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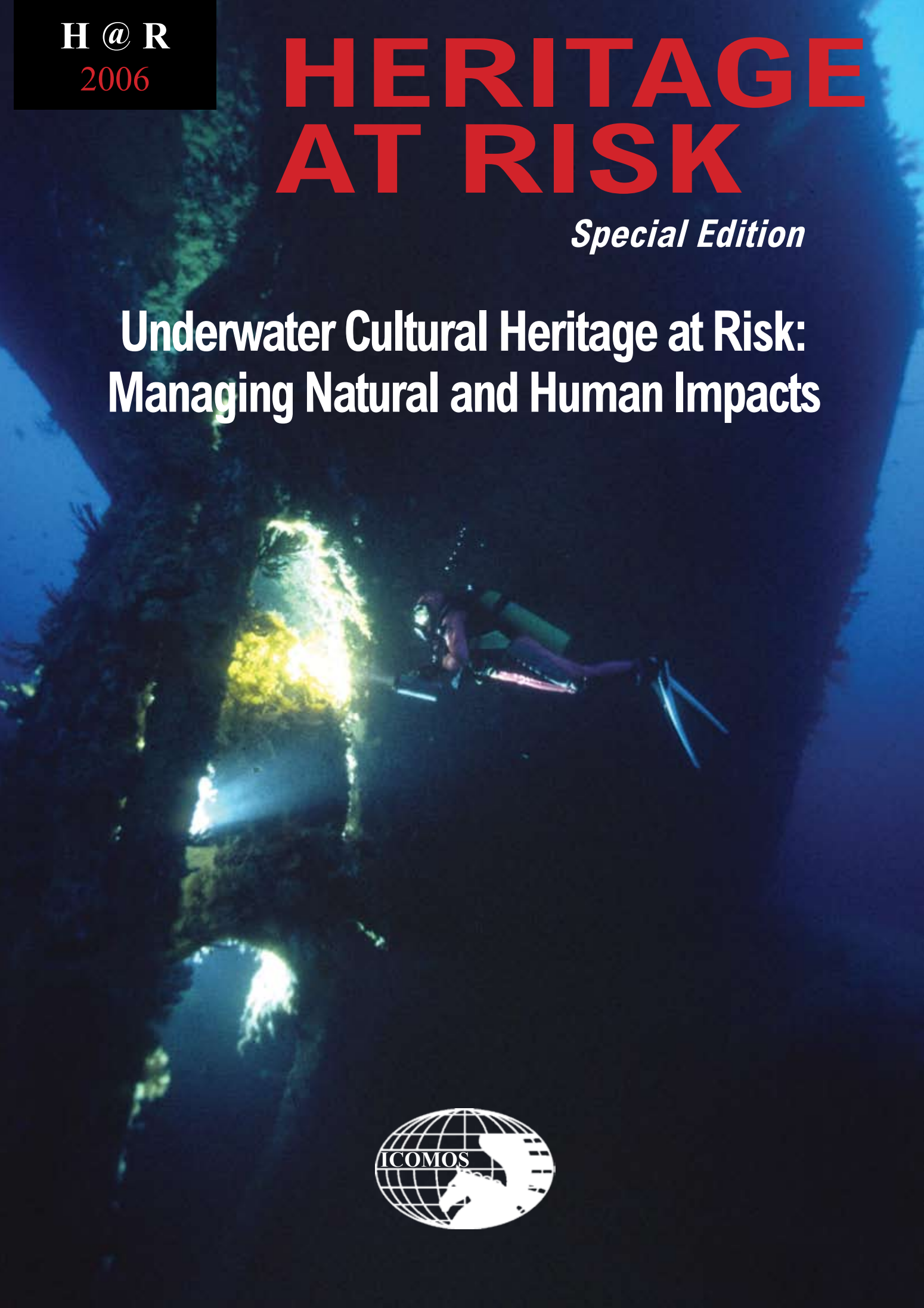
# HERITAGE AT RISK

*Special Edition*

## Underwater Cultural Heritage at Risk: Managing Natural and Human Impacts



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МЕЖДУНАРОДНЫЙ СОВЕТ ПО ВОПРОСАМ ПАМЯТНИКОВ И ДОСТОПРИМЕЧАТЕЛЬНЫХ МЕСТ

# Underwater Cultural Heritage at Risk: Managing Natural and Human Impacts

## Patrimoine Culturel Subaquatique en Péril : Gérer les impacts naturels et humains

## Patrimonio Cultural Subacuático en Peligro: Gestión del impacto natural y humano

**Heritage at Risk Special Edition**
**Hors Série Patrimoine en Péril / Patrimonio en Peligro Número Extraordinario**

**Edited by: Robert Grenier, David Nutley and Ian Cochran**

# Heritage at Risk Special Edition edited by ICOMOS

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Front Cover: Wreck of the *Nord*, Tasmania, Australia (Mark Spencer)

Back Cover: (Top) *Sound of Campeche* - Reconstruction of a modern shipwreck located in the coastal waters of Campeche, based on information gathered in situ and completed by data found at a local archive (Figure: INAH/SAS)
(Bottom) *Cayman Islands* - Anchor on the Glamis site, planned as the first Cayman Islands Shipwreck Preserve (Alexander Mustard)

Inside Front Cover: *Orio IV* - Vertical view of the wreck after the extraction of the iron mineral cargo placed in sacs around the boat to provide protection against the river currents during the dig; seen at the top of the image is the metallic bulkhead of the new port (Luis Mª Naya-INSUB)

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# Introduction to the UNESCO Convention on the Protection of the Underwater Cultural Heritage

**Guido Carducci**
*Chief, International Standards Section*
*Division of Cultural Heritage, UNESCO*[1]

The elaboration and the adoption of this Convention reflects the awareness reached within the international community of the cultural and historical significance of this heritage as well as of the increasing threats this heritage faces.

The Convention has an annex, which is an integral part of the Convention. While the latter covers general legal (wherever the location of the heritage) and special (applicable depending on the location of the heritage) provisions, the Annex has a technical nature and benefited from a rather unanimous support at the time of its adoption.

UNESCO welcomes this book, which provides several examples of sites in danger and contributes to a better understanding of the significance of underwater cultural heritage and of the role of the 2001 Convention.

The rapid progress in exploration techniques has certainly contributed to making the seabed more accessible and exploitable. The natural protection that depth has granted for centuries to underwater cultural heritage, such as wrecks, is nowadays more fragile. The market and the prices it may offer contribute to making exploration, recovery and then trade in this material a lucrative activity.

As the Convention is first of all an international legal instrument, this brief presentation aims at providing some legal understanding of the context (I), the main principles (II) and the possible ratification process (III) of the Convention[2].

## I) Existing Framework

At the international law level, the 1982 United Nations Convention on the Law of the Sea (UNCLOS) is an important reference text. Although it was drafted with a view to offering general provisions on the law of the sea, it includes two provisions (Articles 149 and 303) that refer specifically to archaeological and historical objects. Such specific reference not only confirms a specificity of these objects, differentiating them from "ordinary" objects, but the content of these provisions (Articles 149 and 303 paragraph 1) establish an obligation for States Parties to protect such objects.

For instance, Article 149 UNCLOS reads:

> *All objects of an archaeological and historical nature found in the Area shall be preserved or disposed of for the benefit of mankind as a whole, particular regard being paid to the preferential rights of the State or country of origin, or the State of cultural origin, or the State of historical and archaeological origin.*

Article 303, Paragraph 1 spells out a duty for States Parties to protect these objects found at sea and to cooperate for this purpose.

However, as a whole these two Articles do not specifically establish the content, i.e. the measures to be taken (by States Parties), of these duties to "preserve" (Article 149) and "protect" (Article 303).

Differently from UNCLOS, the 2001 UNESCO Convention represents an international regulation **specific to underwater cultural heritage**. As any treaty, the Convention and this specific regulation are effective only among States Parties (i.e. States that have joint the Convention). The 2001 Convention does not prejudice the rights, jurisdiction or duties of states under international law, including UNCLOS[3]. Every state may become a party to the 2001 Convention, regardless of whether it is a State Party to UNCLOS or not.

## II) General Principles of the 2001 Convention

Although some of the articles in this book may illustrate some of the provisions of the Convention, the general principles of the Convention may be summarized as follows:

1) **"Underwater Cultural Heritage"** means all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years (Article 1).

2) The **preservation *in situ*** of underwater cultural heritage (i.e. the current location on the seabed) is considered as the first option before allowing or engaging in any activities directed at this heritage (Article 2, paragraph 5). Such activities may however be authorized for the purpose of making a significant contribution to the protection or knowledge of underwater cultural heritage (Rule 1 of the Annex);

The preference given to *in situ* preservation as the first option:

- stresses the importance of and the respect for the historical context of the cultural object and its scientific significance and
- recognizes that such heritage is under normal circumstances preserved underwater owing to the low deterioration rate and lack of oxygen and therefore not necessarily *per se* in danger.

3) States Parties shall **preserve underwater cultural heritage** for the benefit of humanity, and take action individually or jointly therefore (Article 2, paragraph 3 and 4). The 2001 Convention does not directly regulate the delicate issue of ownership of the concerned cultural property between the various states concerned (generally flag states and coastal states); it does however establish clear provisions for the States concerned and for international cooperation schemes.

4) The principle that underwater cultural heritage shall **not be commercially exploited** (Article 2, paragraph 7) for trade or speculation or irretrievably dispersed is not to be understood as

- preventing professional archaeology, or the deposition of heritage recovered in the course of a research project in conformity with the Convention (Rule 2 of the Annex) or
- preventing salvage activities or actions by finders as long as the requirements under Article 4 of the Convention are fulfilled

5) Indeed an important compromise between protection and operational needs has been achieved in the 2001 Convention, in particular under Article 4, as any activity relating to underwater cultural heritage to which the Convention applies shall not be subject to the l**aw of salvage** or **law of finds**, unless it:

- is authorized by the competent authorities,
- is in full conformity with the Convention and
- ensures that any recovery of the underwater cultural heritage achieves its maximum protection.

6) Depending on the current location of the underwater cultural heritage, specific regimes for **cooperation between coastal and flag states** (and exceptionally other concerned states), are applicable (Articles 7 – 13):

- States Parties have the exclusive right to regulate activities in their *internal and archipelagic waters and their Territorial Sea* (Article 7),
- within their *Contiguous Zone* States Parties may regulate and authorize activities directed at underwater cultural heritage (Article 8) and
- within the *Exclusive Economic Zone*, or the *Continental Shelf* and within the Area (i.e. the waters outside national jurisdiction), a specific international cooperation regime encompassing notifications, consultations and coordination in the implementation of protective measures is established in Articles 9 – 11 of the 2001 Convention.

7) The 2001 Convention focuses on the protection of the underwater cultural heritage and does not cover nor affect the rules of international law and State practice pertaining to **sovereign immunities**, nor any State's rights with respect to its State vessels and aircraft. The Convention also does not create new grounds for claiming or contending national sovereignty or jurisdiction, and ensures respect to all human remains located in maritime waters (Article 2).

8) **Training** in underwater archaeology, the transfer of technologies and information sharing shall be promoted and public awareness shall be raised concerning the value and significance of the underwater cultural heritage (Articles 19-21).

## III) Joining the 2001 Convention

Governments generally consider existing treaties and decide whether they wish to ratify (or equivalent) them (and become a "State Party") or not.

Arguments in favour or against ratification may be in part common to most governments, and in part specific to the situation of a given State.

So far 6 States are party to the 2001 Convention[4]. Generally speaking, joining the 2001 Convention may contribute to:

- joining an international system for effective protection of the underwater cultural heritage,
- strengthening the fight against the growing looting and pillaging of underwater cultural heritage and sites,
- developing a national industry based on underwater cultural heritage activities,
- creating a protective infrastructure to support current and future underwater tourism in a way compatible with the Convention,
- ensuring interstate cooperation and exchange of experiences,
- offering a stronger position vis-à-vis merely commercial excavation projects so that there are positive repercussions for the local society and scientific knowledge,
- adopting or revising legislation according to international standards and
- becoming a more active party in the protection of cultural heritage.

For those governments that decide to join the Convention, the main phases of the process usually involve:

**At the national level**

*a legal implementation phase* in which, depending on the legal system of the country concerned:

a. a law or decree may be enacted to authorize the consent of the State to be bound by the Convention (by either ratification, or acceptance or approval for UNESCO Member States or by accession for non Member States) and

b. together with the enactment of this law or decree, *or* through separate legislation, the Convention is implemented domestically either by an all-encompassing reference to its text or by reproducing its content as national law.

**At the international level**

(i) the *deposit of the instrument* expressing the consent of the State to be bound by the Convention (the instrument of ratification, or acceptance, or approval or of accession) with the Director-General of UNESCO.

For such instrument a model is available[5].

ii) the *entry into force* of the Convention:

a. the Convention as a whole enters into force three months after the date of the deposit of the twentieth instrument (ratification, or acceptance, or approval or accession) with respect to the first twenty States Parties;

b. afterwards, the Convention enters into force vis-à-vis each new State (beyond the first twenty) three months after the date of deposit of its respective instrument.

1. This brief introduction is written in the author's personal capacity and does not commit the Organization.
2. This presentation follows and develops in part an information kit available at http://portal.unesco.org/culture/en/ev.php-URL_ID=23431&URL_DO=DO_TOPIC&URL_SECTION=201.html
3. See Article 3.
4. Panama, Bulgaria, Croatia, Spain, Libyan Arab Jamahiriya, Nigeria.
5. See the information kit cited.

# Introduction à la Convention de l'UNESCO sur la protection du patrimoine culturel subaquatique

**Guido Carducci**
*Chef, Section des normes internationales*
*Division du patrimoine culturel, UNESCO*[1]

L'élaboration et l'adoption de cette convention reflètent la conscience de la communauté internationale sur l'importance culturelle et historique de ce patrimoine ainsi que sur les menaces grandissantes auxquelles ce patrimoine fait face.

La Convention comporte une Annexe, qui fait partie intégrale de la Convention. Pendant que celle ci couvre les termes juridiques généraux (où que le bien patrimonial soit situé) et les termes spécifiques (applicables selon la localisation du bien patrimonial), l'Annexe est de nature technique et a bénéficié d'un soutien unanime au moment de son adoption.

L'UNESCO se réjouit du présent ouvrage, qui fournit une série d'exemples de sites subaquatiques en danger et contribue à une meilleure compréhension de la signification du patrimoine culturel subaquatique et du rôle de la Convention de 2001.

Le développement rapide des techniques d'exploration a certainement rendu les fonds marins plus accessibles et exploitables. La protection naturelle que la profondeur a fournie pendant des siècles aux sites subaquatiques, comme les épaves, est aujourd'hui fragilisé. Le marché et les prix qu'il offre contribuent à transformer l'exploration, la récupération et le commerce avec ce matériel en une activité très lucrative.

La Convention est avant tout un instrument légal international, cette brève présentation vise à fournir le contexte légal (I), les principaux principes (II) et le possible processus de ratification (III) de la Convention[2].

## I) Cadre existant

Au plan international, la **Convention des Nations Unies sur le droit de la mer de 1982** (« UNCLOS ») est un important texte de référence. Même si elle a été élaborée en vue de proposer des dispositions générales sur le droit de la mer, on y trouve néanmoins deux dispositions (articles 149 et 303) qui traitent spécifiquement des objets archéologiques et historiques. Cette référence explicite ne confirme pas uniquement la spécificité de ces objets, les distinguant des objets ordinaires, mais le contenu de ces dispositions (articles 149 et 303, paragraphe 1) mettent les États parties dans l'obligation de conserver ces objets.

Ainsi, l'article 149 de l'UNCLOS stipule que :

> *Tous les objets de caractère archéologique ou historique trouvés dans la Zone sont conservés ou cédés dans l'intérêt de l'humanité tout entière, compte tenu en particulier des droits préférentiels de l'État ou du pays d'origine, ou de l'État d'origine culturelle, ou encore de l'État d'origine historique ou archéologique.*

Article 303, Pararagraphe 1 stipule l'obligation des Etats parties à protéger les objets trouvés en mer et coopérer à cet égard.

Néanmoins, l'ensemble de ces deux articles n'établit pas le contenu, c'est-à-dire les mesures a prendre (par les Etats parties), de cette obligation de « sauvegarder» (Article 149) et « protéger » (Article 303).

A la différence de UNCLOS, la Convention de 2001 représente bien une réglementation internationale spécifique pour le patrimoine subaquatique. Comme tout traité, la Convention et cette réglementation spécifique ne s'applique qu'entre Etats parties (c'est à dire des Etats qui ont signé la Convention). Elle ne porte pas atteinte aux droits, à la juridiction et aux devoirs des États en vertu du droit international, y compris UNCLOS[3]. Tout État peut adhérer à la Convention de 2001 de l'UNESCO, qu'il soit ou non partie à l'UNCLOS.

## II) Principes Généraux de la Convention de 2001

Bien que certains des articles de cet ouvrage peuvent illustrer certaines dispositions de la Convention, les principes généraux de la Convention peuvent être résumés comme suit:

1) On entend par « **patrimoine culturel subaquatique** » toutes les traces d'existence humaine présentant un caractère culturel, historique ou archéologique qui sont immergées, partiellement ou totalement, périodiquement ou en permanence, depuis 100 ans au moins (article premier).

2) La **conservation *in situ*** du patrimoine culturel subaquatique (à savoir sa localisation actuelle dans le fond marin) est considérée comme l'option prioritaire avant que toute intervention sur ce patrimoine ne soit autorisée ou entreprise (article 2, paragraphe 5). De telles interventions peuvent toutefois être autorisées lorsqu'elles contribuent de manière significative à la protection ou à la connaissance dudit patrimoine (Règle 1 de l'Annexe).

Le fait de considérer la conservation *in situ* comme l'option prioritaire :

- souligne l'importance du contexte historique et de la signification scientifique de l'objet culturel ainsi que le respect qu'il faut lui accorder, et
- prend en considération le fait que dans des conditions normales, ce patrimoine est bien préservé dès lors qu'il est immergé, vu l'absence d'oxygène et la lenteur de la dégradation, et que donc, par principe, il ne se trouve pas nécessairement en danger.

3) Les États parties **préservent le patrimoine culturel subaquatique** dans l'intérêt de l'humanité et prennent, individuellement ou, s'il y a lieu, conjointement, les mesures appropriées, (article 2, paragraphes 3 et 4). La Convention de 2001 ne règle pas directement le problème épineux de la propriété des biens culturels entre les divers États concernés (généralement les États du pavillon et les États côtiers) ; elle contient cependant des dispositions claires pour les États concernés et propose des plans de coopération internationale.

4) Le principe selon lequel le patrimoine culturel subaquatique ne doit faire l'objet d'**aucune exploitation commerciale** (article 2, paragraphe 7) à des fins de transaction ou de spéculation, ni être dispersé irrémédiablement ne doit pas être compris comme :

- empêchant l'archéologie professionnelle ou le dépôt d'éléments du patrimoine récupérés dans le cadre d'un projet de recherche conduit en conformité avec la Convention (Règle 2 de l'Annexe) ou
- empêchant les activités de sauvetage ou les interventions de chasseurs de trésors tant que les dispositions de l'article 4 de la Convention sont respectées.

5) En effet, la Convention de 2001, en particulier son Article 4, a su parvenir à un compromis significatif entre protection et besoins opérationnels, aucune activité concernant le patrimoine culturel

subaquatique à laquelle la Convention s'applique n'est soumise au **droit de l'assistance** ni au **droit des trésors**, sauf si :

- elle est autorisée par les services compétents,
- elle est pleinement conforme à la Convention et
- elle assure que la protection maximale du patrimoine culturel subaquatique lors de toute opération de récupération soit garantie.

6) Selon la localisation actuelle du patrimoine culturel subaquatique, des régimes spécifiques de **coopération entre les États côtiers et les États du pavillon** (et exceptionnellement d'autres États concernés) s'appliquent (articles 7-13) :

- les États parties ont le droit exclusif de réglementer les interventions dans leurs **eaux intérieures, leurs eaux archipélagiques et leur mer territoriale** (article 7),
- dans leur **zone contiguë**, les États parties peuvent réglementer et autoriser les interventions sur le patrimoine culturel subaquatique (article 8) et
- dans la **zone économique exclusive**, ou sur le *plateau continental* et dans la *Zone* (à savoir dans les eaux au-delà des limites de la juridiction nationale), les articles 9 à 11 de la Convention de 2001 établissent un régime spécifique de coopération internationale qui prévoit des notifications, des consultations et une coordination dans la mise en oeuvre de mesures de protection.

7) La Convention de 2001 se concentre sur la protection du patrimoine culturel subaquatique et ne couvre ni modifie les règles du droit international et la pratique des États relatives aux immunités souveraines, ou l'un des quelconque droits d'un État, concernant ses navires et aéronefs d'État. La Convention ne peut également pas servir à faire valoir, soutenir ou contester une revendication de souveraineté ou juridiction nationale et veille à ce que tous les restes humains immergés dans les eaux maritimes soient dûment respectés. (Article 2).

8) Il est nécessaire de promouvoir la **formation** à l'archéologie subaquatique, le transfert de technologie ainsi que le partage de l'information et sensibiliser le public à la valeur et l'intérêt du patrimoine culturel subaquatique (articles 19-21).

## III) Adhérer à la Convention de 2001

Les gouvernements en général prennent en considération les traits existants et décident si ils souhaitent les ratifier (ou autre) ou non et donc devenir un Etat partie ou pas.

Les arguments pour ou contre la ratification sont en partie communs à la plupart des gouvernements, et en partie spécifiques à la situation d'un Etat particulier.

Jusqu'ici six Etats parties ont ratifié la Convention de 2001[4]. En général, ratifier la Convention de 2001 contribuerait à :

- renforcer la lutte contre le pillage de plus en plus fréquent du patrimoine et des sites culturels subaquatiques,
- développer une industrie nationale autour des activités liées au patrimoine culturel subaquatique,
- créer une infrastructure qui protège et favorise le tourisme subaquatique actuel et à venir, conformément à la Convention,
- s'assurer que les États coopèrent entre eux et échangent leurs expériences,
- s'associer à un système international qui protège efficacement le patrimoine,
- pouvoir faire preuve de plus de fermeté vis-à-vis des projets de fouilles à but purement lucratif afin d'en obtenir des retombées positives pour la société locale et le savoir scientifique,
- adopter ou réviser la législation nationale selon les normes internationales,
- jouer un rôle plus actif dans la protection du patrimoine culturel et
- accorder au patrimoine culturel subaquatique plus de visibilité et de reconnaissance.

Pour les gouvernements qui décident d'adhérer à la Convention, la procédure d'adhésion prévoit généralement :

**Au niveau national**

(i) une *phase de mise en place légale* durant laquelle, selon le système juridique du pays concerné,

a) une loi ou un décret peut être promulgué pour autoriser le consentement de l'État à être lié par la Convention (soit par ratification, acceptation ou approbation pour les États membres de l'UNESCO, soit par adhésion pour les États non membres) et

b) parallèlement à la promulgation de cette loi ou de ce décret, *ou* au moyen d'une législation distincte, la Convention est appliquée sur le plan national soit par une référence globale à son texte, soit par une reprise de son contenu dans la législation nationale.

**Au niveau international**

(i) Le *dépôt de l'instrument* exprimant le consentement de l'État à être lié par la Convention (instrument de ratification, d'acceptation, d'approbation ou d'adhésion) auprès du Directeur général de l'UNESCO.

En ce qui concerne cet instrument, un modèle est proposé[5].

(ii) L'*entrée en vigueur* de la Convention :

a) pour les vingt premiers États parties, la Convention, dans son intégralité, entre en vigueur trois mois après la date de dépôt du vingtième instrument de ratification, d'acceptation, d'approbation ou d'adhésion ;

b) ensuite, elle entre en vigueur pour chaque nouvel État (à partir du vingt et unième) trois mois après la date de dépôt de son instrument respectif.

1. Cette brève introduction est écrite par l'auteur dans sa qualité personnelle et n'engage pas l'Organisation.
2. Cette présentation suit et développe en partie un kit d'information disponible sur http://portal.unesco.org/culture/en/ev.php-URL_ID=23431&URL_DO=DO_TOPIC&URL_SECTION=201.html
3. Voir Article 3.
4. Panama, Bulgarie, Croatie, Espagne, Jamahiriya arabe libyenne, Nigeria.
5. Voir le kit d'information cité.

# Introducción a la Convención de la UNESCO sobre la Protección del Patrimonio Cultural Subacuático

**Guido Carducci**
*Jefe, Sección de Normas Internacionales*
*División del Patrimonio Cultural, UNESCO*[1]

La elaboración y la adopción de esta Convención refleja la conciencia de la comunidad internacional sobre la importancia cultural e histórica de este patrimonio y de la amenazas cada vez mayores que corre.

La Convención incluye un anexo que es parte integral de la Convención. Mientras ésta cubre disposiciones generales (independientemente de la localización del patrimonio) y especiales (aplicables dependiendo de la localización de este patrimonio), el anexo es de carácter técnico y recibió un apoyo unánime en el momento de su adopción.

UNESCO agradece la publicación de este libro, el cual proporciona varios ejemplos de sitios en peligro y contribuye a un mejor entendimiento de la importancia del Patrimonio Cultural Subacuático y del papel de la Convención de 2001.

No hay duda de que el rápido perfeccionamiento de las técnicas de exploración ha facilitado que los fondos marinos sean más accesibles y explotables. La protección natural que la profundidad ha concedido durante siglos al Patrimonio Cultural Subacuático, como los restos de navíos, está actualmente más en precario. El mercado y los precios que ofrece pueden contribuir a hacer que la exploración, el rescate y el comercio de este material se convierta en una actividad lucrativa.

Como la Convención es en primer lugar un instrumento legal internacional, esta breve presentación aspira a proveer un entendimiento legal del contexto (I), los principios fundamentales (II) y del eventual proceso de ratificación de la Convención (III)[2].

## I) Marco Existente

En el plano internacional la Convención de las Naciones Unidas sobre el Derecho del Mar de 1982 (UNCLOS) es un importante texto de referencia. Aunque fue redactado con el fin de establecer normas generales en materia de derecho del mar, contiene dos disposiciones (Artículo 149 y Artículo 303) referidas específicamente a los objetos de interés arqueológico e histórico. No solo esta alusión específica confirma la especificidad de dichos objetos, distinguiéndolos de los objetos ordinarios, sino tambien obliga a los Estados Partes a protegerlos.

Artículo 149, por ejemplo, reza como sigue:

> *Todos los objetos de carácter arqueológico e histórico hallados en la Zona serán conservados o se dispondrá de ellos en beneficio de toda la humanidad, teniendo particularmente en cuenta los derechos preferentes del Estado o país de origen, del Estado de origen cultural o del Estado de origen histórico y arqueológico.*

Articulo 303, Par. 1 explica en detalle la obligación por los Estados Partes de proteger los objetos encontrados en el fondo del mar y de cooperar para este fin.

Sin embargo, esos dos artículos no bastan en su conjunto para articular el contenido de esta obligación de « conservar » (Art. 149) y « proteger » (Art. 303), a saber las medidas que deben tomar los Estados Partes.

A diferencia de UNCLOS, la Convención de 2001 representa una norma referida **específicamente al patrimonio cultural subacuático**. Como todos los tratados, la Convención y esta norma especifica es efectiva solo entre los Estados partes (a saber los Estados que han suscrito la Convención). Nada de lo dispuesto en la Convención de 2001 va en perjuicio de los derechos, la jurisdicción ni las obligaciones que incumben a los Estados en virtud del derecho internacional, incluida la UNCLOS[3].Cualquier Estado puede ser Parte en ella, con independencia de que lo sea o no en la UNCLOS.

## II) Principios Generales de la Convención de 2001

Aunque algunos de los artículos de este libro ilustran unas disposiciones de la Convención, los principios generales se pueden resumir así:

1) Por **"patrimonio cultural subacuático"** se entiende "todos los rastros de existencia humana que tengan un carácter cultural, histórico o arqueológico, que hayan estado bajo el agua, parcial o totalmente, de forma periódica o continua, por lo menos durante 100 años" (Artículo 1).

2) La **preservación *in situ*** del patrimonio cultural subacuático (esto es, su ubicación actual en el lecho marino) deberá considerarse la opción prioritaria antes de autorizar o emprender actividades dirigidas a ese patrimonio (párrafo 5 del Artículo 2). Pese a ello, podrán autorizarse tales actividades cuando constituyan una contribución significativa a la protección, el conocimiento o el realce de ese patrimonio (Norma 1 del Anexo).

El hecho de privilegiar la preservación *in situ* como opción más deseable:

- subraya la importancia y el interés científico del contexto histórico de los bienes culturales y la necesidad de respetarlo y
- constituye un reconocimiento de que, en circunstancias normales, ese patrimonio se conserva bien bajo el agua gracias a una tasa de deterioro baja y a la escasez de oxígeno, y de que por lo tanto no está, per se, necesariamente en peligro.

3) Los Estados Partes **preservarán el patrimonio cultural subacuático** en beneficio de la humanidad y adoptarán, individual o colectivamente, todas las medidas necesarias a tal efecto (párrafos 3 y 4 del Artículo 2). La Convención no contiene disposición alguna para dirimir directamente el delicado asunto de la propiedad de un bien cultural en disputa entre varios Estados (que suelen ser el del pabellón y el ribereño). Sí contiene, en cambio, claras disposiciones referidas a los Estados en cuestión y a mecanismos de cooperación internacional.

4) El principio de que el patrimonio cultural subacuático **no debe ser explotado comercialmente** (párrafo 7 del Artículo 2) con fines de lucro o especulativos, ni tampoco ser diseminado de forma irremediable, no será interpretado de tal manera que:

- prohíba el ejercicio de la arqueología profesional o el depósito de bienes del patrimonio recuperados en el curso de un proyecto de investigación ejecutado de conformidad con la Convención (Norma 2 del Anexo),
- impida actividades o acciones de rescate por parte de los descubridores, en la medida en que éstas cumplan los requisitos establecidos en el Artículo 4 de la Convención.

5) En la Convención de 2001, en efecto, se llega a un notable compromiso (Artículo 4) entre el imperativo de protección y las necesidades operativas, pues ninguna actividad relativa al patrimonio cultural subacuático a la que se aplique la Convención estará sujeta a **las normas sobre rescate y hallazgos**, a menos que:

- esté autorizada por las autoridades competentes,
- esté en plena conformidad con la Convención y
- se garantice que toda operación de recuperación de patrimonio cultural subacuático se realice con la máxima protección de éste.

6) Dependiendo de la ubicación actual del patrimonio cultural subacuático, se aplicarán regímenes específicos de **cooperación entre los Estados de pabellón y ribereños** (y excepcionalmente otros Estados interesados) (Artículos 7 a 13):

- los Estados Partes tienen el derecho exclusivo de reglamentar y autorizar las actividades dirigidas al patrimonio cultural subacuático en sus aguas interiores y archipelágicas y su mar territorial (Artículo 7),
- los Estados Partes podrán reglamentar y autorizar las actividades dirigidas al patrimonio cultural subacuático en su zona contigua (Artículo 8) y
- para actuar dentro de la zona económica exclusiva o la plataforma continental y dentro de la Zona (es decir, las aguas fuera de la jurisdicción nacional), los artículos 9 a 11 de la Convención definen un régimen específico de cooperación internacional que entraña notificaciones, consultas y coordinación en la aplicación de medidas de protección.

7) La Convención centra su atención sobre el patrimonio cultural subacuático y nada de lo dispuesto en ella cubre o modifica las normas de derecho internacional y la práctica de los Estados relativas a las **inmunidades soberanas** o cualquiera de los derechos de un Estado respecto de sus buques y aeronaves de Estado. . Ningún acto o actividad realizado en virtud de la presente Convención servirá de fundamento para alegar, oponerse o cuestionar cualquier reivindicación de soberanía o jurisdicción nacional, y la Convencion garantiza por que se respeten debidamente los restos humanos situados en las aguas marítimas

8) La Convención de 2001 obliga a promover **la formación** en arqueología subacuática, la transferencia de tecnología y el intercambio de información, y a sensibilizar a la opinión pública acerca del valor y la importancia del patrimonio cultural subacuático (Artículos 19 a 21).

## III) Adherirse a la Convención de 2001

En general, los gobiernos consideran los tratados existentes y deciden si quieren ratificarlos (o equivalente) y ser Estado parte o no.

Argumentos en favor o en contra de la ratificación pueden ser en parte comun para la mayoría de los gobiernos, y en parte específicos a la situación de un Estado dado

Hasta ahora 6 Estados son parte de la Convencion de 2001[4]. En general, el hecho de ser Parte en la Convención de 2001 sería útil para:

- reforzar la lucha contra los actos cada vez más numerosos de saqueo y pillaje del patrimonio cultural subacuático y los sitios donde éste se encuentra,
- desarrollar en el país una rama de actividad económica basada en actividades que guarden relación con el patrimonio cultural subacuático,
- crear una infraestructura de protección para apoyar, en el presente y el futuro, un tipo de turismo subacuático compatible con la Convención,
- garantizar la cooperación entre Estados y el intercambio de experiencias,
- integrarse en un sistema internacional para la protección efectiva del patrimonio,
- gozar de una posición más fuerte ante proyectos de excavación que sólo persigan fines de lucro y lograr así que también sean beneficiosos para la sociedad local y para el progreso científico,
- promulgar o revisar textos legislativos con arreglo a las normas internacionales,
- participar más activamente en la protección del patrimonio cultural y
- conferir más notoriedad y reconocimiento al patrimonio cultural subacuático.

Para los gobiernos que deciden pasar a ser Parte en la Convención, en general el procedimiento entraña los siguientes pasos:

**En el plano nacional**

i) una *fase de aplicación jurídica* en la cual, dependiendo del sistema jurídico del país en cuestión:

a) se promulga una ley o decreto para autorizar al Estado a que consienta en vincularse a lo dispuesto en la Convención (por la vía de la ratificación, aceptación o aprobación, en el caso de Estados Miembros de la UNESCO, o de la adhesión, en el de Estados no Miembros); y

b) junto con la aprobación de esa ley o decreto, o bien mediante otra disposición legislativa, se aplica la Convención dentro del país, ya sea con una referencia global a su texto o promulgando una ley nacional que reproduzca su contenido.

**En el plano internacional**

i) el *depósito ante el Director General de la UNESCO del instrumento* por el que el Estado consiente en vincularse a la Convención (instrumento de ratificación, aceptación, aprobación o adhesión);

Para este instrumento, hay un modelo disponible[5].

ii) la *entrada en vigor* de la Convención:

a) la Convención como tal entra en vigor para los veinte primeros Estados Partes a los tres meses de la fecha de depósito del vigésimo instrumento de ratificación, aceptación, aprobación o adhesión;

b) posteriormente, para cada nuevo Estado Parte (después de los veinte primeros), la Convención entra en vigor tres meses después de la fecha de depósito del correspondiente instrumento.

1. Esta breve introducción es escrita a titulo personal del autor y no compromete a la Organización.
2. Esta presentación sigue y desarrolla en parte una carpeta de información disponible en http://portal.unesco.org/culture/en/ev.php-URL_ID=23431&URL_DO=DO_TOPIC&URL_SECTION=201.html
3. Ver Artículo 3.
4. Panamá, Bulgaria, Croacia, España, amahiriya Arabe Libia, Nigeria.
5. Ver la carpeta de información citada.

# Foreword

**Michael Petzet**
*President*
*ICOMOS International*

When in November 2001 the UNESCO General Assembly adopted the new *Convention on the Protection of the Underwater Cultural Heritage*, no one expected that explaining and promoting the ratification of this Convention would have proved to be such a difficult task, considering the clear advantages it provides for maritime and riverside countries. In fact, ICOMOS and UNESCO were to experience the ignorance and mistrust that the sea has given rise to in men throughout history. The depths of this mysterious universe, which covers four-fifths of our planet's surface, have only recently become accessible or conquerable, several decades after the conquest of space. Yet this immense part of our universe has served as a communication and transport route for thousands of years, allowing mankind and its multiple civilisations to develop. Unique relics of lost civilisations are scattered on the ocean floors, and the beds of rivers and lakes, including in particular sunken ships.

As the great maritime historian Michel Mollat du Jourdain stated so well, historians have for too long ignored the sea, its fishermen and its sailors. The same is true of international organisations such as the United Nations, UNESCO and ICOMOS. The United Nations' International Convention on the Law of the Sea was not introduced until 1982, and only in 2001, almost twenty years later, did UNESCO adopt the Convention for the Protection of Underwater Cultural Heritage, one of its most recent. Finally, it was only twenty-five years after its foundation that ICOMOS saw the birth of its International Scientific Committee dedicated to the protection and management of underwater cultural heritage (ICUCH).

This young Scientific Committee, founded on the initiative of Australia in 1991, and initially composed of eighteen members, the majority highly specialised and recognised in the discipline of underwater archaeology, received as its first mandate the task of developing a Charter dedicated to the proper management of the underwater cultural heritage. The text produced by ICUCH was adopted in 1996 during the ICOMOS General Assembly held in Sofia, Bulgaria. This document, created to serve as a guide and as the basis, on the operational level, for the drafting of the future UNESCO Convention, is known as the ICOMOS Charter on the Protection and Management of Underwater Cultural Heritage.

This ICOMOS charter met with such success during the four years of deliberations it took at UNESCO to develop an international convention, that finally it was incorporated almost in full as an annex. This annex-charter is today an integral part of the Convention. Several influential countries have not hesitated to declare that the ICOMOS charter constituted the heart and soul of the said Convention and that, without this text, a Convention would never have seen the light of day. This charter was unanimously supported by an assembly which was nevertheless partially divided over the content of the actual Convention, a rather juridical text. All of these countries in return committed themselves to put the ICOMOS charter into practise.

ICOMOS notes, not without some pride, that its Charter for the Protection of Underwater Cultural Heritage, now also Annex to the 2001 Convention, is currently being partially or completely implemented in a number of countries, including some important maritime powers. Opposed to certain juridical aspects of the Convention, many of these abstained from voting in favour of the new Convention. Even in countries strongly in favour of the Convention who, like Canada, are recognized for their management of underwater cultural heritage, this annex has become a major asset which facilitates and allows management and protection to be standardized, even before they ratify the Convention. In fact, by implementing the annex those countries are applying the essentials of the said Convention.

It is not surprising that, considering the relatively recent adoption of the Convention and establishment of the ICOMOS International Scientific Committee on Underwater Cultural Heritage (ICUCH), this first volume dedicated to the Underwater Cultural Heritage comes rather late in the ICOMOS *Heritage at Risk* series, as a special edition. It was time and important for ICOMOS and, without doubt, for UNESCO, that such a publication be produced to raise awareness and foster understanding of the nature of this cultural heritage and the problems it faces world wide: ICOMOS is proud of this first attempt and also hopes that this publication will serve to stimulate the interest of our National Committees, helping them to better understand and support the efforts of those who in their respective countries are fighting to protect, manage and promote this important, and threatened, part of our common cultural heritage.

# Avant-propos

**Michael Petzet**
*Président*
*ICOMOS International*

Lors de l'adoption en novembre 2001 par l'Assemblée Générale de l'UNESCO du texte de la nouvelle Convention pour la protection du Patrimoine culturel subaquatique, nul ne s'attendait à affronter une tâche aussi difficile pour expliquer et promouvoir la ratification de cette convention pourtant si avantageuse pour les pays maritimes et riverains. De fait, l'ICOMOS et l'UNESCO allaient refaire l'expérience de l'ignorance et de la méfiance que la mer a suscitée auprès des hommes au cours des temps. Les profondeurs de cet univers mystérieux qui recouvre les quatre cinquièmes de la surface de notre planète n'ont été accessibles et conquises que tout récemment, plusieurs décennies après la conquête de l'espace. Pourtant cette immense partie de notre univers avait servi de voie de communication et de transport depuis des millénaires et avait permis à l'homme et ses multiples civilisations de se développer. Des vestiges uniques de civilisations disparues se trouvent disséminés sur les fonds submergés, en particulier les navires coulés.

Comme l'avait si bien indiqué le grand historien maritime Michel Mollat du Jourdain, les historiens ont pendant trop longtemps ignoré la mer, ses pêcheurs et ses marins. Il en va de même pour les organismes internationaux comme les Nations Unies, l'UNESCO et l'ICOMOS. La convention internationale de l'ONU sur les droits de la mer est venue bien tardivement en 1982 et près de vingt ans plus tard, la convention pour la protection du patrimoine culturel submergé fut une des dernières adoptées par l'UNESCO, soit en novembre 2001. Enfin, il aura fallu attendre près de trente ans après sa fondation, soit en 1991, pour que l'ICOMOS voit naître en son sein un Comité Scientifique International dédié à la protection et à la gestion des biens culturels subaquatiques (ICUCH).

Ce jeune Comité Scientifique fondé en Australie et formé initialement de dix-huit membres, la plupart hautement spécialisés et reconnus dans la discipline de l'archéologie subaquatique, avait reçu comme premier mandat de développer une charte dédiée à la bonne gestion du patrimoine culturel subaquatique. Le texte conçu par l'ICUCH fut adopté en 1996 lors de l'Assemblée Générale de l'ICOMOS à Sofia, en Bulgarie. Ce dossier, conçu pour servir de guide et de fondement sur le plan opérationnel pour la rédaction du texte de la future convention de l'UNESCO, est connu depuis comme la Charte de l'ICOMOS sur le patrimoine culturel subaquatique.

Cette charte de l'ICOMOS connut un tel succès lors des délibérations tenues pendant quatre ans à l'UNESCO pour développer un texte de convention internationale qu'elle y fut incorporée presque intégralement en annexe. Cette annexe-charte fait maintenant partie intégrale de la Convention. Plusieurs pays influents n'ont pas hésité à déclarer que la charte de l'ICOMOS avait constitué l'âme et le cœur de la dite convention et que, sans ce texte, il n'y aurait pas eu de convention. Elle fut appuyée unanimement par une assemblée pourtant partiellement divisée sur le texte même de la Convention, texte plutôt juridique. Tous ces pays s'engageaient en retour à la faire appliquer.

L'ICOMOS est désormais fier de constater que sa Charte pour la protection du patrimoine culturel subaquatique, devenue l'Annexe de cette convention de 2001, est mise en application partiellement ou totalement dans nombre de pays, incluant de grands pays maritimes opposés à certains aspects du contenu juridique. Beaucoup de ces derniers s'étaient abstenus de voter en faveur de la nouvelle convention. Même dans des pays fortement en faveur de la Convention qui, comme le Canada, sont reconnus pour leur gestion des biens culturels submergés, cette Annexe est devenue un atout majeur qui facilite et permet d'uniformiser la gestion et la protection, avant même que la convention y soit ratifiée. De ce fait, ces pays appliquant l'Annexe appliquent l'essentiel de la dite convention.

Il n'est pas surprenant que, comme la dite tardive convention et comme la naissance récente du comité ICUCH, ce premier volume dédié au Patrimoine culturel subaquatique apparaisse tardivement dans cette collection du *Patrimoine en Péril*. Il était temps et important pour l'ICOMOS et, sans aucun doute pour l'UNESCO, qu'une telle publication soit produite et vienne faire connaître et comprendre la nature et les problèmes de ce patrimoine culturel à travers le monde. L'ICOMOS est fier de cette première tentative et espère que d'autres suivront pour assurer un rattrapage longuement attendu. Nous espérons aussi que ce texte servira à éveiller nos Comités Nationaux et leur permettra de mieux comprendre et mieux supporter les efforts de ceux et celles qui luttent dans leurs pays respectifs pour protéger, gérer et mettre en valeur cette grande composante menacée de notre patrimoine commun.

# Prólogo

**Michael Petzet**
*Presidente*
*ICOMOS Internacional*

Durante la adopción en noviembre 2001 por la Asamblea General de la UNESCO del texto de la nueva *Convención sobre la protección del Patrimonio cultural subacuático*, nadie esperaba enfrentar una tarea tan difícil para explicar y promover la ratificación de esta convención tan ventajosa para los países marítimos y ribereños. De hecho, ICOMOS y la UNESCO volvieron a experimentar la ignorancia y desconfianza que el mar ha suscitado en los hombres en el curso del tiempo. Las profundidades de este universo misterioso que cubre cuatro quintos de la superficie de nuestro planeta han sido accesibles y fueron conquistadas sólo muy recientemente, varios decenios después de la conquista del espacio. Sin embargo, ese inmenso espacio de nuestro universo había servido de vía de comunicación y de transporte desde hace milenios y había permitido que el hombre y sus múltiples civilizaciones se desarrollaran. Diseminados y sumergidos en el fondo de los océanos, ríos y lagos se encuentran restos únicos de civilizaciones desaparecidas, incluyendo en particular los navíos hundidos, estos remanentes patrimoniales que jalonan el fondo.

Tal como lo indicara el gran historiador marítimo Michel Mollat de Jordania, los historiadores han ignorado durante demasiado tiempo el mar, sus pescadores y sus marinos. Lo mismo ha ocurrido con los organismos internacionales como las Naciones Unidas, la UNESCO y el ICOMOS. La convención internacional de la ONU sobre los derechos del mar se produjo tardíamente en 1982, y , casi veinti años más tarde, la convención sobre la protección del patrimonio cultural sumergido fue una de las últimas adoptadas por la UNESCO, en noviembre de 2001. En fin, fue necesario esperar casi veinticinco años después de su fundación, en 1991, para que ICOMOS viera la creación de un comité científico internacional dedicado a la protección y la gestión de los bienes culturales subacuáticos (ICUCH).

Este nuevo comité científico fundado en Australia y formado inicialmente por dieciocho miembros, la mayor parte altamente especializados y reconocidos en la disciplina de la arqueología subacuática, recibió como primer mandato redactar una Carta dedicada a la buena gestión del patrimonio cultural subacuático. El texto concebido por el Comité fue adoptado en 1996 durante la Asamblea General de ICOMOS en Sofía, Bulgaria. Ese documento, concebido como guía y fundamento en el plano operativo para la redacción del texto de la futura convención de la UNESCO, se conoce como la Carta de ICOMOS sobre el patrimonio cultural subacuático.

Fue tal el éxito de dicha Carta de ICOMOS, en las deliberaciones sostenidas durante cuatro años en la UNESCO para elaborar un texto de convención internacional, que fue incorporada casi integralmente en forma de anexo. Ese Anexo-Carta es ahora parte integral de la Convención. Muchos países influyentes no han demorado en declarar que la Carta de ICOMOS constituye el alma y el corazón de dicha convención y que, sin ese texto, no habría sido posible la convención. Fue apoyada unánimemente por una asamblea que estuvo, no obstante, parcialmente dividida sobre el texto mismo de la Convención, texto más bien jurídico. Todos esos países se comprometieron a su vez a hacerla aplicar.

ICOMOS está orgulloso de constatar que su Carta sobre la protección del patrimonio cultural subacuático, convertida en el Anexo de esta convención de 2001, se aplique parcial o totalmente en numerosos países, incluyendo grandes países marítimos opuestos a ciertos aspectos jurídicos del contenido. Muchos de estos últimos países se habían abstenido de votar a favor de la nueva convención. Incluso en los países que apoyaban decididamente la Convención que, como Canadá, son reconocidos por su gestión de los bienes culturales sumergidos, ese Anexo se convirtió en un gran instrumento que facilita y permite uniformizar la gestión y la protección, antes que la convención sea ratificada. Por eso, los países que aplican el Anexo aplican lo esencial de dicha convenci ón.

No resulta sorprendente que, al igual que la convención y la reciente creación del ICUCH, este primer volumen dedicado al Patrimonio cultural subacuático haya tardado tanto en aparece en esta colección del *Patrimonio en Peligro*. Esta esperada publicación, tan importante para ICOMOS y UNESCO, permitirá conocer y comprender la naturaleza y los problemas de ese patrimonio cultural a través del mundo. ICOMOS se enorgullece de esta primera iniciativa y espera que otras sigan para asegurar una recuperación largamente esperada. Nosotros esperamos también que este texto sirva para despertar a nuestros comités nacionales y les permita comprender mejor y apoyar más los esfuerzos de quienes luchan en sus países respectivos para proteger, manejar y valorizar este gran componente amenazado de nuestro patrimonio común.

# Introduction: Mankind, and at Times Nature, are the True Risks to Underwater Cultural Heritage

**Robert Grenier**
*President*
*ICUCH*

The ICOMOS International Scientific Committee on the Underwater Cultural Heritage (ICUCH) was involved from the very beginning in the tough four-year battle which took place at UNESCO, in five week-long sessions from 1998 to 2001, to draft the text of a convention for the protection of this cultural heritage. From the outset of these confrontations, which pitted the key maritime stakeholders against each other, ICUCH realised that the major challenge went beyond reconciling these interests, often underlying and not articulated. The challenge lay in dealing with the profound ignorance of what constitutes the underwater cultural heritage, the threats it faces and the solutions available to protect it, as well as the measures that could be taken to ensure an appropriate legal framework to facilitate the work of those countries and stakeholders wishing to put in place such systems of protection. The discussion had to be freed from the stereotypes linked to concepts and practices on dry land and from the romantic clichés fostered by comic strips, literature or cinema which has nurtured us with archetypes as extravagant as the Titanic or even the image of Red Rackham's treasure, in the *Tintin series*.

First and foremost, it was necessary to gain acceptance of the idea that the underwater cultural heritage is part of the universal heritage of humanity, just as significant and deserving the same protection as the cultural heritage found on dry land, and that it was necessary to liberate this heritage from the age-old tradition of "first-come, first-served" salvaging practice. Historic wrecks had to cease being viewed as sources of "supply" for the coastal populations and, over the last few decades, for divers and enterprises equipped to harvest these collections of cultural objects available to anybody on the marine floors. We had to transform the idea that this heritage has to be saved from the destructive effects of time and the elements, which may be true occasionally, by raising awareness of the fact that mankind is the real enemy, with our diving, dredging and powerful construction equipment, motivated by financial gain, the most powerful opponent of cultural heritage. Mankind is the true threat to underwater cultural heritage, but, equipped with the 2001 Convention and its Annex, we can also be its protector and saviour. We are now able to protect and to save this common heritage of humanity from ourselves and sometimes from nature.

## The Concept of Risk at the Heart of the Problem

No concept is more fundamentally appropriate and associated with underwater cultural heritage than that of risk. Of course, for several years now, the ICOMOS Heritage at Risk publication series has eloquently demonstrated the nature and extent of the dangers that threaten cultural monuments and sites around the world. However, in general, these monuments and sites have the advantage of being accessible and visible, of having an identifiable location, which allows the damages caused by mankind or by the natural elements to be detected, at least most of the time. The destruction of the giant Buddhas of Bamiyan in Afghanistan rapidly made the headlines in the international media. It was the same for the destruction caused by the force of nature in the city of New Orleans in 2005. Under the sea, irreplaceable sites can be destroyed by acts of man or nature without anyone knowing. How many historic wrecks were destroyed by the monstrous tsunami in December 2004 or by the forces unleashed by Hurricane Katrina on the Louisiana coast? We will probably never know. The same applies to the damages caused by mankind, equipped with deep-sea diving suits, with dredges or with mechanical equipment. On dry land, such actions would leave traces and be observed by witnesses, possibly giving rise to a beneficial public outcry. Underwater, almost anything can happen unnoticed.

The risks endangering underwater cultural heritage sites are multiplied by the widespread absence of protective legislation, which has, on the other hand, been generally enacted for dry land sites in most countries. Surprisingly, some countries renowned for the protection and proper management of their cultural heritage never had, and still do not have, national legislation to protect their underwater cultural heritage: this has been the case, until now, of a country such as Canada, equipped with a law on salvaging, which could not be more anti-cultural as it provides legal protection to "salvagers" who destroy archaeological sites. In some sense, such a situation is worse than a total absence of regulative legislation. Other counties, having enacted adequate laws to protect their underwater cultural heritage, lack the capacity to implement these or the political will to do so.

For decades, commercial enterprises or treasure hunters have experienced widespread success along the following rational: "historic wrecks are at risk, threatened by the forces of nature and by time, there are many of them and time is pressing. Archaeologists are not available in sufficient number, nor do they have the time, nor the technical and financial means to save these wrecks, and we have saved more wrecks than all of the archaeologists put together." This argument has succeeded in convincing many politicians worldwide to the detriment of the cultural heritage of their respective countries. The reality is completely different:

A) In general, historic wrecks, after several years or decades of rapid initial deterioration, gradually reach a stabilised state of conservation that will last for centuries, and in some cases, for millennia, as shown by Mediterranean wrecks many thousands of years old or by North American wrecks dating from four or five centuries ago. One only has to point out the well-conserved Greek ship which sank 2300 years ago near Kyrenia, Cyprus, or the four Basque whaling ships sunk close to 500 years ago in the port of Red Bay, in Labrador.

Other examples include the *Wasa*; in Stockholm, close to 400 years old; the *Mary Rose* in England, almost 500 years old, etc. Although the sea initially damages the ships, it then little by little becomes the protector of its prey. A currently famous case is that of the *Sussex*, sunk off Gibraltar in 1694 in thousands of meters of water. At this depth, this incredibly valuable English wreck was in no danger except from the advanced technology used by the contractors involved in its salvage, who should never have received the necessary permits.

B) An inventory of all the wrecks who have been subject to excavation or salvage since the invention of the aqualung (autonomous deep-sea diving suit) half a century ago demonstrates that no historic wreck has ever been saved by commercial contractors or treasure hunters; only archaeologists have succeeded in this task. At the very most, treasure hunters have "saved" objects of commercial value at the cost of the destruction of the archaeological context, which is the real danger. These people exploit historic wrecks as if they were mines of precious metals. The countries that compromise with them, attracted by the promise of receiving 10% and even up to 50% of the spoils, in fact, recuperate only a minimal part of the historic value of the wreck, as 90 to 95 % of this value is destroyed in most cases. These wreck salvagers are in fact like proverbial wolves guarding the flock. Why not conserve 100% of what belongs to the nation?

It is therefore not surprising that the 2001 Convention and its Annex are based above all upon the elimination of the law of salvage and preventing the commercial exploitation of the underwater cultural heritage, both "incompatible with the protection of the underwater heritage." If it were necessary to keep only a single article of this Convention, it is clear that article 2.2 and rule 2 of the Annex, whom together form a single entity, would suffice to eliminate the fundamental problem, the allure of financial gain, source of all of the threats posed to the underwater cultural heritage. The 32 papers, brought together in this publication, illustrate many examples of underwater historic sites endangered throughout the world, whether by humans acting directly underwater, or by the intrusion of our machines, devices and engineering works, or by the forces of nature, or by a combination of the two. For each case analysed, solutions to mitigate the effects are presented, respecting the cultural resource and its conservation, in conformity with the major elements of the Convention. Several of the proposed solutions illustrate, in fact, the principle of *in situ* conservation, whether it be the case of the undersea museum of Louisbourg in Canada, the William Salthouse in Australia or of Bell Island in Newfoundland.

Other, more drastic, solutions are required when both the natural elements and divers constitute a combined menace, as is the case for the *Elizabeth and Mary*, sunk in 1690 on the banks of the Saint Lawrence in Canada. This site is in such shallow waters and so close to the shore that *in situ* conservation was not an option, and a complete recovery of the archaeological remains was the only viable solution. The case of the wreck of a 16$^{th}$-century small ore carrier sunk in the Orio river in Basque Country is an extraordinary and unique example of a simple, small coastal vessel smashed in half by an immense metal pillar during the construction of a highway bridge, who, nevertheless, was able to yield the hitherto unknown secrets of its design and construction, and provide a view of the great saga of the Basque iron and steel industry at its apogee.

The following chapters also demonstrate that the solutions are not unique to developed countries such as Australia, the USA or the United Kingdom, but are also accessible to countries such as Sri Lanka, Turks and Caicos, and Polynesia. This publication allows the assessment and appreciation of the lesser-known, but critical, aspects of this Convention of 2001. In particular, it discusses raising awareness among the public, above all among the diving public, who can become an essential ally, the importance of cooperation between flag countries and coastal countries and the value of opening up to reputable commercial enterprises such as those who organise diving tours and who see in the protection and good management of the underwater cultural heritage a method of prolonging the life of the visited sites, their livelihood. It is for this last reason that the text of the tour guide Rick Stanley has been selected as the first chapter. Finally, throughout these articles, the reader will become aware of the importance of training divers and the public, one of the great successes among the efforts employed since autumn 2001 to promote this Convention. Our main objective is to sensitize the reader to this, all too often unrecognized and misunderstood, reality of the underwater cultural heritage. We hope to make each one of you our ally, if not an active participant, in the activities undertaken to reduce the risks to the underwater cultural heritage in your country, social environment and sphere of activity.

# Introduction : le vrai péril du patrimoine submergé : Ce sont les hommes, parfois la nature

**Robert Grenier**
*Président*
*ICUCH*

Le Comité Scientifique International de l'ICOMOS pour la protection du patrimoine culturel subaquatique (ICUCH) a été associé dès la première heure à la dure bataille qui s'est déroulée à l'UNESCO pendant quatre ans pour développer le texte d'une Convention pour la protection du dit patrimoine, cela au cours de 5 sessions d'une semaine chacune de 1998 à 2001. Dès le début de ces affrontements entre de grands intérêts maritimes, l'ICUCH a réalisé que le défi majeur se situait bien au-delà de la réconciliation de ces intérêts, souvent sous-jacents et non dits. Le défi se situait dans l'ignorance profonde de ce qu'était la réalité même du patrimoine culturel subaquatique, de ce qui le menaçait, des solutions qui s'offraient pour le protéger et des moyens à prendre pour assurer un encadrement juridique propre à faciliter le travail des pays et des intervenants intéressés à mettre en place ces systèmes de protection. Il fallait se débarrasser de stéréotypes liés aux concepts et réalités existant sur la terre, des stéréotypes romantiques dont nous avaient nourris les bandes dessinées, la littérature ou le cinéma qui nous avaient imprégnés d'archétypes aussi extravagants que le Titanic ou même que l'image du Trésor de Rackam le Rouge.

Il fallait avant tout faire accepter l'idée que le patrimoine culturel submergé était un patrimoine universel de l'humanité, tout aussi important, qui méritait la même protection que le patrimoine culturel sur terre, qu'il fallait le libérer des traditions millénaires de la loi du sauvetage, du premier arrivé, premier servi. Les épaves patrimoniales devaient cesser d'être des sources d'approvisionnement pour les habitants des côtes ou, depuis les dernières décennies, pour les plongeurs et entrepreneurs équipés pour moissonner ces récoltes d'objets culturels s'offrant au premier venu sur les fonds marins. Nous devions modifier l'idée qu'il fallait sauver ce patrimoine contre les effets destructeurs du temps et des éléments, ce qui est une réalité à l'occasion, et plutôt faire prendre conscience que l'homme est le véritable ennemi avec son équipement de plongée, avec ses dragues, ses puissants équipements de construction, motivé par ce puissant adversaire du patrimoine culturel qu'est l'appât du gain. Le péril véritable, c'est l'homme. C'est aussi l'homme qui peut être le protecteur, le sauveur, équipé maintenant de cette Convention de 2001 et de son Annexe. Il est désormais en mesure de protéger et de sauver ce patrimoine commun de l'humanité contre lui-même et parfois contre la nature.

## Notion de péril au cœur même du problème

Aucune notion n'est plus profondément appropriée et associée au patrimoine culturel submergé que la notion de péril. Bien sûr, la collection de l'ICOMOS sur le Patrimoine en Péril démontre de façon éloquente, depuis des années, la nature et l'étendue de ces dangers qui menacent les monuments et sites culturels à travers le monde. Mais ces sites et monuments ont en général l'avantage d'être accessibles et visibles, d'avoir une adresse quelque part, de telle sorte que tout dommage causé par l'homme ou par les éléments naturels est décelable la plupart du temps. La destruction du Bouddha géant du site Bamiyan d'Afghanistan a rapidement fait la une des médias internationaux. Il en fut de même pour la destruction par les forces naturelles de la ville de la Nouvelle-Orléans en 2005. Sous la mer, des sites irremplaçables peuvent être détruits par l'action des hommes ou par l'action des forces de la nature sans que personne ne le sache. Combien d'épaves patrimoniales ont été détruites par le Tsunami monstrueux de décembre 2004 ou par les forces déchaînées par l'ouragan Katrina sur les côtes de la Louisiane ? Nous ne le saurons probablement jamais. Il en va de même pour les dommages causés par l'homme muni de scaphandre ou équipé de dragues ou d'équipements mécaniques. Sur terre, de telles opérations auraient des témoins et pourraient soulever un tollé bénéfique. Sous l'eau, presque tout passe inaperçu.

Le péril menaçant les biens culturels submergés est décuplé par l'absence très répandue de législation protectrice, législation généralement présente sur terre dans la plupart des pays. Étonnamment, des pays renommés pour la protection et la bonne gestion de leur patrimoine culturel n'ont jamais eu et n'ont toujours pas de législation nationale pour protéger leur patrimoine culturel submergé. C'est le cas jusqu'ici d'un pays comme le Canada, doté de la loi sur le sauvetage, une loi on ne peut plus anti-culturelle qui permet au « sauveteur » de détruire des sites archéologiques tout en étant protégé par la loi. Cette situation est pire en un sens que l'absence totale de loi. D'autres pays munis de lois adéquates pour protéger leur patrimoine culturel submergé sont d'autre part dépourvus de capacité d'application ou de la volonté politique de le faire.

Depuis des décennies, les entreprises commerciales ou les chercheurs de trésors connaissent un succès généralisé avec le raisonnement suivant : « les épaves patrimoniales sont en danger, menacées par les forces de la nature et du temps, elles sont nombreuses et le temps presse (il y a péril) ; les archéologues n'ont ni le nombre, ni le temps, ni les moyens techniques et financiers pour sauver ces épaves, et nous avons sauvé plus d'épaves que tous les archéologues réunis ». Ce discours réussit à convaincre beaucoup de politiciens dans le monde au détriment du patrimoine culturel de leurs pays respectifs. La réalité est toute autre:

A) les épaves patrimoniales ont généralement acquis, après quelques années ou décennies de détérioration initialement assez rapide, un état de conservation graduellement stabilisé qui va durer des siècles et dans certains cas des millénaires, comme en témoignent des épaves multi-millénaires en Méditerranée ou des épaves de quatre ou cinq siècles en Amérique du Nord. Il suffit de citer le navire grec bien conservé qui avait coulé il y a 2300 ans près de Kyrenia, à Chypres, ou les quatre navires baleiniers basques coulés il y a près de 500 ans dans le port de Red Bay au Labrador.

Ajoutons le *Wasa* à Stockholm, près de 400 ans ; le *Mary Rose* en Angleterre, presque 500 ans etc. Si la mer les abîme initialement, elle se transforme petit à petit en protectrice de ses proies. Un cas célèbre en cours est celui du *Sussex*, au large de Gibraltar, coulé en 1694 à des milliers de mètres de profondeur. A cette profondeur, aucun péril ne menace ce navire anglais contenant une richesse inouïe, si ce n'est la haute technologie des entrepreneurs impliqués dans son sauvetage et qui n'auraient jamais dû recevoir de permis.

B) un inventaire des épaves qui ont fait l'objet de fouilles ou de sauvetage depuis l'invention du scaphandre autonome il y plus d'un demi siècle démontre qu'aucune épave patrimoniale n'a été sauvée par des entrepreneurs commerciaux ou chercheurs de trésors, seuls les archéologues ont réussi cette entreprise. Tout au plus, les chercheurs de trésors ont-ils « sauvé » les objets de valeur commerciale au prix de la destruction du contexte archéologique, ce qui constitue le véritable péril. Ces gens exploitent les épaves patrimoniales comme des mines de métaux précieux. Les pays qui transigent avec eux avec la promesse de recevoir une part du butin de 10% ou même 50%, ne récupèrent en fait qu'une très minime partie de la valeur patrimoniale, 90 à 95% de cette valeur étant détruite la plupart du temps. Ces sauveurs d'épaves sont en fait les loups qui gardent la bergerie. Pourquoi ne pas conserver 100% de ce qui appartient à la nation ?

Il n'est pas étonnant que la Convention de 2001 et son Annexe soient fondées avant tout sur l'élimination de la loi du sauvetage et de l'exploitation commerciale du patrimoine culturel submergé, « incompatibles avec la protection du patrimoine submergé ». S'il ne fallait conserver qu'un seul article de cette Convention, il est clair que l'Article 2.2 et la règle 2 de l'Annexe, qui forment un tout, suffiraient à éliminer le problème fondamental, soi l'appât du gain monétaire, source de tous les périls pour le patrimoine culturel subaquatique. Ce recueil de 32 textes offre autant d'exemples de sites patrimoniaux menacés de par le monde, soit par l'action de l'homme agissant directement sous l'eau ou par l'entremise de ses machines, appareils ou de ses travaux de génie, soit par l'action des forces de la nature, soit par les forces combinées des deux. Pour chaque cas analysé, des solutions d'atténuation sont présentées, respectueuses de la ressource et de sa conservation, en conformité avec des éléments majeurs de la Convention. Plusieurs solutions présentées sont en fait une illustration du principe de la conservation *in situ*, que ce soit le cas du musée sous la mer de Louisbourg au Canada ou le cas du William Salthouse en Australie ou le cas de Bell Island à Terre-Neuve.

D'autres solutions plus draconiennes sont requises quand les éléments et les plongeurs constituent une menace conjointe : c'est le cas du site du Elizabeth and Mary, coulé en 1690, sur les rives du Saint-Laurent au Canada, site si peu profond et si près du rivage que la conservation *in situ* n'y était pas une option, où une récupération complète des vestiges archéologiques s'avérait la seule solution viable. Le cas de l'épave du petit caboteur minéralier du seizième siècle coulé dans la rivière Orio au pays Basque est un exemple extraordinaire et unique d'un simple petit navire côtier défoncé en son centre par l'immense pilier de métal d'un pont d'autoroute et qui, malgré tout, a pu livrer les secrets inédits de sa conception et de sa construction, et ouvrir une fenêtre sur la grande aventure de la sidérurgie basque à l'époque de son apogée. Les chapitres qui suivent montrent aussi que ces solutions ne sont pas l'unique apanage des pays nantis comme l'Australie, les USA ou l'Angleterre, mais qu'elles sont aussi à la portée de pays comme le Sri Lanka, Turks et Caicos, la Polynésie. La présente publication permettra d'apprécier des aspects moins connus mais tout aussi cruciaux de cette Convention de 2001. Il s'agit de la sensibilisation du public et surtout du public plongeur qui peut devenir un allié incontournable, de la force de la collaboration entre les pays du pavillon et les pays côtiers, de l'ouverture aux entreprises commerciales de bon aloi comme celles qui organisent des tournées de plongée et qui voient dans la protection et la bonne gestion des biens culturels submergés une façon de prolonger la vie des sites de visite, leur gagne-pain. C'est pour cette dernière raison que le texte de l'opérateur de tournées Rick Stanley a été sélectionné comme premier chapitre. Finalement, tout au long de ces articles, le lecteur réalisera l'importance de la formation des plongeurs et du public, un des grands succès des efforts déployés depuis l'automne 2001 pour promouvoir cette Convention. Avant tout, nous voulons sensibiliser le lecteur à cette réalité trop souvent méconnue et mal comprise du patrimoine culturel submergé et espérons faire de chaque lecteur un allié, sinon un collaborateur actif pour participer aux entreprises d'atténuation dans son pays, dans son milieu et sa sphère d'activité.

# Introducción: El Verdadero Peligro del Patrimonio Subacuático son los Hombres y, a veces, la Naturaleza

**Robert Grenier**
*Presidente*
*ICUCH*

El Comité Científico Internacional de ICOMOS para la Protección del Patrimonio Cultural Subacuático (ICUCH) ha estado asociado desde el principio a la dura batalla de cuatro años que se ha librado en la UNESCO para elaborar el texto de una Convención para proteger dicho patrimonio, esto es, durante 5 sesiones de una semana de duración cada una entre 1998 y 2001. Desde el principio de ese combate entre los grandes intereses marítimos, el ICUCH se dio cuenta de que el principal desafío estaba mucho más allá de la conciliación de esos intereses, a menudo subyacentes y no manifestados. El desafío residía en la ignorancia profunda de lo que era la propia realidad del patrimonio cultural subacuático, de lo que lo amenazaba, de las soluciones existentes para protegerlo y de las medidas que debían adoptarse para garantizar un marco jurídico que facilitara el trabajo de los países y las partes interesadas para establecer esos sistemas de protección. Era necesario deshacerse de los estereotipos relacionados con los conceptos y realidades existentes, de los estereotipos románticos inculcados por las revistas de historietas, la literatura o el cine, que nos habían imbuido de arquetipos tan extravagantes como el Titanic o incluso la imagen del Tesoro de Rackam el Rojo.

Ante todo, era necesario aceptar la idea de que el patrimonio cultural subacuático era un patrimonio universal de la humanidad, igual de importante y merecedor de la misma protección que el patrimonio cultural situado en tierra firme, que era necesario liberarlo de las tradiciones milenarias de la ley sobre el salvamento, del principio del primero que llega es el primero que se lo queda. Los restos de naufragios patrimoniales tenían que dejar de ser fuentes de aprovisionamiento para los habitantes de las costas o, en los últimos decenios, para los buzos y empresarios equipados para recoger esas cosechas de objetos culturales que se ofrecían al primero en llegar al fondo marino. Teníamos que cambiar la idea según la cual era necesario salvar ese patrimonio de los efectos destructores del tiempo y los elementos, lo que ocurre raramente, y, en su lugar, concienciar sobre el hecho de que el verdadero enemigo de ese patrimonio subacuático es el ser humano, con su equipo de inmersión, con sus dragas, con sus potentes equipos de construcción, motivado por ese poderoso enemigo del patrimonio cultural que es el afán de lucro, la avaricia. El verdadero peligro es el hombre. No obstante, es también el hombre quien puede erigirse en el protector, el salvador, dotado ahora de esta Convención de 2001 y de su Anexo. En lo sucesivo, está en condiciones de proteger y salvar ese patrimonio común de la humanidad de sí mismo y, en ocasiones, de la naturaleza.

## Noción de peligro en pleno centro del problema

No hay ninguna noción que mejor se adecúe y más estrechamente se asocie al patrimonio cultural subacuático que la del peligro. Por supuesto, la colección de informes de ICOMOS sobre el Patrimonio en Peligro demuestra de forma elocuente desde hace años la naturaleza y alcance de los peligros que amenazan los monumentos y sitios culturales en todo el mundo. No obstante, esos sitios y monumentos suelen tener la ventaja de ser accesibles y visibles, de contar con una dirección en algún lugar, de modo que la mayoría de las veces es posible detectar cualquier daño provocado por el hombre o por los elementos naturales. La destrucción del Buda gigante del sitio de Bamiyan en Afganistán acaparó con rapidez los titulares de la prensa internacional. Lo mismo ocurrió con la destrucción por las fuerzas naturales de la ciudad de Nueva Orleans en 2005. Bajo el mar, la acción de los hombres o de las fuerzas de la naturaleza puede destruir sitios irremplazables sin que nadie lo sepa. ¿Cuántos restos de buques naufragados patrimoniales han sido destruidos por el monstruoso tsunami de diciembre de 2004 o por las fuerzas desencadenadas por el huracán Katrina en las costas de Luisiana? Probablemente nunca lo sabremos. Lo mismo ocurre con los daños causados por los hombres y sus escafandras, sus dragas o sus equipos mecánicos. En tierra firme, ese tipo de operaciones tendrían testigos y podrían despertar protestas con efectos positivos. Bajo el agua, prácticamente todo pasa desapercibido.

El peligro que amenaza los bienes culturales sumergidos se ve multiplicado por la ausencia generalizada de legislación que proteja ese tipo de patrimonio, legislación, por otra parte, que sí suele existir para el patrimonio sobre tierra firme en la mayoría de los países. Sorprende constatar que países reputados por la protección y la buena gestión de su patrimonio cultural nunca han tenido y siguen sin tener hoy día leyes nacionales para proteger su patrimonio cultural subacuático. Este es el caso de un país como Canadá, que cuenta con una ley sobre el salvamento, totalmente anticultural, que permite al «salvador» destruir sitios arqueológicos y contar al mismo tiempo con la protección de la ley. Esta situación es peor en cierto sentido que si no existiera ninguna ley. Otros países que sí que cuentan con leyes adecuadas para proteger el patrimonio cultural subacuático se ven, por otra parte, desprovistos de la capacidad de aplicación o de la voluntad política.

Hace décadas que las empresas comerciales o los buscadores de tesoros tienen un éxito generalizado gracias al siguiente razonamiento: «los restos de naufragios patrimoniales están en peligro ya que se ven amenazados por las fuerzas de la naturaleza y del tiempo; son muy numerosos y el tiempo apremia (hay peligro); los arqueólogos no tienen ni los recursos humanos, ni el tiempo, ni los medios técnicos ni financieros para salvar esos restos de naufragios, y nosotros hemos salvado más restos de naufragios que todos los arqueólogos juntos». Este razonamiento logra convencer a muchos políticos del mundo, en detrimento del patrimonio cultural de sus respectivos países. La realidad es muy diferente:

A) Por un lado, cabe señalar que por lo general, los restos

de naufragios patrimoniales han adquirido, después de varios años, decenios o más tiempo de deterioro inicialmente bastante rápido, un estado de conservación gradualmente estabilizado que va a durar siglos y en ciertos casos milenios, tal como lo demuestran los restos de naufragios multimilenarios del Mediterráneo o los restos de naufragios de hace cuatro o cinco siglos de América del Norte. Baste con citar el barco griego bien conservado, que se hundió hace 2300 años cerca de Kyrenia, en Chipre, o los cuatro buques balleneros vascos hundidos hace casi quinientos años en el puerto de Red Bay en Labrador. Añadamos a ello el *Wasa* en Estocolmo, de cerca de 400 años y el *Mary Rose* en Inglaterra, con casi 500 años, entre otros. El mar causa deterioro inicialmente, pero luego, poco a poco, se transforma en protector de sus presas. Un caso célebre en curso es el del *Sussex*, en la costa de Gibraltar, hundido en 1694, a miles de metros de profundidad. A esa profundidad, no hay ningún peligro que amenace ese buque inglés que contiene una increíble riqueza, salvo la alta tecnología de los empresarios que participan en su salvamento y a los que nunca se les deberían haber dado permiso.

B) Por otro lado, un inventario de los restos de naufragios que han sido objeto de excavaciones o de salvamento desde la invención de la escafandra autónoma hace más de medio siglo demuestra que ningún resto de naufragio patrimonial ha sido salvado por empresarios comerciales o buscadores de tesoros; son sólo los arqueólogos quienes lo han logrado. Como mucho, lo que han «salvado» los buscadores de tesoros son los objetos de valor comercial a cambio de la destrucción del contexto arqueológico, que es lo que constituye el verdadero peligro. Esas personas explotan los restos de naufragios patrimoniales como si se tratara de minas de metales preciosos. Los países que se muestran transigentes con ellos a cambio de la promesa de recibir parte del botín, el 10% o incluso el 50%, no recuperan en realidad más que una muy mínima parte del valor patrimonial; en la mayoría de los casos se destruye el 90 a 95% de ese valor. Esos «salvadores» de restos de naufragios son en realidad los lobos que guardan al rebaño. ¿Por qué no conservar 100% de lo que nos pertenece?

No resulta sorprendente que la Convención de 2001 y su Anexo se basen ante todo en la eliminación de la ley del salvamento y de la explotación comercial del patrimonio cultural subacuático, que son «incompatibles con la protección del patrimonio subacuático». Si hubiera que mantener un solo artículo de esa Convención, está claro que el artículo 2.2 y la norma 2 del Anexo, que forman un todo, serían suficientes para solucionar el problema fundamental, esto es, el afán de lucro, fuente de todos los peligros para el patrimonio cultural subacuático. Este conjunto de 32 textos ofrece ejemplos de sitios patrimoniales amenazados en distintas partes del mundo, ya sea por la acción del hombre que actúa directamente bajo el agua o por medio de sus máquinas, aparatos o trabajos de ingeniería, por la acción de las fuerzas de la naturaleza o por las fuerzas combinadas de la acción del hombre y de la naturaleza. Para cada caso analizado, se presentan soluciones de mitigación que respetan los recursos y su conservación, de conformidad con los principales elementos de la Convención. Varias de las soluciones presentadas ilustran, de hecho, el principio de la conservación *in situ*, ya se trate del museo bajo el mar de Louisbourg en Canadá, del William Salthouse en Australia o de Bell Island en Terranova.

Se necesitan otras soluciones más drásticas cuando los elementos y los buzos constituyen una amenaza conjunta: es el caso del sitio del Elizabeth and Mary, hundido en 1690, a orillas del San Lorenzo en Canadá, un lugar tan poco profundo y tan cercano a la ribera que la conservación *in situ* no era posible, siendo la única solución viable la recuperación completa de los restos arqueológicos. El caso de los restos del naufragio del pequeño buque de cabotaje mineralero del siglo XVI hundido en el río Orio en el País Vasco es un ejemplo extraordinario y único de un simple pequeño barco costero destrozado en el centro por el inmenso pilar de metal de un puente de autopista que, a pesar de todo, ha podido desvelar los secretos inéditos de su diseño y construcción, y nos ha permitido entrever lo que fue la gran aventura de la siderurgia vasca en su época de su apogeo. Los capítulos de esta publicación muestran también que esas soluciones no son monopolio exclusivo de los países más ricos como Australia, Estados Unidos o Inglaterra, sino que también están al alcance de países como Sri Lanka, Turks y Caicos, y Polinesia. La presente publicación permitirá apreciar aspectos menos conocidos, aunque igual de importantes, de esta Convención de 2001, esto es, la sensibilización del público y sobre todo de la comunidad de buzos, que se convierte en un aliado obligado, la fuerza de la cooperación entre los países del pabellón y los países costeros, la apertura a las empresas comerciales legítimas como las que organizan excursiones de inmersión y que consideran la protección y la buena gestión de los bienes culturales sumergidos como una forma de proteger a largo plazo los sitios de visita. Ésta es la razón por la que se seleccionó el primer capítulo de Rick Stanley. Por último, a medida que el lector vaya avanzando por el resto de los artículos, se dará cuenta de la importancia que reviste educar a los buzos y al público, uno de los grandes éxitos de las actividades emprendidas desde el otoño de 2001 para promover la Convención. Ante todo, queremos sensibilizar al lector con la realidad, a menudo desconocida e incomprendida, del patrimonio cultural subacuático, y confiamos en que cada lector se convertirá en un aliado, un colaborador activo que participará en los esfuerzos de mitigación en su país, en su entorno y en su ámbito de actividad.

# The International Council on Monuments and Sites

## What is ICOMOS?

The International Council on Monuments and Sites was founded in 1965 in Warsaw (Poland), one year after the signing of the *International Charter on the Conservation and Restoration of Monuments and Sites*, known as the "Venice Charter."

ICOMOS is an association of cultural heritage professionals throughout the world, working for the conservation and protection of monuments and sites – the only global non-governmental organisation of its kind. It benefits from the cross-disciplinary exchange of its members – architects, archaeologists, art historians, engineers, historians, planners — who foster improved heritage conservation standards and techniques for all forms of cultural properties: buildings, historic towns, cultural landscapes, archaeological sites, etc.

ICOMOS has established more than twenty-five International Scientific Committees on various themes and issues related to cultural heritage. These committees undertake research, develop conservation theory; guidelines and charters, and foster training for better heritage conservation in their specialised field.

## ICOMOS is:

- An international forum for discussion on heritage conservation, via its website, Newsletter, Scientific Journal and at workshops, seminars and conferences, including its triennial General Assembly;
- A network of heritage practitioners, with National Committees in over 120 countries, who share expertise and experience directly or through International Scientific Committees;
- A partnership working with national and international authorities in issues and projects of heritage conservation;
- An advocate of international conventions and author of many charters and guidelines regarded as "best practise" for heritage conservation;
- Officially recognised as the advisory body to UNESCO, actively contributing to the World Heritage Committee and taking part in the implementation of the Convention.

Interested professional working in cultural heritage may apply for membership of ICOMOS to the National Committee in their country – a list of all the National Committees and their contacts in on the ICOMOS website. If you do not have a National Committee in your country, you can contact the ICOMOS International Secretariat.

# Le Conseil International des Monuments et des Sites

## Qu'est-ce que l'ICOMOS ?

Le Conseil International des Monuments et des Sites a été fondé en 1965 à Varsovie, en Pologne, un an après la signature de la *Charte internationale sur la conservation et la restauration des monuments et des sites*, dite "Charte de Venise."

L'ICOMOS est une association mondiale de professionnels qui se consacre à la conservation et à la protection de sites du patrimoine culturel. C'est la seule organisation internationale non gouvernementale de ce type. Elle bénéficie des échanges interdisciplinaires de ses membres qui comptent parmi eux des architectes, des historiens, des archéologues, des historiens de l'art, des ingénieurs et des urbanistes. Les membres de l'ICOMOS concourent à l'amélioration de la préservation du patrimoine, à la création de normes et de techniques pour tous les types de biens du patrimoine culturel : bâtiments, villes historiques, paysages culturels, sites archéologiques etc.

L'ICOMOS a créé plus de vingt-cinq Comités Scientifiques sur différents thèmes et questions du patrimoine culturel. Ces Comités entreprennent des recherches, élaborent des réflexions théoriques, des directives et des chartes sur la conservation et encouragent la formation pour une meilleure préservation du patrimoine dans les différentes spécialités.

## L'ICOMOS est :

- Un forum international d'échange autour de la conservation du patrimoine via le site Internet, les Nouvelles de l'ICOMOS, le Journal Scientifique, des ateliers, des séminaires, des conférences et l'Assemblée Générale triennale ;
- Un réseau de praticiens du patrimoine qui partagent leurs spécialités et leurs expériences, directement au sein de leurs Comités Nationaux présents dans plus de 120 pays ou au travers des Comités Scientifiques Internationaux ;
- Un partenariat sur les questions et les projets de conservation du patrimoine, en coopération avec les autorités nationales et internationales ;
- Un défenseur des conventions internationales et l'auteur de nombreuses chartes et directives qui s'efforcent de définir les pratiques les meilleures pour la conservation du patrimoine ;
- L'organe consultatif officiel de l'UNESCO en matière de patrimoine cultural mondial. Il contribue activement au travail du Comité du patrimoine mondial et à la mise en œuvre de la Convention du patrimoine mondial.

Les professionnels intéressés, travaillant dans le domaine du patrimoine culturel, peuvent faire une demande d'adhésion à l'ICOMOS par l'intermédiaire de leur Comité National : une liste des Comités Nationaux ainsi que leurs coordonnées sont accessibles sur le site Internet de l'ICOMOS. S'il n'existe pas de Comité dans votre pays, vous pouvez prendre contact

# El Consejo Internacional de Monumentos y Sitios

## Que es el ICOMOS?

El Consejo Internacional de Monumentos y Sitios fue fundado en 1965, en Varsovia, Polonia, un año después de la firma de la *Carta internacional sobre la conservación y la restauración de monumentos y sitios*, llamada "Carta de Venecia".

El ICOMOS es una asociación mundial de profesionales que se dedica ala conservación y a la protección de sitios del patrimonio cultural. Es la única organización internacional no gubernamental de este tipo. Se beneficia de los intercambios interdisciplinarios de sus miembros: arquitectos, historiadores, arqueólogos, historiadores de arte, antropólogos, ingenieros y urbanistas. Los miembros del ICOMOS contribuyen a la mejora de la preservación del patrimonio, a la ceración de normas y técnicas para todos los tipos de bienes del patrimonio cultural: construcciones, ciudades históricas, paisajes culturales, sitios arqueoógicos, etc.

El ICOMOS ha creado más de veinticinco Comités Científicos sobre diferentes temas y cuestiones del patrimonio cultural. Estos comités emprenden investigaciones, elaboran teorías, directivas y cartas de conservación y estimulan la formación para lograr una mejor conservación del patrimonio, en las diferentes especializaciones.

## El ICOMOS es:

- Un foro internacional donde se discute sobre al conservación del patrimonio- a través del sitio Internet, del boletín , del diario científico, de talleres, seminarios, conferencias, y de la asamblea general trienal;
- Una red de expertos especializados que comparten experiencias directamente desde sus respectivos Comités Nacionales, presentes en más de 180 países, o a través de los Comités Científicos Internacionales;
- Una asociación sobre las cuestiones y los proyectos de conservación del patrimonio, en cooperación con las autoridades nacionales e internacionales;
- Un defensor de los convenios internacionales y el autor de numerosas cartas y directivas que tratan de definir las "mejores prácticas" para la conservación del patrimonio;
- El órganismo consultivo de la UNESCO en materia de patrimonio cultural mundial. Contrubuye activamente al trabajo del Comité del patrimonio mundial. El equipo de la Secrtaría del ICOMOS y la comisión para el patrimonio mundial del ICOMOS están encargados de evaluar las propuestas de inscripción en la Lista del patrimonio mundial, presentadas por los países firmantes.

Los profesionales interesados , que trabajan en el ámbito del pateimonio cultural, pueden enviar una solicitud de adhesión al ICOMOS por mediación de su Comité Nacional: se puede acceder a las informaciones sobre todos los Comités Nacionales en el sitio de Internet de ICOMOS. Si no hubiese Comité Nacional en su país, puede contactar con la Secretaría Internacional del ICOMOS para más información.

## ICOMOS International Committee on the Underwater Cultural Heritage (ICUCH)

The ICOMOS International Committee on the Underwater Cultural Heritage (ICUCH) was founded in Australia in 1991 by ICOMOS Australia. The founding president was Graeme Henderson, director of the Western Australia Maritime Museum at Fremantle.

The birth of the committee was in reaction to the pressing needs brought to light by the discovery and subsequent exploitation of the remains of the Titanic: it was now evident that technologies capable of working at great depth threatened both known and unknown wrecks that, up until recently, had been protected by their inaccessibility. The concept of a committee composed of international experts in underwater archaeology was thus born: this group of experts from eighteen countries had, as a goal, to assist ICOMOS International and UNESCO in promoting the protection and sound management of submerged cultural resources as an important part of humanity's heritage.

Since underwater archaeology is a relatively new discipline, it is poorly understood in many countries and is often the object of false representations which particularly threaten the less well-to-do countries. These countries are often solicited by supposedly famous underwater archaeologists who exploit a country's lack of knowledge of the field. ICUCH's mission is to alleviate this lack of expertise throughout the world by acting as technical expert, by facilitating basic training in underwater archaeology and conservation of artefacts, and finally by putting pressure on countries or organisations that collaborate in the destruction of submerged heritage. The members of ICUCH are available to all: countries, organisations and individuals interested in the protection and sound management of cultural resources found underwater.

## Comité International de l'ICOMOS pour la Protection du Patrimoine Culturel Subaquatique (ICUCH)

Le Comité International de l'ICOMOS pour la Protection du Patrimoine Culturel Subaquatique (ICUCH) a été fondé en 1991 en Australie par ICOMOS Australie. Le président fondateur fut Graeme Henderson, directeur du Musée maritime de Western Australia à Fremantle.

La fondation de ce comité répondait à un besoin pressant mis en lumière par la découverte et l'exploitation désordonnée qui s'ensuivit des vestiges du Titanic : il semblait désormais évident que les instruments technologiques capables de travailler dans les grandes profondeurs menaçaient les épaves connues et inconnues jusque là protégées par leur inaccessibilité. Le concept d'un comité réunissant des experts internationaux en archéologie subaquatique était né : ce groupe d'experts de dix-huit pays a pour mission d'assister l'ICOMOS international et l'UNESCO à promouvoir la protection et la saine gestion des biens culturels submergés en tant que partie importante du patrimoine de l'humanité.

L'archéologie subaquatique étant une discipline relativement récente, elle est peu connue de nombreux pays et elle fait souvent l'objet d'interprétations fausses qui menacent en particulier les pays peu fortunés. Ces pays sont souvent sollicités par de supposés archéologues subaquatiques de grand renom qui exploitent leur manque de connaissances sur le sujet. La mission d' l'ICUCH dans les diverses régions du monde est de pallier cette carence d'expertise en servant d'expert technique, en facilitant la formation de base en archéologie subaquatique et en conservation des objets et finalement en faisant pression sur les pays ou organismes qui collaborent à cette destruction du patrimoine submergé. Les membres de l'ICUCH sont à la disposition de tous pays, organismes et individus intéressés par la protection et par la bonne gestion des biens culturels trouvés sous l'eau.

## Comité Internacional del ICOMOS para la Protección del Patrimonio Cultural Subacuático (ICUCH)

El Comité Internacional del ICOMOS para la Protección del Patrimonio Cultural Subacuático (ICUCH) fue fundado en 1991 en Australia por ICOMOS Australia. El Presidente fundador fue Graeme Henderson, director del Museo Marítimo de Western Australia, en Fremantle.

La creación de este Comité respondía a una necesidad urgente puesta de manifiesto por el descubri-miento y explotación descontrolada de los restos del Titanic: parecía evidente que los desarrollos tecno-lógicos, permitiendo trabajar a cualquier profundidad, amenazarían los restos conocidos y desconocidos, protegidos hasta el momento por su inaccesibilidad. El concepto de un comité que reuniera a expertos inter-nacionales en arqueología suba-cuática había nacido: este grupo de expertos de dieciocho paises tiene por misión asistir al ICOMOS Inter-nacional y a la UNESCO a promover la protección y la buena gestión de los bienes culturales sumergidos como parte importante del patrimonio de la humanidad.

La arqueología subacuática al ser una disciplina reciente, es aún desconocida en algunos países y a menudo objeto de falsas interpretaciones que amenazan en particular a los países menos favorecidos. Estos son a menudo solicitados por supuestos arqueólogos subacuáticos de gran renombre que explotan el desconocimiento de esto países sobre el tema. La misión del ICUCH en las distintas regiones del mundo es paliar esta carencia de expertos sirviendo de consejero técnico, facilitando información básica en arqueología subacuática y en conservación de los objetos, y finalmente presionando sobre los paises u organismos que colaboran en esta destrucción del patrimonio sumergido. Los miembros del ICUCH están a disposición de todos: países, organismos y personas individuales interesados en la protección y en la buena gestión de los bienes cultu-rales encontrados bajo el agua.

## Heritage at Risk

The *ICOMOS World Report on Monuments and Sites in Danger* (*Heritage at Risk*) is published regularly to help save our cultural heritage. The Report is conceived not only as a vehicle to share information among professionals and colleagues, but also to be distributed to the media, relevant organisations, governments and other stakeholders.

The texts in this Special Edition of *Heritage at Risk* will be available online on the ICOMOS International website (www.international.icomos.org) in the rubric *Heritage at Risk*. All texts in this printed edition are presented in English. In the event that the author has submitted a version of their text in their native or second language, these versions also will be made available online.

## Patrimoine en Péril

*La Rapport mondial sur les monuments et les sites en péril* (*Patrimoine en péril*), publié régulièrement, a pour but de contribuer à la sauvegarde du patrimoine culturel. Le Rapport se veut, non seulement un outil pour stimuler l'échange d'information parmi les professionnels, mais aussi pour atteindre les médias, les organisations concernées, les gouvernements et autres parties prenantes.

Les textes de cette édition spéciale de *Patrimoine en péril* seront disponibles sur le site web de l'ICOMOS International (www.international.icomos.org) à la rubrique *Heritage at Risk*. Tous les textes de la version imprimée sont présentés en anglais. Dans le cas où l'auteur a soumis une version de son texte dans sa langue maternelle ou une seconde langue, ces versions seront également disponible sur le site.

## Patrimonio en Peligro

*El Informe mundial sobre Monumentos y sitios patrimoniales en peligro* (*Patrimonio en peligro*), publicado regularmente, tiene como objetivo contribuir a la salvaguarda del patrimonio cultural. El informe pretende ser no sólo un instrumento para estimular el intercambio de información entre los profesionales, sino también una manera de llegar a los medios de comunicaciñon, las organizaciones competentes, los gobiernos y el resto de los actores implicados.

Los textos de esta Edición Especial de *Patrimonio en peligro* estarán disponibles en el sitio web de ICOMOS Internacional (http://www.international.icomos.org) en la sección *Heritage at Risk*. Todos los textos de la edición impresa están en inglés. En el caso de que el autor haya presentado una versión de su texto en su lengua materna o en entro idioma, estas versiones también estarán disponibles online.

**Right: *Orio IV* - After the extraction, with the aide of a suction dredger, of the pad of silt and sand of an approximate thickness of 2m, the iron ore cargo that the ship was transporting appeared**

**(Luis Mª Naya-INSUB)**

# It's All About the 'P's!

**Rick Stanley**
*President*
*Ocean Quest Inc*
*Canada*

*Rick is a member of the Steering Committee for Sustainable Tourism with Hospitality Newfoundland & Labrador and an advisor to Parks Canada on the subject of SCUBA Diving. He is also a founder of Ocean Net, a non-profit organisation with the goal 'To Instil an Ocean Conservation Ethic.*

UNESCO's influence reaches far beyond Newfoundland's Conception Bay – my home, my office and definitely my favourite place to be – and it's safe to say that 'little old me' will never have the same impact upon the World. However, I'd like to think that in this beautiful part of the planet which most people have never heard of, we at Ocean Quest contribute as best we can to some of the UNESCO ideals by increasing awareness of the importance of safeguarding our natural and cultural heritage. How do our activities help address the threat to underwater cultural sites? Well, it's all about the 'P's!


**Figure 1: The unofficial Marine Park of Conception Bay designated by Rick Stanley (Drawing Rick Stanley)**

## Passion

Many good things are borne from necessity, but I firmly believe it's passion which truly influences opinion and is behind most successes. Growing up near the Ocean, like all Newfoundlanders, I've always admired and respected it. Watching icebergs float by in spring, whales feeding in summer or ships and fishing boats going about their business, the sea held a fascination for me which was destined to develop into much more. Taking the "plunge" and learning to SCUBA dive made that fascination into a dream – a passion to turn the amazing underwater world I'd just discovered into a career opportunity, even a lifestyle. Whether beautiful marine life or awe inspiring shipwrecks, what I saw under the Atlantic waves was special, but so much of it was threatened – mostly by lack of awareness of its fragility but, sadly, much of the time by blatant disregard for its existence. That's where my passion came from – the urge to encourage others to respect and care for the natural and historical wonders I'd found beneath the sea on my own doorstep. The company which emerged from the dream, Ocean Quest, is driven by that passion – one which is shared by all its employees and which I hope will sustain it for a long time yet.

## Product

Without a product, there would be no business! The solution was obvious – a dive charter business. I'd do what I loved best, with a bunch of like-minded people and get paid for it. No problem! Well, it wasn't quite as easy as that but the product – with a little hard work and a lot of support from family, friends and a dedicated workforce – is now sold internationally. Diving on shipwrecks, with whales, icebergs and in historic sites is, it appears, quite popular with divers around the World. Ideally, I could show off the Bell Island Wrecks and the magnificent local marine life and pay the bills! In addition to benefiting tourism in the Province, it's helped increase awareness that we need to look after our marine environment and, equally as important, the snapshots of history and culture which find themselves on the seabed in the form of shipwrecks and artefacts. In order to keep selling the product, it needs to remain attractive to the consumer. However, the marine environment is not manufactured, it's a living thing which also provides a unique insight into our past and if its wonders are to be sold as a commodity, it needs to be cared for.

## Protect & Preserve

Along with a successful marine based business comes the responsibility of protecting and preserving its resources. This responsibility has to be shared; it's way too much for one person. Education and encouraging respect is the means by which it is shared. SCUBA Diving is one of the fastest growing sports and there are two distinct types of diver who have an impact on protection: those who truly respect what they see underwater and want to preserve it for future generations to enjoy and those who care little or nothing about what they see and attack shipwrecks with crowbars, taking what they can as trophies to prove they've been there. A picture isn't proof enough for our latter diver, and too often an important part of our heritage is consigned to rust away in

a corner of a garage or be discarded as junk once the bragging rights have been exhausted.

Prime examples of the need for protection are the Bell Island Wrecks in Conception Bay. They are the focus of diving in the Province and will hopefully soon be declared an Underwater National Historic Site, protected by Federal Law. These four Allied ore carriers, sunk by German U-Boats in 1942 with the loss of 69 lives, are amongst the best preserved shipwrecks in the World. There are still many artefacts on the wrecks, including portholes, lifeboats, guns, kitchen utensils and personal items, offering divers a glimpse into the past and perhaps an understanding of what life was like aboard before the fateful days in September and November of 1942. The story of the sinkings is very much part of local folklore, especially due to the historical link with the Bell Island Mines, the source of the ships' iron ore cargoes. The attacks resulted in the only damage caused to "land" by the enemy in North America during WWII when a torpedo struck the Scotia Pier on the island. Education is working and the majority of divers visiting the wrecks these days have the utmost respect for them. Things haven't always been that way, though. They were plundered for years and there are still many divers who don't care about preservation efforts and show no regard for the history surrounding the wrecks or, apparently, those who died on them. Even deck planking and doors fall victim to their pursuit for supremacy in a bizarre competition amongst inconsiderate divers to see who can collect the "coolest" prize. It's this diver who we strive to educate with our "take only pictures and leave only bubbles" policy – one which is welcomed by many and is, slowly but surely, having a positive effect.

Divers visiting the wrecks with Ocean Quest are briefed before departure that theft of artefacts is not tolerated and our policy is generally accepted in good spirit. An internationally renowned diver and author, famous for his 'recovery' of artefacts, visited the wrecks in the company's early days and summed up in a few words what we hope divers will be saying for many years to come. "WOW....Unbelievable! A Wreck diver's dream!" He took nothing except memories and photographs away with him, but his experience was no less rewarding than if he'd had a chunk of rusty old metal (or should that be piece of history?) tucked away in his luggage.

It's not just private divers who need educating. Government organisations and commercial companies employ divers who operate in often harsh conditions for reasons such as repairs, ordnance disposal or rescue situations. They have a job to do – a difficult one – and it's often not feasible for them to take care of their surroundings. But they could do more! For example, extensive damage was done to one of the Bell Island Wrecks in 2005 when a Coast Guard ship moored to it, rather than next to it, during a Police Diving Unit exercise. A call was made to the diving unit to inquire about the circumstances, but no assurance that efforts would be made to avoid similar occurrences in the future was received. In fact, a flippant comment about more damage being done by icebergs highlighted the lack of awareness I believe is prevalent among such organisations. There has been iceberg damage to the wrecks, but it is not significant and has not

**Figure 2: Deb Stanley at one of the companion ways on the *ss Saganaga* (Rick Stanley)**

**Figure 3: Diver from USA, Arch McNamara, taking pictures of Telegraph in Engine Room of *ss Rosecastle* June, 2005 (Deb Stanley)**

**Figure 4: Captain's Head on *ss Lord Strathcona* with porthole intact (Rick Stanley)**

happened at all since 1997. Once again, an important part of local heritage and, indeed, culture was damaged due to ignorance.

There are many wreck sites in the Province, all of which deserve protection from humans! Some say restricting diving on them completely would give them that protection, but I disagree. The 'crowbar divers' would still visit the sites as effective policing of such a rule would be an enormous drain on resources and anyway, why deny the majority the opportunity to get up close and personal with history because of the actions of an ignorant minority? Perhaps, one day, some kind of 'Pay & Play' or registration process will help control needless destruction of our heritage and culture, and people will understand better the laws and repercussions of their actions. Until then all we can do is keep up the education.

Obviously, nature affects all underwater cultural sites, whether it be marine life, weather, icebergs or decay. We have no control over this, and eventually they'll disappear completely. For the meantime though, we need to do our utmost to ensure that process is not accelerated.

## Promote

Like all businesses, promotion is essential. Trade shows, magazines, websites, flyers – whatever it takes to bring divers here is worth it. Feature articles written by visiting journalists also play a big part in increasing awareness of our underwater cultural sites. Photo presentations and seminars by staff and local divers are popular, and even visitors from afar give their time to show divers in their home towns what they're missing!

The best promotion of all, though, is word of mouth and that word is definitely spreading. Relatives of the victims of the sinkings have heard of the good things happening in Conception Bay. Annual Remembrance Day visits to the wrecks with wreaths have prompted private visits by the now elderly children of some crew members who were unaware until late in life of how easy it was to visit the site and pay their last respects to fathers they were too small to remember. From there, they can visit a memorial in nearby Lance Cove, the Bell Island Mines Museum, which has a section dedicated to the wrecks, and chat with Islanders who still recall the attacks.

There are many other examples of what I consider to be part of the promotion process. Every year, an expedition is mounted by the Royal Air Force from the United Kingdom to dive in the area. Wreck surveys carried out by them at sites such as Dildo and Trinity Bay have contributed towards archaeological studies, and a photographic survey at Bell Island produced amazing images which are now in demand all over the world.

In-depth research by the Ocean Quest boat captain, formerly enlisted in the US Navy, led to the discovery of a torpedo close to one of the Bell Island wrecks. Ironically, it was a German diver – a renowned underwater photographer who considers the wrecks an inspiration – who, with Ocean Quest, subsequently recovered part of the weapon on behalf of the Provincial Archaeologists. At times, there is a need to take items from such sites as long as it is for the right reason, and this was such an instance. It's all part of the education.

## Profit

A dirty word? Should there be financial gain from encouraging respect of the ocean and the history it shrouds? Of course! Even non-profit organisations survive on donations from other people's earnings and revenues, which are generated by profit. The other 'P's depend on the support of the Profit, as it depends on them. Without it, Passion dwindles, the Product loses value, Protection & Preservation suffer, and Promotion becomes pointless. No Profit, end of Dream!

So there you have the "P's!" Our efforts, which we hope are worthy, have gained us the unofficial title of "Stewards of the Bell Island Shipwrecks" – a title we are proud of ,and one which we hope is an indication that the message is getting "out there." We need to protect what we have, so that in the future, we can "Dive into History."

# Florida's Underwater Archaeological Preserves: Preservation through Education

**Della A. Scott-Ireton**
*Florida Bureau of Archaeological Research*
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With the longest coastline in the continental United States, as well as hundreds of miles of inland waterways, Florida's history is tied to a maritime context. The remains of ships and boats, as well as prehistoric watercraft, are preserved in the state's waters. Although all historical and archaeological sites on state-owned or controlled lands in Florida, including submerged sites, are protected by law, shipwrecks remain vulnerable to looting, vandalism, and uninformed souvenir collecting by sport divers.

Florida is the top sport diving destination in the United States with thousands of diving and snorkeling visitors contributing to the state's economy and impacting the state's underwater resources each year. With the exception of one shipwreck in a national park, all shipwrecks in Florida waters are open for visitation, although unauthorized disturbance, excavation, or removal of artifacts is prohibited by the Florida Historical Resources Act (Chapter 267 of the Florida Statutes). Most diving visitors, and even many Florida divers, are unaware of the legal protection of shipwrecks. Additionally, a pervasive "finders-keepers" attitude, fostered by the media and local fables of Spanish gold and pirate booty, resulted in shipwrecks becoming targets for looting and treasure hunting. In the face of this continuing problem and the inability to adequately patrol all of the state's submerged sites, State of Florida archaeological resource managers rely on intensive public education programs to promote the protection and preservation of shipwreck sites.

Florida's Underwater Archaeological Preserves are historic shipwrecks around the state interpreted especially for divers and snorkelers. Visitors are encouraged to explore sites, but to "take only photos and leave only bubbles." Interpretation materials include brochures for each site featuring the history of the ship and how it came to be wrecked in Florida, a poster showing all of the Preserves, a laminated underwater guide illustrating site features and providing safe diving tips, a bronze marker designating the site as a Preserve and Florida Heritage Site, and a web page. Additionally, all of the Preserves are listed on the National Register of Historic Places and are included on Florida's Maritime Heritage Trail. These materials are intended to educate the diving public about the importance of shipwrecks as remains of our maritime past and as non-renewable resources deserving protection for future generations to visit and enjoy.

The establishment of Florida's Underwater Archaeological Preserves is the result of partnerships between government and the public to manage and protect submerged cultural resources in a cooperative spirit. Underwater sites of recognized historical and recreational value are designated as State Preserves in response to local nominations, and by a public desire for a fuller understanding and appreciation of these unique public-owned resources. Once a submerged site is nominated, it is carefully researched and evaluated for its suitability to become a Preserve, considering such criteria as historical value, archaeological integrity, biological diversity, public accessibility, diving safety, and recreational potential. If the site meets these criteria, data from its evaluation are presented in a formal public proposal for the creation of a new Preserve. Public input generated by the proposal helps to determine appropriate methods of site enhancement, interpretation, and protection based on local needs and desires. Interested organizations and individuals then work together with state and local governments to prepare the site and to maintain it as an historical, educational, and recreational attraction.

**Figure 1: A diver explores the *Half Moon* Preserve**

Shipwreck parks are a relatively new phenomena as a means of education and preservation through recreation. Following the lead of Michigan and Vermont, where sites in cold, fresh water were established as preserves, Florida's program began in 1987, with the designation of *Urca de Lima*, a Spanish merchant ship cast ashore on the east coast near Ft. Pierce during a hurricane in 1715, as the first state Underwater Archaeological Preserve. Salvaged soon after her wrecking, and again by modern treasure hunters, the remains of the wooden sailing ship lie in shallow water on an offshore reef, where they became a popular location for sport divers. Members of the St. Lucie County Historical Commission approached the Florida Department of State's Division of Historical Resources to explore the possibility of giving the shipwreck a special status that would both interpret and protect the site for future visitors. Local waterfront businesses joined with city, county, and state officials to enhance the wreck with replica cement cannons to replace those removed long ago. An official bronze plaque, embedded in a cement monument attached to a large mooring buoy, was positioned near the wreckage to mark the site and to prevent anchor damage. Interpretive brochures, thousands of which have been circulated, were widely distributed to encourage public visitation and participation in the maintenance of this unique piece of Florida's maritime heritage. *Urca de Lima* thus was


**Figure 2: Poster presenting Florida's Shipwreck Preserves**

adopted by the local community as a new historical attraction; by placing the site in the public's trust, it became important for everyone to preserve.

The pattern for establishing the *Urca de Lima* Preserve proved to be successful, with public interest and participation in its management continuing for nearly twenty years at this writing. Following the popularity of the first Preserve, a second Preserve was established in 1989 on *San Pedro*, a galleon that grounded in the Florida Keys in 1733. *City of Hawkinsville*, a sunken steamboat in the Suwannee River, became a third shipwreck park in 1992. *USS Massachusetts* (BB-2), the nation's oldest surviving battleship, was designated in Pensacola in 1993 and the wreck of the steamer *ss Copenhagen* near Pompano Beach became a Preserve in 1994. In 1997, *ss Tarpon*, a merchant vessel that sunk in a gale off Panama City, was designated a Preserve. In 2000, Florida's seventh Preserve was established at *Half Moon*, a German racing yacht sunk off Key Biscayne near Miami. The eighth Preserve is the Norwegian lumber barque *Lofthus*, wrecked in a storm off Boynton Beach and dedicated in 2004. In the same year the steamer *Vamar*, sunk under mysterious circumstances off Port St. Joe, became the state's ninth Preserve. The molasses barge *Regina*, wrecked in a storm off Bradenton Beach, was added to the Preserve system in 2005. State archaeologists continue to work with local communities to establish Preserves as new sites are nominated and investigated.

As an area set aside for enjoyment by the public and protection by the state, an Underwater Archaeological Preserve is an experiment in cultural resource management. These Preserves are of past and future historical value and can provide a means of education through recreation for generations to come. Furthermore, they offer the public a chance to participate in local historic preservation. Shipwreck Preserves throughout Florida have enabled local communities to develop a sense of stewardship and pride in their submerged historic sites as pieces of their own history and heritage. By establishing a Preserve, residents and visitors have the opportunity to become better informed about their past and to become more aware of the long-term value of preserving a historic shipwreck in its natural setting. This local involvement strengthens a community's ties with the past while enhancing recreation and tourism in the present and contributing to the preservation of all historic shipwrecks.

**Figure 3: Divers inspect the bronze plaque at the *ss Copenhagen* Preserve**

# Marine Aggregates and Prehistory

**Antony Firth**
*Head of Coastal and Marine Projects*
*Wessex Archaeology*
*United Kingdom*

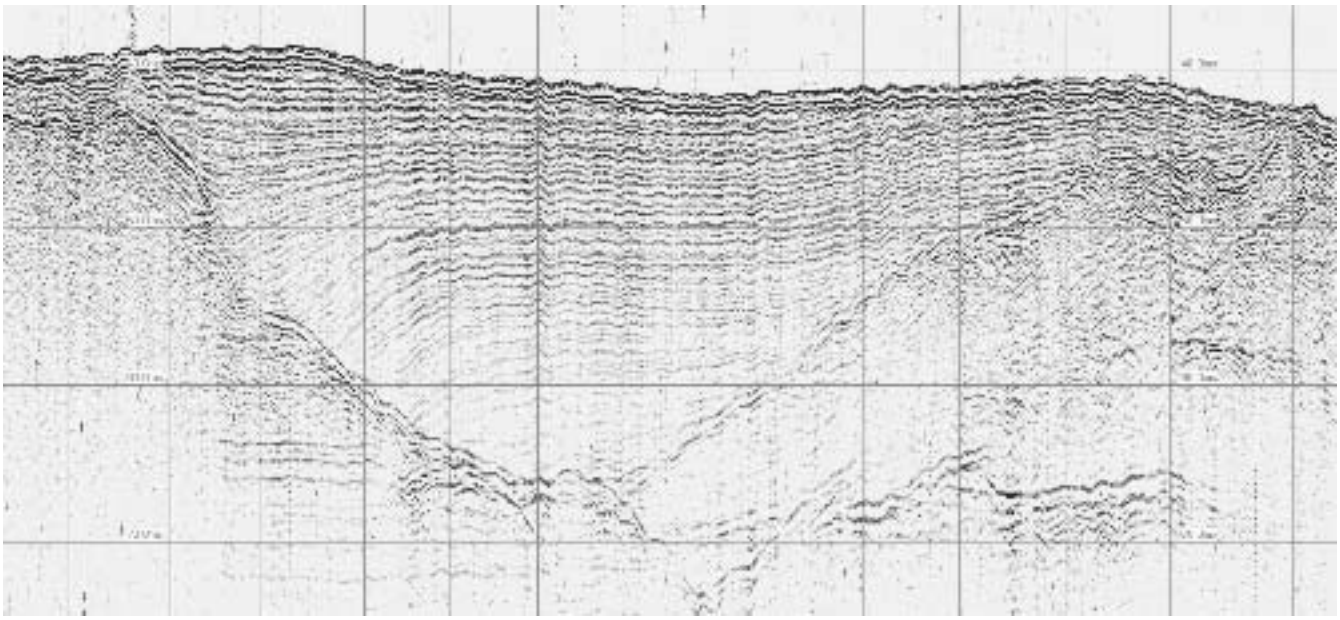
Over the last decade, the companies that dredge aggregates (sand and gravel) from the seas around the UK have taken increasing account of archaeological issues. The process of Environmental Impact Assessment (EIA) provided the initial framework for addressing the implications of marine aggregate for the historic environment in the course of applications for dredging licences. While the EIA framework continues to be of central importance, it has been supplemented by wider initiatives from industry and by the recent availability of substantial resources through the Aggregate Levy Sustainability Fund.

As well as having potential impacts on shipwrecks, marine aggregate dredging has clear implications for prehistoric remains on the seabed. Aggregate companies frequently target sand and gravel that was deposited by rivers in glacial periods when sea-level was up to 130m lower than today. At these times, both after the last (Devensian) glacial maximum and during previous glaciations, there were vast areas of land around the present UK. This land was inhabited periodically by our predecessors, until they were obliged to quit by rising sea-levels. While it was dry land, and while the sea was encroaching, the land supported plant and animal life as well as humans; microscopic evidence of these previous environments can be found within fine-grained sediments laid down at the time, and once-inhabitable land surfaces can be found in and below deposits of peat. Flint artefacts recovered by fishermen, and a small number of *in situ* archaeological sites found close to the shore, strongly suggest that further archaeological material is to be found much further offshore, in the deeper water where aggregate dredging takes place. Furthermore, the aggregate companies are keen to avoid dredging the peats and fine-grained deposits of such potential interest to archaeologists, because this material will contaminate the clean aggregates upon which their business depends. The challenge, therefore, has been to establish whether important archaeological material exists in areas that contain commercially-attractive aggregate deposits, and to develop methods that can enable dredging areas to be assessed and evaluated archaeologically in the course of the EIA process.

Wessex Archaeology (WA) has carried out numerous EIA studies of marine aggregate licence proposals. Initially, aggregate companies were facing the contention that there was uniformly high potential for prehistoric archaeological material across the seabed, and that aggregate dredging was causing untold damage. In WA's early EIA studies, we worked with aggregate companies to understand not only the process of dredging, but also the processes of investigation and monitoring that aggregate companies undertake when prospecting for aggregates and when gauging possible effects relating to other environmental and commercial concerns, such as marine ecology, fishing and sediment transport. It was soon apparent that the aggregate companies had both expertise and data that could be used to inform the assessment of archaeological potential. This initial work often involved reinterpreting geophysical and geotechnical data, and developing models of how sea level change may have affected the landscape. Analogies were also drawn from prehistoric archaeological finds on adjacent coastlines, in the upper reaches of river catchments which – at the time – flowed down through the submerged landscapes that are now being targeted for marine aggregates.

These early studies helped to localise areas of archaeological potential and provide them with context. They also showed that in many instances the aggregates being targeted were adjacent to areas of archaeological potential, but the aggregates themselves were likely to contain only derived archaeological material that had been repeatedly eroded and re-deposited, rather than *in situ* material of higher importance. Other conclusions could be drawn, notably how

**Figure 1: One frame from the digital animated reconstruction of a Mesolithic landscape, based directly upon geophysical and palaeo-environmental data from the ALSF Seabed Prehistory project**



**Figures 2 & 3: Shallow seismic section through an infilled palaeo-channel in about 30m of water, off the coast of Sussex**

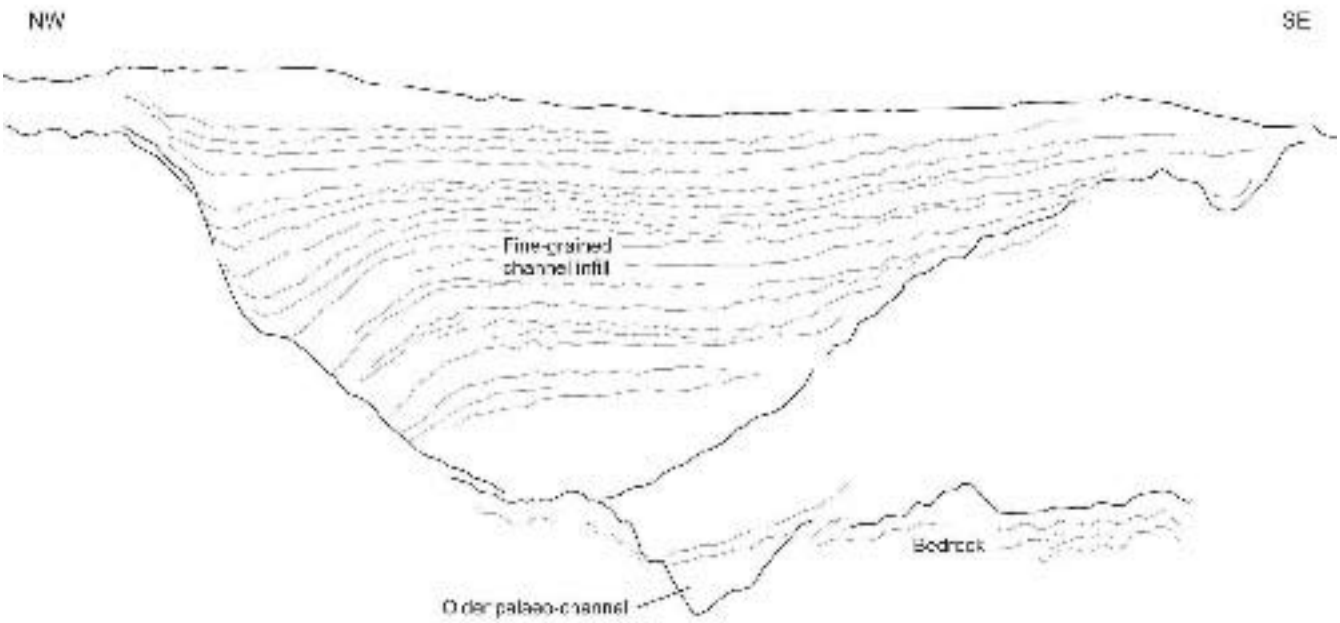



**Figure 4: Flints thought to have been struck by humans, recovered in grab-samples from the English Channel**

complex the sequences of deposition, erosion and inundation could be, and how limited our understanding was. It was also clear that while data obtained for prospecting or ecological purposes could be reinterpreted, the data would be even more useful if archaeological objectives could be incorporated into surveys from the start. Also, our assessments were largely hypothetical, as we lacked direct evidence of prehistoric land surfaces, or of their supposed inhabitants.

At this point, the association representing the majority of marine aggregate companies the British Marine Aggregate Producers Association (BMAPA), took the initiative of seeking to spread the good archaeological practice being developed by some aggregate companies across the whole of the industry. BMAPA, in partnership with the heritage agencies (the Royal Commission on the Historical Monuments of England (RCHME) later incorporated into English Heritage) commissioned a series of strategic projects which included the preparation of (*Marine Aggregate Dredging and the Historic Environment: Guidance Note)* (BMAPA and English Heritage, April 2003).

While the Guidance Note was being prepared, a major fund for strategic research became available. In an effort to encourage more sustainable use of terrestrial and marine aggregate resources, the UK Government introduced a tax on aggregates known as the Aggregates Levy. A part of this tax was directed to sustainability projects, by way of the Aggregates Levy Sustainability Fund (ALSF). Among the agencies responsible for distributing the ALSF were English Heritage and the Minerals Industry Research Organisation (MIRO). Round 1 of the ALSF ran from 2002 to 2004, and among projects relating to prehistoric material on the seabed were two WA projects, Artefacts from the Sea, using funds administered by English Heritage, and Seabed Prehistory, using funds administered by MIRO. Artefacts from the Sea sought to enhance national and local records of previous prehistoric finds made at sea or on the coast, to provide a firmer basis for understanding the context and importance of any archaeological material found in offshore aggregate dredging areas. As part of the project, almost 300 prehistoric artefacts collected by a fisherman, Michael White, were catalogued for the first time. The Seabed Prehistory project sought to improve the application of geophysical and geotechnical survey methods commonly used by the aggregate industry, so that better archaeological results could be obtained. A study area off the Sussex coast was subject to very high resolution sub-bottom profiling, to vibrocoring and to benthic grabbing, followed by digital processing, paleo-environmental analysis and scientific dating. As well as generating important methodological conclusions, the project identified a Mesolithic landscape dating to c. 9000 BP in about 30m of water some 12km offshore, immediately adjacent to an aggregate dredging area. Systematic benthic grabbing of 100m x 100m cells in the same area recovered a small number of flints that are thought to have been struck by humans.

The Seabed Prehistory project has continued in Round 2 of the ALSF, which runs from 2004 to 2007, using funds administered by English Heritage and MIRO. As well as additional grabbing in the original study area off Sussex, which has recovered peat and charcoal as well as more probable human-struck flints, geophysical and geotechnical surveys are being carried out 50km offshore in the Eastern English Channel, off Great Yarmouth in East Anglia, and off the Humber Estuary in the southern North Sea. The Round 2 ALSF project has also included the development of a computer animation of the Mesolithic landscape off Sussex, drawing directly from the data acquired in Round 1, both as a means of public outreach, and as an interpretative device.

Following on from the Guidance Note, BMAPA and English Heritage have recently introduced a Protocol for Reporting Finds of Archaeological Interest, to make it easier for aggregate industry staff on wharves and vessels to report the things that they find. The Protocol acts as a safety net for discoveries that were not anticipated in the course of EIA, but it also helps to increase archaeological understanding throughout the aggregate industry. A Protocol Awareness Programme, involving visits by archaeologists to aggregate workers throughout England to give guidance on how to identify, handle and store artefacts, has recently started with the support of the ALSF.

Collaboration with the aggregates industry has enabled advances in methods and knowledge relating to the prehistory of the seabed around the UK that could hardly have been imagined just a decade ago. Significant scientific discoveries are being made whilst improving the sustainability of continued aggregate dredging. In many respects, the UK aggregate industry has led the way in showing how marine archaeology can be accommodated within commercial activity, and the lessons learned have spilled into other sectors such as offshore renewable energy. These are exciting times, and the best is yet to come.

## Further Reading

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http://www.wessexarch.co.uk/projects/marine/bmapa/index.html

# The Queen of Nations: A Shipwreck with Influence

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*Australia*

## The Shipwreck

The *Queen of Nations*, under the command of Captain Samuel Bache, made the last of its voyages to Australia in early 1881. Part of the cargo consisted of thousands of bottles of spirits and wine. It was later reported that both the captain and first mate became "hopelessly drunk" for most of the voyage.

Before dawn on May 31, 1881, and only a couple of hundred kilometres south of Sydney Harbour, Captain Bache mistook a slag heap fire on Mount Keira off Wollongong for the light on Port Jackson's south head. Accordingly, he turned the ship toward shore in the belief that he was entering Sydney Harbour and literally drove through the surf onto Corrimal Beach, just to the north of Wollongong.

The *Queen of Nations* began to break up nearly two weeks later.

## Location

The *Queen of Nations* shipwreck is on the New South Wales coast, south of Sydney and four kilometres north of Wollongong. The site lies approximately 70 metres off Corrimal Beach opposite the outlet of Towradgi Creek. When exposed, the remains cover an area of approximately 60x15 metres in a water depth of 3-5 metres, within and just past the surf zone.

Periodically, violent storms uncover parts of the wreck. On one of these occasions, in 1976, the wreckage was regarded by the local council as nothing but a swimming hazard. Considerable quantities of timber were dragged out of the water by bulldozers. Most of this was chopped up and burned or used as landfill. The lower hull and its contents were either still buried in sand or could not be effectively removed. As the sand cover returned to normal levels, any exposed remains were reburied and once again forgotten.

The lower hull still remained intact from stem to stern and retained a considerable quantity of cargo and other artefacts. These were exposed in 1991 by another storm-induced scouring at Corrimal Beach. Almost the entire site was exposed. Bottles of spirits and preserved food, baby's bottles, railway iron, tins of lead paint, crates of rubber galoshes and even a variety of cemetery headstones were revealed.

One of the major changes between the exposure in 1976 and 1991 had been the establishment of an Underwater Cultural Heritage Program in the Department of Planning's Heritage Branch. (The Heritage became a separate agency, the New South Wales Heritage Office, in 1996.) When the remains were discovered by divers from the Public Works Department, staff in the Heritage Branch were notified and

**Figure 1: *Queen of Nations* bow (D Nutley 1991)**

**Figure 2: Wheel on *Queen of Nations* wreck site ( D Nutley 1991)**

an inspection and survey was commenced within a couple of days and completed a week later.

Unfortunately, word quickly got out and the vulnerability of the Queen of Nations to looting quickly became apparent. Between the first day of survey and a second visit a week later, the site was subjected to concerted looting. Hammers, dredge hoses and knives were used, often by people using only snorkelling equipment, to pry open wooden crates and to break up concretions. In the process, numerous ceramics, glass and wooden items were smashed and washed out to

sea. This included sealed bottles of preserved pickles and Hennessey's Cognac – still within their original packing crates. The pickled vegetables were in almost mint condition.

This was a devastating loss of information and highlighted a gaping hole in the legislative protection for historic shipwrecks at that time.

Commonwealth legislation was already in place to protect historic shipwrecks, but declaration was on a ship-by-ship basis. Until such a declaration was made, there was provision under the Act to prevent destructive interference with the wreck site. In order to protect the *Queen of Nations*, a submission needed to be prepared, signed off by a Australian Minister and listed in the Government Gazette. The submission required the completion of a site survey, research into the history of the vessel and an assessment of the significance of the site. The legislation that had jurisdiction over this site was national, the Historic Shipwrecks Act of 1976. This legislation is largely administered under delegation to appropriate authorities in each State or Territory. In New South Wales at that time it was the Director of Planning.

In addition to conducting the survey and report preparation, the submission for Gazettal under the Historic Shipwrecks Act required signing off by a number of levels of management. At the State level this consisted of the Manager of the Heritage Branch, the Division Head, the Assistant Director and the Director. Once that was completed, the submission was then sent to the appropriate government department in the National Capital, Canberra, passed through their departmental hierarchy and finally made its way to the Minister. In this case, a gazettal process that often took months was completed in just two weeks. The *Queen of Nations* was a gazetted as a Historic Shipwreck on 7 February 1992 under Section 5 of the Historic Shipwrecks Act. The listing applies to the shipwreck and all relics associated with the shipwreck.

In spite of these efforts, it was not sufficient to save much of the fragile cargo which had survived 110 years under the sea.

The experience with the *Queen of Nations* highlighted the need for automatic, or 'blanket' protection. The ability for this already existed in Section 5 of the Historic Shipwrecks Act but required agreement by all State, Territory and national Delegates in order for it to be enacted. Previous efforts to call up this section of the Act had failed, but the *Queen of Nations* episode placed this issue in a glaring spotlight. As a result of heavy lobbying by New South Wales and other State officials, 'blanket protection' was enacted in 1993. Now, any Australian shipwreck older than 75 years is automatically protected, and it is illegal to remove artefacts or disturb them in any way.

On the positive side, the tragic experience of the Queen of Nations played an important roll in the protection of Australia's underwater cultural heritage. It also, in part, contributed to Australia's strong stand on this issue during the formulation of the UNESCO Convention for the protection of the underwater cultural heritage. It is perhaps one of the most important components of that Convention.

**Figure 3: Marble cross, part of cargo near ship's stern (D Nutley 1991)**

The difference between 75 years for the Historic Shipwrecks Act and the 100 years in the UNESCO convention is neither here nor there. It is the immediacy that automatic protection provides after the lapse of a given period of time. This statutory protection from human interference that sites have from the moment they are found is of the utmost importance. It removes a window of opportunity for those bent on short term site exploitation and allows the immediate application of conservation principles that preserve long-term values of underwater cultural heritage as a source of information and as a truly international heritage.

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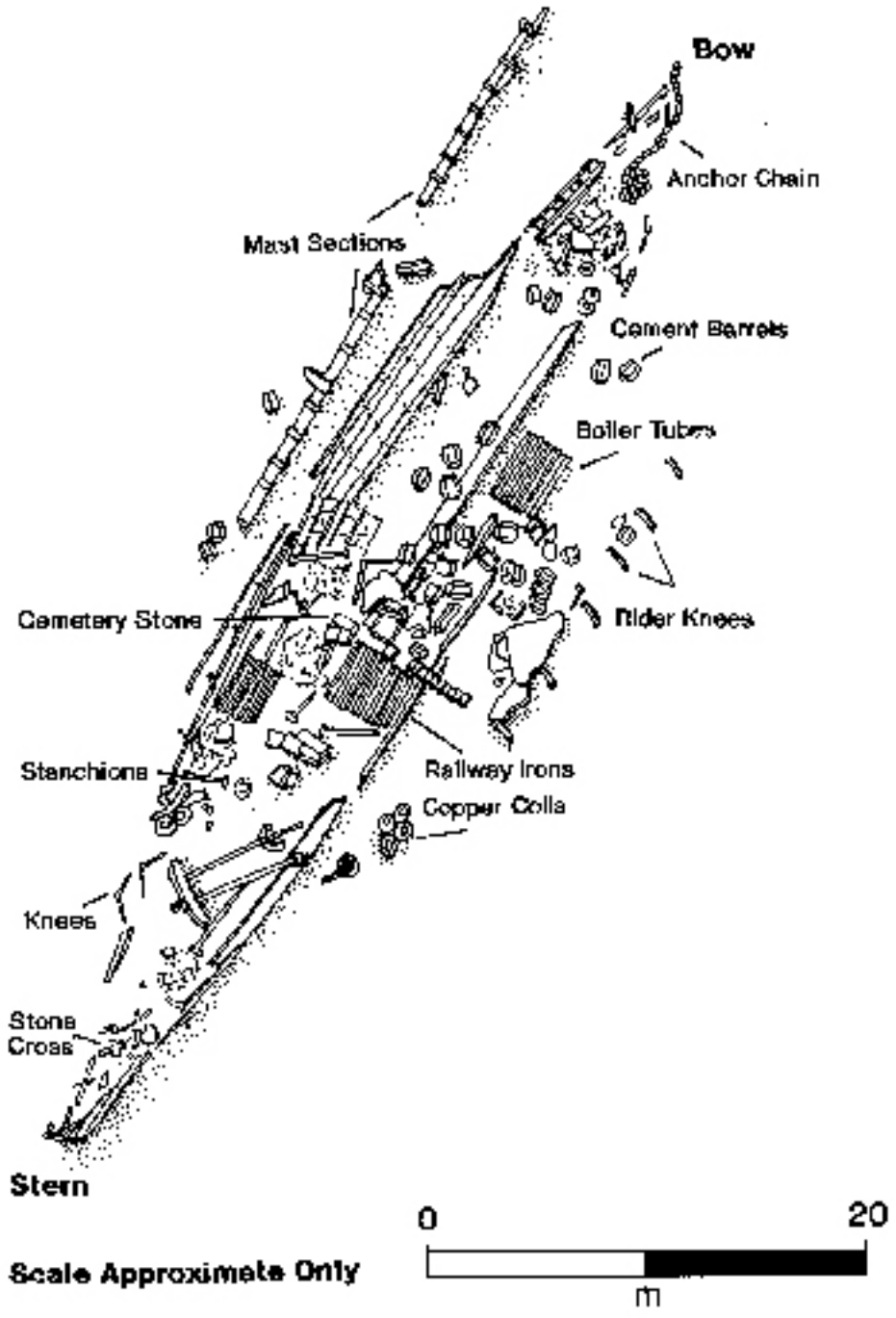


**Figure 4: Site plan, 1991 (Drawn by Tim Smith)**

# RMS Titanic

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## History and Interests

*RMS Titanic* is perhaps the most famous shipwreck in our current popular culture. It was built in Belfast, Ireland by Harland and Wolff. *Titanic* was a British flagged steamship and the largest and most luxurious passenger ship of its time. It was owned by the White Star Line and was reported to be unsinkable!

On April 10, 1912, *Titanic* set sail from Southampton, United Kingdom, on its maiden voyage to New York City with 2227 passengers and crew. It has been said that the captain was trying to break the record for a transatlantic journey despite repeated warnings about icebergs. It was traveling at near top speed of about 20.5 knots when at 11:40 PM on April 14, 1912, an iceberg grazed its side. Less than three hours later, Titanic plunged to the bottom of the sea, taking more than 1500 men, women and children with her, many of whom were trapped inside the ship's hull.

Since its sinking on April 15, 1912 and the associated loss of life, Titanic has captivated the interest of people around the world. These maritime casualties resulted in governmental investigations in the United States as well as the United Kingdom. They had a direct impact on the development of international law regarding safety in the navigation of ships. They were the catalysts for the Safety of Life at Sea Convention, as well as for the establishment of the International Maritime Organization.

## Discovery of the Wreck and Concern about Disturbing the Memorial-Site

The wreckage of Titanic was discovered on September 1, 1985, during a joint French/U.S. expedition lead by Jean-Luis Michel of the French Ocean Institute (IFREMIR) and Dr. Robert Ballard. It was found approximately 340 nautical miles (nm) off the coast of Newfoundland, Canada two miles beneath the high seas (depth of 12 500 feet or 3,800 meters). The expedition discovered that the stern section was some 1,970 feet (600m) from the bow section and did not sink to the bottom intact as was previously believed. Shortly after the discovery, Dr. Ballard appeared before the US Congress seeking to protect the wreck. Congress responded through the enactment of legislation directing the Department of State to negotiate an international agreement to designate the wreck as a maritime memorial. A U.S. company working with IFREMIR returned to the wreck in 1987 and began to salvage artifacts from the debris field.

**Figure 1: A close-up of the *Titanic's* bow**
**(National Oceanic and Atmospheric Administration, Institute for Exploration and University of Rhode Island)**

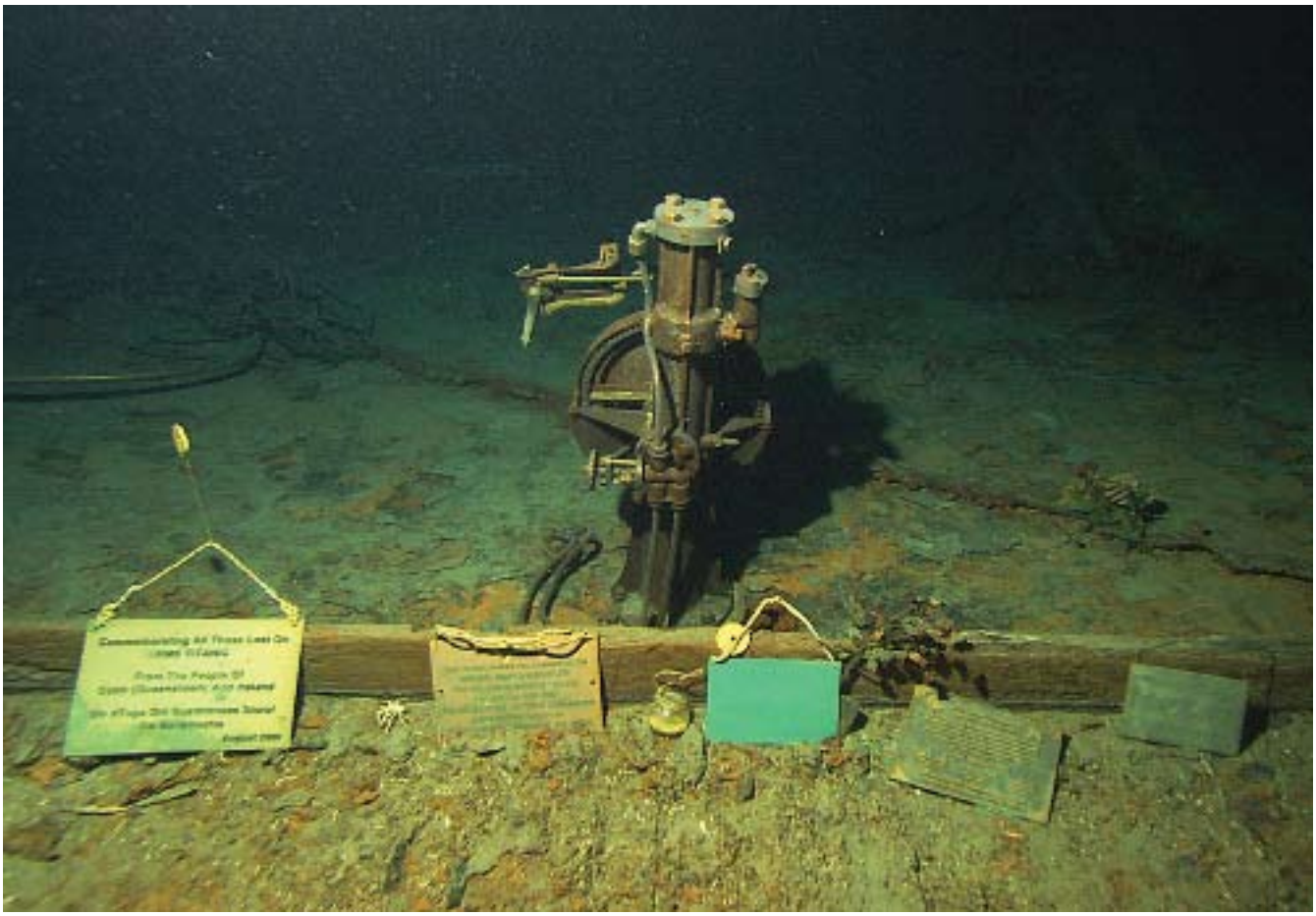

**Figure 2: A view of the steering motor on the bridge of the *Titanic***
**(National Oceanic and Atmospheric Administration, Institute for Exploration and University of Rhode Island)**

## US Acts to Address the Threats of Misguided Salvage

The *RMS Titanic* Maritime Memorial Act of 1986 (Titanic Act) was enacted to protect this unique shipwreck from potential harm caused by misguided salvage. The Congress recognized that while the United States had a significant interest in protecting Titanic, it needed the cooperation of other interested nations. Thus the Congress directed the Department of State to negotiate an international agreement with Canada, France, the United Kingdom and any other interested nation to protect Titanic from looting and misguided salvage. The Titanic Act also directed the US National Oceanic and Atmospheric Administration (NOAA) to consult with these same nations and develop guidelines for the exploration, research and, if determined appropriate, salvage of artifacts.

The tragic loss of so many lives and the encasement of their remains in the hull caused many people around the world to view the shipwreck as a grave site. Accordingly, Congress directed that the agreement should designate the wreck site as a maritime memorial. In addition, *Titanic* is of great interest to scientists, archaeologists, historians, naval architects, educators, salvors, the media, and the public. For this reason, representatives of many diverse groups were consulted and their interests were considered during the preparation of the NOAA Guidelines and the international agreement. *The Final Minutes of the International Agreement Concerning the Shipwrecked Vessel R.M.S. Titanic* (Agreement) were signed in 1999. The salvage company RMS Titanic, Inc. subsequently sued NOAA and the Department of State in an attempt to stop the signing of the Agreement. The suit was dismissed. NOAA published the *Titanic Guidelines on the Research, Exploration and Salvage in 2001*. The United Kingdom signed the Agreement in 2003. The Department of State signed the Agreement on behalf of the United States in 2004.

## The NOAA Guidelines, International Agreement and Annexed Rules

The NOAA Guidelines are based on the International Council of Monuments and Sites (ICOMOS) Charter as well as standards and requirements in the U.S. Federal Archaeological Program developed by the Department of Interior, National Park Service. The NOAA Guidelines and the Rules annexed to the Agreement on Titanic are essentially the same as the Rules annexed to the UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001). The NOAA Guidelines, the Agreement and the Rules incorporate the policy that *in situ* preservation of the wreck site be considered as the first management option. However, if a Party determines that it is appropriate to recover artifacts, then the responsible authority is to take all reasonable measures to ensure that all artifacts recovered

from Titanic by those subject to its jurisdiction are conserved and curated consistently with the Rules and are kept together and intact as project collections. It also requires each Party to take the necessary measures, in respect of its nationals and vessels flying its flag, to regulate through a system of project authorizations: (a) entry into the hull sections of Titanic so that they, other artifacts and any human remains are not disturbed; and (b) activities aimed at the artifacts from Titanic found outside the hull of the wreck so that all such activities are, to the maximum extent practicable, conducted in accordance with the Rules.

## Future Measures to Address Natural Deterioration and Recovery or Salvage

The US Ocean Policy Action Plan provides that the Bush Administration will submit recommended legislation along with the Agreement to Congress for its consideration. While the advice and consent of the Senate is not required for the executive agreement, implementing legislation is necessary for it to come into effect in the United States. Such legislation is currently under development. The United Kingdom has already enacted legislation to implement the Agreement. Although the Agreement and the *NOAA Guidelines are not enforceable by NOAA* or other federal agencies under the current Titanic Act of 1986, they have been cited by the admiralty court in support of its orders regarding management of the collection of Titanic artifacts. The court will likely continue to manage the salvage of the wreck site under the federal common law of salvage until the international agreement becomes effective for the United States through the enactment of legislation.

Jeremy Wierich, a marine archaeologist with the NOAA Office of Ocean Exploration, worked with Dr. Ballard and microbial research scientist Roy Cullimore, to map the wreck site and study the natural deterioration of the ship's hull. The tiny microbes that feed on iron and create icicle-shaped formations called rusticles are responsible for the deterioration. While rusticles have been observed for many years, little is known about them and thus how to slow the natural deterioration process. The *in situ* policy preference to not unnecessarily disturb the wreck site for reasons of historic preservation is consistent with the respectful treatment of the site as a maritime memorial. However, because of the natural deterioration of the wreck, requests for continued salvage/recovery are likely to continue. The NOAA Guidelines, Agreement and Rules set forth the legal and scientific requirements for how to preserve the wreck site as a memorial and a site for historic preservation, as well as for the scientific salvage/recovery of artifacts, when it is determined to be in the public's interest.

As the United States' ocean agency, NOAA's responsibilities include the scientific and cultural aspects of the *Titanic* and its appropriate treatment and preservation. NOAA's research focus is to build a baseline of scientific information from which to measure the shipwreck's processes and deterioration and then apply that knowledge to other underwater cultural heritage sites.

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# The Sound of Campeche: A Place Full of History

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## Background

During the 16th-, 17th- and 18th-centuries, the port of San Francisco de Campeche was a constant target of pirates, corsairs and buccaneers. Legendary characters such as Francis Drake, Lorencillo, Grammont or even Mary Read, one of the few women who practiced piracy, were responsible for the sinking of several ships in the area known as the Sound of Campeche, in the Gulf of Mexico. In addition, there were storms, reefs and hurricanes that contributed as well to the wreck of many European ships. Thus, the Sound of Campeche became an important cemetery of vessels, many of which have survived along the centuries.

The Sound of Campeche encloses the coastal waters of the states of Yucatan and Campeche, in the Southeast part of the Mexican Republic. In 1997, during the first field season of a project undertaken by the National Institute of Anthropology and History (INAH) to search for the remains of the ships lost by the New Spain Fleet in 1631 due to a storm in the Gulf of Mexico, 24 sites were located in this area. The following year, during the second field season, this time using remote sensing systems, more than 70 magnetic anomalies were detected; most of them proved to contain cultural vestiges.

These findings included shipwrecks as well as isolated elements, all products of maritime activities that took place between the 16th-century and the present. All this led to the creation of a project entitled "Inventory and Diagnosis of Submerged Cultural Resources in the Gulf of Mexico." More findings have been made during the sea campaigns of 2003, 2004 and 2005. All findings have been recorded through drawing, photography and video, *in situ* preservation has been applied, and very few recoveries have taken place.

Parallel to the offshore surveys, another group of INAH archaeologists has been working on coastal waters in the state of Campeche with the support of local institutions and individuals.

Many of these sites are at risk from human interference due mainly to two factors: the great distance that makes the task of surveillance difficult or, on the contrary, because of their proximity to the coast which makes access easy. Evidence of looting, including the use of dynamite, was noticed in some of the offshore sites. It is known that sport divers and fishermen have extracted mostly artillery pieces, anchors and iron shots to sell them as archaeological treasures or as well as scrap metal.

## Main Findings

The information gathered *in situ* and the analysis of the extracted pieces allowed preliminary results to be obtained regarding chronology, nationality, state of preservation and importance of some of the sites.

One of the main findings is a 16th-century shipwreck, most probably Spanish. This site was located in an area where shallow waters, abundance of corals and the force of the waves make navigation a difficult task. Probably in this area many ships found their end during the exploration, discovery and conquest epochs. Assorted pieces of artillery and anchors typical from the 16th-century were found lying two and three meters deep on the reef formed by the South and East Triángulos keys (Moya, 2003). There are many questions still without an answer regarding this maritime accident.

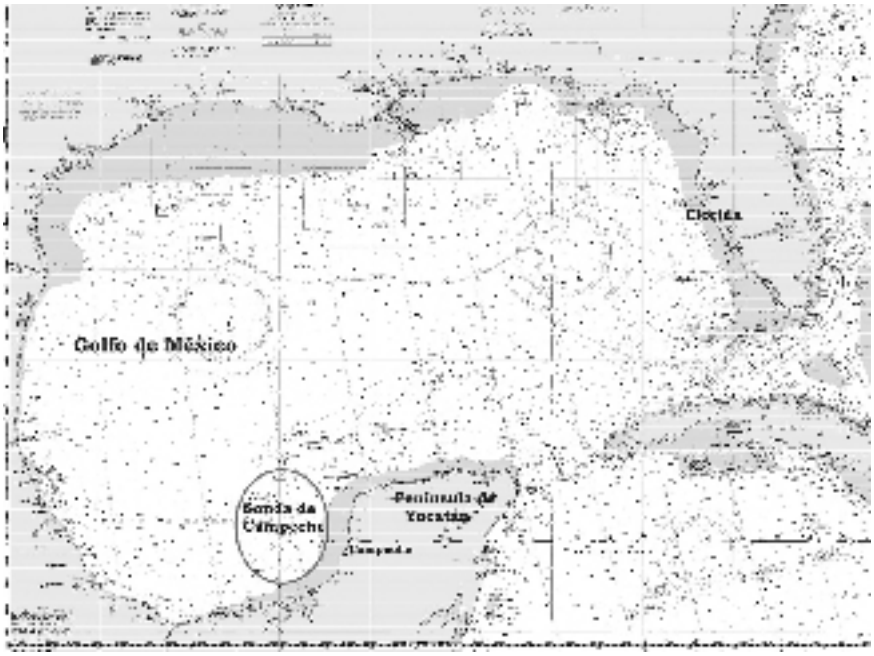


**Figure 1: The Sound of Campeche in the Gulf of Mexico has been a witness of five centuries of navigation (INAH/SAS)**

**Figure 2: Part of the 40 lead ingot collection recovered in 1998 at the Sound of Campeche (INAH/SAS)**

**Figure 3: Archaeologist Donald H. Keith facilitating a training course for members and collaborators of INAH's projects in Campeche (INAH/SAS)**

However, the logistics involved, the dangerous characteristics of the zone, the climatic conditions and financial and time obstacles have not allowed a second visit to this site.

Other important discoveries are two shipwrecks dating from the second half of the 18th-century. Both are probably British, one of them apparently corresponding to the *Meleager*. This site was named Cañón de Cañones, due to the geographical features of its location — inside a "canyon" — and the amount of cannons found there. The second site was named Don Pancho, honoring the local fisherman who acted as our guide and who played a vital role in its location. Here, artillery pieces, navigation instruments, lead bullets, iron shots, and lead ingots were found.

Regarding these ingots, during the 1997 works twenty of them were found; one was recovered as a diagnosis element. When returning to the site in 1998, one ingot was missing and the place showed traces of looting. To manage this threat, it was decided to extract all the pieces, which resulted in a collection of 40 ingots, most of them oval shaped while others are rectangular, semi-triangular or have an irregular shape. The average weight of each piece runs between 49 and 79.5 kilos. 32 show marks, and of those 15 also have holes. Until now, no relationship has been established according to shapes, marks or holes. In the past, when carried in a ship, lead ingots had a triple use: 1) as ballast to stabilize the ship 2) as merchandise that could be sold or exchanged in any port and 3) as metal that could be melted and transformed into bullets or pieces to repair the ship (Galindo 2003). Apparently, this is the largest lead ingot collection ever recovered in the Western Hemisphere.

## An Enriching Experience

The experience in Campeche has proved to be quite positive in many aspects. A campaign to raise consciousness among the local community has been taking place over the last three years, involving mainly fishermen in the protection of the coastal sites. In fact, many of them have taken us directly to sites discovered by them, or have informed INAH about the location of cultural remains. Each field season, there are more fishermen and more local people willing to share with us the location of new sites and to collaborate in their protection and in the inventory project.

As part of this consciousness campaign, lectures on the importance of the UNESCO Convention on the Protection of Underwater Cultural Heritage have been given in diverse forums. Articles and interviews often appear in the local press, radio and TV.

Solid links have been established with local and regional authorities and civilian, academic and military institutions, while collaboration with international institutions and colleagues has played a vital role. In short, the work in the Sound of Campeche has resulted in an excellent training field not only for the members of INAH's projects, but also for collaborators as students, divers, fishermen and even a local policeman.

This has paved the way to begin a permanent underwater archaeology program in Campeche and to sign a collaboration agreement with the state university in order to start working on the treatment of archaeological materials recovered from the sea, with the intention of eventually creating a full laboratory.

At the same time, plans have begun to transform some underwater sites into museums along the coastal waters. These will be opened to the public, under the surveillance of an official guide, as a recreational and educational visit. It is anticipated that this will increase the interest of the local community and the visitors in the submerged cultural patrimony and its preservation.

## Legal Aspect

The National Institute of Anthropology and History (INAH) was founded in 1939 as the official agency to protect, research and preserve archaeological sites in the Mexican Republic. Although Mexico has signed and ratified several international treaties related to the protection of the cultural patrimony, it has not created a specific law regarding the underwater cultural heritage. In the last thirty years, INAH has applied the *Ley Federal sobre Monumentos y Zonas Arqueológicos, Artísticos e Históricos* (Federal Law on Archaeological,

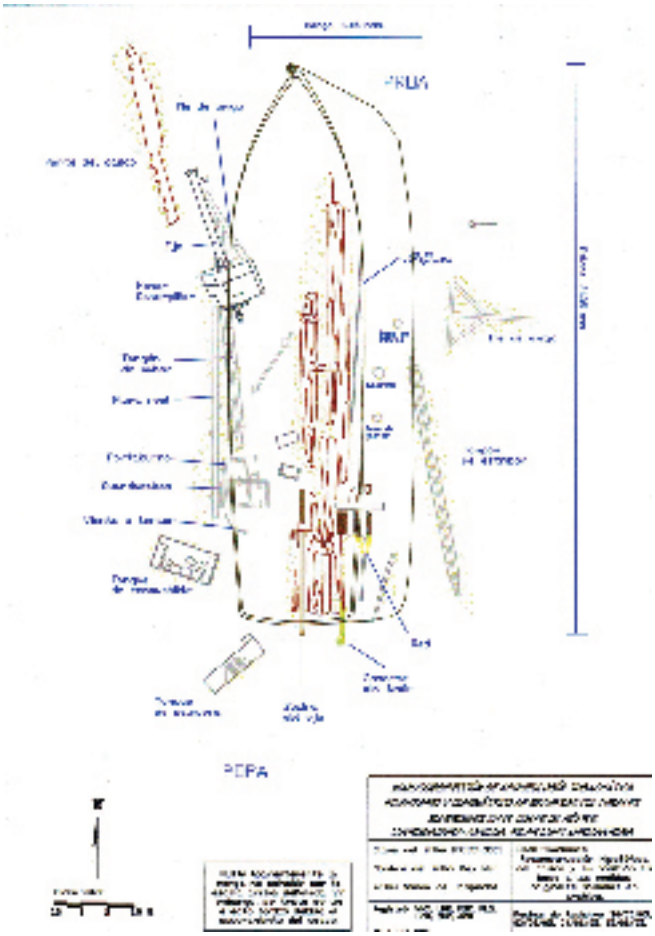

**Figure 5: Reconstruction of a modern shipwreck located at the coastal waters of Campeche, based on information gathered in situ and completed by data found at a local archive (INAH/SAS)**

Artistic and Historical Monuments and Zones) (INAH 1972) and its *Disposiciones Reglamentarias para la Investigación Arqueológica en México* (Regulations for Archaeological Research in Mexico) (INAH 1974), in the struggle to prevent looting and damage to the national patrimony including the underwater cultural vestiges.

Within INAH there is a Consejo de Arqueología (Council of Archaeology), constituted by eleven members of different specialties and institutions, in charge of evaluating and approving or rejecting any archaeological project to be fulfilled in Mexican territory, on ground or underwater, and based on the Reglamento del Consejo de Arqueología (Norms of the Council of Archaeology) (INAH 1990). Every year, this Council receives applications of treasure hunters groups trying to get permits to exploit shipwrecks, many of which are located in the Sound of Campeche. In fact, several of these applications are related to Nuestra Señora del Juncal, one of the flagships of the 1631 New Spain Fleet currently under study by INAH's Vice-Directorate on Underwater Archaeology. None of these applications have succeeded; nevertheless, minor looting exists due mainly to the lack of consciousness of some sport divers and fishermen who are not aware of the importance and cultural value of this legacy.

Mexico's position regarding the protection of its cultural patrimony has been internationally recognized. This position was defended by the Mexican delegation during the experts meetings to elaborate the text of UNESCO Convention on the Protection of the Underwater Cultural Heritage. Mexico was one of the countries that voted in favor of the Convention in November 2001, and is currently working in the process of its ratification. The above-mentioned federal law and regulations have served to stop treasure hunters and commercial exploitation. However, once the UNESCO Convention becomes a legal instrument, it will do even more. The Convention includes norms for responsible archaeological work and ongoing management of underwater cultural heritage. Ratification will prove of great value not only for Mexico, but for all nations who care for their history.

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# The Monte Cristi "Pipe Wreck"

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## Background

The Monte Cristi "Pipe Wreck" faces significant threats from both natural and human origins. The following is an outline of steps taken by the Monte Cristi Shipwreck Project (MCSP) in managing these impacts on this important site.

The "Pipe Wreck," so-called for the large quantity of clay, tobacco smoking pipes carried as cargo, was, until recently, one of the best known, yet least understood submerged cultural resources in the Dominican Republic.

However, this is changing thanks to the generous support of several United States-based non-profit organizations, the University of San Diego (USD), and the dedication of the *Oficina Nacional de Patrimonio Cultural Subacuático in Santo Domingo*. The remains of this 17th-century merchantman are reshaping how we view colonial life in the Americas.

**Figure 1: Yvonne Broeder, Monte Cristi Pipe Wreck team conservator, working at the dredge screen**

The presence of intrusive artifacts on the site along with anecdotal evidence collected by the MCSP team combine to suggest that the "Pipe Wreck" has been salvaged many times over the past three and a half centuries. This is due, in large part, to its location in shallow, clear water less than a kilometer from the mainland. The geographical fact that the northern coast of Hispaniola is located in the seasonal hurricane corridor poses a threat to all submerged cultural resources in its shallow coastal waters, including the "Pipe Wreck." Today, the expansion of the Monte Cristi suburbs and the development of a regional yacht club have resulted in an increasing number of tourist "day cruises" that pass within meters of — if not directly over — the site.

## Archaeological Investigation

When archaeological excavation commenced in 1991, the visible portion of the site comprised scattered ballast stones, pipe stems, ceramics sherds, and concreted iron caldron fragments. Careful study of these artifacts by archaeologists and volunteers of the MCSP led to the formulation of research questions which, to date, have guided seven excavation seasons and several archival studies:

- Could the site be accurately, if not precisely, dated?
- Did the extant hull and cargo suggest a nation of origin?
- Could a specific vessel and journey be implicated?
- Why did the vessel sink in the shallow water of a protected bay?

The investigation of these and other questions eventually led the team to hypothesize that the remains were of an inbound Dutch merchant vessel that wrecked between 1630 and 1665. Testing this idea entailed years of controlled excavation, historical research, and the subsequent conservation, analyses, and interpretation of numerous artifacts. As a result, researchers have revised the original date range, replacing it with a *terminus post quem* (date after which) of 1651 for the vessel's demise and narrowing the temporal window from 35 to 14 years.

## The Artifacts

The remnant cargo of the "Pipe Wreck" – not yet fully excavated – is certainly one of the largest and most diverse of any inbound merchantman destined for the Americas, rivaled only by Belle (1686), the "Quicksilver galleons" *Conde de Tolosa and Nuestra Señora de Guadalupe* (1724), and Machault (1760). Furthermore, a study of comparative contemporary sites suggests the vessel was headed for the eastern seaboard of what is presently the United States, specifically the Hudson River Valley, for its typically Dutch cargo compares well with archaeological collections from upstate New York, and specifically the Dutch-American settlement at Fort Orange (modern day Albany). The most conspicuous artifacts on the site are the pipes and pipe

fragments, the combined collection of which represents the largest aggregation of smoking-related artifacts ever recovered from a shipwreck, and possibly from any known archaeological site. The pipes alone number close to ten thousand, yet only two distinct types are represented in this assemblage: those with barrel-shaped bowls – accounting for approximately 93% of the assemblage — and the remainder (7%) with bowls shaped like inverted cones, known as funnel pipes. All are of Dutch manufacture and date to the middle 17th-century, and although the former were preferred by Europeans and European-American colonists, funnel pipes are clear imitations of Native American designs and were intended for both the colonial and tribal trades.

The wreck's ceramic cargo is composed of Rhenish stoneware from Germany and two varieties of glazed earthenware that are likely Dutch in origin, all of which fit well into the aforementioned temporal framework. Fragments of Westerwald pottery, as well as green-glazed and orange-glazed wares were also recovered, but in such small quantities that they were likely ship's wares rather than merchandise.

Metal artifacts include numerous cooking cauldrons, an assortment of tools, lead shot, and 27 silver coins from two South American mints.

Glass shards of many different colors have been found, but most interesting is a cluster of approximately 800 black glass beads. These, in fact, possibly hold a tantalizing clue to the demise of the ship: originally strung in hanks, these once spherical beads are now slumped and fused into each other, a phenomenon that occurs with intense heat lasting for a short period of time. Along with charred wood and melted metal globules, it appears that there may have been an explosion on board, a scenario that archaeologists are studying with considerable interest.

Faunal remains indicate that sailors aboard the ship subsisted on a diet of beef, pork, salted fish, and conch. Occasionally, they competed with vermin for these foodstuffs, as evidenced by animal bones that bear rat incisor marks. Olive pits and other fruit stones appeared regularly in our dredge screens, indicating that the shipboard diet was indeed varied.

## The Ship

Timber analysis indicates the vessel was constructed sometime after 1642. The manner in which it was built and the predominant wood types used in its construction suggest England as the locus of production. The extant keel, frames (N=17), outer planks (N=9), inner ceiling planks (N=6), and treenails were all shaped from English oak. Additionally, the hull was coated with tar and cow hair and covered with softwood deals (thin, protective outer boards) of spruce or larch, a measure common throughout the 17th-century to protect a ship's hulls from biological degradation caused by teredo worms and bacteria.

**Figure 2: Divers excavate and photograph the extant hull of the "Pipe Wreck"**



**Figures 3, 4 and 5 (Left to Right): Example of a smoking pipe from the wreck site(left); Rhenish stoneware from the "Pipe Wreck," with the highly stylized Bartmänner, or bearded man face adorning the vessel's neck (middle); and shoulder (right)**

## History Threatened, Yet Protected

This research has confirmed the value of archaeological investigation in understanding the history and importance of the "Pipe Wreck". Although not all of our research questions have been answered, these critical bits of information reveal a 17th-century merchant vessel that carried a cargo of European-manufactured trading goods, a part of which may have been for Native American tribes of the eastern seaboard of North America. Sailing during a period of volatile competition between the English and Dutch for maritime, mercantile, and military supremacy in both Europe and the Americas, our ship passed along the northern coast of Hispaniola, where historical sources suggest its crew may have engaged in illicit trade with smugglers. Likewise, there is strong evidence to suggest that this vessel entered the bay in search of salt, as today the outskirts of Monte Cristi are home to large, shallow evaporating pans. How far back this practice reaches is lost in the historical and ethnographic records, although Christopher Columbus noted at the close of the 15th-century that the region held great potential for salt production.

To ensure that the archaeological value of the "Pipe Wreck" is protected against inclement weather and less-than-scrupulous tourists, its timbers have been buried beneath a protective covering of tarpaulins, sandbags, and a meter-thick layer of sand and coral rubble. The MCSP team continues to work diligently with local officials, fishing boat operators, and tourist guides to inform them of the importance of the "Pipe Wreck" to the regional history of the island's northern coast, enlisting their cooperation in protecting one of the Dominican Republic's most valuable cultural resources.

# Foundations in Management of Maritime Cultural Heritage in the Cayman Islands

**Margaret E. Leshikar-Denton**
*Cayman Islands National Museum*
*Cayman Islands*

## Defining Heritage Value

Beyond images of sand and sun, the Caribbean Sea is a real place with an astounding cultural heritage. Pre-Columbian peoples lived here, followed by historical explorers who made discoveries, claimed territories and opened new avenues of commerce. Treasure-laden Spanish fleets attracted pirates, while European nations sanctioned the activities of their privateers. The sugar industry boomed, slavery abounded and nations fought battles in what became a proxy European theatre of war. Colonialism flourished, but as enslaved peoples achieved freedom, local industry and identity took root and developed into the world of today. Physical traces of this colourful past exist in a wide range of Caribbean maritime heritage sites such as anchorages, careening places, ports, harbours, coastal settlements, shipbuilding sites, shipwrecks, salvage camps, forts and lighthouses. These finite and non-renewable cultural sites are significant to world history.

Shipwrecks, popularized by the quest for Spanish gold, are among the most troubled Caribbean heritage sites. Treasure-hunters have lured Caribbean countries into non-beneficial salvage agreements, resulting in legal battles and the destruction or public loss of heritage resources. While treasure-hunting remains an active problem in the region, some countries are experimenting with the notion that there is more long-term value, profit, and public benefit in heritage protection, management and interpretation than in entering into compromising agreements with salvors. This is the course embarked upon in the Cayman Islands.

## Traditional and Creative Management Initiatives

The Cayman Islands are mountaintops that emerge abruptly from the Western Caribbean Sea as landmarks and navigational hazards. Archaeological surveys have failed to identify remains of indigenous populations, but the earliest explorers described diverse fauna. On 10 May 1503, Christopher Columbus sighted Cayman Brac and Little Cayman, identifying abundant sea turtles, while in April 1586 English navigator Sir Francis Drake came ashore on Grand Cayman where his hungry crew made meals of crocodiles and other beasts. Early Spanish, Dutch, French and English seafarers used the Islands as provisioning grounds, but after 1655 when the English occupied Jamaica, they also established seasonal fishing encampments in the Cayman Islands. As settlement became more permanent from the early 1700s, a unique maritime culture emerged based largely on the turtle-fishing industry. Influencing life and history, ships of at least fourteen nationalities have wrecked on the treacherous reefs of the three islands in the past 500 years.

## Legal Protection for Shipwrecks

In the Cayman Islands, shipwrecks that have remained on the seabed for more than 50 years are claimed under the Abandoned Wreck Law (5 of 1966, 1997 Revision), with ownership of artifacts "vested in Her Majesty in right of Her Government of the Islands." While blanket protection for historical shipwrecks is admirable, the law is deficient in two areas: 1) it does not recognize shipwrecks as cultural property and 2) it was enacted to ensure that the government receives a percentage of the value of articles recovered from shipwrecks, and once the government enters into an agreement with a prospector, it must return to the prospector at least one half of

**Figure 1. The treacherous East End reefs of Grand Cayman, where more than 30 ships have wrecked (Dennis Denton)**

**Figures 2: Anchor on the Glamis site, planned as the first Cayman Islands Shipwreck Preserve (Alexander Mustard)**


**Figure 3: Maritime Heritage Trail sign (M. Leshikar-Denton)**

the value of the wreck. Fortunately, the Cayman Islands have not entered into agreements with treasure hunters and have determined that the Abandoned Wreck Law is inadequate to protect and manage Cayman's underwater cultural heritage. Initiatives towards achieving new legislation began in the early 1990s, but have been delayed. Thus, forthcoming legislation has the advantage of taking into account recent international initiatives such as the ICOMOS International Charter on the Protection and Management of Underwater Cultural Heritage (1996) and the UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001).

## An Inventory

In 1979-80 the Institute of Nautical Archaeology, under the direction of Roger Smith with a field team including the author, conducted a survey for the Cayman Islands Government, recording 77 maritime sites within the territorial waters of the Cayman Islands. In more recent times, the database has been enlarged to include 140 shipwrecks and additional maritime sites, by the Cayman Islands National Museum, with assistance from the Department of Environment (DoE), National Archive, National Trust, visiting archaeologists and volunteers. This National Shipwreck Inventory, developed over the past 26 years, provides a sound basis for planning future underwater and maritime heritage management strategies in the Cayman Islands. The premise is that knowledge inspires appreciation among the public for cultural heritage sites, and results in enlistment of allies in the guardianship of these irreplaceable resources. Toward this end, the Museum, DoE, Archive and Trust initiated a three-tiered approach to protect, manage and interpret the Islands' maritime heritage sites: 1) a land-based maritime heritage trail accessible to all 2) a series of interpreted shipwreck preserves for the adventurous aquatic public and 3) controlled management and research of rare and sensitive sites.

## The Maritime Heritage Trail

The Cayman Islands Maritime Heritage Trail, created by a partnership of the Museum, DoE, Archive and Trust, promotes the Islands' maritime legacy, combining heritage, education and recreational tourism. Launched in 2003, the Trail took inspiration from established and successful programmes in Florida and Australia, and benefited from collaboration with Della Scott-Ireton of the Florida Bureau of Archaeological Research. The Trail is a land-based driving tour around the three Cayman Islands with 36 stops marked by signs at historically significant maritime sites. Two colorful poster/brochures, one for the Sister Islands (Cayman Brac and Little Cayman) and one for Grand Cayman, interpret the Trail for explorers. Visitors learn in a fun and interactive way about a variety of maritime themes, activities, and industries unique to the Cayman Islands, such as maritime place names, lighthouses, maritime architecture, shipbuilding, hurricane caves, forts, turtle fishing, anchorages, early explorers, maritime activities, and shipwrecks.

The Partners developed a set of criteria for selecting sites appropriate for inclusion on the Trail. The Trail stops have historical significance, comprise multiple maritime themes, do not adversely impact sensitive sites, include all three Cayman Islands, provide a safe and entertaining activity, and highlight interesting visual features with safe and publicly accessible viewing areas. Designed to have multiple values, the Trail is uniquely Caymanian and encourages a sense of national pride in existing maritime heritage resources. It is a widely accessible, land-based attraction that encourages travel around the coastlines of all three islands, thereby enhancing the local economy. It encourages public visitation and appreciation of heritage sites, resulting in stewardship of these resources. As the first of its kind in the Caribbean region, the Cayman Islands Maritime Heritage Trail can serve as a model for the interpretation and protection of maritime cultural resources in other Caribbean nations.

## Shipwreck Preserves

The second initiative in Cayman's multi-phase program to promote and protect maritime cultural resources is establishment of a series of Shipwreck Preserves in the waters of all three islands. For inspiration and practical knowledge, the Maritime Partners again looked to models in Florida and Australia, as well as other states and the United States National Marine Sanctuaries. They formulated draft criteria

for sites in the Preserve system: a wreck must be located in Cayman's territorial seas or in the contiguous zone, be historically significant, have a reasonably verifiable identity and history, have recognizable features, be environmentally healthy and stable, be robust enough to withstand sustained visitation without compromising archaeological integrity, be accessible to the public, and have safe visitation conditions.

The first Cayman Islands Shipwreck Preserve is planned for the site of the iron-hulled barque Glamis, built in Dundee, Scotland, in 1876 and wrecked under Norwegian flag in 1913. The site, composed of large sections of iron hull fragments, anchors and multiple sailing-ship deck features and located in a shallow clear-water reef environment off the East End of Grand Cayman, has been mapped by the Museum in collaboration with students from the Anthropology Department of Florida State University, including graduate student Bert Ho, with logistical support from DoE and East End dive operators. Interpretive materials will comprise a bronze marker set in cement on the seabed, a laminated underwater guide for site visitors, and a topside brochure featuring the ship's history and dramatic wrecking event. Sites like Glamis, that are structurally stable, located in a healthy environment, and whose histories are known, are appropriate for *in situ* interpretation, where appropriate access is beneficial for the resource and the adventurous public. The Preserves, representing a variety of shipwrecks managed, interpreted and legally protected for the benefit of the public, will be thematically linked as the Cayman Islands Shipwreck Preserve Trail.

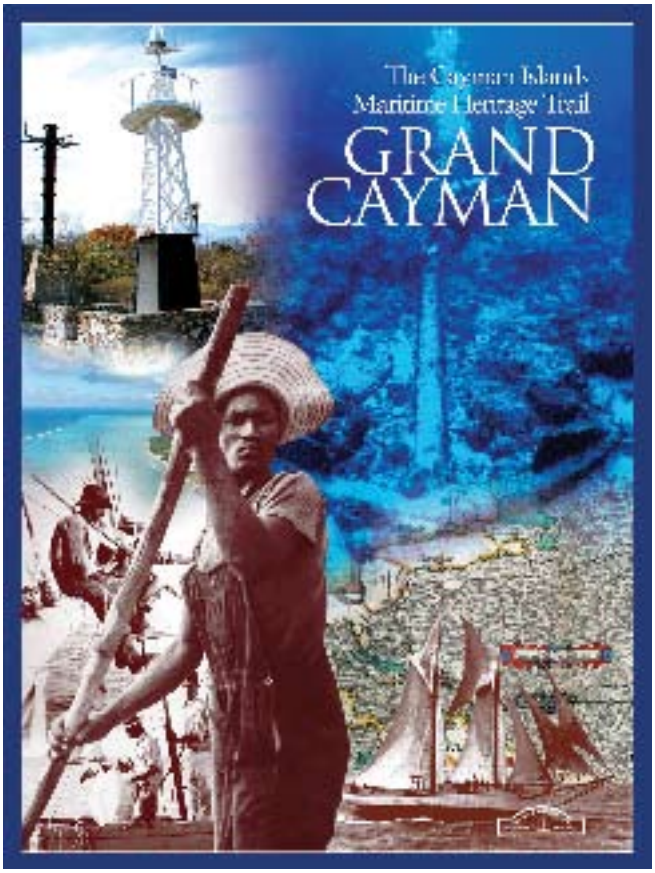
## Rare and Sensitive Sites

Once people interact with history through the Maritime Heritage Trail and Shipwreck Preserves, they will better appreciate and understand that some sites are sensitive and fragile, and might include information available nowhere else in the world. These rare sites deserve special protection, management and study. Research can result in publications, museum exhibitions and filmed documentaries, whereby people are invited to share knowledge that is extracted from these special sites by professional archaeologists. While *in situ* preservation should always be considered as a first option for shipwrecks, if intervention is planned for research purposes or mitigation, a whole range of responsibilities comes into play, among which are demands for funding, professional expertise and documentation, conservation, site stabilisation, collections management and curation, and dissemination of information to the public. Presently, no shipwrecks are under archaeological excavation in the Cayman Islands. There are, however, significant early heritage sites located in the Islands that deserve archaeological attention. For instance, in Grand Cayman *HMS Jamaica*, a British sloop on patrol for pirates, was lost in 1715. An unidentified 16th-17th century wreck of unknown nationality was found on the East End reef, and a mid-18th-century Spanish wreck characterized by a wide range of ceramic material has been discovered. The Duck Pond careenage, active for centuries, still survives in a relatively undisturbed state. The Wreck of the Ten Sail, comprising the frigate *HMS Convert* and nine of her merchant convoy were lost together in 1794. Among sites worthy of specialized archaeological research in the Sister Islands are English vessels lost during a 1670 battle with privateer Manuel Rivero Pardal, a late-17th-century shipwreck of undetermined nationality, and the *San Miguel*, wrecked in 1730.

## Conclusion

Much has been accomplished to lay a foundation for protection and management of maritime heritage sites in the Cayman Islands over the past quarter century. Traditional and creative management strategies have been initiated, but need to be completed and/or maintained, including a new law for underwater cultural heritage, the shipwreck and maritime site inventory, the Maritime Heritage Trail, Shipwreck Preserves, and protection and research into rare and sensitive maritime sites. The Cayman Islands are in a perfect position to build upon their prior achievements, and to contribute to wider public knowledge, protection, management and appreciation of the maritime heritage of the Cayman Islands. It will be a service not only to the Cayman Islands, but to the Caribbean region and to world history.

**Figure 4: Grand Cayman Maritime Heritage Trail poster/brochure front (Courtesy Cayman Islands Maritime Heritage Trail Partners)**



# The Long Struggle between Santa Fé and the San Javier River

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## Introduction

In 1573, a group of Spaniards founded the city of Santa Fé La Vieja, by the San Javier river (part of the fluvial system of the great Paraná river), today in Argentinean territory but at that time part of the Virreinato of Peru, the southern portion of the Spanish Empire in America.

This article deals with the archaeological site resulting from this settlement, and reviews how the natural action of the river in relation to the site's topography represents a clear situation of "heritage at risk," imperilling both the terrestrial portion as well as submerged elements of the site.

## Location

The site known as "*Santa Fé La Vieja*" is situated in the central region of the present Province of Santa Fé (see maps.) The surrounding landscape basically consists of flat lowlands with some very subtle undulations, a formation known as *albardones* (terraces) when located next to rivers. The existence of this geomorphology gave rise to the location of the settlement, as it allowed the city to be built next to the river. Access to the San Javier River, the only available communication channel, made survival, in its most absolute and integral sense, possible for the population. The river facilitated travel, commerce, food supply, and constituted a means of defence.

The settlement's position on the terraces also offered protection from the river's flood cycles. Depending on seasonal rain conditions, Santa Fé was frequently totally surrounded by water, resulting from the raised river level. Whilst the settlement itself was safe from flooding, it became temporarily isolated from the surrounding lower countryside.

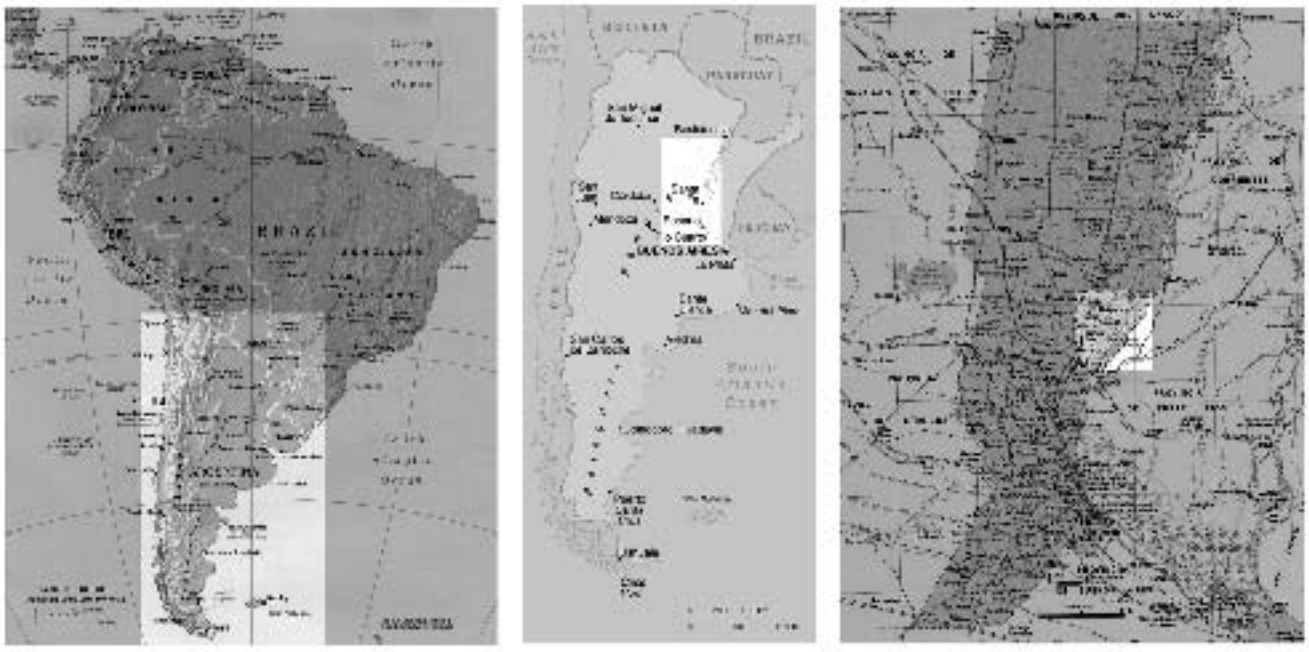
The permanent flow of water over this terrain made of clay and sand causes constant erosion, and therefore changes to the riverbanks. This systematic cycle of flooding creates an erosive process and the transportation and deposition of geological materials. The city of Santa Fé was affected by this never-ending erosive action for which there is no permanent solution. The river and the topography led to the founding of the city; however, they also led to its loss.

## Santa Fé

Juan de Garay founded the city of Santa Fé. Sailing down the river from the already established city of Asunción (1537), he decided to create a permanent settlement, intended as a mid-way resting point to the ocean and then on to Spain. In principle, with this objective of territorial control and consolidation of the European presence, Santa Fé was a city with a European population from several origins (Spanish, Venetians, Germans, and Portuguese) as well as local indigenous inhabitants and black Africans. The city grew, remaining in its original location, until 1690.

The repeated flooding of the river and the resulting periods of isolation together with the erosion process of the terraces banks created difficult living conditions. The city started to suffer the loss of dry land, especially along the river front,

**Figure 1: Localisation**



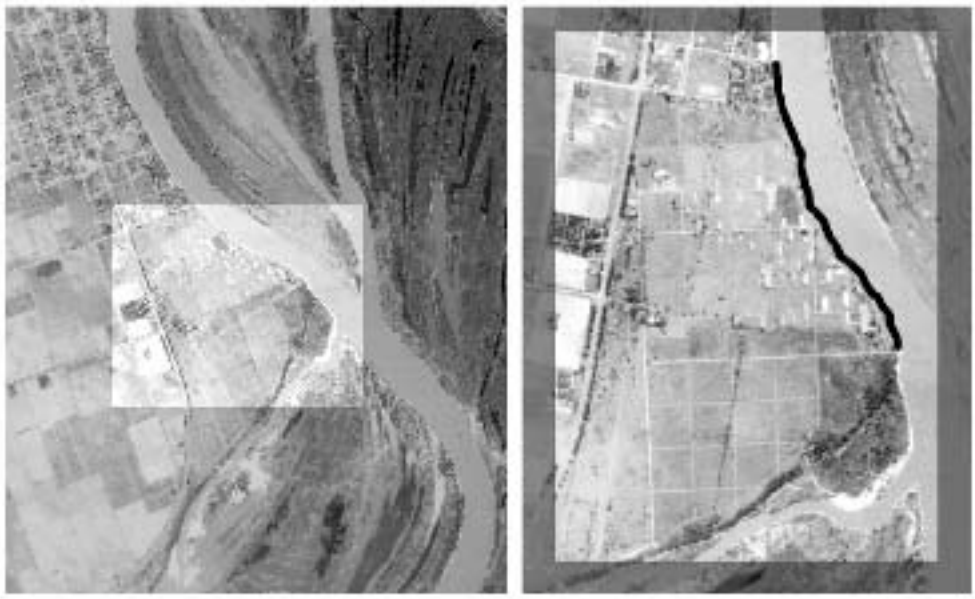


**Figure 2: Archaeologic site and the San Javier River; erosion zone marked in black**

where the blocks near the river were gradually collapsing into the water. This slow, but continuous, process led to Santa Fé losing several main buildings and land lots, which had played a central role since the city's founding, and often belonged to the more influential citizens and groups. In this way, the city's own founder, Juan de Garay, lost his house, and the city square survived till the present (2006) with only 50% of its original surface area (see plan). Furthermore, three of Santa Fé's five churches were lost to the constant erosive action produced by the river (see map of the city in its actual situation).

Understanding that this process was irreversible and progressive, the population decided to move the city to a new location 85 km south, by the central branch of the Paraná River (main river of the system and one of the largest in the world). In this new location, the city was re-founded, but under the name of "Santa Fé de la Veracruz." Beginning in 1690, the new settlement copied perfectly the distribution of the lots and the design of the old city.

## Archaeological Site Formation

It is clear that due to the permanent action of the river, the city was in constant danger and that cultural material from the occupied dry land was transported into the river bed. It would therefore be possible to affirm that the archaeological site known today as "Santa Fé La Vieja" existed from the beginning of the European occupation. It should be remembered that the city underwent a process of abandonment and re-founding in a second location. This process obliged the population to reuse as much material as possible in the new city. It thus defines the formation of an archaeological site with a natural process of erosion and re-deposit of material together with the sudden removal of all materials that could have been reused in the second location. The first part of the process has not, however, finished, and continues even today. This has lead to an archaeological site formed by active anthropic action (the human presence during the city's life) and passive action (abandonment), both basically determining the remains found in the ground. Simultaneously, the river has transported material deposited in dry ground into the water. The process had and has no end. It could be said that this is a case of permanent "mutation" of a combined "terrestrial and underwater" site into an underwater site, if the erosive process of the San Javier River were never to stop. It is clear that from the founding of this settlement, the interaction between man and his environment has been the basis for the formation of a site with two faces (terrestrial and underwater). However it is also clear that this site acquires its identity as an archaeological site starting from a specific moment and due to the continuity of a natural action.

In 1949, Dr. Zapata Gollán, after several years of searching for the remains of the first Santa Fe, located the city and began his research according to archaeological methodology. From the outset, Gollán was aware of the problems the river erosion posed to the site and its determining effects on the existence and deterioration of the remains. In 1995, a five-year project concerning the site's underwater archaeology began under the direction of Mónica Valentini.

The underwater archaeology project resulted, among otherthings, in an understanding of the natural auto-migration process of the San Javier River, and how this process affected and continues to affect both the terrestrial and underwater archaeological remains. The project also was able to establish the speed of the erosive process and to measure its magnitude—information which is of the utmost importance for the future conservation of the site. It determined that while the site is threatened by several problems, the evolution of the San Javier River is the most significant. It exerts a major impact on the site of Santa Fé La Vieja (as much as in the days when it was inhabited) which contains the only existing remains of a sixteenth-to-seventeenth century Spanish colonial city in America, and which was abandoned after almost 100 years of use.

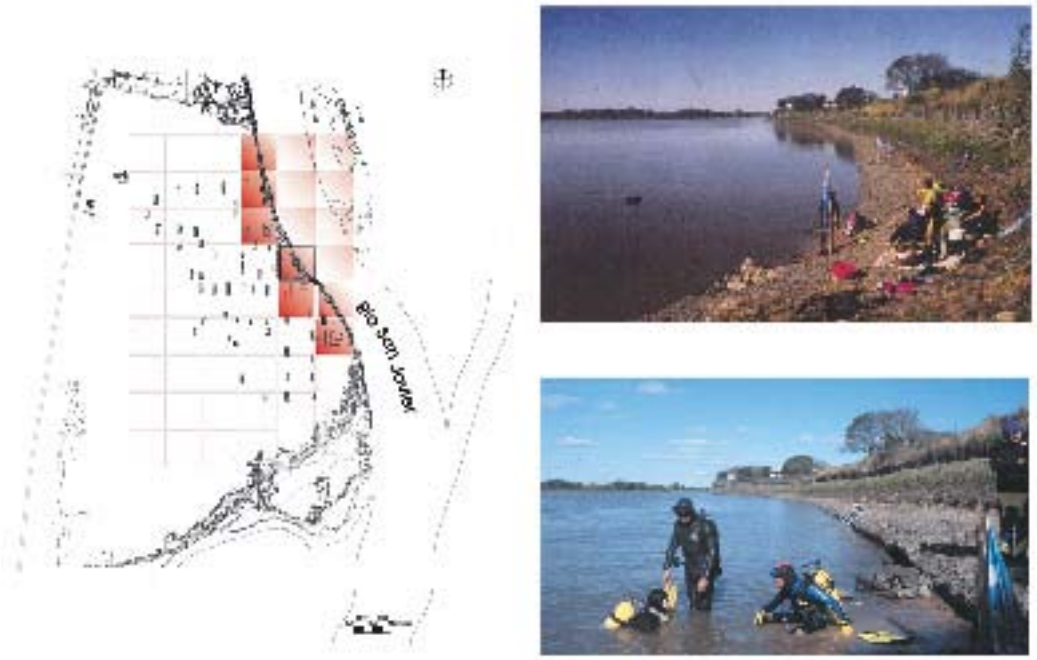



**Figure 3: Erosion of the San Javier river banks; the map shows the area lost due to erosion**

At the same time, the project illustrated the site's indivisible relationship with the river. Not until this project was carried out were archaeological remains in Argentina seen as being the direct results of the interaction between humans and their environment. In general, previous archaeological investigations did not include studies of waterways or basins, and in this manner they often missed the fundamental reasons that a city's inhabitants chose to settle in a specific place and lacked an understanding of their subsequent relationship with their environment.

## World Heritage List Nomination

Given the importance of the site of Santa Fé la Vieja, the provincial authorities decided to initiate the World Heritage List nomination process, according to the UNESCO World Heritage Convention. Argentina, a signatory country of the Convention, began working on the nomination dossier. Yet at the moment, this process is complicated by the very threats that the site faces. In fact, the main issue is to determine how to mitigate the erosive process of the terraces and the site as a whole. Though many attempts have been made to consolidate the banks and the terraces in an effort to at least minimize the erosion, none of these have achieved any stable or lasting results.

## Conclusion

It is clear that this site possesses sufficient value on a local, continental, and international level so as to provide an outstanding example to the world of European colonization in the Americas. Yet this status is threatened by natural processes, and therefore this site must inevitably be seen as "Heritage at risk." Santa Fé La Vieja is also distinctive in that it is not exclusively an underwater site; it derives some of its complexity from encompassing both a land and water phase. How can we reconcile the fact that the same elements which created it and today allow us to read into its past are also those that are threatening its very existence. The challenge lies in the struggle to continue being able to read from this site, a struggle against nature.

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# Pre-Colonial Fish Traps On the South Western Cape Coast, South Africa

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Stretching for more than 400km, from the Cape Peninsula in the west to beyond the harbour town of Mossel Bay in the east, the South Western Cape coast of South Africa is lined with stone fish traps. Built by the area's pre-colonial inhabitants, these traps are a special feature of this coast and have been reported along much of its length.

Although an important part of South Africa's maritime cultural heritage, the fish traps have a surprisingly low public and archaeological profile. Relatively few people know of their existence, and they have only been discussed in two archaeological papers, the first published in 1946 (Goodwin) and the other in 1975 (Avery). No other systematic work has been undertaken to survey and record these sites and their distribution, to establish their age, or to investigate their archaeological associations. In 2004, however, the National Survey of Underwater Heritage (NSUH) started systematically locating and recording the fish traps, in part as a response to the real and potential threats to these sites. This survey was a project of the South African Heritage Resources Agency (SAHRA) funded by a grant from the National Lotteries Distribution Trust Fund.

The heritage significance of these fish traps is clear, and was to some extent officially acknowledged with the declaration of one of the fish trap concentrations near Still Bay as a national monument in the 1980s. In general though, they remain little understood and, although protected by the National Heritage Resources Act (25 of 2000), are at risk of damage or even destruction.

## South Coast Fish Traps

It is clear from the archaeological remains – shell middens, deep stratified cave deposits, rock art and the fish traps – that marine resources have a long history of human exploitation along South Africa's coast. Shell middens are plentiful and in some instances date back more than 100,000 years, well into the Middle Stone Age.

Stone fish traps are found adjacent to many middens on the South Western Cape coast and John Goodwin, one of the fathers of South African archaeology, was the first to propose in 1946 that there was a relationship between some of the middens and the traps. He suggested that the sudden increase of fish remains in Later Stone Age levels at Oakhurst Shelter could point to the inception of the use of fish traps, although he was unable to fix a date for this event.

Sea level data generated since then suggests that the traps presently visible in the inter-tidal zone date to the last 2000 – 3000 years (Avery 1975). However, a means of dating the fish traps absolutely has yet to be found and thus the dating of these sites remains tenuous and open to question. It is possible that the technology of building fish traps is older than the postulated dates and that earlier evidence of their use was inundated as sea levels rose from their late Pleistocene lows about 15,000 years ago.

Stone fish traps have been recorded at De Hoop, Skipskop, Struis Point, Struis Bay Harbour, Cape Agulhas and further west towards Pearly Beach and Danger Point. There are indications that there may be fish traps at Slangkop and Kommetjie on the Cape Peninsula. Sources have also reported an occurrence at Vlaminck Vlei near the mouth of the Berg River on the West Coast and possibly also on the Alexandria Coast northeast of Port Elizabeth in the Eastern Cape. Recent work by the NSUH has confirmed the presence of eleven clusters of fish traps in the area between Still Bay and Mossel Bay.

The traps were constructed and utilized by pre-colonial hunter-gatherer communities and to a large extent fell out of use as the indigenous population of the area was displaced by the European settlers during the 18th-century. In a few instances, however, the descendants of both these indigenous populations and the European settlers still maintain and use some of the traps.

From an archaeological perspective, the fish traps are important as they represent arguably the oldest extant working technology in South Africa. The investment of time and labour involved in building and maintaining these structures suggests the aggregation of small hunter-gatherer groups at certain times of the year or month to pool their labour for mutual benefit. The traps therefore also offer tantalizing suggestions regarding the co-operation between hunter-gatherer groups to collectively exploit marine resources.

## What are They?

The South Western Cape coast fish traps are essentially artificial rock pools consisting of low, stone walls built from beach cobbles and rocks available on site. The positioning of the traps and the form and profile of the walls themselves, indicate that their builders had a sound understanding of shoreline dynamics and the fundamentals of engineering.

The traps are generally located in the inter-tidal zone on shallow rocky platforms overlain with loose rock, cobbles or boulders. These wide platforms effectively increase the size and extent of the inter-tidal zone and, because they are shallow with a gentle slope, are generally subject to less dynamic wave action.

The packed walls are constructed of loose rock cleared from the rocky substrate usually forming a series of linked semicircles, and were built to a height that allowed them to be inundated twice a month at spring high tide. Alternatively,

**Figure 1: Geelkrans, near Still Bay; fish traps from the air; note the trap walls and the substantial packed tongue of rocks on the left**

**Figure 2: Noordkapper Point, Still Bay; these traps are still maintained and used by a group of local farmers**

**Figure 3: Noordkapper Point, Still Bay; aerial view of trap complex showing unmaintained pre-colonial traps in foreground**

natural gullies in the bedrock were utilised by simply being dammed with rock walls to the height of the surrounding bedrock.

The profile of the walls is interesting too. Their inner faces are vertical, making it more difficult for fish to escape once in the pools, while the outer or seaward faces are sloped. This serves the dual purpose of providing less resistance to the force of the surf while at the same time providing an easy entry for the fish. Fish swim or are washed over the walls at spring high tide and remain trapped in the pools behind the walls as the tide recedes, where they can be more easily collected by people.

## Threats

Most of the identified fish traps are no longer in use, and their walls have collapsed. Despite centuries of neglect, most of the traps still retain their spatial integrity and their extent and character is easily discernable. They are however subject to an increasing range of impacts that threaten their survival, and these are largely the result of increased human pressure on the coast and its resources.

Coastal developments have increased the population in the areas these traps occur. This has exposed the traps to human interference which ranges from damage by fishermen who break down walls looking for bait, to the destruction of traps for the construction of harbours or even their conversion into tidal swimming pools. There is also a degree of unintentional damage to the traps simply caused by public ignorance of their existence and importance. Most of these threats can be managed by increasing public awareness of the traps, and by encouraging local coastal communities to understand their significance and importance and to take ownership of "their" traps.

A recent potential threat to some of the fish traps has arisen as the result of South Africa's growing tourism, particularly its eco-tourism industry. In a number of places along the South Western Cape coast, local communities and tourism operators have proposed the rebuilding and reuse of fish traps. This raises complex issues about the reuse of archaeological heritage, and poses questions about whether the re-building and reuse of traps would compromise their archaeological integrity. At the same time the argument is made that the reuse of sites such as these has a positive educational role, will raise public awareness about the need to preserve such sites, and should be encouraged. The answer probably lies somewhere in the middle, and will need to be debated and negotiated by the heritage sector, tourism operators and local communities.

## Conclusion

The current work by the NSUH should result in a complete record of the South Western Cape Coast's existing stone fish traps, their range, extent, location and condition. This information will form the basis for decisions regarding the future conservation, protection and possible reuse of these important pre-colonial sites, and will also add to our sum of knowledge about this oldest extant, yet barely understood indigenous technology.

At the same time, the NSUH is confident that the considerable public interest the surveys of the fish traps have generated in the areas where they have been undertaken will also be seen in other areas. If the surveys can contribute to the creation of a local community interest in and concern for its maritime archaeological heritage they will have contributed to the conservation and protection of these important sites.

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# Protected Zones and Partnerships: Their Application and Importance to Underwater Cultural Heritage Management

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## The Steam Collier Myola 1919

The *Myola*, a steam collier built in 1913, sprang a leak on the 2nd April 1919 and foundered off Sydney's northern beaches.

The wreck of the *Myola* was discovered by recreational divers in July 1994. The site was protected as an historic shipwreck under the Australian Government's Historic Shipwrecks Act 1976. However, a recommendation for the declaration of a Protected Zone around the site was not supported by the Minister responsible. Although the majority of divers strove to protect the site, significant damage was inflicted on the site. This has significantly reduced its archaeological potential as well as its visual appeal and subsequent recreational activity.

The failure of this site to be adequately protected sits in contrast with another collier, the *Lady Darling*, a much shallower site on the New South Wales south coast.

## The Steam Collier Lady Darling 1880

The *Lady Darling* foundered in 1880 but was located on16 August, 1996 after a trawl net became snagged. On the 19 August, divers freed the net, found the wreck site and promptly notified the New South Wales Heritage Office.

Heritage Office archaeologists then visited the site to establish its identity and location. These inspections revealed no signs of prior visitation by divers or previous damage by trawl nets. The professional fisherman who hooked up on the wreck leading to its discovery was unsure why his nets fouled in an area thought to be barren. A few isolated fishing weights have been identified however, indicating that some limited line fishing has occurred over the site.

## Wreck Site Description

The stern and midships remain intact as does the heavy engine and boiler. The decks, deck beams and hull sides have collapsed where they are not supported by bulkheads. With the loss of support, the bow, a relatively strong unit, has broken away from the hull. The bow has pivoted along the keel line and collapsed to starboard, due to the breakdown of the hull sides aft. The structurally strong stern of the *Lady Darling* stands intact to near the upper deck level. Forward of the stern bulkhead, the hull sides have disintegrated to approximately the level of the surrounding sand. The engine room area itself is discernable only by the positioning of the engine and boiler. Two vertical stanchions are visible forward of the boiler and mark the centreline of the hull. They probably served to support the upper deck. This was the main cargo area of the steamer, and with few structural supports in this region, the hull sides have been severely reduced.

All fittings associated with the bow have tumbled outside of the hull and lie to starboard, following the direction of collapse. These include an Admiralty and Porters Patent anchor, the Patent Capstan, a davit, anchor chain and a collection of tumbled deck beams. In the midships region, the donkey boiler, a winch and timber rigging deadeyes, have fallen just outside the hull to starboard. The remainder of the visible relics have fallen within the area limited by the hull. In the stern area, these include a ship's lantern, crockery, deck beams and other structural elements. Towards the bow is a mound of anchor and chain, and the remains of the iron collars which probably supported the forward mast.

Other identifiable features are expected to survive beneath present sand levels, particularly forward of the boiler, the

**Figure 1: *Lady Darling* wreck – from stern to boiler at midships (D. Nutley)**

presumed area of the bridge. Sand levels are likely to vary over the site due to storm and swell activity, with buried structure becoming exposed at certain times. This body of sand is actively helping to preserve the structural remains and other artefacts that form this site.

## Legislative Protection

Shipwrecks along the Australian coast are protected by legislation which aims to conserve sites, while encouraging public access.

Shipwrecks lost more than 75 years ago are protected from interference or damage by the Historic Shipwrecks Act, 1976. The *Lady Darling* has additional legislative protecting it through a Protected Zone placed around the wreck site under section 7 of the Act. A permit is required from the Heritage Office to visit these exclusion zones.

## Site Management

The *Lady Darling* site has been assessed as an important local reminder of the dangers of coastal maritime trade in the 19th-century. Its engine and associated machinery survive as a rare Australian example of a specific development period in marine engineering last century. The shipwreck and its associated *in situ* artefacts retain high recreational importance as the most intact shipwreck for diver visitation in the Eurobodalla Shire region.

On this basis the Heritage Office developed a management strategy to ensure the retention of these values, while also fostering public access. Experiences with the discovery of the *ss Myola* were a critical factor in the desire by the Heritage Office to seek a workable management solution to maintain the integrity of the site.

Expectations were that the *Lady Darling* would be a well sought-after recreational dive site, especially amongst the wreck diving component of the sports diving fraternity. This was despite its relative isolation away from a major urban centre like Sydney. The relative isolation of the site also meant that effective policing of visitation was difficult.

## Development of a site management strategy

With the support of the finders of the wreck site, a 150 metres radius Protected Zone was established around the wreck site. This enabled visitation through a permit system and more detailed examination by the Heritage Office.

Discussions with the charter boat operators focused on protection of the *Lady Darling* wreck, access arrangements and the potential to work jointly to manage the site. A permanent sub-surface mooring system was devised to enable visitation to the site without the threat of inadvertent anchor damage occurring. The mooring design consists of two vertical lines weighted to the seafloor. In the case of the Lady Darling, railway wheels have been utilised, but chained segments of railway line could also be used instead of or added to the railway wheels. The vertical stands are connected some ten

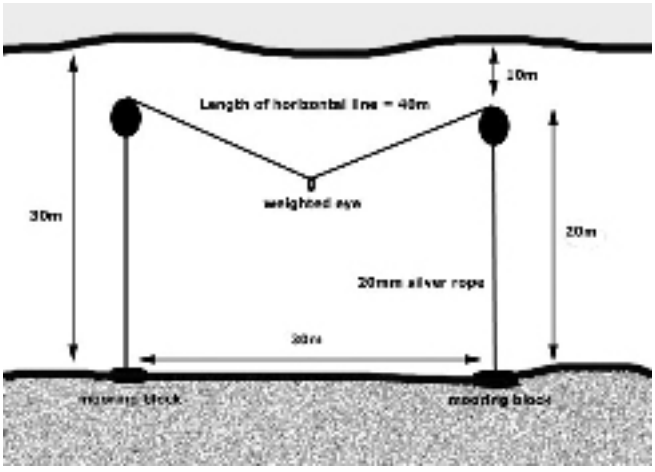


**Figure 2: Configuration of *Lady Darling* mooring system (New South Wales Heritage Office)**

metres below the surface by a horizontal positively buoyant line. Mooring vessels approach the mooring with a grapnel, hook up on the horizontal line and secure it to the boat. The mooring stands either side of the shipwreck to enable efficient entry and exit points for divers.

In line with the Heritage Office's commitment to acknowledge and publicise significant contributions to the Historic Shipwrecks Program in NSW, the award of Finder's Recognition Plaques was arranged for 26 March, 1997. This date enabled the presentation of these awards to the two finders, by the Chair of the Heritage Council of NSW, assisted by the General Manager of the Local Council, and the Narooma Coastal Patrol.

The Heritage Office assisted Local Council to design a bronze outdoor interpretative plaque. Council also funded the production of five separate plaques detailing the protection and access conditions applicable to the site. These were mounted at all local boat ramps and slips. The location of the *Lady Darling* Historic Shipwreck was added to the third of the Office's Shipwreck Atlas of NSW, officially launched at the ceremony, and the Council's interpretative plaque is included in the Heritage Office's Maritime Heritage Online website's Signs and Trails section (http://maritime.heritage.nsw.gov.au).

## Outcomes of the management strategy

The success of the management approach is confirmed by the number of divers visiting the site and its state of preservation. During the initial period alone (August 1996 - June 1997), a total of 448 divers visited the Lady Darling wreck site in 61 visits. The seven permit holders applied for and received permits for the 1997-8 year. During this period, 597 divers visited the site in 76 separate visits — a total of 1,045 divers in the 22 months since discovery.

To date there have been no reports or evidence of artefacts removal from the site. This is a remarkable outcome. It reflects the result of prompt notification, control and the contribution of permit holders in monitoring diving operations at the site. It is an encouraging success story. There is no other iron


**Figure 3: The plaque - funded by the Eurobodella Shire Council (D. Nutley)**

shipwreck in Australia as accessible and as frequently visited as the *Lady Darling* that is as intact and as attractive as the day it was found.

The Heritage Office has received requests for artefacts to be removed from the site in order to safeguard these items and to make the site less attractive to looters. In response, the Heritage Office developed the following advice to assist users of this site to understand the link between archaeological integrity and recreational appeal:

- The site has become a significant facet of dive tourism in the Narooma and Bermagui district. The retention of the site's tourism potential is closely associated with its retention of its archaeological potential. The appeal of the site is enhanced by the knowledge that it has not been 'picked over' either by souvenir hunters or archaeologists. Divers can experience this enhancement either by actually seeing a porthole, dead-eye or ceramic plates on site, or by being aware that these items are somewhere hidden under the sand. Where these items become visible, good quality photographic records can be compiled to enable non-divers to experience the visual context of these elements of a diving experience.
- Removal would deplete the significance of the site and would be accompanied by a very high level of cost. This cost, depending on the quantity and nature of the items removed, the level of conservation required and the preparation or construction of suitable storage and display facilities could be considerable.
- The removal of artefacts from the site would not only reduce its appeal as a dive destination but would remove conditions that lead to the establishment of the current permit system. The site would then be indistinguishable from dozens of other iron shipwreck sites on the NSW coast — none of which control access through a permit system like that on the *Lady Darling*.
- Removal of the site's artefacts, such as portholes, lanterns, ceramics, dead-eyes, etc would remove much of the justification for tightly control access conditions.
- The above issues need to be considered in any proposals for archaeological excavation or other removal of artefacts from the site.

This advice was supplied to the permit holders and has assisted them in dealing with these inquiries also.

The management of the *Lady Darling* site has been a successful partnership. This partnership has included the local dive industry, local council, other key interest groups as well as the State Government through the NSW Heritage Office and the Australian Government through the Historic Shipwrecks Program. Most importantly, the system could not work so effectively without local interest in historical values and long term recreational viability of this site. It is this sense of partnership that is critical to the successful implementation of the UNESCO Convention for the underwater cultural heritage.

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# Old Shipwrecks and New Dredging: An Elizabethan Ship in the Thames

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It is no accident that new dredging for historic ports can result in discoveries of old shipwrecks. In this recent case, a UK port authority has worked with archaeologists and heritage agencies to successfully reconcile the needs of the historic environment with the commercial need for ports to improve navigation by dredging.

Seafaring in the Thames Estuary stretches back several millennia, serving London and the coasts of Kent and Essex. The Thames Estuary continues to be hugely important for shipping, and is the responsibility of the Port of London Authority (PLA). Shipping routes in the outer estuary are restricted to channels between many large and dynamic sandbanks. The PLA has been seeking to improve access to the south by dredging one of these channels, Princes Channel, to make up for sand movements that are blocking previously-favoured channels.

A pre-dredging magnetometer survey in April 2003 showed an anomaly in the Princes Channel that was inspected by the PLA's own diving team in May 2003. The source of the anomaly was identified as a wreck, but it was thought to be a barge like the many other barges from the 19th and 20th centuries that can be found as decaying hulks all around the coasts of Kent and Essex. Like many UK port authorities, the PLA has not merely a right but an obligation to remove wrecks, of whatever age, if they present a hazard to navigation. These powers can override statutory heritage designations.

Unsuccessful attempts were made to disperse the wreck in June 2003 when some iron bars were recovered, so heavier equipment was called in and the wreck was cleared by grabbing in July 2003. Preliminary dredging operations, which had been excluded from the area of the wreck to avoid damage to dredging equipment, were then allowed to take place throughout the area. However, at this point it was realised that the debris from the grabbing included not only ship's timbers and iron bars, but also an anchor and a cannon. Recognising that this was possibly not just the wreck of an old barge, the PLA contacted Wessex Archaeology (WA), a not-for-profit charity, which carries out archaeological investigations for commercial developers, for assistance.

Following a brief inspection of the recovered material, which noted a possible second cannon, remedial archaeological recording was carried out. It was concluded that the remains were of a vessel up to 200 ton burden constructed between 1600 and 1850.

The PLA believed that the wreck had been completely recovered or dispersed, but a bathymetric survey to monitor the results of the channel dredging in October 2003 identified some 'high spots' in the vicinity of the wreck. A further diving

**Figure 1: Part of a leather garment or jerkin excavated from the Princes Channel wreck**

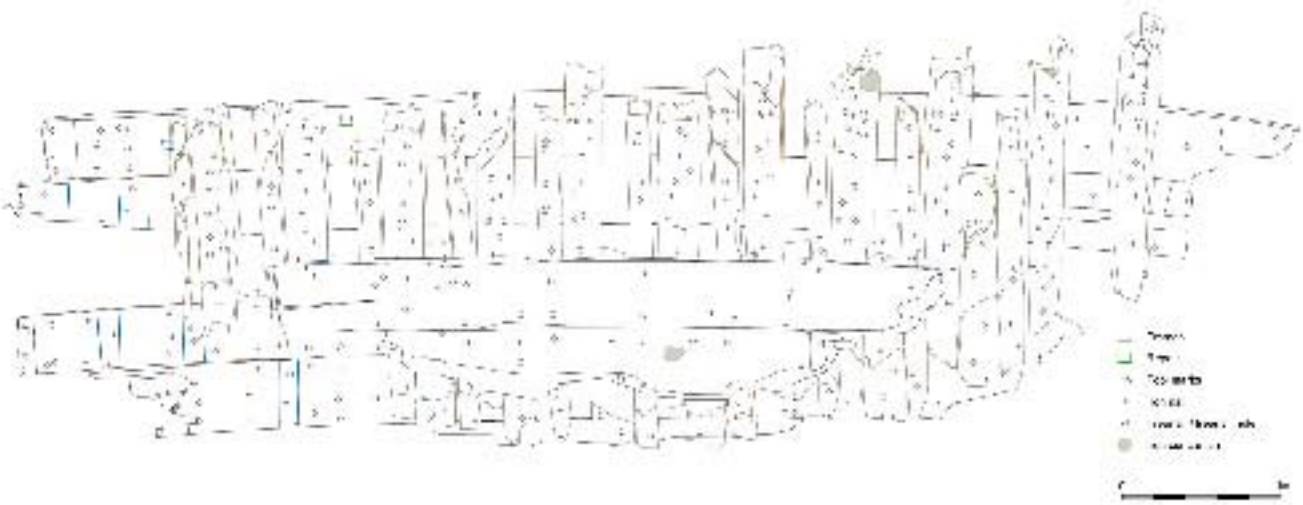
inspection by the PLA established that there was another piece of wooden wreckage. WA was commissioned to carry out an archaeological diving inspection, which confirmed the presence of a section of hull. A brief sidescan survey directed by WA on the same day also showed that there was yet further wreckage present, which probably represented the original site. As the section of hull was thought to be a hazard to navigation in the shallow channel, the PLA took the decision to recover it. The recovery took place later in November 2003, with WA staff in attendance. WA staff then carried out a diving inspection of what was thought to be the original site, which confirmed the presence of two sections of hull structure, partly covered by iron bars. A fragment of a Spanish olive jar was recovered.

In January 2004, the section of hull recovered in November was recorded in detail. Elements of the construction suggested that the ship was built in the 16th century, and possible Iberian influences were noted. Dendrochronological analysis indicated a building date in or shortly after AD 1574 and that the most likely source of the timbers was eastern England, particularly East Anglia and Essex. By this stage it was clear that not only was the wreck of considerable archaeological interest, but also that it needed to be entirely removed if the proposed dredging operations were to continue.

Attention turned to the further information required in order to design an archaeological mitigation strategy to accompany recovery of the remaining wreckage. A high-resolution sidescan survey of the site was undertaken by WA, which resulted in a geo-referenced mosaic that was used to plan operations and to identify targets around the main site. A further archaeological diving inspection, informed by the high-resolution survey, was undertaken to assess the overall disposition of major structural elements and to assess the presence and distribution of artefacts. The results of all these investigations were presented in an evaluation report, and a Project Design for the archaeological mitigation works was

**Figure 2: A section of the lower port side of the hull of the Princes Channel wreck, onboard a PLA salvage barge**

**Figure 3: Digital record of one of the hull sections from the Princes Channel wreck**



prepared. The overall approach combined outline recording of structural remains on the seabed with detailed digital recording of recovered structure once onshore, all within the context of an explicit research strategy. The Project Design was prepared in accordance with the ICOMOS Charter on the Protection and Management of the Underwater Cultural Heritage 1996, which formed the basis for the Rules of the Annex of the 2001 UNESCO Convention, and other relevant professional standards. English Heritage had been informed and consulted on various aspects of the investigations throughout the process, and they approved the Project Design.

Diving operations were severely hampered by weather, taking place on eighteen days from mid-August to mid-October 2004 using a WA team supported by PLA divers, vessels and crews. As well as hull structure – including a rare section of ship's stem – a range of artefacts including iron bars, lead and tin ingots, two further cannon and personal effects were surveyed and recovered. Environmental samples were also obtained. All of the hull sections have been transferred to the care of the Nautical Archaeology Society (NAS) and placed in a brackish lagoon near Portsmouth where they are being used for training purposes. The cannon are in the care of the Royal Armouries, and arrangements are being made to conserve the assemblage of small finds.

A full analysis is yet to be carried out, but a number of conclusions about the vessel can be drawn. The wreck is of a 16th century armed merchantman that was carrying iron, lead and tin. Although certain elements of the construction suggest a Mediterranean or Iberian influence, dendrochronological analysis demonstrates that the ship was built in England, most likely Essex or East Anglia, in or just after 1574. The keel length was probably 20-30m and the possible overall length around 35m. The vessel was probably three-masted, though no elements of rigging were found. The lowest deck served as a gundeck; two gun ports have been recorded in the recovered structure above the main wale, and a total of six to eight gun ports per side can be assumed. One of the cannon recovered during mitigation was marked with the initials "TG" and a grasshopper emblem, linking it to the influential Elizabethan financier, merchant and gunfounder, Thomas Gresham. The Gresham cannon, and the other cast-iron guns, are rare examples of early English cast-iron gun founding. Although the evidence is mixed, the ship was possibly outbound from London or another harbour on the Thames or Medway. The cause of the shipwreck is unknown, but stranding on an adjacent sandbank could have led to the loss; there were no indications of general unseaworthiness or previous damage on the recorded hull elements. It seems likely that the wreck may have been subject to salvage in the 19th century, as there is a report dating to 1846 that refers to the recovery by divers from Whitstable (the same harbour used for the mitigation work) of iron guns, curious ingots and iron from an ancient wreck in the vicinity of Princes Channel.

As well as being significant for its analytical potential, the Princes Channel wreck was very important as a first example of marine development-led archaeology in the UK. This is the first time that a wreck has been discovered, investigated and recovered directly as a result of dredging. It was also the PLA's first major encounter with archaeological procedures, and the first experience of WA and of English Heritage with dealing with this particular set of circumstances. The outer Thames Estuary is a very demanding environment, distant from harbours, subject to strong tides and poor visibility, exposed to the weather, and frequented by large ships at very close quarters. Many lessons have been learned, and some issues remain unresolved.

Key lessons include the successful development of a close working relationship between the port authority and archaeologists, especially in using the considerable experience and facilities of the port authority to support archaeological investigations. The adoption of a "staged approach" to investigation ensured that resources were carefully targeted to enable successive decisions to be taken, and that the eventual mitigation strategy was well-founded. The integration of marine geophysics, diver-based methods, and digital surveying onshore achieved a good overall record of the site on the seabed and of the recovered timbers and artefacts, even though on-site visibility varied from zero to 20-30cm. Despite clearance and dispersal operations before the possible importance of the wreck was recognised, and despite possible 19th century salvage operations and probable impacts from historic fishing activity, the Princes Channel wreck retained considerable archaeological integrity and was certainly worth thorough investigation. Some problems are more intractable, especially the logistical difficulties of operating efficiently in the outer Thames. Also, existing problems relating to the handling, ownership, analysis, publication and long-term curation of shipwreck material in the UK were brought into sharp focus.

It would be fair to say that the learning curve for all parties was very steep, and the PLA committed considerable resources to the investigations. The result, so far, has been very rewarding, presenting an evocative and informative window into the Elizabethan past of today's port.

## Further Reading

http://www.wessexarch.co.uk/projects/marine/thameswreck/index.html

# The Playa Damas Shipwreck
# An Early Sixteenth-Century Shipwreck in Panama

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## Iberian Ships

Located near the lovely little village of Nombre de Dios, on Panama's Caribbean coast, the Playa Damas shipwreck is yet another Spanish shipwreck threatened by treasure hunters. Sunk in very shallow water sometime during the first decades of the 16th century, it was probably initially salvaged soon after its loss, and the only artifacts left were the heavy iron guns and anchors that were probably stored in the holds and were quickly buried in the sand.

There are only approximately eighty known shipwrecks worldwide dating to the period of Iberia's maritime expansion in the early 16th-century. Only a handful of these shipwrecks has been excavated by archaeologists, however, and several of the shipwrecks apparently have been destroyed by treasure hunters in search of valuable artifacts to be sold at auction, or looted by sport divers before any archaeological study or evaluation.

The result is that nautical archaeologists know very little about 16th century Spanish ship building. There is almost no research or scientific study which provides information on the complex technology used to build the ships of Columbus, Vasco da Gama and Magellan. Where was the living space? How was the cargo hold designed? What was the versatility of the riggings and the strength and speed of the hull?

As we are writing these lines, the Playa Damas shipwreck risks being another sad story, another lost opportunity to look into the design and construction of these amazing machines, the space shuttles of their time as Karl Vandenhole, a producer from Spiegel-TV, has called them. A proposed collaboration between a for-profit salvage company, the Government of Panama and the Institute of Nautical Archaeology (INA) is now possibly on the rocks and the investigation of the shipwreck and its artifacts the subject of court proceedings.

The shipwreck, discovered at Playa Damas near Nombre de Dios on the Caribbean coast of Panama in 1997 by amateur historian and diver Warren White, an American expatriate living in Panama, has involved the interests of several groups with overlapping interests. One of the first was IMDI, a salvage company formed by White with Nilda Vasquez of Panama and a group of investors and technical specialists, which removed the first artifacts from the site in 2001. Recovery of artifacts from the wreck by IMDI in 2001 was documented by a video now shown on the Archaeology Channel website. Subsequently, White became estranged from IMDI and has publicly charged that the shipwreck is threatened by IMDI plans to remove more artifacts from the ship. White stated that his biggest concerns for the site are "bureaucratic and governmental mis-management." In interviews with Archaeological Legacy Institute Executive Director Richard Pettigrew in November 2003, Vasquez insisted that IMDI has a legal Panamanian government permit to conduct archaeological exploration of the wreck, but Carlos Fitzgerald, National Director of Cultural Heritage of the Panamanian National Institute of Culture (INAC), responded that IMDI's permit covered production of a video documentary but not archaeological excavation.

## The Project

In July 2003 the Institute of Nautical Archaeology at Texas A&M University (INA) was invited by the media group Spiegel to consider the complete excavation of a shipwreck at Playa Damas, located near Nombre de Dios, on the Atlantic coast of Panama. The media had announced, based on some evidence not confirmed by archaeological analysis, that this shipwreck was thought to be Columbus' Vizcaína, a small 50 ton caravel lost near Portobelo, during his fourth voyage, in 1503. Almost every year somebody finds a piece of wood in the Caribbean and claims that it belonged to one of Columbus' ships; however, regardless of whether or not a ship of Columbus, the shipwreck was of interest, because ships dating from the 15th and 16th centuries are sufficiently rare to be of scientific interest and this one appeared from the evidence to be an early 16th-century Spanish nao or caravel.

The Spiegel group made an agreement with the government of Panama, through INAC, to fully fund the excavation and conservation of the Playa Damas shipwreck. The money was to be donated by several European sponsors who asked for nothing in return.

In July 2003 we went to Hamburg, Germany, to meet with the Spiegel team and discuss the feasibility of this project. Tests carried out by the Spiegel-TV team on materials from the shipwreck, removed with permission from the heritage office and in cooperation with the German government, had already yielded some incredible dates. A sample of the hull's timber – from an oak hull plank – was dated to the late 15th century.

We were very enthusiastic about the project. One of its most appealing features was the fact that Panama had just changed its law concerning the protection of its underwater cultural heritage, being the first country in the world to ratify the UNESCO Convention of the Underwater Cultural Heritage. The Convention had recently been voted by over one hundred countries and its adoption greatly strengthening the state's role in protecting and researching Panama's underwater cultural heritage. This made it a perfect opportunity to show the world that developing countries can be on the front line in fields like nautical archaeology.

The Spiegel group agreed to try to raise a sum of around US$1,200,000 to pay for the excavation, conservation, publication, and possibly exhibition of the artifacts of this shipwreck. The details of the exhibition of the artifacts would have to be planned at a later date, depending upon the

amount of money raised by the Spiegel group, INA and Texas A&M University.

## The Playa Damas Shipwreck Project

It seems that this shipwreck site was known for some time by the local fishermen, who dived regularly on it to catch lobsters. As noted above, it was found by an American diver, Mr. Warren White, in 1997. In the fall of 2001 Mr. Warren White visited this site with a treasure hunting company – Investigaciones Maritimas del Istmo, SA. (IMDI), which used a "mailbox" to dig a trench, said to have been four meters deep, around the vessel. A large collection of artifacts was raised. Most were stored at a facility built at Portobelo by the treasure hunters, sometimes mixed with other artifacts from different provenances. A few artifacts may have been lost forever: a lead seal, numerous stone cannonballs, and two iron guns dropped in the bay of Nombre de Dios after being found too heavy to be raised into a truck on a nearby pier.

On September 2003 a team from Texas A&M's INA visited the site and started the preparation of the logistics of the excavation of the Playa Damas shipwreck. The shipwreck lay at a depth of about 4.5 m (15 ft.) and the site consisted of a ballast pile with an area of about 60 $m^2$, roughly 10 x 6 meters, with three large anchors and an important number of iron guns, at least twelve. A portion of the hull was untouched, protected under the ballast pile. The planking was 6 cm thick, frames were 17 to 18 cm square in section, and stringers were 27 x 7 cm. All these scantlings, the number of guns, and the size of the anchors indicated a ship larger than the 50 ton Vizcaína.

A new sample of timber – this time from an oak futtock – was taken and dated. This sample produced a radiocarbon date of 1530-1550, compatible with the previous one, since hull planks were traditionally cut from much larger trees than futtocks, and the sample from the planking may have corresponded to an inner portion of the tree. Reutilization of timber cannot be excluded as another explanation for the early dating of these samples. Carbon dates from the lining of a shard of an olive jar also yielded compatible dates: 1450-1530.

In order to get the project moving it was thought best to start the treatment of the artifact collection in the USA, at Texas A&M University's Conservation Research Laboratory (CRL), the Nautical Archaeology Program main conservation laboratory. There were enormous difficulties posed by the treatment of the large concretions containing a formidable gun collection, and these could be processed more effectively in Texas.

In September 2003, the week after returning from Panama, INA sent a copy of the protocol signed with the Jamaican government, as a possible model of cooperation, to INAC, for analysis. INA's protocol with the Jamaican government had governed ten years of archaeological work in Port Royal, Jamaica. Under the terms of that agreement INA agreed to fully excavate the shipwreck, conserve and study the artifacts, and publish the shipwreck both in scholarly journals and popular magazines. The artifacts and records remained the property of the Jamaican government. During the following months INA received an authorization to transport the artifacts raised by the salvage company IMDI to Texas A&M University, and an invitation to submit a proposal to excavate the shipwreck, which should be the first step to obtain the protocol between INA and INAC.

We had in mind establishing a network of interests in place, contacting the diving centers to bring their clients and see our work, the Nautical Archaeology Society to organize weekend courses on the site, the local tourism organization to prepare a series of panels with pictures of the ongoing projects, and even the treasure hunting company, to discuss the possibility of making replicas of the artifacts for sale, and recover some of the money that they had allegedly invested in the project when they were convinced that they would become millionaires selling the artifacts from Columbus' Vizcaína.

## Problems

Then the problems began. There apparently was a dispute about permits. Fitzgerald reported in November 2003 that IMDI has no legal right to explore the wreck or remove additional artifacts, claiming his understanding that IMDI never received a written permit to excavate or salvage the site, but instead was granted verbal permission to salvage individual artifacts that were thought to be threatened by theft and a permit to film. An apparent misunderstanding regarding the granted permission threatened a confrontation between IMDI and INAC.

Dr. Filipe Castro, INA project manager for the Playa Damas site, nevertheless submitted a formal proposal for collaboration to Ernesto Cordovez, head of IMDI and Nilda Vasquez's son. The proposed plan called for a cooperative research program by which INA and IMDI both would have a role in the project. According to Vasquez, the last sticking point before agreement can be reached is IMDI's insistence that artifacts not be allowed to leave Panama.

In November and December of 2003 INA learned that the IMDI had decided to salvage the Playa Damas shipwreck. After contacting several shareholders of IMDI, as well as its CEO, Cap. Ernesto Cordovez, INA believed it had an oral agreement of the larger shareholder of the company, Mr. Gassan Salama, who had been appointed governor of the Province of Colon in November of that year. On the telephone he agreed to turn over the artifacts salvaged in 2001 and promised to help INA overcome some bureaucratic problems that might arise regarding the temporary export of the artifacts to Texas, USA. It was agreed that the second half of January 2004 would be a good time to arrange for shipping the recovered material to CRL.

On December 2003, however, IMDI was reportedly visited by executives of a Florida company named Motivation Inc., based in Key West and connected to the Mel Fisher family. After this visit the larger shareholders of IMDI seem to have changed their minds and decided that they wanted to keep the right to sell the artifacts of the Playa Damas shipwreck and start the exploration of a number of shipwrecks for which they had secured salvage permits from the Ministry of Economy

before the publication of the underwater cultural heritage law, which was approved on May 28, 2003 and published in the Gaceta Oficial of Panama on April 2, 2003.

The Playa Damas shipwreck already had been declared a National Heritage site by the Panamanian government before Panama signed a UNESCO convention protecting historic shipwrecks. Panama passed legislation in August 2003, based on the UNESCO convention, declaring shipwrecks National Heritage sites.

There were legal problems related to these permits. The most important one was that they were published in the Gaceta Oficial on December 30, 2003, after the publication of Law 32, published on April 2 of 2003, and Law 58, published on August 12 of 2003, which forbid salvage and establish INAC as the sole authority competent to grant excavations. The second was that even considering that the permits were issued before the publication of law 32 and 58, although not published until December 2003, salvage works should have started within six months, and the license had therefore expired in September 2003. The third problem was that it was not clear whether the Playa Damas shipwreck actually was inside the areas published with the permits.

INA went to Panama in January of 2004 and met with IMDI CEO Cap. Ernesto Cordovez, his mother, Mrs. Nilda Vasquez, a former collaborator of INAC and sometimes said to be the architect of IMDI, and the major shareholders of the company, Mr. Gassan Salama and his lawyer, Mr. Sarturio Segarra. INA was told that IMDI would like very much to work in a joint venture, but opposed the export of the artifacts to Texas A&M University for conservation treatment. Furthermore, they would not yield the right to sell the artifacts of this or any other shipwreck they had planned to salvage. IMDI also announced its intention to hire Motivation Inc. to build and staff a laboratory and pay the investment, at least partially, with the sale of the treasure they planned on finding.

The example of the relations between INA and the Turkish government was explained in detail: after thirty years of continuous INA work in Turkey, the Bodrum Museum is one of the most visited museums in the whole Mediterranean basin. INA excavated shipwrecks had appeared in National Geographic Magazine thirteen times, the INA center in Bodrum received students and scholars from all over the world every year and housed an outstanding library, a laboratory, and a dormitory for students and scholars. A series of TV documentaries has been produced on INA projects in Turkey and elsewhere.

INA also tried to explain that it was not likely that there were any valuable artifacts in such close proximity to the coast – since the Spanish empire possessed an extremely competent salvage industry – and that it was a tragic mistake to destroy Panama's cultural heritage, sell the valuable artifacts at auction, and let the wreck be poorly researched and published. The media reported that the wreck contained emeralds and gold.

## Political Implications

That year IMDI hired a Cuban archaeologist, Mr. Abraham Lopez, formerly employed by Motivation Inc., and started the salvage works on the site early in 2005.

It is not known how disturbed the shipwreck site has been, nor what kind of recording was done by IMDI's team. No report has been released and INA was asked not to make a planned inspection dive early in 2005, after the salvage works were stopped by a court injunction.

In the meantime the New World Legacy, a ship belonging to a treasure hunting company named Admiralty Corporation, was impounded in Panama and found to carry archaeological artifacts, allegedly recovered from a shipwreck in Honduras. The New World Legacy had been impounded before in Panama, in 2000, then carrying a number of archaeological artifacts said to have been recovered from several areas around Portobelo.

The Panamanian government has shown signs of support for the archaeological community and the promotion of long term archaeology projects instead of short term treasure hunting ventures.

Texas A&M University's INA is still trying to get a permit to excavate and study whatever is left of this shipwreck.

As INA's founder, George Bass, says, Sweden's main tourist attraction is the Vasa Museum, which brings many millions of dollars in net revenues every year, employs lots of people and gives Sweden an amazing international visibility. The Bodrum Museum of Underwater Archaeology, created by the INA, is now the most visited archaeological museum in Turkey, takes in about $2.5 million a year in ticket sales alone, to which one must add souvenirs, extra meals eaten in restaurants, taxis, hotels, plane fares, etc. Only the future will say whether the contending parties and the overlapping interests can reach an agreement so that Playa Damas will have a similar happy end.

## Acknowledgements

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# The Sad Case of the ss Maori

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The impact of human agents on underwater cultural heritage is but one of a host of problems that beset the management of this fragile resource. In particular, the degradation of wrecks popular as good dive sites is an area of great concern to the South African Heritage Resources Agency (SAHRA), and is perhaps epitomised in South Africa by the case of the *ss Maori*.

The *Maori* was owned by the Shaw, Saville and Albion Company and was a typical cargo vessel of the early 1890's. She was a steel screw steamer with a registered tonnage of 5,317 tons and was built during the latter part of 1893 by the firm C.S. Swan and Hunter at Wallsend-on-Tyne near Newcastle in the United Kingdom. She was a little over 402 feet long, 48 feet wide, and 29 feet deep, with two decks. Her triple expansion engine was built at the Central Marine Engineering Works in West Hartlepool and had a nominal 461 horsepower.

The vessel was originally square-rigged on her foremast – carrying working masts and rigging on a steamship was still found to be useful by some steamship owners in case of a breakdown of the engines — and as a result she had taller masts than were the norm on many other steamers of the period.

## The Loss of the Maori

At about one o'clock on the morning of Thursday 5 August 1909 the *Maori* went ashore in dense fog and sank near Duiker Point on the Cape Peninsula, about 20km south of central Cape Town.

She had left Table Bay shortly before midnight after recoaling, and sailed into drizzle and thickening fog as she headed south towards Cape Point. Forty minutes later, with her engines going at full speed, the *Maori* struck a rock, which according to those aboard, seemed to stand well out of the water. Shrouded in dense fog the vessel had come very close inshore and had unknowingly entered the bay north of Duiker Point. The first intimation of danger was the lookout's warning cry, but by then the vessel was only about thirty yards from the rock, and although her master, Captain G Nichole, immediately ordered the wheel hard-a-port, the Maori ran up on to the rock (Fig 1).

Badly holed, the vessel started sinking by the bow, and the crew were ordered into the boats. It was assumed that the entire complement had boarded the three lifeboats, but it later became apparent that fifteen crewmen had been left behind. The lifeboat commanded by the Chief Officer and carrying fourteen others was the first to land at eight that morning and raise the alarm.

Ultimately 32 of the crew of 53 were lost, including Captain Nichole and all the navigating officers. The vessel was a complete loss.

## The Maori Today

Today the *Maori* is one of the most popular recreational dive sites on the Cape Peninsula. Its location on the western, Atlantic seaboard of the Cape Peninsula means that during the South African summer months diving conditions on the site are often optimal, with very cold, but very clean water. The sheltered nature of the bay in which the wreck lies means

**Figure 1 : A historical photo of the wreck of the *Maori* taken before the crew left aboard had been rescued. Note the figure on the foremast (Courtesy John Marsh Maritime Collection, IZIKO Maritime Museum)**

that it retains a remarkable degree of structural integrity, with large portions of the vessel surviving relatively intact. When Jaques Cousteau dived on the wreck of the *Maori* in the 1960s he declared that it was the best preserved wreck of its type that he had seen. An added attraction and one of the reasons for its currently degraded state is the fact that much of the *Maori*'s cargo remained substantially intact, packed in her holds until relatively recently.

On a violent coast, where most wrecks break up rapidly, the *Maori* is thus something of a rarity, both as an archaeological and diving site, and it is hardly surprising that with the growth in sport-diving during the last 40 years, the *Maori* has become a site favoured by divers.

Sadly, this popularity has not been without price. Although never salvaged on a commercial basis after her loss, the *Maori* has been the victim of years of souvenir hunting by thousands of divers, and is now a shadow of her former self. At one stage during the 1970s divers used dynamite on the wreck to blast their way into the hull in search of non-ferrous metal. Today her holds are virtually empty and her structure has been further damaged by scores of irresponsibly placed anchors.

This problem is not limited to the *Maori* and manifests itself on many other shipwreck sites along the South African coast. Although underwater heritage has enjoyed blanket legislative protection since 1986 (under the terms of the National Heritage Resources Act any wreck older than 60 years of age is protected) a long tradition of salvage dating back to the early 18th century left a widely held perception that the contents of shipwrecks are there for the taking. However, two decades of legislative protection and a huge amount of work done by the South African Heritage Resources Agency, the IZIKO Maritime Museum and others to publicise the protected status of shipwrecks has slowly borne fruit. There is now a general awareness and grudging acceptance, particularly within the diving community, of the protected status of shipwrecks.

But legislation cannot stand alone. Of equal importance to the protection of underwater cultural heritage is an understanding by those using the resource and the wider South African public of what underwater cultural heritage is, and why it is worth preserving. Without winning over hearts and minds legislation can never truly succeed.

For a few years SAHRA, in conjunction with the IZIKO Maritime Museum, has been developing a pilot Cape Peninsula Shipwreck Route. The route aims to introduce Capetonians and visitors to the city to the hundreds of wrecks that lie in the waters of the Peninsula and thereby increase general public awareness of the importance and fragility of our underwater heritage, while at the same time formalising access to a number of popular, threatened wreck sites.

Land-based information boards are planned for a number of sites on the route around the Cape Peninsula, and the first of these has been installed adjacent to the slipway at the popular harbour of Hout Bay, from which divers access the *Maori* (Fig 2). An accompanying pamphlet has been produced. In addition, underwater information plinths will be installed at the sites often visited by divers, such as the *Maori*. These plinths will not only provide information about the history of the particular wreck and layout of the site, but will also carry a strong conservation message, stressing the legal protection that such sites enjoy, and the responsibilities of divers when visiting them.

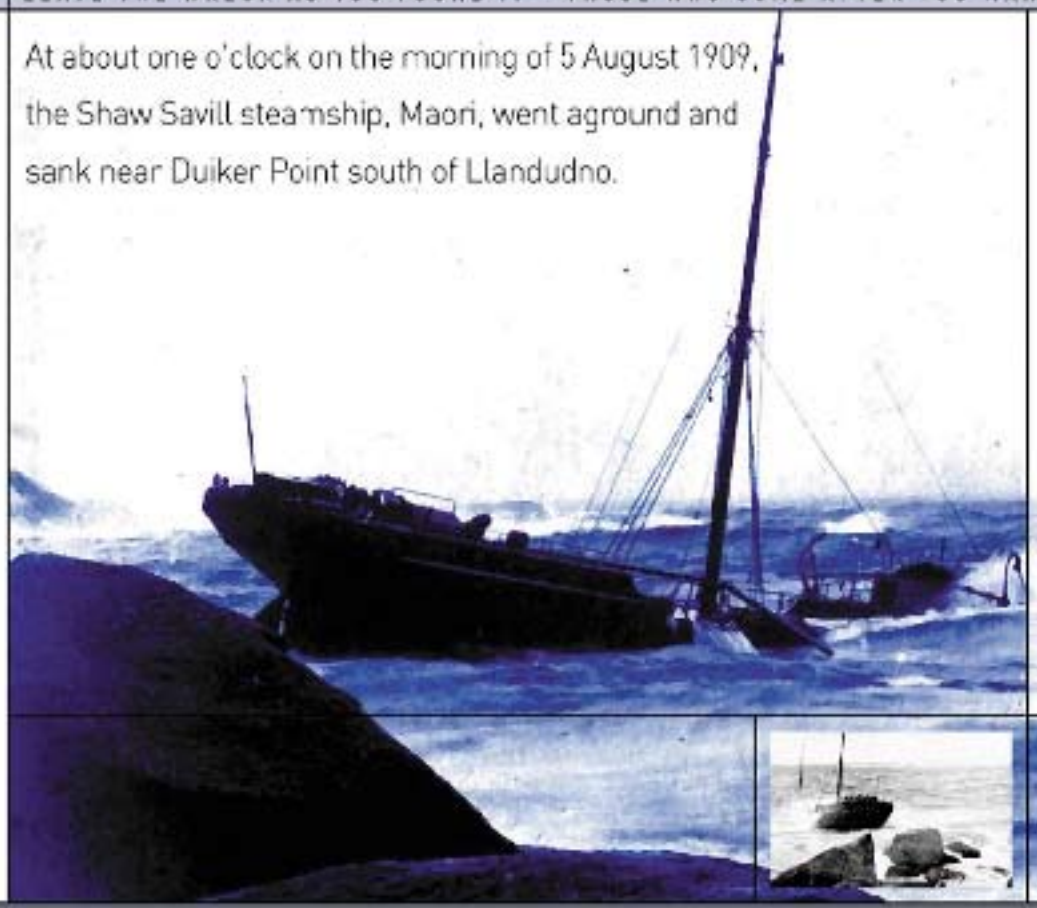
While this approach to managing threatened underwater sites is in some senses *post hoc*, if it proves successful in managing risk on a heavily utilised site such as the *Maori*, SAHRA envisages its useful extension to other threatened, or potentially threatened sites, in the future. It is hoped that an increased awareness amongst visitors of the archaeological potential of a well preserved wreck like the *Maori*, will ensure the long term survival of the site.


**Figure 2: Cape Peninsula Wreck Route sign for the *Maori***

# THE MAORI

LEAVE THE WRECK AS YOU FOUND IT - THOSE WHO COME AFTER YOU WANT TO ENJOY IT TOO. ENJOY YOUR DIVE ON THE MAORI.

At about one o'clock on the morning of 5 August 1909, the Shaw Savill steamship, Maori, went aground and sank near Duiker Point south of Llandudno.



The Maori was a typical cargo vessel of the time. She was a 5017 ton steel screw steamer, 122 metres (402 feet) long, powered by a 461 horsepower triple expansion engine, and was built in England in 1899. She traded between England and New Zealand, and when she was wrecked was bound for Port Chalmers in New Zealand with a cargo which included 2300 tons of railway tracks, explosives, English crockery, and cases of wine and champagne.

The Maori put in to Table Bay to take on bunker coal and departing at midnight on 4 August she steamed into thick fog off Sea Point. Forty minutes later, travelling at full steam, she ran up onto a rock near the shore in what is today known as Maori Bay.

She began sinking immediately, and the crew took to the lifeboats. In the confusion fifteen crewmen were left behind. Their presence was discovered later in the day by local fishermen who managed to get a line across to the wreck. Two men managed to get ashore on this line, but two others drowned in the attempt. The remaining crew had to wait another twenty four hours before a rocket apparatus was set up on the rocks adjacent to the wreck, and they could be hauled to safety.

## THE WRECK

The Maori lies perpendicular to the coast with her stern surrounded by granite boulders, and her bow facing out to sea, about 75 metres offshore. Water depth on the wreck ranges from 7 metres on her stern, to 22 metres on her bow.

Because the Maori lies in the relative shelter of Maori Bay, she is remarkably well preserved, and is structurally largely intact - a rare occurrence in the Cape's notoriously rough coastal conditions. Her boilers, the heat exchanger in her engine, her propeller shaft and various winches mounted on her upper deck are easily identifiable. Sections of the her hull plating and many of their supporting frames, or ribs lie on the seabed around the wreck.

An attraction of the Maori for divers has always been the fact that much of her cargo remained in the hull after she sank. Today, piles of railway lines lie near the stern of the wreck, large steel pipes rest on the rock near her bow, and inside some areas of the hull the remnants of the cases of ceramics, wine and champagne she was carrying are still visible.

## WRECK DO'S AND DON'TS

The Maori has over the years been damaged by visitors, and this is endangering the structural integrity of the wreck, its archaeological potential, and its appeal as a dive site. To ensure that your visit doesn't have a negative impact on this special wreck, please follow these few simple rules:

- Don't damage the wreck in any way - a wreck is not like a reef which can regenerate if damaged. It is finite and non-renewable resource and any damage is permanent.
- Don't take souvenirs - removing anything from the wreck without a permit is not only illegal, it destroys the value of the site for those who'll dive on it after you.
- Don't anchor on the wreck - drop your anchor away from the site to avoid damaging the wreck and its contents.
- Remember that although it is possible to swim under the hull amidships, this is increasingly hazardous given the state of the wreck and her advancing decay.





If you'd like more information about the Maori or wrecks in general, contact: The Maritime Archaeologist, South African Heritage Resources Agency, PO Box 4637, Cape Town, 8000 or visit Hout Bay Museum, Hout Bay Harbour, and SA Maritime Museum, V&A Waterfront.

CAPE PENINSULA WRECK ROUTE

# Atherley Narrows Fish Weirs

**R. James Ringer**
*Underwater Archaeologist*
*Parks Canada Agency*
*Canada*

During the fall of 1615, the French explorer Samuel de Champlain, in the company of a Huron raiding party, passed near the small narrows separating Lake Couchiching and Lake Simcoe in southern Ontario, Canada. In his journal he noted that the Huron, using a number of weirs, caught large quantities of fish that they preserved for winter. Consisting of closely spaced stakes driven into the bottom, perhaps with interlaced material, and extending almost completely across the narrows, the weir directed fish to small openings where they were captured with nets. Champlain's account remains one of the very few early references to native fish weir technology in this part of North America but only depicts the final years of a very ancient site. Some 5,000 years ago, when construction on the Great Pyramid at Giza was commencing, the first fish weirs were being installed at Atherley Narrows. Following the dispersal of the Huron in the 1650s, the weir fishery at the narrows appears to have been discontinued. The Ojibway peoples who moved into the abandoned area, although aware of the existence and function of the weirs, never took up their use. Following Champlain's brief account, the fish weirs at Atherley Narrows fade into relative obscurity and serious study of the site has been a relatively recent development.

Work in the 1960s and 1970s by the Royal Ontario Museum and, more importantly, by Trent University, brought to light the richness of the resource as well as its antiquity. This research led to the narrows being declared a National Historic Site in 1982. Atherley Narrows, located near the present town of Orillia, Ontario, is part of the historic Trent-Severn Waterway and is administered by the Parks Canada Agency. In 1988, as part of a Parks Canada exercise, the site was identified as a threatened resource and Parks Canada's Underwater Archaeology Services were called in to undertake an assessment of the site. Threat to the site came in the form of increased recreational boating traffic, new condominium and marina development as well as sport fishing activity.

The results of a number of years of survey were less than encouraging. All of the areas where weir stake alignments had originally been located had undergone significant change. Where hundreds of closely spaced stakes in aligned patterns were expected, only a very few, generally widely spaced stakes were seen protruding above the bottom. To the archaeologists, it was obvious that the stakes were being extracted or sheared off in some manner. Judging by the amount of fishing line wrapped around many of the remaining stakes and fishing lures actually embedded in the stakes, sport fishing activity appeared to be the main culprit. Contributory causes seemed to be boat anchoring, marina dredging and propeller wash from high speed boating. To mitigate these impacts, Parks Canada embarked on an education program and instituted no-anchoring and no-wake zones at the site.

During the 1990s, Parks Canada became aware of a plan to build a second bridge parallel to the existing highway bridge over the narrows. Plans called for the new bridge to pass directly over a significant stake structure on one side of the narrows and concern for the protection of this feature during construction was expressed. The survey revealed that this stake feature was actively deteriorating. Water currents were slowly exposing and loosening the stakes and the sandblasting effect of water-borne particles was highly degrading the exposed portions of the stakes. By far the most serious threat, however, came from fishing activity. Rather than allow this feature to degrade further, Parks Canada recommended excavation and removal of the stakes to recover as much information as possible. This brought the local aboriginal band into the consultation phase.

The local Chippewas, although never users of the fish weirs, nevertheless deeply value their traditional role as stewards of the weirs. To them, Atherley Narrows was much more than a fishing place. It was a traditional meeting place for Aboriginal nations: a place for treaties, trade, festivities and spiritual ceremonies. Due to this, the Chippewas felt they had a considerable role to play in any decision making process concerning the weir site, a hidden but important component of their cultural landscape.

Consultations, involving interested parties, eventually evolved into a more formal collaborative organization, Fish Fence Circle. This group, composed of representatives of the Chippewas, local municipal governments and historical associations, residents of the area and Parks Canada, and through open and respectful discussions, approved and oversaw the excavation of the stake feature beneath the bridge. The removed stakes were conserved and radiocarbon dating of a few of these revealed that they were some of the more recent from the site. The work of the Fish Fence Circle continues today both on the educational front and arriving at recommendations balancing the use of the area with preservation of the national historic site.

Parks Canada's focus at Atherley Narrows is now on periodic monitoring of the cultural resources with a view towards understanding and mitigating the adverse impacts. The monitoring plan looks at both the natural and cultural aspects of the threats. On the natural side, conservation assessments establish the actual physical condition of the stakes, current meters track the magnitude of the current flow over the site and other measuring devices monitor the rates of sedimentation relating to the burial of stakes. Cultural impacts are monitored by the precise plotting and tagging of numerous stakes providing a means of quantifying resource destruction. The goal is to ensure the viability of this rare, important, enduring and intriguing Aboriginal fishing site.

**Figure 1: A diver observing an alignment of stakes at the Atherley Narrows Fish Weir site; note the fishing lures entangled in the stakes (Peter Waddell/Parks Canada Agency)**

**Figure 2: Archaeologist mapping stakes at Atherley Narrows (Nick Van Vliet/Parks Canada Agency)**

**Figure 3: A diver photographing possible weir stakes (Peter Waddell/Parks Canada Agency)**

# The Four Commandments:

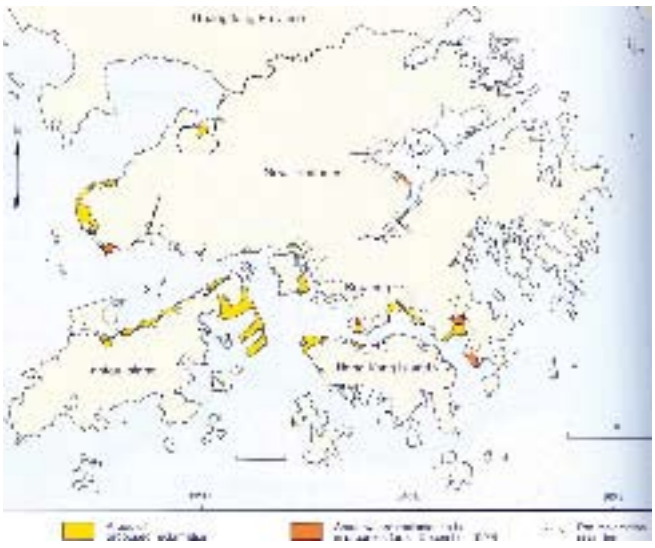
## The Response of Hong Kong SAR to the Impact of Seabed Development on Underwater Cultural Heritage

**Cosmos Coroneos**
*Director*
*Cosmos Archaeology Pty Ltd*
*Australia*

Historically, the impact of seabed development has often been relegated to a position of low priority on the list of threats to underwater cultural heritage. This is largely due to the fact that the more highly preserved underwater sites are generally situated in remote or deep locations where seabed development was less intense. However, threats to underwater cultural heritage via seabed development are increasing due to the rapid increase of urbanisation and expansion of coastal development into such remote areas. The situation is further exacerbated by the irony that the bulk of underwater cultural heritage sites generally occurs in close proximity to coastal urban population centres – centres which have usually been established for centuries, if not millennia, and hence have accumulated a plethora of archaeological sites, varying from maritime related infrastructure to shipwrecks.

Governments, or the agencies that are tasked with the protection of underwater cultural heritage, deal with the impact of seabed development in differing manners ranging from reactive to proactive. The reactive approach involves the development of protection strategies in response to the identification of archaeological sites as they get reported, either directly or indirectly, to the authorities. The effectiveness of this stratagem varies according to the quality of communication networks within local communities and development organisations. This strategy thus has significant flaws, as it relies on incidental observation and goodwill on the part of the sea bed developer. Unexpected archaeological discoveries during construction programmes generally cost money in terms of time lost. Unless there is some financial advantage in publicising a site – or the authorities have been unofficially alerted – such sites are usually severely compromised or destroyed by the construction works. The presence of legislation protecting such sites does not always help, as the developer can claim that the significance or antiquity of the site was not apparent as it was being destroyed. This is especially the case when dealing with seabed development where the impacts can be relatively "invisible."

**Figure 1: Past and proposed reclamations in Hong Kong SAR (Figure 13.2 in J.A. Fyfe, B. Shaw, et al, May 2000, The Quaternary Geology of Hong Kong. Hong Kong Geological Survey)**



Proactive management of underwater cultural heritage in response to seabed development involves engagement at the initial planning stages. This approach enables the construction programme to be planned with full knowledge of the constraints posed by underwater cultural heritage, thereby mitigating losses which may be incurred by the developers through unexpected setbacks and delays. The integration of archaeology and heritage issues at the "ground level" in the development process is consequently more likely to ensure a better outcome with regards to the preservation of underwater cultural heritage.

An excellent example of proactive management of underwater cultural heritage with relation to seabed development is that practised in Hong Kong Special Administrative Region (SAR). It is a model that could well be adapted by other countries. The programme, established three years before the adoption of the UNESCO Convention for the Protection of the Underwater Cultural Heritage, compares well with the Articles and Rules of the Convention.

The Hong Kong we see today, with its skyscrapers and state-of-the-art transport infrastructures, belies the antiquity of the place. Hong Kong's heritage reaches back to 8,000 years ago where Late Neolithic sites have been found on many islands and undeveloped shorelines of the Hong Kong SAR archipelago. These sites are coastal and post date the cessation of the last great sea level rise at 6,000 years ago. It is expected that evidence of earlier human occupation of the Hong Kong region may be found buried under the current seabed.

Hong Kong SAR flanks the western entrance to the Pearl River delta, upon which is sited Guangzhou, one of the world's busiest trading ports for the last 4,000 years. Hong Kong itself straddled the maritime trunk route between southern and northern China. The amount of trade that passed through the Hong Kong archipelago also attracted more than its fair share of piracy and naval warfare. Prior to the establishment of Victoria on Hong Kong Island, the main population centres within Hong Kong SAR were Tuen Mun and Kowloon. Kowloon, and possibly Tung Chung on the island of Lantau, were for a short time Imperial cities hosting the court of the last Song Emperors in the 13th-century.

The heritage of Hong Kong SAR is essentially maritime in character, whether it be through trade, industry, fishing,

piracy, or warfare, and numerous expressions of this rich and ancient cultural diversity can be found on the seabed of the region.

The threats to underwater cultural heritage from seabed development are acute in Hong Kong, possibly more so than most other coastal centres in the world. Hong Kong SAR is situated on a relatively small, mountainous peninsula and equally small, mountainous islands. Population pressures are such that the expansion of the urban sprawl is directed out to sea. Reclamation for housing, commerce and transport infrastructure is a common feature in Hong Kong development.

Underpinning the protection of the underwater cultural heritage of Hong Kong SAR is the Antiquities and Monuments Ordinance (Chapter 53 of the Laws of Hong Kong).

The Antiquities and Monuments Ordinance contains provisions for the protection of cultural heritage which are not dissimilar to other like laws from around the world. For example, cultural objects that pre-date 1800 AD, whether in, on or under land or sea, cannot be removed without a license (Sections 2 and 12).

However, as stated previously, the presence of such laws is not enough to efficiently protect underwater cultural heritage. On their own, these laws are often applied after the act, the act being the discovery of a site during construction. In such circumstances the site may have been already been irretrievably destroyed or severely compromised.

The use of heritage specific laws for the proactive, and therefore more effective, management of underwater cultural heritage requires that they be linked to planning instruments which regulate and monitor the effects of proposed developments. In Hong Kong SAR the relevant planning instrument is the Environmental Impact Assessment Ordinance (Chapter 499).

This Ordinance requires the impacts of a designated project, such as dredging operations, reclamations, etc., on sites of cultural heritage importance be mitigated as part of the project approval process (Schedule 4, Part 6:f). Sites of cultural heritage are defined in the Ordinance as being in accordance with the definitions of 'antiquities' and 'relics' in the Antiquities and Monuments Ordinance.

Annexes 10 and 19 of the Environmental Impact Assessment Technical Memorandum associated with the Environmental Impact Assessment Ordinance give guidelines for assessing impact and significance. The Technical Memorandum identifies a general presumption in favour of the protection and conservation of all sites of cultural heritage and requires impacts on such sites to be kept at a minimum. There is no quantitative standard for assessing the significance of cultural heritage sites, but it is generally accepted that sites of unique archaeological and historical value should be considered highly significant.

Environmental Impact Assessment (EIA) Study Briefs issued by the Environmental Protection Department almost always include the requirement to engage "a qualified marine archaeologist" to "..identify whether there is any possible existence of sites or objects of cultural heritage, for example shipwreck, within any seabed areas that would be affected by the marine works of the Project." The archaeologist is required to adhere to the Guidelines for Marine Archaeological Investigation (MAI) as issued by the Antiquities and Monuments Office. These Guidelines are often appended to the Study Brief.

The MAI guidelines were developed by a British maritime archaeologist Sara Ali (née Draper) who resided in Hong Kong during the 1990s. The Guidelines clearly articulate four tasks — colloquially referred to as the Four Commandments — that have to be followed for the successful undertaking of the MAI. These tasks are as follows:

Task 1 Baseline Review

Task 2 Geophysical Survey

Task 3 Establishing Archaeological Potential

**Figure 2: Kowloon Rock (N. Richards)**

Task 4 Remote Operated Vehicle (ROV)/Visual Diver Survey/Watching Brief

The Baseline Review is in essence a desktop study which examines existing archaeological, historical, geotechnical and hydrographical data associated with the study area. The aim of the exercise is to predict the extent, variety, condition and significance of the underwater cultural heritage within the development envelope.

The Geophysical Survey involves remote sensing techniques such as seismic profiling, side scan sonar and echo sounding. Marine geophysics contractors almost always carry out such surveys during the EIA process for development, principally for project engineers. When the opportunity arises the findings of the Baseline Review (Task 1) are communicated to the marine geophysicists so that they can calibrate their equipment accordingly for the best results. Desired output formats, presentation and basic data interpretation are also requested for Task 3 of the Guidelines.

The Establishing of Archaeological Potential combines the results of Tasks 1 and 2 and identifies, or isolates, areas or anomalies of archaeological potential. The findings of the studies form the basis for the formulation of a strategy for further investigation – Task 4. If no anomalies or areas of archaeological potential are identified then Task 4 is not required.

Task 4, Remote Operated Vehicle (ROV)/Visual Diver Survey/ Watching Brief, allows for a combination of investigation techniques to be employed. The choice of techniques is dependant on the nature of the anomaly or area, whether it is buried or on the seabed surface, and environmental conditions such as high concentration of contaminates, water depth, strong currents or heavy marine traffic. Task 4 also requires that the AMO be contacted immediately if archaeological material is found to seek guidance on its significance and the preparation of appropriate mitigation measures.

The Guidelines for Marine Archaeological Investigation issued by the Antiquities and Monuments Office are founded on solid archaeological principles which conform to the UNESCO Convention for the Protection of Underwater Cultural Heritage.

One of the main strengths of the MAI Guidelines is that they provide developers, project managers and non-heritage related government departments with a clear understanding of the steps involved in the management of underwater cultural heritage at the project development and approval stage. Such proactive engagement is one cornerstone in the effective and successful management of underwater cultural heritage with relation to seabed development.

## Information Sources

Antiquities and Monuments Office website http://www.amo.gov.hk/en/about.php

For details of the Antiquities and Monuments Ordinance (Chapter 53) and the Environmental Impact Assessment Ordinance (Chapter 499):

http://www.legislation.gov.hk/eng/home.htm

For information on the Hong Kong Environmental Protection Department, the interpretations and implementation of the Environmental Impact Assessment Ordinance and the Environmental Impact Assessment Technical Memorandum:

http://www.epd.gov.hk/eia/

**Figure 3: Typical view of Hong Kong waterfront (C. Coroneos)**

# Port Royal, Jamaica: Archaeological Past and Development Potential

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Few people seeing modern day Port Royal, Jamaica, a small isolated fishing village situated at the tip of a 29 kilometer (18 mile) long sand spit called the Palisadoes, would ever think that it once played a major role in the politics of the Caribbean and in the economy of England. However, beneath the ground and the adjacent water of Kingston Harbor lies the only sunken city in the New World, a city that played a pivotal role in Caribbean politics and economics (Figure 1). Port Royal is one of the premier English archaeological sites of the Americas. Founded soon after the conquest of the island of Jamaica from the Spanish by an English invasion force in 1655, it went through a spectacular rise involving rich merchants, notorious pirates/privateers, and affluent planters. Its influence ended dramatically on 7 June 1692, when much of the town sank during a disastrous earthquake. In 1692 Port Royal was arguably the largest English town in the New World and was the most affluent with far reaching influence. Because of its significance as perhaps the best preserved 17th-century English site in the world, comes a great responsibility of all who undertake excavations of the site in terms of proper excavation, careful recording, conservation of the recovered material, and publishing the results. Equally demanding is the responsibility of the Government of Jamaica to protect the different areas of the town, properly house the recovered material, conserve the artifacts, display and interpret the recovered material, and properly develop the site for present and future generations.

## Background History

Visitors to Port Royal prior to the 1692 earthquake would have been impressed with the multistoried brick buildings, the high population density, and general appearance of wealth when compared to the other English colonial towns in the New World. Port Royal, with an estimated population of 7,000-8000, was the largest and most affluent English town in the Americas at this time, rivaled in size and economic importance only by Boston with 6,000 or so citizens All the amenities and vices of any 17th-century port town were present, and because of its loose living citizenry, it has been referred to as 'the wickedest city in the world.' During its heyday Port Royal covered some 21 hectares (52 acres) and was laid out with broad unpaved streets, named after familiar streets in London, each lined with buildings one to four stories in height with brick sidewalks along the front of many of the buildings. In 1692, the density of structures was comparable to that of London and the rent was as high as that paid in Cheapside, a high rent district of London. Following the earthquake in 1692, when 13 hectares (33 acres) of the town sank into the harbor, only 8 hectares (20 acres) survived as an island at the end of the sand spit.

Nothing remotely analogous to 17th-century Port Royal remains today. Visitors now see a small fishing town with just over 2,000 citizens along with an abandoned 19th-century British Naval Base and the headquarters of the Jamaican Coast Guard. Very little exists above the ground to indicate the past glory of Port Royal during its height in the 17th-century, or during its prosperous days in the18th-century and when it served as a British Naval Base. When the Naval Base closed in 1905, it ended Port Royal's prominent role in the economy of Jamaica.

## Environmental Havoc

Port Royal belongs to one of a select group of archaeological sites which includes Pompeii and Herculaneum in Italy and Ozette in the state of Washington. Sites such as these are unique "catastrophic" sites – sites created by some disaster that preserves the cultural features and material and the all-important archaeological context. In undisturbed catastrophic sites, the archaeologist is not dealing with a situation where – over a long span of time – houses, shops, warehouses, churches, and other buildings were constructed, added onto, fell into disrepair, were abandoned, eventually collapsed, were razed and then possibly built over. Port Royal is strikingly different: after only 37 years of existence this bustling city literally sank into the harbor in only a matter of minutes during a severe earthquake preserving the all important *in situ* provenance.

Port Royal is known for the unusually high number of catastrophes that have struck it. The most significant disasters causing extensive damage were the 1692 earthquake (which submerged two thirds of the town), the 1703 fire (the town was burned to the ground), the 1722 and 1744 hurricanes (they both obliterated the town), the 1770 earthquake (which destroyed the hospital), the 1815 fire (the town was extensively burned), the 1907 earthquake (which heavily damaged the Victoria Battery) and the 1951 hurricane (which left only four buildings standing). All of these played a major role in creating the different archaeological components

**Figure 1: Aerial view of Port Royal situated at the tip of the Palisadoes**

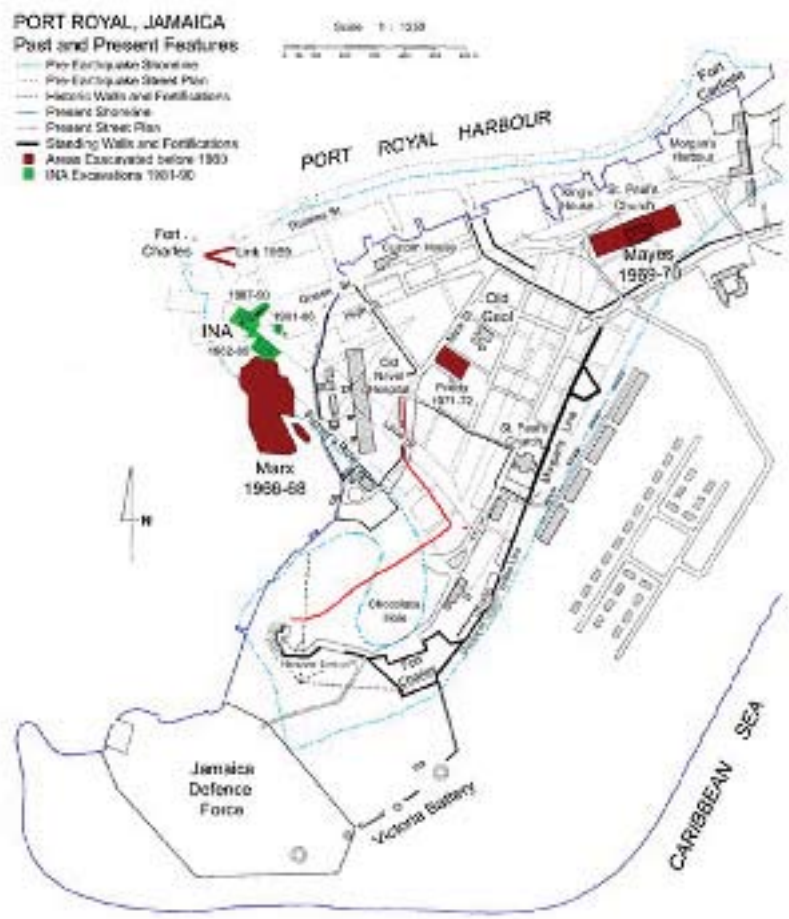


**Figure 2: Port Royal town plan with major archaeological excavations**

represented in the town. Taken as a whole, there are few sites that can rival the potential at Port Royal to conduct research on domestic, business, and military structures dating from the 17th- through the 20th-century.

## Archaeological Excavations

Over the past four decades, the submerged parts of the 17th-century town have received the most interest, but it is important to stress that there are incomparable terrestrial opportunities as well. Three major underwater archaeological excavations in the areas of the old town submerged in Kingston Harbor have been conducted over the past four decades (Figure 2). The first excavation was conducted by Edwin Link in cooperation with the National Geographic Society and the Smithsonian Institute. The 1959 Link excavations concentrated around Fort James, Littleton's Tavern, and the King's Warehouse. The second and largest excavation was conducted along Fisher's Row by Robert Marx in 1965-1967 in association with the Institute of Jamaican Culture. The third and longest running excavation (1981-1990) was directed by Donny Hamilton in conjunction with the Institute of Nautical Archaeology, Texas A&M University, and The Jamaican National Heritage Trust. Hamilton's excavations were located along Lime Street at the intersections of High and Queen Street and resulted in the recording of the best-preserved structures and *in situ* artifacts. The underwater archaeological excavations have revealed most dramatically the affluence of the old town, as evidenced by the prevalence of brick buildings, the density of construction, and the vast array of material culture in the latest styles of the period.

In addition to the major underwater excavations, there have been numerous small land excavations, but only two major ones. Over the years, it has been the developments and improvements in the town that have resulted in the most damage to the archaeological record. The small land excavations conducted usually in reaction to some form of construction or development have been poorly managed and documented, and most have not been published. Too often readily available historical and archaeological information are ignored when various utility and building projects are undertaken. Historic documentation, old maps, and data contributed by archaeologists are either not consulted or the information is ignored.

## Shipwrecks

There are known shipwrecks dating from the 17th- and 18th-centuries lying close to the seawall along the harbor side of town. In fact the only archaeological evidence that can be unequivocally equated to piracy and privateering is found in the form of shipwrecks. During Robert Marx's excavation (1965-1967), he located and tentatively identified three shipwrecks. Along the southeast side of the excavation area, one wreck was identified as the *HMS Swan*, a fifth-rate warship lost in the 1692 earthquake. When the excavation plans are studied, it is obvious that the shipwreck Marx identified as the *HMS Swan*

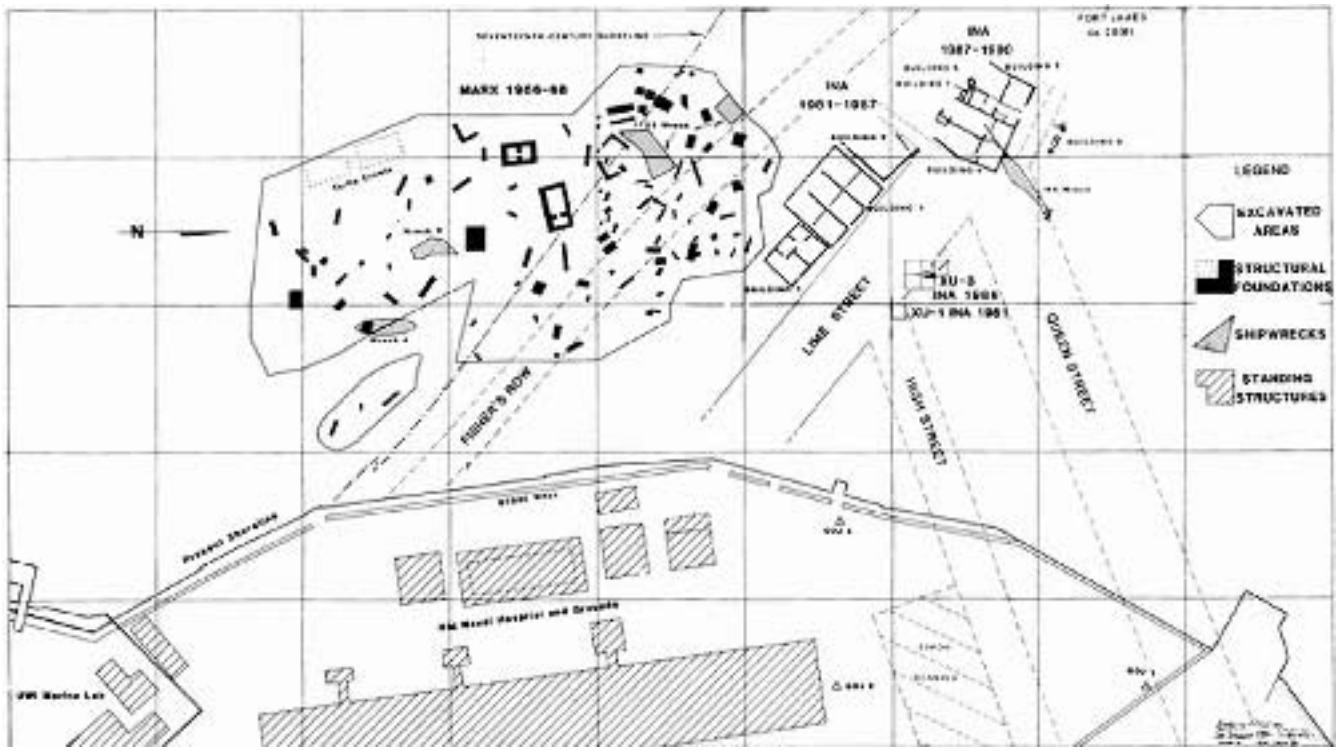


**Figure 3: Underwater excavations conducted by the Institute of Nautical Archaeology and Robert Marx**

lies in the old harbor, not within the boundaries of the town. Since the ship lies outside the town boundary it cannot be the *HMS Swan*, which is described as being careened at the time of the earthquake and was washed into town, landing on top of the house of Lord Pike. A better candidate for the *Swan* is the ship excavated by Hamilton lying across the front wall and floor of Building 4 located at the intersection of Lime and Queen streets (Figure 3). Just west of the ship identified by Marx to be the *Swan* is another wreck identified as the *French Prize*, and at the north end of his excavation area is a ship separated in two localities that Marx identified as the 1722 Wreck on the basis of a 1721 French coin. Historic accounts describe how Port Royal was overwhelmed by the sea and 26 merchant vessels along with 400 persons perished in the harbor during the disastrous August 28, 1722 hurricane. A contemporary observer mentions that only four man-of-wars and two merchant ships survived the storm out of 50 sails in the harbor. The 1722 ship was one of the vessels that sank in this 1722 hurricane that demolished much of the town and destroyed once and for all Port Royal's chance to revive its former prominence.

## Tourism Development Plans

Over the past two decades there have been a number of development plans for Port Royal to develop it into a major tourism center. To date none have gone beyond the discussion and planning stage because of the grandiose nature of most of them and the lack of funding to carry them out. The latest plan by the Port Royal Development Company Limited was initiated in 1998 and includes plans for major development in the land end of Lime Street, the Old Naval Yard, the area of Chocolata Hole, the harbor area, Fort Charles, the center of town, and pretty much every other area of the town. The development plan has the potential to significantly impact, and to some degree destroy parts of the archaeological record in the affected areas. The Government of Jamaica has the responsibility to see that the archaeological damage is mitigated as much as possible and to make sure that there is a knowledgeable archaeologist, well-versed in the history and archaeology of the Port Royal, included in the planning stages of the project.

More archaeological research needs to be conducted in conjunction with any large scale development of the town of Port Royal. There is great tourism development potential in Port Royal and the economy of the depressed town needs to be rejuvenated. The sunken remains of the sunken city are in an archaeological preserve and diving is not permitted without a permit. If supervised diving is to be allowed on the site, it must be monitored and safe guards established to protect the architectural remains and artifacts. Under the right conditions, regulated diving could be allowed thus making this dramatic archaeological site part of the present day economy as well as allowing development of the terrestrial components of the town. However, development must not compromise the incomparable archaeological record that still lies untouched beneath the ground and the water surrounding the town.

# In Situ Site Stabilization: The William Salthouse Case Study

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## Introduction

The wooden sailing vessel *William Salthouse* was wrecked at Port Phillip Heads on Saturday 27 November 1841 at the end of a trading voyage from Canada to the new Port Phillip colony (Victoria) in Australia (Staniforth 2003). The remains of the vessel were relocated in ten to thirteen metres of water by two SCUBA divers during a drift dive in August 1982. As far as can be determined, this was the first time that divers had visited the wreck site, since what was probably limited salvage work ceased in about 1842 (Staniforth & Vickery 1984:4-5).

It is believed that the site had reached a state of relative equilibrium with its environment over the 140 years since wrecking, and only a very small part of the remaining wooden hull structure and organic cargo material protruded above the seabed. The vast majority of the material remains, including the wooden hull structure and wooden-hooped casks, lay buried within a large sand ridge (or sand wave) approximately three metres high (Staniforth 1987).

## Environmental Conditions

The wreck site is located on a sandy seabed covered with highly mobile large and small sand waves. These sand waves result from extremely strong tidal currents (up to six knots) caused by the physical configuration of Port Phillip Bay, a large bay with a relatively narrow opening. The area is now too deep for seagrass to grow, but early charts suggest that during earlier times the water was shallower and the seabed probably had a covering of seagrass. Exactly when, or how quickly, the changes to the seabed flora and topography occurred are impossible to establish with any certainty. Nevertheless, they are considered likely to have resulted from human-influenced changes in the environmental conditions caused by factors such as nearby channel dredging, the scallop fishery and changes to water quality within Port Phillip Bay, most of which occurred in the 20th-century.

## Diver Disturbance

Generally, diving on the site is only possible at slack water — a period lasting from a few minutes to over an hour at the change of tide. The finding of the wreck of the *William Salthouse* very quickly became common knowledge among the diving community in Victoria and the surface of the site was extensively disturbed by souvenir hunters over a period of a few weeks in late 1982. The site was inspected several times by maritime archaeologists from the Maritime Archaeology Unit of the Victoria Archaeological Survey (VAS) in December 1982 and on one occasion as many as twelve dive boats and 60 divers were observed on the site.

The site was declared as an historic shipwreck under the provision of the Historic Shipwrecks Act 1981 (Victoria), but looting continued over the summers of 1982 and 1983, and on 9 February 1983 the site was declared as a 250-metre radius protected zone (Harvey 1996:1-2). Protected zone status meant that no diving was allowed within the protected zone, and an effective enforcement program was put in place using water police and inspectors appointed under the Historic Shipwrecks Act 1981. Further inspections during March 1983 indicated that declaration as a protected zone had largely put a stop to the site disturbance, but surface damage was already clearly extensive.

## Test Excavation

In order to establish the extent of the damage to the site and to evaluate the amount of hull structure and cargo material remaining, it was decided to conduct an emergency test excavation during May 1983. The main aim of the test excavation program was to produce a detailed site plan to aid in future management of the site, and a secondary aim was to conduct research into the stowage methods used aboard the vessel. The wreck site is approximately 25 metres long and 8 metres wide. Two trenches (each 2 metres wide and 8 metres long) were excavated across the site using airlifts - one forward and one aft of the main mast (Staniforth & Vickery 1984:5-11). This represented less than 20% of the surface area of the site, and excavation ceased when complete and undisturbed cask or other cargo material was encountered. The test excavation showed that while disturbance on the site was extensive, this was restricted to the surface levels (0 to 0.3 metres), and below these levels most of the cargo material was undisturbed.

## Site-Monitoring and Public Access

After the test excavation program was completed, the *William Salthouse* site remained a protected zone and was therefore closed to public access and diving. A site-monitoring program conducted by Maritime Archaeology Unit staff was commenced, and in October 1983 increased scouring was noted on the site. Further inspection of the site in 1984 indicated that scouring appeared to have been reduced, and that the stern section of the wreck was then completely covered by sand (Harvey 1996).

As a result of media coverage, public interest was high, and divers wanted to be allowed to dive on the site. In order to allow at least some public access, a permit system was started in March 1984 which allowed a limited number of divers (twelve) to visit the site at strictly controlled times. The permit system was subsequently extensively used by dive charter operators who were warned that evidence of site

**Figure 1: Moving sea grass matting into position (M. Staniforth)**

**Figure 2: Build up of stabilised sand following placement of artificial sea grass matting**

**Figure 3: Close-up of accumulated sand and artificial sea grass fronds**

disturbance could result in the confiscation of their boat for up to 60 days. As a result dive charter operators strongly pushed the "non-disturbance" provisions of the legislation to their divers. Despite this, on-going monitoring of the site showed that accidental damage was occurring. Some was caused by poor buoyancy control among newly qualified divers and some surface disturbance was continuing as a result of hand-fanning by divers (Harvey 1996). Monitoring also showed that sand was steadily moving off the site and sections of the hull and cargo were becoming more exposed.

## Early Site Stabilization Attempts

In 1985 the first attempt was made to reduce scour and increase sediment build-up over the site by positioning five small fences (0.4m high and 1.5m long) made of iron reinforcing rod at right angles to the tidal current. These fences caught mobile kelp and algae that rolled across the seabed, which then resulted in sediment buildup in some places, but increased scour in others. This experiment was followed by several other unsuccessful attempts to increase the sand cover over the site including using a water dredge to pump sand onto parts of the site and bulk dumping of several hundred tons of sand onto the site from the dredge Matthew Flinders. Finally in 1987 the site was closed to diving again and a temporary solution using hessian sandbags to support undermined sections of the hull was put in place (Hosty 1988). By 1989, however, the hessian sandbags were beginning to break down and a more permanent solution was sought.

## Artificial Sea Grass Matting

Artificial sea grass matting made from closed-cell foamed polypropylene (Cegrass Erosion Control System) was purchased from Cebo UK Ltd based in Aberdeen, Scotland. Twenty-four strips (each 1.6 cm wide by either 90 cm, 120 cm or 150 cm long) were attached to a plastic clip and then to an iron reinforcing rod mesh (6m by 2.4 m with a 0.2m square mesh size) to create an artificial sea grass mat. The mats were weighted with 30 cm lengths of railway iron and a total of 42 mats were deployed around (but not over) the site of the *William Salthouse* in 1990.

Sediment deposition around the wrecksite increased immediately. Even over the site where no sea grass matting had been placed, sand began to build up. Minor adjustments to the placement of sea grass mats to eliminate the remaining problems with scouring and a regular monitoring program took place over the next three years to ensure the stability of the site. Public access via the permit system was reinstituted in 1993.

## Conclusion

Artificial sea grass proved to be an effective method of site stabilization on the wrecksite of the *William Salthouse*. The overall cost of the project was approximately A$100,000 making it a cost-effective option for site stabilization for wooden wrecks threatened by loss of sediment cover as a result of environmental change exacerbated by human influences.

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# A Cheap and Effective Method of Protecting Underwater Cultural Heritage

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Australia's underwater cultural heritage is diverse and extensive. The allocation of the limited resources available to protect this heritage is prioritised through balancing competing cultural heritage values of individual sites with an assessment of threat to that site's physical integrity.

Iconic or well known sites justifiably receive the lion's share of attention as they are usually, by the nature of their popularity, under immediate threat. Mitigation measures commonly involve public programmes and policing as well as elaborate and innovative site stabilisation. Rescue excavations have been undertaken in extreme circumstances when the options of *in situ* preservation have been found, or predicted to be, ineffective.

The UNESCO Convention for the Protection of Underwater Heritage does not discriminate between sites based on cultural heritage value. However, not all sites of underwater cultural heritage are faced with equal threats. The majority of Australia's underwater cultural sites are under low to moderate threat and such sites are understandably given less attention. Nevertheless, the forces of nature and collateral cultural impacts relentlessly erode the cultural values of such sites through a gradual yet irretrievable loss of fabric and context. The preservation of these sites is still an imperative.

This article outlines practical steps which conform to the Convention's Articles and Rules and that were taken for the *in situ* preservation of one such site, the *Solway*, a 337 ton ship, wrecked at Rosetta Harbor , South Australia in 1837. The preservation measures implemented were simple, reversible and of little cost to the State. This relatively small outlay of time and money retarded the deleterious effects of natural agents on this site.

The method used to protect the site involved the placement of bags filled with sand over exposed parts of partially buried timbers. The use of sandbags in this way is not uncommon in Australia and is a much used instrument in the tool kit of the underwater cultural resource manager. Such a method, of course, is not applicable in all circumstances; it is most effective when dealing with low relief sites of which a significant proportion is buried in sediment.

The Solway is located approximately 500 metres offshore and in 3 metres of water. The site has been known since the early 1960s. The first inspection of the Solway by the State's cultural resource management agency took place in 1982. Its historical significance, being South Australia's second oldest known shipwreck (by two weeks) and the earliest located shipwreck in the State, enhanced by its relatively high state of preservation, led to the site being declared an Historic Shipwreck under the South Australian Historic Shipwrecks Act 1981.

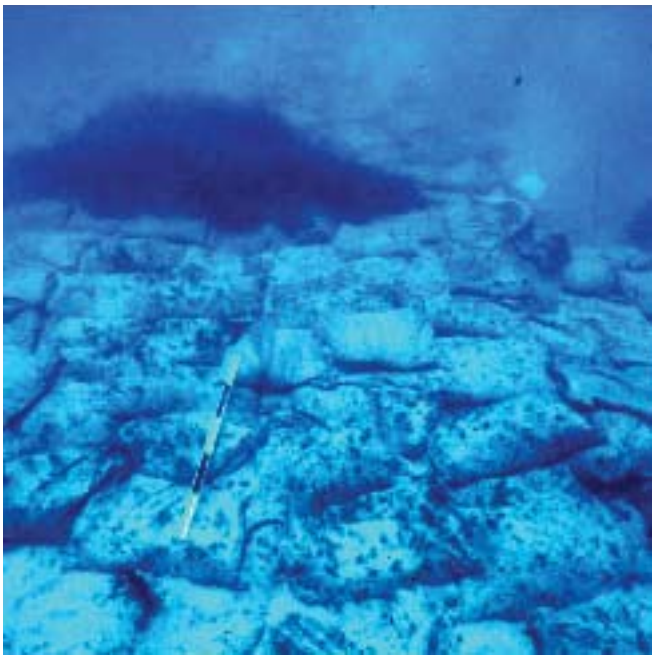


**Figure 1: Sandbags on the Solway (C. Coroneos)**

In early 1994 the site was inspected as part of a Regional Survey Programme. It was found that considerable structural remains of the hull remained intact. The amount of sand covering, in places, and the extent of the remains suggested that a considerable part of the site, from the turn of bilge to keel, was buried. This also suggested that the site could contain a considerable amount of artefacts, including cargo.

The 1994 inspection of the site noted that some deterioration of the site had occurred since the early 1980s. Deliberations by the State Heritage Branch on the appropriate management response prompted a review of the significance assessment of the *Solway*.

Built at Monkswearmouthshore, Sunderland, England in 1829, the *Solway* was a trading vessel with an unremarkable history. When wrecked in December of 1837 it had been in South Australia for two months under charter to the South Australia Company, having sailed from Hamburg with 52 German migrants and cargo. The vessel was driven onto a reef in storm whilst loading whale oil from the whaling stations established in Encounter Bay. There were no fatalities.

The review found that that the *Solway*'s significance extended beyond the superficial historical association as one of the first ships known to have been lost in South Australia. The wreck of the *Solway* is also of historical significance because it symbolised the economic and logistical follies committed by the initial European settlers to South Australia. The site had enhanced archaeological significance as it possibly contained cultural material evidence of the first German settlers to the State.

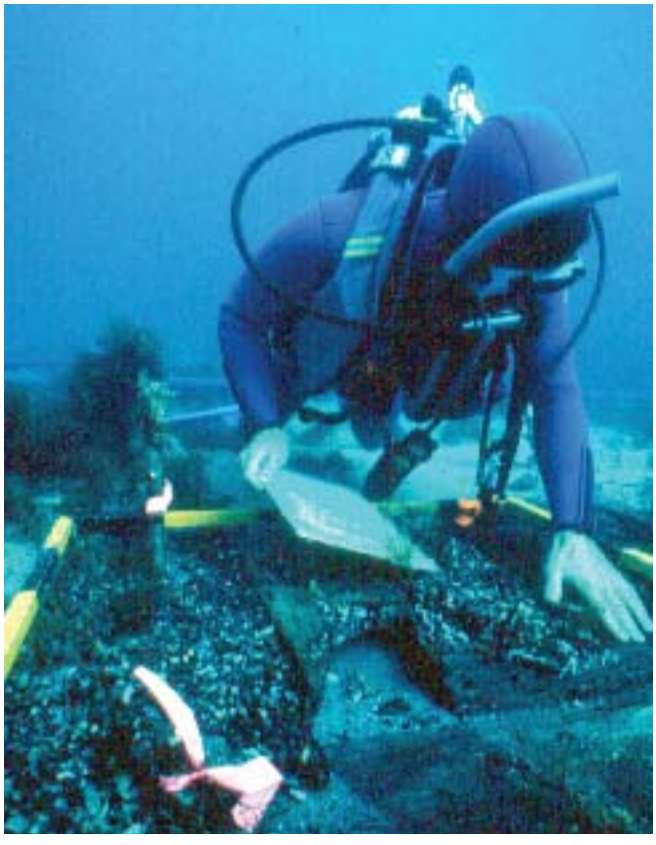
To better ascertain the archaeological significance of the *Solway* a test excavation was conducted in April 1994, with the aim of determining the variety and extent of the remains of cargo and personal possessions on the site.

The test excavation revealed that the site had considerable archaeological and research potential. It was discovered that much more of the vessel's structure had survived than was initially assessed. This was a result of the vessel being situated on a reef composed of relatively soft calcareous limestone. From the time of impact until the breakdown of hull from marine borer infestation and wave action, the keel and bilge of the vessel would have been grinding down the soft reef rock upon which it rested, the weight of the hull given momentum by the constant southerly swells. This would have had the effect of creating a depression in the reef which was filled with sand, thereby preserving the wreck from the turn of the bilge to the keel.

During the test excavation it was also observed that much of the timber that was exposed was "fresh," i.e. not damaged by marine borers. However, only a few centimetres of sand covered the wide expanse of timber floors and planking in the centre of the site, whereas anecdotal information prior to the 1980s indicated that in previous times the site was almost completely covered .

An assessment of the threats to the site indicated that there were no potential, direct, cultural impacts through seabed development, anchoring or looting. However, observations and anecdotal evidence from the site did not reveal whether the recent loss of sand cover was an ongoing, one way process, or a seasonal effect. This posed a management problem.

**Figure 2: Recording the *Solway* (B. Jeffery)**



The Solway was one of many archaeological sites under the State Heritage Branch. Other sites had been assessed to be under greater threat and therefore required a greater share of the agency's time and resources. However, to leave the site alone allowed for the likelihood of the continued erosion of sediment resulting in the loss of structural integrity and what remained of the intra-site contexts. In addition, the site would become increasingly vulnerable to looting.

It was decided to take immediate steps to stabilise the site using sandbags, pending the availability of funds to further investigate the site. The application of sandbags on the exposed timbers would protect the site from two prevalent threats, both biological and mechanical. By artificially replacing the sand over the site, the wreck timbers would be reintroduced to anaerobic conditions thereby limiting the ravages of marine borers. The sandbags would also protect the site from mechanical damage in the form of sand abrasion or larger objects being propelled through the water during storms. The placing of sandbags also served as a minor deterrent to inquisitive divers. As the area was not commonly frequented by boats, there was little fear that the sandbags would be disturbed by dragging anchors.

The sandbags would also serve to act as a sediment trap and the surface of the bags were sufficiently rough to attract the colonisation of marine growth, which in turn would accelerate the rate sedimentation. Polyester sandbags were used, as it was feared that Hessian bags would deteriorate before marine growth could take hold.

The initial deployment of sandbags involved three days of work, filling the bags with clean sand, taking them out and placing them over the freshly exposed timbers. Care was taken to lay the sandbags flat so as to maximise the amount of coverage. The costs were limited to the purchasing of 1,000 sandbags, sufficient sand, accommodation, fuel and the wages of one State Heritage Office staff member. Assistance was provided by volunteers.

In conjunction with the deployment of the sandbags, a monitoring programme was initiated. The purpose of the programme was to gauge the condition of the sandbags, possible disturbances by divers, the effects of storms, the rate of sedimentation and marine growth on the bags, the creation and effects of scouring around the sandbags, and the exposure of other parts of the site.

Subjective observations of sand movements were noted on a copy of the site plan attached to an underwater dive slate. Newly exposed remains and previously exposed remains that had become buried were also noted. Quantitative data of sand movement were obtained from taking measurements from established stations – brass rods hammered into the seabed – around the site. Photographs were taken at each inspection from predetermined locations to obtain a "time lapse" record of the site. Records were also kept of the weather patterns in the area for three days prior to each inspection.

Six months into the monitoring programme another 300 sandbags were laid over parts of the site that were consistently exposed prior to 1994 and on timbers that had recently

become exposed. A further 500 sandbags were deposited on the seabed near the site for future use if required.

The regular inspection of the site after the initial deployment of the sandbags was a critical part of the site preservation process. It was observed that the sandbag mound on the most vulnerable parts of the site modified water movement patterns which resulted in scouring around the bags, thereby exposing more timbers. With regular inspections and a "bag depot" available nearby, it was possible to continually cover newly exposed timbers.

Regular inspections also allowed an investigation of the effect of the sand bags on sand movements across the wider site. The collation of measured observations on site made before and during the monitoring programme showed that the greater part of the site became exposed during the summer months. This seasonal exposure of the site revealed timbers damaged by marine borers as well as "fresh" un-infested timbers. The monitoring programme allowed for refinements to be made to the protection and stabilisation of the *Solway* wreck site.

The sandbagging of the *Solway* is not a unique or innovative form of underwater cultural resource management. However, it is often worth being reminded that underwater sites can be physically protected cheaply, quickly and effectively with minimal effort, all the while conforming with the principles and rules of the UNESCO Convention for the Protection of Underwater Cultural Heritage.

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**Figure 3: The Solway in the 1980s (B. Jeffery)**

# The In Situ Protection of a Dutch Colonial Vessel in Sri Lankan Waters

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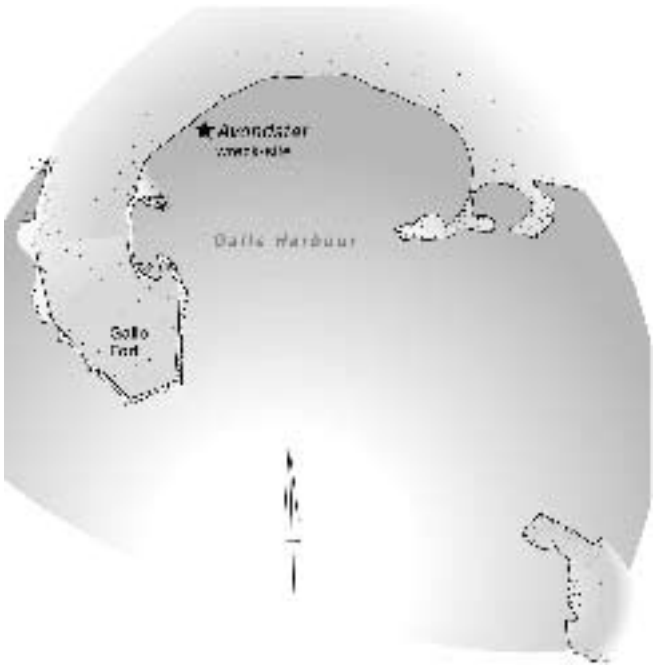
On the 2nd of July 1659, during a calm night, a Dutch Eastindiamen (VOC), called the *Avondster*, ran ashore in Galle Harbour in the south of Sri Lanka and wrecked. The ship had been loading a cargo of areca nuts (Areca Catechu) for India. These are the seeds of a palm tree and an ingredient of sirih, a kind of chew (Figure 1).

By observing the remains of the ship, this is what probably happened: the stern of the *Avondster* hit the sandy seabed and ran ashore on a gradually sloping sandy coast near the Dutch Fort of Galle. Due to the constant pressure of the waves, the sternpost broke off from the rest of the ship. The waves were also responsible for the breaking of the portside under the bilge and the starboard side just above the first deck. Fine fluvial sediment of the river that deposited its water and waste into the bay and coarser marine sand covered the entire wreck. It must have been covered with fine sand and silt very soon after wrecking, which left it in an anaerobic condition for many centuries. In comparison to most other wrecks in tropical waters, the conservation conditions were extremely good for a long time, protecting a large part of the *Avondster*'s wooden structure (Figure 2).

A few decades ago, a road and stone barrier were built only 50 metres away from the site. Since then the environment has been very unstable. In the early 1990s, the wreck was discovered during a survey project of Galle Harbour. The

**Figure 1: Location of the *Avondster* wreck in Galle Harbour (Drawing M. Manders/M.Kosian)**




Galle Harbour project started in 1993 and lasted three years. It was a co-operation between the Department of Archaeology (Sri Lanka), the Central Cultural Fund (Sri Lanka), the Post Graduate Institute of Archaeology (Sri Lanka) and the Western Australian Maritime Museum (Australia).

The *Avondster* excavation project was a follow up of this project and is a joint venture of the Mutual Heritage Centre of the Central Cultural Fund (Sri Lanka), the University of Amsterdam (the Netherlands), The Amsterdam Historical Museum (the Netherlands) and the Western Australian Maritime Museum (Australia). At the start of the *Avondster* project, the decision was made to safeguard the valuable archaeological information of the wreck site by excavation. Many objects will be preserved *ex situ*, but the idea is to leave the wreck itself *in situ*. Information about the ship construction will be gathered underwater. The finds are being conserved in a laboratory near the site especially created for the *Avondster* project.

Throughout the years we have seen the *Avondster*'s wooden construction being destroyed by wood-eating organisms, erosion, as well as human activities such as fishing and diving. Not only the ship, but also objects that belong to the inventory, cargo and the persons on board are deteriorating and moved all over the wreck site by swell, currents, waves, and breakers. This means loss of archaeological information. The turbulent sea at the site possibly also makes the water oxygen-rich from time to time. This, together with the large amount of organic waste found on the site and dumped in the water, make the area extremely favourable for organisms attacking organic archaeological material.

The excavation of the *Avondster* wreck started in 2001 but probably will go on for many years to come. Considering the speed of degradation on the site, the decision was made to physically protect the site in order not to lose much information prior to this excavation. A method of physical protection needed to be designed that would protect the wreck and its contents against:

1. Natural erosion and scouring caused by sea and weather
2. Objects being moved all over the site
3. Wood-eating organisms
4. Looting
5. Fishing activities
6. Chemical degradation, including the corrosion of metal objects (if possible)

Also taken into consideration was the need for the method to be inexpensive, the materials easy to buy in Sri Lanka, the protection easy to install and easy to remove so that the excavation in trenches could continue.

We decided to test a method that was already in use in the Netherlands: covering a site with polypropylene nets. These nets promote sand deposit that will cover the site and leave

**Figure 2: The exposed site of the *Avondster*. After so many centuries, much of its wood is still preserved (R. Muthucumarana)**

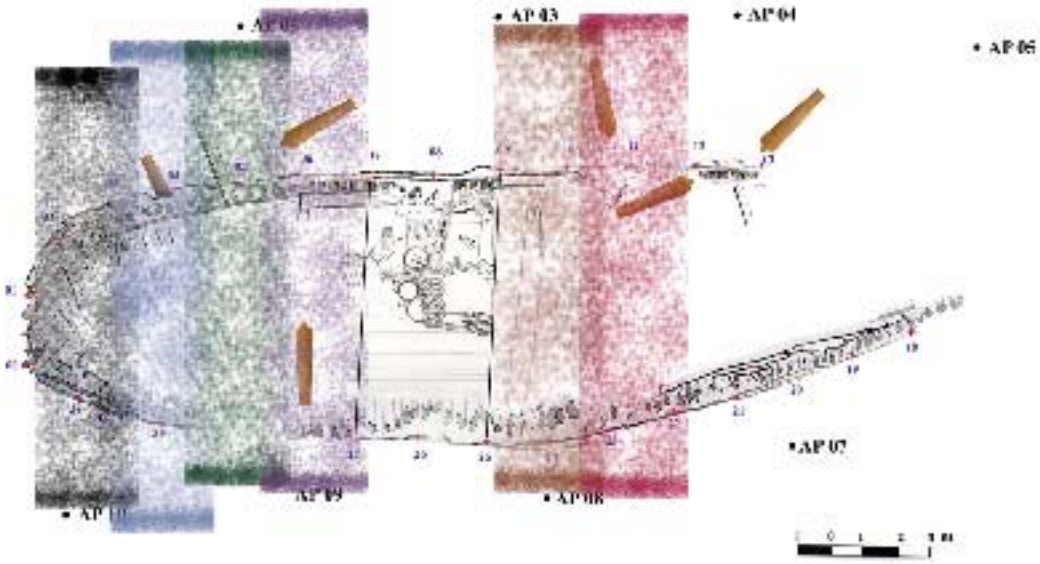



**Figure 3: Schematic impression on where the polypropylene nets have been placed on the *Avondster* wreck (R. Muthucumarana)**

**Figure 4: Sand is penetrating the little holes in the net, covering the wrecksite with a protective sediment layer (R. Muthucumarana)**

it protected in an anaerobic environment. These tests were executed in February 2003, and because the results were very promising, an effort was made to cover the whole site in November that same year. The non-woven polypropylene net is fabricated in Sri Lanka and is normally used for filtering water and for shrimp fishing. In December 2003, the whole bow section was covered with five nets that were 4 meters wide and 25 meters long. They are placed squared on the wreck site covering the hull and the area where parts of the broken-off starboard side are possibly still lying under the sand. The strips of netting are weighted at both ends with sandbags. On the site, the nets extend 4 metres out of the portside of the wreck and 8 metres and more from the starboard side because here more parts of the wreck and objects are expected to be found (Figure 3).

The results of the protection are even more promising than the first test. Within one week after installation, the whole bow side was covered again with sand. This means that in places there was sediment buildup of more than 1 metre. Finally, the whole site has to be protected in order to be effective. For this protection, fourteen nets with a width of 4 metres width and a length of 25 meters are needed. The total material cost of this physical protection of the *Avondster* wreck (about 500 square metres) is approximately € 2,000. The complete covering of the site has not been executed yet (Figure 4).

After the protective nets have been installed on the site, this *in situ* protection has to be maintained. Because of the shallowness of the site, it is obvious that monsoons might have an enormous effect on the environmental conditions at the *Avondster*. For this project, a monitoring scheme was developed, with visual observations on a regular basis.

On the 26th of December 2004, a Tsunami hit Galle Harbour with incredible force. It was thought that it would have affected the conditions on the site. Eyewitnesses state that just before the big wave entered the Galle Harbour, the wreck itself became exposed. Surprisingly, monitoring in April 2005, three months after the Tsunami, revealed that hardly any damage was done to the wreck site and its protection. The covered bow site was still covered with a thick layer of sand. Even in these conditions the protection seems to be effective.

## Conclusions and Consideration

The Bay of Galle has tidal influences but most of the sediment is moved over the seabed by high swell and surge caused by the stone barrier near the site. This caused heavy erosion and abrasion of the *Avondster* site for many years, exposing it to further natural, biological and human deterioration. The protective measurements with polypropylene nets that were executed in 2003 have the opposite effect. Sand that is transported over the wreck site falls down the holes of the net and settles due to the fact that there is hardly any water movement under the net. It creates an anaerobic environment comparable to the conditions in which the wreck has been protected for a few centuries. At the bow where this protection was executed, it worked extremely well. It stopped abrasion and attack by woodborers; probably the most siginificant causes of degradation at the *Avondster* site.

To protect the wreck site effectively prior to excavation, the whole construction has to be again covered with sand. The site will then be a sloping mound of sand and nets within a few months. Within a few years it will be an artificial mound that will prove to be very difficult for looters to enter. However, with the proper equipment, like water dredges or airlifts, the protection is easy to remove. The wreck can then be easily excavated in parts, while the rest of the site is still protected.

Regular, ongoing monitoring of the site is important. At a shallow site like the *Avondster*, high swells and bad weather conditions, which are abundant during the monsoon season, form a potential threat. However, it is also important to keep in mind that some degradation will occur, whatever measures we take. However, we can slow down or stop a number of processes responsible for the deterioration of different materials. If the excavation of the Avondster continues, the contents of the wreck will be preserved *ex situ* without these negative influences. Although some deterioration of the wreck will continue slowly (e.g. bacterial decay), it will be well protected *in situ* for many years to come.

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# Managing Threats to Underwater Cultural Heritage Sites: The Yongala as a Case Study

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*SS Yongala* (1911) was a luxury passenger steamer which foundered and sank during a cyclonic event approximately 12 nautical miles from Cape Bowling Green and 45 nautical miles south of Townsville, Queensland, Australia, in what is now a part of the Great Barrier Reef Marine Park. The *Yongala* was an early 20th-century interstate coastal steamer which supplies a snapshot of Edwardian life in Australia. The wreck lies structurally intact and is host to an amazing diversity of marine life. The wreck has been listed as a gravesite and a significant historic, archaeological, social, scientific and interpretive site. The degree of significance as determined by the *Guidelines for the Management of Australia's Historic Shipwrecks* is assessed as being both "rare and representative." The shipwreck is also one of Australia's most popular wreck diving experiences.

Management of the *Yongala* shipwreck by the Museum of Tropical Queensland (MTQ) illustrates the holistic approach to cultural heritage preservation epitomised in the general principles of the UNESCO Convention for the protection of underwater cultural heritage.

## The Shipwreck Incident

> *with no desire to indulge in idle speculation, simply find that after becoming lost to view by the light keeper at Dent Island, the fate of the Yongala passes beyond human ken into the realms of conjecture, to add one more to the mysteries of the sea...*

The Yongala was built in 1903 by Armstrong, Whitworth and Co. in Newcastle-on-Tyne, England. The vessel was powered by a large triple expansion engine driving a single propeller. The vessel was 363 feet in length and of iron, steel and wood construction. The vessel was employed on a Melbourne to Cairns run from 1907 to its sinking in 1911.

On March 23rd 1911 at 1:40 pm the *Yongala* left Mackay for Townsville but sank in or after cyclonic conditions with the loss of all aboard, reportedly 121 people, although an unlisted servant may have also have been aboard.

## Location and Site Conditions

The *Yongala* lies in open waters in Cape Bowling Green Bay in the central section of the Great Barrier Reef Marine Park (Latitude 190 18' 16'' South, Longitude 1470 37' 19'' East). The site is adjacent to a major shipping channel with shipping traffic passing on both the east and west of the site. The site is clearly marked on all nautical charts as an historic shipwreck.

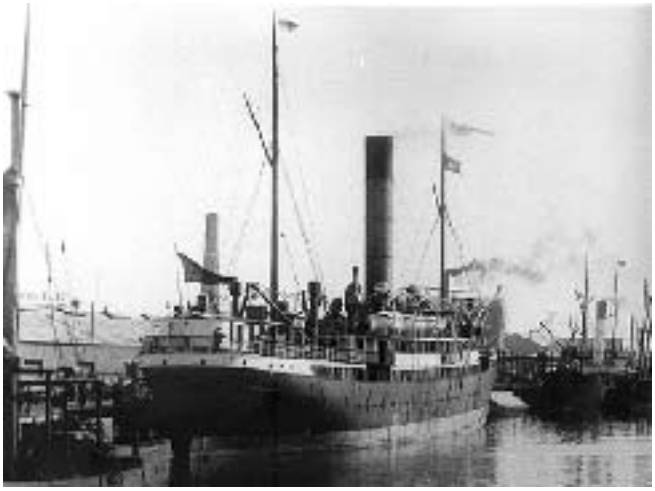

**Figure 1: *SS Yongala* (Courtesy of A.D. Edwards Collection in the State Library of South Australia)**

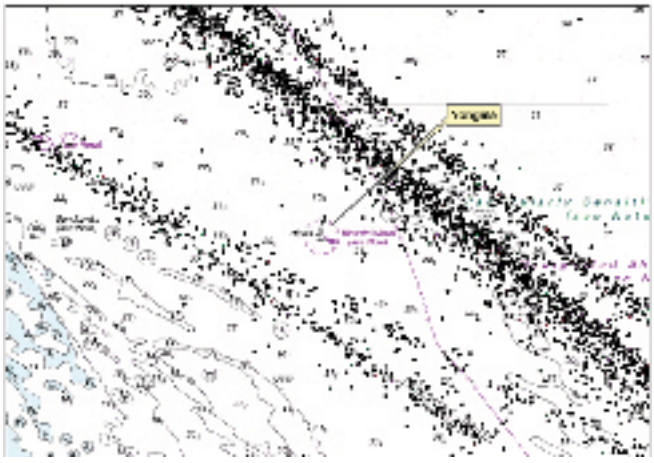

**Figure 2: Shipping traffic past *Yongala* wreck site from Australian Maritime Safety Authority**

**Figure 3: Approximate location of *Yongala* in relation to Queensland coastline and Great Barrier Reef (http://www.townsvilleholidays.info/)**

The wreck sits intact on the seabed, listing to starboard on an angle of 60-70°. The depth of water to the sea floor is approximately 27-30m, with the upper sections of the wreck approximately 16 meters below the surface. The seafloor surrounding the wreck is sandy. Strong currents scour the area, constantly exposing or covering parts of the hull and starboard side decking.

The site is fully exposed to all weather conditions. The summer period is the cyclone season with a peak around January to March. In winter, south easterlies up to gale force can occur, causing large swells to develop.

## Threats to the Site - Environmental and Human

The *Yongala* is subject to its own unique blend of environmental and human threats. Since the *Yongala* is an iron hulled vessel, the predominant threat is corrosion with subsequent loss of structural integrity. Since the wreck sits proud on the seabed, the site is predominantly affected by aerobic corrosion with the rate of oxygen access to the residual metal being the controlling step in the corrosion process.

While storm events may happen regularly with varying degrees of impact on the site, cyclones happen only rarely near the *Yongala*. However, when a cyclone does happen it has major implications for the wreck's condition. This point was proven by Cyclone Aivu in 1989. The force of water movement and associated sandblasting during the cyclone dislodged a memorial plinth cemented to the bow area and scoured a large portion of the wreck clean of concretion.

Human threats to the site are generally less dramatic in their effect than cyclones, but cumulatively are significant. In 1994 under Section 7 of the *Historic Shipwrecks Act*, a provision was added to the permit conditions for divers, making penetration diving illegal. Penetration diving can cause two different types of damage that accelerate corrosion: loss of concretion through mechanical damage and the buildup of oxygen concentration (air pockets) inside the ship wreck's confined spaces.

One of the most significant threats to the site in the years subsequent to its re-discovery was removal of fixtures and fittings from the vessel. This happened primarily through uncontrolled souveniring. Accelerated corrosion is measurable near locations where portholes were removed from the wreck. Ironically the illicit salvage of the *Yongala*'s single bronze propeller circa 1971 has most likely assisted in the preservation of the wreck by removing the largest galvanic couple on the site that would have eventually accelerated the corrosion of the stern area.

More recently dive boats have been the main human threat to the site due to damage associated with anchoring. The site is in open fetch conditions subject to strong currents and wind. Dive boats have been known to drag their anchors over the wreck site, causing significant loss of concretion, as well as to drop their anchor directly onto the wreck causing physical damage.

Since the site is not only a shipwreck but an artificial reef supporting incredible diversity of marine life, mechanical damage to the wreck's corals reduces its aesthetic value. In the last three years an average of 7,774 divers per year have dived the site. Their level of personal skill and buoyancy control varies significantly and sometimes results in damage to the coral. Another threat to the site's marine diversity was fishing. This was a serious threat to the wreck's artificial reef ecosystem up until 1984 when the Great Barrier Reef Marine Park Authority declared the section in which the *Yongala* is situated as a Marine National Park B zone. This zone designation prohibits fishing, aquaculture, bait netting, crabbing, harvest fishing, research without a permit, tourist programs without a permit and shipping without a permit.

## Managing Threats

Under the *UNESCO Convention for Protection of Underwater Cultural Heritage* both formal and informal approaches are recommended to manage threats to sites. In the context of the *Yongala*, managing environmental threats is neither cost-effective nor practicable. For example, the theoretical installation of a large number of sacrificial anodes to mitigate against the corrosion cycle would require an enormous amount of human resources and significant ongoing financial commitment beyond the resources of the MTQ.

The management of threats to the *Yongala* site therefore focuses on the management of dive operators and diver interaction with the ship wreck. These interactions are controlled by legislation and enforcement as well as education as recommended in the UNESCO Convention.

Legislative protections for the Yongala are:

- 1981 the *Yongala* was gazetted as an historic shipwreck under Section 5 of the Commonwealth Historic Shipwrecks Act 1976
- 1982 the site was listed on the register of the National Estate
- 1983 it was also listed under Section 7 of the *Historic Shipwrecks Act* 1976 which supplies a protected zone of 500 meter radius around the site
- 1984 the site was included in the Central Zone of the Great Barrier Reef Marine Park

Under the *Historic Shipwreck Act* the site is protected for its heritage value while being made available to users for recreational and educational purposes. The Act proscribes activities that detrimentally impact on the site and its associated artefact assemblage. This emphasis on the public's right of access and responsibilities on site reflects the values of the UNESCO convention.

Formal approaches to managing threats include site planning, legislation and regulation combined with policing and prosecution. Informal approaches are communications focussed and targeted at individual divers and dive operators.

Within the framework of the existing legislation the MTQ prepared a Conservation and Management Plan for the *Yongala*


**Figure 4: *Yongala* Moorings Layout**

in 2001 to identify and make recommendations on outstanding issues. Following on from a number of recommendations in the report, in 2002 a moorings infrastructure was put into place with funding from the National Moorings Program. The moorings comprise five vessel mooring points, two diver access points and one mooring point with an associated isolated danger mark buoy.

With the moorings infrastructure in place, anchoring within the 500m protected zone was banned and no anchor damage has been subsequently reported.

Not only have the moorings been a success from the point of reduced damage to the shipwreck, but from the operator and diver safety perspectives. Recent consultation with operators has guaranteed ongoing operational funding for the moorings based on a user-pays system. This result has come about through a process of communication and engagement with each operator and other regulatory bodies. Another outcome from this recent meeting is unanimous support from dive operators for each company to present their formal business plan, environmental management plan and signed diver code of behaviour agreement before being issued with a permit. This is being proposed by operators in a bid to improve the quality of dive tourism on the site.

Another strategy put forward by MTQ was engaging diving operators to raise the standards of diving practice by tying in a diving code of behaviour with operator interest. Education of operators in the importance of preserving the site has also resulted in the first successful prosecution in Australia under the no penetration dive restriction incorporated in the Historic Shipwrecks Act. In 2003 an operator supplied an appropriate pre-dive briefing on deck encompassing restrictions to diver activities while on site. This briefing was ignored by a diver, and that person was witnessed entering the wreck. The dive operator called the police and supplied evidence against the diver which resulted in a legal first — the diver was fined $2,000 for making an illegal dive on the *Yongala*. With the operator's evidence, the prosecutor proved that the diver had "ample opportunity to know that the dive was a no penetration dive" and that the *Yongala* is designated not only as an "historic shipwreck, but as a grave site."

Since eventual collapse of the site is a certainty, MTQ has initiated a planning process to prepare for the event and to mitigate against it from an archaeological perspective. This process involves communication with the dive industry, local university, user groups, federal and state governments' regulatory authorities, and is placed within the framework of the MTQ's staff and resources. As part of this planning process the first significant conservation assessment of the wreck was initiated. This includes a combination of non-destructive techniques such as video and still photo documentation and a corrosion survey. This work is being carried out in conjunction with operators, divers, the Great Barrier Reef Marine Park Authority as well as the Environmental Protection Agency-National Parks and Wildlife division.

Under the UNESCO convention object recovery for the protection of the underwater cultural heritage is allowed. As part of MTQ's mitigation plan, an assessments of the following are addressed:

- Significance of individual objects
- Potential information loss associated with collapse of the *Yongala*
- Ability of the museum to fund the excavation, conservation and publication of any rescue archaeology is being addressed.

This will be developed as per the project design framework laid out in the Annex of the UNESCO convention.

Since public education is critical to the management of sites and the mitigation of human threats to the site, MTQ is investing its resources in on site and display interpretive material, pamphlets and web based information, while continuing its policy of face to face engagement with operators and divers.

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# To Dig or not to Dig?
## The Example of the Shipwreck of the Elizabeth and Mary

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*Underwater Archaeology Service*
*Parks Canada*

## The Urgency of Emergency Excavations

Each day cultural heritage managers face a range of issues requiring them to make complex, even difficult decisions. These problems often relate to the delicate balance between, on the one hand, the interests of various groups whose activities either focus on cultural remains or are carried out in the immediate environment of these remains, and on the other hand, the responsibility to provide heritage protection. On other occasions, the potential impact results from the natural features requiring action where the schedule and time frame are beyond the manager's control. Needless to say, underwater heritage is not immune to these realities, and it actually presents unique problems because the remains are immersed.

**Figure 1: Diver recording the plan of *in situ* remains of *Elizabeth and Mary* durring the process of site evaluation in 1995 (Marc-André Bernier)**

This can be a heavy responsibility for underwater heritage managers if they do not have guidelines to provide clear direction and ensure consistency and continuity of action. These guidelines can be policies, directives, or even legislation. No matter what form they take, they must be clear enough so that the action to be taken is not left to drift because of individual interpretation, and flexible enough so that the manager is not put in an administrative straightjacket that limits effectiveness.

The salvage excavations of the *Elizabeth and Mary* are excellent examples of matching a flexible approach with the application of professional principles and rigorous ethics in order to salvage a unique feature of North American heritage.

## The Discovery

On December 24, 1994, a sport diver in Baie-Trinité, Quebec, discovered the remains of a shipwreck recently uncovered by one of the violent storms in the St. Lawrence Estuary. The remains visible at the time of discovery included a section of wooden hull and an area of ballast stone mixed with artefacts, the variety of type and material of which were surprising. The very loose sandy bottom helped keep the objects extremely well preserved over the centuries, but its relative fluidity, along with the combined effect of waves and wind, had exposed the site to such an extent that its very survival was now threatened. At the time of discovery, the identity of the vessel shipwrecked in Baie-Trinité was unknown. Preliminary typological analyses pointed to a late 17th-century vessel, possibly English in origin.

A process to protect the site was set in motion as soon as the wreck was reported to provincial and federal authorities. Both orders of government immediately began working together on an emergency stabilization project, and a marine archaeologist was sent to try to stabilize the most fragile components of the site while gathering as much information as possible in order to confirm the identification of the wreck. The imminent freeze of part of the water covering the site called for immediate action, the top priority being to protect the remains *in situ*. Sandbags were therefore placed on the most vulnerable objects to protect them until the ice melted in the spring.

## Non-Intrusive Assessment Followed by an Excavation

The data gathered during the emergency response confirmed that the site dated back to New France. They also confirmed the precarious situation of the remains. Freshly unearthed, these remains were exposed to a new wave of deterioration following a period of clear stabilization. It must be understood that a shipwreck site generally experiences various cycles of stability and instability. Following a period of accelerated deterioration that occurs when the vessel settles on the

sea floor, the site reaches a level of stability that varies depending on the environment. The equilibrium of the site, although considered fragile, is usually relatively stable. If the site's equilibrium is disrupted, either by a change in the site's natural environment (storm, diverging currents, radical temperature changes, ice) or by direct human intervention, a new cycle of rapid deterioration may occur, and part or all of the remains may be lost.

We often hear the argument emphasizing the vulnerability of underwater sites because they are located in a humid environment that is too often described as hostile. When there is a significant change in an underwater site's state of equilibrium, the usual reaction is to hurry to remove the objects that are threatened. Sound management of underwater heritage and, as in the case cited as an example, public funds force us to avoid acting hastily through a knee-jerk reaction to immediately remove objects from their environment. It is possible, even recommended, to wait as long as possible before deciding to go ahead with the excavation. Obviously there are some extreme situations that require immediate action, but experience has shown that it is a good idea to take the time available to adopt *in situ* preservation as the preferred first option as recommended in the UNESCO Convention on the Protection of Underwater Cultural Heritage. The case of the Baie-Trinité shipwreck is an excellent example of this.

The few months of winter that sealed the Baie-Trinité site under a sheet of ice gave the various stakeholders an opportunity to develop a strategy for an operation in spring 1995. At this time, everything indicated that the ship was from the fleet of Sir William Phips, who attacked the capital of New France, Quebec City, in 1690. After his failed attack on the city, Phips had to resign himself to returning to Boston. On the return voyage, four of his 32 ships were wrecked and dozens of his militiamen perished. There was no question about the site's potential significance, as Phips' siege was a pivotal event in the history of New France and North America.

Despite the obvious significance of the site, both in terms of historical and popular importance and the research opportunities it afforded, the Quebec Ministère de la Culture et des Communications [Department of Culture and Communications] and Parks Canada's Underwater Archaeology Service used a non-intrusive approach to preserve the site *in situ*. A non-intrusive approach means limiting the impact on the site as much as possible, without disturbing structures that are still intact. In other words, no excavations. There were a number of reasons for using this approach in our example.

First, we had to confirm the feasibility of protecting the site *in situ*. Since the ideal solution would be to protect the remains *in situ*, it was important to understand the site and its environment in order to determine to what extent we could mitigate the new dynamics acting on the shipwreck. To do this, minimal recording of the site was necessary to understand its scope and the nature of its components. In addition to learning about the remains, there was a need to gather as much data as possible about the site's environmental conditions: temperature, variations in depth, currents, salt content of the water, etc. An attempt to rebury the wreckage was even planned at the end of the operation in order to determine whether it was possible to provide *in situ* protection.

Another objective was to gather as much information as possible in order to corroborate the identification of a ship from Phips' fleet. Although everything pointed in that direction, this hypothesis was not confirmed. There was a second practical application to the site recording since it provided a basis for this data collection.

Third, although the primary objective was *in situ* preservation, it was important to gather information that would be useful for future excavations. Should it prove impossible to stabilize the site, emergency excavation would be initiated. Any information to help plan and optimize the archaeological

**Figure 2: The wreck of the *Elizabeth and Mary*, at Baie-Trinité in Québec, at the moment of its discovery in January 1995 (Marc-André Bernier)**

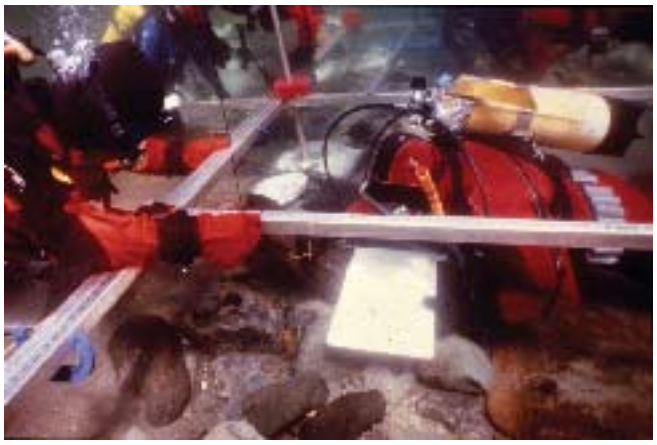

**Figure 3: Emergency archaeological excavations, with the aid of squaring; the digs occurred over two season, in 1996 and in 1997 (Marc-André Bernier)**

excavation work then became critical: extent of the site, types of artefacts, potential need of conservation, soundness of the ship's wooden structure, etc.

A three week operation with these three objectives was launched as soon as spring arrived, with an additional mandate to involve the community in order to encourage its members to take responsibility for the shipwreck's protection. Around twenty local sport divers received basic training in the Introduction to Marine Archaeology course by the Nautical Archaeology Society (NAS), a course endorsed internationally by the International Committee on the Underwater Cultural Heritage (ICUCH). Working under the supervision of a certified marine archaeologist, they took turns gathering data underwater. These divers, whose activities have in the past occasionally had a negative impact on shipwrecks due to a lack of awareness of the importance of protecting shipwrecks, have now become major players and advocates in the quest to protect underwater heritage.

At the end of the project, a map of the visible remains was produced, the diagnostic data about the various artefacts was compiled, and a rough evaluation of the scope of the buried remains was conducted. An effort was then made to stabilize the site. First, the divers brought up unburied objects considered to be very vulnerable, after having documented their origins in detail. The divers then carefully re-covered the site with geotextiles and sandbags.

In concert with this reburial, a regular site inspection program was developed to monitor the conditions of the site mound in order to be able to act immediately if necessary. Having a group of trained local divers paid off in a number of ways. Without these divers, visits to the site would have been much fewer and farther between. On one occasion, when a new part of the site was exposed by another storm, the divers were able to salvage a porringer with a crest on it, which was a key in positively identifying the shipwreck as one of the ships from Phips' fleet. At this point, we should emphasize the importance of not stripping shipwrecks of their artefacts, even if they may seem void of information. A single object can be the missing piece in the puzzle of a shipwreck.

The information gathered during the non intrusive work and the inspection visits made it possible to conclude with certainty that the site was unlikely to be covered by ice again and provided assurance that no parts of the shipwreck were in danger. Some of the tarps had moved during the fall storms, and a new section of the site had been exposed. During this time, the collected data was used to confirm that this was indeed a ship from Phips' fleet.

In view of these findings, the decision to be made by the authorities responsible for managing the site was easy. Although there did not appear to be resources available for an emergency excavation, the decision to do everything possible to salvage these remains was inevitable. It had been proven that this shipwreck was unique and priceless in terms of historical and archaeological value, and the attempt to preserve the site *in situ* had shown that this was not an option. Emergency excavations would have to be carried out.

Over the next two summers, a team of professionals and volunteers carried out archaeological excavations (Fig. 5), which uncovered one of the most interesting sites from the New France era. We now know that the ship was the *Elizabeth and Mary*, a 45 tun merchant vessel built in New England carrying some 50 men, all of whom came from the small town of Dorchester near Boston. But we finally know for certain that the details of their story would have been lost if the site had not been excavated.

## Conclusion

The Baie-Trinité approach to delay emergency excavations for as long as possible was certainly not the only option, and clearly there would have been ample justification for initiating these emergency excavations the first year. However, the selected approach is consistent with a broader policy that favours *in situ* preservation as a first option whenever possible. This approach was therefore not exceptional, but rather part of an organizational philosophy and, accordingly, it had to be applied this way to ensure consistency in the entire action plan to prevent the process from being derailed. The same approach was recently used in 2004/2005 in the discovery of a fourth 16th-century Basque whaling ship in Red Bay, Labrador. This shipwreck is one of three very rare underwater sites from this century in North America, and its state of preservation is only comparable to the other Basque shipwrecks found in the incredible archaeological field of Red Bay. This time, the non-intrusive assessment conducted by Parks Canada established that the site could be protected *in situ*, which is what was done. This did not, however, exclude the collection of scientific data using some test excavations that only had a small impact on a very small percentage of the entire site. These types of decisions may seem difficult for heritage managers, but a consistent and systematic approach guided by professional principles and clear ethics may make the decisions easier, if not obvious. An underwater archaeological excavation uses considerable resources, so we must be well informed if we want to invest these resources in the right place.

# Japanese Midget Sub at Pearl Harbor: Collaborative Maritime Heritage Preservation

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*The views expressed in this article are the personal opinions of the author and do not necessarily represent the official positions of the US government, the National Oceanic and Atmospheric Administration — NOAA, or the Department of Commerce*

## History

On December 7th, 1941, the surprise attack on Pearl Harbor immediately involved the United States in the war against Japan in the Pacific. This was a watershed moment and today it would be difficult to overestimate the importance of this single event on local, regional, national and international history. Some may not realize, though, that in addition to naval aviation, the operation included the deployment by the Japanese Imperial Navy of five two-man midget submarines, known in code as *ko-hyoteki* or "A-targets." These advanced secret weapons, developed in the 1930's, were to make their way into Pearl Harbor and launch their torpedoes. One of the five submarines in this special attack unit inadvertently initiated armed response from the US forces more than an hour before the arrival of the Japanese aircraft squadrons. A small submarine was spotted outside the harbor attempting to enter the channel behind an incoming tug and barge. At 6:40 AM a PBY flying boat on morning patrol and the World War I-era destroyer *USS Ward* commenced the attack. One shot from the *Ward*'s #3 gun appeared to strike the conning tower of the sub, which then submerged amidst exploding depth charges, not to be seen again. Though this contact failed to sufficiently alarm those in command at the time, this was the first combat action of the events of that fateful day, the first shot of the war in the Pacific.

## The Site

The air attack inflicted a tremendous amount of damage, but had a submarine really been sunk before the bombing started? The search to confirm the reported contact began in the early 1980s with a collaborative National Park Service/US Navy operation called Seamark. Throughout the last two decades of the 20th-century there followed a number of subsequent attempts by a variety of projects to locate the site in the deep water area outside the entrance to Pearl Harbor. It was not until 2002, though, that the Hawaii Undersea Research Lab (or HURL, part of the National Oceanic and Atmospheric Administration's National Undersea Research Center at the University of Hawaii) finally came across the 24 meter long midget sub, sitting intact and upright on the sea floor in over 400 meters of water, a 10 centimeter shell hole at the starboard base of the conning tower corresponding to the *USS Ward*'s action report. The site is of considerable historic significance, and also a war grave due appropriate treatment and respect. It is one of a very few physical artifacts from the momentous attack still in its original context. But what actions are needed to preserve the site? What are the threats?

## Evolving Site Management

In September of 2002 the National Oceanic and Atmospheric Administration (NOAA), HURL, and the National Park Service (NPS) met to define goals and begin the formulation of a project design. Clearly this heritage resource deserved proper preservation management, but how and by whom? Immediate threats to the site were identified: dumping of waste or disposal of dredged material, entanglement from fishing activities, looting and salvage, potential explosion of munitions, and damage from anchoring. The natural environment posed preservation threats as well in terms of both corrosion and seafloor instability. Currents on the bottom had scoured sediments from beneath both the bow and stern, setting the sub's 46 ton displacement firmly amidships on harder substrate.

NOAA and the NPS agreed to work closely together and with HURL and the University of Hawaii in the pursuit of long term preservation management. NOAA's programs (National Marine Sanctuary Program and its Maritime Heritage Program, Office of Ocean Exploration) have the capacity for deep sea research and heritage management, and the NPS' Submerged Resources Center has long experience in maritime archaeology and steel warship preservation (Pearl Harbor and *USS Arizona*). Importantly, both management agencies agreed on a precautionary approach, seeking to gather appropriate data with minimal interference to the site for achieving long term preservation goals, in accordance with the National Historic Preservation Act, the National Environmental Policy Act and other applicable laws and policies. UNESCO's Convention on Underwater Cultural Heritage annex rule #1 *in situ* preservation (and Rule #3 as well as others), along with established protocol for war grave sites, guided the creation of the project design from the very beginning. Both the US Naval Historical Center (Underwater Archaeology Branch) and the Navy's Office of Naval Research have also become involved as active partners in the joint preservation project.

**Science Mission:**

To gather appropriate data for long term preservation and site management.

**Preservation Mission:**

To protect and preserve the Japanese midget sub site as a significant maritime heritage resource and war grave for the benefit of present and future generations.

The project design received critical attention, but who ultimately had jurisdiction over the site? Soon after the discovery, contacts were made with both the US Department

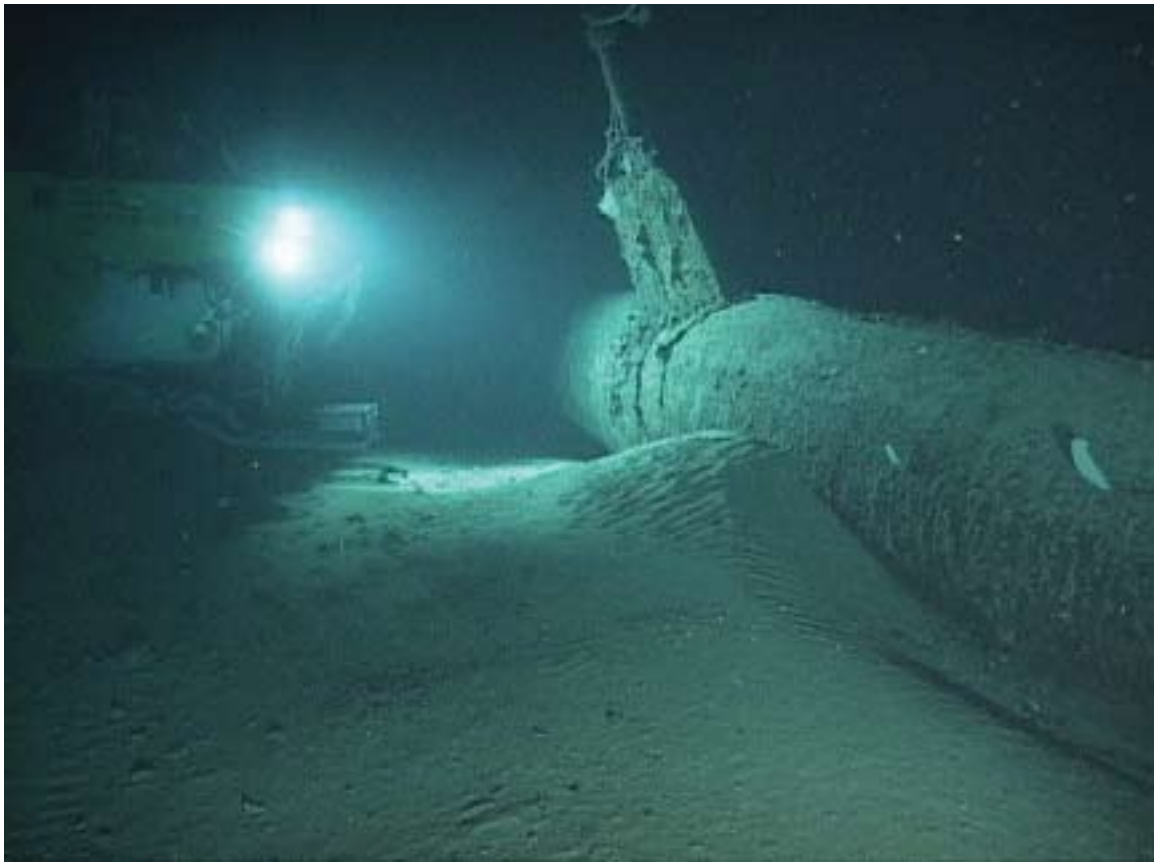

**Figure 1: Portside of midget sub and HURL research submersible *Pisces V* (image HURL 2002)**

**Figure 2: Torpedoes at bow and current scour beneath the forward section (image HURL 2002)**

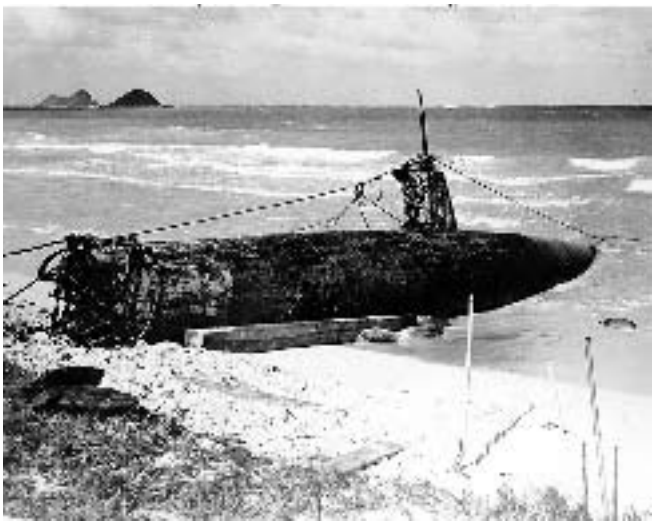

**Figure 3: Sakamaki's midget sub *HA-19* ashore on Oahu, December 8th, 1941 (official U.S. Navy photograph)**

of State and the Government of Japan. On February 12th, 2004, the Government of Japan and the US exchanged diplomatic notes agreeing that: the US owned and controlled the midget sub; the site should be respected as a war grave as well as an historic resource; it should be protected and managed in accordance with international law, US historic preservation laws, and the US Policy for the protection of Sunken Warships (January 19th, 2001); and that under the maritime law of salvage the US, as the owner, is exercising its right to preserve its property where it has been discovered, and provides notice that it should not be salvaged or disturbed in any manner without the express authorization of the owner.

## Current Status

Research missions to the site have been conducted opportunistically from 2002-2005. (HURL conducts pre-season check-out dives in the vicinity.) These dives focused on retrieving environmental parameters (salinity, dissolved oxygen, pH, temperature etc.), video survey footage, limited sediment and corrosion samples, and measurements of corrosion potential (Ecorr) at selected positions along the hull. The midget sub rests on the seafloor with a slight list to port. An even layer of concretion including rusticles covers the exposed areas of the hull. Both Type-97 (mini) torpedoes are loaded in the forward tubes. The shell hole on the conning tower is the only visible entry point on the submarine, and there is no evidence of explosion or major depth charge damage. A limited interior visual survey (via the shell hole) revealed considerable sedimentation, as well as marine life (sponges and crab). Marine life growing on the underside of the sub suggests that the current scouring at the bow and stern is not a new process, but may reflect a relatively stable seafloor profile.

The NPS' Submerged Resources Center, in partnership with researchers at Michigan State University, University of Nebraska-Lincoln, University of New Mexico, and Eglin Air Force Base, has been developing a low impact model for the measurement of steel hull corrosion rates. The Japanese sub offers an excellent opportunity to test this model in a deep water environment. Preliminary results suggest a corrosion rate of 0.5 mil per year, equivalent to a metal thickness loss of 0.9mm over a 60 year period (original hull material 8mm cold rolled MS44 steel plate). It must be emphasized that these data are approximations, and the corrosion investigation represents ongoing work.

There are still a number of issues to be resolved regarding this site. Which of the five subs is this? (Only one, Kazuo Sakamaki's *HA-19* now on display at the Museum of the Pacific War in Fredericksburg, Texas, has been positively identified.) What are the oxygen and pH levels in the interior? What are the stresses on structural integrity, and how dynamic are the sea floor processes scouring the supporting sediments beneath the sub? As a heritage resource, how can the site be "accessed" by the public, and what is the best venue for sharing information from such deep water wreck sites? The site's association with the Pearl Harbor National Historic Landmark warrants its inclusion and nomination to the National Register. NOAA and NPS are addressing these specific maritime heritage issues in the Pacific.

On the management side, what type of protection is most suited for this site? Since the sub's discovery, the Sunken Military Craft Act now helps to define management of naval vessels, but this leads to an interesting situation. The Japanese midget sub is no longer a foreign military vessel, nor is it a US warship, but it is property owned by the United States. NOAA, NPS and the US Navy, along with the US Department of Justice and the State Department, are currently working together to better define these management and site protection issues. The Japanese midget sub preservation project continues to be a work of collaboration commemorating one of the major events of the 20th-century.

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# The In Situ Protection of a 17th-Century Trading Vessel in the Netherlands

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## Introduction

The *in situ* protection of archaeological objects has become an important issue over the years, above, as well as underwater. The reason for protecting underwater sites is partly the large amount of archaeologically interesting shipwrecks and partly because of the growing notion of protecting a representative part of our maritime heritage for future generations. Article 1 of the ICOMOS-charter of 1996 as well as Article 1 of the UNESCO Convention on the Protection of Maritime Heritage of 2001 put emphasis on the fact that protection *in situ* should be the first option.

But if this is going to be the standard procedure, what does it mean? When can or do we want to protect shipwrecks underwater? From what are we protecting them? For how long can we protect a shipwreck? These are the questions that we have to answer ourselves.

The Netherlands have a relatively long tradition of *in situ* preservation of maritime archaeological sites. It started with some shipwrecks found within reclaimed land on the former Zuiderzee-bed in the Flevopolders in the 1980s. Here, more than 30 wrecks are protected against the lowering of the groundwater table. In 1988 the BZN 3 wreck, a ship of the East India Company (VOC) located in the Wadden Sea, was the first wreck under water to be physically protected as well as protected by law. This *in situ* protection consisted of covering the site with 6000 sandbags and polypropylene nets. Throughout the years this method has been simplified and now only the nets remain.

The Netherlands Institute for Ship and Underwater Archaeology (NISA) and the National Service for Archaeological Heritage (ROB) have been involved in several EU-projects, focussing on the degradation and the protection of archaeological and historical heritage *in situ*. Information about what is threatening our heritage was collected in a systematic way. The protection methods in use were evaluated and new solutions were developed. In one of these projects, the MoSS project, the currently used method has been evaluated. This evaluation took place on the Burgzand Noord 10 wreck (BZN 10 Wreck).

## The In Situ Protection of the BZN 10-wreck

The BZN 10 wreck is that of a 17th-century merchant ship loaded with a cargo of Spanish (so-called) olive jars, well-preserved oak casks with grapes and small fish and pine wood boxes with schist slates in different shapes. It was found in an area in the Wadden Sea that is known as the Texel Roads. Here ships were protected from the dominant winds coming from the West and Northwest while they were waiting to be loaded or unloaded or waiting to sail out. The amount of shipwrecks found in this area illustrates that it was not always that safe. Many of these shipwrecks are still in an excellent condition. This can be explained by the fact that when ships wrecked in this area, they quickly disappeared into the soft seabed and were covered up by the sediment that created an anaerobic environment where even organic objects are preserved very well. There is however a threat to them!

The BZN 10 wreck lies within a tidal range of 6 to 9 meters. The Wadden Sea is an unstable environment by nature. Due to ever-changing sandbanks and gullies, sites that are protected by a thick layer of sand can be exposed within a few centuries, decades or even a few years. Then wrecks are liable to abrasion and scouring. The Burgzand area in particular is eroding very heavily. The "Afsluitdijk," a 30 km long dike closing off the former Zuyder Sea that was built between 1927 and 1932 is the cause of this. This large structure prevents the water coming from the North Sea to flow into the former Suyder Sea. The water now has to find another way. This causes erosion of the seabed. It is estimated that in the following decennia the seabed will lower at least two meters more. If no action is taken, many shipwrecks in this area will be completely lost.

When a wreck is sticking out of the seabed, it is liable to many degrading processes. Besides abrasion and scouring, one of the biggest threats is attack by woodborers like the Teredo navalis. This shipworm can destroy wood within a few months, leaving nothing but hollowed-out planks and frames that can easily be destroyed by the currents.

Another big threat is the fishing industry. The Wadden Sea is extensively used as a fishing ground. Wreck parts that are sticking out of the seabed are caught in nets and break off.

## A Legal Protection

If a wreck site is older than 50 years, of historical or archaeological significance and lying in Dutch National waters, then the Dutch Monument Law of 1988 protects it. This means that there is an obligation to report and that excavation can only be carried out with a licence. Besides that, the Dutch government committed itself politically to the operational rules of the Underwater Cultural Heritage (Annex to the UNESCO Convention on the Protection of the Underwater Cultural Heritage, Paris 2001).

The Burgzand Area, in which the BZN 10 wreck is found, is part of the Wadden Sea. This area is listed on the *Tentative List* for the World Heritage Convention. When this area becomes a World Heritage Site, its value for common maritime heritage will be even better ensured.

This legal protection is important, but will there be something left to protect if mechanical and biological deterioration

**Figure 1: Site plan of the BZN 10 wreck. Only structure and objects above the seabed are mapped during a non-intrusive assessment (Drawing M. Manders)**

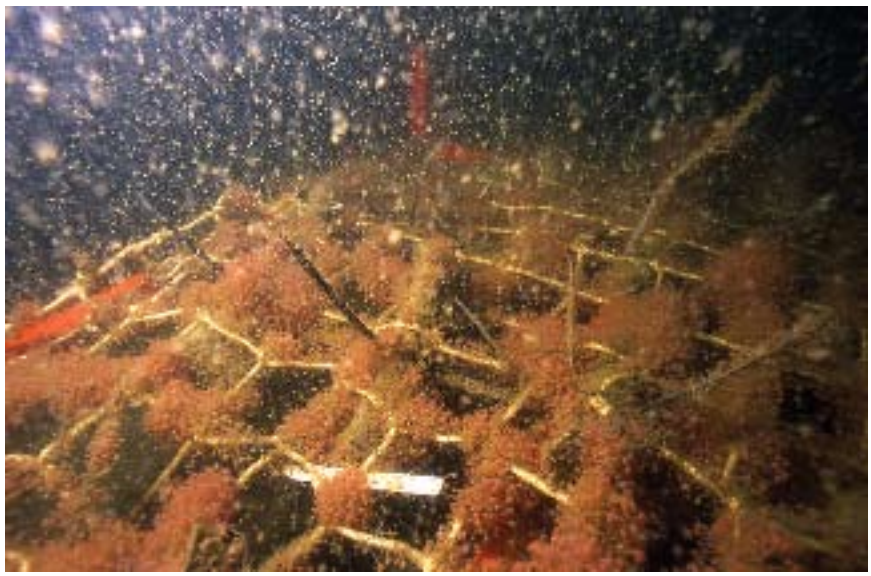

**Figure 2: Fresh pine and oak woodblocks are hanging freely in the water within an open weave net. These samples help us to understand which processes are responsible for the deterioration of shipwrecks that are lying uncovered on the seabed (R. Obst)**

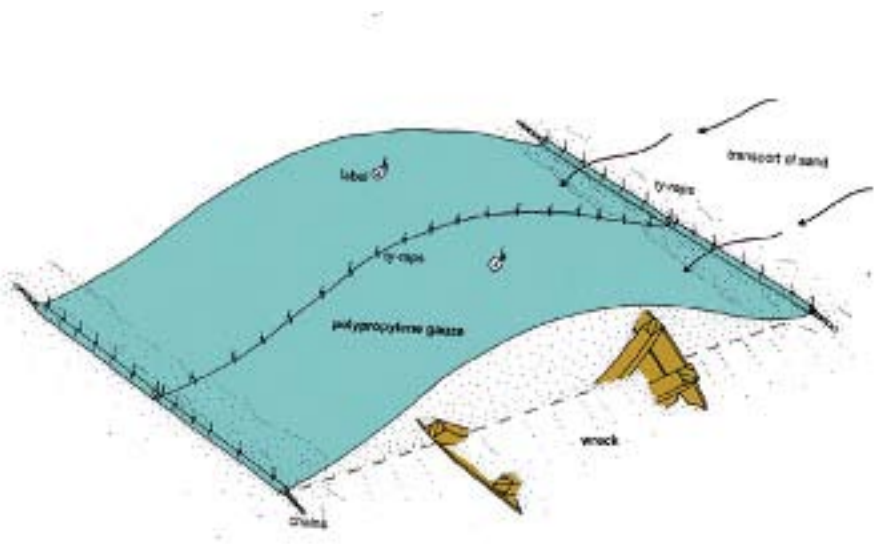


**Figure 3: The method of physical protection used on several sites in the Wadden Sea. Sand that is moved over the seabed by the currents penetrates the holes of the net and settles on the site. Within a few weeks, the whole site is covered again with a thick layer of sediment (Drawing M. Manders/M. Kosian)**

**Figure 4: A Spanish olive jar with basket, within a few hours the basket disappeared due to the strong currents on the site (NISA)**

processes is rapid? The protection of a site should be a combination of a legal and, if necessary, a physical protection.

## A Physical Protection

The BZN 10 wreck has been physically protected to ensure its value for maritime history for the coming years. The whole site (and more), approximately 4,000 square metres, is covered with polypropylene nets (50% density). These nets are placed loosely on the wreck site to capture the sand that is moved across the seabed by the tidal currents to create an artificial mount in which the wreck is kept in an anaerobic environment. This mount stops abrasion, scouring and attack by woodborers. Because the mount is sloping, fishing nets do not get caught on parts of the wreck.

## Monitoring the Site and the Area

The whole site is protected physically and legally. Since 2002 the area has also been extensively monitored on the effects of this *in situ* protection. Firstly, a data logger has been installed to monitor changes in the environment of the wreck (temperature, dissolved oxygen, conductivity, salinity, Redox-potential in the sediment, pH, sedimentation, depth and turbidity). Also, samples of pine and oak wood have been placed on the site in aerobic as well as anaerobic conditions to measure the rate and speed of deterioration of wood on the site. The aerobic condition can be compared with a shipwreck that is lying exposed on the seabed, while the anaerobic condition stands for a shipwreck that is buried under a layer of sediment. In fact, these samples were also covered with polypropylene nets to make the results comparable with the protected wrecksite. The effects of the physical protection are monitored every year with multi-beam sonar. This method, mapping the seafloor using sound waves to measure the depth, has proved to be very effective in getting an overview of sedimentation and of the erosion processes on and around the site. The multibeam images show us that the protection with nets works very well. It catches and keeps the sediment on the site while outside of the protected area the erosion of the seabed goes on. For the coming years, the 4000 square metres of protection will be enough. However, eventually there will be an end to this protection. At that time there will be a need for an excavation plan, people and money to safeguard the valuable archaeological information of the site.

## Conclusion

The Netherlands has a long tradition of *in situ* preservation of maritime objects; since the early 1980s detected shipwrecks on reclaimed land are protected against the lowering of the groundwater table. In 1988 the first wreck under water was physically protected against looting and erosion processes. Now, almost twenty years later, our knowledge has improved, and *in situ* protection has become almost standard procedure. The procedures and techniques we use are evaluated through research, some of it imbedded in large international projects like MoSS and Bacpoles. It shows that we are on the right track. Our protection method, using polypropylene nets, proves to be very successful, as well as our monitoring strategy using multibeam sonar. These two tools give us the possibility to manage our heritage in an effective way.

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# Orio IV: The Archaeological Investigation of an Ore Carrier (patache venaquero) from the 16th - Century

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*Spain*

Gipuzkoa is a Historic Territory of the Basque Country and the Oria is its longest and largest river. Its source lies in the eastern part of Gipuzkoa bordering on Navarra which in turn is the divide between the Cantabrian and Mediterranean slopes; it ends at the fishing port of Orio.

This river was navigable up to the shipyards of Aginaga, six km upstream from its mouth. Over time, a good number of ironworks and shipyards were established along its path and its tributaries, as the ships built on the estuary were able to navigate it, and it allowed the inland transport of iron ore, predominantly from Bizkaia, and the exportation of manufactured iron to the most important ports of the coast.

Throughout history, the biggest problem in navigating this river has been the moving shallow sandbank at its mouth. During storms it is practically insuperable, leading to a high number of shipwrecks occurring even up to today.

## The Finds

During dredging of the estuary of the Oria in 1991, remains of a wooden boat were found on the riverbed. Learning of this find through personal communication with the diver working on the river clearing, it was clear that in order to continue with the dredging, the discovered wreck would have to be destroyed. In view of these circumstances, the author developed an emergency excavation and recovery project with the financial support and authorization of the Regional Council of Gipuzkoa for this find, which was named the *Orio I*.

The emergency excavations were carried out simultaneously to the dredging, as the dredging company refused to halt their work during the archaeological interventions, for purely economic reasons. This meant that the dredger continued its work from the surface whilst the archaeologists investigated the riverbed below without maintaining any safety buffer zone between the two activities.

During the excavation, a second wreck named the *Orio II*, dating from the beginnings of the 16th-century, was located. It too was at great risk of destruction by the dredging, and therefore its investigation and recovery also became necessary before further dredging took place.

As a result, the following year, the *Orio II* was excavated under identical circumstances, which is to say by the same team of archaeologists, with the authorisation and backing of the Regional council and simultaneous to the dredging of the river. During this excavation, the presence of yet another wreck was noted, the *Orio IV*. However, as it was located outside the dredging perimeter and its physical integrity was therefore not endangered by the works, it was considered preferable to preserve it *in situ*.

A year after the excavation of the *Orio II*, during the periodic monitoring carried out by the Society for Underwater Investigation (INSUB) of the commercial sand dredging project in the Oria river, a shipment of iron ingots dating from between the mid 15th- to mid 16th-centuries was found, probably manufactured in one of the area's ironworks. In the excavations that were carried out, no further ship remains were found associated with this cargo.

## Legislation

According to the Basque Cultural Heritage Law, archaeological remains can be protected under three different legal regimes: declared sites, inventoried sites, and areas of potential archaeological interest.

In all three cases, in order for an archaeological intervention to occur, the proposing entity must solicit authorization from the Department of Culture of the Regional Council of the historic area concerned on the basis of plans for the archaeological project.

The estuary of the Oria, where the above-mentioned works were carried out, does not benefit from legal protection in matters of archaeology, despite the fact that five wrecks have been discovered there since 1992 and that it constitutes a historically important navigable route.

## Impact and Archaeology

In 2000, the Basque Government's Department of Public Works and Transportation, promoter of the dredging works, drew up a project for the construction of a fishing port on the left bank of the Oria. Due to the absence of archaeological protection, an archaeological survey was not included in the project. The Regional Council of Gipuzkoa, aware both

**Figure 1: View of the point where the metallic bulkhead of the pier cuts the structure of the boat without damaging the rest of the architecture**

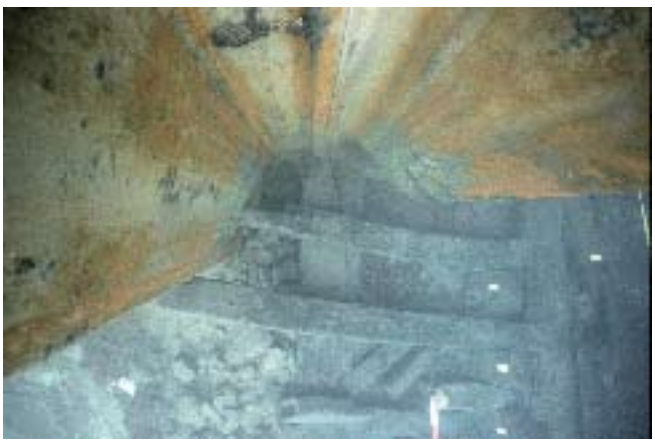

**Figure 2: Given that the stern is located closer to the center of the river, it was more exposed to fluvial abrasion than the rest of the wreck and consequently was further damaged; the stern was, however, significant enough to be able to clarify the typology and chronology of the wreck**

of the scope of the proposed works and of the underwater archaeological record in the area, alerted the promoting department of the Basque Government with regards to the necessity of developing an archaeological component.

It was estimated that the archaeological impact created by the proposed works would include the total destruction of the *Orio IV* wreck discovered in 1992. The archaeological project drawn up by the author proposed the investigation of the site, its complete salvage and its subsequent conservation. In this respect, it is worth noting that the philosophy followed by the author in all archaeological projects he has so far proposed is the preservation of wrecks *in situ* and to proceed to their excavation only to avoid the destruction of the archaeological remains, or when it is the only means available to uncover a significant body of knowledge.

After ten days of survey work through dredging, with no signs of the wreck, the company considered the locating efforts over and thus the archaeological investigation was closed.

However, once all of the infrastructure works for the port were complete and eight months after the archaeological survey had been terminated, the excavating equipment brought up the first pieces of the wreck, twenty meters beyond the limits of the previous survey area.

From this moment on, the archaeological excavation was initiated as previously projected, this time with no interferences by other works.

## Sequence of the Work

Once the archaeological excavation begun and during the first three days, work focused on the removal of extra material foreign to the wreck. As and when the first pieces of the naval architecture emerged from the sandy riverbed, they were labelled to anticipate any possible displacement by the water currents.

The entire interior of the boat was covered with iron ore deposits. These were bagged in m3 sacs and raised to the surface, together with the remains of the wreck's structure, for transport to the desalination reservoir. For this purpose, the 18th-century fluvial reservoir of the Agorregi ironworks was used, today restored and in activity, situated some eight km away. This location is possibly the same ironworks to which the minerals were destined in the 16th-century before the boat capsized.

It has to be emphasised that the area excavated corresponds approximately to only two-thirds of the entire site, since the rest was cut vertically by the exterior metal bulkhead of the new pier construction under which the remaining one-third of the boat remains.

As with previous wrecks, during the final stages of the construction of the pier, the same excavation equipment brought up the remains of a new wreck, named the *Orio V*, composed mainly of bar stocks and other basic derivatives of iron ingots, giving an indication of the archaeological potential of the area. This new wreck lies intact on the riverbed and the Basque Government refuses to initiate any archaeological investigation prior to the continuing dredging of the river. Once again, their preservation will depend on a private initiative.

## Description of the Wreck

The fundamental characteristics of the *Orio IV* are similar to the other two boats found in 1992 in the same estuary, representing Renaissance ore carriers.

*Orio IV* was a coastal transport employed in the transportation of ore along the coast. Its maximum length from the sternpost to the actual exterior bulkhead of the newly constructed pier – that is to say the boat's visible area – is 7.40 m. Its maximum existing width, which corresponds to the area closest to the bulkhead, is approximately 5m.

It is a wooden boat constructed using a floor-futtocks system, with a hull strakes 3 cm thick and an interior lining using loose ceiling planks of oak that cover a space slightly larger than the space covered by the morticed frames.

The keel is sculpted such that in section, it exhibits a T-shaped cross section amidships, tending to a V-shape towards either extremity. This makes for a better attachment of the respective garboard strakes.

The only mast step that has survived is represented by a mortice cut into the keelson amidships. In the same area there was once a mast of which we have no trace. This does not mean that the boat could not have had another mast set on a possible floating mast step, of which we have no trace either.

The stern is flat and its sternpost is joined to the keel with two iron bolts.

The vessel's cargo consists of iron ore, mainly goethite, with a purity of 75%, while the rest is limonite and other minerals. The estimated load of ore, taking into consideration the quantity extracted from the ship and its surroundings, and setting aside the quantity that theoretically must remain

buried under the pier, can be calculated as between 30,000 and 33,000 kg, which is between 600 and 660 hundredweights. This tonnage is within the maximum carrying load typical for this type of ore carrier in the port of Muskiz, which is hypothetically the point of origin of the ore.

## Movable Archaeological Material

Among the few remains found in the wreck, it is worth emphasizing:

- Ceramic shards from three different ceramic vessels. One of the types is glazed green, possibly from Saintonge, France. Another type corresponds to the clear ceramic with caramel glaze, and the third group of fragments belongs to a piece of earthenware, also of foreign origin
- Two fragments of the same rope
- Pine tar pitch in mass
- Caulking between strakes with vegetable remains, possibly hemp
- Leather footwear: This has been investigated in the laboratories of Parks Canada by Stephen Davis. A clear relationship has been found to the shoe from the excavations of Red Bay, dated to 1560 and 1570

## References to the San Juan

Regarding the architecture of the boat, we can point towards very interesting analogies to the Basque whaleboat *San Juan*, sunk in 1565 and investigated and excavated by Parks Canada in Red Bay, Labrador, Canada, as well as to the three other large whaling vessels found in the same bay since 1980. The two fundamental reasons for this relationship are:

These are both vessels built in the Basque Country at around the same time. Although the lengths and uses of these ships are different, the conceptual essence of design and the traditional building method define and base the different manifestations of a unique vernacular architecture, such as:

- The union between floor and futtock by means of a mortice-and-tenon dovetail joint
- The outermost ceiling plank on either side being notched out to receive filler planks set between neighbouring frames, the purpose of which was to discourage water and debris from entering the bilge
- A sculpted keel of varying cross sections

The data that can be provided by the *Orio IV* make it a precious scientific complement for the investigations into 16th-century Basque naval architecture being carried out in Canada, as the naval typology of the ships found in the Orio does not exist in Canada. Moreover, the scant equipment found in these boats provides valuable comparative archaeological material for the Canadian investigation, as for example the footwear mentioned above, so far the only example found in the Basque Country.

## Conclusion

This paper addresses the emergency safeguarding actions and investigations that took place, with both physical and administrative difficulty, of several wrecks from the 16th-century affected by works instigated by the Basque Government in a river area lacking legal protection for archaeological remains, in spite of its history and tradition as one of the most navigable fluvial ways of the Historic Territory of Gipuzkoa.

It represents the long voyage of a ship, which in 1530 transported a load of ore to be transformed into iron by the ironworks in this area of the Basque Country, to be then exported around the world. However, a mishap interrupted its journey close to the final destination and since then the ship has remained hidden like a mute witness to history.

Thanks to archaeological science its remains have been brought back to life 475 years later. Its cargo, initially consisting of ore, has now been considerably enriched with all the precious information it has yielded, the product of investigations carried out thanks to private initiative. The ship's short voyage that never came to an end has thus become an infinite course around the world.

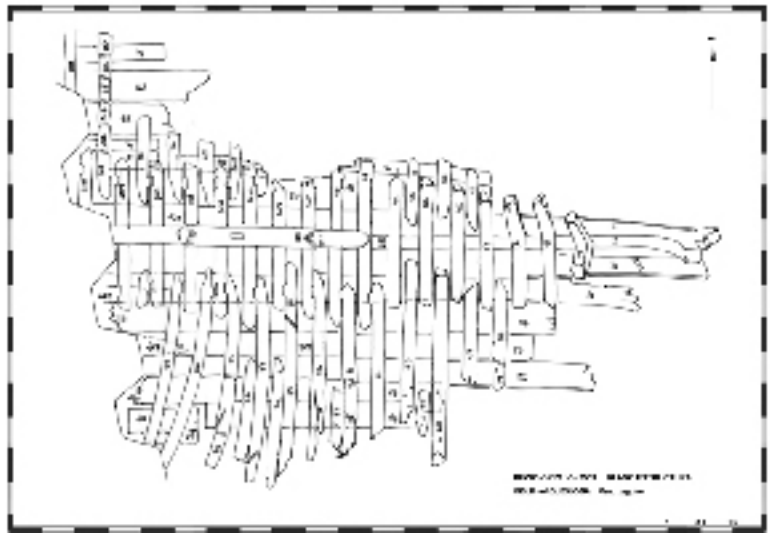

**Figure 3: Sketch of the ship without the sheathing to better view the arrangement of the structure and of the hull of the boat; to the left one can see the wall of the newly built port**

# HMS Swift: Scientific Research and Management of Underwater Cultural Heritage in Argentina

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## History and Discovery of the HSM Swift

It was 6 pm on the 13th of March 1770 when the British sloop of war *HMS Swift*, based at Port Egmont in the Malvinas/ Falkland islands, sank in the Deseado estuary, currently Santa Cruz Province in southern Argentina.

The *Swift* had an overall length of 28 meters and a beam of 8 meters and was armed with fourteen six-pounder cannons and twelve swivel guns. A few days earlier, under the command of Captain George Farmer and with a crew of nearly a hundred men, the Swift had left the British base with the purpose of conducting geographical surveys in the region. However, according to the historical documents, strong and persistent winds drove the ship towards the continental shore. The captain decided to enter the Deseado estuary, a natural and well sheltered harbor which had been visited by sailors and explorers since the 16th-century.

An unchartered rock hidden by the high tide caused the stranding and the subsequent sinking of the ship. Except for three unfortunate men, all the crew were able to reach the shore. They survived in extremely precarious conditions, subsisting by hunting and collecting local wildlife.

After some time they made a brave decision: six volunteers and one officer would row back to Port Egmont for help in one of the Swift's cutters. Unbelievably, they succeeded in the enterprise, and one month after the loss of the Swift they were rescued by HMS Favorite, another sloop of the British squadron.

**Figure 1: One of the display cases of the *HMS Swift* exhibit at the Mario Brozoski Museum in Puerto Deseado (Chris Underwood/Instituto Nacional de Antropología)**

More than two centuries later the challenge of trying to find the remains of the Swift was faced by a group of high school students from Puerto Deseado. They agreed that if the shipwreck was ever found, all its contents would be kept in the town as part of the local historical heritage.

These enterprising young men discovered the remains of the *Swift* in 1982 in an extraordinary state of preservation. A large proportion of the ship´s wooden structure was still in place and the artefacts included a wide range of items made of ceramic, porcelain, glass, wood, leather and other materials.

The site was soon declared historical heritage of the province of Santa Cruz and a new museum was created in the town of Puerto Deseado, named Mario Brozoski in honor of one of the young divers who had found the site. Since then all the artefacts recovered from the *Swift* are kept at this museum, where part of the collection is always on display.

## The Archaeological Research

The first professional archaeological interventions on the *Swift* site began in January 1998, when the underwater archaeology team of the Argentinean National Institute of Anthropology, under the direction of this author, became responsible for the scientific component of the *Swift* Project. The Mario Brozoski museum would retain its role regarding the conservation and management of the collection.

Several research themes are being addressed by our team. One of them is the way in which the archaeological remains reflect the social hierarchies within the crew. For that reason it was decided to begin the excavation at the stern of the site, where the officers´ cabins were located. Numerous pieces of Chinese porcelain, as well as other high quality glass and metal artefacts were found in this area. The team has yet to excavate in an area more likely to be associated with the lower ranks of the crew that may well reveal less prestigious material.

Another topic under study is the diet on board the *Swift*. A very interesting find which sheds light on this subject is a penguin egg, which indicates that the crew collected and consumed local resources in order to augment the supplies provided by the Royal Navy Victualling Board. Other food-related items found in the site include condiments such as pepper and mustard seeds.

We are also addressing some research lines which require the contribution of specialists in ship construction and marine biology. In the first case the main goal is to study the way this ship was built, and some differences have already been detected between the original plans of the ship dating from 1762 and the actual archaeological remains which lie on the seabed. The most significant of these is the modification of the main deck and the addition of a third mast.

The purpose of the study of the site's natural environment is to understand and monitor the impact of factors such as water

**Figure 2: Several components of a wooden piece of furniture recovered from the captain's main cabin at the *HMS Swift* site (D. Vainstub/Instituto Nacional de Antropología)**

**Figure 3: Wood fragment recovered from the *Swift* showing the severe damage caused by the action of marine borers (D. Vainstub/Instituto Nacional de Antropología)**

currents, marine biological agents and sediments. Sadly, there is clear evidence of the attack of marine wood borers in many of the timbers which are part of the ship´s structure and furniture.

Gradually the archaeological and interdisciplinary research conducted at the *Swift* is contributing to our knowledge of several aspects of this 18th-century vessel and its interaction with its surrounding environment.

The *Swift* project has also provided opportunities for training and exchange of expertise for students and professionals from a number of countries. This is an important component of the project and to date people from Argentina, Australia, Canada, Chile, Colombia, England, France, Holland, Mexico, United States of America and Uruguay have participated in the various field seasons conducted at the site since 1998.

Among these international experiences it is worth noting the involvement of British institutions and nationals in the *Swift* project illustrating one of the fundamental principles of the UNESCO convention which is to encourage collaboration between the coastal state and the state of origin of the ship. In 2001 the British Embassy in Argentina sponsored the participation of a professional conservator from the Mary Rose Trust in England in one of the field seasons conducted at the *Swift*, providing a significant input of expertise into the treatment of waterlogged wooden artefacts. The British Embassy also provided a grant which allowed the purchase of chemical products and equipment for the conservation laboratory in the Mario Brozoski Museum.

In 2003 the Nautical Archaeology Society, a UK based organization, together with the Argentinean Embassy in London jointly sponsored the participation of this author in the NAS annual conference in Portsmouth, and in the following year NAS Training organized and sponsored a field season at the *Swift* which included the participation of nine English archaeology students and avocationals supervised by a maritime archaeologist from NAS, who has subsequently become a formal member of the archaeological research team of the *HMS Swift* Project and the Underwater Archaeology Programme of the Argentinean National Institute of Anthropology.

## Threats and Challenges

Being an archaeological site which is clearly protected by law (both at a provincial and national level), the Swift is placed in a favorable position, particularly in comparison to the situation faced by most of the underwater cultural heritage in South America, which is often subject to commercial exploitation.

Nonetheless, several issues pose threats to this site. One is the constant development and growth of the nearby harbor, which either directly or indirectly has a negative impact on the wreck site. This is mainly due to the increasing construction work, environmental contamination and heavy traffic, all of which alter the delicate equilibrium of the *Swift* and its surrounding environment.

Another limitation has to do with the conservation resources. Although the project has a part time conservator employed by the Mario Brozoski Museum, the enormous potential of this site in terms of quality, quantity and diversity of archaeological materials which are present exceeds the capacity of both the human resources and the laboratory infrastructure. The progress of the archaeological excavation must therefore adjust to these limitations, and given the combination of the harbor development and the fragile condition of the ship´s timbers, we cannot help feeling that the clock is ticking.

Nevertheless, 2006 finds the *Swift* project and Argentinean underwater archaeology in general in a quite promising situation, with increasing legal, technical and financial resources assigned to them. The Argentinean National Research Council (CONICET), the Secretariat of Culture and the Municipal Government of Puerto Deseado are currently sponsoring several aspects of the *Swift* project. Other underwater archaeology projects are being sponsored by the first two institutions, and the current research being conducted on the Dutch vessel *Hoorn* also involves the collaboration with several institutions from the Netherlands.

The *Swift* project exemplifies many of the fundamental principles and spirit of the UNESCO Convention on the Protection of the Underwater Cultural Heritage. The project has a number of clearly defined goals: scientific research, training, exchange of expertise at institutional and private levels, as well the dissemination of information to the public through the museum and publications. This integrated approach has led to the *Swift* project becoming emblematic throughout the region and internationally.

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# The USS Monitor: In Situ Preservation and Recovery

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*The views expressed in this article are the personal opinions of the author and do not necessarily represent the official positions of the US government, the US Department of Commerce, or the National Oceanic and Atmospheric Administration (NOAA).*

On March 9, 1862 the ironclad warships *USS Monitor* and *CSS Virginia* (ex-*USS Merrimack*) fought to a draw at Hampton Roads, Virginia, in one of the most famous sea battles in the history of the United States. The *Monitor* sank later that year while being towed south along the Atlantic coast of the United States. *Monitor*'s remains were not discovered until 1973, lying in 230 ft. (71 m) of water off Cape Hatteras, North Carolina. Two years later, the Monitor was designated America's first National Marine Sanctuary, and is managed by the National Oceanic and Atmospheric Administration (NOAA) to prevent looting and unwanted salvage. *In situ* preservation was the primary objective of the management plan. Of course, certain artifacts were periodically recovered, conserved and curated at a museum of public access out of concern that they would be lost to strong currents or looters. During the 1990s, however, NOAA determined that the *Monitor* was fighting a losing battle against both natural and human threats. As a result, NOAA aggressively applied comprehensive planning strategies and ocean technology to the problem of preserving the *Monitor*, resulting in a multi-year recovery project and a major museum exhibition.

## History

At the time of its launching in 1862, the *USS Monitor* was a radical departure from conventional wooden broadside warships. The *Monitor*'s hull was heavily armor-plated and almost completely submerged, presenting enemy gunners a very small target. The only structures above the deck were an armored, rotating gun turret amidships and a pilot house near the bow. The gun turret could be revolved from within to train its two 11-inch Dahlgren smoothbore guns in any direction, independent of the ship's heading.

The *Monitor* was launched on January 30, 1862, early in the American Civil War, and ordered almost immediately to battle. The *Monitor* arrived in Hampton Roads, Virginia, on the evening of March 8, 1862. Earlier that day, the *CSS Virginia* (ex-*USS Merrimack*) had made her maiden voyage into Hampton Roads, sinking two Union warships and running a third aground. Early on March 9, the *Virginia* steamed back into Hampton Roads, prepared to finish off the Union fleet. The *Monitor* advanced to engage her iron counterpart, thus commencing one of the most celebrated sea battles in history. The four-hour duel ended in a draw; however, the repercussions were felt worldwide, hastening the abandonment of conventional wooden broadside warships.

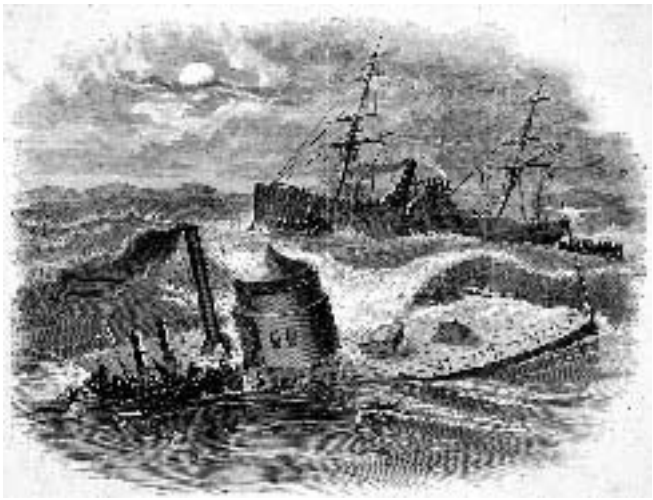

**Figure 1: The sinking of *USS Monitor*, 31 December 1862, as depicted in Harper's Weekly Magazine, January 1862 (NOAA Monitor Collection)**

Although impervious to cannon fire, the *Monitor* succumbed later that year to the power of the sea. While being towed south along the Atlantic coast, the *Monitor* foundered in a gale off Cape Hatters, North Carolina on New Years Eve, with the loss of sixteen lives.

## The Shipwreck

The *Monitor*'s remains were discovered in 1973 in an expedition led by Duke University's Marine Laboratory and funded by the US Government National Science Foundation. The wreck lies on a flat, featureless, sandy bottom in 230 ft. (71 m) of water, sixteen nautical miles SSE of Cape Hatteras Lighthouse. The *Monitor* rolled over as it sank, causing its turret to pull free and fall to the bottom, upside down. The hull then settled onto the turret. The inverted hull came to rest with the stern port quarter supported above the bottom by the displaced turret. The lower hull had collapsed forward of the midships bulkhead, and the stern armor belt and associated structure was badly deteriorated. The position of the turret under the port quarter elevated the stern and port side, producing a list to starboard and creating severe stresses on the hull. Only a small portion of the hull is buried, leaving the rest exposed to strong currents, trawl nets and the possibility of illegal salvage.

Lying near the confluence of the Labrador Current and Gulf Stream, the *Monitor* is swept by strong, opposing currents that frequently generate sudden and severe storms. The adverse weather conditions, strong currents and deep water hamper research by divers and remotely-operated instrumentation.

## Protection, Research, and Management

Almost immediately after the *Monitor*'s discovery was announced, historic preservation managers began earnestly seeking some mechanism for protecting the remains from scavenging or salvage. Because the *Monitor* lay beyond the (then) three-mile territorial sea limit, none of the conventional state or federal legislation was applicable. However, the recently enacted National Marine Sanctuaries Act of 1972 (NMSA), offered the means for preserving the *Monitor* as part of a planned national system of marine protected areas. As a result, on January 30, 1975 the *Monitor* was designated America's first National Marine Sanctuary, to be managed by the National Oceanic and Atmospheric Administration (NOAA), an agency of the U.S. Department of Commerce. The *Monitor* National Marine Sanctuary is now part of a system consisting of thirteen sanctuaries, with another, the Northwestern Hawaiian Islands, in the designation process.

The wreck of the *USS Monitor* presented NOAA with unique management issues. The *Monitor* is considered one of the most significant underwater cultural heritage sites in the United States. Listed on the National Register of Historic Places, *Monitor* also has been designated a National Historic Landmark. NOAA's *in situ* management and recovery plan is consistent with the Annex Rules to the UNESCO Convention on the Protection of the Underwater Cultural Heritage. Over the years, NOAA conducted extensive research at the sanctuary and issued permits to other researchers who added their data to the growing *Monitor* archive that is available to the public. In the early 1990s, NOAA won two legal challenges to its authority and jurisdiction to control public access to the site by permitting access only for scientific research. NOAA, however, subsequently issued permits to recreational divers to visit and photograph the wreck. Those private divers conducted research and photographic activities that contributed significantly to site documentation, especially by generating excellent still and video imagery of the wreck.

During this time NOAA began to accumulate strong evidence that the *Monitor*'s hull was undergoing major deterioration and that the disintegration process was accelerating. NOAA continued gathering data at the site but also began consulting with marine engineers and salvage experts to identify strategies for responding to the developing crisis at the sanctuary. There was a growing realization that even under an *in situ* preservation policy, it was time to consider alternative plans for more rigorous research and recovery at the wreck site.

In 1998, NOAA released a long-range, comprehensive plan for the management, stabilization, preservation, and recovery of artifacts and materials from the *Monitor*, "Charting a New Course for the *Monitor*." This comprehensive plan documents NOAA's response to the challenging problem of the *Monitor*'s deterioration, describing each major planning element in detail and addressing all aspects of management, protection and possible recovery. The US Navy's salvage contractor, Eastport International (now a division of Oceaneering International) contributed an extensive engineering analysis and trade study that provided valuable recommendations on the best methods for stabilization and recovery. After presenting and discussing numerous options, the plan recommended a six-phase program for stabilization of the *Monitor*'s hull, followed by selective recovery of significant components of the hull for long-term conservation and exhibit. The recommendations included estimated timelines and budgets for each phase, including recommended conservation facilities and personnel and anticipated sources of funding for the entire program. The advanced state of hull deterioration and the extremely high estimated cost of total recovery and conservation prevented NOAA from considering an option for recovery of the entire wreck and contents.

Soon after delivery of the comprehensive plan, NOAA was able to announce that a partnership had been formed between NOAA, the U.S. Navy, and The Mariners' Museum for implementation of the plan. The necessary funding was obtained from NOAA, the Department of Defense Legacy Resource Management Grants Program, The Mariners' Museum, and others.

During 1998 to 2002, NOAA and the US Navy carried out the six-phase plan during a series of large-scale missions to the

**Figure 2: US Navy divers videotaping the *Monitor*'s gun turret in preparation for recovery (U.S. Navy)**

**Figure 3: NOAA researchers documenting the bow of the *USS Monitor* (Doug Kesling, NOAA Monitor Collection)**

**Figure 4: The *Monitor*'s gun turret emerging from the sea, 5 August 2002 (U.S. Navy)**

sanctuary. Navy divers recovered the *Monitor*'s propeller, engine, and its famous gun turret, which still contained the guns, carriages and hundreds of other artifacts. Also discovered inside the turret were the remains of two of *Monitor*'s crew. All recovered artifacts and hull components from the *Monitor* are located at The Mariners' Museum, Newport News, Virginia, where they are undergoing conservation treatment that, for the larger objects, may require a decade or more to complete. The plans for conservation and curation are consistent with the US Federal Archaeological Program as well as the Rules annexed to the UNESCO UCH Convention.

## Current NOAA Plans for Management of Underwater Cultural Heritage

In March, 2007, the Mariners' Museum will open the *USS Monitor* Center, a major exhibition facility that will tell the *Monitor*'s story within the broader context of world politics, naval technology, and the American Civil War. The Center also contains a major conservation laboratory, where visitors will be able to learn about the conservation process while observing *Monitor* artifacts being treated.

Although NOAA would have preferred to continue to preserve and manage the *Monitor* on the seabed, close examination of the recovered hull components confirmed that recovery was the appropriate action. Many of the iron components of the *Monitor*'s engine are badly deteriorated, as are the guns and other objects. The rest of the *Monitor*'s hull and contents will remain on the seabed indefinitely, and will continue to attract researchers and divers, while the *USS Monitor* Center will permit millions of visitors to enjoy the *Monitor*.

Nationally, NOAA is placing more emphasis on the underwater cultural heritage aspects of its sanctuaries through its Maritime Heritage Program, a part of the National Marine Sanctuary Program. The Maritime Heritage Program is developing partnerships with other federal and state preservation agencies in order to more effectively protect and manage underwater culture heritage while, at the same time, providing expanded opportunities for the public to visit and enjoy that heritage. The Maritime Heritage Program also is participating in the development, for broader ocean management planning, of an inventory of cultural heritage sites that may be potential threats to the marine environment. NOAA will continue to emphasize resource protection while, at the same time, ensuring that the sanctuaries' natural and cultural heritage is accessible—not just to visitors, but to people worldwide through expanded online content, live webcasts, and other education and outreach strategies.

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# The Molasses Reef Wreck

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Named for the reef in the Turks & Caicos Islands on which it was found, the Molasses Reef wreck is thought to be the oldest shipwreck discovered in the Western Hemisphere. Complete excavation of the site produced Spanish ceramics typical of the late 15th- and early 16th-centuries as well as early-style wrought-iron, breech-loading ordnance. Most of the hull of the ship had disintegrated in the shallow, wave-swept waters of the reef, but about 2% remained trapped beneath the stone ballast. In a better state of preservation were the ship's armaments: swivel guns, cannons, shoulder arms, crossbows, swords, shot and grenades. Following cleaning, conservation and analysis in the US, the entire artifact collection was returned to the Islands where it forms the nuclear exhibit of the Turks & Caicos National Museum.

## Discovery of the Site

Like many other Caribbean shipwreck sites, the Molasses Reef wreck was discovered serendipitously by treasure-hunters rather than by archaeologists. Although fishermen from the Caicos Islands, who free-dive for conch and lobster must have passed through the site many times over the years, its flattened condition, camouflaged by nearly five centuries of marine growth prevented them from recognizing it as the remains of a shipwreck. In 1976 a pair of underwater explorers methodically searching Molasses Reef for salvageable material spotted the site and realized that it was an early shipwreck. They stayed long enough to illegally raise a few artifacts, then returned to Miami.

Four years later in 1980, under the name of "Caribbean Ventures," the men applied to the government of the Turks & Caicos, a British Crown Colony, seeking permission to prospect for and salvage shipwrecks on the Caicos Bank. When permission was granted they announced that they had found the wreck of Columbus' caravel, *Pinta*, and that they expected to make US $100,000,000 from marketing it and from mining other treasure-bearing shipwrecks they said lay nearby. The salvors' argument that the wreck was Columbus' *Pinta* was, at best, thinly supported. Not at all convinced by the Caribbean Ventures prospectus, the Governor of the Turks & Caicos invited Dr. Colin Martin of the Scottish Institute of Maritime Sciences to visit the site and offer a second opinion on its scientific significance. Dr. Martin's report urged the government to insist that an archaeologist be present during the salvage, and suggested the Texas A&M-based Institute of Nautical Archaeology. The Institute sent a two-man reconnaissance team to inspect and map the site. A year later, another band of salvors calling itself "Nomad


**Figure 1: Location of the Turks & Caicos Islands with approximate positions of late 15th- and early 16th-century shipwrecks mentioned in historical references**

Treasure Seekers" showed up claiming it had "inherited" the site from the original discoverers — who had been jailed in the US for poaching on another treasure hunter's site. The government gave Nomad permission to cruise its waters and to "look but don't touch," but forbade it to visit Molasses Reef. After a few weeks, when it became apparent that not only had Nomad been indiscriminately hauling up cannons, anchors and other artifacts from various sites at random and without permission, but also had attempted to steal artifacts from the Molasses Reef Wreck, the government had had enough of treasure hunters. It revoked the Caribbean Ventures salvage permit and invited archaeologists from the Institute to excavate the Molasses Reef wreck.

## Excavation

The reef's remote location, more than 26 km from the nearest inhabited island, meant that a sea-going vessel would be necessary to work the site. Captain Sumner Gerard made his Miami-based 33 m research vessel Morning Watch available to serve as the mother ship. Funding was solicited from the Institute's Board of Directors and a volunteer excavation team of graduate students was hastily assembled. Arriving at Molasses Reef on April 4, 1982, the archaeologists met an unpleasant surprise: a huge crater, made by explosives and enlarged by frenzied digging, occupied the center of the ballast mound. The remains of homemade pipe bombs and intentionally mutilated artifacts lay scattered across the sea bed. Fortunately, the original provenances of the most salient artifacts had been accurately mapped two years previously by the reconnaissance team. Most of the wreck lay in water less than 6 m deep, in a depression between "fingers" of the reef covering an area of some 6,000 $m^2$. A natural ship trap, Molasses Reef had captured other victims as well, and the remains of several later maritime disasters overlay parts of the site.

## Conservation and Analysis

Six months of excavation on the reef, spread over three years, produced more than ten tons of artifacts, all of which were shipped more than 4,000 km back to Texas. Texas A&M University loaned the project use of an old firehouse located on its Research Extension Annex. Over the next several years graduate students and volunteers cobbled together a conservation laboratory for the Molasses Reef Wreck artifacts, making efficient use of well-used, but still serviceable equipment acquired from the State's surplus equipment depots. Pioneering studies in ballast analysis, ordnance design and manufacture, metalography, and sclerochronology were undertaken during the artifact cleaning, documentation, conservation and analysis phase of the project, which consumed seven years.

An intensive study of the ship's ballast undertaken by geologist William R. Lamb managed to trace some of the stones from the ship to their most likely place of origin: Lisbon, Portugal. Experiments carried out by Joe J. Simmons III, discovered how the wrought-iron breech-loading artillery was constructed and how the mysterious lead-iron "composite" shot were made. Sclerochronologist Dr. Dick Dodge of Nova University attempted to date the site by counting the accumulation of annual growth rings in core samples extracted from a large *Montastraea annularis* coral head growing on top of the ballast mound, but the coral head proved to be only about 250 years old — centuries younger than the site.

The vessel's gross dimensions were revealed by combining clues provided by the scant remains of the ship's wooden hull, the distribution of ballast, and curious grooves gouged into the seabed by structures which had entirely disintegrated. It was a medium-size ship of the period — about 19 m long, 5 to 6 m wide and 2 m or slightly more in draft. Preserved portions of the hull included ceiling planking, first futtocks, and hull planking from one side of the ship at about the level of the turn of the bilge. No traces of keel, keelson, or endposts survived. The fragmentary hull remains preserved several construction features commonly found on 15th- and 16th-century Spanish ships: dovetail-joined, transversely-treenailed floors and futtocks, "fillers" closing the gaps between floors and futtocks, and the use of white oak for every major component of the hull.

The presence of two different sizes of iron hearteye straps suggests that the ship had at least three masts: square-rigged fore and main masts and at least one other mast which likely carried a lateen sail. The ship's capacity is more difficult to estimate: The stone ballast in the ship's hold was carefully calculated at 40 metric tons, to which can be added the mass of the armaments, cargo, crew and ship's stores. The "permanent" ballast (large stones placed in the bottom of the ship when it was built to trim its balance) included black limestone originating near Bristol, England, and alkali-olivine basalt similar to that found in the mid-Atlantic islands; however one of the most prevalent types of stone, high alumina basalt, appears to have originated in Lisbon, Portugal. Another prevalent type, Miocene limestone, is

**Figure 2: Mapping the locations of individual stones in the ballast mound transect profile before removing them for petrographical analysis**

**Figure 3: Surviving hull remains of the Molasses Reef Wreck *in situ***

**Figure 4: An "exploded" view of one of the swivel guns from the wreck, showing all its associated parts including swivel, swivel "saddle," breech chamber, breech wedge, projectile, and textile "gasket"**

also found in the Lisbon area. The ballast study by itself may not furnish a definitive indicator of where the ship was built or precisely which ports it visited, but it does supply incontrovertible evidence of connections with Lisbon and Bristol.

The ship was heavily armed, but most of the armaments were stored and not loaded. A surprising dearth of ceramic sherds suggests that most of the ship's provisions were carried in wooden casks and barrels. The crew's modest amenities were predominantly utilitarian: even the tableware was Spartan. No coins or other absolutely datable objects were found, but the characteristics of the artifact assemblage, particularly the pottery and firearms, indicate that the ship ran aground on Molasses Reef in the second or third decade of the 16th-century (1510-1530). Tiny glass beads may be indicators of trade with the Indians. Several sets of leg irons, some of them locked, may have been part of the ship's normal complement of disciplinary gear, or they may have been used to immobilize captives. The almost total absence of objects that might be considered personal possessions argues that the people on board survived the wreck and had sufficient time to organize its abandonment, but the fact that all the ordnance remains on the site suggests that no one ever returned to salvage the ship.

But even after analysis, the identity and mission of the ship that became the Molasses Reef wreck remain a mystery. The wreck does not appear to match any of the more than 120 European ships known to have been lost in the Americas before 1520. Early maps show that Spanish navigators knew of, and had often visited the Turks and Caicos Islands. The purpose of such voyages was to capture Lucayans, the Indians living in the Bahama and Turks & Caicos Islands when the first Europeans arrived, to work as slaves in the mines and fields of Spanish Hispaniola. It is highly probable that the ship which came to grief on Molasses Reef was engaged in this "grey market" enterprise. Departing from Santo Domingo or one of the other Spanish ports in the Greater Antilles, the ship left no record of its final voyage in Old World archives.

## Creation of the Turks & Caicos National Museum

In 1988, responsibility for completing the project passed from the Institute of Nautical Archaeology to Ships of Discovery, a small, publicly-funded non-profit research institute formed by the graduate students who had initiated and carried out the project from the beginning. Two years later, prompted by the sure knowledge that the Molasses Reef Wreck artifact collection would soon be shipped to the Islands, concerned citizens banded together to form the Turks & Caicos National Museum, a publicly-funded, non-profit trust fully sanctioned by but independent of the government, authorized to collect, preserve and exhibit objects and examples of the cultural and natural history of the Turks & Caicos Islands. A Museum trustee donated the "Guinep Lodge," one of the oldest houses on Grand Turk, to become the Museum's home.

From its new base of operations in Dallas, Ships of Discovery completed conservation and study of the artifacts and designed the exhibits which would house them in the Turks & Caicos National Museum. All the artifacts and original data resulting from the excavation were shipped to the Museum in 1990 where they now occupy the entire ground floor, and comprise the Museum's primary attraction. In spite of numerous impediments, the Molasses Reef wreck remains one of very few New World archaeological shipwreck projects actually carried through to completion.

Although scores of caravels and other types of exploratory vessels were wrecked in the Caribbean, only three have been located. Of these, the Molasses Reef Wreck is the oldest, the most complete, and the most carefully excavated. Had the excavation not been undertaken, the fate of the Molasses Reef wreck would have been the same as that of hundreds of other historic shipwrecks in Caribbean waters. Following the site's initial discovery it would have been blasted and picked apart by curiosity-seekers, collectors, and professional treasure-hunters. One by one its artifacts would have disappeared only to grace a mantlepiece or coffee table for a few months, then be forgotten and eventually discarded. Nothing would have been learned and nothing would have been preserved for the entertainment and instruction of future generations.

In contrast, when archaeological finds are properly cared for and held responsibly in the public trust, everyone wins. The Molasses Reef wreck project provided the impetus for the formation of the Turks & Caicos National Museum, which now contains exhibits on the cultural and natural history of the Islands as well. A source of both pride and revenue for people of the Islands, the Museum can also be credited with awakening a new interest in their history. This, in turn, has spun off other endeavors such as strengthening legislation protecting sites of historical and archaeological interest, recording oral histories, repatriating artifacts taken from the Islands more than a century ago, identifying and registering the oldest structures in the Islands, and the collection, conservation, and rebinding of the nation's archives.

# Strategic Options with Regards to Public Access – Awareness Raising in Portugal

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On the occasion of my participation in 1992 at the Lezioni di Archeologia Subacquea di Ustica (Underwater Archaeology Classes of Ustica), I had the opportunity to dive with Edoardo Riccardi along the Underwater Archaeological Trail of Punta Gavazzi, established in the Natural Park of this magnificent small island off the coast of Sicily. The Trail of Ustica, among the first initiatives of this kind world-wide and largely due to the creative instinct of this Italian archaeologist, consists of a circuit marked out using "Ariadne's threads" which allow the divers to visit the archaeological remains scattered along the trail and which are labelled using small plaques.

The experience was marvellous, and it immediately encouraged us to develop something similar in Portugal. Already by the following year we had set up an analogous system at the site of the wreck of the French flagship *Océan*, which sunk on 18 August 1759 off Salema beach, at a depth of around six to nine metres, west of the Algarve during the Seven Year War (Fig.1). The underwater trail of the *Océan*, which, to our knowledge, was the first of its kind established in Atlantic Europe, met with a resounding success.

The underwater trail of the *Océan* currently represents the first of three initiatives spearheaded by the Centro Nacional de Arqueologia Náutica e Subaquática (CNANS) in this field. In 2005, this trail was renewed using new signposting material, 316 stainless steel plaques screwed onto a concrete base/pedestal, with captions in Portuguese and English over a laser-engraved background image.

The two other pilot projects by the CNANS in this area are the trail of Faro A and that of the Pedro Nunes/Thermopylae. The Faro A trail concerns a non-identified ship wreck located off the Santa Maria cape, near the city of Faro, capital of the Algarve province in southern Portugal. The wreck consists of an oblong tumulus situated at twenty metres below on a sandy seabed (Fig. 2). The wreck was dated not through the large amount of iron artillery scattered around, but rather by pewter plates bearing a hallmark/stamp identified as belonging to the Edgecumbe family, from Cornwall, dating to the last quarter of the 17th-century. One of the hypotheses put forward towards its identification is that the ship was part of an Anglo-Dutch squadron, known as the "Smyrna Convoy," which was attacked by the French squadron of Admiral Tourville at the end of the century. Diving at this site was strictly forbidden until 2003, after which IPA/CNANS signed a cooperation agreement with one of the diving

**Figure 1: View of the underwater trail for the *Océan* in 1993**

**Figure 2: Side scan sonar image of the wreck of the Faro A**

schools in Faro (Hidroespaço) in view of organising guided tours. Coordinated by the CNANS, a trail around the wreck was set up and the school's instructors, who had followed introductory training in nautical archaeology organised by the CNANS on the basis of the model developed by the UK's Nautical Archaeology Society (NAS), started supervising visiting divers.

The trail of the Pedro Nunes/Thermopylae concerns the wreck of the "twin" and rival clipper of the *Cutty Sark*. This tall ship, which was considered to be the fastest in the history of the sailing fleet, was bought by the Portuguese navy at the end of the 19th-century and sunk in 1907 during a maritime festival in Cascais, in the presence of the King. Located in 2001 by side scanning sonar at a depth of 30m, the wreck is being examined by several teams of divers, coordinated by the CNANS, in view of setting up a trail that can be visited. The project is supported by the Municipality of Cascais with whom the CNANS has also signed a cooperation agreement.

Furthermore, to raise awareness among and train a wider variety of people, in particular amateur divers, the CNANS adopted the NAS philosophy and training programme, with which it also signed a cooperation agreement giving it the status of a training centre in the framework of the NAS amateur courses. This training course, adopted by several countries across all continents and a number of large international diving organisations, such as CMAS and PADI, is the continuation of a similar experiment started ten years ago by the National Archaeological Museum in Lisbon (MNA) and the non-profit cultural association Arqueonáutica (Fig. 3).

Obviously, the organisation and participation at conferences and scientific meetings, and the subsequent publication of their proceedings and catalogues, as well as the staging of exhibitions, continue to be formidable tools for dissemination, both to the wider public and to specialists. Such initiatives have always taken place in the framework of the overall underwater archaeology strategy developed by the MNA and subsequently by the CNANS, during the past twenty-five years.

With regards to the most recent exhibitions, one must mention the thematic display case created in 2002 at the Maritime Museum of Lisbon, dedicated to the site of the wreck of the *Nau da India* (a Portuguese Indiaman), Nossa *Senhora dos Mártires*, excavated by the CNANS from 1997-1998, whose results were presented in the Portuguese Pavilion during Expo'98, and which have since then been the subject of much literature. Again in 2002, the CNANS organised together with the Municipal Museum of Portimão an exhibition concerning the underwater cultural heritage of the Arade River, presented at the MNA in 2003. The majority of the information, artefacts, graphic and photographic documentation was provided by the CNANS. The other substantial part of the material evidence came from a totally new project, launched in 2000 by the CNANS in cooperation with a local amateur group (the association IPSIIS), which consisted of archaeological prospecting on beaches using metal detectors.

Furthermore, research by the CNANS on the wreck of the 15th-century ship *Ria de Aveiro A* have led to a novel technical and methodological approach, consisting of full-scale plywood and polyurethane models ("2D" and "3D") (Figs. 4). This method will soon be applied to the wreck of the ship *Arade 1*, dating from the 16th-century, which was discovered in 1970 when the river was dredged but which subsequently re-buried itself. Located in 2001 by the CNANS and excavated in a series of annual campaigns until 2005, this wreck has since 2003 been the subject of a PhD thesis at the University of Paris I - IAA under the direction of Eric Rieth.

It is important to underline that the creation of a full-scale model has proved highly effective in museographic terms, as shown by the 2004 exhibition of the wreck of the *Ria de Aveiro A* at the Maritime Museum of Ílhavo, one of the Municipalities on the lagoon of the Aveiro, which witnessed one of the most important maritime adventures in Portugal's history: deep-sea fishing. It coincided with another exhibition organised simultaneously by the CNANS, focusing on the *Ria de Aveiro* and the most important nautical and underwater archaeological finds in Portugal, presented in Aveiro itself, in the emblematic old harbourmaster's building, inaugurated on

**Figure 3: Introductory course to underwater archaeology in the swimming pool**

**Figure 4: 1:1 scale models in plywood and polyurethane, so called "2D" and "3D", of the 15th century wreck *Ria de Aveiro A*, at the CNANS**

this occasion as the seat of the Municipal Assembly and now featuring a vast temporary exhibition hall.

This, in short, is how the CNANS ensures and develops public access –awareness raising in the field of underwater cultural heritage in Portugal.

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# Shipwreck: Threatened in Paradise

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One of the justifications most commonly cited by treasure hunters for why they need to salvage a shipwreck is that the site is in danger of decaying to nothing if left alone at the bottom of the sea or lakebed. In fact, one of the guiding legal principles of marine salvage in some places is that a wreck—even one that may have been underwater for hundreds or thousands of years — is "endangered," and anyone who "rescues" it through recovery of its contents therefore should be entitled to a financial reward, not only for the rescue, but also for the risk and expenditure of one's own assets in the recovery effort.

In actual fact, nearly all shipwrecks that sink in water deep enough to escape immediate salvage undergo a very gradual transition period, from being intact on the bottom to gradually crumbling while fasteners, hull sections or wooden components deteriorate and finally fail, becoming flatter as the contents compress and settle into one another and the surrounding matrix. As a wreck becomes covered by sand, coral, mud or silt overburden which seals it off from the harmful effects of oxygen, it will eventually reach a state of stabilization, where it can remain for hundreds, or even thousands of years. By far the greatest potential for damage to any shipwreck site is human intervention, which can disrupt its stable environment and hasten its decline. The wreck of the ocean liner *Titanic*, which has been significantly damaged by tourist submarine collisions and propeller backwash, is an iconic example of this sort of activity.

There is an even more graphic, if less known, example of a seriously threatened shipwreck site: the wreck of Hawaiian King Kamehameha II's royal yacht. Built at a cost of

**Figure 1: Map of Hanalei Bay on the north shore of the island of Kauai, Hawaii. The asterisk at the bottom indicates the location of the 1824 wreck of the Royal Yacht of King Kamehameha II (Map by Kenneth Spaulding, courtesy Smithsonian Institution)**

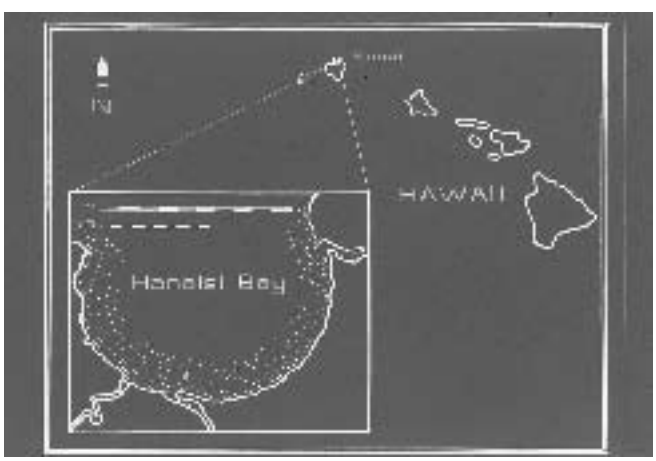


**Figure 2: Underwater archaeologists record the poorly-preserved hull timbers of the famous wreck of the early Royal Hawaiian Yacht *Pride of Hawaii* (P.F. Johnston)**

$100,000 at Salem, MA in 1816 as the first oceangoing yacht in the United States, *Cleopatra's Barge* was the extravagant dream of wealthy local citizen George Crowninshield, Jr. He died shortly after returning from a single cruise to the Mediterranean in 1817, and she was sold to the Boston China trading company Bryant & Sturgis in 1820. They in turn sold her to the King of Hawaii in late 1820 for $80,000 worth of sandalwood, a prized China trade commodity used for such diverse purposes as incense and cabinetry. No fewer than three books have been written about the first four years of the famous ship's history.

King Kamehameha renamed the storied vessel *Ha'aheo o Hawaii* (*Pride of Hawaii*) and used her for the next four years as his private yacht, a cargo and passenger transport, a diplomatic vehicle and even once as a pirate ship. In 1824, while the king was en route to England on a diplomatic mission, a native Hawaiian crew sailed her to the north shore of the island of Kauai and wrecked her in the southwest corner of Hanalei Bay on 6 April 1824. The ship struck a five-foot deep reef just a hundred yards offshore and sank on the spot, after an unsuccessful salvage attempt by the local population.

The wreck of *Cleopatra's Barge* was threatened for reasons different from those evoked by treasure hunters, perhaps for no other reason than archaeologists found it before the salvor community did. Most of the earliest threats were generated by natural agents, rather than human. The first two were revealed as early as 30 December 1844, when a large section of the barge's hull washed ashore during a winter surge. A Honolulu newspaper reported, "Many of the oak timbers are in quite a sound state, except so far as perforated by the teredo or ship-worm." The teredo worm, the underwater equivalent of a voracious underwater termite, had chewed through the wreck's wooden hull, weakening it and possibly causing the structural damage that allowed a section to wash ashore.

The second natural factor that started to break up the hull was the powerful winter surf and unpredictable storm surge, which

had the entire Pacific Ocean to build unhampered from as far north as the Arctic. Human effort also threatened the wreck a few years later, when in 1857, a local Hawaiian salvaged two cannon and a windlass from the wreck site. Then, two tsunamis struck Kauai's North shore in the 1940s and 1950s, battering the bay's shallow waters and disturbing its contents even further. Finally, in September 1991, the famous hurricane Iniki battered the island; the storm's eye actually stalled over the bay, pummeling it further and gradually starting to grind the wreck into pepper against the hard coral bay bottom.

This combination of natural and human agents threatening the preservation of one of New England's most famous shipwrecks for 170 years called for action, before another storm could destroy forever whatever material culture from the royal ship might still exist. Although this Hawaiian monarch had only reigned for five years, he had consolidated all of the island chain under his reign, abolished the taboo system, and introduced wide-scale Christianity into the islands. Not one single artifact existed from his reign, apart from the contents of this shipwreck.

As a consequence, in 1994 the Smithsonian Institution's National Museum of American History obtained the first underwater archaeological permits ever issued by the state of Hawaii. From 1995-2000 the ship was scientifically excavated, providing unparalleled information about the transitional period in Hawaiian history from the lifeways of Old Hawaii to a kingdom irrevocably pointed towards Euro-American value systems and eventual annexation by the United States. More than 1,200 lots of artifacts were recovered from the badly preserved underwater site, and a 40-foot section of the royal ship's stern was discovered, documented and covered over, committing it to its watery grave once again. Several articles and book chapters have disseminated the archaeological results of the multi-year investigations, and a book and museum exhibit are well into the planning phase at this writing.

**Figure 4: This historical reconstruction depicts the native Hawaiian attempt to salvage the shipwreck in May 1824; in the foreground, Boston missionary Hiram Bingham preaches a sermon to the native inhabitants on the evils of drink, which was a factor in the ship's loss (Painting by Richard W. Rogers, courtesy of the Smithsonian Institution)**

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**Figure 3: *Cleopatra's Barge* in August 1818, painted by deaf-and-mute artist George Ropes of Marblehead, Massachusetts, USA; the yacht, which cost the modern equivalent of ca. $13 million dollars, was so unusual that as many as 8,000 visitors per day boarded the vessel during her 1817 Mediterranean cruise (Courtesy of the Peabody Essex Museum, Salem, Massachusetts, USA)**

# The Urbieta Wreck (Gernika) Basque Country

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The Gernika estuary (ria) represents one of the oldest and most important fluvial waterways penetrating the Basque coast.

Its mouth was historically barred by moving sandbanks, its estuary, protected from the dominant northwest winds by the Matxitxaco cape and the island of Izaro. However, the waterway has always been an attractive ship route towards the interior of the region, in particular as its depth makes it navigable up to the city of Gernika, over six km inland from the sea.

The most important records confirming that this estuary has been in use since antiquity are to be found in the Roman settlements of Portuondo o Forua. After that we have to refer to the documentary evidence describing the commercial route of ore carriers and barges with varying cargo up to Gernika and the ports of other municipalities on the estuary. The presence of foundries and the activity of the inhabitants of this mining basin dedicated to the transformation of iron are fundamental when evaluating the importance of the navigation and the port activity in this estuary.

## Legislation

The Statute of Autonomy of the Basque Country agreed between the Spanish and Basque governments recognizes, among other values, culture and the historic, artistic, ethnographic and archaeological heritage as being under the exclusive authority of the Autonomous Basque Community.

In exercising this responsibility, the Basque government voted the Basque Cultural Heritage Law n° 7/1990, of 3 July, to regulate activities concerning cultural heritage. According to the Basque Cultural Heritage Law, archaeological remains can be protected under three separate legal regimes:

- Declared Archaeological Properties (Bienes Arqueológicos Declarados)
- Archaeological Properties on the Listed Inventory (Bienes Arqueológicos Inventariados)
- Areas of Potential Archaeological Interest (Zonas de Presunto Interés Arqueológico.)

To carry out any intervention on these properties or areas, permission must be sought from the Department of Culture of the Regional Council of the concerned historic area including the presentation of preliminary plans for the archaeological project.

Equally, considering the natural values of the Gernika estuary and the whole Urdaibai basin, in 1984 UNESCO declared this area a Biosphere Reserve. The protection of the Biosphere Reserve is regulated by the *Law for the Protection and Regulation of the Biosphere Reserve of Urdaibai* passed by the Basque government on 6 July 1989. Nevertheless, no specific archaeological plan exists for this Park which gives priority to the protection of any possible discoveries related to the fluvial navigation, taking into account the finds that have already appeared and the historical tradition in this regard.

## Impact and Archaeology

In 1998, works to channel the river Oka started in the vicinity of the town of Gernika, in two areas called “Urbieta” and “Portuzarra” (Basque words meaning “between two waters”

**Figure 1: Aerial view of the dig; at the extreme right of the wreck is the stern and at the left is seen the transverse gap caused by the excavation equipment during the dredging of the Oka river**

and "old port" respectively). As the area does not benefit from any preventive archaeological protection, no provision was made for archaeological investigation in the project for the works.

Faced with this situation, an archaeologist regularly working in the region alerted the Town Council to the dangers with regards to the defenceless situation of the municipal archaeological heritage in the area where the public works were about to start. Following this denunciation, the Town Council fortunately decided, although it was under no legal obligation, to approve a special budget for archaeological monitoring of the works that had started.

## Description of the Finds

In July 1998, under four meters of earth and mud at the confluence of the Golako, a left bank tributary to the Gernika estuary, a backhoe excavator used to build a breakwater to channel the river, partially destroyed, but at the same time discovered, a wreck dating from the second half of the 15th century. It proved to be the only medieval ship encountered until now in the Basque Country and was named after the location of its finding, the *Urbieta*.

The archaeological impact of the works threatened to totally destroy the recently discovered wreck *Urbieta*, since the channelling wall would have been built exactly where it lay. Therefore, once the municipal and provincial institutions had been alerted, the Council of Bizkaia agreed upon the necessity to excavate and salvage the wreck, for which Manu Izaguirre, author of this text, and Luis Valdés, archaeologist for the region, drew up the corresponding archaeological intervention plan. This plan proposed the excavation, investigation and complete salvage of the wreck in view of its subsequent conservation.

The vessel was resting on a river bank gently sloping downwards towards the present water level, on top of a series of layers of eroded iron ore gravel. Over this layer of iron ore gravel, alternating layers of mud or sand covered the wreck and bore witness to an important transport activity of this mineral in this area.

All the above leads us to believe that the mineral remains found around the vessel could correspond to the period from when the hull was abandoned until it was discovered in its present situation. Nevertheless, we cannot eliminate the hypothesis that the vessel was also used, at an undetermined frequency, to transport the mineral.

Through the excavations it was possible to observe that the vessel had run aground on its port side which, despite its destruction, had kept all its strakes from its keel to its gunnel. On the starboard side only remains of the garboard strake and of some other strakes were found pushed inwards towards the port side.

The central part of the vessel, along about one-third of its length had been destroyed by the backhoe excavator. While most of the solid pieces could be salvaged, many of the construction details of this part were lost such as the keelson and the

**Figure 2: In order to extract the wreck from the silt of the river, it was required to detach it from the ground by creating a platform of horizontal tubes**

**Figure 3: Once detached from the silt, it required a large crane to lift the block of the wreck onto the bed of a special truck of adjustable height**

**Figure 4: After a careful cleaning of the wreck, the details and design of the archaeological remains were recorded, indispensable for the recreation and elaboration of the real and hypothetical forms of the architecture of the boat**

mast step. The general morphology of the vessel consists of a "clinker-built" hull, a construction form used on our coast until the middle of the 16th-century and which implies a "hull first" construction system where the hull is built before the rib structure which sustains it once completed. In contrast, since the beginning of the 16th-century until today, the carvel system, or edge-to-edge planking, became dominant.

## Extraction

During the excavation process, great difficulties were met in dismantling the vessel to extract it from its site due to the large quantity and excellent condition of the treenails fastening together the strakes of the clinker-built hull. The option of cutting all the treenails implied an excessive archaeological invasion, which is why it was decided to extract the wreck in one piece. This approach presented significant challenges, including the cost of the operation, the subsequent consolidation and final restitution of the original shape of the hull.

To raise the vessel, the surroundings of the vessel were excavated up to a depth of 1.6m over a sufficiently wide area to obtain a horizontal plane that allowed the boring of transversal tunnelling holes and placement of a series of parallel horizontal tubes under the vessel. Taking into account the irregularity of the mud and sand under the boat, a blocking fence was built around the structure using wooden boards and a metal structure to a height of 60 cm.

The horizontal layer of tubes thus created also served as a base for the earthen block on which the vessel was resting. Once this was reinforced by the metal structure, it was extracted using a heavy-duty crane and placed onto a truck/lorry of adjustable height, which transported the whole block to a temporary storehouse near the location of the find.

## Treatment and Restitution of Shape

After all material not part of the vessel (such as mud, sand and consolidation structures) had been removed, the vessel was placed in a metal crate/cage, which was lowered into a bath of PEG 400, at a concentration of 75% and temperature of 60 C° for a period of two years.

Once the treatment had been completed and the weight and length measurements of the treatment control test-bores had been verified, the excess PEG was eliminated and the vessel was packed for transport to the shipyard where the formal shape of its hull was to be restored.

The museographic plan of the Urbieta vessel was to relate its final appearance to its operational life: the archaeological remains that had been recovered were to be reshaped into the original form of the boat. To this end, the original ship's lines were recreated. As the archaeological remains comprised only two-thirds of the port side, didactic/educational needs provided us with the justification to reconstitute the missing portion of the craft. To achieve this objective, fine steel ribs shaped to sustain the hull from the outside were combined with thin longitudinal battens of the same material. These were placed in the axis of the strakes to give a more realistic impression of the volume of the vessel.

In this project of re-shaping, and using other examples from across the world, the advantage of using comparative full-scale or reduced scale reproductions became evident. It allows for the presentation of the details of the vessel to the visitors: its equipment, load capacity and aspects of use and life on board. Placing the scale model next to the archaeological remains allows for immediate comparison of both and helps the general public better understand the association of these elements which would otherwise mean very little. To reconstitute the vessel's original shape, it was necessary to develop tentative plans based on the drawings of the excavated remains and also based on the laboratory drawings of each piece.

The plans of the boat's remains were drawn up by Aurelie Montagne, Joao Alves and Miguel Aleluya and the architectural investigation was directed by Eric Rieth. The development of plans of the hypothetical original form was carried out by naval architect Marc Ginisty. The conservation treatment was directed by Anna Jover in cooperation with Caterina Agüer, and the restitution of the final forms was carried out by Xavier Agote and his team. Manu Izaguirre coordinated the overall project.

Once this process had been completed, the boat was taken to the Maritime Museum of the Bilbao estuary on 9 January 2006 where it will be exhibited, only a few kilometres away from Gernika where it had been discovered seven years before. The entire operation was made possible thanks to the private initiative, good will and discernment of the local and regional institutions, whose competencies do not include the legal protection of archaeology in the Bizkaia area.

## Conclusion

The wreck of Urbieta is a first class discovery as it is the only boat of this period and typology that has been found so far on the Cantabrian coast. This has allowed specialists in the field to look for links between its shape and design and the various traditions of boatbuilding in the northern Atlantic.

Among these specialists, particular mention has to be made of the research group from Parks Canada involved in the study of the 16th century Basque whaleboats. For this group, the Urbieta wreck represents the only evidence of Basque boatbuilding prior to the aforementioned whaleboat, which gives it an extraordinary value, both at the local and international level.

Had this endangered site not been archaeologically rescued, an important chapter of Basque boatbuilding would have been destroyed. A historically valuable and non-renewable resource would have been lost forever.

# Protection of Underwater Cultural Heritage in French Polynesia Fifteen Years of Work by GRAN

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*France*

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## French Polynesia, an Overseas Country: A Specific Regulatory Framework

Since March 12, 2004, French Polynesia has been an "Overseas Country" (formerly an overseas territory) within the French Republic. It is a freely and democratically self-governing autonomous overseas community. The High Commissioner of the Republic is the representative of the State and holds its powers. More simply, the State is responsible for all matters relating to nationality and civil rights; justice; foreign policy; defense and security; currency; some air transport and maritime regulations; municipal administration; the public service; audiovisual communication; and finally, university education and research. Archaeological research, on the other hand, is the responsibility of French Polynesia. The regulations governing underwater archaeology are, however, the same as those in effect in metropolitan France. The Heritage Code has been in effect in French Polynesia since 2004. It includes Consolidated Law No. 89-874 of December 1, 1989 on maritime cultural property, which has been in effect in the territory for more than ten years.

Given this specific legal context, we leave it to the legal authorities to determine whether the UNESCO Convention on the Protection of the Underwater Cultural Heritage is subject to the accession of French Polynesia.

## GRAN Activities in French Polynesia

The Research Group for Naval Archaeology (Groupe de recherche en archéologie navale, or "GRAN") is a non-profit association dedicated to underwater archaeology, maritime history and maritime cultural heritage. The GRAN team in French Polynesia was established in 1990. Prior to that time, there had been no scientific research on underwater cultural heritage. The only activities were the usual recovery of anchors, cannons, wreckage or hewn stone by underwater contractors, fishermen, divers or private individuals, for collections, trophies or sale. A number of ethnologists and archaeologists, primarily Anglo-Saxons, had studied land archaeology since the beginning of the 20th-century, while French research began with Pierre Vérin in the early 1960s. Underwater archaeology, however, had received no attention.

In the past fifteen years, GRAN has been involved in a wide variety of activities in French Polynesia. The conclusion of a framework agreement with the Ministry of Culture, assigning us responsibility for an inventory of Polynesia's underwater heritage, has made it possible to begin looking at the problem of underwater archaeology as a whole.

Three types of activities have been undertaken in connection with the responsibility entrusted to us:

1. Systematic review of archival and documentary sources, to establish as complete a list as possible of the shipwrecks that have occurred in the area.
2. Survey of underwater workers (divers, underwater contractors, fishermen) to establish an inventory of known underwater relics.
3. Operations to verify information on the sites inventoried: exploration, expert appraisals or excavations undertaken on our own initiative or at the request of the Polynesian Ministry of Culture.

GRAN has also carried out operations at the request of other agencies or associations, including museums, municipalities and local or metropolitan French associations. It has also been assigned responsibility by the Ministry of Culture for overseeing the archaeological research being conducted by an Anglo-Saxon team.

At the same time, GRAN has undertaken to:

4. Provide information on its activities to the media and the public.
5. Educate decision-makers and students on the protection of underwater cultural heritage through an educational program in the schools.

## Education on the Protection of Underwater Heritage

Since 2000, every GRAN operation has included a multilingual daily log on its website at www.archeonavale.org. This log, our primary tool for communication, allows members of the public to monitor the progress of the work. Between 300 and 500 people follow every stage of our archaeological operations on a daily basis. The log does more than simply recount events; the documents that accompany it give readers a more complete view of the technical, historical, archaeological and environmental aspects of the operation. To allow teachers from different school systems to use the site for educational purposes, the texts are presented in three languages: French, Tahitian and English. Some other GRAN sites, depending on their location, use other languages as well, such as Spanish or Arabic.

Raising student awareness does not stop at the computer screen. GRAN carries out activities in the schools to ensure that even the very youngest children are aware of the need to protect our underwater heritage. These activities take the form of guided three-level exhibits that allow the children to discover, discuss and handle materials. In some cases, GRAN responds

to individual requests for assistance on educational projects (marine trades, wildlife, plant life, environmental protection, etc.) by providing specific additional information.

GRAN also attends cultural or environmental events (mayors' conferences, sea days, island language days, etc.), at which it interacts with the general public. It has established excellent relations with the Department of Culture, the Museum of Tahiti and the Islands, and the Customs Administration, and participates in the marine science activities of the Natural Sites and Monuments Commission. Its primary concern is to ensure that marine engineering operations are aware of the needs of underwater archaeology.

## Example of a Protective Measure: Excavation of the Tupaparau Underwater Site in Mo'orea

This campaign was triggered by the discovery of numerous stone objects in Mo'orea near Tupaparau Pass in the Afareaitu lagoon. The site was discovered by Mr. Lailau Matahiapo, a well-known Polynesian diver. He kept it secret for three years, before deciding to inform the members of the "Na To E Va'u No Aimeho Nui" Association so that protective measures could be taken.

Alerted by the President of the Association and the senior assistant to the mayor of the island, the Minister of Culture asked the GRAN team in Polynesia to assume responsibility for organizing and carrying out excavation operations. Initial assessment dives were followed by archaeological recovery work between February 22 and April 6, 2003 to avoid possible looting.

The site is significant in terms of both its size (nearly 250 by 50 metres) and the number of articles that it contains (between 2,000 and 3,000). These include not only hewn or worked stone objects, but also volcanic rocks apparently in their natural state. The worked objects found (several hundred) relate to fishing: anchors and fishing weights for lines or nets. Some stones may have come from ceremonial sites such as Marae, while others include unworked basalt prisms, finished basalt tools (adzes) and a very small number of domestic objects, such as a pestle and other less readily identifiable objects.

**Figure 1: (Top) Two divers label anchors and stone fishing weights in the central portion of the site; the concentration of objects is due to the slope of the site and its relief: coral masses, faults and differences in height (GRAN Polynesia © 2003)**

**Figure 2: (Lower Left) After being identified on the bottom, positioned and photographed, objects are removed and brought to land; they are placed in freshwater tanks for several days for desalination (GRAN Polynesia © 2003)**

**Figure 3: (Lower Right) View of anchors and fishing weights from square R9. Each object has an identification label; the method used in this case was a PVC plate (bearing a number written with an indelible felt pen) attached by an elastic band; this method has proven unsatisfactory in areas affected by swell (loss of labels); in addition, the elastic breaks down in the medium term (GRAN Polynesia © 2003)**

While certain passes in the Polynesian islands contain similar objects and some have been looted, this is the first time that a site of this kind has been studied.

The discovery of underwater sites of this kind poses the problem of protecting them against looting. Although this discovery was kept secret for some time by the man who first located it, it was beginning to arouse greed among individuals who do not subscribe to the UNESCO precept: "Underwater cultural heritage shall not be commercially exploited."

This campaign, set up in less than two months, has made it possible to study the archaeological site and to protect nearly 700 objects.

In conclusion, French Polynesia represents an area of 1800 km x 1800 km, including 118 islands and atolls. Given the significance of underwater archaeology in this very large area, GRAN's activities and the means available to it remain relatively limited in practice, but its constant presence, its network of informants, its field work and efforts to develop public awareness have helped to publicize the concept of underwater cultural heritage. As the excavation of the Tupaparau underwater site in Mo'orea indicates, GRAN also represents an effective tool when the Ministry of Culture is called upon to respond to an urgent situation.

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# UNESCO Convention on the Protection of the Underwater Cultural Heritage

**UNESCO**
**Paris, 2 November 2001**

The General Conference of the United Nations Educational, Scientific and Cultural Organization, meeting in Paris from 15 October to 3 November 2001, at its 31st session,

Acknowledging the importance of underwater cultural heritage as an integral part of the cultural heritage of humanity and a particularly important element in the history of peoples, nations, and their relations with each other concerning their common heritage,

Realizing the importance of protecting and preserving the underwater cultural heritage and that responsibility therefore rests with all States,

Noting growing public interest in and public appreciation of underwater cultural heritage,

Convinced of the importance of research, information and education to the protection and preservation of underwater cultural heritage,

Convinced of the public's right to enjoy the educational and recreational benefits of responsible non-intrusive access to *in situ* underwater cultural heritage, and of the value of public education to contribute to awareness, appreciation and protection of that heritage,

Aware of the fact that underwater cultural heritage is threatened by unauthorized activities directed at it, and of the need for stronger measures to prevent such activities,

Conscious of the need to respond appropriately to the possible negative impact on underwater cultural heritage of legitimate activities that may incidentally affect it,

Deeply concerned by the increasing commercial exploitation of underwater cultural heritage, and in particular by certain activities aimed at the sale, acquisition or barter of underwater cultural heritage,

Aware of the availability of advanced technology that enhances discovery of and access to underwater cultural heritage,

Believing that cooperation among States, international organizations, scientific institutions, professional organizations, archaeologists, divers, other interested parties and the public at large is essential for the protection of underwater cultural heritage,

Considering that survey, excavation and protection of underwater cultural heritage necessitate the availability and application of special scientific methods and the use of suitable techniques and equipment as well as a high degree of professional specialization, all of which indicate a need for uniform governing criteria,

Realizing the need to codify and progressively develop rules relating to the protection and preservation of underwater cultural heritage in conformity with international law and practice, including the UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property of 14 November 1970, the UNESCO Convention for the Protection of the World Cultural and Natural Heritage of 16 November 1972 and the United Nations Convention on the Law of the Sea of 10 December 1982,

Committed to improving the effectiveness of measures at international, regional and national levels for the preservation *in situ* or, if necessary for scientific or protective purposes, the careful recovery of underwater cultural heritage,

Having decided at its twenty-ninth session that this question should be made the subject of an international convention,

Adopts this second day of November 2001 this Convention.

**Article 1 – Definitions**

For the purposes of this Convention:

1. (a) "Underwater cultural heritage" means all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years such as:

   (i) sites, structures, buildings, artefacts and human remains, together with their archaeological and natural context;

   (ii) vessels, aircraft, other vehicles or any part thereof, their cargo or other contents, together with their archaeological and natural context; and

   (iii) objects of prehistoric character.

   (b) Pipelines and cables placed on the seabed shall not be considered as underwater cultural heritage.

   (c) Installations other than pipelines and cables, placed on the seabed and still in use, shall not be considered as underwater cultural heritage.

2. (a) "States Parties" means States which have consented to be bound by this Convention and for which this Convention is in force.

   (b) This Convention applies *mutatis mutandis* to those territories referred to in Article 26, paragraph 2(b), which become Parties to this Convention in accordance with the conditions set out in that paragraph, and to that extent "States Parties" refers to those territories.

3. "UNESCO" means the United Nations Educational, Scientific and Cultural Organization.

4. "Director-General" means the Director-General of UNESCO.

5. "Area" means the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.

6. "Activities directed at underwater cultural heritage" means activities having underwater cultural heritage as their primary object and which may, directly or indirectly, physically disturb or otherwise damage underwater cultural heritage.

7. "Activities incidentally affecting underwater cultural heritage" means activities which, despite not having underwater cultural heritage as their primary object or one of their objects, may physically disturb or otherwise damage underwater cultural heritage.

8. "State vessels and aircraft" means warships, and other vessels or aircraft that were owned or operated by a State and used, at the time of sinking, only for government non-commercial purposes, that are identified as such and that meet the definition of underwater cultural heritage.

9. "Rules" means the Rules concerning activities directed at underwater cultural heritage, as referred to in Article 33 of this Convention.

**Article 2 – Objectives and general principles**

1.This Convention aims to ensure and strengthen the protection of underwater cultural heritage.

2. States Parties shall cooperate in the protection of underwater cultural heritage.

3. States Parties shall preserve underwater cultural heritage for the benefit of humanity in conformity with the provisions of this Convention.

4. States Parties shall, individually or jointly as appropriate, take all appropriate measures in conformity with this Convention and with international law that are necessary to protect underwater cultural heritage, using for this purpose the best practicable means at their disposal and in accordance with their capabilities.

5. The preservation *in situ* of underwater cultural heritage shall be considered as the first option before allowing or engaging in any activities directed at this heritage.

6. Recovered underwater cultural heritage shall be deposited, conserved and managed in a manner that ensures its long-term preservation.

7. Underwater cultural heritage shall not be commercially exploited.

8. Consistent with State practice and international law, including the United Nations Convention on the Law of the Sea, nothing in this Convention shall be interpreted as modifying the rules of international law and State practice pertaining to sovereign immunities, nor any State's rights with respect to its State vessels and aircraft.

9. States Parties shall ensure that proper respect is given to all human remains located in maritime waters.

10. Responsible non-intrusive access to observe or document *in situ* underwater cultural heritage shall be encouraged to create public awareness, appreciation, and protection of the heritage except where such access is incompatible with its protection and management.

11. No act or activity undertaken on the basis of this Convention shall constitute grounds for claiming, contending or disputing any claim to national sovereignty or jurisdiction.

**Article 3 – Relationship between this Convention and the United Nations Convention on the Law of the Sea**

Nothing in this Convention shall prejudice the rights, jurisdiction and duties of States under international law, including the United Nations Convention on the Law of the Sea. This Convention shall be interpreted and applied in the context of and in a manner consistent with international law, including the United Nations Convention on the Law of the Sea.

**Article 4 – Relationship to law of salvage and law of finds**

Any activity relating to underwater cultural heritage to which this Convention applies shall not be subject to the law of salvage or law of finds, unless it:

(a) is authorized by the competent authorities, and

(b) is in full conformity with this Convention, and

(c) ensures that any recovery of the underwater cultural heritage achieves its maximum protection.

**Article 5 – Activities incidentally affecting underwater cultural heritage**

Each State Party shall use the best practicable means at its disposal to prevent or mitigate any adverse effects that might arise from activities under its jurisdiction incidentally affecting underwater cultural heritage.

**Article 6 – Bilateral, regional or other multilateral agreements**

1. States Parties are encouraged to enter into bilateral, regional or other multilateral agreements or develop existing agreements, for the preservation of underwater cultural heritage. All such agreements shall be in full conformity with the provisions of this Convention and shall not dilute its universal character. States may, in such agreements, adopt rules and regulations which would ensure better protection of underwater cultural heritage than those adopted in this Convention.

2. The Parties to such bilateral, regional or other multilateral agreements may invite States with a verifiable link, especially a cultural, historical or archaeological link, to the underwater cultural heritage concerned to join such agreements.

3. This Convention shall not alter the rights and obligations of States Parties regarding the protection of sunken vessels, arising from other bilateral, regional or other multilateral agreements concluded before its adoption, and, in particular, those that are in conformity with the purposes of this Convention.

**Article 7 – Underwater cultural heritage in internal waters, archipelagic waters and territorial sea**

1. States Parties, in the exercise of their sovereignty, have the exclusive right to regulate and authorize activities directed at underwater cultural heritage in their internal waters,

archipelagic waters and territorial sea.

2. Without prejudice to other international agreements and rules of international law regarding the protection of underwater cultural heritage, States Parties shall require that the Rules be applied to activities directed at underwater cultural heritage in their internal waters, archipelagic waters and territorial sea.

3. Within their archipelagic waters and territorial sea, in the exercise of their sovereignty and in recognition of general practice among States, States Parties, with a view to cooperating on the best methods of protecting State vessels and aircraft, should inform the flag State Party to this Convention and, if applicable, other States with a verifiable link, especially a cultural, historical or archaeological link, with respect to the discovery of such identifiable State vessels and aircraft.

**Article 8 – Underwater cultural heritage in the contiguous zone**

Without prejudice to and in addition to Articles 9 and 10, and in accordance with Article 303, paragraph 2, of the United Nations Convention on the Law of the Sea, States Parties may regulate and authorize activities directed at underwater cultural heritage within their contiguous zone. In so doing, they shall require that the Rules be applied.

**Article 9 – Reporting and notification in the exclusive economic zone and on the continental shelf**

1. All States Parties have a responsibility to protect underwater cultural heritage in the exclusive economic zone and on the continental shelf in conformity with this Convention.

Accordingly:

(a) a State Party shall require that when its national, or a vessel flying its flag, discovers or intends to engage in activities directed at underwater cultural heritage located in its exclusive economic zone or on its continental shelf, the national or the master of the vessel shall report such discovery or activity to it;

(b) in the exclusive economic zone or on the continental shelf of another State Party:

(i) States Parties shall require the national or the master of the vessel to report such discovery or activity to them and to that other State Party;

(ii) alternatively, a State Party shall require the national or master of the vessel to report such discovery or activity to it and shall ensure the rapid and effective transmission of such reports to all other States Parties.

2. On depositing its instrument of ratification, acceptance, approval or accession, a State Party shall declare the manner in which reports will be transmitted under paragraph 1(b) of this Article.

3. A State Party shall notify the Director-General of discoveries or activities reported to it under paragraph 1 of this Article.

4. The Director-General shall promptly make available to all States Parties any information notified to him under paragraph 3 of this Article.

5. Any State Party may declare to the State Party in whose exclusive economic zone or on whose continental shelf the underwater cultural heritage is located its interest in being consulted on how to ensure the effective protection of that underwater cultural heritage. Such declaration shall be based on a verifiable link, especially a cultural, historical or archaeological link, to the underwater cultural heritage concerned

**Article 10 – Protection of underwater cultural heritage in the exclusive economic zone and on the continental shelf**

1. No authorization shall be granted for an activity directed at underwater cultural heritage located in the exclusive economic zone or on the continental shelf except in conformity with the provisions of this Article.

2. A State Party in whose exclusive economic zone or on whose continental shelf underwater cultural heritage is located has the right to prohibit or authorize any activity directed at such heritage to prevent interference with its sovereign rights or jurisdiction as provided for by international law including the United Nations Convention on the Law of the Sea.

3. Where there is a discovery of underwater cultural heritage or it is intended that activity shall be directed at underwater cultural heritage in a State Party's exclusive economic zone or on its continental shelf, that State Party shall:

(a) consult all other States Parties which have declared an interest under Article 9, paragraph 5, on how best to protect the underwater cultural heritage;

(b) coordinate such consultations as "Coordinating State", unless it expressly declares that it does not wish to do so, in which case the States Parties which have declared an interest under Article 9, paragraph 5, shall appoint a Coordinating State.

4. Without prejudice to the duty of all States Parties to protect underwater cultural heritage by way of all practicable measures taken in accordance with international law to prevent immediate danger to the underwater cultural heritage, including looting, the Coordinating State may take all practicable measures, and/or issue any necessary authorizations in conformity with this Convention and, if necessary prior to consultations, to prevent any immediate danger to the underwater cultural heritage, whether arising from human activities or any other cause, including looting. In taking such measures assistance may be requested from other States Parties.

5. The Coordinating State:

(a) shall implement measures of protection which have been agreed by the consulting States, which include the Coordinating State, unless the consulting States, which include the Coordinating State, agree that another State Party shall implement those measures;

(b) shall issue all necessary authorizations for such agreed measures in conformity with the Rules, unless the consulting States, which include the Coordinating State, agree that another State Party shall issue those authorizations;

(c) may conduct any necessary preliminary research on the underwater cultural heritage and shall issue all necessary authorizations therefor, and shall promptly inform the Director-General of the results, who in turn will make such information promptly available to other States Parties.

6. In coordinating consultations, taking measures, conducting preliminary research and/or issuing authorizations pursuant to this Article, the Coordinating State shall act on behalf of the States Parties as a whole and not in its own interest. Any such action shall not in itself constitute a basis for the assertion of any preferential or jurisdictional rights not provided for in international law, including the United Nations Convention on the Law of the Sea.

7. Subject to the provisions of paragraphs 2 and 4 of this Article, no activity directed at State vessels and aircraft shall be conducted without the agreement of the flag State and the collaboration of the Coordinating State.

**Article 11 – Reporting and notification in the Area**

1. States Parties have a responsibility to protect underwater cultural heritage in the Area in conformity with this Convention and Article 149 of the United Nations Convention on the Law of the Sea. Accordingly when a national, or a vessel flying the flag of a State Party, discovers or intends to engage in activities directed at underwater cultural heritage located in the Area, that State Party shall require its national, or the master of the vessel, to report such discovery or activity to it.

2. States Parties shall notify the Director-General and the Secretary-General of the International Seabed Authority of such discoveries or activities reported to them.

3. The Director-General shall promptly make available to all States Parties any such information supplied by States Parties.

4. Any State Party may declare to the Director-General its interest in being consulted on how to ensure the effective protection of that underwater cultural heritage. Such declaration shall be based on a verifiable link to the underwater cultural heritage concerned, particular regard being paid to the preferential rights of States of cultural, historical or archaeological origin.

**Article 12 – Protection of underwater cultural heritage in the Area**

1. No authorization shall be granted for any activity directed at underwater cultural heritage located in the Area except in conformity with the provisions of this Article.

2. The Director-General shall invite all States Parties which have declared an interest under Article 11, paragraph 4, to consult on how best to protect the underwater cultural heritage, and to appoint a State Party to coordinate such consultations as the "Coordinating State". The Director-General shall also invite the International Seabed Authority to participate in such consultations.

3. All States Parties may take all practicable measures in conformity with this Convention, if necessary prior to consultations, to prevent any immediate danger to the underwater cultural heritage, whether arising from human activity or any other cause including looting.

4. The Coordinating State shall:

(a) implement measures of protection which have been agreed by the consulting States, which include the Coordinating State, unless the consulting States, which include the Coordinating State, agree that another State Party shall implement those measures; and

(b) issue all necessary authorizations for such agreed measures, in conformity with this Convention, unless the consulting States, which include the Coordinating State, agree that another State Party shall issue those authorizations.

5. The Coordinating State may conduct any necessary preliminary research on the underwater cultural heritage and shall issue all necessary authorizations therefor, and shall promptly inform the Director-General of the results, who in turn shall make such information available to other States Parties.

6. In coordinating consultations, taking measures, conducting preliminary research, and/or issuing authorizations pursuant to this Article, the Coordinating State shall act for the benefit of humanity as a whole, on behalf of all States Parties. Particular regard shall be paid to the preferential rights of States of cultural, historical or archaeological origin in respect of the underwater cultural heritage concerned.

7. No State Party shall undertake or authorize activities directed at State vessels and aircraft in the Area without the consent of the flag State.

**Article 13 – Sovereign immunity**

Warships and other government ships or military aircraft with sovereign immunity, operated for non-commercial purposes, undertaking their normal mode of operations, and not engaged in activities directed at underwater cultural heritage, shall not be obliged to report discoveries of underwater cultural heritage under Articles 9, 10, 11 and 12 of this Convention. However States Parties shall ensure, by the adoption of appropriate measures not impairing the operations or operational capabilities of their warships or other government ships or military aircraft with sovereign immunity operated for non-commercial purposes, that they comply, as far as is reasonable and practicable, with Articles 9, 10, 11 and 12 of this Convention.

**Article 14 – Control of entry into the territory, dealing and possession**

States Parties shall take measures to prevent the entry into their territory, the dealing in, or the possession of, underwater cultural heritage illicitly exported and/or recovered, where recovery was contrary to this Convention.

**Article 15 – Non-use of areas under the jurisdiction of States Parties**

States Parties shall take measures to prohibit the use of their territory, including their maritime ports, as well as artificial islands, installations and structures under their exclusive jurisdiction or control, in support of any activity directed at underwater cultural heritage which is not in conformity with this Convention.

**Article 16 – Measures relating to nationals and vessels**

States Parties shall take all practicable measures to ensure that their nationals and vessels flying their flag do not engage in any activity directed at underwater cultural heritage in a manner not in conformity with this Convention.

**Article 17 – Sanctions**

1. Each State Party shall impose sanctions for violations of measures it has taken to implement this Convention.

2. Sanctions applicable in respect of violations shall be adequate in severity to be effective in securing compliance with this Convention and to discourage violations wherever they occur and shall deprive offenders of the benefit deriving from their illegal activities.

3. States Parties shall cooperate to ensure enforcement of sanctions imposed under this Article.

**Article 18 – Seizure and disposition of underwater cultural heritage**

1. Each State Party shall take measures providing for the seizure of underwater cultural heritage in its territory that has been recovered in a manner not in conformity with this Convention.

2. Each State Party shall record, protect and take all reasonable measures to stabilize underwater cultural heritage seized under this Convention.

3. Each State Party shall notify the Director-General and any other State with a verifiable link, especially a cultural, historical or archaeological link, to the underwater cultural heritage concerned of any seizure of underwater cultural heritage that it has made under this Convention.

4. A State Party which has seized underwater cultural heritage shall ensure that its disposition be for the public benefit, taking into account the need for conservation and research; the need for reassembly of a dispersed collection; the need for public access, exhibition and education; and the interests of any State with a verifiable link, especially a cultural, historical or archaeological link, in respect of the underwater cultural heritage concerned.

**Article 19 – Cooperation and information-sharing**

1. States Parties shall cooperate and assist each other in the protection and management of underwater cultural heritage under this Convention, including, where practicable, collaborating in the investigation, excavation, documentation, conservation, study and presentation of such heritage.

2. To the extent compatible with the purposes of this Convention, each State Party undertakes to share information with other States Parties concerning underwater cultural heritage, including discovery of heritage, location of heritage, heritage excavated or recovered contrary to this Convention or otherwise in violation of international law, pertinent scientific methodology and technology, and legal developments relating to such heritage.

3. Information shared between States Parties, or between UNESCO and States Parties, regarding the discovery or location of underwater cultural heritage shall, to the extent compatible with their national legislation, be kept confidential and reserved to competent authorities of States Parties as long as the disclosure of such information might endanger or otherwise put at risk the preservation of such underwater cultural heritage.

4. Each State Party shall take all practicable measures to disseminate information, including where feasible through appropriate international databases, about underwater cultural heritage excavated or recovered contrary to this Convention or otherwise in violation of international law.

**Article 20 – Public awareness**

Each State Party shall take all practicable measures to raise public awareness regarding the value and significance of underwater cultural heritage and the importance of protecting it under this Convention.

**Article 21 – Training in underwater archaeology**

States Parties shall cooperate in the provision of training in underwater archaeology, in techniques for the conservation of underwater cultural heritage and, on agreed terms, in the transfer of technology relating to underwater cultural heritage.

**Article 22 – Competent authorities**

1. In order to ensure the proper implementation of this Convention, States Parties shall establish competent authorities or reinforce the existing ones where appropriate, with the aim of providing for the establishment, maintenance and updating of an inventory of underwater cultural heritage, the effective protection, conservation, presentation and management of underwater cultural heritage, as well as research and education.

2. States Parties shall communicate to the Director-General the names and addresses of their competent authorities relating to underwater cultural heritage.

**Article 23 – Meetings of States Parties**

1. The Director-General shall convene a Meeting of States Parties within one year of the entry into force of this Convention and thereafter at least once every two years. At the request of a majority of States Parties, the Director-General shall convene an Extraordinary Meeting of States Parties.

2. The Meeting of States Parties shall decide on its functions and responsibilities.

3. The Meeting of States Parties shall adopt its own Rules of Procedure.

4.The Meeting of States Parties may establish a Scientific and Technical Advisory Body composed of experts nominated by the States Parties with due regard to the principle of equitable geographical distribution and the desirability of a gender balance.

5.The Scientific and Technical Advisory Body shall appropriately assist the Meeting of States Parties in questions of a scientific or technical nature regarding the implementation of the Rules.

**Article 24 – Secretariat for this Convention**

1. The Director-General shall be responsible for the functions of the Secretariat for this Convention.

2. The duties of the Secretariat shall include:

(a) organizing Meetings of States Parties as provided for in Article 23, paragraph 1; and

(b) assisting States Parties in implementing the decisions of the Meetings of States Parties.

**Article 25 – Peaceful settlement of disputes**

1. Any dispute between two or more States Parties concerning the interpretation or application of this Convention shall be subject to negotiations in good faith or other peaceful means of settlement of their own choice.

2. If those negotiations do not settle the dispute within a reasonable period of time, it may be submitted to UNESCO for mediation, by agreement between the States Parties concerned.

3. If mediation is not undertaken or if there is no settlement by mediation, the provisions relating to the settlement of disputes set out in Part XV of the United Nations Convention on the Law of the Sea apply *mutatis mutandis* to any dispute between States Parties to this Convention concerning the interpretation or application of this Convention, whether or not they are also Parties to the United Nations Convention on the Law of the Sea.

4. Any procedure chosen by a State Party to this Convention and to the United Nations Convention on the Law of the Sea pursuant to Article 287 of the latter shall apply to the settlement of disputes under this Article, unless that State Party, when ratifying, accepting, approving or acceding to this Convention, or at any time thereafter, chooses another procedure pursuant to Article 287 for the purpose of the settlement of disputes arising out of this Convention.

5. A State Party to this Convention which is not a Party to the United Nations Convention on the Law of the Sea, when ratifying, accepting, approving or acceding to this Convention or at any time thereafter shall be free to choose, by means of a written declaration, one or more of the means set out in Article 287, paragraph 1, of the United Nations Convention on the Law of the Sea for the purpose of settlement of disputes under this Article. Article 287 shall apply to such a declaration, as well as to any dispute to which such State is party, which is not covered by a declaration in force. For the purpose of conciliation and arbitration, in accordance with Annexes V and VII of the United Nations Convention on the Law of the Sea, such State shall be entitled to nominate conciliators and arbitrators to be included in the lists referred to in Annex V, Article 2, and Annex VII, Article 2, for the settlement of disputes arising out of this Convention.

**Article 26 – Ratification, acceptance, approval or accession**

1. This Convention shall be subject to ratification, acceptance or approval by Member States of UNESCO.

2. This Convention shall be subject to accession:

(a) by States that are not members of UNESCO but are members of the United Nations or of a specialized agency within the United Nations system or of the International Atomic Energy Agency, as well as by States Parties to the Statute of the International Court of Justice and any other State invited to accede to this Convention by the General Conference of UNESCO;

(b) by territories which enjoy full internal self-government, recognized as such by the United Nations, but have not attained full independence in accordance with General Assembly resolution 1514 (XV) and which have competence over the matters governed by this Convention, including the competence to enter into treaties in respect of those matters.

3. The instruments of ratification, acceptance, approval or accession shall be deposited with the Director-General.

**Article 27 – Entry into force**

This Convention shall enter into force three months after the date of the deposit of the twentieth instrument referred to in Article 26, but solely with respect to the twenty States or territories that have so deposited their instruments. It shall enter into force for each other State or territory three months after the date on which that State or territory has deposited its instrument.

**Article 28 – Declaration as to inland waters**

When ratifying, accepting, approving or acceding to this Convention or at any time thereafter, any State or territory may declare that the Rules shall apply to inland waters not of a maritime character.

**Article 29 – Limitations to geographical scope**

At the time of ratifying, accepting, approving or acceding to this Convention, a State or territory may make a declaration to the depositary that this Convention shall not be applicable to specific parts of its territory, internal waters, archipelagic waters or territorial sea, and shall identify therein the reasons for such declaration. Such State shall, to the extent practicable and as quickly as possible, promote conditions under which this Convention will apply to the areas specified in its declaration, and to that end shall also withdraw its declaration in whole or in part as soon as that has been achieved.

**Article 30 – Reservations**

With the exception of Article 29, no reservations may be made to this Convention.

**Article 31 – Amendments**

1. A State Party may, by written communication addressed to the Director-General, propose amendments to this Convention. The Director-General shall circulate such communication to all States Parties. If, within six months from the date of the circulation of the communication, not less than one half of the States Parties reply favourably to the request, the Director-General shall present such proposal to the next Meeting of States Parties for discussion and possible adoption.

2. Amendments shall be adopted by a two-thirds majority of States Parties present and voting.

3. Once adopted, amendments to this Convention shall be subject to ratification, acceptance, approval or accession by the States Parties.

4. Amendments shall enter into force, but solely with respect to the States Parties that have ratified, accepted, approved or acceded to them, three months after the deposit of the instruments referred to in paragraph 3 of this Article by two thirds of the States Parties. Thereafter, for each State or territory that ratifies, accepts, approves or accedes to it, the amendment shall enter into force three months after the date of deposit by that Party of its instrument of ratification, acceptance, approval or accession.

5. A State or territory which becomes a Party to this Convention after the entry into force of amendments in conformity with paragraph 4 of this Article shall, failing an expression of different intention by that State or territory, be considered:

(a) as a Party to this Convention as so amended; and

(b) as a Party to the unamended Convention in relation to any State Party not bound by the amendment.

**Article 32 – Denunciation**

1. A State Party may, by written notification addressed to the Director-General, denounce this Convention.

2. The denunciation shall take effect twelve months after the date of receipt of the notification, unless the notification specifies a later date.

3. The denunciation shall not in any way affect the duty of any State Party to fulfil any obligation embodied in this Convention to which it would be subject under international law independently of this Convention.

**Article 33 – The Rules**

The Rules annexed to this Convention form an integral part of it and, unless expressly provided otherwise, a reference to this Convention includes a reference to the Rules.

**Article 34 – Registration with the United Nations**

In conformity with Article 102 of the Charter of the United Nations, this Convention shall be registered with the Secretariat of the United Nations at the request of the Director-General.

**Article 35 – Authoritative texts**

This Convention has been drawn up in Arabic, Chinese, English, French, Russian and Spanish, the six texts being equally authoritative.

**Annex**
**Rules concerning activities directed at underwater cultural heritage**

**I. General principles**

**Rule 1.** The protection of underwater cultural heritage through *in situ* preservation shall be considered as the first option. Accordingly, activities directed at underwater cultural heritage shall be authorized in a manner consistent with the protection of that heritage, and subject to that requirement may be authorized for the purpose of making a significant contribution to protection or knowledge or enhancement of underwater cultural heritage.

**Rule 2.** The commercial exploitation of underwater cultural heritage for trade or speculation or its irretrievable dispersal is fundamentally incompatible with the protection and proper management of underwater cultural heritage. Underwater cultural heritage shall not be traded, sold, bought or bartered as commercial goods.

This Rule cannot be interpreted as preventing:

(a) the provision of professional archaeological services or necessary services incidental thereto whose nature and purpose are in full conformity with this Convention and are subject to the authorization of the competent authorities;

(b) the deposition of underwater cultural heritage, recovered in the course of a research project in conformity with this Convention, provided such deposition does not prejudice the scientific or cultural interest or integrity of the recovered material or result in its irretrievable dispersal; is in accordance with the provisions of Rules 33 and 34; and is subject to the authorization of the competent authorities.

**Rule 3.** Activities directed at underwater cultural heritage shall not adversely affect the underwater cultural heritage more than is necessary for the objectives of the project.

**Rule 4.** Activities directed at underwater cultural heritage must use non-destructive techniques and survey methods in preference to recovery of objects. If excavation or recovery is necessary for the purpose of scientific studies or for the ultimate protection of the underwater cultural heritage, the methods and techniques used must be as non-destructive as possible and contribute to the preservation of the remains.

**Rule 5.** Activities directed at underwater cultural heritage shall avoid the unnecessary disturbance of human remains or venerated sites.

**Rule 6.** Activities directed at underwater cultural heritage shall be strictly regulated to ensure proper recording of cultural, historical and archaeological information.

**Rule 7.** Public access to *in situ* underwater cultural heritage shall be promoted, except where such access is incompatible with protection and management.

**Rule 8.** International cooperation in the conduct of activities directed at underwater cultural heritage shall be encouraged in order to further the effective exchange or use of archaeologists and other relevant professionals.

**II. Project design**

**Rule 9**. Prior to any activity directed at underwater cultural heritage, a project design for the activity shall be developed and submitted to the competent authorities for authorization and appropriate peer review.

**Rule 10.** The project design shall include:

(a) an evaluation of previous or preliminary studies;

(b) the project statement and objectives;

(c) the methodology to be used and the techniques to be employed;

(d) the anticipated funding;

(e) an expected timetable for completion of the project;

(f) the composition of the team and the qualifications, responsibilities and experience of each team member;

(g) plans for post-fieldwork analysis and other activities;

(h) a conservation programme for artefacts and the site in close cooperation with the competent authorities;

(i) a site management and maintenance policy for the whole duration of the project;

(j) a documentation programme;

(k) a safety policy;

(l) an environmental policy;

(m) arrangements for collaboration with museums and other institutions, in particular scientific institutions;

(n) report preparation;

(o) deposition of archives, including underwater cultural heritage removed; and

(p) a programme for publication.

**Rule 11.** Activities directed at underwater cultural heritage shall be carried out in accordance with the project design approved by the competent authorities.

**Rule 12.** Where unexpected discoveries are made or circumstances change, the project design shall be reviewed and amended with the approval of the competent authorities.

**Rule 13.** In cases of urgency or chance discoveries, activities directed at the underwater cultural heritage, including conservation measures or activities for a period of short duration, in particular site stabilization, may be authorized in the absence of a project design in order to protect the underwater cultural heritage.

**III. Preliminary work**

**Rule 14.** The preliminary work referred to in Rule 10 (a) shall include an assessment that evaluates the significance and vulnerability of the underwater cultural heritage and the surrounding natural environment to damage by the proposed project, and the potential to obtain data that would meet the project objectives.

**Rule 15.** The assessment shall also include background studies of available historical and archaeological evidence, the archaeological and environmental characteristics of the site, and the consequences of any potential intrusion for the long-term stability of the underwater cultural heritage affected by the activities.

**IV. Project objective, methodology and techniques**

**Rule 16.** The methodology shall comply with the project objectives, and the techniques employed shall be as non-intrusive as possible.

**V. Funding**

**Rule 17.** Except in cases of emergency to protect underwater cultural heritage, an adequate funding base shall be assured in advance of any activity, sufficient to complete all stages of the project design, including conservation, documentation and curation of recovered artefacts, and report preparation and dissemination.

**Rule 18.** The project design shall demonstrate an ability, such as by securing a bond, to fund the project through to completion.

**Rule 19.** The project design shall include a contingency plan that will ensure conservation of underwater cultural heritage and supporting documentation in the event of any interruption of anticipated funding.

**VI. Project duration - timetable**

**Rule 20.** An adequate timetable shall be developed to assure in advance of any activity directed at underwater cultural heritage the completion of all stages of the project design, including conservation, documentation and curation of recovered underwater cultural heritage, as well as report preparation and dissemination.

**Rule 21.** The project design shall include a contingency plan that will ensure conservation of underwater cultural heritage and supporting documentation in the event of any interruption or termination of the project.

**VII. Competence and qualifications**

**Rule 22.** Activities directed at underwater cultural heritage shall only be undertaken under the direction and control of, and in the regular presence of, a qualified underwater archaeologist with scientific competence appropriate to the project.

**Rule 23.** All persons on the project team shall be qualified and have demonstrated competence appropriate to their roles in the project.

**VIII. Conservation and site management**

**Rule 24.** The conservation programme shall provide for the treatment of the archaeological remains during the activities directed at underwater cultural heritage, during transit and in the long term. Conservation shall be carried out in accordance with current professional standards.

**Rule 25.** The site management programme shall provide for the protection and management *in situ* of underwater cultural heritage, in the course of and upon termination of fieldwork. The programme shall include public information, reasonable provision for site stabilization, monitoring, and protection against interference.

**IX. Documentation**

**Rule 26.** The documentation programme shall set out thorough documentation including a progress report of activities directed at underwater cultural heritage, in accordance with current professional standards of archaeological documentation.

**Rule 27.** Documentation shall include, at a minimum, a comprehensive record of the site, including the provenance of underwater cultural heritage moved or removed in the course of the activities directed at underwater cultural heritage, field notes, plans, drawings, sections, and photographs or recording in other media.

**X. Safety**

**Rule 28.** A safety policy shall be prepared that is adequate to ensure the safety and health of the project team and third parties and that is in conformity with any applicable statutory and professional requirements.

**XI. Environment**

**Rule 29.** An environmental policy shall be prepared that is adequate to ensure that the seabed and marine life are not unduly disturbed.

**XII. Reporting**

**Rule 30.** Interim and final reports shall be made available according to the timetable set out in the project design, and deposited in relevant public records.

**Rule 31.** Reports shall include:

(a) an account of the objectives;
(b) an account of the methods and techniques employed;
(c) an account of the results achieved;
(d) basic graphic and photographic documentation on all phases of the activity;
(e) recommendations concerning conservation and curation of the site and of any underwater cultural heritage removed; and
(f) recommendations for future activities.

**XIII. Curation of project archives**

**Rule 32.** Arrangements for curation of the project archives shall be agreed to before any activity commences, and shall be set out in the project design.

**Rule 33.** The project archives, including any underwater cultural heritage removed and a copy of all supporting documentation shall, as far as possible, be kept together and intact as a collection in a manner that is available for professional and public access as well as for the curation of the archives. This should be done as rapidly as possible and in any case not later than ten years from the completion of the project, in so far as may be compatible with conservation of the underwater cultural heritage.

**Rule 34.** The project archives shall be managed according to international professional standards, and subject to the authorization of the competent authorities.

**XIV. Dissemination**

**Rule 35.** Projects shall provide for public education and popular presentation of the project results where appropriate.

**Rule 36.** A final synthesis of a project shall be:

(a) made public as soon as possible, having regard to the complexity of the project and the confidential or sensitive nature of the information; and

(b) deposited in relevant public records.

The foregoing is the authentic text of the Convention duly adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organization during its thirty-first session, which was held in Paris and declared closed the third day of November 2001.

Done in Paris this 6th day of November 2001 in two authentic copies bearing the signature of the President of the thirty-first session of the General Conference and of the Director-General of the United Nations Educational, Scientific and Cultural Organization, which shall be deposited in the archives of the United Nations Educational, Scientific and Cultural Organization and certified true copies of which shall be delivered to all the States and territories referred to in Article 26 as well as to the United Nations.

# Contact Information

## ICOMOS
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## ICOM
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## DOCOMOMO
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## UNESCO
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