
E. Russ
Akula
Minesweeper No-1
Lehtma
Kärdla
Kõrgessaare
Vormsi
Hiiumaa
Altair
Shchit
Sõru
HMS Myrtle
Triigi
Muhu
Veere
Saaremaa

Diving to the wrecks of the HMS Myrtle, Altair, Shchit, Akula, minesweeper No–1 and E. Russ

Maili Roio and Arto Oll

Tallinna 2019

Maili Roio and Arto Oll. Diving to the wrecks of the HMS Myrtle, Altair, Shchit, Akula, minesweeper No-1 and E. Russ.

Design and drawings: Kersti Siitan
Publisher: National Heritage Board of Estonia
Printed by: Just Print OÜ
ISBN 978-9949-7293-7-1

Published with the support of the European Union via the Central Baltic Programme 2014-2020 of the European Regional Development Fund INTERREG.

In this publication, we introduce the historical shipwrecks that are the Estonian destinations of the joint tourist attraction created within the scope of the Estonian-Finnish-Swedish cooperation project "Baltic History beneath the Surface: Underwater Heritage Trails in situ and Online" (Baltacar), which received support from the Central Baltic Programme of INTERREG.

Historical shipwrecks are important elements of the joint past of Baltic Sea countries and non-renewable resources, which are used for scientific research, interpretation of historical events, educational objectives and also for the development of cultural tourism. The purpose of establishment of underwater wreck parks is to facilitate access to antiquities and ensure their sustainable management at the same time. Following the principles that spare the wrecks makes it possible to keep the underwater sites that are sensitive to human impact open to visitors for longer.

All six wrecks are associated with the events of World War I and the Estonian War of Independence. Both of them played a major role in the birth of the Republic of Estonia.

Diving in Estonian waters

Diving to underwater monuments is regulated by the Heritage Conservation Act. Diving to underwater monuments and in their protection zones is allowed under the instruction of a business operator that offers diving services within the scope of its economic activities or on the basis of a diving permit. A diving permit can only be used by the holder of the permit.

Being caring and responsible when practising any activities (incl. diving, sailing, fishing) at sea as well as inland bodies of water helps preserve underwater cultural monuments and significantly reduce human impact. It's possible to get information about underwater cultural monuments by taking a look at the state register of cultural monuments at register.muinas.ee, which also contains information about the shipwrecks that have occurred in Estonian waters. The information can be found in the section Wreck Register. All underwater monuments have been entered on a nautical chart. The Heritage Conservation Board must be informed as soon as possible when a new site is found.

The underwater cultural heritage of the Baltic Sea is a unique source material in the context of Europe as well as the rest of the world. Let's give it the appreciation it deserves.

Dive responsibly!

Minesweeper HMS Myrtle

Technical specifications

Year built: 11.10.1915
Built at: Lobnitz & Company in Scotland
Length-breadth-draught: 81.6 x 10.2 x 3.5 m
Displacement: 1250 tons
Engine power: four-cylinder engine with total power of 1,200 hp, 1 propeller
Speed: 17 knots
Range of action: 2,000 nautical miles at 15-knot speed
Fuel stock: 130-250 tons of coal
Crew size: 79
Armament: 2 x 1-102 mm guns (located in the bow and stern of the upper deck, 50 shells for each gun); 1 x 1-47 mm gun.

Historical overview

The Royal Navy of the United Kingdom started giving attention to mine trawling after the Russo-Japanese War (1904-1905). The main reason for this was the capacity of the Russians to efficiently use naval mines in defence against the Japanese fleet. Two old torpedo boats were reconstructed into minesweepers on the orders of the British Admiralty in 1908 and as of 1913, the Royal Navy already had six minesweepers in its service. Said vessels were used to regularly practice the liquidation of mine fields. In the event of a potential war, 82 vessels of the auxiliary fleet could be equipped with mine trawls if necessary. However, the Admiralty did not have a design of the minesweeper as a specific type of warship with determined specifications. The old vessels used until then didn't have the capacity required for operating in the open sea. This is why the development of a new warship was undertaken. The understanding was that the crews of the future minesweepers had to be small and the vessels could not be armed or armoured. This meant that they were not intended for use in direct warfare. Said criteria were based on the fact that mine trawling inevitably leads to losses, which is why manning the vessels with large crews or investing large sums of money in the vessels would not be practical. Naval architects prepared the first drafts of minesweepers in early 1914.

Due to the start of World War I, the Admiralty decided to continue with the minesweeper project on 25 September 1914, but set new criteria for the vessels to be designed. Wartime required the vessels to perform different roles: mine trawling, anti-submarine operations, supporting convoys, towing vessels and organisation of transport. The need to perform various operational tasks influenced the design of the ships. Ordinary passenger steamers were used as an example, because the construction of the hull of the multi-purpose minesweeper of the navy had to be as simple as possible. This helped save considerable amounts of time for the construction of new ships, which was extremely valuable during wartime. Another reason for making such a decision was that ships similar to cargo steamers were unlikely to be taken for warships because of their shape and the enemy may therefore decide not to attack them. This in its turn reduced the workload of shipyards that specialised in military vessels, as the simple design of the ships mean that they could also be built in civil shipyards.

Naval architects submitted the draft of the Flower class minesweeper in December 1914. Flower class vessels have excellent nautical properties and their good steerability made them easy to stabilise even at stormy seas. Three waterproof walls were built in the bow of the ship, which prevented it from sinking in the event it hit a mine. As the intention was to use minesweepers for transport was well, they were built with large decks and closed railings. This prevented water from building up on the deck. The deadweight of the vessel was also impressive. The deadweight of the deck alone was 50 tons, so that it could be used to transport up to 700 servicemen. Flower class vessels even transported horses on their decks during the war. The simple design of the Flower class vessels meant that shipyards could build them quickly – it usually took just 19 to 21 weeks to complete a vessel.

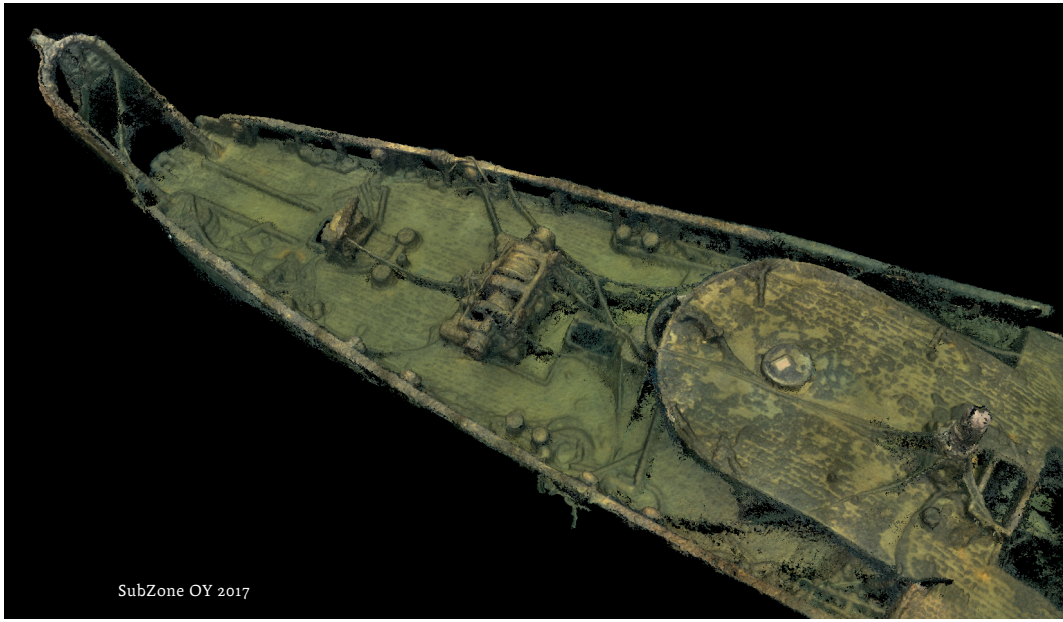
The minesweeper Myrtle, which belonged to the Azalea subclass of the Flower class, was launched on 11 October 1915.

The squadron of British light cruisers operated actively on the Baltic Sea during the Estonian War of Independence (1918-1920). They mainly helped the Republic of Estonia fight against Soviet Russia and controlled the activities of the German troops in the Baltic States. The majority of the British squadron was based at Björko in 1919, where they stopped the Russian Baltic fleet from entering the Gulf of Finland. A smaller part of the squadron was permanently based in Latvian ports. Irrespective of the busy traffic on the Baltic Sea, it was the most mined maritime

area in the world. Russian and German fleets threw approximately 34,000 naval mines into Estonian waters alone during World War I. Only narrow fairways had been trawled through the minefields during the War of Independence, so navigation in Estonian waters only took place under the guidance of experienced mine pilots. The British fleet wanted to clear the fairways of mines in order to develop cargo ship traffic and expand its own operations. Rear Admiral Walter Cowan insisted that minesweepers be sent to the Baltic Sea.

The Admiralty agreed and the Daphne, Gentian, Godetia, Lilac, Lupin and Myrtle of the 1st minesweeper flotilla were sent to the Baltic Sea on 10 June 1919. Tallinn was designated as the base of the flotilla in July 1919. Next, the minesweepers were ordered to clear the fairways west of the islands of Saaremaa and Hiiumaa. The fleet left Tallinn for the minesweeping operation on 14 July 1919.

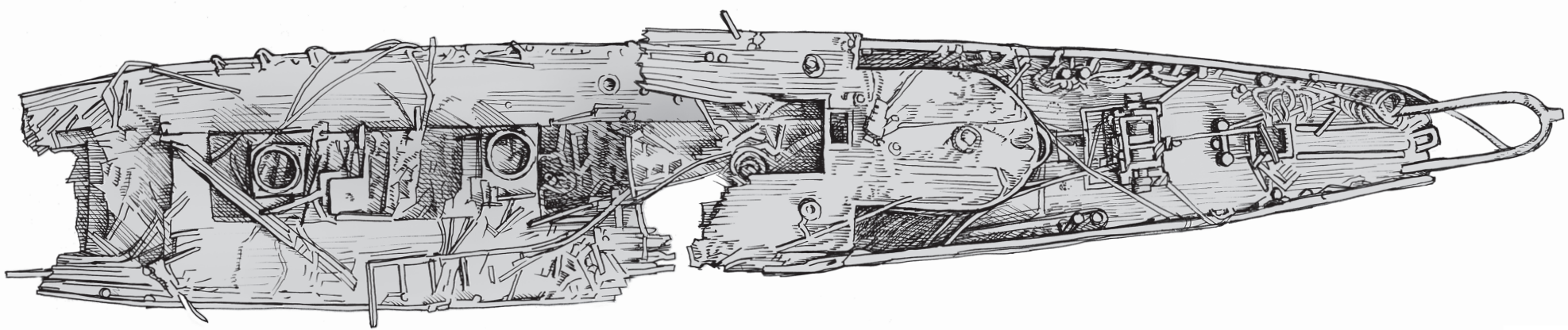
The minesweeper Myrtle perished during a minesweeping operation in a German minefield near Harilaid on 15 July 1919. Six marines were killed: stokers John Amey, Alexander Birch and Arthur Primmett, carpenter Robert Johnson and engineers James Gillies and Thomas Packman.



SubZone OY 2017

Wreck of the minesweeper HMS Myrtle

Perished on: 15 July 1919
Fatalities: 6
Location: Baltic Sea, northwest of Saaremaa
Coordinates: 58 35.350; 21 46.161
Cultural monument reg. no. 22265, register.muinas.ee
Diving: under the instruction of a business operator that offers diving services or on the basis of a diving permit
Depth of wreck: 28 metres
Depth of surrounding area: 34 metres
Dimensions of wreck: length 76 metres, breadth 10 metres.
Direction of wreck: 68-248.
Status: The ship broke in half as a result of an explosion, the stern section of the ship has survived, the bow of the ship sank approximately 8 kilometres west-southwest of the stern. The wreck lies on its straight keel on the bottom of the sea.
A memorial plaque with the ship's name, an image of the flag of the Royal Navy and the date of the shipwreck was placed on the deck of the ship in 2000.
Diving: Suitable for experienced divers. An anchor buoy has been placed next to the wreck for the navigation season and there are information boards on either side of the wreck.



Minesweeper Shchit

Technical specifications

Year built: 1916
Built at: Russian-Baltic Shipyard in Tallinn, Estonia.
Length-breadth-draught: 53 x 6.6 x 1.2 metres
Displacement: 271 tons
Engine power: two steam engines with total power of 650 hp, two Yarrow boilers and two propellers
Speed: 9 knots
Range of action: 450 nautical miles at economical speed (6 knots)
Fuel stock: 40 tons
Crew size: 38
Armament: 1 x 1-75 mm Canet gun (in the bow in front of the bridge, the ship also had two 2 x 1-7.6 mm light machine-guns); naval mines of type M1908 or M1911 (could carry 50-60 naval mines).

Historical overview

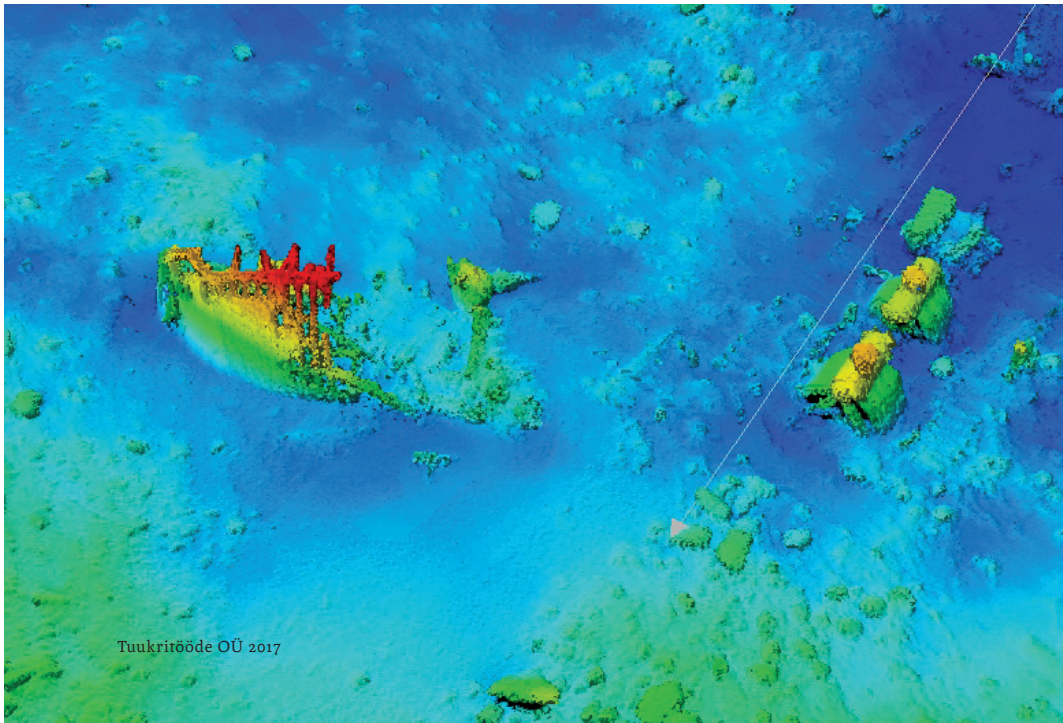
The Imperial Russian Navy focused primarily on the development of underwater weapons in the early 20th century. A lot of attention was therefore given to the modernisation of the construction and mechanisms of naval mines. Although the Russians managed to develop the most efficient naval mines in the world, but laying them turned out to be a problem. Until the start of World War I, the Russians had no special warships for such operations, i.e. no minesweepers.

In autumn 1914 the officers of the Baltic Fleet wanted to increase the number of ships suitable for sweeping. Until then, mine sweeps were usually installed on cargo or auxiliary vessels, which were actually not suitable for sweeping fairways efficiently. However, a smaller vessel was needed during wartime; one that was specially built for laying and, if necessary sweeping mines. The ship also had to have a small crew, because losing ships of this type on sea was inevitable because of its functions. In the event of an accident, losing a smaller ship would not be such a burden for the state's economy.

The Maritime Ministry requested the building of eight minesweepers from the government in late 1914. 1.2 million roubles was allocated to this from the navy's shipbuilding budget for the next five years, which is why the decision made on 30 January 1915 was to build just four minesweepers at first. The building of the minesweepers started in the same year.

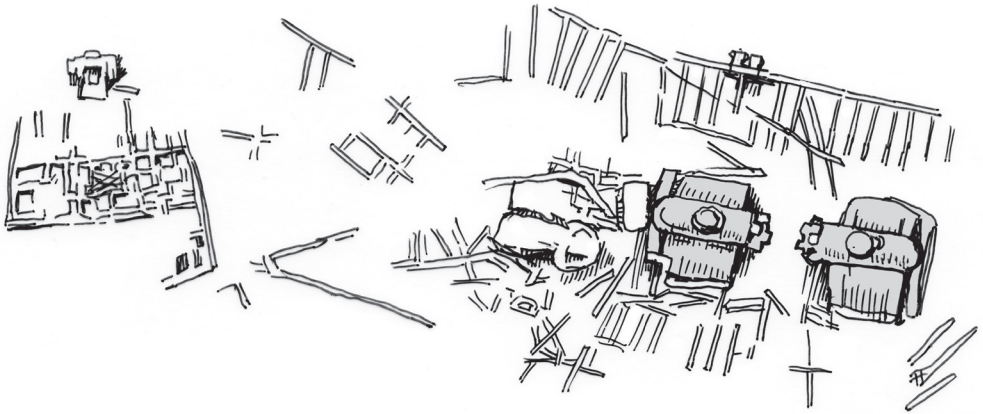
The Russian-Baltic Shipyard in Tallinn started building the minesweepers Shchit and Krambol, which belonged to the new Kapsiul class, and the Putilov Shipyard in St Petersburg started building the Kapsiul and the Gruz. The minesweepers Shchit and Krambol were finally ready in September 1915. The engines and mechanisms of the minesweepers were tested from October 1915 to May 1916. The official services of the minesweepers started in the 3rd division of the 1st minesweeper group in June 1916.

The minesweeper Shchit hit a mine laid by the Germans in Soela Strait on 6 December 1916. The naval mine exploded near the stern of the ship, after which she started to sink. According to the report of First Lieutenant G. Dombrovski, order and discipline were maintained on the ship. The crew didn't panic and all orders of the commander were correctly complied with. The commander of the minesweeper Shchit conceded that saving the vessel was impossible, as the explosion had ripped off part of the stern. The commander therefore ordered the crew to leave the vessel, steam was released from the boilers and secret documents were handed over to the commander of the minesweeper Gruz. An attempt to tow the vessel was made at first, but it failed as the stern of the ship was stuck to the bottom of the sea and only the bow remained above water. The towing line was soon removed and the Shchit sank without any fatalities.



Wreck of the minesweeper Shchit

Perished on: 6 December 1916
Fatalities: none
Location: Baltic Sea, west of Sõru Harbour in Hiiumaa
Coordinates: 58 41.477; 22 24.717
Cultural monument reg. no. 30968, register.muinas.ee
Diving: under the instruction of a business operator that offers diving services or on the basis of a diving permit
Depth of wreck: 11 metres
Depth of surrounding area: 13 metres
Dimensions of the wreck: 33 x 40 metres.
Status: The wreck of the minesweeper lies tight in the sediment of the seabed in a northeast to southwest direction. The stern section has broken off from the rest of the vessel and is located approximately 10 metres from the hull crosswise from the latter.
Diving: Suitable also for beginners.



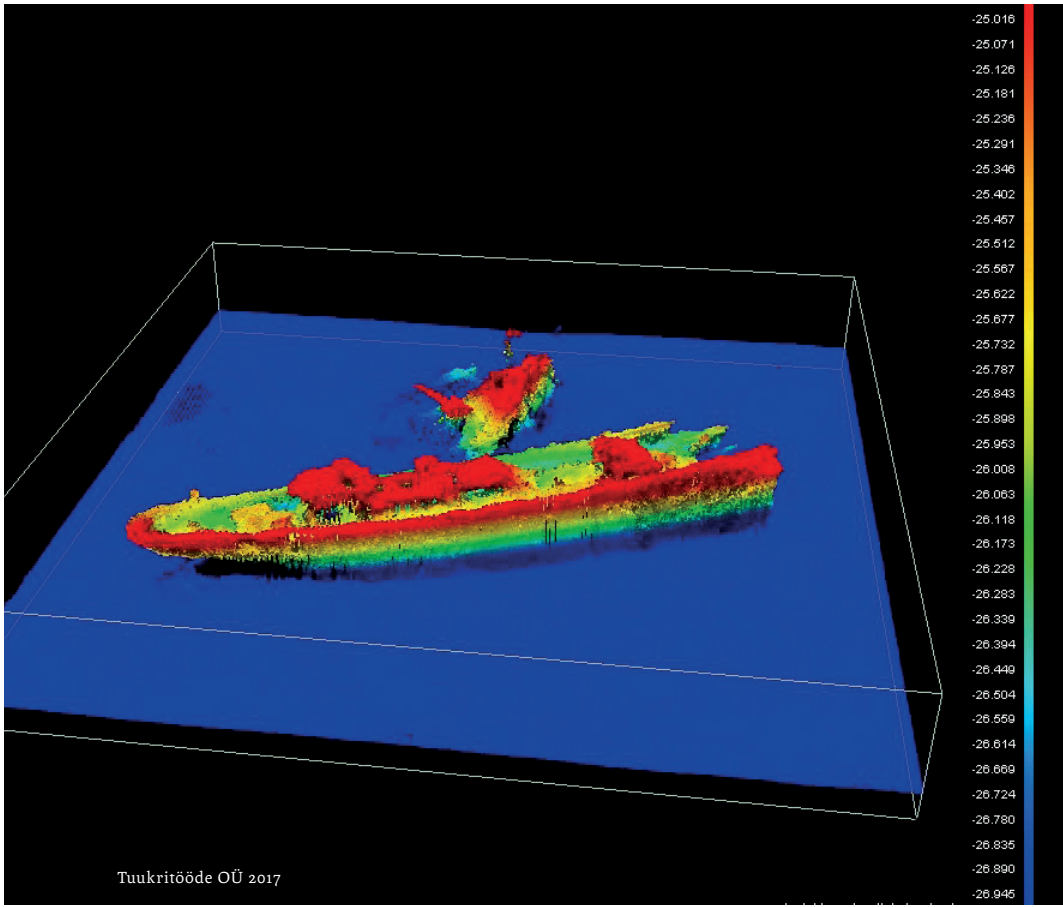
Minesweeper Altair

Technical specifications

Year built: 1916
Built at: Jos. L. Meyer Werft Shipyard in Papenburg, Germany
Length-breadth-draught: 39 x 7.1 x 3.95 metres
Tonnage: 237 grt
Engine power: steam engine with total power of 500 hp
Speed: 11 knots
Range of action: 4,800 nautical miles (at 11 knots)
Crew size: 31

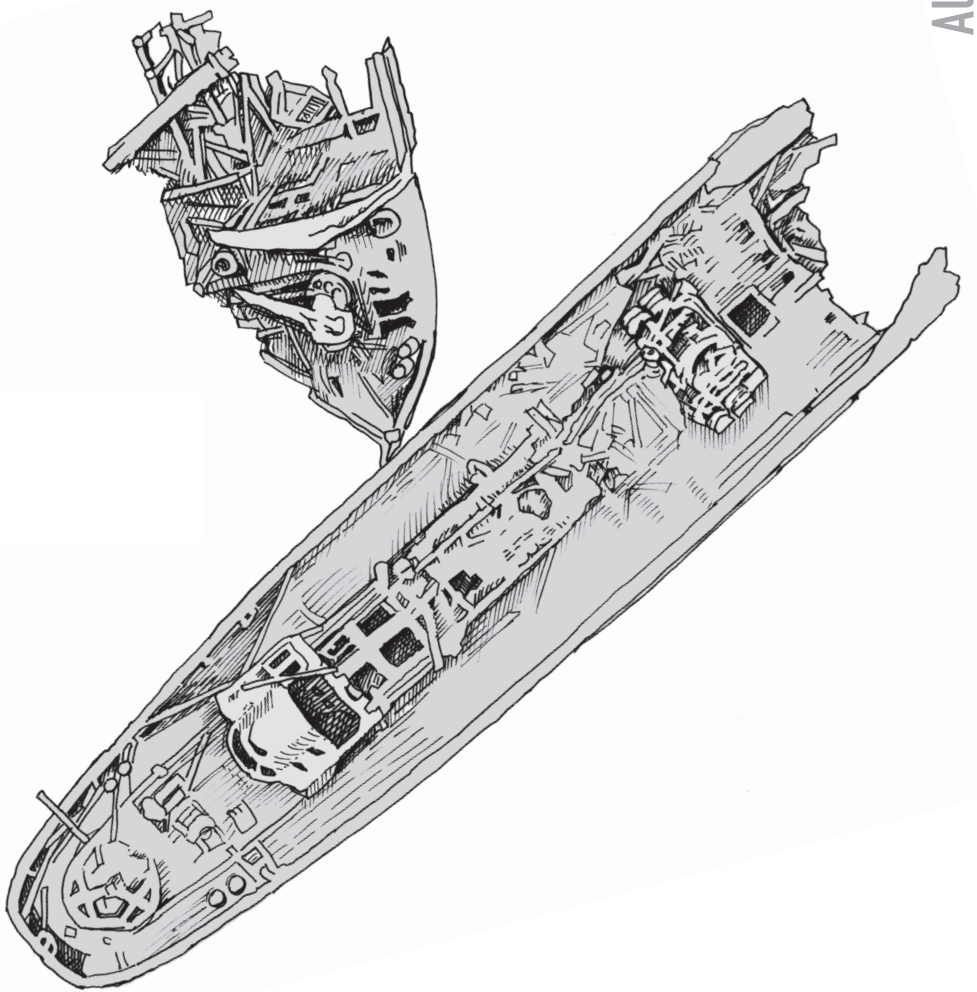
Historical overview

The fish trawler Altair was built in Papenburg on building site no. 325 of the Jos. L. Meyer Werft Shipyard. The vessel was commandeered to the auxiliary fleet of the German Navy on 21 December 1916, soon after it was built. The Altair would have operated as a fish trawler on the North Sea after the war. In 1917 the Altair was included in the 3rd anti-submarine flotilla, which participated in Operation Albion. The trawler Altair perished at 7:18 AM on 14 October 1917 in a Russian minefield in Tagalaht Bay. 10 of the 31-man crew were killed.



Wreck of the minesweeper Altair

Perished on: 14 October 1917
Fatalities: 10
Location: Baltic Sea, west of Sõru Harbour in Hiiumaa
Coordinates: 58 41.129, 22 15.036
Cultural monument reg. no. 30728, register.muinas.ee
Diving: under the instruction of a business operator that offers diving services or on the basis of a diving permit
Depth of wreck: 24 metres
Depth of surrounding area: 28 metres
Dimensions of wreck: length 15 metres, breadth 7 metres.
Status: The ship broke in half as a result of an explosion. The onboard weapons have survived.
Diving: Suitable for experienced divers. An anchor boy has been placed next to the wreck for the navigation season.



Submarine Akula

Technical specifications

Year built: 1909
Built at: Baltic Shipyard, St Petersburg, Russia
Length-breadth-draught: 56 x 3.7 x 3.4 metres
Surfaced and submerged displacement: 380/475 tons
Main engines: three Nobel diesel engines with combined power of 900 hp, 3 propellers
Main electric motors: one electric motor of 225 hp
Surfaced and submerged speed: 10.6/6.5 knots
Range of action: 1,900 nautical miles surfaced, 38 nautical miles submerged.
Diving depth: 50 m
Crew size: 35
Armament: The submarine carried eight torpedoes in total and there were launching tubes on both sides of the board in front of and behind the conning tower, four in total. 4 x 1-457 mm launching tubes, 1 x 1-47 mm gun, naval mines of type M1908 or M1911 (could carry four naval mines).

Historical overview

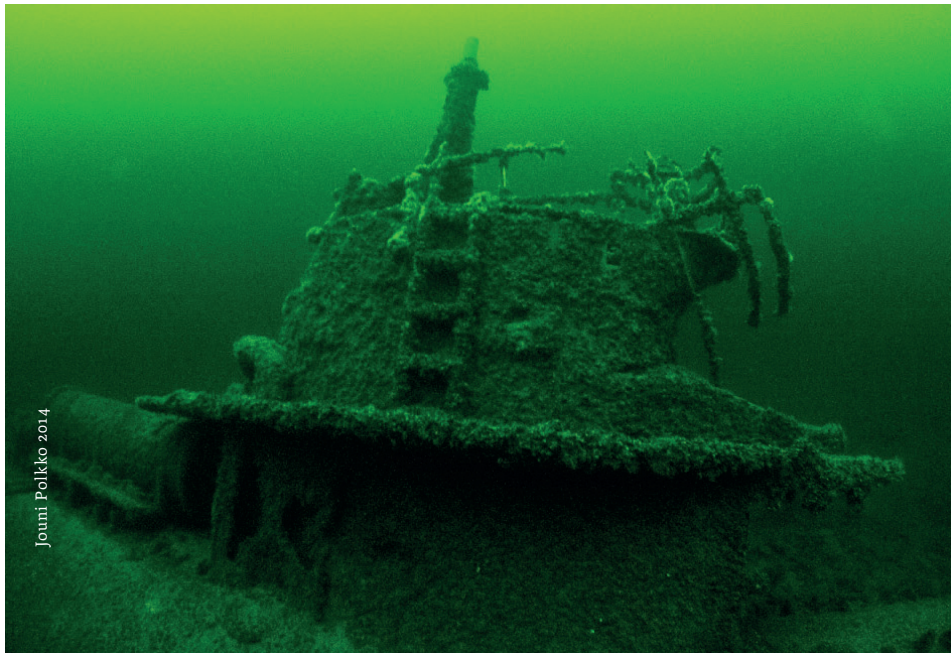
Naval architect Ivan Bubnov presented the draft of a new submarine to the navy in January 1905 in related to the Russo-Japanese War. According to his idea, the submarine had to be able to operate in the territorial waters of Japan and also attack the warships located at the enemy's ports. Basically, the intention was to build a warship with an increased range of action. The Technical Committee of the Russian Navy approved the plan on 3 May 1905. According to the initial design, the submarine was supposed to use oil engines, but the naval architect quickly changed this plan. The oil engines were replaced with three diesel engines (900 hp in total) and three propellers for security considerations. Some data indicate that only two diesel engines were installed on the vessel and one of the propellers was therefore moved with an electric motor. The absence of waterproof partitions was a unique feature of the submarine.

The construction of the submarine Akula started at the St Petersburg Shipyard on 7 December 1906. The main reason of the delay was the fact that since the submarine was a unique prototype, the Russians could not build the necessary engines quickly enough. The diesel engines were finally ready by March 1909.

The launch ceremony of the submarine was held on 22 August 1909 in St Petersburg. Various tests were carried out with the Akula from 1909 to 1911, mostly near Kronstadt, Björko and Tallinn. For example, the torpedoes were launched for the first time on 5 June 1910, the propellers were changed in June and diving was practised in Tallinn Bay in November. The submarine dove 40 times in 1911 alone and travelled 182 nautical miles when submerged. Testing the submarine Akula was officially finished on 14 September 1911, when the Technical Committee of the Navy allowed for the warship to be put to service. This was the first submarine fully developed in Russia, which could be used for patrolling and guarding on sea for longer periods of time. Although the technical leadership of the navy considered the submarine an all-round success, they pointed out some deficiencies as well. One of them was the slow speed of the submarine (only 11.5 knots instead of 16 when surfaced and 6.5 knots instead of 7 when submerged) and the small capacity of the fuel reserve tanks. These deficiencies reduced the range of action of the submarine. However, they praised the steerability, seaworthiness and manoeuvrability of the submarine, which is why the prototype vessel Akula was used as the example when building Bars class submarines.

On 6 November 1911 the Akula was put in active service in the Baltic Fleet and on 25 March 1912 it was transferred to the 2nd submarine brigade.

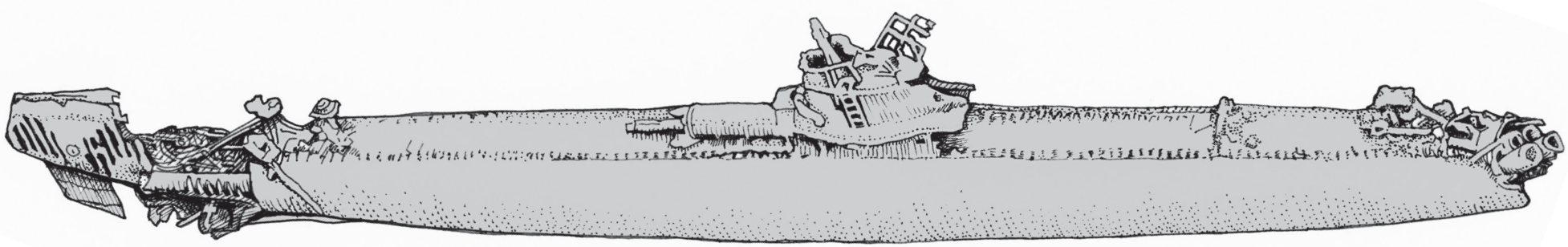
The submarine Akula was used for patrol 19 times in World War I. The last battle raid took place in November 1915, when the Akula was sent on a patrol mission between Liepaja and Klaipeda. Four extra naval mines were placed on the submarine for this mission, which had to be laid in the fairway used by the enemy without being noticed. However, the Akula did not lay the mines. Instead, the vessel hit a mine during the mission and sank with the entire crew. The Akula was deleted from the fleet list on 15 March 1917. 35 crewmembers were killed.



Wreck of the submarine Akula

Perished on: 15 November 1915
Fatalities: 35
Location: Baltic Sea, north of Kõpu Peninsula in Hiiumaa
Coordinates: 59 08.502, 22 11.663
Cultural monument reg. no. 30392, register.muinas.ee
Diving: under the instruction of a business operator that offers diving services or on the basis of a diving permit
Depth of wreck: 24 metres
Depth of surrounding area: 29 metres
Dimensions of wreck: length 40 metres, breadth 4 metres
Direction of wreck: 82-262

Status: The stern section of the submarine broke off as a result of the explosion. Some details of the wreck are scattered around it on the seabed. There are four mines with mechanical fuse mechanisms on the seabed by the port side. The casings of some mines have become dilapidated, exposing the combustion chambers inside. The torpedoes that may be in the launching tubes are not a threat. On torpedo stands upright between the bridge and the stern at an angle of ca 60 degrees. The upper end of the combustion chamber with the fuse is missing and the explosive in the chamber can be seen.
Diving: Suitable for experienced divers. Diving to the wreck is not dangerous when the requirements for diving to monuments are followed. An anchor buoy has been placed next to the wreck for the navigation season.



Minesweeper No-1

Technical specifications

Year built: 1892
Built at: W. Lindbergs Varvs- och Verkstads AB Shipyard in Stockholm, Sweden
Length-breadth-draught: 56.5 x 8.2 x 4 metres
Tonnage: 739 grt
Engine power: 2-cylinder compound steam engine with total power of 850 hp, one propeller
Speed: 10 knots
Range of action: 1,800 nautical miles (at 10 knots)
Sweeping equipment: two Schultz and one Somov-type sweeps.
Armament: 2 x 1-75 mm anti-aircraft guns (one in the bow and the other in the stern), model name Canet 75 mm M1892 (75/50)

Historical overview

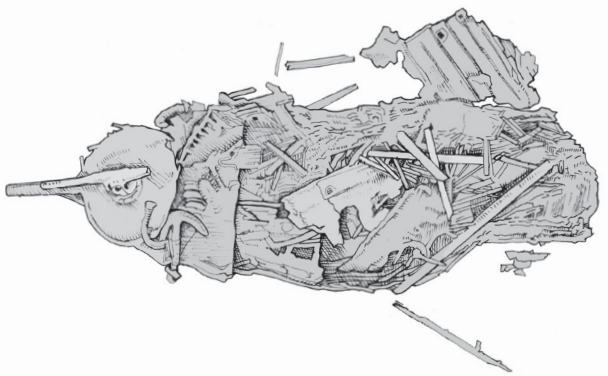
Operated as a cargo ship under the name of Linnea in Finnish waters until 1914. The vessel was commission to the Baltic Fleet of Russia on 14 August 1914 after the outbreak of World War I. At first, it was used as a transport vessel by the navy, but rebuilt into a minesweeper at the end of the same year. The Linnea was renamed the minesweeper No-1 after it was included in the Baltic Fleet. It soon became clear that the size and limited manoeuvrability of the vessel were not that suitable for minesweeping. However, finding a more suitable vessel at the start of the war was not possible, which is why the ship continued serving as a minesweeper also in 1915.

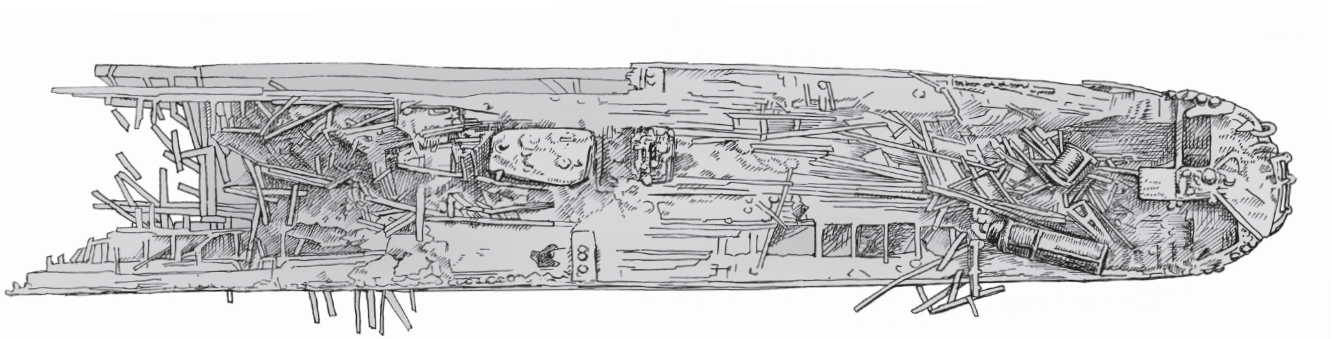
On 16 September 1915 the minesweeper No. 1 hit a mine laid by the German submarine UC-4 five nautical miles northwest of Vormsi island and sank. No crewmembers were lost, as the minesweeper No-10 managed to save them.

Wreck of the minesweeper No-1

Perished on: 16 September 1915
Fatalities: none
Location: Väinameri Sea, northwest of Vormsi island and north-east of Hiiumaa.
Coordinates: 59 06.124, 23 01.751
Cultural monument reg. no. 27805, register.muinas.ee
Diving: under the instruction of a business operator that offers diving services or on the basis of a diving permit

Depth of wreck: 14 metres
Depth of surrounding area: 18 metres
Dimensions of wreck: length 64 metres (two separate parts) and breadth 8 metres
Direction of wreck: 77-257
Status: The vessel broke in two after hitting a mine. A gun has been retrieved from the wreck and conserved, and it can be seen in the Seaplane Harbour of the Estonian Maritime Museum.
Diving: Suitable also for beginners.





Cargo steamer E. Russ

Technical specifications
Year built: 1909
Built at: Stettin Oderwerke Shipyard in Germany.
Length-breadth-draught: 93.3 x 13.4 x ? metres
Tonnage: 2439 grt
Crew size: 27

Historical overview

The steamer E. Russ was built in the Stettin Oderwerke Shipyard in 1909. The vessel, which initially belonged to German shipping company Ernst Russ, was given to England on 2 July 1919.

After the end of the world war, the Liquidation Committee of the US Army that was established on 11 February 1919 started emptying the numerous equipment warehouses in Europe by simply selling the stuff that wasn't being used. Estonia bought goods "... for getting the state in order and establishing national industry" via private limited company Revalis. The distribution plan of the purchased goods was developed by a special committee, who mainly gave the items to the army, the Ministry of Commerce and Industry, the Directorate General for Health and the Ministry of Food Supplies. Supplying the People's Army during the War of Independence has been considered one of the biggest challenges of the government, which was never completely solved. The People's Army needed absolutely everything: clothes, footwear, means of transport, tools, weapons, ammunition, horses, food, etc.

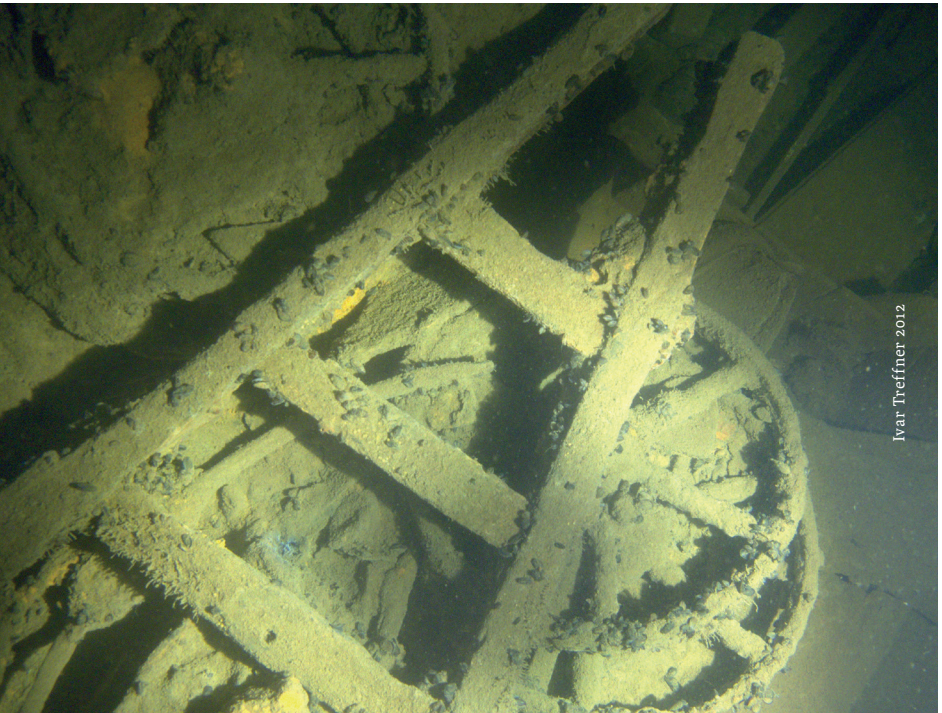
The steamer E. Russ arrived at the Port of Bordeaux in France in early August 1919 from where it was supposed to sail to Tallinn after being fully loaded. Loading the goods at the Port of Bordeaux took almost 17 days and the long voyage could finally start in early September. On 15 September, after being at sea for almost two weeks, the steamer reached Tahkuna Peninsula, where it hit a floating mine on stormy sea at 4 AM. Although the deck watchman spotted the mine, it was too late to save the ship. The ship sank in 15 minutes. The 27 crewmembers and eight passengers managed to escape. One crewmember got injured in the explosion.

The E. Russ carried goods from almost 2 million dollars, incl. almost 50 cars. In addition to this, it carried spare car parts and two motorcycles. The hold of the ship mainly contained food: salted meat, bacon, sardines, oleomargarine, vinegar, dried potatoes and carrots, turnips and onions, plums and bread, marmalade,

condensed milk, coffee and tea. The ship also carried tobacco, cigarettes, candles, towels, boots, clothes, medication. 102 barrels of alcohol had been placed on the deck of the ship.

All kinds of things were salvaged from the sea and the coast after the E. Russ sank, which were all carried to Haapsalu with the help of the coastguard, Kärdla militia and local people and sent to Tallinn by rail on 30 September. Goods worth 11,631.10 dollars were saved: twenty-odd barrels of spirit (3400 litres), approximately 100 boxes of medicines, a box of food, three inner tubes of cards, 20 empty rusted and broken tin containers, some barrels of turpentine, 13 wooden cart frames, a barrel of vinegar and three lifesavers.

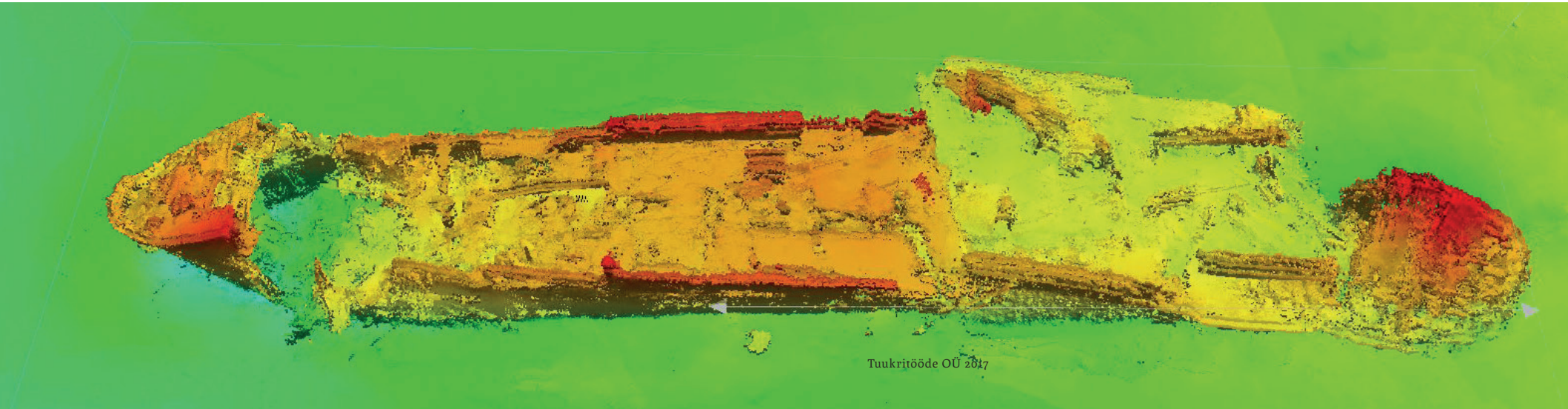
Several attempts were made to lift and demolish the wreck of the E. Russ after the Estonian War of Independence, but they all failed.


Ivar Treifner 2012


Juha Flinkman, SubZone OY 2013

Wreck of the cargo steamer E. Russ

Perished on: 15 September 1919
Fatalities: none
Location: Baltic Sea, north of Tahkuna Peninsula in Hiiumaa
Coordinates: 59 12.577, 22 38.077
Cultural monument reg. no. 30210, register.muinas.ee
Diving: under the instruction of a business operator that offers diving services or on the basis of a diving permit
Depth of wreck: 24 metres
Depth of surrounding area: 36 metres
Dimensions of wreck: length 94 metres and breadth 14 metres
Direction of wreck: 70-250
Status: The damage caused by the naval mine explosion can be seen on the wreck of the steamer. The remains of the scattered cargo can be seen on and around the wreck, which have largely been well preserved. Several tools, incl. hammers, two-man saws, etc., footwear, bottles of various sizes (incl. medicine bottles), household items, tyres of different vehicles, cart wheels, etc., can be seen.
Diving: Suitable for experienced divers. An anchor buoy has been placed next to the wreck for the navigation season and there are information boards on either side of the wreck.



Further information can be found on the website of the National Heritage Board: www.muinsuskaitseamet.ee
and the National Registry of Cultural Monuments
https://register.muinas.ee/

References

Afonin, N. N., Rassol I. R. 2015. Submarines Minoga and Akula. Saint Petersburg, Gangut no 43.

Brown, David K. The Grand Fleet: Warship Design and Development, 1906-1922. London: Chatham Publishing 1999.

Dittmar, Frederick James and Colledge, James Joseph. British warships 1914-1919. London: Ian Allen Publishing 1972.

Friedman, Norman. Fighting the Great War at Sea: Strategy, Tactics and Technology. Yorkshire: Seaforth Publishing 2014.

Gröner, Erich. Die deutschen Kriegsschiffe 1815-1945, vol 8.

Kirejev, I. A. 1939. Trawling on the Baltic Sea during the War 1914–1917. Publishing House of the People's Commissariat of the USSR Navy.

Polmar, Norman and Jurrien Noot 1991. Submarines of the Russian and Soviet Navies, 1718-1990. Annapolis: Naval Institute Press.

Ridley-Kitts, Daniel G. The Grand Fleet 1914-1919: The Royal Navy in the First World War. Stroud: The History Press Ltd 2013

Roio, Maili 2013. Archaeological Finds and Archival Sources: Comparison and Interpretation. - Roio, M. (Ed). Shipwreck Heritage: Digitizing and Opening Access to Maritime History Sources. Tallinn: Heritage Conservation Board, 197-213.

Strelbitski, Konstantin. 1994. Losses of the Russian Navy during World War I from 1914–1918. International Naval History Centre. Lviv.

Online sources:

http://akula1915.ru/

Diving to the wrecks