Prehistoric maritime adaptations in the western Yuman region

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Abstract

Highly developed prehistoric maritime adaptations are documented for the ethnographic Chumash and Gabrielino areas along the Santa Barbara Channel coastline and on southern California's Channel Islands, as well as for the Cochimí area on Baja California's Isla Cedros. In the intervening Western Yuman region, between Batiquitos Lagoon in Carlsbad, California and Bahía de San Quintín in northwestern Baja California, the maritime focus was less strongly developed. However, ethnohistoric and archaeological evidence indicates that exploitation of maritime resources did play a role in this region's prehistoric lifeways as well. Future archaeological investigations will help to test and deepen our understanding of that role.

Introduction

Coastal adaptations can be distinguished as "littoral" or "maritime." Littoral adaptations include the harvesting of marine resources on or immediately adjacent to the shore, including shellfish, some types of fish, shore birds, and marine mammals that are encountered in rookeries or that have become accidentally beached. Maritime adaptations involve the exploitation of marine resources from beyond the surf zone, as well as ocean travel requiring the use of watercraft.

Sophisticated maritime adaptations have been abundantly documented in the Santa Barbara Channel area and on the Channel Islands of southern California, in a region that was occupied during the early historic period by Chumash and Gabrielino speakers (e.g., Glassow et al. 2007; Kennett 2005; Raab et al. 2009) (Figure 1). In that region, relatively elaborate plank canoes were used to make regular voyages between the mainland and islands that lie up to 47 km distant from the nearest landfall, and open-water fish and marine mammals were frequently harvested. Farther south, in Cochimí-speaking areas of central Baja California, evidence of the use of composite keeled watercraft and maritime resources has also recently emerged from another large island, Isla Cedros (Des Lauriers 2005, 2006, 2010).

Most of the intervening coastline was occupied at the time of European contact by speakers of Yuman languages, including Ipai, Kumeyaay, Tipai, Paipai, and Kiliwa (Figure 2). This portion of the coast lacks large offshore islands, and the importance of maritime resources seems to have been much less than it was either to the north or farther south. Nonetheless, evidence exists that maritime activity was not altogether neglected prehistorically in the Western Yuman region.

Ethnohistoric and ethnographic evidence

The written record for aboriginal maritime activity in the Western Yuman region is fairly sketchy and lacks many important details. Nonetheless, it attests to a significant amount of such activity.

Figure 1. Location of the Western Yuman region.

The record began in A.D. 1542, when two Spanish ships commanded by Juan Rodríguez Cabrillo made their way north along the coast between Bahía de San Quintín and San Diego Bay (Bolton 1908; Wagner 1929). Native fishermen were seen at Bahía de San Quintín and Punta Santo Tomás, but it was not specified whether they acquired their fish from the shore, on boats in the bay, or offshore. Indians were also encountered "in some very small boats," apparently in Bahía de Todos Santos (Bolton 1908:21-22). Isla San Martín (near Bahía de San Quintín) was reported to be uninhabited at the time, but "signs of people" were found on the island (Bolton 1908:21-22).

An expedition in 1602 under Sebastián Vizcaíno retraced Cabrillo's route (Bolton 1908; Wagner 1929). In Bahía de San Quintín, Vizcaíno reported encountering more than 20 canoes with Indian fishermen, who were catching fish with hooks and lines (Bolton 1908:73).

The 1769 Portolá-Serra colonization of San Diego involved separate contingents travelling both by sea and overland from central Baja California. This brought European observers into the area, and half a dozen reports and diaries were penned by Gaspar de Portolá (Smith and Teggart 1909), Miguel Costansó (1910; Engstrand 1975), Pedro Fages (Engstrand 1975), José Cañizares (Thickens and Mollins 1952), Vicente Vila (1911), Junípero Serra (1955), and Juan Crespí (2001; Bolton 1927; Palóu 1926). The maritime contingent landed at San Diego Bay, while the routes of the land expeditions passed well inland in the southern portion of their trek but then closely followed the Western Yuman coastline north from Bahía de Todos Santos. At the latter location, Crespí (2001:230-231) reported that the natives "went out fishing in their little canoes [*canoitas*]."

Three members of the seaborne contingent, Vila, Fages, and Costansó, noted native marine activity at San Diego Bay. Vila, the ship's commander, observed that "seven or eight Indians came alongside on their rafts [*balzas*], and in exchange for a few trinkets, they gave us several sea-otter [*nutria*] skins" (Vila 1911:100-101). Fages, a military commander and subsequent governor of California, inventoried a box of items to be sent to José de Gálvez, the Spanish official who had ordered the expedition. It included eight "double nets for fishing [*redes dobles de pescas*]" and

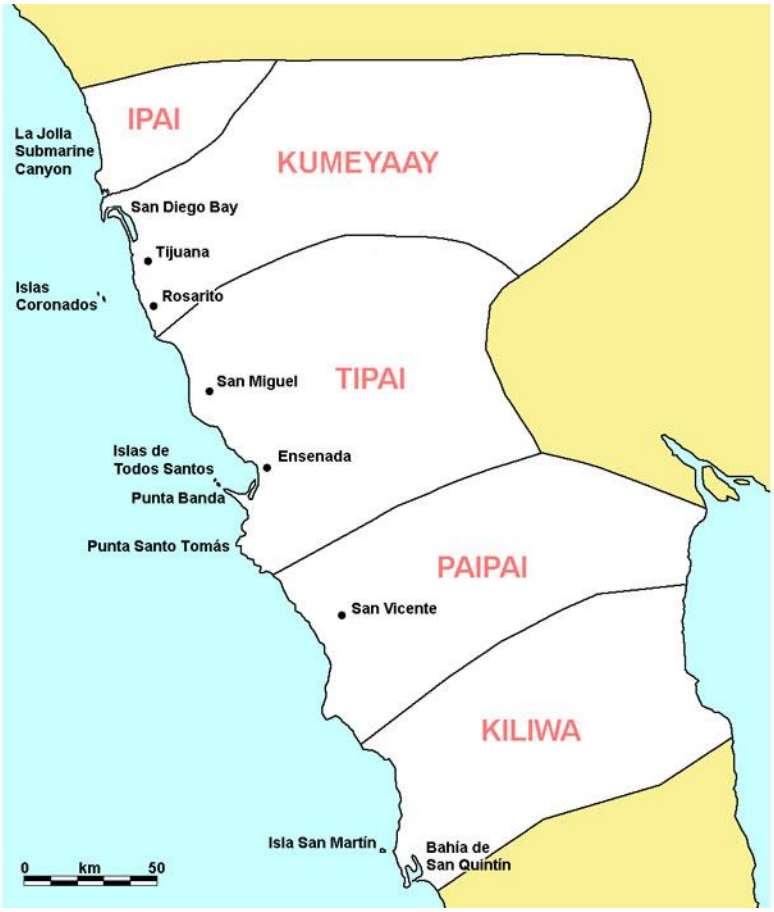

Figure 2. The Western Yuman region.

seven "simple nets for fishing and hunting [*redes sencillas de pescas y cazas*]" (Engstrand 1975). Costansó, an engineer, wrote in more detail. In a letter to Gálvez, he reported:

> I have seen no other evidence of dexterity but their nets, which they weave very well from a thread that looks like hemp, but it is of *ixtle* fiber which they get from a very small species of maguey or mescal.
>
> These nets serve as a belt and, at the same time, as an instrument with which to fish and hunt….
>
> The otters must be rare or they do not dedicate themselves much to hunting them because they have brought few furs despite our having asked by signs for them repeatedly….
>
> There are no thick tree trunks in this land with which they can make canoes, but they supplement the lack of these with balsa rafts made from cattails whose reeds are tied together with *ixtle* fiber. With these they maneuver and can enter the estuaries and beaches of the port to spearfish or fish. They use a short double-bladed paddle and row with the greatest agility from one side to the other. Each raft cannot hold more than one man who sits in the middle over a little stack of hay with legs crossed. They always get their buttocks wet but it does not matter much to them [Engstrand 1975].

In a subsequent report, Costansó (1910:33) repeated and elaborated some of these observations:

> Fish constitutes the principal food of the Indians who inhabit the shore of this port [San Diego], and they consume much shell-fish because of the greater ease they have in procuring them. They use rafts made of reed [*Balsas de Enea*], which they manage dexterously by means of a paddle, or double-bladed oak. Their harpoons [*fisgas*] are several yards long, and the point is a very sharp bone inserted in the wood; they are so adroit in throwing this weapon, that they very rarely miss their mark.

Summarizing the explorers' accounts, Crespí (2001:252-253) wrote that "all the heathens here are great fishermen, having a vast number of tule-rush floats [*balzas de tule*] which they use for catching fish in the sea [*en la mar*]."

Additional references to fishing and watercraft continued during the early mission period. Fages (1937:11) observed in 1775: "They [the Indians at San Diego] add to their food supply by fishing. They would secure better results if they had canoes in which to go out. It would be well if the mission had a canoe of its own and a good fishnet to use in supplying its needs."

The Dominican missionary Luis Sales served at the missions of El Rosario (in Cochimí territory) and San Vicente and San Miguel (in Western Yuman territory) between 1773 and 1790. His recorded observations were generally not geographically specific, but they were likely applicable to the Western Yumans. According to Sales (1956:19),

> The Indians make very small canoes. Among some tribes they are of wood, among others they are made of ferns [*bova*] that grow in the marshes ... they take bundles of the said ferns and bind them to long sticks in the shape of a tiny boat which can support only one man. When this man is about to go to sea he puts this on his head and when he is in the water sets it down and with agility puts himself on board in a kneeling position.

Of particular interest is Sales's account of native practices in hunting sea otters. This was recorded some years after missionization had begun, and the hunting was directed toward an international market for furs that evidently would have had no prehistoric counterpart. Nonetheless, the technology used was aboriginal, and the practices do not appear to have been introduced by Europeans. Sales himself reported that "the manner of collecting these skins is so singular and peculiar to the Indians that neither the English, Dutch nor Spanish have been able to take part in it" (Sales 1956:19). As described by Sales (1956:19-20), the native hunter, in a one-man balsa and provided with a club, a long cord, and two hooks, approached a mother otter and her cub:

> Seeing the canoe she dives under the water and leaves her young on the surface. The Indian comes up immediately and ties the cord to a leg of the little otter so that one hook lies close to the foot and the other about a span away. This done the Indian retires with his canoe, paying out the cord, and when a little way off jerks the cord so as to hurt the otter, and it cries out because of the pain. At its call the mother comes, and as she sees the Indian is far away, she approached it, clasps it and tries to take it away, but since the Indian holds tightly to the cord she cannot. Then the big otter tries by kicking its feet to get the cord off its baby and usually gets entangled with one of the hooks. Now that it is caught the Indian comes up in his canoe with a club in his hand, gives it a blow on the head, and it is his. I have seen

> how much time this operation requires of the poor Indians; sometimes in a whole day they get none, sometimes only one, and sometimes they lose all to a sudden surge of the sea and are drowned. They also hunt them when [the otters] are asleep on the water or when they come up on the beach to rest.

During a round-the-world voyage, George Vancouver visited the Western Yuman region in 1793. At San Diego, Vancouver (1984:1118) noted that the natives had "straw canoes" like those of the Costanoans in the San Francisco/Monterey area. Archibald Menzies, a surgeon and naturalist in Vancouver's expedition, recorded that the San Diego natives

> have no other Canoes than a few bundles of bulrushes fastened together ... with these we saw them sometimes fishing in the harbour, & we were told that they are in general very dextrous in procuring a plentiful supply of fish without going out of the harbour or using any other means of embarkation [Eastwood 1924:346].

By the time professional ethnographic studies of the region were begun in the early twentieth century, the Yumans on the west coast had for generations been largely assimilated by the missions or displaced by nonnative settlement of the near-coastal areas. Consequently, little collective memory concerning maritime adaptations seems to have survived, and ethnographic accounts are meager.

Philip Drucker (1937:13, 1942:100, 124, 172) gathered evidence in the late 1930s. His informants included two inland Ipai, providing hearsay evidence concerning former coastal practices in Alta California, and a Tipai and a Paipai informant, who spoke of former visits to the Baja California coast. According to the Ipai informants, ocean-going balsas were made with tule bundles lashed together with sticks and propelled with paddles. The Tipai and Paipai informants spoke of frequent visits to the coast for shellfish collection but denied any fishing or the use of watercraft.

William D. Hohenthal, Jr. (2001), who gathered ethnographic information in northwestern Baja California during the late 1940s and early 1950s, reported that "the Tipai no longer live along the coast ... and fish is no longer included as a part of their present-day diet.... However, in aboriginal times ... the Indians ate and appreciated fish" (Hohenthal 2001:148).

> Sea mammals were not hunted in aboriginal times, according to consultants; not sea lions because people were afraid of them, because if they were shot with arrows the wounded animals would dive into the water, and because the Indians didn't fancy getting close enough to the beasts to club them to death. Dead animals, if not too far gone, were eaten, as were beached whales [Hohenthal 2001:146].

A Tipai informant remembered "stories told by the old men ... which indicated that the people (Indians) around Ensenada had tule balsas, even during the time of the frailes [missionaries]" (Hohenthal 2001:180).

Delfina Cuero, Florence Shipek's Tipai informant, recounted practices from the early twentieth century:

> We caught fish and cleaned them…. We used cactus thorns on a long stick to spear fish. We also made traps out of agave fiber. We put the traps in the ocean, put a piece of rabbit meat in it, and could come back later to get the fish. We made nets out of tall grasses; ropes and nets were made of agave too. We had other ways to catch fish too, but I don't remember them all. The women made small nets and the

> men made big ones. I can remember the old timers talk about making kəyuš [boats] out of tamu· [reeds]. They would weave them so tightly that the water could not get through [Shipek 1991:25].

She added, "Our family went to the beach down below Ensenada and to Rosarito Beach when we couldn't get to the San Diego beaches any more. Lots of Indians went there every year also to fish and to look for abalone" (Shipek 1991:56).

To sum up, the ethnohistoric and ethnographic records suggest a significant amount of exploitation of coastal resources during the contact period. Much of this may have taken place on shore or in bays, but at least some of it appears to have involved maritime activity.

Archaeological evidence

Three categories of archaeological evidence may bear upon maritime adaptations in the Western Yuman region. These include the presence of archaeological deposits on the region's offshore islands, faunal remains from maritime species found in local prehistoric archaeological middens, and artifacts recovered from underwater contexts.

Island occupations

Three groups of islands lie within the Western Yuman region. From north to south, these are Islas Coronado, immediately south of the Mexico-U.S. border, opposite Tijuana and Rosarito Beach; Islas de Todos Santos, at the entrance to the large bay at which Ensenada is situated; and Isla San Martín, opposite Bahía de San Quintín (Figure 3). Previous reports have documented the presence of archaeological remains on all three group of islands (cf. Laylander 2009). Investigations sponsored by the Instituto Nacional de Antropología e Historia (INAH) in 2016-2017 have greatly augmented the available information on the islands' archaeology. However, most of the investigations so far have been limited to surface reconnaissance. There is still little information concerning the specific prehistoric period or periods during which the islands were visited.

The Islas Coronado include two main islands, Coronado Sur (about 3.5 km in length) and Coronado Norte (1.3 km), as well as two smaller features, Coronado Medio (0.6 km) and Pilón de Azúcar (0.3 km). Elevations range up to 204 m above sea level. Coronado Sur lies about 13 km west of the coastline at Rosarito Beach. Based on Google Earth bathymetric data, if sea level were 45 m lower than it is at present, as was the case around 8500 B.C., Coronado Sur would be linked with the mainland (cf. Masters and Aiello 2007:37). However, to make a land connection with Coronado Norte, a drop in sea level of about 170 m would be required, to conditions predating any likely human presence in the region.

Several previous episodes involving limited archaeological observations on the Islas Coronado have been documented (May and Ike 1981). Probably in the early 1930s, Malcolm Rogers of the San Diego Museum of Man recorded each of the two main islands as an archaeological site and made a small collection of artifacts from Coronado Sur. Carl Hubbs of the Scripps Institution of Oceanography "made at least four field trips to North Coronado Island (1954, 1955, 1959, and 1961). Two units were excavated on the island in 1956 and 1961.... The Hubbs party also collected one large cloth sack of percussion flaked artifacts" (May and Ike 1981:50-52). Darcy Ike made additional archaeological field observations on Coronado Sur in 1979.

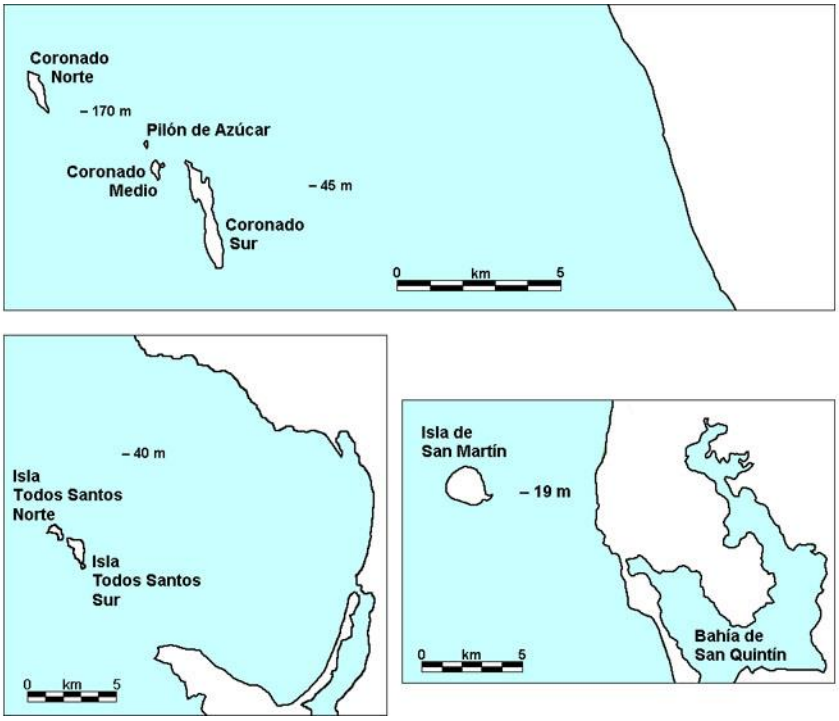

Figure 3. Islands of the Western Yuman region.

In 2016 and 2017, Antonio Porcayo Michelini of Centro INAH Baja California and Todd Braje of San Diego State University fielded small crews who carried out systematic surface inventories on the two larger islands (Flores 2017; Instituto Nacional de Antropología e Historia 2016). They documented 27 prehistoric sites in open-air and rock shelter settings, with assemblages including flaked and ground stone tools as well as faunal remains from mollusks, fish, marine mammals, and deer. The finds included two prehistoric ceramic sherds, likely indicating activity on the islands during the last 1,500 years. Porcayo also reconnoitered Coronado Medio and Pilón de Azúcar, but no archaeological remains were identified on those islands.

The two islands of Todos Santos geologically represent a northwestward extension of the Punta Banda peninsula across the broad mouth of Bahía de Todos Santos, opposite the city of Ensenada. The northern and southern islands are about 1 and 2 km in length, respectively, and their maximum elevation is about 87 m. They lie about 6 km from Punta Banda. Bathymetric data indicate that a drop of sea level of about 40 m, corresponding to conditions prior to about 8000 B.C., would have linked the islands to the mainland.

Hohenthal (2001:79) reported the presence of archaeological remains on the southern island, but he noted that "it is curious that no sherds have been found on these offshore sites." He also reported that this island was a source for red and black chert (Hohenthal 2001:288).

Rubén García and Gengis Ovilla of Centro INAH Baja California (personal communication 2017) carried out a partial archaeological reconnaissance of Islas de Todos Santos in 2017. They identified lithics and faunal remains at open-air sites and in caves and rock shelters, but did not encounter any prehistoric ceramics.

The southernmost island in the Western Yuman region, Isla San Martín, is nearly circular, with a diameter of about 1.8 km and a maximum elevation of 126 m. It lies about 5 km west of the present peninsular coastline. The depth of the channel between the island and the peninsula is

about 19 m, suggesting that the island has probably been separated from the mainland since about 6500 B.C.

Raymond Gilmore recorded flaked basalt artifact workshops and a trail on Isla San Martín in 1973. A collection of nearly 300 artifacts from the site, LC-232, was documented at the San Diego Museum of Man in 1978.

Archaeologists Andrea Guía Ramírez and Fernando Oviedo García (2017a, 2017b) conducted an archaeological reconnaissance for Centro INAH Baja California that focused on the island's coastal perimeter. They observed scattered lithic and faunal remains rather than any well-developed midden sites.

To sum up, archaeological evidence indicates that the islands in the Western Yuman region were visited prehistorically, in at least some cases by maritime, cross-channel means. The artifactual and ecofactual remains so far reported from the islands do not necessarily indicate substantial or long-term occupations. This picture of limited use is unlikely to be contradicted in future investigations, given the islands' small sizes, their limited terrestrial resources, and the limited availability of fresh water.

Faunal remains

Maritime faunal remains in mainland archaeological sites within the Western Yuman region (documented primarily in the Alta California portion of the region) provide evidence that the local offshore waters were exploited. They also tend to suggest, although they do not absolutely prove, that the exploitation of these waters was done by local groups rather than by outsiders, such as maritime specialists from the Channel Islands area to the north.

About 30 species of marine mammals, including cetaceans (dolphins, porpoises, and whales), pinnepeds (seals and sea lions), and carnivores (sea otters) were probably present in the waters off the Western Yuman area under early modern conditions (Jameson and Peeters 1988). Many of these species were not likely to have been targets of aboriginal hunters, either because they were too large or because they rarely if ever ventured close enough to the California shores to have been hunted. Other species ventured into shallow waters, went ashore to use rookeries for mating or giving birth, or accidentally beached themselves, and these may have been acquired by littoral hunters and scavengers rather than by maritime hunters. Among the marine mammal species that have been reported archaeologically but that may fall into this category of potential littoral resources are northern fur seals (*Callorhinus ursinus*), harbor seals (*Phoca vitulina*), and California sea lions (*Zalophus californianus*) (Carrico and Gallegos 1988; Gallegos and Kyle 1988; Pigniolo et al. 1991).

Some of the marine mammal remains found in local archaeological middens likely represent prehistoric maritime procurement. The species that is by far most abundantly represented is the sea otter (*Enhydra lutris*), associated with kelp beds (Gallegos and Kyle 1988; Guía 2007; Lippold 1983; Pigniolo et al. 1991; Winterrowd and Cardenas 1987). Also likely to represent maritime procurement are remains from bottlenose dolphin (*Tursiops truncatus*) (Christenson 1989).

The fish remains recovered from local archaeological middens seem to be strongly biased in favor of species that lived in lagoon or near-shore settings where their acquisition would not have required a maritime technology. However, open-water tuna (Thunnini tribe) species are also present in modest numbers (cf. Noah 1998; Salls 1988). Taxa reported are tuna proper (*Thunnus* sp.), including albacore (*Thunnus alalunga*); little tuna (*Euthynnus* sp.), including black skipjack

(*Euthynnus lineatus*); and bonito (*Katsuwonus pelamis*) (Chace and Bleitz 1989; Christenson 1986, 1987a, 1987b; Laylander 1986; Roeder 1983, 1987; Salls 1988). These species have been found both in early Holocene deposits and in late prehistoric middens. They have not yet been reported from northern Baja California sites (Andrea Guía Ramírez, personal communication 2017). The presence of deep waters lying fairly close to shore, most notably in the La Jolla submarine canyon north of San Diego, meant that maritime travel to acquire these species would not necessarily have involved crossing long distances.

Submerged artifacts

A third category of archaeological evidence may possibly point to prehistoric maritime activity. This consists of artifacts, primarily hundreds of stone bowls or mortars, that have been reported from submerged locations as deep as 30 meters lying off the San Diego coast (Masters 1983; Moriarty and Marshall 1964) and at 20 meters near Islas Coronado (Flores 2017; Instituto Nacional de Antropología e Historia 2016). It is possible that some of these artifacts represent items that were dropped from prehistoric ocean-going watercraft. Patricia Masters suggested that the numerous small mortars associated with kelp bed locations may have been carried in prehistoric watercraft and used for some function related to fishing, such as grinding chum, baiting fish traps, or preparing fish poisons (Masters and Gallegos 1997).

However, it is also possible that the artifacts represent materials that were deposited on dry land at their present locations during terminal Pleistocene to early Holocene periods when sea level was substantially lower than at present. Locations at 20 and 30 meters below present sea level would have been on dry land before around 6000 B.C. and 7500 B.C., respectively. More intensive underwater investigations of submerged assemblages and their contexts would be needed to resolve the question of the circumstances of their deposition.

Modelling and replicating prehistoric maritime activity

In addition to ethnohistoric and archaeological evidence, modern observations and experience may have the potential to shed more light on likely prehistoric patterns of maritime activity in the Western Yuman area. One opportunity involves replication studies of tule balsas. In California, balsa replication experiments have largely been limited to the use of the craft in riverine or bay settings. Roy Pettus and his associates are currently working on a study specifically in this region and aimed at open-ocean use. Such work may shed important light on the materials and methods needed for successful balsa construction, its costs, and the adequacy of such watercraft to operate safely in the open ocean and to cross regularly to offshore islands located several kilometers from the mainland.

Another opportunity concerns the identification of possible balsa launching and landing sites on the mainland coast. San Diego Bay and Bahía de San Quintín seem particularly likely to have served as launching sites, but it is not yet clear how ubiquitous or restricted suitable sites were. Recognition of patterns in ocean currents and winds may also be important, particularly with regard to travels between the mainland and the islands. It seems to be an open question whether the reconstruction of coastal paleogeography prior to about 6000 B.C. can become sufficiently precise to permit the identification of likely locations for early Holocene launching and landing.

Summary

Ethnohistoric and ethnographic evidence indicates that maritime fishing, hunting of marine mammals, and the use of seaworthy watercraft were present in the Western Yuman region during the early historic period, although not to the extent attested farther north. Archaeological evidence indicates that prehistoric inhabitants reached the region's small offshore islands and that open-water marine resources were harvested, at least in minor amounts, throughout the Holocene. Future archaeological investigations should be able to shed additional light on the chronology and extent of native use of the offshore islands and of maritime resources from bases at mainland sites.

Acknowledgments

Thanks are due to Roy Pettus and Susan Arter for their help in discussions at an early stage of this study. Antonio Porcayo, Rubén García, Gengis Ovilla, and Andrea Guía generously shared information on their recent archaeological studies.

References cited

Bolton, Herbert Eugene (editor)
1908 *Spanish exploration in the Southwest, 1542-1706*, Charles Scribner's Sons, New York. (https://archive.org/details/spanishexplorat03boltgoog)
1927 *Fray Juan Crespi, missionary explorer on the Pacific coast, 1769-1774*, University of California Press, Berkeley.
1930 *Anza's California expeditions*, 5 vols., University of California Press, Berkeley.

Carrico, Richard L., and Dennis R. Gallegos
1988 *Data recovery program for a portion of Pump Station 64 force main improvement within the southwest portion of SDi-4609, the village of Ystagua, Sorrento Valley*, Westec Services, San Diego.

Chace, Paul G., and Dana E. Bleitz
1989 "Fish remains from the SDi-10246 site", in *The archaeology of Las Montañas: a paleo-economic interpretation of a Milling Stone horizon site, county of San Diego*, by Robert M. Yohe, II, and Paul G. Chace, Appendix 8, Paul G. Chace & Associates, Escondido, California.

Christenson, Lynne E.
1986 "Faunal analysis at SDi-4513: the Rimbach site", in *Excavation of a portion of SDi-4513: the Rimbach site, city of San Diego, California*, by Susan M. Hector and Sue A. Wade, Attachment 2, Recon, San Diego.
1987a "CA-SDi-197 faunal analysis including a coastal La Jollan subsistence pattern analysis", in *Archaeological test excavation report: CA-SDi-197, a La Jollan period campsite in Sorrento Valley, San Diego, California*, by Martin D. Rosen, Appendix 3. Caltrans District 11, San Diego.
1987b "Faunal analysis results from SDi-4513D", in *Extended Phase I investigation on the periphery of CA-SDi-4513 Locus D of the Rimbach Site, a portion of the ethnographic village of Ystagua, Sorrento Valley, city of San Diego, California*, by Martin D. Rosen, Appendix 2, Caltrans District 11, San Diego.
1989 "Analysis of fish, bird and mammal remains from CA-SDi-4513", in *Village of Ystagua*

(Rimbach SDi-4513): testing, significance, and management, by Dennis Gallegos, Carolyn Kyle, and Richard Carrico, Appendix K, ERC Environmental and Energy Services, San Diego.

Costansó, Miguel

1910 "The narrative of the Portolá expedition 1769-1770", Adolph van Hemert-Engert and Frederick J. Teggart, eds., *Publications of the Academy of Pacific Coast History* 1:91-159, Berkeley. (https://archive.org/details/portolaexpediti00rosegoog)

Crespí, Juan

2001 *A description of distant roads: original journals of the first expedition into California, 1769-1770*, Alan K. Brown, ed., San Diego State University Press, San Diego.

Des Lauriers, Matthew Richard

2005 "The watercraft of Isla Cedros, Baja California: variability and capabilities of indigenous seafaring technology along the Pacific coast of North America", *American Antiquity* 70:342-360.

2006 "Isla Cedros", in *The prehistory of Baja California: advances in the archaeology of the forgotten peninsula*, Don Laylander and Jerry D. Moore, eds., pp. 153-166, University Press of Florida, Gainesville.

2010 *Island of Fogs: archaeological and ethnohistoric investigations of Isla Cedros, Baja California*, University of Utah Press, Salt Lake City.

Eastwood, Alice

1924 "Menzies' California journal", *California Historical Society Quarterly* 2:165-340.

Engstrand, Iris Wilson

1975 "Pedro Fages and Miguel Costansó: two early letters from San Diego in 1769", *Journal of San Diego History* 2(2). (http://www.sandiegohistory.org/journal/1975/april/fages/)

Fages, Pedro

1937 *A historical, political, and natural description of California*, Herbert Ingram Priestley, ed., University of California Press, Berkeley.

Flores Nava, Juan José

2017 "El secreto de las Islas Coronado", *Newsweek en español*. (http://nwnoticias.com/#!/noticias/el-secreto-de-las-islas-coronado)

Gallegos, Dennis, and Carolyn Kyle

1988 *Five thousand years of maritime subsistence at Ballast Point prehistoric site SDI-48 (W-164), San Diego, California*, WESTEC Services, San Diego.

Glassow, Michael A., Lynn H. Gamble, Jennifer E. Perry, and Glenn Russell

2007 "Prehistory of the northern California Bight and the adjacent Transverse Ranges", in *California prehistory: colonization, culture, and complexity*, Terry L. Jones and Kathryn A. Klar, eds., pp. 191-213, AltaMira Press, Lanham, Maryland.

Guía Ramírez, Andrea

2007 "Entre la extinción y el recuerdo: el papel de la nutria entre los antiguos californios", *Memorias: Balances y Perspectivas de la Antropología e Historia de Baja California* 8:210-216. (https://docs.wixstatic.com/ugd/488b16_1f15ce6d338c47fb80e4dd4cbab7b7b2.pdf)

Guía Ramírez, Andrea, and Fernando Oviedo García

2017a *Informe de recorrido a la Isla San Martín*, Centro INAH Baja California, Ensenada.

2017b *Isla San Martín, Baja California*, Centro INAH Baja California, Ensenada.

Hector, Susan M.
1985 *Excavations at SDi-4609, a portion of the village of Ystagua, Sorrento Valley, California*, Recon, San Diego.
Hohenthal, William D., Jr.
2001 *Tipai ethnographic notes: a Baja California Indian community at mid-century*, Ballena Press Anthropological Papers No. 48, Novato, California.
Instituto Nacional de Antropología e Historia
2016 "Realizan primera expedición arqueológica oficial en islas Coronado, BC", http://www.inah.gob.mx/es/boletines/5690-realizan-primera-expedicion-arqueologica-oficial-en-islas-coronado-bc.
Jameson, E. W., Jr., and Hans J. Peeters
1988 *Marine Mammals*, University of California Press, Berkeley.
Kennett, Douglas J.
2005 *The Island Chumash: behavioral ecology of a maritime society*, University of California Press, Berkeley.
Laylander, Don
1986 *Final report of archaeological test excavations at sites CA-SDi-1103, CA-SDi-4615, CA-SDi-4627, CA-SDi-4629, CA-SDi-8121, CA-SDi-10,143, and CA-SDi-10,144, San Diego County, California*, Caltrans District 11, San Diego.
2009 "The role of islands in Baja California's prehistory", *Memorias: Balances y Perspectivas de la Antropología e Historia de Baja California* 10:1-15. (https://docs.wixstatic.com/ugd/488b16_86d9e979dd3740e9a3870c738c02532d.pdf)
Lippold, Lois
1983 "Animal resource evaluation at the Bailey Site SDi-4609", in: *Excavation of a portion of Ystagua: a coastal valley Ipai settlement*, by Richard L. Carrico and Clifford V. F. Taylor, Appendix D, Westec Services, San Diego.
Masters, Patricia M.
1983 "Detection and assessment of prehistoric artifact sites off the coast of southern California", in *Quaternary coastlines and marine archaeology: towards the prehistory of land bridges and continental shelves*, P. M. Masters and N. C. Flemming, eds., pp. 189-213, Academic Press, London.
Masters, Patricia M., and Ivano W. Aiello
2007 "Postglacial evolution of coastal environments", in *California prehistory: colonization, culture, and complexity*, Terry L. Jones and Kathryn A. Klar, eds., pp. 35-51, AltaMira Press, Lanham, Maryland.
Masters, Patricia M., and Dennis R. Gallegos
1997 "Environmental change and coastal adaptations in San Diego County during the Middle Holocene", in *Archaeology of the California coast during the Middle Holocene*, Jon M. Erlandson and Michael A. Glassow, eds., pp. 11-21, Institute of Archaeology, University of California, Los Angeles.
May, Ronald V., and Darcy L. Ike
1981 "Coronado Islands, Baja California, Mexico: research design", *Pacific Coast Archaeological Society Quarterly* 17(1):43-62.
Moriarty, James R.
1968 "Pre-Spanish marine transport and boat building techniques on the Upper and Lower California coast", in *Brand Book Number One*, Ray Brandes, ed., pp. 19-26, San Diego

Corral of the Westerners, San Diego.
Moriarty, James Robert, III, and Neil F. Marshall
1964 "Principles of submarine archeology", *Pacific Discovery* 17(5):18-25.
Noah, Anna C.
1998 "Prehistoric fishing on the San Diego coast", *Pacific Coast Archaeological Society Quarterly* 34(2):5-31. (http://www.pcas.org/Vol34N2/342Noah.pdf)
Palóu, Francisco
1926 *Historical memoirs of New California*, Herbert E. Bolton, ed., 4 vols., University of California Press, Berkeley.
Pigniolo, Andrew, Theodore G. Cooley, Joyce M. Clevenger, and Lynne E. Christenson
1991 *The archaeology of a La Jolla Complex coastal camp: data recovery program at CA-SDi-10,945*, ERC Environmental and Energy Services, San Diego.
Raab, L. Mark, Jim Cassidy, Andrew Yatsko, and William J. Howard
2009 *California maritime archaeology: a San Clemente Island perspective*, AltaMira Press, Lanham, Maryland.
Roeder, Mark A.
1983 "Analysis of fish remains from SDi-4609", in *Excavation of a portion of Ystagua: a coastal valley Ipai settlement*, by Richard L. Carrico and Clifford V. F. Taylor, Appendix C, Westec Services, San Diego.
1987 "Fish remains from a portion of the ethnographic village of Rinconada de Jamo (SDi-5017), Pacific Beach, San Diego County, California", in *An archaeological indexing of a portion of the village of La Rinconada de Jamo, SDi-5017 (SDM-W-150)*, by Cathy L. Winterrowd and D. Sean Cardenas, Attachment D-4, RBR & Associates, San Diego.
Sales, Luis
1956 *Observations on California, 1772-1790*, Charles N. Rudkin, ed., Dawson's Book Shop, Los Angeles.
Salls, Roy Arnold
1988 *Prehistoric fisheries of the California Bight*, Ph.D dissertation, University of California, Los Angeles.
Serra, Junípero
1955-1966 *Writings*, Antonine Tibesar, ed., 4 vols., Academy of American Franciscan History, Washington, D.C.
Shipek, Florence Connolly
1991 *Delfina Cuero: his autobiography, and account of her last years and her ethnobotanic contributions*, Ballena Press, Menlo Park, California.
Smith, Ronald Eugene, and Frederick J. Teggart (eds.)
1909 "Diary of Gaspar de Portolá during the California expedition of 1769-1770", *Publications of the Academy of Pacific Coast History* 1(31):31-89. (https://archive.org/details/ diarygaspardepo00tegggoog)
Thickens, Virginia E., and Margaret Mullins (eds.)
1952 "Putting a lid on California: an unpublished diary of the Portolá expedition by José de Cañizares", *California Historical Society Quarterly* 31:109-124, 261-270, 343-354.
Vancouver, George
1984 *A voyage of discovery to the north Pacific Ocean and round the world, 1791-1795*, W. Kaye Lamb, ed., 4 vols., Hakluyt Society Works, 2nd ed., nos. 163-166, London.

Vila, Vicente
1911 "The Portolá expedition of 1769-1770: diary of Vicente Vila", Robert Senden Rose, ed., *Publications of the Academy of Pacific Coast History* 2:1-119. (https://archive.org/details/portolaexpediti00rosegoog)
Wagner, Henry Raup
1929 *Spanish voyages to the northwest coast of America in the sixteenth century*, California Historical Society, San Francisco.
Winterrowd, Cathy L., and D. Sean Cardenas
1987 *An archaeological indexing of a portion of the village of La Rinconada de Jamo, SDi-5017 (SDM-W-150)*, RBR & Associates, San Diego.