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Radiocarbon Dating and Interpretation on Santa Rosa Island: Final Report

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Introduction

Santa Rosa Island contains a remarkable archaeological record, spanning over 13,000 calendar years (Johnson et al. 2002; Rick et al. 2005a). Despite being the focus of archaeological research on the Channel Islands in the 1940s to 60s (e.g., Orr 1968), in recent years relatively few archaeological projects have been conducted on the island, especially compared to San Miguel and Santa Cruz islands. Erlandson et al. (1999) and Johnson et al.'s (2002) re-investigation of early sites in the Arlington Canyon area and Rick's (2007) investigation of a Late prehistoric and Historic village are some of the few publications focused on the island in the last decade. Despite this fairly limited research on Santa Rosa Island, public visitation has increased greatly in the last five years, spurred in part by a new hiking trail and campground improvements on the island's east coast.

Given the increase in public visitation to Santa Rosa and its fantastic but under-explored archaeological record, Rick initiated a survey, excavation, and radiocarbon (^{14}C) dating program in the Torrey Pine Grove, Old Ranch Canyon, and Skunk Point regions of eastern Santa Rosa Island. This archaeological research has documented the presence of hundreds of archaeological sites in this area, including sites that are adjacent to public trails and other areas. Until recently, however, relatively little was know about these sites, and very few radiocarbon dates had been obtained, leaving a substantial gap in our understanding of Native American settlement, land use, and subsistence on the Channel Islands.

The Western National Parks Association Grant supplied $6000 for radiocarbon dating archaeological sites on Santa Rosa Island, especially those located on the east coast or other areas of heavy public visitation. Twenty radiocarbon dates from 19 archaeological sites were run by the National Ocean Sciences AMS (NOSAMS) Laboratory at the Woods Hole Oceanographic Institute in Massachusetts. These dates have greatly enhanced our understanding of the antiquity of human settlement on Santa Rosa Island and are currently being used to prepare several publications.

Methods

All of the samples collected for radiocarbon dating were obtained by Rick and Southern Methodist University (SMU) Graduate Students from previously recorded archaeological sites. Dates were obtained on marine shells from 19 different

Table 1. Radiocarbon Samples from Santa Rosa Island.

Site #	Location	Sample #	Material	^{14}C Age	Calibrated Age (cal BP) 1 Sigma
SRI-116	Lobo	OS-60415	Mytilus	1440 ± 30	800-690
SRI-543	Lobo	OS-60416	Mytilus	1640 ± 25	1010-910
TP-Cave	Torrey Pine	OS-56416	Mytilus	1800 ± 30	1190-1070
SRI-7a	Orr's Camp	OS-59389	Mytilus	1900 ± 30	1280-1190
OR-35	Old Ranch	OS-60417	Mytilus	1950 ± 30	1330-1230
SRI-544	Lobo	OS-60409	Mytilus	2170 ± 30	1550-1410
SEA-1	Southeast Anchorage	OS-59387	Mytilus	2320 ± 30	1740-1600
OR-26	Old Ranch	OS-60633	Mytilus	2490 ± 35	1940-1810
SRI-82	Old Ranch	OS-54197	Mytilus	2700 ± 35	2210-2040
SRI-196	Torrey Pine	OS-54920	Mytilus	2900 ± 35	2440-2310
SRI-7b	Orr's Camp	OS-59388	Mytilus	3300 ± 30	2900-2780
SRI-91	Old Ranch	OS-60413	Mytilus	4030 ± 30	3820-3690
SRI-93	Old Ranch	OS-60634	Mytilus	4350 ± 35	4260-4100
OR-24	Old Ranch	OS-60410	Mytilus	4700 ± 30	4770-4600
SRI-89	Old Ranch	OS-56420	Chione	6050 ± 40	6290-6190
OR-28	Old Ranch	OS-60411	Saxidomus	6080 ± 45	6330-6210
SRI-84	Old Ranch	OS-56419	Ostrea	6330 ± 35	6600-6470
SRI-61	Southeast Anchorage	OS-59390	Ostrea	6580 ± 40	6890-6750
OR-29	Old Ranch	OS-56415	Chione	7350 ± 35	7650-7560
SRI-155	Skunk Point	OS-56418	Chione	7660 ± 40	7950-7840

archaeological sites. All shell samples were obtained from eroding profiles or in small probes, with all shells being found *in situ* in soils. All shells were washed in tap water and sent to NOSAMS for radiocarbon dating. NOSAMS did all of the necessary pretreatment and processing. All dates were calibrated using CALIB 5.0.1 (Stuiver and Reimer 1993) with a reservoir correction of 225 ± 35 years (Kennett et al. 1997).

Results

The 20 radiocarbon dates provide evidence of a long, continuous human occupation on eastern Santa Rosa Island, as well as a few dates from Lobo Canyon and Arlington Canyon that greatly enhance our understanding of these two regions (Table 1). Of the 20 dates, 15 are from the island's east coast. These dates demonstrate a continuous occupation spanning from 8000 to 1070 years ago. A few glass beads recovered from the area further extend this human occupation through the Historic period. Although dates in excess of 10,000 years have been documented elsewhere on the islands, this 8000 year record is very impressive and further radiocarbon dating will likely push this back in time.

Eastern Santa Rosa is also home to the Abalone Rocks Estuary, the only known estuary on the Channel Islands (Rick et al. 2005b). Today the Abalone Rocks Estuary is a freshwater marsh, but paleoecological and archaeological data demonstrate that during the Early and Middle Holocene it was open to the ocean and supported a variety of estuarine shellfish taxa (clams, etc.) generally not found elsewhere on the Channel Islands. Based on a very small number of radiocarbon dates, Rick et al. (2005b) speculated that this estuary may have supported shellfish

from 8000 to 5000 cal BP at which time it transitioned into the freshwater system of today. Three of the dates below help corroborate this chronology, with the oldest being about 8000 cal BP and no estuarine shell found later than about 6000 cal BP. These dates correspond with the stabilization of sea level in the area and the disappearance of some estuaries on the mainland coast.

In addition to the 15 dates from eastern Santa Rosa, three dates were obtained from three sites at the mouth of Lobo Canyon. Lobo Canyon contains a heavily visited public hiking trail that is near all of the dated sites. The area is known to contain human remains that are over 9000 years old and a large shell midden about 5000 years old (Rick et al. 2005a). However, very little is known about the general pattern of human settlement in the area. All three of the dated sites were Late Holocene in age, dating from about 1550 to 690 cal BP. This includes two small rockshelter sites. These dates are important because they demonstrate this canyon was also occupied throughout the Holocene, although it appears to have been used only sporadically after about 5000 cal BP.

Finally, two dates were obtained from SRI-7, a shell midden located near Arlington Canyon. Arlington Canyon was home to Phil Orr's research station, the base of his extensive archaeological research in the 1940s and 60s. He excavated at SRI-7, a site immediately behind his camp, but never ran any ^{14}C dates from this site. In fact, SRI-7 remained the only site in the Arlington vicinity that had never been dated. Our dates indicate that the site has at least two occupations, one at 2800 cal BP and another at 1200 cal BP. These dates help fill a chronological gap in the Arlington area occupation and further corroborate a continuous 13,000 year record in this area.

Conclusions

The 20 ^{14}C dates funded by the Western National Park Service provided important information on the cultural chronology of Santa Rosa Island and the broader Channel Islands National Park. Rick and his graduate students are currently using these dates in several publications that are in preparation for various journals or other venues. First, the eastern Santa Rosa Island dates are being used in a paper on human settlement in Old Ranch Canyon to be published in an edited volume. Two other papers are also being prepared on the east coast dates. The first is by John Robbins a Geological Sciences PhD student at SMU trying to track the history of the Abalone Rocks Estuary (to be submitted to the journal *Quaternary Research*) and the second is a collaborative paper with Rick and two SMU anthropology PhD students on human subsistence changes related to the appearance and decline of the estuary (to be submitted to *Environmental Archaeology*). The dates from SRI-7 are being worked into a broader paper by Rick on the history and archaeology of Orr's Camp and the Arlington area. This paper will be submitted to the *Proceedings of the Seventh California Islands Symposium* in 2008. Finally, SMU anthropology student Lauren Willis plans to use the Lobo Canyon dates in a broader dissertation project focused on the archaeology of Lobo Canyon.

In addition to these publications, the WNPA funds were also used as a match to get 16 additional radiocarbon dates from the National Park Service Challenge Cost Share program. These radiocarbon samples are all from the east coast and will be available in about two months. Together with the WNPA dates, this will pull eastern Santa Rosa out of the shadows, giving it one of the most extensive ^{14}C records on the Channel Islands. Additional dates are also being funded by Southern Methodist University.

Once these additional dates are reported, Rick will prepare a small information leaflet for public visitors to Santa Rosa Island. This leaflet will highlight the importance of the island's cultural resources, especially those that are adjacent to the campground and trail. The radiocarbon dates supplied by the WNPA will be at the forefront of this publication by highlighting the great time depth of the human occupation of this area. This leaflet should be an important resource for broadening the public understanding of the rich archaeological record of Santa Rosa and the other Channel Islands. Finally, Rick has recently submitted a National Science Foundation (NSF) proposal for continued research on the eastern coast of Santa Rosa Island. The WNPA funded dates supplied the context necessary to help make this a potentially successful proposal.

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