (Smiley)

Level cm.	Proj. Pts.	Bifaces	Reworked Biface	Retouch Flakes	Used Flakes	Cores	Debitage
100-110					2-c		16-c
110-120						9-c 1-o	
120-130						6-c	
130-140						3-c 1-o	
140-150						7-c	
150-160					1-c		2-c
160-170					1-c		3-c

Level cm.	Pestle	Fired Rock	Animal Bone
0-10		121	1
10-20	1	251	3
20-30		300	6
30-40		95	12
40-50		175	14
50-60		105	18
60-70	1	66	1
70-80		90	4
80-90		32	1
90-100		10	2

(None below 100 cm)

(Summary)

Site Son-568 (Smiley)

Level	Proj.	Bifaces	Rework Biface	Retouch Flakes	Used Flakes	Core	Debitage	Fired Rock	Animal Bone
Totals	4-c	2-c		2-c	22-c	2-c	610-c	1245	62
	6-o		2-o	2-o	6-o		122-o		
Grand Totals	10	2	2	4	28	2	732	1245	62

Besides the midden area, two cultural features are present at Son-568. Three housepits are located on the midden; one within the 400' contour, approximately 5 meters northwest of Test Unit 1; a second, 20 m southeast of the unit on a lower contour; and the largest housepit (ca. 5 m diameter) is located approximately 20 m south of Test Unit 1 on the terrace south of the second intermittent stream.

Three cupule rocks are found approximately 92 m southeast of site datum and 100 m east of an old shed. These rocks are 5 m by 5 m and 4 m high and have numerous cupules and at least one grove. Test Unit 2 was placed 20 cm east of the northernmost petroglyph in an attempt to find associated cultural material. Excavation of Unit 2 revealed no midden and only one artifact in the full 40 cm. Stratigraphically, two components were distinguished. The first (0-25 cm) was characterized by dark brownish yellow alluvial sand with disturbed areas by possibly pig rooting activity. No cultural constituents were noted. The final zone (25-40 cm) consisted of darker brown soil and produced a reworked obsidian biface. Excavation ceased at 40 cm because of lack of cultural material. All material excavated from this unit was dry screened.

Western Site Group Chronology

They are 8 sites in this group and 6 of these have enough information to attempt chronological placement. There are noted as follows.

Son-566

There are hopper mortar fragments here so the site probably belongs to the Houx aspect but whether early or late we cannot tell.

Son-567

There is a possible milling stone fragment at 30-40 cm but the projectile point fragments are so small and delicate and the milling stone fragment so doubtful that we are inclined to attribute the entire deposit to the Houx aspect. There is a slight break in the chert-obsidian ratio at 20 cm so we assign the top 20 cm to late Houx and the remainder to early Houx. Square nails were found as in the top 40 cm but these must be due to early white settlers rather than to historic Indian occupation.

Son-575

This is probably at least partially late Houx because of the small side notched point (Fig. 23a) and may also be early Houx as well. We assign it to Houx generally.

Son-572

This site presents some stratigraphic difficulty. We are certain that the upper portions are Houx aspect because of small side notched points on the surface and the 0-10 cm level (Fig. 23d, e). We are also sure that there are Borax Lake components here because of the presence of 2 milling stone fragments and the large side notched points in the lower levels (Fig. 23g,

i). The first obvious break in the chippage ratios comes at the 70-80 cm level but there is a milling stone fragment at 40-50 cm. Reluctantly we conclude that the Houx components go down to the 70 cm level and the (small) milling stone fragment is out of place.

We divide the deposit as follows: 0-20 late Houx (arbitrary division), 20-70 early Houx (chippage break), 70-100 late Borax Lake (chippage break), 100-140 early Borax Lake.

Son-571

There is no definite evidence of late Houx but the upper midden must be Houx because of the small Excelsior point at 10-20 cm (Fig. 22e). We are assigning the deposit from 0-80 cm, where there is a break in the chippage ratio, to early Houx. Levels below that we attribute to late Borax Lake. This leaves a large side notched projectile point (Fig. 22h) out of position in Houx aspect context although not by very much.

Son-568

There are two pestles (one at 10-20 cm and the other at 60-70 cm) so this site must be Houx Aspect. There is a break in chert-obsidian ratio at 70-80 cm and we are therefore assigning the levels down to 80 cm to late and the rest to early Houx.

Western Site Group

Chert-Obsidian Debitage Ratios by Site and Level

Level	Site CA-Son					
cm.	566	567	575	572	571	568
0-10	1.89(127)	4.75(23)	2.13(47)	0.32(66)	0.05(824)	4.00(75)
10-20	1.56(46)	6.75(42)	6.60(38)	0.67(75)	0.03(520)	3.13(66)
20-30	2.78(68)	1.93(82)	5.20(31)	0.43(77)	0.07(392)	3.15(54)
30-40		2.19(83)	1.33(14)	0.41(87)#	0.04(564)	3.18(71)
40-50		4.10(51)	* (3)	0.41(109)	0.09(396)	5.73(74)
50-60		4.13(41)		0.28(109)	0.02(726)	5.13(98)
60-70		2.43(24)		0.49(103)	0.13(585)	4.17(62)
70-80		2.13(25)		1.12(123)	0.07(447)	6.82(86)
80-90		* (7)		2.93(110)	0.28(315)	9.40(52)
90-100		* (2)		9.88(185)	0.14(301)	10.50(48)
100-110				30.00(124)	0.24(118)	* (16)
110-120				* (131)	0.24(53)	9.00(10)
120-130				41.00(126)	1.50(5)	* (6)
130-140				* (76)		3.00(4)
140-150						* (7)
150-160						* (2)
160-170						* (3)

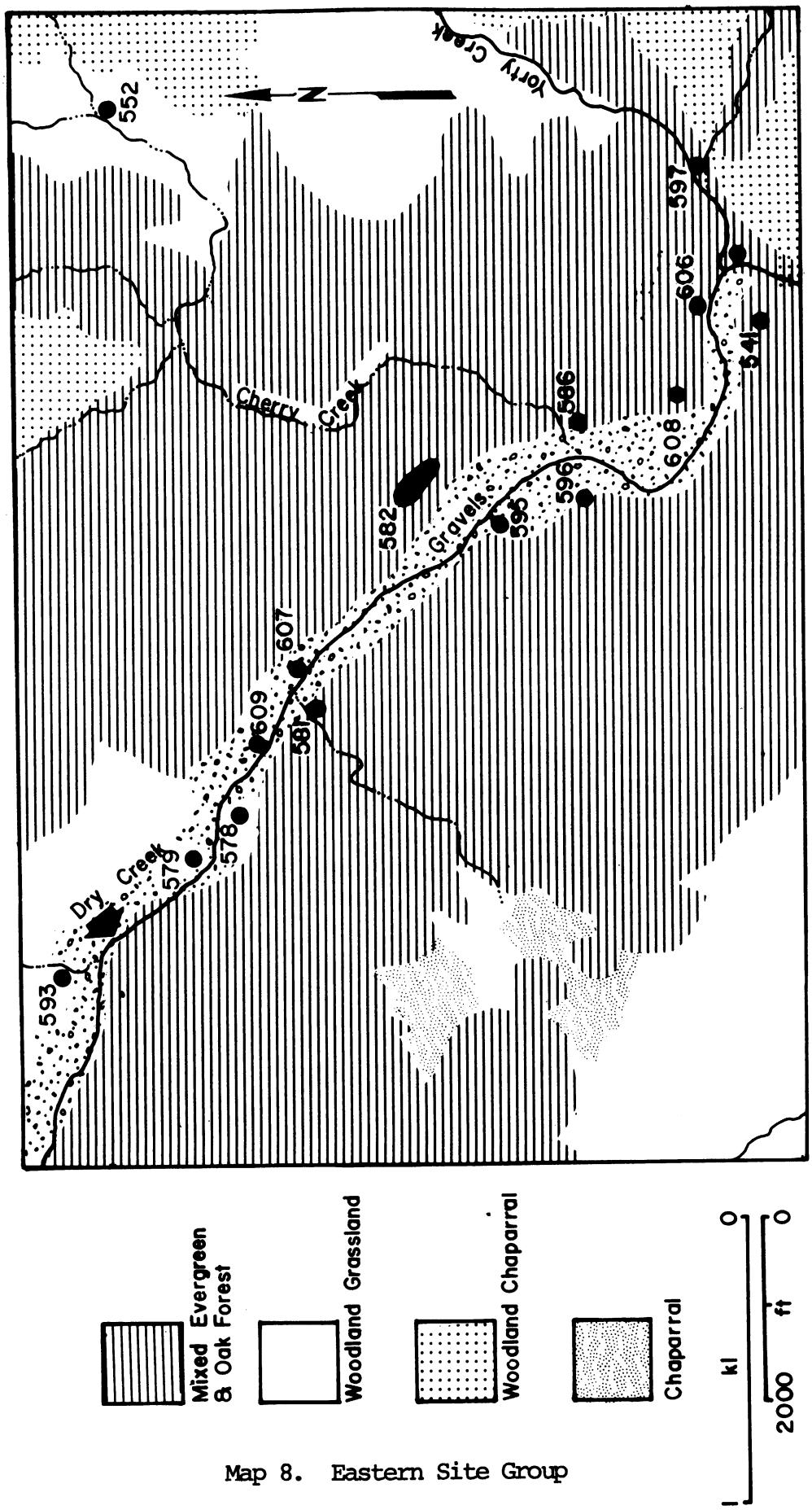
( ) : debitage frequency
* : infinity, or all chert
# : 30-40 and 40-50 levels inadvertantly combined in this site

Western Site Group

Chert-Obsidian Ratios by Site and Phase

	Site CA-Son				
	567	575	572	571	568
Hb	0-20 4.42 (65)		0-20 .48 (141)		0-80 4.28 (586)
H		0-50 3.29 (133)			
Ha	20-100 2.62 (315)		20-70 .40 (485)	0-80 .06 (4454)	80-130 12.27 (146)
BLb			70-100 3.06 (418)	80-130 .21 (791)	
BLa			100-40 61.71 (439)		
	2.84 (380)	3.29 (133)	1.69 (1483)	.08 (5245)	5.00 (732)

H : Houx Aspect
Ha : Early Houx Aspect
Hb : Late Houx Aspect
BLa : Early Borax Lake Aspect
BLb : Late Borax Lake Aspect



Map 8. Eastern Site Group

Eastern Site Group

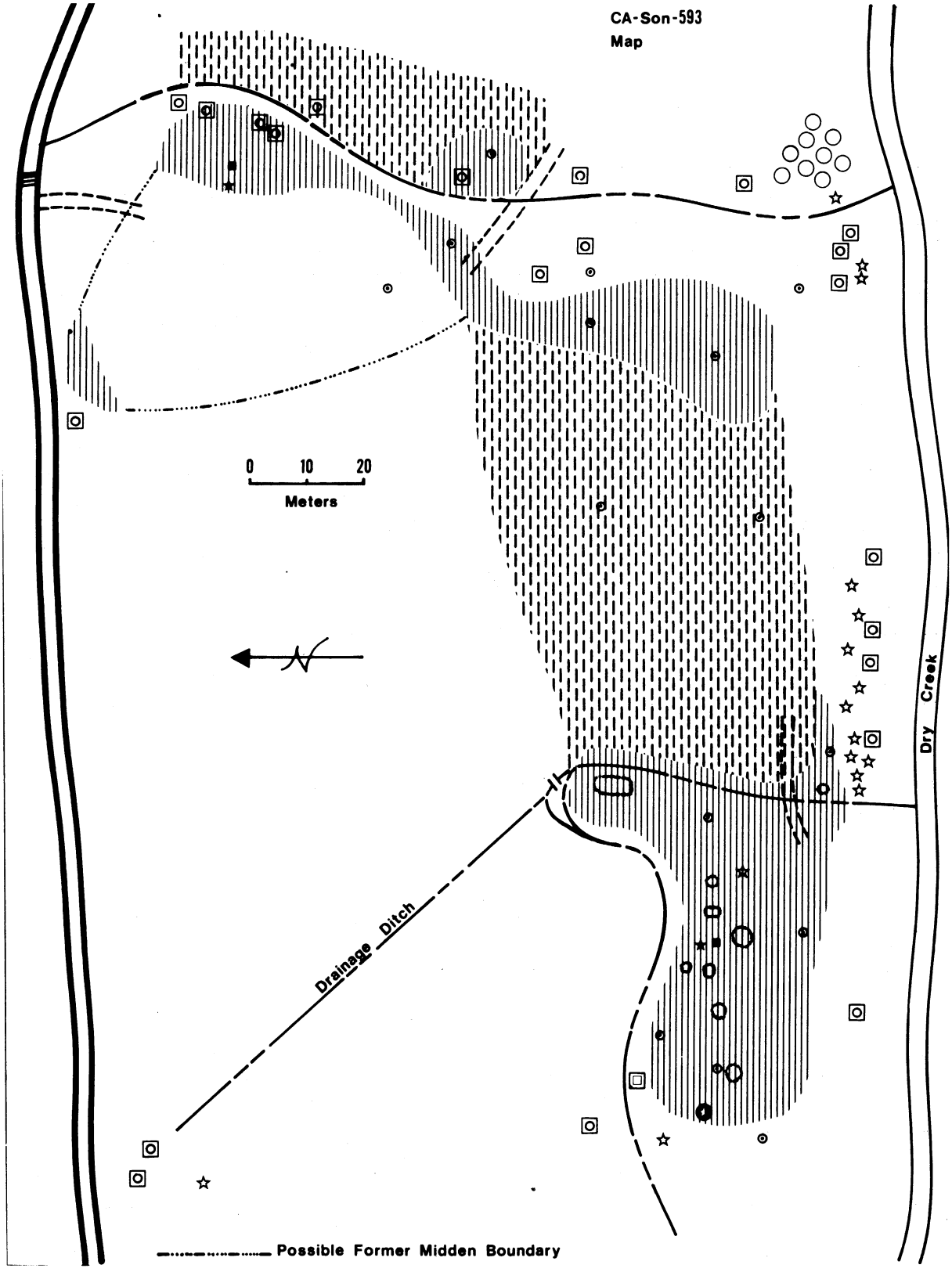
The valley of Dry Creek is wider along this stretch than it is either above or just below where it is pinched between two low mountain ranges. It widens especially on the NW around site Son-593 and again toward the SE at the mouth of Cherry Creek. Perhaps because of the availability of this flat bottom land we have the densest accumulation of sites and also the two largest sites in our area. We argue elsewhere that this area was a tribelet center and had been for many centuries. Perhaps the reason was topographical; they simply had more room for large winter groups to gather. It is also thanks to topography that this area has occasionally been thought suitable for cultivation and as a consequence one of the two largest sites (Son-593) has been partially destroyed.

Another peculiarity of this area is that it is virtually all surrounded by soil types which have been determined as having been mixed evergreen and oak forest (Map 8). This contrasts with other parts of the project where different supposed vegetation patterns prevail. We indicated earlier that we considered mixed oak-evergreen land as slightly less valuable than woodland-grassland territory. In view of the apparently high population density here it may be that our assessment was wrong and that the oak-evergreen environment is the most favorable. Alternatively it may have been the case that immediate environment was of less importance than that of the tribelet territory a whole and that location of principal villages depended more upon other factors such as centrality or on topography as previously mentioned.

A total of 13 sites was recorded for this group beginning with Son-593 in the northwest and continuing downstream to Son-597 at the confluence of Brush Creek and Yorty Creek.

Site Son-593 (Treganza 3 and 4)

As indicated by the title this site was recorded as two separate sites in Treganza's survey. The separate midden deposits were originally one site with the central portion having been disturbed by agricultural acitvity as shown on Map 9. The north midden area is south of Hot Springs Road at the entrance to Hot Springs Ranch. Datum stake 2 was placed on the western edge of this midden. The south midden is about 150 m southwest of this and lies 15 or 20 m north of Dry Creek. This midden was deposited on a low mound a meter or two high. Datum stake 1 is at the highest point of the mound. Both middens are on a flat extensive stream terrace extending about 150 m north-south and 300 m east-west. It is bounded by steepening hillsides to the north and west, by Dry Creek on the south and by a spring fed stream on the east. Directly opposite this flat, across Dry Creek, is an extensive area of land-sliding on a steep slope made up of a part of the Franciscan formation referred to as "melange," an easily weathered, serpentine derived metamorphic rock. Mr. Richard Thompson, a Corps of Engineers geologist, theorized that the mound on which the south midden is located was deposited by an older, more massive landslide which at the same time dammed Dry Creek, forcing it north of this mound. After a short time, perhaps 10 to 20 years, Dry Creek eroded through the landslide and re-assumed its present channel. The



Map 9. Son-593 (legend p. 5).

landslide left behind the low, uneven mound on an otherwise flat terrace and an old stream channel that has since become filled in and plowed over and is now poorly defined.

As previously mentioned, agricultural land leveling has removed much of the midden, especially just west of the north midden. Plowing of the terrace flats has further buried or obscured the midden that still exists. When the land leveling took place and where the midden was taken could not be determined. There is a possibility that the midden shown in the southeast on Map 9 is re-deposited midden from the area north of it.

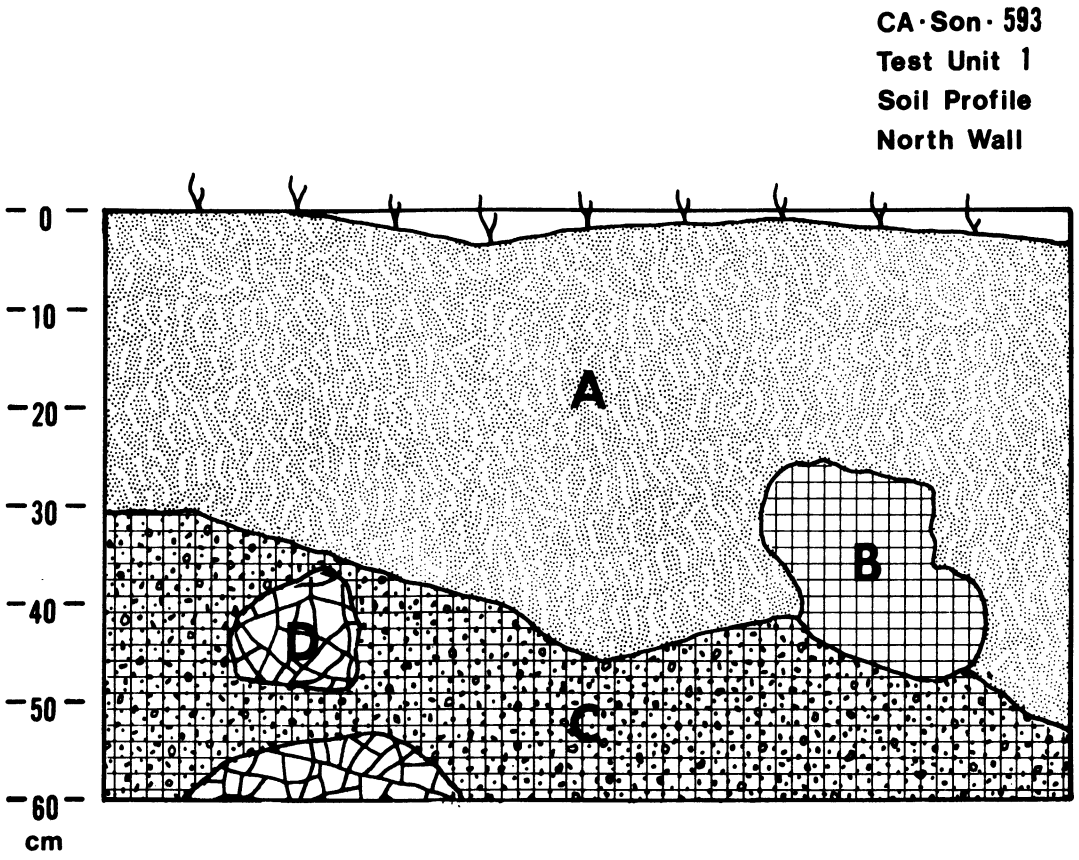
The vegetation in the flat around the site is now open grassland with a few isolated Oregon oaks, live oaks, and buckeyes. The surface must have been more heavily wooded in aboriginal times and may have been an open parkland with the usual riparian suite of laurel, alder, and willow along the fringes of Dry Creek. The slopes north and south of the flat are heavily wooded in oak and madrone with Douglas fir and laurel more prevalent south of Dry Creek.

The soil sequence on the terrace around the south midden is 1.0 to 1.5 m of fine grained alluvial deposit underlain by about a meter of sandy alluvial gravel containing many boulders. Shale bedrock underlies this bed. The midden is very dark brown soil with considerable fire-cracked rock and some animal bone. It generally runs to a depth of 30-40 cm, but goes as deep as 50 cm in one place. A single small side-notched projectile found in the 0-10 cm level, the low chert-obsidian ratio of debitage, and the well developed housepits on the surface identify this as a late midden; we believe a single component midden.

There are 11 well defined housepits on this south midden. They measure between 2.2 and 6.0 m in diameter and were 40 cm to 1.5 m deep. Two are oblong and may be sweat houses while the rest are circular.

There are at least 36 petroglyph rocks on or close to the south midden. All but one of these has cupules as the only design element. The exception is a wedge shaped rock with cupules on its south face and apex and some shallow grooves on its north face. The grooves are not well defined but are similar to other, definitely man-made examples found elsewhere in the North Coast Range. The petroglyphs are on medium sized boulders ranging from 50 cm to 2.0 m (avg. 1 m) in largest dimension. Almost all these boulders are found along the front edge of the terrace just along Dry Creek. They are scattered from the south midden about 300 m downstream. There are also two cupule rocks on the south midden itself and an isolated one on a higher terrace 150 m to the northwest.

The north midden is located on a secondary terrace 80 to 100 m from Dry Creek. A large amount of midden has been removed by land leveling so that the northern section is now represented by two small remnants. In the north midden the excavated deposit can be divided into four units which constitute at least three cultural components. The topmost (A and B in the profile) consist of dark grey to dark brown midden with a large amount of fire-cracked rock and animal bone. It extended from 0 to 70 cm in depth. There are square nails and bottle glass near the surface. Diagnostic artifacts include



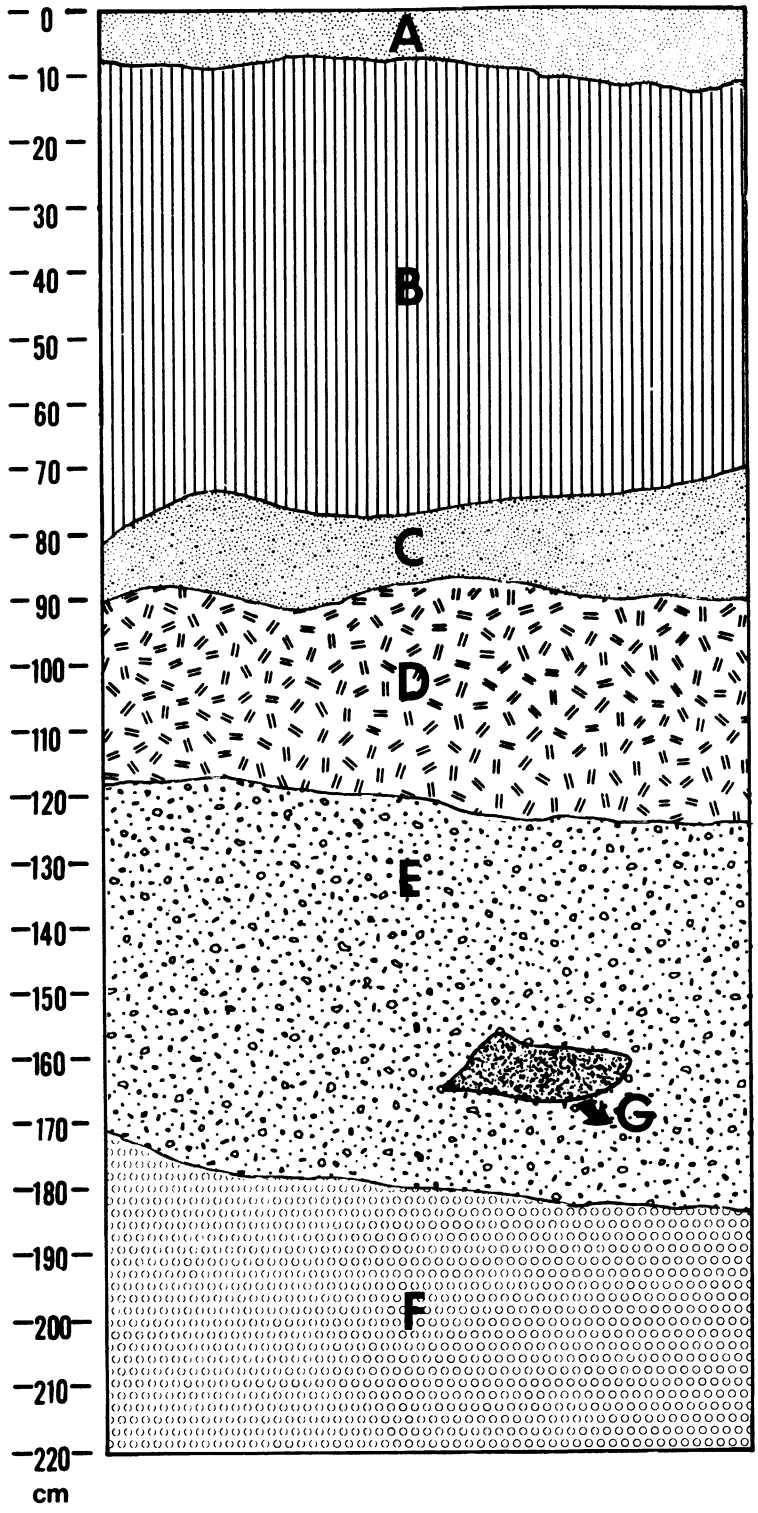
A. Midden; very dark gray; sandy silt. Root zone. Friable.

B. Decomposing shale. Friable.

C. Decomposing shale and gravels; brown to dark brown silt with sand. Friable.

D. Rock.

Figure 6. Son-593, Unit 1 Profile.



A. Midden; dark gray to very dark grayish brown; silty loam. Annual grass roots. Friable.

B. Midden; very dark brown to very dark gray; silt with sand. Friable to moderately compact.

C. Burnt living surface; very dark grayish brown; silt with clay and sand; compact to very compact.

D. Transition Zone; silt with clay and sand; dark brown; friable to moderately compact.

E. Sub-midden; dark brown to brown; silt with clay and sand; small gravels. Compact to moderately compact.

F. Sand and gravels; brown; very loose and friable.

G. Fire hearth; brown, sandy silt with charcoal and gravels. Friable.

Figure 7. Son-593, Unit 2 Profile.

Site Son-593 (Treganza 3 & 4), Unit 1

Level cm.	Proj. Pts.	Scrapers	Used Flakes	Debitage	Fired Rock	Animal Bone
0-10	1-c		3-o	12-c 12-o	50	36
10-20	1-c	1-c	1-c 2-o	14-c 22-o	100	57
20-30				2-c 12-o	100	32
30-40				1-c 3-o	120	10
40-50				1-c	80	5
Total	2-c	1-c	1-c 5-o	30-c 49-o	450	130
Grand Total	2	1	6	79	450	130

Site Son-593 (Treganza 3 & 4), Unit 2

Level cm.	Proj. Pts.	Biface	Rework Biface	Scraper	Retouch Flakes	Used Flakes	Cores	Debitage
0-10						2-c		11-c
						3-c		71-o
10-20						1-c		13-c
			1-o			4-o		71-o
20-30		2-c				1-c		20-c
	1-o					3-o		122-o
30-40							1-c	13-c
	1-o		1-o		1-o	5-o		125-o
40-50						3-c	1-c	14-c
	1-o		1-o			4-o		196-o
50-60						2-c		22-c
	2-o					8-o		191-o
60-70	1-c						1-c	21-c
						4-o		153-o
70-80		1-c						25-c
						5-o		70-o
80-90						3-c		30-c
				1-o	1-o	2-o		40-o
90-100						1-c		14-c
						12-o		37-o
100-110						1-c		17-c
								24-o

Level	Used Flakes	Debitage c	Debitage o	Level	Debitage c	Debitage o
110-120	1-c	12	1	160-170	4	1
120-130		8	3	170-180	8	
130-140		8	1	180-190	8	3
140-150		2		190-200	4	
150-160		3		200-210	9	

Totals

Pr. Pts	Biface	Rework Biface	Scraper	Retouch Flakes	Used Flakes	Cores	Debitage
1-c 5-o	2-c	3-o	1-o	2-o	15-c 50-o	3-c	266-c 1109-o
6	2	3	1	2	65	3	1375

Site Son-593 (Treganza 3 & 4), Unit 2

Level cm.	Pestles	Fired Rock	Animal Bone	Historical Material
0-10		50	2	145 nails
10-20	2	90	28	4 nails
20-30		80	93	
30-40		40	67	
40-50		20	109	
50-60		25	135	
60-70		75	91	
70-80		30	41	
80-90		38	12	
90-100		11	8	
100-110		3	7	
110-120		1	3	
120-130		-	-	
130-140		-	-	
140-150		-	-	
150-160		14	-	
160-170		22	-	
170-180		7	2	
180-190		-	-	
190-200		2	5	
200-210		-	1	
210-220		-	3	
Total	2	508	607	149

two pestles at 10-20 cm and a Gunther Barbed projectile point at 60-70 cm. The latter indicates a very late time period (perhaps 1200 to 1300 AD) so that it may well be out of place at that depth. This represents the latest phase of this part of the project and corresponds to the entire deposit of the south midden.

The next unit (C and D of the profile) is from 70 to 110 cm and consists of dark brown silty midden with much clay and sand and is sealed at the top by a layer of burned and compact soil which may have been living surface. There are no diagnostic artifacts in this level but the chert-obsidian ratio increases markedly. We feel this is a component of an earlier phase.

The third level extends from 110 to 180 cm (level E of profile) and is like the previous level but is more compact and has a larger component of gravel. Again there are no diagnostic artifacts but the chert-obsidian ratio increases to the point that obsidian nearly disappears altogether. This, and possibly the fourth level below, we assign to yet earlier phases.

The lowest level, from 180 to 210 cm (level E on profile) consists of brown sandy gravel. Cultural remains consist of a few chert flakes and some animal bone. Augering of this level indicated only 10 cm more of this material before refusal in very coarse yellow brown gravel.

In addition to the above we should point out that the area around Site Son-593 has a considerable history of Euro-American habitation. According to the Historical Atlas Map of Sonoma County published by H. Thompson and Co. in 1877 there were at least three homesteads in the immediate area. The Scott District School was located very close to Son-593 and may have been the source of the nails and other historic materials in the north midden.

Site Son-579 (Henry Moore)

Son-579 is a site with a very sparse surface scatter or artifacts over a 20 by 80 meter area. Associated with this site and 50 meters down Dry Creek from it, are two petroglyph rocks. During the survey of this area four auger holes were made in the area of the flake scatter and close to the terrace bank where dark soil was seen under 15 to 20 cm of overburden. The augerings showed 10 to 25 cm of very dark grey brown silt which was considered midden. A unit was excavated here to determine if this buried dark soil was midden, but no artifacts were found below the plow zone.

The site is located on the north side of Dry Creek on a secondary terrace that is 2 m above and 5 m north of the gravel stream bed. The stream bed is 50 m. wide at this point; the unusual width is probably the result of recent erosion that washed away the primary terrace that was here, as shown by a remnant of the primary terrace remaining on the stream bed. Local residents report that a site rich in artifacts was in this general area and was located on or next to a "sand bar". The sand bar referred to may have been the primary terrace now eroded away and the surface scatter above may be a peripheral remnant of the site.

The soil of the site is a 2 to 3 m alluvial deposit of silt and sand underlain by a .5 to 1 m boulder bed (i.e. very course stream gravel with many boulders) and finally by shale bedrock. The site is now in open

grassland with riperian vegetation along the front edge of the terrace. This vegetation includes laurel, live oak, Oregon oak, willow, and wild grape. There are also two stands of sedges, the kind used by the Pomo in basketry, along the front edge of the terrace near the site.

The petroglyphs, which are on two sandstone boulders now located on the gravel stream bed, probably were once on the now-vanished terrace. These boulders have been subjected to heavy stream erosion and some of the petroglyphs are now very worn and faint. The petroglyph motifs are unique for the project area and consist of pecked circular grooves and cupules--at least one is a cupule within a pecked circle.

Site Son-578 (Sniffles)

Son-578 is located on the south bank of Dry Creek and 300 m across Dry Creek from Hot Springs Road. It is approximately 900 m east of the east entrance of Hot Springs Ranch on Hot Springs Road. It is a weakly formed midden site on the west edge of a large flat. This flat is bordered on the north by Dry Creek and on the south by an unnamed intermittent tributary. The flat is triangular in shape and is completely surrounded by sheep stake fencing. The flat and most of the site have been disced. Directly south of the intermittent stream is a steep hillside covered with mixed oak/conifer vegetation. Directly north of the flat (between Dry Creek and Hot Springs Road) is a first terrace remnant and Son-579 (Henry Moore), a surface site with associated petroglyph.

The area of the site is open grassland with riparian vegetation along both the intermittent stream and Dry Creek. A large bay laurel is located in the middle of the south edge of the midden area and live oaks are found bordering both water sources. An area of sedge, the type used by the Pomo for basketry, is located along the eastern boundry of this flat and is bisected by the stake fencing. This sedge growth encompasses a 30 by 5 m area, 80 m east of the midden.

The soil of Son-578 is very dark brown sandy gravel. The limits of the midden are defined by the dark brown/brown alluvial sand of the surrounding areas. A series of four auger holes within and outside the midden area confirmed the extent of the midden as an area measuring 60 m by 40 m and limited to the south west edge of the flat.

Test Unit 1 was placed in what was thought to be the deepest section of the midden, 21 m south and 20 m west of the site datum stake. This unit is south of the sheep stake fencing and north of the intermittent stream.

Excavation of Test Unit 1 revealed a shallow, weakly formed midden overlying sterile gravels. The midden extended in depth from 0 to 30 m and consisted of dark grayish brown silt. No projectile points or ground stone tools were recovered. Among the few artifacts from the midden levels were a reworked biface of chert and one retouched chert flake. No animal bone was found and there was little fire-cracked rock. Charcoal flecks and ash were scattered lightly throughout the midden. Gravels began to intrude in the 10-20 cm level and became more abundant with increased depth. The final excavated level, 30-40 cm, consisted completely of gravels and roots. Upon

completion of this level, the center of the unit was augered to a depth of 90 cm and found to be devoid of midden.

Site Son-578 (Sniffles)

Level cm.	Rework Biface	Retouch Flakes	Used Flakes	Debitage	Fired Rock
0-10			1-c	5-c 4-o	14
10-20		1-c	1-c	3-c	32
20-30	1-c			1-c	

Site Son-609 (2 Cups)

Son-609 is located approximately 1.4 miles northwest of Cherry Creek Bridge, and approximately 25 meters south of Hot Springs Road. It is on the edge of the north bank of Dry Creek ten meters east of a garbage dump. The site is a petroglyph site consisting of one rock with 2 large cupules on its upper surface and is about 300 meters upstream from Son-607, a petroglyph site of several boulders with associated surface finds.

Son-609 is located in a riparian environment on brown alluvial sands. Augering was not possible at this site. It is of interest that this rock is located near an historic dump. It is suggested that this dump be excavated in the future for possible proto-historic material. This site as well as Son-607 (petroglyph) and the nearby habitation sites may be important sites for understanding the purpose and location of petroglyph rocks and may also help suggest dates for petroglyph decoration.

Site Son-581 (Madrone Point)

Son-581 is located on a first terrace on the south bank of Dry Creek at the confluence of an intermittent stream and that Creek. This terrace is approximately 300 m south of Hot Springs Road and 150 m south and upslope of Dry Creek. It is completely sheltered on the north, south and west sides by madrones, oaks, and conifers. An old road bed runs across the entire east side of the promontory at the base of a grassy slope that has been heavily logged and has tree stumps scattered on its surface. The site itself has been logged and at present has a fallen log on its northern edge.

A chert scatter, including a chert scraper, was found during the survey phase so the site was augered to test for possible midden. The soil of this promontory consists of red-brown gravely loam. Five auger holes were placed at the tip of the promontory and on its neck and no buried middens or other cultural deposits of any kind were found. Thus this is evidently a strictly surface deposit and future work may be confined to surface collection.

Site Son-582 (Cherry Creek)

Site Son-582 lies on a promontory just back from the confluence of Cherry Creek and Dry Creek, about 100 m NW of the former and 80 m NE of the latter. The site consists of two separate midden deposits lying on either side of a gully which carries water only in wet weather. The midden deposit on the east measures 80 m by 30 m while the smaller one on the west is about 30 m in diameter.

The site lies on the second terrace above Dry Creek. The second terrace here does not necessarily correspond to that on which other sites nearby are located--most of these occur 2-5 m above the stream bed while this one is at about 15 m. The soil is typical terrace soil with fine textured sediments on top grading into coarser sediments below. The fine textured sediments run 50 to 100 cm in depth before reaching gravel. Thus the soil is well drained.

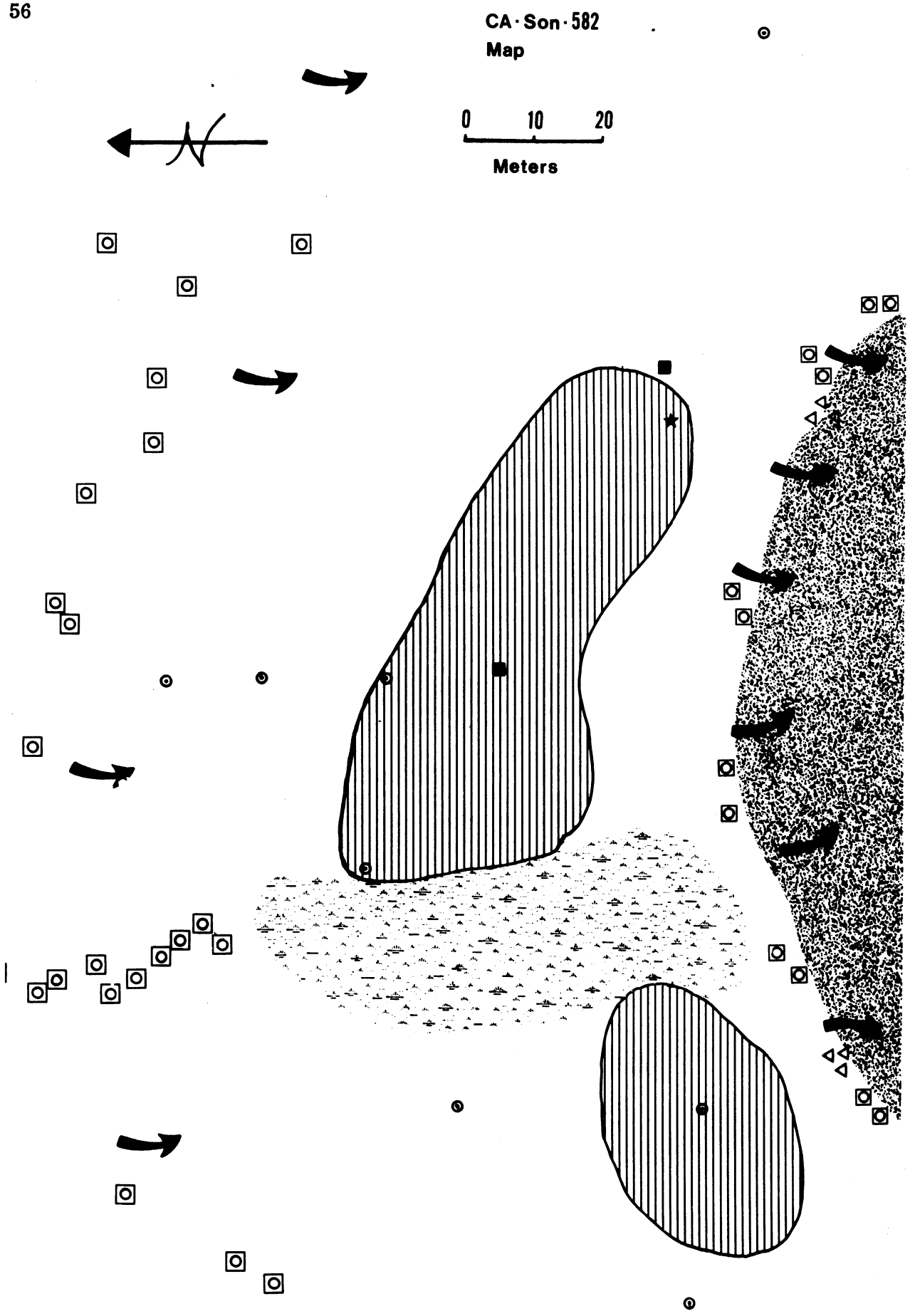
Two test units were excavated in Son-582. Unit 1 was located on the SE edge of the site and was dug to a depth of 90 cm. The soil there is dark brown, friable loam only marginally classifiable as midden. The evidence of human occupation consists of a single projectile point plus a few chert and obsidian flakes.

Unit 2 was placed near the center of the site and proved considerably richer. It was excavated to a depth of 110 cm. Down to 80 cm it was black, sandy midden with considerable quantities of pebbles, cobbles, and angular rock. As indicated in the table there were large quantities of cultural material in this level. Two of the projectile points recovered are of the type called Excelsior (see Fig. 24 a, b). One of them was in the 20-30 cm layer while the other was from 50 to 60 cm.

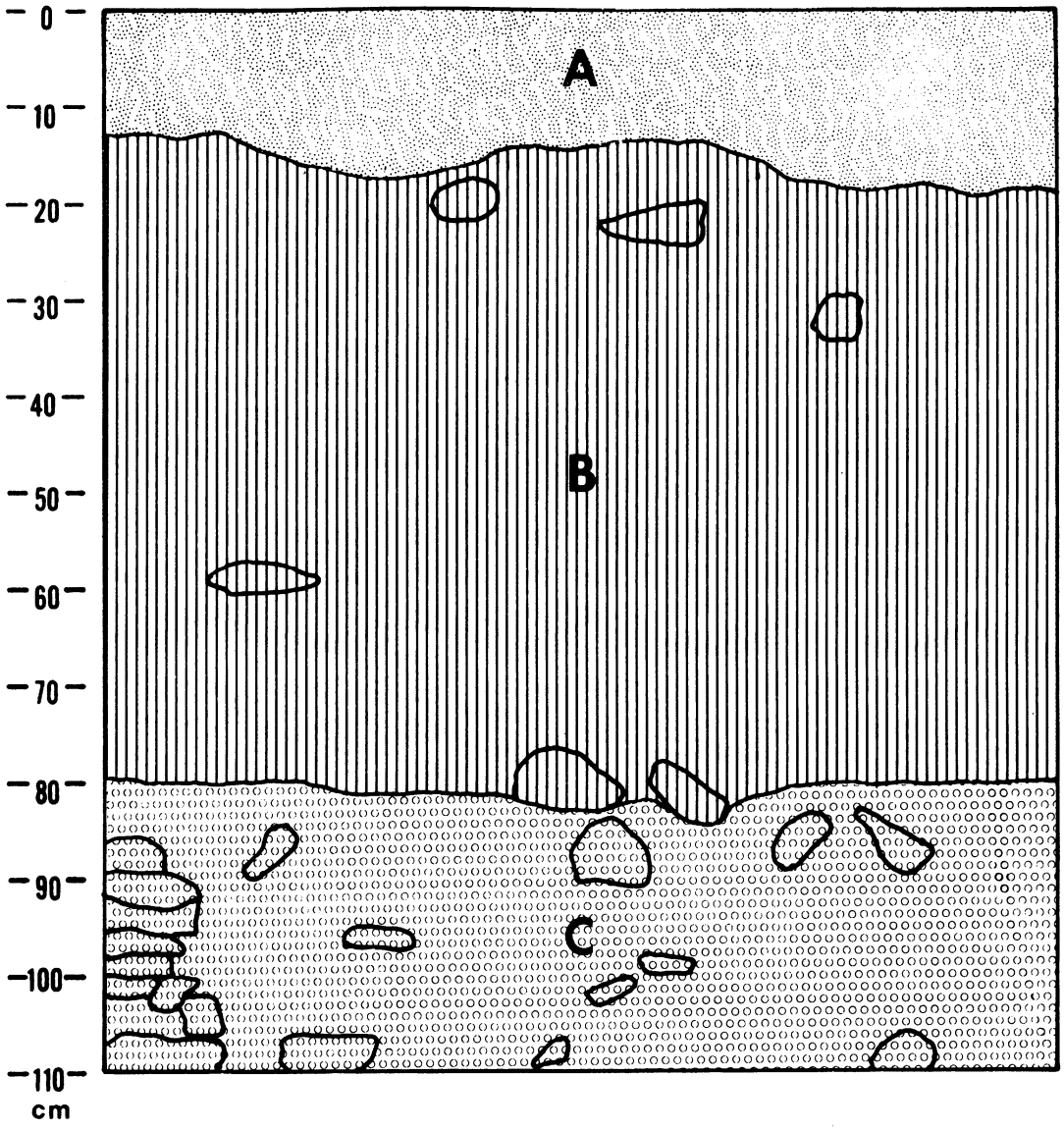
Below 80 cm a change is indicated by an increase in alrge, percussion flaked artifacts and debitage. It is also notable that the ratio of chert to obsidian changed markedly at that level. In addition to this it is the case that animal bone and fired rock no longer occur below that level and it therefore seems likely that the deposit below 80 cm represents a different cultural component from that above.

Map 8 shows Son-582 to be a central site with smaller sites and isolated housepits surrounding it. This, together with suggestions of its suitability as a winter village, raises the possibility that it was a headquarters site for the surrounding territory. In that case one would expect that it contained many houses, one or more sweat houses, and a dance house during the period of its prime occupancy.

This clearly is an important site and future excavation should have as its goal (1) an estimate of the size and number of dwellings at any given time and (2) identification of ceremonial structures. Let us suppose we take a sample of 5% of the site. There is a total of 1700 sq. m so the sample would be 85 one meter units. For the dance house let us assume a diameter of 10 m, giving an area of 79 sq. m or 4.6% of the total site area. If the 85 units were located at random then the probability of at least one being inside the dance house area would be the same as one minus the probability of all of them being located outside the dance house or $1-(.954)^{85}$. This



Map 10. Son-582.



A. Midden; cultivation zone; black; silt with sand and rounded gravels. Moderately compact.

B. Midden; black; sandy silt with gravels and cobbles. Friable to moderately compact.

C. Sandy gravels; cobbles and pebbles; dark brown to dark yellowish brown. Friable to moderately compact.

Figure 8. Son-582 Profile.

Site CA-Son-582 (Cherry Creek)

Level cm.	Proj. Pts.	Biface	Rework Biface	Used Flakes	Debitage	Milling Stones	Animal Bone	Fired Rock
0-10				3-c	30-c		1	
				5-o	30-o			
10-20				6-c	67-c			10
					47-o			
20-30				4-c	55-c		4	60
	2-o			2-o	44-o			
30-40				4-c	65-c		10	80
					50-o			
40-50				3-c	121-c	1?	15	40
	1-o				45-o			
50-60				3-c	63-c	1?	2	50
	1-o	2-o		1-o	54-o			
60-70	1-c			1-c	80-c		3	30
			1-o	2-o	41-o			
70-80				2-c	50-c			60
	1-o		1-o	3-o	25-o			
80-90					34-c		1	
		1-o			11-o			
90-100					13-c			
					1-o			
100-110					1-c			
Totals	1-c			26-c	579-c	2	36	330
	6-o			13-o	348-o			
Grand Total	6	3	2	39	927	2	36	330

figure is .999...hence one is nearly certain of finding the dance house given that the floor once encountered could in fact be detected. Similarily a fair estimate could be made of the number of dwellings, again given that the remains could be identified.

Accordingly we propose that a 5% sample be taken from the site in the following fashion. Along the long axis of the site and along the short axis perpendicular to this dig one four meter unit every four meters. This would be 20 units NW-SE and 8 units NE-SW. Let the remaining 57 units be placed at random over the area outside these two "trenches." If no house floors are encountered (this would be only because of poor preservation) then these 85 units would constitute the total sample. If house floors are encountered the excavations would be expanded to expose up to one half the total structure of until such time as the main features of the structure are determined. In the 85 units of the original sample the excavation would be completed to the base of the cultural deposit. In expanded excavations to expose house floors excavation would continue only down to the floor itself. Thus we would have dug between 5 and perhaps 10 percent of the site. Our experience thus far in the area makes it seem unlikely that any floors would be encountered so the 5 percent figure is the more likely.

Site Son-607 (Riffles)

Son-607 is located on a first terrace remnant on the north bank of Dry Creek, 1.2 miles northwest of Cherry Creek Bridge and 30 meters south of Hot Springs Road. It consists of a grooved petroglyph rock with an associated surface flake scatter. Also, petroglyph rocks with at least one cupule or a few grooves are scattered upstream on the north bank of Dry Creek for the next 300 meters.

The first terrace remnant on which this site is located consists of a long narrow strip (20 meters by 5 meters) situated between Hot Springs Road and Dry Creek. An old road bed runs due west off Hot Springs Road towards Dry Creek, bisecting the area of the surface scatter.

The site has riparian vegetation with oaks, madrones and ash trees covering most of the site. The soil of this entire terrace is brown alluvial sand and shows no sign of midden deposits. Four auger holes were placed on both sides of the old dirt road in the area of surface scatter and revealed no buried midden or other cultural materials. A fifth auger hole was placed approximately 80 meters north of the surveyor's stake (on the eastern edge of this site and used as site datum), and next to one of the petroglyph rocks seemingly associated with this site. Again, no midden deposits were found.

Site Son-595 (Treganza 5)

Son-595 is located on a primary terrace on the south bank of Dry Creek, 200 meters north of the confluence of Cherry and Dry Creeks. This flat terrace is 6 meters above the stream bed of Dry Creek. An old dirt road once crossed Dry Creek and ran along the northern perimeter of the site. It forks at the northwest corner of the site and one section of the road forms the western boundary of Son-595. An old wooden bridge, at the southwest corner of the site crosses an intermittent stream which delimits the southern edge of Son-595.

Site Son-595 (Treganza 5)

Level cm.	Rework Biface	Biface	Debitage	Fired Rock	Animal Bone
0-10			16-c 8-o	74	
10-20	1-o		5-c 18-o	185	
20-30			4-c 7-o	100	2
30-40			1-c 12-c	84	2
40-50			2-c 13-o	52	3
50-60		1-o	8-o		1
60-70		1-o	3-o		2
Totals	1-o	1-o	28-c 69-o	495	10
	1	2	97	495	10

This site has open grassland cover with a preponderance of live oaks both along the intermittent stream and the bank above Dry Creek. One manzanita is located on the eastern edge of the site and one scrub oak grows near the wooden bridge. It was noted that most of the live oaks were fairly recent in age-ca. 40-50 years.

The matrix of Son-595 is midden consisting of grey-brown gravelly silt. Four auger holes placed around the perimeter of the midden area showed it is limited to the 15 m by 25 m area bordered by the old dirt road and the intermittent stream. No housepits or other cultural features are evident on this terrace. Test Unit 1 was placed in the center of the midden concentration, 14 m due east of the site datum, on the north side of the east/west transect passing through this datum.

Excavation of Test Unit 1 revealed a weakly developed midden, a transitional zone between this midden and underlying gravels, and a final gravel component. The midden component consisted of grey-brown silt with gravels (0-50 cm). Few artifacts were recovered from this cultural zone; nearly all were small water flakes. Twice as much obsidian as chert was consistently recovered. Animal bone remains were found in very small quantities. Most of the fire-cracked rock came from the 20-40 cm levels. the only tool from the midden component was a rework biface of obsidian.

The transitional component at this site consisted of a mixture of grey-brown silty loam and yellow-brown sandy gravels (50-60 cm). In this component fire-cracked rock disappears entirely, animal bone and chert are minimal, and obsidian declines slightly. No tools were recovered.

The gravel component at son-595 is characterized by a yellow-brown gravelly clay matrix surrounding massive rocks and cobbles (65-70 cm). Excavation of this level was difficult due to the large amount of rock. Screening was also difficult because of the increased clay content. Artifactual material was minimal. For these reasons, excavation of Test Unit 1 was terminated at 70 cm.

Besides the obvious disturbance by the building of the old dirt road and by the erosion of both Dry Creek and the seasonally intermittent stream, there is evidence of historic occupation of Son-595. In the 0-20 cm levels, nails, strands of wire, glass fragments, and a bolt were found. Also, in the 50-60 cm level one rusty nail was recovered. A piece of glass was also recovered in auger hole "c", on the extreme western part of the alluvial terrace, near the fork in the dirt road.

Site Son-596 (Treganza 6)

Son-596 is located on a secondary terrace on the south bank of Dry Creek, approximately 200 meters west of the confluence of Cherry and Dry Creeks and 250 meters west of Hot Springs Road. The site is at the east end of a large second terrace, approximately 300 meters east of Son-596, which is located at the west end of the same terrace. An old dirt road runs the length of this terrace and connects both sites. The road leads to three dilapidated summer cabins, a pool, and a rock garden situated on the site of Son-596. The cabins are located in a bay laurel grove and the area is surrounded by a wire fence.

The soil of this terrace is dark brown gravelly silt and shows no evidence of midden deposits. Site datum was placed in the center of a surface scatter found on this site during the survey phase. The boundaries of this scatter were indistinct because of the large amount of modern disturbance on this site. Four auger holes were therefore arbitrarily placed 10 meters north, south, and west of datum and 15 meters east of the site datum. No midden deposits or cultural material of any type was found in the auger holes.

This site is interesting because of its close areal relationship with Son-596 on the same terrace and the two higher more permanent sites across Dry Creek (Son-582 and 586).

Site Son-586 (Cat Scat)

Son-586 is located on the edge of a secondary terrace on the north bank of Dry Creek and on the east side of Cherry Creek. It is about 200 meters east of the bridge on Hot Springs Road that crosses Cherry Creek. The site is one of three found nearby; Son-582 (midden) is about 1/2 mile upstream from this site and Son-608 (midden) 1/2 mile downstream.

The terrace has open grassland and cover with scattered valley and live oaks in the area (mainly on the first terrace). An old dirt road runs along the eastern perimeter of this terrace and is paralleled by a wire fence which turns sharply on the southern part of the terrace and bisects the site. Site datum is located on this fence line. About 70 meters southwest of site datum there is a power pole situated in the middle of a surface scatter consisting of obsidian and chert flakes, a grinding stone fragment, worked bottle glass, ironstone fragments, and nails. Thirty meters north of site datum and the wire fence is a housepit measuring approximately 1.5 meters in diameter and 30 cm in depth. The surface scatter, which measures 20 m by 30 m, seems to suggest a post-historic contact date for the housepit.

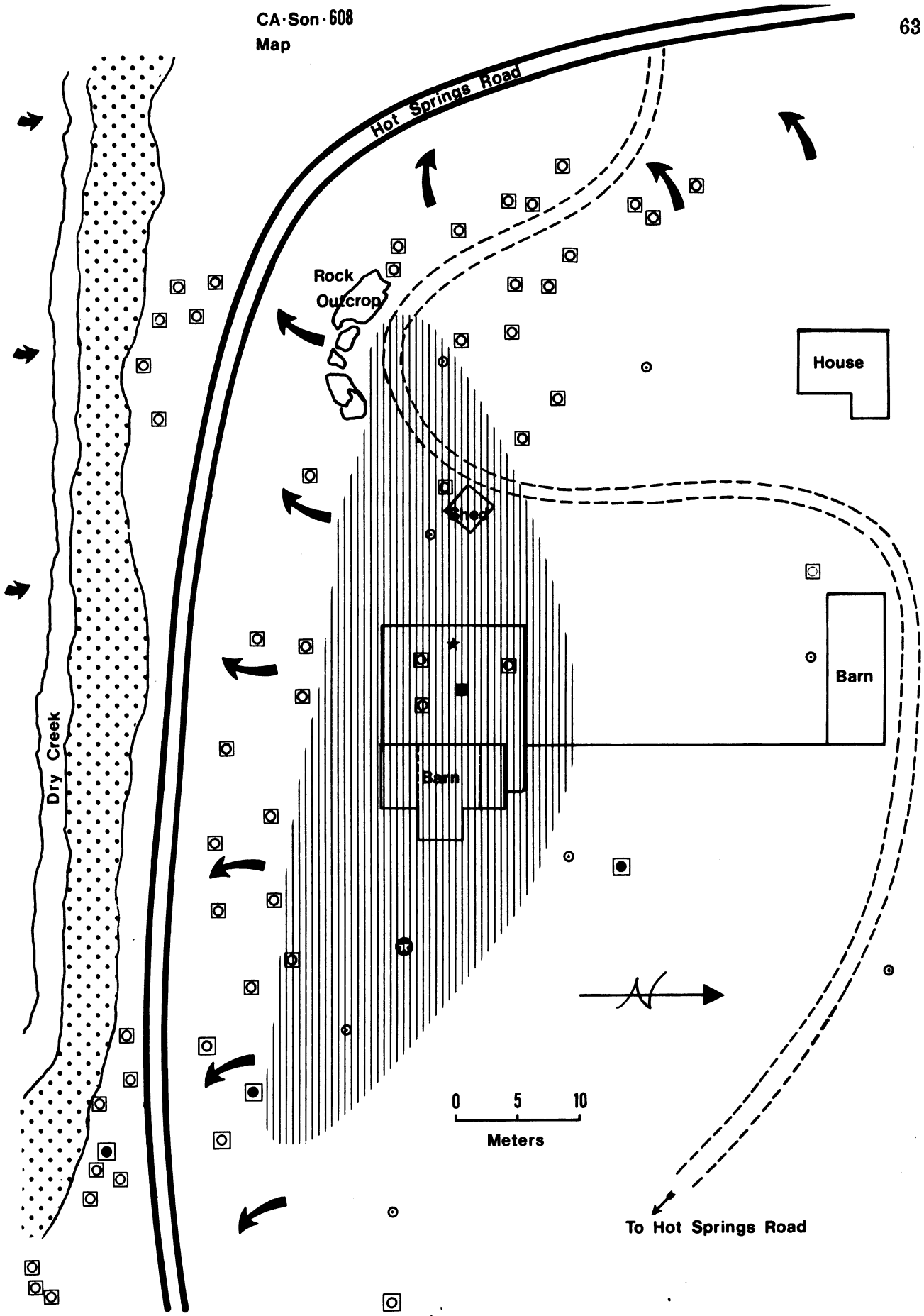
No midden soil was apparent from the surface; the whole terrace consists of red-brown alluvial soil. Five auger holes, lines up basically north-south across this second terrace also revealed no evidence of a midden.

Site Son-608 (Alf)

Son-608 is located on the Alf Young Ranch, 80 m north of Dry Creek and 30 m north of Hot Springs Road. It is also half way between the confluence of Yorty and Dry Creeks and the confluence of Cherry and Dry Creeks, (40 m east and west, respectively).

The site is one of several second terrace sites located on the north bank of Dry Creek facing two first terrace sites on the southern stream bank. It is curious that these sites are all on the highest terrace, since primary and first terraces were also available for habitation on the north creek bank. Perhaps this phenomenon is related to seasonal flooding and the more permanent nature of these highest sites.

This site is disturbed in several places by a private road that winds upslope due east off Hot Springs Road, loops around the terrace and proceeds downslope to connect again with Hot Springs Road. Two barns, a corral, a



Map 11. Son-608 (legend p. 5).

shed and a house are also located directly on the site. The southern barn is found in the center of the terrace and has a fence enclosing a ten meter corral of its western side. This fence extends north from the northeastern corner of the corral for approximately 25 meters and then connects with the southeastern edge of the northern barn. East of the stake fence (connecting the two barns) is a large pasture which includes the entire eastern half of this second terrace. A firepit, (Son-606), seemingly of historic Indian age, is located approximately ten meters east of the southern barn in this pasture. Twenty meters west of the northern barn and separated from it by the road, is the Young farmhouse.

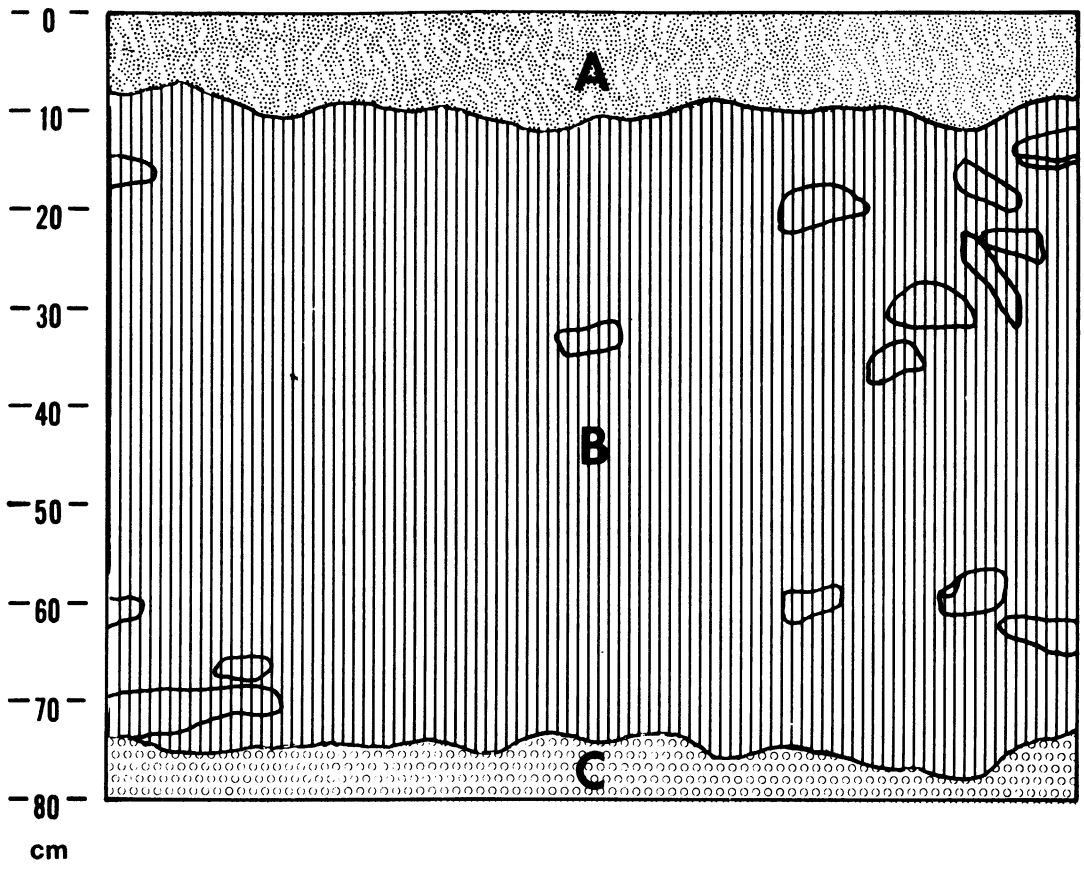
The vegetation of this area is open oak/woodland. In the large pasture is a bay laurel and a large live oak. All along the private road and on the southern slope to Hot Springs Road are stands of Oregon oaks. Most of the site has been heavily grazed, thus destroying most perennials. However, soaproot is found in abundance over the site.

The midden of this site consists of black sandy silt and can be visually distinguished from the surrounding brown sandy silt in most areas. However, humus from the oaks and the animals have made the pasture very dark in color and difficult to distinguish from the midden. A series of nine auger holes test the whole second terrace indicated that the midden extends over an area measuring 50 m by 25 m and is covered in part by the firepit, southern barn and adjacent corral, and by a shed located 10 m west of the corral fence. The private road also cuts through the extreme western edge of this midden area. Augering showed a possibly buried midden extending at least 30 more meters to the north of the southern barn/midden area. In auguering hole D located 35 meters northeast of datum, a chert chip was recovered 55 cm below surface and auger hole I near the bay laurel in the pasture revealed a similar midden at 35-55 cm. This buried midden may correspond to the basal component uncovered in Test Unit 1, and indicates an extension of the site to the northeast in its earlier stages.

A large outcrop of basalt boulders is located approximately 10 meters upslope from Hot Springs Road on the eastern edge of the terrace, and has no apparent markings of any type.

Test Unit 1 was placed three meters east of the site datum stake in what was thought to be the deepest part of the midden. This places the unit within the corral. Excavation of this test unit revealed a well-formed midden extending 70 cm in depth. At that point a basal component consisting of sandy clay and a few artifacts was reached.

A large quantity of artifacts was recovered from the midden with chert dominating the debitage counts. Large amounts of obsidian and fire-cracked rock were found and also small amounts of animal bone. The midden seems to have two clusters of tools. The 0-40 cm level contained six reworked bifaces, two scrapers and seven retouched flakes, but only one projectile point. From 40-60 cm two obsidian projectile point mid-sections were recovered. Both chert and obsidian debitage peak between 40-60 cm as well. It is interesting to note that in these same lower levels a large quantity of vesicular basalt was encountered. This type of basalt has not been seen on any previous sites in the Project Area and, in fact, is not known to be



A. Midden; dark brown; granular loam with gravels; annual grass roots; heavy grazing caused surface compaction. Moderately friable.

B. Midden; silty loam; dark brown; friable.

C. Gravels and sand with cobbles; dark yellowish brown; friable.

Figure 9. Son-608 Profile.

Site Son-608 (Alf)

Level cm.	Proj. Pts.	Biface	Reworked Biface	Scraper	Retouch Flakes	Used Flakes	Cores	Debitage	Fired Rock	Animal Bone
0-10					1-c 2-o	1-c	5-c	59-o	76-c	38
10-20			1-o			4-c 1-o		80-c 69-o	65	4
20-30		1-c	1-o		2-c	8-c 2-o		92-c 80-o	62	5
30-40		1-c		1-o		6-c 1-o		125-c 87-o	70	7
40-50	1-o					2-c 5-o		157-c 97-o	53	14
50-60	1-o					3-c	1-c	72-c 44-o	17	4
60-70						3-c		51-c 26-o	15	1
70-80								1-c 6-o		
Totals	2-o	2-c	2-o	1-c 1-o	3-c 2-o	33-c 9-o	1-c	654-c 468-o	320	35
Grand Totals	2	2	2	2	5	42	1	1122	320	35

endemic to this area. Rather, it has been noted as being common in the Clear Lake Region of Lake County, one of the sources of obsidian used by the local Pomo, suggesting that this basalt was obtained at the same time as the obsidian from that area.

The basal component at Son-608 is nearly sterile in artifactual content. For this reason, only 10 cm were excavated into the sandy clay. The bottom of this unit was then augered to a final depth of 150 cm. The 70 cm core consisted of water-worn gravelly sand and contained no artifacts of any type.

No diagnostic artifacts were recovered from the entire depth of Test Unit 1. However, several surface finds were previously collected by Alf and Ann Young, owners. These artifacts have been drawn and photographed and include five Excelsior and leaf-shaped points and point fragments, and a steatite bead. It should be noted that a small unworked piece of steatite was also recovered in the first level excavated in Test Unit 1.

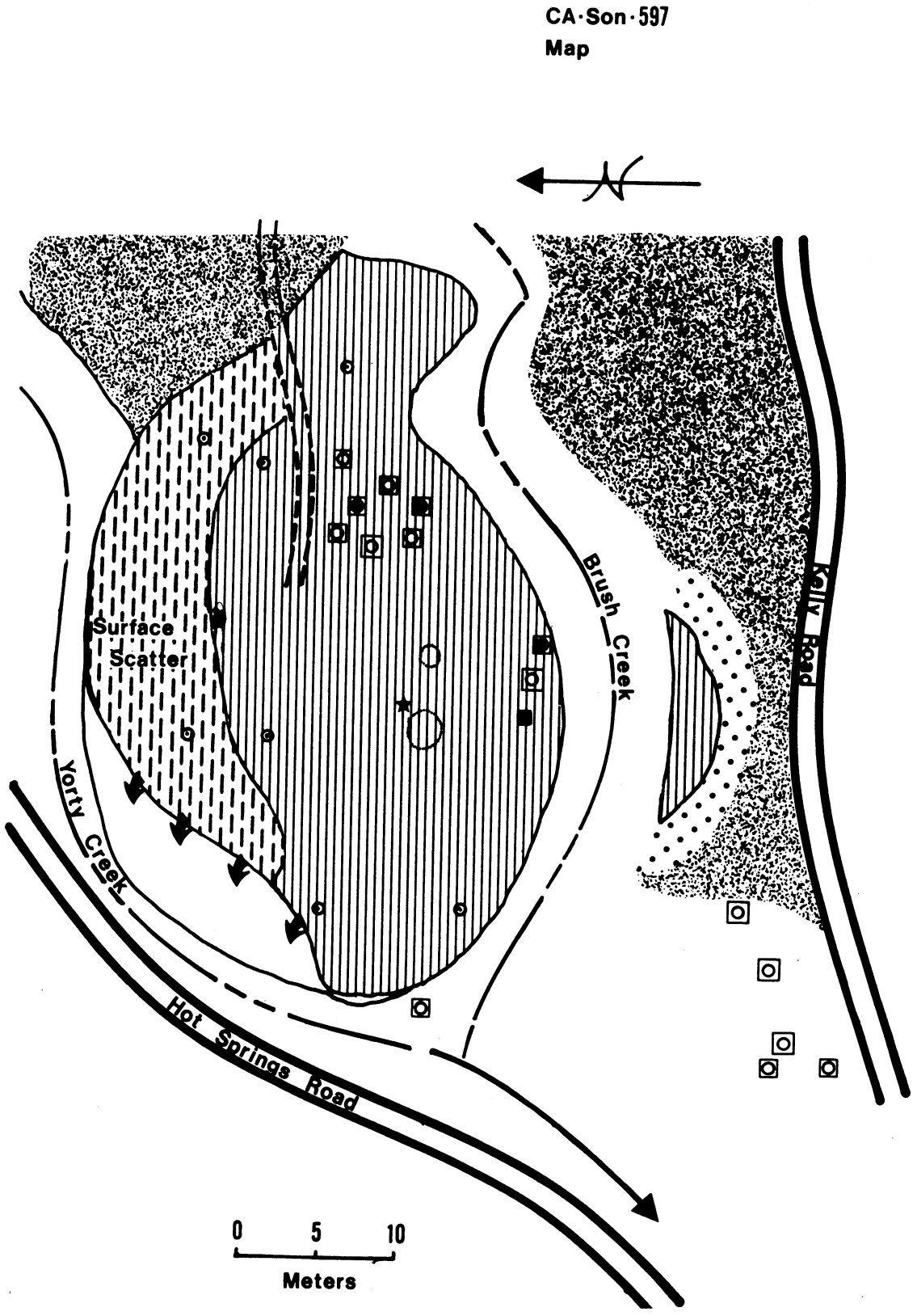
Site Son-597 (Treganza 7)

Son-597 is located on the first terrace at the confluence of Yorty and Brush Creeks. The site is divided into two sections. The main part of the site is bordered by Hot Springs Road and Yorty Creek to the north and by Brush Creek to the south. The second, smaller section of the site is delimited by Brush Creek to the north and by the old stream bed to Brush Creek and Kelly Road to the south. The present course of Brush Creek has destroyed at least a five meter wide strip through the original site.

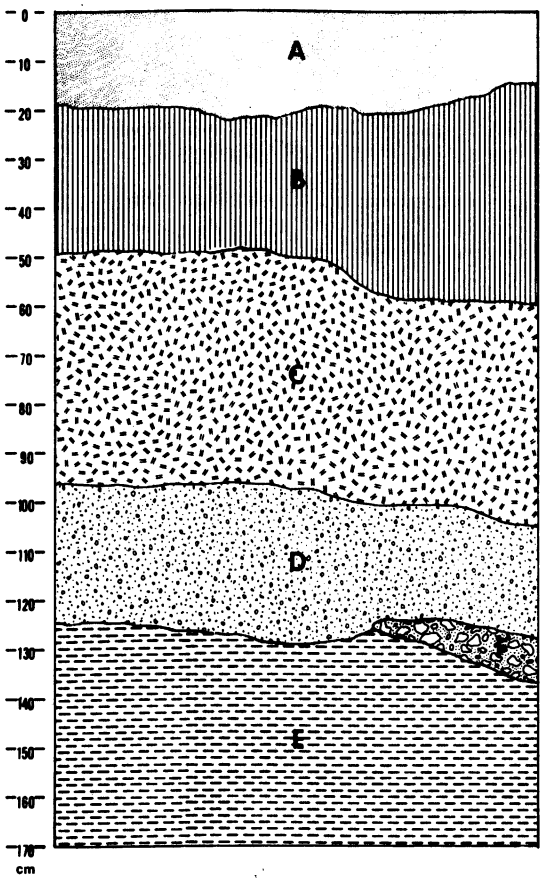
The area of the main section measures approximately 50 by 30 meters and includes most of the promontory left by the convergence of the two creeks. This promontory has open grassland and coverage, with oaks and bay laurels bordering Brush Creek. Wild irises are found on both the eastern and western extremities of the site. A faint jeep trail passes through the center of the main section.

The midden consists of a lower section of a knoll one and a half meters high. On the knoll, two housepit depressions are visible. The larger definite housepit is located on the western part of the knoll, just south of the site datum, and measures approximately 5.5 meters in diameter. The smaller, less distinct housepit is located two meters east of the large housepit and site datum and measures approximately 1.6 meters in diameter. Test Unit 1 was placed 15 meters south of the site datum stake to investigate the area near the housepits.

Excavation of Test Unit 1 revealed three stratigraphic components consisting of dark midden, a transitional zone, and sub-midden levels. The soil from 0-50 cm ranged from black to dark brown and contained the greatest amount of cultural material. Animal bone, fire-cracked rock and obsidian counts reached their peak in the 30-40 cm level, and chert steadily increased to reach its highest quantity in the 40-50 cm level. At their highest points, at least five times as much chert was recovered as obsidian. In this stratigraphic component two possible Excelsior bases (obsidian and quartz) were recovered as well as one triangular straight base chert projectile point.



Map 12. Son-597 (legend p. 5).



A. Midden; annual grass roots; silt with sand and clay; very dark gray to very dark grayish brown. Moderately compact.

B. Midden; brown to dark brown; clayey silt. Moderately compact.

C. Transitional zone. Dark yellowish brown; silt with sand and clay; small gravels. Moderately compact.

D. Sub-midden. Yellowish brown; clay with some sand and silt; small gravels. Compact.

E. Dark yellowish brown; clay; no gravels. Compact to very compact.

F. Gravels and shale. Friable.

Figure 10. Son-597 Profile.

Site Son-597 (Treganza 7)

Level cm.	Proj. Pts.	Biface	Scraper	Used Flakes	Debitage	Fired Rock	Animal Bone
0-10			1-c	1-c 2-o	142-c 41-o	165	4
10-20	1-o			1-c 2-o	63-c 26-o	77	4
20-30				1-c	37-c 19-o	20	2
30-40	1-c			3-c 1-o	87-c 24-o	40	5
40-50	1-c			2-c	131-c 15-o	24	
50-60				2-c	121-c 5-o	10	
60-70	*1-c*			*3-c*	*81-c* 5-o	*12*	
70-80		1-c		1-c 1-o	43-c 2-o		
80-90				2-c	59-c 2-o	5	
90-100				1-c	33-c 1-o		
100-110	1-c			2-c	22-c 1-o		
110-120					6-c 2-o	3	
120-130				1-c	9-c 1-o		
130-140					17-c		
140-150				2-c	11-c 1-o	6	
150-160					5-c		

Totals	4-c 1-o	1-c	1-c	22-c 6-o	867-c 145-o	362	15
Grand Total	5	1	1	28	1012	362	15

In the 50-100 cm levels the soil gradually changed from brown to dark yellow brown and cultural material decreased in quantity. A few gravels began to permeate the otherwise clayey soil in the 80-100 cm levels. The only tools found in these levels were projectile point tip and one bifacially retouched chert knife tip.

The 100-150 cm levels again showed a lightening in soil color, changing from dark yellow brown to brown. In this sub-midden component a heavy gravel lens intruded at the 120-140 cm levels, after which gravels nearly disappear. Also, at 120-130 cm the clay content of the soil greatly decreased perhaps indicating a division within the component. Animal bone, fire-cracked rock and obsidian all but disappear in the gravel intrusion. Chert, on the other hand, seems to peak briefly at the end of the gravels and continues to predominate down to the 160 cm. level. Unfortunately, diagnostic tools of any type are absent from this sub-midden component. The last excavated level, 160-170 cm, was sterile.

Site Son-592 (Treganza 2)

Son-592 is located on a primary terrace on the east bank of Dry Creek, approximately 220 meters south of the confluence of Yorty and Dry Creeks. It is a surface site located approximately 300 m upstream from Son-541, another surface site on the west bank.

This site was relocated using Treganza's San Francisco State College Survey notes during the survey phase of the Warm Springs Archaeology Project. The site was listed as a surface site located on a terrace with open grassland cover and consisting of a sparse scatter of chert and obsidian flakes covering an area measuring 40 by 20 meters. The alluvial silt covering this terrace remained consistent in the area of surface scatter and in the surrounding areas. A series of five auger holes were placed on this terrace to test the site for possible subsurface midden. The holes were placed 20 meters south of site datum; 20, 40, and 80 meters north of datum and 20 meters west of datum. None of the five auger holes revealed sub-surface midden of any kind.

This site remains then, a surface site which has been greatly disturbed by both modern activity and erosional activities of Dry Creek. The site still has evidence of discing and five apple trees are located approximately 60 meters due east of site datum. A modern wire fence runs perpendicular to Hot Springs Road 2 meters west of these apple trees and forms the eastern boundary of this site. Just west of the apple trees and the wire fence are sheep pens enclosed by wire fencing. A gate leading onto the terrace is located approximately 10 meters north of the sheep pens. A second wire fence runs parallel to the creek and is located on the cut bank of that creek. This fence forms the western boundary of this site. A small intermittent tributary runs parallel to Hot Springs Road, connecting the two wire fences and forming the northern boundary of Son-592. Oak trees line both this intermittent stream and Dry Creek, just west of the second wire fence.

Site Son-541 (Terry's Terrace)

Son-541 is located on a second terrace on the west side of Dry Creek, approximately 120 meters downstream and southwest of the confluence of Yorty

and Dry Creeks. It is located on the part of Dry Creek that connects the Upper Dry Creek drainage with the Lower Dry Creek drainage and is just downstream from Son-592, another surface site on the east bank of this same central section of Dry Creek.

This site has open grassland cover with isolated oaks and willows both on the site and on the bank of the terrace above Dry Creek. Dry Creek curves around the site and forms the northern and eastern boundaries of this terrace. A jeep trail runs parallel to Dry Creek (eastern part), bisecting this terrace. This jeep trail forms the western boundary of Son-541, and probably did some damage to the site during its construction. A further indication of modern disturbance is evidenced by a small corral located approximately 5 m northwest of site datum.

During survey the site was located and found to contain both midden indications and a housepit, approximately 2 meters in diameter. A scatter of artifacts enclosed an area 10 meters square around the housepit and midden area. A 20 meter square area on the bank of this terrace seemed to have a concentration of chert flakes. A series of seven auger holes were placed on this terrace to test the extent and depth of the midden component. It was found that only one hole (C) contained cultural material and flakes from this auger testing only extended in depth to 20 cm. The rest of the terrace seems to have only surface scatter.

Eastern Group Chronology

We follow procedures similar to that of the Western Group here and in addition we have two radiocarbon determinations here which we evaluate in discussing the following site.

Site Son-593

We evaluate the two sections of this site separately. The south, actually southwest, midden to judge from the one small side notched projectile point (Fig. 24c) and from the well-preserved housepits on the surface is very late and we attribute it all to the late Houx Aspect.

The north or northeast midden is more complicated. There are two breaks in the chert-obsidian ratios, one at 70 cm and the other at 110 cm depths. These two points also coincide with changes in the character of the midden (see profile). The top 70 cm has the following artifacts: a Gunther point at 50-60 (Fig. 24f), a large Excelsior point at 30-40 (Fig. 24e), and 2 large pestle fragments in the 10-20 cm level. The Gunther point, which indicates late Houx, is thus below the large Excelsior point which would be early Houx at latest; thus one of the two is out of place. We are inclined to attribute the top 70 cm to late Houx (we were so inclined even before our radiocarbon determinations came in). This puts the 70 to 110 cm level in early Houx and material below that in the Borax Lake Aspect.

We have two radiocarbon dates from this site as follows:

UCR-352	Charcoal lump from the 90-100 cm level	1710 + 150 AD 200
UCR-351	Charcoal from hearth in 160-170 cm level	4720 + 240 2770 BC

Thus the 160-170 cm hearth is on the borderline between early and late Borax Lake and we therefore feel the very bottom of the site (but we don't know how much) represents early Borax Lake Aspect. If this analysis is correct then all four of Fredrickson's late phases are present in this site. Incidentally these two radiocarbon dates corroborate or at least do not conflict with, Fredrickson's scheme.

Site Son-582

Both the chert-obsidian ratios and other changes in chipping waste (see site description) indicate a possible cultural change at the 80 cm level. The upper 80 cm seems definitely attributable to the late Borax Lake Aspect on the basis of the two large Excelsior points (Fig. 24a, b) and the two possible milling stone fragments. We therefore attribute the bottom portion to early Borax Lake.

Site Son-608

There is no noticeable break in chert-obsidian ratios nor any in the midden at this site. The excavated portion therefore seems to be one component which, on the basis of large Excelsior points from the surface we attribute to late Borax Lake. The surface finds mentioned in the site description suggest that the site may have other components distinct from this.

Site Son-597

There is a break in debitage ratio and also in the midden at 50 cm depth. On the basis of the single large Excelsior point in the 40-50 cm level (Fig. 24i) we attribute the top 50 cm to late Borax Lake and therefore the bottom to early Borax Lake.

Eastern Site Group

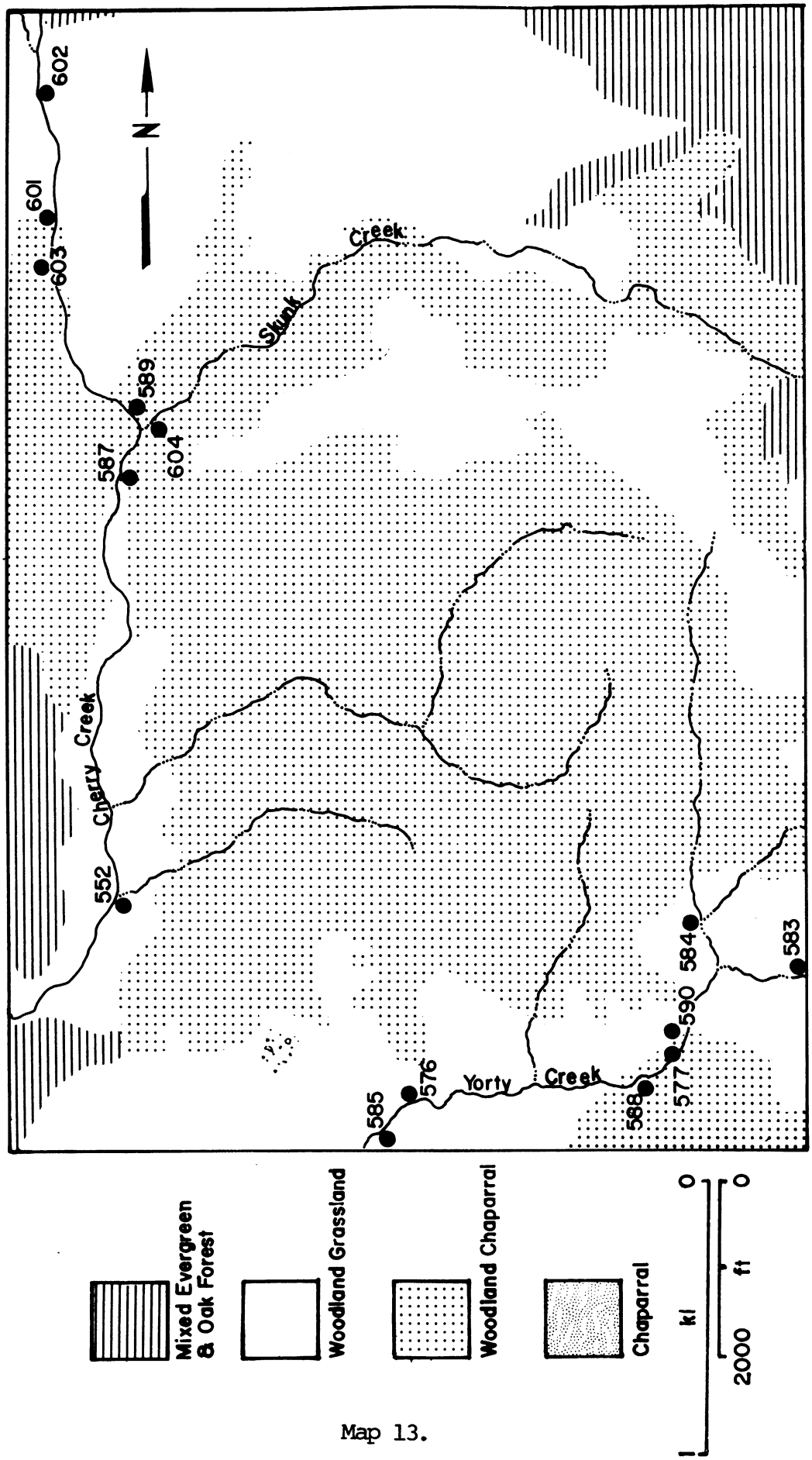
Chert to Obsidian Ratios of Debitage (by period)

Period	Site CA-Son				
	593-1	593-2	582	608	597
Hb	0-50 0.61 (79)	0-70 0.12 (1043)			
Ha		70-110 0.50 (257)			
BLb		110-180 7.50 (51)	0-80 1.58 (867)	0-80 1.40 (1122)	0-50 4.47 (711)
BLa		180-220 7.00 (24)	80-110 4.00 (60)		50-160 19.07 (301)

Eastern Site Group

Chert - Obsidian Debitage Ratios by Site and Level

Level cm.	Site CA-Son				
	593-1	593-2	582	608	597
0-10	1.00(24)	0.15(82)	1.03(59)	1.29(135)	3.46(183)
10-20	0.64(36)	0.18(84)	1.43(114)	1.59(149)	2.42(89)
20-30	0.17(14)	0.16(142)	1.25(79)	1.15(172)	1.95(56)
30-40	0.33(4)	0.10(138)	1.30(115)	1.44(212)	3.63(111)
40-50	* (1)	0.07(190)	2.14(166)	1.62(254)	8.73(146)
50-60		0.12(213)	1.17(117)	1.64(116)	24.20(126)
60-70		0.13(174	1.95(121)	1.96(77)	16.20(86)
70-80		0.36(95)	2.00(75)	0.17(7)	21.50(45)
80-90		0.70(73)	3.09(45)		29.50(61)
90-100		0.38(51)	13.00(14)		33.00(34)
100-110		0.71(41)	* (1)		22.00(23)
110-120		12.00(13)			3.00(8)
120-130		2.67(11)			9.00(10)
130-140		8.00(9)			* (17)
140-150		* (2)			11.00(12)
150-160		* (3)			* (5)
160-170		4.00(5)			
170-180		* (8)			
180-190		2.67(11)			
190-200		* (4)			
200-210		* (9)			
210-220		* (5)			



CHERRY AND YORTY CREEK GROUPS ARCHAEOLOGICAL SITES & VEGETATION TYPES

Map 13.

Yorty Creek Group Description

This small group of seven sites is one of considerable importance - it has deep gravel components which potentially are of great antiquity. Unfortunately we have been unable to date them as yet; there is no charcoal from them and geologists have not studied them intensively.

Yorty Creek is a minor tributary of Dry Creek and therefore the valley it has excavated is narrower and less suitable to habitation. It widens slightly where site Son-576 is located and then again upstream at Son-584 and 583. The reconstructed vegetation here is virtually all woodland-grass or woodland-chaparral, mostly the latter (Map 13). This presumably makes this prime land for deer but no specialization toward hunting is evident in the archaeology. We again find the situation that the total area is so small that topography may be the most important element of the immediate environment.

Site Son-585 (Yorty Cupule Rock)

Son-585 is located in the creek bed of Yorty Creek on a gravel bar, approximately 20 meters north of Hot Springs Road. It is about 150 meters west of the sheep shearing station and pens near the midden site of Son-576. Both these sites seem to be isolated in the central section of the Yorty Creek drainage that is encompassed in the Project Area.

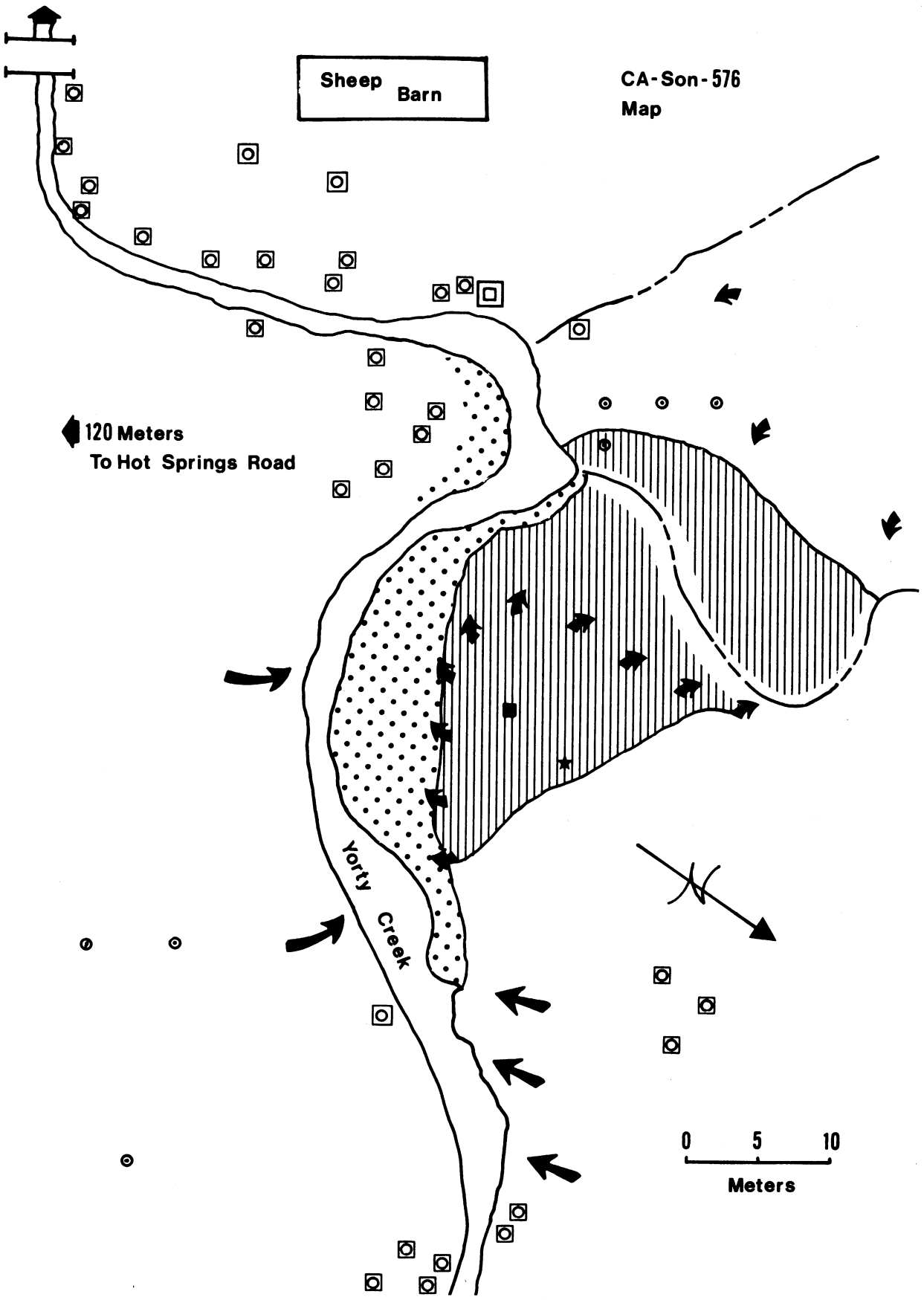
Son-585 is a petroglyph site consisting of a single large rock with approximately 98 pecked cupules on its surface and sides. A great amount of stream erosion has taken place in the area of this boulder. It is located on the very tip of a small gravel bar in the center of Yorty Creek, which reaches a maximum width of 4-5 meters and extends upstream approximately 25 meters. Yorty Creek runs to the north of this bar. The terrace to the south and east of the cupule rock has been eroded to three separate levels. No midden is apparent in the cut banks.

During the field reconnaissance phase, a chert biface fragment was found just west of the petroglyph in the stream gravels. Two large chert cores were also found both upstream and downstream from the petroglyph. At that time a series of five auger holes were placed on each of the first terraces around the petroglyph. No midden or cultural material of any type was recovered from this testing.

Site Son-576 (Sheep Shearing Station)

Son-576 is located on the north bank of Yorty Creek, 120 meters north of Hot Springs Road. It covers the lower terrace of a promontory formed by the erosive and depositional patterns of Yorty Creek. The site is bisected by an unnamed intermittent tributary which drains west of this main promontory. The midden is on a first terrace which slopes steeply down to a gravel bed at the foot of the promontory.

A steep stream cut bank is located on the south side of Yorty Creek and is bordered by a wire fence. Just west of the promontory Yorty Creek runs sharply south, towards Hot Springs Road. On its western bank a wooden fence encloses a sheep shearing station with several corrals and out buildings (50 meters south of the site). Between this sheep station and Hot Springs Road,



Map 14. Son-576 (legend p. 5).

Yorty Creek swings along an east/west line again. A bridge crosses the creek at this point and allows a dirt road to connect the sheep station and Hot Springs Road.

The area of Son-576 has open parkland vegetation with scattered clusters of live oaks. It is notable that in this area there is a preponderance of valley oaks found around the central section of the Yorty Creek drainage.

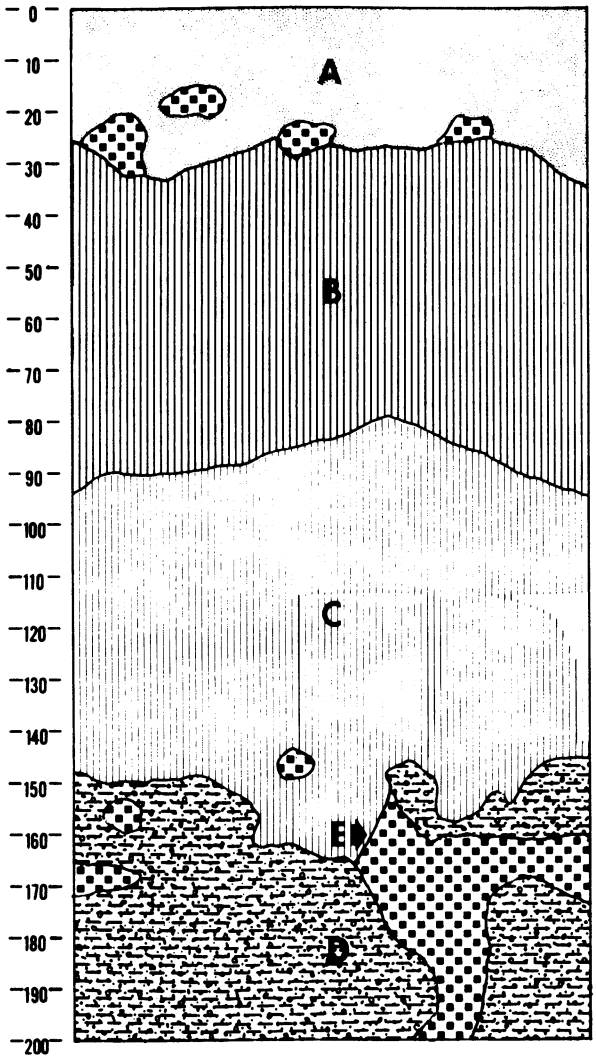
The midden consists of black gravelly loam and can be visually distinguished from the dark tan gravelly loam of the surrounding areas. A series of 19 auger holes were placed both near Son-576 and in the neighboring fields to test the extent of the known midden and to explore for areas of buried midden. Only one of these borings definitely produced midden; an auger hole located just west of the intermittent drainage and approximately 2 meters upslope from Yorty Creek had evidence of midden. From 32-102 cm fire-cracked rocks and heavy charcoal concentrations were noted indicating well-formed midden deposits within those depths. However, those placed west and north of this proved to contain only alluvium with slight traces of charcoal. Thus, it is known that the intermittent stream bisects the midden, but that this midden does not extend as far west as a second seasonal drainage (15 to 30 m west of the first drainage).

Test Unit 1 was placed 3 meters south of the site datum stake, in the center of the promontory. Excavation of this unit revealed that 20-30 cm of recent overburden covers this promontory. The first 20 cm of soil is red/brown and shows signs of disturbance. At the 20 cm level a transitional zone is apparent. The next ten centimeters seem to be basically midden-like with some mottling and rodent activity. From the recent and transitional levels only one tool was recovered, a small leaf-shaped green chert projectile point dated to a late period. Moderate amounts of lithic debitage, animal bone and fire-cracked rock were also found.

A well-developed midden deposit underlies the recent overburden (30-140 cm). This midden has been stratigraphically divided into two different zones on the basis of the clay content of the soil, which greatly increased with depth. However, both zones consisted of black, greasy silt and differed in color only by one half of a chroma.

Heavy concentrations of gravelly clay began to appear at 130 cm; by the next level the entire eastern half of the unit consisted of this material; and by 150-160 cm gravelly clays dominate the whole unit, with only small pockets of midden. Thus, 140-180 cm has been called a transitional zone and represents the bottom of the second midden component. No diagnostic tools were recovered from these levels, but two separate hearths of some size were found. Feature I measured 25 cm by 32 cm, was located in the southwest corner of the unit, and was surrounded by several fire-cracked rocks. The lowest depth of this fire pit was 165 cm. Feature II, the larger of the two hearths, measured 33 cm by 38 cm. It was found in the center of the east wall and consisted of many fire-cracked rocks although it was not surrounded by them. The bottom of this pit was at a depth of 175 cm. Fire unutilized chert and obsidian pieces came from this second hearth as well as six pieces of burnt bone. A charcoal sample from this hearth was submitted for radiocarbon dating.

The last component at Son-576 consists of gravelly clays and is nearly



A. Midden; slopewash deposits; dark reddish brown; granular loam. Friable.

B. Midden I; black, greasy loam with small angular gravels. Friable.

C. Midden II; very dark grey; clayey loam with small angular gravels. Moderately friable to moderately compact.

D. Transitional zone. Brown to dark brown; clay with subangular gravels and sand; shale and pebbles. Compact.

E. Rodent disturbance; krotovina.

Figure 11. Son-576 Profile.

Site Son-576 (Sheep Shearing Station)

Level cm.	Proj. Pts.	Bifaces	Retouch Biface	Scrapers	Retouch Flakes	Used Flakes	Cores	Debitage
0-10						2-c		47-c
						1-o		7-o
10-20	1-c					1-c		17-c
						1-o		10-o
20-30						1-c		44-c
						1-o		12-o
30-40					1-c	3-c		60-c
						1-o		14-o
40-50						3-c	3-c	57-c
								12-o
50-60					1-c	1-c	1-c	47-c
								23-o
60-70				2-c	1-c	1-c	2-c	31-c
	1-o					2-o		16-o
70-80						1-c		20-c
	1-o					1-o		23-o
80-90						1-c		27-c
								27-o
90-100						2-c		53-c
						3-o		7-o

Site Son-576 (Sheep Shearing Station) cont.

Level cm.	Proj. Pts.	Bifaces	Rework Biface	Scrapers	Retouch Flakes	Used Flakes	Cores	Debitage
100-110		1-c				2-c		5-c
	1-o					1-o		1-o
110-120						2-c		18-c
								37-o
120-130						2-c	2-c	36-c
						1-o		51-o
130-140								20-c
			1-o			2-o		26-o
140-150								10-c
			1-o		1-o	3-o		29-o
150-160						1-c		9-c
						1-o		9-o
160-170								8-c
						1-o		3-o
170-180						1-c		2-c
180-190								1-c
								3-o
Total	1-c	1-c		2-c	3-c	24-c	8-c	512-c
	3-o		2-o		1-o	19-o		310-o
Grand Total	4	1	2	2	4	43	8	822

Site Son-576 (Sheep Shearing Station)

Level cm.	Pestle	Fired Rock	Animal Bone	Historical Material
0-10		30	1	shell casing
10-20		40	10	
20-30		?	18	
30-40	1	200	21	
40-50		200	31	
50-60		70	15	
60-70		70	45	
70-80		100	21	
80-90		130	41	
90-100		130	61	
100-110		145	78	
110-120		90	45	
120-130		110	76	
130-140		40	72	
140-150		20	36	
150-160		15	20	
160-170		20	37	
170-180		7	8	
180-190		1	2	

sterile. There were no tools among the few specimens recovered here, only debitage, fire rock, animal bone, and one used flake. Heavy rodent activity in the two levels excavated into the clay obscured the unit and made it impossible to tell if the debitage and other items were intrusive. At two meters excavation of this unit ceased. An auger boring was made to the water table at 270 cm. The auger showed that charcoal flecks were present at least to a depth of 265 cm.

Site Son-588 (Live Oak Housepit)

Son-588 is located on a low secondary terrace on the south bank of Yorty Creek, approximately 1/2 mile from where the eastern edge of the Project Area boundary crosses Yorty Creek. It is on a promontory formed by the confluence of Yorty Creek and an unnamed intermittent stream. It is also approximately 150 meters southwest of site Son-577.

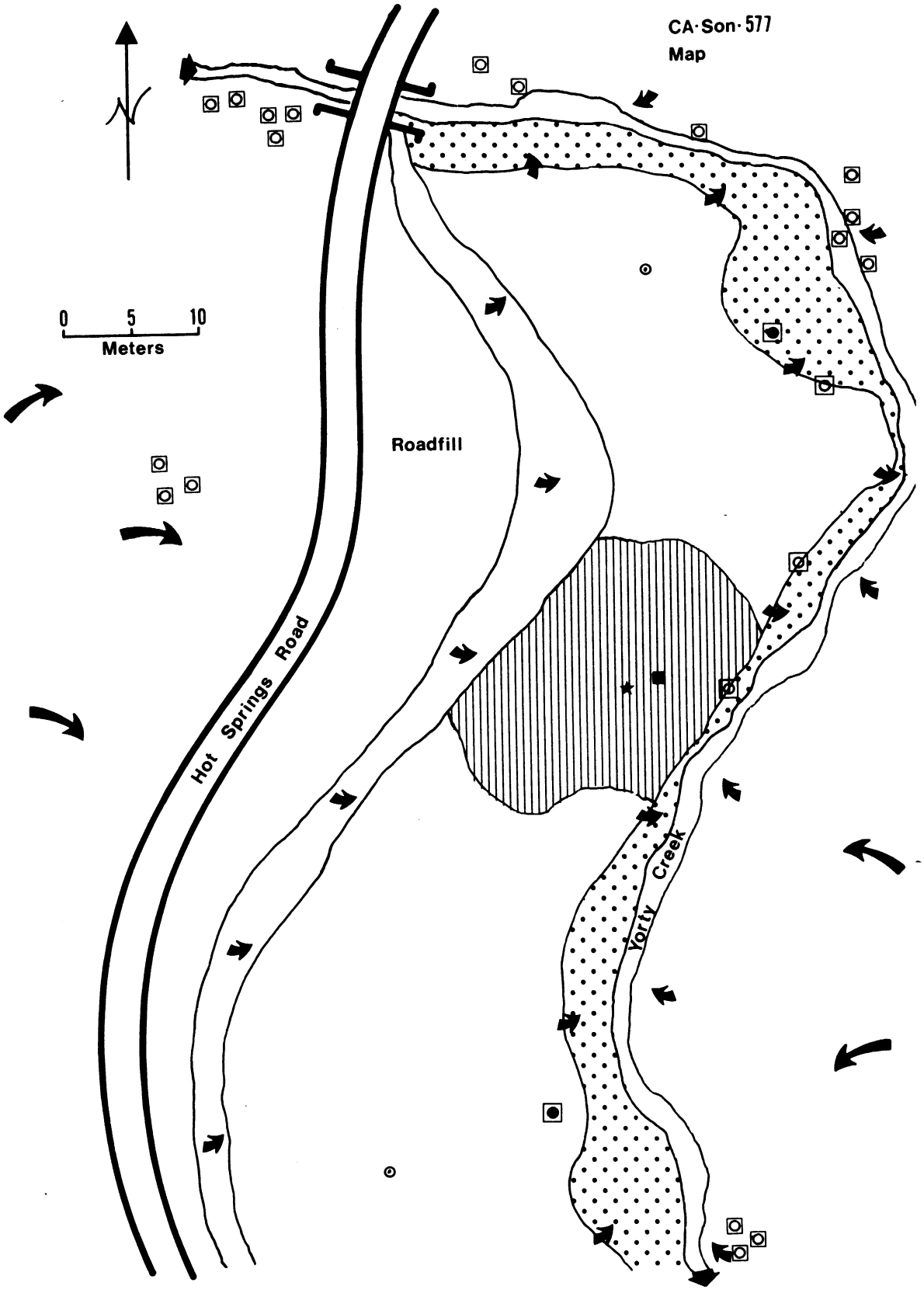
The site is a housepit site consisting of a well-defined housepit with a large live oak growing from the back wall. It is located on a gently sloping grassy slope that has evidence of deforestation. This housepit measures 8 meters by 7 meters by 1.5 meters in depth, and has a distinct square entrance off its northwestern side. A chert scraper, an obsidian flake, a chert flake, 3 square nails, window glass fragments, 1 wire nail, 44 caliber shell casings, an old ceramic bottle cap and window glass pieces were all found on the surface of the housepit. Trowel exploration of this surface and augering around the housepit revealed no evidence of midden.

This site is extremely interesting because of its close proximity to Son-577 which has no housepits but is a deep midden site. It undoubtedly represents a house of very late, probably historic or even late historic (1850's?) date. It is a possible indication of Indian presence in the North Section into the American period, a presence for which there is no historic or ethnographic evidence.

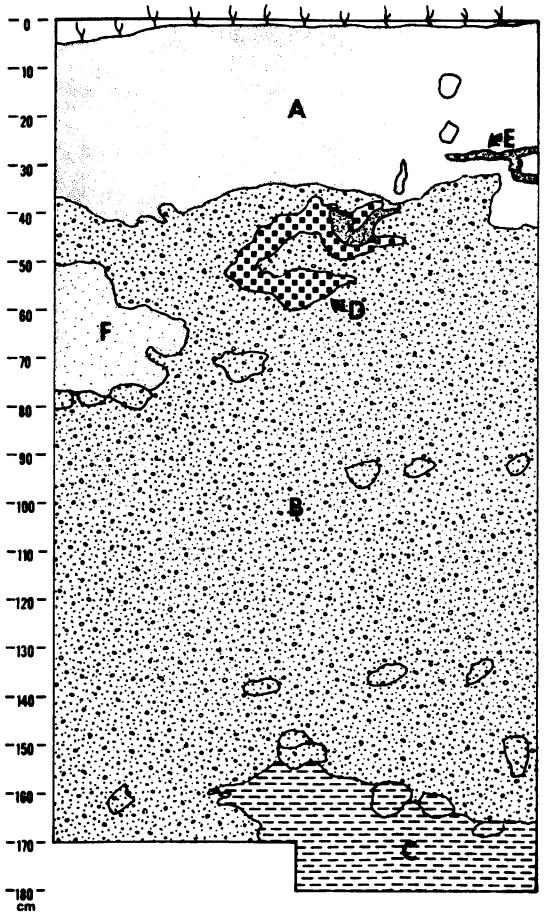
Site Son-577 (Touchdown)

Son-577 is located on the first alluvial terrace on the west bank of Yorty Creek, east of Hot Springs Road. A large turnout area adjacent to Hot Springs Road is about equal in size to the area of the site and entirely covers the western section of Son-577. This site has also suffered from intense stream erosion along its entire eastern perimeter. During survey, chert debitage was found approximately 15 m northeast of the main site area on the opposite stream bank in the gravels. It was thought that this cultural material may have eroded out of the eastern bank of Yorty Creek and that the creek actually bisected Son-577. Erosion by Yorty Creek in this area is so intense that these artifacts have now disappeared.

The site has open grassland cover with a sparse scattering of oaks and bay laurels on its eastern edge, along Yorty Creek. The midden of Son-577 is a black sandy loam. The extent of this midden is delineated by the dark brown alluvium of the surrounding areas. Two auger holes placed north and south of the midden area revealed no buried midden components, thus, delimiting the area of midden to a 20 m by 40 m section of the terrace.



Map 15. Son-577 (legend p. 5).



A. Midden; very dark gray; loam with angular pebbles and small cobbles. Friable.

B. Dark grayish brown; coarse sandy gravels with clay; rounded pebbles and cobbles. Friable to compact.

C. Dark brown to dark yellowish brown; sandy clay; friable.

D. Krotovina disturbance.

E. Ash and charcoal deposit.

F. Dark grayish brown; sand without gravels; friable.

Figure 12. Son-577 Profile.

Site Son-577 (Touchdown)

Level cm.	Biface	Scraper	Retouch Flakes	Used Flakes	Core	Debitage	Fired Rock	Animal Bone
0-10				1-o		33-c 6-o	50	1
10-20			1-o		2-c	47-c 3-o	75	3
20-30				2-c		47-c 2-o	90	20
30-40				1-c		21-c 1-o	?	7
40-50				2-c		15-c	60	4
50-60				2-c		13-c	30	
60-70				2-c		5-c	10	
70-80				3-c		6-c	10	
80-90		1-c		1-c		5-c		
90-100	1-c		5-c		1-c	7-c		
100-110					1-c	3-c		
110-120			1-c	4-c		9-c		
120-130			1-c	7-c		9-c		
130-140				4-c		6-c		
140-150		1-c		4-c	1-c	12-c		
150-160				1-c		3-c		
160-170						1-c		
170-180						1-c		
Totals	1-c	2-c	7-c 1-o	33-c 1-o	5-c	243-c 12-o	325	35
Grand Totals	1	2	8	34	5	255	325	35

No housepits or other cultural features are evident on this terrace. The test Unit was, therefore, placed in the center of the midden concentration 2 m east of the site datum stake, on the north side of the east/west transect passing through the datum.

Excavation of Test Unit 1 revealed a well-developed but shallow midden overlying more than a meter of gravels with cultural material. The soil to about 30 cm was a dark grayish-brown midden with subtle lighter mottling. Animal bone, fire-cracked rocks and chert all reached their highest quantities in this component. Obsidian artifacts were rare. No projectile points or ground stone tools were recovered from Test Unit 1.

In levels 30-50 cm mottling by lighter soils became much more distinct and prevalent. Since midden pockets were still continuing into the mottled soil, these two 10 cm levels were called transitional. However, it is now clear from the stratigraphic profile that much of the mottling in this component and below 50 cm was due to krotovinas and an isolated sand intrusion. Thus, 30-80 cm should be considered as transitional component between the midden and the gravels. This transitional zone, then, contains mottled brown soil with midden pockets and a high proportion of gravels. In this stratigraphic zone all artifacts decrease in quantity. At 50 cm obsidian disappears and at 60 cm animal bones do the same. Chert remaims continuous in small amounts, as does fire-cracked rock.

At the 80 cm level, all intrusions described above are absent and it is safe to say that a pure gravel component begins. Also at this level, the soil becomes slightly lighter and the clay content noticably increases. The gravel component at Son-577 is quite extensive, continuing at 210 cms. This gravel zone is characterized by a distinct change in artifacts. Nearly every piece of chert recovered is large scale, percussion flaked, and exhibits some form of retouch or utilization. Tools tend to be quite informal consisting mostly of heavily retouched flakes; two scrapers and seven retouched flakes were recovered from this gravel component. 18 flakes were heavily utilized and three of the four cores recovered had at least one edge retouched.

Soil from the 0-20 cm levels was dry screened next to the unit. At this level, however, the clay content of the soil made sorting difficult. Therefore, from 30 cm to the end of the unit, the soil was wet screened. The material was washed in 1/4" screens next to the unit by using water pumped from Yorty Creek and spray nozzles attached to the hoses. The 170-180 cm level consisted of excavation only from the eastern half of the unit. At this point excavation became difficult because of ground water percolation. The unit was then augered to 210 cms. Gravels continued at least to that depth.

Site Son-590 (Grindstone)

Son-590 is a petroglyph site consisting of two rocks with approximately 20 shallow, 5-10 cm long grooves. These rocks are located in the stream bed of Yorty Creek, 10 meters west of, and 7 meters below Hot Springs Road. They are 70 meters north of the point where Hot Springs Road first crosses Yorty Creek, and are located in a v-shaped canyon, almost in the actual flowing creek. The rocks cover an area measuring approximately 3 meters square, and is on alluvial sandy silt.

This site is about 300 m downstream from Son-584 (quarry, midden). It's actual association with either of these sites is questionable at present. No artifacts were found with these rocks and no augering of the immediate area was possible due to the position of Son-590. These petroglyphs are extremely interesting because of their decorations. Ethnographic information has indicated that petroglyphs with cupules ground on their surface and sides were used by the Pomo women as fertility rocks.

Site Son-584 (Yorty Quarry)

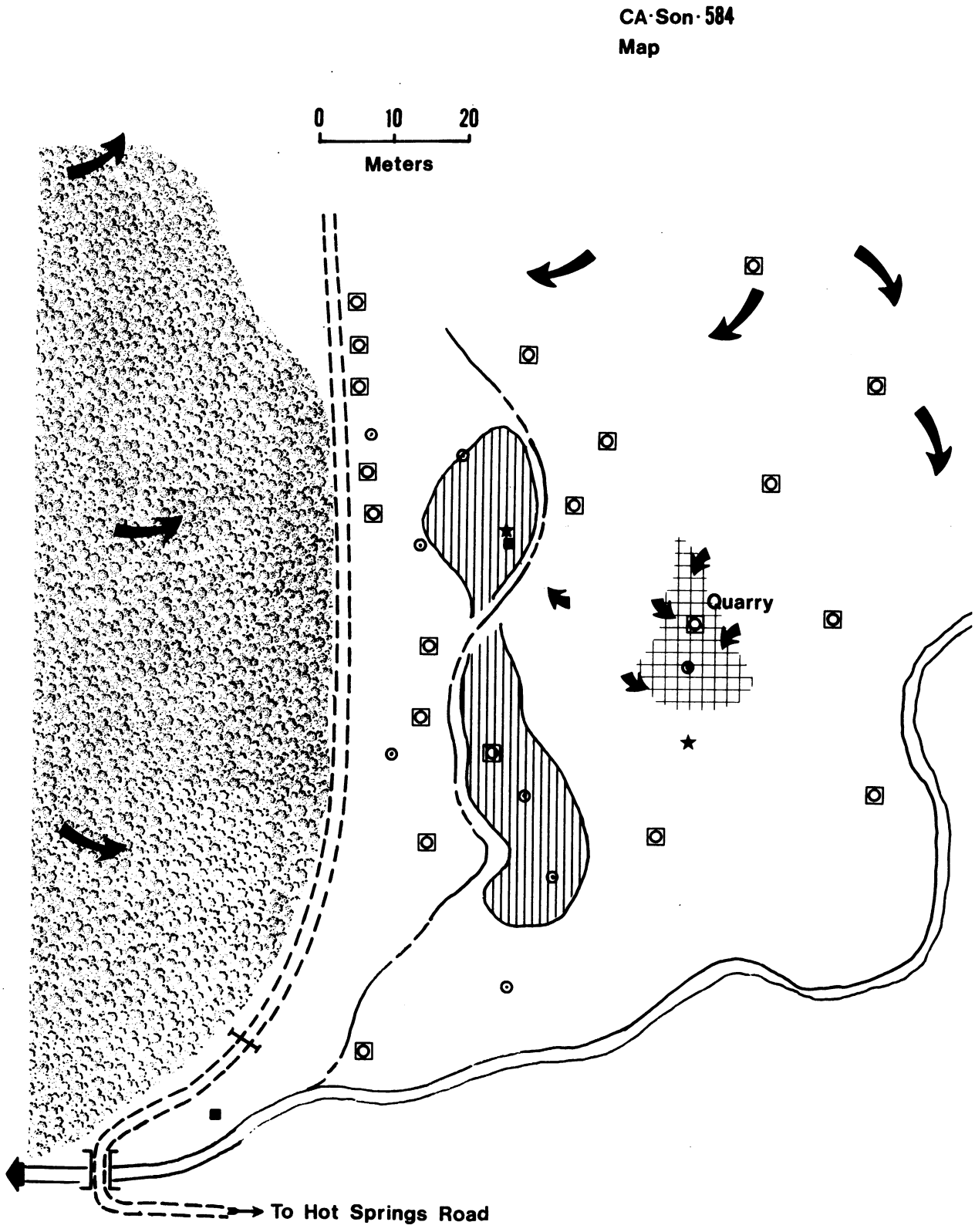
Son-584 is a midden site associated with a quarry. It is located on a primary terrace on the north bank of Yorty Creek and bisected by an intermittent tributary of Yorty Creek. Even though there are two midden areas separated by the tributary, and also a quarry, only one unit was excavated at this site due to the pressure of time.

The artifact bearing strata, as exemplified by the excavated unit and stream cuts, are 80-90 cm deep. As shown by the excavation, there are two definite components at this site, and there may be three. From 0-40 cm, there is a late component that is defined by two small corner notched points, a pestle fragment, and a much higher ratio of chert artifacts to obsidian artifacts. There is also in this late component a possible living surface on which were found many chert tools. This surface was at a depth of 23 cm to 32 cm in the east wall of the unit. This reading corresponds to the present slope of the ground.

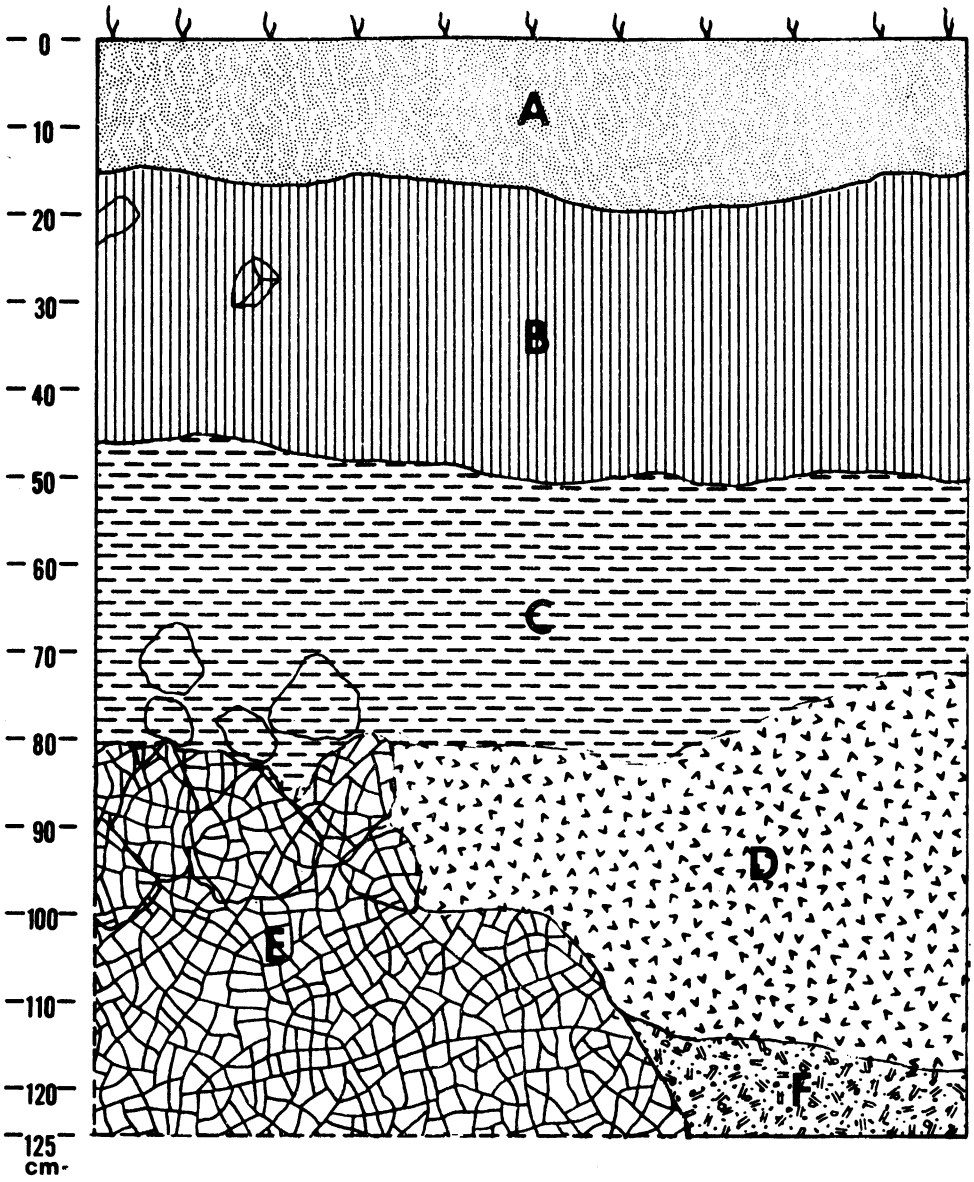
There may be a middle component at Son-584 but it was very poorly defined in Test Unit 1. It may extend from 40 cm to as much as 80 cm and is defined at Unit 1 only by an increase in the use of obsidian so that there is nearly a 1 to 1 ratio between chert and obsidian.

The lowest cultural component was also poorly developed in this unit. We would have expected a gravel layer here to judge from nearby sites but the gravel was found only in the west third of the unit and was replaced elsewhere by nearly sterile clay. The industry in this gravel component characteristically consists of large, percussion flaked chert artifacts. Elsewhere in the immediate area of Son-584, the gravel layer may be seen nearby in stream cuts where it averages 50 cm in thickness. There was an especially rich concentration of chert artifacts in the gravel layer on the NW side of the confluence of Yorty Creek and the tributary which cuts through Son-584, including two cores, two flakes, one of which was retouched, and a bifacially worked tool. None of the artifacts found in this gravel layer is water worn and there is no evidence of their having been redeposited. Augering in the area just S of the quarry showed the gravels at 70-110 cm indicating the gravel component is well represented at the site, although there were only traces in the stratigraphic sequence in Test Unit 1.

Son-584 has a geographic setting similar to Son-583 and Son-576, i.e., it is on a primary terrace on the N bank of Yorty Creek and situated right on the confluence of Yorty Creek and an intermittent tributary. Son-584 is located on the last wide, flat expanse of land along Yorty Creek, before that creek narrows and steepens up to its headwaters. It is then similar to Son-576 in being adjacent to a large, flat area of floodplain.



Map 16. Son-584 (legend p. 5).



A. Brown to dark brown; silty clay; annual grass root zone. Compact.

B. Midden; clayey silt; very dark gray to very dark grayish brown; moderately compact.

C. Dark brown; clayey gravels, compact.

D. Dark gray to very dark grayish brown; silty clay with gravels. Compact.

E. Very dark gray; sandy gravels with clay and silt. Very compact.

F. Bedrock; decomposing shale.

Figure 13. Son-584 Profile.

Site Son-584 (Yorty Quarry)

Level cm.	Proj. Pts.	Rework Biface	Scraper	Retouch Flakes	Used Flakes	Core	Debitage	Pestle	Fired Rock	Animal Bone
0-10							1-c		1	
10-20					4-c	1-c	46-c 6-o		70	1
20-30	1-c			3-c	11-c	2-c	106-c	1	85	16
		1-o	1-o	1-o	4-o		21-o			
30-40							68-c		60	9
	1-o						39-o			
40-50					3-c	1-c	32-c 21-o		70	18
50-60					1-c		29-c		70	15
					1-o		33-o			
60-70					1-c		26-c		20	4
					1-o		16-o			
70-80							19-c			6
					1-o		8-o			
80-90							14-c 8-o			13
90-100							6-c 4-o			9
100-110							2-c 1-o			

110-120							1-o			1
Totals	1-c 1-o	1-o	1-o	3-c 1-o	20-c 7-c	4-c	349-c 158-o	1	376	92
Grand Totals	2	1	1	4	27	4	507	1	376	92

The stratigraphic sequence for this area consists of 1-2 m of fine textured sands and silts which include midden deposits, underlain by less than a meter of sandy, clayey, coarse well-rounded stream gravels, then shale bedrock.

The quarry associated with Son-584 is found on the hillslope just 20 m north of the surface midden area. The greatest concentration of cores, flakes and chunks in the quarry are found in an area of recent slumping where these buried artifacts are now exposed and appear to be emerging from the hillside. The chert is a locally derived red and green banded chert but the actual source of the quarry has not been found yet, and may also, along with most of the artifacts, be buried.

The area of Son-584 is one of open oak woodland, with Oregon oak and live oak being the dominant trees. Recent deforestation has reduced the number of trees which would naturally occur here. A hundred meters down Yorty Creek from the site, the valley of Yorty Creek steepens and narrows for the next 400 meters. In this steep valley the vegetation is open of dense oak-madrone forest with a few Douglas fir present.

Yorty Creek and the unnamed tributary running through the site provide easily accessible water sources. However, both these streams probably dry up during some summer months.

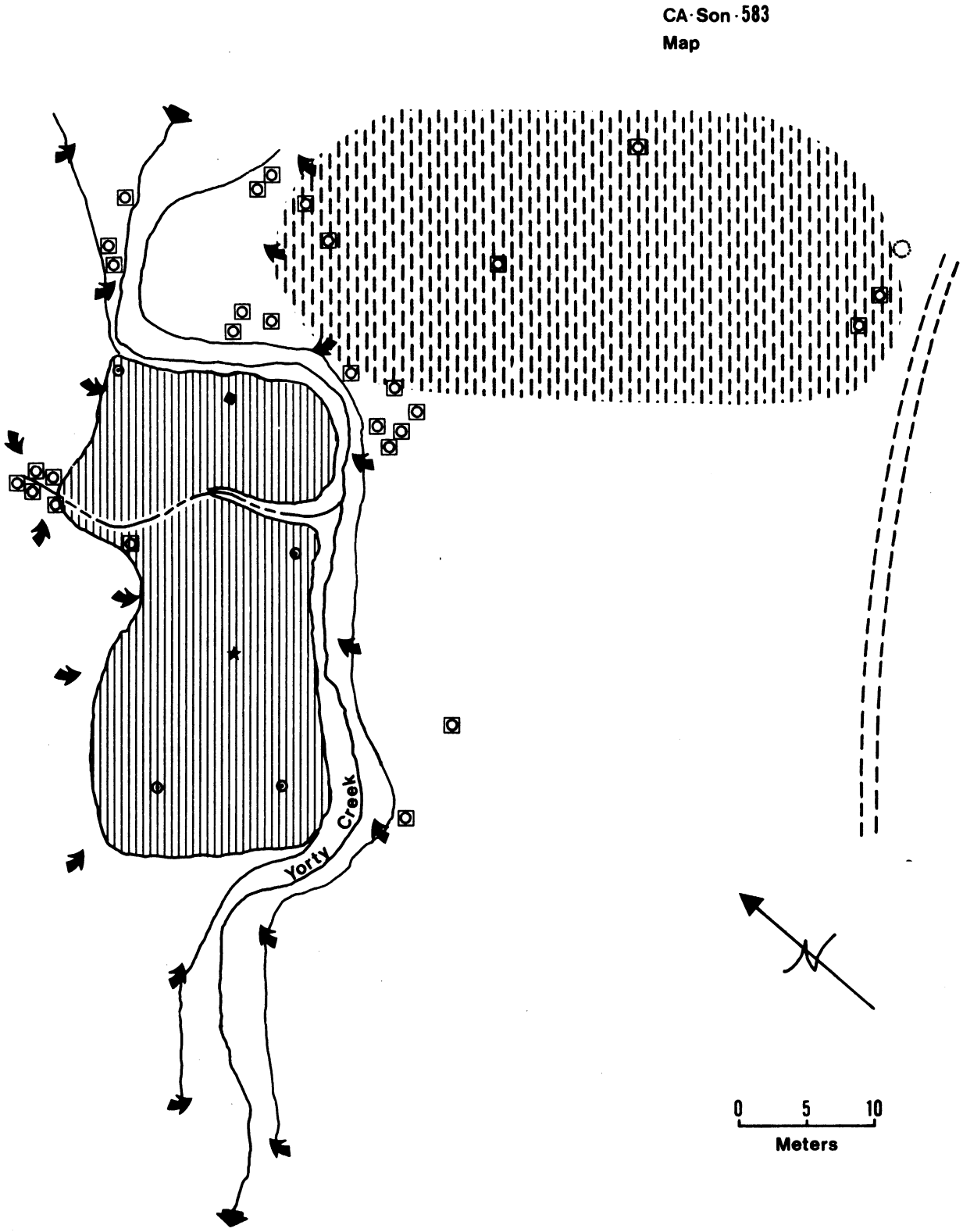
There is very little historic impact on the area of Son-584. The area of this site has been grazed fairly heavily but does not appear to have been plowed. It also has not been disturbed by roads or buildings and local residents did not know of the existence of an Indian site at this location. However, recent heavy stream erosion has cut away a portion of the midden along both Yorty Creek and the intermittent tributary, and recent slumping in the quarry area has not only exposed the artifacts but has moved them.

Son-584 is an important site for three reasons: one, the extent of the midden which contains the late and middle components indicate that it may be the central habitation site for upper Yorty Creek since it is larger than any of the other nearby sites; two, the gravel component, an important and unexpected addition to the archaeology of the project area, is found in all stream cuts around the site with an especially rich concentration just 60 m from the site. A deep and thick buried midden, which may be analogous to the gravel, has been found on the site - all of which indicates this is the prime area for exporing the gravel componet; and thirdly, the presence of the quarry makes Son-584 an important site since it is the only quarry found in the northern portion of the project area.

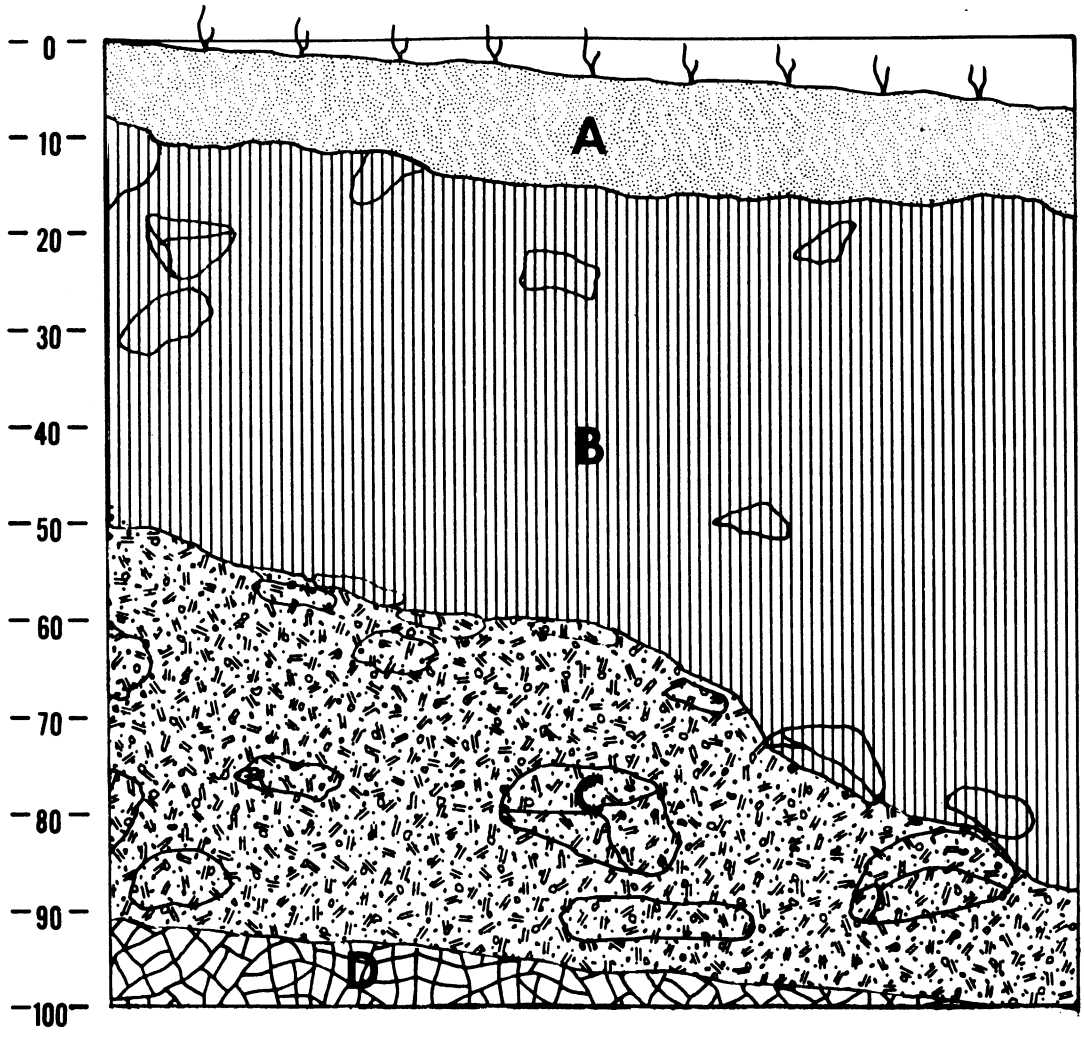
Site Son-583 (Yorty Hollow)

Son-583 is located on a small primary terrace on the north bank of Yorty Creek. It is approximately 150 m north of Hot Springs Road and can be approached by the first dirt road upon entering the Yorty Creek drainage. An abandoned cabin and several farm buildings are located at the northern end of this dirt road on the south bank of Yorty Creek. Son-583 is 250 m upstream from these buildings.

Geographically, this site is very similar to Son-576 in that they are



Map 17. Son-583 (legend p. 5).



A. Midden; black; clayey silt; moderately compact. Annual grass root zone.

B. Midden; black; clayey silt with angular gravels; moderately compact.

C. Grayish brown to dark brown; sandy clay with gravels and cobbles. Compact.

D. Bedrock.

Figure 14. Son-583 Profile.

Site Son-583 (Yorty Hollow)

Level cm.	Proj. Pts.	Scraper	Retouch Flakes	Used Flakes	Cores	Debitage	Fired Rock	Animal Bone
0-10	1-c			1-c		93-c	50	
				1-o		16-o		
10-20				1-c		166-c	150	10
	1-o			1-o		5-o		
20-30				1-c		40-c	215	5
			1-o			9-o		
30-40				2-c		42-c	230	4
			1-o			12-o		
40-50				3-c		85-c	large	2
					1-o	17-o	quantity	
50-60				2-c		62-c	"	2
		1-o		2-o		21-o		
60-70				2-c		24-c	small	
						8-o	quantity	
70-80						13-c		
						2-o		
80-90						3-c		
Gravel 1			1-c	2-c		17-c		
Gravel 2		1-c		3-c	3-c	24-c		
Gravel 3				1-c		31-c		
Totals	1-c	1-c	1-c	15-c	3-c	600-c		23
	1-o	1-o	2-o	4-o	1-o	90-o		
Grand Totals	2	2	3	19	4	690		23

both located on the confluence of an intermittent tributary and Yorty Creek, and they both have a deep, well-developed midden limited to a relatively small area. Both sites seem to have been inhabited by a small group of people on a seasonal basis for a long period of time.

The area of Son-583 shows evidence of historic use. An old redwood sheep stake fence passes through the extreme eastern edge of the promontory and an old road cut can be found 50 m south of the site, running parallel to and 50 m north of Hot Springs Road. Recent disturbance is indicated by a powerline located just south of the old road cut.

Son-583 is in an open oak/woodland community consisting of live oak, Oregon oak, and a scattering of buckeyes and madrones. The surrounding slopes and terraces show signs of heavy deforestation in the form of numerous stumps and fallen trees. Intensive sheep grazing and rapid stream erosion have produced slumping in the area and have otherwise disturbed the site.

The soil sequence in the immediate area consists of 10 cm of overburden, then approximately 1 m of fine-textured alluvial soil, and finally 20-50 cm of coarse gravel overlying shale bedrock.

The midden of Yorty Hollow encompasses nearly all of its promontory, measuring 8 m by 15 m, and averages 50-60 cm in depth. An associated flake scatter extends across Yorty Creek, south to the historic road and includes a possible housepit near this road, (50 m southeast of the midden).

Test Unit 1 was placed in the area where the stream cut indicated the deepest part of the midden: 8 m south, 45° east of the site datum. Excavation of the unit indicated that this area was the edge of an ancient stream cut that eroded onto the shale bedrock, was subsequently overlain by gravels and then filled in by midden and recent overburden.

There are at least two separate components at this site: midden and gravel. The midden is black clayey soil with some angular gravel extending to a depth of 50 cm at the west edge of the unit and 89 cm on the east. This midden overlies at least 40 cm of grey-brown clayey gravels. Within this zone animal bone, fire-cracked rock and obsidian are not present. Only chert debitage survives and increases in quantity with continuing depth. This debitage is characterized by large, informal, percussion flaked tools and flakes, and represents a distinct change from the midden component. These gravels continued to bedrock at 80 cm in the southwest corner of the unit and 102 cms in the middle of the east wall. The midden was first cleared off the top of these sloping gravels in less than complete levels, and then the gravels were excavated in three separate levels. The clay content of this lower zone necessitated wet screening from 50 cm to the end of the unit.

Son-583 will not be subject to inundation. This site, however, has a high potential for destruction by natural erosional processes, and will be located near a proposed recreation area.

Yorty Creek Group Chronology

Our chronology here is based primarily upon typology but again we have two radiocarbon dates (Son-576) for cross checking.

Son-576

This site presents some difficulty in dating. It will be seen from the table of chert-obsidian ratios that there is very little consistency in this statistic throughout the nearly two meters of depth. Even adjacent levels are inconsistent in most cases so there are no natural breaks to be discovered here. In our earlier report we distinguished three components in the site as follows:

0-30 cm. Late Houx
30-50 cm. Early Houx
50-190 cm. Late Borax Lake

Since then we have obtained two radiocarbon determinations from this site.

UCR-353 Charcoal from hearth at 40-50 cm. 675± 140 AD 1325
UCR-354 Charcoal from midden at 170-180 cm. 2300± 160 350 BC

There are only three diagnostic artifacts from the site: a very small Excelsior point from 10-20 cm (Fig. 25g), a large Excelsior point from 70-80 cm (Fig. 25i), and a pestle from 30-40 cm. The large Excelsior point could date Late Borax Lake but it could also be from Early Houx. The small point probably comes from Late Houx while the pestle is most probably from Houx Aspect. These items together with radiocarbon dates suggest that the entire midden should be attributed to the Houx Aspect, part early and part late. But which part. The later radiocarbon date indicates that the top 50 cm. should be Late Houx so we will tentatively assign the remainder to Early Houx.

Son-577, 584 and 583

The chronology of these sites must be dealt with together because at the base of each of them is an artifact bearing layer of gravel which appears to be the same both chronologically and culturally and must be interpreted before the superimposed middens are placed in context. The gravel layer in question is found also away from the numbered sites being exposed by stream cutting in Yorty Creek from about Son-576 at least to the edge of the project. The stream cutting is presumed to be recent and due to changed stream flow conditions since denudation of hillside vegetation in historic times. In any case the gravel banks of Yorty Creek occasionally included flakes and cores apparently modified by man with a few undeniable artifacts such as scrapers and bifaces. Although a few of these items seem a little waterworn none of them could be called "rolled" so we cannot believe they are redeposited from some midden site upstream. The flakes and cores are heavier and cruder than anything from the middens and all are of chert - there is no obsidian at all. We illustrate in Fig. 30 the unquestionable pieces. It will be seen that there is nothing there of diagnostic value from the point of view of either North Coast Range chronology or that of any nearby area.

Thus we are faced with a situation (like that of the Farmington complex) of a crude chert industry in an undated gravel deposit. We feel certain that

the industry is old but we are unable to give it a more precise date. Nearly all the diagnostic material from superimposed middens seems to date from the Houx Aspect. The principal exception is the single large side notched projectile point shown in Fig. 25c. This was from Son-583 and was found embedded in the stream bank 45 cm below surface and well above the gravels. This type we indicate as being (most probably) part of Early Borax Lake. If this is accepted then the gravel layers must be earlier than the Borax Lake Aspect. At the same time there is no evidence of any relationship to the Post Pattern. We therefore are compelled to place them in some pre-5000 BC limbo. We will call them Yorty gravels for present purposes. Clearly a great deal more work needs to be done on these gravels from a geological as well as an archaeological standpoint.

For the midden components of these sites we will make the following chronological placements. Son-577 has nothing diagnostic - we attribute it to the Borax Lake Aspect since it immediately overlies the gravels. Son-584 has 3 stratigraphic levels, the top one (0-40 cm) being attributed to Late Houx because of small barbed projectile point (Fig. 25d, e) and the pestle at 20-30 cm while the bottom layer is Yorty gravels. This leaves the middle level (40-80 cm) either as Early Houx or Borax Lake. Son-583 must also be late Houx in its upper levels (0-30 cm) because of the small point shown in Fig. 25b while the middle levels 30-90 cm must be Borax Lake for reasons discussed above.

Yorty Creek Site Group

Chert-Obsidian Debitage Ratios by Site and Level

Level	Site CA-Son			
cm.	576	577	584	583
0-10	6.71(54)	5.50(39)	* (1)	5.81(109)
10-20	1.07(27)	15.67(50)	7.67(52)	33.20(171)
20-30	3.67(56)	23.50(49)	5.05(127)	4.44(49)
30-40	4.29(74)	21.00(22)	1.74(107)	3.50(54)
40-50	4.75(69)	* (15)	1.52(53)	5.00(102)
50-60	2.04(70)	* (13)	0.88(62)	2.95(83)
60-70	1.94(47)	* (5)	1.68(42)	3.00(32)
70-80	0.87(43)	* (6)	2.83(27)	6.50(15)
80-90	1.00(54)	* (5)	1.75(22)	* (3)
90-100	7.56(60)	* (7)	1.50(10)	* (17)
100-110	5.00(6)	* (3)	2.00(3)	* (29)
110-120	0.49(55)	* (9)	0.00(1)	* (31)
120-130	0.71(87)	* (9)		
130-140	0.77(46)	* (6)		
140-150	0.34(39)	* (12)		
150-160	1.00(18)	* (3)		
160-170	2.67(11)	* (1)		
170-180	* (2)	* (1)		
180-190	0.33(4)			

( ) : debitage frequency

* : infinity, or all chert

Yorty Creek Site Group

Chert-Obsidian Debitage Ratios by Site and Period

Period	Site CA-Son			
	576	577	584	583
Hb	0-50 4.09 (280)			
BLb	50-190 1.13 (542)		0-40 3.35 (287)	0-30 * 9.97 (329)
BLb		0-90 16.00 (204)	40-80 1.36 (184)	30-90 3.81 (289)
BLa		90-180 all chert (51)	80-125 1.77 (36)	Gravels all chert (72)

Hb: Late Houx

Ha: Early Houx

BLb: Early Borax Lake

BLa: Late Borax Lake

Cherry Creek Group Description

This small group does not seem to be of great importance. Aside from the surface site Son-552 the sites of the group occur well up Cherry Creek where the valley becomes narrow and steep-sided. These sites are separated some distance from what would appear to be the main activity centers on Dry Creek and Yorty Creek and we speculate that they may be given over to some specialized activity, perhaps hunting. The supposed prehistoric vegetation cover here is woodland-grass or woodland-chaparral either of which would suggest deer habitat.

Site Son-552 (Cherry Creek Crossing)

Son-552 is located on the east bank of Cherry Creek, approximately 30 meters south of the point where an old jeep trail crosses Cherry Creek. It extends NE-SW along a terrace located on the 400' contour. This site is in the center of the Cherry Creek drainage, all of which is encompassed by the Project Area boundaries, and is more than a mile away from the nearest site to the north or south.

Son-552 is a surface site located beneath a large spreading oak tree with a marsh area east of it. It appears to be an early homestead site with evidence of still earlier Indian occupation. The jeep trail runs a half mile north of Hot Springs Road and bisects the terrace on the north. South of this trail, just above Cherry Creek, is an historic dump with many glass and china sherds, (ca. 25 meters north of datum). A brick lined well is located approximately 30 meters south of the dump and an old rusty plow disc was found 15 meters north of the jeep trail. A basalt pestle fragment was found on the eastern edge of the dump and next to the road. A second pestle was located approximately 8 meters due south of the western part of the dump area, and an obsidian flake was located on the edge of the road north of this same dump section.

The terrace has open oak woodland and grassland cover. The soil seems to be a brown sandy, silty loam with no obvious dark midden showing. Two auger holes were sunk on this terrace, one in the center of the historic dump and a second, located 2 meters west of datum stake. The one in the dump recovered clear and opalized glass fragments and charcoal chunks; the second augering was sterile.

Site Son-587 (Two Housepits)

Son-587 is located in the northern section of Cherry Creek approximately 225 m south of Son-604 and 270 m south of Son-589. It is a housepit site consisting of two circular housepits approximately 2 meters in diameter, 40 cm deep and 10 meters apart. The terrace on which these are located has two seasonal drainages. The northern drainage is located about 90 meters north of the housepits, and the southern drainage, 30 meters south, bisects the terrace. The housepits are approximately 10 meters west of the base of a hill, and about 50 meters east of Cherry Creek.

The terrace seems to have supported an old homestead, witnessed by old fruit trees (just north and south of the southern drainage) 12-18" in

diameter. Sheep stake fencing is found along the eastern edge of this terrace at the base of the hill. An iron pipe was found approximately 15 meters east of the housepits.

This terrace has open grassland cover which has been cleared for the cultivation of the nearby fruit trees. The soil of the terrace and the surrounding area consists of brown gravelly silt and shows no signs of midden deposits or cultural debris. Two auger holes were placed on this terrace, one between the two housepits, and one 45 meters south of the housepits, under the fruit trees. No sub-surface midden was indicated in these holes.

Site Son-604 (Skunk Creek)

Son-604 is located in the northern section of Cherry Creek approximately 50 meters north of the confluence of Skunk and Cherry Creeks. It is located on a narrow flat that lies parallel to Skunk Creek and is approximately 2 meters wide and 3-4 meters long. This flat is on the east bank of Cherry Creek and lies on top of and is surrounded by serpentine outcroppings. It is in a deep canyon with steep slopes, many waterfalls and year-round deep pools.

The terrace on which this site is located has much chapparal, scrub oak, chamise, etc., on its south-facing slopes and has Oregon oak woodland grassland cover on its north-facing slopes. This is a midden site and the area of the midden (2 by 3.5 m) is dark brown friable silt with much angular rock and can easily be distinguished from the surrounding soils.

Two auger holes were placed north and south of datum in the midden area to test extent and depth of this small midden. In both holes the midden extends to 20 cm at the most, with auger refusal by the serpentine bedrock. Most of the extent of the original midden has been washed away and only this small, shallow midden area presently remains.

Site Son-589 (Rake-In-Tree)

Son-589 is located in the northern section of Cherry Creek, approximately 100 meters north of the confluence of Skunk and Cherry Creeks. It is on the east bank of Cherry Creek about 50 meters north of Son-604. It is a housepit site consisting of one housepit located on a rise in an area that has signs of homesteading. The area has old wire fencing around its perimeter and old boards are scattered on the surface of the knoll. A rake head is buried in an oak tree on this terrace. The housepit is located approximately 50 meters east of Cherry Creek and about 22 meters west of the base of a hill. Site datum is located in the center of this housepit. The housepit measures approximately 2 meters in diameter and about 30 cm in depth.

This terrace has open grassland cover with Oregon and black oaks scattered on the surface. No midden deposit was evident on the surface of this knoll. A series of six auger holes was placed around the housepit to test for sub-surface midden deposits. Only one of these six revealed any evidence of cultural habitation, producing small flecks of charcoal and 2 small round nails, (auger hole 5; 3 m west of datum).

Site Son-603 (Salmon Hole)

Son-603 is located on the west bank of Cherry Creek on the northern part of its drainage. It is approximately 750 meters south of the confluence of Snow and Cherry Creeks and a half mile north of the confluence of Skunk and Cherry Creeks. The site is on a terrace measuring about 35 meters by 15 meters which runs north-south, parallel to Cherry Creek. This terrace is one of only a few openings in a heavily wooded, steep sided canyon. Son-603 is located approximately 250 meters south of Son-601 and about a half mile north of Son-589.

This site is a shallow midden emcompassing most of the open terrace. The terrace is bordered on the north and west by steep sided, heavily wooded slopes covered with wild iris. The entire eastern edge of the terrace is delimited by the cut bank formed through erosion by Cherry Creek. The terrace itself has semi-dense oak woodland cover consistent of Oregon, canyon, and coast live oaks with grassland beneath. Some buckeyes, bays, madrones and manzanitas are scattered around the perimeter of the site.

The midden is easily distinguishable from the surrounding lighter soils on this terrace. The entire site is covered with naturally formed augular rocks, making identification of fire-cracked rocks difficult. Test Unit 1 was placed N 30° W, 10.55 meters from site datum in the area which seemed to have darkest midden and the least amount of rocks.

The shallow midden component at Son-603 extended to 50 cm with small midden pockets continuing into the sterile sub-midden gravels below. Obsidian dominated the lithic debitage counts throughout the entire midden depth. A few pieces of chert debitage and animal bone fragments were also recovered. Three obsidian projectile point fragments (all tips) came from this midden component. Singley these are undiagnostic but their general shape and size indicate that they are not of a late phase. We assign the site to the Borax Lake Aspect.

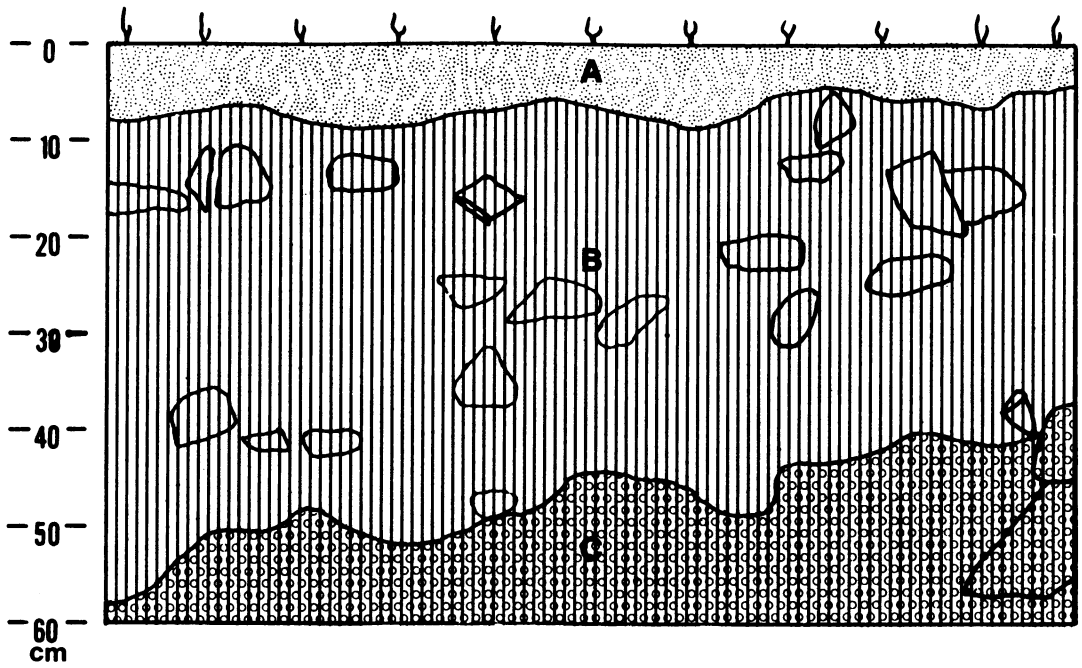
This site is very similar in geographic position to the other four sites located in the northern extreme of the Cherry Creek drainage, (Son-601, 604, 589, 587). This cluster of sites is important geographically because it may be a link to sites of another tribelet in the next drainage. There is a distinct hiatus between these sites and the rest of the sites located in the northern section of the Project Area. This cluster is approximately three miles north of the Yorty Creek/Dry Creek confluence on which creeks the northern sites are located. Two sites located further north, (outside the Project Area on this drainage), probably part of this cluster, have produced interesting surface finds which are part of the Moretti collection. Among these finds is the only charm stone known to exist from this area.

Site Son-601 (Eel Pit)

Son-601 is one of five sites located in the northern section of the Cherry Creek drainage within the boundaries of the Project Area. All five sites are found on the only available open terraces within this heavily wooded, steep canyon. The two northernmost sites, Son-601, and Son-603, are located on the west bank cf Cherry Creek and the three southern sites are on the east bank of this creek.

Site Son-603 (Salmon Hole)

Level cm.	Proj. Pts.	Reworked Biface	Retouch Flakes	Used Flakes	Debitage	Animal Bone
0-10					6-c	7
				1-c	38-o	
10-20					1-c	7
			2-o		30-o	
20-30					2-c	6
		1-o			35-o	
30-40						11
	2-o				46-o	
40-50		1-o			14-o	4
50-60					3-o	
Totals	2	2	2	1	175	35

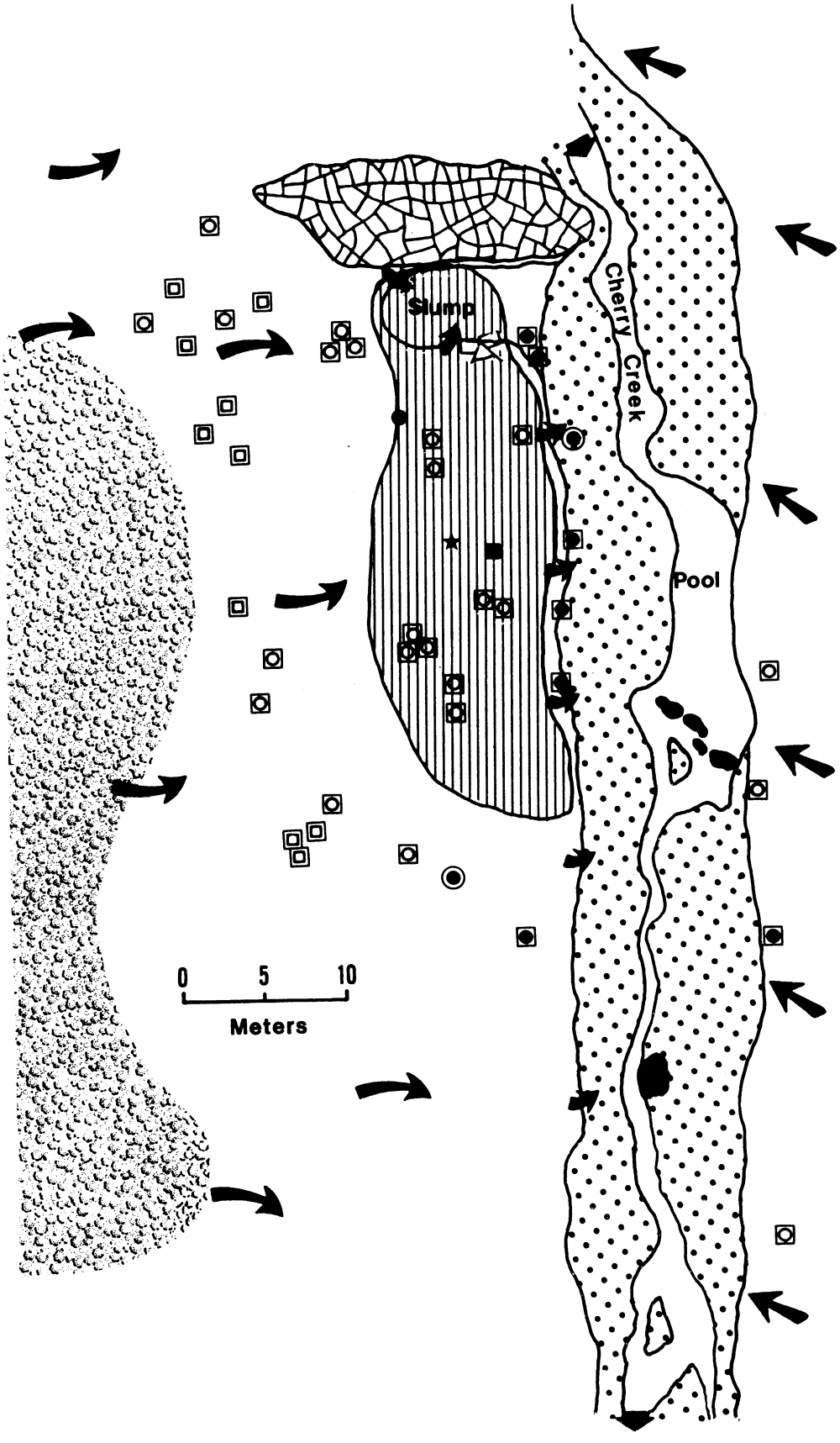


A. Midden; very dark grayish brown; gravelly silt; annual grass root zone. Friable.

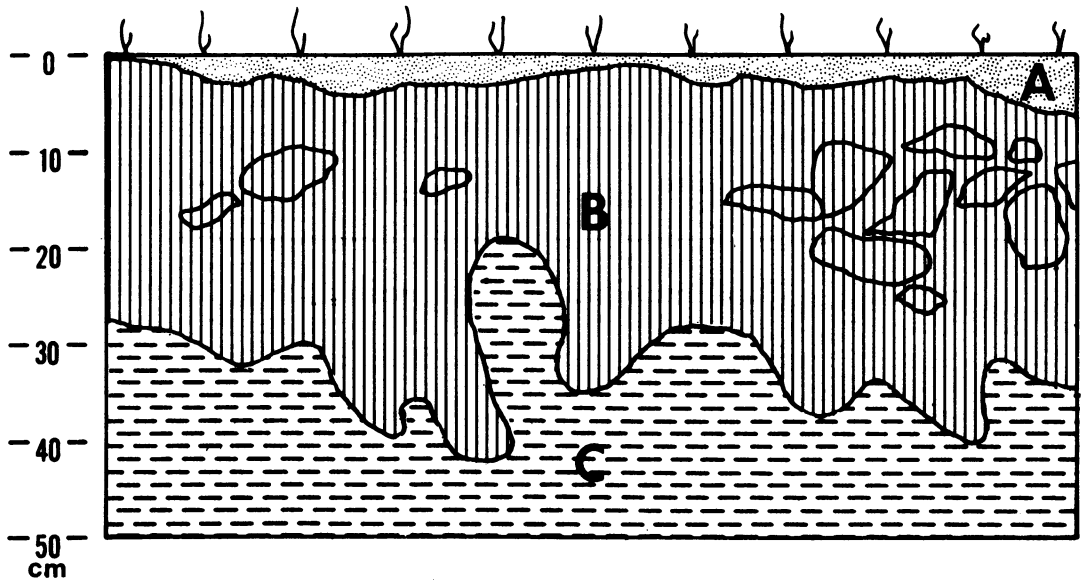
B. Midden; very dark grayish brown; gravelly silt; friable to very friable.

C. Dark yellowish brown; gravels with sand and silt; crumbly.

Figure 15. Son-603 Profile.



Map 18. Son-601 (legend p. 5).



A. Midden; dark brown, silt and sand; annual grass root zone. Friable to moderately compact.

B. Midden; dark brown; silty gravels; friable to moderately compact.

C. Brown; silty clay; compact.

Figure 16. Son-601 Profile.

Son-601 is located approximately 500 meters south of the confluence of Snow and Cherry Creeks and approximately 1000 meters north-northwest of the confluence of Skunk and Cherry Creeks. This terrace is oriented north-south and runs parallel to Cherry Creek, approximately 3 meters above the creek. The terrace measures 30 meters by 15 meters with the midden concentration located within the northern 20 meters of the terrace.

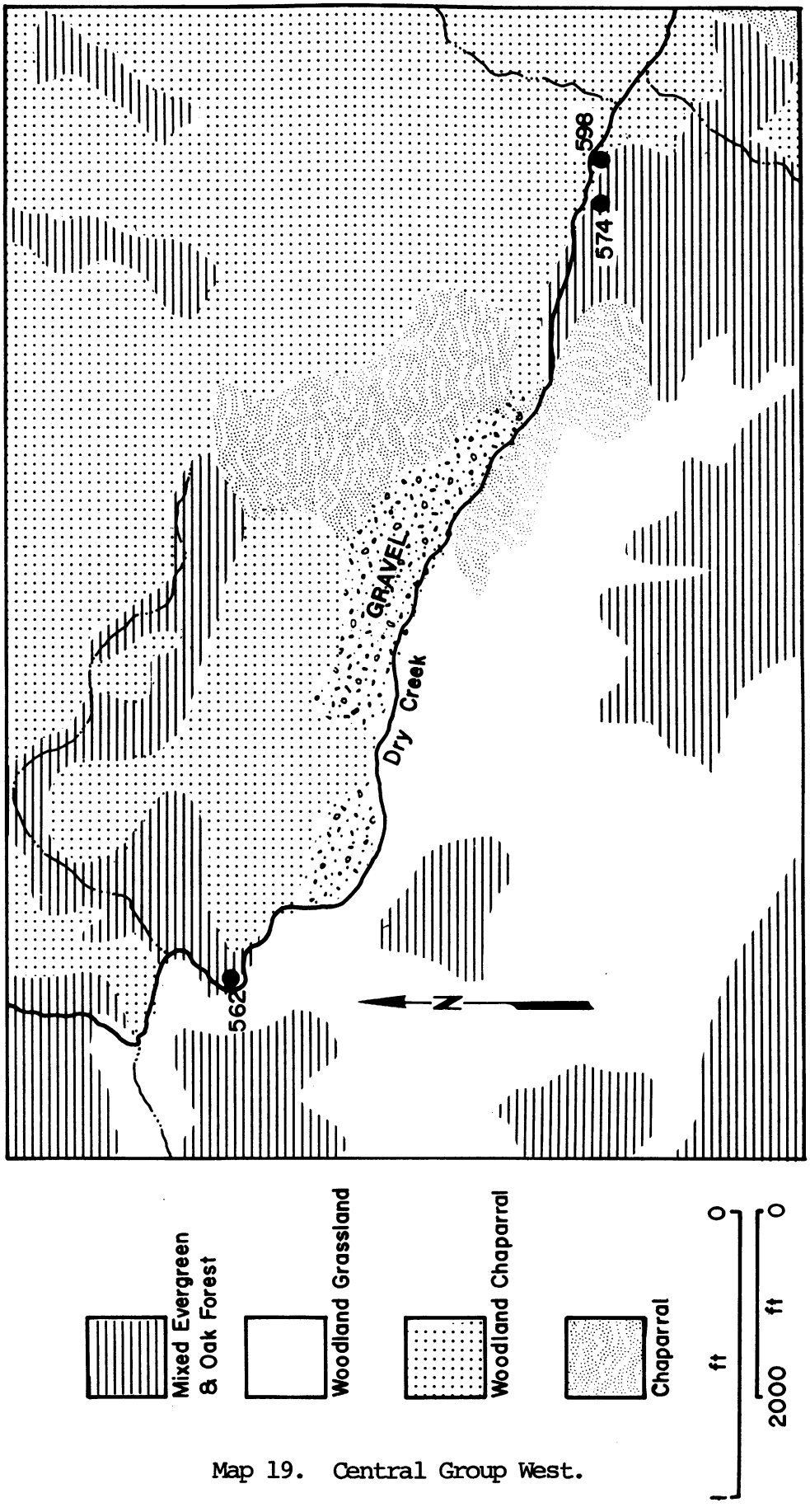
The site has semi-open oak/woodland cover with black oaks, canyon live oaks, bays, buckeyes, and broadleaf maples. Annual grasses and Brodeia are found over the entire terrace. The northern perimeter of the site is delimited by a large bedrock outcrop; the western by steep oak/grassland slopes; and the eastern by the cut bank eroded by Cherry Creek. The area of the midden is easily distinguishable from the surrounding lighter soils on this terrace.

Test Unit 1 was placed in the darkest midden area, 2 meters east of site datum. The area is heavily covered with rocks. The unit was placed in the area of least rock cover, but despite this, the unit was very difficult to excavate. Areas of rock concentrations began to occur in the first level excavated and continued to 30 cm. Roots were equally heavy in these initial levels. Fire-cracked rock could not be visually separated from the other rocks in the unit and was, therefore, not recorded. At 30 cm large areas of krotovina dominated a major portion of the unit. Excavations ceased at 50 cm when the 12 flakes recovered all came from disturbed areas.

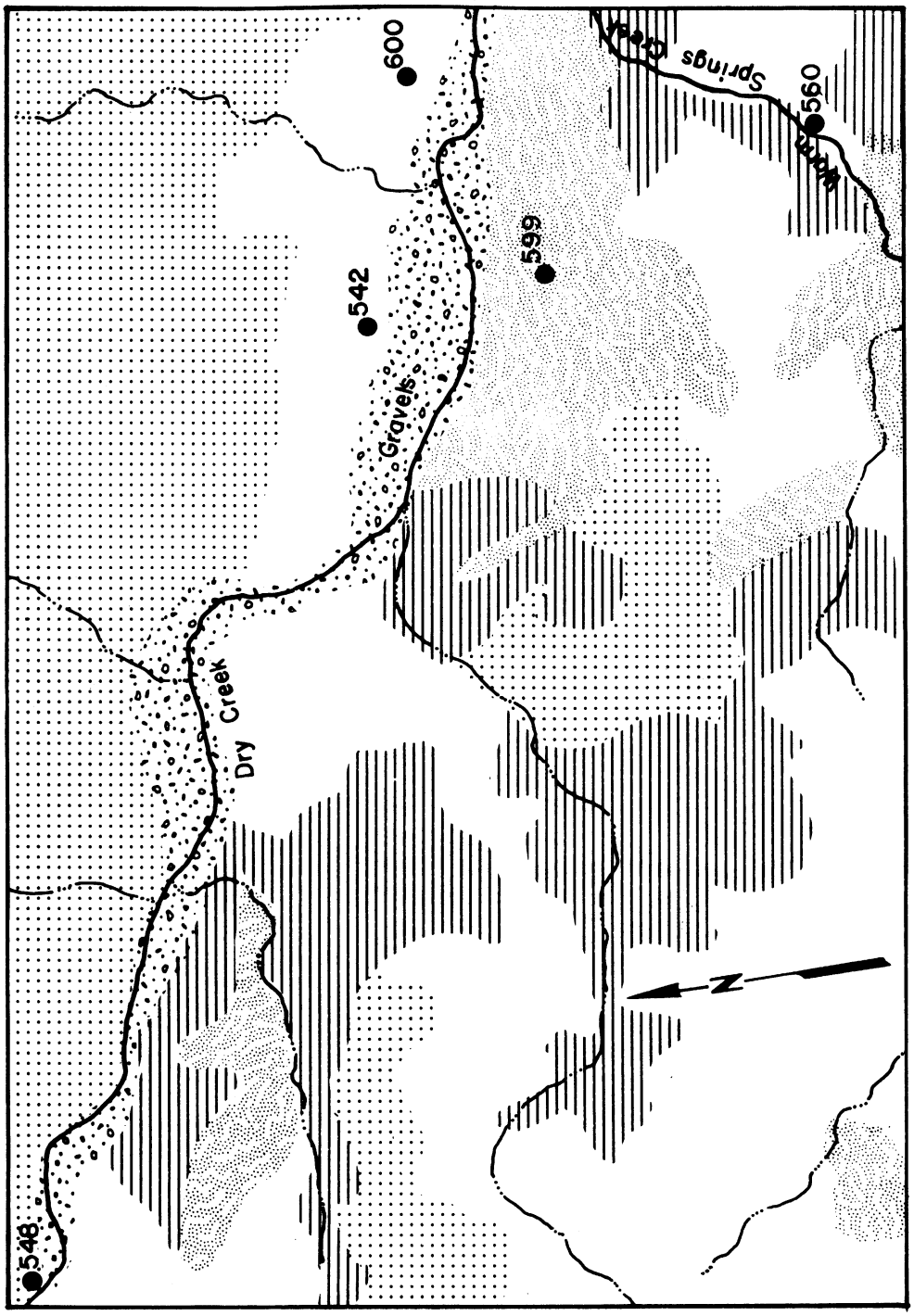
The shallow midden component at Son-601 extended to 40 cm with small midden pockets continuing into the sterile submidden clays below. Obsidian dominated the lithic debitage counts throughout the entire midden depth. A few pieces of chert debitage and animal bone fragments were also recovered. One chert projectile point, a rounded base fragment came from this midden component, (Fig. 24j), suggesting that this site was not late in date.

Cherry Creek Group Chronology

There is insufficient evidence here to warrent extensive chronological treatment but a couple of observations about the two excavated sites seem in line. Firstly there is no evidence in either of these sites of material from Late Houx so on this basis they must be attributed to Early Houx or Borax Lake. This suggests that the specialized hunting or local plant gathering activities hypothesized for these sites was abandoned in this latest period. We are inclined to doubt this and attribute our lack of late evidence to small sample size. The other point worthy of note is the very small chert-obsidian ratios, 0.05 for Son-603 and 0.23 for Son-601. The other sites showing similar obsidian domination are Son-571 in the Western Group and Son-556 in the Lower Warm Springs group. Both these sites have large parts of their deposits attributed to the Early Houx. It may be then that this is also true of the two sites on Cherry Creek.



Map 19. Central Group West.



Map 20. Central Group East.

Central Group Description

The Central Group is on the stretch of Dry Creek from Prichett Peaks on the west to the mouth of Warm Springs Creek on the east. The first half of this stretch is rather narrow and steep sided while the lower half widens out considerably. The first part contains only a few small sites, as one might expect; the second part, which one would have expected would be more favorable to native settlement, was also favorable to orchards and vineyards so that it seems apparent that at least two excellent archaeological sites were almost totally destroyed by agricultural activity.

On the whole, though, and even assuming that there were formerly more sites here the total amount of archaeological remains in this group seems much sparser than elsewhere in the project. As discussed in the conclusions we are hypothesizing that this was a boundary area between tribelets and may have been less densely settled for that reason. There is no obvious ecological reason for the lack of settlement in the distribution of vegetation types as shown on Maps 19 and 20.

Site Son-562 (Oak Point)

Son-562 is in the extreme western part of the Central Section. It consists of a single housepit on a small first terrace on the north bank of Dry Creek. The terrace is five meters upslope from Dry Creek, has open grassland cover, and is encircled by heavy riparian vegetation. Several large stands of oak, bay, manzanita and madrone, with an occasional fir, completely shelter the terrace, which measures 50 meters by 30 meters.

The housepit, two meters in diameter and 80 cm in depth, is in the center of the eastern part of the terrace. During survey the area around this housepit was searched for petroglyphs and cultural evidence, but none was found. A series of 12 auger holes were placed randomly over the entire surface of this terrace, and although charcoal flecks were in evidence in many of the holes, only one obsidian flake was found. This flake was recovered from auger hole 10 at a 55 cm depth and was associated with a few charcoal chunks. However, auger hole 11, two meters north of 10, contained a few flecks of charcoal on the surface and did not reveal buried midden or cultural material. Both of these auger holes were located at the western end of the terrace, at the point furthest away from the housepit.

Site Son-574 (Purple Blind)

Son-574 is a probable hunting blind found on the south bank of Dry Creek, a mile and a half upstream from the Old Rockpile Road Bridge, and directly below Pritchett Peaks. The blind is on a small terrace, 110 meters south of and 15 meters above Dry Creek. It overlooks a gently sloping, grass-covered clearing in a steep, densely-wooded terrain. The clearing is bordered to the north by a barbed wire fence that is on the cut bank of Dry Creek, to the east by a barbed wire and stake fence, and to the south and west by a steepening hillslope. Above the terrace with the blind is another open, grassy clearing.

The vegetation of the site is open grassland with a few scattered stands of oak and manzanita. The surrounding area is a dense oak/madrone forest with some redwood and fir.

The hunting blind consists of a circular depression measuring 2.5 meters in diameter and 60 centimeters in depth. The grassy clearings above and below this blind form a natural path to Dry Creek, making the position of this blind excellent for ambushing game. No midden or cultural artifacts were found in or around the blind.

Site Son-598 (Treganza 10)

Son-598 is a non-midden site with 14 well-defined housepits and a cupule petroglyph rock. It is situated on the south bank of Dry Creek directly below Pritchett Peaks. The site is on a primary terrace, measuring 150 meters by 80 meters, and is two meters above the stream bed of Dry Creek. The terrace is bordered to the north by the Dry Creek stream bed, to the east by an intermittent drainage, and to the south and west by the increasing hillslope.

The vegetation of the terrace consists of open grassland cover with scattered stands of oak, buckeye and manzanita. There is riparian vegetation of laurel and willow along the drainages. The surrounding slopes are covered with a dense oak/bay/madrone forest with some redwood and fir.

The soil around the housepits is the same as the soil of the rest of the terrace; a moderately compact, brown to dark brown, alluvial gravelly sand silt. No midden is in evidence on the surface nor was any uncovered in the five auger holes made in the vicinity of the housepits.

The housepits are clustered on the eastern half of this extensive terrace and cover an area measuring 70 meters by 30 meters. The 14 housepits are very well defined, range from three meters to six meters in diameter, and are as deep as one meter.

The cupule rock is located on the northwest edge of the terrace and the streambed. The rock is a small, low-lying serpentine boulder that was partially buried in the terrace slope. It contains six shallow cupules four to six centimeters in diameter.

There were no artifacts found during an intensive search of the surface of the site during the initial phase of the Warm Springs Archaeology Project. A one meter square test excavation unit was placed in the area of the housepits, between the largest of the 14 housepits and a small one 10 meters to the west, 15 meters due west of site datum. This unit ended at 30 cm after three levels of sterile alluvium. A five centimeter thick burnt layer of soil was uncovered at ten centimeters below surface, which contained no cultural material. This carbonized layer is probably due to natural causes.

Site Son-548 (Turtle Stink)

This is a shallow, weakly developed midden site on the north bank of Dry Creek, three quarters of a mile upstream from the Old Rockpile Road Bridge, at the south base of Pritchett Peaks. The site is located on the western side of a primary terrace, measuring 70 meters by 25 meters, in a steep, fairly narrow valley. The vegetation of the terrace is moderately dense oak/bay woodland, with some buckeye and madrone. There is a dense grass groundcover on the site. The slopes around the site have roughly the same vegetation type, with the lower slopes on the south bank of Dry Creek being more densely wooded and

having occasional redwoods.

The soil of the site is the same as the surrounding terrace soils; a moderately compact, brown, alluvial sandy silt to silt. Three auger holes were made on this terrace in the area of the site but no sub-surface midden deposits were found. The area of the site measures 10 meters by 15 meters and is defined by a sparse scatter of artifacts and fire-cracted rock. The first five to ten centimeters of the surface of the site is disturbed by the rooting of feral pigs, who feed on the acorns from the many oaks on the site. This was the only disturbance of this site; erosion by Dry Creek was minimal.

A one meter square test excavation unit was placed in the area of heaviest artifact scatter, 90 cm due east of site datum. The unit ended at 30 cm in a nearly sterile layer of brown, alluvial silt. An auger hole in the bottom of this level extended to 65 cm and revealed no midden.

Excavation revealed that this is a weakly developed midden site, with only one zone of occupation, and few artifacts, none of them diagnostic:

Level	Scraper	Debitage	Shell	Fire Rock	Bone
0-10 cm		3-c 6-o	1	7	5
10-20 cm	1-o	6-o		6	-
20-30		2-o		1	-

Site Son-542 (possibly "Oak Ball Drifts Out")

This is a disturbed site with a shallow, weakly developed midden located on the north bank of Dry Creek about a mile upstream from the confluence of Dry and Warm Springs Creeks. The site is on the edge of a 9-12 m high first terrace, 150 meters south and east of Old Rockpile Road. The weakly developed midden covers an area measuring 50 meters by 25 meters. It is bordered on the south by Dry Creek, on the east by an intermittent tributary, and it grades into non-midden soil to the west and north. There is an associated flake scatter which is confined to the front of the terrace and measures 120 meters by 40 meters.

Dry Creek is now 300 meters south of this site and is separated from the site by a wide gravel streambed which has been used in the past as a gravel borrow area. Directly below the site there is a year-round pool which is probably the result of mining operations.

The original vegetation on the site was, according to knowledgeable local residents, open grassland with scattered stands of Oregon and valley oak. Riparian vegetation was once quite abundant in the seasonal drainages, and redwoods, which are still found in the upper parts of these drainages, once extended over the terraces to Dry Creek. The natural vegetation has long

since been replaced by cultivated crops starting with hops, plums and finally the present vineyard. This site has been cultivated for at least the past 80 years and the midden is now very disturbed. Artifacts found in the larger area of the flake scatter may have originally been in the midden area but became more widely distributed by agricultural activities.

The soil of the midden is only slightly darker than the surrounding soil deposits on the terrace. It is a loose, dark gray to dark brown, silty gravel with many pebbles and cobbles. The rock content and looseness of the soil did not permit augering.

Two one meter square test excavation units were dug on this site. The first unit was located 45° south and 8 meters west of site datum in the central part of the midden. This unit ended at 20 cm in a sterile, yellow brown, sandy coarse gravel. No artifacts were found in either of the two levels. The second unit was excavated at 59° west and 35 meters south of the site datum, where four chert and obsidian flakes had been seen on the surface. This unit also extended to 20 cm and ended in a sterile, brown, sandy gravel. One chert side-notched point and two utilized obsidian flakes were the only tools recovered in excavation. Surface finds were also few, but included an obsidian corner-notched projectile point fragment, two chert scrapers and a chert core, as well as 20-30 flakes and chips. From this inventory, it is clear that the weak midden at Son-543 has been so disturbed as to render intensive excavation of limited value.

Site Son-599 (Jackson's Blind)

This site is an isolated, well-defined hunting blind located on a minor tributary of Dry Creek, 200 meters upstream from its mouth on Dry Creek. The blind is situated at the southeast dege of an open, flat clearing in a very steep, moderately forested terrain. It is 50 meters west of and 35 meters above the steep-banked tributary. The blind overlooks both the tributary and the clearing. The clearing is bordered on the east by the intermittent stream, on the north by a densely forested slope continuing down to Dry Creek, and on the south and west by a moderately forested steep hillslope.

The vegetation of the clearing is open grassland with very dense grass groundcover. The dense forest north of the blind and clearing consists of predominately oak and madrone with some bay present. The forest to the south and west includes chaparral/oak woodland with some pine on a thin, serpentine-derived soil.

This is the best preserved hunting blind in the Project Area. It is a stone-lined, rectangular depression which measures 2 meters by 1.2 meters and is 80 cm deep. Approximately 40 stones line this pit, some of which still remain in courses. The highest remaining row of courses is oriented towards the southwest.

No midden or cultural material was found at this site. However, Son-600, a late midden site, lies on the north bank of Dry Creek approximately 400 meters below this site. The sharply defined nature of this blind indicates that it is a relatively late feature and may be contemporaneous with the late parts of site, Son-600.

Site Son-600 (possibly "Takoton")

This is a disturbed midden site with a shallow, weakly developed midden located on the north bank of Dry Creek 750 m upstream from the confluence of Dry and Warm Springs Creeks. The site is on a high first terrace approximately 40 meters north of Dry Creek. This site, like Son-542, is a low mound on the edge of the terrace.

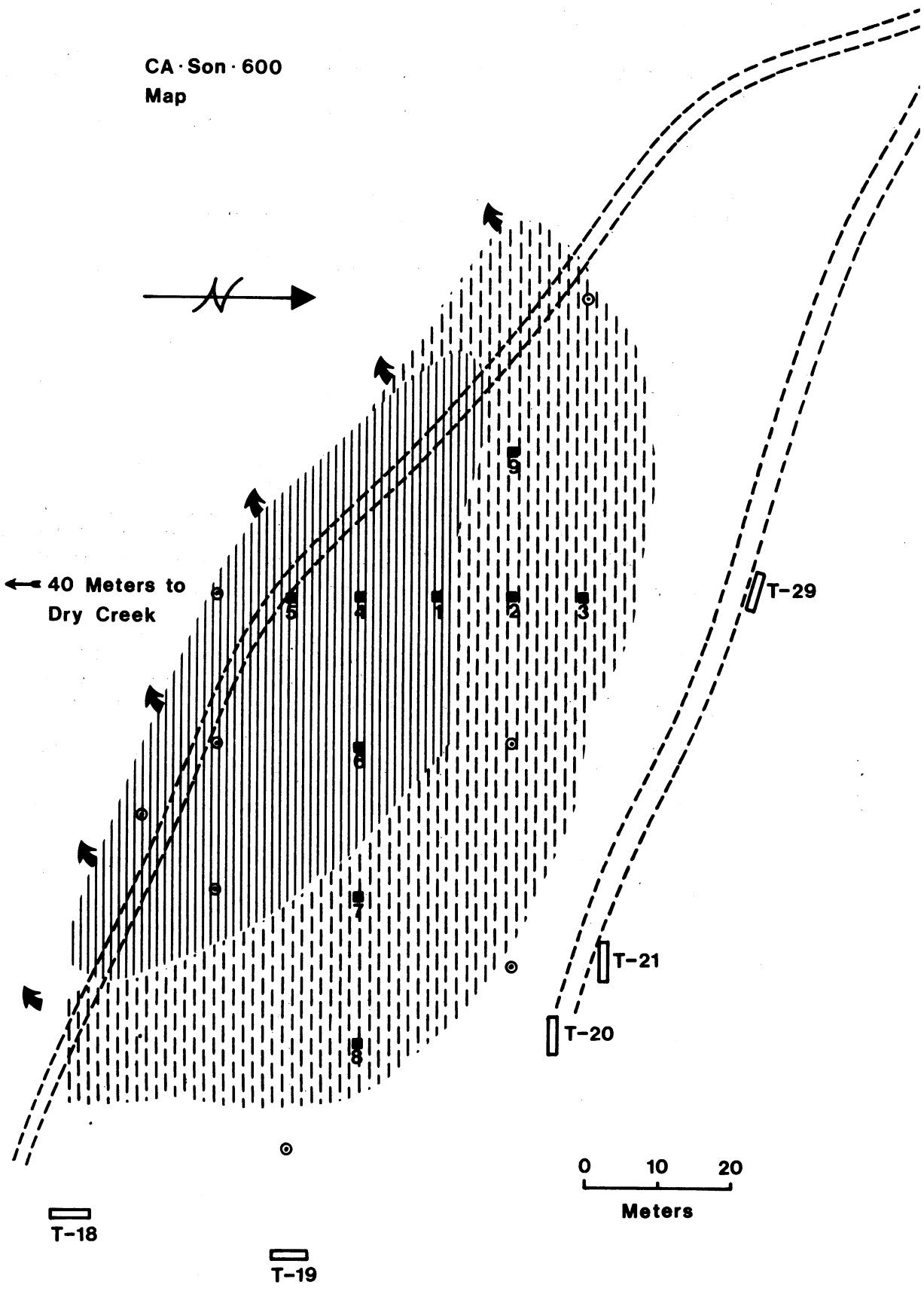
The vegetation of the terrace is now vineyard. Prior to cultivation, this area was in open oak woodland with thick groves of bay, willow, and cottonwood along the fringes of Dry Creek. The slopes to the north are thickly forested with madrone, oak, and pine and remnants of large redwood stands are in evidence in the drainages.

The soil of the site is loosely compacted, dark gray to dark gray brown, gravelly silt. The surrounding soil is brown to dark brown, gravelly silt. Five backhoe trenches were excavated in the vicinity of Son-600 before testing by the Warm Springs Archaeologgy Project, but none showed any signs of midden, (see Map 21 T-18, T-19, T-20, T-21 and T-29). Nine auger holes were bored throughout the entire area of possible midden. These borings demonstrated that the extent of the midden covered the same area as indicated by the surface finds. The midden in the auger holes on the perimeter bottomed out at 20 cm and towards the center at 50 cm. Those outside the darker, midden area were sterile. Although the flake scatter measures 140 by 60 meters, the midden only encompasses an area 100 by 40 meters.

The midden at Son-600, like that of Son-542, is not intact. The previous owner of the land, Mr. Edward Mauritson, stated that there has been much agricultural activity that would have disturbed the site. In the late 1880's all of the oak trees that were growing on the site were pulled out. Grapes were planted, then replaced by hops, which were in turn replaced by plum trees. The plum trees remained for many years until, in 1947, Mr. Mauritson personally bulldozed them out and planted grapes which are still present. While removing the plum trees, four foot deep trenches were dug every 25 feet and new topsoil was deposited in these trenches.

Nine units were excavated at Son-600 to test the depth of the midden, to determine the amount of disturbance, and to delineate the boundaries of the site. Their provenience is as follows:

Unit	Grid	Location	Excavator
1	N9 E20	Midden	Larry Banks; Richard Lerner (1974)
2	N10 E19	Outside Midden	WSAP (1975)
3	N11 E19	Outside Midden	WSAP (1975)
4	N8 E19	Midden	WSAP (1975



Map 21. Son-600 (legend p. 5).

5	N7 E19	Midden	WSAP (1975)
6	N8 E22	Midden	WSAP (1975)
7	N8 E23	Outside Midden	WSAP (1975)
8	N8 E25	Outside Midden	WSAP (1975)
9	N10 E17	Outside Midden	WSAP (1975)

There was no evidence of the trenching described by Mauritson in any of the above units. There is ample evidence, however, of extensive disturbance in each unit excavated. The disturbance in most cases seems to have been caused by tree roots either having been removed from the soil or having been burned in situ.

In unit 4 soil disturbance associated with tree removal extends from 20 cm to over 100 cm and is from 50 cm to over a meter in width. The burning of trees is evident in units 7 and 9. Unit 7 contained a charcoal filled pit, 50 cm in depth which extended over half the unit. Unit 9 also had large areas where burning was evident, involving over 60% of the entire unit.

The soil of all nine units was disturbed even though the disturbance was not always clearly illustrated in the unit wall profiles. The earth was splotchy in color, differentially compacted, and the disturbed areas, unlike krotovinas, were discontinuous. Many of the units showed extensive rodent activity, as evidenced by the sharply defined krotovinas.

The surface indications of the midden extent were borne out by the test excavations. The three units within the midden, units 4, 5, 6 averaged 20-25 artifacts in the first four levels while the other units averaged ten or less per level. Almost all of the tools came from the units within the midden.

Site Son-560 (New Bridge Flat)

This is a shallow midden site on the east bank of Warm Springs Creek, 175 miles upstream from its confluence with Dry Creek. The site is 120 meters west and 22 meters below the Stewart's Point-Skaggs Springs country road. It is approximately a quarter mile upstream from the New Rockpile Road Bridge which spans Warm Springs Creek canyon.

The site is on an open primary terrace, measuring 120 meters by 40 meters, in a very steep, constricted valley approximately 50 meters west of Warm Springs Creek. It is the only inhabitable area for nearly a mile in either direction.

The terrace vegetation includes open oak woodland, some buckeye, wyethia, wild iris, lupine, and much poison oak. The slopes on both sides are covered with a stunted, moderately dense forest of madrone, Oregon oak, and poison oak.

The midden covers a small area, 15 meters by 20 meters on the eastern

edge of the terrace at the base of the hillslope. It is south of an intermittent stream which bisects the terrace. The midden is weakly developed, being only a shade darker than the surrounding soil. Both the midden and terrace soil are dark brown, alluvial gravelly silt. Four auger holes were placed on this terrace but no sign of buried midden was found.

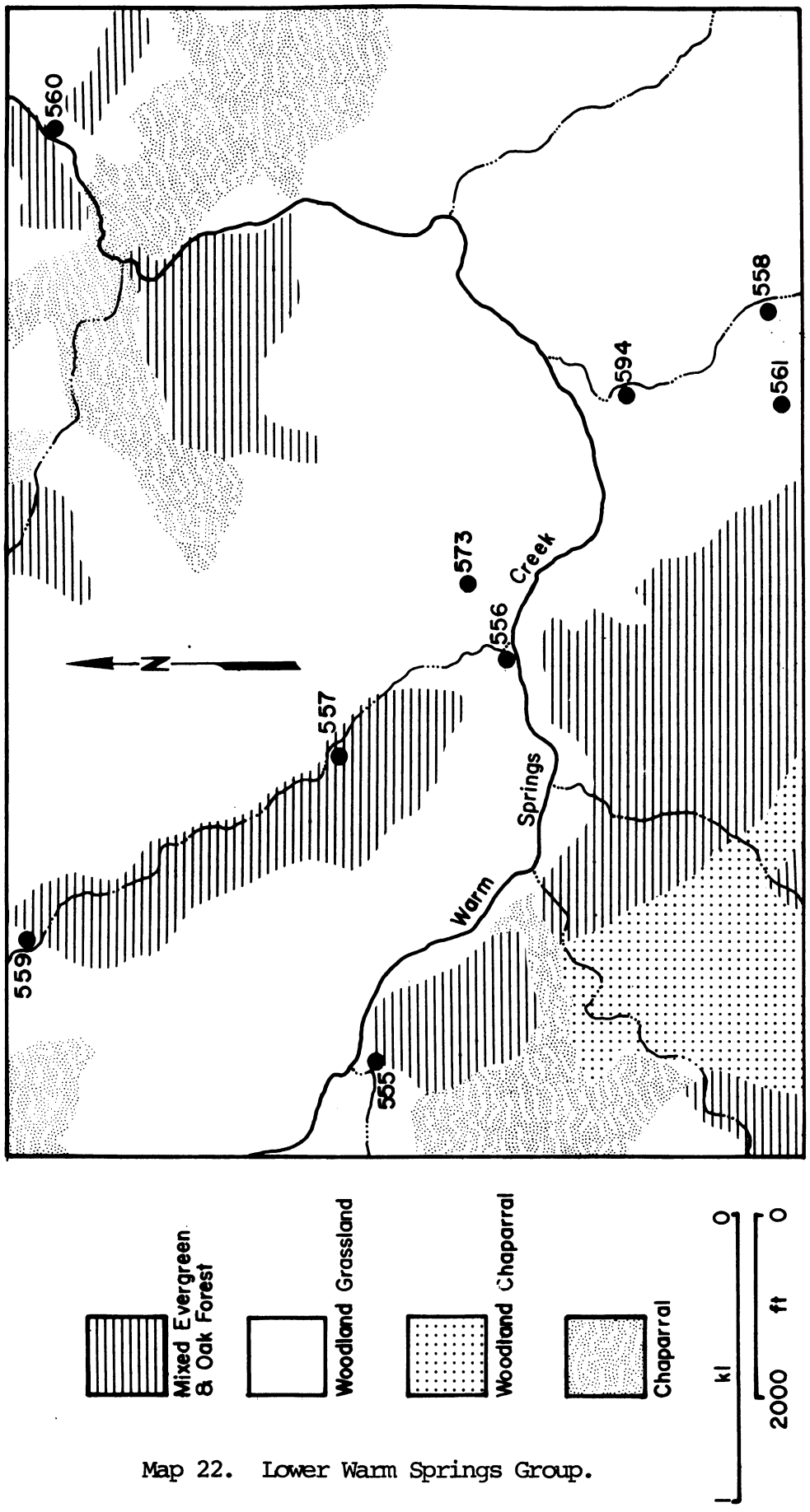
A one meter square test excavation unit was placed in the midden three meters due north of site datum and two meters south of the cut bank of the intermittent stream. The unit ended at 20 cm in a sterile yellow brown, sandy gravel.

During the survey a scraper and several chert flakes were found in the bank of the intermittent stream, and a few flakes on the weakly developed midden. Test excavations showed that there was only 10 to 18 cm of midden. This single occupation zone contained six chert flakes and one obsidian chip. No diagnostic artifacts were found at Son-560.

Central Group Chronology

It is possible to deal (partially) with the chronology of three sites in this group. Site Son-598 has 14 housepits so well defined that they must date to a very late period. Since there is no midden it is impossible that it can have any time depth. Therefore we date it entirely Late Houx. Site Son-542, now destroyed, at one time had a Late Houx component and also a Borax Lake component to judge by the projectile points shown in Figure 26a and 26b.

Site Son-600 apparently also had both Houx and Borax Lake components (Fig. 26c and 26e). The chert-obsidian ratio in the 9 units excavated there is 1.50 (based on 620 flakes) and variation in this was not great from unit to unit. We will not tabulate the material excavated at this site since it was so evidently mixed.



Map 22. Lower Warm Springs Group.

Lower Warm Springs Group

Warm Springs Creek forms a narrower, more restricted canyon, by and large, than does the larger Dry Creek. The exception to this is around the mouth of Little Warm Springs Creek (or Hot Creek) where it opens out a bit for about a half mile along Warm Springs Creek and it is here that we find the important sites. There seems no doubt that ethnographically both lower and upper Warm Springs Creek areas were auxiliary to the larger, more important towns which were further down Dry Creek (Barrett 1908) the sites of which are now under cultivation. The villages in this area may thus have had some specialized function relative to those below. We will discuss this where appropriate but no overall specialization is apparent. Probably this region was more densely wooded and forested than was the open valley of Dry Creek although even this is not certain. In any case a substantial part of lower Warm Springs Creek was apparently given over to woodland grass vegetation. The sites of this group are shown on Map 22 and the eastern part of Map 26.

Site Son-594 (Skaggs Springs)

Son-594 is at present a surface scatter site in the vicinity of the site of the old Skaggs Springs Resort. It is in an area of several naturally occurring hot springs that flow from the west bank of Little Warm Springs Creek (also known as Hot Springs Creek), about 300 m up the creek from its confluence with Warm Springs Creek. Foundations of the hotel, several cabins, and a concrete swimming pool remain to define the site of the old resort. The hot springs are still used by many people and access roads and campsites are numerous. The surface scatter covers a 200 m N-S by 50 m E-W area on the north edge of the extensive, open valley that is 150 m south of the present hot springs. Most artifacts were found along the dirt road that passes over this site. Only half a dozen chert and obsidian flakes were found here.

The surface of this area is covered with a very dense grass ground-cover. The area of Skaggs Springs in general was in open oak woodland but is now dominated by such introduced species as eucalyptus and locust trees. The slopes on both sides of the valley in which Skaggs Springs is located are covered with dense oak madrone forest. Near this site and about 250 m downstream from the confluence of the two creeks already mentioned, is one of the few gathering areas for Angelica, a plant held in high esteem by the Pomos and used both as a spice and a medicine.

There is no midden to be seen anywhere on the surface around Skaggs Springs, the prolonged exploitation of the area by those who use the hot springs (the resort dates from the 1860's), as well as historic cultivation and recent cinnabar mining having totally obscured any midden that is here. Both local residents and ethnographic information collected by Barrett indicated that the area of Skaggs Springs was once a major occupation site. Barrett (1908:220) gives the following account. "Kaho'wani, from ka or aba, water, ho, hot or fire, and wa'ni, ?, at Skaggs Springs, on the east bank of Hot Springs Creek, an affluent of Warm Springs Creek. Mr. Mulgrew, the proprietor of Skaggs Springs, has found on this site a number of mortars, pestles, and other large stone implements as well as many arrowheads and smaller implements."

Additional ethnographic evidence was collected by David Peri and Scott Patterson. There were told by a Pomo (Kashia) informant that different bands used to meet on the terrace on the SW side of the confluence of Little Warm Springs Creek and Warm Springs Creek. As a result of this information, a unit was excavated in this area and 5 m south of the concrete steps that mark the location of the old resort hotel. This unit ended after 20 cm because the extensive disturbance caused by the hotel had obliterated most evidence of Indian occupation. Seventeen augerholes were made in the area of Skaggs Springs. Four were made on the east side of the confluence of the two creeks. Thirteen were made in the extensive valley in which the surface scatter was found and extending from the hot springs up or south to Son-558, a seasonal camp site at the end of the valley. However, in none of these augerholes was found evidence of any midden.

Site Son-558 (Bob-1)

Son-558 is a shallow midden site found on the West bank of Little Warm Springs Creek about a half mile up the creek form its confluence with Warm Springs Creek and at the SW end of the extensive, open valley in which Skaggs Springs is located.

The site is located approximately 50 m up Little Warm Springs from the confluence of this creek and the first major intermittent stream that enters it. It is on an open, flat primary terrace that is immediately west of and 2.5 meters above Little Warm Springs Creek. There are dirt roads on both sides of Little Warm Springs Creek which continue up the creek. A secondary dirt road passes over the midden deposit at the site and crosses the creek, connecting the two larger dirt roads.

The midden is approximately 40 meters north south by 15 meters east west and south west, and the midden extends approximately halfway to the hillslope and grades into non-midden alluvial soil in other directions. The midden is found on both sides of the connecting dirt road that passes over the site, although most is south of this road.

The soil of Son-588 is a very dark gray brown, loose gravelly silt. The surrounding soil is a dark gray brown to gray brown gravelly silt. There are several areas in the vicinity of this site that contain dark-colored soil, but only at Son-588 were artifacts found. These other dark soils may be caused by there being more organic constituents, such as leaf litter, in their soils than the surrounding soils. Auger holes were made in these darker soils but they indicated only 10-20 cm of dark color, underlain by the general alluvium. Auger holes were also put in the extensive terraces to the north and east, but no midden was found.

The vegetation of the site is a mixed riparian/open oak woodland. Dominant trees are bay, Oregon oak, alder, and maple with wild grape an buckeye along the creek.

Little Warm Springs Creek probably maintains a year round flow. The hot springs of Skaggs Springs are approximately 500 meters downstream.

This site has been disturbed recently only by the aforementioned road

which passes over its northern edge. The flat terrace upon which this site is located doesn't appear to have been disturbed by plowing. The site is on the outer periphery of the major historic site of Skaggs Springs Resort, a hotel and spa which was active from the 1860's on. However, the site does not appear to have been disturbed by any resort activities. Erosion is fairly severe along the cut bank of Little Warm Springs Creek.

A 1 x 1 meter test unit was located at 5 m east of the site datum stake in what appeared to be the center of the midden. The unit ended at 50 cms in a sterile, loose sandy gravel. No augering could be done in the floor of this unit because of the looseness of the soil. The nearby cutbank showed no buried midden below 50 cms.

Son-558 contained only 20 cm of a loose, dark gray brown, gravelly silty midden. The first level of this midden was richer than the following levels and included a small obsidian side notched, wide stemmed projectile point, a chert biface, a chert retouched flake, an obsidian retouched flake and a quartz core. The debitage count, after a high of 12 chert and 15 obsidian in the first level, rapidly diminished with depth, and chert and obsidian debitage were found in roughly equal amounts in all levels. Son-558 also contained a relatively large amount of firecracked rock in the first two levels, i.e., 31 lbs. and 23 lbs. respectively. None was found below 20 cm. Animal bone was found in a moderate amount in the first level, 26 fragments, after which only a few pieces occured in each level.

The only diagnostic artifacts from the excavation is the small side notched proj. point from the 0-10 cm level. This was inadvertently omitted from the illustrations but undoubtedly is a late Houx specimen.

Site Son-561 (Buzzard Flap Blind)

Son-561 is an isolated hunting blind site that is situated approximately 300 m south of, and approximately 60 m upslope from, Skaggs Springs. It is on a small ridge between two well watered clearings about half-way up the hills on the west side of Skaggs Springs valley.

Son-561 is on the north facing brow of a small transverse ridge between two gently sloping clearings that are watered by apparently year-round springs. The blind is about 40 m from the west clearing, and about 60 m from the east clearing. Two intermittent drainages trend north from these clearings for approximately 250 m to the area of the Skaggs Springs thermal pools. The area of the site, which is approximately 6 x 6 m is surrounded on the north, east, and west sides by mixed, open oak/madrone woodland, with some manzanita, bay laurels, and buckeye. To the south, the slope becomes more steep and much more heavily wooded with predominantly Oregon oak and madrone, and with Douglas fir increasing upslope.

The soil of this area, including that of the site, is a brown to red-brown silty sand with much colluvial gravel. Logging roads have made some changes in the original land contours in the general area of Son-561, but the immediate area of the site is undisturbed. There was, however, much disturbance throughout the blind because of a thick matting of bay laurel rootlets from the nearby tree.

The pit of the hunting blind at Son-561 was measured at 1.5 m N-S by 1.05 m E-W, and was as deep as 42 cm. There were many large and medium sized rocks, some of which were placed on others, found along the northern and western, or downslope, perimeter of the blind. There were many other rocks that were either within the pit or downslope, apparently having fallen from the rocks that once lined the north and west sides of the blind. These rocks need not have formed a continuous wall, but may have been used to anchor brush screening.

At the present time there are game trails on the east side and on the west side of the blind, both being within 7 m of the blind. There is also a game trail below, and 20 m north of, the blind that goes between the two clearings. The alignment of rocks on the north and west isde of the blind may indicate that aboriginal hunters expected deer and other game would approach the blind from these directions where even now game still passes.

The general procedure used in testing a blind was to first clear the grass ground cover. After the grass was removed, the ground was scraped with a trowel to a hard, undisturbed surface and this detritus was screened in a quarter inch mesh screen. All large rocks were left in situ. This clearing method was continued outside the actual pit to encompass the rocks that had scattered downslope from the rocks lining the perimeter of the blind. The purpose at this time was to remove the soil and leaf litter that had filled in and obscured the original pit contours, and to find any artifacts that might occur in this soil.

The clearing of this blind expanded and deepened the dimensions observed earlier so that the pit now measured 3.8 by 3.1 by 54 cm deep. The thick matting of roots throughout the pit loosened the soil and made it difficult to be fully certain of the hunting blind's original dimensions. No artifacts were found and no other large rocks from the perimeter of the blind were found.

Son-561 will not be subject to innundation. However, because so little is known about hunting blinds, more excavation should take place. The blind could perhaps be trenched to better determine stratigraphically the original dimensions and contours of the pit. In addition, intensive surface collections should be done on the surrounding slopes in order to recover any possible artifacts.

Son-573 (Blue Blind Site)

Son-573 is a possible blind site situated on the north bank of Warm Springs Creek. It is on a flat shoulder that is 250 m north of and 45 m above Warm Springs Creek. It is up the second intermittent drainage below the confluence of Little Soda Creek and Warm Springs Creek at Son-556. The blind is on a gently sloping, 30 x 40 m open, flat clearing in an otherwise steep, moderately wooded terrain. The blind is on the southern edge of this clearing and is oriented towards the rest of the clearing. The blind is a rectangularly shaped, rock-lined depression that measures 2.4 m by 1 m and is 30 cm deep. There are several rocks lining its north and east sides which may have been used to anchor brush screening.

The vegetation of the site is open grassland with a thick ground-cover of

annual grasses and scattered live oak, madrone, and a few digger pines. Along the intermittent drainage are scattered bay, Oregon oak, and live oak. No artifacts and no midden were found at this site.

Site Son-556 (Mrs. Walker's Mortar)

Son-556 is a deep midden site with a housepit and an associated surface scatter on the north bank of Warm Springs Creek and on the northwest isde of the confluence of Warm Springs Creek and Little Soda Creek, the latter being a local name for a major intermittent tributary a half mile up stream from Skaggs Springs. Son-556 is located on an open, extensive primary terrace that is 100 m north-south by 40 m east-west. Across the intermittent creek is another large primary terrace of 40 m north south by 100 m east west. The site is adjacent to and 3-4 m above Warm Springs Creek. It is north of, and across Warm Springs Creek from the Stewarts Point - Skaggs Springs county road. Three dirt roads pass directly over the midden. The first and largest continues up the north bank of Warm Springs Creek, while the dirt road coming down from Little Soda Creek form a Y about 35 m before its junction with the largest of these roads.

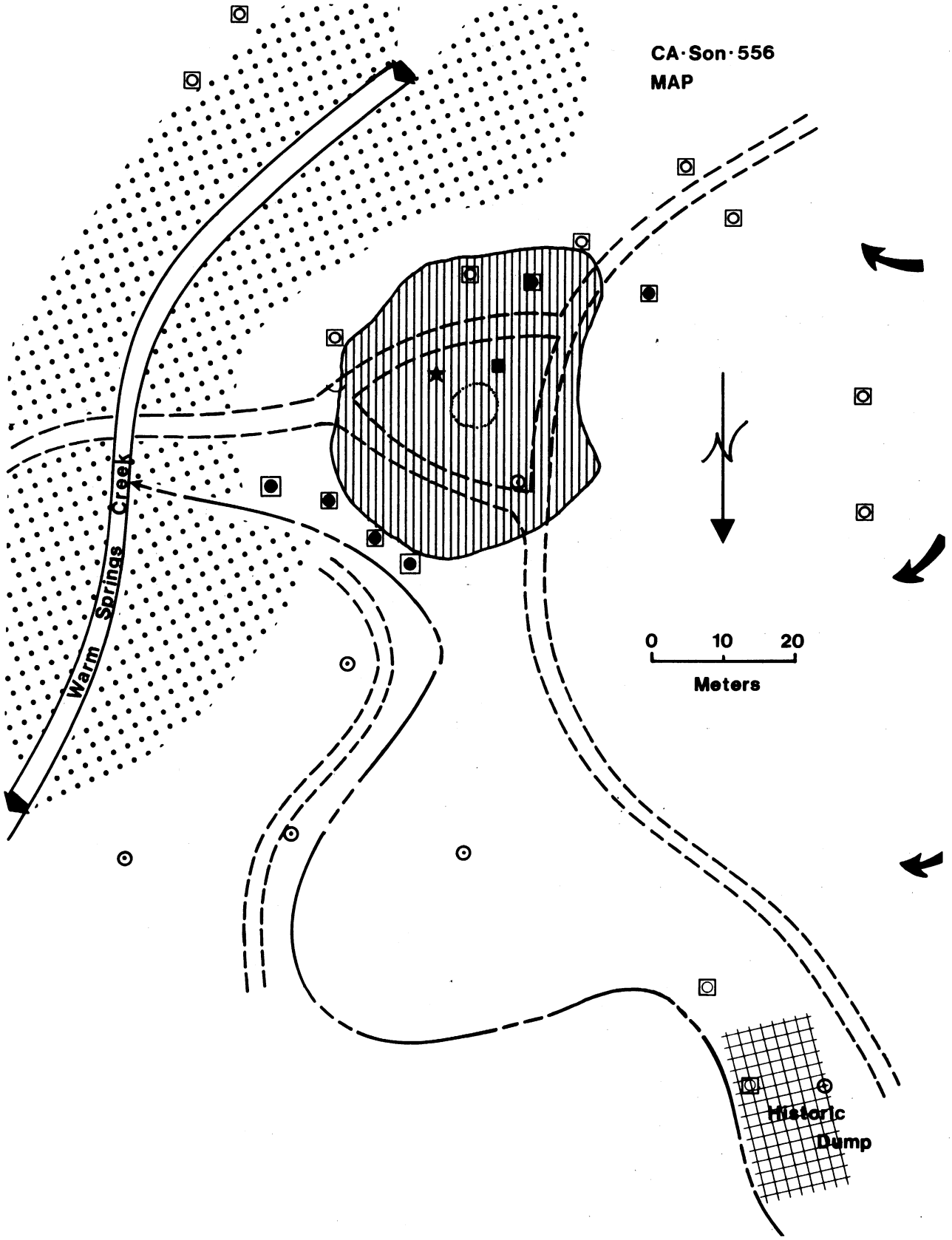
The midden covers an area of 40 by 35 m. It is bordered to the south by the cutbank of Warm Springs Creek, to the east by the bank of Little Soda Creek, to the west by the steepening hillslope, and grades into non-midden soil just past a point where two dirt roads meet and continue up Little Soda Creek. The housepit is within the midden area and about 5 m north west of the site datum stake.

There is a surface scatter of chert, obsidian, and homestead artifacts covering nearly the whole surface of the primary terrace upon which the site is found. This scatter measures about 100 by 35 m.

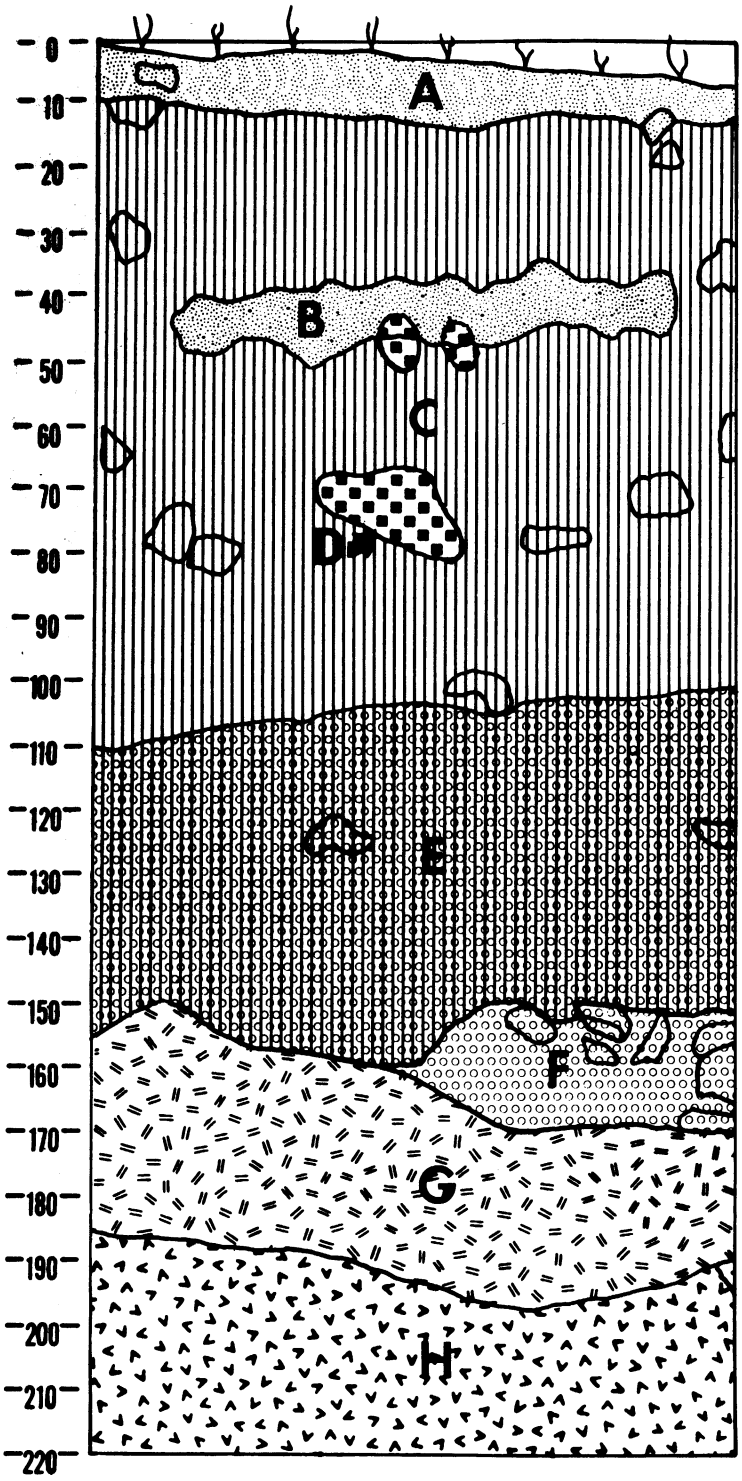
The soil of this site is a dark gray brown, loose gravelly silt. The surrounding soil is a brown gravelly silt. Six augerholes were made in the vicinity of the site. Three were put in the extensive terrace across Little Soda Creek from Son-556. There was no midden found. Two were put in the terrace north of the site. The first, about 15 m north of Unit 1, indicated only weak midden until 75 cm, then darker colored probable midden until at elast 110 cm where the auger bottomed out on rocks. The second of these two, located 70 m north of Unit 1, also found what may be weakly developed, buried midden from 30-110 cm. No artifacts were found in this buried midden, although a firecracked rock fragment was found in the first of these augerholes at 100 cm. The sixth augerhole, 100 m north of Unit 1, found no midden.

The vegetation of this site is now open grassland with riparian vegetation along both drainages. The dominant trees around the site are coast live oak, bay laurel, and Oregon oak, with some wild grape. On the slopes to the north, there is open oak woodland with Oregon oak, and live oak. On the opposite bank of Warm Springs Creek is a dense oak-bay forest.

The surface of Son-556 has been subject to much disturbance. As mentioned, three roads pass over the midden. The largest has been recently bulldozed 10-20 cm into the midden. There has also been a 1 m diameter fire



Map 23. Son-556 (legend p. 5).



A. Midden; dark grayish brown; dry silt with gravels; friable. Annual grass root zone.

B. Yellowish brown; sandy clay lens; compact.

C. Midden; dark grayish brown to very dark gray; dry silt with gravels; moderately friable.

D. Kortovina disturbance.

E. Midden; very dark gray to very dark brown; sandy silt with gravels and cobbles; moderately compact to friable; slightly moist.

F. Rock and charcoal concen tration.

G. Transitional zone; dark grayish brown to dark yellowish brown; silt with sand and clay; moist; compact.

H. Sub-midden; dark brown; clayey silt; moist; compact.

Figure 17. Son-556 Profile.

Site Son-556 (Mrs. Walker's Mortar)

Level cm.	Proj. Pts.	Bifaces	Reworked Bifaces	Scraper	Retouch Flakes	Used Flakes	Debitage
0-10		1-c			1-c		6-c
							12-o
10-20				1-c			19-c
							26-o
20-30					1-c		5-c
				1-o	1-o	1-o	20-o
30-40						1-c	6-c
						1-o	10-o
40-50						1-c	8-c
	1-o						21-o
50-60						1-c	8-c
			1-o		1-o		33-o
60-70	1-c					2-c	10-c
	1-o				1-o	2-o	33-o
70-80							4-c
	1-o				1-o		30-o
80-90			1 drill tip-o				6-c
					1-o	1-o	37-o
90-100							4-c
			2-o	2-o	1-o	2-o	55-o
100-110				1-c			9-c
	2-o		2-o	1-o		1-o	65-o
110-120				1-c		3-c	14-c
			1-o			1-o	90-o
120-130	1-c					1-c	20-c
					5-o		64-o
130-140						1-c	17-c
	3-o		2-o			1-o	63-o
140-150	1-o		1-o		1-o		40-o

Site Son-556 (Mrs. Walker's Mortar)

Level cm.	Proj. Pts.	Bifaces	Reworked Bifaces	Scraper	Retouch Flakes	Used Flakes	Debitage
150-160							16-c
						2-o	55-o
160-170							12-c
	1-o		1-o		1-o	5-o	54-o
170-180	1-c					1-c	21-c
	1-o					1-o	27-o
180-190					1-c		14-c
							18-o
190-200							14-c
	1-o						17-o
200-210							18-c
							10-o
210-220							7-c
						1-o	5-o
Totals	3-c	1-c		3-c	3-c	11-c	238-c
	12-o		11-o	4-o	13-o	19-o	785-o
Grand Totals	15	1	11	7	16	30	1623

Site Son-566 (Mrs. Walker's Mortar)

Level cm.	Cores	Hand Stone	Milling Stone	Mortar	Fired Rock	Animal Bone
0-10					15	9
10-20					31	24
20-30					5	2
30-40	1-c 1-o				11	4
40-50					25	11
50-60					10	14
60-70				1	13	13
70-80	1-c	1	1	1	108	20
80-90	1-o		1		36	17
90-100					37	15
100-110					16	45
110-120					24	31
120-130					23	26
130-140					33	50
140-150					65	10
150-160					45	29
160-170					22	19
170-180			1		22	8
180-190					23	4
190-200					5	7
200-210					6	6
Total	2-c 2-o	1	3	2	575	364

pit recently dug into the midden about 3 m north of Unit 1. Additionally, there was probably a homestead located in the vicinity and the extensive terraces have certainly been plowed, although not recently. Homestead activity on the site is indicated by numerous ceramic and bottle glass sherds found scattered over the terrace. Also, an historic dump was found in a cutbank of Little Soda Creek about 100 m north of the midden. Erosion on the site is fairly severe at the point of confluence of the two creeks and moderate along the cut bank of Warm Springs Creek.

A 1 x 1 m test unit was located on the least disturbed, darkest part of the surface midden at south 65° west, 9 m from the site datum stake. No wet screening was done. The unit ended at 220 cm because the time allotted for the test excavation phase of the Warm Springs Project had elapsed. The artifact count had greatly decreased by 220 cm, but the dozen artifacts found in the last level gave reason to believe that this unit would have gone deeper. An augerhole was made in the floor of the unit. It continued for 50 more cm in the same soil as found in the last level, i.e., a dark brown clayey silt. There followed a lighter colored, coarse silt until the end of the auger at 35 cm. No artifacts were recovered from the augered soil.

Son-556 at 220 cm was the deepest site excavated in the south section of the project. The midden was rich in artifacts and especially so in the strata containing Houx Aspect artifacts. Another significant fact was that obsidian artifacts consistently, and sometimes greatly, outnumbered chert artifacts.

Tentatively, there were five components identified at Son-556 after test excavation. There was an upper midden component extending from 0-50 cm composed of a moderately loose, dark gray brown, gravelly silt. In the north quarter of the unit, it ended on a yellow brown, compact, sandy clay lens. This lens may have been the floor of a dwelling. This stratum contained few tools and only two diagnostic artifacts. The latter included a corner notched obsidian projectile point from the surface, and a fragment of another projectile point from 40-50 cm (probably a Gunther barb). Other tools included a chert biface from 0-10 cm, a nosed chert scraper from 10-20 cm, an obsidian scraper from 20-30 cm, and four retouched and four utilized flakes. The debitage in this component generally numbered under 40 artifacts per level and chert to obsidian ratios generally were.60 or less. There was a sparse to moderate amount of fire-cracked rock with the highest amount, 31 lbs., occurring at 10-20 cm level. Animal bone, which was consistently found in all levels from 0-200 cm, was also present in this component in sparse amounts except at the 10-20 cm level where there were 24 pieces.

The next tentative component is from 50-110 cm in a stratum of less loosely compacted, very dark gray to very dark gray brown, sandy gravelly silt with many rocks. This contained a possible Excelsior point base from 70-80 cm, and either an aberrant form of, or a presursor to, a Gunther point at 60-70 cm (Fig. 27b). There were numerous other, less diagnostic tools in this stratum including two reworked bifaces (a chert and an obsidian core from 70-80 and 80-90 cm respectively. There were also five grinding stone tools which were concentrated around the 70-80 cm level. These include two milling stone frag., a hand stone frag., and two bowl mortar frag. From this same level, there were 108 lbs. of fire-cracked rock, the highest amount of fire found in

this unit and indicative of the concentration of rock at this level.

The next component occurs from 110-170 cm in a stratum of moderately compact, very dark brown to very dark gray brown, sandy gravelly silt. This component also contains many tools and is differentiated from the previous component by the presence of serrated projectile points. Serration is seen by Fredrickson "as an attribute that becomes less frequent" as one moves forward in time (Fredrickson 1973:99). Two Excelsior point bases from 120-130 cm and 160-170 cm were found as well as a medial fragment and two point tips, a serrated point base from 100-110 cm, and a serrated tip and a serrated medial fragment from 130-140 cm. Other tools include 8 reworked bifaces, 7 scrapers, and 8 retouched flakes (including 5 from one level, 120-130). No definite grinding stone implements occurred in this component. The debitage count increased in this component to an average of over 70 pieces per level with a high of 104 pieces at 110-120 cm. The chert to obsidian ratios remain about the same as previous levels. There were moderate amounts (i.e., 20-40 lbs.) of fire-cracked rock per level except for the 140-150 cm level which contained 65 lbs. Animal bone was also present in consistant, moderate amounts. Finally, at 140-150 cm there was an anomalous sliver of bottle glass found, but this probably fell into the unit from above.

The fourth tentative component is in the "transitional zone" from 170-200 cm, a compact, dark gray brown to dark brown clayey sandy silt. The only diagnostic artifacts are an Excelsior point base, a serrated Excelsior point, and a milling stone fragment all of which are from 170-180 cm, and a reworked, small sharply shouldered point from 190-200 cm. All other constituents diminish from previous levels and with depth. The chert-obsidian ratio increases rather markedly.

The last component is poorly defined and extends from 200 cm to the end of the unit at 220 cm. As augering showed, this component could continue as much as 50 cm deeper since the same soil continued to that depth and artifacts were still occurring at 220 cm. This component is in a dark brown, clayey silt. The only distinguishing factor in this stratum is that chert for the first time outnumbered obsidian debitage.

As seen from the preceding description, Son-556 is a very rich and complicated site and potentially the most important site in the southern area of the project. Its deep, well developed midden will aid in establishing a stratigraphic sequence covering the past three thousand years or more. The housepit on the surface and the possible sandy clay floor may provide valuable information about settlement patterns. The site can also help in answering why a site like Son-551, which, at least in part, is contemporaneous with Son-556, would consistently have much more chert than obsidian artifacts whereas Son-556 contained much more obsidian than chert.

Site Son-557 (Pig Skull Dump)

Son-557 is a disturbed, shallow midden site on the south bank of Little Soda Creek (which is a major intermittent tributary to Warm Springs Creek, located a half mile upstream from Skaggs Springs) 600 meters up from its confluence with Warm Springs Creek. At the present time a dirt road which proceeds up from Warm Springs Creek at Son-556 along the south bank of Little

Soda Creek stops at this site. A bulldozed garbage pit is located here and is still used by a local inhabitant. This pit, and the subsequent bulldozing made in the area to cover up the garbage, has destroyed most of this site and disturbed the remainder.

The midden was situated on a flat, open terrace 10 meters south of and 1.5 meters above Little Soda Creek. The midden covered an area of 9 by 9 meters when found in the initial survey. At the time of test excavation, some 6 months later, the midden was half that size and the pit had become larger. The midden was bounded to the north by Little Soda Creek, to the south by the hillslope, to the west by an ephemeral drainage and to the east by the garbage pit and bulldozing.

The area of Son-557 is densely forested. The slopes to the south of the site are covered in a dense oak-bay-madrone woodland. Just to the north, along Little Soda Creek, is a dense riparian growth of bay, live oak with some buckeye and wild grape. The site is now open grassland, but scattered stumps indicate that this was once open oak woodland. At the time of excavation, in late June, all the streams in the area had dried up except Little Soda Creek, which maintained a slight flow. This creek also probably dries up by August.

The soil on the site was a weakly developed midden of dark gray-brown, loose silty gravel. The surrounding soil was a shade lighter - a gray-brown, loose silty gravel to gravelly silt. Augering was impossible in this soil because the soil was too loosely packed to stay in the auger.

A 1 by 1 meter test unit was located 5 meters west of the garbage pit and 2 meters due east of the site datum stake, in an area that was less disturbed than the surrounding area. This unit ended at 40 cm in a sterile yellow-brown loose gravel.

Son-557 was a shallow midden site with very few artifacts. Unfortunately, most of the midden deposit had been destroyed and the test unit had to be located on the periphery. The result was that only one chert core, 8 chert flakes, 3 obsidian flakes and 3 animal bone fragments were found in 20-25 cm of midden.

Son-557 was probably a seasonal camp site, located 14 miles up Little Soda Creek from a major occupation site, Son-556. Approximately a mile up Little Soda Creek from Son-557 is another seasonal camp site with shallow, weakly developed midden, Son-559. The economic function of this site is unknown and its present state of disturbance precludes further excavation for discovering it.

Site Son-559 (Little Soda Creek)

Son-559 is a shallow midden site situated on the north east side of Little Soda Creek, a major intermittent tributary to Warm Springs Creek, and is about a mile and a half up this tributary from Warm Springs Creek. The site is roughly midway between Warm Springs Creek and the top of the ridge whcih divides Warm Springs Creek and Dry Creek. It is on a 50 x 20 m flat shoulder surrounded by steep hillsides. It is between Little Soda Creek to the west and south, an intermittent drainage to the east and south, and is

limited to the north by the increasing hillslope. It is about 75 m below and 250 m southeast of a large flat meadow on which an old house foundation stands. A dirt road proceeding down from the top of the ridge passes through this meadow.

Most of the midden has been eroded away and there appears to be only a small 8 by 10 m remnant left on the north west edge of the flat shoulder and immediately next to Little Soda Creek. The rest of the flat has a sparse to moderate surface flake scatter on a very thin, rocky soil covering serpentine bedrock.

The midden here is a very dark gray brown, rocky, sandy silt with angular serpentine rocks which increase with depth. The surrounding soil is a lighter gray brown, sandy silt colluvium with many serpentine rocks. Augering could not be done due to the extreme rockiness of the soil.

The vegetation of this site is open grassland with sparse groundcover and scattered shrubs such as toyon, spice bush, scrub oak and manzanita. There is a narrow growth of riparian vegetation along Little Soda Creek with bay, some madrone and coast live oak. In the surrounding area, the vegetation is open oak woodland with Oregon oak and live oak dominant and some buckeye and madrone.

Little Soda Creek appears to be a year round stream at this elevation. There was a steady flow of water in it during the time of excavation, early July. This evidently comes from a spring in the meadow above the site.

There appears to be no man-made disturbance at the site. Excavation here showed there was some root disturbance within the midden. Erosion is and has been severe, and it seems most of the midden, which surface scatter indicates once covered this flat, has been washed away.

A 1 x 1 m test unit was located on the midden remnant at 15 m due west of the site datum stake and 3 m northeast of the bank of Little Soda Creek. The unit ended at 40 cms on serpentine bedrock in the western half of the unit and in a decomposing serpentine soil in the eastern half.

Son-559, initially thought to be a surface site, had 40 cm of fairly rich midden. A surface collection made during the initial survey of this site included an obsidian tip of a projectile point, a chert concave base projectile point, a chert side-notched triangular projectile point, and a chert Excelsior point. Despite the promising surface collection, test excavation found no diagnostic tools. The only other tools found were a medial fragment of an obsidian projectile point at 20-30 cm, three utilized chert flakes from 0-10 cm and 2 utilized obsidian flakes from 20-30 cm. Debitage was 21 obsidian and 7 chert at 20-30 cm, and 13 obsidian and 3 chert at 30-40 cm.

There was no obvious fire-cracked rock found in the excavation. 3 shell fragments were found in the first level and there were several bone fragments found in each of the 0-30 cm levels. Charcoal flecks were present in 0-30 cm levels and were abundant in the first level.

Site Son-555 (Woody Woodpecker)

Son-555 is a shallow midden site situated on a primary terrace on the south bank of Warm Springs Creek at the confluence of this creek and Seven Oaks Creek. The site is about 20 m south of the Stewarts Point - Skaggs Springs county road on an open, flat area that once was a homestead site. A dirt road goes through the site from the county road to a man-made, dammed-up pond 50 m to the southwest. The foundation of a homestead was found 30 m south of the datum stake, and an old redwood fence encloses the 50 x 70 m open terrace on which this site is located. There are also numerous introduced species of trees such as eucalyptus, fig, lilac, and apple found in the fenced-in flat.

The surface midden of this site was approximately 35 x 30 m in area. It is bordered to the south by a thick growth of fig trees, to the west by a wire fence, to the east by several small fruit trees, and extended to within 10 m of the county road to the north.

The vegetation of the area of Son-555 is mixed riparian and oak/madrone woodland. The dominant native trees on the site are Oregon and live oaks, bay, madrone, and maple with some manzanita. The slopes in back of, or south of, the site are in a dense oak/bay/madrone woodland. Wyethia, a plant whose seeds were used as a food source, was abundant on the site. Basketry sedges are found 50-100 m down Warm Springs Creek and on the opposite bank from this site.

The soil of Son-555 is a dark gray brown, loose, sandy gravelly silt. The surrounding soil is a much lighter brown sandy silt. Four auger holes were made on the site and indicated the site boundaries already mentioned. In the east part of the midden where it was possible to auger deeply, there was 30-50 cm of weakly developed midden.

Son-555 is one of many sites that were first occupied by the aboriginies, and then by the homesteaders. Other sites in the South Section that show this double occupation are Son-544, Son-556, and Son-594. The midden is considerably disturbed both by the homesteading activities and by more recent road building. There are recent bulldozer tracks on and around the midden.

A 1 x 1 m test unit was located in the least disturbed part in the approximate center of the surface midden at N 10° W, 8 m from the site datum stake. No wet screening was done at this site. The unit ended at 50 cm in a sterile sandy cobble layer.

Son-555 was a shallow site with weakly developed midden that showed a heavy admixture of homestead artifacts along with aboriginal artifacts in the first two levels. The looseness and occasional ashiness of the soil indicate that the first two levels were heavily disturbed. Artifacts from these first two levels include a round bottomed projectile point base (probably an Excelsior point), 3 retouched flakes, 3 utilized chert flakes, 1 obsidian utilized flake, and a chert core as well as square and round nails, a shell button, glass and ceramic sherds, and an iron crank handle from 10-20 cm. The debitage count was 23 chert and 2 obsidian from 0-10, 26 chert and 6 obsidian from 10-20 cm.

Site Son-555 (Woody Woodpecker)

Level cm.	Proj. Pts.	Retouch Flakes	Used Flakes	Core	Debitage	Fired Rock	Animal Bone
0-10	1-c	1-c	1-c 1-o	1-c	23-c 2-o	6	2
10-20		2-c	2-c		26-c 6-o	5	1
20-30			3-c		40-c 3-o	4	1
30-40		2-c	1-c		16-c 2-o		
40-50					2-c		
Totals	1-c	5-c	6-c 1-o	1-c	107-c 13-o	15	4
Grand Total	1	5	7	1	120	15	4

The levels from 20-50 cm were much less disturbed and only one historic artifact was found. Very few tools were found (2 retouched and 4 utilized flakes) and the debitage count, after a high of 40 chert and 3 obsidian in the first level, decreased rapidly. Very little fire-cracked rock or bone were found at any level.

Son-555 is one of the few sites that is located on the south, or shady side, of Warm Springs Creek. This site's location may indicate that is was a special-use site, and not necessarily an occupation site. It could have been used as a camp site for gathering and processing either basketry sedge or Wyethia, both of which occur locally, or used as a camp site while the chert quarry was being used.

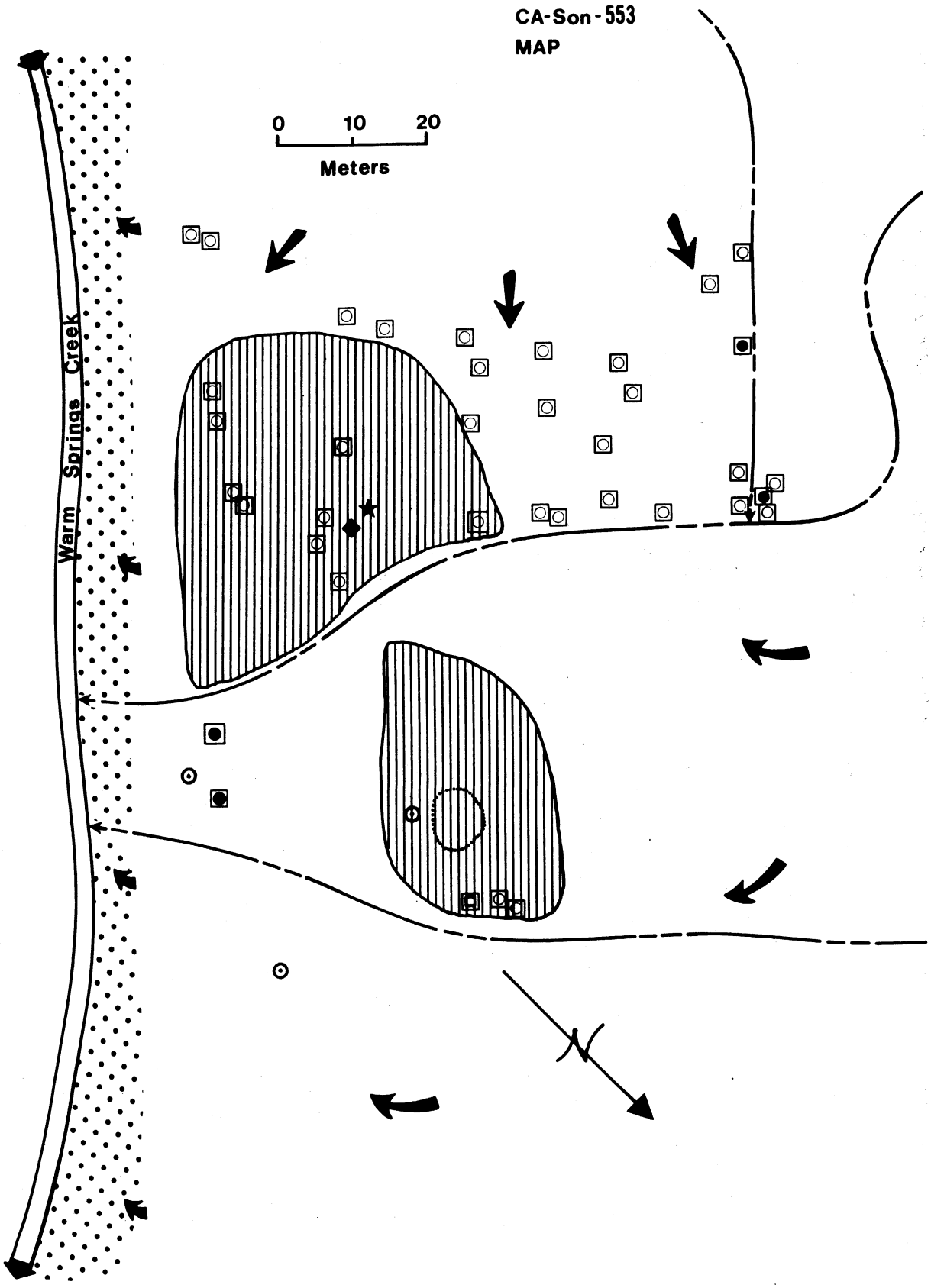
Site Son-553 (Double Black Dirt Delta)

Son-553 is a deep midden site with one well-developed housepit on the north bank of Warm Springs Creek a mile downstream from its confluence with Rancheria Creek. The site is 500 m down Warm Springs Creek from the Baxter Ranch. It is on a primary terrace located in the only substantial widening of Warm Springs Creek Valley in the general area. For almost a mile upstream and for over a mile downstream Warm Springs Creek is in a steep, V-shaped valley with no floodplain. Two hundred and fifty meters downstream from Son-553 the creek flows through a very constricted canyon formed by a resistant facies of Franciscan graywacke and by numerous large boulders of this formation. There is now a waterfall in this canyon. It is very likely that a rockslide at one time dammed up the creek, forming a lake in the area of the extensive terraces. These terraces, which are found on both sides of the creek, are 1.5 m above the creek and on the north side, cover an area of 150 m NE-SW by 70 m NW-SE.

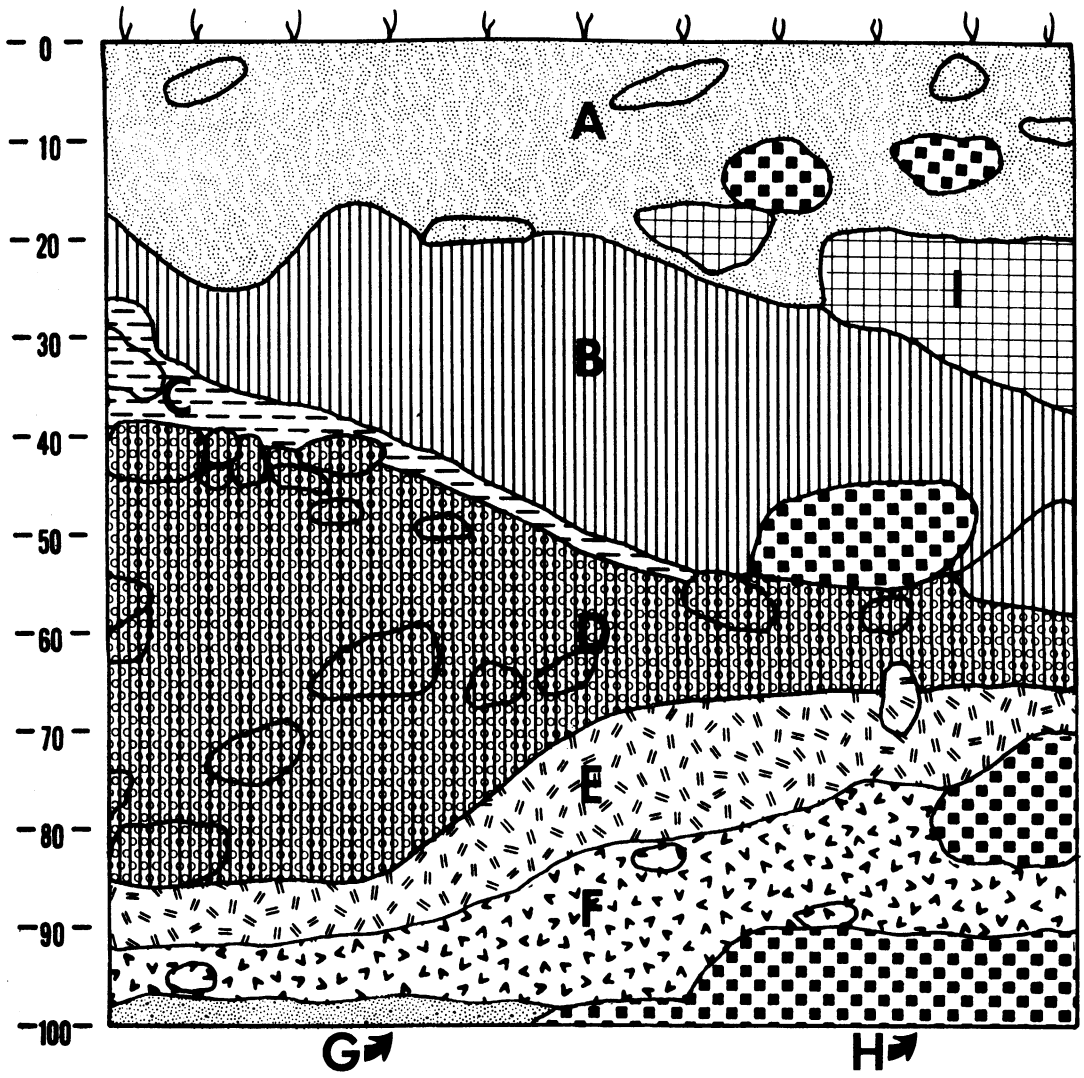
The midden occurs in two separate ateas; the largest and darkest midden is 40 x 40 m and is found on the SE edge of the terrace. It is bordered on the SW by the steep hillslope, on the SE by the cutbank of Warm Springs Creek, on the NE by an intermittent drainage, and imperceptibly grades into non-midden soil to the NW. The second midden is smaller and lighter in color. It is 20 m NE of, and across the intermittent stream from, the darker midden area. This midden covers an area of 32 x 20 m. It is limited on the NE by an ephemeral drainage, on the SE by a barbed wire fence, on the SW by the intermittent stream, and, as in the larger midden, grades into non-midden soil to the NW. On this smaller midden is found a housepit that measures 4.5 m in diameter and 40 cm in depth.

The soil in the larger darker midden is a brown to dark brown, loose, gravelly silt. In the smaller midden with housepit, the soil is a gray brown, compact, clayey gravelly silt. Over the rest of this extensive terrace, the soil is a brown, gravelly, clayey silt to silty sand. Three auger holes were made in the area of Son-553. Two of these were made NE of the midden areas and near the cutbank. Neither showed midden present. A third auger hold was made 1 m south of the large housepit. It indicated 25 cm of weakly developed midden, then non-midden terrace deposits.

Son-553 and the surrounding terraces are in an area of mixed riparian vegetation and open oak woodland. Bay laurel, live oak, Oregon oak, cottonwood, and manzanita are found here. On the north slopes of Warm Springs



Map 24. Son-553 (legend p. 5).



Midden; brown to dark brown; dry; fine-grained silt with gravels; friable to very friable. Annual grass root zone.

Midden; dark brown; silt with gravels; moist; moderately compact.

Dark yellowish brown; moist; compact.

Midden; brown to dark brown; silt with sand and gravels; moist; compact.

Transitional zone; dark yellowish brown; silt with sand and gravels; moist; compact.

Sub-midden; yellowish brown; clay with silt, sand and gravels; moist; very compact.

Yellowish brown sand; moist; moderately compact.

Krotovina disturbance.

Decomposing sandstone.

Figure 18. Son-553 Profile.

Site Son-553 (Double Black Dirt Delta)

Level cm.	Proj. Pts.	Rework Biface	Scraper	Retouch Flakes	Cores	Used Flakes	Debitage	Shell	Fired Rock	Animal Bone	Bone Tools
0-10	1-c 2-o	1-o	1 glass 1-o	1-c 2-o		3 glass 3-o	6 glass 43-c 45-o	16	46	220	
10-20				1-o		17-o	1 glass 21-c 17-o	2	21	98	
20-30	1-o				1-c	1-c 1-o	51-c 9-o		17	45	
30-40				3-c			45-c 10-o	33	26	58	
40-50				2-c		2-c 1-o	25-c 10-o	60	33	53	
50-60		1-c drill tip				1-c	1 glass 40-c 4-o				
60-70							1 glass 56-c 7-o	6	33	55	
70-80	2-o						27-c 3-o	2	25	29	2
80-90						1-o	11-c 5-o	2	8	29	
90-100	1-c						2-o		3	6	
Total	2-c 3-o	1-c 1-o	1-o	6-c 3-o	1-o	4-c 22-o	319-c 112-o	205	275	663	2
Grand Total	4	2	1	9	1	26	431	205	275	663	2

Creek, an open oak woodland of Oregon oak and live oak, with some madrone occurs. On the shadier south slopes, a denser forest of madrone, bay, Oregon and live oak is found.

The dammed-up lake which was present at some point during the occupation of this site would have been used as a fishing source, and possibly some of the many shell fragments found during excavation may have been fresh-water mussels gathered here. There exist now several large, deep pools in the general vicinity of Son-553, most notably the plunge pools formed by the waterfall downstream in which are found a large number of trout.

The only modern man-made disturbance found on the site is a barbed wire fence passing through the larger midden area. Farm buildings and a corral are found only on the NE end of the extensive terrace. There was very considerable rodent disturbance found during excavations. Erosion on the site is minimal.

Two test units were excavated on Son-553. Unit 1, a 1 x 1 m unit, was placed on what looked to be the center of the large, dark midden area at 2 m due south of the site datum stake. The unit ended at 100 cm in a sterile yellow brown sand that was honey-combed with krotavina. An auger hole was placed in the middle of the floor of the unit and went to 230 cms. It contained only alluvial sands and had no cultural material.

Test Unit 2 was a 50 x 250 cm unit that was located in the large housepit in the smaller, more northerly midden. The unit extended from the center of the housepit eastward to beyond the rim. It was located at 24 m N 6° W of the site datum stake. An attempt was made to excavate this unit stratigraphically, and to search for housepit floors. Unfortunately, this excavation took place in July when the ground had become dry and compact. There was little differentiation between soils so stratigraphic excavation was impossible and floors could not be differentiated from the normal soil. Therefore, excavation at this unit was stopped after 20 cm.

Son-553 is a deep, rich midden site that contained two constituents not found in large amounts at other sites. It contained a relatively large number of artifacts made of 19th Century bottle glass, and the largest amount of shell found at any site. Bone was also abundant at this site.

Excavations at Unit 1 indicate that there may be two or more separate cultural components found at this site, an upper midden component and a lower midden component. The upper midden component, from 0-20 cm is characterized by the co-existence of while and Indian artifacts. There were found in these first two levels, an obsidian corner notched projectile point, as well as two other point fragments, an obsidian burin, an obsidian scraper, a scraper made from bottle glass, 4 retouched flakes, 20 obsidian utilized flakes and 3 bottle glass utilized flakes, and 3 square nails. The debitage from these first two levels included 7 glass flakes and had nearly equal amounts of chert and obsidian.

This component was further characterized by a very large amount of animal bone, with 220 pieces in 0-10 cm, and 98 in 10-20 cm. It also contained a large amount of charcoal, and a moderate amount of fire-cracked

rock, and a small amount of shell. Stratigraphically, this component occurred in a loose, brown to dark brown silt with some gravel.

The lower midden component, from 20-80 cm, contained two different strata; one, a dark brown, slightly compact, gravelly silt that extended about 50 cm, and the second, a lighter brown, more compact, sandy gravelly silt. Stratigraphic relationships were obscurred because there was a great deal of rodent disturbance in these strata.

The lower midden component contained only one diagnostic artifact, an obsidian corner notched projectile point from 70-80 cm. Other tools from this component include a chert drill tip from 50-60 cm, a chert biface from 20-30 cm, 5 chert retouched flakes, and 2 bone awl tips from 70-80 cm. Two flakes from bottle glass were found at 50-70 cm, but this low position was almost certainly due to rodent disturbance. The debitage in this component showed that chert consistently out-numbered obsidian. In the 20-50 cm levels, the ratio of chert to obsidian averaged 3:1; in the 50-80 cm levels the ratio was 9:1.

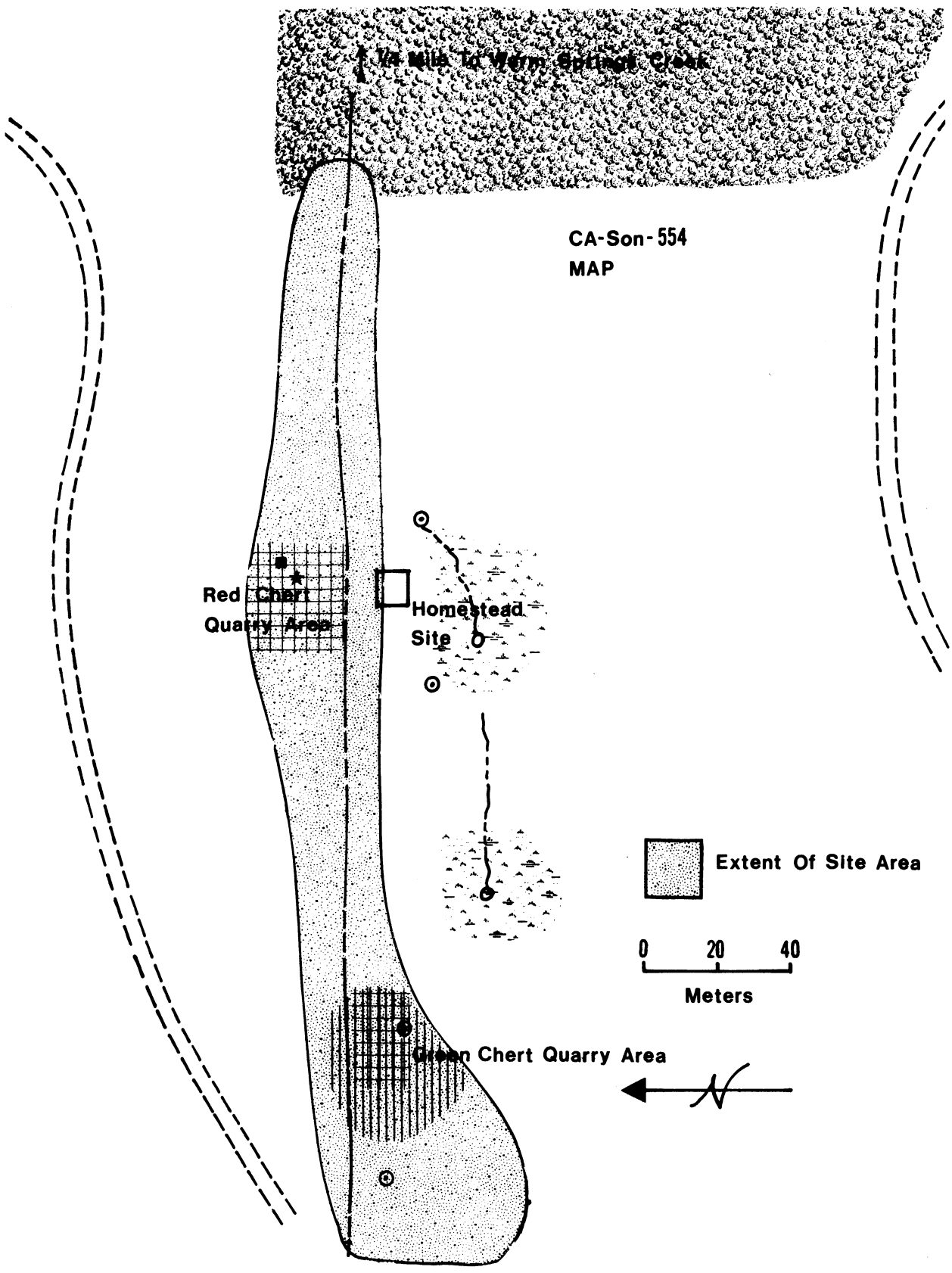
There was less charcoal and less bone in these strata, although the bone consistently numbered 45 to 70 pieces per level from 20-70 cm. This included a dog maxilla, 3 deer teeth, and the distal end of a right human femur from 50-60 cm.

There are also a large amount of shell found in this lower midden component. Most of the shell was concentrated in the 40-60 cm levels and consisted mainly of marine shells such as Mytilus, and Saxidomus. It is not known whether shell was preserved at this site because of the soil chemistry or simply because the site was so late in time that the shell had not yet deteriorated.

The transitional stratum between midden and sterile, from 80-100 cm, has also been extensively disturbed by rodents. The only tool found was a small straight based projectile point, found in a krotovina at 100 cm. This layer contained a rapidly diminishing quantity of all constituents until the sterile sand at 100 cm was reached.

Site Son-554 (Warm Springs Lapidary Center)

Son-554 is a chert quarry site with an associated surface scatter found on the south side of Warm Springs Creek along both sides of an intermittent stream tributary to Warm Springs Creek. The site is at approximately 550 feet elevation. The quarry which extends along both banks of the intermittent stream is in a large, open, flat area in an otherwise hilly, wooded terrain. This flat was once the site of a homestead and the foundations of the homestead and several large eucalyptus trees are found 15 m south of the center of this quarry. There are several old redwood stake fences in the area, one of which passes through the major chert source of this site. Son-554 is bordered to the east by another of these fences, and to the west, 250 m up the intermittent stream, by a more modern wire fence. The site extends 20-25 m on both the north and south sides of the intermittent stream. On the SW edge of this area, there was a small, sparse surface scatter of fire-cracked rocks and 3 retouched chert flakes located



Map 25. Son-554 (legend p. 5).

about 35 m south of the intermittent stream and along the wire fence. The surface scatter was about 10 x 15 m. The total area covered by this site is about 250 m E-W by 50 m N-S.

The quarry occurs in a shale member of the Franciscan Coastal Belt sequence which includes graywacke, shale and conglomerate facies. The shale contains veins and rafted boulders of chert. At this site, the chert is a dense, uniform material that knaps well. Two major sources of this high quality chert, with an accompanying concentration of tools and flakes, were found at this site. The largest occurs 15 m north of the old homestead in an amphitheatre-shaped depression on the north bank of the intermittent stream. It covers an area of approximately 20 x 30 m. The chert here is predominantly red brown with occasional bands of green and light yellow. The second source occurs on the south bank and approximately 50 m upstream from the larger source. The chert here is a light green to gray green chert that covers an area of 15 x 15 m. On either side of these two sources, there is a sparse to moderate surface scatter of chert waste flakes covering the area of the site.

The soil of the site, as well as the surrounding soil, is a dark gray brown, clayey silt to silty clay. There is no midden on this site. Four auger holes were made, but no buried midden was found. An auger hole was put near the chert source on the south bank and although the soil was a compact, brown clayey silt and was not midden-like, it contained a flake and a core from 0-45 cm.

The area of Son-554 is in open grassland with a few scattered oaks. There is a ribbon of riparian vegetation along the intermittent stream. The riparian trees are bay, buckeye, madrone, and live oak. The lower slopes east of the site are covered with dense forests of madrone/oak/bay woodland. The higher slopes on the other three sides of the site are in less dense oak woodland.

The stream which flows along the length of the quarry would be dry at least 3 months of the year. There are two springs, however, on the south bank of the stream that probably maintain a year-round flow.

Son-554 seems to have suffered some recent distrubance. As mentioned, a homestead was located in the general area. A fence line passed through the larger of the chert concentrations. The open, fairly flat field to the north of the site is known to have been plowed. There may have been a trail that went from the homestead across the stream to the plowed field, and this trail goes directly over the larger of the chert concentrations, and may have partially caused the amphitheater-shaped depression here. The disturbance on the rest of the site is minimal. Erosion by the intermittent stream is fairly active and the stream seems to be down-cutting rapidly.

A 1 x 1 m test unit was located on the larger of the chert concentrations. It was located on a gently sloping area just above the exposed concentration of chert tools and flakes at 4 m N 70° E of the site datum stake.

The unit was dry-screened from 0-40 cm. The increasing clay and moisture content of this soil after 40 cm made washing imperative. A pump was brought in and the soil was washed for the rest of the unit. The compactness and high clay content of the soil made excavation and washing slow and tedious. The unit ended at 90 cm in a nearly sterile gravelly clay. An auger hole in the center of the unit went through 60 cm of non-artifact bearing gravelly clay to shale bedrock at 151 cm.

The two chert sources found at Son-554 are accompanied by an extraordinarily large number of chert artifacts. These artifacts include many cores, some retouched and utilized flakes, scrapers, and a few bifaces.

When wet-screening began, a surface collection of the area of concentration chert debris between Unit 1 and the intermittent stream was made because of the disturbance wet-screening would cause. The area of collection measured 10 x 10 m and was biased in that only tools were collected. Surface finds included a medial fragment of a chert projectile point, 6 bifaces, 2 scrapers, 7 cores, and 4 retouched flakes, as well as a fragment of a basalt pestle and a sandstone hammerstone.

Excavation of Unit 1 demonstrated that this quarry site had much more depth than was expected. Unfortunately, since this was a quarry and all tools were rudimentary, no diagnostic artifacts were found and no date can be assigned to this site.

Stratigraphically, the unit can be roughly divided into two strata; one, from 0-40 cm, consisting of dark gray brown compact silt to clayey silt with some gravel. The second stratum, from 40-90 cm, had a higher clay and gravel content.

Excavations uncovered many more cores than were found at any other site, as well as 2 scrapers, 4 bifaces, and a hammerstone. The debitage count was consistently high from 0-60 cm, after which it rapidly diminished.

There were several pieces of redwood fencing found in the 0-10 cm level which is not surprising since a redwood fence once stood in this area. Also, an hexagonal shell casing (possibly from a muzzle loaded gun) was found from 10-20 cm. This historic artifact may have been buried by rodent disturbance or could indicate rapid colluvial deposition.

The only signs of aboriginal living debris, as opposed to work debris, on or around the site occurs at the surface scatter on the SW edge on Son-554. Here there were a few fire-cracked rocks and 3 retouched chert flakes, but no midden.

This quarry site was fully exploited by the local aboriginies. The amphitheater-like depression was probably caused by digging out the high quality chert which exists in veins fairly close to the surface. The chert was then knapped on the spot. Subsequent erosion from the stream below and colluvial deposition from the field above reburied some of the artifacts and exposed others.

Son-554 will not be flooded but should be excavated because of its

great archaeological significance. It is the only quarry site known in the southern area of the area of the project, which ethnographically was the territory of the Dry Creek Pomo. The northern area, in different tribelet territory, has a quarry at Son-582. Although some rare natural resources were shared by different bands, and even different tribes, chert quarries were probably common enough to be considered the sole property of the local band. There exists a unique opportunity to compare the quarrying and flaking techniques of one bank with another. It may also be possible to do source analyses of the chert from the two quarries and compare that with chert artifacts from various sites.

Lower Warm Springs Chronology

While no charcoal for radiocarbon determination was recovered in this group a large number of index artifacts is available to construct a rich chronological picture.

Son-594 had no midden left to excavate. Barrett's (1908) statement sheds some light on the subject. He says there were a large number of mortars and pestles so this together with its identification as a named village indicates that the Houx Aspect right up to the historic period. He also says there are other large stone implements which I think can be taken to be, in part at least, milling stones and hand stones. Thus the Borax Lake Aspect was also present there.

Son-558 had a projectile point that as noted earlier is a late Houx type. It was such a skimpy deposit that this period may be all that was represented.

Site Son-556 has sufficient index artifacts to make its stratigraphic interpretation rather complex. The persons excavating the site note a midden change at 50 cm depth, a change from dark gray brown to very dark gray brown and from moderately loose to less loose. However this was not sufficient to indicate in the profile but only a compact sandy dense at this depth. On the other hand there is a slight but definite decrease in relative amount of chert (relative to obsidian) at the 70 cm level and we feel this is a more reasonable place to indicate a break. Three index artifacts come from above 70 cm: a small side notched point from the surface that could easily be late (Fig. 27a); a crude Gunther barbed point from 60-70 cm (Fig. 27b); and a fragment from 40-50 cm, that appears to be the barb of a Gunther point (not illustrated). These identify the top component as late Houx.

The next midden break occurs at 110 cm depth and this coincides with a break in the chert-obsidian ratio at 120 cm. We assign the levels from 70 to 110 cm to the early Houx Aspect. Within this the levels from 70 to 90 cm have a mortar fragment occurring with two milling stone fragments and a handstone fragment. This would date those levels right around the time of Christ and would imply a considerable time difference between those levels and the ones immediately above, a difference for which there is no physical evidence. We leave this anomily to be dealt with through future excavation.

Next below this is a component from 110 to 170 cm where another midden break coincided with a break in chippage ratios. There are three quite definite large Excelsior points in this component (Figs. 27c, d, e) so it is assigned to Late Borax Lake Aspect.

The remainder we assign to early Borax Lake with the possibility that something yet earlier is at the bottom of the site unassayed. A projectile point found at a depth of 190-200 cm seems to have been shaped with definite intent and is almost identical to one recovered from the Willits site and we therefore feel it must represent a definite and presumably early type as yet undefined (compare Fig. 27f with Meighau 1955:Pl. 4H).

Site Son-559 has no midden to speak of but three diagnostic projectile points were found on the surface. The smallest Excelsior point shown in Fig. 27g would seem to date from early Houx while the other two (Fig. 27h and 27i) are from Borax Lake. We assign the site to these two periods but make no differentiation with respect to stratigraphic levels.

We are assigning site Son-553 entirely to the Houx Aspect and the historic period. The top 20 cm we consider historic because of the glass chippage. Below that we consider it late Houx down to about 50 cm where there is soil and debitage ratio. We consider it early Houx below that.

Chronology of Lower Warm Springs

	Site Son-				
	594	558	556	559	553
Historic					0-20
Hb		X	0-70		20-50
H	X				
Ha			70-110	X	50-100
BLb			110-170		
BL	X			X	
BLa			170-220		

Lower Warm Springs Group

Chert-Obsidian Ratios by Site and Period

	Site Son-		
	556	559	553
Historic			1.03 (126)
Hb	0.40 (217)		4.17 (150)
H			
Ha	0.12 (210)	X	6.38 (155)
BLb	0.21 (445)		
BL		X	
BLa	0.96 (151)		
Total	0.30 (1023)	0.29 (144)	2.85 (431)

Hb: Late Houx

H: Houx

Ha: Early Houx

BLB: Late Borax Lake

BL: Borax Lake

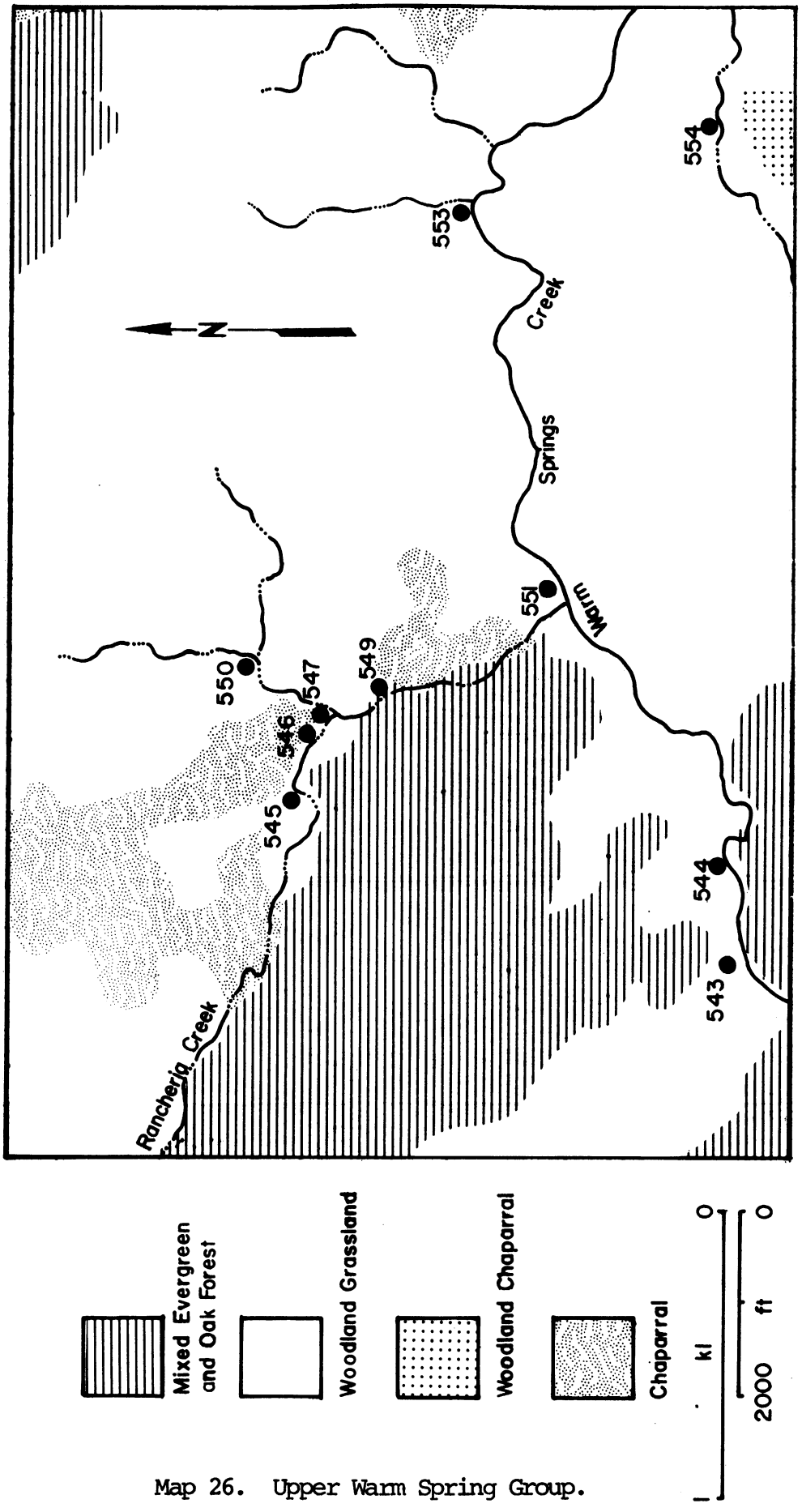
BLa: Early Borax Lake

Lower Warm Springs Site Group

Chert-Obsidian Debitage Ratios by Site and Level

Level	Site CA-Son			
cm.	556	559	555	553
0-10	0.50(18)	0.71(36)	11.50(25)	0.96(88)
10-20	0.73(45)	0.17(49)	4.33(32)	1.24(38)
20-30	0.25(25)	0.19(43)	13.33(43)	3.44(40)
30-40	0.60(16)	0.23(16)	8.00(18)	4.50(55)
40-50	0.38(29)		* (2)	2.50(35)
50-60	0.24(41)			10.00(44)
60-70	0.30(43)			8.00(63)
70-80	0.13(34)			9.00(30)
80-90	0.16(43)			2.20(16)
90-100	0.07(59)			0.00(2)
100-110	0.14(74)			
110-120	0.16(104)			
120-130	0.41(84)			
130-140	0.27(80)			
140-150	0.00(40)			
150-160	0.29(71)			
160-170	0.22(66)			
170-180	0.78(48)			
180-190	0.78(32)			
190-200	0.82(31)			
200-210	1.80(28)			
210-220	1.40(11)			

( ) : debitage frequency
* : infinity, or all chert



Map 26. Upper Warm Spring Group.

Upper Warm Spring Creek Group

The sites of this group are found on Warm Springs Creek at the mouth of Rancheria Creek and above and in the drainage of Rancheria Creek the topography here is dominated by the narrow canyons of the two streams so we would not expect large sites and indeed we do not find sites that are really extensive but several are deep and chronological significant.

The land here is dominated by an area between the two streams on which the vegetation reconstructs as mixed evergreen and oak forest which we believe had considerable stands of redwood. This makes it a fringe area from the standpoint of Mahikaune or Dry Creek Pomo habitat and most probably makes it a specialized area from the standpoint of the people of the tribelet. It also straddles the trail between Dry Creek and the Pacific Coast at Stewart's Point, an important trail ethnographically and probably earlier as well in the exchange and transport of goods between the coast and interior.

The area is shown on Map 26 but the group does not include sites Son-553 and 554 on the eastern part of the map.

Site Son-543 (Days End Blind)

This is an isolated hunting blind site at the extreme western end of the Upper Warm Springs Group. The blind is 300 m downstream from the confluence of Warm Springs Creek and Strawberry Creek and approximately eight meters north of the Skaggs Springs-Stewart's Point road.

It is situated on the north side of Warm Springs Creek, at the beginning of the hill sloping out of the valley of Warm Springs Creek. The blind is in a ten by five meter, fairly flat, shallow basin along an ephemeral drainage. It is bordered to the north, northeast and west by the hillshope of Warm Springs Valley. To the south and southeast the blind has a good view of the lower terraces of Warm Springs Creek.

The vegetation of the area consists of open oak woodland with very thick grass groundcover. Oregon oak, coast live oak and black oak dominate, with some madrone and Douglas fir.

There is no appreciable modern man-made disturbance within the immediate area of Site 543. There was, however, considerable rodent disturbance on the bottom of the hunting blind as well as slumping along the sides of it.

It is known ethnographically that the Pomo used blinds when hunting deer and birds (Barrett 1952:127, 133). Five hunting blinds were found during the field survey. All of these blinds are found in the south, or Dry Creek Pomo part of the Project Area. It is interesting that these seem to be confined to one of the two area tribelets. Since very little is known about hunting blinds, the clearing of two blinds was initiated. Site 543 was cleaned and studied because of its easy accessibility from the country road.

Before cleaning, the depression of the hunting blind measured 139 cm by

129 cm and 36 cm deep. There were eight large rocks, two of which formed courses along the northern edge of the perimeter. Several other large rocks were scattered in the immediate area and had apparently fallen from the northern wall of the blind. These rocks may not have formed a continuous wall but may have been used to anchor brush screening.

The blind was first cleared of grass groundcover and then scraped with a trowel to a hard undisturbed surface. All rocks both within and outside the actual pit were left in situ but were exposed and drawn to scale. This method of clearing the blind exposed a number of rocks that had scattered downslope from the original wall perimeter. It, also, expanded and deepened the blind depression to measure 3.5 meters by 2.8 meters and to a depth of 47 cm. The cleared ground and loose earth were screened with a 1/4" mesh but no artifacts were recovered.

No discernable animal trails were observed in the immediate area of Site 543, but the ephemeral drainage to the east affords easy access to Warm Springs Creek.

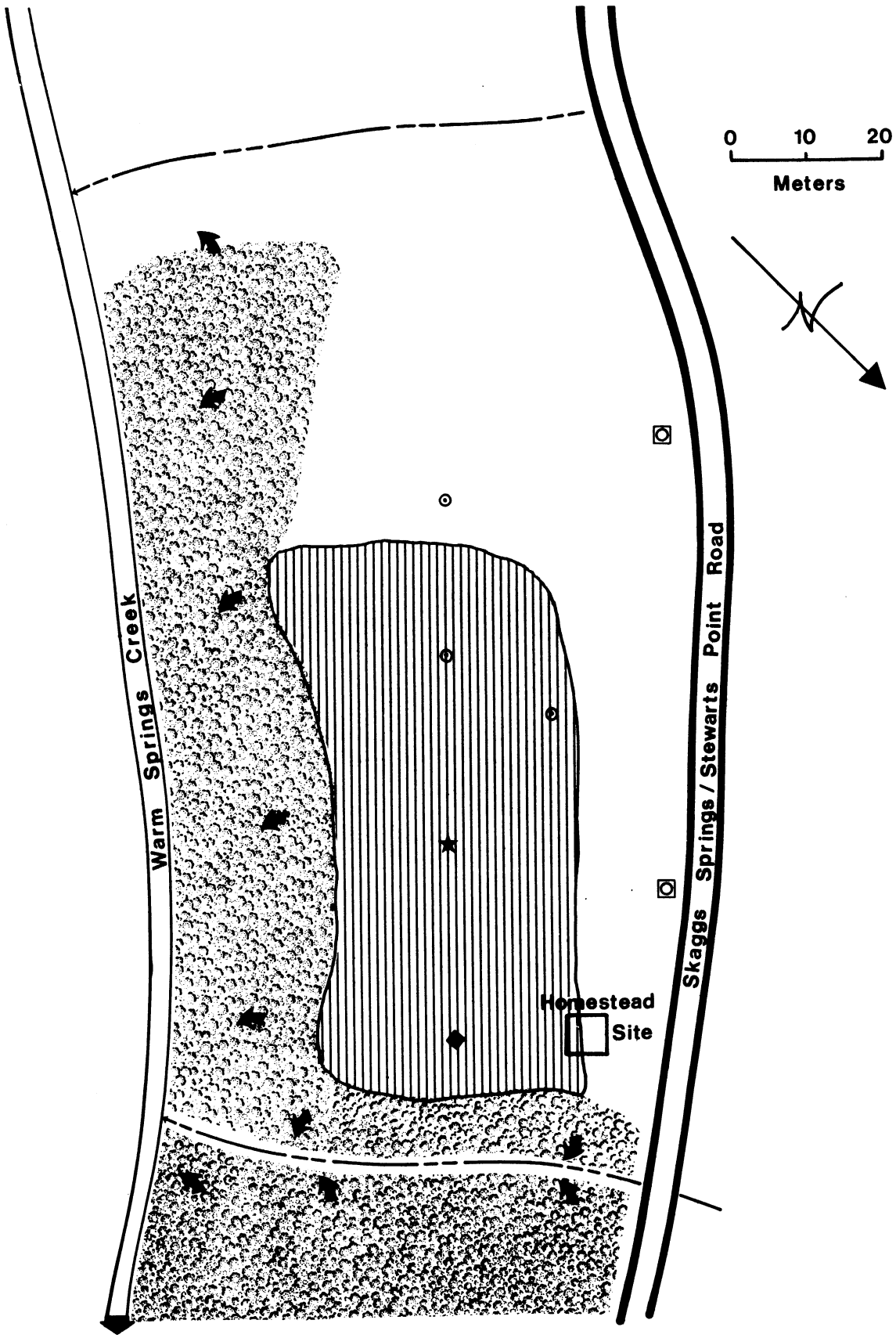
Site Son-544 (Serene Flat)

This is a rich, deep midden site in the extreme western end of the Upper Warm Springs Group. The site is found between Skaggs Spring-Stewart's Point country road and Warm Springs Creek about a half mile west of the confluence of Rancheria and Warm Springs Creeks.

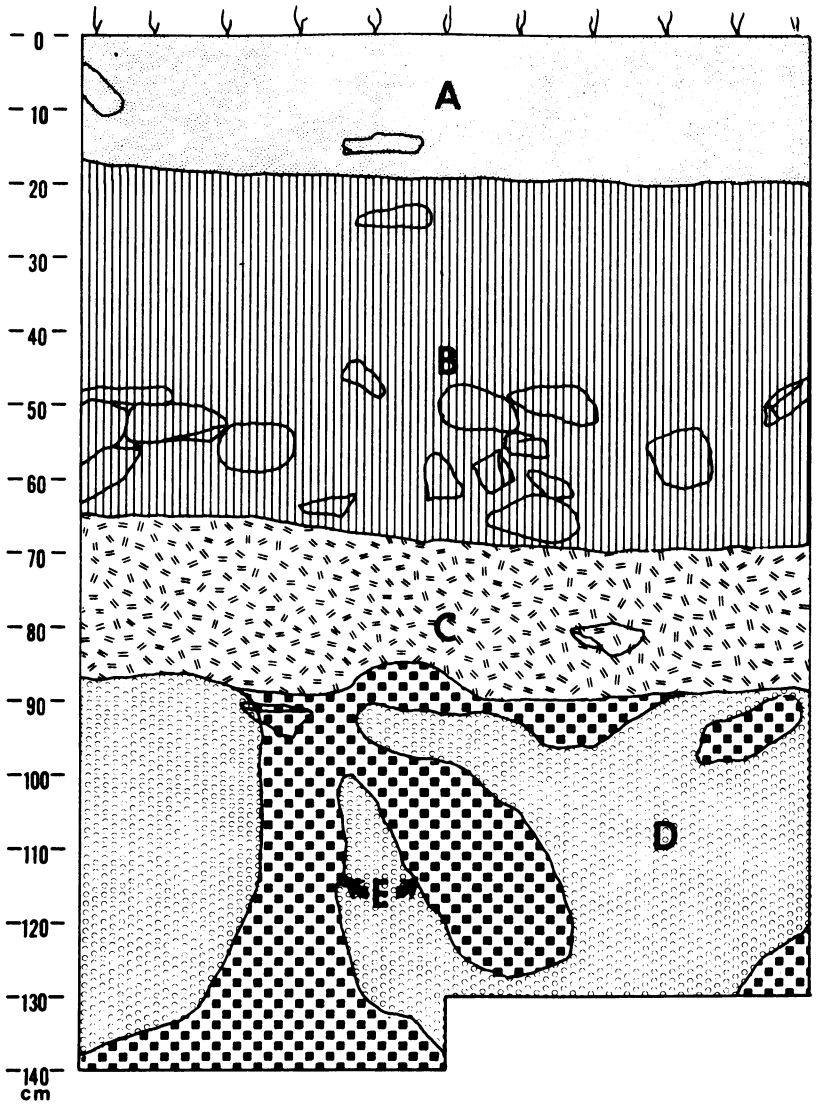
The site is situated on a secondary terrace about 15 meters above and 30 meters northwest of Warm Springs Creek. This flat open terrace is bordered on the southeast by the creek, on the northwest by the canyon slope, on the northeast by a year-round spring-fed tributary, and on the southwest by an ephemeral drainage. It is in an area of open oak woodland vegetation dominated by Oregon, Coastal and Black Oaks with some firs present on the higher slopes. Along both drainages bordering the site is a well-developed riparian vegetation with bays, willows, and oaks as well as thick, dense areas of woodwardia. Several species of Brodeia covered the site at the time of excavation.

The soil of Son-544 is a very dark gray gravelly silt. This contrasts sharply with the pale brown gravelly silt in the surrounding area which contains many angular, talus-derived pebbles. Three auger holes were placed to determine the extent of midden, all on the southwest side of the site. This is the only open side which is not bordered by tributaries or hillslope. Augering revealed that the midden continued onto the open, flat terrace up to 75 meters southwest of the spring-fed tributary, but did not extend over the entire terrace.

Site 544 is known to be an historic homestead site, and was called "Serene Flat" by the original homesteaders. A small wooden house with a brick chimney once stood about 20 meters northwest of the Test Unit 1. Its foundation has been obscured by recent plowing and bricks are scattered in the immediate area. In addition to plowing, the site has been disturbed further by bottle-hunters who have dug several small shallow pits in search of 19th century relics. It is probable that at least the first 20 to 30 cm of this



Map 27. Son-544 (legend p. 5).



A. Midden; dark brown to very dark grayish brown; gravelly silt with cobbles; dry; friable. Annual grass root and plow zone.

B. Midden; very dark grayish brown; gravelly silt with cobbles and fire-cracked rock; dry friable.

C. Transitional zone; very dark grayish brown to brown; silt with sand and clay; subangular gravels; compact; slightly moist.

D. Sub-midden; brown to dark yellowish brown; silty sand with gravels; moderately friable to compact; slightly moist.

E. Kortovina disturbance.

Figure 19. Son-544 Profile.

Site Son-544 (Serene Flat)

Level cm.	Proj. Pts.	Reworked Biface	Scraper	Retouch Flake	Used Flake	Cores	Debitage
0-10			2-c	3-c	4-c		89-c
		1-o		1-o	1-o		69-o
10-20					1-c	1-c	68-c
	2-o	1-o	1-o				69-o
20-30				1-c			75-c
				2-o			57-o
30-40				1-c			73-c
	1-o			1-o			59-o
40-50	1-c						67-c
							61-o
50-60	1-c		1-c		3-c	1-c	99-c
		1-o				1-o	46-o
60-70	1-c		4-c		5-c	1-c	169-c
					1-o		49-o
70-80				1-c	5-c	3-c	162-c
					1-o		47-o
80-90				1-c			70-c
		1-o			1-o		21-o
90-100			1-c	1-c	2-c		73-c
				2-o			18-o
100-110			1-c	4-c			49-c
	1-o			1-o			11-o
110-120					1-c		29-c
		1-o					5-o
120-130			1-c				39-c
							7-o
130-140							1-o
Totals	4-c		10-c	12-c	21-c	6-c	1062-c
	3-o	5-o	1-o	7-o	4-o	1-o	520-o
Grand Total	7	5	11	19	25	1	1582

Site Son-544 (Serene Flat)

Level cm.	Pestle Bead	Shell Rock	Fired Bone	Animal	Historical
0-10			24	100	1 sq. nail
10-20		1	30	46	1 sq. nail
20-30	1		62	124	1 glass frag.
30-40			65	45	
40-50			83	19	
50-60			76	9	
60-70			118	10	
70-80			49	8	
80-90			18		
90-100			24	3	
100-110			5	3	
130-140				2	
Totals	1	1	554	369	

site has bene seriously disturbed by either plowing, historic foundations or pot-hunter holes.

Test Unit 1 was placed at 25 meters north, 45° east of datum in the darkest part of the midden. The unit continued to 140 cm with the last 50 cm being riddled by krotovina disturbance.

Excavations revealed that this was an important, rich midden site. It not only contained a high quantity of lithic debris, but also one of the highest amounts of animal bone found at any site in the Project Area. Moreover, the only shell bead found during excavations came from this site.

Physically site Son-544 can be divided into four strata, the top 20 cm being differentiated from the next 40 cm only because it is a plow zone. These two are evidently equivalent and because of various index artifacts, particularly a clam shell disc bead, we attribute the 0-60 cm levels to the latest time period.

A lower midden component extends from 60-90 cm and includes the remaining very dark gray gravelly silt and a mottled transitional zone. The amount of animal bone rapidly drops off in this component, but conversely, the fire-cracked rock count triples in quantity. This suggests that the very large quantity of faunal remains in the upper midden zone can be attributed to fairly recent deposition rather than to preservation by burning. The proposition of chert to obsidian debitage increases in these lower levels. The diagnostic artifacts from this component are a small side-notched projectile point, a small Excelsior point and a milling stone.

The final, sub-midden component (90-140 cm) includes a dark yellow brown silty clayey sand with heavy rodent disturbance. It is characterized by low quantities of both animal bone and fire-cracked rock, and a decrease in lithic remains. The ratio of chert to obsidian, however, steadily increases, reaching 5:1 in this component. Although no diagnostic artifacts were recovered from this final zone, the chert to obsidian debitage ratios suggests that this sub-midden level is an earlier component than any represented above.

Site Son-545 (Horseshoe Flat)

This is a weakly developed midden site which is one of five habitation sites located within the Rancheria Creek drainage. The site is 3/4 mile upstream from the confluence of Rancheria and Warm Springs Creeks, and is the furthest upstream of the five Rancheria sites. It is about 40 meters north of and directly across Rancheria Creek from the junction of Rancheria Creek Road and Wickersham Road.

Site 545 is situated on a first terrace on the north bank of Rancheria Creek, delineated by the confluence of Rancheria Creek and an unnamed intermittent tributary. The promontory consists of an outcrop of resistant graywacke and is surrounded by large boulders dam deep pools of water in the creek. The site has open grassland vegetation with a scattering of oak stands. The slopes on the northeast side of Rancheria Creek are now open oak/madrone woodland, and the opposite bank is in dense mixed oak/evergreen

forest with redwood, oak and laurel dominant.

The soil of the site is a dark brown sandy silt which contrasts with the surrounding lighter soils. Three auger holes were placed both east and west of the seasonal drainage, which is on the upstream side of the terrace. These revealed no buried midden deposits so the midden at this site is evidently confined to the ten meter square terrace.

Test Unit 1 was placed on the first terrace in what appeared to be the darkest part of the midden, south 80° west, 4.3 meters from datum. It was quickly discovered that the midden was very weakly developed and continued only to 30 cm. The soil became sandier and full of cobbles and pebbles as the unit continued in depth. Only small pockets of midden remained in the 20-30 cm level, and the 30-40 cm level was sterile.

The single cultural component at Site 545 contained only a few artifacts.

Level cm.	Proj. Pt.	Scraper	Retouch Flakes	Used Flakes	Cores	Debitage
0-10	1-c	1-c		2-c	1-c	17-c
				2-o		3-o
10-20						4-c
			1-o	1-o		1-o
20-30					1-c	4-c
30-40						---

One diagnostic artifact was a chert straight based projectile point possibly indicating a Houx component.

Site Son-546 (Farmer's Path)

This is a surface site situated on a primary terrace on the north bank of Rancheria Creek. It is about a half mile upstream from the confluence of Rancheria and Warm Springs Creeks. The site is almost certainly an extension of the well-developed midden site just 90 meters downstream, Son-547.

The area of the site encompasses a flat, open terrace measuring 40 by 20 meters. An old corral and two abandoned farm buildings are located north and west of the midden area. The area is on a footpath which was previously used as a road and presently connects Sites 546 and 547. The site is bordered on the south by Rancheria Creek, and on the north, west and east by the hillslope and the farm buildings.

Site 546 is in open oak woodland with very thick grass groundcover. Oregon Oak is the dominant tree both on the terrace and on the slopes to the north of the site. Madrone and coast live oak stands are present on the

terrace. The lower and opposite slope of Rancheria Creek is now a boggy, open grassland with a dense mixed redwood forest above it. Numerous specimens of several Brodeia species, Mariposa lily, and soaproot were seen on all open areas of both slopes during the spring months. Along Rancheria Creek, the usual riparian vegetation of bay, willow, and cottonwood are present.

The soil of the surface site and the surrounding area is a dark yellow brown alluvial sandy silt. Two auger holes were bored in this area to determine if any midden might be buried. In neither case was midden discovered, the alluvial sandy silt continuing the length of the auger (1.5 meters).

There was a very sparse scatter of chert and obsidian flakes concentrated in a three by five meter area between the corral and Rancheria Creek. Farming activities have obscured, if not destroyed, traces of aboriginal utilization.

No diagnostic artifacts were recovered during surface survey reconnaisance. However, the presence of the collapsed, abandoned farmhouse, outbuilding and corral suggest a date in the homesteading period, e.g., 1850-1900. This site undoubtedly represents a late use of the Rancheria drainage and could be instructive in understanding interrelationships between Europeans and Pomo Indians during that time period.

Site Son-547 (Broken Bridge)

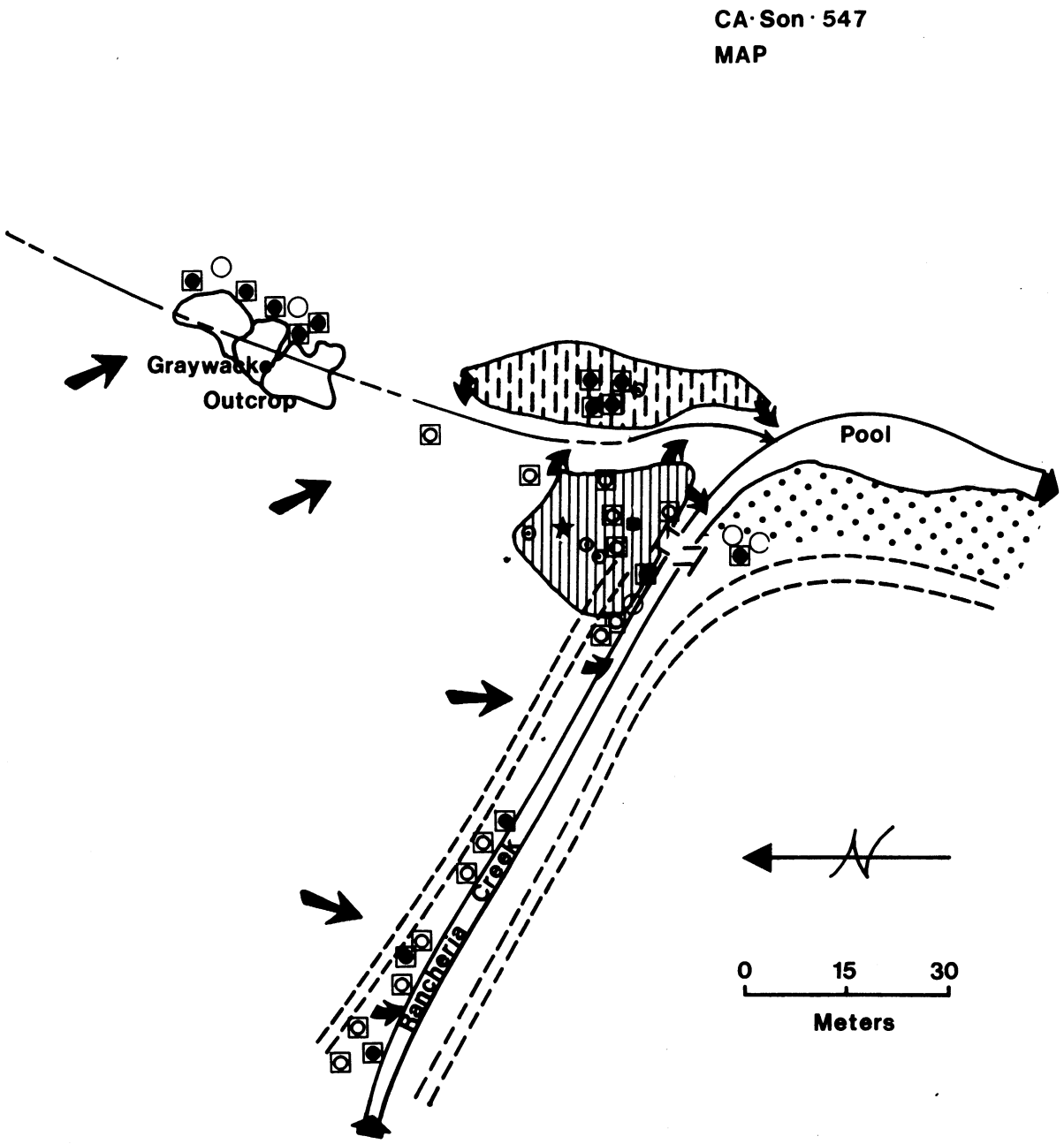
This is an important well-developed midden site situated on the north bank of Rancheria Creek. It is about a half mile upstream from the confluence of Rancheria and Warm Springs Creeks, and is the deepest of five sites located within this drainage.

The site is on a triangularly shaped primary terrace which is at the confluence of Rancheria Creek and its first major tributary. The terrace is on the upstream side of the unnamed tributary and has its apex pointing southeast. The site is bordered to the east by this year-round tributary, to the south and west by the creek itself, and to the north and west (at the base of the triangle) by the hillside. The triangle measures approximately 30 meters to a side.

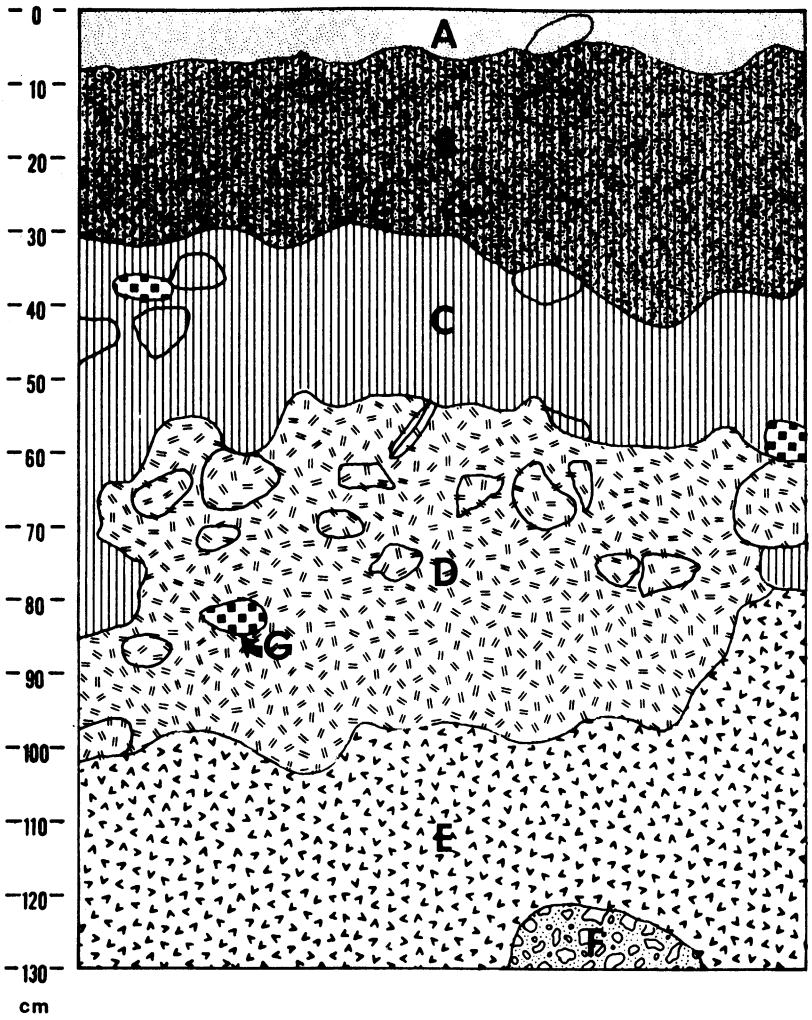
Fifteen meters to the east of datum and across the tributary is an extension of the primary terrace on which this site is located. It measures 40 by 10 meters and is a flat shaded area. This extension contained a sparse flake scatter, but no midden.

The vegetation in and around the site is open oak woodland with oak and bay dominating and allowing moderate grass groundcover. On the slopes to the north, Oregon oak continues to dominate, with some madrone and coast live oak. On the opposite side of Rancheria, the oak forest slowly gives way to a dense mixed redwood cover. Numerous specimens of brodeia, wild onion and soaproot were found growing on or around the site. A well-developed riparian system is absent along the drainages and we find oak woodland growing up to the edges of the stream banks.

The soil of the site is dark gray brown gravelly sandy silt with many



Map 28. Son 547 (legend p. 5).



A. Midden; dark brown; sandy silt with sub-angular gravels; dry; friable. Annual grass root zone.

B. Midden; very dark grayish brown; silty loam; dry; friable. Heavy root disturbance.

C. Midden; very dark grayish brown; silty loam; dry; friable.

D. Transitional zone; very dark grayish brown to dark yellowish brown; sandy silt with gravels. Slightly moist; friable to moderately compact.

E. Sub-midden; dark brown to dark yellowish brown; sandy clay with gravels; slightly moist; compact.

F. Gravels; yellowish brown to dark yellowish brown; sandy clay; moist; moderately compact.

G. Krotovina disturbance.

Figure 20. Son-547 Profile.

Site Son-547 (Broken Bridge)

Level cm.	Proj. Pts.	Biface	Reworked Biface	Scraper	Retouch Flake	Used Flakes	Cores	Debitage
0-10	1-c			2-c		5-c		42-c
				1-o	8-o		16-o	
10-20	1-c	1-c		2-c		1-c		85-c
	2-c		1-o		1-o	9-o		41-o
20-30	2-c					1-c		44-c
			1-o			2-o		21-o
30-40	1-c					5-c		75-c
	1-o				1-o	4-o		23-o
40-50						7-c	1-c	107-c
			1-o			5-o		18-o
50-60	1-c					8-c		91-c
				1-o		9-o		27-o
60-70						2-c		35-c
						4-o		12-o
70-80								25-c
						2-o		10-o
80-90								18-c
								5-o
90-100								3-c
								7-o
100-110								8-c
						1-o		15-o
110-120						1-o		7-o
120-130						1-o		2-o
Totals	6-c	1-c		4-c		29-c	1-c	533-c
	3-o		3-o	1-o	3-o	46-o		204-o
Grand Totals	9	1	3	5	3	75	1	737

Site Son-547 (Broken Bridge)

Level cm.	Hand Stone	Pestle	Fired Rock	Animal Bone
0-10			7	1
10-20	1	1	45	11
20-30			62	21
30-40			52	12
40-50			32	4
50-60			15	7
60-70			19	5
70-80			4	3
80-90			11	6
90-100			6	1
100-110			1	1
110-120			1	
120-130			3	
Total	1	1	258	72

sub-angular cobbles and gravels. The surrounding soil is much lighter, being a yellow brown silt. This entire section of Rancheria Creek is underlain with massive beds of sedimentary rock of the Franciscan sequence. A resistant graywacke outcrop is 20 meters north of the site, up the tributary. This outcrop can be seen in a series of small, shallow bedrock pools.

Four auger holes were placed in the vicinity of the site. The first was placed to the east of the site in the flake scatter, and found no midden. Two holes were bored to the west of Test Unit 1 but were uninformative because they bottomed out on rocks. The fourth auger hole was made 20 meters north of the unit just at the beginning of the hillslope. This hole contained 30 cm of silt slopewash, and then 40 cm of midden. This boring showed that the midden extends over the entire terrace on the northwest side of the confluence. An examination of the stream cuts bordering the site showed that the deepest part of the site was in the southwest section. The midden there appeared to be about a meter deep.

Unfortunately, Site 547 has had much disturbance. The site is adjacent to an old fallen, wooden bridge. At one time a road passed over this bridge and continued through the site up to the buildings and corral of Son-546, 90 meters upstream. As much as 20% of the site has been disturbed by this road. A salt lick was located on the site stimulating heavy sheep grazing, further disturbing the surface. Being situated at a confluence, this site is subject to heavy stream erosion, especially on the tributary side of the promontory. Finally, excavation has shown there to be heavy root disturbance in the upper 40 cm. The nearby bay trees formed a thick matting of roots and rootlets (much more than at any other site) making excavation slow and difficult and stratigraphy uncertain.

Test Unit 1 was placed on the south edge of the site, (south 22° east 10 m from datum), just two meters from the cutbank of Rancheria Creek. The unit was placed so as to avoid the disturbance caused by the road and yet to excavate in the darkest, most central part of the midden. The unit revealed that this site contained a rich midden deposit which continued to 130 cm, ending in sterile stream gravels. An auger hole in the center of the last level continued to 185 cm but encountered no further cultural constituents.

Four cultural components are present at Son-547 which roughly correlate with the stratigraphic levels shown in the profile. The midden component seems to be separated into two distinct periods. The upper midden levels fall between 0-30 cm. Unfortunately, heavy root disturbance has obscured the stratigraphy and made correlation with artifacts difficult. Large amounts of animal bone, fire-cracked rock and lithic debitage were recovered from this zone. The debitage is characterized by a 2:1 chert to obsidian ratio.

Diagnostic artifacts consist of two medium size and one small cornernotched projectile points. One of the larger pieces was found sub-surface in the auger; the other two pieces were recovered in the excavations.

The lower midden component basically continues to 60 cm and consists of dark gray brown sandy silt. This component has fewer tools than the upper midden zone, less animal bone and smaller amounts of fire-cracked rock. The chert to obsidian debitage ratio has increased to over 4:1.

Tools of a diagnostic form include one chert concave based piece, one small obsidian Excelsior point and one possible Desert Side-notched point and in any case very late. Unfortunately, this zone has had very heavy root disturbance. This must account for the side-notched piece which is very late in nature if our interpretation is correct.

The next thirty centimeters encompasses a transitional stratum, characterized by dark yellow brown sandy silt. It lacks any diagnostic artifacts and contains no tools. The chert to obsidian ratio is roughly the same as that of the lower midden component and we include it in the same mixed component. Both animal bone and fire-cracked rock continue to decrease with depth.

The sub-midden zone (90-130 cm) consists of dark yellow brown sandy clay. Few artifacts and nothing diagnostic were recovered from this stratum. The most interesting fact about this component is that the obsidian debitage consistently outnumbers the chert for these last four levels. This reversal is a unique occurrence among the Warm Springs sites.

Site 547 is the richest, deepest site in the Rancheria Creek drainage, and as such was probably the focal site for the other four that surround it. It may have been the primary habitation site in the area with the other used as seasonal camps for fishing, acorns and food collecting. In the late period, this small terrace would not accomodate all of its inhabitants and it is likely that, at least by the protohistoric period, they spread out to include the larger area of Son-546.

Site Son-550 (Fallen Oak)

Son-550 is a shallow midden site with three possible housepits--it is on the bank of the first major tributary of Rancheria Creek and is 280 m up from its confluence with Rancheria Creek. The site is situated on a flat shoulder of the surrounding hills that shelter it from the north, west, and south. The flat covers an area of 50 by 30 meters and the midden covers almost the entire area, measuring 45 m E-W by 28 m N-S. The midden is bordered by gullys north and south, by a hillside on the west, and on the east by the stream forming the major drainage for this small valley.

The site is in open oak woodland with moderate grass groundcover. The dominant trees are Oregon oak and coast live oak with some madrone and black oak. On higher north-facing slopes is found a denser, mixed forest of Douglas fir and oak. At the time of excavation (early June) numerous Brodeia and soaproot were in bloom. The nearest water is the small stream to the east. This flows from the beginning of November to the end of June. In the summer it contains only isolated pools and a trickle of water.

The soil of the site is dark brown gravelly silt with few rocks and pebbles. The surrounding soil was a light brown sandy soil. Two auger holes were placed on the east and west edges of the flat and in each case 15 to 20 cm of midden was recorded, indicating that the midden covers nearly the entire flat.

There is no man-made disturbance in or around Son-550. However

Site Son-550 (Fallen Oak)

Level cm.	Proj. Pts.	Retouch Flakes	Cores	Debitage	Shell	Animal Bone
0-10	1-c	2-c 1-o	1-c	41-c 10-o	1	18
10-20	1-c 1-o	1-c 1-o		34-c 5-o	2	4
20-bottom	1-c	1-c	2-c	16-c 3-o	2	
Totals	3-c 1-o	4-c 2-o	3-c	91-c 18-o	5	22
Grand Totals	4	6	3	109	5	22

excavation showed some root and rodent disturbance within the midden. Erosion on the site is minimal.

A meter square test unit was located at S 45° E, 6 m from the site datum stake. The unit was placed here because it appeared to be the deepest and most central part of the site. No wet screening was done. The unit was excavated to bedrock which was from 20 to 40 cm (average 28 cm) below surface.

The unit produced 4 projectile points all indicating that this is a single component site to be attributed to late Houx Aspect. There are three shallow, circular depressions in the site which appear to be housepits. They have diameters of 3, 2.2, and 2.1 meters respectively. Thus we have hamlet of perhaps 20 people occupied only during the winter (because of water supply) and only during the latest aboriginal period. This is an unusual degree of specificity and merits further investigation of its association with tools and other midden components.

Site Son-549 (Sunshine Flat)

Son-549 is a midden site on the east bank of Rancheria Creek upstream from its confluence with Warm Springs Creek. The site is found on the first inhabitable, flat, open area up Rancheria Creek from Warm Springs creek. The flat is 10 m east and 2 m above Rancheria Creek and is about 50 by 60 m in area. It is sheltered on all sides by steep hills. The midden covers an area of 55 m E-W by 40 m N-S. It is limited on the west by the cutbank of Rancheria Creek, on the east and north by a small drainage that is dry at least half the year, and to the south by a hill. It is in open grassland with a few scattered Oregon oaks. The hills in back or east of the site are in open oak woodland with Oregon oak, coast live oak, and madrone. Across Rancheria Creek to the west is a dense forest of redwood, bay laurel, and oak.

Water can be found year round in Rancheria Creek, although better drinking water is available at the spring across Rancheria Creek some 70 m west of the site.

The soil of the site is a gray brown sandy silt with few rocks and pebbles. The surrounding soil is lighter in color, being a light brown sandy soil. There is a large, high outcrop of rock 50 m east of the site over which an ephemeral stream occasionally flows. Six augerholes were made on the flat. There showed that a layer of at least 25 cm of midden was present over most of the flat, but deepest and darkest on that part of the flat closest to Rancheria Creek. The only disturbance found at Son-549 is the extensive rodent disturbance of the midden. There is minor erosion taking place along the cutbank of Rancheria Creek.

Surface finds discovered during the initial survey of this site gave indications that this might be a rich site. Unit 1, located in what surface features indicated was the center of the site, at S 30° E, 3 m from the datum stake, proved to be uninformative. Therefore, after augering had better defined the midden extent, a second excavation unit was located at S 25° E, 10 m from the site datum stake.

Site Son-549 (Sunshine Flat)

Unit 1

Level cm.	Proj. Pts.	Reworked Biface	Scraper	Used Flakes	Retouch Flakes	Debitage
0-10						10-c
				2-o	1-o	5-o
10-20			1-c	1-c		5-c
	1-o					7-o
20-30				2-c		7-c
		1-o			1-o	3-o
30-40				1-c		6-c
				1-o		4-o
40-50					1-c	13-c
					1-o	2-o
50-60						2-c
						1-o
60-70						2-c
					1-o	1-o
70-80						1-c
Totals			1-c	4-c	1-c	46-c
	1-o	1-o		3-o	4-o	23-o
Grand Total	1	1	1	7	5	69

Site Son-549 (Sunshine Flat)

Unit 2

Level cm.	Proj. Pts.	Reworked Biface	Scraper	Used Flakes	Retouch Flakes	Debitage
0-10					2-c	19-c 7-o
10-20					1-c	21-c 11-o
20-30						19-c 13-o
30-40						9-c 7-o
40-50					1-c	30-c 7-o
50-60					1-c	22-c 10-o
60-70						23-c 4-o
70-80						24-c 1-o
80-90						12-c 1-o
90-100			1-c			1-c
Totals			1-c		5-c	180-c 61-o
Grand Totals			1		5	241

In the first three levels of Unit 1, wet screening was used. However, dry screening proved to be an effective and wet screening was dropped after the 30 cm level. No wet screening was used in Unit 2. Unit 1 ended at 80 cm in nearly sterile, compact, yellow brown sand. Unit 2 ended at 110 cm in the same sterile sand.

Surface finds at Son-549 included two pestle, a mortar fragment, and a leaf shaped chert projectile point. Unfortunately, the point has been lost.

Unit 1, as mentioned, turned out to be located a little off the center of the midden. Artifact count was less than 20 pieces per level, virtually no bone was present, and fire-cracked rock occurred only in minor amounts. Only 4 retouched flakes, 1 scraper, 1 reworked biface, 1 biface, and a medial fragment of a projectile point were found, and all in the first three levels. Chert artifacts outnumbered obsidian by at least 2:1 in most levels, except in the 10-40 cm levels where obsidian nearly equaled chert.

Unit 2, located more within the midden, did have a higher debitage count per level (averaging 30), but contained fewer tools. Only 6 retouched flakes were found. As in Unit 1, chert outnumbered obsidian by at least 2:1 except from the 20-40 cm levels where the ratio was more nearly equal. Fire-cracked rock was present in low quantities except from 50-70 cm, where a rock concentration occurred. This could not be called a feature however, because the rocks were randomly distributed, and neither charcoal, bone, nor artifacts were found in any concentration.

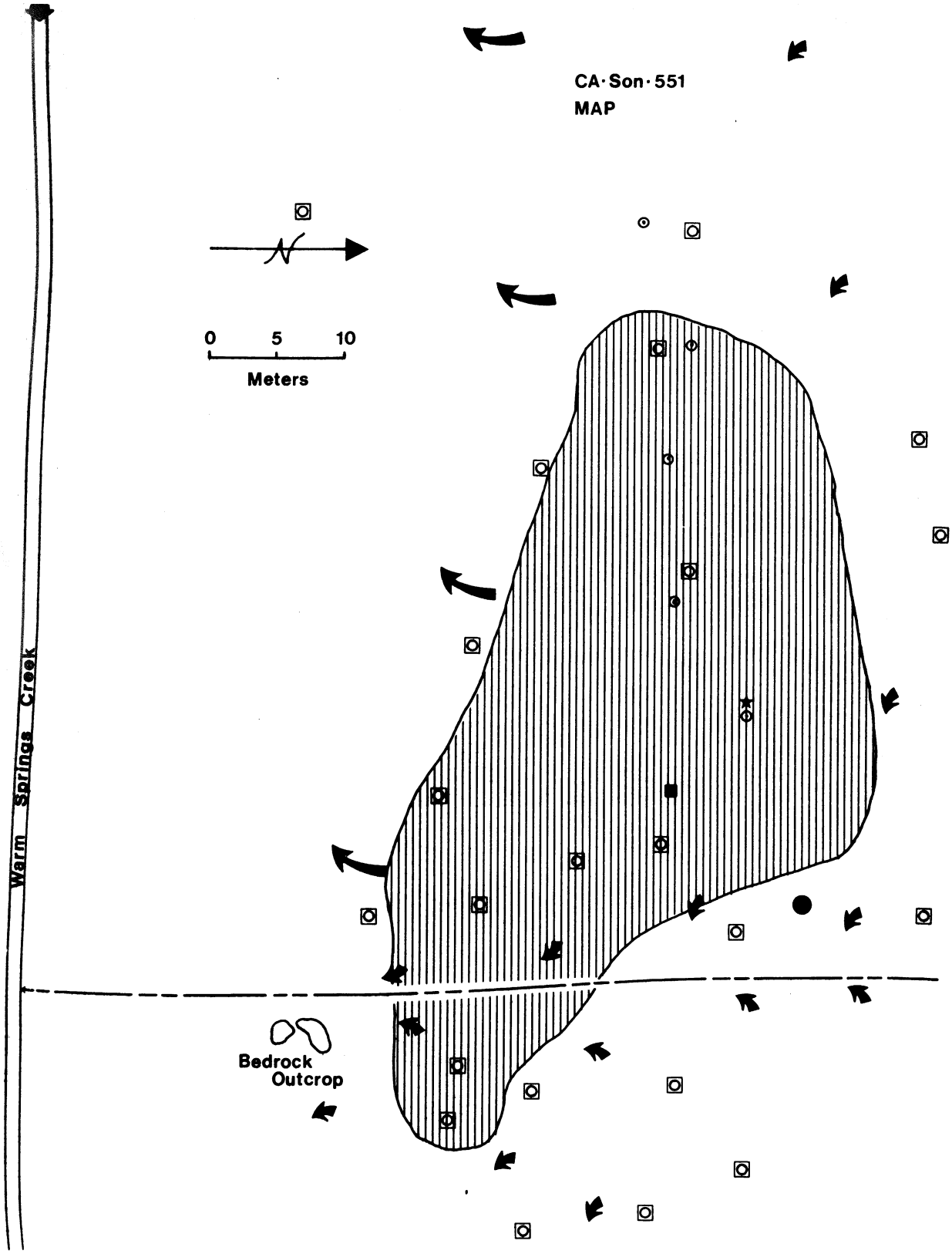
This is perhaps the least productive site in the Project in spite of its considerable depth of midden. It would be of some interest to test this site further just because it is so unproductive. There may be unique activity patterns or other conditions which would be important to understand in terms of total lifeways of the Pomo or their predecessors.

Son-551 (Monday Morning Terrace)

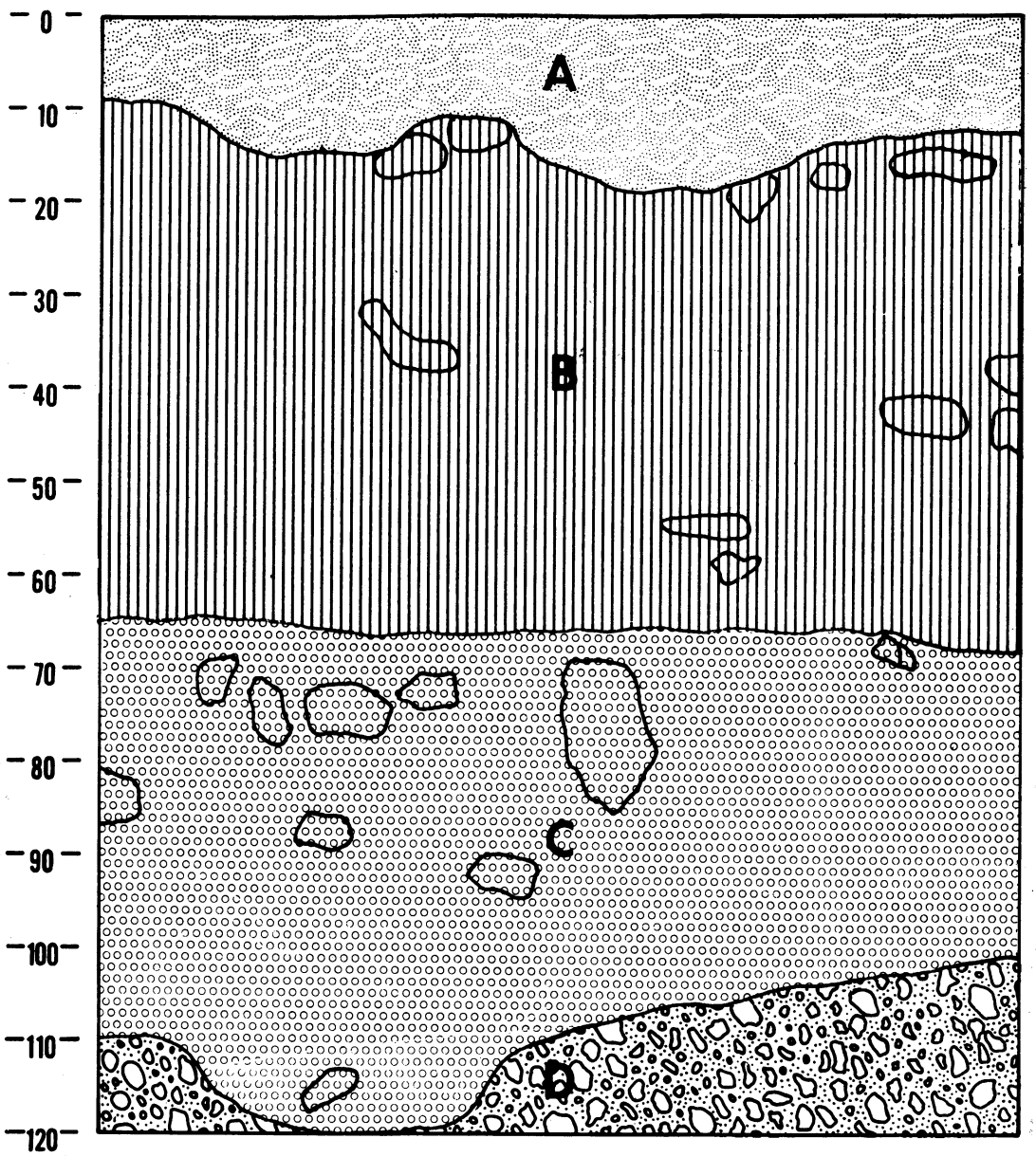
Son-551 is a midden site with an associated surface scatter on a secondary terrace on the NW bank of Warm Springs Creek 200 m below its confluence of Rancheria Creek. It is on a flat secondary terrace 60 m north of Warm Springs Creek and 6 m above it. The terrace faces SW and is protected on other sides by the surrounding hills. The midden occurs on the SE boundary of the terrace and on the west side of an ephemeral drainage. The midden covers an area of about 45 m E-W by 30 m N-S. It is bordered on the east by the ephemeral drainage, on the south by the slope of the secondary terrace, and imperceptibly grades into non-midden terrace deposits to the west.

The soil of the site is a brown to dark brown alluvial gravelly silt. The midden is not very much darker than the surrounding soil which is a brown rocky gravelly sand. The midden's light color - it is lighter in color than that encountered at any other site - can possibly be explained by its having been leached by groundwater percolating through the porous alluvial deposits of the site.

Nine augerholes were made in and around the site. Two augerholes were



Map 29. Son-551 (legend p. 5).



A. Midden; brown; gravelly silt; dry; compact. Annual grass root zone.

B. Midden; brown to dark brown; gravelly silt; slightly moist; friable to moderately compact.

C. Transitional zone; brown to yellowish brown; silt with sand and gravels; moist; moderately compact to compact.

D. Sub-midden; yellowish brown; sandy gravels; moist; compact.

Figure 21. Son-551 Profile.

Site Son-551 (Monday Morning terrace)

Level cm.	Proj. Pts.	Biface	Reworked Biface	Scraper	Retouch Flakes	Used Flakes	Debitage
0-10		2-c		1-c 1-o	5-c 1-o	5-c	195-c 12-o
10-20	 2-o	1-c				6-c 1-o	124-c 10-o
20-30						4-c	168-c 11-o
30-40	1-c 1-o		 2-o		1-c	1-c	120-c 12-o
40-50	2-c	1-c		1-c	1-c	7-c	215-c 16-o
50-60	1-c	1-c		1-c		4-c 2-o	190-c 15-o
60-70					4-c	6-c	231-c 6-o
70-80						3-c	67-c 4-o
80-90						1-c	29-c 2-o
90-100							19-c 1-o
100-110							9-c
110-120							4-c
Totals	4-c 3-o	5-c	 2-o	3-c 1-o	11-c 1-o	37-c 3-o	1371-c 89-o
Grand Totals	7	5	2	4	12	40	1460

Site Son-551 (Monday Morning Terrace)

Level cm.	Cores	Pestle	Hammer Stone	Fired Rock	Animal Bone
0-10	1-c			1	
10-20			1	63	
20-30		1		25	1
30-40				23	
40-50	1-c			61	
50-60	1-c			29	
60-70	2-c			28	
Total	5	1	1	230	1

done in the first terrace below Son-551. Both showed 70 to 110 cm of brown alluvial silts and sands but no midden. The augerholes on the second terrace seemed to indicate that the midden covered the SE side of the terrace and extended about 45 m to the west. However, with the soil colors so similar, and with the augering having been done in June when the soil was dried out, it was difficult to be sure of the precise extent of the midden.

Son-551 is in open grassland with a moderately thick grass groundcover. There is a scatter of small Oregon oak, coast live oak, madrone, and manzanita. On the first terrace below the site are large valley and Oregon oaks. At the time of excavation (early June), numerous mariposa lilies, a food plant gathered by the Pomo, were in bloom on and around the site.

During most of the year, the nearest water is 60 m to the south at Warm Springs Creek. There are several large pools in the environs of the confluence of Rancheria and Warm Springs Creeks that could have been used for fishing.

Son-551 has almost no disturbance and erosion here is minimal. A 1 x 1 m test unit was excavated at N 30° E 10 m from the site datum stake. The unit was located here because surface features indicated it to be the richest part of the site. No wet screening was done. The unit ended at 120 cm in a nearly sterile, yellow brown, compact sandy gravel. An augerhole was put in the floor of the finished unit. It continued to 182 cm in the same yellow brown sandy gravel before bottoming out on rocks. No cultural material was found in augering.

The midden may be divided into two physical layers. From 0-70 cm it is a dark brown to dark gravelly silt while from 70-110 cm it is a compact brown to yellow brown gravelly sandy silt. The cultural divisions do not coincide with this. On the basis of a small corner notched point found on the surface and a pestle fragment from the 20-30 cm level we consider the upper portion to belong to the Houx Aspect, presumably early Houx since there is nothing extremely late from any part of the site. There is a largish Excelsior point from 40-50 cm level which may be attributable to late Borax Lake. Chert debitage shows a marked increase at this level as does fire cracked rock. Presumably the late Borax Lake component begins here and continues to the bottom of the site although there may be something earlier which we have not identified simply for lack of evidence.

Chronology of Upper Warm Springs

It is possible to interpret the chronology at site Son-544 in several ways. The clam disc bead in the 10-20 cm levels makes it clear that late Houx is represented. There has also been some thought that the site was occupied during the historic period (some historic Indian site must have existed to account for the name Rancheria Creek). This possibility is rejected on the grounds that such sites always contain quantities of chipped glass and other historic objects which this does not. The first real physical break comes at 60 cm and coincides with a break in the chippage ratios. The question is

Upper Warm Springs Creek Group

Chert-Obsidian Debitage Ratios by Site and Period

Period	Site CA-Son				
	544	547	550	549	551
Hb	0-20 1.14 (295)		0-40 5.05 (109)		
H		0-30 2.19 (249)		0-100 2.69 (310)	
Ha	20-60 1.41 (537)				0-40 13.49 (652)
BLb	60-90 3.43 (518)				40-120 17.36 (808)
BL		30-90 3.69 (446)			
BLa	90-130 4.52 (232)				
Post		90-130 0.35 (42)			
Total	2.04 (1582)	2.61 (1737)	5.05 (109)	2.64 (310)	15.40 (1460)

Hb : Late Houx
H : Houx
Ha : Early Houx
BLb : Late Borax Lake
BL : Borax Lake
BLa : Early Borax Lake
Post : Post Pattern

Upper Warm Springs Creek Site Group

Chert-Obsidian Debitage Ratios by Site and Level

Level cm.	Site CA-Son 544	547	549-1	549-2	551
0-10	1.29(158)	2.63(58)	3.00(15)	2.71(26)	16.25(207)
10-20	0.98(137)	2.07(126)	0.71(12)	1.91(32)	12.40(134)
20-30	1.32(132)	2.10(65)	2.32(10)	1.46(32)	15.27(179)
30-40	1.24(132)	3.26(98)	1.50(10)	1.28(16)	10.00(132)
40-50	1.10(128)	5.94(125)	6.50(15)	4.29(37)	13.44(231)
50-60	2.15(145)	3.37(118)	2.00(3)	2.00(32)	12.67(205)
60-70	3.45(218)	2.92(47)	2.00(3)	5.75(27)	38.50(237)
70-80	3.45(209)	2.50(35)	* (1)	24.00(25)	16.75(71)
80-90	3.33(91)	3.60(23)		12.00(13)	14.50(31)
90-100	4.06(91)	0.43(10)		* (1)	19.00(20)
100-110	4.45(60)	0.53(23)			* (9)
110-120	5.80(34)	0.00(7)			* (4)
120-130	5.57(46)	0.00(2)			

( ) : debitage frequency
* : infinity, or all chert

whether to assign the entire 0-60 cm late Houx or to make an arbitrary break assigning part of it to early Houx; the projectile points shown in Figs. 28b and 28c at 40 to 50 and 50 to 60 cm respectively could be in either. We are choosing the second option mainly because the Excelsior point shown in Fig. 28c seems slightly large for a late Houx component. This gives us 0-20 cm as late Houx and 20-60 cm as early Houx.

The lower portions of the site have both physical and chippage ratio breaks at 90 cm so we are attributing 60-90 cm to late Borax Lake and 90-130 cm to early Borax Lake.

Site Son-547 must be mixed to some extent because of the heavy root infestation. Because of physical and debitage changes we are assigning the top 30 cm to the Houx Aspect and from 30 to 90 cm to the Borax Lake Aspect. This would have the large leaf shaped piece shown in Fig. 28h from the 20-30 cm level too high. The piece shown in Fig. 28k and identified as a possible Desert Side-notched fragment would be much too deep, but then if it is indeed a Desert Side-notched point it would be far out of range geographically as well.

For the portion of the site from 90-130 cm we are going out on a limb and propose it as belonging to the Post Pattern. It is our experience here and elsewhere that in early portions of sites when a change of chipping material occurs it is always obsidian that disappears (except where obsidian is local as at Borax Lake). Here we find just the reverse and we associate this with a pattern earlier than the others observed here, thus the Post Pattern. We shall discuss the implications of this proposal in the concluding section.

Site Son-550 we attribute entirely to late Houx for reasons given in the site description.

Site Son-549 can be classified as belonging to the Houx Aspect on the basis of the pestles and mortar fragments found on the surface. The bottom of the site may belong to an earlier period but further excavation will be required to make the attribution definite.

As discussed in the site description earlier we consider that for Son-551 the top 40 cm is early Houx while the bottom of it is late Borax Lake.

SUMMARY AND DISCUSSION

Chronology and Debitage Ratios

The following table summarizes the archaeological components from the Warm Springs project according to present evidence. This chronology is basically a summary, a sequence of projectile point types and grinding tools, which of itself does not say anything about more important cultural changes that have occurred in the area. We must take up the question of such changes, but before doing so we summarize the chert-obsidian ratios for chipping waste. Among some of the general characteristics of the summary table, it is noted that the overall ratio is 0.94 or a little more than 50% obsidian. This is based on a count of 18,764 flakes, in this count, 5245, or more than a quarter come from Son-571, and of these, 93% are obsidian. From these numbers we can only conclude site 571 is extremely specialized as an obsidian chipping station. Therefore we exclude it for a moment for both the western group and for the project as a whole, and we obtain the following modified totals:

	Hb	Ha	BLb	BLa	Total
Western Group	2.63	1.13	3.06	61.71	2.36
Grand Total	1.12	1.45	2.15	6.46	1.80

This gives us an overall ratio of 1.80 or just under 2 to 1 chert to obsidian. Furthermore the overall changes from the earliest to the latest period is generally consonant with individual site changes. Accepting these figures as reasonable we can measure them against some particular values given in the table.

Looking at totals for groups it is notable that both Yorty Creek and Upper Warm Springs have high chert values, 2.98 and 3.85 respectively. This must be related to their proximity to the two chert quarries. The Yorty quarry (Son-584) is very close to all sites on Yorty Creek, and also to Son-597, assigned to the Eastern group but at the mouth of Yorty Creek, which also has very high chert values 5.98. The Upper Warm Springs sites are in similar proximity to quarry site Son-554, which while nearby has been formally included in our Lower Warm Springs group. From the standpoint of high chert debitage ratios both Lower Warm Springs sites 553 (5.10) and the quarry site itself should be included in the Upper group.

These figures thus indicate that people occupying the Yorty Creek and Upper Warm Springs Creek sites used the nearby quarries, which is not surprising. What is surprising however, is that the people occupying the other sites relied so heavily upon obsidian, although chert was readily available. In other words, are we to account for such differences simply by a mile or two of distance? It is probable that there was a very casual use of chert by those people near quarries but with more care exercised when the material had to be fetched even a short distance.

Chronological Summary of Warm Springs Archaeological Components

Site Group	Houx Aspect Late	Houx Aspect Ind*	Houx Aspect Early	Borax Lake Aspect Late	Borax Lake Aspect Ind*	Borax Lake Aspect Early	Yorty Gravels	Post Pattern
Western	567	575	567					
	572		572	572		572		
			571	571				
	568		568					
Eastern	593		593	593		593		
				582		582		
				608				
				597		597		
Yorty Cr.	576		576					
						577	577	
	584		584?				584	
	583					583	583	
Central	598							
	542				542			
		600			600			
Lower Warm Spr.		594			594			
	558							
	556		556	556		556		
			559			559		
	553		553					
Upper Warm Spr.	544		544	544		544		
		547			547			547
	550							
		549						
			551	551				
Total Components	14	5	11	9	4	9	3	1

*Ind: indeterminate

Chert-Obsidian Ratios by Component

Sites		Hb	Ha	BLb	BLa	Total	
	567	4.42	2.64			2.84	
	572	.48	.40	3.06	61.71	1.69	
Western	571		.06	.21		.08	
	568	4.28	12.27			5.00	
total		2.63	.16	.59	61.71	.39	
	593-1	.61					
	593-2	.14	.49	7.50	7.00	.24	
Eastern	582			1.40	4.00	1.66	
	608			1.40		1.40	
	597			4.47	19.07	5.98	
total		.15	.49	1.93	11.83	1.16	
	576	4.09	1.03				1.65
	577				16.00	16.00	
Yorty Cr.	584	3.35				3.35	
	583	9.97			3.81	5.87	
total		4.93	1.03		5.85	2.98	
Lower	556	.40	.12	.21	.96	.30	
Wm. Spr.	553	4.17	6.38			5.10	
total		.99	.75	.21	.96	.58	
	544	1.14	1.41	3.43	4.52	2.04	
Upper	550	5.05				5.05	
Wm. Spr.	551		13.49	17.36		15.04	
total		1.59	3.44	7.24	4.52	3.85	
Grand Total		1.12	.40	1.58	6.46	0.94	

Hb: late Houx; Ha: early Houx; BLb: late Borax Lake; BLa: early Borax Lake.

If we consider site totals, it will be seen that they can be placed in three categories: (1) high obsidian sites (ratio < 1.0); (2) high chert sites (ratio > 5.0); and (3) intermediate, or "normal" sites. According to this breakdown three sites specialize in obsidian technology, sites 571 (preeminent), 593 and 556. Only one component from these has been attributed to early Borax Lake, the bottom of Son-556. That component is on the borderline of the ratio category, has only a small number of chips, and may be of doubtful attribution anyway. We can therefore conclude that obsidian specialization and its high frequency use began in late Borax Lake times, indicated also by the (unadjusted) grand totals which show a jump in obsidian use at this time with yet further increases in early Houx.

The importance of these figures is two-fold. First, the long range trend toward the greater use of obsidian is a measure of the increasing importance of trade in later periods. This will come as no surprise to California archaeologists who have long seen trade as a defining characteristic for the later periods in Central California, (differentiating them from earlier periods). In this case, though, the measure is rather more precise than we have seen in the past. Thus the grand totals indicate almost no trade in early Borax Lake, a sharp jump in each of the two succeeding periods, followed by a decrease in late Houx. If we take this last trend at face value, it is an occasion for surprise. The late Houx period corresponds roughly to what has been called Phase II of the Central California Late Horizon. The phase marker for Phase II has always been the clam shell disc bead which was thought to have been a sort of currency, "the life-blood of trade." If this is so, then surely we should see more trade in this period, not less. Thus, the evidence from these Warm Springs Sites will be regarded with some skepticism. Nevertheless it is evidence, and we should consider the possibility that trade peaked at an earlier period and was actually declining just prior to the historic period.

The second important aspect of high frequency obsidian counts relates to particular sites. It would appear that, when obsidian came into heavy use in late Borax Lake times, site Son-571 immediately became specialized in that industry and was the only site to do so in Upper Dry Creek. It continued this dominance in the next period (early Houx), but in late Houx it was replaced by site Son-593, the tribelet center, as the obsidian center as well. This means that in late Borax Lake and early Houx the obsidian specialists were living at a small site detached from the chief tribelet village. In late Houx the chief village became the center for obsidian manufacture. To see this we compare not just ratios but total numbers.

	Hb	Ha	BLb	BLa
Son-571	-	244-c 4210-o	136- c 655-o	-
Son-593-2	114-c 929-o	86-c 171-o	45-c 6-o	21-c 3-o

So far as present evidence is concerned, the switch is conclusive. If further excavation supports this conclusion, we have evidence of a change in social organization. For the two middle periods the situation would seem

analogous to certain African tribes in which iron workers were of a different caste than that of the group as a whole and might therefore keep some distance from them. This distinction would then have been obliterated in late Houx when obsidian specialists were included in the village center. We might wonder whether in the earlier period the obsidian specialists were not also the obsidian traders going from group to group carrying their raw material which they chipped locally (to order?) at a place reserved for them. This intriguing possibility seems worth considerable investigation.

If we turn now to the other debitage ratio categories, as noted previously, the high chert sites, with one exception, are all located near one or the other of the two chert quarries. The exception is Son-568, not near any known quarry and surrounded by sites with medium or high obsidian use. This is all the more remarkable because its two Houx components date to a period of increased obsidian use. It is almost as if obsidian was shunned. The remaining sites are in no way remarkable with regard to chert-obsidian ratios.

In connection with chipping waste ratios we will discuss another problem mentioned only incidentally above. This concerns a category of artifact we have called reworked bifaces in the tables for individual site and which are described below in an appendix by Nancy Whitney. This category of artifacts is made from a leaf shaped piece, almost always of obsidian, snapped off or truncated and then further modified in various ways. One of the most common ways of modification was to use the snapped end as a striking platform for a blow along the long axis of the piece. Thus a long narrow flake would be taken off the edge of the piece which could then be described in European terminology as a burin. Fredrickson (1974:44) is, so far as we know, the first to discuss this in the North Coast Range. He attributes a burin industry to late Borax Lake Aspect and indicates that it continues into early Houx, this on the basis of his excavation at site Lak-261.

In the following table we give the provenience of 66 specimens. These constitute all reworked bifaces and debitage identified as having come from reworked bifaces and which can be attributed to dated components. The components are as determined from stratigraphic considerations given for each site group. The summary shows frequencies of 13 for late Houx, 38 for early Houx, 14 for late Borax Lake, and 1 for early Borax Lake. The single specimen from early Borax Lake is from a component of doubtful attribution and its presence there makes the attribution even more doubtful. On the whole we feel that our data support Fredrickson's conclusion that the industry begins in Late Borax Lake times and continues into Houx.

There are some other aspects of this chronology that are not quite so clear. If we take the numbers 13, 38 and 14 as representative frequencies of the three phases, we must conclude that the full flowering of the industry is confined to early Houx. The difficulty with this is same one encountered in considering chert-obsidian debitage ratios, namely that overall frequencies are dominated by those of a single site--Son-571. If we exclude that site, the relevant frequencies become 13, 15, and 11--pretty much the same. The question comes down to this: we have found a major manufacturing center for early Houx at Son-571, have we missed comparable centers for late Houx and

Occurrence of Reworked Bifaces by Site and Component

Group		Site Component				Total
		Hb	Ha	BLb	BLa	
	567		2			2
Western	572	3	3			5
	571		23	3		26
	568	2				2
	593	3				3
Eastern	582			2		2
	608			2		2
Yorty	576		2			2
Lower	556	1	4	6		11
Wr. Spr.	553	1				1
Upper	544	3	1	1	1	6
Wr. Spr.	551		4			4
Total		13	38	14	1	66

early Borax Lake? If we did miss them, it would be because of insufficient sampling at the sites in the project or because they were at sites outside the project. Our tentative conclusion is that we did not miss them, that in fact, this specialized industry is to be identified primarily with early Houx. This should be easy to test with further excavation.

We have not been able to go into the question of the function of these tools. The answer to this important question may be the key to a lot of the archaeology of the region. It will have to await micro-analysis of these tools and other analyses based on association.

If we turn to chronological summary of components, we see total components numbering 14, 11, 9 and 9 for the four periods latest to earliest. This indicates a stable population during this time--we would always expect more components of the latest periods because of accidents of preservation and excavation. Considering only the Western, Eastern and Yorty Creek groups the comparable figures are 7, 6, 6, and 6 so that for the Upper Dry Creek tribelet we have even more stability. Taken together these figures indicate that the situation regarding tribelet territory and population, outlined in the next section, can be projected back through time as far as the early Borax Lake period. This argues really basic stability of subsistance pattern and social organization for many thousands of years in this part of California. This is in conflict with the conclusions of some others on this subject, notably Fredrickson (1974: Fig. 3), a point we will discuss further below. Whatever general validity the point has it is none the less in accord with the data of this limited area.

Territory and Population

The situation with respect to boundaries is complicated by reports of several ethnographers with sometimes conflicting statements. To begin with we should discuss the nature of Central California political units. The classic definition of these groups is by Kroeber (1932:258):

> "Each of these [tribelets] seemed to possess a small territory usually definable in terms of a drainage; a principal town or settlement, often with a chief recognized by the whole group; normally, minor settlements which might or might not be occupied permanently; and sometimes a specific name, but more often none other than the designation of the principal town. Each group acted as a homogeneous unit in matters of land ownership, trespass, war, major ceremonies, and the entertainment entailed by them."

There has been considerable discussion of the political units of native California in recent years especially by Kunkel (1974) and Bean (1974). Both these authors seem basically to accept Kroeber's definition. Kunkel's discussion is especially relevant to us. In general we are quite sympathetic to his point of view, which is that native California social organization may be more typical of preagricultural peoples situated in favorable environments, more typical than "peripheral badlands wanderers" who are

supposed by some to be analogous to paleolithic man. However, one aspect of his argument we do not find supported and disagree with it. Kunkel sees the tribelet as being made of more fundamental political divisions which he calls residential kin groups (which may be patrilocal, matrilocal or ambilocal). He says, furthermore, that "Tribelets were important but somewhat fragile political entities, breaking up fairly often into their component parts--the kin groups--which then combine in new ways." While it may be true that various kin groups changed tribelets from time to time, our reading of the literature indicates that the tribelet, based on specified territory and with a central town, was the fundamental unit. The degree of attachment of California Indians to their home territory is extraordinary. We have heard of informants who would know the name of virtually every tree and rock within their tribelet territory while nothing less significant than, say, Mt. Shasta outside their territory would warrant their attention. R. F. Heizer (1966:26-30) has fully documented this attachment.

Our point of view, then, is that the tribelet, territorily at least, was a relatively fixed entity regardless of whether persons might shift in or out of it. This is the important point archaeologically since it is only the territory we can identify, not the people.

When we began archaeological testing at Warm Springs, we more less fell heir to the notion that the project area was divided between the Mahilkaune or Dry Creek Pomo, called Mehinkownah by Merriam, and the Mahakamotcemei or Cloverdale Pomo, called Makahmochummi by Merriam. This is essentially the division presented by Stewart (1943). As our investigations progressed, it became apparent that Dry Creek Valley above Pritchett Peak contained archaeological resources of what could only be regarded as a tribelet center (especially Son-593 and Son-582), not as an area subsidiary to the Cloverdale center over the hills in another drainage to the east. The ethnogeographic material of C. Hart Merriam indicates support for this judgement. Heizer's (1966) compilation of this material gives as inhabitants of Upper Dry Creek the Sha-kow-we-chum-mi and for Middle Dry Creek the Me-hin-kow-nah (Stewart's Mahilkaune). There is a problem with the boundary between these two groups. Heizer's map has it running along Warm Springs Creek (the boundary between his 12s and 12u). This conflicts with Barrett's place names (evidently obtained from informants of Middle Dry Creek) and with Stewart's boundary as well. We therefore place it further north so that the drainage of Warm Springs Creek is in Mahalkaune territory.

In coming to this conclusion then we are putting the West, East, Cherry Creek and Yorty Creek groups in Shakowe territory while Upper Warm Springs and Lower Warm Springs Groups go into Mehinkownah lands. Looking at the archaeology of the boundary zone (Map 1 and Maps 19 and 20) we see no sites of considerable consequence. Sites 542 and 600 may have been ethnographic sites and are the only sites in the Central Group for which we have indications of substantial midden. These two may have been significant villages, but they are at the eastern end of the Central Group, far below our proposed boundary. They have been destroyed so even that degree of importance is questionable. The other site indicating considerable population is Son-598. This site has 14 well defined house-pits indicating a population of perhaps 70. There is, however, absolutely no midden deposit here, indicating that the village must have existed for the briefest possible

time. One wonders if this is not one of Kunkel's residential groups which split off temporarily from one or the other of the tribelets to settle here in no-mans-land.

Between the mouth of Yorty Creek and the cluster of sites at the mouth of Warm Springs Creek we have a housepit (562), a hunting blind (574) a large but ephemeral village site (598), and a minute midden (548). It is true that there may once have been sites here near Dry Creek that have been eroded away (see the gravels on Maps 19 and 20), but we doubt this because there are not even remnants there. Thus, the near blank here indicates a buffer zone between two tribelets and furthermore indicates its existence for a long time, perhaps thousands of years. This suggests that tribelet boundaries, or some of them, may last a very long time indeed.

From the above we conclude that the Upper Dry Creek or Shakowe tribelet included the drainage of Dry Creek from Pritchetts Peak most of the way up to Yorkville, the sites recorded herein constituting only the southern half. There appears to be an excellent settlement area just north of the project area but it has not been surveyed.

The sites on Warm Springs Creek and just above its mouth on Dry Creek we attribute to Mahalkaune tribelet which had its chief village perhaps at the mouth of Pena Creek to the south. Thus, the sites we have from this tribelet are peripheral and perhaps subsidiary.

We turn now from the consideration of the tribelet territory to the question of demography. A point of considerable importance, originally raised by Gifford (1918, 1926), is that of the nature and development of the corporate kin group in California and the relationship of these groups to demography. This was brought out by Goldschmidt in 1948 and has been recently discussed by Kunkel (1974) with reference to the Pomo in particular. Goldschmidt's point was that lineages and clans arose because of large or at any rate locally dense population. While Kunkel believes the pertinent elements are not precisely lineages or clans, he would probably agree that population was a crucial factor. The burden of the argument concerns the number of persons with whom an individual has regular face-to-face contact, that when this number reaches a certain but unspecified point, it becomes necessary to form social categories for purposes of interaction. From our point of view the question is simply how many people are in a tribelet the regular face-to-face group.

The tribelet we are most concerned with here is the Shakowe or Upper Dry Creek Pomo because we believe we have the principal village of that group whereas the sites of Mahilkaune on Warm Springs Creek are peripheral and will not help us with that group.

The problem can be dealt with either by means of individual site counts or by the area density method (Cook, 1976). The site count method involves determination of how many persons lived at each site and which sites were occupied simultaneously. On this first question we can do no better than consult the data of Cook and Heizer (1968) concerning house numbers and village size in California. The data from their Table 2 contain the

following information for the surrounding groups.

Aboriginal Group	Village Space per House (sq. m)
Yuki	73
Pomo, coast	79
Pomo, interior	158
Wappo, valley	120
Wappo, hill	190

We take the Pomo of the interior as our best figure and then take the total extent of midden as the size of the village and calculate the number of houses represented. If we assume an average of 6 persons per house, we then have a population per village estimate.

As regards the point of simultaneous occupation, we want to consider only sites occupied regularly each winter. It is our opinion that only sites with considerable midden deposit should be so considered and surface sites as well such special sites as petroglyphs, hunting blends, quarries, should be excluded from our calculations. Incidently, it should be pointed out that these opinions are actually hypotheses which should be tested in a variety of ways.

Finally, we must deal with the question of chronology. We will present our data assuming that all sites identified as late Houx were occupied at the same time. We are aware that the question of micro-chronology is being ignored here, that if, for example, it was customary for one village to change sites every ten years, a custom gone undetected by us, then our calculation would be in error by a considerable factor. We might point out in this connection that the denigration of chronology by some persons who consider themselves theoreticians is entirely misplaced. If a fact absolutely fundamental to inferences regarding social organization, and population is such a fact, depends on micro-chronology then we simply must deal with it. From this standpoint J. A. Bennyhof is more than justified in his concern for typological minutia and perhaps we can dispense with such remarks as "Good grief, yet another paper on California Indian beads!"

In any case, we present our data as late Houx considering these the best approximations available. The following sites we consider to be permanent villages of the relevant time period:

Late Houx Component	Population
567	26
572	12
568	20
593	150-240 (depending on site size)
576	12
584	12
583	20

Site Son-593 has a variable estimate because it has been partially destroyed and we are uncertain about its former boundary. Thus the estimate is 102 persons for the small sites making the total of 252 or 342 depending on the Son-593 figure. Our judgement is that in the area above the project boundary there is one more locality about as well suited for habitation as those we have surveyed. This would mean we would expect about as many sites again as are already recorded for a total population about twice the above or between 504 and 684.

The population question can also be approached from the angle of area density. Considering that the northern boundary of the tribelet would be at the bend of Dry Creek downstream from Yorkville and include the drainages of the tributaries from there down to Pritchett Peak, this is an area of about 65 square miles. After considerable manipulation, Cook (1956) has decided that 8 persons per square mile is reasonable for this kind of territory. This gives us a total of 520, the same as our smaller figure above.

Thus, our figures are quite similar though derived by distinct methods. The question now is whether 500 is enough people to initiate the process outlined by Goldschmidt (1948). In any case, it is a large figure considering that the valley seems to support only about a dozen people today.

Site Specialization

We have already discussed the subject of site specialization to some extant in relation to chippage ratios and now turn to the general question especially from the standpoint of land use. In some ways this subject is the most important one in a study of this sort in which many sites are tested but none is excavated extensively. Our breakdown of sites yields the following broad categories: hunting blinds, quarries, petroglyphs, living sites. Living sites include both surface sites and midden sites and can be further broken down as shown below.

Hunting Blinds

A single hunting blind (site Son-605) was located outside the project boundary was not included in the site descriptions. Four other blinds were found in the Warm Springs project, one each in the Warm Spring Creek groups and two in the Central Group. These blinds are simply rock rings 2 to 3 meters in diameter located away from streams in places commanding actual or possible game trails. Unfortunately there seems very little hope of being able to date hunting blinds since they characteristically have no midden or other cultural refuse associated with them. Two of the blinds were cleared and excavated but even then nothing was found. One supposes that they cannot have been of great antiquity since they remained more or less intact but even this is not very convincing.

The area surveyed at Warm Springs, centered as it was on the pool of proposed Lake Sonoma, contained very little upland away from the streams. Such uplands would be the places one would expect to find hunting sites (and those we did find were so located), hence we believe our present sample leaves

this category of site badly under represented, as compared with, for example, midden sites. We feel that if the entire tribelet territory of Upper Dry Creek were surveyed as thoroughly as the project area there might be, ten, twenty, or fifty hunting blinds located.

Quarries

Just two quarry sites were recorded in the Warm Springs project, site Son-584 on Yorty Creek and Son-554 on a small tributary of Warm Springs Creek. Site 584 is associated with a midden which we have attributed to late Houx. The quarry itself may have been used earlier as well. Site 554 we have not been able to date at all. Nearby sites are heavy chert users in all periods so the quarry may have been used many thousands of years.

In the nature of things a reconnaissance of a dam project, while it is likely to discover most valley bottom occupation sites, will find the quarries only if suitable outcroppings also occur in these areas; quarries are as likely or even likelier to be outside the area as within it. Thus our inventory of tribelet areas is as incomplete in quarries as it is in hunting blinds. All we can say is that the quarries we did find were used by nearby sites predominantly (see under chronology). No source analysis for materials was attempted and this should be done in the future.

Petroglyphs

Petroglyphs are quite an important element of the archaeological resources of the Warm Springs area. All petroglyph sites were in the territory of the tribelet above Pritchett Peak, none in the Central and Warm Springs Creek site groups. All petroglyphs here consist of small pits or cupules with an occasional groove, pecked into the faces of boulders of various sizes.

It may be worthwhile to discuss briefly the absence of petroglyphs in the southerly groups. In the section on tribelet boundaries we concluded that sites of these groups were subsidiary to a tribelet center located down Dry Creek, out of the project area. In the course of our field work, we had occasion to conduct a site survey several miles downstream. This took us through what was presumably the center of the tribelet to which our southern sites belonged. However, we found not a single petroglyph site among those sites either. This might indicate that the people living there were not making petroglyphs and never had. Although that may be true, we are inclined to doubt it. All the sites located south of the project area were in fields long cultivated, and hence places in which suitable petroglyph boulders would have been removed. In any case, the downstream survey was only a hundred yards or so on either side of Dry Creek on alluvial fill with little or no natural rock. Thus there could very well be many unrecorded petroglyphs back toward the hills where there are suitable boulders. One petroglyph we did note in the territory of this tribelet was discovered by Dr. D. W. Ritter of Chico, California. It was at the confluence of Little Strawberry Creek and Warm Springs Creek--it consisted of pits and grooves on a small rock outcrop. There may well be other such petroglyphs.

The petroglyphs upstream can be summarized briefly. A total of nine of

our numbered sites exhibit petroglyphs: site 566, 570, 568 in the Western group; sites 593, 579, 609 and 607 in the Eastern group; and sites 585 and 590 on Yorty Creek. These can be put in four groups for present purposes. (1) Site 566 is outside the project area and may be associated with other sites up Dry Creek. It is apparently a considerable petroglyph on a flat rock 3 by 4.5 m with scores or hundreds of pits. We have not been able to assign the associated midden to a phase, and it otherwise isolated as well. (2) The two sites on Yorty Creek are also more or less isolated. Site 585 is a large boulder in a gravel bar in the stream and has a total of 98 pits in it. It is only 300 m downstream from site 576 (Houx Pattern) but there is no clear association. Site 590 consists of two large rocks, also in the streambed, with about 20 shallow grooves in them. There is no association here either but there are sites nearby of many phases.

The other two categories require some additional comment. The sites in the Western Site Group category (3), consist of two petroglyph occurrences which are remarkable for size and number of cupules. Site 570 consists of two very large boulders covered with pits. The petroglyphs at 568 are on three similarly large rocks. These boulders are several meters in greatest dimension and have hundreds or thousands of pits. The inference is unmistakable that these were very important places to the inhabitants over a long period of time. The petroglyphs at site 568 are not actually with the midden but rather are 90 m upstream from it. Site 570, also without midden, is 280 m farther upstream. These large and important petroglyphs are evidently associated with a group of 3 midden sites which are in any case special sites. The situation is this: the midden sites 572, 571, and 568 are very close to each other (300 m airline) on the north bank of Dry Creek on shallow terraces. Furthermore, there are other particular features (e.g. site 571 has a tremendous amount of chipping waste) which we will discuss in following sections. The two groups of petroglyphs are found between sites 571 and 568, and we feel therefore that they are associated with the site specialties of the little cluster.

If we are correct in the association of these sites, then some effort at chronology can be made. The three midden sites contain components of all four of our later phases, thus the petroglyphs could belong to any or all of them. A test excavation was made just beside the petroglyph at site 568. We hoped to recover artifacts in direct association to help date the glyphs itself. However, we found none, not even the hammerstones which must have been used in making the pits. Indeed in the excavation of the three associated midden sites we found only a single specimen that could be described as a hammerstone. The nature of the glyphs is such that a great many hammerstones must have been used. We believe that the petroglyphs may have had considerable ritual or religious importance. If this is so the implements used in making them may also have had sacred significance and consequently were not left around casually but rather cached or otherwise secured in such a way as to make them now difficult to find.

The last category of petroglyphs (4) is on the edge of Dry Creek, or even in it, beginning at Son-593 and then continuing sporadically downstream for about a kilometer at sites 579, 609 and 607. At site 593 we found a total of 36 small boulders (.5 to 1 m diameter) with one or more cupules in them.

Two of the boulders are on the south midden and the remainder are on the side of the creek over a distance of about 300 m downstream. The other examples are probably an extension farther downstream of this same scatter. One site, Son-579, is now in midstream but was probably once on a midden since eroded by flooding. It is unusual in having circular grooves, one of which has a pit in its center.

Of this group it would appear that at least the two on the midden at Son-593 are attributable to the very latest phase of prehistoric occupation. Just how much earlier they were being made is difficult to say.

Perhaps it would be well to discuss now the general problem of petroglyph chronology in the North Coast Range. It is known from ethnographic accounts that the people of this region made a sort of petroglyph of the type reported here which are called baby rocks. There are several accounts of these among which is one obtained by Barrett (1952:386-87) from a man who claimed to have personally proved the merits of two cup and groove rocks in Knights Valley, six miles north of Hopland.

> "The procedure was said to be as follows: the sterile pair went to the rock and there first a prayer for fertility was made. Then, by means of a pecking stone, some small fragments were chipped from one of the grooves or cuppings in the surface. These were then ground to a very fine powder which was wrapped in some green leaves and taken to a secluded spot. Here the powder was made into a paste and with it the woman's abdomen was painted with two lines, one running from the top of the sternum to the pubes, the other transversely across the middle of the abdomen. Some of this paste was also inserted in the female. Intercourse at this time positively assured fertility, due to the magic properties of this rock."

These "baby-rocks" were similar in form to others known further north where they are used for weather control and are known as "rain-rocks" (Heizer 1953). Heizer and Clewlow (1973:30) have argued that from a stylistic standpoint the two types of petroglyphs are the same. These authors are of the opinion that it is a very recent style (30-31). They seem to base their opinion on the fact that since it is known to be late, and since there are very few examples in their sample, then it cannot go back much in time. We agree with them that these are equivalent styles and that they were made recently but not that they are only recent. The scarcity of reported examples we feel is from a lack of field work rather than a lack of petroglyphs. Our experience in the Warm Springs area indicates that complete on-foot survey of an area does in fact reveal many petroglyphs. That this experience is not unique is shown by that of others (Fredrickson, personal communication) in the area. The principal reason North Coast petroglyphs are not widely known is that they have not been reported by the general public (this is the main source of information for scholars of this subject). The reason they have not been so reported is two-fold: (1) many or most are obscured by dense North Coast vegetation and (2) they are so unspectacular that they go unrecognized by the general public (and even some professionals). This latter reason is the most important one - petroglyphs and pictographs elsewhere are easily seen to be the work of man and are fascinating to amateurs hence become well known, whereas those of the North Coast range are not so recognized or are easily

forgotton. Thus in disagreement with Heizer and Clewlow, we believe there are actually very many of these petroglyphs in the North Coast Range and that they have been made for a long time in the area.

The petroglyphs of Warm Springs would seem to us, in fact, to be very good examples of what has been termed the pit-and-groove petroglyph style. This style was first named by one of us (Baumhoff, Heizer and Elsasser 1958) and described in detail by Heizer and Baumhoff (1962:208, 234-238). It was maintained there that this was an ancient and widespread style and specifically included the examples from Lake and Sonoma counties. This style is precisely the equivalent of those at Warm Springs. Heizer and Baumhoff indicated a belief that in the Great Basin the style dated about 5000 to 3000 BC (1962:234). The evidence for that dating was admittedly rather flimsy but it still seems clear that an early beginning date is not out of the question. The fundamental questions on this subject concerns the unity of the style and whether these particular examples are correctly attributed to it. We quote Heizer and Baumhoff (1962:237) on this.

> "These California petroglyphs differ from the Nevada specimens in that, for the most part, they are simply pitted boulders; they do not also have grooves. This differentiates them slightly, but the pits themselves are so similar and at the same time so arbitrary that one cannot help thinking they must be part of the same tradition."

We agree with this and also accept the earlier finding of 5000 BC as a beginning date for the style hence we conclude that they were being made during all four phases of our sequence.

It seems possible that this petroglyph style is a fundamental part of an ancient and widespread culture of speakers of the Hokan languages. So far as we know this notion of such a cultural group was first advanced by Kroeber (1923:130) when he said that in the "first period" (undated) of man in California "people....almost certainly comprise the ancestors of the modern Hokans,..." adding "perhaps the Penutians." This notion was apparently never abandoned by Kroeber although later discussions are more about the language itself than other aspects of their culture (cf. Kroeber 1955, 1959). Some time ago one of us took up this notion of Kroeber's and suggested that certain archaeological traits were part of this basal Hokan culture (Baumhoff and Olmsted 1963:280). We would like to propose here the pit-and-groove petroglyphs as an element of that ancient culture. Our feeling is that it was an important part of the ritual of these early Hokan speakers, that the particular ritual declined in the latest period, perhaps replaced by the Kuksu cult of the ethnographic period, but was retained as a survival in its fertility context (weather control farther north). We would say that the large and impressive petroglyphs upstream were made as part of the earlier more fundamental ritual while the smaller ones near Son-593 and downstream may have been later and residual. This hypothesis obviously leaves plenty of room for testing. We will have more to say about this in discussing overall site configuration. At this point it is sufficient to say that while the evidence for the above case is thin, we nevertheless have a considerable intuitive confidence in it. What we need most here is a method of dating petroglyphs. We know from experience that this is an extremely difficult business, but it is quite basic to a whole range of prehistoric behavior because petroglyphs

are perhaps the most important and abundant ritual relics left to us.

Living Sites

The living sites will be considered in two categories. Sites above Pritchett Peak will be considered as a unit (Western, Eastern, Yorty Creek, and Cherry Creek site groups), an integral tribelet territory centered on large winter village site(s) associated with smaller sites specialized in a variety of ways. In the southern part of our area, thought to be peripheral to another tribelet, sites will be dealt with individually on an ad hoc basis.

Living Sites: Southern

These are the sites of the Central Group and the two groups on Warm Springs Creek. With respect to the Central group, the long stretch of Dry Creek between Pritchett Peak and the mouth of Warm Springs Creek, we can say that there are 3 small surface sites (562, 548 and 560) and one large surface site (598). In addition, two other sites were destroyed by agriculture. The destroyed sites may have been a 5 house village (542) and a large village (600) but we feel certain from having tested the remnants that they were never very rich and probably not important.

In the two site groups on Warm Springs Creek there is a total of 14 living sites. Of these, 8 fall in the categories including small or medium in area, mostly poor and either very shallow or surface. They must have been temporary camps for small groups. These sites include the following: Son-558, 557, 559, 555, 545, 546, 550, 549). The remainder include the Skaggs Springs site (594) which is entirely destroyed but which, according to Barrett (1908:220), may once have been an important site and site Son-547, which is dealt with in Appendix A.

The other four sites may be characterised as 5 house hamlets - they are deep, rich, and of moderate size. Two of these sites have components of all four phases (576 and 544), one is early and late Houx (553), and the other (551) combines late Borax Lake and early Houx.

A striking feature of the Warm Springs Creek groups is the large number of hamlet size sites (some of the shallower sites are that size too) as opposed to the fact that there are none of the minute but rich stations that are so evident in the Northern Groups (see below). We do not know what to make of this and simply leave it for further research.

Living Sites: Northern

For the northern area, it is possible to establish clusters of sites according to trichotomous criteria. The first category is size, dividing sites into small (one to two houses), medium (four or five houses), and large (20 or more houses). The second division is depth according to which a site is surface, shallow (20-80 cm depth), or deep (a meter or more). Finally sites can be categorized as rich (199 flakes per 10 cm and abundant artifacts), poor (10 or 20 flakes per 10 cm and few artifacts), or intermediate. Applying this trichotomy, the data on the following table are obtained.

Warm Springs Sites Catagorized by
Area, Depth, and Richness of Midden

	Large			Medium			Small		
	rich	med	poor	rich	med	poor	rich	med	poor
Deep	593	582		597	566 567 568 584		572 571	576	
Shallow				608		578	583	577 603	575 604 589 601 595
Surface			579					586 541	564 581 596 592 588 587

The sites shown there segregate fairly well into five groups. The first group consists of the large, deep sites 593 and 582. These are undoubtedly the large winter villages or headquarters sites. Site 582 is entirely Borax Lake while 593 is largely Houx. Thus during Borax Lake times the bulk of the population lived at 582 (593 was probably a minor village then) and moved to 593 during the later period.

The second group consists of the sites which are deep and of medium size into which we assimilate site 608 which is formally categorized as shallow but at 80 cm only just barely so. Of these six sites 597 and 608 are Borax Lake while the other four are Houx. We see these sites as being satelite hamlets attached to the major towns in the first group. This probably argues a larger population in Houx than Borax Lake times although not necessarily so since later components are generally identified more readily than earlier ones. Just what these "satelite hamlets" represented sociologically is far from clear. A casual persual of Barrett (1908) and Kroeber (1932) does not reveal much about such places. Kroeber (1932:257) says there are "minor settlements which might or might not be occupied permanently". These are evidently those occupied permanently. There is not a lot to indicate that they were specialized from what we have been able to discover archaeologically although more might well be found with additional excavation. One change through time can be noted--the two earlier sites in this group are "rich" while the later ones are only "medium." This means that there was a relatively large amount of chipping debris and other artifact material at the two earlier sites which in turn may very well mean that artisans, particularly stone chipping specialists, were found at the 4 to 5 house hamlets during Borax Lake times but not later.

The third group consists of the small, deep sites. Again it seems reasonable to assimilate site 583 to this group since it is within 10 cm of being "deep." These four sites do sort neatly chronologically. They are divided as follows: 572 has components of all four phases, 571 the middle 2 phases, 576 the last 2 phases, and 583 the first and last. In analyzing this we begin with the fact that Son-571, particularly its early Houx component, is a chipping station par excellence--nearly a quarter of the obsidian debitage from the entire project is from there. Furthermore about a third of the products from the specialized reworked biface industry are from there. Thus, for the early Houx period, we can say that this is a specialist site. To a lesser extent the same can be said of Son-572 and 583 in regard to their early Houx and Borax Lake components. However, the same is not true of Son-576, which represents the last phase. This site had every appearance of a rich site during excavation--dark, rich, deep midden with much perserved bone and charcoal (very unusual). It had every external appearance of being unusual as well--a tiny, deep site on a small point of land just big enough for a house or two. Yet the midden content is very slight as compared with other sites. If this site was special, then it was so in non-material or perishable goods.

From the above evidence we may conclude that during the Borax Lake period certain single house sites as well as 5 house hamlets were occupied by specialists, that during the early Houx period only the one house sites were so occupied, and that during the late Houx period the specialists moved to the main village (Son-593).

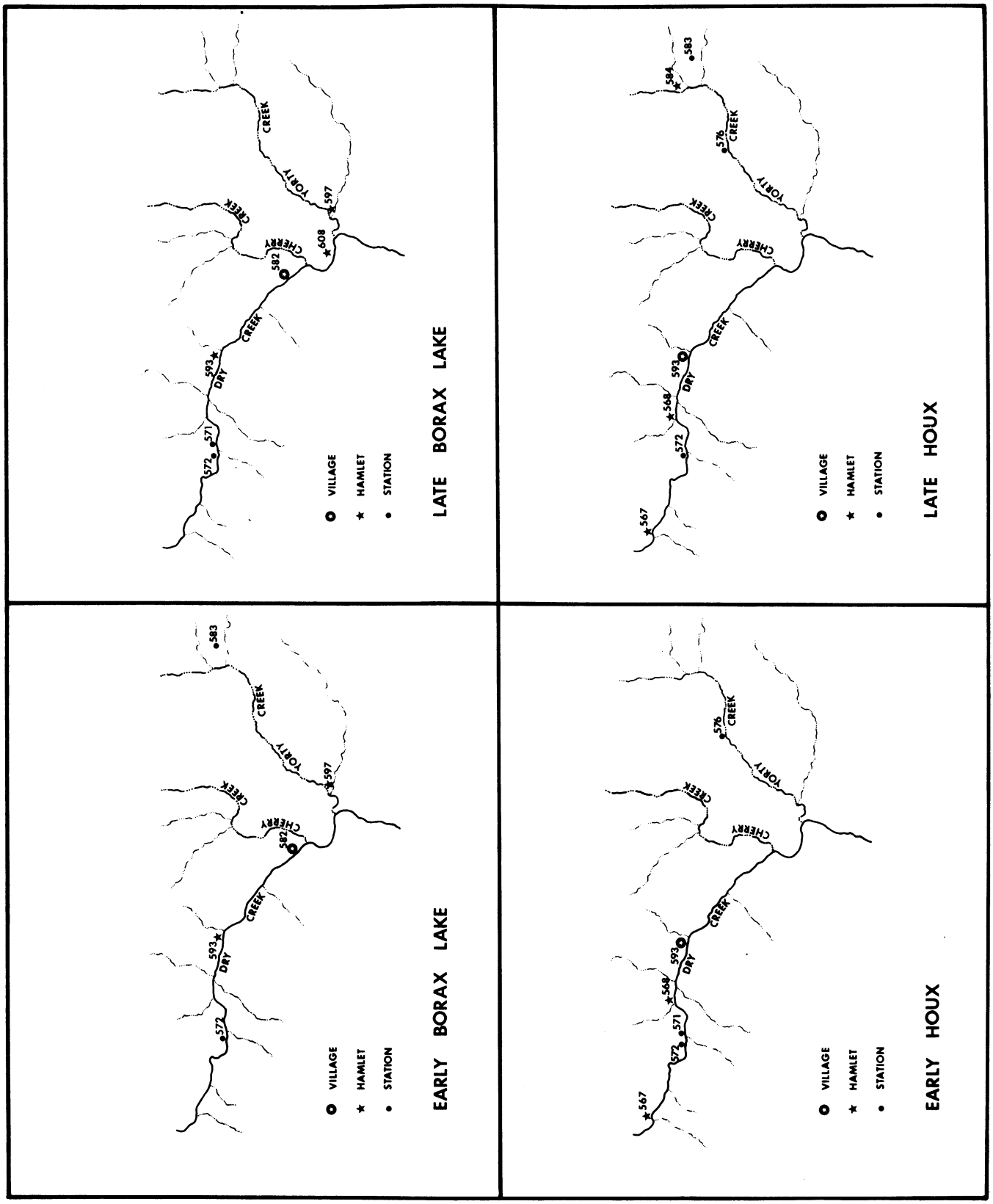
The two final site categories include those sites which are usually poor, always small, and are either surface sites or have very shallow middens. These sites appear to differ from those above in displaying an occupancy of the most intermittent character; the others, while they may not have been occupied year round, must have been occupied year-after-year over a very long period of time. Unfortunately it is impossible (with few exceptions) to sort these surface sites chronologically. Probably they were inhabited by one or a few families for special purposes, such as acorn gathering or deer hunting, for a few weeks once every several years. The determination of such functions requires reconstruction of micro-environments in detail which is impossible at the moment but is not necessarily impossible as a long range goal.

In addition to the sites in the five categories above there are two sites which do not group at all. These are a large surface site (579) and a medium sized, shallow midden site (578). They are on opposite sides of Dry Creek from each other about a quarter mile downstream from Son-593 which we consider to be the major winter village of the Houx period. As noted in the site description site 579 may have once been more extensive and been washed out by flooding. One conjecture is that these two sites were adjuncts to the main village at Son-593.

The considerations presented above for the living sites of the northern area (above Pritchett Peak) can at this point be combined with earlier discussions to present an overall scheme for the development of the tribelet there. During early Borax Lake times site 582 at the confluence of Cherry Creek and Dry Creek was the major winter village. At this time site 597, near the confluence of Yorty Creek and Dry Creek was a 5-house hamlet. One-house sites were at 583 up Yorty Creek and 572 up Dry Creek. There is slight evidence of occupation at 593 (destined to become the major village later). The only evidence of specialization in this period is the large quantity of chert debitage at site 572 indicating a heavy emphasis on chipping there. We know of no quarry nearby but there could easily be one outside our survey area. Obsidian is very scarce in deposits of this period. Given the imprecise nature of our stratigraphy we suggest the possibility that obsidian may not have been used at all during early Borax Lake times here and that the few pieces we have recorded are due to accidents of deposition, recording, or interpretation.

In the late Borax Lake period the same principal village site is continued at site 582 but the satellite configuration changes. Downstream occupation continues at 597 (at the mouth of Yorty Creek) with an increase of debitage and general richness. Between these two a new hamlet (Site 608) is established now and continues only during this period and leaves quite the richest remains of the period; one wonders if it was not a chief's or shaman's residence or something of the sort. Upstream from the principal village occupation continues at 593 (still minimal) while another mile upstream a complex of sites begins which in the following period is to flower spectacularly. At this time the complex consists of sites 571 and 572. Site 572 had already been occupied in early Borax Lake times and had already shown signs of specialization in chert manufacture.

It is time now to discuss these two sites which together form the



Map 30. Settlement Pattern Chronology.

nucleus the complex just mentioned. In many ways they are twin sites. Only a quarter mile apart, the middens are found on a very narrow terrace just above the north bank of Dry Creek heavily overgrown by oak and madrone. Both sites are on beautiful, deep pools in the creek. The middens are both very small and could not have accomodated more than two houses (one house is more likely). Perhaps most importantly we find that both sites have areas on terraces below the middens immediately adjacent to the creek which have an abundance of grinding tools. We have designated these as grinding areas but it may be that they were in fact also occupied as living sites and that the evidence of that has been washed away by floods, leaving only the heavier grinding tools remaining. Whatever the explanation of these lower areas maybe, it is evident that these two sites are remarkably similar in external features. The middens, however are not the same. Site 572 has components of all four periods while 571 has only the middle two. Site 572 is categorized as a rich site and with justice, especially at the bottom, but not outstandingly so. Site 571, on the other hand, is by far the richest site we tested on this project, and is particularly so in its late component (early Houx).

Thus we find in late Borax Lake times the beginning of rather extreme specialization at these tiny living sites. It is also at this time that we find a very great increase in the use of obsidian rather than chert (perhaps it is even the beginning of the use of obsidian, as conjectured previously), and here too we find the beginning of the specialized reworked biface industry. Finally, the Excelsior point, which is to typify this and the succeeding phase, begins here. This is an impressive number of changes. One thing striking about these is that they seem to prefigure the florescence which occurs in the next phase; they are, so to say, formative.

In the early Houx period there are very substantial changes in settlement. The first of them is that the main village at site 582 was abandoned and the bulk of the population moved to site 593 which had previously been only a hamlet. In the description of that site earlier we mentioned a possible occurrence which may have been related to this move. This suggested that a landslide at one time forced Dry Creek to the north slightly, against what is now the north portion of Son-593 and only after the creek had cut through this was the present large flat available for settlement. If this event occurred shortly before the time of Christ, it may have been what prompted the move to this inviting place. If this is so, however, it is a remarkable coincidence because it happened simultaneously with great changes upstream.

Upstream, at the complex around 571 and 572, where we had 2 one-house stations, we now find in addition a hamlet of 5 houses just below at site 568 and another about a mile above at site 567 so that the population of the little enclave changes from about a dozen to 75 or more. At the same time the hamlets south of Cherry Creek (608 on Dry Creek and 597 on Yorty Creek are abandoned. Another remarkable change that occurs at this time is shown in the midden content of site Son-571. This component yielded a total of 4210 obsidian flakes. The next highest count in our digging is 929 and that comes from the late Houx component of Son-593 (also significant); no other is more than in the 400's. Thus there is evidence of overwhelming specialization at this site. Further evidence is found in the distribution of reworked bifaces;

23 specimens of a total of 66 for the whole project come from this component while the next highest figure for the components considered here is 3. We can only conclude from the above that tremendous things were happening at the 571-572 complex in the early Houx period.

We suggested earlier that we believe the large petroglyphs nearby (one designated Son-570 and the other included with the description of Son-568) were associated with this complex of specialist sites. We also indicated that we were unable to date these glyphs. If the glyphs are part of the site complex, as they seem most clearly to be, then we would argue that some of them were made in Borax Lake times and the bulk of them in early Houx. We have earlier argued that these petroglyphs constitute the principal remaining evidence of what was once a set of fundamental Hokan religious observances. We do not know the nature of this religion, studies of comparative Hokan have not approached anything of this sort yet, but, if it was as important as we think, then it must have been deeply embeded in local social organization. By analogy with North American ethnographic examples we can believe there must have been specialists, priests or shamans, associated with it.

Consider this with what we have said previously; we have living at the two stations and associated hamlets (1) the traders, since the obsidian is there, (2) the artisans, because of the obsidian chips and reworked bifaces, and (3) the priests. We have all these things present to some degree in late Borax Lake, and they come to a peak of intensity in early Houx. In the face of this we can only come to the conclusion that the rich and powerful lived at the 571-572 complex while the common people lived downstream at Son-593. The evidence here is obviously not conclusive, and the notion needs a lot of further testing, nevertheless it is the most convincing case for such social stratification we have seen in California archaeology.

One other thing happened in the early Houx period that requires discussion and that is the introduction of the mortar and pestle as the principal grinding tools. Fredrickson (1974:46) indicates the introduction of this complex into California earlier than we find it (3000 to 2500 BC), and he presumes that it is associated with acorn processing technology. As a general statement, we have no quarrel with this, but it is evidently not true for our small area; the mortar and pestle complex seems much later. It may be that our evidence is faulty, the sample of grinding stones is regretably small, but what we have is consistent with Fig. 1. On the other hand the number and size of late Borax Lake components is such that there seems no possibility they did not have the remainder of acorn processing technology--it is inconceivable that the number of people represented could have been supported without really large scale recourse to the acorn crop. This aspect of subsistence development seems to us to be a really major question for Warm Springs archaeology for which the answer is not even suggested by the testing thus far carried out.

In the final period, the late Houx, we again find major changes in settlement pattern. Site 593 continues as the major village but the midden changes--the debitage changes from moderate to abundant and, as noted, has the second highest frequency of obsidian in the project. At the same time our upstream complex sites 571-2, site 571 is abandoned and 572 has only 20 cm of deposit. The hamlets continue to be occupied at sites 567 (slightly) and 568

(extensively) but now there is no specialization to be associated with them; also there is a hamlet once again on Yorty Creek at site 584.

As indicated in the discussion of petroglyphs above, we believe that when the 571-2 complex was for all practical purposes abandoned in late Houx times, then the petroglyphs associated with it were also abandoned. We believe the small petroglyph boulders near site 593 are survivals from the earlier period now used as in the ethnographic period in connection with fertility rituals. We think that one of the events of this period was the acquisition of the Kuksu cult. The Kuksu or "big head" religion was centered on a men's secret society which conducted dances or other performances in which the initiates impersonated the god Kuksu. These performances took place in a large earth covered lodge. Kroeber believed that this was a very late development originated by the Patwin and spread rapidly from there to nearby areas including the one under discussion here. Kroeber's argument was presented in 1925 and was reiterated as late as 1948 (564-568). Kroeber's argument was based essentially on an age-area notion. Such notions are not now fashionable, and we agree that a great deal skepticism is most advisable in applying them. However, one of us recalls a statement once made by R. H. Lowie the burden of which was that while Kroeber's large scale conjectures were apt to be suspect, small ones that he made about material with which he thoroughly conversant were usually correct. We agree with Lowie's assessment generally, and furthermore, since Kroeber's conjecture about the Kuksu cult being very recent among the Pomo seems inherently probable, we believe it marks the beginning of late Houx, and the attendant demise of the earlier religion, the Hokan cult, which was associated with the massive petroglyph boulders.

We might mention in passing two ways in which the above conjectures might be tested. For one thing, if we could find a way to date the petroglyphs, we would be on much firmer grounds. This will probably have to be done either through associated artifacts (doubtful but possible) or by means of relative patination (not yet feasible but perhaps so in future). The other test would be by identifying archaeologically the large earth covered lodges which Kroeber said were associated with Kuksu. In this area, the latter will require extremely fine micro-stratigraphy, if our experience is any guide, and even that might not be good enough. We were unable to identify house floors even when housepits were present.

In any case, if we are correct that the earlier religion with segregated priests broke down and that the traders and artisans moved back to the main village, then this suggests that the stratification that we saw in the earlier period had now broken down into a more egalitarian situation. Whether the inception of the Kuksu cult was a causative agent in this or whether it was just one part of a more general change we cannot say. The archaeological inventory does change slightly. A new point type is introduced (Gunther barbed, is this also from the Patwin?) and the reworked biface industry declines to its late Borax Lake level. Generally speaking late Houx seems poorer than early Houx.

The foregoing discussion is further summarized in the table that follows.

Site Characteristics by Type and Phase

	Site	Depth cm	Cht-Obs Ratio	No. Flakes	Rework Biface	Proj. Points
Late Houx						
Village	593	70	0.14	1043	3	6
	567	20	4.42	65	-	1
Hamlet	568	80	4.28	586	2	9
	584	40	3.35	287	-	2
	572	20	0.48	151	3	4
Station	576	50	4.09	280	-	1
	583	30	9.79	329	-	2
Early Houx						
Village	593	40	0.49	257	-	-
	567	80	2.64	315	2	5
Hamlet	568	50	12.27	146	-	1
	571	80	0.06	4454	23	19
Station	572	50	0.40	485	2	2
	576	140	1.03	542	2	3
Late Borax Lake						
Village	582	80	1.40	867	2	6
	593	70	7.50	51	-	-
Hamlet	608	80	1.40	1122	2	2
	597	50	4.47	711	-	3
Station	571	50	0.21	791	3	2
	572	30	3.06	418	-	2
Early Borax Lake						
Village	582	50	4.00	60	-	-
Hamlet	593	30	7.00	24	-	-
	597	110	19.02	301	-	2
Station	583	60	3.81	289	-	-
	572	40	61.71	439	-	2

It is possible, and for some purposes useful, to view the situation as a developmental sequence in which we would call early Borax Lake incipient, late Borax Lake formative, early Houx, classic and late Houx post-classic. The incipient period would be the first development of tribelet organization, the formative would see beginnings of trade and specialized industries which culminate in the classic period and finally tail off in the post-classic. This would define the cultural growth of the Southern Pomo in their distinctness up to eight hundred or a thousand years ago when they became more closely affiliated with other Central Californians, especially the Patwin and Miwok.

To look at this sequence in another way we can see it as progressive Penutianization of the Hokan peoples. Kroeber says that Kuksu is a basically Penutian cult. This means that the postulated Kuksu spread in our post-classic or late Houx period was in fact the Penutianization of Pomo religion. But this was only the last of a series of changes brought about upon what we regard as the basic California culture of the Hokan people. At some time in the distant past, probably Fredrickson's 2500 to 3000 BC is as good a dividing line as any, California was occupied almost entirely by Hokan speakers (and perhaps Yukian speakers as well). At this time ancestral Penutians came into the area ultimately occupying most of the favored portions. They may have brought with them a good deal of acorn technology or they may have developed it soon after they came. In any case there is apparently a great increase of population at this time which must have been dependent on acorn gathering. Soon after this the Penutians began to influence the native Hokans, pushing them out to the margins or isolating them there and at the same time exerting cultural influences on the remnant populations. The native Hokan culture apparently differed from that of the intruders in using handstone and milling stone for grinding rather than mortar and pestle, in making twined basketry rather than coiled, and in making pitted boulder petroglyphs while the early Penutians made petroglyphs, if any, more like those of the Great Basin. Fredrickson thinks the mortar and pestle replaced the mano and metate by 2500 BC while we feel that this change occurred 2000 years later at Warm Springs. Pitted boulder petroglyphs we think remained very important until 1200 AD when they became mere survivals. If bone were better preserved so that bone awls could be recovered in large numbers, we could probably date the introduction of coiled basketry. Unfortunately this is not the case, and we remain in the dark on this issue.

These are a few of the changes that came about through contact of the Pomo with Penutians. We think a similar series of changes may have taken place among, for example, the Chumash and the Yana. In fact from this point of view one might see the culture history of California in the last 5000 years as the Penutianization of the Hokans, in some places earlier, in others later, and still others never complete at all. At the same time there was a process of adaptation of the Penutians to local conditions. Consideration of both processes will generate a whole series of hypotheses some of which have been outlined above.

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APPENDIX A

POSSIBLE PRE-BORAX LAKE COMPONENTS

The four-phase sequence from Early Borax Lake to Late Houx (Fig. 1) we have argued represents a continuous occupation by the Pomo or their ancestors dating from 5,000 BC up to the historic period. In doing our field work we were alive to the possibility that earlier material might also exist. Most recent work in the North Coast Range suggests that some categories of earlier remains may exist but were not found by us. The recent work referred to is at Lake Berryessa, the reservoir behind Monticello Dam on Putah Creek some 50 miles southeast of Warm Springs. The drought of 1976-77 was such that the lake level there had dropped about 50 feet by May, 1977. The sides of the lake thus exposed were largely devoid of vegetation and also been modified by the action of the water, in some places covered with silts apparently the result of lateral slope movement but in others eroded by beach action or by the lateral movement itself.

One of the results of these processes was to expose archaeolgoical remains of a very different nature than those found prior to the construction of Monticello Dam. At this point we are conjecturing that these remains were covered by a soil horizon making them impossible to discover and the lake action dissolved or otherwise moved this covering soil. It is entirely possible that similar remains are present in the Warm Springs area but went undiscovered because they are similarly covered by recent soils. Really extensive augering is the only way that these could be discovered.

Aside from this possibility we know of only two possible candidates for pre-Borax lake components in the Warm Springs area: The Yorty Creek gravels and the bottom layer of Site Son-597.

Yorty Creek Gravels

We noted earlier in the summary given for the Yorty Creek Group the existence of a possible early component on this small creek.

Three sites there have a sub-midden gravel component, Son-593, 584, and 577. These sites are all on Yorty Creek, in the northeastern part of the project area. At 583 and 584 the gravels were encountered at 90 cms and 60 cms below the surface, respectively, and extend to 120 cms and 135 cms where they overlie bedrock. At 577 the gravels were encountered at 100 cms and excavated to 180 cms where water table percolation brought the excavation to a halt.

In addition, we have found artifacts in the gravels in the stream-cut banks of Yorty Creek, extending from the eastern edge of the project area at Son-583 to just upstream of Son-576, the site at the Sheep Shearing Station. These gravels generally are one to two meters below the surface overburden. Chert artifacts only have been found in the gravels exposed by the stream cuts.

At 583 and 577 the artifacts in the gravels are entirely of chert;

obsidian drops off completely. At 584 there are roughly equal amounts of chert and obsidian. At all locales the chert industry can be characterized as consisting of large percussion flaked informal tools made on locally available red, brown, and green fine-grained siliceous rocks such as chert and jasper. No grinding stones or diagnostic artifacts such as projectile points have been found in association with this industry.

Approximately 140 artifacts (tools and flakes) have been found in the gravel component of the tree sites; of these about 60, or 43% show some evidence of having been water worn; the remainder are fresh appearing. In the opinion of Mr. Dick Thompson, geologist, Corps of Engineers, San Francisco District, who examined the sites and stream cuts, the artifacts in question have not been moved any great distance and then redeposited but have been water rolled locally with respect to their point of origin or original site context. Six of the most convincing artifacts are shown in Fig. 30. We noted earlier that these must be earlier than Early Borax Lake. Just where it is to be placed in this open ended time period is not now possible to say. Neither is it possible to define an "industry" or "culture" more precisely so as to relate to other early California manifestations. It is our estimate that a large amount of excavation and additional observation of exposed gravels together with assistance from geological specialists will be required before any archaeological answer are obtained.

Site Son-547

Son-547 is stratigraphically one of the most interesting in the project. The top layer of the site is terribly embeded with roots. Orlins finds that this is the heaviest root growth ever encountered by him in an archaeological site. One expects that some mixture of artifacts would be caused by this churning and since the roots were most abundant in the top 30 cm one would expect the most confusion at this level. On the contrary, it is found that this level is consistent stratigraphically and also interms of chert-obsidian ratios. The next zone (30-90 cm), which has a smaller growth of roots, fluctuates strikingly in chert-obsidian ratios and has artifacts from three different time periods. One can only hope that this represents nothing more serious than a sampling problem which could be obliterate by additional excavation. Finally, in the deepest levels (90-140 cm), we encounter the anomalous situation of debitage consisting almost totally of obsidian in contrast to the other sites in the Project which have chert as the principal or exclusive component of deep level debitage. We grant that a total of 55 chips is a small sample but the consistency of the low chert-obsidian ratios in the four levels adds sufficient weight so that its significance can hardly be thought to be spurious (see Table p. 164).

What then is the explanation? At this depth it can scarcely be due to root mixture and, in any case, root mix would have been more likely to bring down chert than obsidian since chert is the dominant material in the site as a whole. We must look elsewhere for an explanation. We note that the nearest obsidian source, Mt. Konoci, is only about 25 airline miles distant so it is not difficult to imagine people obtaining material from there either by trade or transport (although we do not know that this was the source). The striking feature is the contrast with other early deposits both here and elsewhere in California in which only strictly local material is found whether it be chert,

obsidian, or some other substance. In the usual case of early deposits we thus have evidence of extreme localism or, in other words, of tribelet organization. The difference between this and later situations is that in addition to tribelet organization we also have extensive trade networks. The situation at Son-547 indicates either a very early system of trade relationships or, alternatively, a pretribelet system of social organization very much more free ranging than has been present in California in more recent times. To assume the first alternative is to assume a once wide trade network subsequently cut off entirely only to begin again at yet a later date. While this is possible it seems to us that the second or per-tribelet, free ranging hypothesis is preferable and we therefore tentatively accept it. Admittedly the present evidence is a rather slender thread to support any considerable hypothesis but then it is, after all, only a hypothesis.

APPENDIX B

AUXILIARY TECHNIQUES

Because of the exigencies of court action against the Corps of Engineers a variety of archaeological aids which could have assisted in analysis of the Warm Springs materials were not performed. Among the most obvious of these were faunal analysis and obsidian analysis (both source and hydration). In the North Coast Range the abundance of rainfall combines with acidity of soil to make preservation of bone almost impossible. Perusal of the tables included with each site description reveals that this statement almost but not quite true. Several of the sites, notably Son-593 and 576, produced fairish quantities of bone. Unfortunately nearly all the bone consists of tiny unidentifiable fragments so its usefulness will ultimately be derived through techniques different than those usually employed. However, there were a small number of identifiable pieces and a large excavation sample may yield sufficient quantities to be useful.

Obsidian source and hydration analysis is another matter. This could very well be quite revealing with regard to trade patterns and chronology. This is being undertaken at present and we hope to make it available in the near future.

We did perform both a palynological assay and a water separation or floatation project. The results are presented herewith.

Palynology

Several samples from one site (Son-582) were submitted for purposes of pollen identification to Mr. James West of University of California, Davis. West centrifuged the samples and prepared slides (which are still available). He reports that no pollen remained in the samples. It may be that other sites have superior pollen preservation qualities; we would think that Son-593 and 576 would have the best chance in this regard.

Water Separation

A floatation analysis of five of our sites was carried out by Terry Zontek and Jane Melville. They report the following procedures and results. Their detailed site by site results are also available.

Procedure

At each site tested a ten centimeter wide column sample was removed from one wall of the test unit excavated. The sample was taken out in ten centimeter depth increments, producing a ten centimeter cube, representing a one percent sample of each ten centimeter unit level. The vertical and horizontal boundaries of each sample were scratched on the wall with an icepick using a meter stick as a straight edge. In most cases the samples were removed beginning with the 0-10 cm level, surface representing 0 cm. A dustpan was placed along the bottom border of the sample as the sample was cut out of the profile with a square-nosed trowel. The samples were then bagged,

sealed, and labeled with provenience data.

The tools for the water separation method were an ordinary fine mesh tea strainer and a large galvinized washtub with the bottom replaced by a 1/16" mesh screen strengthened by braced metal cross bars. For each sample processed by this procedure a place was chosen which had a pool of water at least 18" in depth through which ran a moderately swift current. The depth was important for submersing the washtub and the current necessary to carry the soil away form the work area. The washtub was placed on the bottom of the pool and the sample was poured in with one hand while the other produced a mild turbulence. The light fraction was then scooped off the water surface with the tea strainer, the tub raised and lowered to further release floating material, and that material collected. Both the light fraction and the heavy fraction on the bottom of the screen was bagged, sealed, and labeled with provenience data.

The first step of laboratory sorting was done with tweezers and a hand lens. The sorting categories for the light fraction were organic material (charcoal, seeds, seed husks), bone and other organic matter (roots, rootlets, etc.); for the heavy fraction, bone, lithic debris and rootlets. The organic matter was then examined under a Bausch and Lomb variable power dissecting microscope. A clear plastic ruler with 1/4" markings was used to measure specimens to insure that items that would have been recovered in a 1/4" screen were eliminated. After sorting, tabulations were made of the items in each category. The separate categories were then placed in film cannisters, sealed, and labeled.

Results

Column samples for water separation-microanalysis were examined from five sites within the Warm Springs Dam Project Area. This material has not yet been analyzed; however, the following quantities of material were collected from the samples:

Site (CA-Son-)	Lithics		Bone		Seeds
excavated levels	w-s	unit	w-s	unit	w-s only
582 (11 levels)	51	746	20	35	24
%	6%		36%		100%
571 (13 levels)	680	5225	490	433	10
%	12%		53%		100%
576 (20 levels)	82	843	302	672	4
%	9%		31%		100%
553 (10 levels)	75	408	250	663	--
%	16%		27%		

556 (22 levels)	181	1034	389	376	25
%	15%		51%		100%
Totals	1069	8256	1451	2179	63
%	11%		40%		100%

w-s (water separation)

% (w-s/unit + w-s totals)

The quantity of seeds recovered through this program was disappointingly small; however, it should be emphasized that not a single seed was found in test unit excavations using 1/4" mesh screen. The low seed count may be partly attributed to destruction of unburnt seeds by reaction to local soil chemistry. Water separation procedures will be potentially valuable for collecting any remains that have been preserved in feature fills such as hearths.

On the other hand, over a thousand pieces of lithic debris were recovered by water separation. This amounts to an average of 11% of the total lithic count from these five sites. In a future study these additional pieces will be extremely helpful in understanding the nature of the complex reworked tool industry at Warm Springs.

Perhaps the most important category of items recovered by the microanalysis program was the faunal material. Over 1,400 small pieces of animal bone were collected, both burnt and unburnt, resulting in 40% of the total amount of bone found at these five sites! The fact that these pieces are small does not diminish their importance. Normal unit recovery with 1/4" mesh screening is biased towards collecting large mammalian remains. Through a water separation program it is possible to also recover reptile, rodent, bird and fish remains which may well have constituted a major part of the animal food resources.

A program of this type coupled with regular excavation procedures is necessary for any large-scale excavation of an archaeological site. Too much is lost through 1/4" mesh screening providing biased and partial recovery of archaeologically significant remains. For this reason we suggest that a water separation-microanalysis program accompany any future excavation plans in the Warm Springs Dam Project Area.

APPENDIX C

A TYPOLOGICAL STUDY OF THE REWORKED BIFACES OF THE WARM SPRINGS ARCHAEOLOGY PROJECT

BY NANCY WHITNEY

Complete Bifaces

For the purpose of this study of the reworked bifaces of the lithic industry at Warm Springs, all the projectile points, spear points, knives, blades and other symmetrical bifacially worked tools are collectively referred to as "bifaces," regardless of function. It is clear that all categories mentioned above were occasionally reworked; therefore, all bifacially worked tools are considered potential core pieces.

A tool was counted and measured as a complete biface if the maximum original dimensions were preserved on the piece. Thus, a tool may be considered to be whole even if a small section of the original piece is missing.

Thirty-four complete bifaces were found on the surface or collected from the test excavation units during Phases I and II of the Warm Springs Archaeology Project. These complete bifaces may be divided typologically into six distinct shapes:

foliates	4-o*	9-c	13 total
straight based	1-o		1 total
concave based		2-c	2 total
side-notched	6-o	5-c	11 total
corner-notched	1-o	3-c	4 total
barbed		3-c	3 total
	12-o	22-c	34 total

*o-obsidian
c-chert

Note that 12 pieces were made of obsidian and 22 from chert, or well over half of the total number were chert. It is interesting in this regard that only five of the 89 reworked pieces were manufactured from chert. Obsidian bifaces were clearly preferred for purposes of reworking.

Incomplete Bifaces

This category includes all fragments of projectile points, spear points, blades, knives and other bifaces which cannot be shown to have been reworked.

The terms "base" and "tip" were used for pieces with the distal or proximal end missing. Therefore, a base fragment may include either a small,

complete base or the majority of a piece which is missing only its tip. A midsection is missing both ends.

There were 146 biface fragments recovered from surface survey reconnaissance or test excavations. These incomplete bifaces fall into three categories:

tips	30-o	18-c	48 total
bases	43-o	39-c	82 total
midsections	10-o	6-c	16 total
	83-o	63-c	146 total

Eighty-three (57%) of the total number of fragments were manufactured of obsidian while 63 (43%) chert pieces were recovered. It is important to recall that only 35% of the complete bifaces were obsidian and to note that 94% of the reworked bifaces were made from obsidian. It appears that most obsidian bifaces were fragmented and appear either as unworked fragments or as reworked pieces.

Fifty-six percent of the fragments occur in the form of obsidian and chert bases. Many of these pieces had been broken at the thickest part of the body. This suggested that the breakage may not have been accidental. All incomplete bifaces were then examined to see if there was clear evidence of intentional breakage. It was postulated that if the fragment had a small projection or hinge on the break, then the piece was probably held against a hard edge and snapped off. In fact, 120 of the 146 biface fragments, or 82%, contained this hinge. In the other 26 cases the hinge was either not present or, in the case of some of the coarser cherts, could not be distinguished. In addition, it was found that 76 fragments, or over half (52%), of the examples had a punch mark directly opposite the hinge on the other surface. It seems clear that not only were most of the bifaces intentionally snapped, but also they were truncated by holding a punch in the center of one surface of the piece.

When sub-divided into the fragment categories, we see that 58% of the total number of biface fragments that can be shown to have been intentionally truncated are bases. For obvious reasons, one would expect to find may tip fragments but relatively few truncated bases, assuming that the breakage was accidental.

	Hinge plus punch mark		Hinge only		Total
tips	20-o	2-c	8-o	7-c	37
bases	25-o	17-c	9-o	19-c	70
midsections	10-o	2-c		1-c	13
	55-o	21-c	17-o	27-c	120

All of the figures suggest that the inhabitants of the Warm Springs area were intentionally truncating the bifaces by removing the bases in order to create a striking platform for reworking their tools.

Six distinct shapes of incomplete bifaces can be recognized from the fragments recovered:

foliates	37-o	19-c	56 total
straight based	2-o	14-c	16 total
concave based		1-c	1 total
side-notched	5-o	5-c	10 total
corner-notched	4-o	5-c	9 total
barbed	2-o	1-c	3 total
	50-o	45-c	95 total

Note that over half (59%) of the types are leaf shaped and that most of these (67%) were of obsidian. Examination of foliates in terms of fragmented sections revealed that nearly 80% of the foliate fragments are bases and that 78% of these bases were made of obsidian:

tips	4-o	3-c	7 total
bases	30-o	14-c	44 total
midsections	3-o	2-c	5 total
	37-o	19-c	56 total

As more components of the Warm Springs lithic industry were examined, it became increasingly clear that the inhabitants of this area were intentionally truncating bifaces for the purpose of reworking them. In normal archaeological contexts biface fragments are indicative of projectile points, spear points, knives and blades which had been broken through use or during manufacture and discarded. However, many of these fragments may be regarded as the debitage of this industry. The base sections were snapped off of the original piece to provide the widest striking platform possible for reworking the biface. Further, it seems that a particular kind of biface was preferred in this industry as well as a particular material; namely, obsidian foliates.

Reworked Bifaces: Technique of Manufacture

The eighty-nine reworked biface fragments recovered from the surface and the test excavation units at Warm Springs were examined with regard to a particular hypothetical method of manufacture. It was found that by using this approach, all but eleven pieces could be categorized. Thus, 88% of the pieces can be interpreted within the framework of the system described below.

Figure 1 is a schematic representation of a foliate. Each step of manufacture involved in producing the final reworked form is labelled next to or on the piece.

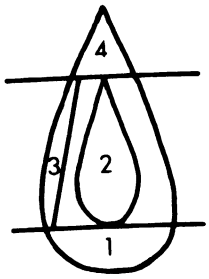


FIGURE 1

The first step in the manufacturing process involved removing either a base or tip from the biface in order to produce a platform from which the rest of the piece could be shaped. With the unworked bifaces short base fragments are numerous: bifaces were truncated at the basal end in order to obtain the widest section of the biface for striking platform.

Next, on the thicker bifaces, a flake was removed from the center of one or both surfaces of the biface in order to thin the piece. This flake was usually struck from the platform towards the tip. Two of the actual "thinning" flakes were measured and examined. Many of these flakes remain in the debitage level bags, uncounted, since they were originally unrecognized.

The third step was to remove an edge from the side of the biface, which will be referred to as "truncating the edge longitudinally." As with the "thinning" flakes, this edge was removed by striking a blow from the platform which had been formed by the initial transation. These longitudinally truncated edges will be referred to as "spalls." Fifteen spalls of this type have been recorded in the inventory records, most of these being fragments of the original longitudinal truncation.

A final step, in the case of the largest bifaces, involved removing the remaining tip from the piece, giving the tool a rectangular rather than a triangular shape. With the smaller bifaces, this step was apparently not necessary. It may be that the tips of the larger bifaces had to be removed in order to decrease the length of the finished tool.

Completion of these steps yielded what must have been the desired product. A complete tool, then, can be defined as a fragmented foliate resulting from one or more transverse truncations, having one original edge with the opposite edge truncated longitudinally. Fifteen complete tools were recovered as well as fifteen tool fragments. It is significant that fifteen spalls (or spall fragments) were also found.

The average dimensions of the fifteen complete tools were calculated; the average length is 3.0 cm, the average width is 1.49 cm, and the average thickness is .92 cm. Thirteen of the fifteen tools have a "hinge" on the transverse truncation, and one-third of these thirteen have a punch mark

opposite the hinge, indicating that these tools were intentionally truncated. The tools invariable exhibit secondary retouch. Both step and marginal retouch are consistently found on the remaining original biface edge and on the negative flake scar left by the longitudinal truncation. Furthermore, one-third of the pieces have step retouch on one or both sides of the transverse truncation. If sharp edges remain on the piece, either from the removal of the "thinning" flake or from the truncations, these were removed. All fifteen of the tools bore at least some evidence of this process. Also, the spurs left on the various truncation scars were removed in many instances.

Naturally, the production of these tools created debitage. This debitage was often retouched and utilized, and can be organized into nine separate types. Figure 2 is a schematic representation of a leaf-shaped biface with each type labelled next to or on the piece.

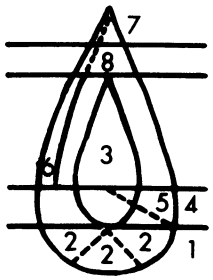


FIGURE 2

Type 1 comprises complete bases that have been removed from the biface and subsequently retouched. One of these has been found in the debitage. The piece has been heavily retouched on the transverse truncation.

In several cases it seems that these bases were further truncated in order to form a number of small triangles, which were subsequently retouched. Six of these were found in the reworked biface industry. These are labelled "step 2" on the base of the foliate in Figure 2.

The third type of retouched debitage involves reworking the flakes removed from the truncated biface as "thinning" flakes. Two of these flakes have been retouched subsequent to their removal.

Type 4 includes midsections which have been thinned. Seven examples of this type of retouched debitage have been inventoried. Occasionally this piece is further truncated as shown on the foliate in Figure 2. This truncated piece, type 5, is then retouched and used as a tool in its own right. Six of these are known.

All fifteen of the spalls resulting from the longitudinal truncation of the biface show some retouch. They are generally very small pieces. Despite

their diminutive size these spalls seem to have been utilized as tools. They are labelled "type 6" on the foliate in Figure 2.

Type 7 includes tips that have been longitudinally truncated or "spalled" before being removed from the core piece. Subsequent to their removal, they are retouched on their truncated edges and re-used. Six retouched tips were included in the reworked biface industry. Of this total, five have been "spalled."

The eighth type of retouched fragment comprises midsections that are either only retouched, or "spalled" and retouched. Of the five midsections in this type, two have been truncated longitudinally and three have been only retouched. All five pieces have been retouched subsequent to their removal from the original biface.

The final type of retouched debitage comprises bases that have been modified into end scrapers. There are two examples in this category of which one was formed on a base that had a "thinning" flake removed and the other on a base that was both "thinned" and "spalled." Both were formed on rounded bases that had been heavily retouched.

Of the fifteen complete tools only one was manufactured from chert. Four other chert reworked biface pieces were recovered; two are spalls and two belong to the category of "miscellaneous" unidentified pieces. Three of the five chert pieces have been burnt including the complete tool and two spalls. The small number of chert reworked bifaces indicates that obsidian was preferred as the raw material in this industry. This preference may be due to the fact that obsidian is substantially easier to work than chert.

Reworked Bifaces: Selection of Complete Bifaces to be Used as Cores

The complete and incomplete unworked biface fragments suggested that the reworked biface industry utilized mostly obsidian foliates as core pieces. The measurements of the tools from the reworked biface process were compared to the measurements of the various complete biface shapes to determine which type was most commonly reworked. The following is a list of the average lengths, widths and thicknesses for the six biface types as well as for complete reworked biface tools.

	length	width	thickness	
foliates	3.7 cm	1.89 cm	.73 cm	41 pieces
straight based	5.5	1.93	.60	3 pieces
concave based	-	-	-	0 pieces
corner-notched	2.60	1.65	.40	4 pieces
side-notched	1.90	1.35	.41	11 pieces
barbed	-	1.55	.35	2 pieces
reworked tools	(3.0) cm	(1.49) cm	(.92) cm	15 pieces

Only obsidian pieces were considered in these averages since 94% of the reworked biface industry consists of obsidian fragments. Incomplete measurements are in parentheses.

Transverse, longitudinal and facial truncations made it impossible to record original measurements of the reworked pices. Of the 14 obsidian reworked biface tools, six were not thinned and retain complete thicknesses. The average thickness of the unthinned pices is .96 cm. As this is an incomplete thickness, it becomes significant that this measurement is thicker than that of the complete pieces.

Comparing the reworked tools with the original biface shapes, it is clear that the average thickness of the reworked biface tools is much larger than any of the original bifaces, coming close only to foliates.

The width measurements are incomplete on the reworked biface tools because of the longitudinal truncation. Note, however, that even with this incomplete width these tools are wider than side-notched pieces and come close to the width of the barbed type. If one adds the average width of the fifteen spalls recovered to the average width of the fifteen reworked biface tools, it seems likely that an approximate width for the original piece can be attained. The average width of the tools is 1.49 cm plus 1.00 cm for the spalls, or 2.49 cm for the average width of the original bifaces before reworking. This width is, again, larger than any of the complete or incomplete unworked biface types and only approximates straight based and foliate pieces.

The length is incomplete because of the one or more transverse truncations of the original piece. Even with this truncated length, the reworked tools are longer than either the corner-notched or side-notched complete bifaces. The length closely approximates that of the complete foliate average length but is much lower than the straight based length. Only three straight based pieces were made of obsidian and, therefore, considered in this comparison. Thus our sample for this category is small.

All of these figures indicate that the reworked pieces are closest in shape (length, width, and thickness) to obsidian foliates or, possibly, straight based pieces. Assuming that the thicker the piece is, the larger the piece, then, the largest obsidian bifaces were being reworked. In fact, it would seem that the size that was preferred is so large that it is not represented among our complete biface pieces, foliate or straight based. The largest bifaces were reworked so commonly that few fragments of the originals are left.

The chart on the next page (Figure 4) plots average thickness to average lengths of the complete and incomplete unworked obsidian obsidian foliates. In this way the shape of these pieces is reflected in a proportion of thickness to length. When the average thickness and length of the reworked tools is placed on this graph (shaded area), it becomes clear that only a very few of the complete or in complete unworked pieces come close to the original measurements of our bifaces. Obviously, the largest obsidian bifaces were reworked in this industry. These pieces measured over 3.0 cm in length and were more than .90 cm thick.

This reworked biface industry is known from two other locales in the North Coast Ranges: from the Clear Lake region as found at Lak-261

(Fredrickson 1973), and from Little Indian Valley (Orlins 1971) is eastern Lake County. However, at this time it is not possible to understand the relationship between the Warm Springs industry and the other industries since they have not yet been adequately described.

EXPLANATION OF ILLUSTRATIONS

? = reconstructed dimension
() = actual but partial dimension

	Specimen Number	Material	l.	w.	th.	wt.	Type
Fig. 22a	70-304	obsidian	-	1.7	0.2	(1.4)	
b	70-313	obsidian	1.9?	0.9	0.5	3.0	Excelsior
c	70-320	red chert	2.0	0.8	0.3	1.5	Gunther
d	70-365	red & black obsidian	-	1.6	0.8	(2.1)	Excelsior
e	70-562	obsidian	2.6	1.5	0.6	2.6	Excelsior
f	70-578	brown chert	-	1.6	0.9	(7.0)	Cascade?
g	70-615	obsidian	-	-	0.7	-	
h	70-613	red chert	4.5	2.3	0.8	9.0	early side-notched
i	70-626	obsidian	-	2.0	0.6	(2.0)	Excelsior
j	70-643	lt. grey chert	3.8	-	0.8	-	Excelsior
k	70-647	obsidian	-	2.3	0.8	-	
Fig. 23a	70-539	obsidian	1.6	1.1	0.3	0.5	late side-notched
b	70-551	green chert	2.6	1.9	0.3	-	
c	70-661	green chert	3.2	1.7	0.6	3.1	
d	70-662	green chert	2.1	1.5	0.5	1.1	late side-notched
e	70-675	obsidian	2.3	1.3	0.3	0.6	late side-notched
f	70-676	grey chert	-	1.2	0.4	-	late side-notched
g	70-723	brown chert	-	1.9	0.7	(5.3)	early side-notched
h	70-736	obsidian	5.7	2.5	0.8	12.1	
i	70-745	green chert	6.0	1.9	0.7	5.1	early side-notched

	Specimen Number	Material	l.	w.	th.	wt.	Type
Fig. 24a	70-55	obsidian	4.1	1.7	0.9	7.8	Excelsior
b	70-68	obsidian	3.5?	2.3	0.8	(4.6)	Excelsior
c	70-259	obsidian	-	1.4	0.3	(0.2)	
d	70-462	obsidian	2.6?	1.2	0.8	(4.6)	Excelsior
e	70-391	obsidian	3.6?	2.0	0.9	(4.8)	Excelsior
f	70-403	obsidian	1.5?	1.4	0.4	(0.7)	Gunther
g	70-1547	grey-green chert	2.6?	2.0?	0.3	(0.6)	Gunther
h	70-163	brown chert	2.3?	1.2	0.5	(2.5)	
i	70-233	quartzite	-	2.2	0.8	(3.0)	Excelsior
j	70-1349	grey chert	-	2.0	0.4	(1.4)	
Fig. 25a	70-83	tan chert	-	2.4	0.7	(5.0)	
b	70-85	obsidian	-	1.5?	0.3	(0.3)	Gunther
c	70-6	tan chert	3.7	1.7	0.6	3.4	(in gravels)
d	70-120	green chert	2.3	1.6	0.3	0.8	Gunther
e	70-125	obsidian	1.6	1.4	0.3	0.3	Gunther
f	70-1527	obsidian	2.0	1.6	0.3	0.4	late side-notched
g	70-171	green chert	2.3	1.3	0.5	1.1	Excelsior
h	70-212	obsidian	-	1.7	0.8	(4.4)	
i	70-218	obsidian	4.3	2.3	0.8	6.8	Excelsior
j	70-252	obsidian	-	2.3	0.9	(8.6)	
Fig. 26a	70-5	obsidian	2.7	1.5	0.4	0.7	Gunther (?)
b	70-1535	reddish chert	-	1.9	0.7	(3.1)	early side-notched
c	70-1051	obsidian	2.7	2.0	0.6	2.9	early side-notched
d	70-1235	tan chert	-	1.5	0.5	(0.8)	
e	70-1236	obsidian	2.0	1.0	0.3	(0.3)	late side-notched

	Specimen Number	Material	l.	w.	th.	wt.	Type
Fig. 26f	70-1538	obsidian	2.5?	1.6?	0.4	(1.0)	late side-notched
g	70-10	obsidian	2.5?	1.8	0.4	(1.0)	late side-notched
h	70-1053	obsidian	2.9	1.6	0.3	1.3	late side-notched
i	70-1109	obsidian	2.1?	1.3	0.4	(0.7)	late side-notched
j	70-1145	gr., striped chert	2.8?	2.0	0.5	(2.0)	
Fig. 27a	70-12	obsidian	2.2?	1.6	0.4	(0.8)	late side-notched
b	70-1449	red chert	1.8	1.2	0.5	1.8	
c	70-1491	reddish chert	2.4?	1.9	0.8	(3.6)	Excelsior
d	70-1508	obsidian	3.3?	1.9	0.6	(2.5)	Excelsior
e	70-1515	greenish brn. chert	4.5	2.3	0.8	7.4	Excelsior
f	70-1521	obsidian	2.5	1.8	0.7	3.0	
g	70-2*	red chert	2.5	1.7	0.5	2.6	Excelsior
h	70-1*	red chert	4.1	1.7	0.9	5.6	early concave base
i	70-3*	red & green chert	3.7	2.1	0.7	5.0	early side-notched
Fig. 28a	70-1212	obsidian	1.6	1.4	0.3	0.6	late side-notched
b	70-1167	brn. chert	2.0	1.3	0.4	0.7	late side-notched
c	70-1174	red & green chert	3.2	1.9	0.7	3.5	Excelsior
d	70-1182	reddish chert	4.4?	1.8	1.0	(8.3)	Cascade?
e	70-8	white chalcedony	2.4?	1.7	0.3	(0.6)	
f	70-950	obsidian	2.8	1.5	0.3	1.3	
g	70-962	reddish brn. chert	1.7	1.4	0.3	0.4	

	Specimen Number	Material	l.	w.	th.	wt.	Type
h	70-963	gr. & tan chert	-	2.3	0.9	(7.2)	early leaf-shaped
i	70-968	reddish brn. chert	-	2.1	0.7	(5.0)	early concave base
Fig. 28j	70-973	obsidian	2.6?	1.8	0.9	(4.5)	Excelsior
k	70-977	basalt or	-	-	-	(0.2)	Desert Side-notched?
Fig. 29a	70-919	gr. chert	-	2.0	0.4	(1.2)	
b	70-896	green trans-lucent chert	2.3?	1.7	0.3	(0.6)	Gunther related
c	70-904	obsidian	2.0	1.4	0.3	(0.4)	same
d	70-905	gr. chert	2.5?	2.0	0.4	(1.3)	
e	70-912	green trans-lucent chert	3.2	1.7	0.4	0.9	Gunther related
f	70-830	obsidian	2.8?	1.9	0.4	(1.3)	late corner-notched
g	70-855	tan chert	3.9?	2.2	0.8	(5.5)	Excelsior

Fig. 30A 70-277 Near site Son-584. In gravel creek bank north of the confluence of Yorty Creek and a small tributary. This is a large keeled piece of brown chert. It has secondary flaking on its edges. Wt. 51 gr.

30B 70-274 In gravels below and 5 m SE of Unit 1 of site Son-576. Large, thick scraper of pink chert with yellow band. Wt, 18 gr.

30C 70-181 Site Son-577, 90-110 cm depth. Green chert. The nibbling shown at the top of the piece appears to be battering to make a platform rather than retouching. Water rolled. Wt. 21 gr.

30D 70-931 Site Son-585, in gravels. Reddish chert. Looks like handaxe. Wt. 79 gr.

30E 70-179 Site Son-577, 80-90 cm depth. Dark grey chert. Chipping at top and top left is recent and probably not man made. Chipping at bottom and on right edge is man made and has cortex formed over it--same cortex over entire piece except areas at top and top left. Wt. 18 gr.

30F 70-280 Near Son-584. Same location as Fig. 30A. Also same material but with white banding. Another handaxe. Wt. 80 gr.

30G 70-188 Son-577, 110-120 cm depth. Green chert. A flake stuck from top and then trimmed with most of outside cortex left. Wt. 38 gr.

*Specimens shown in Fig. 27g, h, and i are clearly from material quarried at nearby Son-554.

WARM SPRINGS PROJECTILE POINTS
NORTH SECTION - WESTERN GROUP

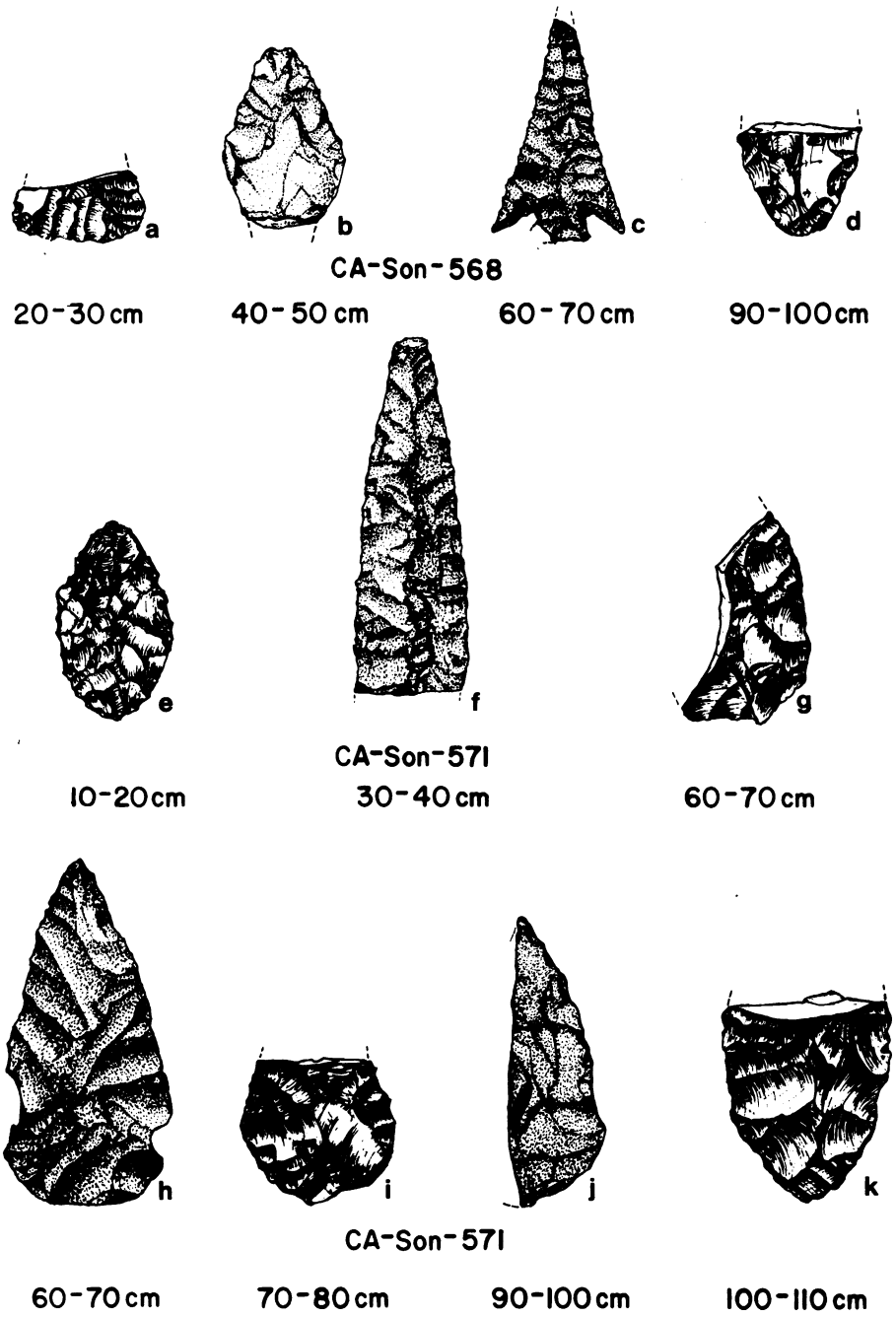


Figure 22. (Actual Size).

WARM SPRINGS PROJECTILE POINTS
NORTH SECTION - WESTERN GROUP

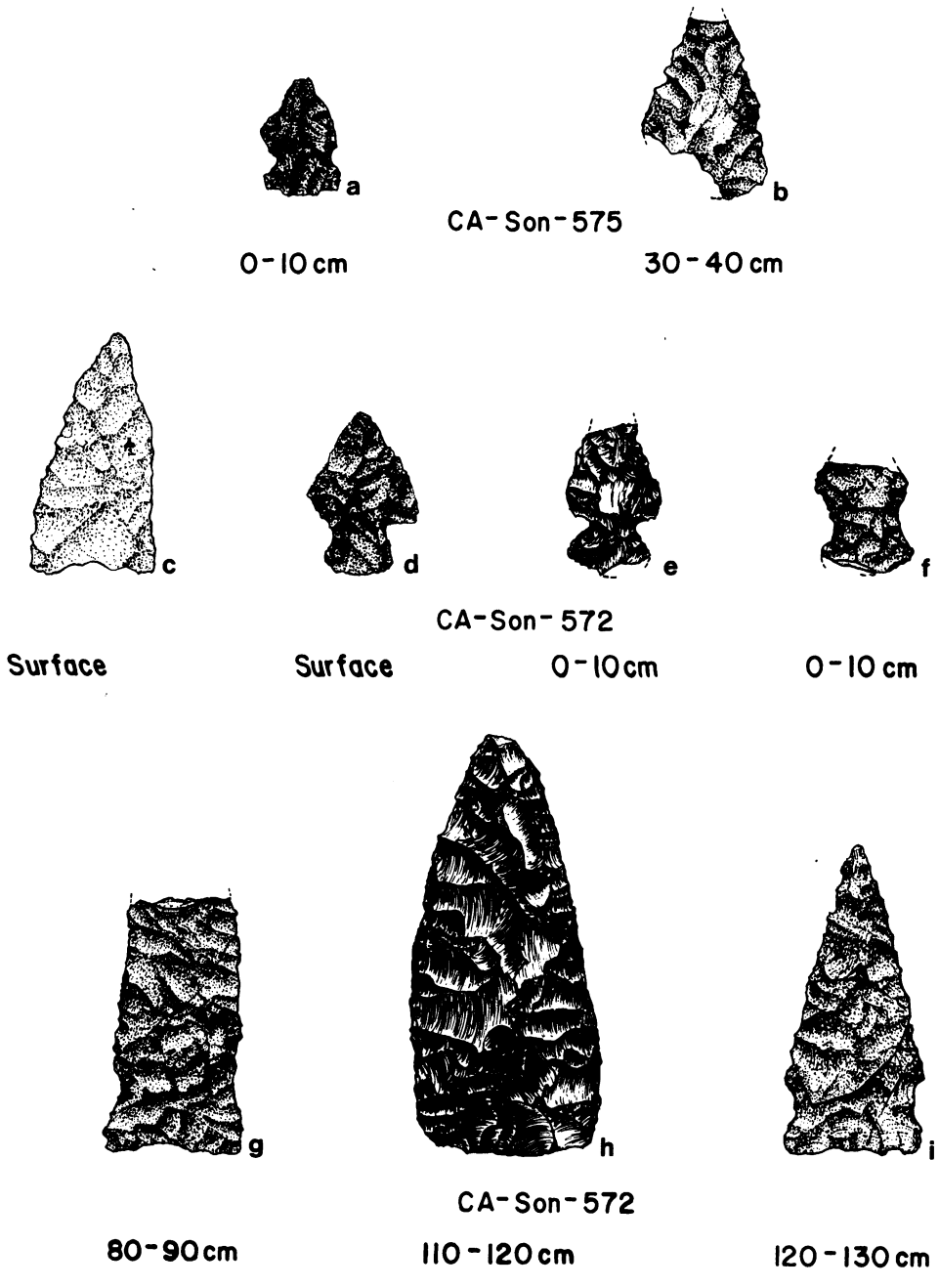
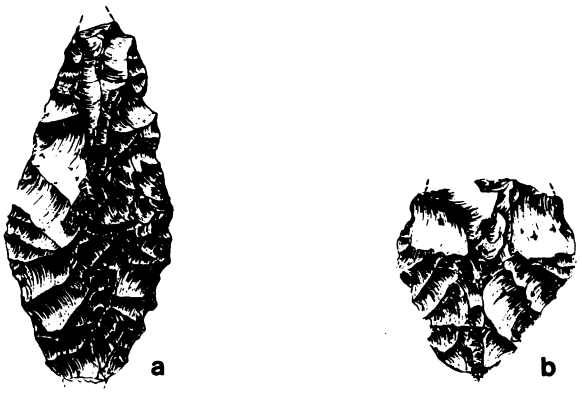


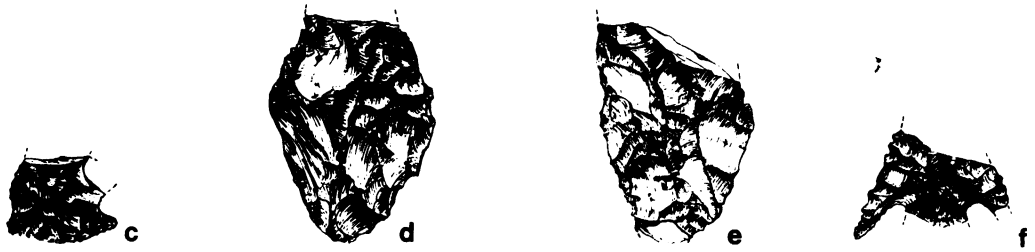
Figure 23. (Actual Size).

WARM SPRINGS PROJECTILE POINTS
NORTH SECTION - EASTERN AND CHERRY CREEK GROUPS



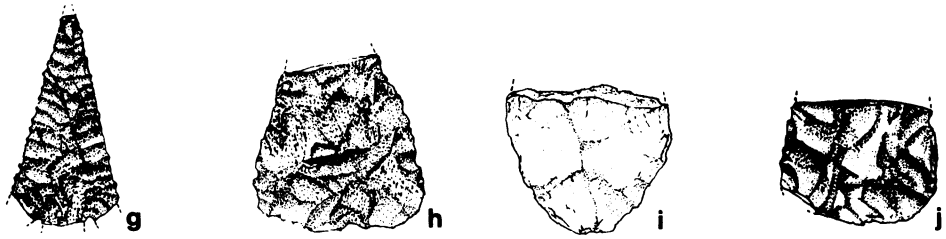
CA-Son-582

20-30 cm 50-60 cm



CA-Son-593

0-10 cm Surface 30-40 cm 50-60 cm

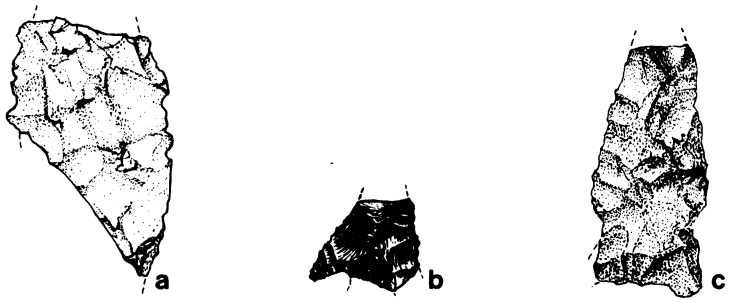


CA-Son-592 CA-Son-597 CA-Son-597 CA-Son-601

Surface 30-40 cm 40-50 cm 20-30 cm

Figure 24. (Actual Size).

WARM SPRINGS PROJECTILE POINTS
NORTH SECTION - YORTY CREEK GROUP

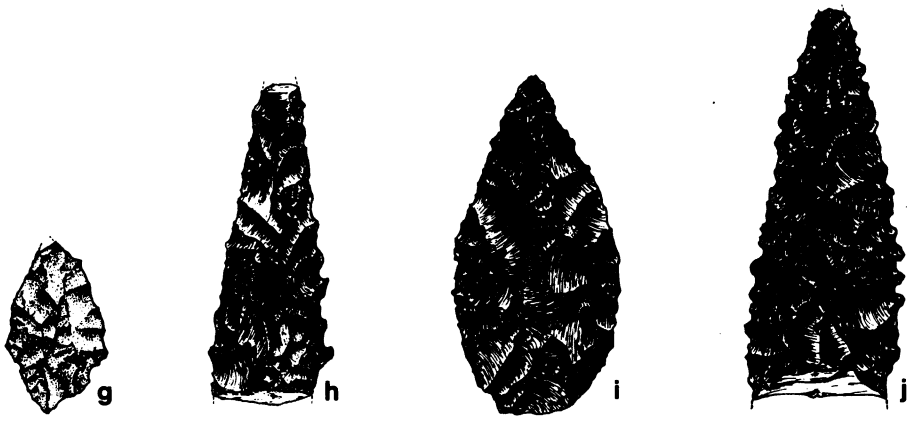


CA-Son-583

0-10 cm | 10-20 cm

CA-Son-584

20-30 cm | 30-40 cm | 0-30 cm



CA-Son-576

10-20 cm | 60-70 cm | 70-80 cm | 100-110 cm

Figure 25. (Actual Size).

WARM SPRINGS PROJECTILE POINTS
SOUTH SECTION-CENTRAL AND LOWER WARM SPRINGS GROUPS

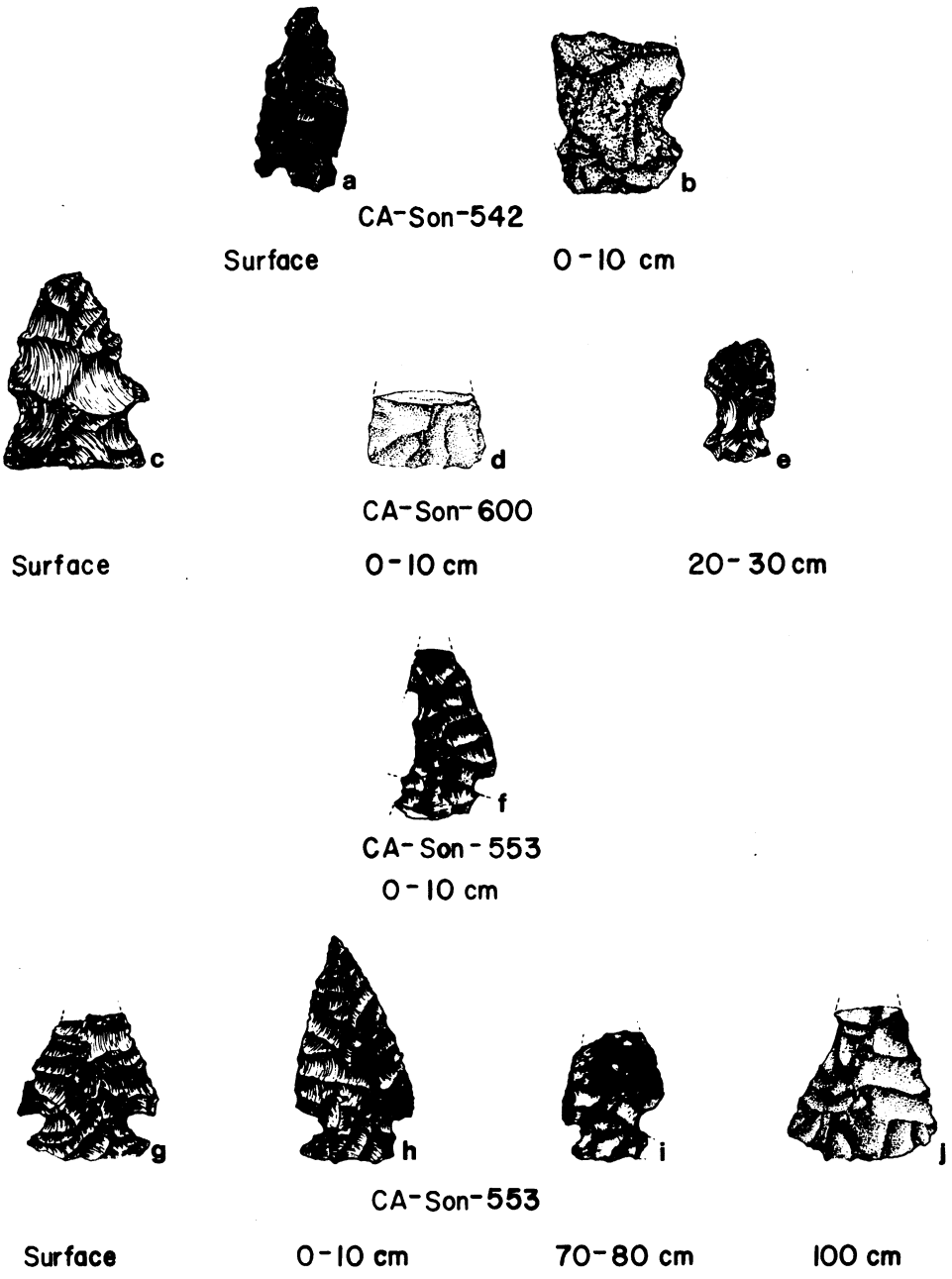


Figure 26. (Actual Size).

WARM SPRINGS PROJECTILE POINTS
SOUTH SECTION - LOWER WARM SPRINGS GROUP

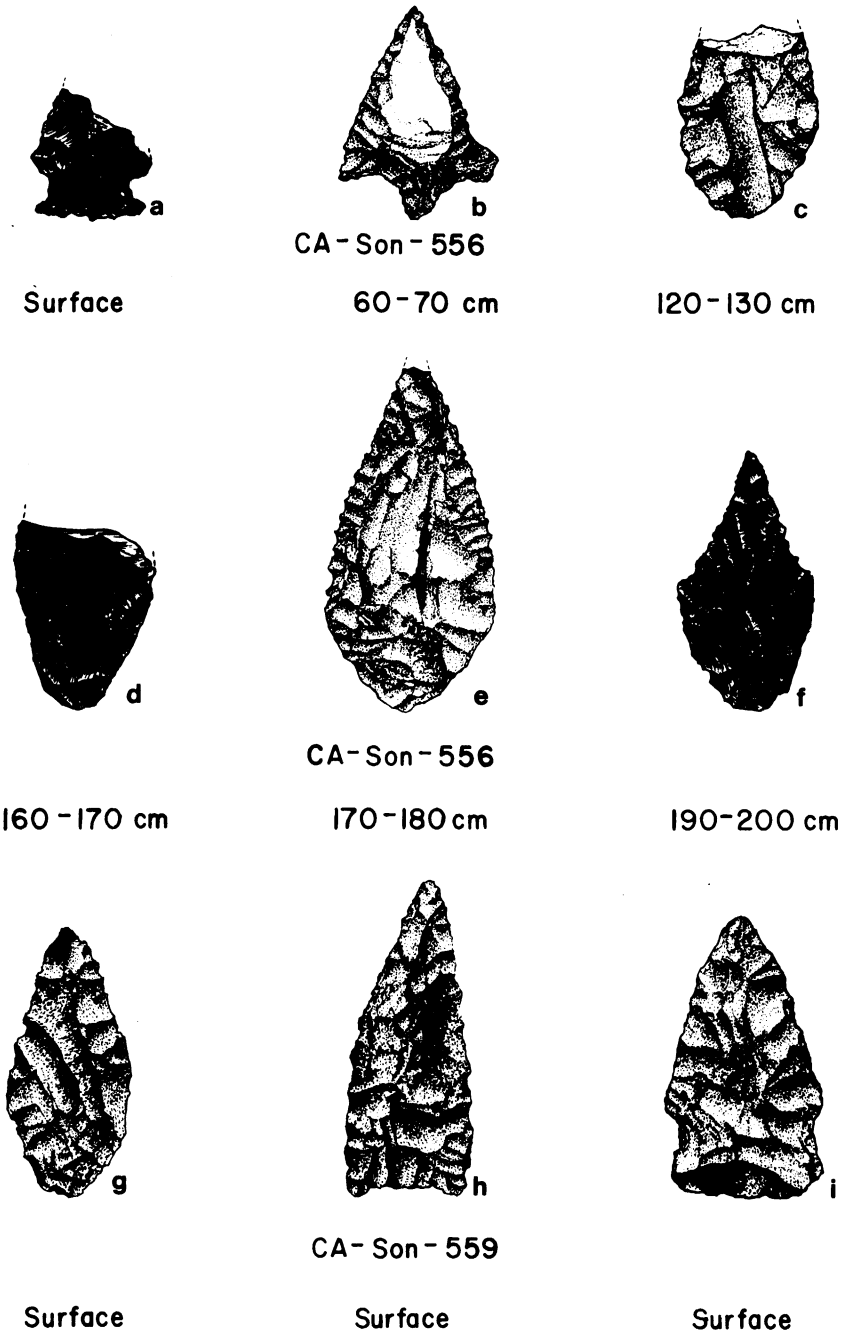
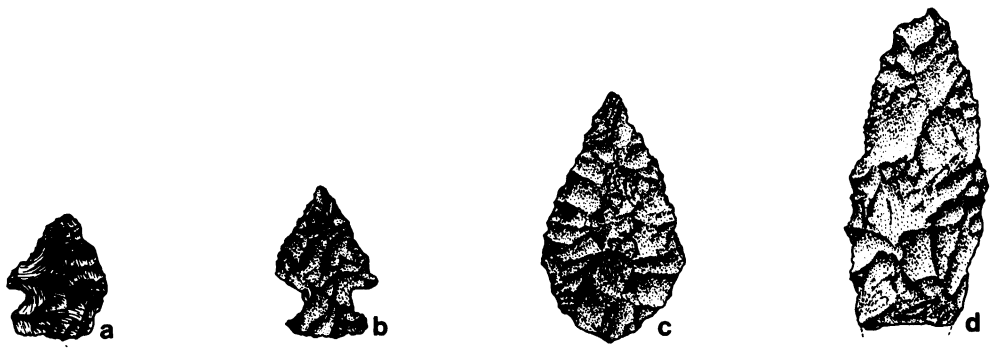


Figure 27. (Actual Size).

WARM SPRINGS PROJECTILE POINTS
SOUTH SECTION - UPPER WARM SPRINGS GROUP



CA-Son-544

Surface | 40-50cm | 50-60cm | 60-70 cm

CA-Son-547

0-10 cm | 10-20 cm | 20-30 cm

CA-Son-547

20-30 cm | 30-40 cm | 40-50 cm | 50-60 cm

Figure 28. (Actual Size).

WARM SPRINGS PROJECTILE POINTS
SOUTH SECTION - UPPER WARM SPRINGS GROUP

CA-Son-545

0-10 cm

CA-Son-550

0-10 cm | 10-20 cm | 10-20 cm | 20cm-Bedrock

CA-Son-551

Surface | 40-50 cm

Figure 29. (Actual Size).

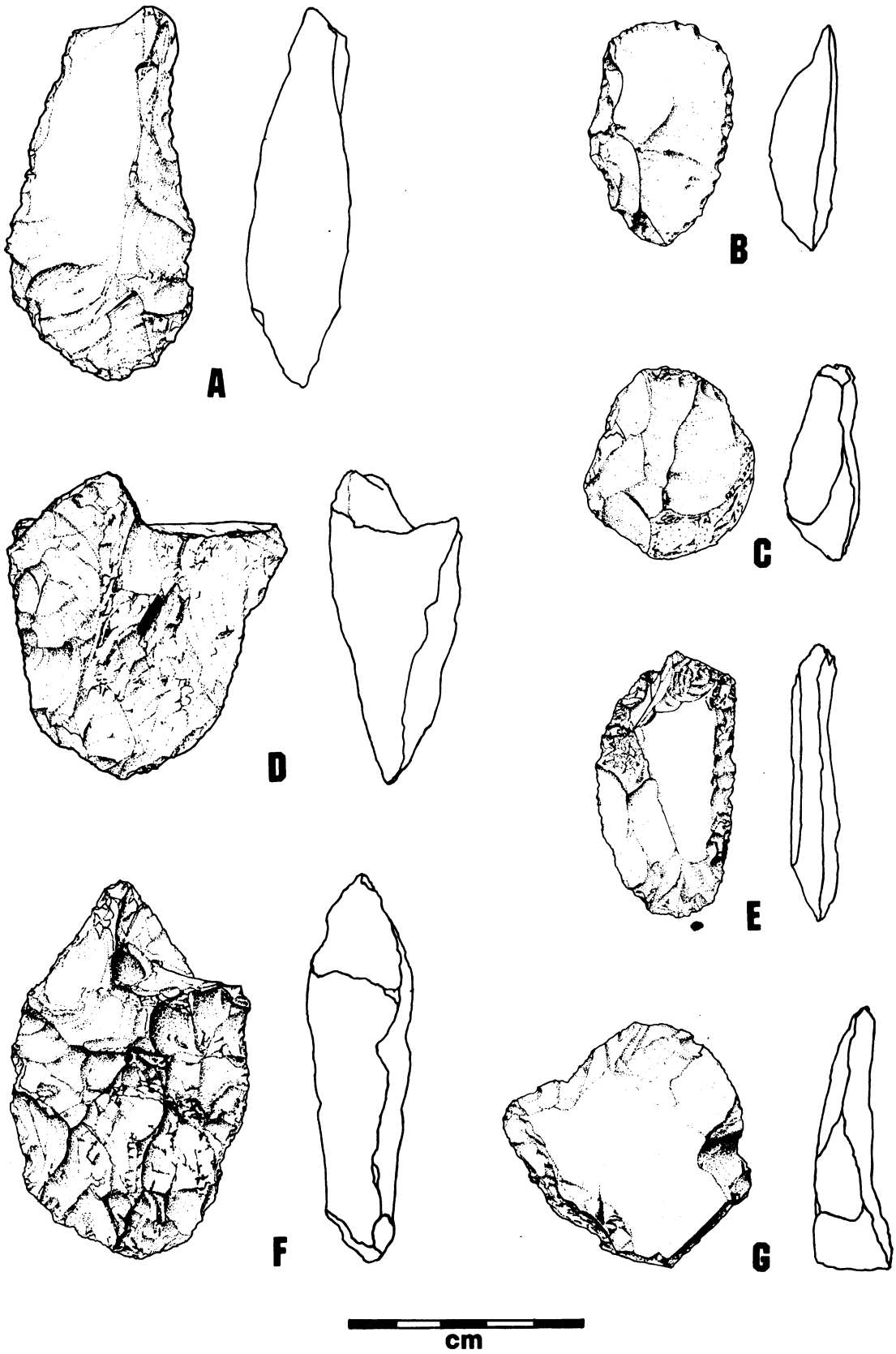


Figure 30. Artifacts from Yorty Creek gravels.