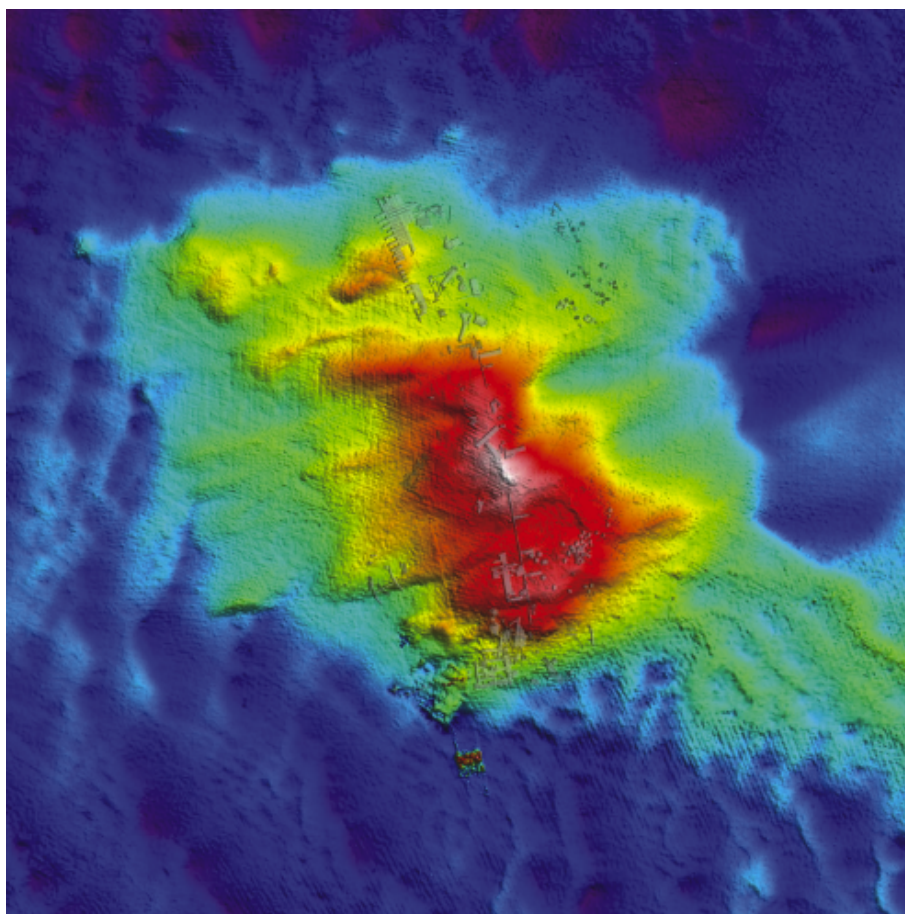


Management plan of shipwreck site Burgzand Noord 10



NISA 2004



Education and Culture

Culture 2000

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0. Administrative details

0.1. Date

29-04-2004

0.2. Purchaser

Dutch state (Department OCW/ROB)

0.3. Contractor

NISA

Work executed by the diving team

(F. Koppen, P. Leensen, Th. Maarleveld, M. Manders, R. Mulkens, A. Overmeer, H. Schraal, A. Vos, L. Vroom)

Report: drs. M. Manders

0.4. Approved authorities

ROB

0.5. Central registration number

(CMA) 09 G-006

0.6. Location research area

Province: Noord-Holland, The Netherlands

Municipality: Texel

Place: Burgzand

Toponymy: Burgzand Noord 10 (BZN10)

0.7. Coordinates

Measured by R. Mulkens

Map: Hydrographical chart of the Wadden Sea nr. 1811.3 (edition 2001) scales 1:75000

0.8. Environmental context

Coastal Geology

The site is always situated under water, in an area with a sloping seabed of old sand banks and gullies. Shallow tidal zone. Hard Pleistocene seafloor with a top layer of sand.

Climate

Sea climate of northwest Europe. Four seasons.

Flora and Fauna

Sea flora and fauna of northwest Europe. More details will come from the MRAS

who does the determination within the MoSS project. Bacteria and fungi are present in wood as well as woodborers (at least the *Teredo navalis*). Also tube worms (seasonal?), sea anemones, all kinds of seaweed, crabs, barnacles, etc.

Human impact

There is no infra structural work going on in this area. However, the area is regularly used for recreational purposes and for fishing activities. There is sand coming near to the wreck site once in a while. We don't yet know if this affects the site. In 1932 the Afsluitdijk was constructed. Due to this dike, the water is now abruptly stopped from entering the former Zuyderzee. It instead bounces back and leaves the Wadden Sea for the North Sea with great force. This causes heavy erosion of the seabed in the Burgzand area (up to 7 metres). No change is expected before 2040-2060.

The Western Wadden Sea has been placed on the Tentative List by UNESCO. Until now the management of the whole area has not been very transparent. This has led to the need for a different management strategy which will be decided upon in 2004/2005. Responsibility for the area will come into the hands of one body instead of the many different authorities now responsible. At the same time drilling for gas under the Wadden Sea has been approved by the Dutch government since some research has showed that this would not affect the area. This belief is not shared by nature conservation organisations. They think that it will cause the inclination of the seabed. It is intended that a substantial part of the profit from this should flow back into the management of the Wadden Sea area. This could mean a financial injection of up to about EUR 700.000.000 - for nature and also (hopefully) the safeguarding of cultural heritage.

0.9. Size of research area

In 2001: Surface: approximately 800 square metres.
Width: 22 metres
Length: 36 metres
Site protection was extended in 2003 to 2000 square metres.

0.10. Depth

6 to 9 metres (tidal movements)

0.11. Owner terrain

Municipality of Texel

0.12. Reported by

10-11-1999 by Mr. Hans Eelman (Texel) to Dr. J. van den Akker (ROB-Maritime Heritage). The wreck was sighted for the first time in 1999 by H. Eelman. In the local diving scene it acquired the name "Lelie 2". According to its discoverer it was possibly a fragment of an earlier found wreck (BZN 8) which he thought

was the “Lelie”. The two wrecks are located approximately 200 metres from each other.

0.13. Periods of research

- * 07-08-2000 to 22-08-2000: non-intrusive Assessment. Physical protection of the vulnerable parts of the wreck.
- * 24-08-2001 to 28-08-2001 monitoring and partly physical protection with gauze (800 square metres).
- * 10-06-2002 to 17-06-2002 monitoring and installation of equipment for MoSS.
- * 11 + 12-07-2002, monitoring and working for MoSS.
- * 29-08-2002. Monitoring, changing data logger and lifting samples 3 months.
- * 17-12-2002. Monitoring, changing data logger and lifting samples 6 months.
- * 2-06-2003. Monitoring and preparation for MoSS.
- * 11 to 23-06-2003. Monitoring, lifting samples 12 months, changing data logger and the size of the area with physical protection to 2000 square metres.
- * 15-07-2003. Monitoring, check-up for physical protection.
- * 29-08-2004. Monitoring and changing data logger.
- * 15-1-2004. Monitoring and changing of data logger.
- * 15-03-2004. Monitoring and changing of data logger.
- * 15-06-2004. Monitoring, changing data logger and taking samples of 2 years (aerobic and anaerobic).

0.14. Description of Research area

The Burgzand is an area with old submersed sand banks that is part of the Western Wadden Sea. This area is a part of the Tentative List produced by UNESCO. Research can only be done here under special conditions (the Dutch program of requirements and the UNESCO-convention of 2001). The wreck is lying on the old Texel Roads: a safe natural haven sheltered by the Island of Texel. The distance between the wreck site and the harbour of Oudeschild (on the Island of Texel) is approximately 3, 5 kilometres.

0.15. Deposition of archives

Archive of Maritime Heritage (ROB): Information on the discovery of the wreck, the assessment information and the management plan of BZN 10.

Address: Kerkstraat 1, P.O. box 1600, 3800 BP Amersfoort, The Netherlands.

Archive of the NISA in Lelystad: Dive reports and drawings.

Finds are in the open depot at the NISA in Lelystad.

Address: NISA: Oostvaardersdijk 01-04, 8242 PA Lelystad, The Netherlands.

Additional information can be found on Texel at the address of Mr. H. Eelman.

0.16. Legal status

The wreck is not legally protected, but part of the Western Wadden Sea (Tentative List UNESCO). The Monuments Law of the Netherlands (1988) can be applied (the wreck is older than 50 years).

0.17. Recognized threats

- * Natural erosion: abrasion, (under) scouring
- * Fishing activities
- * Sports diving, Looting
- * Wood borers
- * Bacteriological attack
- * Overgrowth by sea organisms
- * Fungi attack
- * Crabs

0.18. Date of re-assessment/re-evaluation

Scheduled for the second half of August 2004. Then there will be another dive on the site to change the data logger.

1. Introduction

1.1. Previous studies (Literature)

Baarda, F., Schatten in de Waddenzee, in: National Geographic May 2004, Dutch issue.

Kuijper, W & M. Manders, South American Palm fruits in shipwrecks, Environmental Archaeology 8, 2003, 185-187.

M. Manders, Waardestellende verkenning van het BZN 10 wrak, Internal report, NISA, 2001.

MoSS Newsletter 2003: IV. Theme: Burgzand Noord 10. December 2003.

MoSS Newsletter 2004: III. Theme: The Safeguarding Theme. May 2004.

MoSS Newsletter 2004: II. Theme: The Monitoring Theme. March 2004.

MoSS Newsletter 2004: I. Theme: The Visualization Theme. January 2004.

Website MoSS: www.mossproject.com

1.2. Historical context

*Seafaring of the 17th century.

*Merchant vessels trading between the Baltic Area and the Mediterranean (“doorgaande vaart”).

*The Texel Roads, an anchorage area for ships with too much draught for sailing the shallow Zuyderzee. They were waiting there to be loaded or unloaded with cargo.

2. Assessment of the site

2.1. Description of research assignment

2.1.1. Reference to working standards

KNA (Quality Standard Archaeology, NL).

NISA standards for non intrusive assessments and monitoring.

Annex of the UNESCO convention 2001.

European Community Culture 2000 Programme/ The MoSS Project.

2.1.2. Research objectives

In 2000: The primary task was to carry out a non intrusive assessment at the site:

1. To evaluate a shipwreck that has been found by local divers. This has to result in selection advice being given according to fixed (standard) criteria. In this way shipwrecks can be compared.
2. What is the value of the Burgzand Area (Western Wadden Sea) for (Dutch) maritime heritage? This area is nominated as a World Heritage site (Tentative List, UNESCO for World Heritage) by the Netherlands and Germany. This nomination has to be based on its natural historical and cultural historical significance. The cultural historical significance will be proved by doing non intrusive assessments on different shipwrecks in this area. The BZN 10 is only one of many wrecks in this area being assessed.
3. 2001-2004. "To develop tools for different European countries to protect (mutual) maritime Heritage in an effective way." BZN 10 is being used as a research object and sampling site within the EU-project MoSS. Within the project answers are sought for the following questions:
 - What is "preservation in situ"?
 - How long can a shipwreck be protected?
 - When is protection in situ possible and when not?
 - Is the current approach viable?

2.1.3. Expected results

- * To find a 17th century shipwreck at the location shown to us by its discoverers. Immediate result (short term).
- * The wreck also has a cargo. Immediate result.
- * Possibly it is a fragment of the "Lelie". Immediate result.
- * The wreck is archaeologically interesting. Immediate result.
- * Finding answers about how wrecks degrade and how these objects can be safeguarded. Middle and long term result. Parts of the research will be described in the final publication of the MoSS-project, but much of this information will become available in subsequent years and if research continues after the MoSS project.

2.1.4. Aim / wishes of purchaser

To build up a well documented archive of archaeological interesting shipwrecks in Dutch waters.

2.1.5. Imposed research conditions

Non intrusive assessment at the site. Following the strategy that can be seen in the scheme described in attachment 6.

If of archaeological value, then the wreck should be physically protected to safeguard its information value.

2.1.6. Evaluations in between

After the non intrusive assessment (in 2000):

it was decided to protect the wreck. After every monitoring (until 2004 this will be done within the MoSS project) there will be an evaluation.

2.2. Working procedure

2.2.1. Research methods

- * See the working procedures of the KNA and NISA.
- * Non-intrusive research methods were used. See also attachment 6.
- * The area was mapped with Web-it. Only things sticking out of the seabed were recorded. Objects that could help us to identify or date the site were lifted as long as they were lying on the seabed surface (“guiding fossils”). See attachment 1.
- * Drawings of construction elements were made underwater.
- * The site has been recorded on digital video and in photographs.
- * Wood samples were taken for dendrochronology (intrusive).
- * Special research has been done for MoSS according to the protocols developed within this project (see MoSS-protocols on monitoring). The environment has been monitored with a data logger and woodblocks and cellulose textile samples have been placed to monitor their deterioration.
- * The wreck site and its protection have been monitored with multi beam sonar from the sea’s surface.

2.2.2. Imposed work conditions

See NISA Work regulations.

2.2.3. Density of perception grid

Only things sticking out of the seabed were registered. No excavation has taken place.

The non-intrusive assessment had to be done in a maximum period of 10 days. The drawing of the site was done by sketching in combination with Web-it.

2.2.4. Natural sciences, applied sciences and other research

- * Samples (wood, Shirley textile and soil) have been taken within the MoSS project and are being investigated in Portsmouth by MRAS and UoP.
- * Some biological studies have also been carried out on the organisms growing on the site like *Teredo navalis*, seaweed, fungi and bacteria (by MRAS).
- * A data logger (EauxSys Ltd.) has been placed on the site to investigate the water around the wreck (dissolved oxygen, salinity, depth, temperature, conductivity, turbidity: in water and pH and Redox: in sediment and the sedimentation on the wreck)
- * Side Scan Sonar
- * Multi beam sonar
- * Opus 3D

2.3. Research results

2.3.1. Environmental research

- * The environmental research consists of collecting visual information on the natural environment and any changes to it.
- * Other changes, like those caused by fishermen and wreck divers are also described.
- * In addition, a datalogger has been placed on the seabed next to the ship measuring pH and redox potential in the sediment, the amount of sedimentation and dissolved oxygen, temperature, salinity, turbidity, depth and conductivity in the water. In 2003 two sediment samples were taken from the site and sent to the MRAS for analysis.
- * The influence of the environment on the degradation of the ship's wood has been investigated by placing wood samples in the water and in the sediment next to the wreck.
- * Cellulose (Shirley textiles) has also been placed in the sediment.
- * For the results see the final results of the MoSS project.
- * Information about the environments of comparable wreck sites BZN 3 and BZN 15 will soon be available from the BACPOLES project (www.bacpoles.nl).

2.3.2. Physical condition

2.3.2.1. Finds visible on surface

- * All of the finds that were visible during the assessment are drawn on the site plan. A large part of the cargo of olive jars was surfacing the seabed. Some of the jars still had their baskets while others had already lost them due to heavy erosion.
- * Parts of the rigging were also visible. In total 9 canons were seen as well. Further, some ceramics used on board, barrels with fish and grapes, items of kitchenware and an Obignya nut (palm fruit) have been taken from the site.

2.3.2.2. Completeness

2.3.2.2.1. Completeness wreck parts

An almost complete starboard side has remained in place on the seabed. Two complete decks can be followed from the flat stern to the bow. The beams of the deck are sticking approximately 2 metres out of the seabed. Near the bow there's the galley and even a wooden figurehead has been sighted on the outside of the ship in the bow. Parts of the rigging are still outside the wreck over the starboard side.

2.3.2.2.2. Stratigraphy intact

The wreck has not been excavated, it is therefore uncertain if the whole stratigraphy is intact. However, if we look at the condition of the finds surfacing the seabed, we may assume that the find layer has hardly been disturbed.

2.3.2.2.3. Mobilia in situ

Yes. The finds that have been located and (some of them even) taken up were all found in a logical place. Used earthenware was found especially around the galley and in the aft of the wreck, above the second deck. The casks, chests with schist slates and olive jars were found below the first deck, in the hold. The kitchenware was found around the galley. Much of the mobilia must still be in situ.

2.3.2.2.4. Relation between mobilia and wreck parts

See at 2.3.2.2.3.

Yes.

2.3.2.2.5. Relations between mobilia

The relations between the mobilia that have been seen are: canons and wheel carriages, the cargo; Iberian (olive) jars, casks and boxes with schist slates. If we look at 2.3.2.2.3 to 2.3.2.2.5 it is clear that there is a relation between the different mobilia.

A shipwreck with its contents has an assemblage value.

2.3.2.2.6. Stability of natural environment

The natural environment is not stable. The tidal movement of the sea stirs up the top layer of the seabed and creates currents around the wreck site that take away the protective layer of sand. Due to (probably) the salinity and the temperature of the sea water (that can reach up to 23 degrees Celsius in summer), there is strong degradation of the wood by wood borers like the *Teredo navalis*. Due to the Afsluitdijk, the seabed will erode by another two metres in the next decennia. The natural under water channels or gullies in the Wadden Sea are changing all the time. This means that an area that has been a sandbank for centuries might suddenly disappear and become an under water channel where

ships can pass. This can be very damaging for ship wrecks that were relatively protected by the sand and then suddenly become exposed.

The condition of the wreck parts show however, that the wreck has been protected by the sediment for a long period of time.

2.3.3. State of preservation

When we did the assessment in 2000, the wreck had just been uncovered by a change in the environmental conditions. It looked as if the wreck had not been exposed to the sea water for too much time. All parts of the wreck and cargo were in extremely good condition. Only the deck beams that were sticking out of the seabed had been attacked by woodborers.

2.3.3.1. Organic wreck parts

Wood: good solid condition. Only the wood sticking out of the seabed has been degraded severely by woodborers.

Hemp (rope): fairly good condition. The rigging has hardly been visibly damaged; however the strength of the rope has been lost.

2.3.3.2. Metal wreck parts

The iron is in very bad condition. Most of the iron is hollowed out by concreting (pyrite concretion)

2.3.3.3. Organic mobilia

Very good condition. The baskets of many olive jars are preserved. Some of the casks that have been found were still complete and closed, even with their willow hoops still in place. The chests of the schist slates also seem to be in a good condition. We even found grapes in casks still recognizable and comparatively in a very good condition.

2.3.3.4. Metal mobilia

The iron is in a bad condition while the copper, brass and lead are in a better condition although there has not been any research undertaken to determine their exact condition. Usually copper, brass and lead will be in a good condition while pewter can be of lesser quality.

2.3.4. Cultural-historic and archaeological data

2.3.4.1. Identification

2.3.4.1.1. Cultural context

Post-Medieval, probably not Dutch. The wood, inventory and construction of the vessel point to a northern German origin. The largest cargo (jars) points to an Iberian origin. Grapes and small fish (anchovies) also point in that direction. It is not yet known where the schist slates come from. Hypothesis: A German ship from the second half of the 17th century which was wrecked on its return

voyage from the Iberian Peninsula. It was lying on the Texel roads probably because it intended to trade goods with the Amsterdam Staple Market.

2.3.4.1.2. Century

Building: second half 17th century.

Wreckage: second half 17th century (dating by mobilia)

2.3.4.1.3. Exact dating

Tree Ring Datum (dendrochronology): After 1645 AD and after 1646 AD (post quem). See attachment. Dendrochronology dating by RING. The only wood samples that could be dated were pine samples.

2.3.4.1.4. Function

Trader

2.3.4.1.5. Type

Armed trader with a squared stern and two continuous decks with a considerable flair. The exact type of the ship is not known.

2.3.4.1.6. Operating area

Sea

2.3.4.1.7. Propulsion

Sail (sailing ship)

2.3.4.1.8. Size

Length over the stern and the bow post is more than 35 metres. Width and height are not reconstructed yet.

2.3.4.1.9. Material

Oak, pine and iron

2.3.4.1.10. Building tradition

Carvel built vessel. It is not known if the ship was built according to a frame first or shell first method.

2.3.4.1.11. Inventory

Yes; cooking gear, ceramics, canons

2.3.4.1.12. Cargo

Yes; Iberian jars, schist slates, casks with anchovies and grapes, little bells, balance bowls and wood to make small oval wooden boxes.

2.3.4.1.13. Personal belongings

Yes; small clay pipe.

2.3.4.2. Constructional features

The ship's structure stretches out over more than 35 metres.

* The site consists of an almost complete starboard side; preserved from the squared stern to the bow and from the hold to the bulwarks.

* The aft can be followed until the end, with its six shell planks sticking out and under these, planks with a profile sticking out of the seabed at a 90 degree angle to the other shell planks. This indicates a squared stern.

* A wooden figurehead was located on the bow.

* There are two continuous decks with a considerable flair.

* The galley is situated relatively far from the bow, very probably a long way before the main mast.

* Many different kinds of pulley block and other parts of the rigging have been found.

* The fact that so much pinewood (*Pinus sylvestris*) has been used to build the ship is extraordinary. Pinewood is used in some of the shell planks, the frames, the deck beams, deck knees, ceiling planks and planks in the cabins. This is not common for Dutch ships. The pinewood has been identified as coming from northern Germany (see dendrochronological report; attachment).

* On the west side of the wreck, at the bow section, two big anchors were found with shafts that were 2, 5 and 1, 6 metres long respectively.

* In the aft, as well as the bow section of the wreck, two wooden gratings were found. The one in the aft is 105 cm in width.

* The hatch of a gun port was found near one of the anchors west of the bow. It is 64 cm in width. It is probably not lying in situ.

* The shell planks of BZN 10 are approximately 5 cm thick, the wales approximately 7 cm. The frames of the bulwarks in the aft are only 10 cm thick with a width varying between 17 and 21 cm. It was only possible to measure one frame lower in the construction of the aft. This curved frame has a maximum thickness of 18 cm. In the bow section the measured frames are from 11 to 17 cm wide. One frame high up in the ship is 18 cm thick. The ceiling is 4 to 5 cm thick. The beam shelf ("balkweger") is 8 cm thick.

* The deck beams are huge. The deck beam from the first deck is 31 cm wide and 28 cm thick. One deck beam from the second deck is 28 cm wide and 21 cm thick. The beams are usually supported on two sides with deck knees. Many deck beams are sticking out of the seabed at a height of over two metres.

* The deck beams in the middle of the ship, between the first and the second decks, are 1, 90 m apart from each other (height first deck).

* Shell planks, frames and ceiling are attached to each other with wooden pins (diameter 3, 5 cm).

To conclude in relation to the expected results:

We have found a 17th century armed trader with its cargo. However, as a result of its strange construction elements which were observed during the non-

intrusive assessment, we have to draw the conclusion that very probably the BZN 10 wreck is not the Lelie (it was called Lelie 2) and isn't very likely to be the BZN 8 wreck (Called the Lely) either.

It is more likely to be of North-German origin, but in future this will have to be investigated further.

3. Cultural valuation of shipwreck BZN 10

(In this chapter a description of the wreck's value is given. The value can be expressed by using descriptive, judgemental or scoring methods. Here the scores are omitted, but in theory this method can be used to compare all kinds of wreck sites and to prioritize them.

3.1. Experience aspects (quality)

3.1.1. Aesthetic values

3.1.1.1. Visible

3.1.1.1.1. Visible as landscape element

The wreck is situated on the seabed, 6 to 9 metres below the surface of the water. The water is unclear. It is therefore very difficult to make it visible as a landscape element.

Judgement: Not very suitable

3.1.1.1.2. Visible as exposition element

The assessment made it clear that an almost complete starboard side with cargo, personal belongings and inventory is preserved in an excellent condition. The wreck has the potential to be very suitable for exhibition purposes or as a study object after conservation.

Judgement: Very suitable

3.1.2. Memory value

3.1.2.1. Historic

The wreck cannot be matched to any specific historical events yet.

Judgement: No judgement

3.2. Physical quality

3.2.1. State

3.2.1.1. Presence of ship construction

The site contains wreck parts in relation.

Score: X

3.2.1.2. Completeness of the wreck parts

It is not a complete ship, but only one complete side of a ship. This means that the whole ship can be easily reconstructed.

Score: X

3.2.1.3. Stratigraphic conditions

During the assessment the stratigraphy has not been researched.

Score: No score

3.2.1.4. Mobilia (portable antiquities) in situ**3.2.1.4.1. Relation between mobilia and ship parts**

There is a relation between the mobilia and the wreck parts. However, the mobilia have been moved by post depositional processes transversely over the wreck to the starboard side.

Score: X

3.2.1.4.2. Relation between mobilia

There is a certain relation between the different mobilia.

Score: X

3.2.1.5. Stability of the natural environment

The wreck is lying in a dynamic environment (tidal movements and changing of gullies). Besides this, the wreck is being attacked by different sea organisms and human activities.

Score: There is no stability in the environment. Since the wreck will be of high value archaeologically, it will be important to establish ways to protect its valuable information, in or ex situ

Score: X (in 2000). Due to the protection measures it is now (2004) X.

The Score of State: (average of above points) X.

3.2.2. State of preservation**3.2.2.1. Wreck parts****3.2.2.1.1. Organic material**

Excellent for all the parts that are covered with sediment. The material disintegrates very quickly when sticking out of the seabed. This counts at least for the wood, plant materials and bones.

Score: X

3.2.2.1.2. Metal

Not fully investigated. We know however, that the condition of iron in the Wadden Sea is normally very bad. It is usually heavily corroded and often hardly any iron will remain. However, the kind of corrosion (pyrite) leaves holes which can be filled with epoxy to reconstruct the form and size of the object.

Score: no score yet but probably low due to the condition of the iron.

3.2.2.1.3. Composite

Not fully investigated

Score: no score yet

3.2.2.2. Artefacts**3.2.2.2.1. Organic material**

See 3.2.2.1.2.

Score: X

3.2.2.2.2. An-organic

Not fully investigated: The group is very different: earthenware is good, iron is bad.

Score: No score yet

3.2.2.2.3. Composite

Not fully investigated

Score: No score yet

End score conservation: (preliminary) X because of the excellent state of the organic parts. This can change after the research on the metal.

3.3. Quality of archaeological information**3.3.1. Grade of Uniqueness**

Maritime archaeology still has a very small base on which it is building its experience. For now, ships can be easily graded as being rare. However, this might change in the future.

In comparison to all the ships that have been found up until now, 17th century wrecks comprise a large number. In the Netherlands 17th century shipwrecks are in relative terms, not rare. This is also true for armed merchant ships. Foreign ships however, are rare in the Netherlands. The construction that has been used for the BZN 10 ship is unusual, and is therefore rare. The inventory and cargo are rare, especially in this state.

Score: X

3.3.1.1. Chronological

See above, chronologically not extremely unique.

3.3.1.2. Regional

Northern German merchant vessels had not been known previously in the Wadden Sea. So this vessel is “one of a kind”.

End score: X

3.3.2. Significance of information**3.3.2.1. Geographical significance**

This wreck contains important information about the ship building traditions in northern Europe, probably even the northern German shipbuilding tradition, so it has to be valued. It contains a lot of information about this because the ship is capable of being completely reconstructed. Northern German and Dutch

ship building traditions from the 17th century can also be compared.

Score: X

3.3.2.2. Historical or archaeological significance

In combination with its geographical significance it is of high value. Many (original) details relating to shipbuilding, its cargo and inventory are preserved. This makes it a source of very high value, not only for investigating the shipbuilding tradition, but also an important source on the trade between northern and southern Europe.

Score: X

3.3.3. Representativity

Since we still have a lack of knowledge about traders from the 17th century, it cannot be stated whether this wreck is representative of a 17th century trader (especially northern German ships).

Score: No score

3.4. Conclusion

Although it is just a part of a ship, it can be fully reconstructed. The construction, cargo and inventory are all highly informative. Until now no parallel to the BZN 10 wreck has been found. If this wreck is going to be excavated it is recommended that it should be undertaken as a joint venture with some German partners.

The ship and its mobilia are very important to preserve.

4. Site management

4.1. Cost-benefit analysis and general conclusion

Originally the funding for the non-intrusive assessment came through the normal yearly budget for the archaeological diving team of the NISA/ROB. It was one of many wrecks that had to be assessed.

With the help of the EU and the Culture 2000 programme we were able to undertake extensive research on the degradation of the BZN 10 wreck. Because this wreck is seen as being a representative example of the many wrecks found in this area, we can make statements on the condition of wrecks in the whole area.

More important is the fact that we can develop tools to do assessments and to monitor and protect archaeologically interesting wreck sites.

From 2001-2004 the research on BZN 10 has been financed through the MoSS project.

This support has been very beneficial, not only for the wreck site, which has been physically protected, but also for other sites in this region and further beyond; in this way, new methods to protect wrecks are developed and slowly but surely, a new approach to archaeological shipwrecks is coming into use.

4.2. Site management agenda

4.2.1. Safeguarding

4.2.1.1. Legal

No specific legal protection. All wrecks older than 50 years are protected under the Dutch Monuments Act of 1988.

4.2.1.2. Physical

The wreck has been completely covered with debris nets. See MoSS Newsletter 2003: IV: Theme: The Burgzand Noord 10, December 2003.

4.2.2 Monitoring

1. A comparative Zero-measurement was taken during the non-intrusive assessment on the 7th to the 22nd of August 2000.
2. 1st monitoring: 24 to 28-8-2001
3. 2nd monitoring: 10 to 17-6-2002
4. 3rd monitoring: 11 + 12-7-2002
5. 4th monitoring: 29-8-2002
6. 5th monitoring: 17-12-2002
7. 6th monitoring: 2-6-2003
8. 7th monitoring: 11 to 23-6-2003
9. 8th monitoring: 15-7-2003
10. 9th monitoring: 29-8-2003
11. 10th monitoring: 15-1-2004
12. 11th monitoring: 15-3-2004

13. 12th monitoring: 15-6-2004
(monitoring with diving, data logger, etc.)
1. 1st side scan sonar image: SNAP (appr. 2000)
2. 2nd side scan sonar image: RWS 2002
3. 1st Multi beam image: April 2002
4. 2nd Multi beam image: July 2003
5. 3rd Multi beam image: June 2004
(Monitoring without diving)

4.2.3. Visualizing

The following actions have been planned and executed:

In 2000 a site plan was made and the object (ship, cargo and inventory) was investigated, photographed and visualized in other ways.

In June 2002, divers from the archaeological Unit of Mecklenburg Vorpommern took pictures to test the photogrammetry. Due to the poor visibility this was not successful. However, the pictures taken by the photographer (Roland Obst) are good enough to publish in books, presentations and to put on the internet. The Nisa diving team has been taking digital photos and recording films. The photos still have a poor quality but we are working on this, however, the environment is far from favourable. Rijkswaterstaat and the IMAGO-project have been taking side scan sonar, multibeam and OPUS 3D pictures. The multibeam pictures are of excellent quality. These can be used to show how the environment around the wreck is changing over time. The Opus 3D pictures are still being worked on. The system can be compared with a 3d sub bottom profiler. It can penetrate into the sediment.

Objects from the BZN 10 wreck have been lifted, conserved and put on display for the public.

Within the project the BZN 10 wreck has been the subject of different articles for scholars and also a much broader general public (see attachment on Literature and chapter 1.1).

4.2.4. Finance

Project budget MoSS: See attachment

Costs per diving action: (2003/2004): Renting a boat: EUR 1000,-

Four divers p/day: $4 \times 200 =$ EUR 800,-

Travelling: EUR 100,-

Depreciation of dive equipment: EUR 100,-

Work before and after: $2 \times 130 =$ EUR 260,-

In total: EUR 2260,- This is an indication since costs can fluctuate.

Covering of the site:

2000 m² debris netting = EUR 2000,-

Tyrops (600) = EUR 25,-

Old chains: 30 ct/kg = EUR 100,-

In total: EUR 2125,- This is an indication since costs can fluctuate.

Costs sonaring: The first one by SNAP cost EUR ****. It does not apply for the second one (RWS): nothing was charged for it. Costs Multi beaming: The first one was not charged for and the second was paid for with a closed budget. The third multi beam (June 2004) cost EUR 2400,-.

Costs covering site: EUR 0,30 p/kg shackles (chains), EUR 50,- per roll debris nets (3 x 25 meters, nets however, need to be overlapping to be effective)) and EUR 4,- per 100 ty raps.

4.3. Date of re-assessments/re-evaluation

* Approx. 15th of August 2004. Then we will change the data logger again and also do some visual monitoring.

* Approximately July 2004: Evaluate Multi beam recording of the BZN 10 site and compare it with 2002 and 2003 to see whether the site has changed.

Attachments

1. Shortlist NAVIS
2. Site plan BZN 10
3. Budget MoSS-project The Netherlands
4. The method of physical protection that has been used on the BZN 10 wreck
5. The Western Wadden Sea Area
6. Scheme of assessments as executed by the NISA/ROB diving team
7. Monitoring with multibeam sonar on the BZN 10 wrecksite

Appendix 1

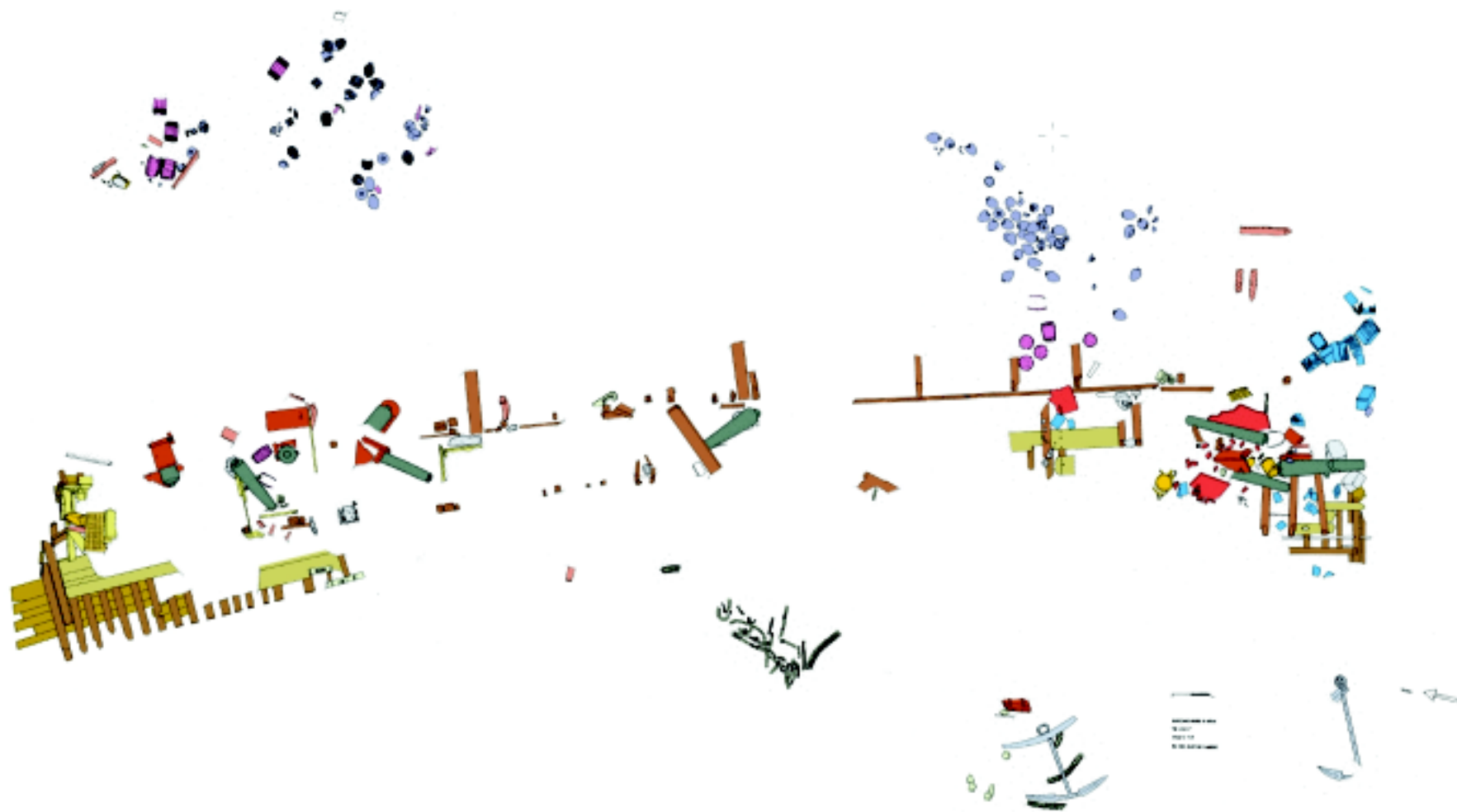
Shortlist NAVIS

Can be found under 2.3.4.1. NAVIS is a database for maritime related objects from before 1300. Chapter 2.3.4.1 has the same kind of design.

Appendix 2

Site plan BZN 10

It consists of everything sticking out of the seabed in 2000.



Appendix 3

Budget MoSS-project The Netherlands

This budget that is presented was agreed with the EU and the partners of MoSS before the project was started. There might be some small differences between this and the actual cost of the research.

Sort of costs 2001-2002*	Page	NATIONAL	EU	TOTAL
Archaeologist/Scientist/Diver	01/02/01		20154	20154
Divers	01/02/02	4347		4347
Ship	01/02/14		4600	4600
Processing of data	01/02/15		1600	1600
Travelling costs	01/02/15	400		400
Lodging	01/02/15	1200		1200
Diving gear	01/02/15	1200		1200
Accommodation costs	01/02/15	1200		1200
Video registration and processing	01/02/15	1200		1200
Preliminary report 2001	01/02/15	2800		2800
TOTAL 2001-2002		12347	26354	38701

Sort of costs 2002-2003*	Page	NATIONAL	EU	TOTAL
Archaeologist/Scientist/Diver	02/03/01		28215	28215
Divers	02/03/02	4969		4969
Ship	02/03/12	8000		8000
Sonar	02/03/12	2000		2000
Diving gear	02/03/13	2500		2500
Analyses + processing of data	02/03/13		5000	5000
Measuring equipment	02/03/13		4600	4600
Travelling costs	02/03/13	500		500
Accommodation costs	02/03/13	2500		2500
Video registration and processing	02/03/14	1800		1800
Preliminary report	02/03/14	3500		3500
TOTAL 2002-2003		25769	37815	63584

Sort of costs 2003-2004*	Page	NATIONAL	EU	TOTAL
Archaeologist/Scientist/Diver	03/04/01		12630	12630
Divers	03/04/01	2484		2484
Ship	03/04/13	8000		8000
Sonar	03/04/13	2000		2000
Diving gear	03/04/14	2500		2500
Analyses + processing of data	03/04/14		5000	5000
Measuring equipment	03/04/15		4600	4600
Travelling costs	03/04/15	500		500
Accommodation costs	03/04/15	2500		2500
Video registration and processing	03/04/15	1800		1800
Final Report	03/04/15	5000		5000
TOTAL 2003-2004		24784	22230	47014

		NATIONAL	EU	TOTAL
TOTAL PROJECT COSTS		62900	86399	149299

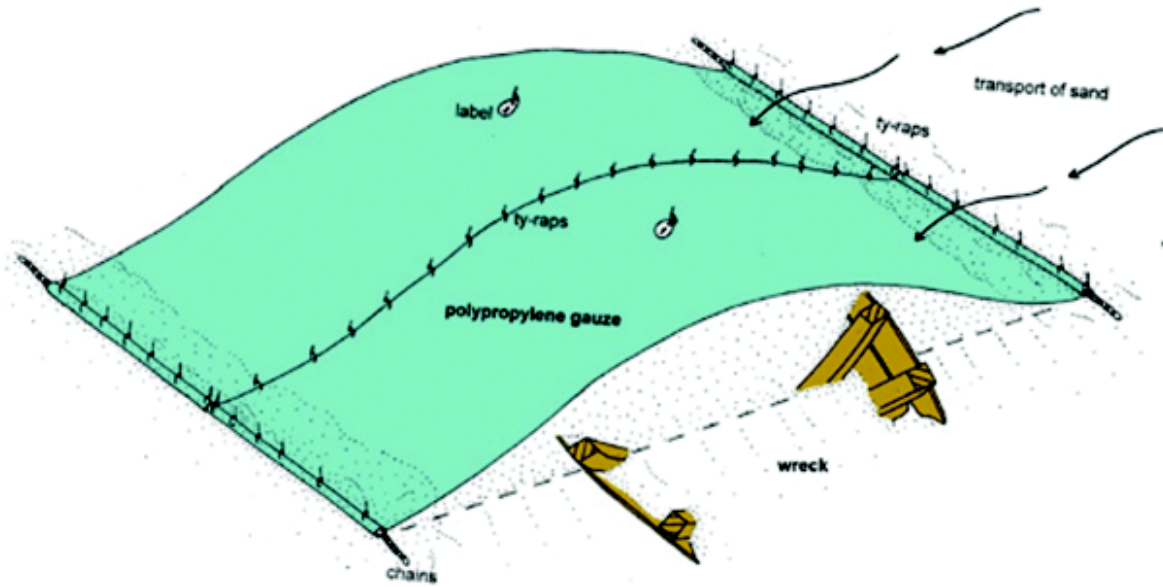
* 2001-2002 = period 1/07/2001-30/06/2002

* 2002-2003 = period 1/07/2002-30/06/2003

* 2003-2004 = period 1/07/2003-30/06/2004

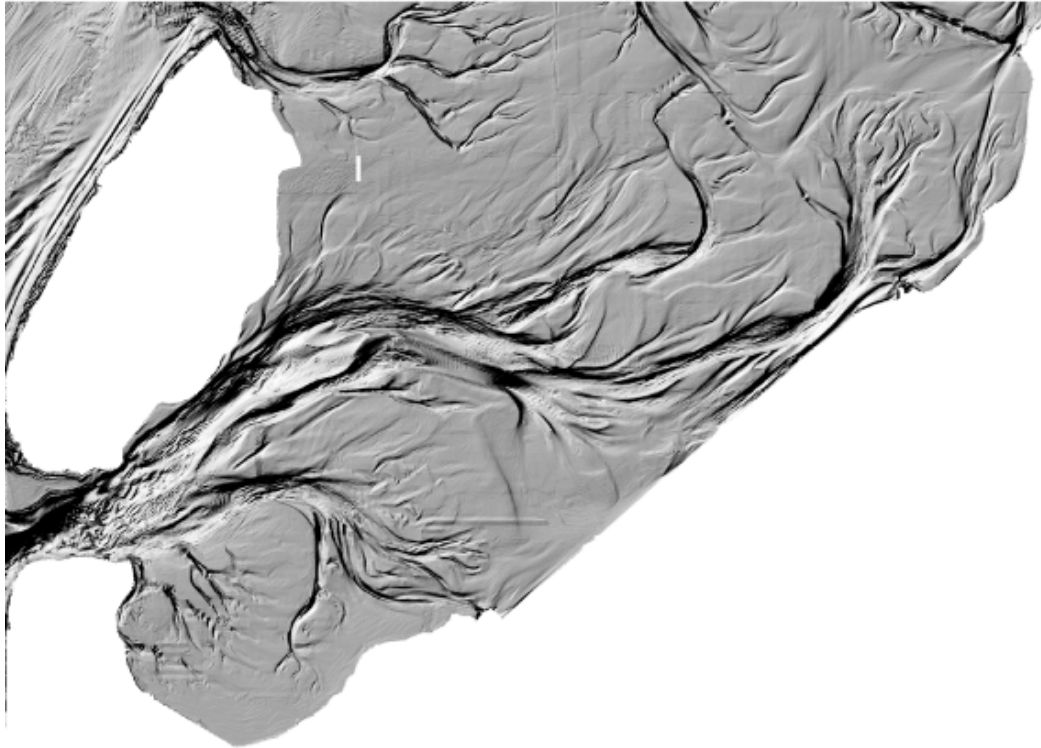
Appendix 4

The method of physical protection that has been used on the BZN 10 wreck



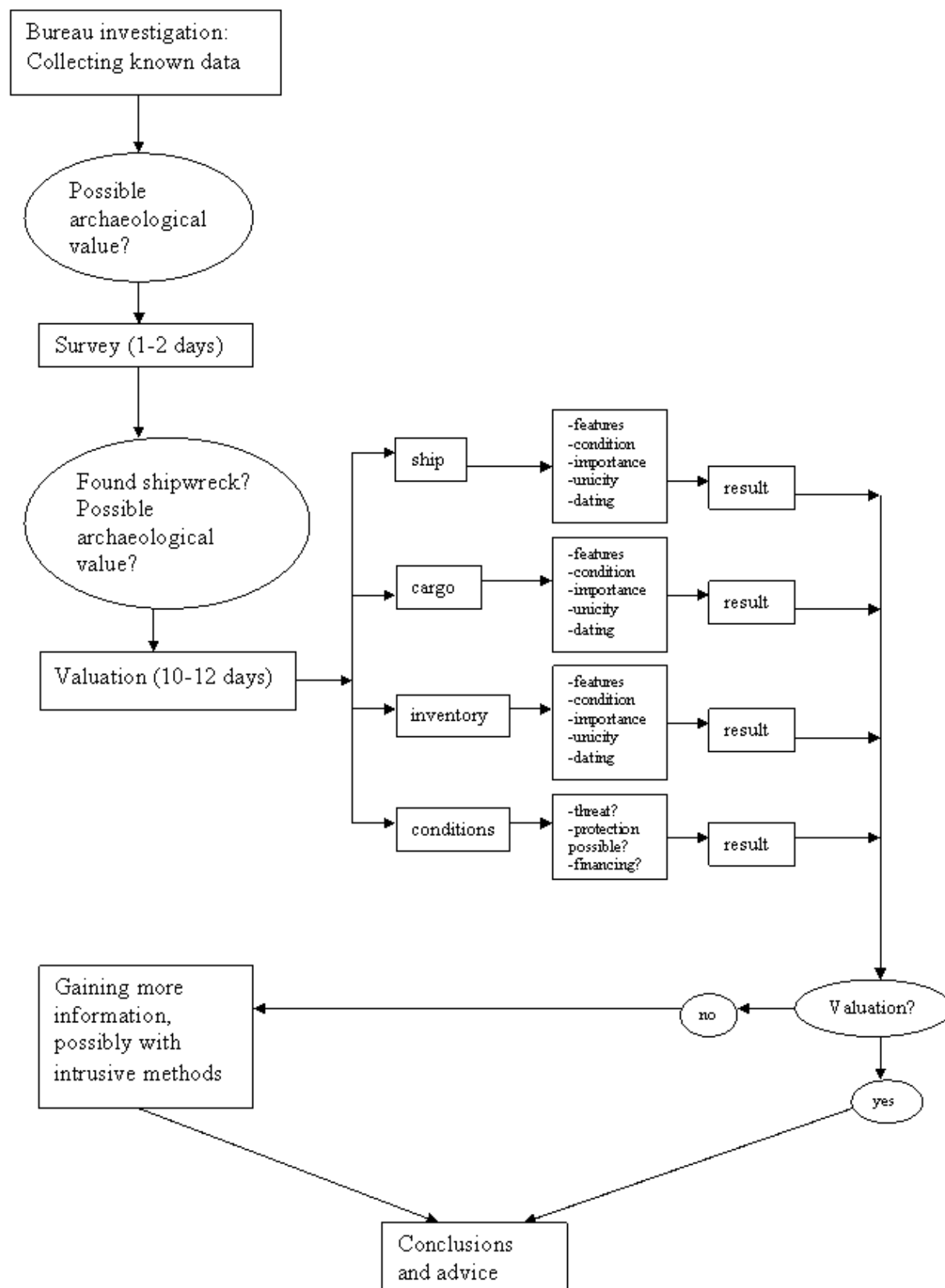
Appendix 5

The Western Wadden Sea Area. Burgzand is part of this.



Appendix 6

Scheme of assessments as executed by the NISA/ROB diving team



More information, drawings and photos of the site can be found in the different newsletters of the MoSS project. See also chapter 1.1 for more literature.

Appendix 7

Monitoring with multibeam sonar on the BZN 10 wrecksite

