# A Prehistoric Fishing Kit from San Clemente Island, California

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Abstract – The striking development in the 9,500 year adaptation of the maritime culture to San Clemente Island is the increasing importance of kelp bed fishing. This evolution can be traced through faunal and artifact records. The artifact assemblage has been clarified by the discovery of a sea-grass bag containing a complete fisherman's kit. This "tackle box" was examined by tomography to define artifact provenience prior to dissection. The resulting data fill an important void in California Island archaeology.

#### Introduction

Schumacher (1877) was the first to recognize certain tools associated with shell fishhook manufacture:

"Among the articles discovered, my attention was again arrested by a deposit of shell-flakes....some of which were partially worked into fish-hooks, others finished. Other kinds of implements were found, such as double-pointed borers, of coarse gritty sandstone, flint points, and a whetstone shaped something like a doubleedged knife." (Schumacher 1877: 42).

These artifacts were described as tools utilized in the manufacture of single-piece shell fishhooks (Schumacher 1877; Rau 1884). Toolkits for the production of shell fishhooks also have been found in association with various phases of fishhook manufacture at Point Mugu and Redondo Beach (Robinson 1942).

During the 1979 excavation of the Bullrush Canyon Site (SCaI-137) on Santa Catalina Island, a fishhook-manufacturing kit was discovered in Unit 14 (Feature 2). This feature consisted of artifacts deposited in a small cache pit. The artifacts included schist abraders, chert flakes, *Haliotis* shell fishhook blanks and completed circular shell fishhooks (Rosenthal 1986).

Fray Luis Sales, while in Baja California in the late 18th century, gives an historic account of these fishing kits:

"Their furnishings are nothing more than a little fiber sack to keep seeds in, a little wild tobacco with its clay pipe, some pieces of flint to make arrows, some bones to flake them.... and if he is a fisherman some lines and hooks." (Rudkin 1956:31)

# Discovery of the San Clemente Island Fishing Kit.

The major focus of the 1985 UCLA Field School was the excavation of the Nursery Site (SCII-1215) on San Clemente Island. The site, named for a nearby native plant nursery, was discovered in 1984 during a construction project for the U. S. Navy. This locality is an extensive sandy shell midden located in the north-central part of the island, and investigations have shown it to contain a number of house pits. The preliminary survey and test excavation, conducted under the direction of Clement Meighan, disclosed a large circular house pit surrounded by post holes which contained the remains of whale-

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bone house supports. There are conflicting evidences on chronology, but the site is clearly late and the radiocarbon date of  $1,490 \pm 30$ years B.P. (UCLA 2592) appears to be the most reliable for dating the specimens described here (Goldberg & Titus 1986).

During the 1985 excavation, a small twined and beaded sea-grass pouch was discovered in association with a grave of an adult male. Several scattered fishing artifacts had spilled from the pouch. The bag, *in situ*, measured 20 x 8 cm in diameter (Fig.1). Due to the delicate and friable nature of the twined pouch, it was removed in a large block of matrix, packed in a secure wooden container and transported to the laboratory at UCLA for excavation.

Meighan requested that the pouch be Xrayed prior to any disturbance. In order to provide data which would aid in the excavation process, it was felt that a preview of the pouch contents would result in minimal damage and also furnish a record of the original position of the contents. A series of tomograms, as well as standard X-rays, was taken of the pouch in its original longitudinal orientation. The tomograms were taken as a sequence of predetermined focal planes set at intervals of 0.5 cm. These cross-section images, taken in 0.5 cm increments, provided not only 20 consecutive views of the contents but, in effect, a complete scan through the pouch.

# Methods

The specialized medium of X-ray photography allowed this enveloped feature to be dissected and provided a knowledgeable guide of its contextual association. The matrix block, containing the sea-grass pouch, was set on a camera-mount light table for excavation. The pouch was excavated by stratigraphic artifact layer. This process was conducted in the following manner. The first artifact was exposed and photographed by a series of cameras with various types of film. The next lowest artifact was then exposed, and the same process was repeated. When an entire series of

artifacts was uncovered, the level was photographed, drawn to scale on a clear mylar sheet, and then this layer of artifacts was removed. The excavation process was similar to the dissection of a pedestal in an archaeological site. Each succeeding level of artifacts was examined and subjected to the same proceedure.

The excavation methodology employed on this unusual feature resulted in a complete record of the provience for each artifact. This strategy also allows for the reconstruction of any portion of the feature through reference to the mylar overlays in conjunction with the photographs and tomograms.

## Results

The pouch, which ultimately yielded 82 items (Fig. 1, Table 1), was a complete "tackle box." In addition to the primary fishing implements, this tackle box or fishing kit contained secondary tools and some raw material for the manufacture of fishhooks and other fishing equipment.

## A. Stone Artifacts

**Drills:** The drills were concentrated near the bottom of the pouch and tended to be grouped to one side as if placed at the bottom of the bag after the longer net spacers were inserted. Seven drills were present - two each of chert, jasper and chalcedony and one of quartz. The largest drill was made from jasper (Fig. 2-78), and the smallest from chalcedony (Fig. 2-58).

**Bifacial knives:** There were two crudelymade bifacial knives in the kit - one made from chert and the other from basalt. The chert knife, which may have been hafted, retained some asphalt adhesive on one end (Fig. 3-6). The basalt knife is illustrated in Figure 3-67.

Worked Flake Tools: Two chert flakes, knapped from the same core, were located in close proximity to each other within the pouch. The edges displayed secondary retouch and indicated their use as probable cutting or scraping instruments. The smaller flake bore



Figure 1. Dorsal view of fishing kit (Mylar overlay of level 4) partially excavated, showing its position on the left tibia and fibula. Note beads scattered near proximal end of tibia.

traces of asphaltum (Fig. 3-32). In addition, a large flake recovered from the pit matrix also was knapped from the same chert core (Cat# 3473).

**Side Scraper:** This unifacially-flaked artifact was manufactured from the same brown chert core as the flake tools just described (Fig. 3-4).

Fish Scaler: A tabular piece of schist with a partially ground and sharpened edge was found with the other fishing artifacts within the kit. Similar objects occasionally are recovered from San Clemente Island archaeological sites associated with fish remains. It is believed that the artifact may have been used as a fish scaler (Fig. 3-24). An experiment was conducted with a similar schist artifact made by the junior author which indicated that such tabular artifacts are more efficient at removing fish scales than modern devices manufactured for this specialty. It therefore appears that the object recovered from the fishing kit was possibly utilized in a similar manner.

Abrading Stones: Six abraders, utilized in shaping and sharpening fishhooks (Schumacher 1875), appeared to be arranged within the pouch in terms of surface texture and hardness. The texture ranged from very hard and rough andesite (Fig. 3-63) to medium-grained sandstone (Fig. 3-41), and finally to soft, finegrained schist - the most common type (Fig. 3-34, -35, -47). These schist abraders, because they show little evidence of utilization, are probably the most common item thrown away by archaeologists. A small basalt beach pebble (Fig. 3-73) was probably used for filing curved surfaces as evidenced by a wear (abraded) pattern

Table 1. San	Clemente	Island	fishing	kit artifacts
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		Matorial	Longth	Width	Thickness	Plate No.
Catalog No.	ltem	Material	Lengui	widui	THICKIESS	
Stone Artifacts						
2003	Drill	Chert	2.18	1.25	1.09	55
2004	Drill	Jasper	3.19	2.59	1.27	56
2805	Drill	Chalcedony	3.73	1.30	1.23	57
2075	Drill	Chalcedony	2.16	1.17	0.94	58
2012	Drill	Quartz	3.16	2.30	1.25	74
3912	Drill	Jasper	3.97	1.66	1.34	78
3910	Drill	Chert	3.33	1.58	0.99	79
3917	Biface knife	Basalt	4.87	4.32	1.19	67
3903	Knife	Chert	4.88	2.59	0.98	6
3844	Flake tool	Chert	2.37	1.93	0.90	32
3870	Flake tool	Chert	4.87	3.72	1.19	42
3880	Scraper	Chert	6.87	6.20	2.11	4
3842	Fish scaler	Schist	9.28	4.97	0.60	24
3862	Abrader	Andesite	5.01	3.28	0.44	63
3901	Abrader	Sandstone	2.84	1.86	0.53	41
3879	Abrader	Schist	3.79	2.21	0.67	34
3872	Abrader	Schist	5.16	3.54	0.43	35
3873	Abrader	Schist	4.20	2.08	0.40	47
3885	Abrader	Basalt pebble	2.49	1.79	1.40	73
3911	File ?	Root cast	4.6	0.76	0.76	68
3906	Flake tool	Mica	3.28	1.89	1.38	7
3845	Flake tool	Chert	2.70	1.95	0.43	45
3883	Plake tool	Gillere				
Shell Artifacts		TT	1.00	1 7 1	0.22	10
3857	Fishhook	Haliotis	1.55	1.21	0.22	17
3876	Fishhook	Haliotis	1.45	1.15	0.29	30 40
3887	Fishhook	Haliotis	1.93	1.50	0.40	49 50
3888	Fishhook	Haliotis	2.12	1.//	0.30	50
3889	Fishhook	Haliotis	2.15	1.80	0.27	)] 10
3848	Fishhook blank	Haliotis	2.32	1.89	0.29	10
3849	Fishhook blank	Haliotis	2.57	2.15	0.30	11
3850	Fishhook blank	Haliotis	2.03	1./6	0.45	12
3864	Fishhook blank	Haliotis	2.86	2.27	0.30	20
3869	Fishhook blank	Haliotis	1.90	1.46	0.30	31 42
3881	Fishhook blank	Haliotis	2.56	2.19	0.29	4) 44
3882	Fishhook blank	Haliotis	2.48	2.19	0.38	44
3884	Fishhook blank	Haliotis	2.53	2.26	0.30	40 51
3890	Fishhook blank	Haliotis	3.11	2.99	0.38	52
3891	Fishhook blank	Haliotis	2.70	2.46	0.35	))
3897	Fishhook blank	Haliotis	2.89	2.34	0.30	)4 (0
3898	Fishhook blank	Haliotis	3.11	3.07	0.49	60
3902	Fishhook blank	Haliotis	1.09	1.07	0.30	64
3903	Fishhook blank	Haliotis	2.32	2.21	0.30	65
2004	Fishhook blank	Haliotis	2.33	2.01	0.11	66
2008	Fishhook blank	Haliotis	2.36	2.01	0.44	/0
3015	Fishhook blank	Haliotis	2.27	2.02	0.32	11
2951	Shell tool	Mytilus	3.78	3.32	0.30	13
2086	Shell tool	Mytilus	4.74	4.35	0.30	48
2000	Shell tool ?	Mytilus	4.00	2.59	0.54	14
3054	Beads-2	Olivella	-	-	-	18
2020 2020	Bead	Olivella	-	-	-	20
20/0	Beads-2	Olivella	-	-	-	27
2005	Bead	Haliotis	-	-	-	39
2011						100

Catalog No.	Item	Material	Length	Width	Thickness	Plate No.
Shell Artifacts (co	ont.)					
3909	Bead	Olivella	-	-	-	71
3818	Beads-2	Olivella	-	-	-	80
3919	Beads-3	Olivella	-	~	-	81
3878	Worked shell	Mytilus	4.05	3.13	0.60	40
3897	Worked shell	Haliotis	1.69	1.12	0.66	59
3914	Shell	Fragment	2.46	1.35	0.40	76
<b>Bone Artifacts</b>		-				
3839	Net spacer	Bone	13.0	2.5	0.6	1
3840	Pry	Bone	13.0	3.02	1.40	2
3841	Worked rib	Bone	8.4	2.29	1.88	3
3859	Net spacer	Bone	14.0	2.23	0.76	21
3861	Unk. tool	Bone	11.7	1.85	0.65	23
3846	Barb	Bone	3.14	0.32	0.16	8
3847	Barb	Bone	3.48	0.29	0.18	9
3855	Barb	Bone	3.15	0.39	1.05	17
3867	Barb	Bone	2.86	0.39	0.39	29
3868	Barb	Bone	4.03	0.37	0.22	30
3875	Barb	Bone	2.19	0.30	0.15	37
3910	Barb	Bone	2.94	0.38	0.28	72
3853	Composite barb	Bone/wood	1.70	1.22	0.90	15
3854	Composite barb	Bone/wood	2.01	1.35	1.35	16
3900	Composite barb	Bone/wood	3.10	1.35	1.28	62
3874	Cordage/asphalt	Impression	-	-	-	36
3899	Cordage/asphalt	Impression	-	-	-	61
Basketry	0 1	•				
3920	Basket	Sea grass	20.00	8.0	8.0	82
3843	Faunal	Bird bone	-	-	-	5
3860	Faunal	Mammal bone	· _	-	-	22
3866	Faunal	Mammal bone	-	-	-	28
3871	Faunal	Mammal bone	-	-	-	33
3907	Faunal	Bird bone	-	-	-	69
3913	Faunal	Bird bone	-	-	-	75
3863	Faunal	Bird bone	4.10	0.97	0.24	25

approximately 0.03 mm in width which completely encircles the margin of its edges. This abraded pattern matches the width of the single piece *Haliotis* shell fishooks from the pouch.

Table 1. continued

Several sites on San Clemente Island have yielded calcareous sandstone casts of roots which can be found in the sand dunes along the western side of the island. These casts are unusual "stones" and were thought to have been collected by the aboriginal peoples as charms. The presence of a root cast in the fishing pouch (Fig. 3-68) caused a reexamination of the cast itself. Viewed under a microscope, the root cast displays numerous fine sharp grains of jasper imbedded in a calciferous matrix very similar to a modern corundum grinding wheel. This root cast appears to be perfectly adapted for utilization as a round file for shaping the interior margin of shell fishhooks. The utilization of this unusual ecofact, therefore, appears to be that of a grinding implement.

**Miscellaneous Worked Stone:** Two artifacts fall into this class: a biotite mica flake tool (Fig. 3-7) and a chert flake (Fig. 3-45). Similar tools were found at the Empire Landing Site (SCaL-26) on Santa Catalina Island (Reinman & Eberhart 1980).



Figure 2. Drills



Figure 3. Flake tools and abraders.

## **B.** Shell Artifacts

Single-piece Shell Fishhooks: Strudwick (1985) has classified single-piece shell fishhooks into left- and right-pointed varieties within four major types. The shell fishooks in the fishing kit were all *Haliotis* shell of the knobbed shank type (Type 1-b, after Strudwick 1985). Four of the specimens were left pointed and one was right pointed (Fig. 4). Most of the single-piece shell fishhooks were grouped toward the bottom of the basket and to one side of the central cluster of shell fishhook blanks.

Single-piece Shell Fishhook Blanks: The most common item contained within the fishing kit were *Haliotis* shell fishhook blanks exemplifying various states of completion. The series of blanks indicates that, during manufacture, the *Haliotis* shell was initially broken into an approximation of the desired ovate shape. The outer edge was ground to the proper size, and a hole subsequently pecked into the center of the blank (Fig. 4-60). This perforation was then reamed open and ground to the finished hook-shaped product. Of the total 24 blanks recovered (Fig. 4), 17 were located within the pouch, and 7 had spilled from the pouch into the pit matrix. The skeleton of a mouse was present, part of which intruded into the pouch with the remainder in the surrounding midden, indicating that the rodent had disturbed the upper portion of the bag after internment.

**Miscellaneous Shell Artifacts:** Three margins of *Mytilus* shell, cut anteriorly-posteriorly across the center of the valve, were found. A matched left and right valve of the same individual *Mytilus* was filled with asphaltum (Fig. 5-85). These shells may have been used as asphalt containers; however, one must not rule out other uses for the cleanly cut and ground shell. In northern California such items were used as thumb protectors in *Iris* cordage production (Hoover 1974).

**Olivella Shell Beads:** During the excavation of the fishing pouch, several *Olivella* shell disc

beads appeared within the matrix, usually in association with the upper portion of the bag. The rim of the pouch was incomplete. Most of the upper layer of the rim had decayed away, while the lower portion was intact. A single bead was observed affixed to the lower rim with vegetable-fiber thread. The rim of the pouch apparently had been decorated with at least 13 beads prior to the time of interment (Fig. 8).

## C. Bone Artifacts

Net Spacers: Two thin pieces of mammal bone, probably sea mammal ribs, had been shaped to about hand size (Fig. 6-1, -21). These items are too short and thin to have been abalone pries and are too thick to be effective bone knives. It is suggested that these tools were employed as net spacers (see Hiroa 1964: Fig. 204; Mathewson 1985: Fig. 10). They were packed loosely and oriented lengthwise within the uppermost layer of the pouch.

**Bone Knife:** Included in a cluster of net spacers and abalone prys was a bifacially flaked section of mammal long bone. Traces of asphaltum are evident on one end, while the other end is blunt and displays use-polish (Fig. 6-23). This artifact appears to have been a bone knife.

Abalone Pries: This artifact (Fig. 6-2) is 1 cm thicker than the average thickness of the net spacers and has been broken laterally across its center. The remaining worked end has been beveled in the fashion characteristic for a chisel or pry. A cetacean rib fragment (Fig. 6-3) also was associated with the bails and pries. One end is beveled, the other is broken. It is difficult to determine the function of this worked bone due to its poor condition. It may have been employed as a soft hammer, abalone pry or net spacer.

**Composite Barbs:** Eleven composite barbs of bird bone with asphaltum adhering to their proximal ends also were recovered – five of which exhibited cordage impressions. The barbs generally were located in the vicinity of the mouth of the pouch. Despite the excellent context and preservation of the fishing kit, it was difficult to determine if these barbs actually formed part of composite fishhooks or composite fish spear points. Figure 7-62 shows an almost complete artifact with the barb still in place, wrapped with cordage, and secured with asphaltum. Not enough of the point/shank remains, however, to determine the nature or function of the artifact. The barbs and pieces of cordage in Figure 7-16, -17, -36 and -37 are also composite sections that belong together.

## **D.** Basketry

The sea-grass pouch containing the above artifacts exhibits an S-twined weave (Fig. 9). The start of this basketry pouch is similar to those described by Rozaire (1957: 168-169; Fig. 21b). The warp strands, which are bent and set in a radiating pattern, are fixed in place by double rows of plain, two-strand S-twining. The base was constructed with two-strand closed-twining which forms five, closely-spaced double rows. The upper walls of the basket are open-twined with double rows of closed Stwining set at evenly spaced intervals. The rim of this soft-twined pouch was at one time decorated with shell disc beads (see above).

#### E. Miscellaneous Material

Several wooden shanks, wrapped in cordage and dipped in asphaltum (*i.e.*, composite fishhooks), were found (Fig. 7-15, -16, -36, -61 and -62). A bird-bone, pipestem fragment with asphalt adhesive on its unbeveled end also was recovered from within the pouch, and the incised steatite pipe was retrieved from the pit matrix (Fig. 7-100).

Although no sinkers were found within the pouch, four possible specimens, lenticular in outline, were present in the surrounding matrix (Fig. 8). The two serpentine, "fish effigy" sinkers (Fig. 8-95, -97) are flat in cross-section and have a notch or "mouth" cut on one end. One of these is drilled near the notched end giving the sinker an eye. The other two sinkers are rounded in cross-section and have minimal grooves on one end. The smaller serpentine sinker apparently was attached to the line with asphaltum (Fig. 8-93), while the larger schist sinkers were attached by the incised grooves around their mid-sections (Fig. 8-96). Similar zoomorphic sinkers resembling fish are discussed as fish effiges by de Cessac (1951:19; Pl. 1) and Meighan (1976: Fig. 1a-d).

An unusual, steatite whale effigy was located in the pit matrix and associated with the sinkers. This zoomorphic form has a deep mouth notch on one end and high dorsal fin on one side. The resulting stylized shape of the killer whale (*Orcinus orca*) is similar in outline to the petroglyphs depicted on San Nicolas Island (Bleitz-Sanburg 1987:264; Rozaire & Kritzman 1960). The three holes drilled into this unusual specimen are located near the mouth, the tail stock and under the dorsal fin.

#### Discussion

The Nursery Site sea-grass pouch contained the first complete primary and secondary fishing toolkit ever recovered in southern California (Fig. 10). Primary tools are those applied directly to the work being performed. For example, shell fishhooks may be considered primary tools. Secondary tools, such as the abrading stones and drills, are those used in the manufacture of primary tools. The kit, therefore, contains evidence that, as of 1,400 years B.P., aboriginal fishermen exploiting the waters of the Southern California Bight were able to support themselves for some time away from the home camp by packing equipment repair tools along with their fishing tackle.

The excavation methodology conducted in this project not only preserves the artifacts for future archaeologists but, utilizating tomagram X-rays, series photography and mylar overlays, provides the rare opportunity for future researchers to observe a destroyed archaeological context in its original form and reconstruct the provenience if necessary.



Figure 4. Single-piece Haliotis shell fishhooks and blanks in various states of completion.



Figure 5. Single-piece *Haliotis* shell fishhook blanks, bone barbs and *Mytilus* Shell container filled with asphaltum (5-85).



Figure 6. Large bone tools.



Figure 7. Composite fishhooks (asphaltum with cordage impressions) and bone barbs.



Figure 8. Miscellaneous stone artifacts (effigies, sinkers and steatite pipe bowl.



**Figure 9.** The preserved sea-grass pouch after excavation. Note beads which were associated with the rim of the pouch.



Figure 10. The excavated fisherman's kit and its contents.

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