

DISCOVERY AND MANAGEMENT OF THE WRECK OF USS *ALBACORE* (SS-218)

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ABSTRACT

The wreck of USS *Albacore* (SS-218) was discovered on 25 May 2022 and resurveyed in October by Dr Tamaki Ura's team of researchers at La Plongée Deep Sea Engineering Society. Following the initial discovery, volunteer researchers for the Naval History and Heritage Command (NHHC) examined recorded footage of the wreckage to identify the wrecked boat. Key features identified the wreckage as belonging to an American submarine from the Second World War. Further investigation and archival research identified the submarine as the American *Albacore*, a *Gato* class submarine lost in action in Japanese waters on 7 November 1944. The U.S. Navy formally confirmed the identity of the wrecksite as the *Albacore* in February 2023.

After an overview of the vessel's history, this paper covers the initial search and discovery of *Albacore* during 2022. In particular, the use of a Remotely Operated Vehicle demonstrates the viability of this approach for initial identification assessments of deep wrecks. An outline of the identification process is provided that covers key features of *Albacore* observed on both the underwater footage and archival imagery. The identity confirmation process and media outreach efforts surrounding the discovery are covered, followed by a discussion on the continuing management and treatment of *Albacore*.

Key Words: Submarine, Second World War, Japan, US Navy

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INTRODUCTION

The USS *Albacore* (SS-218) is one of 52 American submarines lost during WWII. She served on ten war patrols and sank at least 10 enemy vessels, with a potential for three more unconfirmed sinkings. This includes six enemy combatant ships and ties *Albacore* for the most sinkings of enemy combatant ships by any American submarine during WWII. Reported lost at the end of 1944, *Albacore* was discovered by a team of researchers from the University of Tokyo in May 2022 (Johnston, Katona, and Iwasaki 2022). A team of researchers associated with the Naval History and Heritage Command (NHHC) reviewed the collected footage and compared it with archival imagery and records to determine the identity of wreckage as belonging to *Albacore*. NHHC archaeologists verified the identity of the wrecksite and corroborated the initial assessment of the wreck's identity. The discovery, investigation, and announcement (NHHC 2023) laid out a template for approaching wreck sites in the future, with particular relevance to contemporary submarines.

HISTORY OF USS *ALBACORE* (SS-218)

Albacore was laid down on 21 April 1941 at Groton, Connecticut by the Electric Boat Company ("Albacore II (SS-218)"). It was launched on 17 February 1942 and commissioned on 1 June of the same year. Following the submarine's shakedown cruise, it crossed the Panama Canal and arrived in Pearl Harbor in mid-1942. She departed for her first of 11 war patrols on 28 August 1942 in the waters surrounding Truk. This patrol ended on 20 October 1942 with *Albacore*'s return to Midway for a refit. During her inaugural war patrol, *Albacore* experienced her first combat actions when she

engaged two enemy cargo vessels on 13 September 1942 with damage to the leading vessel, but missed the second. She then proceeded to make a night surface attack on an enemy tanker on 1 October 1942, and heavily damaged it. On 9 October, three Japanese warships, including one *Zuikaku* class carrier, pursued *Albacore* for most of the day. The next day, *Albacore* crew sank an enemy freighter after shaking off pursuers. Two Japanese submarine chasers, supported from the air, encountered *Albacore* on 11 October but broke off the chase after seven hours of silent running by *Albacore*. She departed the area the next day and headed to Midway Atoll for the first refit.

Departing Midway for her second war patrol on 11 November 1942, *Albacore* set out for the waters off New Britain and New Guinea. Rebuffed from her first assigned patrol area by Japanese destroyers, she started patrolling the area around Madang harbour in New Guinea. Two enemy vessels were spotted: one destroyer and one suspected transport. Releasing a salvo of torpedoes, the *Albacore* crew sank the transport on 18 December 1942. On her arrival in Brisbane on 30 December 1942 her crew learned they had sunk the Japanese light cruiser *Tenryu* of 3300 tons. This was only the second Japanese cruiser sunk by an American submarine during WWII, and succeeded in weakening the enemy hold on New Guinea. This engagement was certainly one of *Albacore*'s most significant.

After receiving an overhaul on her main engines, *Albacore* departed for her third patrol on 20 January 1943. During this patrol, the crew sank one destroyer and one frigate, with suspected damage to another vessel. Her fourth patrol achieved no confirmed enemy sinkings, although she reportedly engaged several enemy convoys. The next war patrol, this time under the command of Lt. Cmdr Oscar Hagberg, achieved similar results. *Albacore*'s crew sank the ship *Heijo Maru* on 4 September 1943. Her seventh patrol would see *Albacore* come close to destruction. She pursued a Japanese convoy, but was accidentally bombed by a plane from the US 5th Air Force on 6 November. Although she received no damage during this attack, *Albacore* did lose contact with her quarries. On 10 November 1943, she was once again the victim of friendly fire when she was bombed by an American aircraft and suffered significant damage. All auxiliary power was knocked out, and the main induction valve was broken. For two and a half hours, she continued to move between 30 and 400 feet before restoring her trim and returning to the surface. She completed her patrol and returned to Brisbane on 5 December 1943, where she also received a new commander in Lt. Cmdr. James Blanchard. She completed one more patrol, before setting sail for Pearl Harbor on 22 February 1944. Three days later, she sailed for Mare Island Navy Yard for her final overhaul.

She arrived back in Pearl Harbor on 13 May and departed for her ninth war patrol on 29 May in waters west of the Marianas Islands. She engaged no enemy ships during this patrol. *Albacore* shifted her position to the south on 18 June to support the American landings on Saipan. Admiral Nimitz planned to get the submarine, along with several others, to intercept a Japanese relief force. *Albacore* encountered a large concentration of Japanese Navy ships, and torpedoed near the aviation gasoline tanks of the aircraft carrier *Taiho*. The loss of one of Japan's largest and newest aircraft carriers, along with a second sunk by USS *Cavalla* that same morning, caused the rest of the Japanese fleet to retreat to the relative safety of Okinawa, facilitating the subsequent landing of the U.S. forces in Guam, Tinian, and Saipan. *Albacore* would go on to sink two more ships after this action.

Albacore departed Midway Atoll for her final war patrol on 28 October 1944. This was the last time anyone received any communications from the submarine. A Japanese report, issued by the Japanese Ominato District Guard Unit, references an underwater explosion off of Hokkaido, Japan. Forces at Ezan Lighthouse and aboard *Fukuei Maru* #7, both reported an explosion a few miles off the coast on 7 November 1944. NHHC volunteer researchers Yutaka Iwasaki and Stephen Katona triangulated these two sightings to develop a predicted location for the wreckage. The same records reported details of surface debris found at the explosion site. One winter jacket or jumper was found with the marking "ALB-5" on the back. This is presumed to be an abbreviated form of *Albacore* and used to identify the clothing as belonging to the submarine. A pair of white shorts, labelled with "ASK," was also found. These initials match those of Arthur Star Kruger, a Seaman 2nd Class who was listed as a member of the crew of *Albacore* at the time of her demise. Associated with the clothing items were also large amounts of heavy oil, cork, bedding, and American food supplies. This evidence, coupled

with later video evidence collected by Dr Ura and reviewed by David Johnston and Steve Katona, later confirmed the identity of this wreck as belonging to *Albacore*. With no outgoing communications received from *Albacore*, she was ultimately declared lost on 21 December 1944 and stricken from the Naval Vessel Register on 30 March 1945.

Over her relatively short career, *Albacore* conducted 11 war patrols and is credited with 10 sinkings against enemy vessels, with another three not yet confirmed. She earned nine battle stars and four Presidential Unit Citations (PUC). The submarine received the PUC for her second, third, eighth, and ninth patrols. Six of her 10 sinkings were against enemy combatant ships, ranking her as one of the most successful submarines against enemy combatants during WWII.

DISCOVERY OF SITE USS ALBACORE

Following archival research and location data in Japanese records, Dr Tamaki Ura and his team developed a survey pattern covering the suspected area of *Albacore*'s sinking. They completed surveys in the Shiryasaki Sea between Honshu and Hokkaido, Japan (Johnston, Katona, and Iwasaki 2022). On 25 May 2022 two multibeam systems were used to develop a bathymetric map of the area, while a towed system equipped with side scan sonar was used to develop a clearer image of the seafloor and any wreckage still located there. Dr Ura's team found a wreck, about 50 metres in length.

After identifying a shipwreck site, Dr Ura's team conducted underwater surveys using ROVs on 26 May and 2 October 2022 (Johnston, Katona, and Iwasaki 2022). All survey activity was broadcasted live via internet (Nico Nico News, May and October 2022). The initial survey attempts in May encountered difficulties brought on by the harsh underwater surroundings and poor visibility. The depth, over 200 metres, also complicated matters. Despite difficulties, several images suggested the discovery of an American submarine. The confirmed location of the shipwreck was within one nautical mile of the location of the underwater explosion reported by Japanese forces off Hokkaido on 7 November 1944. Dr Ura's team returned with volunteer researchers and archaeologists from NHHC, in October 2022 with a larger and more powerful ROV to confirm the identity of the wreck as *Albacore*.

The data collected on these two trips showed a shipwreck split, as the fore part was lost and the aft end was buried in the sand. The break occurred forward of the conning tower fairwater. The centre section, including the conning tower and its aft part, was surveyed by the ROV. The shipwreck is heeled over to starboard about 5 degrees. The bridge has been smashed down to the port side of the submarine. Many fishing nets and marine concretions cover the wreck.

ANALYSIS OF ALBACORE FOOTAGE

Unlike surface vessels, there are a number of challenges facing those attempting the identification of American submarine wrecks. WWII submarines typically had little to no markings to distinguish themselves. Surface vessels usually have their name and assigned numbers marked in several locations. In this case, only the visual modifications, outlined below, and some deductive reasoning guided NHHC researchers who relied heavily on historic photographs from the Mare Island Navy Shipyard.

Volunteer researcher David Johnston reviewed the footage collected by Dr Ura's team with location data derived from Japanese historical reports. As mentioned above, the official ship history provided by the Dictionary of American Naval Fighting Ships (DANFS) alongside archival material confirmed that *Albacore* underwent its last major refit at the Mare Island Navy Yard in California starting on 25 February 1944. She departed Mare Island Navy Yard on 5 May 1944. A collection of U.S. Navy photographs shows *Albacore* during its final overhaul at Mare Island Navy Yard. **Figure 1** shows several modifications made to the submarine and highlights three as they relate to the video analysis

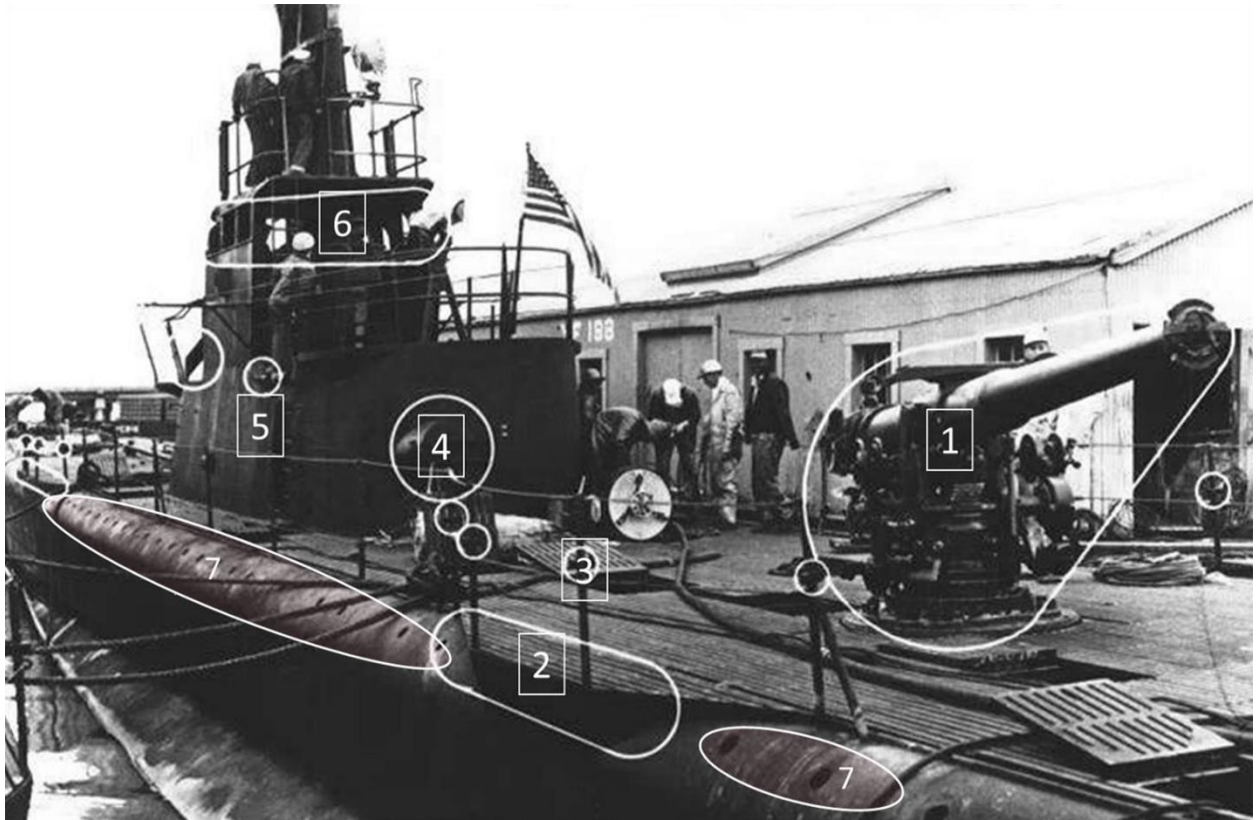


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Figure 2. The vent holes that allowed researchers to identify the wreck as *Albacore* as captured during the 2022 survey led by Dr. Tamaki Ura (Niconico Live, October 2022).



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(Katona and Johnston 2022). A watertight gun ammunition locker, containing rounds for the deck gun. This can be seen on the aft port side of the conning tower fairwater, shown as feature four in the accompanying photograph. It is likely that an identical locker existed on the starboard side as well. Second, NHHC researchers noticed the removal of steel plates on the upper edge of the fairwater. The removal revealed the structural I-beam ribs shown as feature six in the photograph. Finally, one of the most important aspects is labelled as feature seven in the image. A line of vent holes drilled along the upper corner of the superstructure on both sides of the submarine allowed air to escape the superstructure faster, speeding diving times (**Figure 2**). Another key identifying feature is the SJ Radar antenna mounted on *Gato* class submarines like *Albacore*. Based on the Mare Island overhaul photographs, the SJ radar mast was mounted forward of the periscope shears, and this is where it was found on the wreck (**Figure 3**). SJ Radar systems were installed on most USN submarines between 1942 and 1944. This system was key to differentiating *Albacore* from any submarines of different nationalities in the area. The SJ Radar dish was unique to American submarines in the Pacific theatre, and clearly differentiated it from British, Dutch, and Soviet submarines that could also have operated in the same area as *Albacore*.

All of the aforementioned features were identified by co-author Johnston during his review of the footage collected by Dr Ura's team. The most informative features included the SJ Radar system and the vent holes along the upper edge of the superstructure. Researchers also identified one of *Albacore*'s 20 mm anti-aircraft gun mounts, affixed during a previous refit, and the exposed ribs

revealed in the conning tower during her final refit. Some additional features, including possible hatches and ladders, were also documented.

These observed features, many which clearly differentiated *Albacore* from any other contemporary submarine lost in the area, provided sufficient evidence for archaeologists at NHHHC to confirm the identity of *Albacore*'s remains. The SJ radar system established the remains as those of an American submarine, while features installed/opened during its final refit in early 1944 set it apart from any other American submarines lost in the area. The combination of archaeological documentation, historical records, and location data provided the necessary confidence for NHHHC to assert the submarine wreck's identity.

ANNOUNCEMENT AND OUTREACH

Coupled with the first press release (NHHHC 2023) were announcements on Facebook, Instagram, Twitter, and LinkedIn. The total number of views in the first four days reached 269,657 across all NHHHC platforms. The largest number of responses was on Twitter, followed by Facebook and Instagram. The press' response to the NHHHC announcement was also encouraging. Several domestic and international outlets, including NPR, CNN, Fox News, Popular Mechanics, and Science, ran features. Outside the United States, the story was picked up by Spanish, Hungarian, Polish, Italian, French, Japanese, and Vietnamese publications.

NHHHC's volunteer researchers also coordinated with a number of organisations focused on research and preservation of the history of lost WWII submarines and their crewmen. In particular, those involved in the organisation On Eternal Patrol (OEP), website that records lost servicemen of American submarines, worked to find next of kin of *Albacore*'s crew members (OEP 2023). NHHHC supported these efforts by issuing a letter on the discovery signed by the Command's Director that could be forwarded to any next of kin on the website. Efforts are underway to organise a memorial event involving next of kin in the near future.

MOVING FORWARD: WHAT'S NEXT?

The NHHHC's experience with *Albacore* has illustrated the effectiveness of collaboration when addressing future submarine discoveries. Research partners, such as Dr Ura, spearheaded research efforts that led to the discovery of a wreck of interest, while he gained experience with submarine wreck investigations. NHHHC volunteer researchers, lending their time and analytical skills, also gained valuable experience and insight into the methods used to identify submarines. Finally, NHHHC archaeologists, historians and archivists lead to the wreck identity confirmation. In tandem with partners, NHHHC then coordinated the associated public announcement. This collaborative approach allowed for a pooling of knowledge, expertise, time and resources that increased confidence in and accelerated the official confirmation of the identity of the wreck. Both of these facets are crucial, allowing for the public to be informed in a timely manner of the site's importance, while at the same time ensuring protective measures can be applied, which now constitutes a sunken military craft under the jurisdiction of the Department of the Navy. Further disturbance must be sanctioned by NHHHC.

At present, NHHHC has no plans to recover *Albacore*, or any part of it. The sea is considered a fit and final resting place for U.S. Navy sailors. The focus now shifts to the continued preservation of this war grave.

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