The Porkkala Wreck Park Project 2018 – 2022

Citizen Science in action

Report 21.04.2023 by the Suomen Meriarkeologinen Seura ry (Maritime Archaeological Society of Finland), known as ‘MAS’.

Authors: Maritime Archaeologist in charge, D. M. Cleasby, MSc Maritime Archaeology & Project manager, M. Luoto, MAS Chairman of the board.

Contents

Acknowledgements

There are many groups and persons to thank for the making of the project and without whom it could not have been born or survive:

MAS members past and present have given their enthusiasm, time, and resources, returning year on year. This includes the work of the MAS Committee, past and present. Particular mention should go to the present MAS chairman and logistics director for the Wreck Park, Markku Luoto; the old chairman Kalle Virtanen, who dived on the sites for years and worked in the 2018 camp; and to Topi Sellman for photographing most of the sites and making the 3D photogrammetry models.

The diving community has been generous in providing their resources and a steady stream of new MAS members. These clubs include Nousu, Calypso, H20, Taursu, OxyDC, RiURSu, Nautic club, PSK Kupla, Sukeltajat ry, Plutot, Ylen sukeltajat, Urheilussukeltajat ry, Teredo Navalis, Partiosukeltajat, Jyväskylän sukeltajat ry, PADI, SS Simpu, Scuba Libre ry, Gummiwihta ry, Cetus ry, Rovaniemen urheilusukeltajat ry, Syvyys Helsinki ry, Wärtsilä ry, and not forgetting those that do not belong to a club.

The Finnish Heritage Agency, especially to Maija Matikka, who advised on cultural heritage protection and processed the research applications, and to Minna Koivikko for continual support and advice.

Kristin Ilves, Assistant Professor in Maritime Archaeology at Helsinki University for being the onsite maritime archaeologist for the 2019 field camp.

Tuomas Aakala, of the University of Eastern Finland for analysing the dendrochronology samples and Julius Paužolis of the Vilnius Radiocarbon for the radiocarbon dating analyses.

All the funding sources and partners – Museovirasto, Weisell säätiö, SKR/Harry Hendusen rahasto, and the camp participants paying their contribution.

The media especially Yle for covering our project each year, both live on television and radio, on Swedish Yle, and web features on Yle Areena. Sanomat for newspaper coverage early on.

And last but not least - the visitors to the Wreck Park

Images on title page by MAS:

view south from Porkkala peninsula

anchor on *Sankbådan* wreck

drilling a timber with the compressed air dendro drill

Abstract

This report by the Maritime Archaeological Society of Finland (known informally as MAS) charts the beginnings, challenges, evolution, and results of the Porkkala Wreck Park Project which began in 2018 and concluded at the close of 2022. It has successfully coalesced the key elements of a research goal, a defined geographic area, a sound and evolving scientific-based approach, and a team of skilled, enthusiastic volunteers. Consequently, it has advanced yearly in its effectiveness, its goals and scale, with the original target of 11 wrecks to be incorporated into the Wreck Park readily achieved but managing to research dozens more in addition.

Its methodological tools include archival research if available, extensive site inspections, photogrammetric survey, and 3D modelling, and dating wrecks through dendrochronological and radiocarbon sampling. It followed a common citizen science practice strategy to amass data that could be added to the maritime archaeological and historical database but also provide material for academics in related fields to formulate further research. As many of the wrecks in the area had few readily identifying features as to date, provenance and function it was decided to gain baseline data on many wrecks, while simultaneously developing the 11 more interesting sites in terms of both cultural value and diver experience as diver trails for the diving community to visit.

This broad approach has provided evidence for the archaeological record that this coastline has experienced considerable traffic both local and from all around the Baltic and beyond.

Many of the wrecks in the national Finnish cultural database have been dated to the 17th to 19th centuries, as is true at Porkkala, but results from Porkkala also seem to indicate that vessels as far back as the 13th century have been found. This could significantly extend back in time our knowledge of what maritime traffic frequented this area.

The true strength of this citizen science project lies in the harnessing of its participants' abilities. They offer not just accomplished diving skills, but their enthusiasm, time, equipment, and their real-life skills and knowledge, such as in engineering, management, photography, fundraising, team building and more, all essential ingredients for a successful rounded project. A focus on archaeology is honed by a theoretical training programme, other online interaction sessions, and regular support by cultural heritage agencies. It disseminates findings to the public and has encouraged 'Blue Growth' by setting up diver trails.

This report details these aims, methodologies, results and then analyses what was successful and what was not. It concludes with suggesting sustainability strategies to maintain the Wreck Park through initiatives such as local clubs 'adopting' wrecks to protect them and even provide ongoing data.

Introduction to the project and MAS

This project came about through the evolving vision and sheer dedication of members of MAS over many decades. Since MAS was formed in 1995 it has grown in knowledge, skills and developed an identity and ethos, backed up by a professional organisational structure, while still retaining its primal curiosity and sense of fun. However, it could not have happened without the enthusiasm, time and resources offered by Finnish hobbyist divers and dive clubs from which MAS members have mostly originated. They wanted more from their usual diving experience, to know more about the rich cultural maritime heritage of the waters they visit and explore it through the pursuit of maritime archaeology theory and fieldwork.

Maritime research and archaeological fieldwork had been conducted for years by MAS members in various areas of Finnish waters so that many members had amassed not just excellent diving skills, but awareness and knowledge of the full spectrum of Finnish maritime history and archaeological heritage. They then applied this to the wrecks and sites they already knew, but then proactively sought to discover new ones, gaining skills in search and survey techniques, such as remote sensing and photogrammetry.

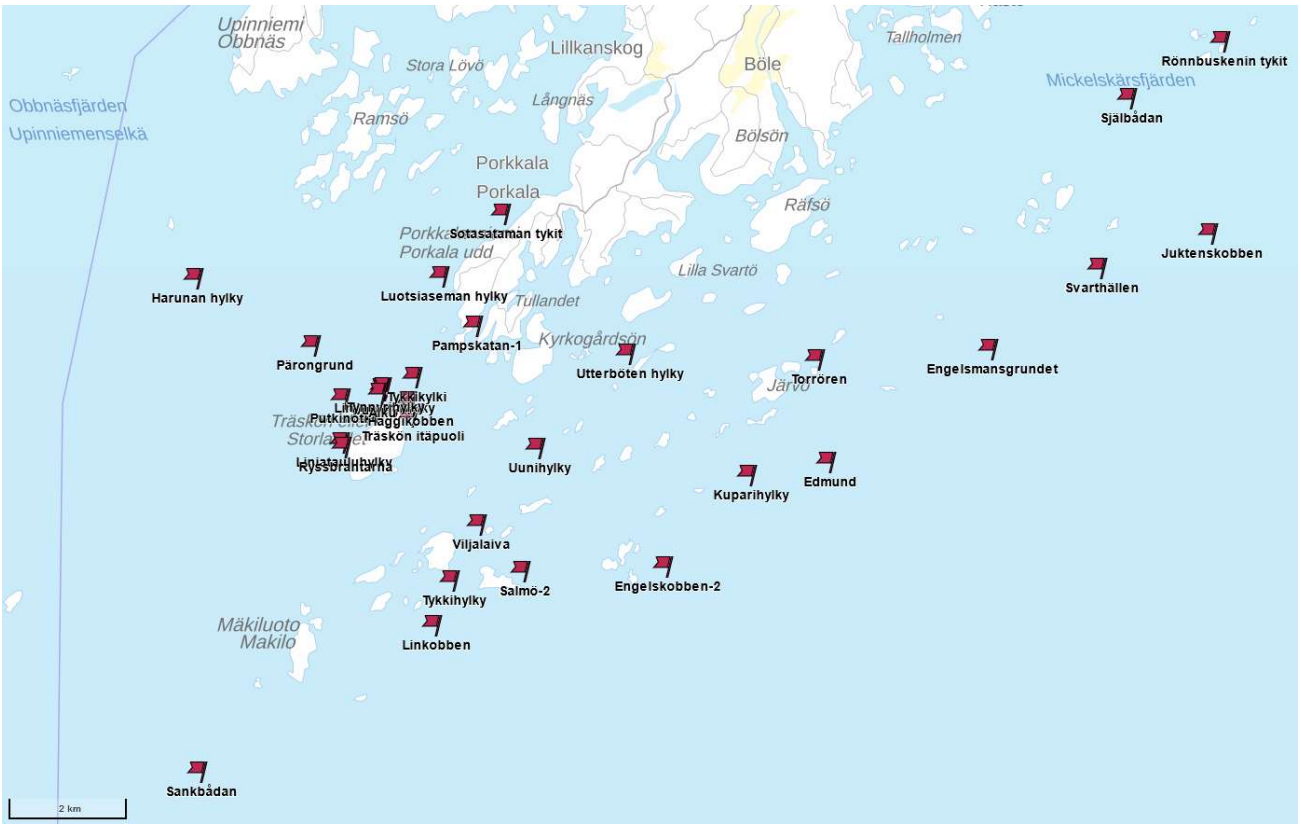
The Porkkala Wreck Park Project, which started in 2018, was specifically intended to harness all this knowledge and skills. It would provide an ambitious platform to realise its potential and raise the level of its research effectiveness and productivity. It's 5-year programme set within one defined locality, researching and revisiting the same wrecks year on year while incrementally adding newer ones of interest, would allow members to develop a greater awareness of the intricacies of not just each site, but the cultural character of the area.

Within this programme and time period various aims would be explored and expanded on. This would deliver positive outcomes not just for acquiring useful archaeological data of the maritime cultural heritage of the Porkkala area but also deliver a tangible, informative resource for divers with their various interests in the form of a 'Wreck Park'. By the end of 2022 this would consist of 11 core wrecks to explore within a semi-structured experience that provided safe guidance to the divers while also informing them what they were looking at. Such 'diver trails' varied in their size and complexity according to the sheer size, complexity, and cultural value of the site, as well as the anticipated diver experience. Beyond those 12 wrecks it should be noted that dozens more in the Porkkala area have been researched, dated, 3D modelled, and information added to the cultural database, as well as the national wreck database 'hylyt.net'.

Alongside the actual diving research MAS has sought to draw attention to the project and its other archaeological activities by reaching out to various groups and institutions in society. Relations to the dive club fraternity has been maintained through various channels. These include regular formal outreach communication; through MAS members discussing the project within their own clubs; through talks given at diving club's training and social events; through the regular flow of divers who come to Nautical Archaeology training courses run regularly by MAS; through the official Wreck Park website and Facebook site; through articles

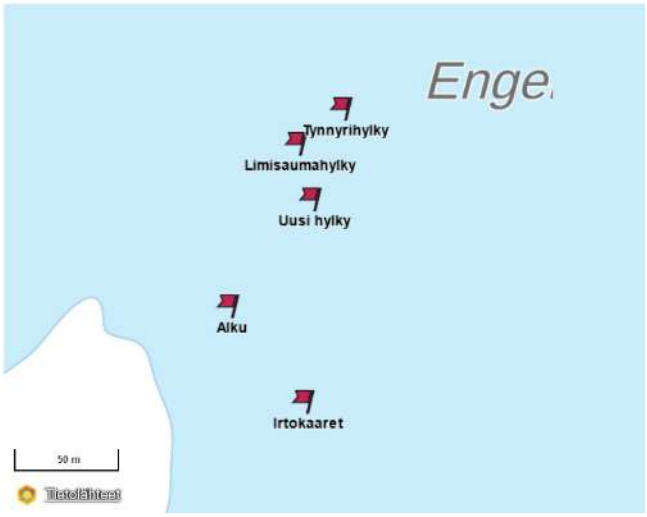
in the magazine ‘Sukeltaja’, published by the national diving organisation ‘Sukeltajaliitto’; and also through a MAS presence at events like wreck seminars and boat shows, which also provides interaction with the general public. A particular emphasis has been placed on informing the wider public of the progress made in the Wreck Park and its other activities. There have been various segments in newspapers, interviews on live television, courtesy of Yle, both in the studio, but live from the boats conducting the research and even relayed from underwater.

Lastly, within the 5-year programme MAS has developed its interactions and relationships with cultural heritage institutions such as the Finnish Heritage Agency, with the various funding sources required for research to exist and with various governmental and private commercial groups that might become productive partners for mutual benefit.



Map 1 All successfully surveyed wreck sites during the Porkkala Wreck Park -project 2018-2022

Map 2 Close-up on the wrecksites around Träskön



Map 3 Close-up on the wrecksites on Remmarudden reef

There are altogether 30 wreck sites (depicted in Map 1), in which meaningful research activities were conducted i.e. the wreck was found and surveyed. Furthermore, there were about half a dozen other dive sites, where the anticipated wreck site was not found, but which can't be written off yet, as the surveys were not complete due to poor visibility.

Porkkala Wreck Park consists of 11 wrecks on 9 dive sites (depicted on map 4) of the 30 surveyed, which were furnished with a marker and/or mooring buoys, as well as with guidelines to the wrecks and between various parts of the wreck site. The "parked" wreck sites are:

1) **Remmarudden reef** in Träsko - flag buoys with three wrecks and a 500kg mooring buoy. Alku, Tynnyrihylky and Limisaumahylky can all be dived from the same mooring buoy. Coordinates: 59° 57.4540' N and 24° 22.2811' E

2) **Häggikobben's Tykkikylki** - 500kg mooring buoy and a piece of a 1700's double-decked warship and its cannon and platform. Coordinates: 59° 57.3511' N and 24° 22.7482' E

3) **Putkinotko** - flag buoys and a 100-metre-long guide rope with cannons, rigging ammunition, huge blocks and ballast blocks. Coordinates: 59° 57.3542' N & 24° 21.5258' E

4) **Linjatauluhylyt** - flag buoys and a 70 m long guide rope between the deep (~24m) and shallow (~9m) sections. Coordinates: 59° 56.9482' N and 24° 21.5442' E

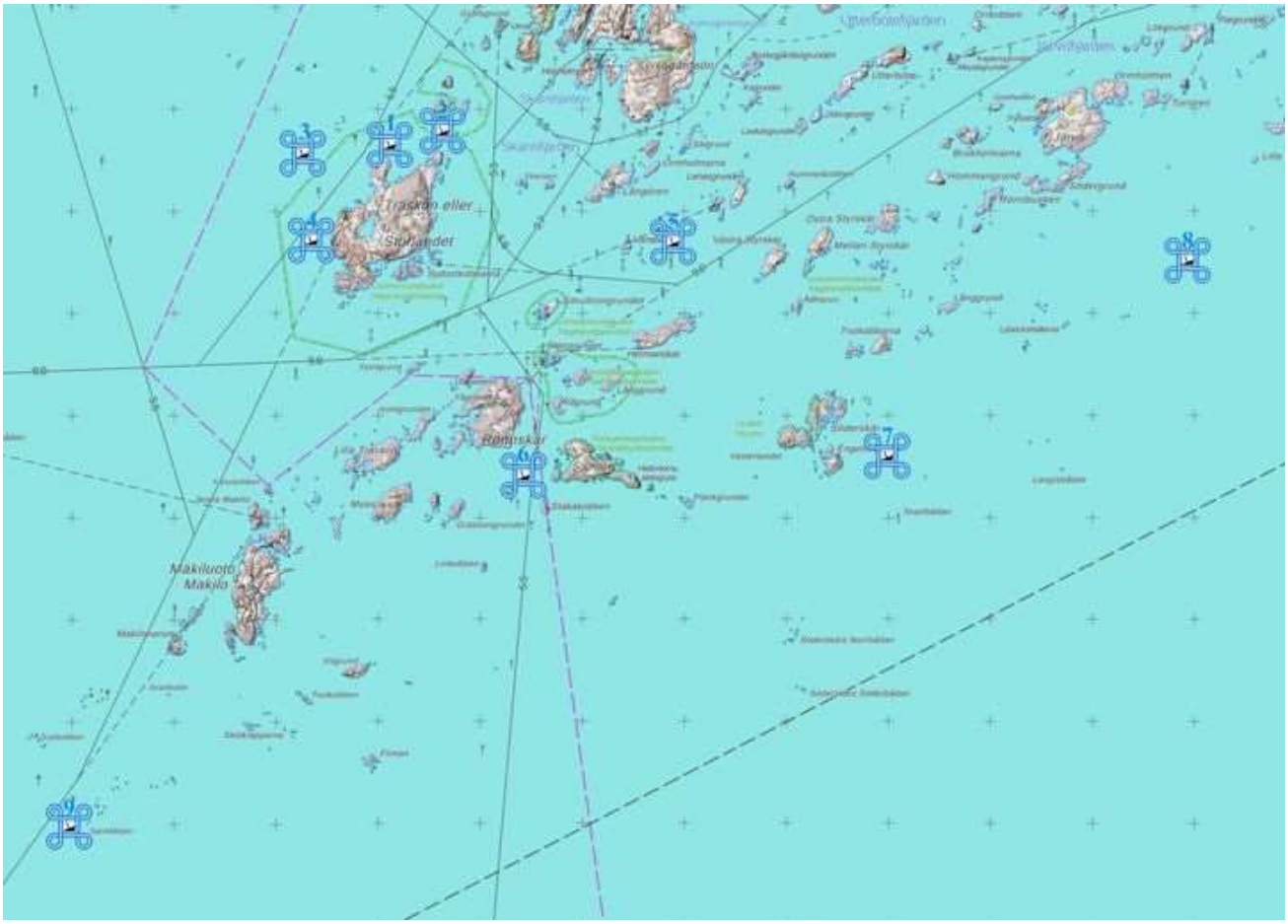
5) **Uunihylky** - flag buoy at the stern of the wreck and guide cord between the islet and the rocks to the wreck. Adhesion to a stone on the islet. Coordinates: 59° 56.9607' N and 24° 25.1453' E

6) **Rönnskär's Tykkihylky** - 1000kg mooring buoy and guide cord for cannon side, Nikhaka and low-lying anchors and cannons. Coordinates: 59° 55.7090' N and 24° 23.6639' E

7) **Engelskobben 2** - flag buoy in the bow of the wreck. Coordinates: 59° 55.9210' N and 24° 27.5900' E

8) **Edmund** - 2000kg mooring buoy with guide cord all the way to the edge of the wreck. Coordinates: 59° 56.9374' N and 24° 30.5221' E

9) **Sankbådan** - flag buoy near the anchors of the shallow part (~17m), from where the guide rope to the deep part (~23m). Coordinates: 59° 53.8510' N and 24° 19.1508' E



Map 4 The "parked" wreck sites included in the Porkkala Wreck Park

Project aims

1. ***The development of a broad ontology of many of Porkkala wrecks***, which would provide baseline data to add to both the national cultural heritage database (kyppi.fi) and national wreck database (hylyt.net). Most of the wrecks studied offered minimal previous knowledge of their age, form, function, and provenance and could be described as 'skeleton' wrecks. These can be broadly characterised as exhibiting varying degrees of structure, sometimes more intact, with their original shapes possible to interpret with keel and hull elements visible and frames protruding, while others could be more dispersed and harder to interpret.

   The only true exception in the area would be the 'Edmund', a 20th century wreck with intact hull and decks chosen to provide diver experience of a larger intact vessel. In some wrecks, it was clear there was more underlying structure, but thick sediment layers and a research requirement not to make unnecessary intrusive actions meant that this could not pursued further, so research concentrated on the surface features of a site. Most of the wrecks had few identifying surface artefacts to investigate to aid in the wreck's interpretation. This could be due to site formation processes such as the initial wrecking events, later salvage attempts, or natural processes such as currents washing out wrecks or sedimentation deposition, or a combination of all these.

   Other human activities such as anchor dragging, being snagged by fishing nets or dredging may have led to wrecks becoming more damaged and less intact. It is very possible that artefacts may have been opportunistically and systematically removed from these wrecks by recreational divers. All these processes may have left us with these wooden 'bones'. However, on the positive side the beneficial preservation conditions that the Finnish waters of the Baltic provide particularly for organic materials like wood mean that a considerable amount of structural data exists.

   Data would be gathered on their form, basic construction method, their age via using dendrochronology and radiocarbon dating, their provenance and any identifying features such as associated artefacts or ship features.

   It was hoped that this approach could be applied to researching the many other similar types of wrecks that Finnish waters contain. This baseline information could allow other researchers in this or related disciplines to formulate new questions and search for answers concerning the Porkkala region. For instance, the level to which international or interregional maritime traffic and the communities of the Porkkala region may have interacted at various times in history, and its effect on local societal development? The Porkkala area may well have experienced considerable stimulus at times or been a focus for activity, but it's relatively sheltered waters may also have been a convenient thoroughfare to other destinations, without markedly affecting the locality.

2. ***Providing a degree of protection for the wrecks in several ways***. Monitoring them would allow an assessment of the dangers that those wrecks faced and allow potential preventative measures. These could be from natural degradation processes against which at the very least the information the wrecks contained could be studied before it was lost. These natural processes may well result in exposure of various parts of the wreck over time which later monitoring could pick up and allow further research. Other wrecks could be at risk of haphazard anchoring damage so that marking them with flags and buoys could warn vessels to stay clear. Other wrecks could be subject to excessive diving, so-called 'diver wear,' or even to being vandalised or looted by divers.

   The concept of 'Adopt-a-Wreck' conceived by the Nautical Archaeology Society of the UK would be employed with MAS being the initial adopter, but with the long-term objective for local dive clubs to adopt, monitor, protect, research, and publicise wrecks in which they were interested. It was hoped that the popularity increasingly enjoyed by the land-based Finnish 'Adoptoi Monumentti' concept (Adopt a Monument) could be mirrored in underwater contexts.

3. ***The formation of a resource for the diving community*** in the form of information about interesting wrecks and an open invitation to explore them. The project's newly researched wrecks would be added to the wreck database as well as updated entries to older known wrecks. Diver trails would be set up on the wrecks that were more interesting in terms of their cultural historical and archaeological value, their age, their size and spread of features if the wreck was impressive or extensive.

   Some wrecks with cannons were selected as it was expected they would provide excited interest from divers not even normally interested in archaeology. In the case of the first diver trail set up outside Träskö bay, 2 and then finally 3 wrecks (detailed later) were to be linked together to provide a diving experience that could be explored anew each time from different directions. All these diver trails were intended to deliver information about the wrecks and with their guidelines and direction markers provide a modicum of safety and reassurance for divers of all abilities.

4. ***It would provide a focus for MAS fieldwork and team building***. New MAS members had for almost 20 years been taught an entry level of maritime archaeological theory through adopting the Nautical Archaeology Society (NAS) training programme from the UK. MAS delivers these courses to 20 – 30 new members each year. Various MAS members had also been involved in smaller and larger projects and maritime archaeological research over the years.

   The Porkkala Wreck Park Project was to provide a focus in one specific area for developing fieldwork experience to complement the previous theoretical knowledge gained and evaluate the applicability of theory to practice and vice versa. This practical learning would be tailored to further develop the skills and awareness of the more abled divers or those with maritime archaeological experience, while at the other end

of the scale allow beginner divers or those new to maritime archaeology a welcoming safe space to learn and feel part of the team.

It was an essential aim to develop an initial core team and a core set of goals to help the project find its feet and establish a sound foundation for the future. The team's processes and internal communications would be examined and improved yearly while incorporating new interested members. The team would follow a citizen science type model with all members being volunteers. Only one or 2 of those would be professionally trained maritime archaeologists, acting also as volunteers, who would guide the process, provide some degree of field training, and ensure that general archaeological standards and those set by the Finnish Heritage Agency would be followed.

The rationale for selecting the Porkkala maritime area

Historical background

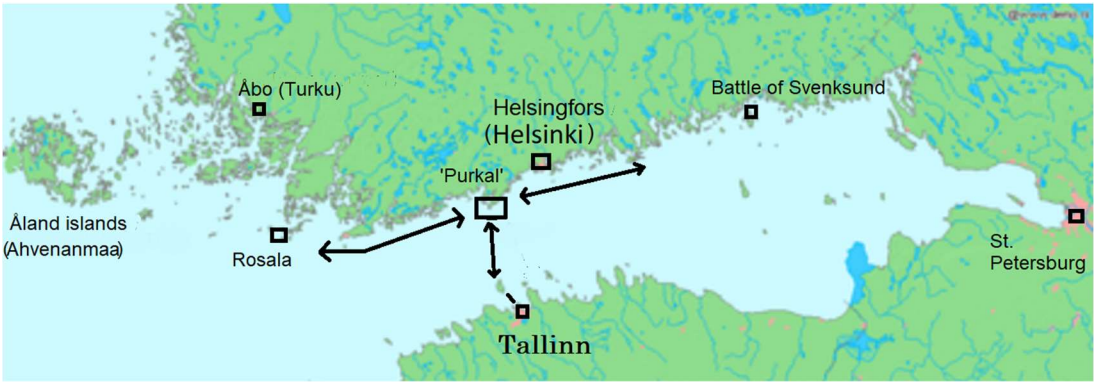
The Porkkala region seems to have a long cultural heritage which might to some extent be reflected in the maritime archaeological heritage of the area, or at least raise that potential. However, little current maritime data exists from prehistory. Stone age rock art was discovered near to Lake Vitträsk in the Kirkkonummi area to the north of the Porkkala peninsula. Several bronze age burial cairns were discovered on the Porkkala peninsula and on the island of Träskö (see reference Links:). The latter of these was where the first project wrecks were investigated, although with little expectation to find Bronze Age vessel finds in the waters there as little has been found elsewhere in Finland and none in sea environments.

A Viking presence was clear in parts of the southwest of the coast of Finland, such as at Rosala. Trade goods provide evidence of Viking connections to and from Russia which may well have travelled along the northern coastline of the Gulf of Finland past areas like Porkkala. There is only one boat find from that 'Viking' period in the seas of the Gulf, the 'Lapuri' boat, excavated by Harry Alopaeus (1989) on the eastern north coastline of the Gulf. It should be noted that its 3 radiocarbon datings produced a wide range of results, but its style is 'Viking', although it may well be used by local communities rather than long distance voyagers. According to Forssell (1983) another Scandinavian clinker tradition boat from the 13th century was found in the castle of Turku.

In the 13th century the Danish King Waldemar 2nd Sejr took a journey, colloquially known as King Valdemar's Itinerary. The journey started at Utlängen in Blekinge, continues along the Swedish coast by way of Åland to Finland, via a place referred to as 'Purkal' (Porkkala), even the Danish word 'brunsø', which has been translated as Träskö-Storö ('Träskö big island'). He then crossed the Gulf across to Reval (Tallinn) in Estonia (ref. archaeologia-navalis.org) It seems to favour a route that island hops and hugs the coast as much as possible,

presumably to avoid the worst weather or pirates. It may well have been the custom to sleep ashore than on cramped boats exposed to the weather.

The journey was included in the 'Liber Census Daniae,' King Valdemar's land cadastre, which encompassed also detailed administrative documents on Danish provinces in Scania and Estonia. King Valdemar's Itinerary may well indicate just a single journey but is more likely a regular trusted route that not only linked territories administered by Valdemar but was used by others. In subsequent centuries as the Hanseatic League took control of the sailing routes and sailed in larger ships, coastal hugging became less important, and the Baltic could be crossed quicker west to east or from the south directly over to Tallinn or Riga.



Map 5 of ancient sea routes on the Gulf of Finland

Many historical events occurred over the next 700 years or so, though there are few written mentions readily available that mention Porkkala. There is a brief reference from Porkkala in early 1789 where the Swedish navy was unable to clear the Russian ships from the area (ref. loquis.com), and which preceded the much larger engagement at Svensksund in August 1789. Vaheri-Hyvärinen-Saari in the hylyt.net entry states, that a naval division of three galleys and three gunboats led by the Finnish admiral Salomon Mauriz von Rajalin attacked a Russian high seas navy division off Porkkala, but the division suffered heavy losses in the face of superiority. The Russians had cut off the channel at this point with two ships of the line, three frigates, three brigs and a number of smaller vessels. In return, they received two frigates commanded by Rajalin, twenty galleys and a number of gunboats and smaller vessels (Gunnar 1992; Jägerskiöld, 1990). The hylyt.net entry concludes that *Linjatauluhylky* found near Träskö Island there must have sunk in the skirmish.

One of the objectives of the project would be to investigate whether the wreck was part of that event. Several other wrecks from Porkkala originated from the middle to late 18th century and could well be warships, and even be involved in the 1789 engagement. There was considerable involvement of foreign navies in Finnish waters also in the Crimean War (1854 - 1856), particularly from the British navy blockading Russian ports and attacking its ships. There is a connection to this in Porkkala because there exists a small island on the south-east end of Träskö named 'Engelsmans Batterigrundet' (Englishman's battery foundation).

The waters around Porkkala were presumably busy during the First and Second World Wars, although the Wreck Park project would not discover any direct evidence of that. The period

of 1944 – 1956 has been documented in detail when the Porkkala area was controversially leased to the Soviet Union as a naval base. After Finland reclaimed the area there are still substantial remnants of buildings exhibiting the Russian presence on the islands.

The waters around Porkkala in the 21st century are now much calmer. The coastline and the islands have many attractive homes and second homes. Day visitors frequent them to enjoy the scenery, water sports enthusiasts like sea canoeists, owners of yachts and motorboats, all served by several well-resourced and sheltered marinas, and of course dive boats and the recent maritime archaeology project.

Image: Battle of Svensksund 1789

Image: Culturally protected Porkkala Kallbåda lighthouse, built 1920 & seal sanctuary

Image: Monument left after Russian lease period 1944 - 56

Image: Porkkala as area for ‘Blue growth’ & homes for island communities (MAS)

Porkkala has many wreck sites to choose from

The relative abundance of wrecks near Porkkala may well be due to several factors:

- Many ships sailing west to east or east to west may well have taken the routes seemingly sheltered from the open sea between the many islands and along its various channels. However, these waters contain many submerged hazards with dramatic changes in depth and channel clearance. These waters can also become very rough with sudden wind direction shifts driving vessels towards already hard to see hazards and certainly challenging for a navigator unfamiliar to the area.

- When travelling particularly west to east around the peninsula vessels would have found themselves exposed to more open seas, and it seems likely that vessels might have waited on the western sides of the peninsula for more favourable winds to arrive, therefore increasing the number of vessels in the area. Without finding a sheltered anchorage they may well have been at risk from wind direction changes. If these vessels decided to round the peninsula into more open seas, they might encounter dangerous weather and be at more risk.

- Porkkala itself may well have been an important destination for many vessels for whatever reason. That coastline is characterised by many wide access water channels that reach considerable distance into the hinterland, particularly on either side of the peninsula itself.

- The Porkkala area offers the shortest crossing point to the south side of the Gulf. The 13th century Itinerary of King Valdemar has already been mentioned as a probable regular travel route. It is only some 50km to the island of Naissaar, off the coast of modern Estonia, which would have offered shelter. Such a crossing would have allowed vessels to avoid sailing around the whole gulf and through possible hostile territories more eastward. That island sits just outside of the larger sheltered areas offered within Tallinn Bay.

  The city of Reval (modern Tallinn) was founded by the Danes in 1219, became a member of the Hanseatic League in 1285, passed to Sweden in 1561 and was ceded to Russia in 1721. It has been a prominent trading hub and port for many centuries. It seems possible that the number of wrecks in the Porkkala area has some degree of connection to this short route across to a vibrant trading hub but would need wreck evidence in Porkkala of a typical 13th century vessel or trade goods from Tallinn It may well have been frequented for some time before Tallinn was founded. A possible research question for future academics could be to explore the causal Links: between maritime traffic in the Porkkala region and the development of the Tallinn area and vice versa. After Helsingfors (Helsinki) was founded by Swedish King Gustav 1 in 1550 as a trading hub on the southern Finnish coast the direction of crossing routes may have altered to connect it more directly to Tallinn.

- Another factor that may have contributed to this crossing route was that Träskö island not just was a harbour sheltered from the south, east and west, but offered fresh water. Vessels could stop there for water before or after the crossing without having to venture onto the mainland and possible hostile encounters.

Other project location factors

- Dive clubs and many MAS members were familiar with the area and already interested in learning more about many of the wrecks.

- There were many wrecks listed on the wreck database (hylyt.net), but little known about them.

- MAS members had already been conducting pieces of research in the area, such as wreck inspections, photogrammetry and remote sensing looking for new sites.

- The main dive boats to be used in the project were quartered in the marinas around Helsinki and while it still took time for them to get to Porkkala the costs in time and fuel were not as significant as if a more distant research area were chosen.

- Porkkala marina offered good facilities and a sufficient size of quay for berthing several large vessels. Another close marina was also used in later years. Träskö island's bay also afforded excellent shelter for picturesque overnight anchorage if weather conditions were favourable.

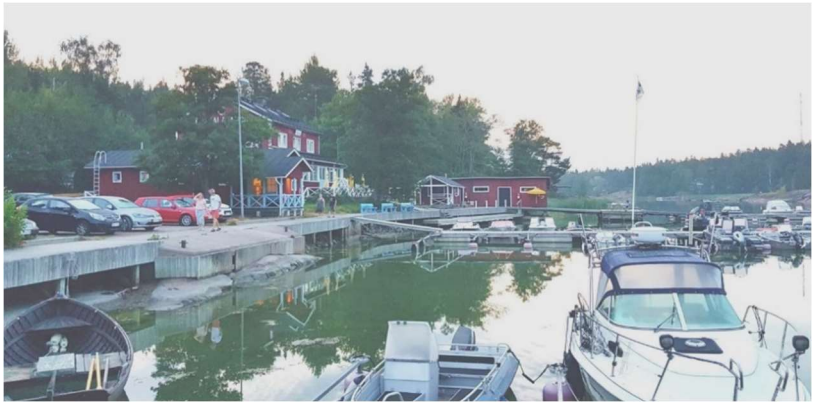


Image: Porkkala's marina with wide quays and good facilities (MAS)

Images: Träskö Bay (MAS)

Yearly Project summaries

A summary will be given of the events of each project year. For more details, please refer to the full reports linked in the appendices. However, it should be noted with regret that the 2021 report is not listed there because the laptop it was stored on ready to be submitted was stolen while in harbour. The 2022 report was not written separately as it was to be subsumed into this final report. These summaries chart only the broad outlines of the season's work with the methodologies explained in a later section, and thankfully the results of all the years combined is detailed in the results section.

2018

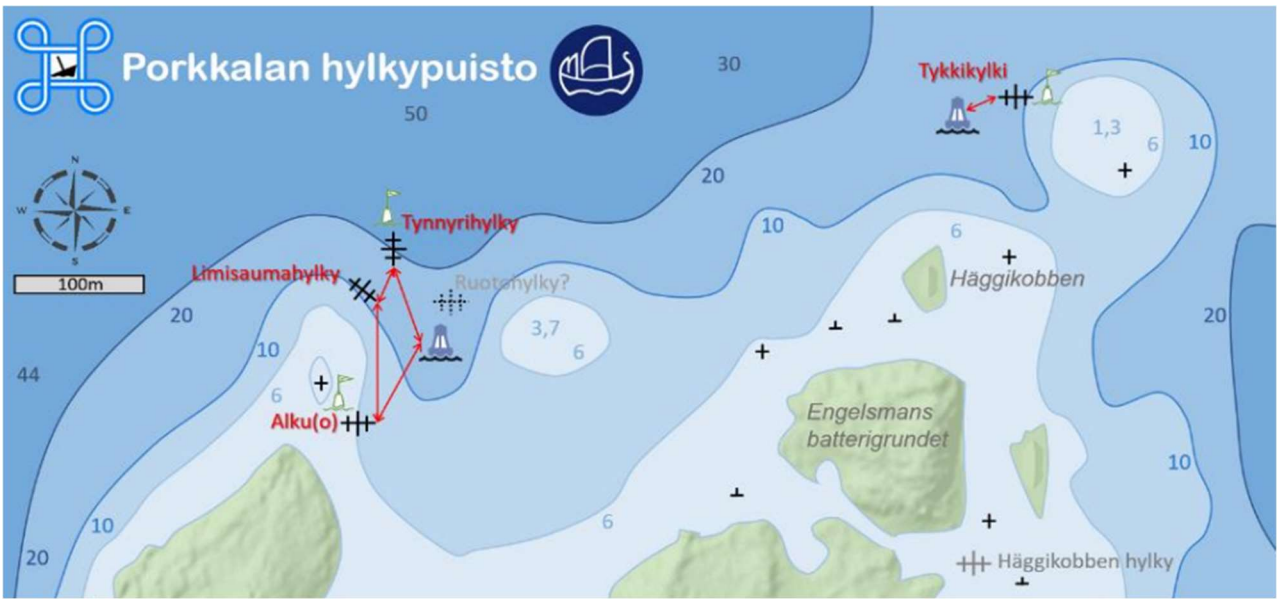
The initial plan for the wreck Park was entitled the Träskö-project as it focussed on several wrecks in the Träskö island area. Members of Nousu ry dive club and MAS were motivated by examples of other wreck parks such as Helsinki's underwater park *Kronprinz Gustav Adolph*, set up in 2000 (Tikkanen 2000). The Baltacar project, a cooperation initiative from 2014 - 2020 between Sweden, Finland, and Estonia, provided further inspiration for MAS to start its own project. Its initial aims were stated as 'enhancing the public appreciation of Porkkala's unique underwater cultural heritage through better publicity of shipwreck information, easier diver accessibility and safety on the wreck sites, as well as preserving these shipwrecks for future generations'. As the project grew it would develop the concept of an ontology of many of the wrecks present, describing the concept of learning as much knowledge of them as reasonably possible within the project's physical, manpower, ethical and financial constraints. However, for now it had to see if its first steps could be feasible, relevant, and able to be developed successfully.

The wrecks around Träskö island were selected as a central focus. Its northern facing bay offerred a good shelter for operations in most weathers. Initial dives conformed that there were several wrecks that would make interesting diver trails. North-east of Träskö was a small wreck with a cannon present, a probable small warship, which was named *Träskön Segelkobben/tykkikylki* (Cannonside wreck) and which proved to be interesting to dive clubs.

Just outside Träskö bay were 3 wrecks not far from each other. The *Träskön tynnyrihylky* (Barrel wreck), named for its visible barrels, sitting at 17m, is a 'skeleton' wreck with frames protruding, was then of unknown age, and dives there could often be dark and obscured by silt. Considerable time had to be spent removing nets and old lines covering the wreck which were a hazard to the divers. Nearby were the scattered remains of what looked like a vessel of a different construction technique, 'clinker built' with overlapping timbers rather than the edge-to-edge timbers of *Träskön tynnyrihylky*. It was similarly imaginatively named *Limisaumahylky* (Clinker wreck). This was considered of potential value because in the general North European evolution of boats 'clinker built' vessels preceded 'carvel'. Therefore,

the vessel might be considerably older, although it should be noted that clinker style vessels were being built in the Baltic up until the 19th and 20th centuries.

The third wreck, the *Alku*, was a reasonable dive distance away nearer the island and was a smaller but slightly more intact vessel, at 8m, enjoying more favourable shelter and light conditions, and was known to have sunk in 1880. This had clearly suffered damage in recent years because its windlass had been torn off its brackets and dragged from the bow to the stern. The excessive lines on the *tynnyrihylky* and damage to *Alku* highlighted to the team the need to protect these vessels.



Map 6: Träskön site of teh Porkkala Wreck Park as of 2019

The proximity of the 3 wrecks was considered perfect as a combined trail because it would offer diving conditions for both near beginners on *Alku* but be more challenging on the *Träskön tynnyrihylky* for others. Inexperienced divers could gradually build up their confidence by exploring different routes. All the wrecks were surveyed and photogrammetrically recorded, and the images copied onto dive slates with notes highlighting key wreck features of interest. These could be taken below to help orientate divers to the wrecks.

Between the *Träskön tynnyrihylky* and *Alku* a large tethering buoy was put in place, so dive boats did not need to anchor. From a cable at the bottom of that buoy bright guidelines went off to the wrecks and looped back to each other so that divers would not get lost and felt reasonably secure. A considerable amount of time was put into planning the right sizes and tolerances of the buoys, flags and similarly lengths and strengths of the lines.

In future years, labelled direction markers would be placed that told divers exactly which way they were going. Once they reached the wrecks a dive slate would be placed there depicting the wreck to inform their visit and lines would take the diver around the interesting features

of the wreck. Flags were also set in place over each wreck so divers could descend or surface at those points, increasing the options for their experience.

At this point, the *Limisaumahylky* was not added to the park as its features were less cohesive and there was no time that season to add lines back and forth. Based on the dive records some 200 hours of dive time was spent researching, constructing, and maintaining these initial dive trails.

Image: Recreational divers using dive guides (MAS)

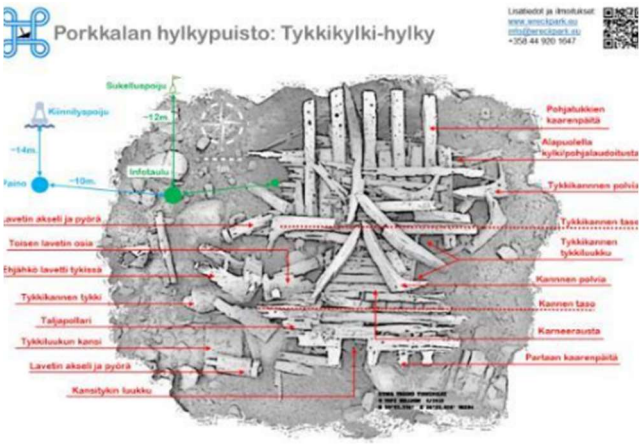


Image: dive slate for Cannonside wreck (MAS)

Funding provided by the Finnish Heritage Agency and the European Cultural Heritage fund of 2018 for around 4000 euros covered basic equipment and fuel costs with divers volunteering their services for free. Advice was sought from the Finnish Heritage Agency as to best practice and whether any permissions were required for placing lines and info-boards on the sites. Discussions also took place with Metsähallitus, the national natural environment agency, and the process for acquiring necessary future permissions understood.

The Wreck Park was officially opened in September 2018 where diving occurred on the wrecks with live underwater footage and commentary shared to the environment minister Tiilikainen. The event was attended by over 60 people and several media representatives. It was covered by all the main newspapers and the following day a live interview on Finnish national television spread news of the project further. A website was also created for the wreck park (wreckpark.eu) and by the end of 2018 had received around 12,000 different visitors. According to best estimates at least 150 different divers had visited the sites, many of them twice.

2019

From the autumn of 2018 into spring of 2019 MAS had numerous planning meetings about how to develop the project further, both internally, with interested members from dive clubs, with funding organisations and with the Finnish Heritage agency. The aims and scale of the project were expanded from the previous year. A research permit was applied to from the Finnish Heritage Agency (MV/52/05.04.01.02/2019) that allowed investigation of the wrecks already researched and others in the area. An essential important addition was the permission to take dendrochronological dating samples from timbers, once they had been photogrammetrically recorded first. Therefore, the baseline recording of a wreck could be accomplished in terms of form, apparent construction method, date and even perhaps the provenance of the vessel from analysing the wood. The scheduling model was to have a relatively long summer field camp of 9 days for a large group to accomplish the set tasks. 2 days of diving also occurred in August but the large field camp from 29.6 – 7.7 was the focus. The project relied on the presence of large numbers of interested volunteers. As dive clubs have busy schedules for their own activities in the summer one large camp agreed in advance seemed the most successful strategy to bring together the personnel and the required dive boats they volunteered for use.

From 29.6 – 7.7 some 31 participants, from 16 different clubs, both divers and assisting personnel, took part in the project. 28 divers completed at least 1 dive, and some 155 paired dives were carried out. 11 wrecks were researched. 20 outside visitors also came to see the project, and on the 4$^{th\ of}$ July the media visited. The first day was assigned to getting the necessary equipment onboard the boats and the last to taking it off. 8 different vessels were used for the various tasks There were large boats like MS Stella and DSV Maija from which to dive which had considerable space for equipment, a compressor, as well as dining and bed space. DSV Deeptech was used as a typical mobile diving platform, while DSV Vuoksi functioned as the diving platform from which the dendrochronological sampling and its dedicated air compressor would operate. DSV Vuoksi also functioned as the communications hub from which the camp director, Markku Luoto, and the maritime archaeologist, Kristin Ilves, coordinated activities with the other boats. Briefing meetings with the participants were held every morning, where tasks, the appropriate dive boat and appropriate personnel were coordinated. Communication radio continued throughout the day between the boats which might be tasked to different wrecks., Feedback discussions were held at night and in the following morning updated objectives and planning made.

One of the initial tasks of this year and every subsequent year was to check the condition of the diver trails already in place. The lines on *Träskön tynnyrihylky*, *Alku*, and *Träskön Segelkobben/tykkikylki* were checked and cleaned, including the info-boards.

In total, 11 wrecks were dived on during the camp and some new discoveries made – these included the five wrecks mentioned in the permit (# 1-5), four additional wrecks (# 6-9) that are registered in the Finnish Heritage Agency database and two unregistered new wreck sites (# 10-11)

1. *Träskön tynnyrihylky*, (Barrel wreck) MV nro 1185

2. *Träskön Segelkobben/tykkikylki*, (Cannonside wreck) MV nro 1188

3. *Rönnskärin tykkihylky*, MV nro 1195 – new hull parts and a possible deck gun were recorded.

4. *Linjatauluhylky*, MV nro 1187

5. *Limisaumahylky*, (Clinker wreck), unregistered, N 59°57,506' | E 24°22,273' (WGS84) – excellent photogrammetric recordings were made of the site.

6. *Kuparihylky* (Copper wreck), MV nro 1214 - a rudder and new hull parts were discovered and recorded. It was named because copper pins were discovered on it.

7. *Utterböttenin hylky*, MV nro 1230 – its outer planking was found to be made of oak, not spruce or pine as suggested before.

8. Truttkobbarnan hylky, MV nro 1210

9. Långörenin hylky 2, MV nro 1228 – nothing much was found here, hence it's disputable whether there is a wreck at all?

10. New wreck site, unregistered, N 59°57,204' | E 24°22,791' (WGS84) - an anchor, part of a mast and planking were found. It looked to be potentially an 18th century wreck.

11. Potentially new wreck site (an anchor), unregistered, N 59°57,465' | E 24°22,383' (WGS84)

A theoretical and practical delineation was already being explored as to how wrecks were selected and for what purpose. Some were studied purely for their research value but might not be particularly appropriate as a dive visitor experience. They might be too small or non-descript but contain valuable data. Others might be extensive, have elements seemingly exciting to divers or be already popular and so were selected for Wreck Park 'status' These would be prepared for visiting divers, and would include different elements like tethering buoys, marker flags, underwater guidelines and information boards and be tailored to the complexity of the site. To this list in 2019 were added:

- ***The Kaljaasi 'Edmund' wreck***, MV nro 2382 - it was the most well-preserved structurally intact wreck in the area and already heavily dived on, and in need of regular monitoring to protect it. It was named 'Edmund' because it was locally considered an English wreck.

- ***Rönnskärin tykkihylky***, MV nro 1195 - due to its accessibility for all divers with wreck parts situated in both shallow and deeper waters, in the depths between 5-18 meters. It also had

an impressive variety of wreck related items (cannons, anchors, hull parts, and a rudder). Preliminary guiding lines were installed during the camp.

- ***Linjatauluhylky***, MV nro 1187 - situated in the depths of about 10-30 meters with interesting features and with depth range for the more experienced divers.

Full descriptions and results for those wrecks designated as part of the Wreck Park will be given in the Results section (page 40), which will combine all of the research on them over the 5 years of the project. Most Important discoveries from other wrecks i.e. the ones not included in the Porkkala Wreck Park will also be added there.

Methodologies

One of the main aims of the 2019 camp was to employ dendrochronology dating. An underwater drilling tool, designed by Pekka Paansalo, was employed to take dendrochronological samples. Powered by compressed air it was designed to drill a hollow bit vertically down through timbers so that it captured a sufficient sample of the rings. The sample could then be recovered from the drill bit at the surface. The goal to get several samples that week were hindered by high winds at critical moments when drilling was planned.

However, 5 samples were collected that week. It was first attempted on the rudder of *Rönnskärin tykkihylky*. Compressed air from a dive cylinder was originally used to power it but did not have sufficient pressure and volume to penetrate far into the dense timbers. Compressed air piped from the surface vessel partly remedied that issue, but it was found that considerable down pressure was needed to make progress with the process taking a full exhausting 90 minutes to get the drill fully in. Unfortunately, it did not pierce through the whole timber and subsequently broke inside the hole and ended up in 3 pieces. Of no use for dendrochronology the pieces did produce a radiocarbon date of around 1579calAD.

4 samples were later taken on Limisaumahylky which was considered to have potential to be very old because of its clinker frames. The drill's performance was partly improved by using a cargo winch tied around the frame and an intact sample extracted after 135 minutes drilling. Unfortunately, its 28 rings were insufficient to be dated. Some species of oak are known to produce very thick rings. However, it did yield an early radiocarbon date of 1350calAD. The second sample emerged intact but was not useful for dendrochronology, returning a radiocarbon date of 1500calAD.

The next 2 attempts resulted in the drill working slowly and getting stuck and breaking the cores. Its radiocarbon dates were again around the 1500calAD mark. Although this was frustrating it allowed valuable insights into necessary improvements in the process. The following winter a 4th version was designed with a heavier drill press that would be anchored firmly to the timber and not tilt inside the bore causing it to get stuck.

Another part of the project of 2019 that needs mentioning is the building of an *airlift* to use as an underwater excavation tool. The intention was to clear away some of the thick silt covering *Träskön tynnyrihylky* so that better preserved core wreck timbers could be visualised for dendrochronological sampling, but not to excavate inside the wreck structure itself or disturb its contents, which would have required an excavation license. The construction phase provided valuable insights. Unfortunately, a storm broke out and damaged the airlift piping, while it was being assembled on the surface. Hence, later on the piping broke apart while being lowered into the operating depth.

An additional piece of research involved trialling an *underwater laser scanning tool*, brought by an American maritime archaeologist Michael Murray. When used to scan the stem post of *Träskön tynnyrihylky* it had difficulty processing the imagery due to the high level of particulates in the waters common on that wreck. However, in clear water the technology seems to have great potential.

In summary, this was an encouraging first main season. MAS had brought together a large team who were keen to learn and be involved. Participants had got to familiarise themselves with several wrecks, learned how diver trails are put together and been part of a large project. They had also had fun, a key motivating ingredient of citizen science projects. On the negative side the wreck dating aims had been frustrating but valuable lessons learnt. The days of strong winds had restricted some activity but also bonded the group more.

The most important lessons were learnt about the project's organisational structure. Although morning briefings set the general plan for the day, they were not always detailed enough for those in nominal charge on all the boats for the full day i.e., if Plan A was completed or impossible to achieve, then what would be Plan B or C to be getting along with? There were reasonably long periods when the communications broke down and different boats were unsure what goals to pursue, resulting in lost diving time and some periods of team inertia. It was recognised at the time and in a feedback session after the project that there should be more delegation of decision making handed down not just to the individual skippers on each boat but to someone aware of the archaeological priorities at hand.

2020

Discussions within MAS, online presentations of the previous findings and planning meetings occurred within the autumn of 2019 and spring 2020. Permissions and fieldwork guidelines for the project were gained from the Finnish Heritage Agency (MV/121/05.04.01.02/2020), particularly for the dating sampling which constituted intrusive damage, though limited, to the wrecks. Once again, the project grew in terms of its scope and size.

The field camp of 9 days occurred at the beginning of July. 35 participants from 18 dive clubs attended, all with a palpable sense of excited anticipation. 32 of those made a combined total of some 181 paired dives. Intensive research was conducted on 8 wrecks, with stormy weather curtailing several days or rough waters limiting diving to only the most experienced. A sizeable 'fleet' of diving support vessels massed for the project. 88 dives also occurred within the rest of the year over 21 days where some 16 wrecks were recorded photogrammetrically (18 days) or dendrochronologically sampled (3 days).

The volunteer divers represented a large variety of experience & expertise from inexperienced beginners with only tens of dives in their logs to seasoned dive instructors and experts with thousands of dives over the decades. On average, participants had some hundreds of dives and P2/AOWD+ expertise. Age distribution was also from 17 to 64 years of age, the median being around 40 years old. Most participants were natural Finns, but some international flavour was brought in by English maritime archaeologist David Cleasby and by double citizenship members from Somalia, Germany, Lithuania, and Belgium. Some foreign participants, e.g. from MAS Sweden, had to cancel their participation due to Covid-19.

Partly due to official Covid-19 recommendations, the camp participants were divided into diving and ship crews around the galleys, to delegate task management, enable simultaneous diving activities and to break the participants into smaller "galley bubbles". Volunteers accommodated into Deko2 and Stella would form one galley bubble and the ones in Maija, Vuoksi and Estelle2 made up another bubble. This also served to strengthen the bonds within those groups and maintain consistent dive buddy pairings. Throughout the week dive teams might work on one wreck for a few days until they had made satisfactory progress but were then rotated to another site, so they never became isolated or bored and saw more of the other wrecks.

As on previous camps one of the first tasks was to check and clean the existing diver trails. This year the existing *methodologies* were improved, and new ones added:

- ***The organisation structure*** was addressed by more detailed daily task planning and giving more autonomy to each skipper. Each boat had its tasks for the day and alternates, if necessary, which turned out to be important when the weather changed, and more sheltered sites were needed. The maritime archaeologist had 2 assistants with archaeological experience who were deployed to the other 2 dive boats. They took responsibility for keeping tasks on track and ensuring the documentation was filled out.

The MAS 'fleet' at Porkkala in 2020. Diving support vessels (DSV) from left: MAS flagship Stella, Sukeltajat Ry's Maija, H2O's DEKO-II, Estella-2, Nousu's Vuoksi and various support boats - probably the largest maritime archaeological fleet on the Baltic Sea ever!

- ***Safety protocols*** were tightened. The safety consciousness of Finnish divers has always been quite high through their training and focussed dive logging. Particular care was made to ensure that each site and each task was risk assessed and documented by the skipper or assigned person. A small light vessel was tasked if necessary for diver drop off and pick up and someone always tasked to be nearly ready as a rescue diver.

- **New *documentation tools*** were introduced. These were adopted from the Nautical Archaeological Society fieldwork proformas, and each member orientated to their use. These included dive logs, risk assessments, dive plans, dive records, sheets for wreck stetches and incident/near miss forms. Of equal importance were sheets for detailed recording of the samples taken, so that there was no risk of later confusing where they came from, which would have destroyed their usefulness.

  For the divers, the dive planning and dive recording sheets were the most important for them to address seriously. Proper dive planning meant a greater chance of task completion. The dive record sheets were not just to record basic actions and put down everything they saw of relevance but to allow the divers to explore their archaeological thinking. They also prompted divers to identify what went well and what might still need to be completed on the next dive.

  There were also permatrace sheets for underwater recording, such as for sketching sites or 2D hand measuring of sites or cannon/timber/hulk recording. However, due to the task load and the rough weather there was little time for these. Forms were included for divers who took photographs and video to document their footage, as even the worst clips could inform more about the site if missed by others. These photo/video forms were variably used but a system was also set up post-project for all footage to be added to the MAS database.

- ***Training in maritime archaeology theory and practice*** was one of the additional aims of this camp. However, bad weather and the extensive task load meant that practical basic maritime archaeological training became impossible. However, the maritime archaeologist took some time with the participants to explain important principles and methods, give positive feedback on their experiences and make them fully aware of the importance of their participation.

- ***An underwater tracking system*** *(UWIS)* was trialled successfully on several wrecks. This had several useful functions. It allowed divers to be tracked underwater from the surface, therefore adding a layer of safety. Divers could monitor their own position and direction of travel through use of an underwater tablet. Positional data about wrecks or anomalies to be investigated gained from surveys could be placed on the tablet before diving and allow the divers to swim straight to them. Divers in turn could record the position of any object they find. It worked well despite some dives cancelled due to the weather and it was decided to use it in future.

- ***Organic samples*** were taken from the barrels on *Träskön tynnyrihylky* using plastic tubes and to determine what its contents were. This could provide information on the ship's function if they stored commodities that were known to be exported from certain destinations or imported to others. However, laboratory analyses proved that they were full of silt and had presumably totally decayed, been washed out or were originally empty.

Images: Impossible diving conditions, which gives an idea of conditions facing past mariners (MAS) Barrels on the Barrel wreck, the specimen tubes (MAS)

- ***The dating sampling process*** was improved with a 4th version. The original drill bit (32mm) was changed into a commercially available "Birmensdorf" type of drill bit (12mm). Also, the proprietary drilling "jig" was changed into a commercial column drilling jig. The updated version of the dendro-drill could be attached more sturdily to a timber using bolts and could produce a specimen within 15-30 minutes, with half of that time taken setting it up and removing it. See front cover for view of the drill in action. Within the year as a whole some 25 dating samples were taken (see results section, p 40). However, it proved very difficult to determine the orientation of annual

rings in the wood and/or the biological condition of the wood, as the timbers may be rotten from the inside as well. Hence, most of the samples were not usable for dendro dating, but only for radiocarbon dating and wood type analyses.

- Thermoluminescence dating was also considered as a dating source. Half burnt brick was taken from the galley of the *Varmbådanin uunihylky* (the 'Stove wreck') and there were bricks on Träskön tynnyrihylky if needed. These were not processed because it was considered enough dating information would come from the dendrochronological and radiocarbon sources. The price for the laboratory analysis also seemed above budget.

Here is a list of the extensive work done for that whole year (please note that the full wreck analyses and dating results will be given later, p 40):

1. ***Träskön tynnyrihylky***, MV nro 1185 - Dozens of park maintenance dives, a new photogrammetry model, 4 samples were collected.

2. ***Träskön Segelkobben/Tykkikylki***, MV nro 1188 - Dozens of park maintenance dives, 3 samples were collected.

3. ***Rönnskärin tykkihylky***, MV nro 1195 - Several park development dives, additional photogrammetry model, 2 samples were collected.

4. ***Linjatauluhylky***, MV nro 1187 and Ryssbrantarna MV nro 1220 – These are the same wreck but at different depths? Dozens of park maintenance dives, a new photogrammetry model, 3 samples were collected.

5. ***Träskön Limisaumahylky***, MV nro 1000039839 - Dozens of park maintenance dives, new photogrammetry model, 1 sample was collected.

6. ***Kuparihylky***, MV nro 1214 - Several park planning dives, additional photogrammetry model videos, no samples were taken.

7. ***Utterbottenin hylky***, MV nro 1230 - Several park planning dives, 2 samples were collected.

8. ***Truttkobbarnan hylky***, MV nro 1210 - Several inventory dives, no new finds.

9. ***Långörenin hylky 2***, MV nro 1228 - Several inventory dives, no new finds, hence the existence is disputed.

10. ***New wreck site*** (an anchor and part of mast), unregistered, N 59°57,204' | E 24°22,791' (WGS84) - Several inventory dives, no new finds.

11. ***Potentially new wreck site*** (an anchor), unregistered, N 59°57,465' | E 24°22,383' (WGS84) - Several inventory dives, no new finds.

12. ***The Kaljaasi 'Edmund' wreck***, MV nro 2382 - Several park planning dives, additional photogrammetry model videos, no samples were taken.

13. ***Pampskatan 1 hylky***, MV nro 1225 - A few park planning dives, new photogrammetry model, 1 sample was taken.

14. ***Salmen 1*** hylkymerkintä MV nro 1192 - Several inventory dives, the wreck was confirmed as nonexistent.

15. ***Varmbådanin uunihylky***, MV nro 1183 - Several dives were made to add this to the Wreck Park, a new photogrammetry model made, 3 samples were collected

16. ***Engelskobben 2 hylky***, MV nro 14039773, Several park planning dives, new photogrammetry model, 2 samples were collected.

17. ***Remmarudden***, Träskön länsipuolen matala, MV nro 1191, A few park planning dives, video for 3D-model, 1 whittling sample was collected.

18. ***Torrörenin hylky***, MV nro 1221 - A few inventory dives, some video documentation, no samples were collected.

19. ***Pärongrundetin hylky***, MV nro 1200 - A few park planning dives, a new 3D-model, no samples were collected.

20. ***Svarthällenin hylky***, MV nro 1222 - A few park planning dives, some video for 3D-modelling, no samples were collected.

21. ***Juktenskobbenin hylky***, MV nro 2302 - A few park planning dives, additional video taken for 3D-modelling, no samples were collected.

22. ***Harunan hylky***, MV nro 1198 - A few park planning dives, new 3D-modelling, no samples were collected.

On the media day of the camp, YLE's TV and radio departments published news from the camp, and a reporter from Helsingin Sanomat wrote an open story about the camp for the HS Espoo publication.

In summary, the field camp took the project to a new level in terms of organisation and ostensible results, despite the interruptions from the bad weather. There were still some instances of communication breakdown and a few safety breeches that were addressed immediately with direct sensitive feedback. The management structure performed better with the camp director closely communicating with and supported by the boat captains. These

collaborated closely with the maritime archaeologist and the 2 support assistants so tasks remained on track wherever possible The Wreck Park size was gradually expanded as a few more wrecks were added, while data about many of the wrecks grew substantially. Some of the wreck's results proved especially exciting, such as a possible early date for Utterböte of 13th to 14th century.

2021

It has already been mentioned that the interim report for 2021 was lost due to theft and apologies are made if there are any significant gaps in this section. However, the more detailed profiles of the wrecks and their dating information were preserved and are given in the later results section (p 40). As with the previous years there were meetings within MAS in autumn 2020 and spring 2021 to discuss what could be improved for the next year. Permissions for research were gained from the Finnish Heritage Agency and additional funding sought.

One realisation in the planning process was that the activities of 2020 had collected a considerable amount of data on many wrecks and now it was time to concentrate more on the core wrecks, especially those for the originally promised Wreck Park. The existing diver trails needed not only to be cleaned but some signs and markers changed. Others needed their entire structure with buoys, cables, lines and so on built. There were also some obvious gaps in the dating data for some wrecks that needed addressing.

Covid restrictions in Finland were still in place which resulted in less participants than last year. This did not constitute a problem as it was felt that a slightly smaller team might be more effective to push the project along more intensively. 30 persons participated in the field camp, of whom 26 divers produced 81 paired dives.11 wrecks were intensively dived on.

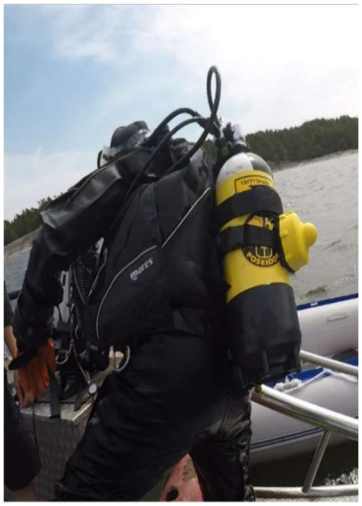
Methodology changes

In addition to the usual tasks of maintain the diver trails and completing photogrammetry surveys, several additions to the methodology were employed:

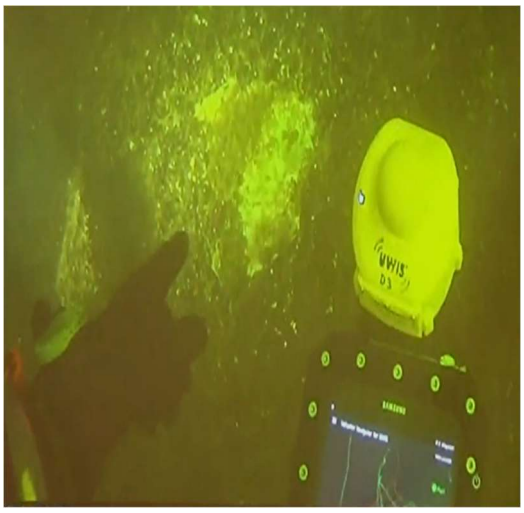
- ***The documentation had been streamlined*** so that it was more fit for purpose. Some elements were reduced while retaining its core archaeological content. The previous forms were reconfigured and translated into half Finnish, half English, and now made more sense to the divers both in terms of language but the ethos of diving they were used to. The English language element was retained as it was necessary for the foreign divers and archaeologists MAS wished to attract to the project and further spread the word of this Finnish project abroad.

- ***A metal detector*** was further added to the equipment inventory and used here and there to find hidden features and particularly smaller metal artefacts.

- ***The co-operation with Finnish Heritage Agency*** was deepened, as they kindly brought their survey vessel Wellamo and conducted sidescan surveys initially near the Rönnskär wreck, but then more extensively in the wide area north of Träskö island and its bay. This area had been known for years as containing many cannons but without obvious wreckage. There were various interpretations for their presence. The most likely explanation was that these cannons had been dumped overboard to allow a foundered ship to escape. It was possible that one of the other wrecks further away had carried them or that the strong currents in the area had somehow moved the wreckage away. This detailed survey allowed all the objects and anomalies to be recorded. The UWIS system was then set up and data from the sidescan loaded onto the tablet so divers could search for the targets.



Images: UWIS underwater tracking helping to find objects (MAS)



- ***Taking of dendrochronological samples*** was as always part of the process. However, in many cases the timbers selected were not wide enough for the drill to be placed upon. Some were timbers flat to the seabed or mounted upon others. This can cause a problem for the technique because it requires an assessment that the drill bit can pass through the timber into empty space below or it may become stuck in a lower timber due to counter rotational forces between different timbers with different densities. This can cause a substantial loss of time retrieving the bit and the sample often breaks making interpretation by the dendrochronologist Tuomas Aakola difficult.

  With some wrecks it was clear after an attempt or 2 that the timbers were rotten in the centre. In addition, the surface condition of many timbers, especially with darkened oaken timbers, made it difficult to determine the direction of the ring patterns. In all these cases it is essential to take time with the selection of places to take samples and

plan a strategy accordingly. This resulted in a change of strategy and methodology sometimes.

An electric knife powered by portable compressed air was used on some timbers. Unfortunately, it cut very slowly if at all on the harder timbers and the noise and vibration for the diver made it ineffective and hard to use. A small chainsaw powered by compressed air was used by the maritime archaeologist to take small slices for dendrochronology or if the sample was insufficient for radiocarbon dating. The chainsaw model had appropriate safety features and was first practiced with in controlled conditions with a risk assessment for each dive. This rapidly speeded up the process for sample taken. It was especially appropriate for planks where the ring pattern could be seen on its upper surface and were too thin for the dendro drill. However, it was always considered not the prime method for a dendrochronological dating method because it could cause more timber damage.

One of the main benefits of the dendro drill was that it left just a hole through the timber. The common approach to taking a sample with a saw or chainsaw could be problematic. Aside from the safety concerns where the sample was taken could cause more obvious damage to the timbers than necessary or produce a poor sample. Taking off the end of the timber, or close to the end, might seem quicker as it is one cut only, but its internal structure might be rotten internally through being exposed more to the elements. If the cut is made mid-section, there is more chance of an intact ring structure, but 2 cuts are required and invariably a distal 'orphan' piece is left isolated on the wreck with a glaring gap between. Care was therefore taken in all cases that chainsaw samples were taken as far as visibly possible from non-deteriorated timber and in discrete places that did not interfere with the structure or aesthetic look of the wreck.

Below is a list of the activities wreck by wreck:

- ***'Putkinotko/ Remmaruuden'*** – the area where the cannons were found was extensively dived. Almost a dozen cannon of different sizes were found, some of which looked like small deck guns, as well as cannonballs and barshot. 3 large cannons were found at a shallow depth in a relatively straight east-west orientation, one of which sat dramatically upside down on its carriage. A dendro sample was taken from the carriage for dating which can be seen in the results section. The cannons were photogrammetrically recorded in detail but also as a continuous context. It made sense to link these interesting features with a diver trail. The diver could descend the flag buoys placed at either end and swim across not just the 3 large cannons but several small ones and other objects in between. This site was given Wreck Park status.

- ***Rönnskär*** – A considerable amount of the week was spent erecting a full dive trail here. This site was spread over quite an area, with several cannons, wooden wreckage

and 2 anchors. The dive trail was erected with a tethering buoy and lines with direction markers that linked all the features in a large circle, including an outlying deck cannon. A dendrochronology sample was taken, and detailed photogrammetric recording made of the cannons. On the Media Day a diver was filmed underwater by an ROV while swimming around and describing the interesting features of the wreck.

- ***Träskön tynnyrihylky*** - 3D modelling was conducted and a metal detector search.
- ***Träskön Segelkobben/Tykkikylki*** – further 3D modelling was conducted and maintenance of the diver trail.
- ***Engelskobben 2 hylky*** - 3D modelling was conducted and a dating sample taken.
- ***Linkobbenin hylky*** – 2 dating samples were taken, one for dendrochronology, the other for radiocarbon. 3D modelling was also conducted.
- ***Sankbådan*** – The original wreck coordinates were incorrect, so the wreck needed to be found. The correct coordinates, when established after some searching, were later updated to the wreck database.

This dramatic site is characterised by an upper and lower level. Above sits large, long timbers and 2 anchors, with one prominently upright (see cover page). Below down the slope are multiple timbers crushed into a gully. 3D modelling was taken of the entire site and a flag buoy set up with guiding lines below across the top site and leading to the area below. A simple whitling sample for dating by radiocarbon was taken.

- ***The Kaljaasi Edmund wreck*** – This wreck that sank in 1907 was the most intact wreck in the Wreck Park and important for providing diving variety. Video photography was made of the wreck's prominent features and a full 3D model made.
- ***Salmen 2*** – This wreck sunk in 1898 was visited for diver orientation.

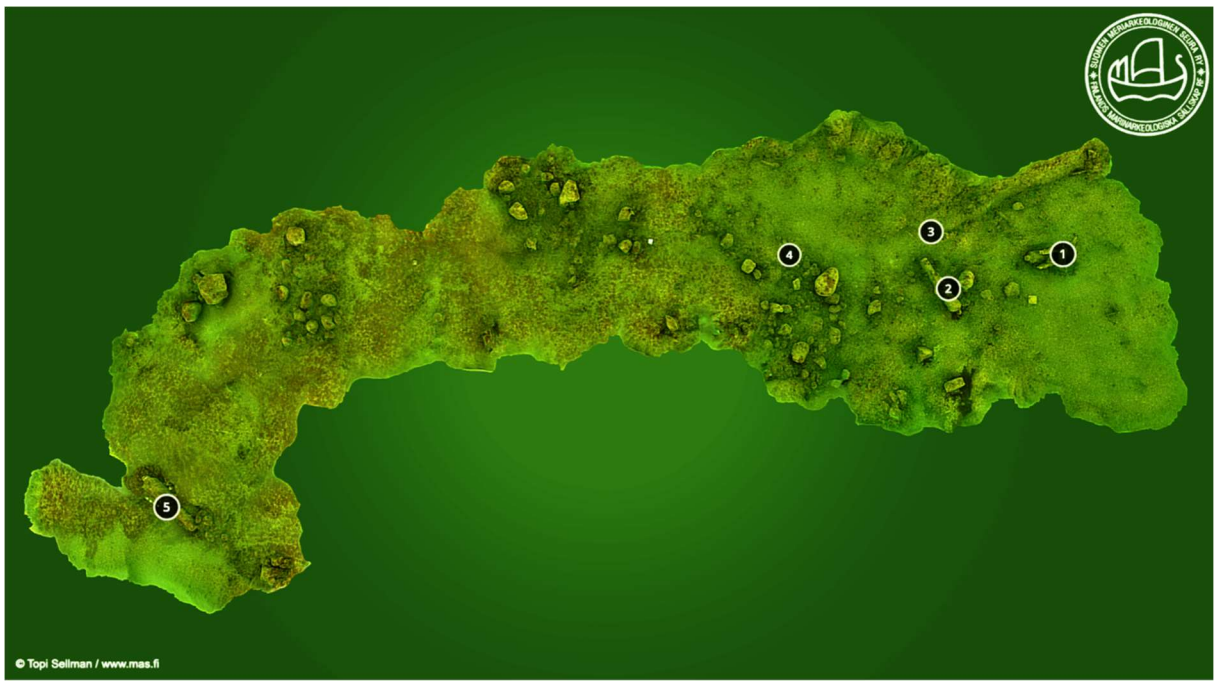


Image: Photogrammetry plan view of Putkinotko/Remmaruuden site (Topi Sellman, MAS)

Image: Photogrammetry of upturned carriage on cannon site above, marked as no. 1 on larger context above

(MAS – Topi Sellman)

It felt at the time as a more successful season with a cohesive team into their stride. An autumn feedback session conformed this. On the media outreach day over 40 visitors came to the site which involved a spectacular underwater interview broadcast live on Yle, the national TV network.

2022

As was already mentioned there is no separate interim report for this year. It was felt that there was little need as the full report was due soon and the results for 2022 would be covered in the later results section. A summary is given here. This was to be last year of the project and for which there was funding. Therefore, the original key objectives needed to be completed as much as possible. The 11 wrecks given Wreck Park status needed to have completed diver trails in some form dependent on the size of the site and number of features and backed up with appropriate research in terms of dating and photogrammetry.

The 9-day camp was slightly smaller in scale this year partly due to the fact MAS ran 2 other field expeditions to the Saaristomeri area of western Finland on exciting intact wrecks like the Börstö and Vrouw Maria. The core team came as always but it was clear from the discussions that some people were relieved the project was concluding after 4-5 years and new horizons being sought. Some 25 participants took part of whom 21 dived, making a total of 59 paired dives on 8 different wrecks. 20 people visited the park. The media day saw an excellent underwater interview broadcast to the media on national television channels. Outside of the camp an additional 48 paired dives were made over 8 separate days by small groups of divers.

Methodology

- ***Completing the diver trails*** was the main priority, such as setting up flags, renewing old lines, putting on direction markers. It was discovered in some cases that flags from the summer were missing on 1 or 2 sites, leaving the question whether they had become loose and drifted or more likely removed by someone for whatever reason, or damaged by-passing traffic. Some underwater lines on the Rönnskär on autumn dives seem to have been cut since the summer. These observations reaffirmed the need for yearly or even twice-yearly maintenance.

- On the ***Putkinotko / Remmaruuden site some more detailed inspection*** of the 3 largest cannons were made. Extensive photogrammetry was completed of these and a wide avenue between them in which other objects such as a large pulley block and Sansome small possibly deck cannon were seen. There was the opportunity for divers to gain experience in measuring the cannon dimensions by hand using the traditional tools of tape measures and underwater proformas to record on. Each cannon had different dimensions and some minor changes in features. Measurements of the muzzle size, bore diameter (to estimate cannon ball size) or its overall length, or its stylistic features, could be useful in attempting to typologically match it to a rough period or manufacturing tradition.

  However, it was difficult to gain exact measurements due to the thick concretion on their surfaces. This could only be done by raising a cannon, deconcreting it or x-raying it, all of which was beyond the scope of this project. The Finnish Heritage Agency gave permission to use tools such as a kitchen rolling pin to remove the concretion from the top of the cannon, ahead of the assumed touch hole position, where often the emblem or name of the nationality was placed. The trunnions, or axles, on which the cannon sat on its mounting were also to be inspected for individual company makers' marks. Evidence from both could be crucial in determining their relative age and provenance, especially where no wooden structure and type were associated.

  The eastern of the cannons was upside down nestled deeply from halfway into the seabed but with its carriage still attached above. Because it was upside down it was impossible to inspect the cannon's upper face. One trunnion was exposed but had no markings. A section of concretion was removed from the top of the middle cannon but disappointingly nothing found. It was clearly the right way up because a sighting ridge was clearly there. The third cannon was clearly upside down and one cleaned trunnion revealed nothing.

  In all cases the trunnion ends were badly decayed and deteriorating quicker than the rest of the cannons with the appearance of a white crumbly appearance where dark metal was expected. A search to 3D model outer lying cannons and objects that had been seen on the previous year and dives, such as several more cannon up to 12, a mound of cannonballs and isolated bar shot was unsuccessful. A similar attempt to

deconcrete the upper surface of the upright cannon on the Rönnskär was commenced but could not be completed.

- ***The dendro drill technology was developed more***. Instead of it needing compressed air piped from the surface vessel an electric version was trialled that mounted into the rig. This was far easier to set up and when fully charged could perform well but needed several adjustments throughout the year.

- ***A water dredge*** designed by a field camp participant was brought to site for members to trial. A mock site was set up in Träskö bay with buried objects for divers to unearth carefully. It provided useful experience for future projects and fine tuning of the functioning of the dredge.

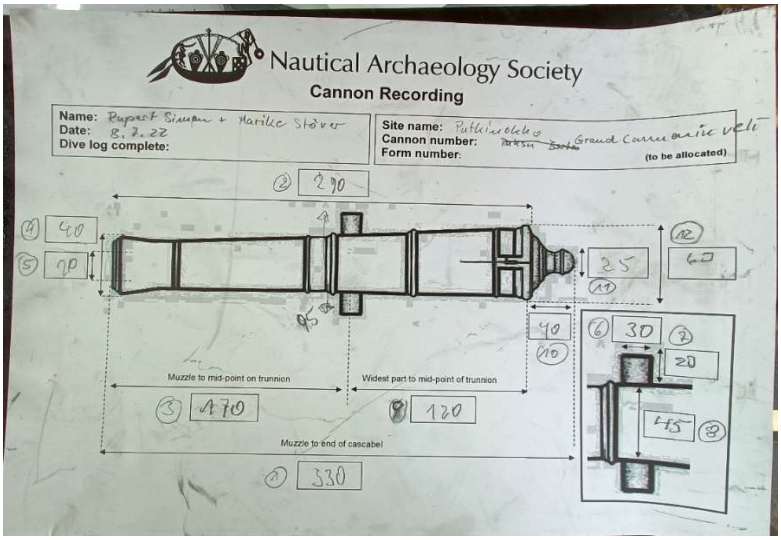


Image: Measurements from 'Grand Cannon' at Putkinotko

(MAS – Rupert Simon & Marika Stover)

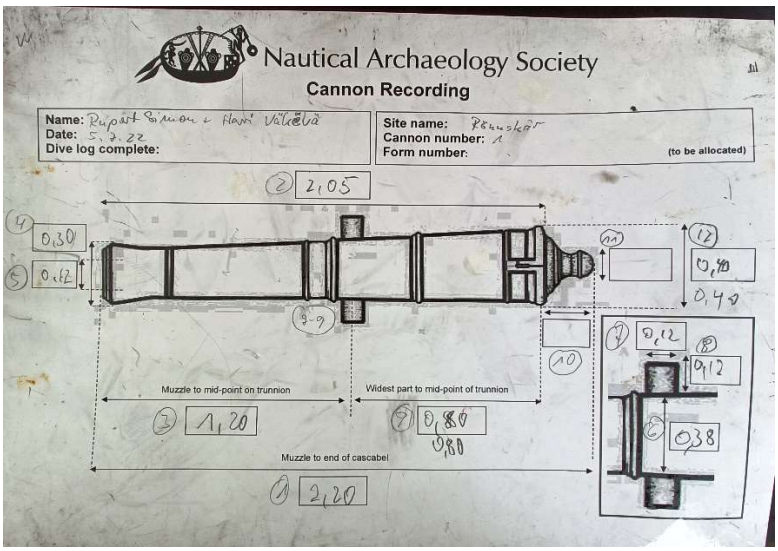


Image: Measurements from Rönnskär cannon no.1 (position recorded on video) (MAS – Rupert Simon & Harri Väkevä)

Here are brief details of the wrecks dived on

- ***Putkinotko / Remmaruuden*** – As stated above, photogrammetry, maintenance on the diver trail and cannon research was conducted. A search for the other cannons was unsuccessful partly because on this visit the UWIS system with its recorded anomalies was unavailable. From the manual measurements taken it was not possible to typologically match the cannon or ascribe them to any period or nationality of origin. The variations in size and the distance between makes it impossible to link them. It is true that in early periods before cannon size were standardised across the navies of for instance Great Britain or Sweden cannon of diverse sizes could be carried on board the same ship, and it may be possible that some cannons were being transported for future use on land.

  In these cases, the likeliest explanation was that they came from sinkings or from being thrown overboard to lighten a ship's load. The measurements in the illustrations above may be useful for future researchers, who can gather greater accuracy by taking measurements from the 3D models on the MAS website, and then comparing those to design drawings in different nation's historical archives or archaeological databases, such as the 'Big Cannon Project' (see link).

- ***Sankbådan*** – 2 dendro samples were taken. One in the field camp was not conserved because a drill malfunction meant it failed to penetrate far into the wood. The other in the autumn from a rudder piece was a decent 21cm long. The flag buoy was secured to the bottom and given rope to avoid excessive rigidity and potential damage to the system. Old lengths of guiding line were removed, and a new line run from the upper level to the lower level of the wreck.

- ***Rönnskär*** – A considerable amount of work was made tidying up the diver trail, replacing lines, cleaning algae off lines and connecting the lines ínto a cohesive circuit. One cannon was manually measured as shown above. The site was again recorded photogrammetrically with especial detail taken of the cannons. The site was considered ready for visitors. 2 dendro samples were taken in the autumn, both of good length, one from a rudder timber.

- ***Träskön Segelkobben/Tykkikylki*** – A buoy was installed, a guideline to the wreck reinstalled and the old info board. Removed as covered in sea life. A new info-board needs to be printed and put in place.

- ***Linjatauluhylky*** – A new flag buoy was put in place and the line to the wreck repaired.

- ***Varmbådanin uunihylky*** – This large 30m long wreck in shallow water wedged between 2 large rocks was studied in more detail and 3D modelled. Its features included gunports, millstones, ballast, and the bricks from the oven. Due to the danger posed by the close rocks, flag buoys were set up a reasonable distance from the wreck at both ends and the guiding line laid between them down the centre of the wreck,

guaranteeing access from both directions and some degree of shelter. At some future date an info board still needs to be added.

- ***Kaljaasi Edmund wreck*** – The buoy system was finished. A chain now held a buoy to a rock a small distance from the wreck, so tethering would not damage the site. A line was laid on the bottom to guide divers to the bottom of the hull. Another vertical line guided them to the deck level. Old guidelines were removed, and markers attached to the lines.

- ***Träskön tynnyrihylky / Alku / Limisaumahylky*** – Lines were replaced on *tynnyrihylky,* and the old info-board removed for replacing with a new one. Limisaumahylky was 3D modelled in more detail, and lines replaced on it. A line was extended from *Limisaumahylky* to *Alku,* so a long circuit was formed for the 3 wrecks. Confusing old lines were removed. On the western side of the wreck was a shallow rise with timbers sticking out from thick silt. Probing the silt seemed to indicate that there was more wreckage underneath which might be the main wreck site and might explain the relative lack of other clinker shape timbers on the site.

This was an important last season. 2022 provided fewer dating samples, but ensured the diver trails for the Wreck Park were almost ready, with only some info-boards left to be printed on slates and secured on site.

	2018	2019 Field Camp	2020 Field Camp	2020 Extras	2021 Field Camp	2021 Extras	2022 Field Camp	2022 Extras
Paired Dives (some singly)	> 200 dive hours	155	181	88	81	80	59	48
Divers		28	32	Small groups	26		21	
Total Participants		31	35	Dendrodate	30	36	25	
Represented dive clubs		16	18	& Photogram	14			
Days diving		9	9	21	9	6	9	8
Wrecks researched	4	11	8 (bad weather)	16	8 (intensive)		8	
Outside Visitors to the Camp	>60	20	>50		> 40		>20	

Image: Table of basic statistics (MAS)

Funding information

The project is extremely grateful to the following funding sponsors without whom the project could not happen:

2018

Finnish Heritage Agency (4000€) from the European Year of Cultural Heritage 2018 Fund

2019

SKR/Harry Hendusen rahasto (35 000€), Finnish Heritage Agency (10 000€), Participants' contributions (3159€), Meriarkeologinen seura (1187€)

2020

Weisell Foundation (8000€), Participants' contributions (c.3000€)

2021

Participants' contributions (c.3000€)

2022

Participants' contributions (c.3000€)

Wreck descriptions & project results

In the following section the wrecks will be described in basic terms and then any dating results and suggestions about the identity and function of the wrecks given. There will be some duplication from previous sections in his report because the summaries of each year's events was included.

Please note that 'Kyppi.fi' is the National Heritage database reference, where objects over 100 years are categorised by the Finnish Heritage Agency as fixed ancient remains and given a certain level of cultural heritage protection.

Hylyt.net is the Finnish wreck database, which can contain information from all sectors of society interested in the subject, and from which divers often make plans to dive and give feedback to afterwards. Much of the information data has been taken from hylyt.net, which normally gets updated as wrecks are visited, their condition reassessed and entries updated. The research taken by MAS has been added to the hylyt.net database and previous entries corrected if erroneous or the condition of the wreck and its contents have changed.

1.Träskön tynnyrihylky (Barrel wreck)

Links:

- Kyppi.fi https://www.kyppi.fi/to.aspx?id=112.1185
- Hylyt.net https://hylyt.net/hylkykortti/3015
- Sketchfab https://sketchfab.com/3d-models/stora-traskon-barrel-wreck-mw1185-hires-91fcf40b83194601bdb565d6466f8e48
- Sketchfab Barrel & Clinker wreck https://sketchfab.com/3d-models/traskon-tynnyri-ja-limisaumahylky-7b8dc9b433c14ac8acd59cfdda40015e

Co-ordinates – 59°57.474' N 24°22.272' E WGS84

Dimensions – 30m x 6m

Form / structure – An oak built, round bottomed, smooth jointed vessel, which is sunk in the mud up to its deck beams. The bow and sternposts sit upright to a height of 5m. The deck structures have collapsed but the side planking remains reasonably intact to a height of 1 - 1.5m giving the shape of the vessel It is likely that there is considerable intact structure underneath. Features include a water pump, the remains of a hearth, the foot of a 3-legged cauldron, and plenty of barrels of different sizes in the mud in the hold, from which the wreck was given its descriptive name.

Depth – 17- 21m

Known history / investigations:

The wreck was discovered in the early 1970s.

It was reported to the National Museum Agency in 1986 and in 1987 hobbyists from Teredo Navalis and members of the National Museum Agency made a small-scale excavation of the sediment, with a sketch made of the wreck. It featured in studies of Finnish wrecks in 1992 and 1996 as stated in hylyt.net.

In 2017 the first 3-D map was made by MAS member T. Sellman, and when compared to the drawings from the 1980s showed likely recent anchoring damage had occurred.

MAS Porkkala Wreck Park 2018 – The diver trail set up.

MAS Porkkala Wreck Park 2019 MV nro 1185 – The diver trail was maintained, an attempt made at excavation; barrel sampling was undertaken which found nothing.

MAS Porkkala Wreck Park 2020 - Dozens of park maintenance dives and a new photogrammetry model were made; 4 samples were collected.

MAS Porkkala Wreck Park 2021 - 3D modelling was conducted and a metal detector search.

MAS Porkkala Wreck Park 2022 - Lines were replaced on *tynnyrihylky,* and the old info-board removed for replacing with a new one.

Dating: See attached Excel “Näyte_ja_ajoituskirjanpito2019-2023.xls”

Successful samples MAS-ID’s are: **Tid25F** and **Mid2021-25y**

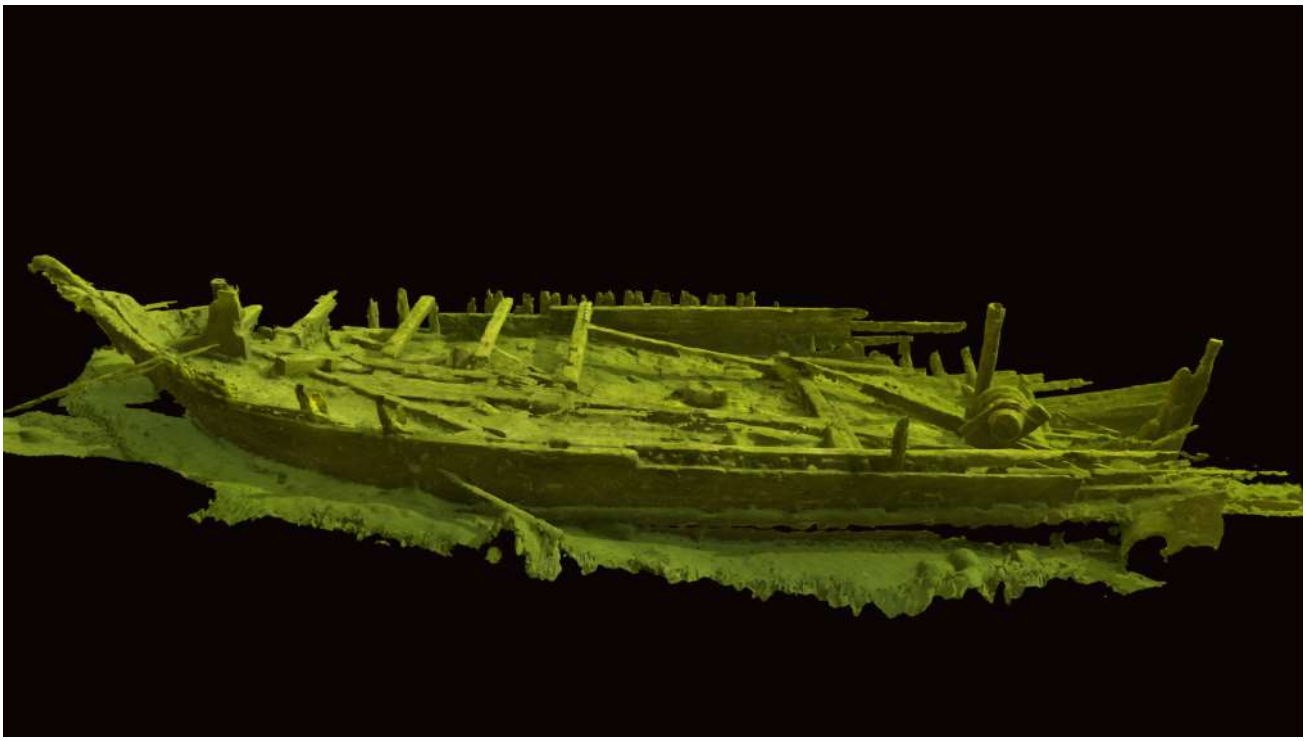
Altogether five dating samples were taken by MAS coring methods between 2020-2022. Only the very last sample produced enough growth rings (101) for a dendrochronological matching against Wasa ship’s sequences, which produced a dating between AD1529-1629. Two radiocarbon datings were also made which support the dendrochronological dating by placing the dates before AD1640. Hence, it’s reasonable to assume that the ship was made on the

first part of 17th century. The dendrochronological correlation was somewhat weak, so the providence of the wood material used can only be assumed to be somewhere in Scandinavia.

Suggested re-interpretation of the wreck:

He wreck was never really analysed in a scientific manner, but a general assumption based on the stem & stern posts was, that the wreck dates to the turn of the 16th to 17th century, which seems quite right. Maybe current datings put it more precisely on the second quarter of the 17th century, but the error margin is unknown, hence it could be from the first quarter too. No reinterpretation needed, the assumed dating is somewhat confirmed.

2. Alku, also known as Kalkkihylky



Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1186

- Hylyt.net https://hylyt.net/hylkykortti/1271

- Sketchfab.com https://sketchfab.com/3d-models/stora-trasko-alko-alko-wreck-59780ab33664469ebb4cb073d16f888f

Co-ordinates – 59°57.420' N, 24°22.210' E WGS84

Dimensions – 20m length x 4 – 5m wide

Form / structure – The ship's deck planks have almost completely disappeared, revealing lime loaded up to the deck beams. The bow and stern posts are standing, but the side planking has detached from them and opened up straight. The wreck is partially buried at the bottom. Its left side has completely collapsed. Diving and anchoring have damaged the

wreck. The windlass has been torn off and dragged from the bow to the stern, apparently as a result of anchoring.

Depth – 7 – 8m

Known history / investigations:

It is known to have sunk 21.5.1880. Captain Johan Karlsson was the captain of the ship. The ship had sprung a leak on its way from its home place to Helsinki and it was lost with its cargo.

The wreck was reported to the Museovirasto in 1995.

MAS Porkkala Wreck Park – Wreck was investigated, a 3D model made, and it was added to the diver trail involving the Barrel wreck.

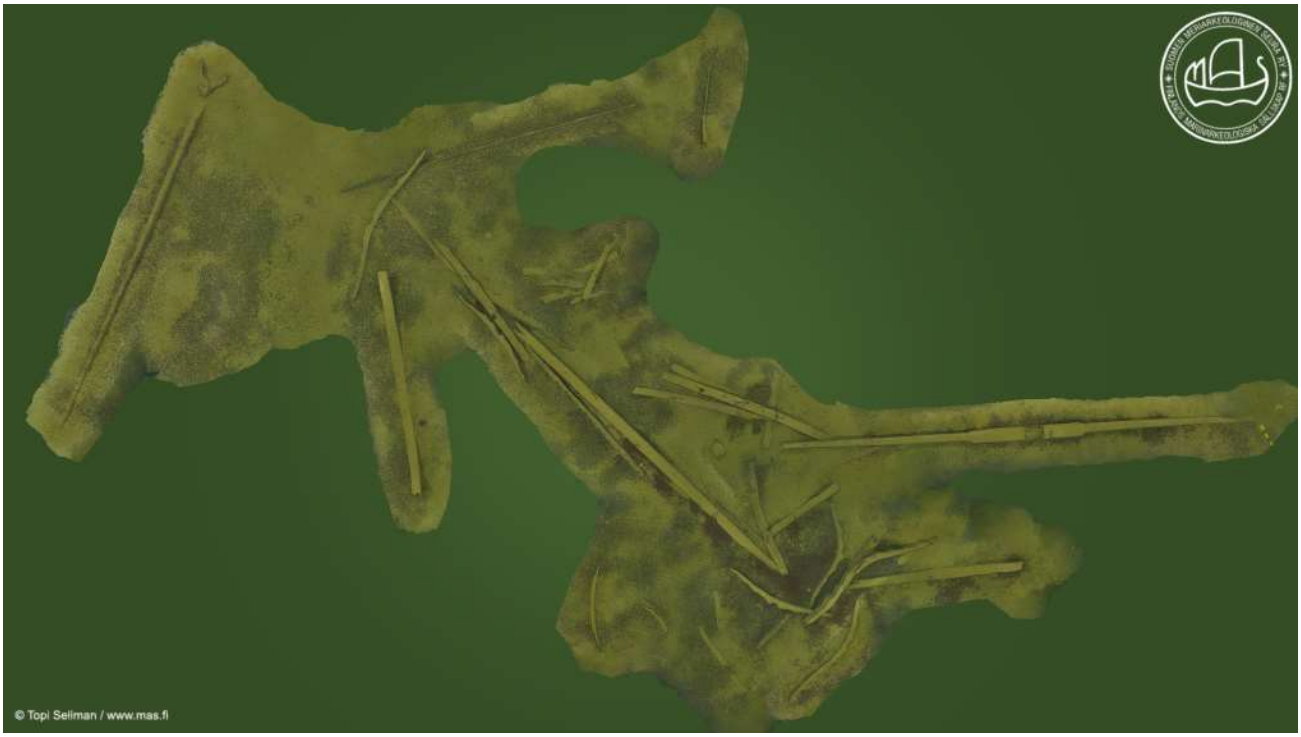
Dating:

Its sinking date of 1880 is very firm, so no new dating data was required.

It is known to have sunk 21.5.1880. Captain Johan Karlsson was the captain of the ship. The ship had sprung a leak on its way from its home place to Helsinki and it was lost with its cargo.

Suggested re-interpretation of the wreck: The wreck was commonly known as “Alko” but MAS treasurer Juha Hakala found historical evidence from customs records that the name of the ship was spelled “Alku”. No other re-interpretation needed.

3. Limisaumahylky (Clinker wreck)



Links:

- Kyppi.fi https://www.kyppi.fi/to.aspx?id=112.1000039839

- Hylyt.net https://hylyt.net/hylkykortti/10234

- Sketchfab https://sketchfab.com/3d-models/stpra-trasko-limisauma-jaannosalue-1226ad8b24104ec78b6d35e3e44cb0b6

- Sketchfab https://sketchfab.com/3d-models/traskon-tynnyri-ja-limisaumahylky-7b8dc9b433c14ac8acd59cfdda40015e

Co-ordinates – 59°57.506' N, 24°22.273' E WGS84

Dimensions – A dispersed wreck over a wide area ~50m x ~30m.

Form / structure – It is a wooden-hulled ship with a split seam, a keel and 'pig keel' some 8-19 timbers, including a mast step. The size is hard to estimate but the timbers are more than several metres long. A sandy mound on the eastern side may well cover more intact wreckage.

Depth – c. 16m

Known history / investigations:

In 1993 the Finnish Museum Agency was made aware of the wreck with its keel and skeleton frames.

MAS Porkkala Wreck Park 2018 – The wreck was inspected and set for further study.

MAS Porkkala Wreck Park 2019 – 3D photogrammetric recordings were made of the site.

MAS Porkkala Wreck Park 2020 - Dozens of park maintenance dives and a new photogrammetry mode was made, 1 sample was collected.

MAS Porkkala Wreck Park 2022 - Limisaumahylky was 3D modelled in more detail, and lines replaced on it. A line was extended from *Limisaumahylky* to *Alku,* so a long circuit was formed for the 3 wrecks. Confusing old lines were removed. On the western side of the wreck was a shallow rise with timbers sticking out from thick silt. Probing the silt seemed to indicate that there was more wreckage underneath which might be the main wreck site and might explain the relative lack of other clinker shape timbers on the site.

Dating: See attached Excel "Näyte_ja_ajoituskirjanpito2019-2023.xls"

Successful samples MAS-ID's are: **#2B (#4D, #3C, #1A)***

*Three additional coring samples were taken from two loose bottom timbers found more than 100 meters from the Limisaumahylky site, but it was soon deemed, that they are likely from a different wreck based on their shape, wood material and dating. Those are now called "Irtokaari" (loose frame) A1 & B2, but they are still labelled under this wrecksite.

Two coring samples were taken from the keelson in 2019, but none produced enough growth rings (51) for a dendrochronological dating. One radiocarbon dating was made, which has its probability maximum at AD1520, but also the latter half of the 16th century or even the early 17th century are possible as is the late 15th century.

Suggested re-interpretation of the wreck:

It's difficult to say much about the original vessel from which the wreck parts are from. Based on the keelson length and stepped frames, it is assumed that it was a single masted and clicker built vessel not more than 18-20 meters in length. There's certain imparity with the keel and keelson versus the frames – namely in the suggested length by keels versus the fairly narrow width suggested by the stepped frames. Hence more research is needed – especially concerning the numerous hull parts lying around the wide area as to which wreck they belong or are there yet more wrecked vessels in the same area?

4.Träskön Segelkobben/tykkikylki (Cannonside wreck) - MV nro 1188

Links:

- Kyppi.fi https://www.kyppi.fi/to.aspx?id=112.1188
- Hylyt.net https://www.hylyt.net/item/stor-traskon-tykkijolla-2746/
- Sketchfab https://sketchfab.com/3d-models/stora-trasko-tykkikylki-cannonside-wreck-b977b3d02df14d468b865811ccd2dbd5

Co-ordinates – 59° 57.560' N 24° 22.810' E

Dimensions – 6.70m x 6.90 m

Form / structure – It is part of an oaken wooden-hulled vessel. It is the part that extends from the warship's bow to the water line. In connection with the side piece, there are two ship's gun mounts and one gun tube, which is covered by a thick crust of rust. It has been estimated that the cannon was over a 30 pounder. There is a cracked wheel next to the pallet, presumably from the gun carriage. Next to part of the wreck is a possible cannon port hatch. The wreck part is of sturdy construction and has large knees, suggesting a large ship (ship of the line (?). There is no small equipment in connection with the piece. It is known that there was a lot of recreational diving at the site.

Depth – 11 – 14m

Known history / investigations:

The wreck sits east-northeast of Träskö island. Marine archaeologist Harry Alopaeus completed an inspection dive on it on 17 July 1979 and considered it part of an old warship. The Maritime Archeological Society of Finland considered it possible that this is part of the larger wreck and comes from a double-hulled Russian warship that took part in hostilities between Russia and Sweden in the summer of 1789. iIt was added to hylyt.net in 1996 by Karisto Oy dive club with the suggestion that it was part of the *Linjatauluhylky* wreck that had floated off partly because of the small size of the wreckage and the presence of cannons. A date for its sinking was suggested for August 1789 but that source was not available here or may have been simply a suggestion.

While it is true that the currents between the islands are strong the suggestion that the wreckage floated from the other wreckage or vice versa seems contradicted by the distance between the 2 wrecks. The 2 cannon that were initially central to the site presumably have sunk to the bottom long before such a drift. Of course, if literary sources were to substantiate those claims to its origin or its sinking date were to come forward, they would change this conclusion. The location of the site was found by transversal echo sounding in 2010. It has also been suggested that the wreckage is from a smaller vessel, a gunboat or tukkijolla, a vessel with a cannon on the bow and stern. That there were 2 cannon originally found on the wreck may be coincidental.

MAS Porkkala Wreck Park 2018 – A diver trail was set up.

MAS Porkkala Wreck Park 2019 – The diver trail was maintained.

MAS Porkkala Wreck Park 2020 - Dozens of park maintenance dives were made; 3 samples were collected.

MAS Porkkala Wreck Park 2021 – Further 3D modelling was conducted and maintenance conducted of the diver trail.

MAS Porkkala Wreck Park 2022 - A buoy was installed, a guideline to the wreck reinstalled and the old info board. Removed as covered in sea life. A new info-board needs to be printed and put in place.

Dating: See attached Excel “Näyte_ja_ajoituskirjanpito2019-2023.xls”

Successful samples MAS-ID’s are: **Tid22E**

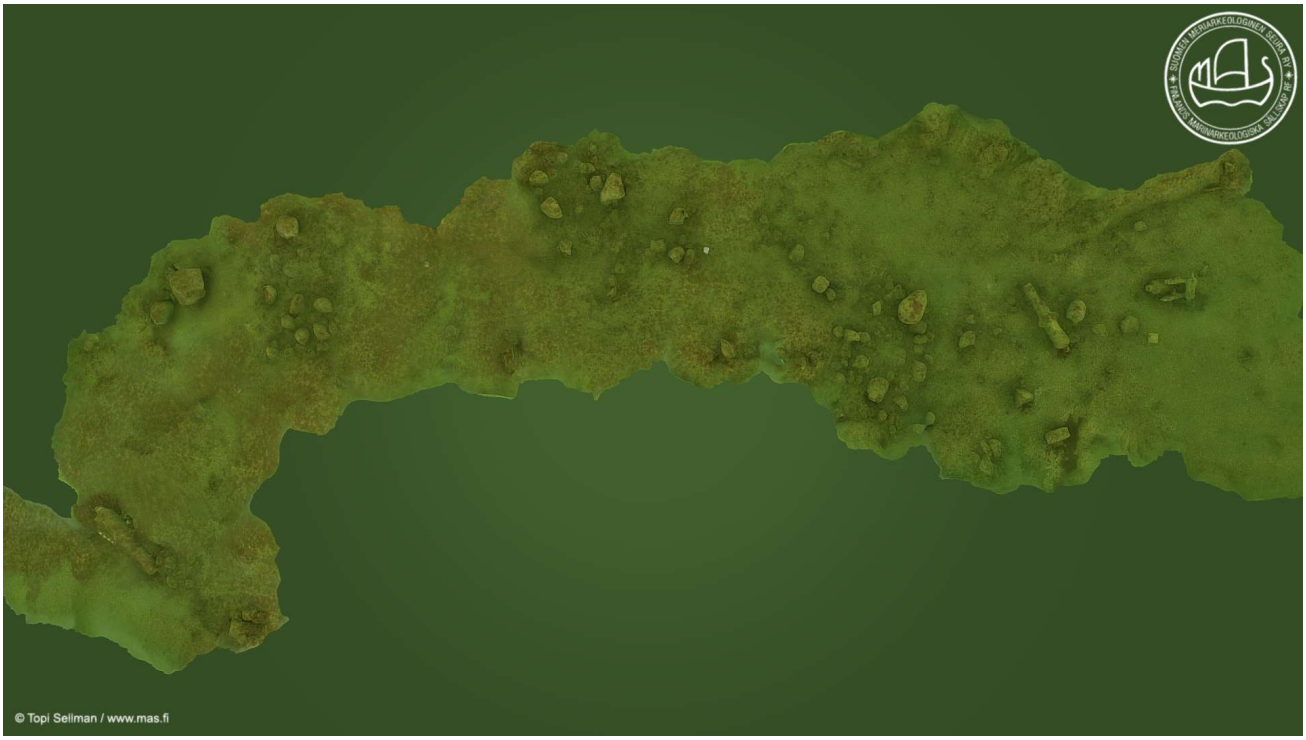
Altogether three coring samples were taken, none of which produced enough tree rings (56) for successful dendrochronological dating and two were so spoiled, they were not given ID’s. The radiocarbon dating for Tid22E puts it to 18th century, which would require more samples and wiggle matching thereto to say anything more precise.

However, the wood material was analyzed by Dr. Tuomas Aakala and it proved to be pine.

Suggested re-interpretation of the wreck:

The wrecksite was known as “Tykkijolla” for decades due to two cannons originally on site. Some even assumed that to be a Swedish one. The size and form, dagger & hanging knees, the gunports and the pine material all point towards a two decked warship of eastern origin. The frames at the site suggest that the hull was ripped from keel to gunwale from two gunports – about 6m wide. Hence, it’s a very good question as to what happened to the rest of the ship thereafter? Re-interpretation is that the wrecksite definitely is not a “tykkijolla” or any other complete vessel but just a part of the hull.

5. Remmarudden, Träskön länsipuolen matala - MV nro 1191



Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1191
- Hylyt.net https://hylyt.net/hylkykortti/2348

- Sketchfab https://sketchfab.com/3d-models/spikarna-fhd-6532-84096-6c3b78d2a5a04b86b3844a650361e287

- Sketchfab cannon&carriage https://sketchfab.com/3d-models/remmarudden-lavettitykki-7d314730d8da4bb9bf5168007076fffd

- Sketchfab 'Grand Cannon' https://sketchfab.com/3d-models/remmarudden-iso-tykki-e851ae0f57f246969ad53ec5dc00f4be

Co-ordinates – 59°57.354' N, 24°21.526' E WGS84

Dimensions – A wide area at least 50m in radius.

Form / structure – Not a shipwreck but a spread of finds from different vessels.

Depth – 3 - 10m

Known history / investigations:

The area had been notified and investigated earlier in 1981 and 1982.

MAS Porkkala Wreck Park 2020 - A few park planning dives and video for a 3D-model were made and 1 whittling sample was collected.

MAS Porkkala Wreck Park 2021 - The area where the cannons were found was extensively dived. Almost a dozen cannon of different sizes were found, some of which looked like small deck guns, as well as cannonballs and bar shot. 3 large cannons were found at a shallow depth in a relatively straight east-west orientation, one of which sat dramatically upside down on its carriage. A dendro sample was taken from the carriage for dating which can be seen in the results section. The cannons were photogrammetrically recorded in detail but also as a continuous context. It made sense to link these interesting features with a diver trail. The diver could descend the flag buoys placed at either end and swim across not just the 3 large cannons but several small ones and other objects in between. This site was given Wreck Park status.

MAS Porkkala Wreck Park project 2022 - some more detailed inspection of the 3 largest cannons were made. Extensive photogrammetry was completed of these and a wide avenue between them in which other objects such as a large pulley block and Sansome small possibly deck cannon were seen. There was the opportunity for divers to gain experience in measuring the cannon dimensions by hand using the traditional tools of tape measures and underwater proformas to record on. Each cannon had different dimensions and some minor changes in features. Measurements of the muzzle size, bore diameter (to estimate cannon ball size) or its overall length, or its stylistic features, could be useful in attempting to typologically match it to a rough period or manufacturing tradition. However, it was difficult to gain exact measurements due to the thick concretion on their surfaces. This could only be done by raising a cannon, deconcreting it or x-raying it, all of which was beyond the scope of this project. The Finnish Heritage Agency gave permission to use tools such as a kitchen rolling pin to remove the concretion from the top of the cannon, ahead of the assumed touch hole position, where often the emblem or name of the nationality was placed. The trunnions, or axles, on which the cannon sat on its mounting were also to be inspected for individual

company makers' marks. Evidence from both could be crucial in determining their relative age and provenance, especially where no wooden structure and type were associated.

The eastern of the cannons was upside down nestled deeply from halfway into the seabed but with its carriage still attached above. Because it was upside down it was impossible to inspect the cannon's upper face. One trunnion was exposed but had no markings. A section of concretion was removed from the top of the middle cannon but disappointingly nothing found. It was clearly the right way up because a sighting ridge was clearly there. The third cannon was clearly upside down and one cleaned trunnion revealed nothing. In all cases the trunnion ends were badly decayed and deteriorating quicker than the rest of the cannons with the appearance of a white crumbly appearance where dark metal was expected.

A search to 3D model outer lying cannons and objects that had been seen on the previous year and dives, such as several more cannon up to 12, a mound of cannonballs and isolated bar shot was unsuccessful. A similar attempt to deconcrete the upper surface of the upright cannon on the Rönnskär was commenced but could not be completed. As stated above, photogrammetry, maintenance on the diver trail and cannon research was conducted. A search for the other cannons was unsuccessful partly because on this visit the UWIS system with its recorded anomalies was unavailable.

An attempt to deconcrete 3 of the main cannons to identify them was unsuccessful. From the manual measurements taken it was not possible to typologically match the cannon or ascribe them to any period or nationality of origin. The variations in size and the distance between makes it impossible to link them. It is true that in early periods before cannon size were standardised across the navies of for instance Great Britain or Sweden cannon of diverse sizes could be carried on board the same ship, and it may be possible that some cannons were being transported for future use on land.

In these cases, the likeliest explanation was that they came from sinkings or from being thrown overboard to lighten a ship's load. The measurements in the illustrations above may be useful for future researchers, who can gather greater accuracy by taking measurements from the 3D models on the MAS website, and then comparing those to design drawings in different nation's historical archives or archaeological databases, such as the 'Big Cannon Project' (see link).

Dating: See attached Excel "Näyte_ja_ajoituskirjanpito2019-2023.xls"

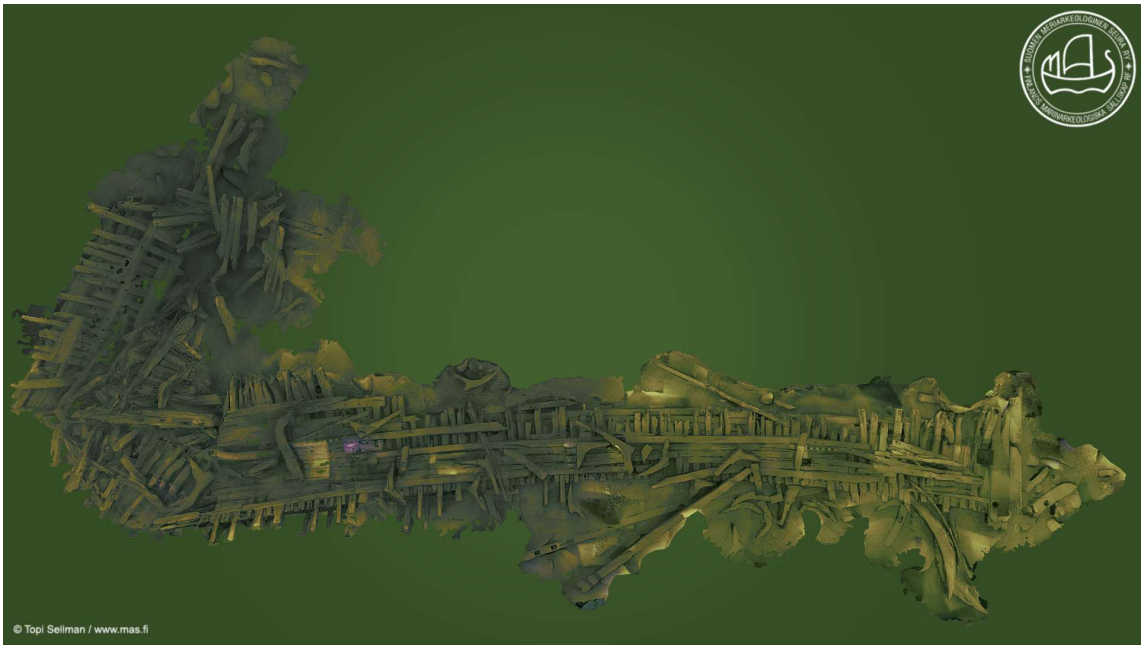
Successful samples MAS-ID's are: **Mid104D**, **Mid#2021-14n**

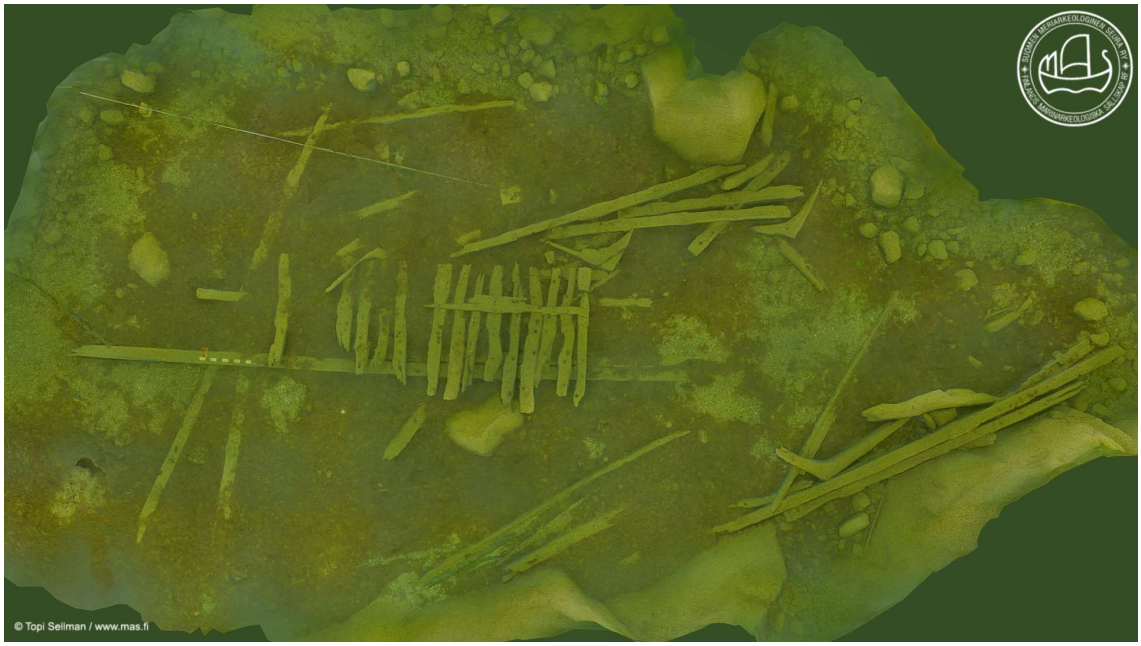
Altogether two samples were taken, one by sawing and one by whittling, none of which produced enough tree rings for successful dendrochronological dating. The radiocarbon datings are 75 years apart, but place the wood material to late 16th or early 17th century. Since the wood is oak and heavily worked to produce a gun carriage, 100 or 200 years can easily be lost. One can only say that the wood for the carriage was alive late 16th century.

Suggested re-interpretation of the wreck:

The site is clearly not a shipwreck site but a site of offloading anything heavy like cannons, iron ballast bars, cannon balls etc. The nearby shallow is very smooth in form, hence it's likely the offloaded vessel sailed on.

6. Linjatauluhylky - MV nro 1187 & Ryssbrantarna MV nro 1220





Links:

- Kyppi.fi https://www.kyppi.fi/to.aspx?id=112.1187
- Hylyt.net https://www.hylyt.net/item/linjatauluhylky-1674/#
- Sketchfab Linjatauluhylky https://sketchfab.com/3d-models/linjatauluhylky-10m10t-test-cd060917e2114cf98621db7cc9627c1f
- Sketchfab Ryssbrantama https://sketchfab.com/3d-models/ryssbrantarna-kirkkonummi-3a0f74502105419896c5aa36d8c5549e

Co-ordinates – 59° 56.940' N 24° 21.510' E

Dimensions – One part is 30m long x 2-5 m wide, the other part about 10 m long.

Form/Structure – The wreck sits at the foot of a rocky slope. It is a solid ship with a wooden hull and even seams and is obviously oak. The wreck has broken into two larger parts, one parallel to the beach slope (deeper) and the other perpendicular to the shore (shallower). The length of the part parallel to the beach is about 30 meters and the width varies from 2 to 5 meters. It has about 80 arches, both inner and outer planking, several knees, and a presumed loading hatch. The part of the wreck that is perpendicular to the shore is about 10 meters long, the deck has collapsed, the deck structures and side arches are partially visible, a bowsprit is present, and the planking of the port side is partially left.

The following observations and assessments have been made in 2020 about the part at a depth of about 25 meters. The ship has been copper-plated, but the copper plates have been lost or salvaged. However, the vertical joint rivets remain. The ship was most likely a merchant ship because the hatches visible in its bow and stern are typical hatches for loading long goods found in 18th-century merchant ships. The cover of one hatch is also left next to the wreckage, quite close to the corresponding hatch. The ship may have had a few cannons, because in the stern, but clearly more central than the loading hatches, larger hatches can be seen on both sides of the ship, which could be cannon hatches. It is imagined that the wreck broke into halves on the shore and part slide down to the lower depths.

Depth – 12 m & 24 - 28m

Known history / investigations:

Hylyt.net has an entry that suggests the wreck was sunk as part of an engagement between Russian and Swedish navies in July 1789 at Porkkala (See earlier report history section). This may well be possible but is speculative.

MAS Porkkala Wreck Park 2019 – inspection dives were conducted.

MAS Porkkala Wreck Park 2020 - These have been concluded as the same wreck split into different depths. Dozens of park maintenance dives and a new photogrammetry model were made; 3 samples were collected.

MAS Porkkala Wreck Park 2022 - A new flag buoy was put in place and the line to the wreck repaired.

Dating: See attached Excel “Näyte_ja_ajoituskirjanpito2019-2023.xls”

Successful samples MAS-ID’s are: **Tid16B, Tid17C**

Altogether two coring samples were taken, one from the deeper and one from the shallower part, none of which produced enough tree rings (20) for successful dendrochronological dating. The radiocarbon datings suggest 18th century, which would require more samples and wiggle matching thereto to say anything more precise.

However, the wood material was analyzed by Dr. Tuomas Aakala and it proved to be oak.

The hylyt.net entry suggests that the wreck may have sunk because of the naval engagement between Russian and Swedish navies. The entry ascribes the engagement to 30.7.1789, although the archival data has not been tracked down here. Another second source had set a date for earlier that year around March.

Suggested re-interpretation of the wreck:

Nothing on the wreck sites hint towards warships. On the contrary, there are several observations, which hint towards a cargo vessel: The framing is fairly light compared to that of known warship wrecks. The lack of “knee triplets” and a scarce number of knees altogether is another hint. There are also small cargo ports and even one lid prevails on the lower part of the hull for long stuff and those were typical for freighters only. The last remains of copper sheading also hint towards a cargo vessel as Atlantic warships were considerably stronger built.

7. Rönnskärin tykkihylky - MV nro 1195, also known as Salmö 3

Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1195
- Hylyt.net https://www.hylyt.net/item/ronnskarin-hylky-1-2386/#content
- Sketchfab https://sketchfab.com/3d-models/ronnskar-tykkihylky-kirkkonummi-bda69936fe7d4b6ea831145fd2179954

Co-ordinates – 59° 55.730' N 24° 23.770' E WGS84 (Geo link)

Dimensions – Widely dispersed site, with 2 large pieces of wreckage and several other objects. The size of the single piece is about 10 x 2.4 meters with an extended structural part of about 5.6 meters

Form / structure - A flat-seamed side piece of a wooden-hulled armed vessel. There are three cannons connected to the side piece, two of which are connected to the platform. Remains of cannon ports can be seen in the side piece. There are loose parts of wrecks in a wide area, at least up to a depth of 18 meters. In the shallower water there are two anchors with one cannon next to them and two bigger cannons a little further away. About 10 meters outside the wreck, part of the ship's rudder was discovered (1981) with hinge structures remaining. The length of the rudder is 6.80 meters and the length of the platform detached from it is 2.40 meters. The building material of the wreck is some kind of soft wood, possibly pine or larch (confirmed later as pine).

Depth – 12 – 20m

Known history / investigations:

Maritime archaeologist Harry Alopaeus made an inspection visit to the site in 1981 and assumed that the site dates to the time of the Swedish-Russian wars 1788-1790 but considered a younger date also possible.

MAS Porkkala Wreck Park 2019 – New hull parts and a possible deck gun were recorded. A coring sample #5E (2019) was recovered.

MAS Porkkala Wreck Park 2020 - Several park development dives and an additional photogrammetry model were made; 2 samples (Tid18D) were collected, one discarded.

MAS Porkkala Wreck Park 2021 - A considerable amount of the week was spent erecting a full dive trail there. This site was spread over quite an area, with several cannons, wooden wreckage and 2 anchors. The dive trail was erected with a tethering buoy and lines with direction markers that linked all the features in a large circle, including an outlying deck cannon. A dendrochronology sample was taken (Mid#2021-13m), and detailed photogrammetric recording made of the cannons. On the Media Day a diver was filmed underwater by an ROV while swimming around and describing the interesting features of the wreck.

MAS Porkkala Wreck Park 2022 – A considerable amount of work was made tidying up the diver trail, replacing lines, cleaning algae off lines and connecting the lines ínto a cohesive circuit. One cannon was manually measured as shown above. An attempt to identify the upright cannon on its carriage by deconcreting it was unsuccessful. The site was again recorded photogrammetrically with especial detail taken of the cannons. The site was considered ready for visitors.

Dating: See attached Excel “Näyte_ja_ajoituskirjanpito2019-2023.xls”

Successful samples MAS-ID’s are: **#5E, Tid18D, Mid#2021-13m**

Altogether four coring samples were taken, none of which produced a successful dendrochronological dating and one was so spoiled, it was not given an ID. The coring sample #5D (2019) produced 127 tree rings, which normally would be enough for dendrochronological dating, but since the wood material was identified as Larch – possibly Siberian, there were no available reference material past AD1584, which could explain the failure. The radiocarbon dating of Tid18D-sample places the wood material very well (>92%) on the 15th or 16th century with highest probability score at AD1450. The other two samples also support the turn of the 15th-16th century.

The wood material was analyzed by Dr. Tuomas Aakala and it proved to be Larch.

Suggested re-interpretation of the wreck:

Given the cohesion of the three radiocarbon datings, it’s reasonable to expect the shipwreck to be considerably older than late 18th century. The typology (e.g. larger wheels, axel type) of the remaining gun carriage also supports the older interpretation. Given the Larch material of possibly Siberian origin, the warship could be of Russian origin from the early 16th century or even late 15th century. The late 15th century in Finland was still weak on written sources, but wars against Russia are recorded: e.g. the “Vanha viha” war 1495-1497 with the famous Viborg castle explosion. On the 16th century there are records on wars with Russians as in 1516, a short nameless skirmish and “Suuri Venäjän sota” 1555-1557, in which the “father of Finnish grammar” Mikael Agricola was the special envoy to negotiate peace with Russian Czar “Ivan the terrible”. However, there are no records of naval battles on Porkkala waters in any of those wars.

8. Varmbådanin uunihylky - MV nro 1183

Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1183
- Hylyt.net https://hylyt.net/hylkykortti/3080
- Sketchfab https://sketchfab.com/3d-models/varmban-midres-big-9e3320db5a2c45faa24f414b68799421

Co-ordinates – 59°56.961' N, 24°25.145' E WGS84

Dimensions – 31.6 length x 7.1, width

Form / structure - According to the Hylyt.net entry, the shape of the rigid wreck is typical of a war frigate, and it may have been of the rowable type. It has had a large and wide transom and one battery cover on which the cannons have been located. Some of the wheels of the gun turret are in the recesses of the timbers of the stern to remind us of the ship's armament. Rigging, cannons, anchors and more valuable equipment have been removed from the wreck. The distance between the cannon gates is 2.8 meters. The ship may have been set on fire. The body cover with the oven has collapsed on top of the ballast stones. Some spurs, a grinding stone, a wooden mallet, and coins worth a quarter of a shilling from 1636 from the time of Gustavus II Adolf's daughter, Queen Kristina, were brought to light during the excavations. The wider dispersal site covers an area of 40 x 12 m.

Depth – 8 – 11m

Known history / investigations:

The wreck was found by the Norppa club and was investigated by Teredo Navalis in 1974-75, first on the ice on weekends and later in summer camps. Pre-MAS opinions offerred the interpretation that the side view of the 17th-century frigate was close to the Dutch-style pinas, which mainly differed from frigates only in terms of its cross-sectional proportions. Pinasses were used not only as merchant ships equipped with a few cannons, but also as warships, where cannons were placed full sided on either one or two battery decks. In 1975 Museovirasto conducted a check of the wreck. The wreck appears in studies written in 1990, 1992 and 1996.

MAS Porkkala Wreck Park 2020 - Several dives were made to add this to the Wreck Park, a new photogrammetry model made, 3 samples were collected.

MAS Porkkala Wreck Park 2022 - This large 30m long wreck in shallow water wedged between 2 large rocks was studied in more detail and 3D modelled. Its features included gunports, millstones, ballast, and the bricks from the oven. Due to the danger posed by the close rocks, flag buoys were set up a reasonable distance from the wreck at both ends and the guiding line laid between them down the centre of the wreck, guaranteeing access from both directions and some degree of shelter. At some future date an info board still needs to be added

Dating: See attached Excel “Näyte_ja_ajoituskirjanpito2019-2023.xls”

Successful samples MAS-ID’s are: **Tid21G** (2020)

Altogether three coring samples were taken, two of which were so spoiled, they were not given ID’s. The radiocarbon dating for Tid21G places the wood on the 16th century. Additionally, a dendrochronological dating suggests that the tree from which the sample was collected was alive 1468, but the amount of wood and sap wood missing was impossible to determine, hence it could be considerably younger. The same of course applies to radiocarbon dating as well. Therefore, the date of the coin found, and typology of other finds are more relevant in determining the shipwreck date, which is placed in the 1630’s.

However, the wood material was also analysed while doing the dendrochronological dating by Dr. Tuomas Aakala and it proved to be Oak of possibly north German origin.

Suggested re-interpretation of the wreck:

Some sources have listed the vessel as a Russian Shebeik etc. but quite confidentally we can assume that it’s the Swedish Crown’s ship, most likely a man-of-war i.e. a two decked warship. The large hearth and somewhat lighter support structures and just a few gunports point at an armed auxiliary vessel e.g. fleet’s bakery and storage vessel? The 30 year’s war and “Suuri Pohjan sota” are both potential war’s during which the vessel might have sunk. It’s also possible that the ship has been lost to natural causes, as it lies in the midst of rocks and shallows.

9. The Kaljaasi ‘Edmund’ wreck, also known as Järvö 1 hylky - MV 2382.

Links:

- Kyppi.fi https://hylyt.net/hylkykortti/495

- Hylyt.net https://www.hylyt.net/?s=Edmund&categories=0&locations=0&dir-search=yes

- Sketchfab https://sketchfab.com/3d-models/edmund-lowres-draft-28cc43d6f31c4e22bed6e055240ff7d2

Co-ordinates – 59° 56.937' N, 24° 30.522' E WGS84 (Geo link)

Dimensions – 27m long, 6 m wide.

Form / structure – A wooden-hulled, 2-masted flat-bottomed sailing ship, with a copper plated hull. Its hull is reasonably intact. Most of the masts have fallen to the bottom on the right side. Parts of the rigging sit inside the ship. The anchor is in place and a chain runs from it out of the left clix. On the right inside of the bow is a large iron anchor. The frame beam is also in place. There is a broken part of the foremast, surrounded by the remains of the deck winches. The anchors are in place in the anchor beds and in the winch. The bowsprit is broken, and the transom has fallen to the bottom behind the stern. There was apparently a cargo of grain in the body.

Depth – 22 – 25m.

Known history / investigations:

The wreck was discovered in 2001 and inspected by Museovirasto in 2004. Based on the appearance of the wreck, it was estimated that it could be a ship built in the second half of the 19th century. It is believed to be the schooner Edmund (65t) from Kirkkonummi, skipper Sigismund Lundberg, which was wrecked on the way from Helsinki to his wintering place at Bockfjärden in front of Porkkala on 10 December 1907 in a storm near Järvö, near Porkkala. Three lives were lost in the accident. (haverit.hylyt.net). In 2011 it was discovered to have suffered damage particularly to the aft roofing areas and objects had been removed from the aft cabins, as well as the rudder moved, and pulley blocks removed.

MAS Porkkala Wreck Park 2020 - Several park planning dives and additional photogrammetry model videos were made; no samples were taken.

MAS Porkkala Wreck Park 2021 - This wreck that sank in 1907 was the most intact wreck in the Wreck Park and important for providing diving variety. Video photography was made of the wreck's prominent features and a full 3D model made.

MAS Porkkala Wreck Park 2022 - The buoy system was finished. A chain now held a buoy to a rock a small distance from the wreck, so tethering would not damage the site. A line was laid on the bottom to guide divers to the bottom of the hull. Another vertical line guided them to the deck level. Old guidelines were removed, and markers attached to the lines.

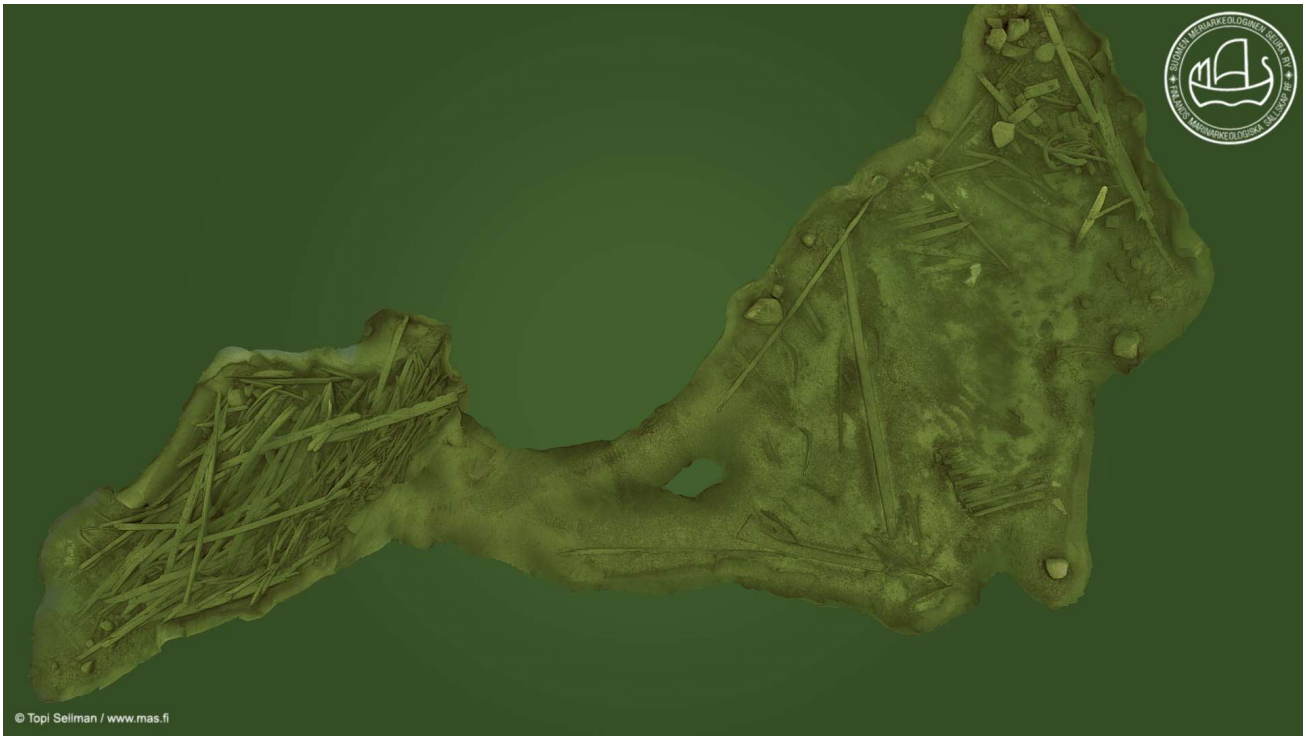
Dating method and data:

No dating samples were taken as many typological observations point towards a 19th century wreck site.

Suggested re-interpretation of the wreck:

The current reference to Edmund does not match the wreck site. The shipwreck is made of oak, has a copper sheading and "a British style" stowe/heating structure amidships. It's almost certain that the ship's origin is outside Finland, possibly even off the Baltic Sea. Naturally it could be bought under the Finnish (then Russian) flag, but MAS members have already found some more likely candidates for identification, which are researched in more detail.

10. Sankbådan hylky



Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1262

- Hylyt.net https://hylyt.net/hylkykortti/2492

- Sketchfab https://sketchfab.com/3d-models/sankbadan-kirkkonummi-a011b805e1224ac1a806bd2d5fb21f2

Coordinates – 59°53.861' N, 24°19.153' E WGS84

Dimensions – Dispersed, extensive spread in 2 areas. Around 20m length.

Form / structure – This dramatic site is characterised by an upper and lower level. Above at 17-18m sits large, long timbers and 2 anchors, with one prominently upright (see cover page). Below down the slope at 22-25m are multiple timbers crushed into a gully.

Depth – 20 – 25m

Known history / investigations:

The wreck was reported in 1996.

MAS Porkkala Wreck Park 2021– The original wreck coordinates were incorrect, so the wreck needed to be found. The correct coordinates, when established after some searching, were later updated to the wreck database. 3D modelling was taken of the entire site and a flag buoy set up with guiding lines below across the top site and leading to the area below. A simple whitling sample for dating by radiocarbon was taken.

MAS Porkkala Wreck Park 2022 - 2 dendro samples were taken. One taken in the field camp was not conserved because a drill malfunction meant it failed to penetrate far into the wood.

The other in the autumn from a rudder piece was a decent 21cm long. The flag buoy was secured to the bottom and given rope to avoid excessive rigidity and potential damage to the system. Old lengths of guiding line were removed, and a new line run from the upper level to the lower level of the wreck.

Dating: See attached Excel “Näyte_ja_ajoituskirjanpito2019-2023.xls”

Successful samples MAS-ID’s are: **Mid#2021-17q, Mid#2022-22u**

The datings of the Sankbådan wreck present a good question whether there are two wrecks or one wreck with recycled timbers in its structure or cargo as the spread of dates is almost 300 years. The Mid#2022-22u sample produced a dendrochronology dating – albeit weak – to late 16th century with only 61 tree rings. A radiocarbon dating from the same sample dates even a century earlier, but as the sampled tree ring was not recorded, it could be from the sample’s core side. The other sample, Mid#2021-17q gives the highest probability score at AD1660. Following the precautionary principle one could say that the wood materials are from the 17th century the latest, but it’s also possible that they originate from two different structures of which the other may not have been a vessel.

Suggested re-interpretation of the wreck:

There is strong evidence, that the original interpretation of the wreck site being a recent 20th century vessel is well off. The typology of the anchors and led bushings point towards 17th or early 18th century vessel. Hence the wreck site is definitely an intact cultural remain more than 100 years old and thus automatically protected by the Finnish law. The origin of oak timbers could be from northern Germany. The vessel appears to have had a lead shedding and bushings. Nothing points towards a war ship; hence we presume it to have been an Atlantic cargo vessel. The tightly packed wood material on the western “gulgh” may be cargo or another vessel.

11. Engelskobben 2 hylky - MV nro 14039773

Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1000039773

- Hylyt.net https://hylyt.net/hylkykortti/10206

- Sketchfab https://sketchfab.com/3d-models/engelskobben-2-kirkkonummi-490f7640a91644778ff4922b705177fb

Co-ordinates – 59°55.900' N, 24°27.564' E WGS84

Dimensions – 20m length

Form / structure – A wooden smooth-seamed wreck. There is an upright log anchor, with another near the stern and a windlass at the bow. The stern has collapsed. There are many ballast stones in the wreck. In the centre 3-5 leather rolls had been observed in the past as cargo. Oe mast step was witnessed also in the past.

Depth – 22m

Known history / investigations:

In 2017 Mas member T. Sellman made a partial 3D model of the wreck.

Porkkala Wreck Park 2020 - Several park planning dives and a new photogrammetry model was made, and 2 samples were collected.

Porkkala Wreck Park 2021 - 3D modelling was conducted and a dating sample taken. A diver trail was set up on the site.

Porkkala Wreck Park 2021 – a mooring buoy was setup on the big rock outside the wreck.

Dating: See attached Excel “Näyte_ja_ajoituskirjanpito2019-2023.xls”

Successful samples MAS-ID’s are: **Tid14l, Mid#2021-15o**

Altogether two coring and one sawing samples were taken, none of which produced enough tree rings (18) for successful dendrochronological dating and one was so spoiled, it was not given an ID. The radiocarbon dating for Tid14l was somewhat dubious as it was exactly the same as of another sample in a same set. The lack of confidence resulting the clarification discussion with the laboratory led to a termination of co-operation with the lab. However both samples show similar, strong probability towards early or mid 17th century the latest.

However, the wood material was analyzed by Dr. Tuomas Aakala and it proved to be oak.

Suggested re-interpretation of the wreck:

There was no previous interpretation of the shipwreck. There aren’t any artefacts which typology would challenge the dating of the ship being from mid or latter part of the 17th century. The very basic form of anchor windlass and the size of the anchors could support it, but then again similar items are seen in shipwrecks that date a century later. However, there’s nothing which would point towards a war ship, thus the vessel was most likely a western European freighter – probably of Dutch type (assumption based on the bow parts).

12. Kuparihylky (Copper wreck) - MV nro 1214 (also called Lybeckshällarna)

Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1214

- Hylyt.net https://www.hylyt.net/item/kuparihylky-1534/

Co-ordinates – 59° 56.790' N, 24° 29.020' E WGS84 (Geo link)

Dimensions – Dispersed site hard to interpret.

Form / structure – The keel and timbers are left of the wreck. There are other parts of the wreck in the area with traces of burning in some places. It is assumed that there would be parts of two different ships in the area, which is a question for future research. A wire has been observed around one or some parts, which is thought to be related to attempts to lift parts of the wreckage. There have also been rumors that there is a wreck of a warship there and that cannons were sometimes taken from the place without permission. The wreck got its name from the 15-20 centimetre copper nails which attached the boards to the ribs.

Depth – 12 - 18 m

Known history / investigations:

According to an observation from the 1980s, there are also remains of the wreck on the west and northeast sides of the largest islet. The wreck was reported to the Museum Agency in the 1970s and again in the 1980s.

MAS Porkkala Wreck Park 2019 - A rudder and new hull parts were discovered and recorded. It was named because copper pins were discovered on it.

MAS Porkkala Wreck Park 2020 - Several park planning dives were made, additional photogrammetry model videos made; no samples were taken.

Dating method and data: No dating was taken as during the project it was discovered that Juha-Petteri Elo has made a 3D-model of the largest wreck part, hence MAS efforts were concentrated on other wrecksites.

Suggested re-interpretation of the wreck: There are statements from people who claim to have been eye witnesses to the lifting of copper ingots from the wreck, which were then taken to Outokumpu for recycling. This has supposedly happened in the 1970's and would have been the namesakes origin.

13. Utterböttenin hylky - MV nro 1230

Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1230

- Hylyt.net https://hylyt.net/hylkykortti/3077

-Sketchfab https://sketchfab.com/3d-models/utterbote-kirkkonummi-2754ea65ed8344b8a1aeb69d83d5db27

Co-ordinates – 59°56.790' N, 24°29.020' E WGS84

Dimensions – 12m long x 5m wide that is visible.

Form / structure – The wreck is an oaken wooden vessel. The stern and the bow are badly disintegrated with no visible signs of deck structures.

Depth – 14 -18m

Known history / investigations:

Teredo Navalis dive club dived the wreck in 1998 and its position was rechecked in 2010 by echo sounding.

MAS Porkkala Wreck Park 2019 – Its outer planking was found to be made of oak, not spruce or pine as suggested before. A 3D-model was made of the wreck site by photogrammetry from 4k video.

MAS Porkkala Wreck Park 2020 - Several park planning dives were made, and 2 samples were collected.

Dating: See attached Excel “Näyte_ja_ajoituskirjanpito2019-2023.xls”

Successful samples MAS-ID’s are: **Tid1H, Mid#2021-9i, Mid#2021-10j**

Altogether one coring sample and three sawing samples were taken, one of which produced enough tree rings (81) for successful dendrochronological dating, albeit weak correlation up to AD1329 and pointing towards Poland for the origin of the wood material. However all three radiocarbon datings made from the same or other samples place the dating at least a century later to 15th century and Dr. Aakala himself considers the radiocarbon datings more probable due to the low correlation of denro sequences. This also puts a question mark on the supposed origin of the wood. One sample was so spoiled, it was not given an ID.

However, the wood material was analyzed by Dr. Tuomas Aakala and it proved to be oak, except the for the potential mast or other rigging item which was pine.

Suggested re-interpretation of the wreck:

Some earlier interpretations assumed the wreck to be that of a fairly recent “talonpoikaisalus” i.e. a local farmer boat built from pine. This is not the case as the ship is built of oak, thus most likely of foreign origin. The clinker-built hull is definitely not Cog-type nor does it resemble the earlier Scandinavian tradition following Knarrs & alikes. Hence, there is potential for a new hull type of the era, or this could be an example of a small Hulk type ship. Clearly the shipwreck is several hundreds of years old and thus a concise cultural heritage site thus automatically protected by the Finnish law.

14. Truttkobbarnan hylky - MV nro 1210

Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1210
- Hylyt.net https://hylyt.net/hylkykortti/2977
- Sketchfab https://sketchfab.com/3d-models/trutkobbarna-kirkkonummi-0906c7262b5f46bdacbff31a8ca323a0

Co-ordinates – 59°56.552' N, 24°27.598' E WGS84

Dimensions – 20m length

Form / structure – An oaken vessel where only the lower structure remains as well as parts of the side timbers and keel. Some outer wreckage exists in the area.

Depth – 8 -10m

Known history / investigations:

The site had been notified to Museovirasto in 1976 and partly mapped in 1987.

In 2017 MAS member T. Sellman made a 3D model of the site.

MAS Porkkala Wreck Park 2019 – The site was inspected.

MAS Porkkala Wreck Park 2020 - Several inventory dives were made, but no new finds.

Dating: Not dated due to lack of time and resources

Suggested re-interpretation of the wreck:

No re-interpretation as it's always been labelled as an unknown hull fragment. More research and a new model covering the whole area would be needed to assess the wreck site's priority.

15. Långörenin hylky 2 - MV nro 1228

No model/picture exists as finds were so scarce. The existence of this wreck is disputed.

Links:

- Kyppi.fi https://www.kyppi.fi/to.aspx?id=112.1228

- Hylyt.net https://www.hylyt.net/item/langorenin-hylky-1597/

Co-ordinates – 59° 57.123' N 24° 24.269' E

Dimensions – Broken site hard to interpret.

Form / structure - On the south side of Långörn island parts of a broken wooden wreck were found such as an anchor windlass and rigging parts. However, no larger structure was found.

Depth – 12m.

Known history / investigations:

Metsähallitus' 2016 oblique echo soundings of the Porkkala area found some possible parts of a wreck but MAS diving surveys could not confirm the found timbers to be of a vessel.

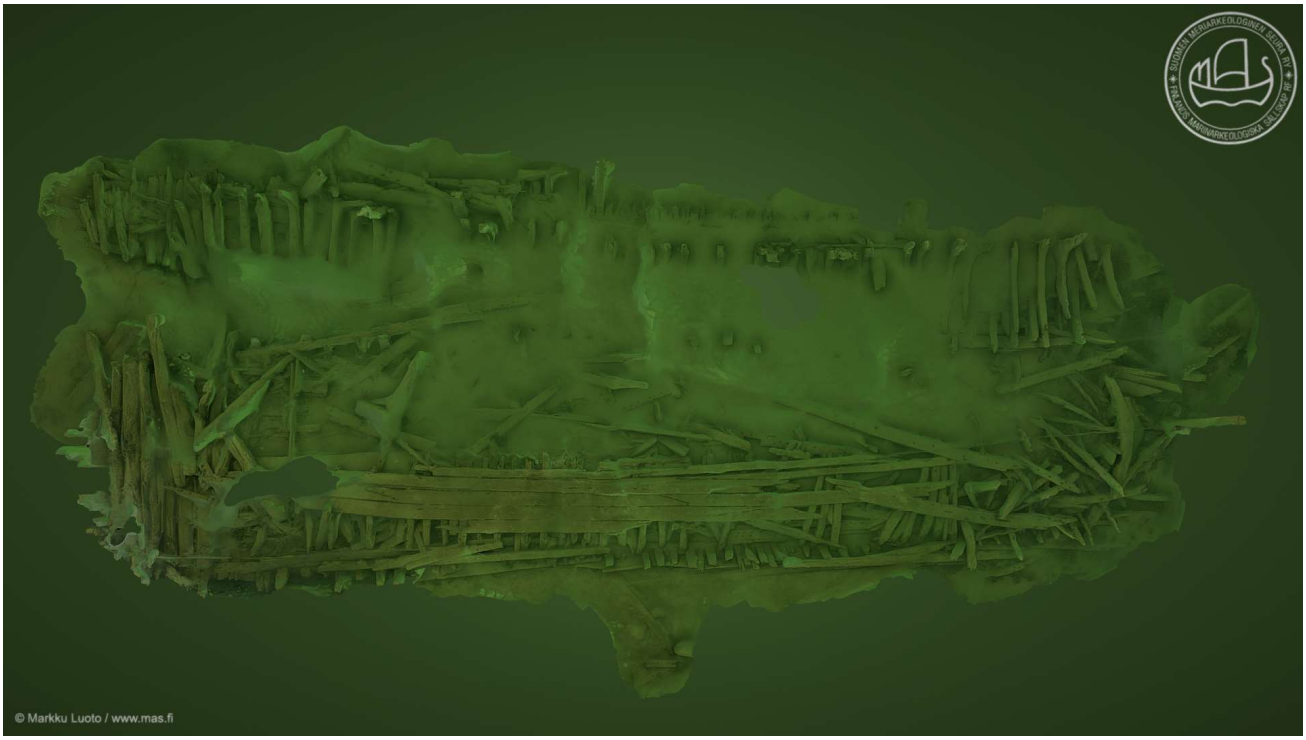
MAS Porkkala Wreck Park 2019 – The site was inspected.

MAS Porkkala Wreck Park 2020 - Several inventory dives were made, but no new finds.

Dating: No dating was done

Suggested re-interpretation of the wreck: The existence of the whole wreck site is disputed due to lack of finds.

16. Pampskatan 1 hylky - MV nro 1225



Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1225
- Hylyt.net https://hylyt.net/hylkykortti/2136
- Sketchfab https://sketchfab.com/3d-models/pampskatan-mv1225-70219d57b00d41a4a5e4a52819dd5e2e

Co-ordinates – 59°58.080' N, 24°23.900' E WGS84

Dimensions – 25 - 40m long, 8 - 11m wide.

Form / structure – The wreck has partially sunk into the soft bottom mud. The bow part is close to the shore at a depth of about 1m. According to observations made in 1997, the ship is made of oak and has smooth seams. The deck beams have been cut across at the knees, the starboard side has collapsed from the bow to the stern outwards and the aforementioned knees are still attached to the side. The bow of the ship is almost intact at the height of the bow spine. The structure and shape of the bow are clearly visible. The bow spine has come off and is lying on the bottom in front of the bow.

According to observations made in 2021, the starboard side has collapsed outwards on the west side of the wreck and two rows of knees are visible. So the ship has been at least double-decked. The knees are very strong. The side of the stern has collapsed into the wreck at the lower row of knees, i.e. the lower deck, and the side planking of the stern is visible. The stern is seven meters deep and rises about two meters from the bottom. Parts of the rigging and anchor play are not visible. The ship has probably been a warship, from which the rigging and other equipment that can be used again have been dismantled.

Depth – 1 - 7m

Known history / investigations:

The wreck was reported to Museovirasto in 1974. Local residents thought the wreck had been there since the 18th century. Harry Alopaeus dived on the wreck in the 197os and produced sketches. Club divers have visited the wreck in 1993 and 1997. In 2010 Ari Kapanen located the wreck by echo sounding.

MAS Porkkala Wreck Park 2020 - A few park planning dives and a new photogrammetry model were made, and 1 sample was taken.

Dating: See attached Excel "Näyte_ja_ajoituskirjanpito2019-2023.xls"

Successful samples MAS-ID's are: Tid8A

Only one coring samples was taken due to extremely bad visibility, which didn't produce enough tree rings (5) for successful dendrochronological dating. The radiocarbon dating for Tid8A puts it to mid 17th or late 18th century, but not in between. The strength and form of the structures and some typologies in the stern are make the late 18th century more likely..

However, the wood material was analysed by Dr. Tuomas Aakala and it proved to be oak.

Suggested re-interpretation of the wreck:

The radiocarbon dating seems to confirm the local tell tales about an 18th century wreck site. Judging by the "knee triplets" and their spacing, plus the over all strength of the hull and structural parts, this wreck had been a mas-of-war i.e. at least a two decked war ship with cannons on board. The origin and usage of the ship would require further studies and successful dendrochronological dating and determination of the wood sourcing.

17. Torrörenin hylky - MV nro 1221

No model was made as the findings were so scarce. The existence of a wreck in the are is not disputed but it clearly is not in the area of the given location.

Links:

-Kyppi.net https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1221

-Hylyt.net https://hylyt.net/hylkykortti/2951

Co-ordinates – 59°57.880' N, 24°30.247' E WGS84

Dimensions – Dispersed fragmented site.

Form / structure – The broken parts of a larger vessel were found in 1981, consisting of loose spars, V-shaped sections, and others.

Depth – 5 – 8m

Known history / investigations:

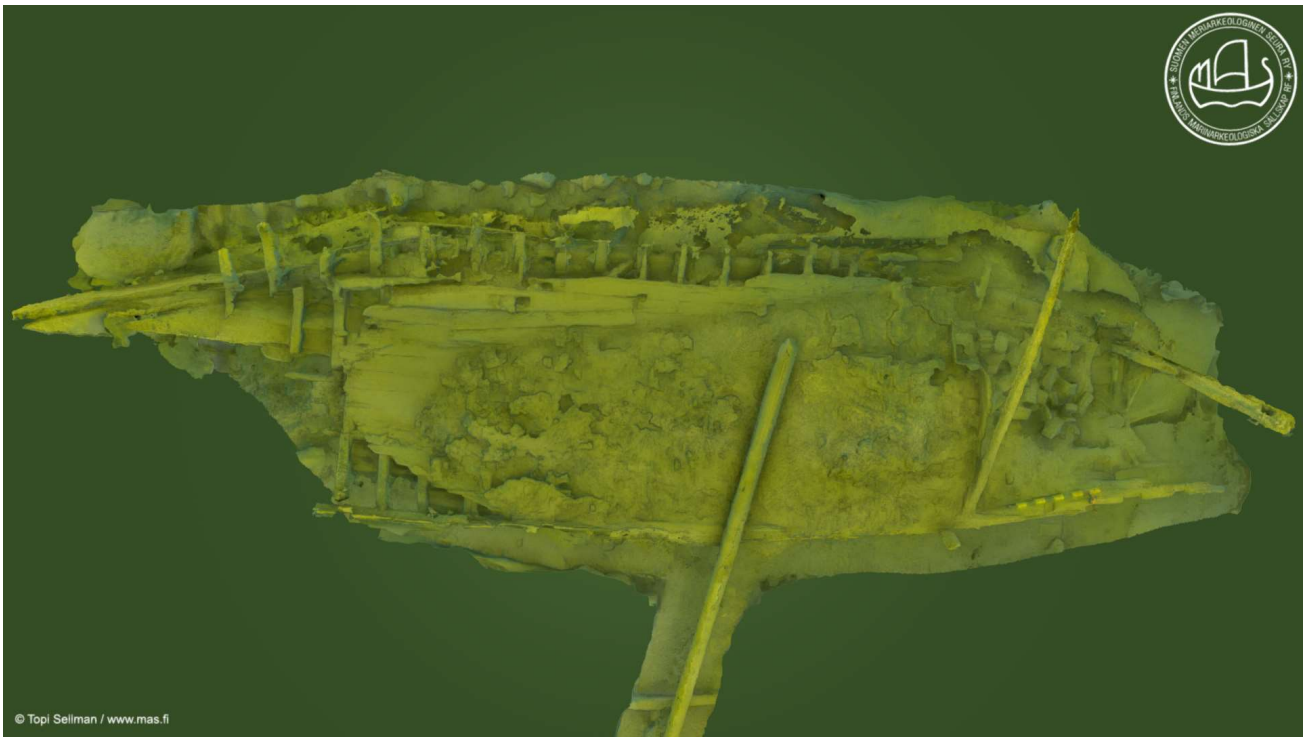
It was found in 1981 and dived also in 1996. In 2007 hobbyists carried out sounding without finding a wreck.

MAS Porkkala Wreck Park 2020 - A few inventory dives were made, some video documentation taken, but no samples were collected. At a depth of about 7.5 meters, one larger beam 30-40 cm thick and 4-5 meters long was observed. At a depth of about 5.5 meters (at the leeward side) there is the bow and stern or stern of a smaller ship or a large boat with a clinker construction method.

Dating: no dating sample was taken.

Suggested re-interpretation of the wreck: the actual wreck site – if such exits – is yet to be found. There could be more findings on the sea side of the reef. Now only the continental side was surveyed.

18. Pärongrundetin hylky - MV nro 1200



Links:

-Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1200

- Hylyt.net https://hylyt.net/hylkykortti/2158

- Sketchfab https://sketchfab.com/3d-models/parongrundet-2b23496a5edd450da317a3602572f4f6

Co-ordinates – 59°57.892' N, 24°21.123' E WGS84

Dimensions – Length 10.65m x 3.3m wide.

Form / structure – A wooden hulled vessel with 2 anchors. It has a single mast, a rudder, stern and hinges, 2 bulkheads with limestone as cargo, hearth bricks and one boiler outside the stern. Outside the wreck is a boat with clinker seams.

Depth – 16 – 18m

Known history / investigations:

The wreck was reported in 1992, photographed in 1993 and drawn in 2005.

MAS Porkkala Wreck Park 2020 - A few park planning dives occurred, a new 3D-model was made, no samples were collected. The location of the wreck in the kyppi register was found to be incorrect and was corrected.

Dating: No dating sample was taken, as several typologies place the wreck site into the 19th century.

Suggested re-interpretation of the wreck: No re-interpretation needed. The origin of this wreck is recorded in the Finnish/Russian pilot organisation's history.

19. Svarthällenin hylky - MV nro 1222

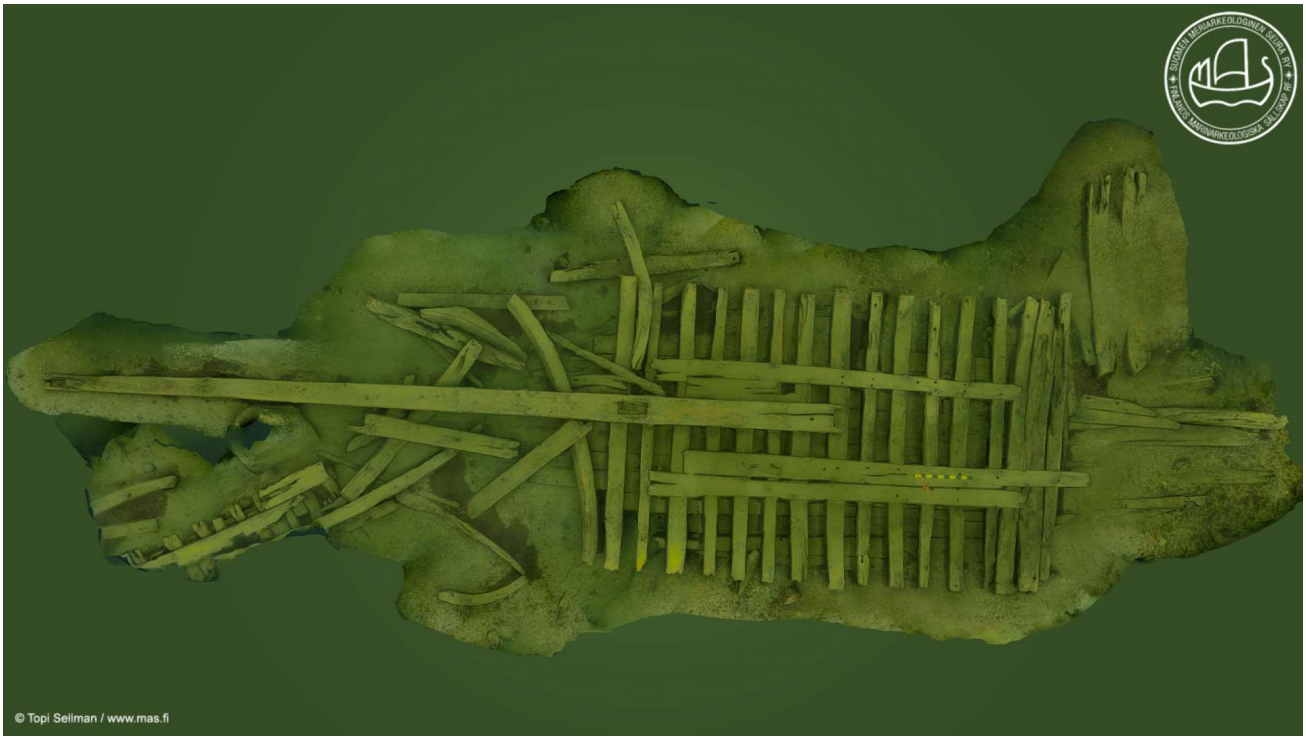


Image: Svarthällen part IV

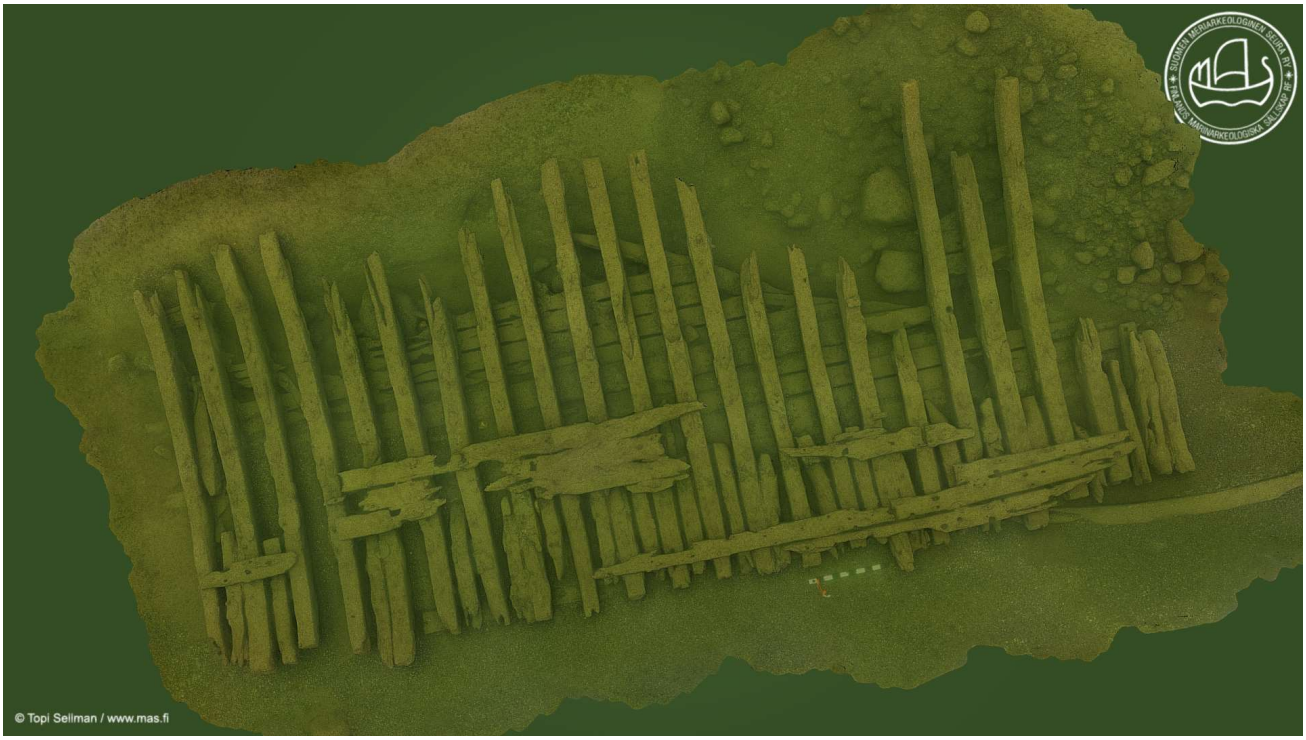


Image: Svarthällen part V

Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1222
- Hylyt.net https://hylyt.net/hylkykortti/2828
- Sketchfab https://sketchfab.com/3d-models/svarthallen-kirkkonummi-5592cedc5de74cfb91f3ef41971ba272
- Sketchfab https://sketchfab.com/3d-models/svarthallen-kirkkonummi-3b2a29f275834cf68b2ed8db2b49e9ce

Co-ordinates – 59°58.787' N, 24°35.399' E WGS84

Dimensions – 30m +

Form / structure – There are wreck parts apparently from at least two ships. There are at least three larger solid parts and a large log anchor in the area, and these are at different depths around the shallows. Wreck divers assume that at least a ship named Wega has been wrecked in the area. At a depth of 23-25 meters is the bottom part of the ship and the keel. The arches are thick and the arches have both exterior and interior planking. Nearby is a stout knee.

In the easternmost part of the wreck, which is at a depth of 9-10 meters, there is arching and external and internal planking attached to it.

The southernmost part of the wreck includes a ‘pig’ keel with a mast shoe. This part of the wreck is about 17 meters deep.

On the south side of the wreckage, on the slope at a depth of 11-12 meters, there is a large log anchor with a stem about three meters long.

Depth – 18 – 30 m

Known history / investigations:

The wreck was found at the turn of the 1980s and 1990s and reported in 1998.

In 2017 MAS made a 3D model of the site.

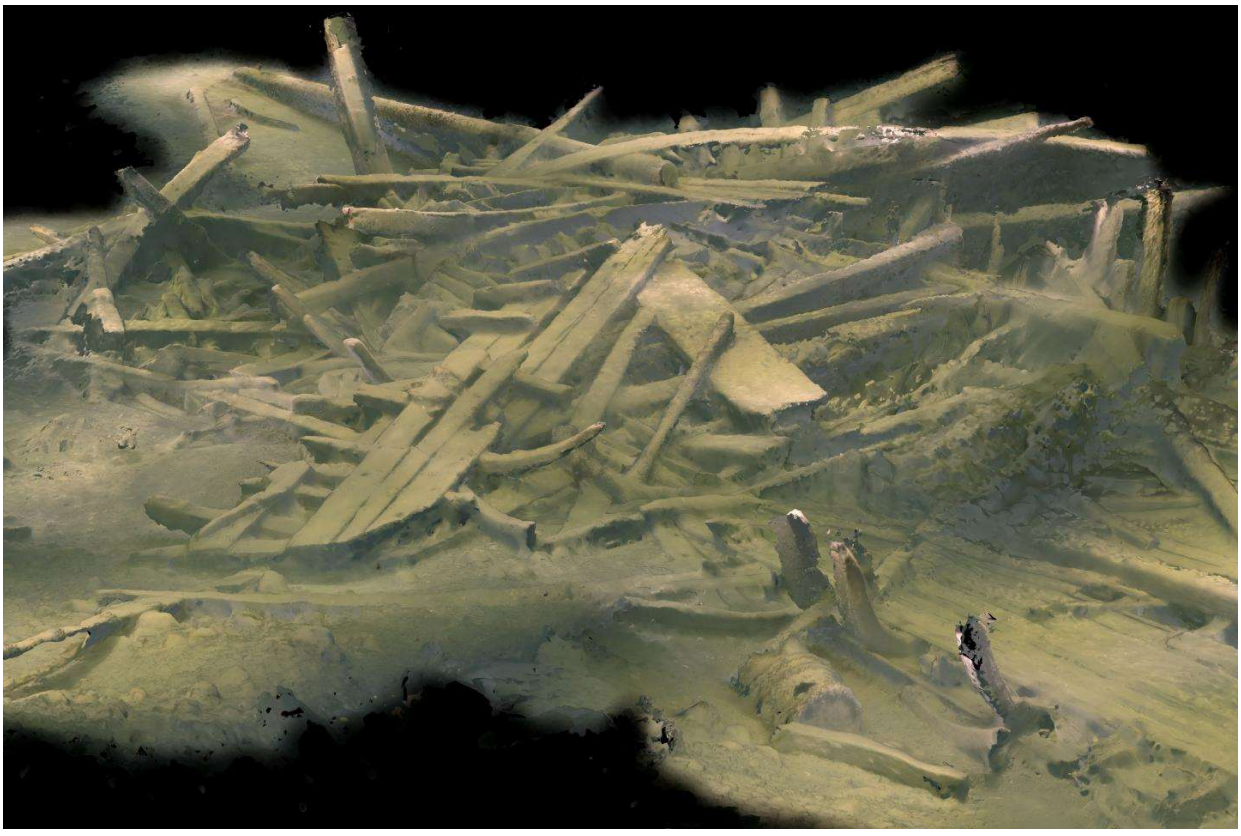
MAS Porkkala Wreck Park 2020 - A few park planning dives were made, new 3D-modelling was undertaken, but no samples were collected.

Dating: There are at least three hull part sites which are not documented yet – including the ”main site” with some intact hull up to gunwale. MAS ontology process only takes daring samples of more or less completely documented wreck sites, hence no dating sample is taken yet. Several typologies hint towards the latter part of 18th or early 19th century – at least regarding the yet undocumented “main site”. Some features resemble the north German tradition on the Ostsee Küsste.

Suggested re-interpretation of the wreck:

Some sources claim the wreck site to be that of a war ship, but nothing MAS has observed supports the claim. On the contrary, there are many typologies that are much more commonly found in commercial traders. However, nothing certain can be said before the completion of the survey.

20. Juktenskobbenin hylky - MV nro 2302



Links:

-Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=2302

- Hylyt.net https://www.hylyt.net/item/juktenskobbenin-hylky-1169/

-Sketchfab – in progress. The picture above is by Richard Eller who has also made a 3D model of the wreck site. Unfortunately, it's not publicly available – hence MAS is producing an open one.

Co-ordinates – 59°59.178' N, 24°37.409' E WGS84

Dimensions – Length 22 m x 6.3 width

Form / structure - The stern part of the wreck has broken up. The bottom part of the wreck is visible up to the midship. The deck is mostly gone, but there are still parts of the deck on the forward side of the amidships. In the same area, you can see leather hide scrolls and wooden barrels that were cargo. The right side has been torn off from the bow side of the centre of the ship and moved to the lower slope next to the wreck. From the side piece, a two-part mast extends perpendicularly out to the lower slope. The ship has apparently been blunt-bowed and flat-bottomed. There are three anchors in the wreck area. All anchors are located in the bow area of the wreck. One of the anchors is broken inside the wreck and the other two are at the bottom on both sides of the bow.

Depth – 24 – 30m

Known history / investigations:

The wreck was reported in 2002, mapped in 2003.

In 2018, in cooperation with the University of Helsinki, the Finnish Museum Agency and SubZone Oy, two leather bolts were removed from the wreck for examination. The so-called sheepskin was an important Russian commodity in the 18th century, and FT Mikko Huhtamies organized the funding for the related research project. Researcher Krista Vajanto analysed two leather samples in 2018. The leather came from a cow or a calf. Birch tar is known to be used in the manufacture/treatment of leather. However, the analysis did not find any definite evidence of birch tar.

According to FT Mikko Huhtamies, Juktenskobben island got its name from the shipwreck of a ship carrying sheepskin. He considers it possible that the ship is called Oraniebaum. Oraniebaum was shipwrecked in Porkkala while on the way from Kronstadt to Hamburg in 1767. Its captain was Johan Hindrich Siemsen from Hamburg. The cargo on the ship was, among other things, leather. The marine explanation of the shipwreck has been preserved. The auction minutes of the Helsinki Magistrate's Office show that in 1767 there was a big sheepskin auction in Helsinki. Huhtamies interprets that the 1767 coin found on the mast leg of the wreck indicates that the ship was built or enriched in the year of the shipwreck. Oraniebaum is the best guide for the identification of the Juktenskobben wreck.

MAS Porkkala Wreck Park 2020 - A few park planning dives were taken, additional video was taken for 3D-modelling, but no dating samples were collected.

Dating: The MAS documentation of the site is not yet complete. MAS ontology process only takes dating samples of more or less completely documented wreck sites, hence no dating sample is taken yet. Several typologies hint towards the latter part of 18th century. Some features resemble the north German ship building tradition on the Ostsee Küsste.

The date of the ship's construction can be determined based on the money found in the mast shoe; the coin was minted in 1767. The coin is in the collection of the Finnish Maritime Museum under the number SMM072003.

Suggested re-interpretation of the wreck: No re-interpretation needed.

21. Harunan hylky - MV nro 1198

Links:

-Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1198

- Hylyt.net https://hylyt.net/hylkykortti/890

- Sketchfab https://sketchfab.com/3d-models/haruna-5fce45bf833140afabb99bec112ce6e4

Co-ordinates – 59°58.409' N, 24°18.709' E WGS84

Dimensions – 20m length x 5m wide

Form / structure – A wooden vessel, which may be Russian due to the late 19th century coin found in the mast step.

Depth – 15m

Known history / investigations:

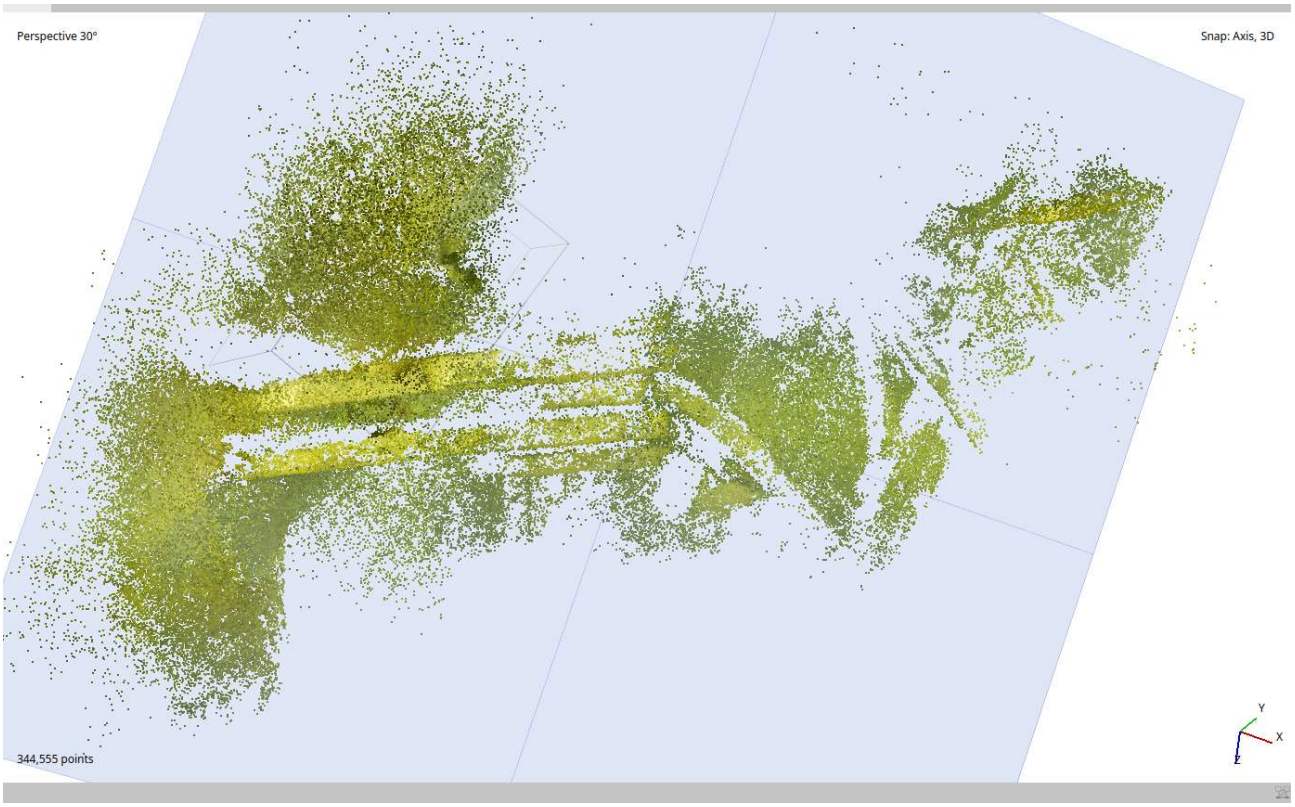
It was reported to Museovirasto in 1992 and hobbyists measured, sketched and photographed it with permission in 1993.

MAS Porkkala Wreck Park 2020 - A few park planning dives and new 3D-modelling were made; no samples were collected.

Dating: It is likely to be Russian and late 19th century coin found in the mast step, a 5-penny coin from the reign of Alexander 2nd and 3rd, having been minted in 1872-75 or 1888-92 which has been curated by Museovirasto.

Suggested re-interpretation of the wreck: No re-interpretation needed. The origin of this wreck is recorded in the Finnish/Russian pilot organisation's history.

22. Linkobbenin 2 hylky - MV nro. 1211



Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1211
- Hylyt.net https://www.hylyt.net/item/linkobbenin-hylky-2-1679/
- Sketchfab model in process. (see picture above)

Co-ordinates – 59°55.321'N 24° 23.321' E. WGS84 (Geo link)

Dimensions – Dispersed, hard to measure.

Form / structure – Very dispersed, hard to interpret.

Depth – 15 – 24m

Known history / investigations:

Investigated in 2007 by Museovirasto. A 2017 update noted the wreck is in poor condition, 'the shape of the ship's hull or the direction of the keel cannot be discerned. Structural parts (arches, side planking, beams, knees) are loose on the bottom or in small units. The ship has apparently been smooth seamed. The structures are quite sturdy, but not abundant; some of the wreckage may be further away'.

MAS Porkkala Wreck Park 2021 – 2 dating samples were taken, one for dendrochronology, the other for radiocarbon. 3D modelling was also conducted.

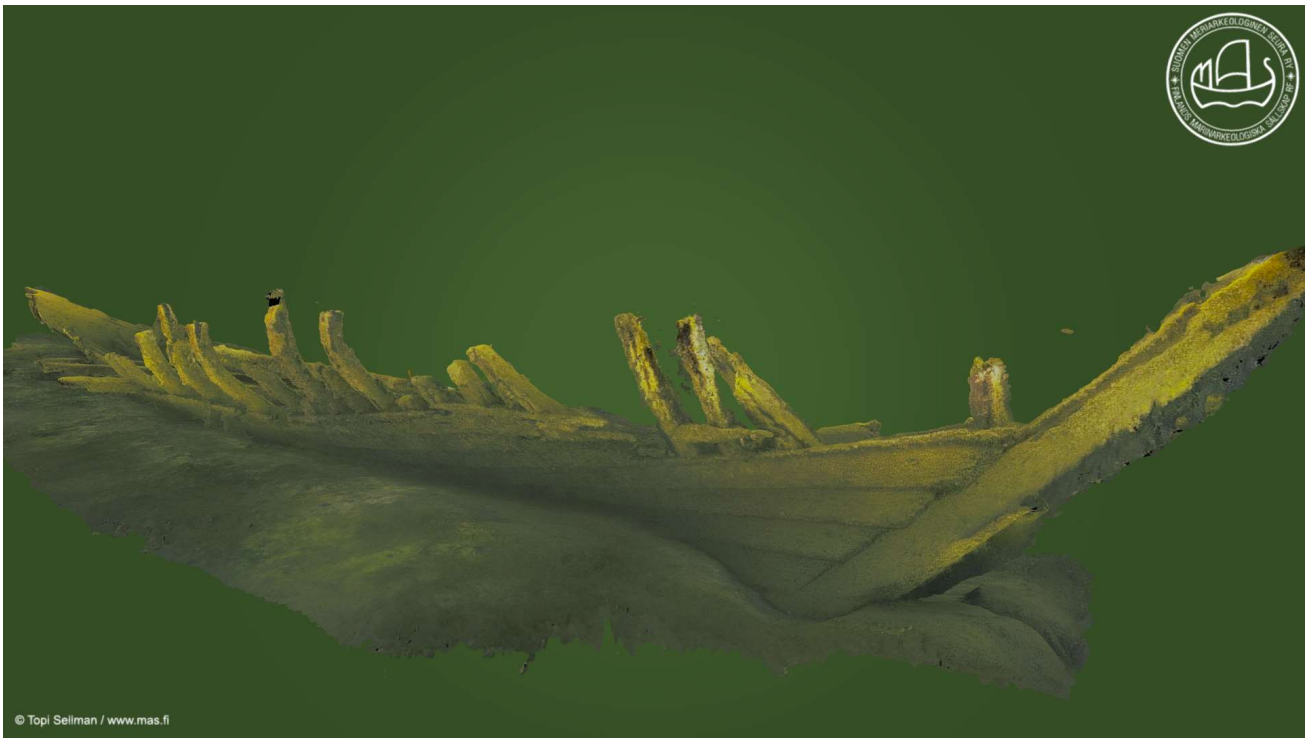
Dating: See attached Excel "Näyte_ja_ajoituskirjanpito2019-2023.xls"

Successful samples MAS-ID's are: **Mid#2021-19s, Mid#2021-20s**

Altogether two whittling samples were taken. One from the presumed cargo "wood sticks" (pine) and the other from a ships structural parts (oak?). Both were radiocarbon dated and both samples scored the highest probability AD1860 and the results are strikingly similar.

Suggested re-interpretation of the wreck: There was no previous interpretation, but very likely, it's a question of a 19th century trader of foreign origin (as there is/was no oak in Finland for ship building).

23. Salmen 2 (known also as Salmö 2)



Links:

- Kyppi.fi https://www.kyppi.fi/palveluikkuna/mjreki/read/asp/r_kohde_det.aspx?KOHDE_ID=1181

- Hylyt.net https://hylyt.net/hylkykortti/2466

- Sketchfab https://sketchfab.com/3d-models/salmo-2-kirkkonummi-54b00e8f7b624321914ae06b21490598

Co-ordinates – 59°55.823' N, 24°24.971' E WGS84

Dimensions – Approximately 20m length x 5m width.

Form / structure – The right side rises 1.5m from the bottom, with the left side in sand, therefore on its side. The hull consisting of the bow, side boards, arches, bowsprit and transom survive. The stern and bow are prominent.

Depth – 17 - 20m

Known history / investigations:

The wreck was reported to Museovirasto in 1976 and mapped by hobbyists in 2017.

MAS Porkkala Wreck Park 2020 - This wreck sunk on 5.12.1898 was visited for diver orientation. To the west of the Salmen 2 wreck, there used to be wreck information under the name Salmen 1. This object was removed from the register in 2020, because the same wreck had apparently been mistakenly entered into the register twice, so that there are not two wrecks in the area.

Dating: no dating sample was taken as many typologies found on the wreck site suggest that it is from the late 19th or early 20th century.

The wreck has been assumed to be the 1898 shipwrecked Amatus, but research has not confirmed this.

Suggested re-interpretation of the wreck:

MAS surveys have found nothing to challenge the local assumptions.

24. Salmen 1 hylkymerkintä - MV nro 1192

Project activities:

Porkkala Wreck Park 2020 - Several inventory dives, the wreck was confirmed as non-existent and removed from the register. It has been interpreted as confused with Salmen 2

Suggested re-interpretation of the wreck: there's no wreck at given location!

25. New wreck site (east side of Stora Träskön)

Links: – Unregistered

Co-ordinates – N 59°57,204' | E 24°22,791' (WGS84)

Dimensions –

Form / structure – Very little structure. An anchor and part of a mast.

Depth – 4-8m

Known history / investigations:

2019 - Several inventory dives were made, but no new finds.

26. Potentially new wreck site (the shallow on the mouth of Stora Träskö bay)

Links: – unregistered

Co-ordinates – N 59°57,465' | E 24°22,383' (WGS84)

Dimensions – 2x2m

Form / structure – An anchor, no wreckage.

Depth – 3m

Known history / investigations:

2019 - Several inventory dives were made, and no new finds.

Project evaluation and discussion

Methodologies

1.*Organisational strategies and team development* - These were developed organically as time progressed. This was a project conducted on a scale and ambition not seen in Finland before by a society nominally of volunteers, except for the work of the H_2O dive club, and the project should be examined in that light. Benefits and pitfalls appeared on the way and were dealt with in a constructive manner that did not derail the project but made it stronger. Considerable and essential time was spent on forward planning things ahead of time to avoid problems appearing in the field where it might be too late to address them.

Funding applications were made carefully and well in advance and the project was never in the position where it was unsure it could run the following year. In fact, the funding was sufficient to extend it to 2022. The funding sources seemed pleased with the ongoing results. The final funding report was made to the main sponsors in April 2023, and we await any final feedback.

The provision of the right equipment was a major logistical challenge. It relied on each diver bringing their own properly functioning equipment. The dive clubs that volunteered their boats needed to ensure that everything was in place, from seaworthiness, navigational technology

etc, to working spaces for large numbers of divers, dining galley preparation and sleeping quarters. It was no accident that these things invariably ran well because the club boats were prepared for their own diving seasons with timely prepared routines and practices. In particular, we are grateful for the presence of Sukeltajat Ry's Maija, H_2O's DEKO-II and Nousu's Vuoksi for attending year after year in great shape. The trick was to coordinate the dates of the camp well in advance, so it did not clash with the busy field trips of these clubs and in many cases a week on the Wreck Park was seamlessly preceded or followed by the dive club's own outings.

Special mention should be made of the largest vessel in the fleet, MS Stella, owned by Vesa Saarinen, affectionately called the flagship of the fleet. It provided ample and quite luxurious space for diving, dining, accommodation, and social activities and was particularly creditable for the good impression it made on media days. It was maintained and readied each season at the owner's own expense with some small expenses covered by MAS. Within the project the owner built a new sauna for the evenings after the dives because unfortunately the old one burnt down. Of even more value is that in 2023 a lift for the diver's is being added.

Special credit should be paid to the chairperson Markku Luoto for his ceaseless energy throughout the year in organising the camps in terms of securing funding, outreach to other clubs and the media and organising the camp participants. He played a vital role in not just bringing all the equipment together but innovating the special tools such as the dendro drill and the airlift. Over the 5 years some of the equipment did not accomplish all their tasks but these failings were always addressed soon after. There were very few equipment crises, the occasional compressor needing replacing at the last moment, all of which were surmounted.

Organising the team was a much more a developmental process. There had been regular dependable members from the start but for the project to grow it needed to incorporate fresh personnel. One concern was that the average age of the participants was around middle 40s, with some middle to late 60s, a situation quite common in diving groups. Fresh blood was needed not just for the Wreck Park but future MAS projects. It was partly remedied during the 5 years through outreach to dive clubs and training in the Nautical Archaeology Society (NAS) introductory training but remains an issue. Some students at Helsinki University have attended several field camps and it is hoped that its Masters in Maritime Archaeology programme will bring more younger divers to MAS projects with insight into the subject matter by offering them valuable fieldwork experience.

For the effective integration of a citizen science team several key elements are necessary and were thankfully available within the project, MAS and dive club members:

- Preplanning the yearly recruitment with sufficient time and tailoring it to the number of available boats and tasks. Prospective participants needed to sign up and their dive and archaeological experience assessed. It seemed appropriate that they had already received NAS introductory training as a minimum. All signed a waiver that they undertook activities at their own risk and healthy for the diving to be done. In return, they were assured that they would not be asked to do anything they were not happy

with or experienced for. In most cases this worked. However, on a few occasions divers turned up with poorly functioning equipment and their diving skills and depths reached were not sufficient for even the most basic of tasks. Project members helped to correct equipment issues.

However, they were asked to make simple dives in the shelter of Träskö bay, then if appropriate given orientation dives on wrecks at shallow depths. It was always understood that everyone had to start somewhere, every participant had their own path to follow and could in time be productive for the Wreck Park or future projects. However, after 2020 it was made mandatory that all divers had to have made a few dives in the months before to take part and would be allowed to dive on wrecks appropriate to their recent depth range. Depth was not the only consideration as many of the wreck sites could be very dark, with vision obscured by thick silt and surface conditions turn rough very quickly.

- Core team members that are known for their skills and responsibilities and to whom new members can go to for advice and feedback. Each boat had such key personnel for issues related to the boat and from 2020 an assigned archaeological and documentation person to advise on those issues.

- When integrating newer members, especially those with less diving experience and familiarity with the wrecks and the work already done, it was essential to match their abilities with the objectives set for them. Therefore, a variety of experiences had to be incorporated into the daily plans so they could develop their skills and knowledge at a comfortable rate. They were given challenges that allowed them to feel part of the team and gradually the plan was to stretch that comfort zone, so they developed as divers and useful archaeological assistants.

Image: Morning briefings (MAS)

Image: Team bonding with tasty food (MAS)

- Diving pairs were organised within each boat with club members generally diving on their own boats and taking on other divers as necessary. This worked generally fine with people diving off the boat they slept on to minimalise the unnecessary, and even more so when Covid restrictions were in place making dining and sleeping ‘bubbles’.

- *Clear objectives* for the whole week were essential to orientate members and allow an awareness of overall research directions. Briefings were given every morning where participants could clarify these objectives and their roles. In the evenings, an evaluation was made as to what was successful and tasks for the next day set for each boat.

  In the early years of the project this daily process started well but for many reasons sometimes broke down. If there was bad weather on one wreck the skippers of the individual boats might not have suitable preplanning or permission from the project coordinator to pursue other objectives in more sheltered sites. Time was sometimes lost because these boats could not contact the camp director because he himself was under water or occupied. This could result in group frustration.

  From 2020 onwards several processes were put in place that reduced these instances of lost dive time and reduced objectives met. Tasks lists were set out for the week and for the day that each boat held, and which highlighted not just one task on one wreck but alternatives on other wrecks. The skippers were involved centrally in these plans and reassured they had autonomy to decide what sites and conditions were suitable for diving, as is the norm. The maritime archaeologist recruited an able person on the other boats to ensure the documentation was filled out by divers and to coordinate with during the day, so each boat had meaningful purpose. This provided a necessary second tier of delegation and formed a useful partnership with the skipper of each boat.

- Members needed to be valued as a key principle, given encouragement and positive feedback. Not everyone could be a great diver or proficient at every task. However, members were valued for simply helping the team in any capacity or trying to learn new skills. Members also might have other contributions to make like boat skills, general planning, drawing sites and finds, photography below water or documenting events above water, cleaning, assisting with food preparation, and so on. It is easy to forget that participants come from different occupations and may have accountancy skills, engineering ability, nursing skills and so on or simply be great at teambuilding or making people laugh.

- A key ingredient of any team is that they can relax within their role and so achieve good results while feeling positive. This is especially true for citizen science projects where different mindsets can be at play. Members were very enthusiastic and wanted to produce results that they are satisfied with and are valuable to the project. This can result in a degree of perceived stress and pressure to produce scientific level data and results. However, they are not scientists but volunteers without the extra incentive of

a salary. It was important that conditions are a mixture of professional discipline balanced with a sense of discovery and fun. Morale building social activities naturally occurred each evening after work with activities like visiting the sauna, swimming even a karaoke evening. Good food was essential for morale. In 2019, lunch occurred onboard with evening meals on land in the marina restaurant. However, sometimes boats came back too late for the restaurant. In 2020 nearly all the meals were served on board and made by proficient cooks. This also allowed boats not to be tied to harbour timetables and to stay out at Träskö bay overnight.

2*. Safety issues* - All the normal diving safety protocols were employed, such as diligent dive logging, a safety diver in preparation and a light rescue boat. Risk assessments for each site, task and weather change were added through the new documentation. However, it must be acknowledged that there some instances where divers broke the safety protocols by passing their maximum dive dives. There were also a few concerning moments when divers entered the water without their buddy into fast currents or rough waters and had to be quickly recovered. Diving in a group of 3, which initially was allowed on occasion so diving tasks could be videoed was prohibited after one of the divers became separated from the others causing confusion and potential harm. In one case 2 divers carried on below assuming perhaps erroneously that their buddy had surfaced. Buddy pairs and all divers followed the protocol that if they became separated, they would search for the other for 3 minutes then surface, but this becomes far more complicated if 3 are in the water. However, and thankfully, over 5 years no diver or participant was injured to the credit of the project. All these cases were documented as near misses and talked through with the divers and became learning experiences for them and sensitively for the group.

3. *Training* – one of the aims of the project was to provide training in basic maritime archaeological field techniques to follow up their NAS Introduction classroom teaching. Unfortunately, that never happened. It would have required relatively clear water where divers would have measured a simple site underwater using 2D survey techniques and then recreated that in measured drawings. The priorities for the week were such that there was never time to devote to it. The task of measuring the wrecks was also being managed by the detailed 3D photogrammetry, so basic survey techniques were not necessary. Some teaching of field techniques was given ad hoc by the maritime archaeologist from teaching aids when time allowed on the boat. It was conceded that basic archaeological field training would need to be

4. Dating methodologies – The original approach to gaining dating samples was to employ dendrochronological methods since the resolution of the dates provided would be high. There

are principles to best practice to produce optimum results, expressed well by Dominguez-Delmas (2019).

- As many samples as possible from one wreck or at least 8 are usually needed. These should be taken from a spread of core structural timbers across the wreck that represent the original construction phase of the vessel. The thickness of the rings for that wood type are then matched to a section of the regional sequence. This may be a floating chronology but if the sequence is secured exactly at some point, then a range of dates for that timber can be known, even its felling date if the outer layers of the timber are represented. However, these regional sequences my not be complete or have a limited range. For the Rönnskär the comparative sequence for pine only goes back to 1584AD so we know it is older than that but how much? It may well be that other older sequences exist in the academic world for pine, and it has been speculated that Russian databases may contain them but the sharing of this data has been problematic.

- Normally somewhere over 50 rings is needed to be able to match the pattern to the northern European pattern for that tree species. There are many reasons why the ring numbers may be insufficient. Some samples may be rotten inside. If relatively whole timbers are present the optimal angle to take samples should be radially from the pith or bark if present (which indicates the felling year) to the core of the timber (its first growth year). If the angle is chosen poorly the angle can be so oblique to the radius that it contains few rings. A thick core is also no guarantee of lots of rings since it depends on tree species. A small piece of pine can have twice as many rings as a thick piece of oak. Even within species such as oak some subspecies put on thicker rings each year and will produce surprisingly few rings.

- It is a known phenomenon that boats can be repaired with newer or older timber, which is interesting in itself to understand, but will skew the dating interpretation of the wreck if only a few samples are taken. Those new or recycled timbers can also have been made from a different tree type or subspecies which will be misleading as to the original provenance of the wood and its possible original construction site. Vessels that have travelled far may have species from different regions or even continents for which there are incomplete sequence patterns.

The project's preferred sampling methodology was to use the dendro drill. This would satisfy the requirement from the Finnish Heritage Agency to cause minimal damage to the timbers, compared to traditional methods of sawing off sections of thick timbers or planks. Early drill models proved ineffective, lacking power, sufficient stability on the timber and optimal drill width and cutting edge. By 2020 it was far more effective, cutting sampling times from 1.5 hours down to 15 – 30 minutes. A version in 2022 did not require compressed air and ran on battery and is still being perfected. Part of the desire to innovate this device was to pioneer this technology and for MAS to add something new to the maritime archaeological world. However, the number of viable samples with sufficient rings produced turned out to be low. Several attempts were foiled by the drill bit not penetrating deeply enough due to mechanical factors in design or its application or the density of the timber. If it became stuck the dive will have been wasted and often another dive needed to recover it. What was recoverable from

the sample was often broken and useless. In other cases the centre of the timber was rotten. The number of samples that were viable compared to attempts was later estimated as one out of five samples produced a some kind of a dating.

It was clear after the 2020 season and in 2021 that there were few successful dendrochronological dates gathered. They had produced excellent early dates for *Utterböte* and *Varmbådanin uunihylky* but most wrecks had no dates. Even with the project being extended to 2022 the number of dives on each vessel would be limited. There were pressing priorities to finish the diver trails on the 11 or 12 wrecks promised for the Wreck Park.

A change in strategy was necessary but far from ideal. Dendro samples would still be taken for each wreck but, if not possible, radiocarbon samples would be taken with a small chainsaw or knife so at least some dating samples were available. Radiocarbon dating had already been sensibly conducted on the dendro samples received, even those that failed to provide enough rings. Switching to more radiocarbon dating had advantages and disadvantages as have already been explained. Faster sampling meant more samples could be taken. However, they would mean more intrusive and destructive effects for the wreck. To offset the degree of destruction, cuts were not made mid-section on timbers, thereby avoiding the creation of timbers left orphaned from the main structure and affecting the overall integrity of the wreck. Cuts were made on discreet parts of a timber or those not part of the main structure, or if necessary, on end sections of timbers.

The interpretation of the radiocarbon dates has also become an important discussion point. When several results have become available for one wreck there has been considerable variation and invariably these calibrated dates did not overlap the dendrochronological dates. There are important research questions to ask about the interpretation of the results, the major one being how they should be interpreted correctly. The science is complicated and there seems a tendency in archaeology to reduce complex variables that the dating scientists understand into simple solid dates for easier use. The interpretation of calibrated radiocarbon dates remains an issue where the maximum probability meets the largest probability area. No concise method seems to exist among archaeologist how to compromise between both.

5. *Cannon research* – The objective was to try to investigate the cannons at *Putkinotko/Remmaruuden* and try to link them with local wrecks and a vaguely documented historical reference to an engagement at Porkkala between Swedish and Russian forces. No useful identfications were gained from the cannons themselves or by a preliminary attempt to typologically match them to archival drawings or other sites. The dating taken from the upturned carriage seems to date at least a century earlier (see dating excel sheet in appendices). The only wrecks that seem to roughly match the age range to 1789 were *Linjatauluhylky/Ryssabrantama* and *Träskön Segelkobben/tykkikylki*. Both were warships with cannons. The former is somewhat distant on the western side of Träskö island. It contains 2 cannons and should be visited a later date to see if the cannons match any at *Putkinotko/Remmaruuden.* It is unclear if *Träskön Segelkobben/tykkikylki* is the remains of a larger warship or a *tykkijolla* (cannon sloop) which was a smaller gun platform that was often

used in the Swedish/Russian conflicts and effective at the battle of Svensksund later in 1789/1790.

A replica of such a vessel, the *Diana*, built by the Ehrensvärd society, exists in Suomenlinna (see reference link). These types of vessels were designed by Frederik Chapman (1768) for the Swedish Archipelago fleet and their ability to employ oar as well as sail power meant they were not dependent on the presence of wind to move. They could gain advantage by using shallow water or narrow channels where larger vessels could not follow and surprise larger sailing vessels from those channels between islands or river mouths. There were originally 2 cannons on *Träskön Segelkobben/tykkikylki,* one of which was removed in the past. They seemed small compared to those at *Putkinotko/Remmaruuden.*

There has not been an attempt made yet to deconcrete part of the cannon left underwater to look for identification marks, and there have been access issues to the previously raised one. The same can be said of the cannons on Rönnskär, some of which are large, others smaller. The 2022 season was the first time that deconcreting parts of the cannons was added to the research permit and allowed only limited time within that week. Future research should be scheduled in the Wreck Park to research these but not technically as part of the current project.

6. Findings that expand our knowledge of the Finnish maritime archaeological record.

- The vast majority of wrecks in the Finnish maritime archaeological database stem from the 17th to 20th centuries, particularly with Swedish, Dutch and locally built vessels, and correspond to an explosion in trade, particularly due to tar exported from Finland and the growth of St. Petersburg. The dates for *Utterböte* and *Varmbådanin uunihylky* provide maritime data for periods missing from that database. *Utterböte* has a date for the 14th century and its timber originated from Poland. *Varmbådanin uunihylky* is 15th century and came from North Germany. In those times and countries, the Hanseatic League was the dominant trading force in the Baltic before it was challenged in the 16th century by Sweden.

In our timeline we now have impressions of changes and trends in the identity of maritime travellers to visit the shores of Porkkala. Vikings were certainly present in Sääristomeri in the 11th century, the Danish via King Valdemar II at Porkkala in the 13th (and presumably people from Tallinn on the return journey), ships from the Hanseatic League in the 14th and 15th century, the Swedish monarchy in the 16th century, and then possible Russian vessels in the 18th century. Of course, that is entirely simplistic and there is no reason multiple trading vessels from different origins could not have been frequenting the area at the same time. Little is also known about the native boat building traditions, whether they were building small or larger vessels and in which method, whether they acted independently or as agents for foreign businesses or political entities.

Future developments for the Wreck Park

The project has finished but the Wreck Park must be made sustainable, or all the progress will be lost. The following are ongoing initiatives:

1.This includes physical care such as replacing the old info-boards, creating, and installing new info-boards for the wrecks that currently do not have them, and replacing old guidelines. This requires divers to perform once or twice a year on up to 11 wrecks. Individual members of MAS and dive clubs are committed to this maintenance but without the presence of this now finished project the commitment in time and resources will be exacting. A new system is needed. Invitations are being given to dive clubs to 'Adopt' some of these wrecks and incorporate the maintenance and protection of these wrecks into their usual club activities. In the ongoing outreach talks MAS gives to dive clubs to inform of its activities and hopefully gain new members it will include a segment for adopting these wrecks.

Image: Info-boards already destroyed by underwater conditions within 3 years (MAS)

2. Although MAS itself has built the Park it does not own the wrecks or function as a licensee as happens for instance in the UK. The wrecks are the cultural property of the Finnish people, protected by law and managed by the Finnish Heritage Agency. MAS has functioned as the research partner in this enterprise. It will not function as a supervisor, more of a coordinator and source of information and advice. Divers and interested parties are free to call MAS via the Wreck Park Facebook website or MAS society Links:.

3. In order for the wrecks in the Park to avoid excessive 'diver wear' MAS or wreck adopters will advertise as open certain wrecks each season. This can be rotated to allow wrecks and their wildlife to recover. Other wrecks will not be off limits as Park access is free and open to all that respect the integrity of the wrecks and will rely on goodwill.

4. A portal has been opened on the MAS website (sukellusilmoitus) for divers to add observations from their dives, not just in the Park but for all of Finland. This will aid the overall ontology formation concept. MAS has always operated and open-source policy for the data it discovers, its images, 3D models and so on. It is hoped that divers will reciprocate this and will provide information on;

- the state of wrecks, whether they have deteriorated since their last visit or been damaged, or new features that have been discovered.

- new sites found and add descriptive details and locations for them for future archaeological investigation.

- basic awareness to MAS which sites are visited more. This will aid the monitoring of possible ‘diver wear’ on sites.

5. The Porkkala Wreck Park website will be updated with information from this report when accepted.

5. An article is planned for the International Journal of Nautical Archaeology concerning the different dating methodological tools employed, particularly the dendro-drill, which is considered a useful innovation in the worldwide maritime archaeological field.

Summary of the project

The original plan to produce a Park with 11 or 12 researched wrecks with diver trails was achieved. Feedback from dive clubs seem to be positive and by all anecdotal accounts visitor numbers are good and hopefully higher than before. Some were quite extensive in size such as at *Träskön tynnyrihylky / Limisaumahylky / Alku* or the *Rönnskär* because of the size of the site and richness of material, while others were simpler. At this moment 8 of them are not 100 % complete, only because they need info-boards to be made and placed on site.

A question that does need asking is whether the aim of aims of building a Wreck Park was fully compatible with the desire to produce an ontology of wrecks for the area. To make this ontology the photogrammetric recording, the study of the boat’s form and function and the dating of sites were equally important. However, in retrospect it seems like the time and dives taken for the Wreck Park diver trails may have outweighed those for taking dating samples and analysing the wrecks themselves, which has limited the time given to gather archaeological research data.

It is true that the time used for the dendro drill to be redesigned, and become dependable, restricted the number of dendrochronological dates produced. It also forced a need to take more radiocarbon dates, a method that would produce less accuracy for dating wrecks. The result was very few dendrochronological dates. Relatively few radiocarbon dates were collected for each wreck, often 1 or 2, that often gave quite wide date ranges. It is possible that more data could have been gathered if the project were not pursuing 2 or more masters.

It could also be argued that the aim to provide an ontology of wrecks in the area that might be representative of the wrecks of the Porkkala region itself hampered the gathering of sufficient data for any single wreck. The project did not just research the 11 or so main wrecks but over 22 full 3D models were produced in the Porkkala area and dates gathered for more

than the dozen main wrecks. So, should the number of wrecks researched have been restricted to the promised main 11 or reduced even further to increase the quality and quantity of the research data known for each wreck? It is a common dilemma in research whether to know a lot about a few things or a little about a lot of things, quality versus quantity. Many scientists and academics would argue very reasonably for the former as more data on one site would allow stronger interpretations.

However, it should be remembered that this project has not been conducted by seasoned scientists but citizen scientists with a principal objective to gather data for later researchers to carry further. The project has been learning day by day how to evolve, trying to achieve its core aims, sometimes taking small detours or reaching out too ambitiously. It has managed to achieve a reasonable balance between building a Wreck Park and providing useful data.

Beyond the validity of the methods and the data gathered it is important not to forget the citizen in the science. This project was never going to produce detailed, ‘perfect’ data. The development of the team itself was as important a goal. The process that the project itself and the individual members went through has allowed them to develop not just their diving and archaeological skills but their critical thinking and ‘archaeological brains’. This has allowed MAS to be confident in its abilities and develop its identity as a member of more scientific bodies, such as the Delegation of Scientific Societies, and be a part of scientific events. It is one of the leading operators of open science (avointiede). Members are now more ready for the next project with better knowledge, skills, and awareness.

MAS and the Wreck Park team have become a respected resource not only to assist on maritime archaeological projects run by professional cultural heritage agencies like the Finnish Heritage Agency, but even do types of research for them, such as in recording specially protected wrecks in the Saaristomeri. The Porkkala Wreck Park has been the first step in a longer rewarding journey.

Reference List

Literary references

Alopaeus, H. 1989. Der Schiffsfund von Lapuri. *Deutsches Schiffsarchiv **11***, 1988, 21-34.

Chapman, F. H. 1768. Architectura Navalis Mercatoria. The Classic of Eighteenth-Century Naval Architecture. 2012 copy by the Courier Corporation.

Dominguez-Delmas, M., Rich, S., Daly, A., Nayling, N. and Haneca, K., 2019, Selecting and Sampling Shipwreck Timbers for Dendrochronological Research: practical guidance. *The International Journal of Nautical Archaeology* (2019) **48.1**: 231–244 doi: 10.1111/1095-9270.12329

Forssell, H. 1983. *Fynd av sydda båtar I Finland*. Båtar I. Skärgårdsmuseet, Pernå. Lovisa.

Tikkanen, S. 2000. Linjalaiva Kronprins Gustav Adolf – 1788 haaksirikkoutunut ruotsalainen sotalaiva. *Nautica Fennica 2000*. Suomen merimuseo (The Maritime Museum of Finland. Annual Report 2000).

Relevant Links:

Wreck Park reports

2018 Porkkalan Hylkypuiston vuosiraportti
https://www.mas.fi/sites/mas.fi/files/testi/2018_porkkalan_hylkypuisto_vuosiraportti_2018.pdf

2019 Porkkala Wreck Park interim report
www.mas.fi/sites/mas.fi/testi/porkkala_wreck_park_interim_project_report_2019.pdf

2020 Porkkala Wreck Park interim report
www.mas.fi/sites/mas.fi/files/testi/porkkala_wreck_park_interim_project_report_2020.pdf

2022 MV/125/05.04.01.02/2022 KIRKKONUMMI, Porkkalan hylkypuiston hylkyjen ajoittaminen

Historical

Stone age Kirkkonummi — Kirkkonummi - Wikipedia

Cape of Porkkalanniemi — History - Nationalparks.fi

Porkkala ‘engagement’ ’https://www.loquis.com/en/loquis/2707665/Battle+of+Svensksund

Gunnar, A. 1992. *Gustav III:s ryska krig, Militärhistoriska avd. vid Militärhögskolan, Pdrobus förlag*, Västervik.

Jägerskiöld, S. 1990. Ruotsinsalmi, Kustaa III:n meritaistelut 1788-1790, Otava Keruu.

King Valdemar 2nd mentions ‘Purkal’

- King Valdemar’s Itinerary (transcription) – Archaeologia Navalis (archaeologia-navalis.org)

- The fairway of King Valdemar (kalmarlansmuseum.se)

Internet sources

Adoptoi Monumentti https://adoptoimonumentti.fi/?lang=en

BALTACAR https://projectbaltacar.eu/

Big Cannon Project https://www.bigcannonproject.org/database

Cannon sloop ‘Diana’ https://www.suomenlinnatours.com/en/cannon-sloop-diana

Finnish national wreck database www.hylyt.net

Finnish Heritage Agency cultural environment database
https://www.kyppi.fi/palveluikkuna/portti/read/asp/default.aspx

MAS Facebook: https://www.facebook.com/meriarkeologia

MAS Sketchfab: https://sketchfab.com/mas-fi

MAS Web pages: https://mas.fi/fi

NAS Adopt a wreck https://www.nauticalarchaeologysociety.org/adopt-a-wreck

Nousu ry dive club www.nousu.fi

Porkkala Wreck Park Facebook: https://www.facebook.com/hylkypuisto

Porkkala Wreck Park web pages: http://wreckpark.eu/