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)

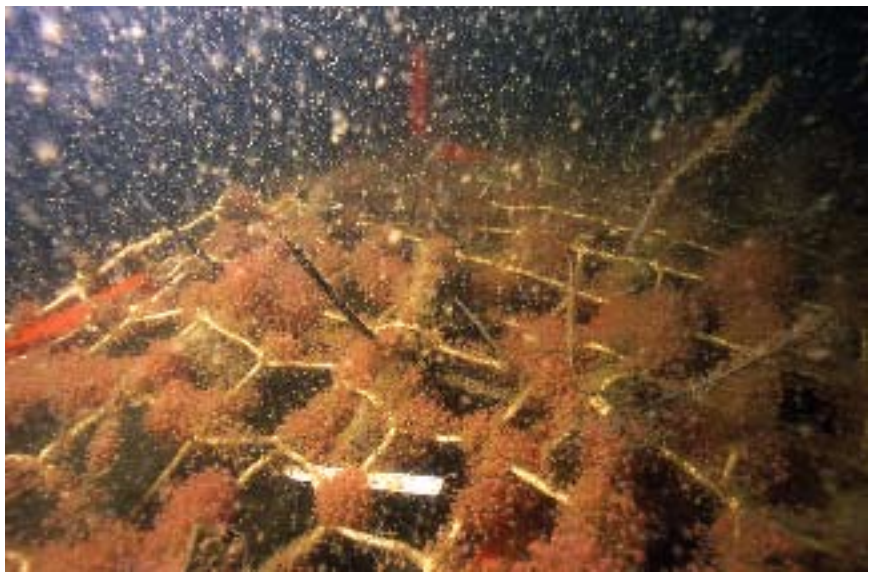

Figure 2: Fresh pine and oak woodblocks are hanging freely in the water within an open weave net. These samples help us to understand which processes are responsible for the deterioration of shipwrecks that are lying uncovered on the seabed (R. Obst)

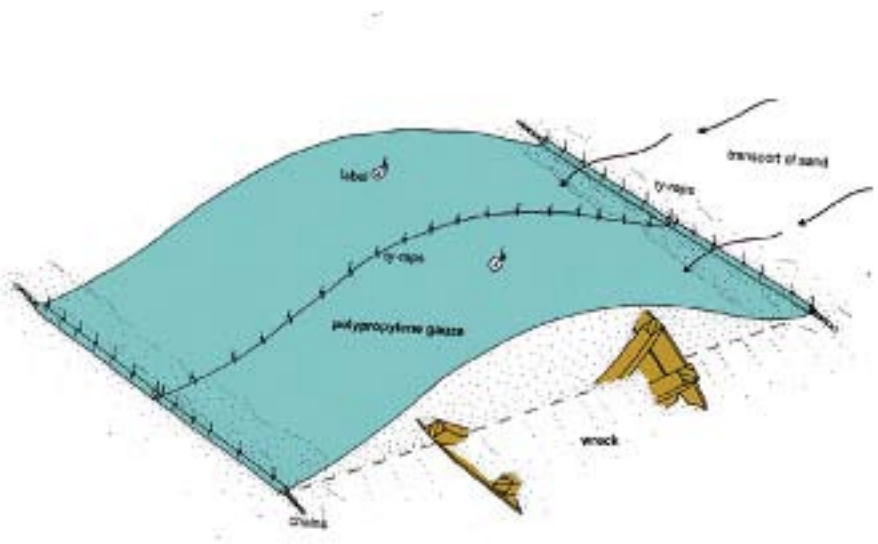

Figure 3: The method of physical protection used on several sites in the Wadden Sea. Sand that is moved over the seabed by the currents penetrates the holes of the net and settles on the site. Within a few weeks, the whole site is covered again with a thick layer of sediment (Drawing M. Manders/M. Kosian)

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.

Further Reading

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