MINUTE ITEM
This Calendar Item No. C104 was approved as Minute Item No. 104 by the California State Lands Commission by a vote of 3 to 0 at its 6-19-98 meeting.

CALENDAR ITEM
C104

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06/19/98
W 25383
Pelkofer

AUTHORIZATION TO CONTINUE JOINT CULTURAL RESOURCES SURVEY

APPLICANTS:

National Park Service
Point Reyes National Seashore
Attn: Don Nebaucher, Superintendent
Point Reyes, California 94956

National Oceanic and Atmospheric Administration
Gulf of the Farallones NMS
Attn: Ed Ueber, Manager
Fort Mason, Bldg. 201
San Francisco, California 94123

California State Lands Commission
Attn: Peter Pelkofer, Senior Counsel
100 Howe Avenue, Suite 100 South
Sacramento, California 95825

AREA, TYPE LAND AND LOCATION:

20 acre parcel of ungranted tide and submerged land, located in the Pacific Ocean, Drakes Bay, Marin County, California.

LAND USE:

Mapping, identification and retrieval of artifacts from historic sites and vessels.

TERM OF THE PROPOSED PERMIT:

For an additional two years, commencing at the end of the present permit in September, 1999.

CONSIDERATION:

The public benefit; pursuant to 2 Cal Code Regs. 2003

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STATUTORY AND OTHER REFERENCES :

A. Public Resources Code Section 6301 (Administration of tide and submerged lands)

B. Public Resources Code Sections 6309, 6313 and 6314 (Shipwreck and Historic Maritime Resources Program)

C. Public Resources Code Section 6370, et seq.; 2 Cal Code Regs. Section 2954 (Environmentally significant public lands)

D. 14 Cal Code of Regs. Sections 15000 et seq. (State EIR Guidelines)

PERMIT STREAMING ACT DEADLINE:

N/A

OTHER PERTINENT INFORMATION:

1. At its meeting of July 11, 1997, the Commission approved a three year agreement between the National Park Service (NPS), the National Oceanic and Atmospheric Administration (NOAA), and the California State Lands Commission, each of which exercises jurisdiction in the water of the Pacific Ocean offshore of the Point Reyes National Seashore. Subsequently at its meeting of August 26, 1997, it authorized the issuance of a two year cultural resources survey permit. The parties have accomplished most of the activities authorized under that permit and seek to extend the terms of the permit to continue with the survey and to complete the agreement. If approved, this Commission action will extend the term of the permit and authorize a contract to implement the agreement.

   Beginning in January 1997, the parties to the agreement met at the headquarters of the Point Reyes National Seashore to begin a multi-year, joint research project to assess submerged cultural resources in selected areas of Drakes Bay. The assessment will enable the three agencies to manage, study, and protect significant shipwrecks within the Seashore. For management purposes, the project was divided into four phases. During Phase I (February-September 1997), project team members met approximately every six weeks to coordinate efforts to maximize the fieldwork scheduled for the fall of 1997. That fieldwork, designated Phase II, was commenced during two weeks in October 1997. A report by the State Lands' contract archaeologist, James Allan, is attached as

Exhibit B.

Phase III, as authorized by this permit, will commence in the fall of 1998 and will consist of additional testing for magnetic anomalies in the surf zone and along the beach area. Based on the results of the 1997 survey, locations have been selected for additional testing of equipment. Several new vessels and various types of dredging equipment will be tested, including removal of sand overburden by use of propeller directed water jets.

Phase IV is scheduled to take place in during 1999 and possibly in 2000. It is planned to actively excavate at selected sites. It will also include conservation, documentation, analysis, and interpretation of any historic artifacts recovered during Phase III or Phase IV. A final project report will also be prepared during Phase IV.

The Institute for Western Maritime Archaeology at the University of California at Berkeley is a non-profit public benefit corporation dedicated to research, teaching and publication in maritime archaeology and history of the Pacific Coast. The Institute has agreed to furnish a marine archaeologist under contract to represent and protect the Commission's interest in the project. Authorization is requested to contract with the Institute for services in Phase III of the project in an amount not to exceed $10,000.

2. Pursuant to the Commission's delegation of authority and the State CEQA Guidelines (14 Cal Code Regs. 15025), the staff prepared a Proposed Negative Declaration identified as EIR ND 681, State Clearinghouse No. 97072080. Such Proposed Negative Declaration was prepared and circulated for public review pursuant to the provisions of CEQA.

   Based upon the Initial Study, the Proposed Negative Declaration, and the comments received in response thereto, there was no substantial evidence that the project would have a significant effect on the environment. (14 Cal Code Regs. 15074(b)) The Negative Declaration and Mitigation Monitoring Program were adopted by the Commission August 26, 1997.

3. This activity involves lands identified as possessing significant environmental values pursuant to Public Resources Code Section 370, et seq. Base upon the staff's consultation with the persons nominating such lands and through the

CEQA review process, it is the staff's opinion that the project, as proposed, is consistent with the use classification.

EXHIBITS:

A. Location Map

B. Summary Report prepared by the Institute for Western Maritime Archaeology, Joint Submerged Cultural Resources Assessment and Survey Drakes Bay, Point Reyes National Seashore, Phase I and Phase II January-October, 1997.

IT IS RECOMMENDED THAT THE COMMISSION:

1. CERTIFY THAT A NEGATIVE DECLARATION, EIR ND 681, STATE CLEARINGHOUSE NO. 97072080, AND A MITIGATION MONITORING PROGRAM WERE PREPARED AND ADOPTED FOR THIS PROJECT PURSUANT TO THE PROVISIONS OF THE CEQA; THAT THE COMMISSION HAS REVIEWED AND CONSIDERED THE INFORMATION CONTAINED THEREIN, AND THAT THE CONDITIONS OF THE ORIGINAL PERMIT AND THE PROPOSED ACTIVITIES ARE STILL PROPERLY COVERED UNDER SAID NEGATIVE DECLARATION.

2. DETERMINE THAT THE PROJECT, AS PROPOSED AND APPROVED, WILL NOT HAVE A SIGNIFICANT EFFECT ON THE ENVIRONMENT.

3. AUTHORIZE AN EXTENSION OF THE PERMIT FOR A PERIOD TO AND INCLUDING DECEMBER 31, 2000 AND THE CONDUCT OF ACTIVITIES PROPOSED IN PHASE III AND PHASE IV OF THE JOINT CULTURAL RESOURCES SURVEY OF DRAKES BAY, MARIN COUNTY, CALIFORNIA.

4. AUTHORIZE A CONTRACT IN AN AMOUNT NOT TO EXCEED $10,000 FOR SERVICES WITH THE INSTITUTE FOR WESTERN MARITIME ARCHAEOLOGY AT THE UNIVERSITY OF CALIFORNIA AT BERKELEY.

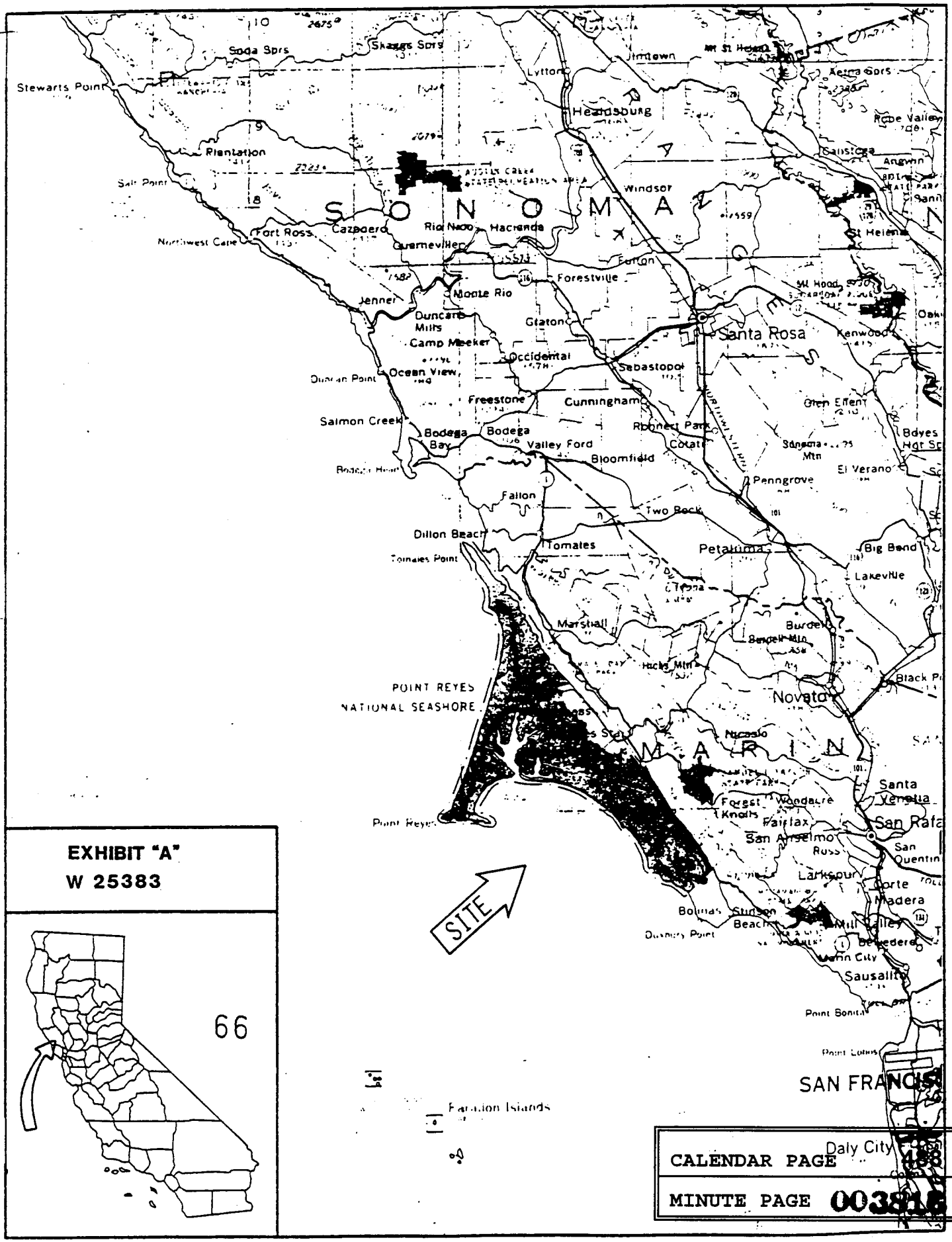

EXHIBIT "A"
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Joint Submerged Cultural Resources Assessment and Survey
Drakes Bay, Point Reyes National Seashore
Phase I and Phase II
January – October 1997

Summary Report to the State Lands Commission

Prepared by
The Institute for Western Maritime Archaeology
Contract C97069
November 1997

EXHIBIT B

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Introduction

In January, 1997 representatives of the State Lands Commission, National Park Service, and the Gulf of the Farallones National Marine Sanctuary met at the headquarters of the Point Reyes National Seashore to begin planning a two-year, joint research project to assess submerged cultural resources in selected areas of Drakes Bay. Such an assessment will enable the three agencies to carefully manage, study, and protect significant shipwrecks within the Point Reyes National Seashore and other resources that may lie in adjacent waters.

Agreements were reached between the three agencies regarding the project's research objectives, permitting requirements, cost allocations, and administrative protocols and responsibilities. A project team comprising representatives of all three agencies was created to coordinate planning and to oversee the project's administration.

For management purposes, the two-year project was divided into four phases. During Phase I (February-September 1997), project team members met approximately every six weeks to coordinate efforts to maximize the fieldwork scheduled for October 1997. During the Phase I planning period, a draft project research design was prepared by archaeologists from the National Park Service and the Institute for Western Maritime Archaeology, representing the State Lands Commission. In conjunction with this, a protocol was also developed to address the potential requirements of storage, stabilization, and conservation of any artifacts that would be recovered during fieldwork. That fieldwork, designated Phase II, was conducted in October 1997 and forms the basis of this report. Phase III will commence in the fall of 1998 and will consist of extended test excavations and possibly full excavations of selected magnetic and/or acoustic anomalies identified in the Phase II surveys. Phase IV will commence with the completion of the Phase III field work and will comprise the conservation, documentation, analysis, and interpretation of any historic artifacts recovered during the fieldwork. The project's final report will also be prepared during Phase IV.

Three primary objectives have been identified for the two-year project:

- To detect and evaluate shipwreck sites in selected portions of Drakes Bay.

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- To locate the remains of the *San Agustin,* wrecked in 1595.

- To recover examples of material culture that might provide new insights into historical lifeways, and that may be suitable for public interpretation.

In addition, three specific objectives were defined for the Phase II field work:

- To conduct remote sensing surveys in Drakes Bay over areas selected on the basis of historical research, archaeological research, and hypothetical modeling as being likely repositories of shipwreck remains.

- To test various combinations of hydraulic excavation tools in order to evaluate the most appropriate and efficient tool kit for use in Phase III.

- To deploy, evaluate, and recover various mechanical and electronic devices designed to prevent contact between divers and sharks or marine mammals.

Field Operations

Phase IIa: October 12-18, 1997

On October 12, 1997 project team members representing the National Park Service (NPS), NOAA, the State Lands Commission (SLC), the Institute for Western Maritime Archaeology, and the San Francisco Maritime National Historic Park, convened at the Pt. Reyes Lifeboat Station, the project's incident command post, to initiate the fieldwork of Phase II. Representatives of the NPS Submerged Cultural Resources Unit (SCRU) were in attendance, as were the volunteer diving coordinator, videographers from NPS, and representatives of the Drake Navigators Guild. Administrative procedures and project responsibilities were agreed upon and fieldwork commenced the following day, October 13.

The NPS SCRU team assumed responsibility for all remote-sensing operations, which were initially conducted from the 45' trawler *Madonna*, a privately-owned vessel under contract to

the project. A Geometrics 876 marine magnetometer, along with the NPS SCRU team's navigation and positioning equipment were installed aboard the vessel. In addition, a side-scan sonar unit, provided on a contractual basis with David Clark Associates, was installed on *Madonna*. Delivery of a sub-bottom profiler was expected in the latter part of the first week.

During the first week of Phase II, the NPS SCRU team surveyed two of the areas considered to be likely repositories of cultural resources, one on either side of Drakes Estero. Sixty five transects covering nearly two square miles were surveyed at 30 meter intervals with the magnetometer and side-scan sonar. The acoustic data collected indicated that any submerged cultural resources that might be present in the survey areas lacked surficial expression. However, several large, discrete magnetic anomalies were identified in the two survey blocks with the magnetometer. The location, association, and spatial arrangement of these magnetic anomalies indicated that their source was likely to be ferrous materials buried in the bottom sediments, rather than discrete geological formations. The locations of the anomalies were calculated with a differentially-corrected Global Positioning System (DGPS), so reacquisition to within less than one meter of each anomaly was possible.

Concurrent with the remote sensing survey, three other operations were being conducted during the first week. A second research vessel, the 52' *Shana Rae*, attempted to take up to six core samples of the sub-bottom matrix for later chronometric and geomorphological analysis. A commercial "vibra-core" drilling system was deployed in an effort to recover 4-inch diameter samples, 20 to 30 feet in length. Due to the presence of a solidified stratum of impenetrable sediment approximately 6 feet beneath the bottom surface, none of the cores were successful.

While the *Shana Rae* conducted the coring operation, project members prepared the dredges, pumps, and hoses that would be used to test the subsurface magnetic anomalies. Two teams were engaged in preparing the mechanical and electronic equipment that would be deployed to provide safety barriers between divers and sharks or other forms of marine life. One team completed preparation of an 8 square foot shark cage while waiting in San Francisco for the return of the *Shana Rae*, which would be used on-site to deploy and recover the cage. The second team remained at Drakes Bay and, using the State Lands Commission's vessel *Wet*

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Dog, developed the procedures necessary to efficiently deploy, anchor, and recover a 250 foot long shark net in the variable sea states that were encountered there.

Near the end of the first week, the magnetometer cable twisted while remote-sensing survey operations were underway. During the several days required to repair the cable, the acquisition of magnetic survey data was suspended, although the survey team continued operations with the side-scan sonar.

By the end of the first week, the NPS SCRU team had completed 100% coverage of the survey blocks with the side-scan sonar and 60-70% coverage of the survey blocks with the magnetometer. Earlier in the week the sub-bottom profiler had arrived, but it had been shipped with a sensor that was inappropriate for the particular bottom type found in Drakes Bay. Consequently, the sub-bottom profile survey was not pursued.

Nothing of any significance was seen in the side-scan sonar record but several magnetic targets had been identified in the two survey blocks to the east and west of Drakes Estero. Three of the largest, each 10 to 12 gammas in intensity within an area approximately 50 square meters in size, were selected for ground-truthing.

Phase IIb: October 19-24, 1997

With the beginning of the second week, diving operations commenced on two of the three anomalies. Objectives of the dives were:

- to determine the source(s) of the magnetic anomaly using hydraulic injection dredges.
- to examine and map the stratification of the sub-bottom matrix as it was exposed in the test excavations.

Early in the second week, the *Shana Rae* returned from San Francisco, where the vibra-core equipment had been removed and the shark cage secured to the vessel's rear davit. One anomaly on the west side of the Estero mouth was selected and the *Shana Rae* was positioned

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above it on a four-point moor. On a daily basis for the remainder of the week, the shark cage was lowered from the vessel's stern until all but the top of the cage was submerged. Two divers then entered the nearly submerged cage through a top-mounted hatch and the cage was lowered to the bottom. Divers were equipped with surface-supplied air and hard-wired communication devices that permitted diver-to-diver and diver-to-surface communication.

Once on the bottom, divers lifted the cage floor and deployed an induction dredge to move bottom sediments from the suspected location of the magnetic anomaly to a point some distance away from the excavation, where they were re-deposited on the bottom. By the end of the second week, divers had excavated approximately 385 cubic feet of bottom sediment, achieving a depth below the bottom surface of nearly eight feet. Despite the success of this excavation, the source of the anomaly had not been identified by week's end.

Concurrent with the operations conducted from the *Shana Rae*, the State Lands Commission's vessel *Wet Dog* was used to conduct ground-truthing operations on the anomaly identified on the east side of the Estero. The shark net was deployed from the *Wet Dog* on a daily basis around the anomaly, which was relocated each day with a hand-held, DGPS unit. The net was deployed each morning and recovered each evening to prevent the accidental snaring of boat propellers, marine mammals, and other forms of aquatic life during the period diving operations were not being conducted.

At least one, and oftentimes two, inflatable dive boats, a 16 foot Zodiac and a 15 foot Avon, were used as support platforms for the *Wet Dog* during net deployment and dive operations. Once the net was successfully deployed, anchored, and closed, one of the inflatable boats was positioned inside the circle formed by the net to serve as the diving platform. Divers working within the net were equipped with SCUBA and used wireless communication systems that permitted diver-to-diver and diver-to-surface communication.

The difficulties associated with the strong, variable currents found in Drakes Bay, particularly those found near shore, required large investments of time on a daily basis to properly deploy and anchor the net. Consequently, the time available in the second week to conduct ground-truthing operations within the net was considerably less than that afforded the operation

conducted from the *Shana Rae*. As a result, a comparatively smaller quantity of bottom sediment was removed from over the second anomaly and, as with the operations conducted from within the shark cage, the source of the magnetic anomaly could not be identified.

While ground-truthing operations were underway, the SCRU team's magnetometer and positioning equipment was transferred from Madonna to the NPS' 25 foot Boston Whaler. The shallower draft and increased maneuverability of this vessel provided a means to survey the near-shore waters west of the surf-zone. Several anomalies were identified in this portion of the survey that will warrant investigation during Phase III.

Summary

Although the source of the tested anomalies could not be identified, the efforts of well-over a dozen people during the two weeks of field-work achieved the three specific goals established for Phase II. The previously defined survey blocks were investigated with both side-scan sonar and magnetometer. Over twenty magnetic anomalies were identified that, in view of their size, configuration, and spatial relationships, may be potentially associated with historic shipwrecks. The effectiveness and efficiency of using both a shark cage and a shark net during diving operations were evaluated, and the capability of different combinations of pumps and dredge heads to move bottom sediments was tested.
In evaluating the two approaches to shark protection that were employed, it is clear that each is capable of providing adequate, safe separation between divers and various forms of marine life. However, each also possesses positive and negative functional traits that need to be considered in light of the overall project goals.

Shark Cage

The rigid-wall construction of the cage provides the strongest and most durable protective barrier, but it also makes the cage extremely heavy. The weight of the cage requires that it be deployed and recovered from a vessel of substantial size. Such a vessel must be firmly anchored in order to deliver the cage to the same location repeatedly, and to insure that shifting currents and changing tides don't move the vessel and, by extension, the cage when it

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is resting on the bottom. To insure such a positive anchor, the vessel needs to set an array of four anchors – a process that is both technically difficult and very time-consuming. Although different anomalies within the boundaries of the anchoring array could be tested, the need to obtain a four-point mooring precludes moving the shark cage from one area of anomalies to the next within a reasonable amount of time. However, a vessel large enough to support the shark cage also provides a large, stable working platform that offers convenient dredge pump and communication stations, as well as space for tank storage.

The weight of the cage is also a function of the size of the bottom area that can be investigated. To keep its weight to a manageable level, the cage was designed as an eight-foot square, with sides seven feet tall. This obviously limits the area of the bottom that can be investigated at any one time to 64 square feet. Excavation of such a relatively small area in unconsolidated bottom sediments such as those found in Drakes Bay requires the angle of repose of the sidewalls to become increasingly more obtuse as the depth of the unit increases. To prevent the cage from slipping into the unit as it is excavated, it is necessary to extend horizontal stabilizing bars from the bottom of the cage, which increase the weight of the cage and add to the potential difficulty of recovering it from the bottom.

In order for it to be an effective component of the excavation operation, the cage must be lowered to nearly the same location on the bottom after each shift change of divers. Assuming an effective four-point moor has been obtained, repeatedly repositioning the cage over the excavation unit should be possible, but cycling the cage from the bottom to the surface to exchange personnel may require at least partial disassembly of the dredge system. Reacquisition of the hoses will be necessary when the cage is re-deployed, which may require divers to leave the confines of the cage. The alternative to both these issues is to leave the cage positioned on the bottom, and have the divers swim to and from the cage from the dive platform. While this would eliminate the problems of site reacquisition and equipment recovery, it would expose the divers to potentially unfavorable interactions with marine life in that portion of the water column where such contact is most likely.

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Two other safety factors pertinent to the use of a cage underwater warrant consideration. The first is that, by its very nature, a cage creates an overhead environment. Coupled with the limited visibility found in the waters of Drakes Bay, this introduces an additional element of risk in the event an incident occurs requiring rapid recovery of the divers.

Secondly, since the discharge hose of the dredge system must be long enough to deposit excavated sediments far enough from the excavation in order to prevent the spoils from migrating back into the unit, the length of this hose must extend some distance outside the cage. As is frequently the case, the end of the hose must be cleared of dredge spoils which tend to accumulate around it. Whenever this occurs, a diver must leave the confines of the cage to uncover and reposition the hose, and is thus potentially exposed to the undesirable contact with marine life that the cage is designed to prevent.

Shark Net

Although it does not offer the rigidity of a cage, the shark net provides an acceptable protective barrier around a much larger area of the bottom surface than that covered by the shark cage. The size of the protected work area is highly variable, obviously only limited by the length of the net and our mechanical ability to deploy and recover it.

It is the latter issue that bears some consideration. A net 250 ft. in length provides a protected work area of approximately 5,025 sq. ft. While this is considerably larger than the work area provided by the cage, acquiring that space efficiently and quickly requires a good deal of coordination with other boats and is totally dependent on the strength of the currents and tides, wind, and the sea state.

Prior to setting the net, anchors and buoys must be deployed so that, once the net has been formed into a circle, its top rope can be fastened to hold a circular shape. This adds substantially to the amount of time necessary to successfully deploy the net. To prevent snagging boats or trapping marine life in the net, it must be recovered at the end of each day, which is also a very time-consuming and strenuous process. The demands of setting and recovering it probably preclude deployment of a single net in any more than two different locations per day.

By reducing the net width from 50 feet to 30 feet, significant weight saving may be realized, which will make handling the net easier. However, the weight of a saturated net is still substantial enough to warrant limiting overall length to a maximum of 250 feet, which by extension also limits the maximum work area on the bottom to a circle approximately 80 feet in diameter.

Although it does not create an overhead environment, the net tends to billow underwater in the prevailing current. This creates a potentially dangerous situation in that a diver working near the sides of the net may become entangled in it during tidal changes or shifts in the current. While this is not as critical as working in an overhead environment, it does necessitate that divers work in buddy teams – a requirement that is sometimes relaxed in relatively shallow water when diver-to-surface communications are being used.

Suggestions and Considerations for Phase III

The shark cage and the shark net each have positive and negative attributes, but neither possesses enough of the former to warrant selection as the most appropriate means of creating a barrier between divers and marine life. A combination of the favorable qualities of each may be found in the approach suggested during the final project de-briefing. Use of an open-well barge or platform boat would offer a large, stable, working platform that would allow the dredge pumps to be placed close to the water, would provide adequate storage space for tanks, and sufficient room for control of the diving operations. The shark net could be attached to the perimeter of the barge, lowered to the bottom during diving operations, and raised and secured to the barge at the end of each day. Since the net would not be retrieved from the water on a daily basis, the size and weight issues would not be a factor. Divers would enter and leave the water through the open well and, depending on the size of the platform, should be able to deploy the dredge's exhaust hose within the confines of the net. With an opening of sufficient size, adequate light should reach the bottom.

An approach of this nature would probably solve the shortcomings experienced with both the net and the cage. The barge could be moved from one anomaly cluster to another, anchored over the site, and left in place until all anomalies within the confines of the net had been

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ground-truthed. The barge would be left on-station for the duration of Phase III and project team members would be ferried back and forth from the boathouse, providing for relatively rapid daily mobilization.

For obvious reasons, use of the open-well barge would not be suitable for testing the anomalies in the surf zone. For practical purposes, ground-truthing those anomalies could only occur when the water and the surf zone are calmest. Although the high-energy of the surf zone and the relatively shallow water would preclude use of either a shark cage or net, it is assumed that, for the same reasons, use of such protective devices would not be necessary.

Two final considerations are the environmental and legal issues that must be addressed in advance of the commencement of Phase III. As the preliminary testing conducted during Phase II demonstrated, it is highly likely that a considerable amount of bottom sediment must be moved to determine the source of the magnetic anomalies. To accomplish this as efficiently as possible, the largest possible dredge should be used. From the work conducted with the 4 inch dredges used in Phase II, it appears that at least a 6 inch dredge will be required to move the amount of sediment necessary to test the maximum number of anomalies over a two week period.

Fortunately, a dredge – unlike an airlift- simply moves sediments from one location on the bottom to another, with little or no impact to the water column. However, the nature of the disturbance to the bottom sediments, and the effect of that disturbance on both the marine flora and fauna, must be thoroughly considered and the impacts addressed prior to initiation of Phase III. Likewise, the legal issues of such disturbance, particularly those relating to jurisdiction of the bottomlands and responsibility for the impacts that will result from dredging, should be clearly delineated prior to resumption of the project.