

THE SAN DIEGO WRECK SITE OFF FORTUNE ISLAND, PHILIPPINES

Maharlika A. Cuevas

Archaeology Division, National Museum, P. Burgos Street, 1000 Metro Manila, Philippines

ABSTRACT

This report summarises the activities and results of a series of underwater archaeological expeditions conducted in the waters off Fortune Island to search for and recover the remains of the wreck of the Spanish galleon San Diego. The expeditions were conducted by researchers from the Underwater Archaeology Section of the National Museum of the Philippines, jointly with a private company called World Wide First (WWF). The Museum personnel assigned to this project were led by Dr. Eusebio Dizon, Head of the Underwater Archaeology Section, while private counterparts were headed by Mr. Franck Goddio, President of WWF. The site is located about 900 m northeast of Fortune Island at 19° 09' 22" North latitude and 120° 30' 37" East. The island is situated 12 km west-southwest of Nasugbu Point, outside the mouth of Manila Bay and approximately 80 km southwest of Manila (see Figure 1).

HISTORICAL BACKGROUND

Manila was one of the richest cities in Asia during the early 17th century. Its involvement with the galleon trade of Acapulco caused it to be continually harrassed by English, Portuguese and Dutch marauders. The Dutch struggle for independence from Spain also menaced Manila from 1500 to 1648. The Spanish warship *San Diego* sank on December 14 1600 near Fortune Island after a naval engagement against the Dutch naval fleet led by Captain Oliver Van Noord. It was captained by Don Juan Antonio de Morga, a Spanish judge and inquisitor who wanted to fight a glorious battle, although he evidently knew little about naval matters.

EQUIPMENT AND PERSONNEL

During the excavations in 1992, the steel supply boat *Osam Service* was used as the research vessel. This Singapore-based vessel had a crew of 10 and was equipped with a four-point mooring system. On board was WWF equipment, mostly leased from *Divecon*, that included a diving bell, a recompression chamber operated by a diving doctor, two hookah rigs (Kirby-Morgan type) with communication system, scuba diving gear, high pressure compressors and a two-seater submarine. It was also equipped with marine radios that facilitated regular communication with the WWF base in Manila. The tugboat *Cargo Lift Count* was used as the supply vessel to transport personnel and equipment from Wawa pier. The *Kaimiloa* was also used for accommodation.

The fourth marine vessel used in the expedition was the two-seater submarine, capable of reaching a maximum depth of 60 m. This was used for observation during the course of the underwater archaeological activities at the wreck site. It had a maximum speed of one knot and carried enough air to last for 12 hours.

The 1993 excavations saw a lot of improvement in terms of the equipment used and personnel involvement. During this period, the workboat *Rio Das Contas* was used as the research vessel. This boat had a more powerful hydraulic crane and additional cabins. The other vessels used in 1992 were also used again. In addition to this, a Remote Operating Vehicle (ROV) owned by the National Geographic Society was employed to document the underwater activities at the wreck site. This sophisticated vehicle was equipped with a still camera, a multi-directional video camera, a stereo video camera and a laser system, which could take points for accurate measurements of any object. Several monitors were used to view everything that was captured in the cameras mounted on the ROV. The tracking system, depth and

CUEVAS, THE SAN DIEGO WRECK SITE OFF FORTUNE ISLAND, PHILIPPINES

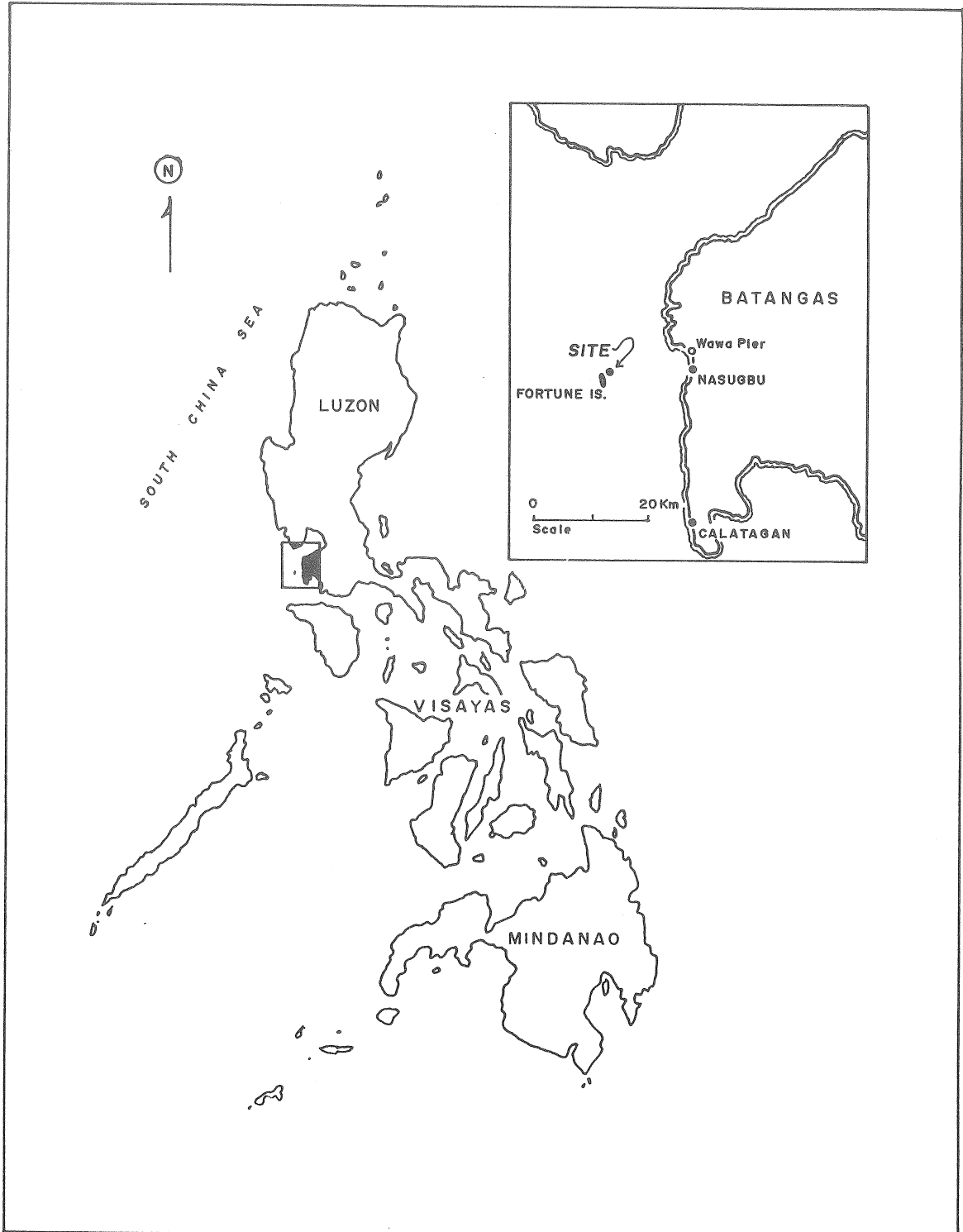


Figure 1: Map of the Philippines showing Fortune Island

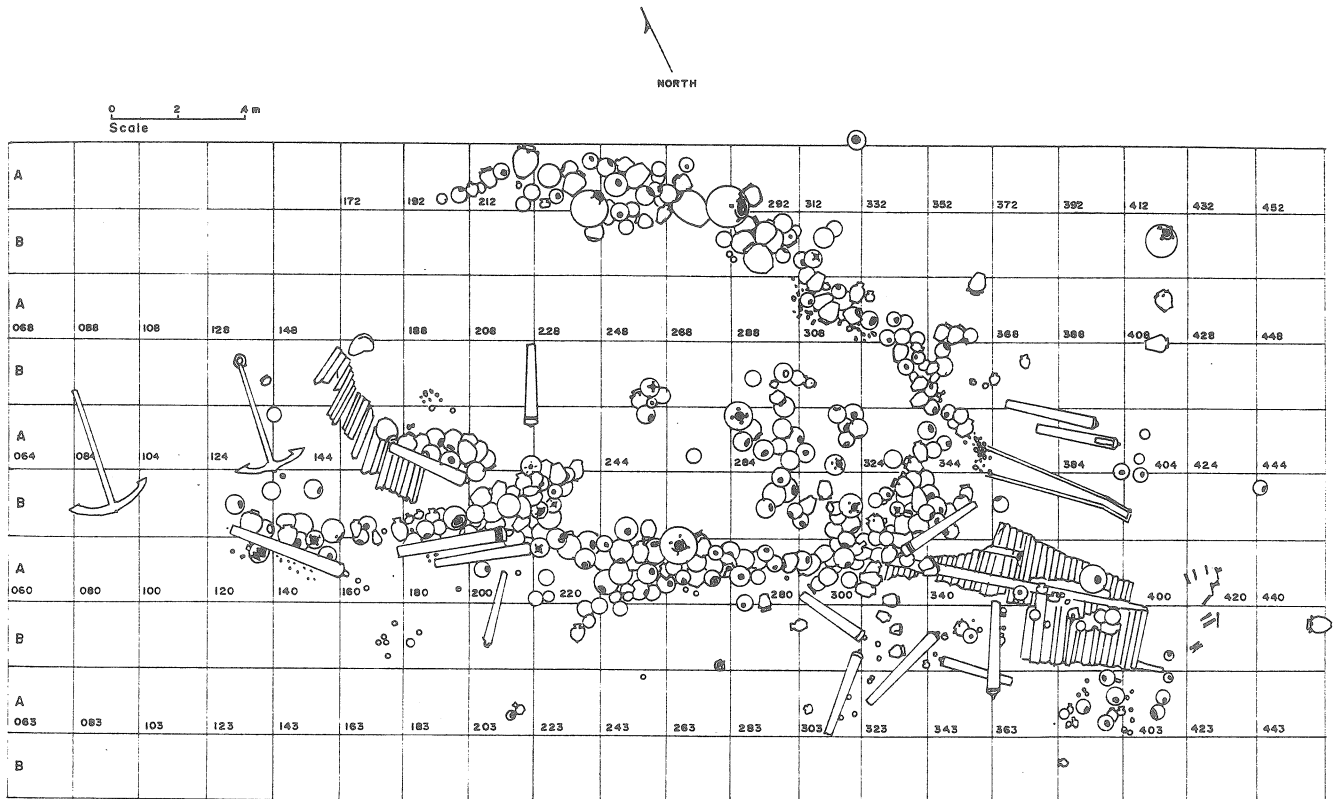


Figure 2: Site plan of the Fortune Island Underwater Archaeology Project, showing locations of planks, cannons and pottery vessels.

course sensor and other relevant data were displayed in a separate monitor.

The main underwater excavation work was undertaken by French commercial divers using *Divecon* equipment from Singapore that was mostly rented by the WWF. At the start of operations in 1992, diving activities were conducted for 24 hours with two groups of divers working on alternate shifts. At that time, two divers using compressed air worked as long as 50 minutes at the bottom and decompressed for a total of 130 minutes at different ascending stages. Pure oxygen was used by the divers starting at the 9 meter decompression stage up to the 3 meter stage before surfacing. After two weeks of this work schedule, however, diving activities were done only during the daytime for efficiency and safety reasons. The work schedule was consequently modified. Divers made a maximum of two dives per day with the second dive much shorter in duration to compensate for the residual nitrogen that accumulated in the body during the first dive.

The new schedule of work underwater saw 4 divers simultaneously doing specific tasks on the wreck site; two of the divers using scuba and two the hookah rig. Often they were joined by the Photomarine divers who made video and photo documentation of activities and finds. Inside the submarine, Mr. Goddio regularly observed work underwater and planned activities as the excavation progressed. The details of the site plan were also recorded during this observation work and through consultation with divers.

In the 1993 excavations, several revisions were made with regards to diving activities that further improved underwater work efficiency and dive management. At this time, nearly 20 divers worked regularly on the site with most of the divers in the 1992 campaign still present. In this year only the scuba system of diving was employed using new sets of double tanks and dive gear. This improved the divers' efficiency and the vital safety factor. Many problems of decompression sickness with near fatal accidents had been experienced the previous year in the use of the hookah diving system.

CUEVAS, THE SAN DIEGO WRECK SITE OFF FORTUNE ISLAND, PHILIPPINES

THE WRECK SITE

The shipwreck is situated approximately 50 m below sea level in a small sandy seabed valley about 900 m north-east of Fortune Island. It is marked by a mound 3 m high with a few cannons scattered on its top and covered partially by sand. The mound covers an area of about 40 by 20 m, approximately 600 square meters (see Figure 2).

In April 1991, the initial survey and exploration phase of this project was undertaken using the *Kaimiloo*, a catamaran owned by the WWF. A three-point positioning system using beacons was used to delimit the survey area. A deep tow magnetometer and a sub-bottom profiler were used to determine anomalies and features at the seabed. The exact location of the wreck site was established after a series of bounce dives by WWF divers checking anomalies detected by the magnetometer. After the first excavation in 1992, a re-survey of the area using the same vessel was conducted to check for other artefactual materials in the immediate vicinity of the excavation area. In the process, a few loose materials were retrieved several meters away from the mound of the wreck.

Actual excavation work on the wreck was undertaken in two expeditions. The first was during the summer of 1992 when most of the artifacts were retrieved. The second was in the summer of 1993 when the rest of the artifacts were recovered and the hull of the *San Diego* was fully exposed after removing the ballast stones.

At the start of activities on the wreck site during orientation dives, surface finds comprising loose artifacts that were being moved around the site by the water currents were retrieved. A baseline with markings at 2 m intervals was then laid across the mound for measurement reference. A 2 x 2 meter steel grid square was used for recording the locations of finds. Two electric water pumps were fixed beside the mound for dredging. Controlled excavations by squares proceeded thereafter.

Hookah rig divers with umbilical hoses from the diving bell performed the seemingly sedentary task of excavating the squares most of the time. Scuba divers with more freedom to move underwater were given the task of cleaning the excavation squares and moving materials underwater (i.e. cannons, equipment) as work progressed. Heavy materials were moved underwater with the use of liftbags.

Photomarine company divers constantly documented the progress of work and the finds on video and photographs. The observer from the submarine also coordinated with these divers and updated the draft of the site plan on board the research vessel. Recovered archaeological materials were lifted to the surface in a steel frame box pulled up by a rope through a pulley at the

stern of the research vessel. Bigger jars and concretions that did not fit in the steel box were put in a large net and brought to the surface by liftbags. The heavy bronze cannons, the biggest weighing approximately 2.8 tons, were lifted from the seabed by a crane and hauled directly on to a rented barge toward the end of the 1992 expedition.

Excavations made in 1993 saw the removal of the big deposit of ballast stones on top of the hull. This time, the excavation was started at the stern portion of the hull (partly exposed in 1992) and proceeded towards the bow in a systematic manner. Retrieval of artifacts was also done within a 30 m radius around the wreck site. Newly detected anomalies in the immediate vicinity were also checked for any archaeological significance.

After the hull was fully uncovered in the 1993 expedition, archaeologists from Direction des Recherches Archéologiques Sous-Marines in France took measurements of the exposed hull to record profiles. Some parts of the wooden remains were raised to the surface to permit detailed study and measurement. Tracing of the individual planks using plastic sheets was likewise undertaken. Photo and video documentation of the hull was undertaken and a photo-mosaic of the hull was made using the ROV.

On board the research vessel, the Museum and the WWF personnel with the available divers led by Mr. Goddio attended to the primary de-concretion and cleaning of the newly lifted artifacts. The sand contents of the jars were carefully removed using a water hose to check for contained materials. The Museum personnel then worked on the accessioning, labelling and recording of all specimens. They also supervised the packaging and storage of specimens in the designated container van for this purpose. Due to the limited working space aboard the research vessel the Museum personnel on site supervised the transfer and accompanied the periodic transport of the packaged specimens to storage in Manila. Throughout the expedition, a project logbook was maintained by Museum personnel making entries of activities and finds on a daily basis.

THE FINDS:

1) Porcelain (all forms)	Totals
Intact	423
Complete	51
Restorable	242
Broken	164
Fragments	548
Sherds	2,260
Unclassified	792
	4,480

2) Stonewares	
Intact	327
Complete	106
Restorable	171
Broken	261
Fragments	2,165
Sherds	920
Unclassified	239
	4,189
3) Earthenwares	
Intact	78
Complete	14
Restorable	22
Broken	75
Fragments	473
Sherds	758
Unclassified	62
	1,482
4) Metals	
Cannons	14
Sword fragments	31
Helmets	3
Cannon balls	197
Musket balls	17,189
Gold Ornaments	2
Coins	139
Locketts	66
Buckles	104
Buttons	6
Lead Ingots	5
Implements	32
Unclassified	3,330
	21,118
5) Organic materials	
Bones	2,727
Wood	191
Seed	55
Rope	134
Charcoal	10
Coconut husk	2
Cork	1
Ivory	6
Resin	4
Shell	2
Teeth	2
Tusk	1
Bark	2
Bead	1
	3,138
GRAND TOTAL	34,407

Significantly, the *San Diego* was the first wreck in the history of underwater archaeology in the Philippines to be found with all its durable material contents "encapsulated" in a small mound in deep water. The excavations yielded a wide variety of artifacts, many of which are rare finds. The general positioning pattern of the artifacts on the wreck site was such that the cannons were sitting over the stoneware jars, and beneath the jars were piles of ballast stones resting on the ribs and planks of the ship. Often, jars were found piled in layers with the smaller artifacts having moved down and settled beneath them.

The variety of artefacts uncovered from the wreck site includes blue and white porcelain plates, dishes, bottles, kendis and boxes; stoneware jars and jarlets; earthenware pots; musket and cannon balls of stone and lead; metal navigational instruments; weapons; silver coins; animal bones and teeth; and seeds. Notable among the metal finds were a navigational compass and a maritime astrolabe. A block of hardened resin perhaps used for caulking and fire starting was also retrieved.

Most of the ceramics are intact pieces or are restorable. The animal (meat) bones were found mostly inside the jars. It was noted that bones of wild pig were commonly found inside the dragon jars. Most of the artifacts have coral concretions that allowed only minimal description of the finds in the inventory record. A more detailed analysis of the finds is expected to be undertaken during the conservation stage after thorough cleaning.

Since the limited working space on board the research vessel did not allow for immediate conservation on site, the retrieved artifacts were packaged in their wet condition. Complete stoneware jars and pots were packaged individually in carton boxes. More fragile porcelain materials were stored in wooden and plastic boxes. Plastic bubble sheets for packaging were used to cushion the artifacts in transport and storage prior to conservation work.

The wooden parts of the hull that were brought on board for detailed study were later returned to their approximate original positions in the wreck site. After full documentation was made of the hull a backfill of sand was deposited covering it completely from the elements. A few undiagnostic plain stoneware and earthenware sherds, along with coral concretions, were left in a marked excavated square at the wreck site and covered with sand. The retrieved specimens were brought to Manila and stored in a warehouse where conservation can be carried out. The bones have been brought to the National Museum Zooarchaeology Section for analysis

CUEVAS, THE SAN DIEGO WRECK SITE OFF FORTUNE ISLAND, PHILIPPINES

and identification, and to the Chemical and Physical Laboratory for conservation and preservation.

A total of 176 days were spent working at the *San Diego* wreck site off Fortune Island. Not only time but much effort and money were poured into this project, which resulted in the recovery of 34,407 pieces of archaeological material dating to the later part of the 16th century. Many things have been learned from this excavation project – new technology in the fields of magnetometric survey and positioning systems, in underwater photography, laser mapping systems and computing. Also important is the relationship with private groups willing to support archaeological research in a Philippine setting.

DOCUMENTATION ON THE SAN DIEGO WRECK SITE RESEARCH

- Alba, L. and Conese, E. 1993. Fortune Island underwater archaeological excavations: a second preliminary report. Manuscript, National Museum, Manila.
- Cuevas, M. 1992. Fortune Island underwater archaeological excavations: a preliminary report. Manuscript, National Museum, Manila.
- Nicolas, N. and E. Conese 1991. On the archaeological survey off Fortune Island. Manuscript, National Museum, Manila.
- Underwater Archaeology Section 1992. Fortune Island Underwater Archaeology Project. Field Logbook, National Museum, Manila.
- Underwater Archaeology Section 1993. *Saga of the San Diego*. Manila: Concerned Citizens for the National Museum, Inc.