

MICRONESIAN

JOURNAL OF THE HUMANITIES AND SOCIAL SCIENCES

Vol. 5, n° 1/2

Combined Issue

November 2006

SUBMERGED CULTURAL AND HISTORIC RESOURCES OF MALOELAP ATOLL, MARSHALL ISLANDS

Matthew B. Holly
Marshall Islands Aquatics

This paper provides a summary of the results of a long-term survey (1998–2005) aimed identifying and evaluating the significance of all known cultural and historical underwater resources of Maloelap Atoll. The survey was non-intrusive, meaning there was no collection or disturbance of any of the artifacts or site deposits. The survey was conducted to provide the community and the members of the Marshall Islands Government with accurate and up to date information on their various underwater resources. The information would then be used to protect these sites, primarily, and obviously, for the growing Marshall Islands tourism industry.

The Marshall Islands are located in the Central Pacific, approximately 2,500 miles from Hawaii, New Zealand, Australia, Guam and Japan. Aligned in two parallel chains, the eastern Ralik chain and the western Ratak chain, the 29 atolls and five islands of the Marshall Islands stretch between 4 and 15 degrees north of the equator, and at 160 and 173 degrees east latitude covering over one million square miles of ocean. Located west of the International Date Line, each day ‘starts’ first in the Marshall Islands, being the previous day in Honolulu or Los Angeles.¹

Maloelap Atoll possesses over 100 separate islets located on a distinct fringing coral reef, with channels in the west, southwest and south-southwest providing a navigable connection between the lagoon and the open ocean. The lagoon averages 150 feet in depth, but generally drops rapidly to thousands of feet on the oceanside. It has one of the larger lagoon areas within the Republic.

The wind typically comes from the east to northeast, the average daily temperature is 85 degrees Fahrenheit, and with a very humid climate and frequent rains. Housing is typically island style, with few concrete buildings other than those built by the Japanese military 60 years ago. The current population is estimated at nearly 1,200, the majority of which live on the five islands of Kaven, Tjan, Ollet, Taroa and Airik.

Maloelap Atoll today is a lush green jungle of islands along the east side of the atoll overlooking a deep blue lagoon. Two airstrips are on the atoll; with one cut from the jungle on Kaven, and the airstrip on Taroa re-cut from the original World War II Japanese Runway “A”. Kaven has the largest population center today, but Taroa was the center of the Japanese military on Maloelap, and the focus of this paper.

The aim of this paper is to provide an overview of the submerged cultural resources of Maloelap Atoll. It will describe the sites en-

This is a peer reviewed contribution. *Received:* 10 Dec 2006 *Revised:* 15 Dec 2006 *Accepted:* 16 Dec 2006

© *Micronesian Journal of the Humanities and Social Sciences* ISSN 1449-7336

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Persistent identifier: <http://www.nla.gov.au/nla.arc-65664>

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countered during surveys, provide background on potential sites not yet located, and will discuss the cultural significance of these sites in relation to the Republic of the Marshall Islands Historic Preservation legislation.

HISTORICAL BACKGROUND

There was limited prior historical research concerning any submerged cultural or historical sites of Maloelap Atoll. Most historical information was limited to studies of sites related to the Japanese military period on the islands, with some additional social, anthropological and archaeological studies. Information obtained from military aircraft mission reports even contains errors, written from fast glimpses of battle from memory hours after the event. Oral history of the atoll from local informants, young and old, was sparse, and in many cases conflicting. Generally, the only positive oral information useful for this survey came from fishermen or spear-fishermen, who had the experience of searching the waters of Maloelap with their own eyes.

Spanish and German Period

Maloelap Atoll is estimated to have been visited by Spanish explorers as early as the sixteenth century, and it was one of the Marshall Islands atolls to be 'discovered' by Captains Marshall and Gilbert in 1788. Maloelap Atoll was called "Calvert's Island" by Captain Gilbert (Spennemann 2004). Maloelap was also recorded in text in 1821 by Russian Captain Otto von Kotzebue, who recorded a significant amount of early Marshallese culture and custom during his voyage, and called Maloelap "Arakschejef I."

Missionaries were the next most common visitors, with the Missionary packet *Morning Star* III visiting Maloelap often from 1878 until the German period.

The Germans administered the Marshalls from 1885 to 1914, but Maloelap was not considered an important atoll and not given much attention (Spennemann 1992). There are no known underwater assets from this period in Maloelap Atoll, and only a few trading stations existed which required ship brought commerce. There is a rumor of the remains of an

older vessel on the Oceanside reef near Airik Island, and possibly another wreck on the oceanside of Kaven, but these sites have not yet been investigated. As far as can be ascertained, there is no mention of losses of any turn of the century vessels at Maloelap.

Japanese Mandate Period And World War II 1914 -1945.

The Japanese expelled the Germans from the Marshall Islands shortly after World War I began. After WWI the islands were given to the Japanese as a "Class C Mandate" by the League of Nations. Maloelap was probably first used by the Japanese military in 1935 after her withdrawal from the League of Nations and with the establishment of weather and lookout station throughout the Marshall's.

Secretly the Maloelap base was being well developed, with a full service Naval Air Base being constructed. Two 5000 foot runways, hangars, service shops, barracks, bunkers and lots of guns of every description. Taroa was completed with a large pier with a crane, two smaller work docks, and channel and anchorage pillars constructed to aid shipping. A large power station and pier was built at nearby Pigete Island which supplied Taroa with power via an underwater submarine cable over three miles long. The Americans were very surprised on their first visit to Maloelap.

War came to Maloelap suddenly on the morning of February 1, 1942, with two raids by U.S. Naval aircraft from carrier USS *Enterprise* (CV-6). The first air raid totaled five Grumman F4F "Wildcat" aircraft with two 100-pound bombs each. The first plane of the Marshalls attack flew off the deck and into the water, and under the path of the carrier. They next arrived over Maloelap and started to bomb Tjan or Ollet by mistake.

The Taroa base was described as a small "Ford Island" (as in the Pearl Harbor base). The first aerial encounter resulted in the two opposing aircraft having a mid-air collision during the attacks upon each other. Both pilots lived. The first raid was followed by a Naval bombardment from offshore American ships. The attacks stirred up a hornet's nest, and the ships were chased for the next twelve hours.



Figure 1. The northwestern tip of Taroa in mid 1944 (top of photo is northeast).²

While the *Enterprise* raid caused only minor damage to the Japanese installations on Taroa, with losses on both sides, it gave the American public a much needed morale boost after the Pearl Harbor attack and their recent loss of Wake Island and Guam (Lundstrom, 1984:63-80).

The Maloelap Base was expanded and eventually held over 3,000 personnel on the atoll. It was designed as a fighter base with bomber staging and reconnaissance patrols to defend the eastern flank of the Marshall Islands.

Unfortunately for the Maloelap defenders, the loss of Guadalcanal, secured by February 1943, and the Allied pressure on Bougainville and Rabaul, forced the Japanese military planners to draw new defensive lines on their Pacific map. On September 30, 1943, Admiral Koga was given Imperial Headquarters Directive No. 280, which ordered him to shorten his defensive lines, with Maloelap, and the rest of the Marshall's, left on the outside. Ordered to fight and die to the last man, Maloelap was ad-

ditionally re-enforced in late 1943 and early 1944 with more aircraft and supplies.

The next major air-raids occurred in October 1943, with the first attack and reconnaissance missions by B-24's of the 7th Air Force's 30th Bomber Group. These were the first raids in preparation for the invasions of the Gilbert and Marshall Islands. They did not find a sleepy base as in 1942, but ran into radar equipped, heavy anti-aircraft fire complete with copious fighter protection from the bases Mitsubishi A6M "Zero" fighters, primarily of the 252nd Air Group (Hata, 1989:115-116).

The American bombing raids continued and grew, especially after the capture of the Japanese bases in the Gilberts in November 1943, which provided closer airfields. The Maloelap garrison was attacked primarily by US Army medium (B-25) and heavy bombers (B-24). By the date of the invasion of Kwajalein and Majuro in February, 1944, all the Japanese aircraft in Maloelap, along with all the main transport vessels in the lagoon or surrounding atolls had been destroyed. The remaining avia-

tors, key to future defence of Japan, were removed by flying boats or submarine, which also provided the last supplies for the 3,429-man garrison (USSBS, 1947:136). The Maloelap garrison was cut off and left to die.

Over the next 18 months the Maloelap Airbase and surrounding facilities were bombed with over eight million pounds of bombs and artillery rounds, as shown by craters in the area near the admirals headquarters in Figure 1. Towards the end of the war, US forces evacuated all the Marshallese on Maloelap secretly, and the Japanese were left alone. By the time the Maloelap garrison surrendered onboard the Destroyer Escort *Wingfield* on September 6, 1945, the Commander of the atoll, Rear Admiral Tamada had lost 2,363 of his men, nearly 66% of the garrison.

At the end of the war, the US Government began the repatriation of Marshallese back to Maloelap. As there were no Marshallese on the atoll towards the end of the war, there are few eyewitness accounts for underwater sites potentially available.³

Trust Territory Years

The period after the war was dominated by the United States and its policies. While international focus was on the nuclear testing program and the development of Kwajalein, more local attempts were made to improve the infrastructure in the Marshall Islands. The building of docks, roads, clearing of dangerous ordinance and re-planting of coconuts all included the removal of war relics in their path. The aircraft "Boneyard" on Taroa grew, and parts of Taroa were replanted with coconuts. The collection of copper and brass for cash, cutting up airplanes for their aluminum panels, and pushing relics into bomb craters and filling them over was all done without any local concern. While destroying the past in an archaeological sense, this removal of war items erased from view many of the horrible memories the Marshallese people had suffered during the war. This mentality has been explained this very simply, and this lack of concern for sites of the past has eliminated many sites from this and prior periods.

RESEARCH DESIGN

Preliminary research, primarily the identification of potential sites for this report, was done by archival military and historical research, oral history by local informants, and by my own past experience in SCUBA diving at Maloelap Atoll. The research has been over a period of some 24 years, since my first dive on the *Terushima Maru* in 1981. This information generated a list of known sites that were explored and documented for this survey.

The actual fieldwork was carried out during August 1998, July 2000, October 2003, and on various visits of sort duration, usually day or two for tourism charters or my own leisure (between 1981 and 2005). The fieldwork copied the basic format, with a few improvements, of my previous underwater surveys for the RMI HPO.⁴

This inventory of the submerged cultural and historic resources of Maloelap Atoll was done in the format of a non-intrusive archaeological underwater survey. No site or individual artifact was removed or negatively disturbed. Photography, both still and video, was used to record these sites and artifacts, and in the rare cases of posing items for photographic identification, they were replaced to their exact original or more protective immediate locations.

Each site was assigned three two-letter abbreviations followed by a three-digit number, as adopted by the RMI HPO office. The first abbreviation identifies the site as located in the Marshall Islands (MI), the second, the atoll, Maloelap (Mp), and the third, underwater (Lg), followed by a number identifying the site, (001). In this report Maloelap sites were numbered clockwise around the atoll, starting from the North to the South. Sites were recorded using GPS, and some sites additionally logged using compass coordinates to conspicuous points on shore.⁵ All GPS work referenced known points on the Department of the Navy, Oceanographic Office chart number 6014 of Maloelap and Aur atolls, later revised by the Department of Defense to chart number 81771, both taken from Japanese surveys of the atoll between 1928 and 1941. All sites are clearly mapped.

Limitations To Research

The primary limitation to research is the fact Maloelap Atoll is 100 miles from the district center of Majuro, and has no modern infrastructure of any kind. This meant there was no electrical power, no SCUBA compressors, very limited supplies or support of any means, nor any way to quickly remedy any problem or emergency with only one air-flight per week. Everything, including gasoline, SCUBA tanks, camera equipment, generator, food, even bedding, had to be shipped via yacht, small boat or aircraft before or with my expeditions. Extra items for essential equipment, repair kits, even first aid, all had to be included, and they *all* had to be sealed against water damage from the ocean or the rains. Maloelap is also occasionally windy on the water and thick with mosquitoes on land. As most outer islands in the Marshall's, it is a wonderful place to visit, but a difficult place to work.

The secondary limitation to research was environmental. The lagoon is typically calm along the eastern shore, protected by the reef, and generally has excellent underwater visibility. Thus most sites were easy to get to and to survey with all necessary equipment. However, occasional wind and hard rain made for difficult survey days. This affected some of the photo work adversely, but most sites were still filmed well enough to complete the analysis of each site. Only the pier at Pigete Island, Maloelap (Site 6), lacks underwater footage, as the day's work ran out of daylight.

Site age and search area size created another limitation, as most of the sites of this survey were created before or during the battles of World War Two. Even if artifacts weren't bombed war relics, the effects of over 60 years of water action and decay have depreciated both their condition and cultural significance. Thus merely locating all the pieces of an aircraft that crashed into a plain of coral rubble or the analyzing of a ship bombed into a puzzle of metal shards becomes part of the *normal* limitations to research for many sites in this report. This is a survey, not a historical resurrection.

The final limitation to this survey was that there was virtually no prior research into the

submerged history of Maloelap Atoll, and most of the known work was lacking in detail.⁶

THE SURVEY FINDINGS

The survey was carried out clockwise along the lagoonside shore, starting in the north, going to the south. In total eight sites were located.

Japanese Mitsubishi A6M "Zero" Aircraft Wreckage at Northern end of Ollet Island (Site MI-Mp-Lg-001)

The Wreckage of a Japanese Mitsubishi A6M "Zero" aircraft, probably a version of the model A6M2/3-22/32, was found in the lagoon off the northern portion of Ollet Island (Figure 2). It sits in sand and coral in four to 10 feet of water, depending on the tide. It is located approximately 200 yards from the shoreline at low tide, and is easily identifiable from the prominent propeller blade sticking out of the water.

GPS Position (at the aircraft engine): N 08.46.096 x E 171.10.199.

Level of Site Significance: *LESS SIGNIFICANT*

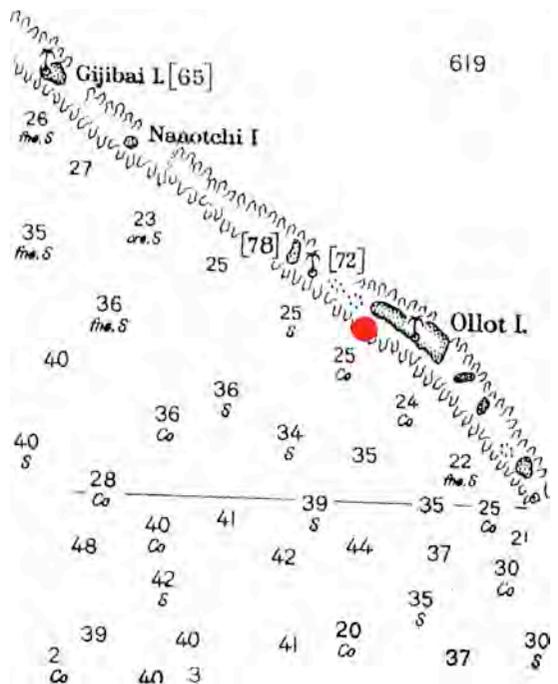


Figure 2. Location of site MI-Mp-Lg-001.⁷

Description

The aircraft, a Japanese single engine fighter, was reported to have forced landed in the lagoonside shallows of Ollet island due to fuel exhaustion as the sky above the Airbase at Taroa was controlled by US naval aircraft. Two other similar aircraft also landed in the shallow water lagoonside of Ollet on the same day, and they are Maloelap Sites Two and Three.

The aircraft and their pilots belonged to Air Group 252, which was dispersed to Taroa with 16 aircraft and crew in late November 1943, after the capture of the Gilbert Islands by Allied Forces. Over the next month most of these aircraft were lost attacking US Forces in the Gilberts or intercepting US bombing missions against Maloelap. All reserves of fighter aircraft for Air Group 252 were then sent to Taroa during December 1944, and were slowly lost to US attacks. The raids of January 29 and 30, 1944 destroyed all remaining flyable aircraft (Bartsch, 1986:39) claims these three aircraft force landed at Ollet sites. It is reported 120 aircrew and pilots were evacuated from Maloelap, Wotje and Eniwetok by eight flying boats and land attack aircraft on February 5, 1944, and Air Group 252 ceased to exist (Hata, 1989:115-116). The (remaining personnel were incorporated into other services on the base.

The aircraft engine is the prominent artifact at the site (Figure 3). It sits on a sandy bottom with coral growth over remaining portions of the aircraft (Figure 4). No fuselage or empennage sections remain other than what is deeply buried in the sand or coral. A portion of the wing, notably the right wing, lies on the sandy bottom nearby (Figure 5). Small shards of aircraft aluminum or aeronautical debris are found throughout the immediate area, covering an approximate 150 square yard area centered from the aircraft engine point.

Unique items at this site are the surviving exhaust collection manifolds (Figure 6), and the remains of the folded up landing gear shown in Figure 7 which verifies the story of a forced, and probable safe landing. It is unknown if the 20mm cannon or other weapons remain buried in the sand and coral, but the safe landing presumes the weapons of war and

their ammunition was undamaged and were removed from the aircraft.

The site is visible from shore at low tide (Figure 8), and offers close inspection (Figure 10). A bullet hole, probable from strafing American planes, shows clearly through the upright propeller (Figure 10).

No significant artifacts were found at the site.

Evaluation

This site is remarkable well preserved considering the water flow from the higher tides sweep around the end of Ollet at this point and should have washed the site clean, slowly eating away the aircraft remains. Some objects may still remain buried in the sand and coral, but not enough I imagine to provide any more historical clues

It is interesting to note that many historians and warbird collectors still believe the Marshall's hold Mitsubishi "Zeros" that participated in the Pearl Harbor attack. It is historically known that the four carriers using "Zeros" and "Val's" in that attack did in fact later donate their aircraft to the air units throughout western Micronesia, from the Marshall's through Truk, but this aircraft was not one of them.

The RMI HPO office should continue to try to protect these less significant assets, as sooner or later, when they are all gone, even parts of sites will become significant.



Figure 3. Close photo of right side of Sakae engine. No cowling survived, but the blades are still in place.



Figure 4. Engine and propeller sit upright amongst the coral and sand.



Figure 7. Landing gear is retracted into wing, which may verify a forced landing.



Figure 5. Section of wing from this aircraft was washed towards shore and rests upon a rubble bottom. The main site is approximately 60 yards away.



Figure 8. Photo of the engine exposed at the site during low tide.



Figure 6. A unique item at the site, the exhaust collectors, is a rare find, as most have been lost over time.



Figure 9. Low tide offers a close inspection of the site.

shown in the Site 2, photograph 5. Other artifacts may remain deeply buried in the sand or coral. Small shards of aircraft aluminum or aeronautical debris are found throughout the immediate area, covering an approximate 200 square yard area centered out from the aircraft wing point.

There are no significant or unique items at this site but the safe landing presumes the aircraft was stripped of remaining valuables.



Figure 12. A section of the left wing of the Central Ollet A6M lies partially buried in the sand at low tide. It has torn off at the landing gear area.



Figure 13. The Ollet Island amateur archaeological sand excavation teams stands during a break in uncovering the artifacts at site 2.

Evaluation

It is unusually that this site, more protected than Maloelap Sites One or Three, has been swept virtually clean by time and the environment. I presume the coral has overgrown most of the aeronautical items a bit deeper and

farther offshore at the original crash site. I am sure some objects may still remain buried in the sand and coral, but not enough to provide any more historical clues



Figure 14. Section of wing from this aircraft was washed towards shore and rests within the sandy beach. An unknown fuselage section is in the upper right, and an exhaust collector segment is in the lower center. The main site is approximately 100 yards away.



Figure 15. The classic earlier model wingtip was exposed at the end of the wing. This allowed the identification of the wing as that of the left wing.

Sunken Japanese Vessel *Seisho Maru* (Site MI-Mp-Lg-003)

The sunken wreckage of a Japanese fishing boat was located in the shallow water off Ollet Island. It is immediately off the marine railway area near the southern end of the island. Shallow parts of the wreck can almost be walked upon at low tide, and all the wreck is easily snorkeled, even from the beach. The water is generally very clear and calm at low tides, and

has a nice collection of marine life in and around the vessel. A map of the site, Map of Maloelap Survey Site 3, follows the photo section of this report.

GPS Position (At the wheelhouse position): N 08.45.858 x E 171.10.423.

Secondary reference compass courses are not necessary, as the vessel is only a few hundred yards south-southwest from the end of the Taroa, Maloelap pier.

Level of Site Significance: *SIGNIFICANT*

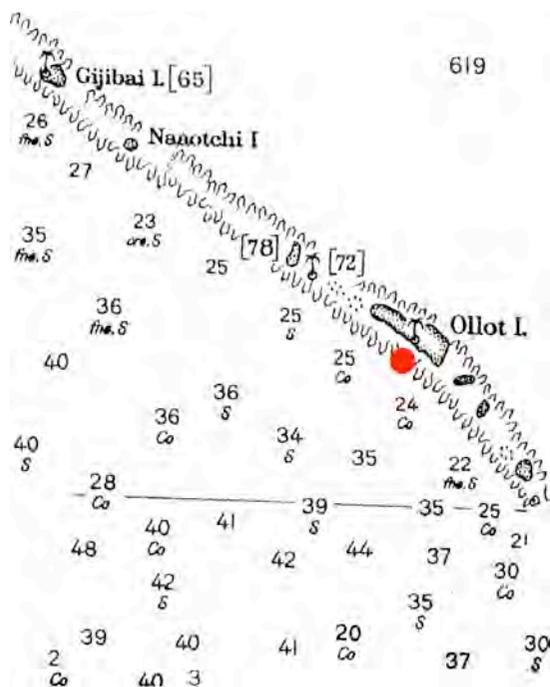


Figure 16. Location of site MI-Mp-Lg-003.

Pre Survey Research

The research of all vessels known to frequent Maloelap Atoll to determine the names of the known sunk and un-located vessels at Maloelap and other atolls has been a 15-year quest. It has been especially difficult near the time frame of the destruction of all shipping (January and February, 1944), as most atoll documents were destroyed and the US Navy did not ask these kind of questions after the war. Hints of and tidbits of information have led to archival research from all sources. The best and prime stand-alone source for Maloelap is the English translations of IJN Admiral Kamada, commander of the Maloelap garrison at the end of

the war. He was required to write a listing of the treatment and disposition of all American POW's from Maloelap, and this was titled "*Treatment of Captives*", by Admiral S. Kamada, IJN, dated September 30, 1945, and listed in the files of the Destroyer Escort USS Wingfield (DE-194), which handled the surrender of the Maloelap garrison. It was listed as exhibit No. 30 of the subsequent War Crimes investigations of Maloelap Atoll.

Within the document, four definite vessels are listed. The *Kaikou Maru* (given as 124 tons) and *Seisbo Maru* (given as 127 tons) were listed as the atolls "Patrol Boats". Two other vessels, the *Kotoshiro Maru* (given as 94 tons) and the *Dairokushinto Maru* (no size), were listed as "Mail Boats". A "Konto Maru" unknown details, visited on December 23, 1943 on way to Kwajalein, and the *Shinko Maru* on or about the same time, also with no details. The other visitor, the *Ogashima Maru*, listed as a 1,400 GRT freighter, left the atoll on January 21, 1944 with eight American POW's. The vessel was damaged and later sunk outside of Kwajalein. The POW's survived the sinking, but were probably executed on Kwajalein.

Comparing all lists, especially against known Wotje and Kwajalein vessels, the vessel sunk in the shallows of Ollet, Maloelap is very probably the *Seisbo Maru*. It was a fishing boat converted into a Naval Auxiliary Patrol Boat, and it was armed with a sizable bow gun probably 20 to 40mm. None of the "Mail" boats were armed as such. Similar vessels were lost around the Marshall's, even at Wotje and Kwajalein, but most were of wood hull construction, the *Seisbo Maru* was steel. The size, 127 ton, was correct for the length, beam and draft of the vessel surveyed. No other vessel found in the Marshall's, or described without a known loss site, fits all the evidence. A search of the site for builder's plaque or other information or details of any kind was unsuccessful. Internet searches for the name *Seisbo Maru* list two others lost, but none could substitute for the Maloelap vessel.

Description of site

The vessel was sunk upright on a sandy bottom in 15 feet of water at the bow and nearly 30

feet of water at the stern. It measured approximately 100 feet long and 20 feet of beam, with probably a 9-foot draft at the stern. The most conspicuous point of trauma which probably sunk the vessel was the hole created in the forward area of the port side by a small to medium sized bomb, which opened the entire vessel forward of the engine room to the sea. There are also many smaller holes around the vessel, any one of which may have sunk or helped sink the vessel, or they may have opened up or rusted through over time. There is no sign of fire, but there is very little left of the pilothouse, or any other structure, as they were all made of wood upon the steel deck. The vessel is easy to inspect, and due to its shallow location, is an easy site to explore.



Figure 17. The bow of the vessel Seisbo Maru. Note part of the bow spirit has fallen away. The chain comes out of the port side chain locker and out the port side tube to the anchor. There was no starboard side anchor or chain.

Unfortunately, there is not much left to see—most certainly due to the shallow depth; the wreck was picked clean by the desperate Japanese garrison on Maloelap. It looks like even small machinery was removed, and not removed by visiting divers, as the nearby deeper site of the *Kaikou Maru* is a treasure chest of nautical artifacts which remain untouched.

The ship was anchored in shallow water with an approximate 1,000-pound naval anchor, Nelson type (Figure 17, Figure 18). Approximately 150 feet of chain was used, which ran up the port side anchor tube to a windlass on deck. The foredeck survived the bombing,

but the welded gun mount holding the bow gun behind it did not. The only major trauma to the structure of the vessel happened at this point, as the perfect aim of bombing blew the gun and its mount out of the vessel (Figure 19), dropping all of the gun assembly and part of the port side of the hull onto the sand, including the gun pedestal (Figure 20).



Figure 18. The anchor of the Seisbo Maru was approximately 1,000 pounds. It was set to the port, and had approximately 120 feet of chain on the bottom.



Figure 19. The port side of the vessel at the gun mount position is blown out of the vessel. The mount, and possibly the gun, are in the sand to the left of the hull damage out of view.

The bow gun was probably a 20 or 40mm unit, and if not damaged to severely, was probably recovered. So part of the gun remained in the sand, but I did not have time to dig and inspect it. I found no ammunition of any kind at the site, as usually the stern would have a light machine gun and ammunition nearby.



Figure 20. The gun pedestal lying in the sand. The welded mount is nearby.



Figure 21. The main deck of the vessel, with fish holds set on steel frames, with a wood deck over the entire vessel. Taken from the starboard side.

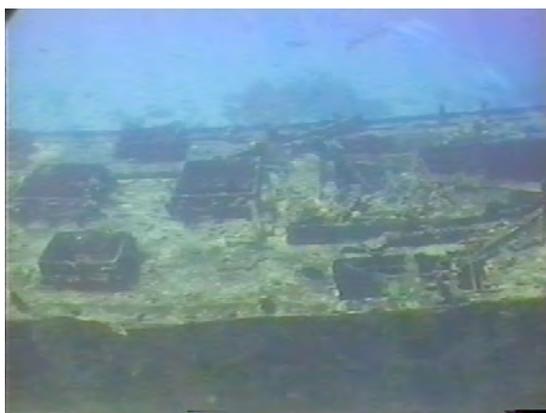


Figure 22. The Seisbo Maru mid-ship. The main deck to the left, the engine room exposed where a pilothouse used to stand. Taken from the port side.

The rest of the vessel is interesting to explore, especially below the main deck (Figure

21), primarily since it is very open and bright. The sand is cleaner, and not as dirty to film around as other sites. The area where the pilothouse was located is now entirely gone (Figure 22), as is the area above the main engine (Figure 23) where the kitchen used to be. No dishes were found. The main engine is exposed from above (Figure 25), and the ships telegraph is still mounted as 60 years ago in Figure 26. Radios were still mounted below, but there was not a tool or part remaining in the engine room.



Figure 23. Stern house area of the vessel with the kitchen and the rear of engine room exposed. Taken from Port side.



Figure 24. Stern house area of the vessel looking forward. Photographed in 1990.⁸

The stern, old style rudder, and the original complete three-blade propeller were intact, less a few steel panels missing on the port side (Figure 27). The vessel had no name on the stern we could determine, and we tried to ask for information from the locals.



Figure 25. Main engine exposed from missing stern house section.



Figure 26. Engine room telegraph to set engine speed survives 60 years.



Figure 27. Stern of the Seisbo Maru, showing the large (old style unbalanced) rudder, 3-blade propeller complete, and parts of the hull plate missing in the foreground due to corrosion.

Evaluation

The vessel was both well preserved and very empty. No artifacts of any kind were seen, even small personal items lost in the corners. The vessel was great for photography, and a very safe and easy wreck dive for beginning SCUBA divers.

Sunken Japanese Vessel *Kaikou Maru* (Site MI-Mp-Lg-004)

This site is sunken vessel *Kaikou Maru*, identified by the author during prior visits to the site. The vessel was sunk off Ollet Island, Maloelap, by bombing from US military forces during World War II. It was not at anchor, but tied to the stern of the vessel upwind of it, the *Seisbo Maru* (Maloelap Site 3), which was approximately 120 feet forward of it on a compass course of 60 degrees (the typical wind angle), and anchored in shallow water. The *Kaikou Maru* sits upright on a 45 foot (bow) to 65 foot (stern) sandy bottom, with one small coral head to the starboard midship and another just forward of the bow.

The site is generally very clear at low tide, with the vessel sitting on a beautiful white sand bottom. A map of the site, Map of Maloelap Survey Site 4, follows the photo section of this report.

GPS Position (At the center of the vessel):
N 08.45.860. x E 171.10.420

Level of Site Significance: *VERY SIGNIFICANT*

Pre-Survey Research

The vessel was identified by Japanese kanji figures translated by the author, and verified later by comments made by Admiral Kamada in his document *Treatment of Captives*, dated September 30, 1945, which was given to US Investigators into War Crimes after the surrender of Japan. Kamada listed the *Kaikou Maru* and *Seisbo Maru* as the Maloelap Patrol vessels.

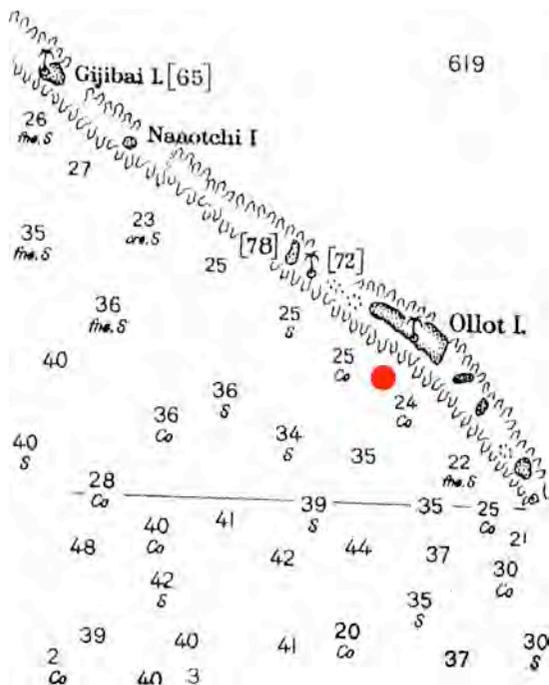


Figure 28. Location of site MI-Mp-Lg-003.



Figure 29. The *Kaikou Maru* was sunk by this damaging near miss bomb blast that holed the engine room area to the sea.

The vessel was notable for the rescue and transport of the now famous American Prisoner of War captive Louis Zamperini (and Phillips), of whom Zamperini was later featured in television's "60-Minutes", and who authored the book *Devil at My Heels*, 2003, which recalls his Pacific life raft and Prisoner of War ordeal. Admiral Kamada remembers Zamperini much better than Zamperini recalls the Admiral, but Zamperini had just been recovered from a raft after 45 days in the Pacific.



Figure 30. The holes in the bow were probably created by corrosion over time, and not by the effects of war. This was the "wind and water line" area of the vessel, which decays the fastest.

The *Kaikou Maru* also transported eight captured American flyers that force landed their B-24 aircraft "Baby Sandy II" on a west Majuro reef (Majuro RMI HPO Site Survey, Site No. 1, 2000), also listed in the Admirals text. His comments places the American prisoners of war alive until their transport to Kwajalein, where their story, and probably their lives, ends.



Figure 31. The gun mounted on the bow is the prominent feature of the vessel. It probably fired a 40mm round, but no ammunition was found at the site. A ready ammunition locker generally sat nearby.

The technical aspect of the research is also complementary to the vessel, as the vessel found matches the overall size and description of the *Kaikou Maru*. There is no other locatable vessel in the Marshalls campaign that has such a colorful history and thus meets the "Very

Significant” level of recognition with its unique history, besides being well preserved and rich in cultural artifacts.



Figure 32. The bow gun was not used for the defense of the ship during the attack, as deduced from the weatherproof plug still being in the barrel.



Figure 33. The bow gun trained towards the port side, aft.



Figure 34. The rear sight of the bow deck gun. The sight was calibrated and made of brass.



Figure 35. The main deck forward had a wooden mast socket, and the larger hatch behind it was used for easy and clean entry into the hold.

Survey Details

The *Kaikou Maru*, which translates into “Happy Ocean Ship”, was built in March 1932 with an approximate 110-foot length and 24 foot beam, drawing approximately 8 feet of water. It was rated at 124 tons according to Japanese documents (*Kamada, 1945:6*). Designed as a fishing boat, it was converted to a Naval Auxiliary and served as one of two Maloelap patrol boats for the atoll, and made regular trips between the main Japanese Naval base at Kwajalein and all the nearby atolls. Military records also show it visiting Majuro to pick up American aircrew POW’s.

It was of riveted and welded steel construction, with a diesel engine for propulsion, driving a three blade bronze propeller. It had multiple cargo holds in the bow, a pilothouse over a radio room, engine room, and a stern house with kitchen over the stern. The few accommodation spaces were in the bow, pilothouse area and possibly in the stern.

The *Kaikou Maru* was sunk at anchor by a near hit of a medium sized bomb, while tied to the stern of the *Seisho Maru*. A hole was created in the hull on the port side from near deck to keel, adjacent to the engine room ladder (Figure 29). There was no other significant damage to the ship, and only the bow current is holed, probably due to corrosion (Figure 30).

The photographic and survey tour of the vessel will start at the bow. The most prominent site of the vessel is the intact deck gun on

the bow (Figure 31). Estimated to be a 40mm unit, the gun has not been molested or stripped of any item, although no ammunition for the gun was found aboard the vessel. The gun was not fired in defense, as it still had its' environmental plug in place (Figure 32). The gun was trained to port (Figure 33), and had all but one of its' sights still in place (Figure 34). It is an unusual find, as I would have presumed the Japanese garrison would have recovered it for their own defense use on shore. They had moved much larger guns from sunken vessels for use as shore batteries in other Marshall Islands bases.



Figure 36. The hold bottom was covered with a thick muck which easily clouded photographic opportunities, but which hid many nautical and period artifacts.



Figure 37. A pump-up blowtorch was found port side forward in the hold.



Figure 38. A nautical trailing log (the torpedo looking object). This was trailed behind the vessel and attached to a calibrated device that then measured hull speed.

The hold below the main deck was next visited (Figure 35). The forward deck has a socket for a wooden mast, long decayed away. Below the deck the bottom of the hold was filled with a thick muck (Figure 36), which held a treasure of nautical artifacts.

Some of the artifacts included the ships trailing log, starboard side forward, (Figure 37) used to determine the vessels speed while underway, a fishing light, port side mid-hold, powered by the ships power and lowered into the water to attract fish (Figure 39), and stacks of bottles here and there around the hold, these on the port side aft in the hold (Figure 40), and an unknown bit of something shiny (Figure 41), found in the port side mid-hold. Other items not shown include a glass globe for a lamp, ballast stones, miscellaneous parts, cables, wires, and more bottles, many of these in perfect condition. The hold is a SCUBA muckers paradise, and meets the HPO very significant requirement of "rich in artifacts".

The next site was one of my favorite finds, as the builders' plaque (Figure 49) was located on the fallen pilothouse front wall. It describes who built the vessel and its' specifications. This one still remains on the vessel. Within the fallen pilothouse, I located the ship's compass housing (Figure 43), the ship's horn, a prism to allow natural light into the room (Figure 45) and the ships binnacle, another wreck divers prize (Figure 50). Behind the binnacle, which was made of steel by the way, not brass, lay the steering wheel ring. This ring, made of bronze,

showed the vessel had a large oversized wheel, and it was additionally marked with degree points for navigation. A rudder angle indicator, which I had first thought was an inclinometer, was also within the collapsed pilothouse (Figure 44).

Towards the stern of the vessel on top of the stern deckhouse I found a handful of unused 7.62mm machine gun rounds (Figure 46), supporting the local claim that SCUBA divers removed the gun years ago. It could have also been easily removed by the Japanese garrison forces.



Figure 39. The sealed lamp was a fishing tool. Supplied by electricity for light, it was lowered into the shallows to lure baitfish to a net, or lowered deep to attract tuna to a nearby baited hook.



Figure 40. Many bottles litter the bottom. Most are labeled "Dai Nippon Brewery, Ltd.". Some are broken and offer danger to un-gloved fingers.



Figure 41. Some items were of completely unknown use to the author.

The stern house also held a kitchen, access to the engine room internally, and probably accommodations. I did not film the engine room or stern internal areas, it was a very tight fit covered in easily disturbed silt. The stern held davits for a workboat hung out to starboard (Figure 48), and the propeller and rudder were complete and buried in the sand (Figure 47). The area had a wonderful setting for photography, moderate local marine life, and nothing else in the area.

Evaluation

The site is the *best* SCUBA diving site for an underwater photographer in Maloelap Atoll. Careful movement and close inspection in and around the *Kaikou Maru* will show many unique and rare nautical and period items. The vessel is both intact and esthetically pleasant, and shallow enough to afford moderate dive times on the site. Areas out of view in the dark of the ship conceal many personal and military items. Dangers present are the thick mud hiding shards of broken glass and which can easily reduce visibility to zero. Careful planning makes this a wonderful site to visit. The Maloelap Atoll Local Government, besides the RMI HPO, should offer much more protection to sites like these, because after wreck divers read this report, they will be on their way to Maloelap.



Figure 42. The forward deckhouse held a radio room, and the pilothouse above it had collapsed, revealing many other artifacts.



Figure 45. A broken glass prism found near the magnetic compass was probably mounted in the ceiling for additional natural light.



Figure 43. The magnetic compass housing was located on the starboard side of the pilothouse area. The compass is gone, removed or fallen out, but the side magnets remain.



Figure 46. Japanese 7.62 machine gun rounds on the stern deck house roof verifies the vessel had a light machine gun mounted here at one time. It was allegedly removed by SCUBA divers many years ago.



Figure 44. The rudder angle indicator fallen amongst the pilothouse debris.



Figure 47. Rudder and propeller of the vessel are complete, and completely buried in the sand.



Figure 52. Photograph taken by Bartsch in 1986 of the Southern Ollet A6M "Zero". The forward panel with ejection chutes for the fuselage machine guns was still in place.



Figure 55. A photo of the site as the tide ebbs.



Figure 53. Photograph taken in 2000 shows the same aircraft with notably more holes in the wing, sections of the fuselage and the 20mm cannon missing.



Figure 56. Coral rubble packs every orifice of the aircraft.



Figure 54. Higher tides cover all but the propeller tip. Fast and surging water makes photography difficult.

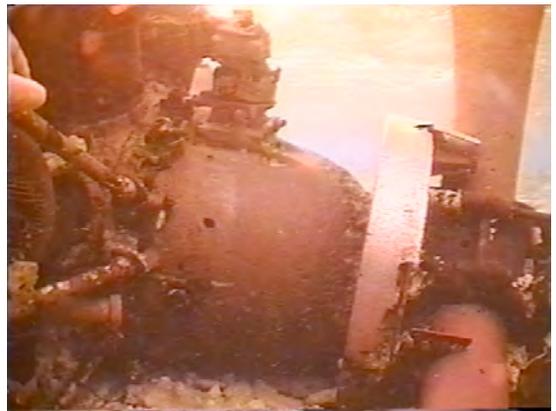


Figure 57. The close up photograph of the engine with propeller hub helps identify the aircraft model.



Figure 58. Photo of the 20mm cannon ammunition drum partially torn open with 20mm shells removed during one of the islands scrap drives for brass and copper.



Figure 59. Cavity in left wing where 20mm cannon used to reside.



Figure 60. The long barreled 20mm Cannon in the right wing. Note the calcium growth on the barrel tip, protecting the steel from corrosion.



Figure 61. Photo of the left wingtip. This is not a folding wingtip; so earlier identification made it an A6M2 Model 11, which was a lighter production model for Imperial Japanese Navy (IJN) shore based units. As many variants were produced, and field modifications made, it would take a true aircraft expert to determine the exact model.

The aircraft and their pilots belonged to Air Group 252, which was dispersed to Taroa with 16 aircraft and crew in late November 1943, after the capture of the Gilbert Islands by Allied Forces. Over the next month most of these aircraft were lost attacking US Forces in the Gilberts or intercepting US bombing missions against Maloelap. All reserves of fighter aircraft for Air Group 252 were then sent to Taroa during December 1944, and were slowly lost to US attacks. The raids of January 29 and 30, 1944, destroyed all the remaining flyable aircraft. Author W. Bartsch, in his article in *After the Battle, Issue 54*, (Bartsch, 1986:39) claims these three aircraft force landed at the Ollet sites (Figure 52). It is the only site that had any serious prior research, and his photo adds an important reference within this report.

It was also reported the surviving Maloelap pilots and other aircrew from Wotje and Eniwetok were evacuated by eight flying boats and land attack aircraft on February 5, 1944, and Air Group 252 ceased to exist (Hata, 1989:115-116). The remaining personnel were incorporated into other services on the base.

The aircraft engine standing within the wrecked fuselage is the prominent artifact at the site (Figure 53). The aircraft sits on a rubble bottom with coral shards amongst every orifice of the aircraft. Calcium has additionally

formed on many steel parts due to the cathode processes created by the dissimilar metal reactions to the magnesium wing spar and attached magnesium parts. The rest of the metal aircraft skin is heavily damaged, full of coral rocks and rubble (Figure 56), with the remaining aircraft skin worn to a shiny pink hue.

No fuselage section past the pilot area or empennage sections remain or were located. Small shards of aircraft aluminum or aeronautical debris were found throughout the immediate area, covering an approximate 150 square yard area both up current and downwind from the aircraft site.

Items at this site include a well-polished Saka engine (Figure 57) and the rare 20mm cannon in the right wing (Figure 58). The left wingtip, which is not a folding wingtip, confuses the possible verification of aircraft model as an A6M3-22a as noted in Bartsch, (Site 5, photo 8). Model A6M2 Model 11s had non-folding wingtips, but flush mounted 20mm cannons. It is unknown if other weapons or parts remain buried in the sand and coral, but it is safe to presume some lie nearby.

Evaluation

This site is remarkable well preserved considering the fast water flow from the ocean side at higher tides sweeps directly across this point and should have washed the site clean, slowly eating away the aircraft remains. Some objects may still remain buried in the sand and coral, but not enough I imagine to provide any more historical clues.

This remains a significant site due to the sense of history already given to it by the publication of the story in the "After the Battle Magazine" in 1986. Few other Marshalls underwater archaeological sites have photographic history from any time frame, so this site shall remain an important reference point in history.

The RMI HPO office should continue to try to protect these and all other assets, as sooner or later, when they are all gone, even parts of such sites will become valuable and irreplaceable assets.

Japanese Pier at Pigete, Maloelap (Site MI-Mp-Lg-006)

The Japanese pier at Pigete, Maloelap is another infrastructure item built by the Japanese military to fortify the Marshall Islands before the hostilities of World War 2. It is similar to many Japanese piers built throughout the Marshall Islands.

GPS Position (At the shore side base of the dock): N 08.44.387 x E 171.10.422

Level of Site Significance: *LESS SIGNIFICANT*



Figure 62. Location of Pigeyatto Pier

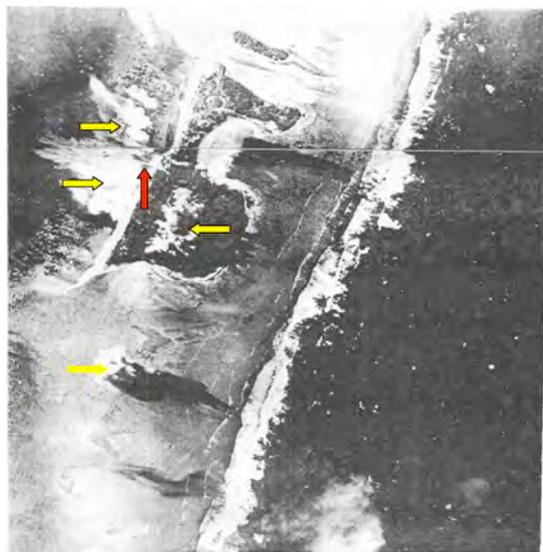


Figure 63. War-time image of Pigete Island after a bombing raid. The pier is identified by the vertical arrow, while horizontal arrows mark bomb hits.⁹



Figure 64. The Japanese Pier at Pigete stretches nearly 100 yards from the natural shoreline. The pipe trench, blown open farther down on the right side, held both water and fuel lines. An anti-aircraft position was set up on the right side end.

Description

The Japanese Dock was constructed in a manner similar to the piers and seaplane ramps at other Marshall Island atolls, yet unique for a number of internal construction features. The area around the pier site was similarly scoured of coral and large stones, which were used to construct an underwater sub-foundation. Next, a section of interlocking concrete blocks were placed on the bottom on the edge of the outside dimensions of the pier, and fill material placed between the walls. This created a platform to work from, and at lower tides they then either placed or poured larger interlocking concrete blocks that sat on the lower blocks and fill material and extended upward above the high water mark. The internal area was then similarly filled with sand, and poured concrete formed to make the pipe trenches, cap the edges, and finish the top slabs. The design depth of the pier face allowed for its' use by four meter draft vessels or less.

The unique features were the covered internal troughs set in concrete that allowed for installation of water and fuel pipes. They supported both the fuel farm for the power station on the island, and in turn, allowed vessels to be given water from the water collection system built on the island. Much of this water and fuel system is still intact, although the pipes are destroyed within the damaged sec-

tions at the deeper end of the pier. An aerial photograph taken by a US military aircraft shows the pier and island power station under attack (Figure 63).



Figure 65. The Japanese pier at Pigete Island from the south. Note the damaged section near the end, struck by American bombs during the war.

The pier was heavily bombed during the war, and time and weather has torn apart part of the area that was weakened by this bombing. Otherwise, the pier, seen from surface photos towards the lagoon and from the south shore (Figure 64, Figure 65) show the pier in remarkable shape, 60 years after its' construction.

Evaluation

The Japanese Piers and Docks around the Marshall Islands have always been an interesting study, as most have been built for decades of use. Archival research has failed to find the contractors who built the piers and docks, nor any architectural plans. Most of these structures have become the pyramids of the Marshall Islands, and will survive longer than the author.

Wreckage of an American B-25 Aircraft (Site MI-Mp-Lg-007)

The wreckage of an aircraft, which I have identified as from a North American B-25 "Mitchell", was located on the reef and in the lagoon off the southern end of Chierumarokku (Japanese spelled) island. Two aircraft engines, the prominent items of the site, expose at lower tides, and both are on the south side of the island. A large debris field of small to medium sized aircraft debris was found mixed

within the beach rubble of the island, on the adjacent reef south, and spilled into the lagoon both lying and buried in the sand to a distance 300 yards southwest of the island. It is possible larger buoyant sections could have floated with the natural flow of the current into the lagoon and sank nearby, but none were located. The shallow parts of the site were walked and photographed at low tide, with the lagoon area snorkeled and SCUBA dives made. The water was very clear and calm at low tide, but choppy and rough at higher tides (Figure 66).

GPS Position (At the engine close to shore): N 08.43.054 x E 171.12.948. (At the underwater wing segment): N 08.43.021 x E 171.12.953

Secondary reference compass courses were not necessary as Chierumarokku Island and the engine blocks are prominent and visual landmarks.

Level of Site Significance: *VERY SIGNIFICANT*



Figure 66. The arrow indicates the site of the American B-25 Wreckage. Note the listing of the "Pillar (10ft)", southwest of the island. It was the northern anchorage marker for Tarao. The pillar still exists lagoonside of Chierumarokku Island today.

Description

The aircraft wreckage, the debris field of a U.S. Army B-25 medium bomber, was located and identified by the author in 1981 on an exploratory diving trip to the island with friends. The site is historically important as it marks the final resting place of six American aircrew listed in military records as Killed-in-Action from this aircraft. The aircrew remains have not been located, even with many inquiries to

local Marshallese elders. The study of the archival records including the diary of the Japanese commander of Maloelap Atoll during World War II also gave no clues.



Figure 67. The author walks past the north B-25 engine near the shore of Chierumarokku Island at low tide.

The aircraft, a model B-25G Medium Bomber, was made by North American Aviation, Inc., and had a wingspan of 67 feet with a length of 51 feet. It typically carried up to 3000 pounds of bombs in different assortments and configurations during the war. It normally carried six aircrew on Pacific over-water missions.



Figure 68. The close up view of the northern B-25 engine, with many parts, including the exhaust collector ring manifolds, still attached.

This aircraft, serial number 42-64924, (a model B-25G-5) was based in Tarawa, Gilbert Islands as part of the 7th Air Forces 41st Bomb Group, 47th squadron. The mission on which the aircraft was lost, on January 28, 1944, was

listed in the 7th Air Force, Mission Report No. 85. This aircraft with six other B-25s' were tasked with attacking any shipping and assorted targets on the Taroa, Maloelap Base. This aircraft was struck by anti-aircraft fire on its' approach to bomb the Maloelap airbase, approximately one mile out from the target. This days approach was from a westerly direction (courses ranging from 85 to 100 degrees) flying in a line abreast formation over the lagoon at an altitude of 100 feet or less. After being struck by anti-aircraft fire from Taroa at over a mile from the target, the aircraft immediately caught fire and burst into flames.



Figure 69. The southern engine of the B-25. All exhaust collector rings are present and attached, with only minor damage.



Figure 70. One of many small engine and aircraft parts found around the site. This is part of the carburetor.

Although the mission report seems to state the aircraft was lost over the target, I believe it veered left and went straight into the water just south of Chierumarokku Island. The approach

course given and crash point are at right angles if the aircraft actually drop its' bomb load on target. The bomb load was of mixed types and was all armed at this point, thus the aircraft probably blew up on impact with the water or shallow reef, approximately five feet deep at high tide. All the aircrew were probably killed on impact, and the remains were all unrecoverable.

The mission report also says the aircraft was lost inside of the reef, $\frac{3}{4}$ of a mile "east" of Taroa island. This is probably an error, as Chierumarokku Island is approximately $\frac{3}{4}$ of a mile "west" of the airbase, and there is no other wreckage on or near the reef to the southeast. A course $\frac{3}{4}$ of a mile east is out into the ocean, and very deep water, probably over 500 feet deep $\frac{3}{4}$ of a mile from shore. There are also no typical comments in the mission report about any attempted forced landing, life rafts, or any sign that the aircrew may have survived the crash. There are no other B-25 losses un-accounted for in the Bomber Group records. I presume this technical error was to honor their lost companions in their last attempt to hold their course to the target.

Forty-one aircrew and eight aircraft were lost from the 41st Bomber group as a result of raids upon Maloelap Atoll. Two other B-25 aircraft lost in Taroa raids are listed further below in this paper.



Figure 71. Photo of aluminum beach debris near the high water mark on the south side of the island.

The site was located again in 2000 and photographed. The two engines, Wright Cyclone model 14 GR-2600-13's, were easily iden-

tifiable from their design and twin row 14-cylinder configuration. Figure 67 and Figure 68 show the north engine near the island, and a close up of the backside. A photo of the southern engine is reproduced as Figure 69, with the Figure 70 showing one of the many small parts found around the site. Both engines had been rolled on the reef for years by the wave action and were worn down to the cylinder heads and exhaust collector rings. No propellers or any other identifiable exterior portions of the engines were located.



Figure 72. Part of the landing gear assembly sits amongst the coral rocks on the southeast side of the island



Figure 73. Aluminum debris was literally lying at the edge of the jungle on Chierumarokku Island.

Many many small aluminum parts and metal shards with assorted rusting fasteners were located on the reef and mixed within the beach rubble of Chierumarokku island (Figure 71 shows debris in the sand on the southern face of the island. Figure 72 shows the remains

of a landing gear within the coral rocks. Figure 73 shows parts literally removed from the jungle near the high water mark.



Figure 74. Beach objects collected near the north engine from pockets in the reef. Items include, from left to right, a hydraulic/pneumatic fitting, a brass rod, a stainless rod, a bronze engine injector part, and six brass bullets, either 5.62mm or 7.65mm Japanese rifle rounds, and one .50 caliber US machine gun round on the far right.

Mixed among the debris were numerous small caliber rifle rounds, as the Japanese used the island and/or this B-25 wreckage for target practice. Figure 74 shows a handful of assorted parts collected from pockets in the hard reef.



Figure 75. Underwater photo of a probable wing aileron section lying on the sand in shallow water south of the main debris site.

A part of the wing was discovered and photographed underwater (Figure 75), as was a section of probable fuselage framing (Figure 76). Both were closer to the lagoonside drop off.

Table 1. Crew List.¹⁰

1 st Lt. Robert L. Cecil,	Pilot	Service No. 0-733727 (Arizona)
2 nd Lt. John H. Cambell,	Co-Pilot	Service No. 0-742281 (California)
2 nd Lt. Melvin E. Miller,	Nav/Bombardier	Service No. 0-741804 (Ohio)
T/Sgt. Clayton H. Fisher	Radio/Gunner	Service No. 17011932 (Nebraska)
S/Sgt. Wilbur A. Homeyer	Waist Gunner	Service No. 38032423 (Texas)
S/Sgt. David Levin	Tail Gunner	Service No. 20308638 (Penn.)

It is possible more aircraft parts are buried in the sand and may be discovered later or as the sands shift. Marine life nearby consists of yards of clean white sand with pockets of beautiful coral growth and local reef fish. The Japanese anchorage marker built before the war still stands on the lagoonside reef for reference (Figure 77).



Figure 76. Aircraft frame sections underwater southwest of the island in the sand in shallow water.



Figure 77. Harbor anchorage marker listed on the map as a pillar near Chierumarokku Island still exists.

Figure 78 shows Chierumarokku Island. The island is very small, measuring little over 100 yards in diameter. There are no temporary or permanent houses or shelters on the island, which was a local bird hunting sanctuary island in 1981. It is a sad comment there are no birds on the island today. You may walk to the site from Taroa at low tide, but it is a long walk over rough terrain near the engines, usually under a very in a hot sun. Plan for two hours round trip, and take water!

The crew lost in this crash are listed with their rank and serial number in Table 1.

Their remains are presumed to be lost at sea, buried on Chierumarokku Island, or washed into the lagoon. If buried on the island, there are no markers or local stories to support this theory.



Figure 78. Chierumarokku Island during an ebbing tide. Note the northern B-25 engine exposed in the distance, the darker object to the right of the inflatable boat.

Evaluation

The aircraft wreckage and aircrew story are both unique and significant assets of Maloelap Atoll. The assets, the prominent Wright Cyclone engines, have become an impromptu memorial site for this aircraft and the lost aircrew. It is additionally possible, although unlikely, their remains are buried somewhere on Chierumarokku island. The site should be provided with protection from unsupervised visitors, and the local Maloelap government should do its part to protect this part of their history. It has been suggested a memorial marker be erected on the island identifying this loss.



Figure 79. Location of site Site MI-Mp-Lg-008

Sunken Japanese Vessel *Terushima Maru* (Site MI-Mp-Lg-008)

The sunken wreckage of a Japanese freighter known correctly as the *Terushima Maru* is Maloelap Survey Site number eight. It is easily spotted from both the air and from shore, as two prominent masts of the large vessel still extend above the water at even high tides. The entire vessel can be easily snorkeled, and easily reached from the beach. The water is generally very clear and calm at low tides, and has a nice collection of marine life in and around the vessel. A map of the site, Map of Maloelap Survey Site 8, follows the photo section of this report.

WARNING:

**THIS VESSEL HAS LIVE DEPTH CHARGES !!!
DO NOT SCUBA DIVE BELOW DECKS AND
TOUCH ANYTHING !!!**

GPS Position (At the wheelhouse position): N 08.42.260 x E 171.13.680.

Secondary reference compass courses are not necessary, as the vessel is only a few hundred yards south-southwest from the end of the Taroa, Maloelap pier.

Level of Site Significance: *SIGNIFICANT*

Pre Survey Research

Many errors surround the history of this vessel. The misspelling of the name of the vessel in three or four different versions has added to research difficulties. The vessel has also been listed as sunk by both the US Navy and US Army Air Force at many different dates and at two different locations. World War Two historians, who tried to place names to two seemingly different incidents and close the file on these encounters, compounded these errors. More recently modern writers and researchers have compounded all the errors by writing many of them into "official" reports and books. It is easy to write history, but it is hard to correct it. Please let me try.

Let us first examine the correct spelling to identify the vessel. The United States Strategic Bombing Survey (USSBS), which was created after the war, was composed of a few hundred civilian and military personnel of all services and talents and given the task to determine the effectiveness of weapons and tactics used in WWII. They issued assorted reports, and one turned into the USSBS Publication of *"The Campaign Against Wotje, Maloelap, Mille (Mili) and Jaluit*, published in 1947. The actual survey was carried between October and November of 1945. Within this report, the vessel at Taroa anchorage was identified as the *"Torushima Maru"*.

This information was either taken from or then given to the JANAC group (Joint Army-Navy Assessment Committee), who reviewed all Japanese vessel loss claims (vessels claimed sunk over 500 tons) to military action during WWII, and after the war published their own report, the *"Japanese Merchant Vessels Lost in World War Two"*. It has been reproduced in many formats. A wide range of spelling variations is on record for this ship, which con-

fuses the identification (“*Torishima Maru*”, “*Toreshima Maru*”, or “*Toroshima Maru*”).

Official US Navy writing has compounded the problem. Prestigious US Navy writer Robert Cressman, author of “*The Official Chronology of the US Navy in World War Two*”, published in 2000, lists the vessel “*Terushima Maru*” sunk by the Submarine Pollock SW of Maloelap. (on page 160).

The U.S. Army Air Force claimed to sink the unknown named Taroa, Maloelap anchored vessel many times. The Navy also says they sunk it, and the Marines did shoot it up too. Many more pieces of paper.

When I was in Maloelap on an earlie trip, I did a video survey of the vessel. In filming down the hull I found a section of port side hull plate bent from top rail to nearly the bottom, that’s about 16 feet of hull plate, straight up and down. The pattern of bending was odd and unique, with the steel crushed into a rippled look, with more and deeper ripples at top of the vessel, and smaller ones towards the bottom. It didn’t register until I found a similar pattern on the exact opposite side of the vessel. It was as if the vessel had been grabbed by the nose and the tail, (bow and stern) and crushed together, with a slight push upwards. This is exactly what happens to a vessel that has a torpedo explode under its’ hull. The explosion makes a temporary air pocket that the vessel “fails” into, breaking the back of the ship. This torpedo ran too deep; and the explosion bent the ship, but did not break it. It limped into the nearest port, the Taroa anchorage.

More research disclosed a vessel with a similar name listed as sunk by a US Submarine. The USS *Pollock*, SS-180, on its seventh war patrol (in the Wotje general area) listed the sinking of the “*Terushima Maru*”, and listed it as sunk SW of Maloelap on May 18, 1943. I do not have the log of the submarine to determine if they saw or just presumed this vessel was sunk, but I do know it was listed as sunk at night. A few more hints of confusion and error are within the general loss information, as the vessel was listed as sunk at 08N by 171E. These are very general coordinates, as the same submarine sunk the “*Bangkok Maru*” off Jaluit two days later at the specific coordinates, 06-47

N by 169-42 E, and I know it was attacked for hours and never came up to take a sighting in the immediate area. Why did the *Terushima Maru* get a general location, if it was definitely sunk?

In my opinion, after the war, the military wanted to match all high probability successful attacks with a known loss, so this vessel was probably chosen, and recorded into history. Apparently a torpedo detonated, so they presumed an explosion meant a hit, and thus a sinking. The vessel may have even taken water and could have been seen low in the water, but I do not think it was sunk. I feel the submarine observations and presumptions of this loss were wrong.

All the names are similar in spelling and pronunciation, so an error is easy to imagine. Next, the *Terushima Maru*, listed as 3110 GRT, meets the general size of the Taroa vessel, which I estimated at just over 300 feet in length and 3000 GRT. I have my surveyed vessels Nankai Maru in Mili anchorage, the Toyotsu Maru beached at Wotje and a number of surveyed Kwajalein vessels for comparative examples. The size is right.

The loss date is realistic, as a ship heavily damaged to a submarine in the Marshalls in May of 1943 may not have been worth a tugboat and armed escort for a trip to a dry-dock, realistically only going to Japan. Rabaul was too dangerous and Truk did not have adequate facilities. So in Maloelap the vessel stayed.

Indeed, the caption to the original USSBS report (photo 66, p. 191) reads “*Toroshima Maru* damaged by submarine May, 1942, sunk by aerial attack December 1943”.

While this confirms the torpedo attack it raises the question the information was never corrected.

In summation, the vessel sunk in Taroa, Maloelap is the *Terushima Maru*. The US submarine *Pollock* damaged it on May 18, 1943, and it limped into Maloelap. It was anchored close in to shore to protect it from sinking in deep water if attacked. It was attacked and it did sink, and the survey details follow.



Figure 80. Aerial view showing the submerged Terushima Maru off Tarao.¹¹



Figure 83. The wreckage forward of the house is scrambled at best. No artifacts of any note were found in the vessel.



Figure 81. The two main service masts still stand after 60 years in the water.



Figure 84. The area in front of the pilothouse starts to resemble a ship. The stairs have no place to go.



Figure 82. A large pile of chain near the chain locker is helping to crush the remaining bow sections into the sand.



Figure 85. The area behind the pilothouse is open and exposes a large steam boiler.



Figure 86. The area behind the boiler has the small working hold generally used for the vessel to carry fuel for the boiler.



Figure 89. The Demon plate. The loose plate moves and creaks with tidal currents and attracts fish, and sharks. Plate has been loose since author visited the site in 1981.



Figure 87. Clean hull forward of port side torpedo damage.



Figure 90. Abundance of marine life inside the wreck! Inside the hold near the demon crack area, starboard side.



Figure 88. Torpedo damaged port side. Metal plate was deformed more at the top than bottom. A similar pattern was seen on the starboard side.



Figure 91. The depth charges were rolled down these railroad style tracks and off the stern into the deep to foil attacks by submarines. This track ran down the port side next to the last hold.

Description

The *Terushima Maru* was probably built in the late 1920's or early 1930's, and was listed as 3110 GRT by an unknown someone, with an estimated length of 300 feet and a beam of 30 feet. It probably had 15 feet of draft at the stern. I have no information on the builder, the owner or the operator. Believe me, I have looked. The vessel now sits in 20 to 35 feet of water, with the two main service masts above water (Figure 80, Figure 81).

The vessel was configured with two holds forward, and two holds in the stern each separated and serviced by one of the tall masts, with the pilothouse that also held accommodations, in the middle. A small hold was behind the pilothouse, generally used for the ship, probably supplies and fuel. There was a stern house that probably housed the crew, and the vessel sported an anti-aircraft gun or two, as it was reported on many attacks to be shooting at attacking American planes.

The gun position was probably forward, more high and dry, which accounts for the mangled metal forward. Figure 82 shows a large pile of chain that was near its locker and now is crushing the remaining hull. But not all this damage is from the war. The Trust Territory demolition man, Mr. Steve Achen, deceased, blew the top off the vessel in the 70's. It is fortunate he did not set off the depth charges aboard. So it is very hard to determine what damage was caused from what. The 1945 photo in the USSBS report shows the vessel fairly intact.

In any case, there is not much exciting to document in the bow. The next nice maritime view starts on the deck and in front of the pilothouse (Figure 83, Figure 84). The boiler can be seen through the missing pilothouse area in Figure 85. The small hold is visible in Figure 86.

The torpedo analysis can be seen by comparing Figure 87 with Figure 88. The hull is very clean in the first photograph, taken a few feet in front of the second photograph location, which shows the heavy bending of the hull plate.

Demons also reside in the wreck. Local story claims the sharks come when the vessel

talks. Actually, the vessel does make noise with the change of the tides, as a large section of the hull plate starboard side is loose, and grinds away when the current is strong in the area (Figure 89). The squeaking metal may also signal high tide is coming, and the fish come out to feed.

There are many fish around this vessel and more inside too (Figure 90). Depth charges also exist (Figure 92). Depth charges are one of the few dangerous items remaining from World War Two. Many Japanese warships, when sunk, carried their live depth charges with them. If pre-set to 33 feet, as was a custom, and the safety forks fell off, they detonated. Many men were killed in the water in this manner. The depth of the hold is about 35 feet deep. The depth charges sit on a mid-deck, at about 20 feet down. If they were to roll off, or the deck deteriorates and fails, they are bound to detonate. Moving these depth charges is dangerous; blowing them in place would destroy the ship and this site. No easy answers.

The depth charges were run down a track (Figure 91) and then off the back of the vessel (Figure 93). They had a safety diaphragm that was covered with a fork like safety device. This fork was pulled off by a mechanical "finger or hook" at the end of the tracks, arming the depth charge. The safety forks were made of wood and metal, and have long since corroded away.

The stern also offered more torpedo related information. The vessel was not at anchor, it was well inshore of the anchorage, and additionally had used a long length of it heavy hoisting cable to make a stern mooring so the vessel wouldn't shift its position. I think this also verifies the vessel was "parked". No active vessel would anchor so close and shallow, or waste heavy hoisting cable for a mooring. They planned to stay for a while (Figure 94).

A view of the massive propeller is the final photograph (Figure 95). There were no significant artifacts anywhere in or around the vessel, hardly a broken bottle. The site is great for marine life photography, and fun for the SCUBA visitor, but again, be careful.



Figure 92. The author poses with six live depth charges. A seventh was seen in the bottom of the hold in 1981, and cannot be seen today. Be careful !!! Japanese depth charges had two pressure diaphragms, one for depth of detonation, one as a safety. The safety cover forks are all gone...



Figure 93. The depth charge track on the starboard side where it exits the stern.

Evaluation

The vessel, the *Terushima Maru*, is a wonderful wreck dive, shallow and in clear water. Unfor-

tunately, few artifacts are present outside a broken bottle or two. The beautiful marine replaces the loss. The unique story gives it a sense of history. Hopefully, the danger of the depth charges will someday be removed.



Figure 94. The stern was tied off by hand with heavy cable. This was not a typical way to secure a boat at anchor. This was a way to secure a boat to a certain point, with no immediate plans for departure. It was a mooring, and sealed the fate of the vessel.



Figure 95. A massive propeller drove the ship. The propeller is complete, but with no identifying marks.

OTHER SITES IN MALOELAP ATOLL

Unrecorded Known Sites

Taroa, Maloelap Pier

The Pier at Taroa is another excellent survey site. It is similar to both the docks at Wotje and Roi, Kwajalein. I had time to do a land survey with notes, but no in water work was recorded.

GPS reference at the end of the pier was .N 08.42.236 x E 171.13.501

Small Landing Craft at Maloelap Pier.

A small Japanese landing craft is buried in the sand along side the north side of the Maloelap Pier. The bow structure sticks out of the sand and is currently used as a mooring point for a local boat tied up behind the pier for protection. There is a surrender photo somewhere I cannot locate which possibly shows this vessel in a bombed out condition awash in this general area. The site was not filmed, but is similar to the Daihatsu Type "A" landing craft I located buried on Melka Island, Site MI-Mi-Lg-005, Mili Atoll, by the Japanese to protect it from the American bombings.

Loss of previously known Underwater Sites

The debris of a Japanese Mitsubishi GM4 "Betty" bomber was discovered upon informants information lagoonside of Nawaj island in 1983 (at approximately. 08.445.832N x 171.10.407E). Nawaj, or Naaotchi Island on the Japanese charts, is approximately three miles west of Ollet Island. The bomber had apparently made a forced landing upon the Oceanside reef, probably due to fuel exhaustion, and had been destroyed by time and the energy of the higher tides, washing much of the aircraft into the lagoon. Larger pieces of the aircraft washed down the sandy reverse slope, and the tail section stopped in about 70 feet of water. The tail was easily identifiable as that from a "Betty" bomber from its' shape. No photos were taken on this 1983 trip.

The informant, an elderly man in 1982, was no longer alive during my trip to the atoll in 2001 when I tried to relocate the aircraft debris field and film it. Two dives by three divers found absolutely nothing where the prior debris was located. Not one piece of aluminum or anything else aeronautical was located from the shallows to over 100 feet of water, just pretty white sand. An additional skin diving survey was done on the shallow reef, looking for the aircraft engines or other heavy items, also with no success.

The site, heavily flooded at high tides, was a natural mechanism for sand movement from

the oceanside to the lagoonside, and had completely covered the limited wreckage I had discovered in 1983 with sand. Eighteen years of water movement had eliminated all traces of the site. This bit of history, other than my record of the aircraft type and its' loss, is gone.

Loss of known partially terrestrial and underwater Sites

The Japanese military had developed a marine railway on Ollet Island, with a track system running from shore into the water. Portions of the shore side rail track, rail engine and assorted support items were still in the jungle. The lagoonside railway and support items were gone and nothing remains but shards of small rusty steel debris in the sand and coral. The two vessels sunk lagoonside of Ollet island MI-Mp-Lg-004 and 005 were located directly off this marine railway site.

Known Losses at unknown Sites recorded in United States Military Documents

The loss of a North American "Mitchell" B-25G medium bomber on January 22, 1944 was discovered in archival research documents, including the Mission Report (MR) of the squadron, number 47, and the USAF Missing Aircrew Report (MACR) number 1845. The bomber, bureau number 42-64948 was part of the 41st BG (M), 47th squadron. While flying a strike mission against Taroa, another B-25G aircraft just ahead and abreast of this aircraft jettisoned their bombs to lighten their aircraft to escape attacking fighters. The bombs exploded with fragments striking this following aircraft, causing engine fires. The aircraft was immediately attacked by four "Zero" fighters, and was last seen engulfed in black smoke and crashed into the lagoon approximately 10 miles SSW of the Japanese base at Taroa in the southern portion of the atoll. The crew of six, Lt. Heun, pilot, Lt. Klotz, Lt. Mc Laughlin, S/Sgt. LeFors, S/Sgt. Fenno, and S/Sgt. Smith were all listed as KIA. No local informants have provided any other information. The first aircraft, bureau number 42-64949 which was also damaged, flew south outside of the atoll and crashed approximately 10 miles south of the atoll in the ocean, also killing all six aircrew

aboard. A third aircraft from the squadron was also lost that day, shot up and out of fuel, force landed approximately 45 miles NW of Makin, their home base. All of these crew were rescued.

The US Navy lost two Douglas TBF-1 “Avengers” in a mid-air collision during a raid on the atoll on January 29, 1944. The crew was part of VT-5, a torpedo squadron based from the US carrier CV-5 “Yorktown”, and three were immediately listed as KIA, the other three as MIA. I have not discovered any report to identify a specific site, or even a general area, of the loss within the atoll. No local informants have provided in other information. The six aircrew were lost from aircraft bureau numbers 6175 (KIA) and 6213 (MIA). Additionally, three other aircrew were lost from the same type aircraft and squadron that day, and listed as MIA and presumed lost at sea, but confusingly, they are not listed on the ABMC (American Battlefield Memorial Commission) list of the “Tablet of the Missing”, where the prior six aircrew are. It should be noted there are still many mistakes in the history of US losses of personnel in WWII, and there are many more US and Japanese aircraft and aircrew losses re-

ported in and around Maloelap Atoll during the conflict.

Known losses at unknown sites recorded In United States and Japanese Military Documents.

The loss of the 39 ton vessel “Wa” Maru”, as listed in a Japanese document of unknown source. The vessel was listed as sunk on September 15, 1944, but this is probably an error, as every major vessel over 10-20 tons was sunk much earlier in the conflict. “Wa” in Marshallese means vessel or ship. The location of this smaller, possibly locally built boat, is unknown.

SIGNIFICANCE OF MALOELAP ATOLL’S UNDERWATER ASSETS

Each site was judged according to its’ significance level, based upon the criteria listed in the RMI Historic Preservation Legislation of 1992.

Judgments on each of the sites level of significance were based upon the surveyed assets and my underwater and historical experiences. All background information to make these judgments is included in each individual Site discussion.

Table 2. Maloelap Sites And Their Significance¹²

Site	Location	Type	Level	Justification
1	Northern Ollet	Mitsubishi A6M “Zero”	Less Significant	Possesses historical value and a sense of the past, but is common and only the aircraft engine stands in place. Poses significant, but nearly impossible, research questions. Other similar models are in other locations in better condition.
2	Central Ollet	Mitsubishi A6M “Zero”	Insignificant	Possesses historical value and a sense of the past, but is common and only bits and pieces of the aircraft, some buried in the sand, remain for the site. Posses significant, but nearly impossible, research questions. Other similar models are in other locations in better condition.
3	off Island	<i>Seisbo Maru</i>	Significant	Possess historical or archaeological value, one of a kind, with unusually features, and an unidentified history with future research questions. Although severely damaged, the steel hull is visually intact, and has as aesthetic value of pleasing to the eye. Has both a “sense of the past”, and can more easily studied, due to its’ shallow depth, verses other similar vessels.

Site	Location	Type	Level	Justification
4	off Ollet Island	<i>Kaikou Maru</i>	Significant	The vessel is well preserved, rich in artifacts and has a unique history. The site has social historical value, is pleasing to the eye, and carries with it a wonderful sense of the past. It can be easily studied, and would make a wonderful research platform for future archaeological work. The site should be protected from scavengers.
5	Southern Ollet	Mitsubishi A6M "Zero"	Significant	Possess historical or archaeological value, as it is one of a kind within Maloelap Atoll. It has unusual features and an unidentified history with future research questions. Possesses historical value, a sense of the past, and an aesthetic value, but is a common aircraft. Photo record from past research adds value for future reference to this and other sites. Other similar models are in other locations in better condition, but this site is easily visited and analyzed.
6	Pigete Island	Japanese Pier	Less Significant	Although damaged by bombing and the environment, these Japanese built piers are overlooked as some of the few water build assets over 60 years old that exist within the Marshall Islands. They possess substantial research questions and archaeological value. Even though they are common in construction, they exemplify the builders' excellence in their work.
7	Off Chieru-marokku	B-25 Aircraft	Very Significant	Site is disturbed and virtually destroyed, but the aircraft has a unique one-of-a-kind history. Although many better sites exist, this site should be identified and developed as a memorial to the men lost in the aircraft, as it represents a true "sense of the past". The patterns of debris distribution also pose unique archaeological questions that could aid in other project research questions.
8	Off Taroa	<i>Terushima Maru</i>	Significant	The site is partially destroyed, but is a unique asset for the atoll. This wreckage is the only large WW2 Japanese asset underwater in the atoll. The site has few assets, other than live dangerous ordinance, but it does have a myriad of historical errors that are great examples for modern researchers. The site is shallow and easy to survey, and is an asset to SCUBA diving visitors.

CONCLUSIONS

The Maloelap Survey was done over a few years of time, with assorted goals of survey, photography and exploration on each trip. This made the survey work efficient within certain sites, such as the Ollet vessel wrecks, but distracted from other sites than needed more inspection, like the piers of Maloelap. All of the known or archival researched underwater sites at that time were discovered (Ops, I never did find the Pigete to Taroa submarine power ca-

ble). A few new unknown researched topics, such as the A5M "Claude", the first aircraft shot down by the US Navy in Japanese territory, the two "Avengers" which had a mid-air collision and were lost, and the southern B-25 crash, will have to be searched for at a later time.

It was sad that some sites I visited 20 years ago simply do not exist today. The vast collection of archaeological artifacts at Maloelap Atoll are on-shore, and the nautical history of

Maloelap, compared to other outer islands with prior Japanese WW2 bases or German history, is sparse. There were few traders or trading posts, fewer ships, and a better harbor to protect those who came inside the lagoon. What was shown was that time, wind, water, and waves have done more destruction than artifact collecting visitors or divers. But maybe that is because there are few visiting divers.

There has been little touched underwater. The only known artifact removal underwater was the loss of the small machine gun on the stern house of the *Kaikou Maru* years ago. Maloelap has a small collection of underwater artifacts, but nevertheless, these should be protected. The local government council should approach the RMI HPO office for assistance. These sites are important to the sense of history of the Maloelap Atoll and all of the Marshall Islands. One good weekend of serious collectors, and the prime Maloelap sites could be easily stripped.

My main recommendation would be to teach the local person nearest the sites to watch and protect them. Charge a few dollars to visit the site, and then have him maintain it too. This is a hard sell. This attitude has not gone over well in Maloelap in the past, as many have been promised tourism development that has never arrived. So they have sold 2 ½ aircraft, stripped the island of copper and brass, killed all the nearby birds, and watch out fish.

ACKNOWLEDGMENTS

This work was accomplished with the help of many people, both SCUBA and non-divers alike. I first must thank the research people. To all the archival experts and staff at the National Archives and Records Administration, the Air Force Historical Research Agency, the Marine Corps Historical Center, the Marine Corps University, the Navy Historical Center, the Navy Judge Advocate General Office, the Army Center for Military History, the Army Total Personnel Command Office, the Office of the Secretary of Defense: POW/Missing Personnel Office, the American Battlefield Memorial Commission, Mr. Warren Gray, Mr. Ted Darcy, Joseph Baugher's Website, and a

whole bunch of authors and the alumni associations from all the services, thank you!

The Maloelap Atoll survey was really accomplished with the assistance of 26 years of SCUBA divers, diving students, employees, tourists, archaeologists and researchers, impossible to list all here. They all know how they have helped me, and know I appreciated it. They are exemplified by my friend, jungle partner and technical detail expert, Mr. Bernie Cotter, who passed away too soon in 2005. See you on the other side, and hold me a chair.

This report is as accurate as possible on this date, yet it seems every day I learn something new or find another artifact or clue that may change a bit of history. As I wrote before, it is easy to write history, but it is very hard to change it. Any comments to correct or update this report would be appreciated and added to any future version.

The research and this publication have been financed *entirely without* Federal funds from the Historic Preservation Fund grant program of the National Park Service or the Marshall Islands Historic Preservation Office. This one is my labor of love.

ENDNOTES

1. This fact sometimes affects modern historical records as an item occurring at the same moment on the 2nd, for example, in the Marshall Islands, may be listed as occurring on the 1st by the reporter in the United States.
2. Matt Holly private collection, donated by USMC pilot Richard Carlton of VMSB-331.
3. As a result, only little information was passed on and could be given to me by informants during this survey.
4. Primary SCUBA equipment was of Scubapro or Oceanic manufacture, with assorted manufactures of SCUBA tanks, accessories or safety equipment. A Garman 45 hand held GPS and military type compass were used for mapping. Underwater video was filmed with a Nikon VN-760 Hi8 camera in a Bentley marine housing. Still photography underwater was with a Sea and Sea Motor Marine MX10 system, and a Sony Mavica model FD-83 digital camera was used for photography above water. This report was built on a Compaq desktop computer using the Microsoft "Word" and Adobe PDF formats.

5. The Arc View GIS system was not used, as the internal software data for the Marshall Islands is incorrect, that is it is in error by 300 to 600 yards to the north of true and 300 to 400 yards to the east of true, and even if corrected, is not transferable to other programs. Soon other navigation programs will allow transferable corrections, and then the GPS coordinates will be added within a revised report.
6. Previous research was done in the fields of Archaeology, Anthropological or historical studies, mainly within the Republic of the Marshall Islands Historic Preservation Office Reports. Sites and topics by *Spennemann, 1989*, (erosion at Taroa), *Adams, 1990*, (Terrestrial WWII on Maloelap), *Christiansen, 1994* (Terrestrial WWII on Maloelap), *Spennemann, 1995*, (General History with a reference to the *Terushima Maru*) and *Weisler, 2001*, (Excavation at Kaven, Maloelap) primarily discussed sites and assets on shore. Only the *United States Strategic Bombing Survey (USSBS), 1947* (reference to the Site 9, "Toroshima" Maru) and Bartsch, 1986, in his article in *After the Battle, Volume 54* magazine lists a site (the Site 5 Zero aircraft) documented in this report.
Bits and pieces of nautical tales, military history works, and a few other anthropological publications exist, few of which discuss or are relevant to the submerged resources discovered during this survey.
7. Map based on United States Department of Defense, Defense Mapping Agency Chart of Maloelap and Aur, No. 81771, which was improved upon from the United States Navy Hydrographic Office chart No. 6014, of which both charts claim were taken from Japanese charts and surveys of the atoll between 1928 and 1941. These surveys were incorporated into the Japanese chart No. 435
8. Phot D Spennemann 1991
9. Source: Winton, 1979, page 102-103, with annotations by the author.
10. From Missing Air Crew Report Number 2054
11. Photo: D Spennemann 1991
12. Criteria For Recognition As Cultural Or Historic Property (HPA Act 1992).
A Site or Asset shall be recognized as having cultural or historic value if it appears to meet one or more of the following criteria:
 1. Possession of cultural value.
 2. Possession of social value.
 3. Possession of interpretive or educational value.

4. Possession of research question and answer archaeological value.
5. Possession of archival or information of archaeological value.
6. Possession of archaeological or builders excellence.
7. Possession of archaeological representation.
8. Possession of historical ambience or "sense of the past".
9. Possession of aesthetic value with "sense of the past pleasing to the eye".
10. Possession of social historical value.
11. Possession of particularistic historical value.

Definitions Of The Levels Of Significance

Very Significant. One of a kind, preserved, rich in artifacts, or unique history.

Significant. One of a kind, well preserved, not disturbed by construction or the assets of a prehistoric site not yet surveyed.

Less Significant. Similar to other assets, disturbed by construction or the environment, common history.

Insignificant. Abundant in other areas, located in disturbed or destroyed areas, no significant history.

Undetermined Significance. No detailed survey of site

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AUTHOR BIOGRAPHY AND CONTACT

The author of this paper became a N.A.U.I. (National Association of Underwater Instructors) SCUBA Instructor (No. 5074), in May 1978, in San Diego, California. He graduated in 1979 with a B.S. Degree in Accounting from San Diego State University.

Matt moved to Majuro, Marshall Islands, in June 1979 And eventually started his own business, Marshall Islands Aquatics. During the next 21 years, he has made over 5000 SCUBA dives around the Marshall Islands, for SCUBA training, tourism, commercial work, and for fun.

His first charter was to attempt to locate the crash site of Amelia Earhart in Mili for author Vincent Loomis in 1979. Research into World War Two history began in 1983 after he found a Martin PBM-3 Mariner aircraft in Majuro lagoon. Since then he has found or re-discovered over 100 historic underwater sites, primarily WW2 ships and aircraft, and found the remains of a U.S. Army WW2 aviator and his aircraft lost in the jungle of Mili in 1994. He recently located an intact Douglas TBD-1 "Devastator" in Jaluit lagoon.

Matt has been involved in aquaculture projects, underwater bathometric surveys, private reports for marinas, and underwater construction and design. Commercial work has included salvage, ship repairs, re-floating a 1,200-ton vessel, and sinking a 400-ton vessel for an artificial reef. He has produced underwater videos on pollution and tourism, and has a collection of underwater videos of his work.

CONTACT: Matthew B. Holly P. O. Box 319, Majuro, MH 96960 Marshall Islands. Email: matthollymarshalls@yahoo.com

