USS LST-496 AND 523

Report of the investigation of WW2 wrecks reported to be USS LST-496 and USS LST-523, Baie de Seine, Normandy, France

Southsea Sub-Aqua Club | BSAC Branch 0009
May 2023

Front cover images

US LST-496 loading at an English port early June 1944 © PD-US Expired

and

US LSTs loading at an English port early June 1944 © PD-US Expired

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Summary

Southsea Sub-Aqua Club's 2022 expedition project 'US LST-523' continues our desire to learn more about the WW2 Allied invasion of Normandy and the stories of the numerous individual ships, vessels and craft that took part in this momentous and historic endeavour. Our focus has been on smaller ships and craft rather than the more significant ships and whose role was less obvious, but just as vital, to the overall success of Operation NEPTUNE.

The role of the Landing Ship Tank (LST) in military maritime operations is seldom told yet they were often the saviours and work horses of the invasion. The LSTs were also essential to the successful exercise to ensure that the Allied forces were able to be supplied with men, equipment and supplies to strengthen and reinforce their foothold in Normandy as the invasion continued.

Our investigation has revealed some surprising and unexpected results, which we are pleased to share through this report. As a result of our surveys and subsequent research we believe that these wrecks have been confused with each other over the passage of time. Indeed, our conclusions are that the wreck long reported to be LST-523 is in fact LST-496. This report sets out the evidence from survey and research which supports this conclusion.

In addition to the investigation and recording these wrecks our LST project aimed to raise awareness of Operation NEPTUNE and its place in modern history. We also wish to illustrate the role recreational divers can play in documenting the historic environment that otherwise remains unseen and potentially forgotten.

Acknowledgements

Our sincere gratitude goes to the many people and organizations who have assisted and supported us in this challenge, especially.

- The French Cultural Ministry, Département des Recherches Archéologiques Subaquatiques et Sous-Marines (DRASSM)[1]. In particular, we wish to thank Cécile Sauvage.
- Chris Howlett – Subject matter expert on the Normandy Campaign and formerly of UKHO, for his advice, support and contribution to this report.
- Miss Audrey Patraux for her assistance with translation of this report into French and photographic images.
- Mr Richard Rowley for assistance with location/position images.
- Christine T. Cohn, Historian at the US Department of Defense, Defense POW/MIA Accounting Agency (DPAA) and her colleague Commander Dane Evan Johnson, US Navy for assistance with research of casualties.

[1] The French organization responsible for the management of all subaquatic and submarine archaeological activities. DRASSM is qualified to deal with all matters of archaeological research that involve diving, is charged formally to control submarine archaeological research and discoveries, and to implement the legislation on maritime cultural goods.

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[2] Alison Mayor, Martin Davies, Tom Templeton, Doug Carter, Robert Watkins, Jenny Watkins, Jim Fuller, Alison Bessell.

USS LST-496 AND LST-523

1. Introduction

In June 1944, following two years of meticulous planning the city of Portsmouth and other harbour towns along the south coast of England prepared for Operation NEPTUNE[3], the Naval assault phase of Operation OVERLORD, and the largest ever maritime invasion. The Allied fleet of nearly 7,000 ships, vessels and craft with their precious cargo of hundreds of thousands of troops and equipment finally set sail on 5th June 1944 to cross the Channel to Normandy. In the early hours of D-Day on the 6th June 1944, the first soldiers landed on the French beaches code named UTAH, OMAHA, GOLD, JUNO, and SWORD. So began one of the most daring and ambitious campaigns of WW2 which ultimately led to the liberation of France and the end of WW2 in Europe.

Many vessels were lost or damaged during Operation NEPTUNE as German defences fought to repel Allied forces. Seventy-five years later the wrecks of the Baie de Seine remain the last resting place for many who made the ultimate sacrifice for our freedom.

Of the vessels that took part in the Normandy Campaign many were lost as a result of enemy action, weather, or mines. Thousands of men made the ultimate sacrifice and for many their last resting place is unknown.

This project centred on two vessels, United States Landing Ship Tanks, LST-496 and LST-523 which sank to the west of the Baie de Seine in June 1944. Our aim was to survey and record the wrecks and confirm their identity through archive document research.

However, following our survey and historic research we were surprised to discover that the wrecks are likely to have been previously incorrectly identified, as evidenced and explained in the detail of this report.

1.1 Background

Since 1954 members of Southsea Sub-Aqua Club (SSAC)[4] have enjoyed exploring our underwater world and the history that lays hidden in the depths. Over time our members have contributed much to the recreational diving world and the wider community through their determination, skills and hard work. From the invention of Octopush (underwater hockey) to the discovery of the historic Tudor flagship 'Mary Rose'[5] SSAC Branch[6] have been one of the most active and productive branches of the British Sub-Aqua Club. For the last twelve years the club have been actively

[3] The codename for the naval assault phase of Operation OVERLORD.
[4] Established in April 1954 as Branch 0009 of the British Sub Aqua Club (https://www.bsac.com/home/)
[5] Led by Alexander McKee, it was members of SSAC that found and identified the wreck of Henry VIII warship Mary Rose.
[6] www.southseasubaqua.org.uk

recording wrecks along the south coast of England and in particular the wrecks associated with the largest ever maritime invasion; the WW2 wrecks of D-Day and Operation NEPTUNE[7].

It was a natural progression to extend this work to learn more about the Normandy campaign through the investigation and recording of unidentified wrecks of the Baie de Seine believed to be lost during this historic endeavour. In 2017 our Project Cardonnet investigated and recorded several of the WW2 Operation NEPTUNE wrecks on the Banc du Cardonnet, located in the Baie de Seine, Normandy. In order to achieve this the dive team were required to obtain formal permission from the French authorities and to achieve French commercial diver equivalence certification[8]. The success of Project Cardonnet in recording these wrecks has enabled the dive team to return to Normandy and, having obtained approval, to conduct three more successful projects.

'No Roses on a Sailor's Grave' investigated a wreck of a British Landing Craft near Ouistreham.

'Finding Cato' investigated the wrecks of three British minesweepers; and

'Two Tugs' investigated wrecks reported to be the British Tug 'Sesame' and the US Navy tug Partridge. Both wrecks were proven to have been misidentified.

The inspiration for this project came about because of a discussion with Chris Howlett, which began to question whether the wreck site known as LST-523 had been misidentified, as his review of the historical records had identified some inconsistencies with the wreck site. We became curious about the wreck as certain features did not align with early research. Our objective was to investigate the two wrecks and the circumstances that led to the loss as described in the official documentation.

The project team members are extremely aware of the ultimate sacrifice made by many in the Normandy campaign and throughout WW2. We are always respectful of the fact that many of these wrecks are the last resting place of brave soldiers and sailors from the Allied forces. Based in the historic naval city of Portsmouth, from where many thousands of men set sail for Normandy, we are always sensitive to the fact that we are visiting a special place, one that few people can visit. We take the greatest care not to disturb or interfere with any wreck or remove artefacts. Indeed, several members of the project team have either served in, or with, the British Armed Forces and/or have family members who have served.

1.2 The Wreck Sites and Survey

Using the skills and knowledge we have developed from our training with the Nautical Archaeology Society and previous projects and with the approval of DRASSM, we planned to record the wrecks sites identified by DRASSM. Both wrecks are located to the west of the Baie de Seine on the approaches to OMAHA beach. Using side scan and multibeam sonar data gathered by DRASSM[9], this project centred on the sites using DRASSM wreck reference numbers as follows.

EA3232 – supposed US LST-496, and

[7] Operation NEPTUNE was the maritime phase of Operation OVERLORD - The invasion of Normandy by sea and the liberation of France.
[8] Institut National de Plongée Professionnelle (INPP - 'Classe 1Bb')
[9] DRASSM multibeam surveys ref EA3232 and EA3152

EA3152 – supposed US LST-523.

Various survey techniques were used.

- Physical measurements
- Photography.
- Photogrammetry.
- Videography; and
- Side-scan sonar.

Where practicable, 3D photogrammetry models of significant wreck features were created to aid identification and improve the wider knowledge, understanding of the wreck sites. To create a holistic record of the wrecks a marine life survey was also undertaken.

1.3 Expedition Unknown… the Television Programme

Our wreck investigation projects came to the attention of Circle the Globe media production company whose 'Expedition Unknown' series is broadcast on the Discovery Channel. Following our survey, we were delighted to return to Normandy to dive with the director and host of the programme Josh Gates and tell him about some of the wrecks we have been investigating. The resultant television programme was broadcast on the Discovery Channel and will be a significant help in delivering our aim to raise awareness of Operation NEPTUNE and the history of some of the wrecks in the Baie de Seine to a global audience.

2. Project Aims and Objectives

2.1 Project Aim

The primary aim of our project was to record the wrecks and, through reference to the documentary historical record, confirm the identity of the wrecks. In addition, we aim to share our findings with others to raise awareness of the heroic sacrifice made by Allied forces in seeking to liberate France.

2.2 Project Objectives

Our principal objective was to investigate and record wrecks, allegedly those of USS LST-496 and LST-523, to confirm their identity as follows:

Objective 1: to contribute to the knowledge of the archaeological sites through production of a field report and photogrammetry models to assist in the interpretation of the wrecks. The resultant documentation may be used to confirm the extent and preservation of the vessel which can become a baseline for future condition surveys. The data will be submitted to DRASSM and may be of use to professional archaeologists, avocational archaeologists, and for recreational divers who only want to visit the wreck and enjoy the experience.

Objective 2: to confirm, or otherwise, the identity of the wrecks to enable the story of the role of Landing Ship Tanks and those who served on them to be remembered today and in the future.

To achieve these objectives, we recorded key identifying features of the wrecks and cross referenced this with historical photographs and documentary records where available.

2.3 Permission to Survey

In order to undertake a survey and document the wrecks permission must first be sought from the French authorities, namely DRASSM and the Prefecture Maritime. An application, with supporting project plan was submitted and permission was granted on by the Ministry of Culture on 26h May 2021 [10]. However, due to the UK and French travel restrictions to curb the spread of the COVID-19 pandemic, the 2021 the initial project plan was postponed until 2022 and updated application was required to be submitted. The revised permission documentation was received dated 28th March 2022[11] and is included at Annex A to this report.

[10] Ministère de la Culture OA 4790.
[11] Ministère de la Culture OA 30 4917

3. Operation NEPTUNE and the Role of LSTs.

3.1 Operation NEPTUNE

On D-Day, 6th June 1944, Allied forces launched a combined naval, air and land assault on Nazi-occupied France[12]. Codenamed Operation 'OVERLORD', the Allied landings on the Normandy beaches marked the start of a long and costly campaign to liberate north-west Europe from German occupation. Early on 6th June 1944, Allied airborne forces parachuted into drop zones across northern France. Ground troops then landed across five assault beaches: codenamed UTAH, OMAHA, GOLD, JUNO and SWORD. By the end of the day, the Allies had established a foothold along the coast and could begin their advance into France.

The invasion was conducted in two main phases - an airborne assault and amphibious landings. Shortly after midnight on 6th June 1944, over 18,000 Allied paratroopers and glider borne troops were dropped into the invasion area to provide tactical support for infantry divisions on the beaches. Allied air forces flew over 14,000 sorties in support of the landings and having secured air supremacy prior to the invasion, many of these flights were unchallenged by the Luftwaffe.

Figure 1 Aerial photo of ships and tugs of the Royal Navy massing off the Isle of Wight before setting off for the Normandy beaches. (© IWM (A 23720A))

[12] Source Imperial War Museum web site. https://www.iwm.org.uk/

The maritime phase of Operation OVERLORD was codenamed Operation 'NEPTUNE'. In overall command was British Admiral Sir Bertram Ramsay, who had served as Flag Officer at Dover during the Dunkirk evacuation four years earlier. He had also been responsible for the naval planning of the invasion of North Africa in 1942, and one of the two fleets carrying troops for the invasion of Sicily the following year. On 1st June, from his headquarters at Fort Southwick on the outskirts of Portsmouth, Admiral Ramsey took command of the immense armada of ships for Operation NEPTUNE.

The invasion fleet, which was drawn from eight different navies, comprised 6,939 vessels: 1,213 warships, 4,126 landing craft of various types, 736 ancillary craft, and 864 merchant vessels[13]. Much of the fleet was supplied by the UK, which provided 892 warships and 3,261 landing craft. In total there were 195,700 naval personnel involved; of these 112,824 were from the Royal Navy with another 25,000 from the Merchant Navy, 52,889 were American, and 4,998 sailors from other allied countries.

Figure 2 Normandy Invasion, June 1944. Four LST's take vehicles aboard during pre-invasion loading operations at an English port. Circa early June 1944. Ships visible include USS LST-496; USS LST-506; USS LST-291. US National Archives Photo # 80-G-252172 (US PD time expired)

[13] www.ddaymuseum.co.uk/d-day/d-day-and-the-battle-of-normandy-your-questions-answered

Two important co-ordinating bodies were created. The Build-Up Control Organisation (BUCO) was formed on 20 April 1944 at Combined Operations Headquarters (although it was not part of it). It was charged with responsibility for regulating the build-up of vehicles and personnel by allocating priorities for the available shipping. Once the final plans for the landing were drawn up, all further alterations had to be implemented by BUCO. Movement Control (MOVCO) was responsible for the movement of units to the coastal areas and ports from which they would embark. Like BUCO, it had separate staffs for the American and British zones which operated independently. There was also the Turnaround Control Organisation (TURCO), which controlled the turnaround of shipping at the ports of loading; the Combined Operations Repair Organisation (COREP), which handled repairs to damaged ships and landing craft; and the Combined Tugboat Organisation (COTUG), which managed a fleet of tugboats.

Figure 3 Admiral Bertram Ramsay, Allied Chief, Expeditionary Force, with Commodore H W Faulknor, DSO, RN, watching from the bridge of an MTB as the Invasion Fleet sets out from its base. (© IWM (A 23841))

The invasion fleet was split into the Western Naval Task Force (under Admiral Alan G Kirk) supporting the US sectors and the Eastern Naval Task Force (under Admiral Sir Philip Vian) in the British and Canadian sectors. Available to the fleet were five battleships, 20 cruisers, 65 destroyers, and two monitors. German ships in the area on D-Day included three torpedo boats, 29 fast attack craft, 36 R boats, and 36 minesweepers and patrol boats. The Germans also had several U-boats available, and all the approaches had been heavily mined.

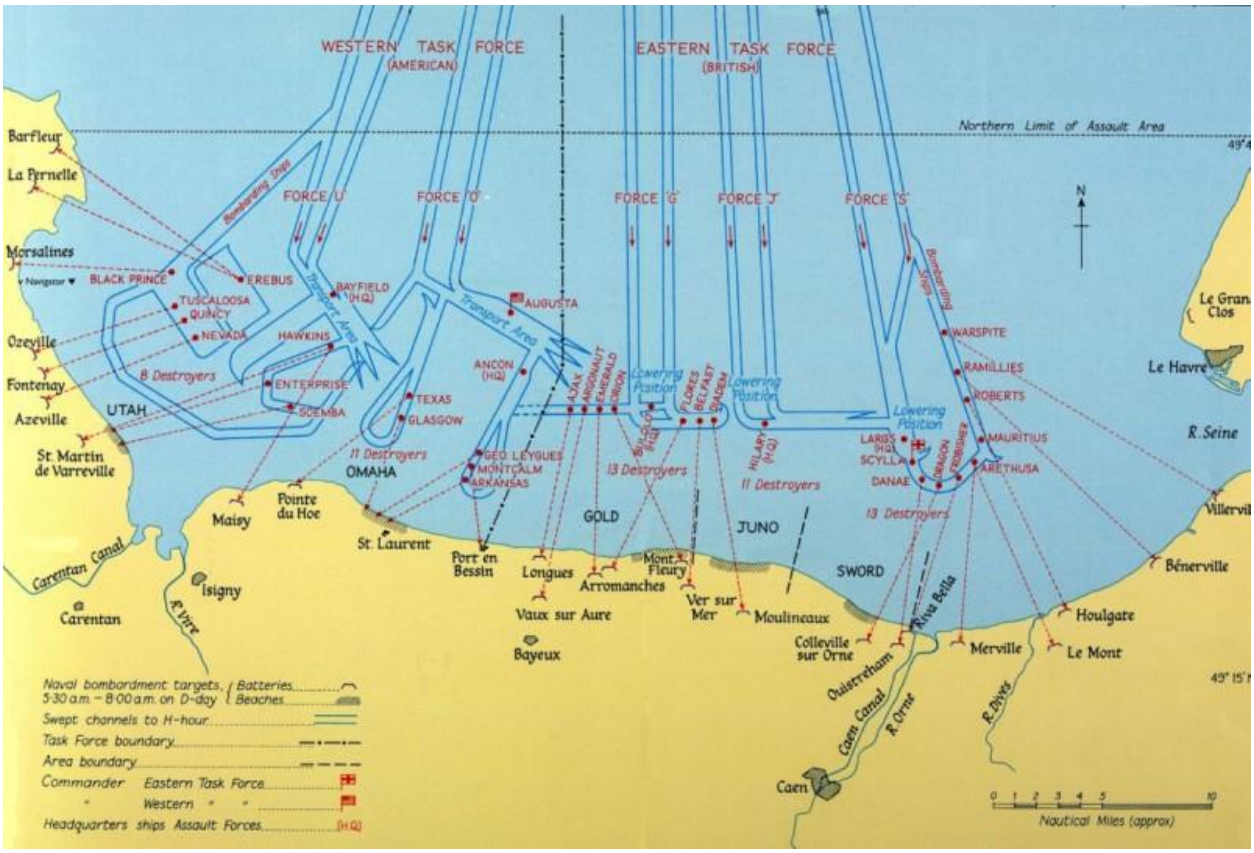

Figure 4 Map of the invasion area showing channels cleared of mines, location of vessels engaged in bombardment, and targets on shore. (US PD time expired)

Beginning at dawn on 6th June 1944, two naval task forces landed over 132,000 ground troops on the beaches of Normandy as part of Operation NEPTUNE, the seaborne invasion of northern France. The target 80 Km (50-mile) stretch of the Normandy coast was divided into five sectors: UTAH, OMAHA, GOLD, JUNO, and SWORD. The Western Task Force was responsible for the American beaches at UTAH and OMAHA, and the Eastern Task Force was assigned to the British at GOLD, JUNO and SWORD. Within these task forces were five Naval Assault Forces - one for each of the five beaches. The Allied navies bombarded German coastal defences both before and during the landings and continued to provide artillery support after D-Day as troops moved further inland.

Naval forces and merchant ships also helped transport men and supplies during the crucial post-invasion build-up. Daily convoys, controlled and guarded by the Royal Navy, brought reinforcements and supplies from England and took casualties and German POWs from France. Operation NEPTUNE was completed on 30 June 1944 ('D'+24), when responsibility for the reception and defence of shipping was transferred to the Flag Officer, British Assault Area and the Eastern Naval Task Force was formally disbanded. By this date, 570 Liberty Ships, 180 troop transports, 788 coasters and 905 LSTs, as well as 1,814 LCTs and LCI(L)s, had delivered their cargoes to the far shore, landing 861,838 men, 157,633 vehicles and 501,834 tons of stores.

By the time the Battle of Normandy ended in August 1944, these numbers had increased to over 2 million men, 400,000 vehicles and 3 million tons of stores and supplies. The build-up convoys continued, and a strong seaward defence was still necessary, to protect the anchorages and convoys against the surface ships and U-Boats based on the Biscay coast, as well as the "Small Battle Units"

deployed from the beaches to the east of the river Orne, until the former was all sunk, or neutralised (in late August), and Le Havre was captured on 12 September 1944.[14]

3.2 The Role of Landing Ship Tanks

Landing Ship, Tank (LST), or tank landing ship, is the naval designation for ships first developed during World War II (1939–1945) to support amphibious operations by carrying tanks, vehicles, cargo, and landing troops directly onto shore with no docks or piers. This enabled amphibious assaults on almost any beach.

The LST had a highly specialized design that enabled ocean crossings as well as shore groundings. The bow had a large door that could open, deploy a ramp and unload vehicles. The LST had a flat keel that allowed the ship to be beached and stay upright. The twin propellers and rudders had protection from grounding. The LSTs served across the globe during World War II including in the Pacific War and in the European theatre.

The first tank-landing ships were built to British requirements by converting existing ships; the UK and the US then collaborated upon a joint design. The British ships were used in late 1942 during the Allied invasion of Algeria. By 1943 LSTs had participated in the invasion of Sicily and mainland Italy. In June 1944 they were part of the huge invasion fleet for the Normandy landings.

Over 1,000 LSTs were laid down in the United States during World War II for use by the Allies; the United Kingdom and Canada produced eighty more.

The majority of LST's were designed and built in America and supplied to Britain under the Lend Lease agreement. Over 1000 ships were built, the majority in the Mid-West. The name was changed during build: initially called "Atlantic Tank Landing craft" the name was changed to "Landing Ship Tank" after the original design was finally extended to 100m in length which was considered by many to qualify as a "ship" and not a "craft."

LSTs proved to be one of the most versatile vessels ever built with many conversions to other roles during the war and after. Examples were Fighter Direction Tenders (FDT) Landing ship Tank Hospital (LSTH) Landing Craft Repair Ships (ARL). Their roles also included ammunition replenishment, and some had flight decks fitted to launch small planes for reconnaissance during amphibious operations. Despite nicknames like "Large Slow Target" and "Large Stationary Target," which were applied to them by crew members, the LSTs suffered few losses and was a highly successful design that helped in many campaigns throughout the second world war.

During WW2, LSTs were used extensively in amphibious operations around the globe including the Pacific, Mediterranean, north Africa and Atlantic theatres.

For Operation Neptune, a total of 236 LSTs were assigned for use in Operation Neptune with 130 to the Eastern Task Force and 106 to the Western Task Force.[15]

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14 https://www.royalnavy.mod.uk/-/media/royal-navy-responsive/documents/events/d-day-70/13_472-nhb-operation-neptune-d_day-book.pdf

15 https://www.royalnavy.mod.uk/-/media/royal-navy-responsive/documents/events/d-day-70/13_472-nhb-operation-neptune-d_day-book.pdf page 29

3.3 Naval Losses during the Normandy Campaign (Operation NEPTUNE)

On D-Day itself vessel losses were much less than anticipated. Three destroyers (Norwegian, British and American), one US minesweeper, one RN MTB and one US patrol craft were sunk or damaged beyond repair by all causes. One British merchant ship was lost.

Allied naval vessel losses associated with the invasion forces, from 6th June to 12th September 1944, totalled 50 major and 10 minor war vessels sunk or damaged beyond repair and 26 merchant vessels lost outright.[16].

Remarkably, only 7 LSTs were lost during Operation Neptune (6 June to 12 September 1944), though one ship was re-floated.

8 June 1944	USS LST-499 sunk by mine, Baie de la Seine
9 June 1944	USS LST-314 torpedoed by enemy E-boats in the Channel
9 June 1944	USS LST-376 torpedoed by enemy E-boats in the Channel
11 June 1944	USS LST-496 sunk by mine, Baie de la Seine
15 June 1944	USS LST-280 sunk by U-621 but later re-floated.
19 June 1944	USS LST- 523 sunk by mine, Baie de la Seine
14 August 1944	USS LST-921 sunk by U-boat in Bristol Channel, England.

Noting that the wreck can be confirmed as a LST from the features and observations made in this report, the candidate ships for the project wreck sites[17] are therefore limited to USS LST-499, LST-496 or LST-523. Research into the loss of these three ships was conducted; see chapter 8 of this report.

16 https://www.royalnavy.mod.uk/-/media/royal-navy-responsive/documents/events/d-day-70/13_472-nhb-operation-neptune-d_day-book.pdf

17 DRASSM wreck numbers EA3232 and EA3152

4. Project and Survey Methodology

4.1 Position of the Wrecks

The wrecks are positioned 16km (9.1 Nautical miles) to the Northwest (EA4630) and 20Km (10.7 Nautical miles) to the North (EA3234) of Port-en-Bessin. Our boat (Southsea Explorer) journeyed out to the sites for each dive, with a transit time of between 30 - 40 minutes. The transit time was dependent on the sea state and weather conditions on the day. Below is a table (1) indicating the known charted positions and their distance and bearings from Port-en-Bessin to the sites that we will be using.

The positions and navigation bearings are as follows: -

Site Number (supposed)	Latitude	Longitude	Distance	Bearing	Reciprocal
EA3232 (LST-496)	49°30.186'N	00°47.910'W	9.1NM	350°N	170°S
EA3152 (LST-523)	49°28.661'N	00°58.009'W	11.0NM	312°NW	132°SE

Table 1 Positional data of wreck sites. (Source DRASSM)

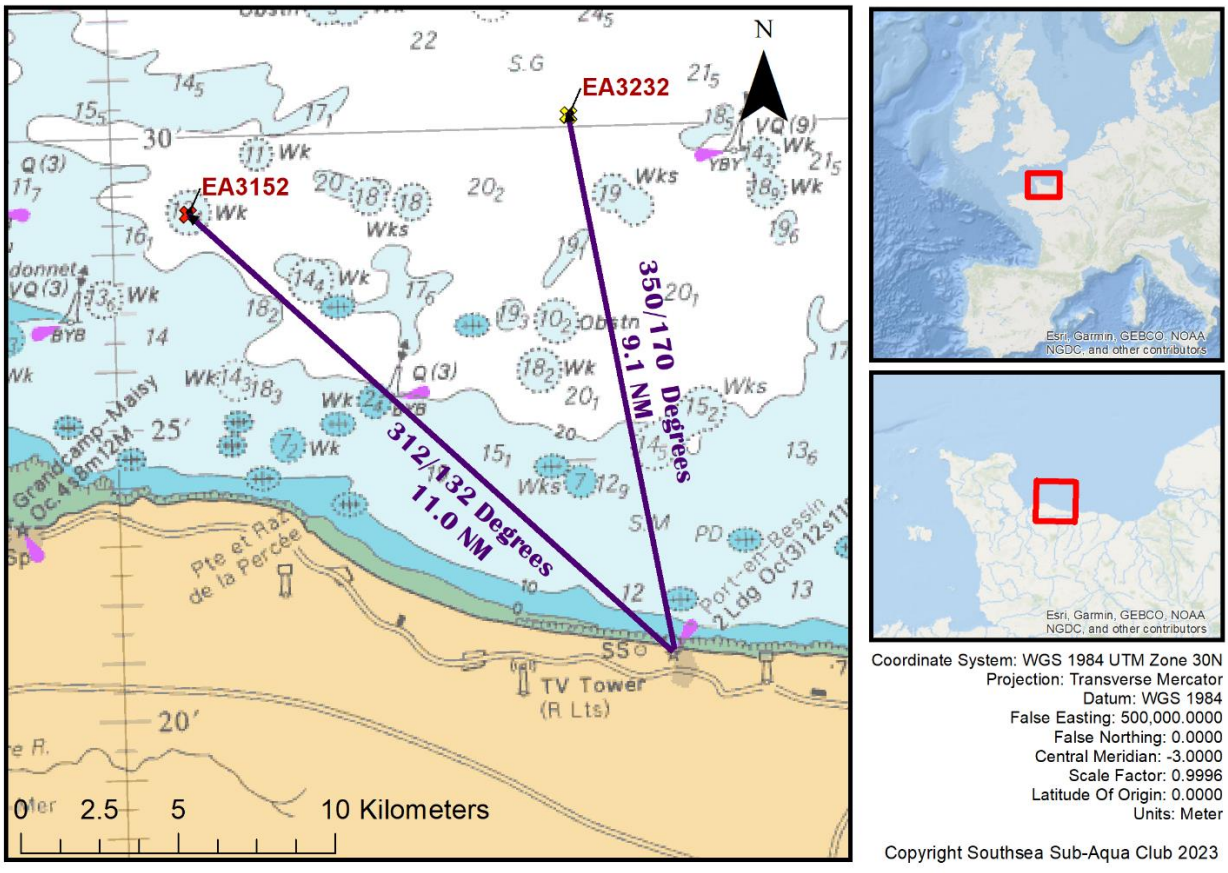

Figure 5 Extract from chart 7421 showing position and direction of EA3232 and EA3152.

4.2 Expedition Plan and Logistics

We travelled from Portsmouth to Ouistreham via ferry on the morning of 3rd July 2022 and arrived that afternoon at Port-en-Bessin.

Figure 6 Southsea Explorer - SSAC's well equipped dive boat. (© Martin Davies)

Our boat 'Southsea Explorer' is well equipped for diving and has been purposely designed for diving operations. Fitted with two navigation systems, five sonar systems and two DSC VHF radios, Southsea Explorer has capacity for a maximum of 10 persons, (8 divers and 2 crew). The boat is equipped with first aid and emergency oxygen and has a ladder to aid recovery of divers from the water. With a powerful 175Hp engine and 120L of fuel it has a maximum operating range of 60 miles (100Km).

Boat operations were conducted from the harbour at Port-en-Bessin. This harbour is tidal and has access to the sea by a lock gate system, which operates 2 hours either side of High Water. Our experience has shown that we can access the water 3 hours either side of high water if we use the slipway next to the fish market. These access times were considered when planning the diving operations. The dive team ensured that the programme for the day allows sufficient time to arrive at Port-en-Bessin and access the outer harbour through the lock system or by launching directly from the slipway. The daily programme was adjusted to allow for the distance to dive site and slack water for diving operations. For much of the survey week we planned to dive once a day due to the restriction of low water at the port.

Figure 7 the outer harbour at Port-en-Bessin. (© Martin Davies)

Port-en-Bessin had all we needed in terms of shops, fuel, goods and services and provided an excellent base to explore the area where there are many points of interest particularly those connected with D-Day and the Battle of Normandy.

We stayed in a 17 century gîte at Commes to the east of Port-en-Bessin.

Our favoured launching point is the outer slipway at Port-en-Bessin, this provides us with good access to the Baie de la Seine, its central location within the bay allows us to access many wrecks with reasonable time and distance scales. When the neap tide is present, we can launch and recover our boat 3 hours either side of the high-water mark. This gave us a useful window of opportunity for diving although normally only one dive is achievable within the tidal cycle.

Figure 8 the launch site at Port-en-Bessin. (© Martin Davies)

4.3 Diving and Survey Methodology

We were aware that in order to record and document the wreck we would require permission from the DRASSM and the Prefecture Maritime. An application with associated project plan, risk assessment and emergency plan were submitted to DRASSM in November 2018 and subsequently approved on 28 March 2019. However, due to COVID-19 pandemic the project was postponed, and permission was subsequently re-issued in 2022. A copy of the DRASSM and Prefecture permission documentation can be found at Annex A.

All divers taking part in the survey activity met the required certification level of INPP Level 1Bb. The diving was conducted in accordance with BSAC Safe Diving Practices, French diving regulations and MT19. All divers held current 'Fit to Dive' medical certification.

4.4 Project and Diving Management

The nominated Project Leader was Martin Davies, and the appointed Dive Operations Manager was Tom Templeton. Table 2 below details the dive/survey team members, their relevant qualifications and roles in the project.

Name	Qualifications	French equivalent	Role
Martin Davies	HSE Scuba Diver BSAC Advanced diver Assistant Open Water Instructor Diver Coxswain/Boat handler O^2 Administration First Aid for Divers DSC VHF Radio operator	INPP Level 1Bb **EQ119/17-1B** CMAS 3* diver BS EN 14153-3 ISO 24801-3	Project Leader Diving Officer for SSAC Photographer

	Technical Diver - Open Circuit Mixed Gas Diver (Nx/He) 60m Accelerated Decompression Procedures (80%) Advanced Nitrox Diver Gas Blender O^2/N2/He Certificate in Nautical Archaeology RYA level 2 Powerboat RYA International Certificate of Competence RYA Day Skipper Compressor Operator/Instructor Automated External Defibrillator AED.		Coxswain
Alison Mayor	BSAC Advanced diver Assistant Open Water Instructor Technical Diver - Open Circuit Mixed Gas Diver (Nx/He) Accelerated Decompression Procedures (80%) Advanced Nitrox Diver Gas Blender O^2/N2/He Compressor Operator Practical Rescue Management First Aid for Divers Oxygen Administration Chart work and Position Fixing RYA Powerboat Level 2 Underwater photographer Automated External Defibrillator (AED) Certificate in Nautical Archaeology Fellow of the Nautical Archaeology Society SeaSearch Observer.	INPP Level 1Bb **EQ121/17-1B** CMAS 3* diver BS EN 14153-3 ISO 24801-3	Surveyor Diver Photographer Report writer
Doug Carter	BSAC Advanced diver Nautical Archaeology Society Introduction/Part 1 VHF/DSC radio operator Compressor Operator Gas Blender O^2/N2/He Technical Diver - Open Circuit Mixed Gas Diver (Nx/He)	INPP Level 1Bb **EQ 118/17 1B** CMAS 3* diver BS EN 14153-3 ISO 24801-3	Survey Diver
Jim Fuller	BSAC Advanced diver BSAC Open Water Instructor VHF Radio Operator Nautical Archaeology Society Introduction/Part 1 O^2 Administration	INPP Level 1Bb **EQ 120/17 1B** CMAS 3* diver CMAS 2* Instructor BS EN 14153-3	Survey Diver

	First Aid for Divers Automated External Defibrillator AED RYA Power boat Level 2 Compressor Operator/Instructor.	ISO 24801-3	
Tom Templeton	BSAC Advanced diver BSAC Open Water Instructor Boat Handling Diver Coxswain Award O^2 Administration VHF Radio Certificate RYA Powerboat Level 2 Mixed Gas Blender Instructor Explorer Mixed Gas Diver Instructor (60m) Compressor Operator/Instructor.	INPP Level 1Bb **EQ 122/17 1B** CMAS 3* diver CMAS 2* Instructor BS EN 14153-3 ISO 24801-3	Survey Diver Photographer Coxswain Dive Manager
Alison Bessell	HSE Part IV BSc Hons Marine Biology Dive Leader O^2 Administration First Aid for Divers DSC VHF/GMDSS radio operator Nautical Archaeology Society Introduction/Part 1 RYA Level 2 Powerboat Compressor Operator.	INPP Level 1Bb **EQ 098/18 1B** CMAS 2* diver BS EN 14153-3 ISO 24801-3	Survey Diver Marine Biologist Dive Manager
Jenny Watkins	BSAC Advanced diver BSAC Open Water Instructor VHF DSC Radio Operator Nautical Archaeology Society Introduction/Part 1 O^2 Administration/instructor First Aid for Divers instructor Automated External Defibrillator AED Practical Rescue Management Advanced diving techniques RYA Power boat Level 2 Compressor Operator.	INPP Level 1Bb **EQ/099/18-1B** CMAS 3* diver CMAS 2* Instructor BS EN 14153-3 ISO 24801-3	Survey Diver Dive Manager
Robert Watkins	BSAC Advanced diver BSAC Open Water Instructor VHF DSC Radio Operator Nautical Archaeology Society Introduction/Part 1 O^2 Administration/instructor First Aid for Divers instructor Automated External Defibrillator AED Practical Rescue Management Advanced diving techniques	INPP Level 1Bb **EQ/100/18-1B** CMAS 3* diver CMAS 2* Instructor BS EN 14153-3 ISO 24801-3	Survey Diver Photographer Coxswain Dive Manager

	Compressor Operator/Instructor RYA Power boat Level 2 + Day skipper Diver Coxswain Award RYA International Certificate of Competence.		
Audrey PATRAUX	FFFESM Niveau 3 Advanced Nitrox	INPP Level 1Bb	Survey Diver Photographer

Table 2 Project participants, qualification, and roles

All divers were certified by a hyperbaric doctor as fit to dive in accordance with French diving regulations and to qualify for INPP certification. All British participants are current members of the British Sub-Aqua Club and as such hold Third Party Liability insurance (Third Party Liability Insurance Policy) of £10,000,000 in addition to standard travel and medical insurance.

A comprehensive dive plan, risk assessment and incident plan were produced as part of the approved project plan submitted to DRASSM for consideration.

Following approval by DRASSM and the Maritime Prefecture a Notice to Mariners was issued to inform sailors and vessels that the survey was taking place. Two INPP certified divers were required to remain on the boat during diving operations to provide surface / rescue cover during diving operations.

Before the project began and prior to each dive a comprehensive briefing was given to all taking part. Relevant information was provided including.

- Diving team composition.
- Boat details, including safety equipment.
- Dive times to coincide with slackest possible water.
- Pre-dive planning using French diving tables (MT20) and back up computer calculations.
- Risk assessment including a daily risk assessment; and
- Daily operations plan and weather.

All boat and diving equipment used were certified as in test/service. Emergency Oxygen and first-aid equipment, boat radios and navigation equipment were checked each day.

Figure 9. Southsea Explorer undergoing, pre-launch checks at Port-en-Bessin. (© Alison Mayor).

We chose to conduct our operations from Port-en-Bessin where there is a large and well-maintained slip way to launch boats. Access to the open water was possible up to 3 hours before and after High Water. We launched and recovered the boat daily.

Figure 10. Port-en-Bessin boat launch (© Alison Mayor).

The survey was planned to coincide with a good neap tide to maximise slack water period and thereby dive times.

5. Dive Management and Programme

We planned a series of 6 dives to conduct the investigation during the period 3rd July to the 8th July 2022. The dates selected were on good neap tides and this allowed longer dive times. The longer period of slack water provided the maximum opportunity to record data and adds to the safety of diving operations.
Diving was conducted to ensure surface safety cover of two INPP qualified divers was always maintained.

5.1 Port-en-Bessin Tide and Slack Water Times

The SHOM chart for the area is number 7421 (De la Pointe de La Percée à Ouistreham). Tidal predictions were calculated with UKHO 'Total Tide' software and checked against locally published tidal information. High and Low water calculations based on 1582 LE HAVRE. The tidal predictions for area SN159W for the days of the project were as follows; (note: All times are expressed as local time (UTC +2). All diving subject to weather and sea conditions at the time.
Using Tidal prediction software (Admiralty Total Tide) the estimated slack water and tidal stream directions were calculated with reference to three tidal diamonds (SN159X, SN159R and SN106B) these are the closest tidal diamonds to the wreck sites. The Stream is the tidal flow direction at the beginning and end of the slack period. Predicted tides height is in metres above Chart Datum.

Sunday 03 July 2022			Slack time between			Duration (Minutes)	Stream
Low	08:26	1.7 m	09:25	To	10:03	38	289/139
High	13:42	6.5 m	14:50	To	16:00	68	128/287
Monday 04 July 2022							
Low	09:02	1.8 m	10:00	To	10:43	43	288/137
High	14:17	6.4 m	15:26	To	16:42	76	127/289
Tuesday 05 July 2022							
Low	09:37	1.9 m	10:36	To	11:25	48	290/135
High	14:51	6.2 m	16:03	To	17:23	80	127/289
Wednesday 06 July 2022							
Low	10:15	2.1 m	11:16	To	12:13	56	291/133
High	15:31	6.1 m	16:40	To	18:13	93	127/291
Thursday 7 July 2022							
Low	10:58	2.2 m	12:03	To	13:08	65	293/135
High	16:24	6.0 m	17:30	To	19:13	103	127/294
Friday 08 July 2022							
High	04:415	6.0 m	05:36	To	07:30	113	127/295
Low	11:40	2.6 m	123:00	To	14:20	80	295/134

	Unable to launch/recover due to low water
	Possible but too early or late in the day
	Planned dive

Table 3 Tidal data and projected slack water times – local French time (GMT+2).

The green highlighted times in Table 3 above represented those tides which were likely to be suitable for diving the sites near Port-en-Bessin. We noted that actual slack water was usually 10-15 minutes before the projected time.
The longer slack water periods of up to 70 minutes, provided an excellent opportunity to gather data, photographs and video, along with measurements and site plans if possible. The maximum dive time was no more than 60 minutes. Nitrox gas was used to reduce the risk of decompression illness and extend dive time.
For diving operations, we embarked at Port-en-Bessin 60-70 minutes before the dive time and planned to be at the dive site at least 30 minutes before dive time. For convenience we left a buoy on each wreck site for the duration of the survey on that wreck. The buoy was removed at the end of the survey.

5.2 Dives Conducted

The weather and sea conditions were very favourable for the survey and diving was achieved over 6 days. The first wreck to be surveyed was EA3232 (supposed LST-496) followed by EA3152 (supposed LST-523). The following dives were recorded.

Date	Wreck Site	Number of Divers	Total Dive Time (minutes)	Maximum Depth (metres)
3rd July 2022	EA3232	6	181	29m
4th July 2022	EA3152	9	437	27m
5th July 2022	EA3152	9	460	27m
6th July 2022	EA3152	8	402	26m
7th July 2022	EA3152	9	451	26m
8th July 2022	EA3152	9	416	25m
	Total	**50**	**2347**	

Table 4 Summary of dives completed.

5.3 Search Techniques

Initial location of the dive sites was made by using the position data from the DRASSM survey data. We used our boat echo sounder to locate the wreck. Our boat 'Southsea Explorer' is equipped with Raymarine Axiom RV™ side scan sonar with RealVision 3D imaging. Once located with the sonar, a shot line was deployed to mark the wreck site and to enable divers to descend to the wreck.

5.4 Survey Methodology

Survey methods used during the survey included:

- Swim-over surveys to get a general impression of the wreck and determine any key features to aid identification.
- Basic measurements, (distances and objects).
- Photography and video.

The main reason for using photography was to produce 3D models of artefacts and wreck features using photogrammetry[18]. The dive team successfully recorded the wrecks in detail using 3D images created by photogrammetric techniques as well as by video and by taking basic measurements.
Images were processed using AGISOFT PhotoScan to produce 3D visualizations that can be viewed using ADOBE pdf reader (via Google Chrome). In due course the images and supporting documentation will be made fully accessible to the World Wide Web[19] and will allow use of Virtual Reality (VR) to visit the wrecks in a fully interactive way.
Photogrammetry relies on a disciplined approached to the survey process and is particularly challenging when underwater visibility and light penetration is poor. A degree of overlap and recognizable points assists the photogrammetry software to process multiple points (pixels) in a geometric space. In the underwater environment marine growth, movement and current provide additional challenges to obtaining a series of images that can generate a 2D or 3D image.

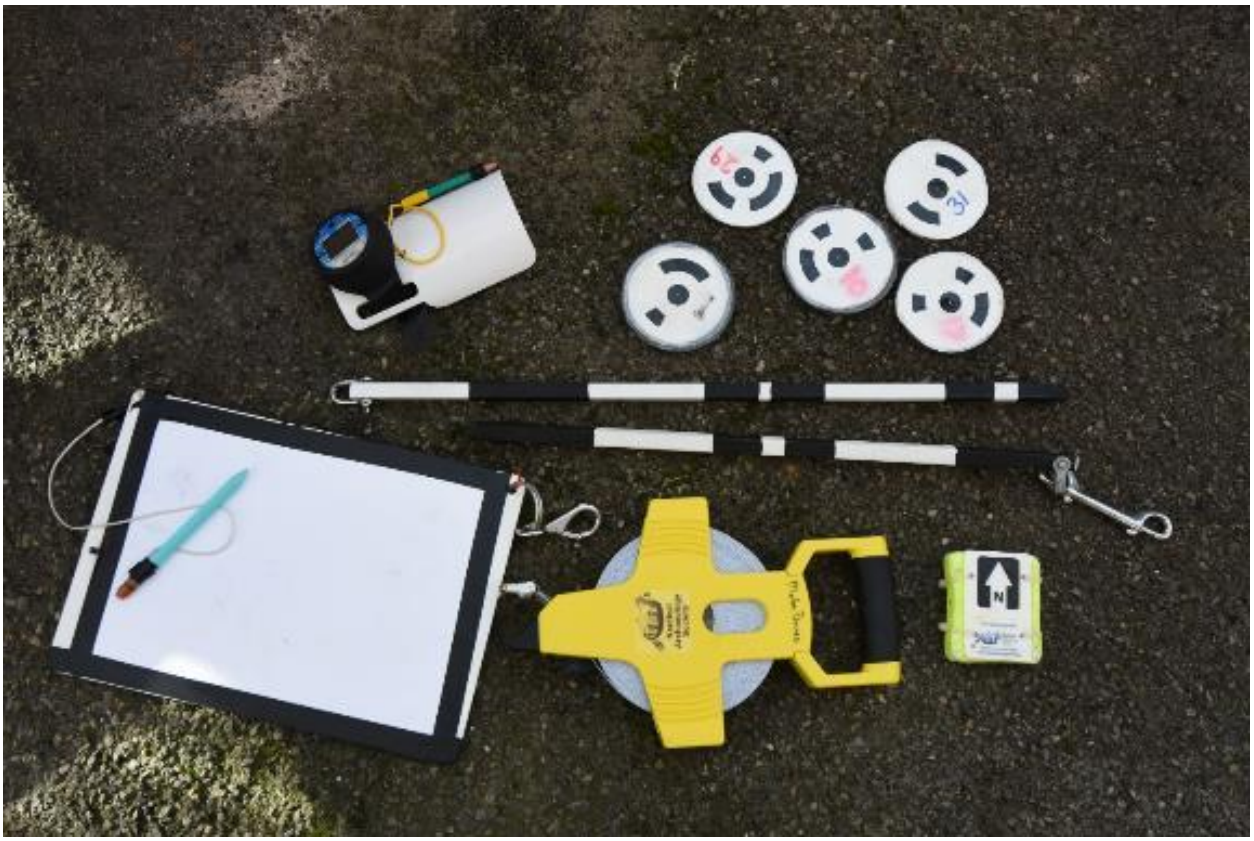

Figure 11. Typical survey equipment used for the project. (© Martin Davies)

Additional survey equipment such as scale bars and circular 'targets' were used to assist the software to identify control points and assist in the creation of the image. Each target has a unique identification symbol irrespective of orientation.

[18] Photogrammetry has been defined by the American Society for Photogrammetry and Remote Sensing (ASPRS) as the art, science, and technology of obtaining reliable information about physical objects and the environment through processes of recording, measuring and interpreting photographic images and patterns of recorded radiant electromagnetic energy and other phenomena.
[19] Hosted on Sketchfab.com.

Figure 12. Use of photogrammetry targets (© Martin Davies)

Before each dive survey tasks were briefed detailing the objectives for each diving pair. Where known the relevant information on the vessel's history and possible orientation/features were included. Where available, ship construction plans and photographs were used to gain an appreciation and understanding of the construction and lay out of the LST to aid divers in the identification of key features and the general orientation of the wreck.

Following each dive, log sheets were completed and archived. From the log sheets it was possible to develop plans for future work.

As this project was a non-disturbance survey project a 'finds index' was not required.

5.5 Skills Developed

Most of the work completed was by video and photography. However, the low visibility and poor light penetration sometimes proved challenging and affected some of the photogrammetry models.
At the end of the diving day a debriefing session and log completing session allowed discussion of results and made sure that the record of the day's diving could be used to contribute to the outcomes of the project.
The feedback sessions were very useful in helping people to understand what they had been recording and resulted in increased understanding of what had been observed and recorded. Where possible, images were viewed to help identify key features of the wreck.

5.6 Research and Documentation

To assist in the identification of the wreck it was important for us to obtain details of the construction of an LST and the types of vehicles that may have been onboard.

It was useful to view short public broadcast films of the time which showed the construction of LSTs and training to land/beach and unload cargos. (YouTube) [20, 21, 22, 23]

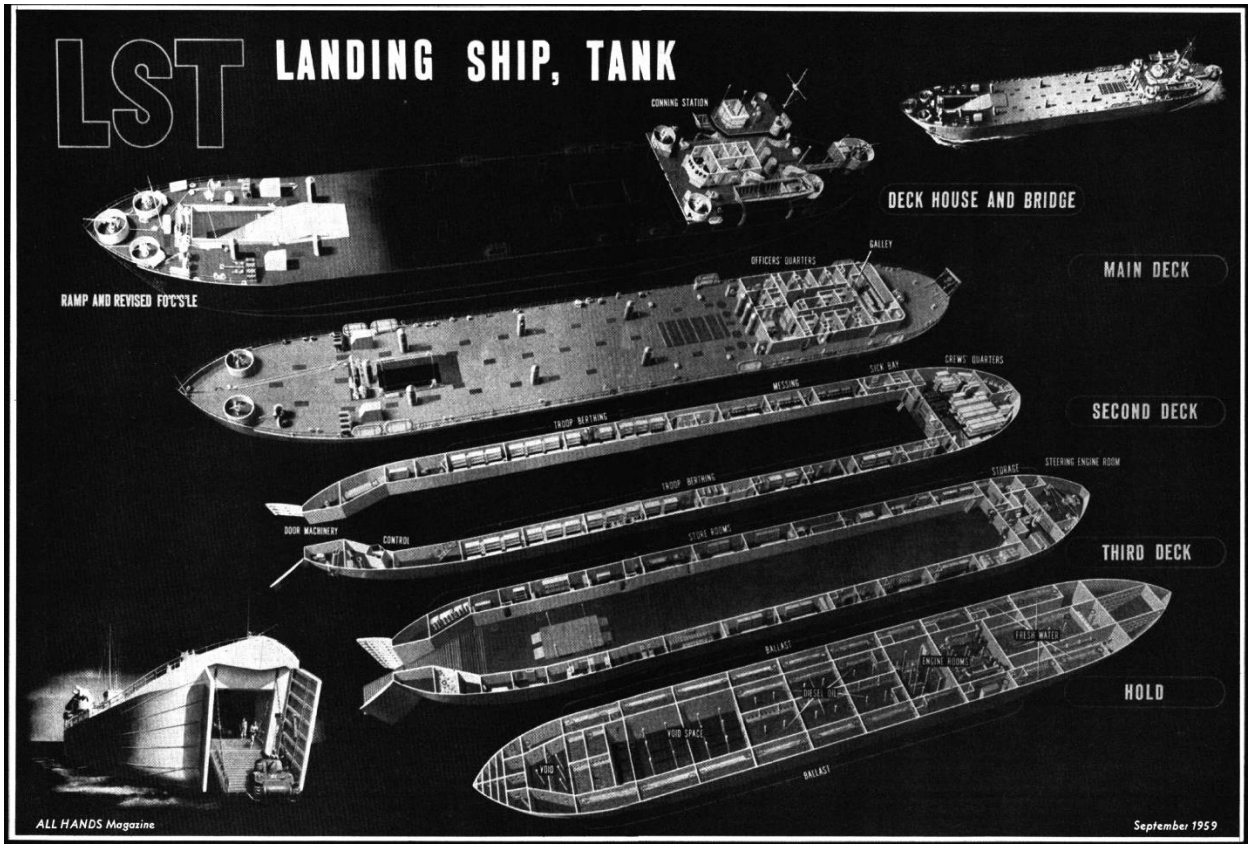

Figure 13 Technical drawing of a U.S. Navy World War II-tank landing ship ("LST")
(© US Navy All Hands Magazine DOD US PD)

All three LSTs (496, 499 and 523) were LST-491 class design. However, from LST-513, the elevator to transfer equipment between the tank deck and the main deck was replaced with a 12 by 32 ft (3.7 by 9.8m) ramp that was hinged at the main deck. This allowed vehicles to be driven directly from the main deck down to the tank deck and then across the bow ramp to the beach or causeway, speeding the process of disembarkation.[24]

5.6.1 LST-491 Class Specification

LST-491 Class Landing Ship Tank Specifications:[25]

Displacement

1,625 t.(lt)
4,080 t.(fl) (sea-going draft w/1675 ton load)
2,366 t. (beaching displacement)

Length - 328' o.a.

---

[20] https://www.youtube.com/watch?v=9eCCgRCzN1Y&t=3s USCG film – Beaching an LST
[21] https://www.youtube.com/watch?v=CD2pSpiPeGY
[22] https://www.youtube.com/watch?v=JrDo6_WWDZg
[23] https://www.youtube.com/watch?v=y60DBcuf-yE
[24] https://en.wikipedia.org/wiki/Landing_Ship,_Tank#cite_note-15
[25] http://www.navsource.org/archives/10/16/160496.html

Beam - 50'
Draft
light 2' 4" fwd, 7' 6" aft
sea-going 8' 3" fwd, 14' 1" aft
landing 3' 11" fwd, 9' 10" aft (landing w/500 ton load)
limiting 11' 2"
maximum navigation 14' 1"
Speed - 11.6 kts. (trial)
Endurance - 24,000 miles @ 9kts. while displacing 3960 tons
Complement
13 officers
104 enlisted
Troop Accommodations
16 officers
147 enlisted
Boats - 2 LCVP
Cargo Capacity - (varied with mission - payloads between 1600 and 1900 tons)
Typical loads
One Landing Craft Tank (LCT), tanks, wheeled and tracked vehicles, artillery, construction equipment and military supplies. A ramp or elevator forward allowed vehicles access to tank deck from main deck.
Additional capacity included sectional pontoons carried on each side of vessel amidships, to either build Rhino Barges or use as causeways. Married to the bow ramp, the causeways would enable payloads to be delivered ashore from deeper water or where a beachhead would not allow the vessel to be grounded forward after ballasting.
Armament (varied with availability when each vessel was outfitted. Retrofitting was accomplished throughout WWII. The ultimate armament design for United States vessels was.
2 - Twin 40MM gun mounts w/Mk. 51 directors
4 - Single 40MM gun mounts
12 single 20MM gun mounts
Fuel Capacity Diesel 4,300 Bbls
Propulsion
two General Motors 12-567A, 900hp Diesel engines
single Falk Main Reduction Gears
three Diesel-drive 100Kw 230V D.C. Ship's Service Generators
two propellers, 1,700shp
twin rudders

5.6.2 Construction and Service History

USS LST-496

- Laid down, 24 August 1943, at Missouri Valley Bridge and Iron Co., Evansville, IN.
- Launched, 22 October 1943.
- Commissioned in full as USS LST-496, 27 December 1943, LT. Robert J. Gregory USNR in command.
- Commanding officer LTjg. Koch, Stanley H., USNR February 1944 - 11 June 1944 (Killed in Action 11 June 1944)

- Sunk by enemy mines off Omaha Beach, Normandy, 11 June 1944
- Struck from the Naval Register, 22 August 1944

USS LST-499

- Laid down, 3 September 1943, at Missouri Valley Bridge and Iron Co., Evansville, IN.
- Launched, 5 November 1943
- Commissioned USS LST-499, 10 January 1944, LT, Elmer F. Witte USNR in command
- During World War II USS LST-499 was assigned to the Europe-Africa-Middle East Theatre.
- Invasion of Normandy, June 1944
- Sunk as a result of enemy action, 8 June 1944
- Struck from the Naval Register, 22 August 1944

USS LST-523

- Laid down, 15 October 1943, at Jeffersonville Boat & Machine Co., Jeffersonville, IN.
- Launched, 6 December 1943
- Commissioned USS LST-523, 3 February 1944, LTjg. Harold H. Cross, USN, in command
- During World War II USS LST-523 was assigned to the Europe-Africa-Middle East Theatre.
- Final Disposition, sunk by enemy mine, 19 June 1944, off the Normandy beachhead.
- Struck from the Naval Register, 22 August 1944

5.7 Other Tasks

In addition to recording observations and images from the dive it was also important to prepare for the next day of diving. Diving equipment and photographic/survey equipment was prepared for the following day.
There were opportunities to visit museums and other places of interest in order to conduct research, but also to better understand the context and challenges that were present during the historic events of 1944.

6. Survey of EA3232 - Supposed USS LST-496

6.1 Wreck Data

The charted position of EA3232 is 49°30.186N, 00° 47.910 and is 9.5 miles from Port-en-Bessin harbour entrance.
The DRASSM multibeam image below shows a small amount of wreckage and debris field covering an area of approximately 10m x 20m.

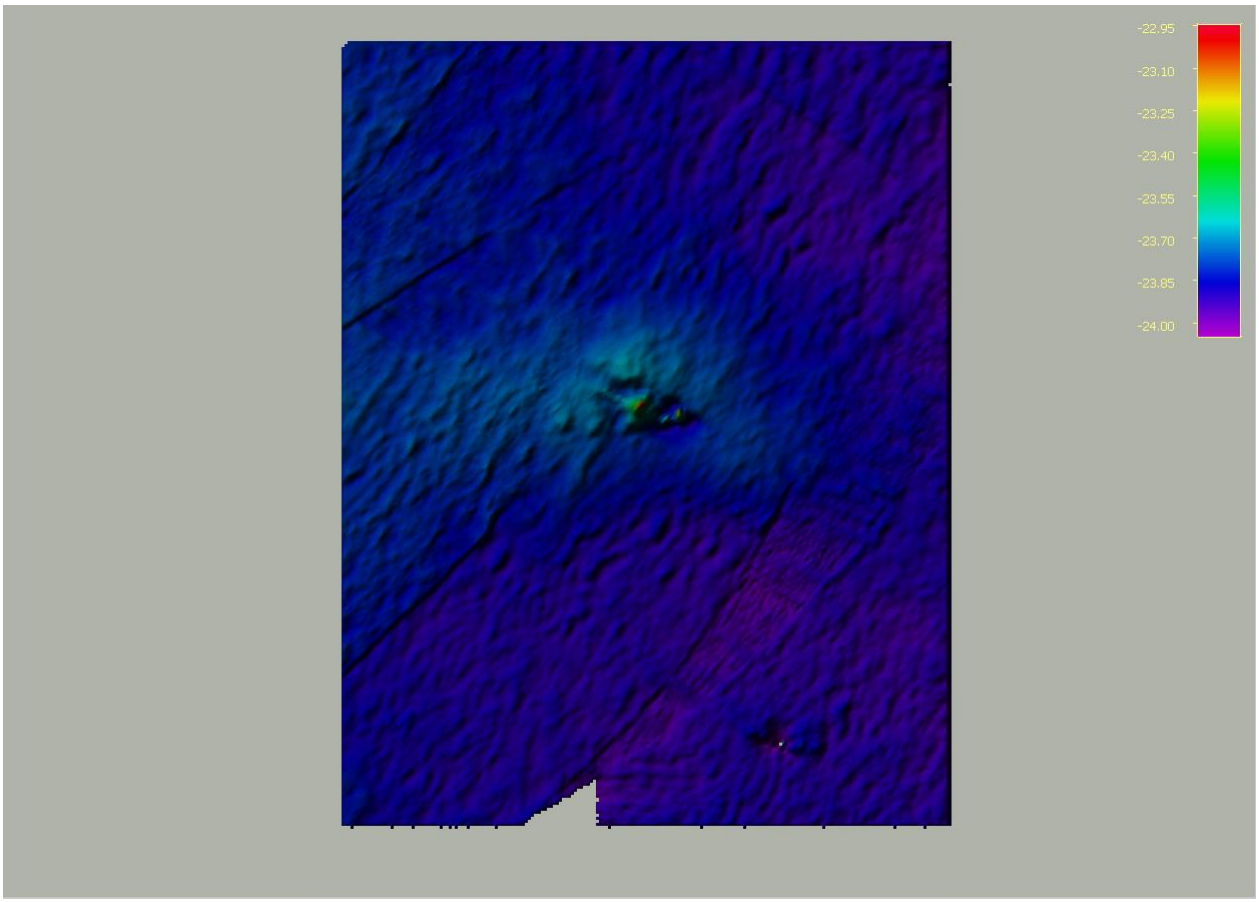

Figure 14 Multibeam image of site EA3232 (© DRASSM)

The main wreckage at the site was difficult to interpret. There was nothing obvious that gives any clue as to the type of vessel or identity. Due to depth and time constraints, we were only able to examine the area surrounding the highest point of the site. This area surrounds a large rock approximately 2m in diameter.
The extracted view of a photogrammetry model below represents the main site area that was dived and searched. The full photogrammetry model of site EA3232 can be viewed in more detail on the Sketchfab portal.
https://sketchfab.com/3d-models/not-lst496-model-6a2c9eea68074c38a21a1a8cba8e2144

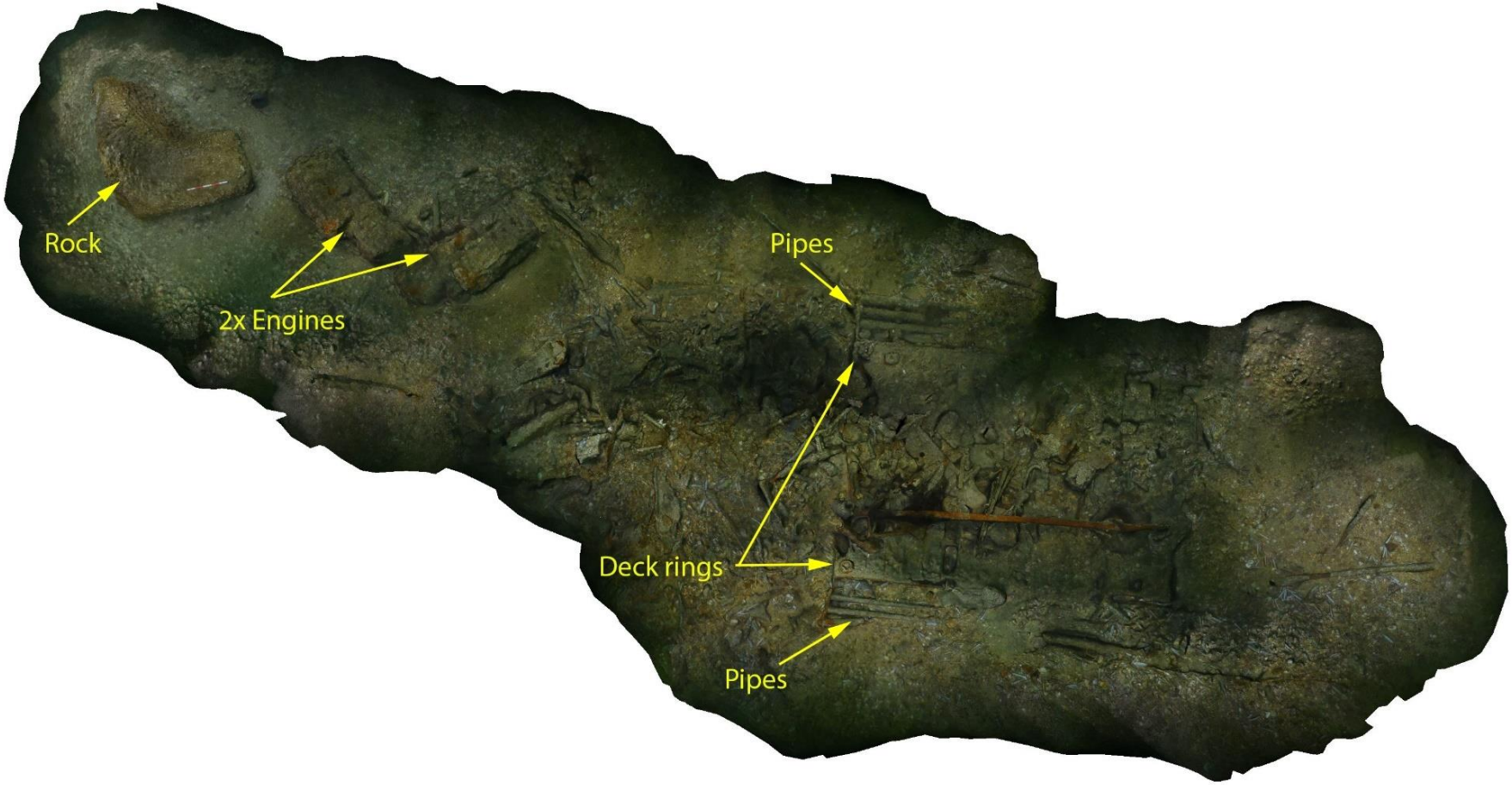

Figure 15 Extract of photogrammetry model of the wreck site EA3232 (supposed LST-496) Scale bar = 0.5m. (© Martin Davies)

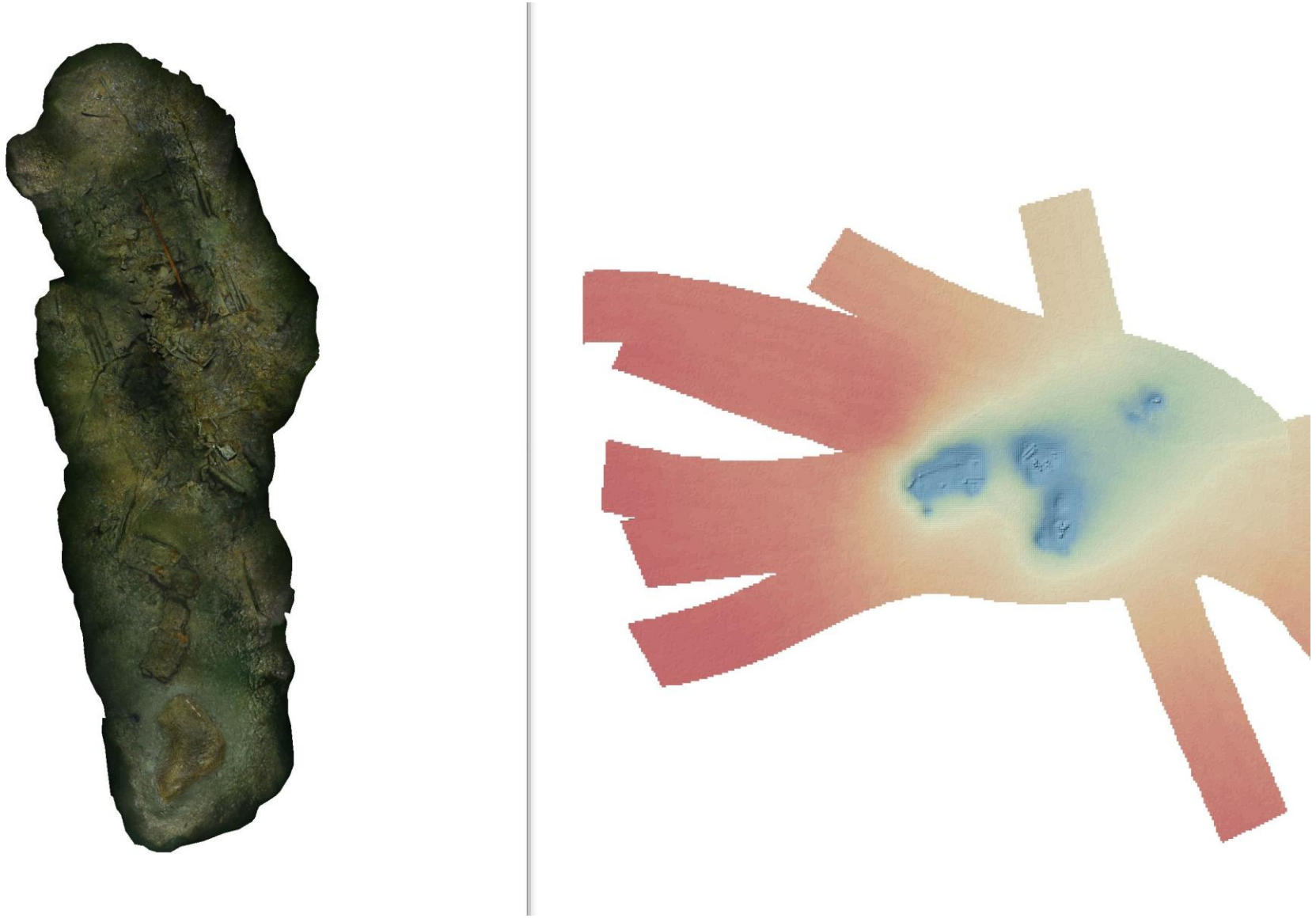

Figure 16 Comparison of photogrammetry to DRASSM multibeam of EA3232 (© Martin Davies and DRASSM)

6.2 Artefacts Observed

6.2.1 Deck and fittings

Close to the rock we observed a piece metal wreckage approximately 2m wide. This feature which appeared to be deck plate with two fastening rings and pipes underneath (see figure 17 below). The two sides of the wreckage are symmetrical and approximately 2m across.

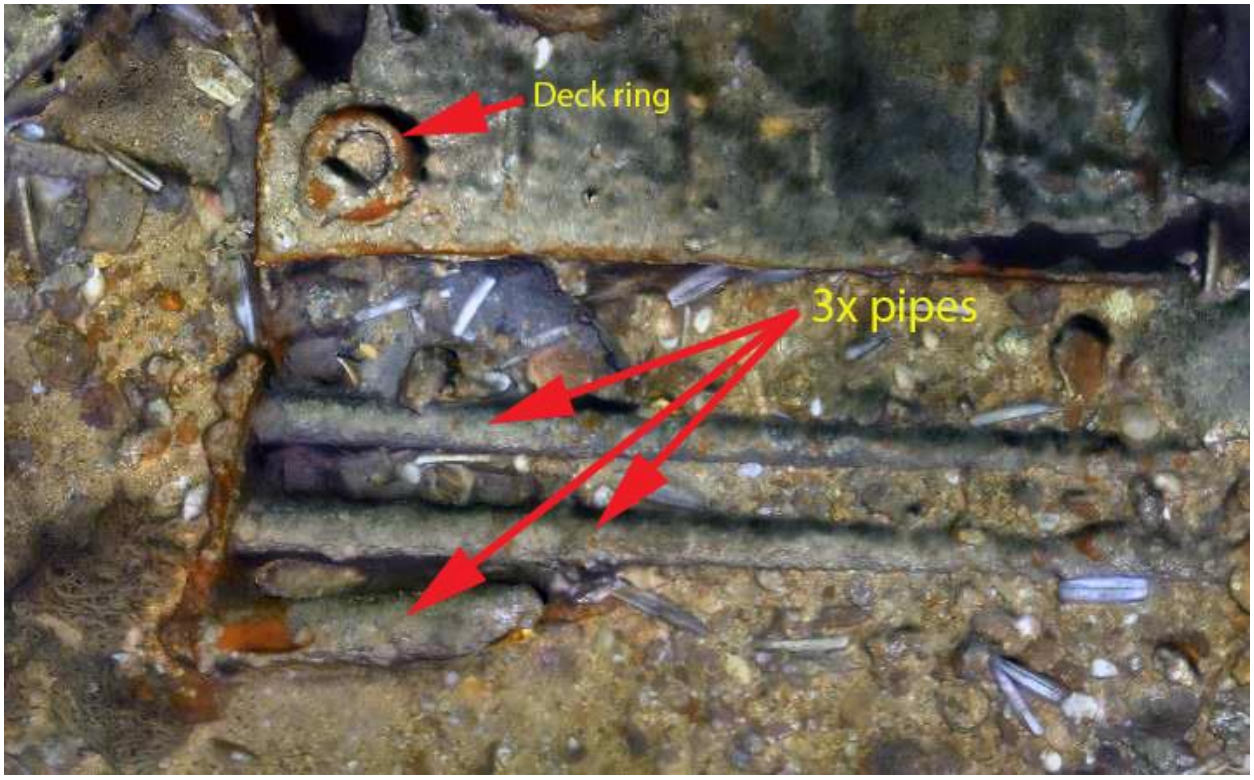

Figure 17 one side of the metal wreckage of possible deck including deck ring and pipes. (© Martin Davies)

6.2.2 Engines

There are two small engines near to the large rock as can be seen in the image below.

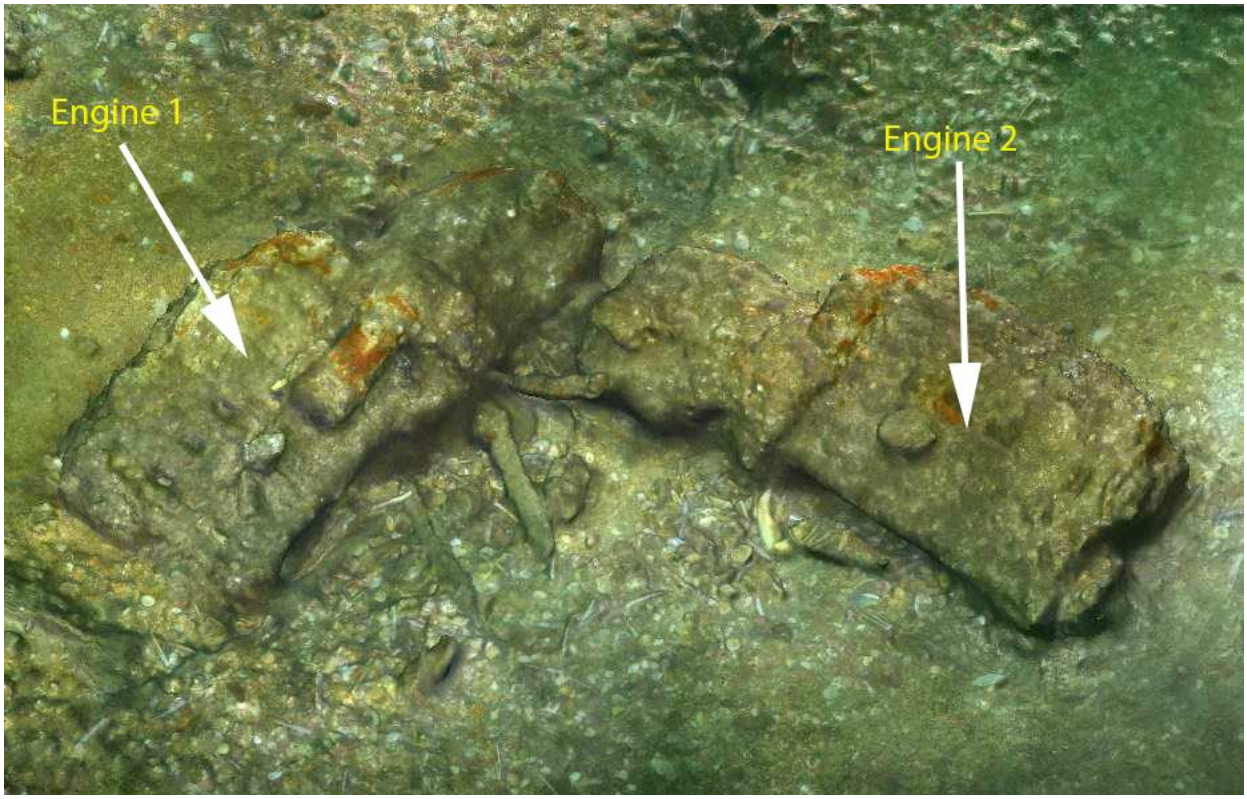

Figure 18 Two small 6-cylinder engines can be seen close to each other. (© Martin Davies)

On the image below you can clearly see features of the engine, for example, the starter motor, the shape of the flywheel housing, the bottom pulley and openings where either the inlet or exhaust system would have been connected.

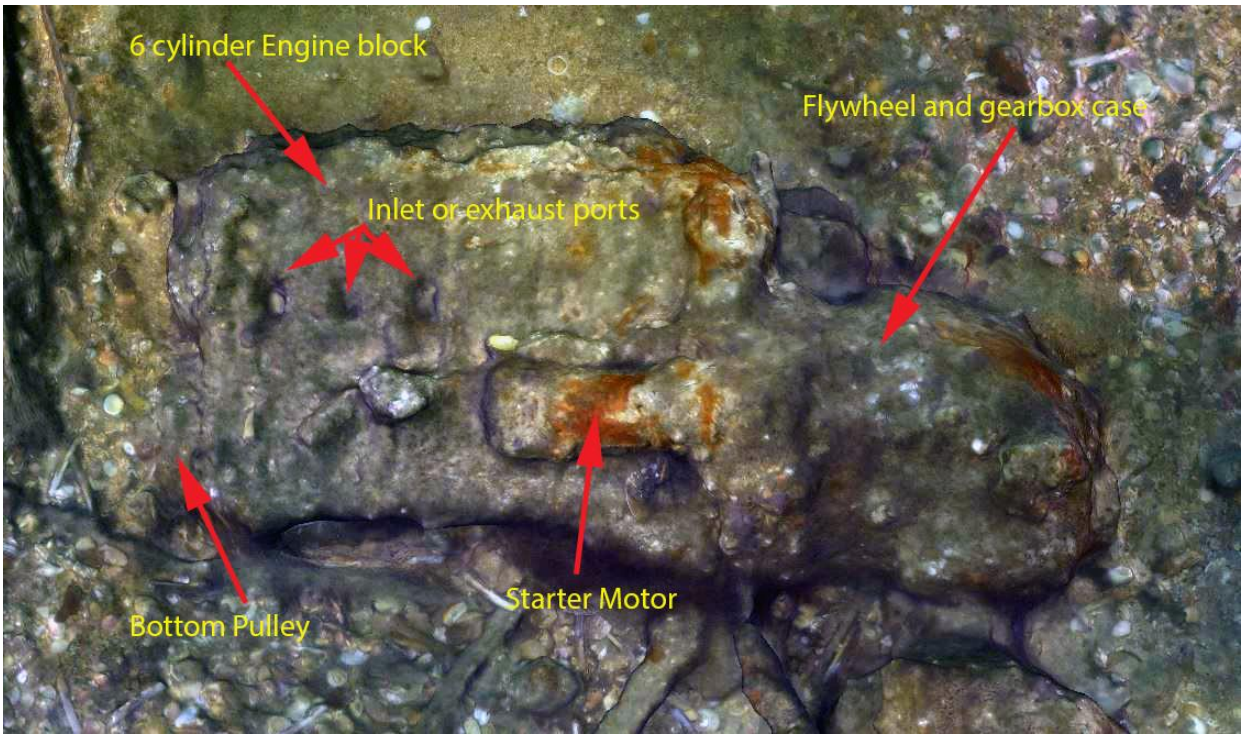

Figure 19 Some features of the engines can be seen. (© Martin Davies)

The engines are most likely be 6-cylinder diesel engines. They appear to be small for marine engines and may be vehicle engines. Two engines would suggest twin propulsion of the vessel, but no shafts or steering gear was seen. Equally the engines could have been used to drive machinery or generator sets but in the absence of any other equipment it is difficult to be clear about their use. The engines are close to each other, but no other parts of the engines are present. For example, the inlet or exhaust manifolds are missing. These are normally cast iron and, like the engines, would not deteriorate as quickly as less robustly built components. No engine mounting frames were observed.

This small nature of the site, standing only 2m from the seabed at its highest point, and the artefacts observed are not what would be expected of a large LST type vessel. A typical LST was over 100m long and had a displacement of 1625 tonnes. Even if the wreck had been salvaged what remains on the seabed is not representative of a ship of that size.

LST-496 was also carrying a large cargo of tanks and vehicles; there is no evidence of any armoured vehicles on the site.

The UKHO[26] record 23973 for site positioned at EA3232 accessed via Wrecksite.eu initially reports the wreck as being that of an unidentified Landing Craft Mechanised (LCM)[27] citing French wreck record number 14590080 as the reference.

> *"H4551/76 15.11.76 LCM REPD IN 493011.8N, 004733.3W [EUR]. POSN BY DECCA. (RISDON BEAZLEY, 27.10.76, SURVEYED 1955-56). NCA."*

> *"H1271/85 22.7.85 WK 21.5MTRS [11FMS 4FT] SHOWN ON FR 6927.* ***WK OF UNKNOWN LCM*** *IN 493014.6N, 004749.7W [EUR]. POSN ACCURACY 20MTRS. EXAM'D BY E/S, SONAR & MAGNETOMETER. LEAST DEPTH 21.5 IN GEN DEPTH 23MTRS. HT 1.5MTRS ABOVE SEABED. (FR WK RECORDS 1984 NO.14590080). BR STD."*

The record subsequent reports that the wreck site is that of LST-496 citing French wreck records for 2007.

> *"15.5.07 THIS IS LST 496, US FLAG. (FRENCH WK RECORDS 2007). NCA."*

6.3 Landing Craft Mechanised (LCM)

The L**anding Craft Mechanized** (**LCM**) was a landing craft designed for carrying vehicles. They came to prominence during the Second World War when they were used to land troops or tanks during Allied amphibious assaults.
Although designed to carry vehicles and light tanks, the LCMs proved to be versatile craft and were used to deploy troops and supplies to the beaches[28]. There were several designs, but the LCM (2) and LCM (3) were the most likely to have been used during Operation Neptune. A total of 139 LCM (3) were assigned to the Force O Far Shore Service Group OMAHA for the assault on Omaha beach[29].

LCM (3) Higgins design
In appearance very similar to the LCVP which Higgins Industries also constructed, with a 10-foot (3.0 m) wide load area at the front and a small armoured (1/4 inch steel) wheelhouse on the aft decking over the engine room.

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[26] United Kingdom Hydrographic Office (UKHO)
[27] https://en.wikipedia.org/wiki/Landing_Craft_Mechanized
[28] https://www.nationalww2museum.org/war/articles/louisiana-landing-craft-higgins-boat-d-day
[29] https://www.ibiblio.org/hyperwar/ETO/Overlord/NEPTUNE-OpsPlan/OpPlan-2-44-1.html

Figure 20 A Coast Guard manned transport lowers a Jeep into an LCM landing craft during June 1944. (U.S. Coast Guard Collection in the U.S. National Archives. PD).

Landing Craft Mechanized 3 (LCM) specification[30]

Creator/User: United States of America
Crew: 4 (1 coxswain, 1 engineer, 2 crew members)
Propulsion: 2 Diesel engines, 110-225 hp (twin Gray Marine 64H9N Detroit Diesel 6-71 engines)
Transport capacity: one 30-ton tank or 60 equipped soldiers
Speed (loaded): 8 knots.
Speed (empty): 11 knots
Length: 15.25 m
Weight: 25,000 kg

[30] https://www.dday-overlord.com/en/material/warships/landing-craft/lcm

6.4 EA3232 Survey Observations

Although we only managed to dive the site once, the combination of diver reports, photographic and multibeam images provided sufficient information for us to make the following observations.

Observation 1 – We found no features that indicate this small site could be that of a Landing Ship Tank. There were no ship frames or features consistent with the supposition that a large vessel had been wrecked at the site.

Observation 2 – There is no obvious shape of a hull, the main area of wreckage is not recognisable as of part of a vessel.

Observation 3 – There is no evidence of steering gear or propellers. No ship's bollards or winches were observed. No anchor or chain has been found.

Observation 4 – There are two 6-cylinder engines present on the site but no indication they were part of a vessel/craft. Normally, the engine would be attached to a heavily constructed metal frame. It is noted that LCM and similar small landing craft were powered by two vehicle engines. A possible alternative explanation is that they were spare engines being transported on a "Lighter" or barge and this may be the reason for the missing ancillary parts.

Observation 5 – There is very little of the wreck remaining though it is likely that more wreckage may be buried in the substrate.

6.5 EA3232 Survey Summary and Conclusion

There is only one large wreck site within a 3 Nautical Mile (NM) radius of EA3232 site - HMS ISIS, 2.9 NM. This wreck was identified because of an earlier survey by Southsea Sub-Aqua Club[31]. HMS ISIS has been heavily salvaged but sufficient remains to positively identify the wreck. USS Susan B Anthony is 3.3 NM away. Within a 3 NM radius there are no other large wreck sites that could be LST-496. We therefore conclude that the reported and charted position for LST-496 being EA3232 is incorrect.

The two engines are missing many parts which may indicate they may have been spare engines and just being transported to either replace old engines or that they were scrap and being returned for refurbishment. However, there are some deck rings which would suggest they may be associated with a vessel. It is noted that the LCM (3) had two diesel engines. The two engines look more like vehicle engines and not large marine engines. An alternative hypothesis is that the wreck may be cargo or salvage that has been displaced off a vessel.

Conclusion The site would appear to be a collection of objects from WW2 era. However, it is difficult to confirm the wreckage is from a seagoing vessel. Having surveyed site EA3232 and from the above Observations 1 to 5, we have found no evidence that support the belief that this is the site of LST-496. Our findings from diving the wreck are more consistent with the wreck being that of an LCM (3) rather than an LST.

[31] 'Two Tugs' report http://www.southseasubaqua.org.uk/images/diving_projects/Tale_of_Two_Tugs/Two_Tugs_Report.pdf

7. Survey of EA3152 – Supposed USS LST-523

7.1 Wreck Data

The charted wreck position of LST-523 is 49° 28.661N, 00°58.009W, (WGS84). The wreck lies 11NM from Port-en-Bessin harbour entrance.

The wreck first appears in the UK Hydrographic Office (UKHO) records in January 1956[32]. In July 1961 it was reported in UKHO records that salvage operations were taking place and that a buoy had been placed near to the wreck. The first UKHO mention of the site being USS LST-523 was in December 1984

> *"Referred to as an LST-523 (probably American). Mined 19.6.44. Stands 8.4mtrs above seabed and is lying 050/230 Degrees. Dispersed in several parts. Keel is highest part. (BREST NM 84 46 22 & FR WK RECORDS NO.14590095)".*

It is not clear how the reported identity (USS LST-523) was established however, what is clear is that this assumed identity has been used for many years. The general seabed depth is 22m with the top of the wreck being the stern and propeller shafts at 16m.

In 2019 DRASSM conducted a survey of the wreck site and kindly supplied the following multibeam images to inform our survey. These images clearly show the intact nature of the upturned hull at the stern and the propeller shafts. On closer examination of the images some of the LST cargo of tanks can be seen in the mid-section. Also visible is the damage to the forward section of the ship and the collapsed bow door.

The wreck covers an area approximately 100m x 18m and has an orientation of north south with the bow to the south. The stern is position is 49° 28.684' N 0° 57.989'W and the bow at (bearing of 188° from the stern) 49° 28.631N 0° 58.002' W. The highest point of the wreck is the stern and propellor shafts which are 5m above the general seabed depth of 24m.

[32] UKHO wreck number 23962 sourced from www.wrecksite.eu

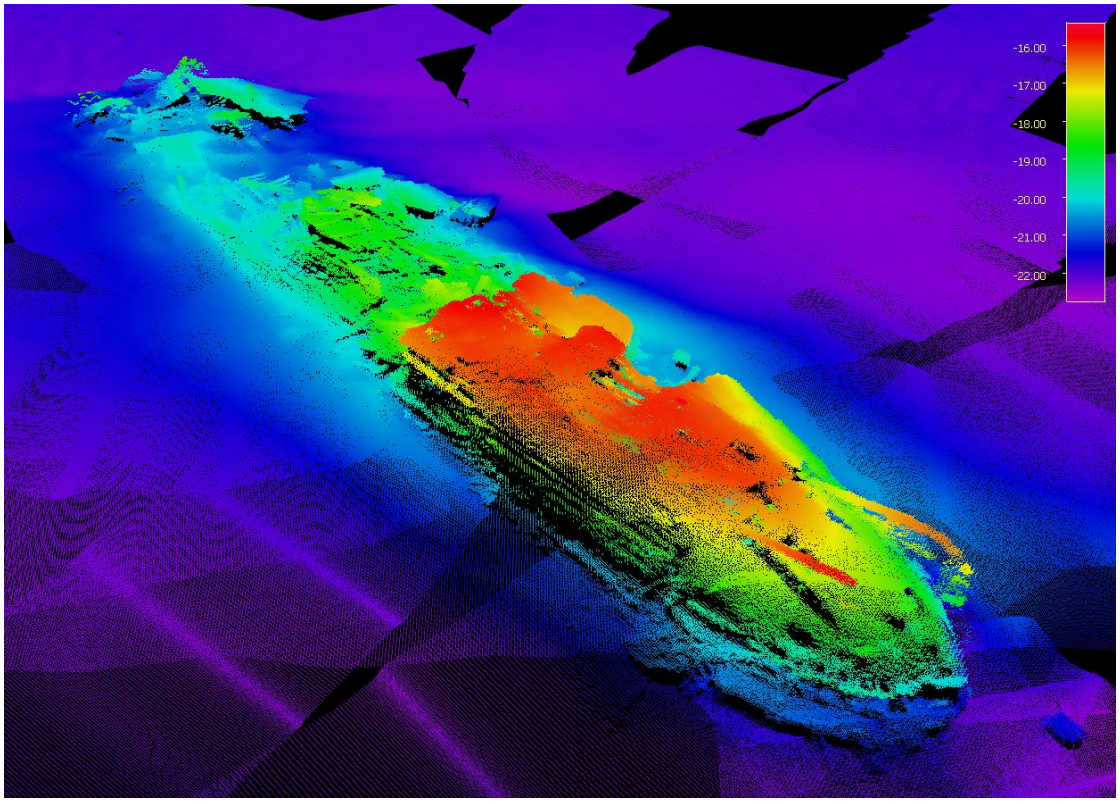


Figure 21 Multibeam image of EA3152 stern view (©DRASSM)

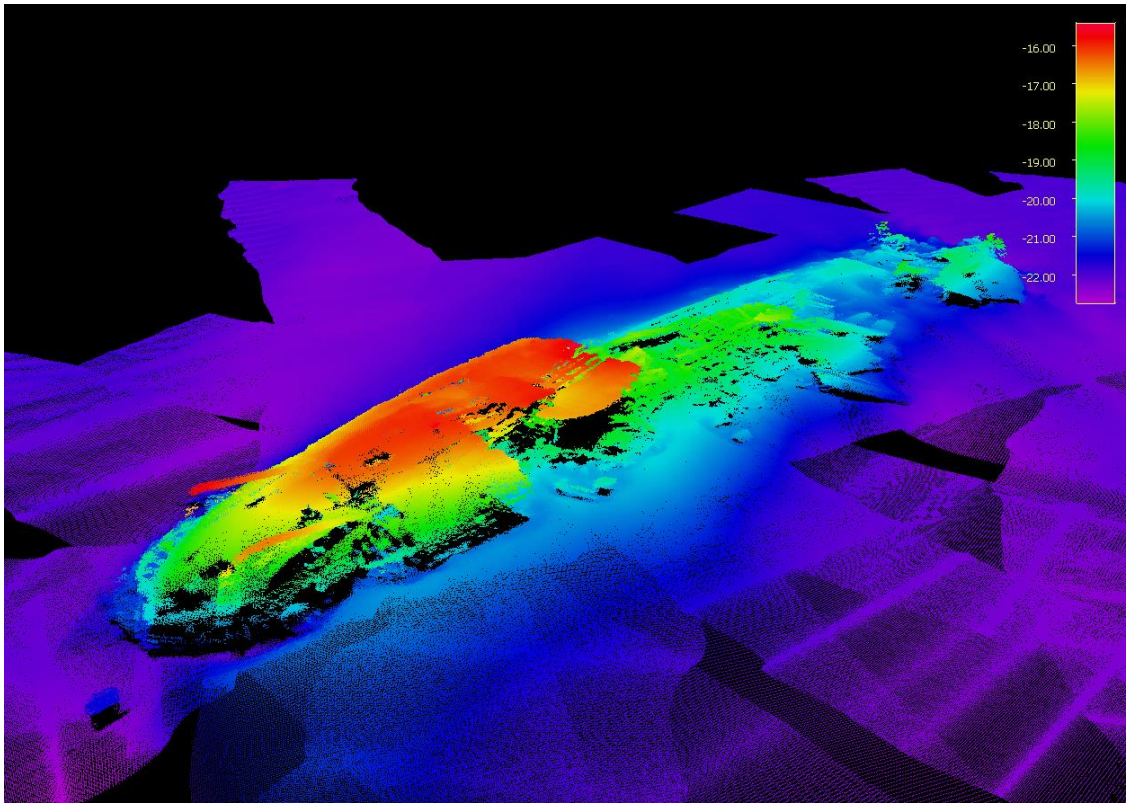


Figure 22 Multibeam image stern port side EA3152 (©DRASSM)

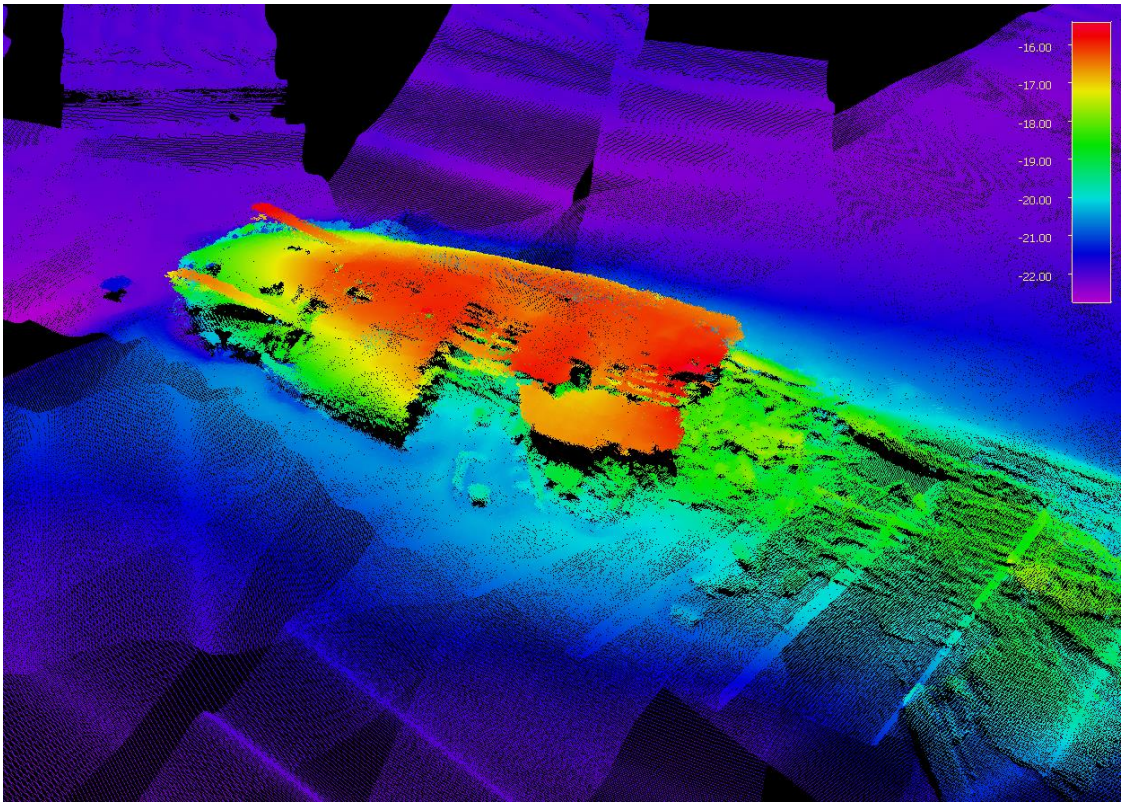


Figure 23 Multibeam image port side EA3152 (©DRASSM)

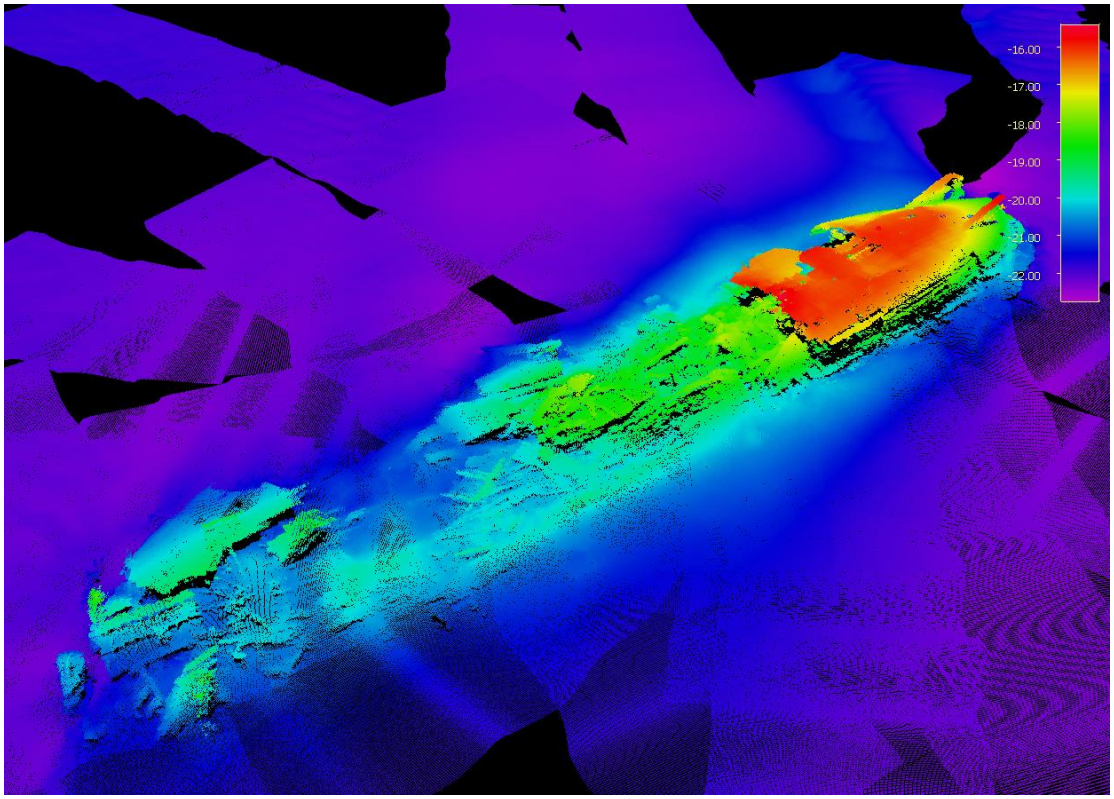


Figure 24 Multibeam image of the starboard side of wreck EA3152 (©DRASSM)

7.2 Survey Findings and Observations EA3152 – shipwreck structure

The wreck site is that of a large steel ship and extends over 100m in length. The highest point of the wreck is approximately 7m above the seabed and is the propeller shafts at the stern of the upturned hull. There was a notable scour at the stern area. The two propellers have been salvaged, assumed to be part of the salvage operation recorded in 1961.

The upturned hull at the stern is relatively intact. The port rudder is in place, but the starboard rudder is missing but reported as located on the seabed nearby.

A 50m safety line was established for the duration of the survey to enable divers to find their way more effectively across the debris field to the bow area. This line also assisted us in returning to the shot line at the end of the dive. (See figure 25 below)

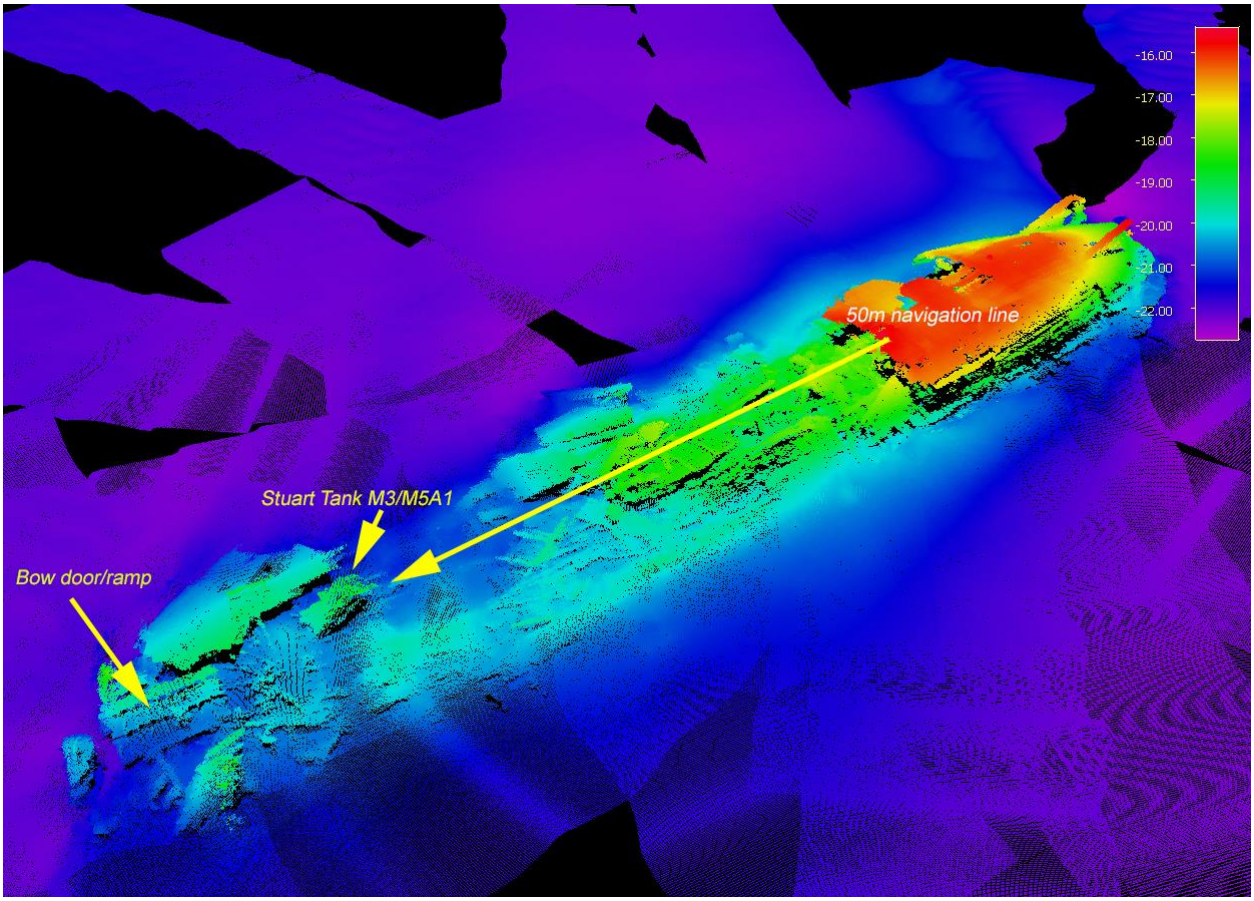


Figure 25 Multibeam image annotated to show distance of line across debris field. EA3152 (© DRASSM)

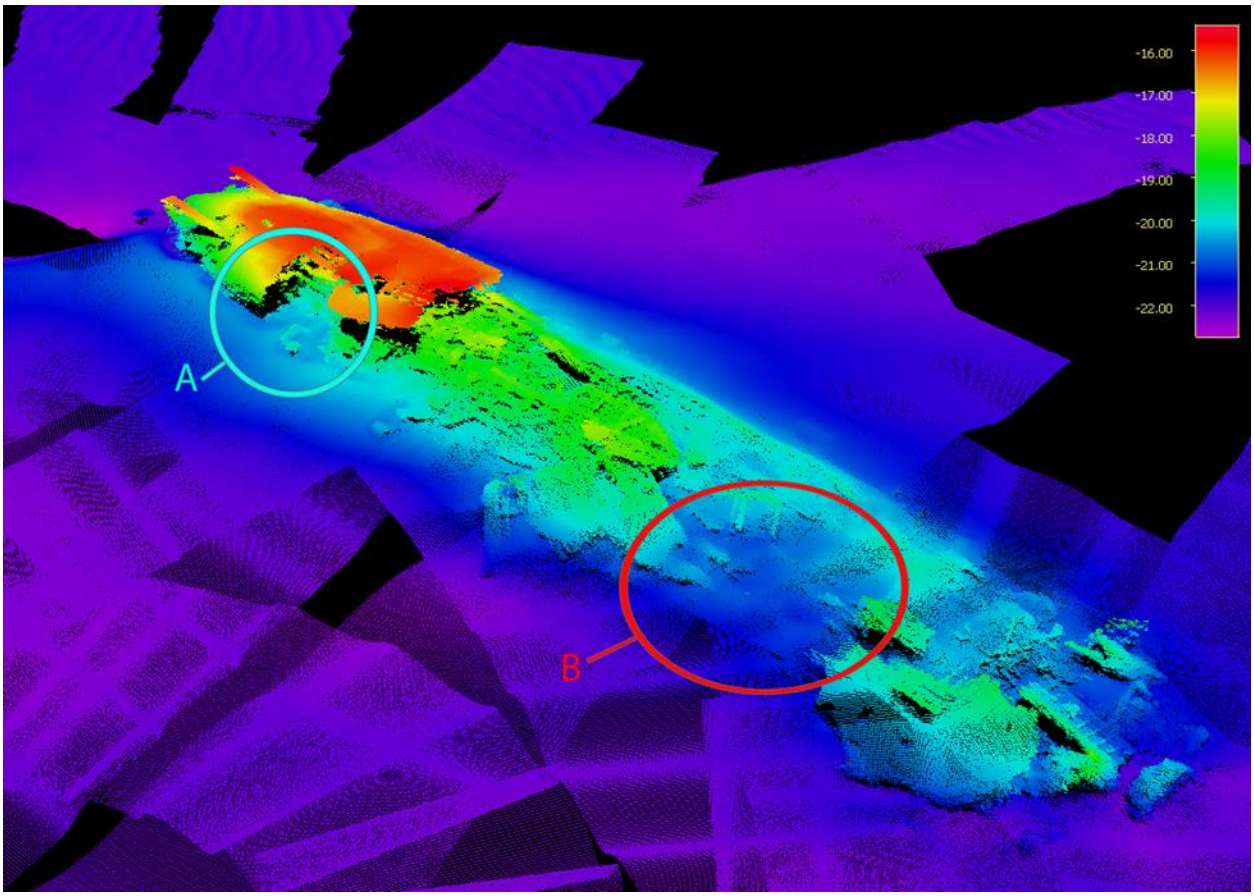


Figure 26 DRASSM multibeam image showing the damage to the starboard side (A) and the damage to the forward part of the ship (B). (© DRASSM)

There is notable damage to the hull on the port side approximately 15m from the stern. This can be seen on the DRASSM multibeam Figure 26 above (identified as area A). This damage may have been the result of a mine explosion.

Figures 27 and 28 below have been compiled from the LST-496 Action Report of Senior Surviving Officer, Lt Atkins (see paragraph 8.5 below) and his description of the damage caused by the mine in relation to the ship's plan for an LST. Figure 27 shows a hole approx 15 feet in diameter in relation to frame 43 and figure 28 shows the blast damage upwards through the starboard side to the officers quarters.

The position of the damage to the hull in the multibeam image (figure 26) is consistent with the action report for LST-496 at paragraph 8.5. of this report).

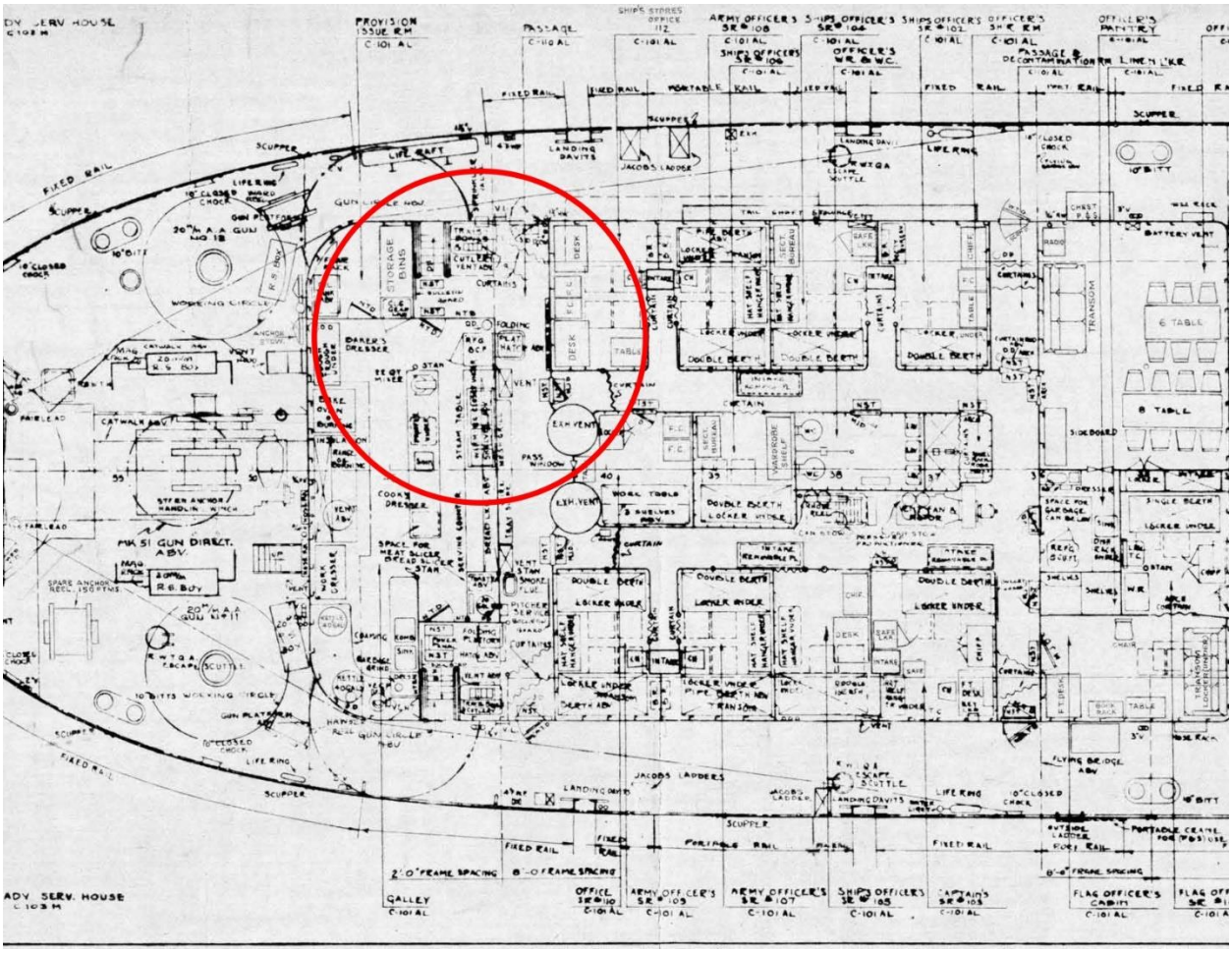


Figure 27 Annotated extract from LST ships plan. The red circle indicates the reported position of the mine explosion from below the main deck at frame 43 on the port side of the ship. (© US PD)

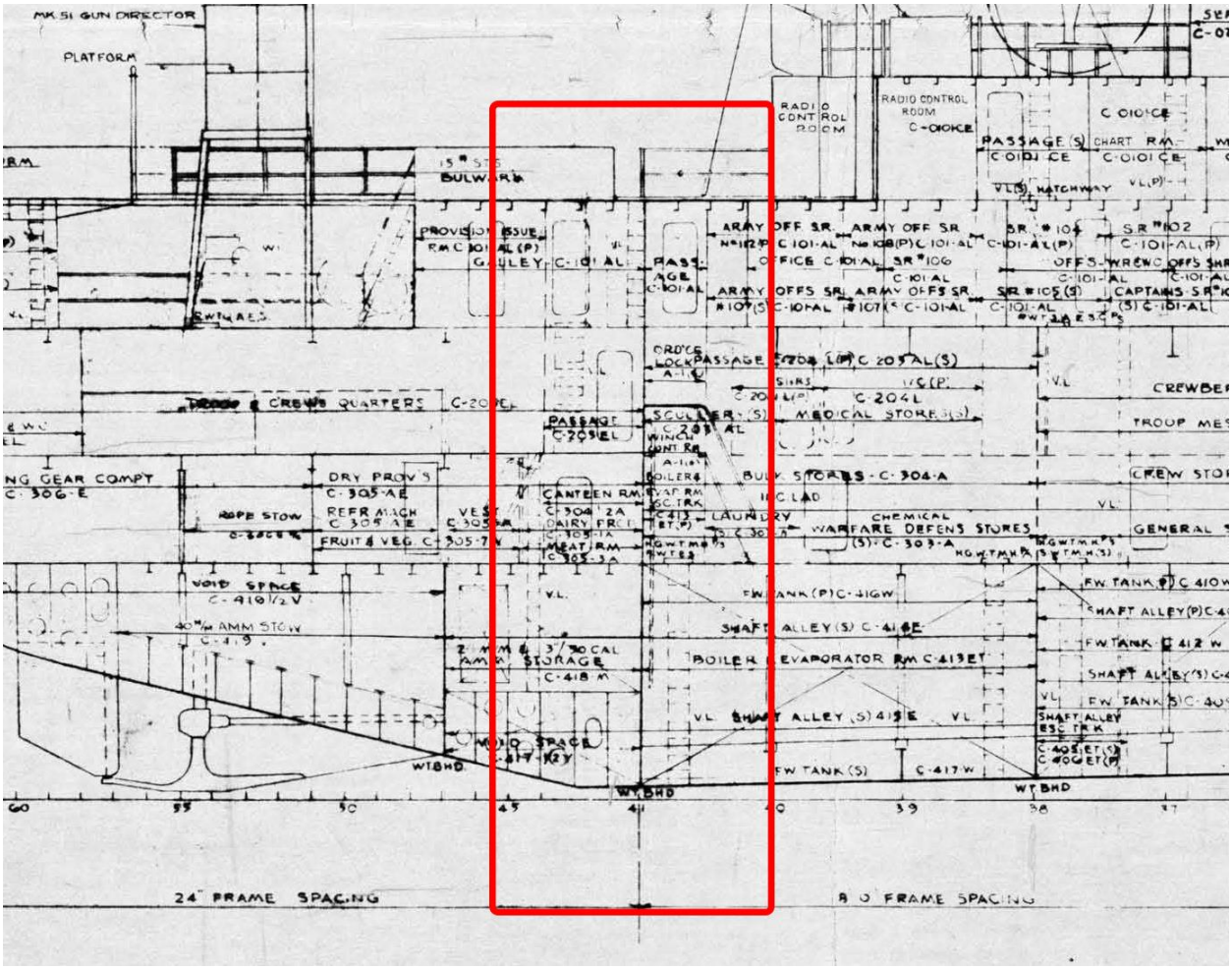


Figure 28 Annotated LST ships plan. Area of explosion passing up through the ship around frame 43. (© US PD)

Moving forward there is a notable break in the hull at approximately 33m from the stern forward of the engine room and at the start of the tank deck. From this point the hull has collapse and the hull plates are missing. This area of the ship is open and exposed. In this area the ship's machinery and visible cargo of tanks and vehicles can be seen. The area, approximately 24m in length, was the focus of photographic survey with the intention of creating a photogrammetric model and to record the cargo.

Forward of this section, there is an area with a distinct lack of wreckage (Area B). The damage to the hull would indicate large explosions(s) and this aligns with historical reports of the bow of LST-496 being first dynamited and then depth charged to clear the channel. (See paragraph 8.6 page 66).

Crossing the debris field towards the bow, there is a small, upturned tank. A photogrammetry model was created of this vehicle. (See Figure 38)

The bow area is broken though there are areas of the hull still intact particularly on the port side. Importantly one of the bow doors is intact confirming the ship to be an LST. (See paragraph 7.4.1)

The general seabed comprised of clean, coarse sand and shell. There was evidence of lost fishing equipment on the site, such as lobster pots and heavy netting but also filament lines and hooks.

Observation 6 – From the multibeam images and diver survey the wreck is very intact with many features that would identify it as a WW2 Landing Ship Tank, in particular the bow door and stern sections. The dimensions of the wreck are consistent with an LST.

Observation 7 – The ship had a cargo of tanks and other military equipment suggesting that it had not previously beached to unload her cargo at the time of the sinking.

Observation 8 – The damage to the forward section of the wreck suggests the wreck has been subjected to large explosion(s). There is also damage to the hull on the starboard side towards the stern.

Observation 9 – The propellers were not present and are assumed to have been salvaged.

7.3 Survey Findings and Observations EA3152- Key Features

With such a large wreck to survey, the dive team concentrated on three key areas of the wreck to gather data for comparison against the historic information. The three areas comprised of the amidships area where much of the hull has been damaged, the bow door and some of the armoured vehicles present to aid identification of the type/model of vehicle.

Figure 29 below shows the position of the photogrammetry models of key features created during the survey.

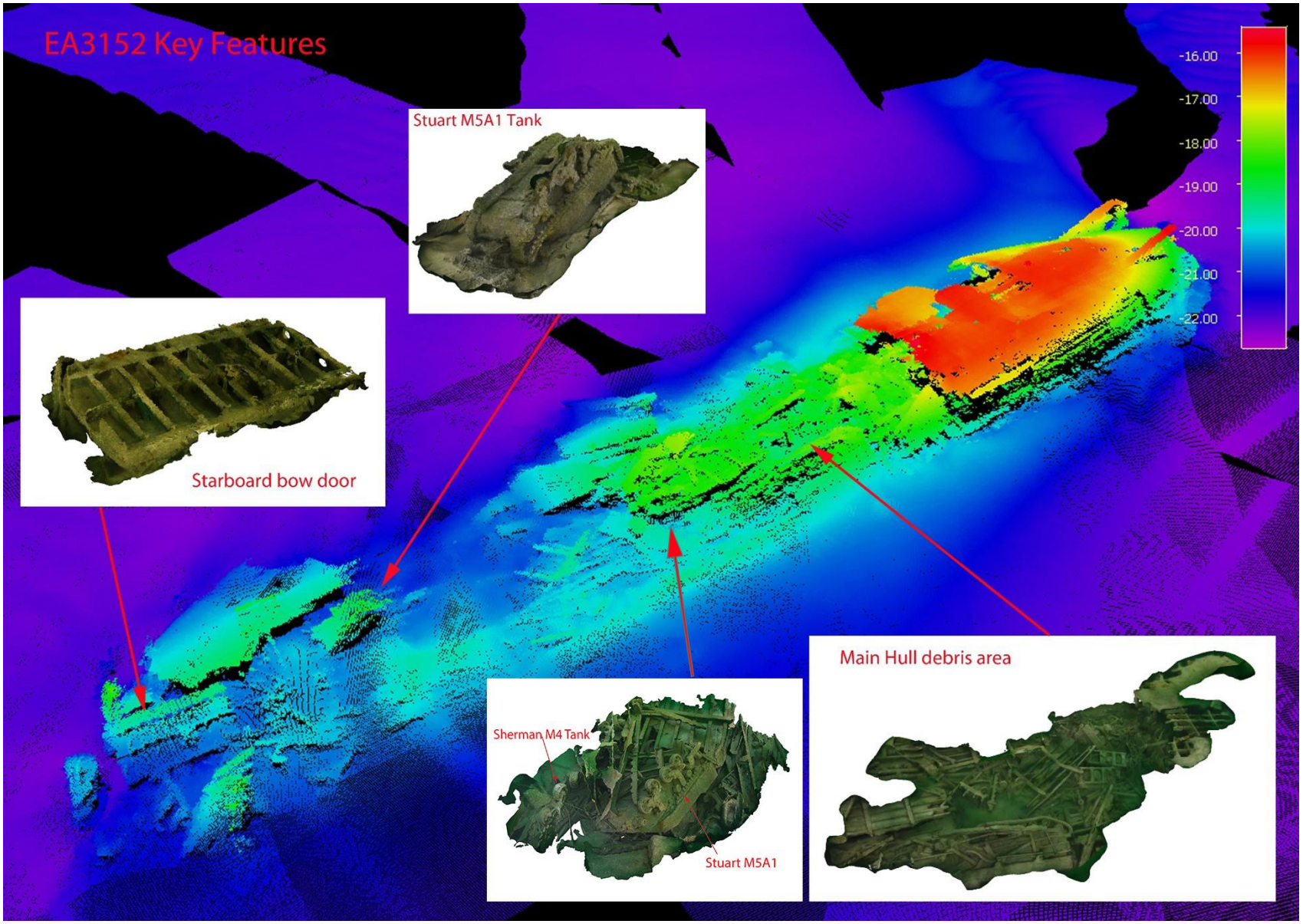


Figure 29 EA3234 DRASSM multibeam image annotated to show location of key features. (© DRASSM and Martin Davies)

7.4 Observations of Key Features of EA3234 Wreck

7.4.1 Bow Door

One of the two LST bow doors can be found on the wreck. A photogrammetry model was created by team member Audrey Patraux – figure 30 below.

The photogrammetry model can be viewed from the Sketchfab portal.

https://sketchfab.com/3d-models/lst-bow-door-176fb35539a640e0a621fb2278d1f1c9

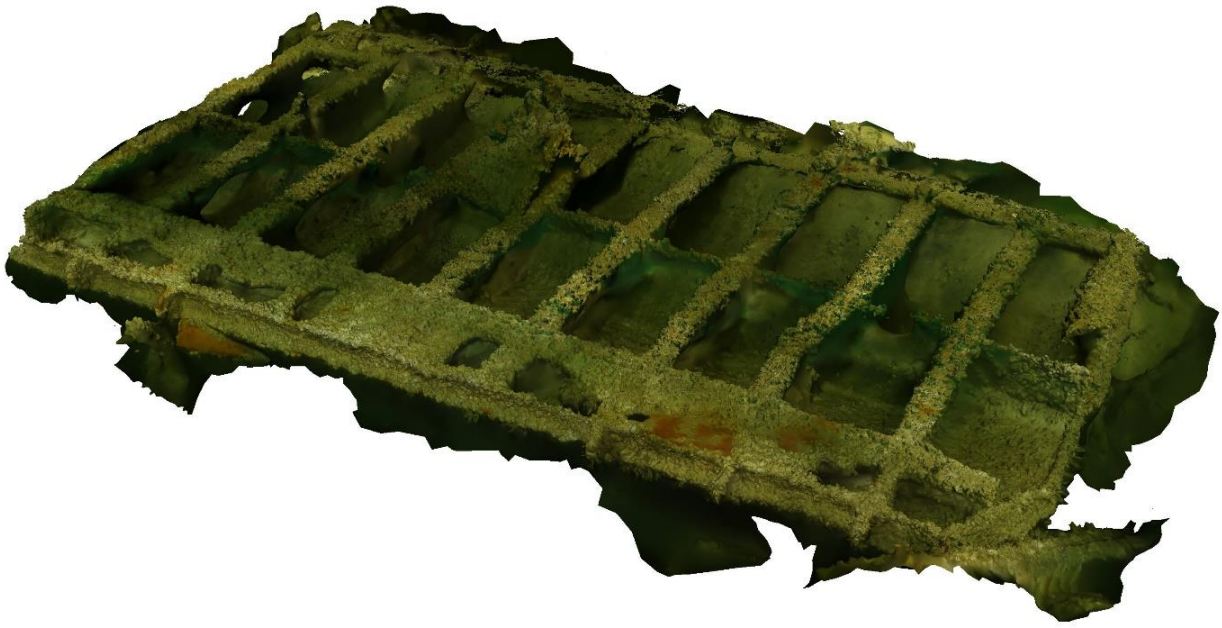


Figure 30 Image taken from photogrammetry model of starboard bow door EA3234 (© Audrey Patraux).

By examining historical photographs of LST bow doors it is confirmed that this is the starboard bow door. See figure 31 below.

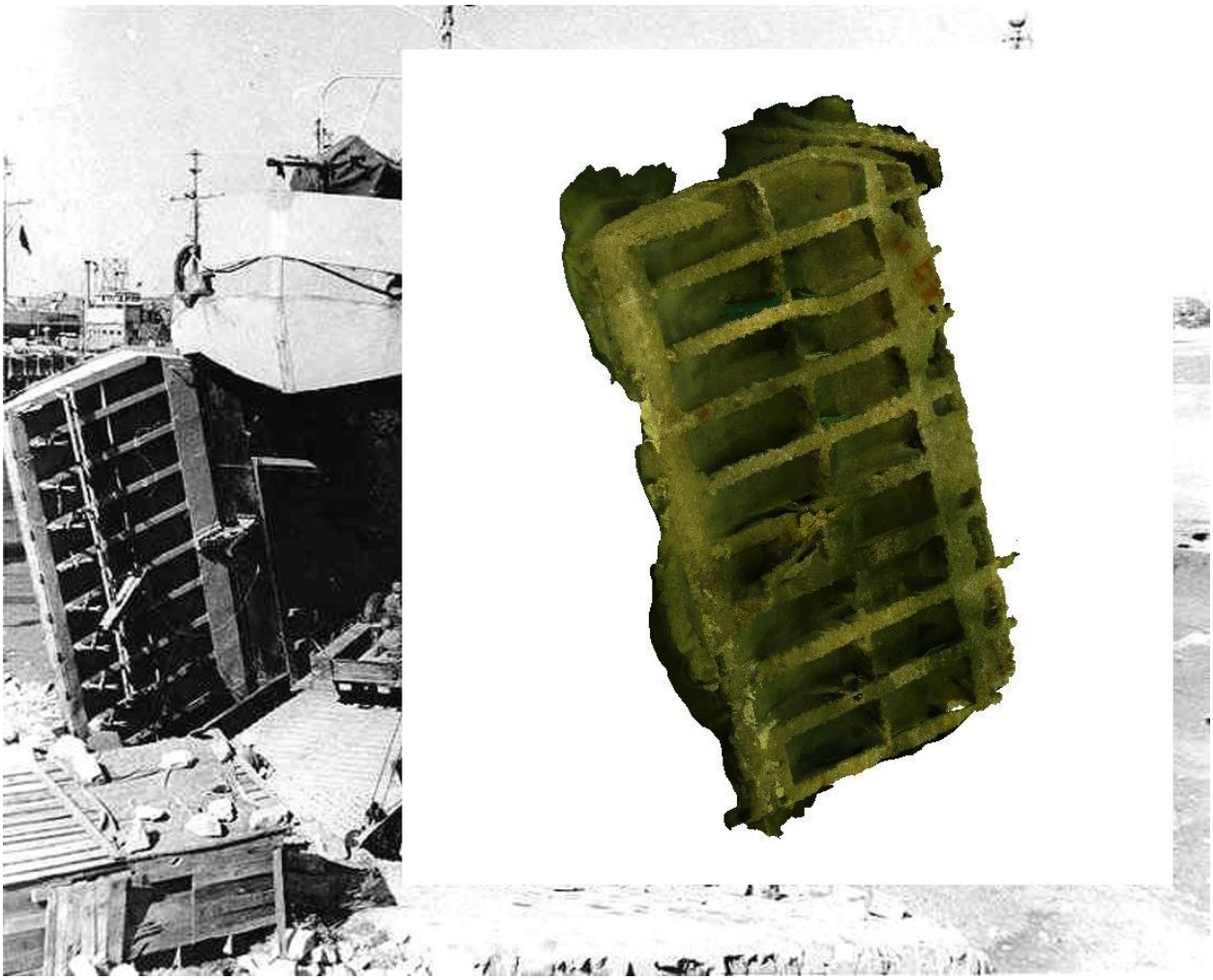


Figure 31 Comparison of original photograph of LST starboard door to the photogrammetry model. The model has been rotated to align with that of the WW2 LST image. (© US PD time expired and Audrey Patraux)

7.4.2 Debris field and cargo

The mid-section of the wreck has collapsed and exposes part of the cargo of tanks. With a weight of up to 30 tons the tanks would have been placed in the lower tank deck section of the hold. The design of the tank deck allowed for the tank engines to be started whilst preparing to disembark. Lighter vehicles would have been stored on the upper deck. LST-496 and LST-523 were fitted with an elevator to lift other vehicles to the upper deck. Later versions of LSTs were fitted with a ramp instead of an elevator.

The image below (figure 32) is created from a 3D photogrammetry model available to view on the Sketchfab portal using the following link.

https://sketchfab.com/3d-models/lst496-cargo-1-1m-399c086a961f4344b5fa44f46525ffde

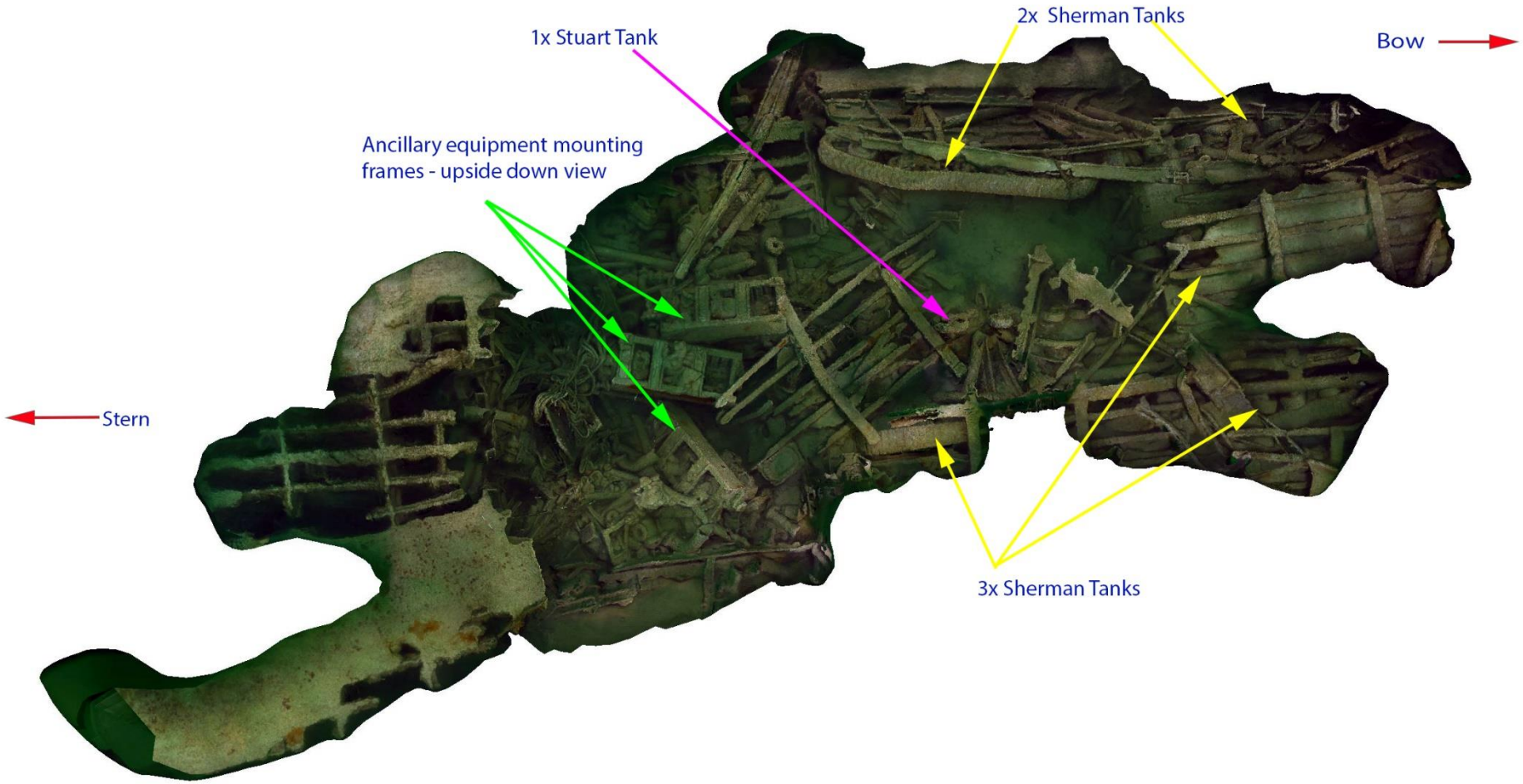


Figure 32 plan view of the debris field and artefacts EA3234 (© Martin Davies)

7.4.3 Ancillary Equipment Mounting Frames

Noting that the ship is upside down the three equipment mountings match the location of the mountings for the three generators, forward of the two main engines on a LST ship plan. They were positioned between frames 30 and 28 on the ship.

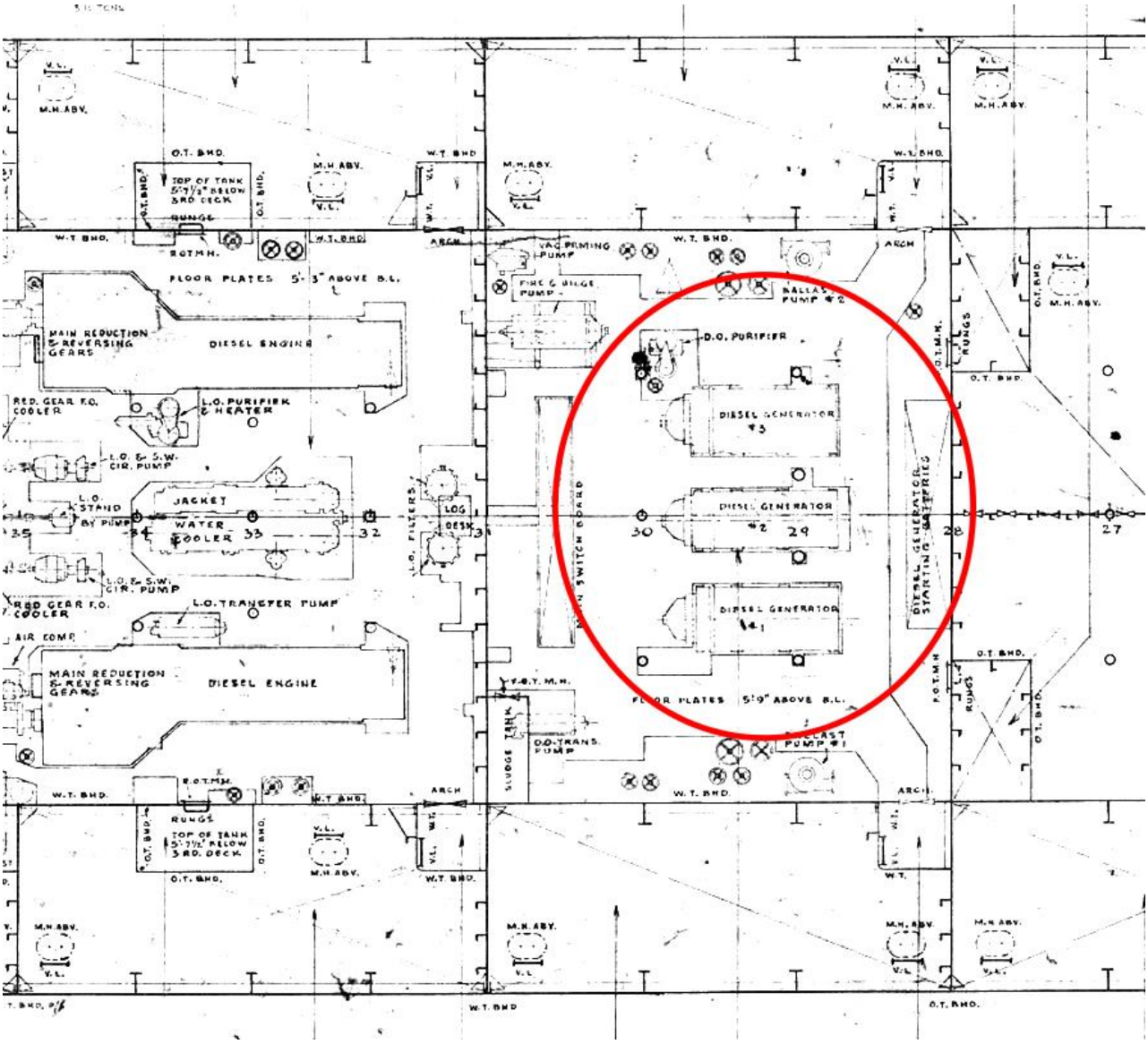


Figure 33 Extract of LST plan showing the three diesel generators. (© US PD time expired)

7.4.4 Tanks

During our survey we recorded a total of up to 10 tanks: five Sherman M4, three Stuart M5A1 and two unidentified tanks. All tanks were upside down, consistent with the LST capsizing. The majority were partially buried under ship hull and frames which made full identification difficult. The tank cargo included Sherman M4 medium tanks and the Stuart M5A1 light tank. The Sherman tank was much larger than the Stuart M5A1 and the easiest way to distinguish the tanks was from the bogey or suspension assemblies. Sherman M4 tanks had 3 pairs of bogey 'volute' suspension wheels whereas the Stuart tanks only had two. The Sherman M4 wheels were much larger than those of a Stuart M5A1.

7.4.5 Sherman M4 Medium Tank

The M4 Sherman, officially Medium Tank, M4, was the most widely used medium tank by the United States and Western Allies in World War II. The M4 Sherman proved to be reliable, relatively cheap to produce, and available in great numbers.[33]

Armor: 12.7 to 177.8 mm (0.50 to 7.00 in) depending on location and variant.

Crew: 5 (commander, gunner, loader, driver, assistant driver/bow gunner)

Designed: 1940

In service: 1942–1957 (United States)

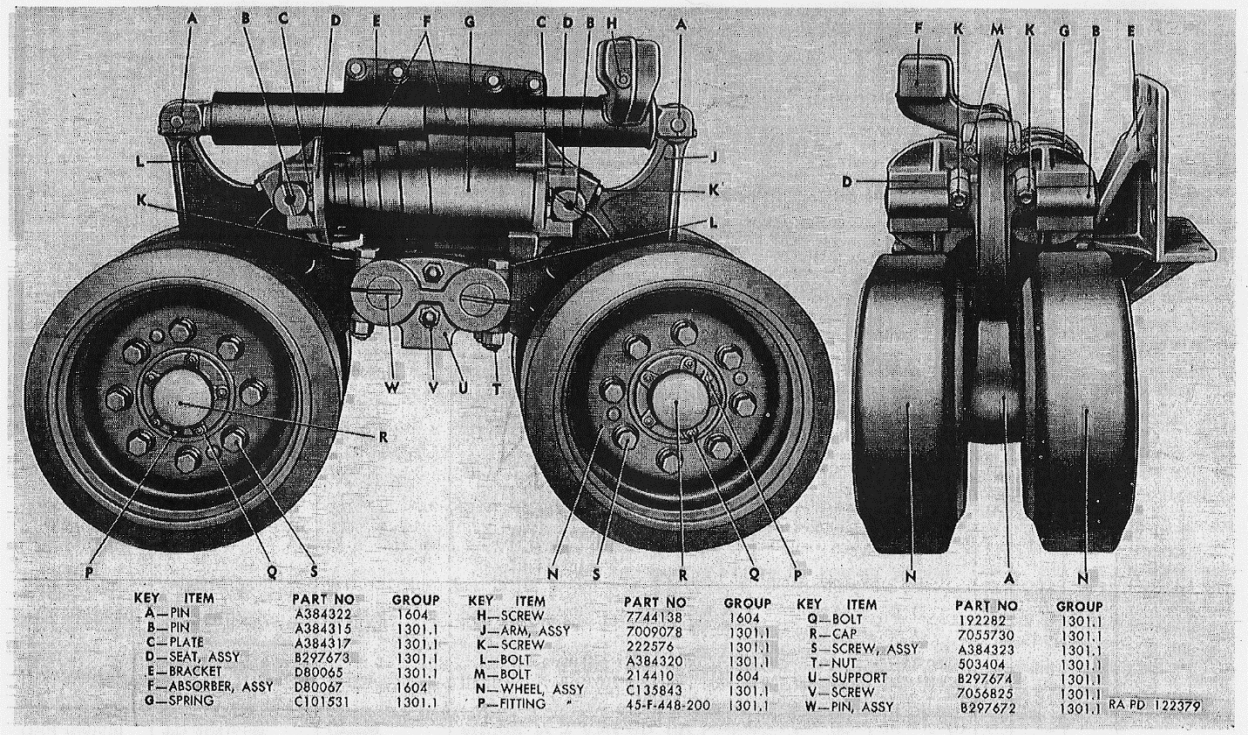
Length: 19 ft 2 in–20 ft 7 in (5.84–6.27 m) depending upon variant.

Maximum speed: 22–30 mph (35–48 km/h) on road, depending upon variant.

Produced: September 1941 (prototype); February 1942 – July 1945. The M4 was the most-produced tank in American history, with 49,324 produced (including variants).

Figure 34 US Sherman M4 Tank 'Hurricane' (US PD)

[33] Source Wikipedia



KEY	ITEM	PART NO	GROUP	KEY	ITEM	PART NO	GROUP	KEY	ITEM	PART NO	GROUP
A	PIN	A384322	1604	H	SCREW	7744138	1604	Q	BOLT	192282	1301.1
B	PIN	A384315	1301.1	J	ARM, ASSY	7009078	1301.1	R	CAP	7055730	1301.1
C	PLATE	A384317	1301.1	K	SCREW	222576	1301.1	S	SCREW, ASSY	A384323	1301.1
D	SEAT, ASSY	B297673	1301.1	L	BOLT	A384320	1301.1	T	NUT	503404	1301.1
E	BRACKET	D80065	1301.1	M	BOLT	214410	1604	U	SUPPORT	B297674	1301.1
F	ABSORBER, ASSY	D80067	1604	N	WHEEL, ASSY	C135843	1301.1	V	SCREW	7056825	1301.1
G	SPRING	C101531	1301.1	P	FITTING	45-F-448-200	1301.1	W	PIN, ASSY	B297672	1301.1

RA PD 122379

Figure 13–1. Horizontal volute suspension assembly (7067331), front and side views.

Figure 35 Sherman Tank suspension assembly 1944 (© US PD).

The Sherman M4 tank had improved suspension and was enhanced to provide a wider track making it easier to steer by spreading the load across a wider area[34].

Figure 36 Tracks and wheel and suspension assembly of upside-down Sherman tank. (© Martin Davies)

[34] https://www.youtube.com/watch?v=IJ-7H5GCNp0

7.4.6 Stuart Tank M5A1

These agile and capable light tanks were nick named as 'Honeys' by the British. Archive film of Stuart M5A1 tanks during the Normandy campaign, including loading on to LST and arrival on the Normandy beaches can be found on YouTube[35].

As with the Sherman M4, our main source of identification was the running gear and suspension assemblies. In addition, to distinguish between Stuart M3 and M5 tanks the shape of the tank was also important.

The change from an aircraft engine to a vehicle engine was one of the most significant enhancements to the M5 and required a larger engine space. This resulted in the rear of the Stuart behind the turret having a higher, squared profile. Another useful source of information which also included detail of the suspension, track and wheels was found on YouTube.[36]

Figure 37 Stuart M5A1 tank (© US PD)

Figures 38 and 39 below are of Stuart tanks found on the wreck and are from photogrammetry models. Both tanks are upside down and the two pairs of suspension wheels are visible. Also clearly visible is the raised engine compartment that is indicative of a M5A1 version.

The full 3D photogrammetry model can be viewed via the following link.

https://sketchfab.com/3d-models/stuart-tank-m5a1-713ecc3b962545018cf32ebe9d41daec

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[35] https://www.youtube.com/watch?v=F9HmFYPIMDM

[36] https://www.youtube.com/watch?v=m78pstQWMhI

Figure 38 Front and right-hand side view of a Stuart M5A1 tank. Note the raised engine section which distinguishes it from a Stuart M3. (© Martin Davies)

Figure 39 The second of the Stuart M5A1 tanks (© Martin Davies)

8. LSTs in Operation Neptune

8.1 Three candidate LSTs

As mentioned previously, the total number of LSTs in Operation Neptune was low (6) and only 3 were reported as sunk in the western area of the Baie de la Seine; USS LST-499, LST-496 and LST-523. Research of the historical documentation has been conducted for each of these ships to help confirm the identity of wreck site EA3152.

LST-499	8 June	Sunk	Mined
LST-496	11 June	Sunk	Probably mined
LST-523	19 June	Sunk	Probably Mined

Details of the reported loss of each of the three candidate ships LST-499, 496 and 523 are set out below and is gathered from official war diary and action reports from the ships involved in the events, as well as personal accounts from some of those present.

8.2 Background

LST-496 and LST-499 had taken part in Exercise Tiger and had therefore some experience of engagement with enemy forces. Exercise Tiger was one of a series of large-scale rehearsals for the D-Day invasion of Normandy, which took place in April 1944 on Slapton Sands in Devon. Coordination and communication problems resulted in friendly fire injuries during the exercise, and an Allied convoy positioning itself for the landing was attacked by E-boats of Nazi Germany's *Kriegsmarine*, resulting in the deaths of at least 749 American servicemen.

LST-499 was assigned to the 10th LST Flotilla, Group 32, Division 63 and was part of Force U[37] under the command of Rear Admiral Moon, US Navy. LST-499 took part in the UTAH beach landings but was delayed in unloading her cargo until the early hours of 8th June 1944.

LST-496 and 523 were assigned to US Eleventh Amphibious 'Force B'[38] under the command of Commodore Edgar USN. LST-496 was assigned to 43 LST Group 31 and LST-523 to Group 35. As part of 'Force B' or 'Baker' LST-496 and 523 were part of the essential follow-up support required to deliver men, supplies and equipment in support of the Western Task Force at OMAHA beach.

Force B ships loaded at Falmouth and Plymouth and left from Fowey, Helford River, Falmouth and Plymouth. They arrived with the other ships at the Western Task Force area on the 6th/7th June 1944 as follow-up convoys B1 and B3.

LSTs continued to supply the Allied forces throughout the rest of the Normandy campaign.

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37 https://www.ibiblio.org/hyperwar/ETO/Overlord/NEPTUNE-OpsPlan/OpPlan-2-44-1.html

38 https://www.ibiblio.org/hyperwar/ETO/Overlord/NEPTUNE-OpsPlan/OpPlan-2-44-1.html

Figure 40 US LSTs 382, 499, 284, and 380 loading men, vehicles, and supplies for the upcoming Normandy Invasion in Brixham Harbour, Devon, England, Jun 1, 1944. United Stated Army Signal Corps SC206438. (© US PD-time expired)

8.3 The Loss of LST-499

The US Navy War Diary, Home Commands Operation Neptune situation report for Friday 9th June reports (page 179 para E). It should be noted that LST-376 and 314 were lost on the crossing and did not arrive in the assault area.

> *"Casualties. LST-499 mined and sunk. LST-376 and 314 torpedoed and sunk."*
> *"8 June 1944* 0910 *LST-499 struck mine off port beam of USS BAYFIELD. She was badly damaged aft."*

In an itinerary[39] covering the period from initial launch to her fateful loss in Normandy that was sent to a relative of a crewman aboard LST-499 the following account is given.

> "*On June 5th, we left Brixham loaded with army and equipment. This was the real invasion. On June 6th we arrived off Normandy about noon. Due to heavy fighting and rough seas we were unable to unload until about 2:30 on 8th. At 8 o'clock on the 8th, we started our return to England and at 9:05 we struck the mine that was the end of our LST and many fine friendships."*

[39] https://exercisetigermemorial.co.uk/john-casner-jr-story-lst-499

The following account of the sinking of LST-499 is from one of her crew JOHN CASNER, JR. - U. S. Navy LST-499 - Seaman 2nd Class [40]

> *"LST-499 went on to participate in D-Day on June 6, 1944, at Utah Beach. Our LST was unable to unload on the beach due to enemy artillery fire, so the ship remained approximately a half-mile off shore, and* **we unloaded our tanks and artillery onto LCT's and LCM's** *which went in the rest of the way. By the time they were all unloaded, it was dark and the weather was stormy. We stayed in that position until June 8th,* **when we beached our ship on UTAH and loaded wounded on board our tank deck.** *Our ship had been staffed with medical personnel to treat their wounds and perform surgeries. As the ship was backing off of the beach, I was down below on the tank deck talking to a wounded soldier. When a fellow crew member came up to speak to the soldier, I walked away heading to my compartment through the laundry room. Two minutes later, our ship hit a mine at the stern. I was knocked out for a couple minutes. When I came to, I was laying in water that was coming down from the escape hatches I went up to the top deck and then up another level to the 01 deck. I was ordered to go back down to the tank deck and help with the wounded. Once I arrived on scene, I realized that the soldier and sailor I had just been talking with had both been killed. I was in shock, and there was no time to think about it. I went to pick up a stretcher with a wounded soldier and my left knee gave out. Until then I didn't realize I was hurt. Along with an injured leg, the left side of my jaw was cracked, my mouth was bloody, and I lost some teeth. I was evacuated from the ship for medical attention. Fourteen crew members died, but I never found out how many injured soldiers died as a result of the explosion of the mine.*
>
> *After I recovered, I was transferred to LST-515, which carried supplies and ammunition back and forth from England to France until the war ended in Europe. LST-515 went back to Boston, and we were getting ready to go to the Pacific Theater of operations, when the Japanese surrendered."*

Lt M.S Beasley USNR of **USS LST-380** writes in the ship's war diary of 8th June and reports;

> "*1025 LST-499 in a sinking condition with two L.C.I.s alongside her starboard side. LST-346 went along port side to remove casualties.*
> *1115 LST-346 underway from alongside LST-499."*

F X Riley Commanding Officer of **USS LCI(L) 319** [41]reports in the ship's war diary dated 9th July 1944:

> *"8 June*
> *1805 received message from CTU 125.4.3 to take over salvage of LST-499 which had been towed in to the beach by LCI(L) 321.*
> *1810 Underway, Notified by LCI(L) 321 enemy medium batteries firing close to LST-499. Proceeded to LST-499.*
> 1827 *Moored alongside LST-499 and sent 6 fire-fighters aboard to attempt pumping out LST. Water rising too fast. Removed Secret and other papers. Turned them over to proper staff officers of CTF 125. Found two dead LST crew members aboard. One was removed for burial ashore. Rise of water prevented removal of second.*
> *2038 Attempted towing in closer to beach but unable to move LST at all.*
> *2105 secured towing.*

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[40] John Casner Jr Story - LST 499 | Exercise Tiger Memorial

[41] Accessed via US National Archives catalogue https://catalog.archives.gov/id/78517501?objectPage=3 NAID 78517501

2105 moored alongside LST-499.
2245 Unmoored, anchored 200 yards from LST-499 to keep looters off. Three LCMs tied up alongside."

The following day, 9th June 1944, saw LCI(L) 319 tasked with other duties until later that evening;

"*1945 alongside LST-499 to salvage all possible valuable equipment. Removed 2 radios and generator set, loud speaker, drills and miscelaneous items. Ship had been badly looted while we had been called off to other duties. Three bodies were found on stretchers in a forward port boatswain's locker. Beach-master requested to send graves registration personnel. Bodies removed to upper deck on bow. "*

LCI(L) 319 was then tasked to other duties.

USS ATR-3 War diary for 8th June 1944[42]:

"1003 Underway in accordance with BAYFIELD despatch #080952 to assist USS LST-499 in sinking condition from hitting a mine.
10:30 Moored port side to LST-499. Salvage Officer boarded LST-499 to determine damage and commence salvage operations; 500 GPM handy billy put on board to pump after magazine.
1200 USS LCI 219 moored alongside to starboard with orders from BAYFIELD to beach LST-499. LCIs 283 and 11 moored to port of LST-499.
1300 With LCI 11 in towing position ahead, LCI 283 to port and ATR-3 to starboard, with LCI 219 to our starboard, commenced slipping anchor cable of LST-499.
1314 HMS MINSTER while crossing from port to starboard at a distance of 250 yards, struck a mine and sank immediately. Ordered LCI 219 to cast off and pick up survivors.
1315 LST-499 slipped anchor cable, proceeding to beach. LCI 11 cast off tow. Due to leading tow wire from stern chock, she was unable to maneuver at lead position."

USS PC-484 reported that on 8th June 1944[43] she arrived to assist LST-499 and that later that afternoon at approximately 4:30pm she reported that enemy shore battery had fired at them without effect but that ten minutes later LST-499 was hit and settled in the water.

USS KIOWA (AT72) war diary for June 1944[44] reports that;

"June 14Anchored in the assault area. Underway to conduct salvage operations on LST-499 sunk by mine. Most of the watertight hatches and doors were found open and those that had been closed were sprung so badly that several days were required to make watertight.
June 15 0700 continued attempt to raise LST-499. Patched holes in bulkheads and closed doors to the tank deck. ***Position 49° 26' 24" N, 01° 10' 00" W***
June 16 0700 continued work and salvage operations on LST-499.
June 17 0700 continued work and salvage operations on LST-499. Completed closing off and started salvage pumps. ***At 1758 ship afloat*** *when called away to assist HMS Glenroy hit by mine, flooding engine room.*

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[42] Accessed via US National Archives catalogue https://catalog.archives.gov/id/78483203?objectPage=6 NAID 78483203.
[43] Accessed via US National Archive catalogue https://catalog.archives.gov/id/78544929?objectPage=4 NAID 78544929.
[44] Accessed via US National Archive catalogue https://catalog.archives.gov/id/78509749 NAID 78509749.

June 27 Inspected LST-499 and conducted search for lost salvage pumps. Ship had to clear derelict to prevent damage from heavy seas. ***Position 49° 26' 24" N, 01° 10' 00"W.*** *"*

It is clear from the above reports that much effort was given to beach and refloat LST-499. However, it was finally considered 'derelict' on 27 June 1944. Original US Coastguard film[45] dated 15th June show USS LST-499 sinking at the stern and being supported by other vessels. The following images of a sunken LST are believed to be of LST-499 as they are in keeping with the film footage.

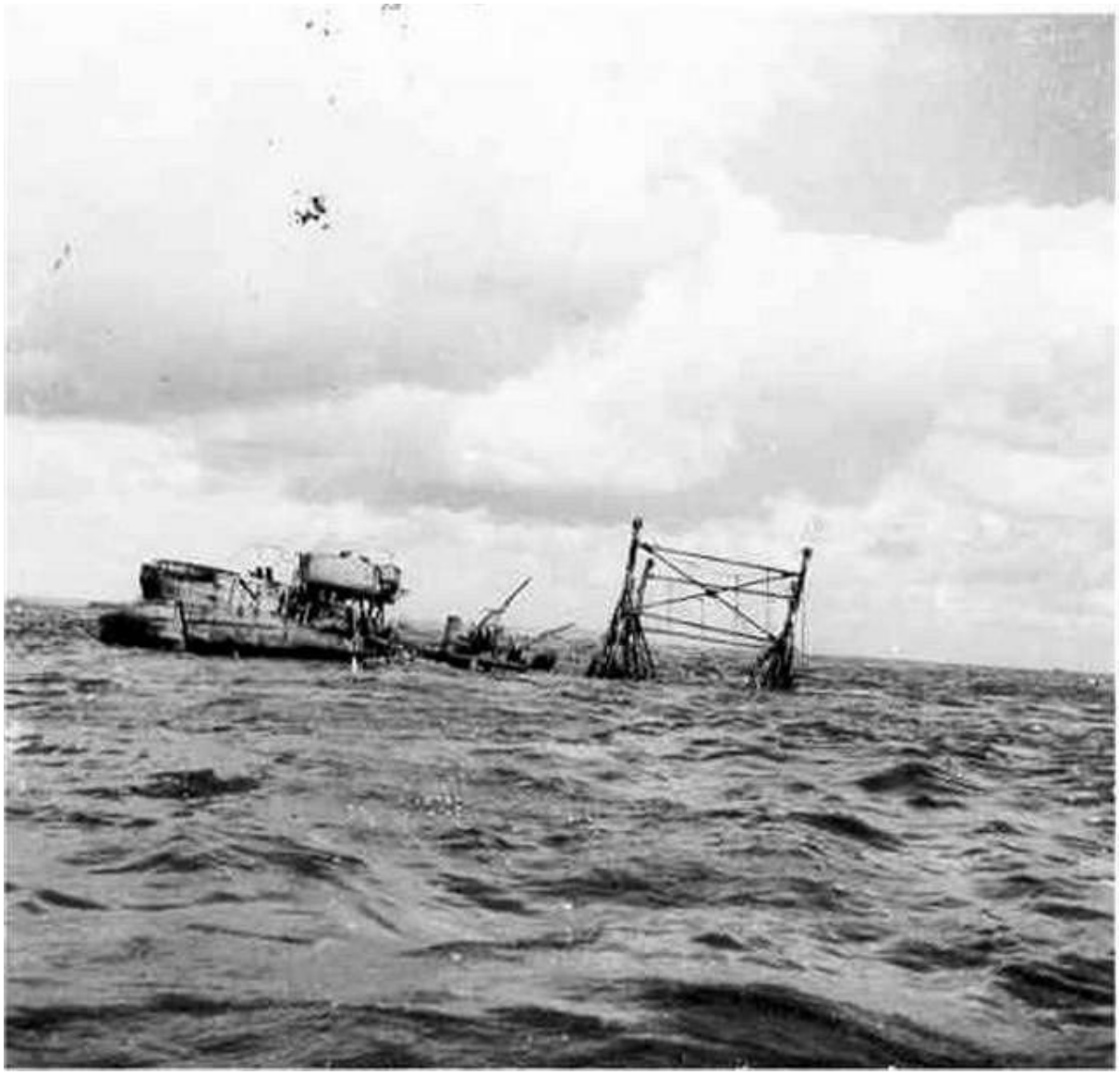

Figure 41 A partially sunken LST off Normandy coast 1944 (© US PD)

[45] https://www.youtube.com/watch?v=tvdknUv0enE (from 4 minutes)

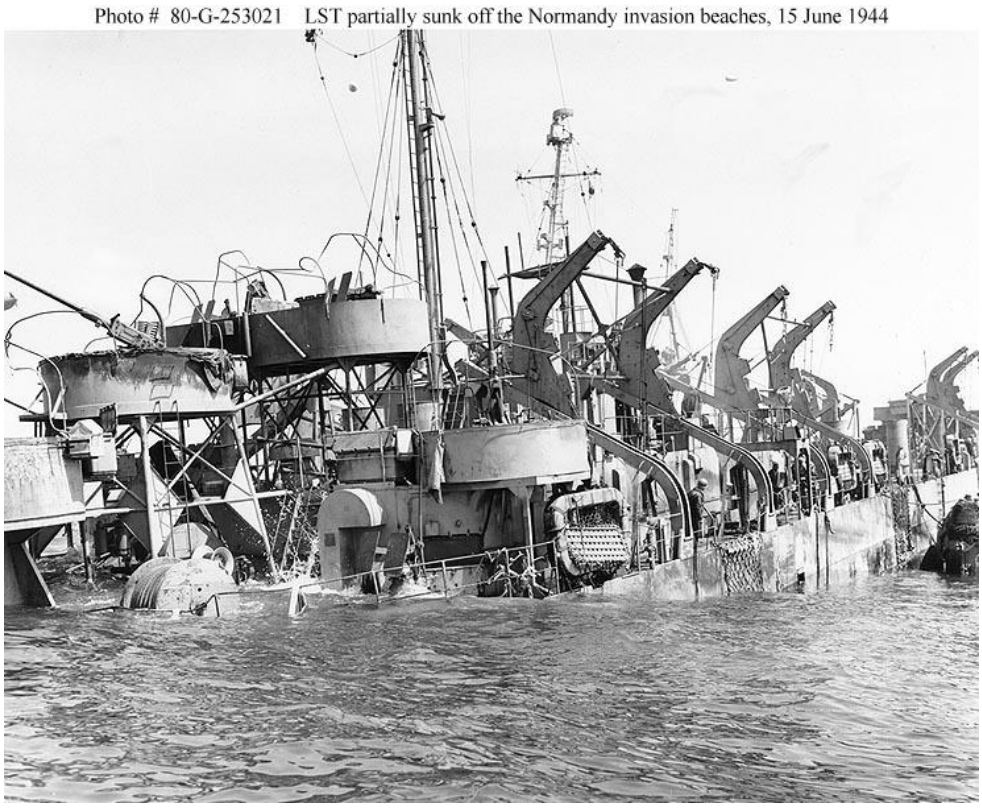

Figure 42 A partially sunken LST Normandy 15th June 1944. (© US PD)

Figure 43 Stern of partially sunken LST Normandy 15th June 1944. (© US PD)

8.4 Observations from an analysis of LST-499 reports

Observation 10 - LST-499 had unloaded her cargo of tanks and vehicles and had taken onboard injured personnel to be returned to England. She was manoeuvring off UTAH beach when the mine struck. No vehicles would have been present on the ship when it was hit by a mine.

Observation 11 - Attempts were made to pump out and re-float LST-499 which appear to have been abandoned after 27 June 1944.

Observation 12 - The location reported for the LST-499 **Position 49° 26' 24" N, 01° 10' 00"W** is in shallow water off UTAH beach and as such would have provided relatively easy access for salvor companies which were contracted to remove navigational hazards and recover valuable metal resources after the war. [46] It is noted that the position reported is very close to that believed to be the USS Charles Morgan. (49° 26.352'N 01° 09.99'W (WGS84)). The UKHO report for wreck no 23472 accessed via Wrecksite.eu[47] notes that significant US medical equipment was found on the wreck. This is consistent with the fact that LST-499 was carrying injured soldiers back to England when she struck a mine.

8.5 The Loss of USS LST-496

The research of historical documentation related to the loss of USS LST-496 provided signifcantly more details than that associated with the loss of USS LST-499 and LST-523. In particular, the report by the Senior Surviving Officer of LST-496 Lt O.A. Atkins USNR dated 4th August 1944[48] provided key information about the cause, nature and timing of LST-496 sinking. Lt Atkins also details the names, rank and service numbers of those aboard who were killed, injured or uninjured. This document provides signifcant details which are relevent to the hypothses of the identity of wreck.

LST-496 was carrying an LCVP Landing Boat Crew, LST medical Group 35, Foxy 29 and war correspondent Albert Q. Maisel from Cosmopolitan magazine. **The ship carried a complement of 142 enlisted men, 13 officers plus one Army medical officer. In a**ddition there were approximately 241 Army enlisted men and 17 Army Officers on board as passengers. [49]

In the report Lt Atkins confirms the ship left England at 0600 on 11th June 1944 with a full cargo of **mainly light and medium tanks but also containing a few half tracks, jeeps and two and a half ton trucks**. LST-496 was in convoy heading to **Dog Red sector, OMAHA beach.**

His report continues;

> *"At 2115 on 11th June, when the ship was approximately 6 miles from its destination, at least two mines were hit. There were two blasts almost simultaneously, but with enough delay to indicate there were two mines instead of one. These mines may have been of three types, contact, magnetic or acoustic.* ***The center of the blast was approximately at frame 43 about 15 feet inboard from the port side of the ship****. The damage to the ship was tremendous.* ***A hole, approximately 35 or 40 feet in diameter was blown through the bottom of the ship;*** *the blast extended upward actually blowing off a large part of the super-conn, boat davit number 6, its motor and etc. Since the blast was under the Officer's Country, tremendous damage was done*

[46] https://archeologie.culture.gouv.fr/epaves-debarquement/en/les-rois-de-la-ferraille

[47] https://www.wrecksite.eu/ukhoDetails.aspx?23472

[48] Accessed via US National Archives and Records Agency https://catalog.archives.gov/id/78551981 .

[49] LST-496 Muster Roll accessed via US National Archive catalogue https://catalog.archives.gov/id/126631645.

to most of this area. The main deck was blown open as far athwartship as the starboard bulkhead, forward into the wardroom and aft on the port side to Compartment 106. Upon hitting the mines, the auxiliary engine room was knocked out leaving the ship in complete darkness immediately. The main engine-room was also completely flooded in less than one minute."

"All officers of the ship's complement were either killed or injured. The number of casualties among the enlisted me was approximately 75%. Most of the officers and a high percentage of the men were incapacitated and therefore, because of injuries received, unable to take part in the actions following the blast. The Commanding Officer and Executive Officer were immediately killed when the mines were hit. Although water-tight integrity had been carefully set, it was immediately obvious , due to the tremendous damage to the ship, that it was only a matter of a short time before it would sink. The immediate problem was to get all men including those injured and dead off the ship as soon as possible. The cooperation received from other ships nearby was excellent. At least one corvette, two patrol craft and a destroyer escort came alongside to remove the injured before the ship sank. In addition, a large number of small boats were sent to the scene by various ships. With this excellent assistance, all men were removed from the ship before sinking. This included all injured and dead that could be located after several complete searches. It is believed however, that a few men were trapped, particularly in the main engine-room, since they are missing. All officers and men performed their duties efficiently and bravely in carrying out their duties in caring for the injured, removing them from the ship, and in abandoning the ship."

Lt Atkins adds;

"The last men to leave the ship were members of the ship's complement approximately five minutes before it sank. The ship remained afloat for approximately forty minutes."

Further accounts of the loss of LST-496 were made by other craft and vessels as follows;

USS LCI(L) 530, Flagship War Diary [50]

"11 June 1944

While at the stern of convoy EPL 4, investigating the craft destinations, it was noted an LST near the head of the column suffered an explosion and was sinking by the stern. En route, several craft were informed of the accident. PC's and small craft responded. AM's replied they were ordered to remain on station. Upon arrival at the scene, ***area C35, LST-496 was down by the stern with about one foot freeboard****, the bow about normal draft.* ***Port side of the deck house was badly wrecked****. PC 568 and 1332, and K79 were alongside revacuating casualities and 568, unwounded. Numerous LCVPs were nearby, having been landed from other LST's in convoy. No personnel were seen taken on them. DE 66 took position alongside to port when PC 1332 loaded backed away. This craft steamed off in direction of Omaha before check of personnel could be made.*

By 2147 the stern was completely awash.

At 2159 LCI(L)'s and two recue tugs arrived.

At 2206 LST-496 under tow by DE, K79.

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[50] During the Invasion of Normandy **USS *LCI(L)-530*** was redesignated ***LCH-530*** and served as flagship to CAPT. James E. Arnold, USNR, NOIC Utah Beach (TG 125.10 – Far Shore Service Group), in addition to transporting Staff and Headquarters Company of VII Corps from Dartmouth to the invasion beaches. Landing Craft Infantry LCI (navsource.org)

At 2210 salvage tugs commenced taking over. Remaining of LST convoy departed scene.

2218 ***LST turned completely over and submerged, except for bow portion, forty feet long, fifteen feet high****. No personnel were seen in the water."*

USS LST-350 reported

"at 2111, when about five miles off OMAHA beach, the LST-496 ahead of this ship in column, hit a mine. The explosion was on her port quarter. It seemed to lift the whole ship several feet. She immediately beganto settle by the stern with a port list. In about five minutes her fantail was awash. We signalled that we would come along her starboard side to take off survivors. On receiving the answer "Hurry" we headed in. When about 300 yards off her, a British corvette came up ahead of us and signaled us to stand off – she would go alongside. A PC came up and tied up to the 496's portside. We put over a boat to stand by if needed. Received two casualites. At 2219 the LST-496 capsized, rolling over on her port side."

USS RAVEN war diary[51] recorded;

*"2112 While RAVEN was preparing to anchor in position "***C33***" in eastern PRAIRIE (Inner Screen Overlay) the US LST-496, which was proceeding in convoy towards OMAHA beach, was observed to suffer a heavy explosion right under her propellors, bearing 114°T at 1500 yards distance from this ship. All engines were put ahead full and ship's company was called to Rescue of Survivors stations. A British corvette and several American SC's and PC's went alongside to remove the injured.*

2115 RAVEN arrived on scene and stood by at 500 yards distance. The stern of the LST-496 was seriously crumpled and settling rapidly. Various small craft were alongside removing the Army personnel on board. A U.S DE made fast along the port side of the 496 and removed additional personnel.

2210 – USS LST-496 capsized and sank as she was taken in tow by U.S Navy Tug ATA-125. It is believed that all survivors of the mine explosion had been removed at this time. No heavy equipment was salvaged."

USS BALDWIN (DD624) War Diary June 1944 page 2[52]

"*June 11, 1944*

2125 ***LST-496 hit mine near C-33 on screen grid****. Ordered by ANCON to investigate. 2220 On scene; found all survivors had been rescued by DE-66 (AMESBURY) and tug. Sent report to ANCON and proceeded to station No.49 on Dixie Line, previously assigned."*

USS KIOWA (AT2) ATR72/A12-1 serial no 31 page 2[53]**.**

"June 11

2146 underway to go to the assistance of LST-496. Ship sunk on arrival of this vessel. Planted marker buoy and returned to anchorage in assault area. Position 49° 26' 30" N, 01° 08' 30" W."

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[51] Accessed via US National Archives https://catalog.archives.gov/id/78601678?objectPage=14 NAID: 78601678 Note that LST is referred to as LST-495 in error.

[52] Accessed via US National Archives https://catalog.archives.gov/id/78508477?objectPage=2 NAID 78508477.

[53] Accessed via US National Archives https://catalog.archives.gov/id/78509749?objectPage=2 NAID 78509749.

USS ATR-47 report

"Sunday 11th June 1944.

2120 Observed LST on bearing 327T distant 4 miles, have underwater explosion; main engines started.

2136 Received orders from Shuttle Control in HMS CERES to proceed to assistance of USS LST-496 which had struck a mine.

2157 Alongside USS LST-496.

2207 10" hawser passed to bow of USS LST-496, now sinking fast by the stern, her after deck is awash, and she has a list to port. USS AMESBURY (DE-66) alongside to port removing Army and Navy personnel.

2210 Commenced towing USS LST-496 slowly.

2217 USS LST 496 capsized, rolling over to port, caused by loss of G.M., ship filling rapidly with water and her heavy deck cargo of trucks. USS AMESBURY made clear, having removed all personnel still aboard. After searching for additional survivors, finding none, we returned to vacinity of HMS CERES for further instructions."

USS PC-568 was on screening station 34 and reported (Action Report[54] dated 27 June 1944. Page 8.)

"June 11th 1944:

2120 Observed long piller of water and heard explosion in vicinity of US-LST 496.

2121 Proceeding to side of US LST-496.

2125 Alongside US LST-496.

2140 Standing Clear of US-LST-496.

2145 Received doctor from British LST-402.

2155 Received doctor from US LST-133. 2210 proceeding on orders from CTG 122.4 from USS Ancon with 198 survivors. Standing off from USS Ancon.

2232 proceeding in accordance with orders from USS Ancon to US LST-283. 2254 Secured alongside US LST-283 and beginning transfer of survivors.

June 13th 1944:

1050 ***Dropped depth charge on sunken LST-496 in accordance with orders from C.T.G 122.4.***

1100 Resumed patrolling station 34 in Area Screen."…

Part IV of the report;

"During the action described this vessel, although subject to enemy fire, was not hit. The only damage suffered was that caused by the US LST-496 which rolled against our starboard side as ***she gradually began turning over****."*

[54] Accessed via US National Archive catalogue https://catalog.archives.gov/id/78601646 NAID 78601646

USS PC-1232 PC-1232/A-4 Serial No.001 dated 30 June 1944[55]

> *"11 June*
>
> *2210 proceeded to LST-496 which appeared to have hit mine – 2243 went alongside LST-496 to pick up survivors. Took aboard five injured men, five uninjured men and four dead men. Underway to transfer men to hospital ship. 2305 moored alongside LST-283. Transferred survivors and returned to station.*

USS ATR-2 Operations during Assault phase of Neptune – Supplementary Report thereof dated 12 June 1944.

> *"D + 5 Day: LST-496* ***Dynamited bow, causing same to sink to clear channel.****"*

Commander 11th PHOBFOR – Report of Ops Perios 6/4-29/44 – Assault on Vierville – Colleville Sector, Coast of Normandy, France[56]

> *"12th June (D+6)*
>
> *1320 ATR-2 reported setting* ***of dynamite charge at 0157 to complete settling of LST-496. Bow settles at 0320." and***
>
> *"1455 Reported to CTG-122.4 that ATR-2 had exploded dynamite charge to complete settling of LST-496.* ***Depth of water at 1000 over LST was above 24 feet at low water****. Wreck marked but* ***ATR-2 suggested that a destroyer drop a few depth charges over it.****"*

LST-496 was carrying vehcles and men of the 2nd Armoured Division. In the report of the Office of the Division Commander concerning Operation Neptune APO 252 there is a report of an USS LST being lost due to enemy action in the period from D-Day to D-Day + 8 (ie 14th June 1944).

> *"During this operation one LST was sunk due to enemy action; this ship was contained thirty-one tanks and thirty-two other vehicles, all of which were lost. One hundred and twenty-eight survivors were returned to England and within thirty-six hours after being contacted by rear elements of the Division were re-equipped and on their way back to France. The replacement of the vehicular losses was difficult because of the shortage of replacement vehicles at this early stage of the operation, however these were soon replaced."*

In the 67th Armoured Regiment report APO#252 for Operational Report for the period 6 June – 30 June 1944 there is also reference to a mined LST on 11 June 1944. This is assumed to be LST-496 being the only LST lost that day.

> *"11 June 1944 - Regiment less detachments arrived at OMAHA beach about 1630 and landed shortly thereafter. Proceeded immediately to dewaterproof area, moved to assembly area about 1-1$^{1/2}$ miles West of [???] where the Regiment assembled. LST carrying "G" Company and part of Ho. Co., 3d Bn. And "C" Company struck floating mine at beach. Ship sunk within one hour with loss of lives, many injured, and complete loss of all vehicles and equipment on board."*

8.6 Observations from an analysis of LST-496 reports

Observation 13 - The ship is reported by several vessels to have fully capsized. This is consistent with the multibeam image of EA3152 which shows the upturned hull of the vessel.

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[55] Accessed via US National Archive https://catalog.archives.gov/id/78556528 NAID 78556528

[56] Accessed via US National Archives https://catalog.archives.gov/id/78542875 NAID:78542875 page 36.

Observation 14 - The details of the mine damage to LST-496 align closely with a breach to the hull that can be seen on the multibeam image of EA3152 when compared to the LST ship plan. There is a breach in the hull on the port side which is in the vacinity of frame 43 and beneath the Officers' quarters and bridge house.

Observation 15 - LST-496 was fully loaded with light and medium tanks and other vehicles. This is consistent with the vehicles found on the wreck EA3152.

Observation 16 - Following the capsize and sinking of LST-496, the bow of LST-496 remained above the surface of the water. The bow section was subsequently blown up with dynamite (ATR-2 12 June 1944) and depth charged (PC-568 13 June 1944). The damage caused by these actions is consistent with the debris field near the bow of the wreck in the multibeam image of EA3152.

Observation 17 - The position of the incident is reported as in the vacinity of C33 of the Screen Area of the Dixie Line.

Observation 18 - It is likely that the salvage operations conducted in 1961 included the recovery of the ship's propellers and may have also recovered artefacts from the ship resulting in further damage to the midships and bow area. Further details of the salvage activity may be held in French archives.

8.7 The Loss of LST-523

USS LST-523 had taken part in Operation Neptune designated to LST Group 49 and assigned to Division 97 to Force "Baker" initially based in Falmouth, England. initial

LST-523's first voyage to Normandy was to transport 35th Signal Construction Battalion to OMAHA beach on D-Day+1 7th June 1944.

In his personal account[57] of his time aboard LST-523 Bill Allen recollects that the ship made three return journeys to the Normandy beaches, and it was the ship's fourth sailing which ended with the ship being sunk. Bill Allen's recollection of the events of the ship loss are consistent with the historical reports found during our research.

LST-523 was carrying Army personnel and equipment from the 207th and 300th Combat Engineers to OMAHA beach when the ship is believed to have struck at least one mine, possibly two.

In his Action Report following the loss of his ship[58], **LST-523's Commanding Officer** (Lt H.H. Cross) provides details as follows.

> *"USS LST-523 Action report LST523/A16-3 (written from memory)*
>
> *After arriving with Follow-Up Force B-3 for the initial landing, LST-523 became a part of "Shuttle Force",*
>
> *On the 19th June 1944 Lt Cross was directed at 1245 pm to anchor off UTAH Beach. Fifteen minutes later, orders came from USS BAYFIELD to beach prior to 1330pm.*
>
> *"At 1303 the ship dropped anchor in ten fathoms of water to swing the ship in order to make a proper approach for beaching.*
>
> *At 1310* ***underway proceeding to beach****.*

[57] https://www.youtube.com/watch?v=YXxUseUSp0A&t=1599s

[58] Report reference LST523/A16-3

At 1315 ***terrific explosion of mine.***

The ***ship broke in two just forward of the superstructure****; the stern stopped dead in the water and began to settle.* ***The bow continued to make headway for approximately 600 yards."***

Lt Cross added that.

"The Commanding Officer was suspended from the halyards by his right leg and was unable to observe the actions of his crew."

The rescue of personnel onboard LST-523 was hampered by the arrival of stormy weather conditions. In a report by USS KIOWA (AT72) for the 19th June 1944 the problems encountered are detailed as follows.

"19th June Anchored in the assault area. Went to the assistance of LST-523 blown in half by a mine. Picked up six (6) survivors two of which were seriously injured. Attempted to transfer survivors to LST-285 but due to heavy weather was unable to remain alongside for transfer. The ship touched bottom lightly while alongside. Attempted to transfer patients by LCM but unable to effect due to heavy weather. Anchored in assault area with both anchors down to ride out northeast storm. Position 49° 26' 24" N, 01° 10' 00" W. Heavy artillery fire was observed in the OMAHA beach section which precluded transfers ashore. "

It was not until the evening of 22nd June that USS KIOWA was finally able to transfer the survivors of LST-523 to an LST going back to England.

Lt. Willett of **USS LST-56** reported the incident on 19th June 1944[59] as follows.

*"1310 - Sighted LST-523 off starboard quarter at approximately 1 ½ miles, having struck a mine****, split in two sections amidships and sinking****.*

1400 – Took aboard one Army survivor with broken leg from LST-523.

1420 – Dispatched Doctor and two Corpsmen to LCT-5 to assist with casualties.

1450 – Doctor and Corpsmen returned to ship.

USS LST-288 reported[60]:

"*1150 –* ***Off UTAH beach with LST-523 600 yards astern****. At 1301 felt impact of explosion and observed LST-523 in a sinking condition. Mine explosion appeared to have split the vessel in two parts just forward of the superstructure. Two boats in water were immediately dispatched to assist survivors."*

LCI(L) / LCH-419 also reported[61] the incident on 19th June:

"At 1256 the USS LST-523 struck a mine just aft of amidships and was blown completely in half. ***Both halves remained floating and drifted slowly apart, the stern half sinking much more rapidly than the forward half****. At the time of her accident, she was within 500 or 600 yards of us. As we were preparing to get underway and let an MT get out of the area, an LCVP came alongside and transferred casualties and survivors of the LST to us. We got underway to the hospital ship USS LST-285 to give them our charges. We moored alongside her starboard side in a choppy sea.*

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[59] Accessed via US National Archive catalogue https://catalog.archives.gov/id/78514242?objectPage=8 NAID 78514242.

[60] Accessed via US National Archive catalogue https://catalog.archives.gov/id/78509840?objectPage=4 NAID 78509840.

[61] Accessed via US National Archive catalogue https://catalog.archives.gov/id/78551955?objectPage=4 NAID 78551955.

For the next three hours we remained alongside the LST passing her our wounded and acting as a bridge across which the small craft could pass the casualties that they had picked up. Whilst moored in this fashion five of our six fenders were destroyed by the two ships pounding on each other. Our port ramp was battered until it was inoperative, and a small hole was punctured in the skin of the LST amidships. In trying to hold the two ships together, two of our six-inch lines were broken."

USS BANNOCK war diary reported on 19 June 1944[62]

"1307 underway and standing in near beach to assist in rescue of personnel of U.S.S LST-523, mined as it approached the beach for a landing.

1312 commenced steering various courses at various speeds standing by in vicinity of LST-523. Heavy seas made rescue difficult. Small landing boats taking the survivors from the water."

Subsequently, on the afternoon of 22nd June USS BANNOCK reported the salvage a 5,000-pound anchor and 110 fathoms of chain from USS LST 523. Attempts on 28th June to salvage equipment from LST-523 had to be abandoned due to heavy seas.

8.8 Post WW2 reports

In 2000, the US Naval History and Heritage Command, Underwater Archaeology Branch (UA) began a three-year archaeological remote-sensing project off the Normandy coastline, France. The outcome of this project is summarised by James S. Schmidt[63] the following comment is made which casts doubt on the assumed identities of the wreck of LST-496 and LST-523.

"Archival research and oral history interviews provide compelling evidence that the identities of LST-523 and LST-496 have been confused with one another."

In a Press Release dated June 2018[64] the US Defense Prisoners of War/Missing in Action Accounting Agency (DPAA) announced that the remains of a U.S. serviceman recovered during salvage operations in 1961, had finally been identified following advances in DNA technology. Navy Reserve Radioman 2nd Class Julius H.O. Pieper, 19, would be reburied alongside his twin brother in the US cemetery in Normandy. Both brothers had been killed when LST-523 hit a mine on 19th June 1944.

Pieper's twin brother, Radioman 2nd Class Ludwig J. Pieper, was also killed in the attack, but his remains were recovered after the incident and buried at the Normandy American Cemetery in France. Julius will be buried next to his brother.

In this press release the DPAA states that French salvage divers had 'dismantled' LST-523 in 1961. The use of the word 'dismantled' suggests that a significant proportion of the wreck was removed.

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62 Accessed via US National Archives catalogue https://catalog.archives.gov/id/78516045?objectPage=13 NAID 78516045.

63 https://www.history.navy.mil/research/underwater-archaeology/sites-and-projects/ship-wrecksites/remote-sensing-operation-neptune.html

64 https://www.dpaa.mil/News-Stories/News-Releases/Article/1548126/funeral-announcement-for-sailor-killed-during-world-war-ii-pieper-j/

8.9 Observations from an analysis of LST-523 reports

Observation 19 - The historical documents confirm that LST-523 was sunk on 19th June 1944 almost certainly as a result of striking a mine. LST-523 was positioned off UTAH beach having dropped her anchor and begun her approach to the beach.

Observation 20 - The explosion caused the ship to break in two just forward of the main superstructure or bridge area. Both parts of the ship continued to float for a period and slowly drifted apart by 600 yards. The stern sank first. The two sections of wreck are likely to be at least 600m apart. This account does not align with the wreck EA3252 which has the bow section in place.

Observation 21 - There are no reports to indicate that LST-523 capsized or turned over.

Observation 22 – LST-523 was transporting Army personnel and equipment of the 207th and 300th Combat Engineers not units from an armoured (tanks) regiment. LST-523 was not carrying tanks.

Observation 23 - LST-523 was salvaged in 1961 and was described as 'dismantled' by a US Department of Defense report.

8.10 Analysis of Historical Position of Wrecks

Historical positions given for the three USS LST lost in the area extracted from historical accounts and documentation above.

LST Number	Latitude	Longitude	Comment
LST-499	49° 26' 24"N	01° 10' 00"W	Ship was retracting from UTAH Beach having delivered cargo of equipment and men when she struck a mine. Ship had taken onboard many injured troops for return to England. Ship was refloated for a short time but later reported as a total loss.
LST-496	49° 30'N	00° 50'W	Approx 5 to 6 miles from destination (Dog Red – OMAHA Beach) struck mine near C33 Dixie Line. Sank 45 mins later. near C35. 6 to 5 miles from Grandcamp Light at a bearing of 220 degrees.
LST-523	49° 30'N	01° 10'W	Ship had deployed her anchor and was proceeding to UTAH Beach to offload. Ship broke in two pieces. The bow settled approximately 600 yards nearer to the beach.

Table 5 Historical reported positions of LSTs

Further historical details of the position of LST-496 and LST-523 can be found in a report of 'Mines, Minefields and Minesweeping for Operation Neptune' the in the Western Task Force Area during Operation Neptune.[65] The chronological record at Appendix 1 to Annex H of this report contains the following remarks.

[65] ALLIED NAVAL COMMANDER-IN-CHIEF, EXPEDITIONARY FORCE - Report of Naval Operations in the Invasion of Normandy, France, 6/6/44-7/3/44 Annex H Appendix 1 (page 542-547) – Mines and Minesweeping for Operation Neptune (C53967). NAID 101779483. Accessed via US National Archives catalogue https://catalog.archives.gov/id/101779483

Chart Serial Number.	Despatch Number.	Originator	Remarks
(27)	11---	C.T.G. 122.4	LST mined position C34
(28)	120125B	Com. L.S.T. Cr. 30	L.S.T. 496 mined and sunk position 6 to 5 miles 220° from GRANDCAMP Light.
(45)	191415B	C.F.T. 125	L.S.T. 523 destroyed by mine, position L54

Table 6 Extract from Appendix 1 - Mines and Minesweeping report for Operation Neptune

It is believed that the LST mentioned in serial number 27 is likely to be LST-496 as it is close to other reports of striking a mine in the area of C33.

The Mine Data Plot at figure 44 below, taken from this report[66] shows the position of LST-496 (#28) being closer to OMAHA beach to the east and the wreck of LST-523 (#45) being close to UTAH beach to the west. The chart also shows the position of the 'Dixie Line' and 'Screen Area' to the south of this line with positions established via the south of this line using letters 'A' to 'M' and east to west using numbers '1' to '60'. It is noted that there is no comment on the loss of LST-499 within this section of the report.

[66] https://catalog.archives.gov/id/101779483?objectPage=547

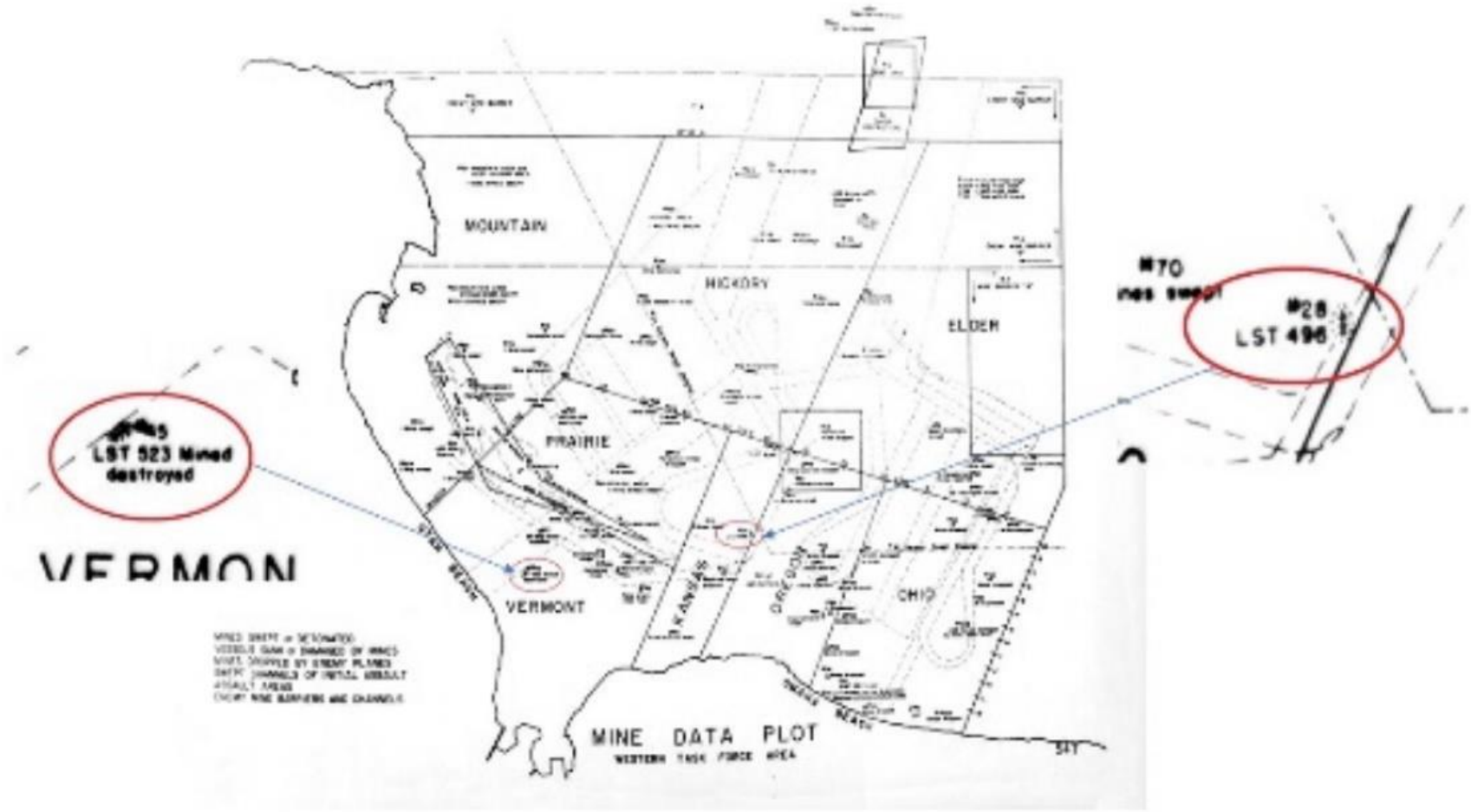

Figure 44 Mine Data Plot – Western Task Force Area extracted from the Report of Naval Operations. Annex H Appendix 1 Mine Data Plot

As noted at serial number 28 of the report (see Table 6 above) despatch number 120125B gives the position of LST-496 as follows;

"LST-496 mined and sank in position 6 to 5 miles 220° from GRANDCAMP light"

In the extract of the navigational chart in figure 45 below the bearing and distance from site EA3232 and EA3152 has been calculated.

The distance from the charted position of EA3232 (supposed LST-496) to Grandcamp Light is 12NM and the bearing is 235°. The distance is double that of the record and the bearing 15 degrees more than reported at the time for LST-496 position when wrecked.

The distance from the charted position of EA3152 (supposed LST-523) to Grandcamp Light is 6.2NM and a bearing of 211°. This position and distance is much closer to the archival official record mentioned above for the position of LST-496.

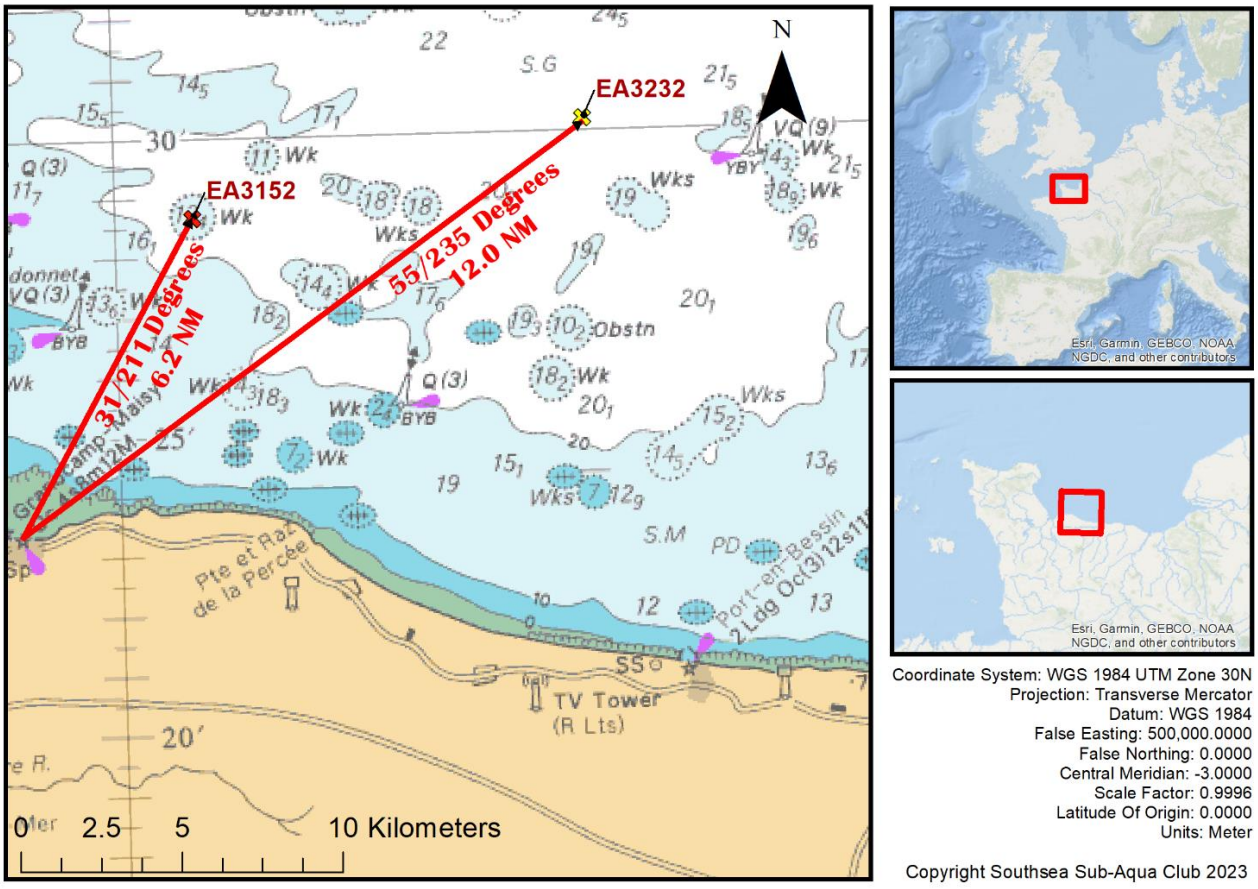

Figure 45 Bearing and distance to wreck sites from Grandcamp Light.

Observation 24 - The position of EA3152 closely aligns with the archival records for the loss of LST-496.

9. LST-496 and 523 Project – Final Conclusions.

The survey project of the two wreck sites has led us to believe that the wrecks have been wrongly identified for many years. The physical and archival evidence summarised by our observations 1 to 24, provide a compelling case for the wrecks being those of different vessels.

Our final conclusions are that.

Wreck EA3232 is not that of USS LST-496 but is possibly the remains of an LCM; and

Wreck EA3152 is not that of USS LST-523 but is that of USS LST-496.

Further research and investigation would be required to locate the remains of LST-499 and 523. Both ships are likely to have been heavily salvaged due to their reported proximity to the beach and being in relatively shallow water.

It is also noted that there was also a discrepancy on the charted position of the wreck of the USS Charles Morgan which closely aligns with the reported position of LST-499. However, this hypothesis would require further investigation to verify this possibility.

Our sincere gratitude goes to all who have helped us as part of the project, including those who have assisted behind the scenes with research and translation etc. We are also grateful for DRASSM financial assistance and for the patience shown as a result of domestic problems which significantly delayed the completion of this report.

In the 78th anniversary year of the D-Day landings we were privileged to have the opportunity to conduct this survey and thank DRASSM for the opportunity to complete this project.

Martin Davies

On behalf of Southsea Sub-Aqua Club.

Appendix 1 – Report of Loss - Casualty list USS LST 499

Appendix 2 – Report of Loss - Casualty List USS LST 496

Appendix 3 – Report of Loss - Casualty List USS LST 523

Annex A - Survey permission documentation.

Appendix 1 – USS LST-499 Report of Loss – Casualty List

The following Servicemen are reported to have been casualties of LST-499. Sources:

1) Captain A.C. Jacobs USNR Director of the Departments Welfare Division letter to Lieutenant E.F. Witte USNR reference Pers-5323a-asg dated 9 November 1944. Subject: List of Casualties of USS LST-499.
2) COMNAVEU (INVASION) (ATLANTIC) P-53512-CJM dated 5 July 1944 CTU 122.1.1...CTF 127
3) https://www.wrecksite.eu/peopleView.aspx?25fRwlsf7qBG1jeNCPz8eg== This web site provides details of 39 crew of LST-499 reported as having died and a link to details of the American cemetery/memorial.

Copies of the above documents (1 and 2) were kindly provided by the US Defense POW/MIA Accounting Agency (DPAA).

In compiling this list, the later dated document (1) has been used as the primary source and updated with service numbers from document 2. The total number of reported casualties from LST-499 ship's complement was 110 (12 dead and 98 wounded). An additional serviceman's death is listed in reference 3) and is listed separately below.

It has not been possible to establish how many injured servicemen who were aboard LST-499 to be transported back to England were killed as a result of the loss of LST-499.

Name	Rank or Rating	Service Number	Status
WITTE, Elmer Frederick	Lieutenant, USNR		Wounded
BERRY, George Elwood, Jr.	Lieutenant (jg), USNR	0-192 847	Wounded
BOYLSTON, Bedford Forrest	Lieutenant (jg), USNR		Wounded
SADLER, Henry Harrison, Jr	Lieutenant (jg), USNR		Wounded
COLE, Herbert Wesley	Ensign, USN	0-309 643	Wounded
ELLISON, Wayne Russell	Ensign, USNR		Wounded
NICCOLI, Russell Charles	Ensign, USNR	0-226 410	Wounded
RATTERMAN, Cletus Aloysius	Ensign, USNR		Wounded
REILLY, Thomas Edward	Ensign, USNR	0-312 653	Wounded
RICHARDSON, Montella Adrian, Jr.	Ensign, USNR	0-270141	Dead
TRIPPLE, Edgar Davis	Ensign, USNR	0-268 907	Wounded
AKER, Francis Joseph	Seaman 1c, USNR		Wounded
BECKER, Thomas Frederick	Motor Machinist's Mate 3c, USNR		Wounded
BENJAMIN, Edgar Logsdon	Motor Machinist's Mate 2c, USNR	867 24 24	Wounded
BOYD, Kenneth Joseph	Motor Machinist's Mate 1c,	633 89 71	Wounded
BRONK, Alfred Joseph,	Boatswain's Mate 2c, USN	225 10 75	Wounded
BROWN, Joseph Byron	Radioman 3c, USNR		Wounded
BROWNING, Billy Brooks	Seaman 1c, USNR		Wounded
BUSH, Edward Joseph	Fireman 2c, USNR	815 67 01	Wounded
CAMPBELL, Melvin James	Fireman 2c, USNR		Wounded
CANADA, Arthur Bradley	Motor Machinist's Mate 1c, USN	807 28 90	Wounded
CARLSON, Ellis Allarik	Fireman 2c, USNR	808 14 14	Dead
CASNER, John Joseph, Jr.	Seaman 2c, USNR		Wounded
CASSILLE, John Michael	Fireman 2c, USNR		Wounded

CONSTANTINEAU, Albert Henry	Boatswain's Mate 2c, USNR		Wounded
CORWIN, Robert Lee	Fireman 1c, USNR		Wounded
COSTANZO, Frank Charles	Seaman 2c, USNR		Wounded
COTTER, John Joseph	Seaman 2c, USNR	711 94 96	Wounded
COUNTERMAN, Alfred Benjamin	Seaman 1c, USNR		Wounded
COURSON, Frank, Jr	Seaman 1c, USNR	823 45 43	Wounded
CRAIG, James Thomas	Seaman 2c, USNR		Wounded
CUMBIE, Jack Earl	Seaman 1c, USNR	659 62 18	Wounded
DAGROSA, Joseph Patsy	Seaman 2c, USNR		Wounded
DANIEL, Amos Alton	Seaman 2c, USNR		Wounded
DAY, Ralph Wallace	Seaman 2c, USNR		Wounded
DE GRASSO, Angelo	Motor Machinist's Mate 2c, USN		Wounded
DE LOSO, Joseph	Seaman 2c, USNR	758 71 87	Wounded
DE LUCA. Dominick Paul	Seaman 2c, USNR		Wounded
DILLARD, Gordon Earl	Seaman 2c, USNR	657 38 74	Wounded
DOSS, Neal Douglas	Seaman 2c, USNR		Wounded
DWYER, Johnny Ransom	Radioman 3c, USN		Wounded
EAVES, Arnold William	Seaman 1c, USNR	832 77 74	Wounded
EDWARDS, Iclm Talmadge	Seaman 2c, USNR		Wounded
EMERSON, George Emmett	Seaman 1c, USNR		Wounded
EWALD, Donald William	Ship's Cook 3c, USNR	861 14 31	Wounded
FISHER, John Louis	Pharmacist's Mate 3c, USNR		Wounded
GALLAGHER, Michael Joseph	Boatswain's Mate 2c, USNR		Wounded
GIBILARO, Frank Joseph	Motor Machinist's Mate 2c, USNR	811 93 21	Wounded
HARRIS, Robert	Steward's Mate 2c, USN		Wounded
HARRISON, Gale Dewey	Seaman 2c, USNR	293 32 98	Wounded
HILL, Ralph Edwin	Coxswain, USNR	805 43 66	Wounded
HIXON, Samuel Ray	Motor Machinist's Mate 2c, USNR		Wounded
HOTCHKISS, John Thomas	Fireman 1c, USN	800 14 14	Dead
HOUGH, Joseph Francis	Motor Machinist's Mate 3c, USN	245 58 96	Dead
HURWITZ, Samuel	Seaman 2c, USNR	836 36 78	Dead
JOHNSON, Martin Adolf, Jr.	Seaman 1c, USNR		Wounded
KNISLEY, David Preston	Coxswain, USNR		Wounded
KOPERA, Edward Edmund	Yeoman 3c, USNR		Wounded
KOVACS, James	Motor Machinist's Mate 2c, USNR	820 89 28	Dead
KROCZYNSKI, Richard	Seaman 1c, USNR		Wounded
LEAR, James Thomas	Hospital Apprentice 1c, USNR		Wounded
LIGHTCAP, Gerald Lewis	Gunner's Mate 3c, USNR		Wounded
LYSAGHT, John Edward	Electrician's Mate 3c, USNR	646 40 83	Wounded
MAGNAN, Richard Joseph	Signalman, USN	801 31 66	Wounded
MALONEY, Richard Joseph	Seaman 1c, USNR	810 94 44	Wounded
MALOOF, Joseph John	Gunner's Mate 2c, USNR	807 40 29	Dead
MANN, Donald Edward	Seaman 1c, USNR	825 03 99	Wounded
MARKOVCY, Frank Brody	Seaman 1c, USNR		Wounded
MC CLEARY, John Barnard, Jr.	Motor Machinist's Mate 2c, USNR		Wounded
MC NEILL, Benjamon	Steward's Mate 1c, USNR		Wounded

MORAWE, William Ernest	Quartermaster 3c, USNR		Wounded
MORETTI, Anthony Marco	Gunner's Mate 3c, USNR	205 27 70	Wounded
MOULTRIE, Joseph Clyde	Ship's Cook 2c, USNR		Wounded
MOYER, Kermit	Motor Machinist's Mate 2c, USNR		Wounded
MUCCI, Frank Nicholas	Gunner's Mate 3c, USNR		Wounded
MURRAY, John Henry	Gunner's Mate 3c, USN	351 04 15	Wounded
NAVESTAD, Per Juel	Quartermaster 2c, USN	225 34 61	Wounded
NELSON, John Allen	Gunner's Mate 3c, USNR	634 45 51	Wounded
PAYNE, Okey Leonard	Radarman 3c, USNR		Wounded
PETERS, Samuel Donald	Motor Machinist's Mate 3c, USNR	245 53 06	Wounded
PEZZURO, Joseph John	Ship's Cook 3c, USNR		Wounded
PIPPIN, Hugh Heartwell	Seaman 1c, USNR		Wounded
PLUM, David Leo	Radioman 3c, USNR		Wounded
PREIS, Herman Louis	Storekeeper 3c, USNR		Wounded
RATLIFF, Jewel Barnard	Seaman 2c, USNR		Wounded
ROZSA, John Andrew Frank	Motor Machinist's Mate 3c, USNR	807 86 95	Wounded
SACKS, Leonard Morton	Hospital Apprentice 1c, USNR		Wounded
SERVIS, Francis Elwood	Seaman 2c, USNR		Wounded
SHIGLEY, Bertram Earl	Electrician's Mate 3c, USNR	851 66 03	Wounded
SHUMAKER, Ernest Daniel	Seaman 2c, USNR	263 73 03	Wounded
SILKS, John Noah	Seaman 2c, USNR		Wounded
SKIPPER, Jack Wilbur	Seaman 2c, USNR		Wounded
SLICK, Albert Roberts, Jr.	Seaman 1c, USNR	815 19 32	Wounded
SMITH, William David	Seaman 1c, USNR		Wounded
SOUTHER, Nelson Luther	Seaman 1c, USNR	892 85 70	Wounded
SPENCE, Noah James, Jr.	Seaman 2c, USNR	263 72 62	Wounded
SPICER, Gordon Ray	Seaman 2c, USNR		Wounded
STAMPS, Grover Cleveland, Jr.	Seaman 2c, USNR		Wounded
STANFIELD, Ralph Henry	Fireman 2c, USNR	893 31 48	Dead
STEED, Thomas Garrison	Seaman 2c, USNR		Wounded
STEPHENSON, Alvin William	Seaman 1c, USNR		Dead
STONE, Albert Lindsay	Seaman 1c, USNR	833 99 82	Wounded
STRUB, Otto Charles, Jr.	Pharmacist's Mate 1c, USNR		Wounded
SUSANEK, Joseph John	Seaman 2c, USNR		Wounded
TINSLEY, Grady Jerome	Seaman 2c, USNR	892 84 87	Dead
TRUNK, William Burge	Motor Machinist's Mate 1c, USNR	633 60 08	Dead
VOGT, John Reuel	Coxswain, USNR	653 73 53	Wounded
WALKER, Franklin Dallas	Seaman 2c, USNR	756 06 64	Wounded
WIGGINS, William Harold	Seaman 2c, USNR	865 12 11	Wounded
WORRELL, William Warren	Electrician's Mate 3c, USN	301 11 92	Dead

Table 7 List of casualties reported for US LST-499 derived from References 1 and 2.

Additional name from source reference 3 above.

Name	Rank or Rating	Service Number	Status
ARNOLD, Lloyd Frederick	Hospital Assistant 1c	828 13 84	Dead

Table 8 Additional casualty of LST-499 reported under Reference 3.

Appendix 2 – USS LST-496 Report of Loss – Casualty List

The following Servicemen are reported to have been casualties of LST-499. Sources:

1) Lieutenant Ozell A. Atkins, USNR, Senior Surviving Officer, USS LST-496 Report of Action 11 June 1944 and subsequent correspondence. https://catalog.archives.gov/id/78551981
2) https://www.wrecksite.eu/peopleView.aspx?o1BcQjEWmd9Iuk2diLOcdQ== Although not an official record, this website includes some additional names (listed separately below) and link to the American Cemetery. It is noted that these personnel were initially reported as missing but later declared dead after Lieutenant Atkin's Report of Action.
3) It is noted that https://www.navsource.org/archives/10/16/160496.htm U.S. Navy casualties are reported as 15 Killed in Action and 85 Wounded in Action, U.S Army casualties, 14 Killed in Action and 14 Wounded in Action.
4) One of the Army personnel killed was First Lieutenant Brigido Gonzales of the2nd Armored Division, 67th Armored Regiment, Company C (Service Number: 0-1012253). Details on the NHD web site indicate that 8 Army personnel were killed when LST-496 sank. https://nhdsilentheroes.org/profiles/brigido-gonzalez/

Lt Akins reports the following casualties from LST-496 complement of officers and enlisted ratings. A total of 8 killed, 10 missing (presumed killed), and 101 injured. This report was subsequently clarified in respect of two ratings (WATTS and VELLACICH) see note * and ** below. Those initially reported Missing were later declared Dead.

Name	Rank or Rating	Service Number	Status
KOCH, Stanley Heiberg	Lt., D-V(S), USNR	0-144 900	Dead
HARTUNG, Frederick Abram II	Lt., D-V(S), USNR	0-252 062	Dead
HENDERSON, Charles H., Jr.	Lt. (jg) MC-V(G) USNR	0-137 550	Dead
McARTHUR, Farish Doff	Ensign D-V(G)	0-269 939	Dead
ATKINS, Ozell A.	Lt., D-V(G)	241 888	Wounded
SZYLEJKO, Henrich W.	Lt. (jg) MC-V(G)	200 199	Wounded
BOOTH, Russell (n)	Ensign, USN	285 723	Wounded
RICHARDSON, Arleigh D., III	Ensign D-V(G), USNR	256 519	Wounded
McKEON, Thomas B., Jr.	Ensign D-V(G), USNR	269 959	Wounded
SCOTT, Rex Harold	Ensign D-V(G), USNR	312 737	Wounded
SCHNAPP, J. B.	Ensign D-V(G), USNR	312 722	Wounded
MERCIER, Emmett J.	Ensign D-V(S), USNR	271 233	Wounded
MAXWELL, Herman M.	Ensign D-V(S), USNR/ Lt., (jg)	271 968	Wounded
BOYETTE, Robert Dunn	Seaman 1c, USNR	657 84 73	Dead
CLIPPARD, James Benton	Seaman 1c, USNR	829 73 20	Dead, 6 June 1944 ****
PEACOCK, Edward Lloyd	Chief Commissary Steward, USNR	556 15 33	Dead (Died of wounds 6 July 1944)****
WATTS, Henry Harry, Jr.	Seaman 2c, USNR	805 56 59	Dead **
BONCHACK, Fred Philip	Motor Machinist's Mate 3c, USNR	822 72 29	Missing, later declared dead 12 June 1945 ****

DAVIS, George Gordon	Gunner's Mate 3c, USNR	709 68 73	Missing, later declared dead 12 June 1945 ****
EVANS, Lenard Lester	SC3c, USNR	870 41 59	Missing, later declared dead 12 June 1945 ****
EZELL, Oceamus (n)	Steward's Mate 2c, USNR	939 89 37	Missing, later declared dead 12 June 1944****
GOODMAN, Douglas Donald	Seaman 1c, USNR	576 14 82	Missing, later declared dead 12 June 1945 ****
HANSEN, Stansel "H"	Motor Machinist's Mate 3c, USNR	875 87 12	Missing, later declared dead 12 June 1945 ****
JOHNSON, Herman Commodore	Steward 3c, USNR	836 85 28	Missing, Dead 12 June 1944 ****
LIPETZKY, Cletus Foy	Motor Machinist's Mate 2c, USNR	730 19 54	Missing, later declared dead 12 June 1944 ****
STRIPLING, Charles (n)	Steward's Mate 2c, USNR	560 91 90	Missing, later declared dead 12 June 1945 ****
WEBER, Louis Joseph	Seaman 2c, USN	378 40 08	Missing
ANDREWS, Russell Everett	SM3c, USNR	807 44 37	Wounded
BAKER, James Earle	PhM2c	604 48 97	Wounded
BEINLICH, Hororius August	GM3c, USNR	853 63 93	Wounded
BERRY, John Russel	BM2c, USNR	408 84 42	Wounded
BIRDSONG, Emmett Bendall	MM2c	659 05 02	Wounded
BOSICK, Peter Charles	EM3c, USNR	817 62 63	Wounded
BREJNAK, Walter Joseph	EM3c, USNR	862 67 04	Wounded
CHEW, Albert John	Seaman 1c, USNR	815 17 09	Wounded
DERBY, Frank Dabney	GM3c, USN	266 60 30	Wounded
DEVILLE, Arnold Anthony	GM3c, USNR	644 62 56	Wounded
DOMANSKI, Walter (n)	GM3c, USNR	224 84 45	Wounded
DOUGHTIE, Mack (n)	EM3c, USNR	834 79 47	Wounded
EBERT, William John, Jr.	Seaman 1c, USNR	821 35 45	Wounded
EVANS, Tom Curtis	StM2c, USNR	939 89 14	Wounded
FEWELL, John Richard, Jr.	EM3c, USNR	637 86 06	Wounded
FRELUND, Roy Walter	MoMM2c, USNR	621 69 25	Wounded
FROST, Francis Nolan	MoMM2c, USNR	865 84 81	Wounded
GASIOROWSKI, Clarence Frank	MoMM3c, USNR	851 77 11	Wounded
GAUL, Albert Michael	MoMM2c, USNR	817 43 31	Wounded
GERMAIN, Owen "E"	MoMM3c, USNR	800 07 71	Wounded
GIBLIN, John Joseph	MoMM2c, USN	202 08 07	Wounded
GOULD, William Francis	Coxswain, USNR	810 18 43	Wounded
HERSTEIN, Edward (n)	F1c	871 82 44	Wounded
KING, Thomas William	MoMM2c, USNR	642 79 69	Wounded
KRETZSCHMAR, Theodore Richard	MoMM2c, USNR	707 85 30	Wounded

LANIGAN, John Joseph	MoMM1c, USNR	710 57 11	Wounded
LATON, HOYLE Mabon	MoMM1c, USNR	834 26 03	Wounded
LEE, Edwin Davis	MoMM2c, USNR	637 18 26	Wounded
LOHMAN, Arthur Edwin	MM2c, USN	329 28 52	Wounded
MANGION, Charles (n)	Quarter Master 2c, USNR	643 20 90	Wounded
McDERMOTT, Vincent Patrick	Coxswain, USNR	814 27 20	Wounded
MEDLIN, Lynn Greer	Yeoman 3c, USNR	631 03 46	Wounded
MORROW, Kenneth Samuel	PhM2c, USNR	250 18 55	Wounded
NESTER, Victor Joseph	SF2c, USNR	706 80 71	Wounded
NORDSTROM, Robert Theodore, Jr.	SK3c, USNR	757 63 13	Wounded
ORR, Dorsey Bunn	RM3c, USNR	628 78 07	Wounded
ROBERTS, Thomas Elvin	Seaman 2c, USNR	966 13 82	Wounded
RUBIN, Emanuel Charles	SM3c, USNR	810 44 26	Wounded
SANDOR, Joseph Raymond	SF3c, USNR	895 86 43	Wounded
SCOTT, Sammie William	SC2c, USNR	630 52 67	Wounded
SICKER, Leonard John	Seaman 1c, USN	249 76 56	Wounded
SILER, Anthony John	Seaman 1c, USNR	854 86 87	Wounded
SIMPSON, Eli Wilse	Seaman 2c, USNR	856 34 90	Wounded
STAMPFLER, Frank E.	Quarter Master 3c, USNR	703 16 84	Wounded
STROWGER, Kenneth MacKonachie	RM 3c, USNR	874 80 57	Wounded
TASCHNER, Earl James	RM 3c, USNR	653 66 36	Wounded
TASSINO, Gaetano Louis	Seaman 2c, USNR	800 97 76	Wounded
TRAWICKI, Joseph (n)	Seaman 2c, USNR	306 46 10	Wounded
ULLMER, Walter Eugene	Seaman 1c, USNR	851 10 37	Wounded
UPTAGRAFFT, Jackson (n) Jr.	Seaman 1c, USNR	837 86 43	Wounded
VANDUSEN, Harold Gordon	Seaman 2c, USNR	293 27 71	Wounded
VELLACICH, John Thomas	Coxswain, USNR	869 06 50	Dead**
VLAROS, Tassos Lukas	Coxswain, USNR	854 14 39	Wounded
VUKOVICH, Joe Michael	Seaman 2c, USNR	858 47 37	Wounded
WADDINGHAM, John Melvin	Seaman 1c, USNR	895 75 21	Wounded
WAHLRAB, Edward Leo	Seaman 1c, USNR	613 51 19	Wounded
WALDRON, George Franklin	Coxswain, USNR	312 95 84	Wounded
WALKER, Joseph Hamilton	Seaman 1c, USNR	846 03 39	Wounded
WALSH, James Raymond	Seaman 2c, USNR	818 71 87	Wounded
WARDINSKI, Norbert (n)	Seaman 1c, USNR	868 44 40	Wounded
WARNER, Joseph Russell	Seaman 2c, USNR	225 40 14	Wounded
WATERMAN, James Vernon	Seaman 1c, USNR	757 76 37	Wounded
WATERS, Roy Thomas	Seaman 2c, USNR	864 31 20	Wounded
WEAVER, James Ellis	Seaman 1c, USNR	837 88 29	Wounded
WEBER, Harold Allen	Seaman 2c, USNR	855 36 12	Wounded, missing later declared dead12 June 1945 ****
WHITCOMB, Harry Milton	Seaman 1c, USNR	667 26 23	Wounded
SCHIFF, Irwin James	Seaman 1c, USNR	851 52 05	Wounded
BARTASI, George Joseph	MoMM2c, USN	810 17 64	Wounded
BRASSE, Harvey Francis	Seaman 2c, USNR	758 65 44	Wounded

BREWSTER, Philip James	Seaman 1c, USNR	800 46 02	Wounded
BURCHETT, Gallard Lee	Seaman 1c, USNR	658 63 43	Wounded
DAVIS, Walter Morris	MoMM2c, USNR	666 96 68	Wounded
HAGER, Charles Henry	Seaman 1c, USNR	827 11 28	Wounded
HENKLEMAN, Richard Gordon	Seaman 1c, USNR	256 58 32	Wounded*
MISSELE, Fred Francis	Seaman 1c, USNR	853 46 92	Wounded
OCHS, Raymond Francis	F1c, USNR	203 61 43	Wounded
WELCH, William Richard	Seaman 2c, USNR	601 48 78	Wounded
TIERNEY, Joseph Augustus	Seaman 1c, USNR	711 89 22	Wounded
BARSHAY, Berbard (n)	HA1c, USNR	811 45 67	Wounded
CARROLL, Nelson Lawrence	HA1c, USNR	245 91 50	Wounded
CASSIDY, James William III	Ph3c, USNR	256 58 03	Wounded
ELLIOT, Lester Lloyd	HA1c, USNR	814 61 44	Wounded
FAILLA, Emanuel John	HA1c, USNR	814 80 71	Wounded
KEAST, Bert Francis	HA1c, USNR	820 59 36	Wounded
KELLY, Francis James	HA1c, USNR	762 26 40	Wounded
MARTIN, Earl Houston	PhM3c, USNR	726 63 25	Wounded
O'BRIEN, Ernest Roy	HA2c, USN	234 46 35	Wounded
QUATTROCHI, Joseph Angelo	HA1c, USNR	814 41 36	Wounded
REDGATE, Robert Emmet	PhM3c, USNR	808 87 52	Wounded
ROZZANO, Sam Frank	HA1c, USNR	800 37 75	Wounded
SARDILLI, Angelo Peter	HA1c, USNR	807 85 06	Wounded
SWARK, Harold Floyd	CPhM(AA), USN	291 55 43	Wounded

Table 9 List of casualties and wounded personnel for LST-496 derived from references 1, 2, 3 and 4.

* (HENKLEMAN wounded during enemy action prior to 11 June 1944)

** (VELLACICH, John Thomas - was later confirmed as killed and WATTS, Henry Harry, was reported on 9th June 1944 to have died while unloading at OMAHA Easy Red Beach by a falling LST elevator.) https://catalog.archives.gov/id/78551981?objectPage=10

*** https://www.therecordlive.com/story/2019/07/16/news/orange-county-family-awaits-wwii-sailors-discovery/27844.html

**** amended in the light of advice from US DoD.

Additional casualties listed at Reference 2.

Name	Rank or Rating	Service Number	Status
ATHANS, George	Ship's Cook 3c, USNR	707 67 53	Missing -later declared dead 2 Oct 1944
BARNHARDT, William Russell	Motor Machinist's Mate 2c, USNR	650 76 27	Missing – later declared dead 2 Oct 1944
DANA, Charles Anderson	Ensign, USNR	0-293765	Missing -later declared dead 2 Oct 1944
NICHOLSON, Calvin Elwood	Seaman 1c	245 18 28	Missing -later declared dead 2 Oct 1944

Table 10 Additional LST-496 casualties listed at Reference 2.

In addition, at paragraph 5(b) of his report, Lieutenant Atkins estimates casualties of Army personnel onboard at the time as “an estimated eight Officers killed and four injured. Enlisted Army men as six killed and ten injured.”

Whilst a definitive casualty list may not exist, there was significant loss of life and injury as a result of LST-496 striking the mine on 11 June 1944 with up to 24 who are likely to have perished in the light of the two lists above. Many more are reported as wounded.

Appendix 3 – USS LST-523 Report of Loss – Casualty List

The following Servicemen are reported as fatalities of LST-523. It has proved difficult to locate official records to confirm casualties (dead, missing and wounded). Other sources have therefore been used:

1. https://navylog.navymemorial.org/lst-523?page=1 Compiled by CAPT R.O. Strange USN (Ret.) this web page notes that 43 servicemen lost their lives as a result of LST-523 striking a mine on 19 June 1944. Forty names are listed.
2. The U.S. Navy at Normandy, Fleet Organization and Operations in the D-Day Invasion by Greg H. Williams ISBN 978-1-4766-4037-2 (e-book). This book provides details of 44 servicemen who died.
3. https://www.wrecksite.eu/peopleView.aspx?WXT6aTyx3zNK3l090BUhFA== This web site provides details of 39 crew of LST-523 as having died and a link to details of the American cemetery.
4. Attachment (spreadsheet) to US DoD Historian Christine T Cohn email to Alison Mayor dated 2 June 2023 with names of those Army personnel who were killed when LST523 sank. The list was compiled from the deceased personnel files of the missing that were created in the post-war investigation period. It forms the main list below.
5. lst-523 crew list - Navy, Marine Corps, and Coast Guard Records Forum - Navy, Marine Corps, and Coast Guard Records - History Hub In a recent post on this forum Jo Shipley includes a list of the members of the 300th Engineering Combat Battalion who died on June 19th, 1944. Most are listed on the Tablets of the Missing at the Normandy cemetery. Approximately 9 have burial sites at the cemetery. Jo has included members of the 300th ECB who died later and are buried in the Normandy Cemetery. A total of 91 names are listed, many of those appear in the documentation provided by US DoD at reference 4. However, several additional names are included which have been listed separately below.

Name	Rank or Rating	Service Number	Status
BAGLIERI, Sylvester Frank	Seaman 2c	711 79 48	Reported missing; declared dead 20 June 1945
BARTELS, Richard John	Motor Machinist's Mate 3c	225 46 66	Reported missing; declared dead 20 June 1945
BOLEN, William Franklin	Coxswain	636 49 04	Reported missing; declared dead 20 June 1945
CARNEY, William Henry, Jr.	Gunner's Mate 2c	640 14 15	Reported missing; declared dead 20 June 1945
CEPLECHA, Theodore Charles	Fireman 1c	870 70 38	Dead
CLAIR, Charles Elmer	Fireman 2c	859 80 08	Reported missing; declared dead 19 June 1945
DAMIRGIAN, Homer	Ensign, USNR	0-311956	Reported Missing; declared dead 20 June 1945. Not listed at Reference 3.
DAVIS, Melvin Loyd	Motor Machinist's Mate 1c	623 16 96	Reported missing; declared dead 20 June 1945
DILLENBURG, Charles Mathias	Watertender 1c	610 85 44	Reported missing; declared dead 20 June 1945

FARMER, Roy Eugene	Fireman 1c	859 68 04	Reported missing; declared dead 20 June 1945
FLOWERS, Hubert	Seaman 2c	896 85 68	Reported missing; declared dead 20 June 1945
FORRESTER, William Kenneth	Fireman 1c	873 44 39	Reported missing; declared dead 20 June 1945
GLAPION, Ferdinand Albert, Jr.	Steward's Mate 1c	645 58 63	Reported missing; declared dead 20 June 1945
GLENN, Richard Louis	Quarter Master 1c	250 73 74	Reported missing; declared dead 20 June 1945
GRAHAM, John McAvory	Pharmacist's Mate 1c	404 96 26	Reported missing; declared dead 20 June 1945
GREEN, Charles Putnam	Yeoman 2c	815 15 79	Reported missing; declared dead 20 June 1945*
GRIFFITH, William M.,	Ensign, USNR	0-309702	Dead
HALTNER, Michael Adolph	Motor Machinist's Mate 3c	813 16 29	Reported missing; declared dead 20 June 1945
HARSEY, Heber Vance	Electrician's Mate 3c	829 23 43	Dead
HATFIELD, Harry	Motor Machinist's Mate 2c	711 02 91	Reported missing; declared dead 20 February 1945
HILL, Ira Lew	Coxswain	245 96 13	Reported missing; declared dead 20 June 1945
IVEY, Thomas Melvin,	Quarter Master 3c	755 03 78	Dead
JACOBS, Robert James	Ship's Cook 2c	204 76 08	Reported missing; declared dead 20 June 1945
KOOS, George	Motor Machinist's Mate 2c	857 69 23	Dead
LAZZARA, Anthony John	Seaman 2c	609 27 35	Reported missing; declared dead 20 June 1945
LEWIS, Harvey Howard	Seaman 2c	895 47 29	Reported missing; declared dead 20 June 1945
LITTLE, Hamilton Archie	Seaman 1c	827 20 64	Reported missing; declared dead 20 June 1945
LOFTON, John	Seaman 1c	896 94 60	Reported missing; declared dead 20 June 1945
MILLER, John Jacob, Jr.	Pharmacist's Mate 1c	283 41 44	Dead
MYRON, Robert Elmer	Ensign, USNR	0-279463	Dead
PIEPER, Julius Heinrich Otto	Radioman 2c	648 85 23	Reported missing; declared dead 20 June 1945
PIEPER, Ludwig Julius Wilhelm	Radioman 2c	648 85 22	Dead
REGAN, Linus William,	Ensign, USNR	0-286659	Not listed at Ref 3. Missing declared dead 20 June 1945 **
REIFERT, Elroy Edward	Seaman 1c	862 71 17	Dead

RUTHERFORD, Harold	Motor Machinist's Mate 3c	834 88 41	* Name not listed in reference 1 or 3. ** Dead ***
SILVA, Frank	Fireman 1c	803 02 88	Reported missing; declared dead 20 June 1945 **Dead
SIMMONS, Asbell	Steward's Mate 3c	939 88 96	Reported missing; declared dead 20 June 1945
STABILE, Vito Vittorio	Lt. (jg) MC, USNR	0-139772	Dead * Name not listed in reference 1.
STARBUCK, James Ghent	Chief Pharmacist's Mate	261 28 45	Reported missing; declared dead 20 June 1945
STURM, William C	Seaman 1c	896 05 68	* Name not listed in reference 1 or 3 ** Dead 7 June 1944 ***
SULLIVAN, John Patrick	Storekeeper 1c	208 79 52	Declared Dead 19 July 1944
VOGEL, Frank Arthur	Ensign	0-314384	Reported missing; declared dead 19 July 19445
WHITLEY, Vernon Edgar	Seaman 1c	263 71 66	* Name not listed in reference 1 or 3 ** Dead 7 June 1944 ***
WILLIAMS, Joseph Ralph	Motor Machinist's Mate 1c	626 62 74	Reported missing; declared dead 20 June 1945

Table 11 List of US Navy casualties for LST-523.

* The Journey of LST-523 «Tribute to my Father Tribute to my Father (wordpress.com)

** Amended in the light of information from US DoD.

*** It is believed that Harold RUTHERFORD, William STURM and Vernon WHITLEY may have been killed as a result of an earlier incident on 7th June 1944 and not as a result of the sinking of LST-523.

Army Personnel Losses

In respect of Army casualties LST-523 was carrying members of the 207th Combat Engineers and 300th Combat Engineering Units. The casualty figures for Army personnel are very high.

The After-Action report (Phase II) for 207th Combat Engineers dated 27th September 1944, provides a summary of losses from the sinking of LST-523 as follows.

a. "Officers 2 Missing in Action[67], 1 Lightly Injured in Action, 1 Returned to Duty

[67] One officer, Captain Elmer L. Reitz, 01 110 210 is noted as Missing in Action 19th June 1944.

b. Enlisted Men 4 Killed in Action, 14 Missing in Action, 7 Seriously Injured in Action, 1 Seriously Wounded in Action and 5 Lightly Wounded in Action. 9 men Returned to Duty with other units and 41 men Returned to Duty with 207th Engineers."

In his After-Action report 300th Combat Engineers dated 6th February 1945 (page 3), 1st Lt. Warren W Dray includes a paragraph summarising the Unit's casualties associated with LST-523 striking a mine and sinking.

> *"On 19 June 1944 U.S. LST No. 523 carrying the second wave of this organisation to France, (6 Officers and 195 EM) struck an underwater mine off the coast of UTAH BEACH, France, and sank. By 30th June 1944 approximately 40 survivors had returned to duty. 169 Officers and Enlisted men missing in action. "*

At Reference 4 above the following 90 names and details are provided for Army Officers and Enlisted Men of 207th (twelve) and 300th Combat Engineers plus one medical officer from 115 Station Hospital – 311th Dispensary.

Last Name	First Name	MI	Suffix	Rank	Service Number	3rd Echelon	Date of Death
BELTRAMI	Michael	J		Tec 5	33458812	207th Engineers	19 June 1944
BERDOSH	John		Jr	PFC	35091388	207th Engineers	19 June 1944
COWAN	Richard	E		TEC 5	35601979	207th Engineers	19 June 1944
JACKSON	Woodrow			TEC 5	35473897	207th Engineers	19 June 1944
MARTALUS	John	P		SSG	33144579	207th Engineers	19 June 1944
MCCUBBIN	David	V		PFC	35695346	207th Engineers	19 June 1944
MOWERY	Donald	G		PVT	35091458	207th Engineers	19 June 1944
REITZ	Elmer	L		CAPT	O-1110210	207th Engineers	19 June 1944
SULLIVAN	Edward	J		MSG	36034857	207th Engineers	19 June 1944
THOMPSON	Buford	L		PFC	34686225	207th Engineers	19 June 1944
WEAVER	Daniel	B		PVT	31381404	207th Engineers	19 June 1944

IANNARINO	Charles	A		PVT	35625946	207th Engineers	19 June 1944
MCCLAIN	William	E	Jr	CAPT	0-480526	115 Station Hospital - 311th Dispensary	19 June 1944
Akin	Dennis	M		Private	38451421	300th Engineers	19 June 1944
Alexander	Clifford	C		Technician 5th Grade	38399159	300th Engineers	19 June 1944
Baker	William	F		Private	38400331	300th Engineers	19 June 1944
Baltrukonis	Vincent			Private	35919655	300th Engineers	19 June 1944
Barraza	Bernardo	M		Private First Class	38454240	300th Engineers	19 June 1944
Barron	Harry	E		Captain	0-1105981	300th Engineers	19 June 1944
Basney	Donald	C		First Lieutenant	0-1113564	300th Engineers	19 June 1944
Blankenship	Dwight	L		Private	38432054	300th Engineers	19 June 1944
Bumpass	James	W		Private	38451732	300th Engineers	19 June 1944
Caldwell	Dewey	J		Staff Sergeant	33005815	300th Engineers	19 June 1944
Calhoun	John	H		Private	38056594	300th Engineers	19 June 1944
Cantu	Andrew	P		Private	38453998	300th Engineers	19 June 1944
Cochran	Andy			Private First Class	38466182	300th Engineers	19 June 1944
Courtney	John	D		Private	38416529	300th Engineers	19 June 1944
Crout	Horace	D	Jr.	Private	42028501	300th Engineers	19 June 1944

Di Iorio	John	D		Corporal	38416545	300th Engineers	19 June 1944
Drozd	Leo	M		Private	38432067	300th Engineers	19 June 1944
Durbin	William	R		Technician 5th Grade	38465845	300th Engineers	19 June 1944
Eastteam	William			Technician 5th Grade	38272666	300th Engineers	19 June 1944
Embleau	Phillip	W		Private	37518098	300th Engineers	19 June 1944
Flick	Thomas	W		Private First Class	33675075	300th Engineers	19 June 1944
Flores	Alfonso	R		Private First Class	38454516	300th Engineers	19 June 1944
Foraker	Joseph	W	Jr.	Corporal	38432264	300th Engineers	19 June 1944
Galloway	George	R		Sergeant	38451333	300th Engineers	19 June 1944
Galloway	Orville	C		Technician 5th Grade	38451908	300th Engineers	19 June 1944
Garza	Rafael	G		Private	38454114	300th Engineers	19 June 1944
Gerard	Albert			Private	33674953	300th Engineers	19 June 1944
Gill	Manuel	H		Private	38032435	300th Engineers	19 June 1944
Gonzales	Servando			Private	38453138	300th Engineers	19 June 1944
Gray	Marvin	A		Technician 5th Grade	32664303	300th Engineers	19 June 1944
Haller	Charles	M		First Lieutenant	0-1110529	300th Engineers	19 June 1944
Hancock	Harold	W		Sergeant	38431756	300th Engineers	19 June 1944
Hankins	Douglas	G		Corporal	38416505	300th Engineers	19 June 1944

Haught	Olaf	R		Private	38451953	300th Engineers	19 June 1944
Hobgood	Roy	M		Private	38451193	300th Engineers	19 June 1944
Holzborn	Albert			Private	37410186	300th Engineers	19 June 1944
Hunter	Emmett	E		Private	38400004	300th Engineers	19 June 1944
Hurst	Cecil			Technician 5th Grade	38450878	300th Engineers	19 June 1944
Jewell	Harris	G		Private First Class	38451809	300th Engineers	19 June 1944
Kalbas	Willie	H		Private	38453898	300th Engineers	19 June 1944
Kerr	William	C		Private First Class	20273546	300th Engineers	19 June 1944
Ketchum	Wilmor	M		Private First Class	38451459	300th Engineers	19 June 1944
Kincade	James	H		Private First Class	33674886	300th Engineers	19 June 1944
King	George	C		Private First Class	34807523	300th Engineers	19 June 1944
King	Howard	T		Technician 4th Grade	38454038	300th Engineers	19 June 1944
Kratz	John	M		Technician 5th Grade	38417422	300th Engineers	19 June 1944
Lacy	Ulion	V		Private First Class	38416508	300th Engineers	19 June 1944
Lassen	James	H		Sergeant	38416424	300th Engineers	19 June 1944
Leyva	Joe	R		Technician 5th Grade	38454231	300th Engineers	19 June 1944
Lochridge	Vinas	L		Private	38474537	300th Engineers	19 June 1944
Lutz	Orville	H		First Lieutenant	0-1106916	300th Engineers	19 June 1944

McAnally	Charlie	L		Private	38431732	300th Engineers	19 June 1944
Merriott	Clarence	M		Private First Class	38466199	300th Engineers	19 June 1944
Motl	William	L		Private First Class	38453532	300th Engineers	19 June 1944
Noes	Benjamin	J		Private	35797113	300th Engineers	19 June 1944
Nolen	Cecil	D		Private	34821876	300th Engineers	19 June 1944
Oliver	Joe	D		Private	38432042	300th Engineers	19 June 1944
Padia	Joe	J		Private First Class	38416627	300th Engineers	19 June 1944
Patterson	Richard	L		Staff Sergeant	17000132	300th Engineers	19 June 1944
Reynolds	Earl	B		Private First Class	38432156	300th Engineers	19 June 1944
Richardson	Jeff	B		Private First Class	38381542	300th Engineers	19 June 1944
Ring	Louis			Private	36579312	300th Engineers	19 June 1944
Robinson	David	P		Private	35552254	300th Engineers	19 June 1944
Rohrman	Henry	B		Private	31386043	300th Engineers	19 June 1944
Schulz	Louis	E		Private	38453885	300th Engineers	19 June 1944
Shappell	Leonard	L		Private First Class	32757191	300th Engineers	19 June 1944
Shears	William	E		Private	34794718	300th Engineers	19 June 1944
Shuler	Carl	D		Private	39380509	300th Engineers	19 June 1944
Strauss	Herbert			Private	38416950	300th Engineers	19 June 1944

Striplin	Wallie	E		Private First Class	38466087	300th Engineers	19 June 1944
Toepper	Junior	R		Private First Class	38453833	300th Engineers	19 June 1944
Vardaman	Austin	D		Private	38451706	300th Engineers	19 June 1944
Warriner	Eugene	J		Corporal	38371604	300th Engineers	19 June 1944
Weeks	Roy	M		Private First Class	38044236	300th Engineers	19 June 1944
Whitfield	Omagene	C		Technician 5th Grade	38466149	300th Engineers	19 June 1944
Williams	George	W		Private	34703902	300th Engineers	19 June 1944
Young	Foster	C		Corporal	38208553	300th Engineers	19 June 1944

Table 12 List of reported Army casualties of LST-523 as per reference 4.

In addition to the Army personnel listed above which are from official sources, Reference 5 to this appendix provides an additional 13 names which may be associated with the loss of 300th Combat Engineers aboard LST-523. These have not been investigated further as part of this report but are added for completeness.

Last Name	First Name	MI	Suffix	Rank	Service Number	Enlisted from	Date of Death
Amendola	Frank			Private	32994450	New York	19 June 1944
Anglin	Lenoy	R		Private First Class	38432037	Texas	19 June 1944
Bedwell	Troylee	M		Private	38451918	Arkansas	21 June 1944
Hutchison	Eugene	W		Private First Class	38466238	Oklahoma	21 July 1944
Long	Wayne	L		Private First Class	38474392	Texas	19 June 1944
Maberry	Simon			Private	38451597	Arkansas	19 June 1944
Mooty	Hudie	H		Technician 4th Grade	38451757	Arkansas	26 June 1944

Moseley	Elmer	L		Corporal	38451739	Arkansas	2 July 1944
Sutherland	Dewey	L		Private First Class	34689023	Georgia	25 June 1944
Tolbert	Joseph	A		Private	38432179	Texas	19 June 1944
Tucker	John	E		Major	O-1100369	Oklahoma	27 June 1944
Watashe	Johnnie			Private	38466151	Oklahoma	19 June 1944
Woods	Joseph	G		Sergeant	38451932	Arkansas	19 June 1944

Table 13 List of additional Army personnel listed at reference 5.

From these reports the estimated total of personnel (Navy and Army) who lost their lives as a result of the tragic sinking of LST-523 could be in excess of 130.

Annex A - Permission Documentation

MINISTÈRE
DE LA CULTURE

Liberté
Égalité
Fraternité

Arrêté du 28/03/2022 n° 2022 – 417
relatif à une opération d'archéologie sous-marine
OA 30 4917

Direction générale des patrimoines et de l'architecture

Département des recherches archéologiques subaquatiques et sous-marines

Affaire suivie par
Cécile SAUVAGE
cecile.sauvage@culture.gouv.fr

Poste : 04 91 14 09 64

Références :

000565

Drassm
147, plage de l'Estaque
13016 MARSEILLE
(France)
Tél. +33 (0)4 91 14 28 00
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le-Drassm@culture.gouv.fr

La ministre de la Culture,

Vu le Code du Patrimoine ;

Vu l'arrêté de la ministre de la Culture en date du 29 juillet 2021 portant nomination du chef du service à compétence nationale « Département des recherches archéologiques subaquatiques et sous-marines » ;

Vu l'arrêté du 7 février 2022 portant définition des données scientifiques de l'archéologie et de leurs conditions de bonne conservation ;

Vu la demande initialement présentée par M. Martin DAVIES le 05/12/2019, reportée en raison du contexte sanitaire et redéposée en date du 01/12/2021 ;

Arrête

Art. 1 – M. Martin DAVIES est autorisé à procéder, en qualité de responsable scientifique, à une opération archéologique d'identification de biens culturels maritimes, avec plongée humaine et utilisation de matériel spécialisé, à compter du 03/07/2022 jusqu'au 09/07/2022.

- Façade maritime : Manche
- Département : Calvados (14)
- Commune : Saint-Pierre-du-Mont et Sainte-Honorine-des-Pertes
- Intitulé de l'opération : Projet LST 523
- Coordonnées géographiques (rayon de 200 m autour de chaque point mentionné ci-dessous) :
49° 28.676' N / 00° 57.993' O [EA 3152, supposé LST 523]
49° 30.1981' N / 00° 47.908' O [EA 3232, supposé LST 496]
- Numéro de la carte marine : 7421 (SHOM)
- Profondeur : 30 m maximum

Art. 2 – Conformément à l'article L. 532-8 du code du patrimoine, l'opération est exécutée sous la direction effective du titulaire de l'autorisation et placée sous sa responsabilité.

Art. 3 – L'opération est effectuée sous le contrôle du directeur du Département des recherches archéologiques subaquatiques et sous-marines (Drassm), ci-après désigné le Département, qui prescrit toutes mesures qu'il juge utiles pour assurer le bon déroulement scientifique de l'opération.

Le titulaire de l'autorisation doit présenter, à toute demande des autorités compétentes, une copie de ces documents.

Le titulaire de l'autorisation tient régulièrement informé le directeur du Département de ses travaux et découvertes. Il lui signale immédiatement toute découverte importante de caractère mobilier ou immobilier. Les mesures nécessaires à la conservation de ces vestiges doivent être prises après son accord.

A la fin de l'opération et avant le 1er décembre courant, le titulaire de l'autorisation adresse au directeur du Département, en double exemplaire plus une version numérique, un rapport final d'opération accompagné des plans précis, des photographies nécessaires à la compréhension du texte et d'un résumé illustré destiné au *Bilan scientifique du Drassm*. Le contenu de ce rapport devra être conforme au document de *Recommandations pour le rapport final d'opération dans le domaine public maritime* transmis au responsable de l'opération.
Les coordonnées géographiques mentionnées dans le rapport devront être exprimées en WGS 84 (degrés minutes décimales). Enfin, les archives éventuellement consultées seront indiquées et des copies des éléments pertinents seront jointes au dossier et indexées. Le rapport indiquera aussi les études complémentaires à envisager.
Il est attendu que le contenu et la présentation du rapport soient soignés, notamment dans le rendu des textes et illustrations.

L'ensemble des documents relatifs à l'opération (notes, photographies, relevés, correspondances, etc.) est remis au directeur du Département aussitôt que sont rédigés les rapports, notes ou publications scientifiques sur les recherches effectuées.

Art. 4 – Prescriptions particulières à l'opération :
Cette opération d'identification de biens culturels maritimes a pour but de poursuivre la documentation de deux épaves du Débarquement de Normandie. La même équipe a déjà conduit une opération similaire en 2017 sur des épaves du banc du Cardonnet (OA 3331) ainsi que deux opérations en 2018 (OA 3331 et OA 3374) et une opération en 2019 (OA 3809).

Il s'agit cette fois-ci de préciser l'identification de deux sites traditionnellement identifiés comme les *Landing ship tanks* (LST) n° 523 [EA 3152] et n°496 [EA 3232].
L'épave du supposé LST 523 a fait l'objet d'un levé au sondeur multifaisceaux par le Drassm en 2018 et d'une plongée d'expertise en 2019. Ces études ont montré que si le site correspond bien aux vestiges d'un LST, son emplacement n'est pas cohérent avec les coordonnées connues pour la perte du LST 523.
À l'emplacement généralement associé à l'épave du supposé LST 496, le Drassm n'a relevé en 2018, lors d'une prospection au sondeur multifaisceaux, que des débris étalés sur 11 m de longueur et 8 m de largeur. Par ailleurs, ce point ne semble pas correspondre au point connu pour la perte de ce bâtiment.
Par la réalisation de plongées d'expertises et la confrontation entre données de terrain et recherches en archives, l'opération menée par M. DAVIES visera à tenter d'identifier formellement ces deux épaves (typologie des vestiges et identification exacte du site).

Par ailleurs, l'opération permettra d'assurer une documentation plus fine de ces deux sites. Ainsi, au cours des plongées, un maximum d'informations sera recueilli sur ces sites : dimensions, nature des vestiges, enfouissement, degré de conservation, etc. Chaque site fera *a minima* l'objet de la rédaction d'une fiche épave, en vue de préciser l'inventaire (carte archéologique nationale). Le propos

devra s'appuyer sur des prises de mesures ainsi que la réalisation de croquis et de photographies.

L'utilisation ponctuelle d'un sondeur ou d'un sonar à balayage latéral est autorisée sur ces sites afin de compléter l'imagerie qui pourra être acquise par photographie sous-marine.
Les photographies réalisées pourront également servir à la réalisation d'une photogrammétrie 3D des sites étudiés.

Concernant le mobilier archéologique :
Compte-tenu de la problématique de cette opération, aucun vestige archéologique mobilier, de quelque nature que ce soit, ne pourra être prélevé au cours de cette opération sans autorisation préalable du directeur du Drassm.

Concernant les conditions d'intervention :
L'intervention, même sans le recours à la plongée, s'effectuera conformément au Manuel des procédures de sécurité en milieu hyperbare applicable aux activités placées sous le contrôle du Drassm[1] qui s'applique sur l'ensemble des chantiers, le plan de prévention des risques devra donc être appliqué tel que fourni et validé par le Drassm.

Art. 5 – Le responsable d'opération s'engage à ce que toutes les mesures sanitaires soient prises pour que les gestes barrières et les règles de distanciation soient scrupuleusement respectées au cours de l'opération. Dans le cas où les conditions opérationnelles ne permettent pas le respect de ces règles il importe, en conscience, que le responsable d'opération annule ou ajourne l'opération.

Art. 6 – Le titulaire de la présente autorisation se conformera strictement aux prescriptions émises par le Préfet Maritime de la Manche et de la Mer du Nord, qui sont annexées au présent arrêté.

Il est notamment tenu de signaler, sans délai, au Centre des opérations maritimes de Cherbourg toute découverte ou suspicion de munition ou d'élément explosif via le CROSS Jobourg (VHF 16 ou téléphone 196) ou le sémaphore le plus proche.

Art. 7 – Le directeur du Département est chargé de l'exécution du présent arrêté.

Pour la Ministre et par délégation,

Signature numérique de Arnaud Schaumasse
DN : cn=Arnaud Schaumasse, o=Ministère de la Culture, ou=DRASSM, email=arnaud.schaumasse@culture.gouv.fr, c=FR
Date : 2022.06.01 00:45:27 +02'00'

Copie : Préfet maritime de la Manche et de la mer du Nord

1 https://www.culture.gouv.fr/Thematiques/Archeologie/Acteurs-metiers-formations/L-archeologie-au-ministere-de-la-Culture/Le-Departement-des-recherches-subaquatiques-et-sous-marines/Documentation-scientifique-et-technique