

Information Sheet: Caring for Shipwreck Artefacts in Museums

This factsheet has been created for Victorian museums who are custodians of shipwreck artefacts. It outlines preventative conservation methods for shipwreck artefacts that are within the capabilities of museum workers and volunteers and provides guidance on when to seek professional help.

SHIPWRECKS IN AUSTRALIA

As an island nation, shipwrecks are an important part of Australian heritage. The artefacts associated with shipwrecks can tell us much about the past with information preserved in the item itself, the way it has been preserved or corroded on the sea floor and the positioning of the artefact within the shipwreck.

SPECIAL CARE FOR SHIPWRECK ARTEFACTS

Shipwreck artefacts are different from other historic museum items in three ways.

- All artefacts from shipwrecks over 75 years old have protective legislation that applies to them. See the *Shipwreck Legislation audio slide show* for more information.
- Shipwreck artefacts have an intrinsic appeal to the general public as coming from another world that is not easily accessible to most of the population.
- Shipwreck artefacts have made a major transition from a very wet but stable environment to a very dry and changeable environment. If this transition is not controlled carefully, then the shipwreck artefacts, which may have survived several hundred years underwater, may not survive very long in the museum environment.

This is why shipwreck artefacts require specialist care to prevent them from crumbling and corroding away.

CONSERVATION BASICS

The general principal of conservation is to perform minimum intervention on an artefact to ensure that it survives as long as possible. Preventative conservation is a sub-discipline that involves preventing artefacts from deteriorating by controlling the environment around them.

While only professional conservators should carry out conservation, museum workers and volunteers are able to incorporate preventive conservation techniques into the day to day museum operations to ensure that artefacts last well into the future.

Conservation basics include:

- correct artefact handling: only when necessary, use gloves, support artefacts when moving them. See *Museum Collection Care factsheet* for more information.
- good housekeeping: keep food away from artefacts, dust regularly, set pest traps. See *Museum Collection Care factsheet* for more information.
- creating a stable environment: minimise light and heat in areas with artefacts by installing curtains, using low heat light bulbs, providing barriers between artefacts and environment in the form of display cases and boxes. See *Conservation and Lighting Factsheet* for more information.

SHIPWRECK ARTEFACTS BY MATERIAL TYPE

The method of underwater preservation of shipwreck artefacts depends upon the material type represented in the artefact. The following section will outline the key points for preservation of the main material types likely to be encountered by museum workers and volunteers. These are: wood, metal, ceramics and glass.

For each material type the information will be explained in the following way:

- an outline of the underwater processes that contributed to the artefacts' preservation
- a description of the professional conservation techniques that should only be attempted by conservators
- tips on preventative conservation and monitoring techniques that can be completed by museum workers and volunteers.

WOOD

Underwater processes effecting wood

- The degradation of cellulose, one of two main components of wood, leaves wooden items structurally unsound and liable to crack and disintegrate upon drying.
- Marine worm will attack any wood left exposed on seafloor, burrowing into the timber and contributing to the structurally unsound artefact.

Professional conservation of wood

Qualified conservators replace the water in shipwreck wood with a waxy substance called polyethylene glycol (PEG) which prevents the wood from collapsing during the drying process. PEG treatment is a specialist activity, is time consuming and expensive so it is not always a viable option. A large table from the *SS City of Launceston*, housed at Heritage Victoria's conservation Centre, had a PEG treatment that lasted for over 10 years and which has only recently begun its drying phase.

Preventative conservation of wood

Wooden artefacts should be stored or displayed in a cool, stable environment and away from strong light. Wooden items in warm humid environments can be subject to higher instances of biological growths such as mould and more prone to insect attack, while fluctuating seasonal conditions can cause the timber to shrink and crack. It is important to maintain good housekeeping routines to reduce the risk of insect or other biological attack.

When attempting to move wooden artefacts, remember that while an artefact may look to be in sound physical condition, it may be fragile structurally from the degradation processes, so always keep it well supported when lifting or carrying and be aware of its fragile aspects.

Monitoring of wood

Monitor wooden artefacts in storage and display spaces for:

- drying out and shrinkage
- biological deterioration by algae or fungi or evidence of other biological organisms through bird and rodent droppings, wood dust, tooth marks or holes.

METAL

Underwater processes effecting metal

Metal artefacts can have a good survival rate underwater but this depends on a number of factors. Most metals that are underwater will corrode to a certain extent until they reach an equilibrium with their surrounding environment. Once they become stable they can survive for some time underwater unless their environment changes – such as becoming exposed on the sea floor due to storms or illegal activity.

- Pure gold usually survives underwater for a great length of time without corroding.
- Silver will corrode quite easily, become very fragile and form a concretion with similar items such as silver coins.
- Copper, brass and bronze can develop a shiny pitted surface and can become covered with a layer of concretion as well as green or black corrosion product.
- Ferrous metals such as cast and wrought iron and steel usually corrode to form thick concretions that can entirely engulf the artefact. Cast iron can form dense concretions around the artefact while wrought iron will develop a dense concretion layer around the original metal which can then often disappear entirely leaving only a void.

Professional conservation of metal

Professional conservators can work towards making metal objects more stable and to slow down further corrosion by treating them in various ways. One such method is desalination treatments to leach out the chloride ions which are the cause of corrosion in metal.

Preventative conservation of metal

Preventative conservation for metal items involves:

- desalination
- storage or display in a cool, low light, stable environment with low humidity to prevent corrosion from continuing.
- Keep like metals together and away from dissimilar metals will also prevent corrosion from starting again.
- Do not remove corrosion products or concretions as these could be holding the artefact together or could contain important historical or environmental information.
- On no account use abrasive cleaners or wire brushes on metal artefacts as these can remove makers marks and fine important details. If the museum finds it necessary to remove concretions be sure to seek professional advice first.

Monitoring of metal

Monitor metal artefacts in their stable display or storage environments. Watch out for new corrosion activity or salt build up appearing on the surface of metal artefacts and if they do seek the advice of a qualified conservator.

CERAMICS

Underwater processes effecting ceramics

When ceramics are in the underwater environment, salt from sea water will penetrate the artefact and can damage glazed surfaces. Equally so, when the ceramic artefact is removed from the salt water environment, the salts within the ceramic body can move and end up coating the exterior of the ceramic with salt crust which often disrupts the glaze and causes a great deal of damage.

Ceramic artefacts are prone to breakage and chipping if left exposed underwater but if protected by burial they can remain in good condition.

Professional conservation of ceramics

The professional conservation procedure for treating aged shipwreck ceramics is to desalinate the ceramic body by keeping the artefact totally submerged in a fresh water bath and periodically changing the the water. Low fired and unglazed pottery may have absorbed more salt so may take longer to desalinate than higher fired porcelain and stoneware. When testing of the wash water has indicated that the majority of the salts have been removed from the ceramic body, the artefact can then be slowly dried and made ready for display or storage.

Preventative conservation of ceramics

Preventative conservation procedures for ceramics are as follows:

- do not clean stains or remove marine growth as they can contain important information and may also be integral in holding the item together. Glazed surfaces can be very fragile and should be treated with care.
- Seek professional advice before attempting to 'restore' or glue together pieces of a broken ceramic. Conservation grade adhesives are required to ensure long term adhesion without long term adverse side effects.
- Do not empty the contents of any vessel as this can provide vital information about the purpose of the vessel.
- Care needs to be taken to pack artefacts carefully for storage or transportation, and adequate support needs to be arranged for artefacts when on display.

Monitoring of ceramics

In the long term, watch the outside surface of ceramics for the build up of salt, as this is an indication of an incomplete desalination process. Seek professional advice from a qualified conservator if this happens.

GLASS

Underwater processes effecting glass

Glass is made from silica and a variety of other components that give the glass colour. The ratio of silica to other components determines the stability and longevity of glass underwater. These other components or mineral compounds can leach out over time and they are the cause of the iridescent rainbow patterns and flaking of the outer surface of glass artefacts.

Professional conservation of glass

Due to the great variations within glass there are a variety of professional conservation methods required. In general glass should be desalinated and dried carefully but this should be performed by qualified object conservators.

Preventative conservation of glass

The preventative conservation method for glass is to carefully pad any glass in storage and provide adequate support for any glass shipwreck item on display. Take all measures to avoid chipping and breakage of these very fragile items. Do not clean the surface of glass to remove staining or marine growth as this could lead to the surface flaking off.

Monitoring of glass

Watch for de-laminating or flaking of the surface of glass artefacts and seek professional guidance of a qualified conservator if this happens.

HOW TO CARE FOR SHIPWRECK ITEMS RECENTLY REMOVED FROM THE SEA

If a new shipwreck artefact is discovered and brought to the museum, it should first be reported to Heritage Victoria's Maritime Heritage Unit. Then a conservator specialising in maritime artefact conservation should be consulted. However, there are some simple procedures that can be completed by non-conservators to ensure that the artefact does not rapidly deteriorate.

These can be considered as 'first-aid' procedures for shipwreck artefacts.

- Keep the artefact wet at all times either by being totally submerged in an appropriate sized tub filled with water or if the item is too large, wrap it with material that will retain the moisture and keep the item wet.
- Refer to a conservator for the next steps!
- Next the artefact should be desalinated to remove the salt content. A simple method is to ensure that the fresh water surrounding the artefact is changed regularly as the salt will be leached out of the artefact into the water in a continuous cycle. When changing the water be sure that there is not a flood of water travelling past the item as this could cause sections to break off.
- The levels of salt coming out of the artefact must be monitored by a conservator to ensure that all the salt has been removed
- Dry the artefact very slowly. No fans or heaters should be used for this process. Air-drying is the best method for some artefacts, but not others so seek the advice of a conservator.
- Continue to monitor the artefact over the long term to ensure that it does not corrode, become pest infested or disintegrate.

LINKS AND RESOURCES

Heritage Victoria

<http://www.dpcd.vic.gov.au/heritage>

Australian Institute for the Conservation of Cultural Material

<http://www.aiccm.org.au/>

ReCollections, the best practical conservation advice

http://www.collectionsaustralia.net/sector_info_item/3

Caring for marine objects factsheet

http://www.anmm.gov.au/webdata/resources/pdfs/collections/Caring_for_marine_objects_2009.pdf

Caring for metal objects

http://www.anmm.gov.au/webdata/resources/pdfs/collections/Caring_for_metal_2009.pdf

Heritage Victoria Centre for Conservation and Research

<http://www.dpcd.vic.gov.au/heritage/archaeology/material-and-artefact-conservation-about#hvcfcar>

Shipwreck conservation resources list

<http://www.anmm.gov.au/site/page.cfm?u=1481>

Texas A & M University Conservation Manual

<http://nautarch.tamu.edu/CRL/conservationmanual/index.htm>

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