REASSESSING ARCHAEOLOGICAL SITE DENSITY AT SAN CLEMENTE ISLAND

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ABSTRACT

Knowledge of the distributions of small and low density archaeological sites is essential to an understanding of prehistoric settlement patterns. A resurvey of selected portions of earlier archaeological site survey coverages at San Clemente Island has demonstrated a significantly higher density of these categories of sites than previously understood. This finding has influenced both the design of future research and the management of cultural resources at the island.

INTRODUCTION

A recent paper by Michael Glassow (1985) on "The Significance of Small Sites in California Archaeology" suggested that those data most relevant to the study of settlement systems should be the distributions and abundances of the full range of site types. There has been a prevalent tendency in California archaeology to systematically neglect sites on the smaller end of the size range, or to assess them as having no appreciable significance. That some public agencies are occasionally advised by archaeologists, or assume on their own, that small (and/or surface and disturbed) sites are of limited value to the study of prehistory would seem to confirm this observation (see Talmage et al. 1977). As a result, these types of cultural resources frequently have been ignored in the development of local and regional research designs (Talmage et al. 1977:1). Institutional recognition of this problem is reflected in the State of California Office of Historic Preservation's (1986) recent efforts to develop regional definitions and research goals for dealing with sparse lithic scatters.

The investigation of small sites is particularly necessary in settlement pattern studies, where the configuration of the full range of archaeological data must be sampled in order to obtain a viable base to make inferences relevant to prehistoric demographic patterns, prehistoric procurement activities and general adaptive strategies (Talmage et al. 1977:1). Glassow (1985:1) believes that the continuation of any trend to ignore such sites will lead to an increasingly skewed sample and a

biased understanding of aboriginal California settlement systems. Of equal significance to management and research is how much such a tendency is reflected in earlier surveys. Rationales for many research designs and cultural resource management decisions are often based on data from surveys dating back 25 years or more. The reassessment of the adequacy of these older data bases can be an important step in assuring both the accuracy of research assumptions and the objectivity of management recommendations. In this paper, I report on results from a recent resurvey of portions of San Clemente Island as examples of the importance of evaluating earlier survey data, especially as this relates to understanding the character and distribution of smaller sites in attempting to define settlement systems.

SAN CLEMENTE ISLAND

San Clemente Island is the southernmost of the eight California Channel Islands. It is located approximately 92 km from the nearest point on the mainland (Palos Verdes), and 32 km from Santa Catalina Island. The island has a length of 34 km with its axis trending northwest to southeast. It varies in width from 2.5 km to 6.5 km and comprises about 148 square km. The island's geology consists of a sequence of Miocene basaltic andesite and dacite flows and volcanic breccia with localized lenses of shallow-water marine sediments (Merifield et al. 1971; Olmsted 1958). These rocks are folded into a northwest-trending anticline which dips gradually to the southwest. The southwestern slope of the island is characterized by a singular development of ascending wave-cut terraces and associated beach deposits resulting from tectonic uplift and fluctuating sea level during the Pleistocene.

The geography of the island can be divided into six topographic or geomorphic zones (Yatsko 1987). These include: the Coastal Terrace, the first emergent marine terrace along the westerly coast of the island; the Upland Marine Terraces, sequences of up to 19 wave-cut terraces ascending to elevations of up to 500 m along the gradually-sloping western side of the island; the Sand Dunes, active or recently active calcareous dune deposits at the northern and southern extremes of the island; the Plateau, a rolling, peripherally-dissected upland ascending gradually to a maximum elevation of 599 m; the Eastern Escarpment, a precipitous, dissected fault scarp associated with the offshore San Clemente Fault; and, the Major Canyons, a series of deeply-incised drainages along the southwesterly slope of the island.

The island's vegetation is largely introduced annual grasses and indigenous cactus on the uplands and Coastal Sage Scrub on the lower elevations. Historically, however, the native perennial bunch grasses coexisted over the upper parts of the island with numerous trees and woody shrubs, many

endemic to the San Clemente or the Channel Islands. The mid-19th-century introduction of sheep, goats and cattle, and in this century feral pigs, significantly altered this island ecology.

San Clemente Island is presently a Naval Reservation administered by the Naval Air Station, North Island, San Diego, as an auxiliary landing field, research and development test facility, training area, and gunnery and bombing range. The island has been Federal land since statehood in 1850. Before the Navy acquired it in 1934, San Clemente Island was used extensively for sheep and cattle ranching under a series of leases from the Department of Commerce. During this time, the island also experienced other historic activities associated with the sea otter trade, seal hunting, the Chinese abalone industry and smuggling (Hatheway and Greenwood 1981).

Recent archaeological and chronometric data have shown that San Clemente Island had aboriginal occupation by fully maritime-adapted groups as early as 9,700 years ago (Meighan 1986; Salls 1988). The Island Gabrielino who occupied the island at contact had departed or died out by 1820, leaving little ethnographic record (Bean and Smith 1978; Johnson 1988; Kroeber 1925). They did, however, leave a rich archaeological legacy.

In the late 19th and early 20th centuries, San Clemente Island experienced intermittent periods of archaeological activity. The early history of these investigations is largely one of uncontrolled, poorly-provenienced relic collecting (e.g., Flynn 1942; Glidden n.d.; Holder 1910; Murbarger 1947; Murphy n.d.; Schumacher 1878; Trask 1897; see also Reichlen and Heizer 1963; Zahniser 1981). A 1939 survey and excavation of Big Dog Cave by Arthur Woodward (1939, 1941, 1942) for the Los Angeles County Museum of Natural History began an ongoing series of increasingly systematic and research-oriented archaeological investigations. These have included efforts by Spencer Rogers of San Diego State College in 1950 (Noah 1987); Gaylen Sayler (1959) for the San Diego Museum of Man in 1954-55; Marshall McKusick and Claude Warren (1959) for the UCLA Archaeological Survey in 1958; and Bruce Bryan (1962, 1963), Gordon Redfelt (1964) and Charles Rozaire (1962) for the Southwest Museum between 1962 and 1964; Michael Axford (1975, 1976, 1977, 1978, 1984) with San Diego Mesa College field schools between 1975 and 1980; Jack Zahniser (1981) for Chambers Consultants and Planners (under Navy contract) in 1980; and Clement Meighan (1984a, 1984b, 1986) and Douglas Armstrong (1985) with UCLA Archaeological Survey field schools from 1983 through 1987 (see also Foley 1987; Rechtman 1985; Salls 1988; Titus 1987). Most recently, in 1987 Mark Raab of the North-ridge Center for Public Archaeology began a five-year cooper-ative small-sites research program at the island (Raab and Yatsko 1987).

Some of these efforts were largely site surveys (i.e., Axford 1976, 1977, 1978, 1984; McKusick and Warren 1959; Zahniser 1981), which among them produced 1750 site records. These various surveys were applied with different strategies and intensities, and, correspondingly, have differing results. McKusick and Warren's (1959) fairly cursory, "representative" survey and excavation sampling over the northern and western peripheries of the island (see Figure 1) in September of 1958 produced the earliest documented estimate for the density of cultural resources at the island. On the basis of the 120 sites recorded, approximately 350 sites were estimated to exist within a total island area of 66 (sic!) square miles, or about 5.3 per square mile (equivalent to 2 per square km) (McKusick and Warren 1959:111-112). Twenty years later, Axford (1984:2-3) documented a recovery of some 1900 site loci (recorded as 1634 sites) from a "complete" coverage of the northern 60% of the island (see Figure 1), implying an overall island total of about 3200 sites, or 21.6 per square km.

DATA VERIFICATION RESURVEY

Over the last two years I have been conducting a resurvey of portions of San Clemente Island covered by these earlier surveys to verify the adequacy of the record data. The need for a "data verification" resurvey was in response both to cursorily observed discrepancies within the coverages of earlier surveys, and to inquiries from reviewing agencies (e.g., the California State Historic Preservation Office) regarding the reliability of existing survey information for the island. Beginning in January 1986, resurvey has been conducted within those areas of the island covered by Mesa College between 1975 and 1980 (Axford 1976, 1977, 1978, 1984) and by Chambers Consultants and Planners in 1980 (Zahniser 1981). These were chosen because between them they account for better than 95% of the available site records, and cover the whole range of the island's topographic and ecological environments. Their reports also contain some documentation of field methodology for comparison.

Assessment of the completeness of the existing record data has been accomplished through the use of what can best be referred to as a "methodologically unlovely" (Schiffer et al. 1978:2 (citing Aikens)) stratified sampling strategy. To the extent possible, the resurvey has evaluated these previous coverages by sampling from the different field seasons and from coverages in different topographic or ecological environments. For the Mesa College survey coverage, this involved selecting areas covered during different field seasons over their nearly five years of work, as these are distributed through the three dominant, habitable topographic/geomorphic zones at the island (e.g., the Coastal Terrace, Plateau and Upland Marine Terraces). The choice of specific resurvey units was arbitrary, but related in part to other ongoing management

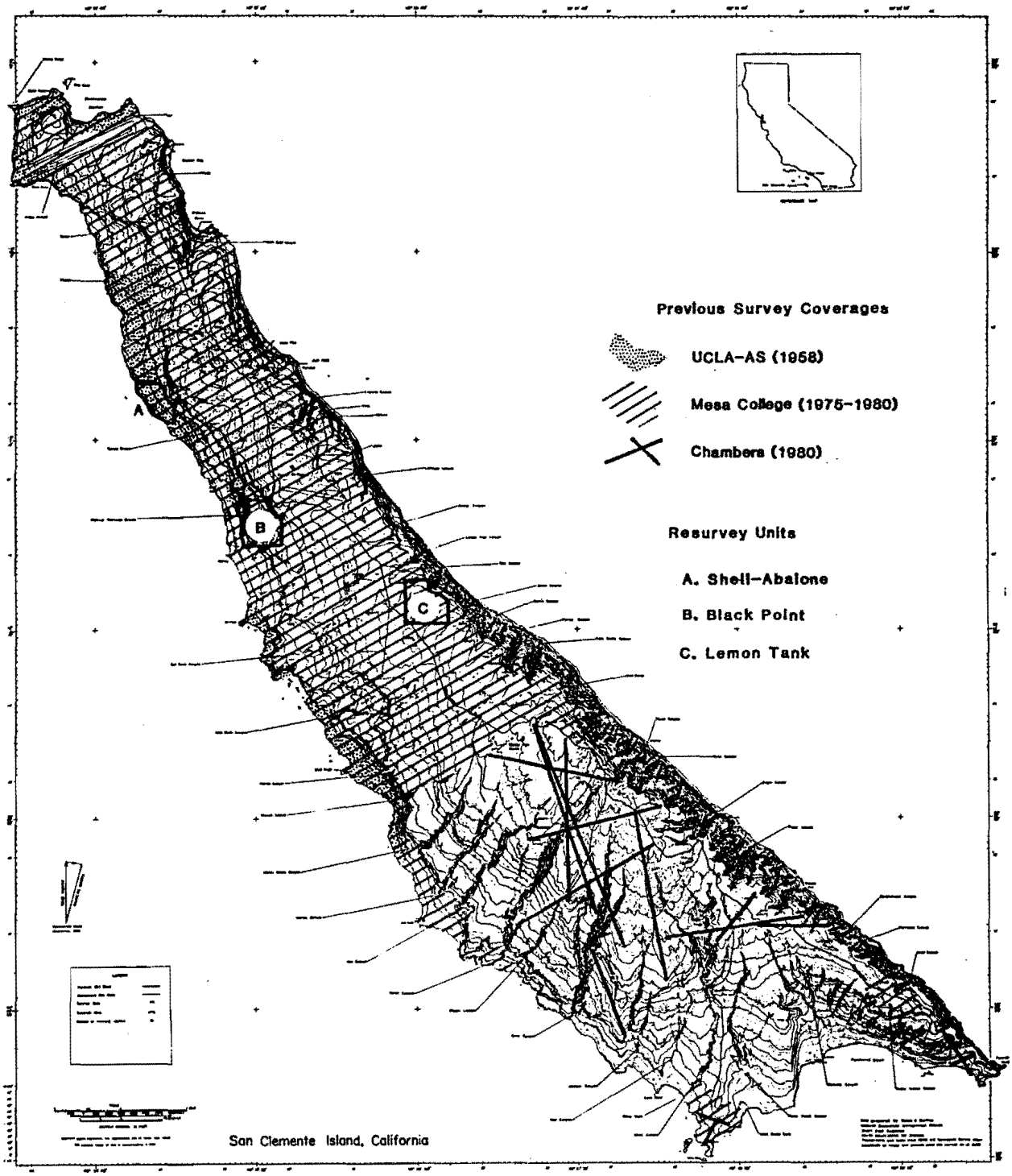

FIGURE 1. Previous archaeological survey coverages at San Clemente Island, and data verification resurvey units.

and research needs, and the concomitance of the unit's geography with a single topographic sheet. For the Chambers' coverage, it being a "probabilistic" sampling by 23 random transects (see Figure 1), an arbitrary sample of 5 of these transects was resurveyed. In all instances, resurvey was done through a systematic pedestrian inspection of the ground surface at regular (10-15 m) intervals by volunteer survey crews. Resurvey coverage areas are shown on Figure 1.

Results of this resurvey have confirmed the presence of a significant error in the representativeness of the earlier site record data. Not only were numerous sites not found by the earlier surveys, but many recorded sites were mislocated or unrelocatable. Further, and perhaps expectedly, most of the sites not previously recorded come under categories of "small" or "low density" (after Schiffer et al. 1978:2). These findings have substantially changed earlier perceptions of the categories and relative numbers of "types" of sites at San Clemente Island (see Axford 1984:Summary of Sites). A complete report of the data verification resurveys is in preparation.

For this paper, results from three of the resurvey sampling units are described to demonstrate how this reassessment of site densities is contributing to the design of future research and concerns for the management of cultural resources at San Clemente Island. The subject sample units, as drawn from the Mesa College survey coverage, are referred to as "Shell-Abalone", "Lemon Tank" and "Black Point", respectively (see Figure 1). The boundaries of these units were defined by the quadrates within the one-kilometer UTM grid, as these correspond to the margins of each sampled topographic zone.

Shell-Abalone Resurvey Unit

The Shell-Abalone unit was drawn from within the coverage area of Mesa College's 1975-76 field season, and is in the Coastal Terrace topographic zone. This stretch of the Coastal Terrace, with elevations below 30 m, is approximately 1/2 km in width, typical in its flat, slightly undulating topography, and featureless except for a scattering of bedrock "stacks". The fine-grained, clayey soils are thin to non-existent, and the vegetation is archetypical of the Coastal Sage Scrub ecology that dominates this zone. The area of the Shell-Abalone unit is approximately 40 hectares.

The Mesa College survey (and McKusick and Warren) had recorded 50 sites in Shell-Abalone, or approximately 125 sites per square km (see Figure 2). These sites are comprised mainly of small, shallow, carbonaceous shelly midden deposits, some with housepits, which range in maximum diameter from 4 m to 20 m. The resurvey was able to relocate all but one of these, although the high density of sites and ambiguities in the records made this process difficult.

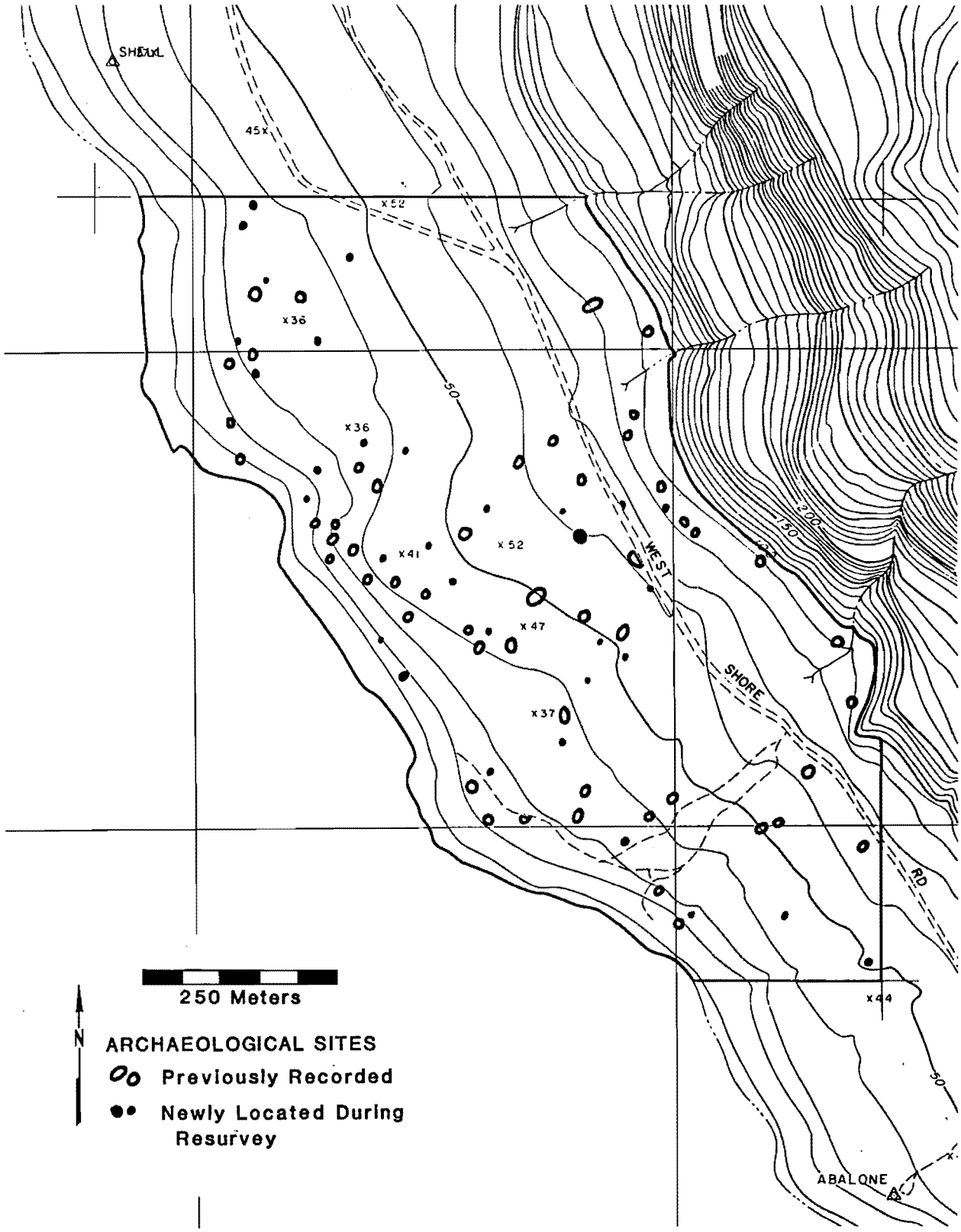

FIGURE 2. Archaeological site density in the Shell-Abalone Resurvey Unit.

The resurvey of Shell-Abalone recovered 32 new site locations, for a total of 82, or a density of over 200 sites per square km (see Figure 2). While 13 of these newly recovered sites were comparable to types previously recorded, the remaining 19 constitute a type overlooked or misinterpreted by the earlier survey. These consist of highly weathered, deflated and buried ("embedded") marine shell deposits with associated lithics, often only partially exposed in small erosional features.

Lemon Tank Resurvey Unit

The Lemon Tank unit was drawn within the coverage area of Mesa College's 1978-79 field season. This area of the Plateau topographic zone is located at its eastern periphery, between 350 m and 410 m elevation along its boundary with the Eastern Escarpment topographic zone. Geomorphically an ancient, eroded marine terrace, the rolling, marginally-dissected topography and its mixed annual-perennial grassland ecology are typical for the Plateau. Prehistorically, however, the area was probably characterized by a mosaic of perennial grasslands and shrub thickets, with oaks groves along the eastern periphery. The fine-grained, expansive clayey soils are variably deep to thin, deriving largely from an underlying, interbedded deposit of marine sandstones. The volcanic bedrock outcrops on most high points. The area of resurvey coverage here was approximately 80 ha.

Mesa College recorded five sites within the area of the Lemon Tank unit, a density of 6.25 sites per square km (see Figure 3). Three of these are large, well developed midden sites, with task loci, abundant groundstone, house depressions, and depths of up to a meter. As originally recorded, sizes ranged from 30 m to 70 m in diameter. The two remaining sites were smaller, one a lithic scatter, the other a shallow, localized midden about 10 m across. The resurvey readily relocated all of these but found that is some cases the records did not describe the full extent of the deposit. In one case, a recorded site (CA-SCll-1532) was increased in area from 800 to 6000 square m, while another (CA-SCll-1524) increased from 1400 to 8400 square m.

The resurvey at Lemon Tank recorded 37 new sites, for a total of 42, or a density of 52.5 sites per square km (see Figure 3). All but three of the newly recorded sites are of the same general type: small, discrete, shallow deposits of midden soil with associated, peripheral scatters of fire-cracked rock, flaked lithics and groundstone. Only one of this type had been found by the earlier survey. Of interest in locating these deposits was the observation that, for the grassland environment in which they occur, the enriched organic nature of these sites' soils results in differential vegetation conditions on the sites in most seasons, making them easily identifiable, even at a distance.

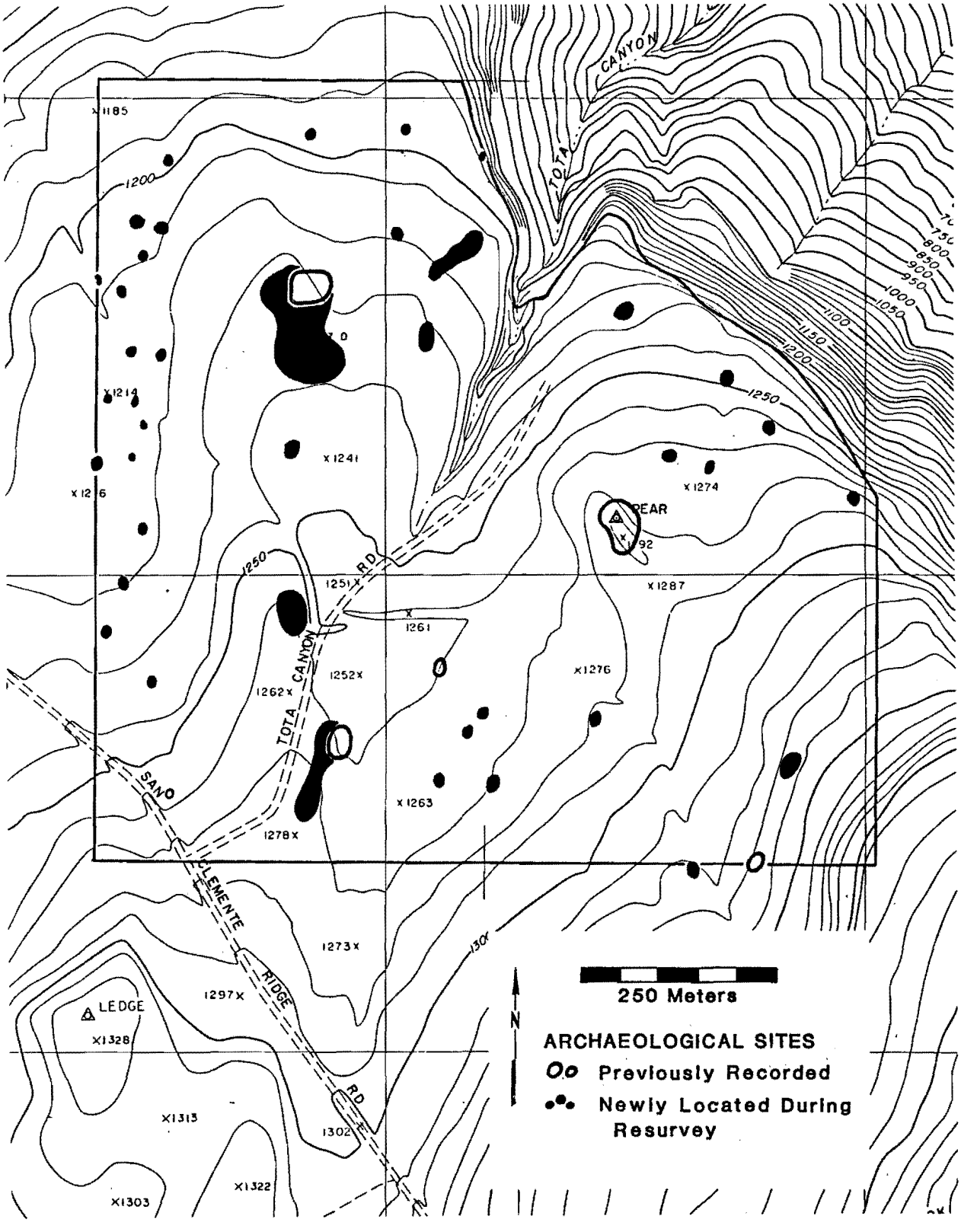

FIGURE 3. Archaeological site density in the Lemon Tank Resurvey Unit.

Black Point Resurvey Unit

The Black Point unit was drawn from contiguous coverage areas surveyed during Mesa College's Spring 1976 and Spring 1978 field seasons. It is in the Upland Marine Terrace topographic zone, the ascending sequences of emergent wave-cut terraces that characterize the western and southern slopes of San Clemente Island. This stretch of the northern, laterally-contiguous portion of the zone lies between elevations of 30 m to 270 m. It is comprised of six terraces, varying in width from 50 m to 450 m, separated by steep sea cliffs up to 50 m high. The flat to gradually-sloping terrace platforms make up approximately 50% of the area in this unit. The thin, fine-grained, clayey soils on the lower terraces are similar to those on the westerly-adjacent Coastal Terrace. However, the upper terraces here are largely covered by a stabilized sand dune. The vegetation is transitional between the Coastal Sage Scrub ecology of the Coastal Terrace and the Island Grassland of the Plateau. The area of the Black Point unit is approximately 90 hectares.

The Mesa College survey had recorded 37 sites in Black Point, or approximately 41 sites per square km (see Figure 4). Sites here are comprised mainly of shallow, shelly midden deposits, which range in maximum diameter from 4 m to 20 m. The resurvey relocated all of these. However, as with Shell-Abalone, the high density of recorded and unrecorded sites and ambiguities in the records complicated this process.

The resurvey of Black Point discovered 39 new site locations, for a total of 76, or a density of about 84 sites per square km (see Figure 4). However, when considered only for the area of the terrace platforms, those portions of the unit most readily accessible to occupation, the density is nearly 170 per square km. Of these newly recovered sites, 10 were comparable to the class of highly-weathered, deflated and embedded marine shell deposits and flaked lithics noted for the Shell-Abalone unit.

DISCUSSION

The most readily apparent observation to be made from these results is that the earlier, ostensibly "complete", surveys had a consistently high error in the locating of cultural loci for the areas sampled by the resurvey. This ranged from the discovery of around 60% of the identifiable sites in the Shell-Abalone unit, downward to only 12% in the Lemon Tank area. Without more detailed information on survey strategy and implementation, it is difficult to identify specific causes for this error. However, implications in the record data suggest limitations in fieldworkers' experience, inadequate supervision, little or no review of record forms, poor continuity between field seasons, poorly defined methodology and insufficient analysis of and adjustment to

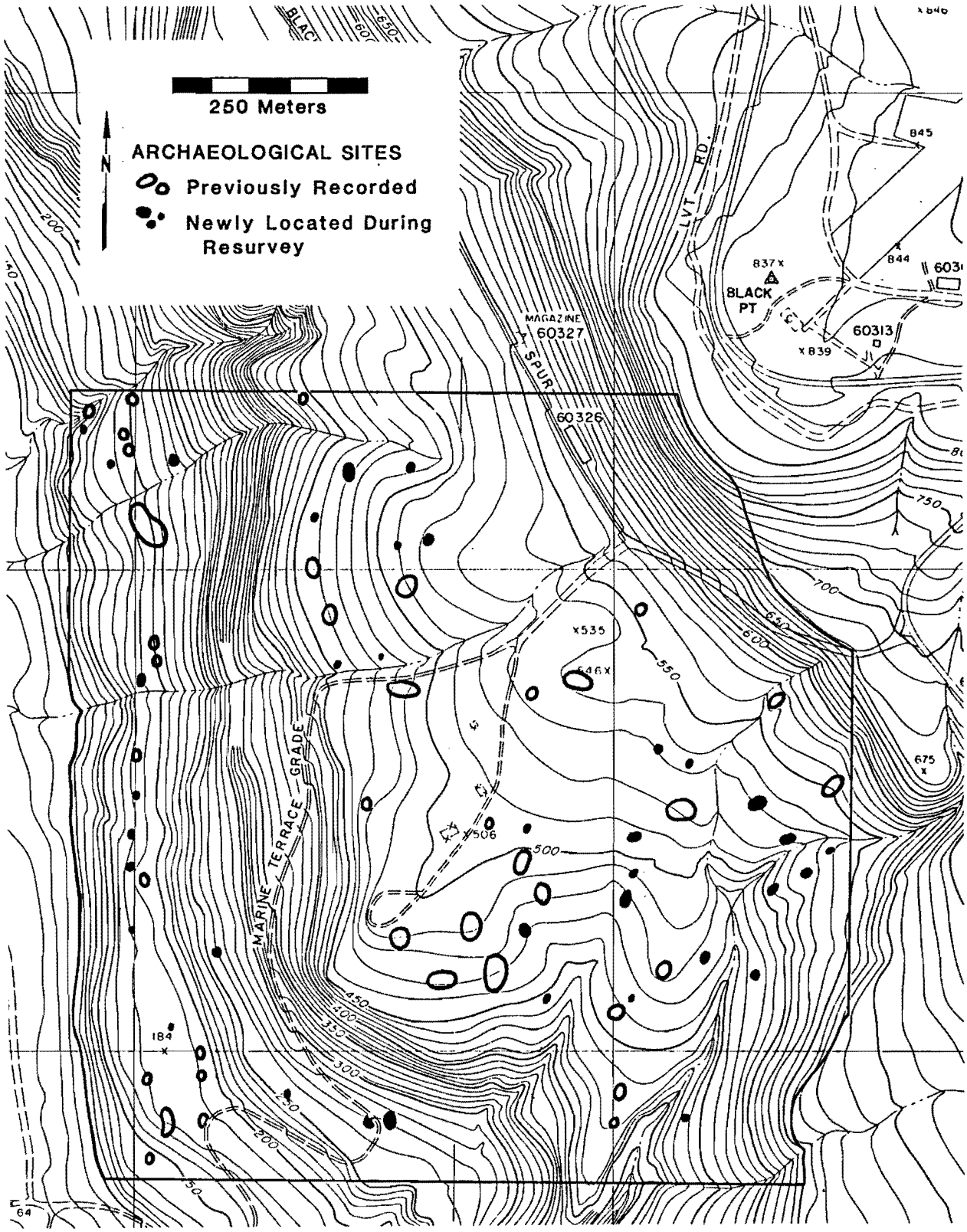

FIGURE 4. Archaeological site density in the Black Point Resurvey Unit.

changes in assumptions for the original research design.

The resurvey also revealed much higher zonal and island-wide site densities. However, because the sample was not statistically representative of the island's topographic diversity, estimates of overall numbers of sites cannot be accurately generated. Cursory investigations at other locations within these topographic zones do indicate that the observed densities are most likely not localized anomalies, but rather indicative of general patterns in site distributions. A clear preliminary understanding has developed that the characteristic site type at San Clemente Island is the small, shallow, discrete "occupation mound" described.

Although not yet confirmed by excavation (scheduled for 1988-90), in situation and character these smaller sites are analogous to two sites (CA-SClI-1492 and CA-SClI-1487) excavated on the central Plateau by the 1986 UCLA field school. One of these (CA-SClI-1487) has been interpreted by Meighan (1986:7-12) as probably representing an individual household occupation of temporally-limited, seasonally-recurring, duration. Timothy Earle (personal communication 1988) has advanced a similar interpretation, seeing these numerous small sites as representative of a family-level foraging economy (see Johnson and Earle 1987:27-61). This interpretation of seasonal nomadic use and abandonment, while yet to be validated by additional archaeological evidence, is plausible and provides a possible explanation for the San Clemente Island paradox of a very high density of archaeological sites in the absence of any other clear indications of a great population size (Meighan 1986:10-11). Because this type of site may contain the most important information for understanding the island's prehistoric settlements systems, its continued investigation has been made a priority.

Information presently unavailable regarding these sites is chronological data. The few dozen C-14 dates for San Clemente Island derive from an even smaller number of large, stratified contexts. Because these dates indicate a possibly continuous occupation of the island from as early as 9,700 B.P., the numerous small sites should exhibit an inter-site stratigraphy. Germane to this consideration are the "carbonaceous", "deflated" and "embedded" deposits observed in the Coastal Terrace and Upland Marine Terrace zones. Provisionally, these differences represent a temporal distribution among the sites in these zones. In comparing all sites, this display of differential physical characteristics of weathering, midden constituents and erosion allow them to be stratified into a relative chronology. Such an interpretation may be essential to understanding their functional and demographic relationships.

As a result of the above findings, the direction of NAS North Island-sponsored research at San Clemente Island has changed. A 10%, stratified, random sample of all accessible areas of the island is presently being conducted under contract. This survey is designed to complete the evaluation of the existing data, to sample previously unsurveyed areas, and to demonstrate actual island-wide site densities. This survey should also provide for the development of a representative site typology for the island, which will be used to stratify a planned excavation sampling of the island's small sites. NAS North Island has signed a 5-year cooperative research agreement with the Northridge Center for Public Archaeology at C. S. U., Northridge, for the specific purpose of conducting this research (see Raab and Yatsko 1987).

In the area of cultural resource management, an accurate knowledge of site density and distribution is essential in planning and directing military use at San Clemente Island. The identification of significantly higher zonal site densities than previously understood has changed perceptions of archaeological sensitivity for each of these zones. Ongoing management at San Clemente will progressively focus on determining the significance of these smaller cultural resources and integrate such determinations into planning for operational and training needs. Currently, NAS North Island has a contracted survey underway to inventory the cultural resources within certain prescribed high-use areas over the northern half of San Clemente Island. Management seeks to designate these areas as training and development zones for consolidating and concentrating presently more dispersed activities. The goal is to develop a programmatic cultural resource mitigation strategy for identified National Register-eligible sites within these areas.

CONCLUSIONS

In this paper I have reviewed the results of a recent data verification resurvey of portions of San Clemente Island as an example of reassessing the adequacy of earlier surveys within the consideration of how well they represent small sites in the archaeological environment. Overlooking or avoiding this class of cultural resource at San Clemente Island would clearly distort our understanding of prehistoric demography, procurement strategies and maritime adaptation. Of equal importance here, I think, is the question of evaluating the adequacy of existing survey data. While not every cultural resource management program has the luxury of time and resources to do so, it seems to me that it is very important to occasionally assess the adequacy of existing site record data. Decisions regarding planned development, use, and research goals may often be based on survey data whose validity are unconfirmed. As managers, and researchers, we must be fair to the resource by ensuring that our choices are valid.

ACKNOWLEDGMENTS

While in the past I have mourned the drift away from the volunteer ethic in archaeology with the growth of contract archaeology, the resurvey effort described in this paper was conducted entirely with volunteer, weekend labor. There is promise and reassurance in the knowledge that voluntarism in field work has not become a quaint artifact of the discipline's past, but is alive and well. I wish to heartily and humbly thank a fine group of dedicated archaeologists and friends: Roy Salls, Anna Noah, Carol Goldberg, Shelly Madden, Jo-Michelle Boyer, Paul Farnsworth, Larry Leach, Bob Rechtman, Janet Scalise, George Gumerman, Stan and Judy Berryman, Joe Simon, Vince Lambert, James Snead, Jill Humphries, Monica Smith, Orton Knudsen, Karen McDonald, Dana Bleitz-Sanburg, George Kritzman, Marty Biskowski, Donna Redding-Gubitosa, Russ and Robin O'Daniel, Mark Raab, Virginia Howard, Kate Harper, Diane Hamann, Sinead N. Ghabhlain, Rita Sheppard, Rick Wessel, Scott Edmondson, Timothy Earle, Mark Allen, Liz DeMarrais, Michael Kolb, and Leslie Quintero and her Palomar College field class (Scott Campbell, Sandra Cassidy, Kirsten Collins, Deborah Karrer, Yurie Maree, Patricia Mitchell, Debbra Owen, Jacqulyn Pray, Jean Radakovich, Virginia Ridgway, Joan Reichert, Tim Vize, Nicky Waldo and George Woodward).

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