Site Security Champion Ron Howell briefing Devon & Cornwall Police prior to diving the Salcombe Canon protected wreck. Credit: MSDS Marine

Protective marking and new technologies

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In recent years there have been several steps forward in tackling heritage crime. The development of methods to reduce heritage crime at sea followed on from the high-profile thefts from protected wreck sites, including a bronze cannon from the Dunwich Bank protected wreck and a torpedo tube hatch from the *Holland 5* protected wreck.

Forensic markers have already been used to great effect on historic buildings for several years. Products are used to mark heritage metals, such as the lead on the roofs of churches. The well-publicised use of these materials has been of benefit as both a deterrent and to aid enforcement action and potential recovery. Forensic marking in this way allows scrap dealers to be alerted to the provenance of the material and provides a way to flag when material has been removed from sites illegally. In this way, material can be directly linked back to where it came from.

Underwater forensic marking

No equivalent technology existed to mark material underwater, so Historic England commissioned a project to develop a product that was suitable for use in the marine environment. The project was undertaken by MSDS Marine and was funded by Historic England and the Cultural Heritage Agency of the Netherlands. The products underwent vigorous testing in a range of environments. Once the best products were identified from the tests, two were taken forward for deployment in a real-world situation.

The markers were deployed on protected wreck sites in English waters during the summer of 2023. One of the sites marked was the wreck believed to be the *Klein Hollandia*, a Dutch vessel lost in 1672. The site includes several bronze cannon, which are highly tempting targets for unscrupulous salvers. They are worth a high price for their scrap metal value and highly attractive to collectors. All of the bronze guns on this site have now been forensically marked. This means that should any of the guns be stolen, the marking product will enable enforcement authorities to identify them as well as link individuals who have been in contact with the items to the site. This is an incredibly important development for underwater sites that are often located away from the sight of managers and custodians.

Satellite monitoring

Another way in which archaeologists are attempting to tackle the threat of heritage crime offshore is through the application of satellite monitoring technology. The Maritime Archaeology Sea Trust (MAST) has developed the Maritime Observatory, in partnership with OceanMind. As well as examining patterns of vessel movement through the monitoring of vessel Automatic Identification Systems (AIS) the observatory uses a combination of satellite-based electro-optical (EO) and synthetic aperture radar (SAR) imagery to monitor activities in the vicinity of key sites. To the frustration of heritage managers and enforcement officials, AIS can be switched off, allowing a

vessel's activities and precise location to go undetected. However, through these additional methods of monitoring the true pattern of activity can be established. MAST has undertaken work to monitor the wrecks of Second World War British warships in the Java Sea, and has recently undertaken a review of activities in two areas around the coast of England on behalf of Historic England.

Expanding on techniques on land

The use of new technologies to tackle heritage crime on land has been progressing at pace along with that in the marine zone. The forensic marking of heritage metals has now incorporated new techniques of physical stamping, in addition to the forensic markers. These stamps are clearly visible to potential thieves, providing a deterrent effect, and are also easily identified by scrap dealers. The markers will allow the sites to be identified, as they link back to the National Heritage List for England. These improved methods, along with a comprehensive training package for scrap metal dealers, makes it much harder for thieves to offload stolen material.

The products outlined here form part of a suite of methods to tackle heritage crime on land and at sea. By working together with partner agencies and members of the public we can make it much harder for thieves to target these sites and help reduce the threat of crime taking place. New opportunities and developing new technologies will help tackle the ever-present threat of criminals targeting the historic environment.

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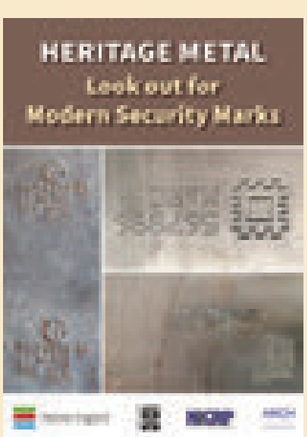
MSDS Marine diver holding an underwater sign indicating that a site is forensically marked and visiting divers should look but not touch. Credit: MSDS Marine



Security marking on heritage metals. Credit: Historic England

Alison James

Alison is a director at MSDS Marine with experience in the management of historic shipwreck sites, volunteer involvement, community engagement and education initiatives. Previously Alison spent ten years with Historic England managing England's protected wreck sites and working with the licensed teams and volunteers who work on the sites. Alison is also a Trustee of the Nautical Archaeology Society.

Hefin Meara

Hefin is a committee member of the ClfA Marine Archaeology Special Interest Group. He is a maritime archaeologist at Historic England, with responsibility for marine designation casework and the management of protected wrecks. This year he has been involved with several projects to mark the 50th anniversary of the Protection of Wrecks Act 1973. He is also currently working on the redevelopment of the National Marine Heritage Record and is also preparing a conservation management plan for the wreck of Sir Ernest Shackleton's *Endurance*, in partnership with the UK Antarctic Heritage Trust.