

**Little Archaeological Evidence of the Olympia oyster (*Ostrea lurida*) at Drakes Estero,  
Point Reyes National Seashore, California**

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Point Reyes Archaeology: Background Information

A minimum of 17 Native American archaeological shell middens<sup>1</sup> are still extant around the shoreline of Drakes Estero and Estero de Limantour. The Estero de Limantour is a branch of the same lagoonal system and considered to be a part of Drakes Estero for the purposes of this briefing statement. Many more archaeological sites are clustered along Tomales Bay, the Point Reyes headlands, and other areas of the Point Reyes peninsula.

The prehistoric archaeological sites of Point Reyes have been the subject of study since the early 20<sup>th</sup> century. The first known scientific excavation was conducted in 1940 at site CA-MRN-232 along the Estero de Limantour by the University of California, Berkeley (Moratto 1974). Additional excavations quickly followed, conducted by the University of California, the California Department of Parks and Recreation, San Francisco State College, Santa Rosa Junior College, Sonoma State University and one historical society, the Drake Navigators Guild. The history of archaeology on the Point Reyes peninsula has been summarized and referenced by Moratto (1974:50-62 and 1984:269-272) and Stewart (2008). Most recently, NPS completed a draft National Register of Historic Places district nomination (Stewart 2008) for 72 sites within Point Reyes National Seashore including the sites along Drakes Estero.

On the basis of standardized artifact typologies for the San Francisco Bay Area the sites of Drakes Estero and the Estero de Limantour appear to date from within the last 2,000 years. Two calibrated radiocarbon dates from site CA-MRN-468 on the eastern shore of Drakes Estero range from A.D. 1400 to 1650 (Meyer 2008). Obsidian hydration dates for artifacts recovered from CA-MRN-235/301 on the southwestern shore of Drakes Estero and from CA-MRN-308 along the Estero de Limantour range from approximately A.D. 719 – 1750 (Origer 2008). Ming dynasty porcelain sherds from the 1595 wreck of the *San Augustin* and also possibly from the presumed landing of Francis Drake in 1579, provide approximate indicators of contemporaneity for eight<sup>2</sup> of the extant sites along Drakes Estero and the Estero de Limantour that they have been recovered from. Basal occupation dates earlier than 2,000 years ago are thought to be possible for at least several of the Drakes Estero sites but they have not yet been reliably demonstrated. Virtually all of the Coast Miwok Indians who inhabited the Point Reyes peninsula and surrounding areas were inducted into the Spanish mission system by the early 19<sup>th</sup> century (Milliken 1995).

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<sup>1</sup> From the mouth of Drakes Estero moving clockwise around the shoreline and ending on Limantour Spit the extant shell middens are: CA-MRN-235/301, CA-MRN-258, CA-MRN-256, CA-MRN-230, CA-MRN-296, CA-MRN-305, CA-MRN-468, CA-MRN-304, CA-MRN-242, CA-MRN-663, CA-MRN-308, CA-MRN-307, CA-MRN-232, CA-MRN-389, CA-MRN-216, CA-MRN-298/298E, and CA-MRN-391.

<sup>2</sup> CA-MRN-235/301, CA-MRN-230, CA-MRN-242, CA-MRN-308, CA-MRN-307, CA-MRN-232, CA-MRN-216 and CA-MRN-298.

## The Question of *Ostrea lurida* at Drakes Estero

In *Shellfish Mariculture in Drakes Estero, Point Reyes National Seashore, California*, a report released by the National Research Council, the authors (Peterson et al., 2009:20) assert that:

“The Olympia oyster, *Ostrea lurida*, was a former constituent of Drakes Estero of some unquantifiable abundance, as evidenced by the mounds of its shells in the Coast Miwok midden near the on-land facilities of DBOC [Drakes Bay Oyster Company].”

No archaeological references or substantiating data are cited in support of this assertion about *O. lurida*, which is critical to the report’s conclusions. Furthermore, in the course of an on-site condition assessment conducted by this author on May 20, 2005 no “mounds” of any kind of shells were visible at the site (CA-MRN-296) which is a historically disturbed shell midden located atop a coastal terrace.

The site consists of a dispersed but contiguous anthrosol of unknown depth with high percentage of shellfish fragments and whole shells from several species, not necessarily including *O. lurida*, that were refuse from the site’s former inhabitants and also from the historic dumping of nonnative oyster shells by the predecessor to the DBOC, as will be shown. Finally, a large body of archaeological literature documenting the Coast Miwok shell middens of Drakes Estero was apparently overlooked by the report’s authors.

To inform and address the question of whether *O. lurida* is in fact abundant in any of the shell middens of the area a literature review is presented below. The review includes most of the primary sources available for Native American archaeological sites along Drakes Estero. The literature for sites near to but not along the Estero (e.g. CA-MRN-394 and CA-MRN-236 on the ocean coast) has not been reviewed for references to *O. lurida*. The archaeological data are summarized by date from earliest to latest.

### Archaeological Research at Drakes Estero

Beardsley (1947), in his doctoral dissertation for the University of California at Berkeley and in later publications describes the results of several major excavations he conducted on the Point Reyes peninsula. Along Drakes Estero and the Estero de Limantour he excavated sites CA-MRN-242 and CA-MRN-232, respectively. Beardsley was focused primarily on the recovery of chronologically diagnostic artifacts and the analysis of burial traits. Although he did not mention the presence of *O. lurida* at either site, seven *O. lurida* shells are recorded in the catalog records for the collection Beardsley recovered from site CA-MRN-242 (Phoebe Hearst Museum of Anthropology 2006).

Unfortunately, no information on the provenience of the shells is available with the result that we don’t know whether they and any similar specimens were found on the site’s surface, mixed throughout the midden or were taken from the basal deposits of the site. Beardsley also recorded the presence of a wooden frame shack approximately 9’ by 12’ on the southern end of the site and noted that the site had disturbed by deep furrows made for growing artichokes, that there was extensive rodent activity, and that much of the site had already been lost to erosion. These observations are important to keep in mind because they indicate a possible historic, non-Indian source for the presence of *O. lurida* at the site.

Greengo (1951:24 and 29) included CA-MRN-307 on the Estero de Limantour in his quantified, comparative analysis of molluscan samples excavated in column samples from six coastal shell middens ranging from Bodega Bay to Monterey Bay. He reported no *O. lurida* at CA-MRN-307. The primary molluscan constituents were *Saxidomus nuttalli* and *Clinocardium nuttalli*. Meighan (2002) reported the overall results of the University of California excavations that took place between 1949 and 1951 at site CA-MRN-307 and cited Greengo (1951) as the source for the shellfish analysis.

Treganza (1959), in his report to the California Department of Parks and Recreation, summarized archaeological investigations at a number of sites on the Point Reyes peninsula. With regard to Drakes Estero, Treganza reported on excavations he conducted at CA-MRN-308 on the Estero de Limantour. He reported no *O. lurida* but noted that the shell of the site represented:

“...mainly *Saxidomus*, *Schizothaerus* [now *Tressus nuttalli*], *Clinocardium*, *Macoma*, *M. edulis*, and *Polinices*.” (Treganza 1959:14).

Von der Porten (1963) in reporting the result of excavations conducted by the Drake Navigators Guild and Santa Rosa Junior College at CA-MRN-235/301 on the southwestern shore of Drakes Estero observed that the predominant molluscan species at the site were: *Clinocardium nuttalli*, *Protothaca staminea*, *Saxidomus nuttalli*, and *Polinices lewisi*. Not observed or mentioned was *O. lurida*.

Treganza and King (1968:16) in reporting the results of archaeological excavations conducted by San Francisco State College at sites CA-MRN-216 and CA-MRN-298E on Limantour Spit observed only the “Trace” presence of *O. lurida* in contrast to the presence of nine other mollusks that were present at three progressively higher levels of categorization: “Appreciable quantity,” “Common” and “Exceedingly numerous.” The “Exceedingly numerous” and “Common” species were: *Saxidomus nuttalli*, *Mytilus californianus*, *Macoma nasuta*, *Clinocardium nuttalli*, and *Tressus nuttalli*.” *O. lurida* was not present in a quantified faunal analysis of CA-MRN-216 by Henn (1970:199-203). Wilson (1970:211-221) conducted a quantified analysis of excavated molluscan remains from site CA-MRN-298E. Again, no *O. lurida* were reported. Predominant species for both CA-MRN-216 and CA-MRN-298E included but were not limited to *Saxidomus nuttalli*, *Protothaca staminea*, and *Mytilus* spp.

Riley (1976) in reporting the results of 16 archaeological site evaluations of which six<sup>3</sup> were at Drakes Estero and Estero de Limantour, reported the presence of *O. lurida* only at one of the six sites, CA-MRN-242, along the eastern shore of the Estero and only after reporting the presence of five other shellfish species.

“Midden constituents visible on the surface include obsidian, chert, and fire-cracked rock; valves from *Saxidomus nuttalli*, *Tresus nuttalli*, *Clinocardium nuttalli*, *Protothaca staminea*, *Mytilus californianus*, *Ostrea lurida*, and *Polinices lewisi*; mammal bone and fish bone.” (Riley 1976:18-19)

Riley also recorded the remains of the wooden shack at CA-MRN-242 that was first observed by Beardsley (1947).

With regard to the archaeological site, CA-MRN-296, in the vicinity of what is now DBOC, Riley made the following statements (italics added for emphasis).

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<sup>3</sup> CA-MRN-230, CA-MRN-232, CA-MRN-242, CA-MRN-258, CA-MRN-296 and CA-MRN-304.

“At Mrn-296 the midden consists of a very thick deposit of oyster shells with occasional valves of *Tresus nuttalli*, *Saxidomus nuttalli*, and *Clinocardium nuttalli*...”

“As is apparent from the above discussion [not quoted here], Mrn-296 has suffered from extensive cultural modifications. These include fencing, grazing, impoundment of stock, grading, gardening, and the dumping of shells from the oyster farm. One of the oystermen met during the field inspection indicated that shells from the oyster farm had been heaped on Mrn-296. He said that this practice had been terminated because the truck could no longer make it up the hill. This comment confirmed some doubts which I had developed when examining the midden. The surface of the deposit is covered with shells from a species of oyster that I have not seen in other central California shellmounds. *Furthermore, oysters are not a major constituent in any other Estero archaeological deposit.*”

*“I conclude that a large part of the shell deposit at Mrn-296 is a result of the oyster farm operations rather than aboriginal activity. At this point, a visual inspection of the midden surface will not clearly differentiate between the aboriginal and recent shell deposits. If the Indian site still exists, it is apparently buried below the debris from the oyster farm.”* (Riley 1976:56-57)

The predominant species reported by Riley at the Drakes Estero sites she inspected were: *Clinocardium nuttalli*, *Saxidomus nuttalli*, *Protothaca staminea*, *Tressus nuttalli*, *Macoma* spp. and *Polinices lewisi*.

Upson (1977), in describing 15 Point Reyes archaeological sites which six<sup>4</sup> were at Drakes Estero (three of which were redundant with sites visited by Riley), reported the presence shellfish species he observed. He did not report *O. lurida* at any of the sites including CA-MRN-242 where it had been reported by Riley. The predominant species seen and reported by Upson at the Drakes Estero sites were: *Clinocardium nuttalli*, *Saxidomus nuttalli*, *Tressus nuttalli*, *Protothaca staminea*, *Mytilus californianus*, *Macoma nasuta* and *Polinices lewisi*.

Origer (1982, page 37 and Tables 14-17) analyzed the result of archaeological excavations conducted by Santa Rosa Junior College at site CA-MRN-230 on the western shore of Drakes Estero. He reported the results of shellfish quantification by weight for four of 11 excavation units. From all four units he reported the total of 0.1 grams of oyster shell (species unidentified), which made up less than 1% of the shell recovered by weight. The predominant species represented were: *Protothaca staminea*, *Saxidomus nuttalli*, *Tressus nuttalli* and *Clinocardium nuttalli*.

Polansky (1998), in her Sonoma State University master’s thesis on Point Reyes archaeological settlement patterns reported on visits to 13<sup>5</sup> sites at Drakes Estero and Estero de Limantour, and other sites at Point Reyes as well. When possible she estimated approximate counts of shellfish species in 5 meter by 5 meter square sample areas at most sites. Polansky (1998:163) confirms Riley’s observation of *O. lurida* at CA-MRN-242 noting “100+” specimens in her sample area, although other species at the site were recorded in significantly higher numbers by her:

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<sup>4</sup> CA-MRN-235, CA-MRN-242, CA-MRN-258, CA-MRN-304, CA-MRN-307 and CA-MRN-468 (DNG-12).

<sup>5</sup> CA-MRN-216, CA-MRN-230, CA-MRN-231/305, CA-MRN-232, CA-MRN-242, CA-MRN-256, MRN-258, CA-MRN-296, CA-MRN-298, CA-MRN-304, CA-MRN-307, CA-MRN-389 and CA-MRN-391.

“*protothaca*: 200+”, “*clinocardium*: 200+”, “*macoma*: 500+”, “*mytilus*: 1000+”, and “*saxidomus*: 1000+”.

Polansky (1998:141) also reported 2 oyster specimens (species unidentified) at CA-MRN-230 where Origer reported that oyster (species unidentified) made up less than 1% of his shellfish sample by weight.

For site CA-MRN-296 near DBOC and discussed by Riley above, Polansky (1998:209) observed substantial quantities (“2000+” specimens) of oyster shell which she described as “apparently native and not modern” but failed to note or discuss Riley’s detailed observations of site disturbance and contamination by historic era oyster shell deposits. Polansky (1998:208) also stated: “There have been several archaeological investigations, including much excavation here in the past.” but provided no references. This does not seem to be supported by the histories of archaeological research by Moratto (1984 and 1974). While it is possible that informal, undocumented digging took place at the site, we have not yet found any written record of it.

At site CA-MRN-258, on the west side of the Estero, Polansky (1998:171) notes the presence of oyster shells (species unidentified) on the beach below the site but describes them as “maybe modern” which, again, seems to indicate that she was uncertain in distinguishing between native and non-native oysters. Polansky did not observe oyster at the remaining Estero sites she visited. Considering the indefinite identifications of oyster species and the incomplete discussion of the recent history of CA-MRN-296, it is not clear that Polansky was able to accurately distinguish between native and non-native oyster shell at the time of her study. Her observations of native oyster shell at CA-MRN-296 should therefore be treated with caution.

#### Comparison with Bodega Bay and Tomales Bay, Marin County, California

To evaluate the consistency of the Drakes Estero data with the surrounding area a preliminary comparison was made with archaeological sites at Bodega Bay and the west side of Tomales Bay. Greengo (1951:26) included two sites at Bodega Bay in his comparative study of molluscan species and at both sites *O. lurida* represented less than 1% of the total shell sample by weight. He also described the predominant species observed at the excavation of CA-MRN-266 on northern end Tomales Bay. They consisted of *Mytilus californianus* in the lower levels and *Saxidomus nuttalli*, *Saxidomus giganteus* and *Macoma nasuta* in the upper levels (Greengo 1951:10). *O. lurida* was not mentioned. Treganza (1959:29) briefly describes differences in shellfish species observed at seven excavated Tomales Bay sites but notes the presence of only *Saxidomus nuttalli*, *Schizothaerus nuttalli*, *Protothaca staminea* and *Mytilus edulis*. *O. lurida* was not mentioned.

Upson (1977:56) inspected CA-MRN-395 on Hog Island in Tomales Bay. He recorded the presence of *Clinocardium nuttalli*, *Tressus nuttalli* and *Protothaca staminea*, but not *O. lurida*. More recently Compas and Praetzellis (1994) inspected the surfaces of 13 archaeological sites on the western shore of Tomales Bay and recorded molluscan species represented on or adjacent to the sites. They did not observe *O. lurida*, but they did record the presence of exotic oyster shell from *Crassostrea gigas* at 11 sites. This nonnative species is grown for commercial harvest in Tomales Bay. Its presence on the sites probably resulted from storm deposition, frequent use of the sites as camping and picnic spots by kayakers and boaters, and in several cases from recorded historic occupation and use. Polansky (1998) and Riley (1976) did not visit any Tomales Bay sites.

While this preliminary comparison is not comprehensive and does not include any of the sites on the eastern shore of Tomales Bay or additional sites at Bodega Bay, the results so far are not inconsistent with those from Drakes Estero.

### Conclusion

Twelve primary sources that document archaeological excavations and site inspections around Drakes Estero have been reviewed, along with other publications and reports that provide contextual information. To a greater or lesser degree they identify the molluscan constituents of the shell middens on the basis of surface observation or the analysis of excavated remains. These studies indicate that *O. lurida* seems to be a quantifiable but comparatively minor constituent of only one shell midden (CA-MRN-242) and that its reported presence on the surface of CA-MRN-296 near DBOC is suspect. The possibility that the *O. lurida* shells observed at CA-MRN-242 were deposited there during the historic era should not be dismissed without further research considering the historic disturbances recorded at the site by Beardsley (1947).

Detailed written analyses of the molluscan constituents of excavated sites CA-MRN-216, CA-MRN-230, CA-MRN-298E, and CA-MRN-307 indicate that *O. lurida* is either not present or was not observed in any noticeable quantity at those shell middens. Nor was *O. lurida* documented at the remaining sites of the Estero from surface examination. The relative absence of *O. Lurida* is consistent with a preliminary review of archaeological literature for Bodega Bay and Tomales Bay.

On the basis of the current archaeological record it cannot be asserted that *O. lurida* is represented in any abundance at the archaeological shell middens of Drakes Estero. Any assumption to the contrary is not supported by the archaeological data which represent a span of time from approximately 200 to 2,000 years before present. If we assume that the Coast Miwok inhabitants of Drakes Estero made regular use of all edible molluscan species that were readily available to them, then we would have to conclude that the *O. lurida* population of the estero was small to nil within the time period represented by archaeology. Additional archaeological sources will be reviewed as they become available and the conclusions of this literature review will be revised if warranted.

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