

ARCHAEOLOGICAL SURVEY AND INVENTORY
OF
SUBMERGED RESOURCES IN THE LAGOON OF
WOTJE ATOLL

WOTJE REPORT
SITES OF WOTJE ATOLL

AUGUST 2000

PREPARED FOR THE HISTORIC PRESERVATION OFFICE,
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WOTJE SURVEY

This work was accomplished with the help of many people, both SCUBA and non-divers alike. I must again thank Richard Williamson, Chief Archeologist for the Marshall Islands Historic Preservation Office, for his assistance and many comments concerning the construction of this survey report.

The Wotje site survey portion of this report was accomplished with the assistance of Mr. Johnny Damron, Captain of the "Isis", Mr. Aki Mike, my long time diving partner, Wotje Senator Mr. Litokwa Tomeing, Wotje Mayor Mr. Joe Hanchor, and IroiJlaplap Remius Hermious. The research portion was aided by Mr. Alan Carey, author of "*Reluctant Raiders*", who also provided some last minute advice on finding a lost PB4Y, and Mr. Satoshi Yoshii and Kim Kowata for their helpful Japanese to English translations.

The oral information provided which helped me locate sites or research archival stories is credited in the bibliography, as the information that was acquired from many sources referred to in this report. All current photographs were taken by me or my employees, and any archival photos or drawings used were from my reference library and given reference and credit. All equipment used underwater and for the building of this survey and report is listed in the appendix.

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 relevant to one site or another. Every answer generates another question. Any comment to correct or update this report would be appreciated and desired, and added to any future version. My E-mail address is on the cover page.

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August 2000

WOTJE REPORT

TABLE OF CONTENTS

	PAGE
Acknowledgments	2
Table of Contents	3
Table of Photographs and Drawings	5
Table of Maps	10
Introduction	12
Historical Introduction to Wotje.	14
Summary of Sites Map	16
SITE NUMBER 1	
Wreckage of American SB2C Dive Bomber at Ormed, Wotje.	17
SITE NUMBER 2	
Wreckage of Japanese Vessel Oceanside of Ormed Island, Wotje.	28
SITE NUMBER 3	
Historical Site Lagoonside of Ormed Island, Wotje.	31
SITE NUMBER 4	
Japanese Seaplane Ramp.	34
SITE NUMBER 5	
Wreckage of Japanese H8K Flying-Boat.	41
SITE NUMBER 6	
Japanese Docks at Wotje	51
SITE NUMBER 7	
Central Vessel Wreckage.	59
SITE NUMBER 8	
Japanese Aircraft Dump.	68

SITE NUMBER 9	
Steel Vessel Wreckage.	75
SITE NUMBER 10	
Japanese Aircraft Engine.	85
SITE NUMBER 11	
Southern Vessel Wreckage.	92
SITE NUMBER 12	
Borudou Maru Wreck.	101
SITE NUMBER 13	
Toyotsu Maru Wreck.	116
SITE NUMBER 14	
Toton Island Wreckage.	129
OTHER SITES IN WOTJE.	131
CONCLUSION.	137
REFERENCES.	138
BIBLIOGRAPHY.	140
Appendix 1. List of Military Documents	145
Appendix 2. List of Wotje Vessels	158
Appendix 3 List of US Aircraft Losses.	163
Appendix 4. List of separate still photographs.	165
Appendix 5. Video Tape Summary.	168
Appendix 6. Equipment used for Survey.	170

WOTJE REPORT

TABLE OF PHOTOGRAPHS AND DRAWINGS

SITE NUMBER		PAGE
PHOTO NUMBER	DESCRIPTION	
HISTORICAL INTRODUCTION TO WOTJE.		
1.	Scanned photo of a B-24 Bomber over Wotje.	14
SITE NUMBER 1. AMERICAN SB2C DIVE BOMBER		
1.	Scanned drawing of SB2C Aircraft.	19
2.	Scanned military photo of SB2C Aircraft.	19
3.	Aerial photo of oceanside of Ormed Island.	20
4.	View of Ormed Island from aircraft engine.	20
5.	Aircraft engine underwater.	21
6.	Close-up of aircraft engine.	21
7.	Right side landing gear with wing section.	22
8.	Pilot area with armor and left wing visible in background.	22
9.	Fuselage with trailing edge of wing with dive brake.	23
10.	Aircraft left wing.	23
11.	Aircraft folding wing assembly.	24
12.	20mm cannon motor.	24
13.	20mm muzzle extending from right wing.	25
14.	Presumed aircraft tie-down point.	25
15.	Close-up rivet pattern on aircraft.	26
16.	Scanned military photo of SB2C aircraft with pilot.	26
SITE NUMBER 2. ORMED OCEANSIDE WRECK		
1.	Aerial photo of oceanside of Ormed Island.	29
SITE NUMBER 3. ORMED LAGOON SIDE SITE		
1.	Scanned photo of Ormed site in Spennemann report.	32
SITE NUMBER 4. JAPANESE SEAPLANE RAMP		
1.	North side of ramp from in the water.	35
2.	Deep end of the seaplane ramp at the south-west end.	36
3.	Ramp edge boundary marker.	36
4.	Cement bags used in wall foundation.	37
5.	Formed concrete blocks for walls of ramp.	37
6.	Destroyed anti-aircraft position in water.	38
7.	Seaplane operations building.	38
8.	Military photo of the seaplane ramp during March 1944.	39

SITE NUMBER 5.		FLYING BOAT WRECKAGE	
1.	Aircraft Drawing.		43
2.	Military Photograph of H8K2		44
3.	Bow of the Flying-Boat.		44
4.	Remains of inner bow area.		45
5.	Aircraft flight controls.		45
6.	Aircraft seat.		46
7.	Top turret of Flying-Boat.		46
8.	Tail turret of Flying-Boat.		47
9.	Heavy metal spar of aircraft.		47
10.	Number 4 Engine.		48
11.	Metal skeleton of fabric covered control surfaces.		48
12.	Twin aerial torpedo mounts.		49
13.	Marine Life in aircraft wing section.		49
 SITE NUMBER 6.		 WOTJE DOCKS	
1.	Main Dock looking out from Shoreside.		52
2.	Damaged Deep End of the Main Dock.		53
3.	Crane Top Section Underwater near Main Dock.		53
4.	Anti-Aircraft Site Blown into the Water.		54
5.	Main Dock Tie-Up Bollards		54
6.	75mm Japanese Artillery Round near Dock.		55
7.	Shoreside Winch for Small Service Dock.		55
8.	Small Service Dock.		56
9.	Military aerial photo of dock area during April, 1944.		57
 SITE NUMBER 7.		 CENTRAL VESSEL WRECKAGE	
1.	Bow of vessel .		60
2.	Bow of vessel with bow spirit remains.		61
3.	Copper sheathing on remains of wood hull.		61
4.	Ballast stones behind main engine.		62
5.	Propeller and shaft at stern of vessel.		62
6.	Close-up of propeller.		63
7.	Main engine, Niigata 3 cylinder diesel.		63
8.	Niigata engine ID plate.		64
9.	Porthole remains on air tanks.		64
10.	Fuel tank with cover.		65
11.	Kerosine lantern and globe in the bottom.		65
12.	Kerosine lantern and globe assembled.		66
13.	Japanese bomb nearby vessel.		66
 SITE NUMBER 8.		 JAPANESE AIRPLANE DUMP	
1.	Large wing.		69
2.	Wing near nacelle.		69
3.	Engine mounting area on wing.		70
4.	Two wing sections.		70

5.	Inside wing end.	71
6.	Close up of wing joining section.	71
7.	Structural aircraft joint.	72
8.	Unique wing section.	72
9.	Control arm.	73
10.	Back of wing section south of main debris field	73

SITE NUMBER 9. STEEL VESSEL WRECKAGE

1.	Scanned photo of bombing survey map, 1947.	77
2.	Bow section of vessel with chain tube.	78
3.	Bilge keel on port side of remaining hull.	78
4.	Bow anchor and chain windlass.	79
5.	Steel mast post base .	79
6.	Main engine.	80
7.	Ships service air tank..	80
8.	Ships service diesel tank with access hatch.	81
9.	Generator and flywheel.	81
10.	Brass bomb detonator.	82
11.	Coral and steel debris from demolition.	82
12.	Tiger cowries in steel debris..	83
13.	US 5 inch artillery shell.	83

SITE NUMBER 10. JAPANESE AIRCRAFT ENGINE

1.	Engine covered in coral growth.	86
2.	Double row of cylinders with 140mm diameter bore.	87
3.	Rear of engine.	87
4.	Drive gear on rear of engine.	88
5.	Butterfly valve from dual carburetor.	88
6.	Supercharger shaft with blades.	89
7.	Exhaust manifold section.	89
8.	Numbers on aluminum governor.	90
9.	Aluminum part from gearbox or supercharger.	90

SITE NUMBER 11. SOUTHERN VESSEL WRECKAGE

1.	Bow section of Southern Vessel Wreckage .	93
2.	Hull lumber remains on starboard bow.	94
3.	Hull bottom with thru-hull fittings.	94
4.	Main engine.	95
5.	Air storage tanks.	95
6.	Kitchen stove near stern.	96
7.	Emergency anchor.	96
8.	Burnt glass from running light.	97
9.	Burnt hull lumber.	97
10.	Brass lock.	98
11.	Bottle in sand near vessel.	98
12.	Black lip pearl oyster near main engine.	99

13. Large US bomb near site. 99

SITE NUMBER 12 BORUDOU MARU WRECK

1. Scanned drawing of vessel. 104
2. Bow of vessel from a forward angle. 105
3. Port side chain encrusted with coral. 105
4. Starboard anchor still in place. 106
5. Hull damage on bow area, starboard. 106
6. Bow of vessel on starboard side of hull. 107
7. Bow of vessel from main deck view. 107
8. Number 1 hold. 108
9. Crows nest on forward mast. 108
10. Bridge area of vessel. 109
11. Vessel steering binnacle without wheel. 109
12. Bomb or artillery hole in hull starboard mid-ship. 110
13. Engine room skylight. 110
14. Lifeboat or work-boat davits. 111
15. Nurse shark resting next to main deck. 111
16. Funnel mount without funnel. 112
17. Small artillery hole in stern on starboard side. 112
18. Stern and stern railing. 113
19. Massive rudder. 113
20. Pilfered bottle left behind on deck. 114
21. Author Matt Holly inspecting the propeller. 114

SITE NUMBER 13. TOYOTSU MARU WRECK

1. Aerial Photograph of vessel at Egmedio island.. 119
2. Surface photo of vessel near Egmedio Island. 120
3. Drawing of vessel. 120
4. Bereavement monument. 121
5. Damage on bow port side. 122
6. Damage on bow starboard side. 122
7. Hole in starboard side from possible artillery round. 123
8. Bottle in number 2 hold. 123
9. Stern debris with king post and winch. 124
10. Stern debris. 124
11. Large propeller with rudder and diver. 125
12. Close-up of propeller with ID. 125
13. Surface photo of ships gun mount 126
14. Surface photo of gun on Wotje island. 126
15. Marine life on port side. 127
16. Marine life at stern debris. 127

SITE NUMBER 14. TOTON ISLAND WRECKAGE

No photos taken at this site.

OTHER WOTJE SITES.

- | | | | |
|----|-------|------------------------------------|-----|
| 1. | WO2-1 | Marshallese evacuating Wotje | 132 |
| 2. | WO6-1 | Aerial photo of Paroa island area. | 136 |

APPENDIX PHOTOS.

- | | | | |
|----|--------------|-----------------------------------|-----|
| 1. | Appendix 2-1 | Aerial photo of Shonan Maru No. 6 | 160 |
| 2. | Appendix 3-1 | Crew photo of lost PB4Y in Wotje. | 163 |

WOTJE REPORT

TABLE OF MAPS

WOTJE SITE NUMBER		PAGE
	Wotje Atoll Summary of Sites Map.	16
Site Number 1	Map WT1	
Wreckage of SB2C Aircraft.	Map of Oceanside Ormed Island.	27
Site Number 2	Map WT2	
Ormed Oceanside Wreck.	Map of Oceanside Ormed Island.	30
Site Number 3	Map WT3	
Ormed Lagoonside Wreck.	Map of Lagoonside Ormed Island.	33
Site Number 4	Map WT4	
Japanese Seaplane Ramp	Map of North Wotje Anchorage.	40
Site Number 5	Map WT5	
Japanese Flying Boat.	Map of North Wotje Anchorage.	50
Site Number 6	Map WT6	
Wotje Docks.	Map of North Wotje Anchorage.	58
Site Number 7	Map WT7	
Central Vessel Wreckage.	Map of Central Wotje Anchorage.	67
Site Number 8	Map WT8	
Japanese Aircraft Dump.	Map of Central Wotje Anchorage.	74
Site Number 9	Map WT9	
Steel Vessel Wreckage	Map of Central Wotje Anchorage.	84

Site Number 10 Japanese Aircraft Engine	Map WT10 Map of Central Wotje Anchorage.	91
Site Number 11 Southern Vessel Wreckage	Map WT11 Map of Central Wotje Anchorage.	100
Site Number 12 Borudou Maru Wreck	Map WT12 Map of Wotje Anchorage.	115
Site Number 13 Toyotsu Maru Wreck	Map WT13 Map of Lagoonside of Egmedio Island	128
Site Number 14 Toton Island Wreck	Map WT14 Map of Toton Island Area.	130
Other Wotje Sites		
Site 1.	Map of Kabin island.	131
Site 2.	Map near Niibunku island.	132
Site 3.	Map near Akeo island.	133
Site 4.	Map of Enibin island.	134
Site 5.	Map of Kechaien island.	135
Site 6.	Map near Paroa island.	136

Site Maps 1-14 All scanned from: *U.S. Navy Department Oceanographic Office, Map Number 6018, Eastern Wotje, 1968.*

INTRODUCTION

The following report is the result of survey work conducted between June 1, 2000 and July, 2000 at Wotje Atoll in the Republic of the Marshall Islands. The survey was done for the Historic Preservation Office of the Ministry of Internal and Outer Island Affairs, Republic of the Marshall Islands. The Survey, called the "Archaeological Survey and Inventory of Submerged Resources in the Lagoon of Wotje Atoll", was basically conducted to provide members of the Marshall Islands government with accurate and up to date information and opinions on their various underwater assets. The information would then be used to develop and/or protect the sites, primarily, and obviously, for SCUBA diving and tourism. Additional archival research was done at this time to supplement my own research into many of these and other sites.

My background in this field is detailed and overlapping. I have been a SCUBA Instructor since 1977, and have operated a SCUBA diving commercial and tourist oriented business in the Marshall Islands since 1979. I found that a tourist visitor provided with complete information on any site was a much happier visitor, so I began my research. I now have an extensive marine and military library, underwater video collection of my work, and a database of both US and Japanese vessels, aircraft, and causality information.

After 20 years, I put all my experience, research and knowledge to work and completed detailed underwater surveys of Majuro and Kwajalein for the Marshall Islands Historic Preservation Office in 1999. This survey of Wotje is done in a similar manner.

The underwater sites chosen for Wotje Atoll were all taken from military and historical reports. Obvious sites include World War II shipwrecks and aircraft, and these were the bulk of the survey items. Items were lost from both sides, before, during, and after World War II. After the known sites were surveyed, attempts were made to locate the "lost" sites and re-discover them. Once all these sites were located, or not, we used any additional time on site to search suspected or rumored areas for artifacts. Sites were also chosen to study the impact of years of divers, and for some of the more inaccessible sites, to compare the lack of impact by divers. In Wotje, this was easy to distinguish, and basically all known sites were located, and most of these had already been affected by artifact collecting divers. Any significant or affected artifacts were listed for each site surveyed.

The survey work consisted of multiple SCUBA dives on the known sites of Wotje Atoll, with searches done nearby each day for other reported or alleged items. We worked in this pattern around the anchorage, moved up to Ormed and the eastern islands for 2 days, then back to the parameters of Wotje anchorage until we left. Most of the sites I had never been visited before, and I hired on 4 different days a HPO sponsored local spear-fishermen for knowledge and extra eyes. I was fortunate on most of the dives to have good weather and visibility, as the Wotje anchorage is typically murky, and the

visibility restricted. This affected the photo work adversely, but most sites were still filmed well.

Most of the sites were boat dives, primarily for ease of equipment use, but some were accessed by beach dives. Survey techniques on each site usually began with identifying its' exact location by GPS or compass reference points, and defining the sites parameters on the bottom. We are fortunate that the GPS differential factor was eliminated in early 2000, as the reference points are now more exact. Video footage was taken on virtually every dive, with separate still photography on most of the sites. Some dives were exploratory in nature, to find an exact location, item or artifact, but this was generally at the end of the day after the work in our primary sites had been completed. The days were long, with lots of water time, and many areas visited. A second diver was used on the deep, long distance or multiple shark area dives for safety.

All planned sites were found, and additional ones added, with the exception of 2 aircraft which we could not find, but are known to have crashed in the atoll. Details of aircraft and ship design, specifications, and military performance not needed for identification and available from common sources has been omitted from this report to avoid excess repetitive information. Sources for this information are available in the references cited or bibliography sections of this report.

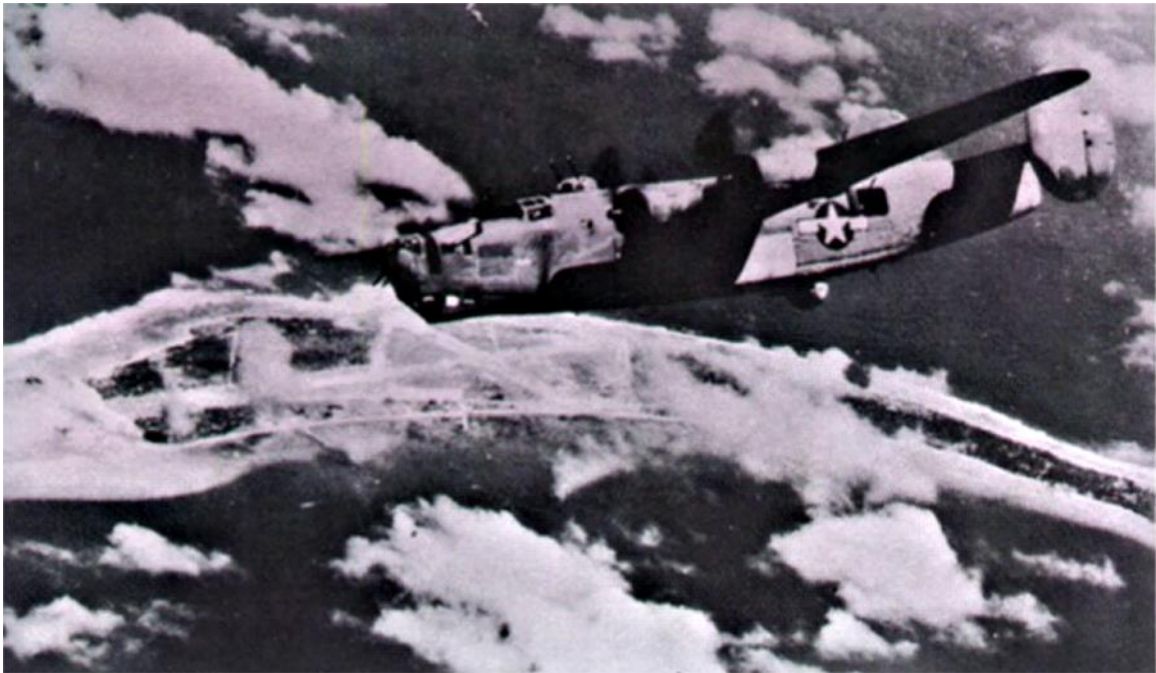
Lastly, a number of appendices follow in this report. Appendices include a select references, a research bibliography, a review of separate still photography, a list of all known or reported Wotje vessels and shipping, a list of known aircraft losses, a list of equipment used for this survey, and a review of the raw video footage.

This report has also been designed for its' expansion easily via computer at a future date, thus this is the first edition, 2000, and there may be future editions as research and input information continues.

Matthew B. Holly
Majuro, Marshall Islands
August 2000

HISTORICAL INTRODUCTION

THE HISTORY OF WOTJE ATOLL PERTAINING TO THIS SURVEY OF UNDERWATER ASSETS



Above photo is of a U.S. Army B-24 Heavy Bomber over the Wotje Airbase and anchorage, taken early in the bombing campaign of the island (probably November or December, 1943). Note the small vessel (tied up to a mooring we located) Northwest of the seaplane ramp. (Scanned from Dorr, 1999:37).

EXPLORERS AND COLONIAL HISTORY, 1700 -1914.

Wotje Atoll was estimated to have been visited by Europeans as early as the 16th century, and discovered historically by Captains Marshall and Gilbert in 1788. Wotje was recorded in text in 1816 by Captain Kotzebue and his group of naturalists. In 1884, Wotje and some nearby atolls were explored by Japan while looking for a slain pearl-diving crew wrecked on Ujae. Many feel this was the information Japan used to develop plans for Wotje after World War 1. The Germans administered the Marshalls from 1885 to 1914, but Wotje was not considered an important atoll since it was not used for coconut plantations. There are no known underwater assets from this period in Wotje Atoll.

JAPANESE MANDATE PERIOD AND WORLD WAR 2, 1914 -1945.

The Japanese ousted the Germans from the Marshall Islands shortly after WW1 began, being allies of the British at that time. After WW1, the islands were given to the Japanese as a protectorate. Wotje military development began quietly in the 1930's, with major airbase construction started in 1939. There are two shipwrecks on the oceanside of Wotje at Kabin and Ormed Islands from this period, but there are little remains or knowledge of these incidents. I visited the remains of the one at Ormed during this survey, and it is listed as MI-WT-LG-002.

War came to Wotje suddenly on the morning of February 1, 1942, with 2 raids by US Carrier aircraft and a bombardment of the Wotje facilities by US surface ships. Although the air-raid totaled 23 aircraft with 58 bombs and no aerial torpedoes, claims were made of 7-9 ships sunk, 1 beached, others damaged, and the island left a smoking ruin. The bombardment force also claimed 2 ships sunk, many more damaged, and the island in ruins. These results were impossible to prove, and the totals were probably greatly exaggerated. Some of these vessels sunk or beached during this raid were located during this survey and are included in this report.

These attacks stimulated Japanese military development, and by mid 1943 Wotje had developed into a major Japanese base, with the construction of runways, hangers, repair facilities, barracks and living quarters. Defensive guns of all descriptions were installed around the island. Docks, complete with a crane, moorings and a massive seaplane ramp were built. Visiting shipping became regular, and Wotje was given 13 of its' own vessels as a Guard Force. Seaplanes began regular visits and reconnaissance missions. The garrison force of Navy, Army and Civilian workers numbered over 3000 men.

When the US forces returned in late 1943, attacks on Wotje were made to destroy the base and suppress any attempts to thwart the US conquests of Majuro, Kwajalein, and Eniwetak. All Japanese aviation was destroyed, virtually all shipping sunk, and the atoll was by-passed and left to starve. The atoll was continually bombarded until the end of the war, even with an occasional shot-down of attacking American planes. Modern air power techniques were developed and refined from these bombing missions, with the first uses of napalm, delay fuses, depth bombs, air dropped sea-mines, pathfinder aircraft, air coordinators, and rescue operations.

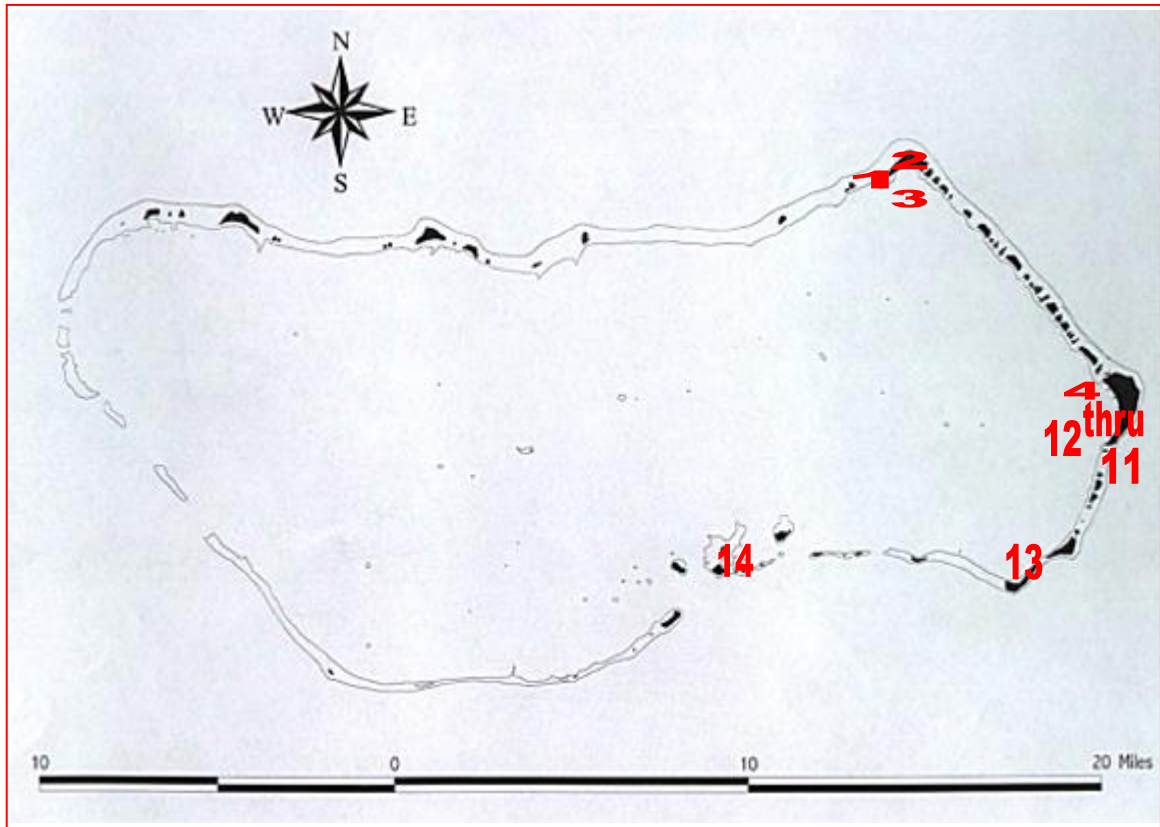
By the time Japan surrendered in 1945, 60 percent of the Japanese garrison had died, leaving only 1,244 survivors. Additional underwater sites were created during this period, with a few more from dumping military hardware after the end of hostilities. More sites were searched for and located from this period and surveyed for this report.

Some of the few modern sites which could be mistaken for older sites are identified at the end of this report in the Other Sites section, as are areas searched underwater without results, which may still have underwater assets or sites nearby. Other details of the history of Wotje during World War 2 can be explored through books listed in the Bibliography of this report.

WOTJE REPORT

SUMMARY OF SITES MAP

SITES ARE NUMBERED IN RED



Wotje Atoll is a ring of land and reefs around a relatively shallow lagoon. It averages 25 miles long east-west, and 8 to 10 miles long north-south. The main shipping channel is in the south central area, identified by site number 14 in red. The lagoon averages 30 feet deep near the shore, 60 to 130 feet deep within a 1/4 mile from shore, and a little over 200 feet at its' deepest point. The outside ocean drops off rapidly from the reef, being generally 2000 to 3000 feet deep after a mile from the shoreline. The main population lives at Wotje island on the east end, with a smaller population living on Ormed island in the northeast corner. The rest of the atoll is sparsely populated.

WOTJE SITE 1 REPORT

NAME: WRECKAGE OF AMERICAN SB2C AIRCRAFT
RMIHPO Site Number MI-WT-LG-001

GENERAL DESCRIPTION AND LOCATION

The Wreckage of the American SB2C Aircraft was the most northern of the sites located during the Wotje Survey. The wreckage was found off the northern corner of Ormed island, out on the inter-tidal reef plane, in 3 to 6 feet of water. The wreckage is scattered over an apx. 400 yard long by 50 yard wide area, starting from apx. 100 yards inside the breakers, and then along a course of 160 degrees magnetic towards the lagoonside channel off the western end of Ormed island. An aerial photo was taken of the area, and a map of the site, Map WT1, follows the photo section of this report.

GPS Position: The fuselage and left wing section are apx. 250 yards west on a compass course of 280 degrees magnetic from the GPS position N 09.32.808 x E 170.08.445, taken at the most NW palm tree on Ormed Island. The aircraft engine is at a compass course of 322 degrees magnetic from this same GPS position, and most of the aircraft debris is on the path between these 2 main items. (There is a conspicuous rock 305 degrees magnetic at low tide from the engine, and the MI WT LG 002 site main boiler is 35 degrees magnetic also from this engine).

DETAILS

The American SB2C wreckage is a debris field of aircraft parts, sitting amongst the coral and sandy bottom of the oceanside reef plain. A drawing of the aircraft was scanned in as Photo WT1-1, and a military photo of the aircraft is Photo WT1-2. These photos and diagrams, along with the military details of the aircraft (*Angelucci & Matricardi, 1979:98-99*), helped identify the wreckage as a SB2C, and eliminated other similar featured aircraft of the era and theater, such as the Douglas SBD "Dauntless" (with a 9 cylinder engine) or Grumman TBD/F "Avenger" (a much bigger wingspan and different folding wing pattern). The major portions of the aircraft, being the engine, starboard wing, and main fuselage/left wing, are noted on the map, and can be barely seen (at the red arrows) in the aerial Photo WT1-3.

The aircraft engine is the farthest major piece from shore, and is barely exposed at low water (Photo WT1-4). The engine, Photo WT1-5, is basically intact, missing a few cylinders and the propeller. Conspicuous were the stainless steel exhaust manifolds, still shining, and significantly different than the Japanese versions that turn black with age and exposure to the elements. A close-up of the engine (Photo-WT1-6) shows the double row of cylinders which totaled 14, the correct amount for a SD2C engine (which was a Wright Cyclone model R2600).

More debris was located following the typical current flow 160 degrees magnetic towards the lagoon. The next large section located was part of the starboard wing with a landing gear still attached (Photo WT1-7). A 20mm cannon was still mounted in the wing, with the ammunition storage area torn open and the shells removed.

Pilot armor plate on the fuselage section is seen in Photo WT1-8, with the left wing in the background. The fuselage has a section of left wing attached, with the dive brake still retracted (Photo WT1-9). The left wing is shown in more detail in Photo WT1-10, with the folding wing section in Photo WT1-11. Minor wreckage is scattered along the bottom towards the fuselage/left wing section which sits closer to the beach, and even includes a radio. The 20mm cannon firing motor/solenoid is shown in Photo WT1-12, and the cannons muzzle in Photo WT1-13. A conspicuous identifying feature was the presumed tie down point located in the wing edge next to the fuselage (Photo WT1-14).

This aircraft seems to have made a controlled, wheels up crash landing, and did not fall out of the sky. This was determined by the basic good condition of most of the components, only damaged by time and the sea. The detail of the aircraft rivet pattern is shown in the close-up Photo WT1-15, and again visible in a National Archives photo of a Marine Corp SB2C of VMSB-231 in Majuro during July 1944.

Military records show many SB2Cs' lost during the Marshall's' campaign, but none could be traced to this site. All early model SB2Cs' had definite loss data other than Wotje, and this aircraft has features of a SB2C Model 4. Most were Marine Corp aircraft, but all my research in Marine Corp losses, including the most active units of VMO/VMF-155, VMSB-231, and 331 did not list any relevant Wotje crashes or losses. It is possible it was a US Navy carrier loss, as the Navy did have some 1 day passing assaults on Wotje, or that the aircraft was a "tag-along" from the aircraft replacement pool in Majuro, and was not listed in normal causality listings. So far I do not have any conclusive loss data.

COMMENTS AND CONCLUSIONS

This site was known to many older Marshallese, but not listed on any reports I have ever reviewed. The site was shown to me by Mr. Budason Kiosa, a local resident of Ormed, who is over 50 years old, lived on Ormed and fished the local waters his entire life. He did not have any stories on the outcome of the aircrew, but remembered some military people from Kwajalein had come to the site over 20 years ago and removed a "machine gun"(the rear seat gunners). The point of my comment is that even after 55 years, the outer islands can hide even locally known common history. This information is dying off with the elders, and soon will become lost secrets of the past. More research into these sites, especially the ones from the war years, is needed much sooner than later, otherwise the site history may be impossible to re-construct.

My only suggestion is to provide a copy of this report to the Wotje Council and Councilmen from Ormed, and teach people on Ormed the value of protecting this site as they can as part of their history.

PHOTO SECTION OF WOTJE SITE 1 REPORT

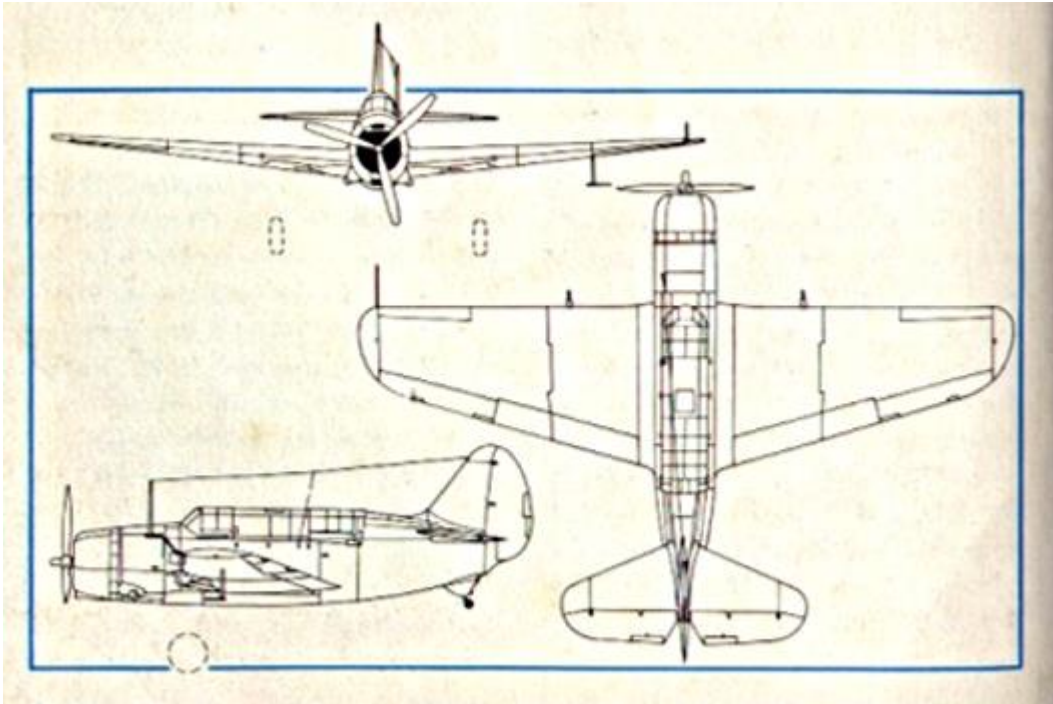


Photo WT1-1. Scanned Drawing of a SB2C "Helldiver" (*Angelucci & Matricardi, 1979:98*).

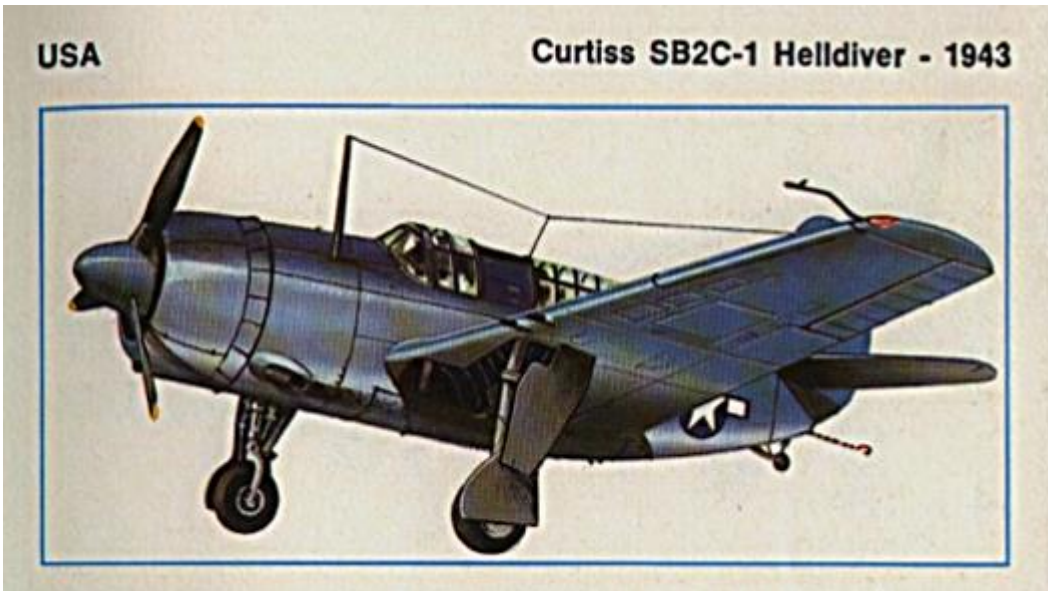


Photo WT1-2. Scanned Military Drawing of a SB2C "Helldiver" (*Angelucci & Matricardi, 1979:99*).



Photo WT1-3. Aerial Photograph of the Oceanside and reef of Northwestern Ormed Island. Red arrows show positions of large pieces of the SB2C wreckage; left arrow, engine; center arrow, right wing; right arrow, left wing and fuselage. WT2 site debris is in the background.



Photo WT1-4. Photo with top of engine exposed with Ormed Island in the background on a 150 degree magnetic compass course. Diver is Mr. Aki Mike.



Photo WT1-5. View of entire engine remains of SB2C aircraft. Note bright stainless steel exhaust manifolds in right side of photo.



Photo WT1-6. Close-up of Wright Cyclone R 2600 engine of a SB2C "Helldiver".



Photo WT1-7. Landing Gear Hub at the end of the severed right wing



Photo WT1-8. Pilot area with structure and armor to the right of the photo, with left wing extending to top of photo. Fuselage ends at right of photo, but continues to the left for apx. another 8 to 10 feet.



Photo WT1-9. Left wing section to the left of photo, with the remaining fuselage to the right. Note air brakes retracted in left wing assembly.



Photo WT1-10. Left wing section from the opposite view.



Photo WT1-11. Close-up view of folding wing section.



Photo WT1-12. Electric Motor or Solenoid to fire the 20mm cannon.



Photo WT1-13. Muzzle of 20mm cannon in right wing section.



Photo WT1-14. Presumed tie down point of aircraft located on wing directly next to the fuselage. Fuel tank was locally removed from the compartment visible in the lower right, taken through the opening above chiseled through the top of the wing.

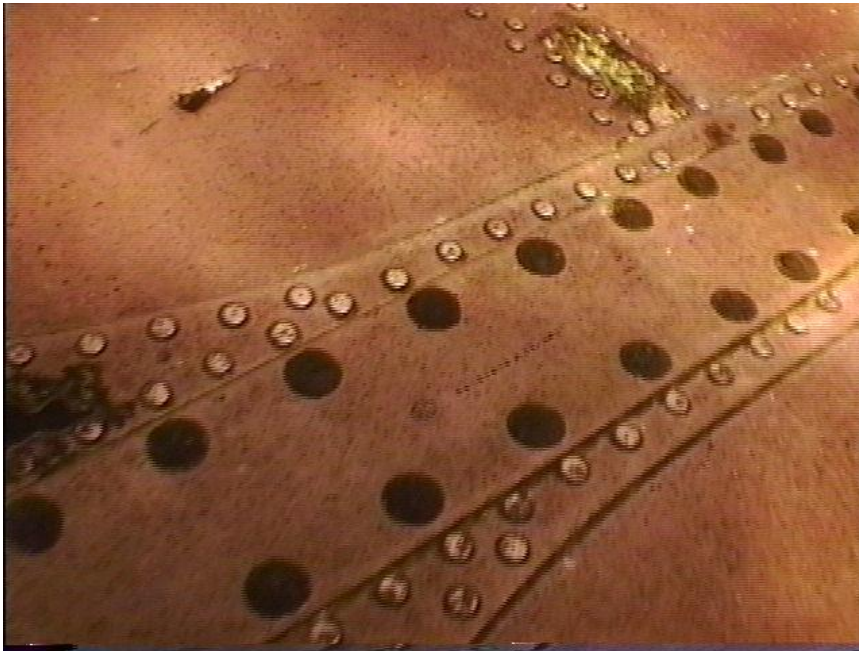


Photo WT1-15. Close-up of rivet pattern under pilot seat area.

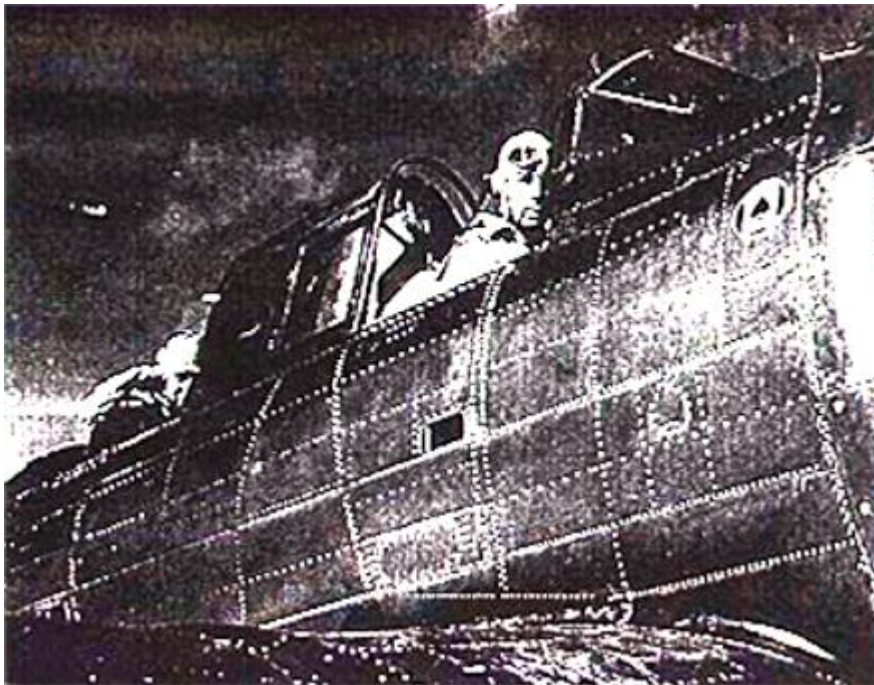


Photo WT1-16. Scanned photo of Captain John P. Adams, USMC, in his SB2C-4 of VMSB-231 in Majuro, August 1944. (*National Archives negative number 397752*). Note the same tight rivet weave typical in the site Photo WT1-15.

WOTJE SITE 2 REPORT

NAME: ORMED OCEANSIDE SHIPWRECK
RMIHPO Site Number MI-WT-LG-002

GENERAL DESCRIPTION AND LOCATION

The Ormed Oceanside Shipwreck is a debris field from an unknown large steel Japanese Cargo Vessel. The remains are scattered over an apx. 600 yard wide by 400 yard deep area, on the tidal reef area north of the center of the island. The main debris is apx. 300 to 500 yards from the beach. The area is difficult to cross due to the many coral pockets and patches on the reef plain. The debris, except the larger pieces, is underwater at high tide. Most of the coral reef is alive, and the water visibility excellent. A map of the site, Map WT2, follows the Photo Section of this Report.

GPS Position: 305 through 350 degrees magnetic from N 09.33.071 x E 170.08.627, this position is at the high water mark looking northward towards the debris area.

DETAILS

The Ormed Oceanside Shipwreck was listed on the first US Navy Oceanographic Office Chart of 1944, Number 6018 of Eastern Wotje, as taken partially from earlier Japanese charts and data. Local Ormed residents stated the vessel washed ashore long before the war years, but had no data of its' name, characteristics, or reason for grounding.

Basic inspection showed it was a steam boiler driven vessel, as a large boiler has rolled up on and across part of the reef. The propeller and shaft were visible and typical for an apx. 300 foot long, 2,000 to 3,000 ton vessel. The vessels hull was riveted steel plate, with no indication of welding or stainless steel, dating the construction as probably after 1920 but before 1930. Shards of hull metal and heavily rusted bits and pieces litter the reef. A closer inspection and cleaning of the propeller may shed some light on the age, manufacturer, or name of the vessel.

COMMENTS AND CONCLUSIONS

This wreck was included in this report as remains are still visible, its location is known, and was reported in earlier reports. Possibly other researchers may discover its name and history from other sources, so this site report merely documents the wreckage as described existed at the time of my survey.

There were no artifacts visible on the site or surrounding debris.

PHOTO SECTION OF WOTJE SITE 2 REPORT

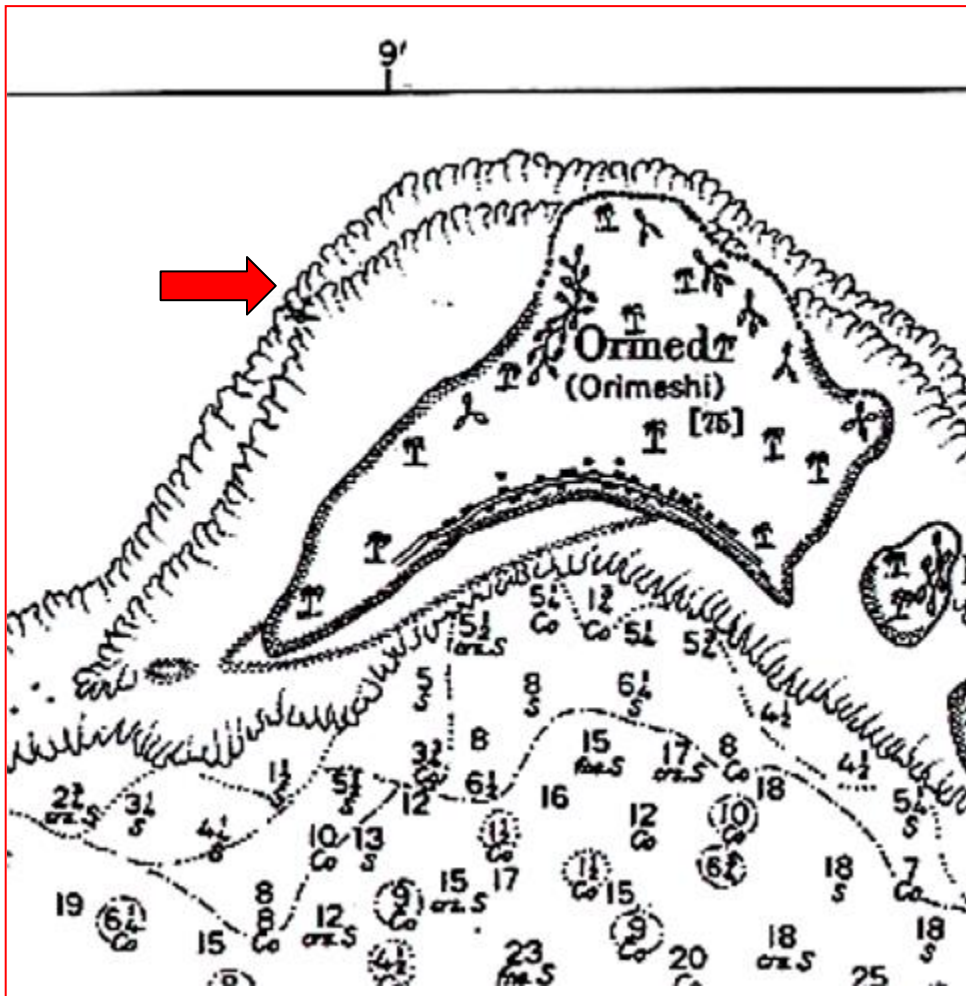


Photo WT2-1. Red arrow shows location of large debris from Ormed Oceanside Wreck, visible at low tide on the exposed reef of this aerial photo. The largest item is a round boiler, rolled up onto the reef, which is the item directly off the point of the arrow.

MAP OF WOTJE SITE NUMBER 2 REPORT

Site is identified on the Map by the red arrow.

The Map was scanned from the US Department of the Navy Oceanographic Office Chart 6018, Eastern Wotje, revised in June 1968.



WOTJE SITE 3 REPORT

NAME: ORMED LAGOONSIDE SHIPWRECK
RMIHPO Site Number MI-WT-LG-003

GENERAL DESCRIPTION AND LOCATION

The Site does not exist. The site of a submerged vessel near the lagoonside of Ormed Island was originally reported in the *Spennemann* HPO Report 1991/7 "The Submerged Cultural Resources of Wotje Atoll, 1991, item 3.6, page 27, based upon an aerial photograph from a 1978 aerial survey.

Upon arrival to Ormed Island, we viewed a dark patch of water located in the area listed in the Spennemann report. A reading on our depth-finder indicated a possible vessel below by the straight edges viewed on the screen, typical to shipwrecks, and the apx. depth of 30 feet was correct. I assembled my diving equipment, underwater video camera, and even took a GPS position of the site. Upon entering the water I found the nicest shipwreck looking reef you could imagine, even with a little cut that could be the wheelhouse shadow. There was no vessel.

Presuming the vessel moved by storm or broke up, I searched the immediate area, and then expanded my search to both inshore and into deeper water. Nothing was found. An inshore downwind beach search located no remains of any kind of any vessel. It must also be noted the US Navy Chart also incorrectly shows a reef edge along the lagoonside of the island, where there is no reef, but a gently rising sandy bottom. There were many small, high rising coral heads lagoonside, but no vessel or remains. The visibility was milky and only fair, with little marine life. A Map of the site, WT3, follows the photo section of this report.

GPS Position (of the ship shaped coral area): N 09.32.890 x E 170.08.902

DETAILS

As no vessel was located, I went to shore and contacted the local residents. After introductions, I was lead to a Mr. Budasan Kiosa, a life-time resident of Ormed and a fisherman. He stated there had never been any vessel on the lagoonside beach or anywhere nearby at any time. He did know of the wreckage of an airplane on the oceanside reef (Now Wotje Site MI WT LG 001), and of additional oceanside wreckage of a Japanese ship (Now Wotje Site MI WT LG 002). He also took us to look at another site near Aeko Island, listed at the end of the site reports in the "Other Wotje Sites" section.

COMMENTS AND CONCLUSIONS

I presume this Wotje Site Number 3 was incorrectly identified from the 1978 aerial survey and the *Spennemann* report, and was perpetuated incorrectly in following reports, as it was never physically inspected or identified. It shows that mistakes are made, repeated, and hopefully corrected as history rolls on. Sometimes it's easy.

PHOTO SECTION OF THE WOTJE SITE 3 REPORT

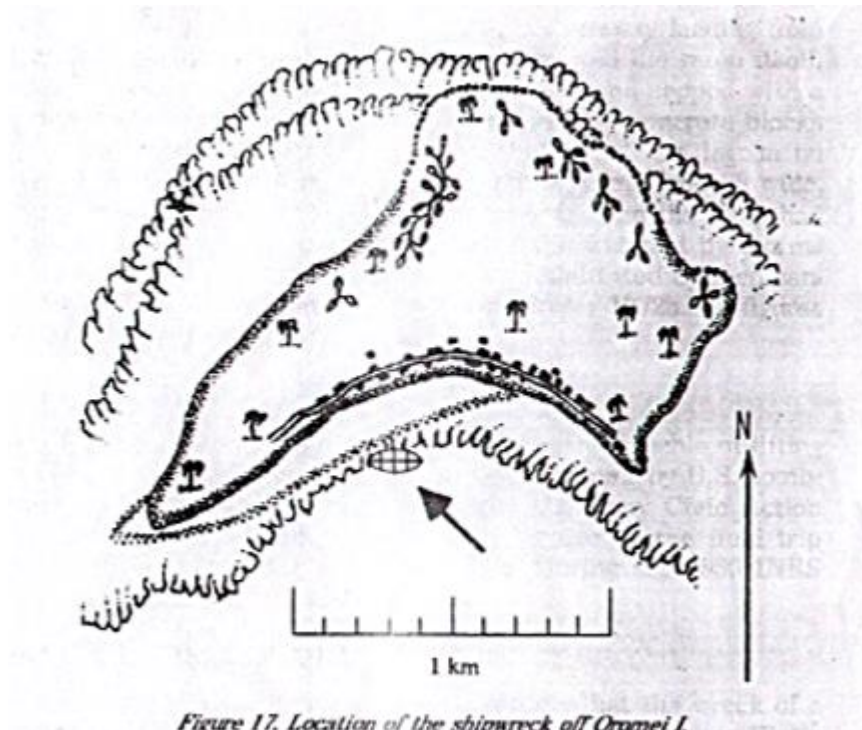


Figure 17. Location of the shipwreck off Oramed I.

Photo WT3-1. Scanned map from *Spennemann, 1991/7:27* Arrow points to exact position of the lagoonside coral heads formed like a vessel. Also note there is no coral reef line along the shoreline, as Ormed has a sandy bottom and beach along its' entire length.

WOTJE SITE 4 REPORT

NAME: WOTJE SEAPLANE RAMP
RMIHPO Site Number MI-WT-LG-004

GENERAL DESCRIPTION AND LOCATION

The Wotje Seaplane Ramp is a massive concrete structure extending out over 200 yards into the lagoon from the lagoonside beach (Photo WT4-1). It starts apx. 600 yards south of the north end of Wotje island, and apx. 600 yards north of the Wotje main dock. It extends out into the lagoon across a sandy bottom and ends in apx. 13 feet of water at high tide. The ramp is laid out on a compass course of 45/225 degrees magnetic. A Map of the site, MapWT4, follows the photo section of this report.

GPS POSITION: At the shoreline N 09.27.586 x E 170.13.854
 At the end of the ramp N 09 27.639 x E 170.13 936

DETAILS

The Wotje Seaplane Ramp starts in deep water with pre-cast concrete sections laid on the lagoon bottom (Photo WT4-2). Small pyramid shaped concrete markers were placed on the outside edges with attached floats to mark the width and start of the ramp (Photo WT4-3). These pre-cast sections slowly rose shallower, supported by a built-up coral foundation.

The Seaplane ramp was created like similar ramps at Ebeye and Jaluit by workers clearing the lagoon bottom of all the coral, rocks and rubble from the surrounding area and using this as a sub-foundation for the construction of the ramp. Bags of cement were also used in the foundation (Photo WT4-4), to help anchor the walls. Various sizes of concrete formed blocks were used to build the walls of the ramp, which, like the Main Dock, was filled with coral material quarried from the island to the north of Wotje.

Pre-cast and pre-formed blocks were laid up along the bottom, forming the walls (Photo WT4-5), with larger, wider blocks on the bottom, and smaller narrower blocks on the top, forming an inward tapered wall, to hold the fill material in place.

An Anti-Aircraft Site, listed in *Christiansen, 1994*, as Site D656, was blown into the lagoon on the north side (Photo WT4-6). Other debris, but no vessels, was found nearby.

An Air Control Center building for Seaplane Operations was located inshore near the seaplane ramp and is noted as *Christiansen, 1994*, Site D643, and was attached as Photo WT4-7. An aerial photo taken from attacking U.S. aircraft shows the shore area of the seaplane ramp and the nearby base facilities (Photo WT4-8).

COMMENTS AND CONCLUSION

It is unfortunate there is not an economic value or use for this massive bit of construction, other than a second Wotje dock. The Seaplane ramp, with repairs, could be exactly as built in 1940. I do not have any suggestions, as unless deliberately destroyed, this site will be around for generations in the future.

PHOTO SECTION OF SITE REPORT NUMBER 4.



Photo WT4-1. North side of the Japanese Seaplane Ramp from in the water.



Photo WT4-2. Start of the ramp in deep water, south-west side.



Photo WT4-3. Pyramid shaped edge markers for Seaplane Ramp.

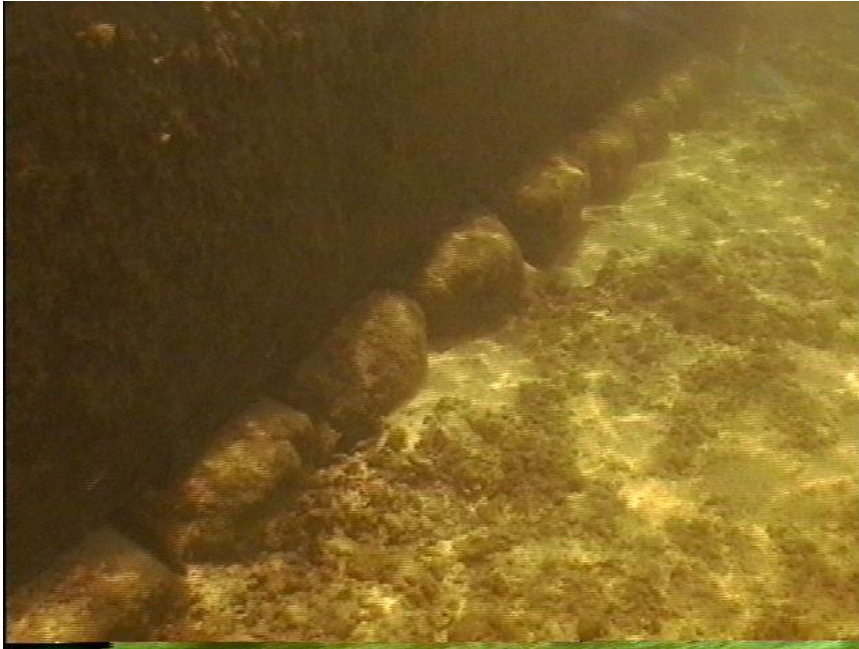


Photo WT4-4. Cement bags used as the Seaplane Ramp wall foundation.

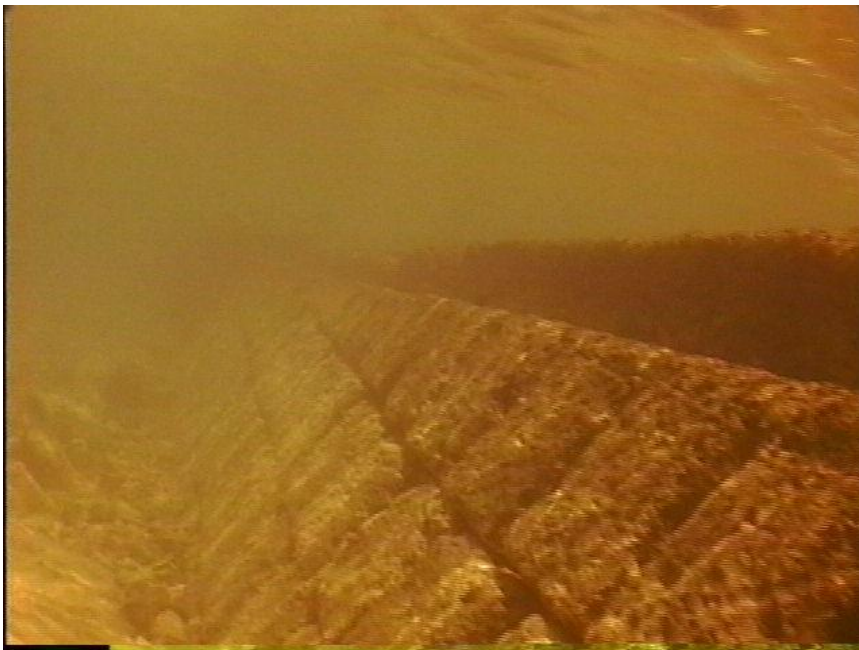


Photo WT4-5. Formed blocks laid for walls of the Seaplane Ramp.

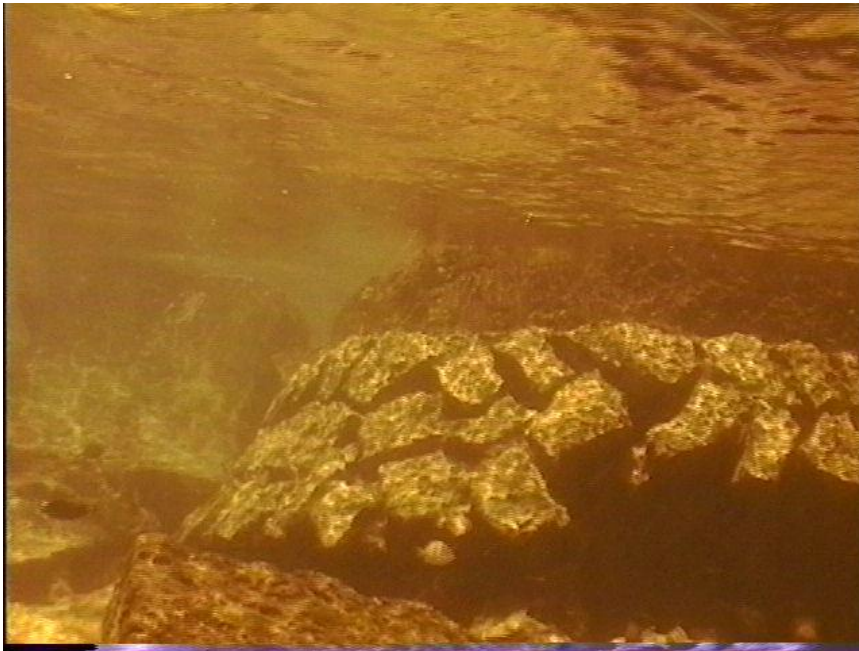


Photo WT4-6. Anti-aircraft site blown into the water off the Seaplane Ramp.



Photo WT4-7. Seaplane Operations Buildings, inshore from Seaplane Ramp.



Photo WT4-8. A scanned aerial photo of the Seaplane Ramp area was taken from an original photo provided from the collection of R. Carlton, a Marine Corp aviator from VMSB-331, based in Majuro during WW2. The photo was actual taken by a photo plane of VMSB-231, a sister squadron, on March 13, 1944.

MAP OF WOTJE SITE NUMBER 4 REPORT.

Site is identified on the Map by the red arrow.

The Map was scanned from the US Department of the Navy Oceanographic Office Chart 6018, Eastern Wotje, revised in June 1968.



WOTJE SITE 5 REPORT

NAME: WOTJE FLYING-BOAT WRECKAGE

RMIHPO Site Number MI-WT-LG-005

GENERAL DESCRIPTION AND LOCATION

The Site 5 Report describes the remains of a Japanese H8K model 2 flying-boat, code named "Emily" by the Allies during the war. The aircraft is sitting in 28 to 34 feet of water on a sandy bottom lagoonside of the Wotje Seaplane ramp. The wreckage is apx. 700 yards west of the shoreline, on a compass course of apx. 210 degrees magnetic from the deep end of the Seaplane Ramp. The site is also listed in *Christiansen, 1994, Volume 2, "The Archaeology of World War II in the Marshall Islands"*, page 44 as site D802. The marine life is sparse except within parts of the wings of the wreckage, and visibility generally poor to good, typical of the cloudy visibility of the Wotje Anchorage. A map of the site, Map WT5, follows the photo section of this report.

GPS POSITION: See RMIHPO.

DETAILS

A Kawanishi H8K Flying Boat was a very large, 4 engine, long-range, reconnaissance aircraft, with models 1 and 2 used in the Marshall Islands area from 1941 through 1944. The aircraft at this site was probably a model 2 aircraft, the most plentiful of the series, as only 14 model 1 versions were produced. It is also difficult comparing the Mitsubishi engines underwater for small differences (water injection), as the rest of the comparably armament is missing. The aircraft measured 124 feet long, 92 feet wide, and stood 30 feet off the water. Photo WT5-1 is the scanned drawing of the aircraft, a H8K3 model, (there were negligible changes in structure). Photo WT5-2 is a military photo of a model H8K2 aircraft.

The aircraft was also called the "flying porcupine" by the Allies, being armed with 5 20mm cannon, 1 in the top turret, 1 in the tail turret, 1 manually operated in the nose, and 1 manually operated in each of the port and starboard beam blisters. It also had 5 other hand held 7.7mm machine guns fired through various openings in the aircraft. When the aircraft flew low against the water protecting its ' belly, it was very difficult to approach and attack.

This sites aircraft belonged to the Yokohama Naval Air Group, or Yokohama Kokutai, later changed to the 802nd Naval Air Group, and had 9 of these aircraft designated for the Marshalls. Others in transit, generally coming from Truk Lagoon via Eniwetak and Kwajalein Atolls, occasionally increased these numbers. This unit also used H6K4 model flying boats, code named "Mavis" by the allies, before their replacement with these longer ranged H8Ks.

The first combat sortie of a H8K1 in the war came from Wotje. During this mission they bombed the Hawaiian Islands on the night of March 4-5, 1942 (*Francillon, 1995: 309*) and (*Lambert, 1990:42, 202*). There was as a second failed attempt in June of 1942. Other H8Ks of this Air Group were lost in Jaluit Atoll (2 have been located), at sea, and possibly Kwajalein Atoll. The remaining aircraft were used at the end of January and early February 1944 to evacuated pilots and other key personnel from the Marshalls bases to points west.

Military history lists 2 flying boats officially lost at Wotje during the war, one on land, and the one in the water located at this site. The remains of at least one H8K were located on land at the Wotje airbase (5 different engines complete with 4 blade propellers were located on shore). Other aircraft were listed as strafed, bombed and probably sunk in the lagoon, but were not located during this survey, and were probably only damaged, later repaired, and removed from the Marshalls. Some of these other aircraft could be H6K models.

The aircraft at this site was reported destroyed on the water on a January 8, 1944 dusk raid by Navy PB4Y aircraft (The Navy version of a B-24 Heavy Bomber) of VB-109 based in Abemama, Gilberts. It was specifically credited as destroyed by Lt. Commander Janeshek, flying with his crew #10 in their aircraft "Come Get It", Bureau Number 32068 (*Carey, 1999: 25 ,184*). A H8K Flying Boat was also listed as destroyed by the 7th Air Force on December 24, 1943, by B-24 Bombers of the 11th Bombardment Group, 431st or 98th Squadrons, on a low level attack (*7th Air Force: Mission Report 41 "Strike against Wotje, 24 December 1943"*). As small aircraft debris from other Flying Boats litter the bottom in 2 other areas, it is likely one "destroyed" aircraft was repaired and flew away.

The bow of the aircraft at the site (Photo WT5-3) shows the forward windows indicated in the attached drawings and military photo (WT5-1 and WT5-2). Photo WT5-4 shows the remains of the inner bow area, including the forward hatch. The flight deck controls are visible in Photo WT5-5, and an aircrew seat is in Photo WT5-6.

The only remaining armament were the remains of the top turret (Photo WT5-7), and the stern turret with its curved armor plates (Photo WT5-8), without there 20mm cannons. Photo WT5-9 shows the heavy metal structure used in the aircraft. Photo WT5-10 shows the number 4 engine still attached to the wing, Photo WT-11 shows the metal skeleton of the fabric covered control surfaces. Photo WT5-12 shows twin aerial torpedo mounts and the sites marine life is shown in the open wing section in PhotoWT5-13.

COMMENTS AND CONCLUSIONS

This aircraft site is well worn and well stripped, probably first by the Japanese during the war, and then later by locals and collections due to it the sites shallow depth. But even with these losses, the aircraft is easily recognizable and quite photogenic, and a nice dive and tourist site.

The greatest risk is by continuing anchoring by inter-island trading boats, and by continued siltation at the site. I would recommend the Wotje Council install a warning buoy in deeper water downwind from the flying-boat site to warn boat operations of this historical asset and keep anchors from ruining the site.

PHOTO SECTION OF WOTJE SITE 5 REPORT

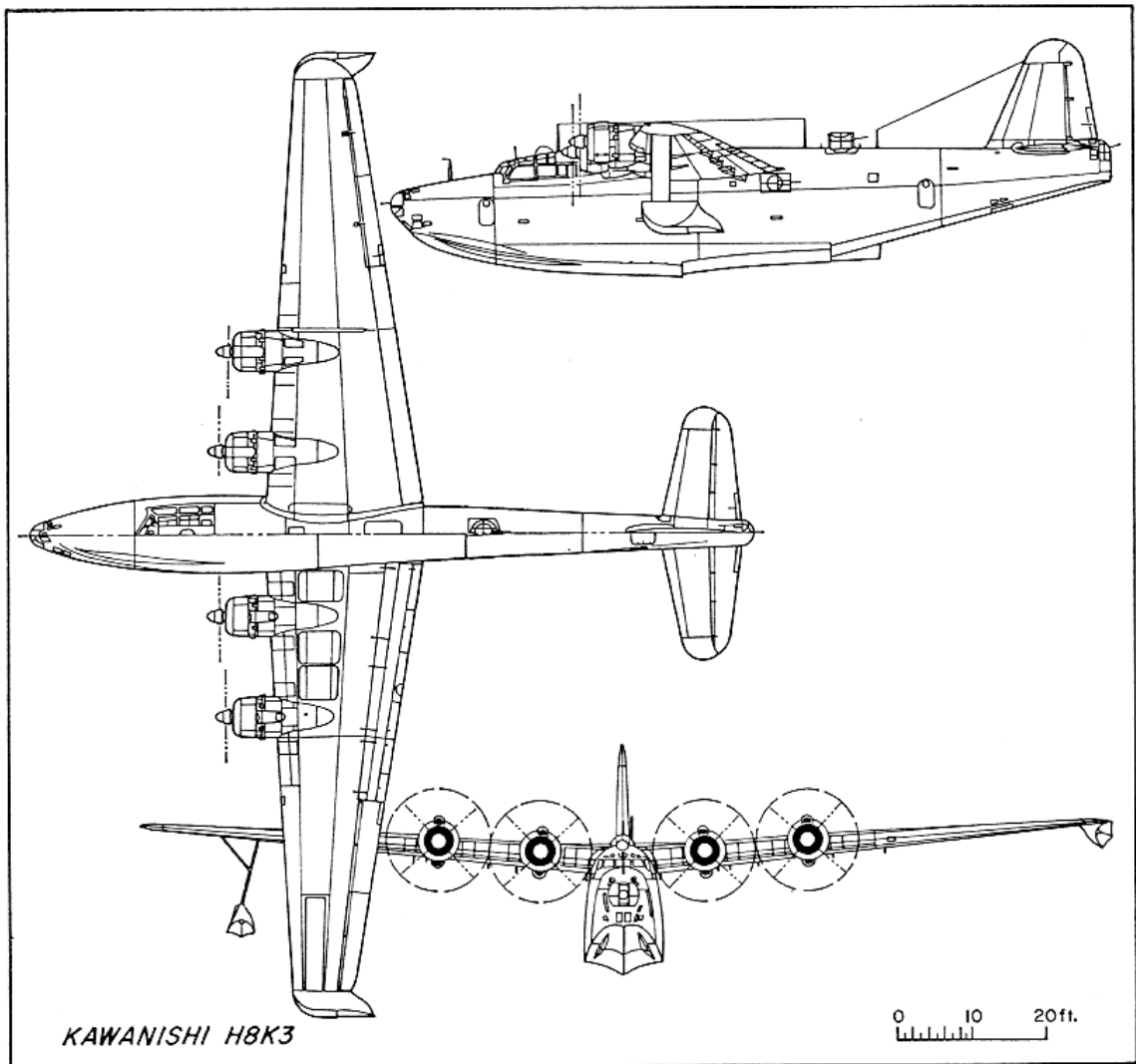


Photo WT 5-1 is a scanned drawing of the Kawanishi H8K Model 3, which except for minor engine and rudder changes, is the same as models 1 and 2. (*Angelucci & Matricardi, 1977:178*).

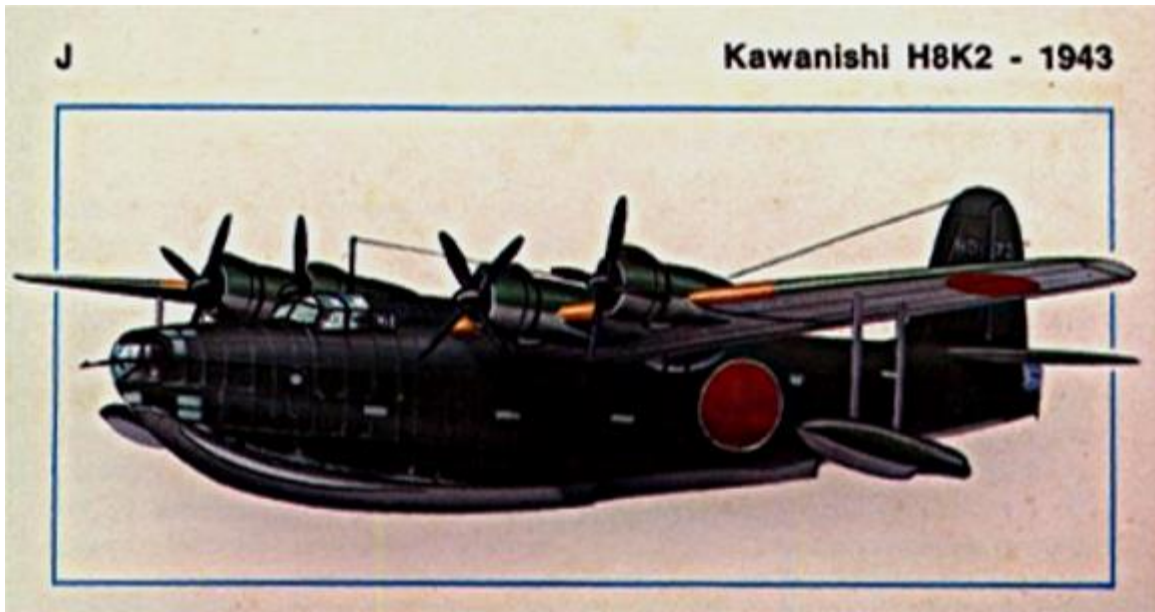


Photo WT5-2 is a scanned photo of a Kawanishi H8K Model 2 Flying Boat (*Angelucci & Matricardi, 1977:179*).



Photo WT5-3. Bow section of the Kawanishi H8K2 at the site. Note the lower window frames visible in the photo.



Photo WT5-4. Remains in the bow section of the flying-boat. Note the forward hatch door, a storage compartment box, and an engine cylinder in the photo.



Photo WT5-5. Flight deck controls of the Kawanishi H8K with coral growth.



Photo WT5-6. Aircrew seat located in the bow area behind the flight controls of the aircraft.



Photo WT5-7. The top turret of the aircraft with the 20mm cannon removed.



Photo WT5-8. Tail turret assembly without the 20mm cannon, showing the attached curved armor plate at the left of the photo covered in an orange algae

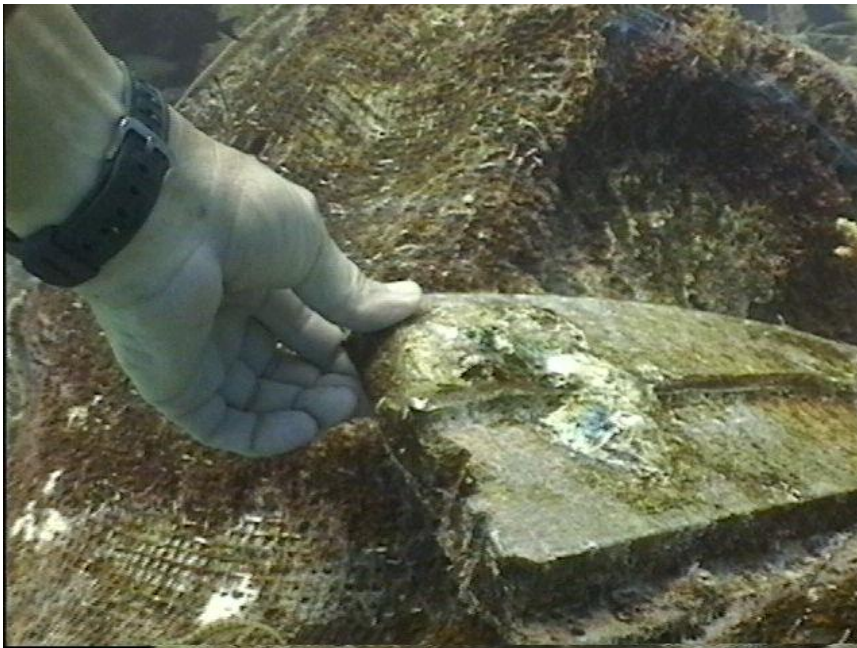


Photo WT5-9. Heavy metal structure of the aircraft, laying over an internal fuel tank.



Photo WT5-10. Number 4 engine of the Kawanishi H8K aircraft.



Photo WT5-11. Metal skeleton of the fabric covered wing control surfaces.



Photo WT5-12. Mounts for aerial torpedoes, left one covered in white growth.



Photo WT5-13. Marine life within the wing of the aircraft.

WOTJE SITE 6 REPORT

NAME: WOTJE DOCKS

RMIHPO Site Number MI-WT-LG-006

GENERAL DESCRIPTION AND LOCATION

The Wotje Base facility had 2 docks, one large ship service dock with crane service, and one small service dock nearby to the south. Only the larger dock remains in service today, even with bomb damage. The area has generally good to poor visibility, and very little marine life. The exception is on the coral patch reef to the south, which is shallow, alive, and full of small tropical fish and marine life. A map of the site, Map WT6, follows the photo section of this report.

GPS Positions: Main Dock, Shoreside : N 09.27.399 x E 170.14.098
Deep Water: N 09.27.375 x E 170.14.004
Small Dock, Shoreside : N 09.27.348 x E 170.13.835

DETAILS

The main dock extends into the lagoon apx. 200 yards from the natural shoreline on a magnetic compass course of apx. 250 degrees (Photo WT6-1). The dock is made of large formed concrete blocks installed as walls on a coral sub-foundation collected from the surrounding lagoon floor. The area between the walls is filled with material from shore. Wotje had a railway system to collect coral fill material from the islands to the north of the base to use for construction programs. The concrete block size and shape were designed to both interlock the blocks together and allow for the ease of installation. Unfortunately, as in other Japanese Docks built in the era, if sections are destroyed by bombing, it is very difficult to properly repair the damage area (Photo WT6-2). Local repairs have been made to one inner section, and allows the tie up of 100 foot or less vessels of shallow draft inside the dock.

The main dock also had a service crane on the extension to the north, which was destroyed by the bombing and blown into the water (Photo WT6-3). An anti-aircraft site was also on the south end, and was also blown into the water (Photo WT6-4) Other items off the dock are also in the water, such as the ships services bollards (Photo WT6-5), and a 75mm artillery round, possibly from the AA gun. (WT6-6).

The small service dock is apx. 150 yards to the south of the main dock, sticking into the lagoon at a 45 degree angle to the beach towards the south. It was probably used for unloading smaller items or unloading directly onto the beach. The small service dock was more simple and typical in construction, being concrete poured into forms. It has trapped sand over time and made it useless. A service winch was located inshore (Photo

WT6-7) to help pull small vessels to the shore for unloading, and the small dock is nearby (WT6-8).

An aerial photo from April 1944, Photo WT6-9, was taken of the dock area during an attack on the Wotje base facilities by Marine Corp squadron VMSB-331.

COMMENTS AND CONCLUSIONS

I enjoy reviewing the Japanese docks, as their design has allowed them to stand up to the environment and tests of time, even with bomb damage. They are robust and well designed, sort of the pyramids of the Marshall Islands, and will be around for generations to come. I am surprised more outer islands have not refurbished these assets, as the Wotje main dock could be repaired and still remain a historical asset, and an economic one too.

PHOTO SECTION OF WOTJE SITE 6 REPORT



Photo WT6-1. Japanese built Wotje Main Service Dock. Only the far end destroyed by bombing.



Photo WT6-2. Deep end of Main Service Dock, heavily damaged by bombing and time, with crane base exposed on original end of dock.



Photo WT6-3. Top of Crane section underwater off end of Main Service Dock.



Photo WT6-4. Anti-Aircraft Site blown into water from bomb damage at the end of the Main Service Dock.



Photo WT6-5. Ships service tie up bollards at the end of the Main Service Dock.



Photo WT6-6. A 75mm artillery round lies on the lagoon bottom, possibly from the anti-aircraft position on the end of the dock.



Photo WT6-7. A winch was set up inshore to haul boats ashore to the small dock.



Photo WT6-8. Remains of Wotje Small Service Dock.

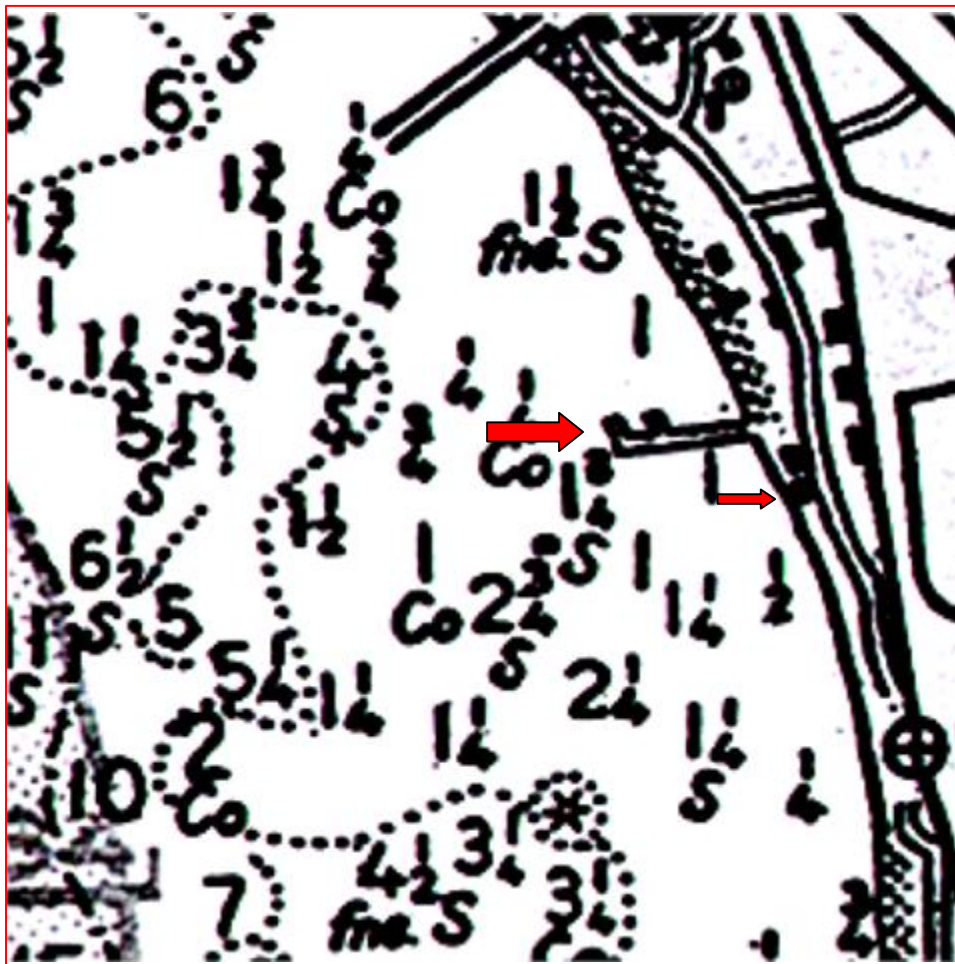


Photo WT6-9. A scanned aerial photo of the Dock area was taken from an original photo provided from the collection of R. Carlton, a Marine Corp aviator from VMSB-331, based in Majuro during WW2. The photo was actual taken by a photo plane of VMSB-331, on April 7, 1944.

MAP OF WOTJE SITE NUMBER 6 REPORT.

The Wotje Main service dock is shown by the **large red** arrow, the small dock by the **small red** arrow.

The Map was scanned from the US Department of the Navy Oceanographic Office Chart 6018, Eastern Wotje, revised in June 1968.



WOTJE SITE 7 REPORT

NAME: CENTRAL VESSEL WRECKAGE

RMIHPO Site Number. MI-WT-LG-007

GENERAL DESCRIPTION AND LOCATION

The Central Vessel Wreckage is the remains of a wooden Japanese vessel sunk in apx. 18 to 24 feet of water lagoonside and south of the Main Wotje Dock. It is apx. 500 yards from the shoreline, and rests on a sandy bottom with occasional small coral heads nearby. It is on a magnetic course of 225 degrees from the end of the Wotje Main Dock. A map of the site, Map WT1, follows the Photo Section of this report.

GPS Position: See RMIHPO.

DETAILS

The Central Vessel was a fishing vessel converted for Naval Auxiliary duty. I could not locate the name of the vessel or the date it was sunk. It appears to have been at anchor on a mooring upwind apx. 150 feet away, was attacked and had minor but mortally damage, broke or burnt of its' mooring, and floated downwind until sinking. There was no anchor or bow chain in the wreckage or the immediate area. It may have had fire damage to the stern area, as some items are fused together, but this could also be to its 55 plus years underwater.. I do not think it was hit by a bomb or near miss, as much of the vessel hull structure is intact, and many fragile items are not broken. It probably was strafed and holed, a sunk soon after.

The bow of the vessel had a bow spirit, decayed away in Photo WT7-1. The bow and most of the vessel had concrete poured between the frames, generally a repair technique for older boats not worthy or far away from repair areas. This concrete is visible, as is the base of the bow spirit in Photo WT7-2 .

The vessel was all wood construction, with copper sheathing added over the lower, under the water line areas, also seen in Photos WT7-2 and WT7-3. Ballast stones were added in the stern area, possibly to balance the weight of the concrete forward, seen in Photo WT7-4. The propeller and shaft are visible in Photo WT7-5, and a closer view is in Photo WT7-6. These features, from bow to stern, give the vessel an estimated overall length of 70 to 75 feet long, with a 16 foot beam, and a 7-8 foot draft, weighting apx. 50 to 60 tons, depending on how the vessel was configured, or less if it was stripped down.

The main engine was a robust 3 cylinder diesel unit, (Photo WT7-7) manufactured by Niigata, a large Japanese diesel engine manufacturer, as translated from the engine identification plate (Photo WT7-8). Niigata Corporation is still making diesel engines today.

The site had other identifiable features and items, such as a porthole frame resting on the ships service air tanks (Photo WT7-9), and a fuel tank access port and cover in Photo WT7-10. My favorite find was the brass or copper kerosene lantern with its glass globe intact in the left of the Photo WT7-11, and after I dusted them off an assembled them in Photo WT7-12. The last item near the site was a large aerial bomb, probably a Japanese 250kg model.

COMMENTS AND CONCLUSIONS

This vessel was one of the nicest vessels discovered in the anchorage, and was not identified in any other specific prior reports. The vessel had lots of original items, ballast stones, occasional bottle, and the brass or copper kerosene lantern. The Niigata engine plate could be cleaned further an may give additional vessel information. The vessel, in my opinion has not been searched by divers, and probably offers more artifacts in the sand.

The vessel could also be protected from ships anchoring in the area by buoying the downwind side of the site with a warning marker. These could and should become standard items for outer island underwater historical sites.

PHOTO SECTION OF WOTJE SITE 7 REPORT



Photo WT7-1 Bow of Central Vessel Wreckage, with decayed bow spirit.



Photo WT7-2. The bow of the Central Vessel, with decayed bow spirit and residual concrete repairs between the frames on the port side obviously evident.



Photo WT7-3. Copper sheeting on the port side of the Central Vessel Wreckage.



Photo WT7-4. Ballast Stones behind Niigata Main engine.



Photo WT7-5. Propeller and shaft of Central Vessel Wreckage.



Photo WT7-6. Close-up view of propeller of Central Vessel Wreckage.



Photo WT7-7. Robust 3 cylinder Niigata Main engine.



Photo WT7-8. Engine ID plate translating into Niigata built diesel engine.



Photo WT7-9. Porthole parts sits atop the ships air service tanks near main engine.



Photo WT7-10. Access door and cover on diesel fuel tank.



Photo WT7-11. Brass lantern and glass globe for the lantern in the bottom of the Central Vessel Wreckage.



Photo WT7-12. Kerosene lamp and globe assembled.



WT7-13. Large Bomb near the site, probably Japanese 800 Kg. G.P. Type.

MAP OF WOTJE SITE REPORT NUMBER 7

Site is identified on the Map by the red arrow.

The Map was scanned from the US Department of the Navy Oceanographic Office Chart 6018, Eastern Wotje, revised in June 1968.



WOTJE SITE 8 REPORT

NAME: JAPANESE AIRCRAFT DUMP
RMIHPO Site Number MI-WT-LG-008

GENERAL DESCRIPTION AND LOCATION

The Japanese Aircraft Dump is a collection of Japanese Aircraft parts, primarily wing components. They are located apx. 500 yards from shore, between the central and steel vessel wreckage. The site is 24 to 28 feet deep, on a sandy bottom, with parts of the debris buried under the sand. The site has poor to good visibility, with the only marine life hiding inside the wings. A map of the site, Map WT8, follows the Photo Section of this Report.

GPS Position: See RMIHPO.

DETAILS

This site was most likely the dumping ground for the remains of Japanese aircraft damaged by US bombing of the airbase. Most pieces are larger sections of Japanese aircraft wings (Photos WT8-1 through 5), probably from the Mitsubishi G4M model "Betty". The nacelles are the only easily comparable feature, and look similar to the G4M outline.

There are 2 pairs of wings, some structure debris (Photo WT8-6 and 7), but no engines, fuselage, or tail sections. There are some unique features (Photo WT8-8), and control arm (Photo WT8-9) that may identify the plane remains to an expert. The last photo, WT8-10, shows the back of another wing section south of the main debris field.

COMMENTS AND CONCLUSIONS

This site was a curious dive, only to locate the unknown and try to identify it. It most likely is a pair of damaged "Betty" wings, but one wonders why all the effort to dump them where they could be easily seen. I am guessing they were damaged early in the war, when the effort to clean up was easier to accomplish.

PHOTO SECTION OF WOTJE SITE 8 REPORT



Photo WT8-1. A large aircraft wing section at Site 8.



Photo WT8-2. Front edge of a wing section, with an engine mounting area on the left edge of the photo.



Photo WT8-3. Part of the engine mounting area on the wing section.



Photo WT8-4. Two more wing sections at the site, with stub inboard wing section on lower left of photo.



Photo WT8-5. Inside the exposed edge of the large wing section.

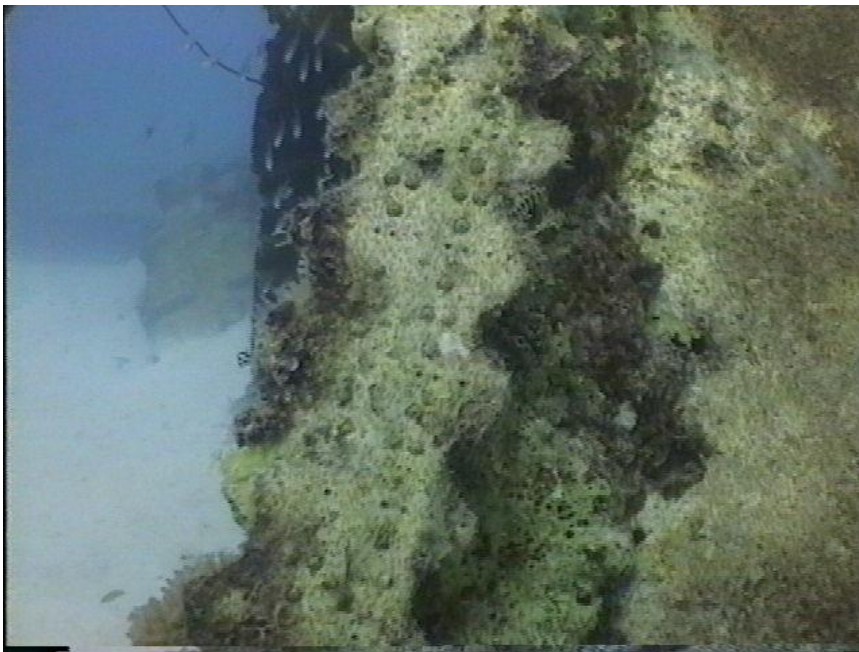


Photo WT8-6. Joining section for wing to fuselage surfaces.



Photo WT8-7. Structural joining sections of unknown aircraft type near the large wing section.



Photo WT8-8. A unique structural piece near the large wing section.



Photo WT8-9. A control arm stuck in the sand, very similar to a control arm for the ailerons for a Mitsubishi G4M "Betty" bomber.

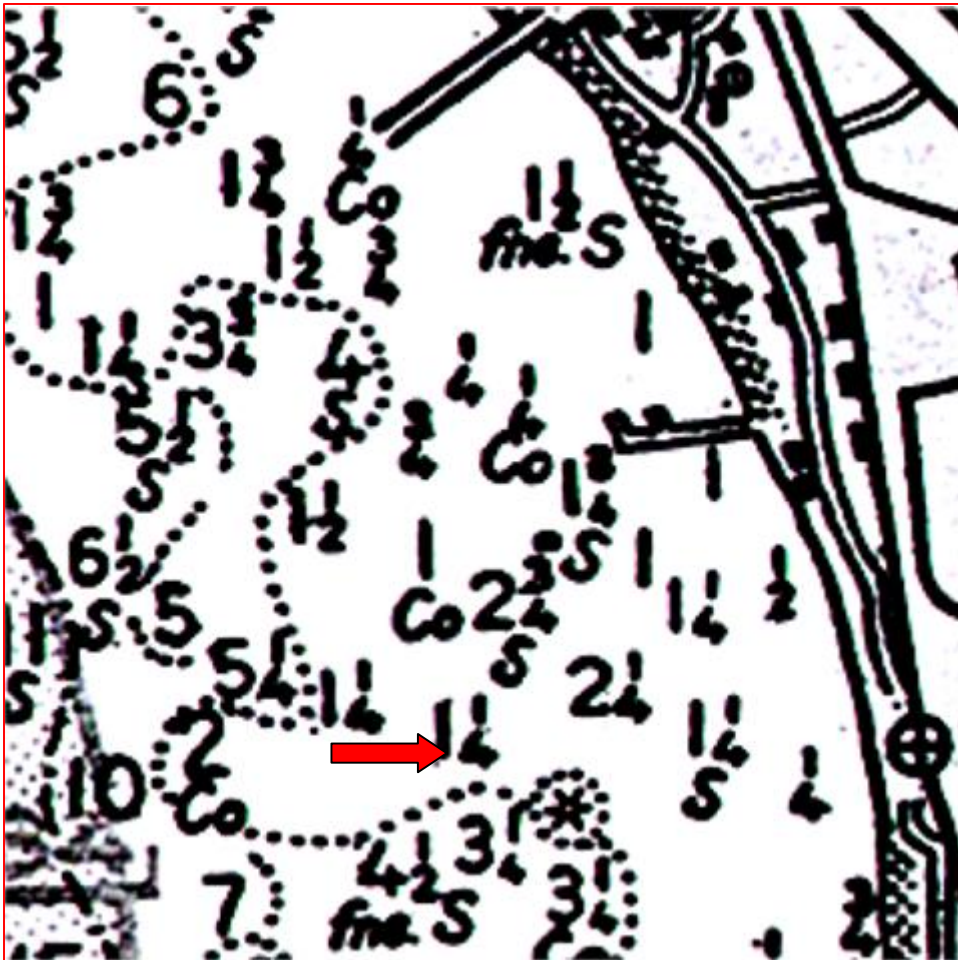


Photo WT8-10. Back of another wing section, south of the main debris field.

MAP OF WOTJE SITE REPORT NUMBER 8.

Site is identified on the Map by the red arrow.

The Map was scanned from the US Department of the Navy Oceanographic Office Chart 6018, Eastern Wotje, revised in June 1968.



WOTJE SITE 9 REPORT

NAME: DEMOLISHED STEEL WRECK
RMIHPO Site Number MI-WT-LG-009

GENERAL DESCRIPTION AND LOCATION

The Demolished Steel Wreck is the debris field of a Japanese steel hulled vessel located on remains of a shallow coral area on the lagoonside of the southern anchorage area. The wreckage is 5 to 15 feet deep, scattered over an apx. 100 square yard area. The site is 358 degrees magnetic to the deep end of the main dock, 70 degrees magnetic to the house south of the old power plant structure, and 166 degrees magnetic to the house near the southern dual purpose gun batteries. The wreckage site is virtually void of all life, and much of the wreckage is fused together or into the bottom. It is easily located by the large dark area of reef patch as viewed from the surface. A map of the site, Map WT9, follows the Photo Section of this report.

GPS Position: See RMIHPO.

DETAILS

The Demolished Steel Wreck is called and identified as such in this report as the original Japanese vessel was destroyed by explosive demolition by Mr. Steve Achen, the Trust Territory demolition expert at that time. This was reported to me years ago and re-affirmed by local residents during this survey. The vessel was demolished by Mr. Achen in the late 1970's, probably in 1977 or 1978, as when I met him in 1979 he had completed his work in Wotje and was working in Maloelap. This correlates with the description of the vessel unaccounted for in the *Spennemann* 1991/7 HPO report, on pages 23 and 24. It was also not listed in the *Christiansen* 1994 HPO Report, Volume 2 on Wotje.

The vessel was listed as a " 140 ton supply vessel, hulk" in the USSBS of 1947 (Map, item 39) (Photo WT9-1). Why Mr. Achen made the decision to destroy the original vessel is unknown, but the blast also destroyed the shallow coral head the vessel sat upon, and threw steel debris throughout and around the perimeter of the site.

The original steel vessel was reportedly beached on this site after being damage by aircraft or shellfire during the American raids. It is not know if the vessel was beached during the February 1942 raid, or during the pre-invasion raids of late 1943 and early 1944. My guess is the vessel was damaged in the February 1942 raid and beached on the coral area, as no anchor or chain was found on the bottom, and there were no moorings nearby. The vessel was also already shown on the May 1944 chart, and was reportedly well above the water, I can only presume it was easy to add to the last Japanese charts or the 1st US Navy Department Oceanographic Office chart 6018 of Eastern Wotje, even though Wotje was still in Japanese hands.

The remains of the vessel I surveyed indicate it was slightly longer than 100 feet, apx. 24 feet wide, and weighted an estimated 150 tons, based upon the remains I saw at the site. I do not consider it a true military craft, such as a true Patrol Boat, as I saw no armament, weapons platforms, or similar equipment in the wreckage. I also do not consider it a converted fishing vessel, as I found no fishing gear, hatches, hatch frames, or typical whaler hull or bow designs in the wreckage. The only unique item found was a 4 blade propeller, with 1 blade blown off, typical used for faster or more powerful engines and vessels. The propeller and shaft were typical of the size vessel I have estimated.

The listing of the "13 small patrol craft" designated for Wotje (*JICPOA Bulletin No. 57-43. December 15, 1943, page 21.*) does not list any vessel specifications, and the list of names provided from *Christiansen*, (1994, Vol. 2: 21), also does not list any specifications. Various other sources list 140 ton vessels lost in Wotje, again with no specifications of vessel use, design, or layout. I am again guessing this vessel was designed for cargo service, and converted to a patrol vessel, probably armed with 1 or 2 small weapons. It is probably one of the vessels in the list of Japanese vessels named in Appendix 2.

The bow is shown in Photo WT9-2, with 2 anchor tubes. The vessel had an attached bilge keel, with the port side shown in Photo WT9-3. The vessels windlass is in Photo WT9-4, and a steel mast post base in Photo WT9-5. If an original photo of each of the Wotje vessels could be found, it could more easily identified.

The main engine, a large robust older diesel model is in Photo WT9-6. The vessels air tank for starting the main engine is in Photo WT9-7, the diesel tank shown in Photo WT9-8., and the generator with flywheel is in Photo WT9-9. A brass bomb detonator was found for Photo WT9-10, and the coral and steel debris from the bottom in Photo WT9-11. The only marine life found was 2 tiger cowries in some steel debris in Photo WT-12.

No other identifying features were observed after a though search of the debris, but a 5 inch US artillery round was found nearby, so possibly the vessel was also a target of US surface vessels (Photo WT-13).

COMMENTS AND CONCLUSIONS

The wreckage on this site so scrambled and mismatched to determine the true features of the vessel. The demolition threw the bow next to the stern, propeller over the bow, and fused the steelwork and coral debris together. The older Wotje people say it was done to remove the visions of war from their daily view, and even though it has destroyed a valuable historical asset from the war, this may have been the point, and the only reason they needed at the time.

PHOTO SECTION OF WOTJE SITE REPORT 9

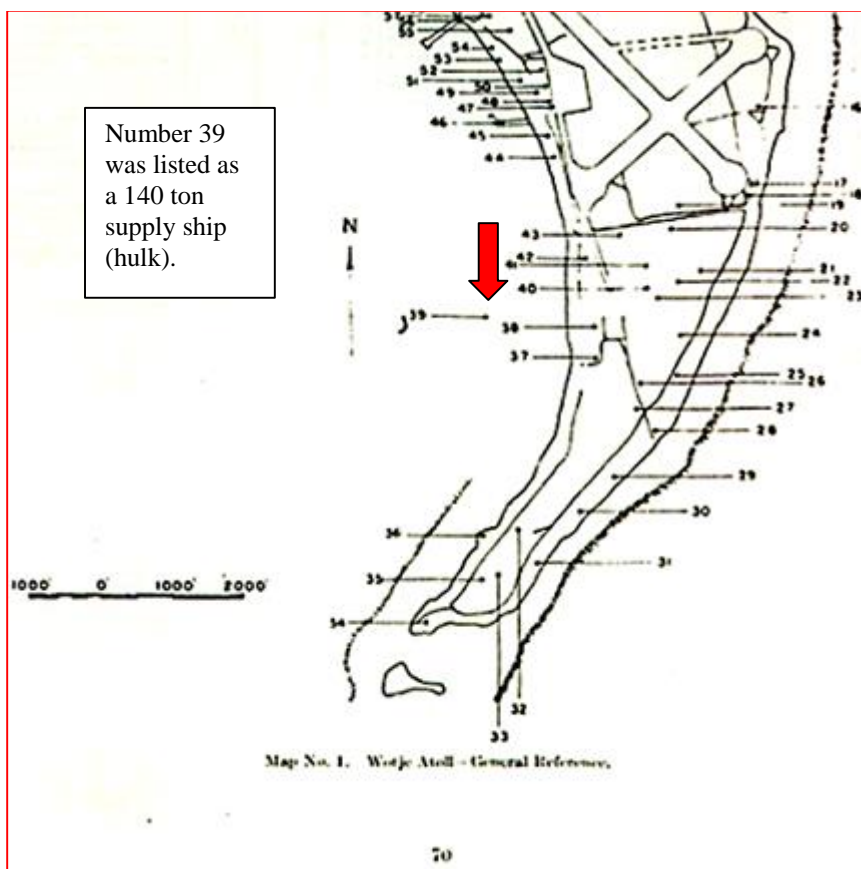


Photo WT9-1. Scanned map from USSBS, 1947:70. Map item number 39 shows location of a "140 ton supply ship (hulk)". No name was given.



Photo WT9-2. Bow of steel vessel with chain tube opening. Note rust mark at false waterline, indicating vessel rotted for along time before being demolished.



Photo WT9-3. Bilge keel on remaining hull section on port side bow.



Photo WT9-4. Windlass from bow of demolished steel vessel.



Photo WT9-5. Main mast post from forward area of vessel.



Photo WT9-6. Remains of vessels main engine.



Photo WT9-7. Air tanks for ships service.



Photo WT9-8. Diesel fuel tank access and cover.



Photo WT9-9. Flywheel from ship service generator.



Photo WT9-10. Brass bomb detonator amongst ships debris.



Photo WT9-11. Coral and steel debris pulverized by the demolition.



Photo WT9-12. Two tiger cowries in the steel vessel remains.



Photo WT9-13. A nearby 5 inch US artillery round.

WOTJE SITE 10 REPORT

NAME: JAPANESE AIRCRAFT ENGINE PARTS
RMIHPO Site Number MI-WT-LG-010

GENERAL DESCRIPTION AND LOCATION

. The Japanese Aircraft Engine parts were located during the hunt for the Steel Vessel Wreckage (Site MI-WT-LG-009), and are located apx. 100 yards south of that site. The aircraft engine parts are on a sandy bottom in 10 to 15 feet of water. The engine was literally the sites marine life, being completely overgrown with live coral. A map of the site, Map WT10, follows the Photo Section of this report.

GPS Position: See RMIHPO.

DETAILS

The Japanese Aircraft Engine parts were located during the hunt for the Demolished Steel Vessel Wreckage. Local skin divers, after my careful explanation and examples studied on shore, pointed the engine out to me during our survey. Careful searching of the immediate area resulting in me finding the aircraft gearbox, supercharger, propeller blades and other miscellaneous items.

The engine is hardly recognizable from some angles, being overgrown with coral (Photo WT10-1) One cylinder head was missing, allowing the measurement of the cylinder bore, 140mm diameter, in Photo WT10-2. This measurement is typical of a smaller engine, such as belonging in a fighter, rather than engines in Japanese bombers or flying-boats. The rear of the engine is seen in Photo WT10-3, and a close up of the secondary gears, possibly used for timing the machine guns firing through the propeller of a fighter aircraft, is shown in Photo WT10-4.

A nearby site had a butterfly valve in the sand from the dual throat carburetor (Photo WT10-5), and the supercharger shaft and exposed blades imbedded in another coral head (Photo WT10-6). The section of exhaust manifold, also typical of a fighter aircraft, was located on the sand nearby (Photo WT10-7), and a close up of an engine part showed letters on polished aluminum, the piece similar to engine R.P.M. governors (Photo WT10-8). Photo WT10-9 was another piece of aluminum from the gear box or supercharger section of the engine.

One propeller blade was located in the sand under the edge of the engine, and a second blade, very bent, was located about 100 feet away partially buried in the sand. No aircraft aluminum for skin or wings was located, nor any structural members.

COMMENTS AND CONCLUSIONS

This engine has many characteristics of engines used in most Mitsubishi A6M3 "Zero" fighters, which did visit Wotje and provide air cover for the atoll. Typically they stayed overnight only, and were based in Maloelap or Roi, Kwajalein.

It is unknown how this aircraft engine and parts ended up in this location. It is also possible this was another dump site, or the engine was blown out of the demolished steel vessel, or the aircraft parts fell out of the sky from an aircraft destroyed in the air. The site is on the approach to the cross runway.

There is no information concerning any known Japanese aircraft losses at this site.

PHOTO SECTION OF WOTJE SITE REPORT NUMBER 10.



Photo WT10-1. Aircraft engine heavily coral encrusted.

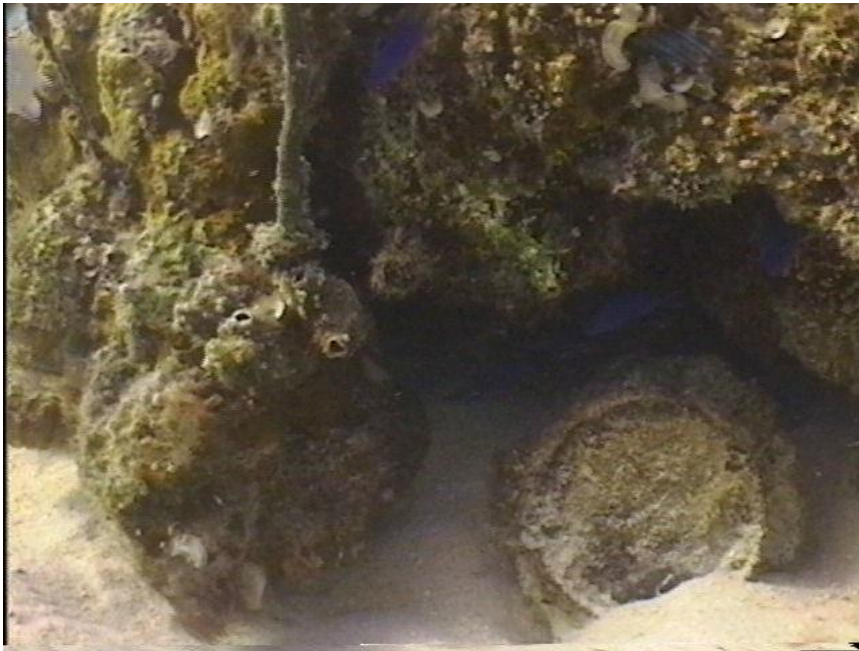


Photo WT10-2. Double row of cylinders, 140mm diameter, in heavily encrusted coral.



Photo WT10-3. Rear of engine.



Photo WT10-4. Close up of rear of engine. Note secondary drive gear.



Photo WT10-5. Carburetor butterfly valve among engine debris.

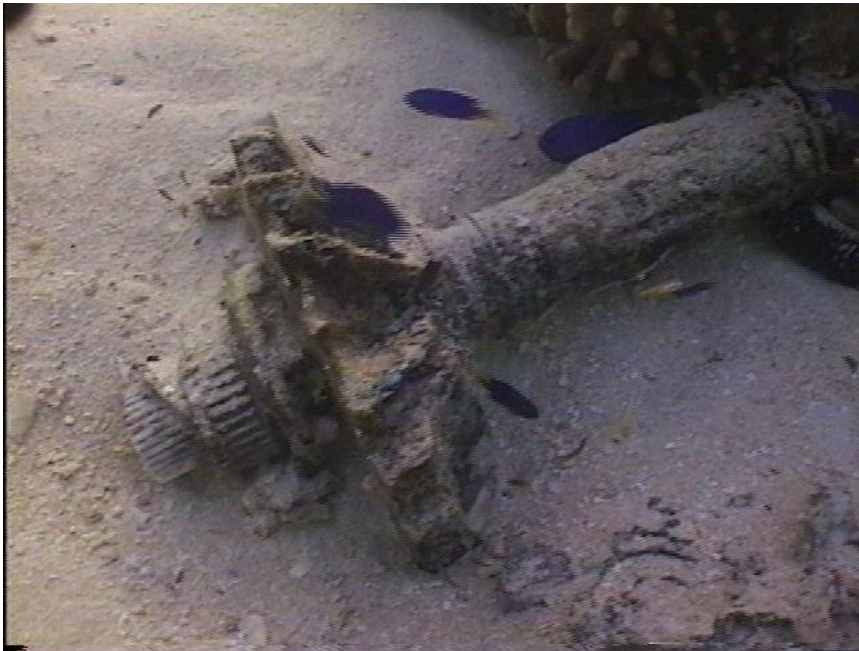


Photo WT10-6. Engine supercharger drive shaft with blower blades.



Photo WT10-7. Engine exhaust manifold.



Photo WT10-8. Carburetor governor, unknown type, with letters.

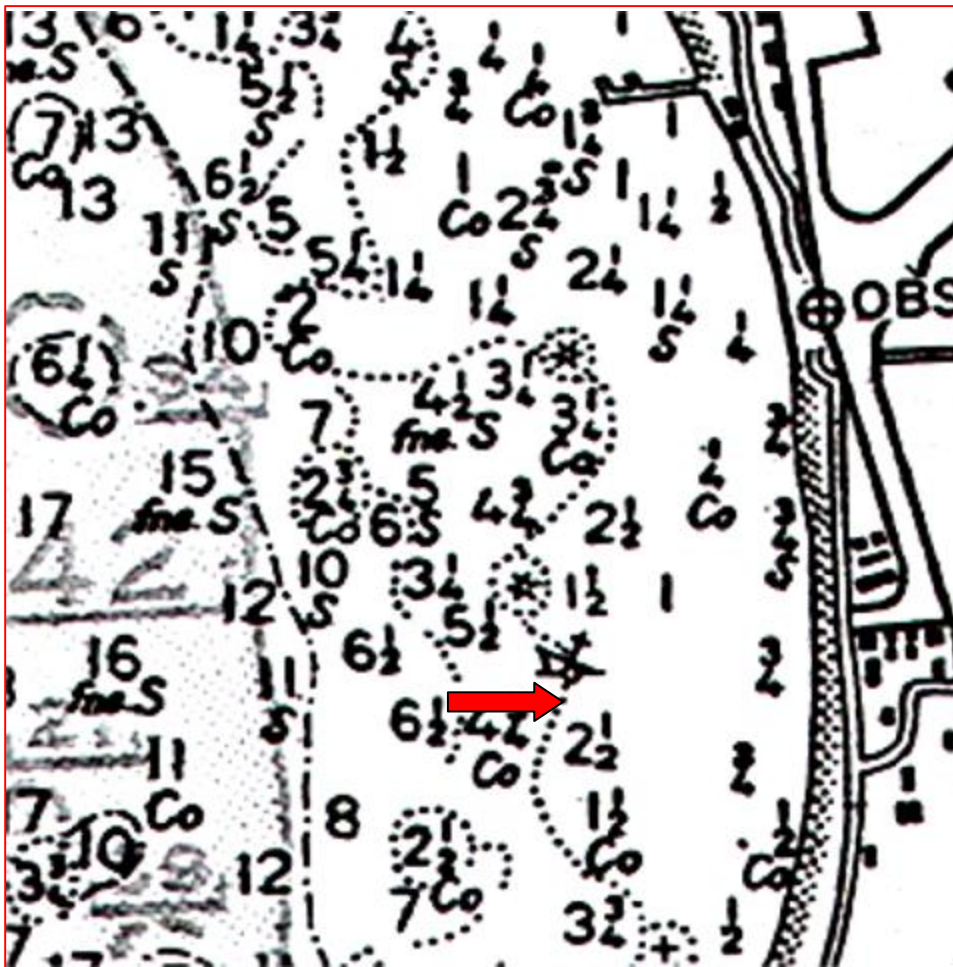


Photo WT10-9. Aluminum part from gear box or supercharger housing.

MAP OF WOTJE SITE REPORT NUMBER 10.

Site is identified on the Map by the red arrow.

The Map was scanned from the US Department of the Navy Oceanographic Office Chart 6018, Eastern Wotje, revised in June 1968.



WOTJE SITE 11 REPORT

NAME: SOUTHERN VESSEL WRECKAGE
RMIHPO Site Number MI-WT-LG-011

GENERAL DESCRIPTION AND LOCATION

The Southern Vessel Wreckage is the remains of a small Japanese fishing boat which was sunk on a sandy bottom in 12 to 16 feet of water. The vessel was on an apx. East-West course, apx. 300 yards from the closest shore. The vessel is due north of the "Lead House" at the southern dual purpose gun position. The site visibility was better than other Wotje anchorage sites, but had only a small amount of local marine life.

GPS Position: See RMIHPO.

DETAILS

The Southern Vessel Wreckage was a wood hulled Japanese fishing boat, probably converted to a local Wotje "Guard Vessel"(See possible name in appendix). The vessel was apx. 100 feet long with an apx. 16 foot beam. The vessel was sunk at anchor, and there were indications it was attacked and set afire, and sunk upright at this site.

The vessel is possibly listed in the *Spennemann, 1991/7 HPO Report*, page 24, as a third vessel seen in a 1976 aerial photograph. This vessel was listed as in 3 to 4 fathoms of water, with no part of the vessel protruding above the water. No other details were given.

The at this site vessel had a extended bow and bow spirit, as shown by the remains in Photo WT11-1. The only large piece of wood hull remaining was the starboard section of the bow shown in Photo WT11-2. The keel layout is visible in Photo WT11-3, with the brass thru hull fittings still in place.

The main engine was a typical 6 cylinder unit, but was more modern than other units surveyed (Photo WT11-4). The engine and generator were air started, and air storage bottles were found near the main engine (Photo WT11-5). The gearbox and main shaft were attached to the main engine, but the propeller had already been removed. The stern items remaining were the kitchen stove nearby (Photo WT11-6), and the fuel tanks and steering gear. Small broken shards of dishes and bottles were also found in the area. A spare anchor, probably stowed on the stern, also rested on the bottom at the stern of the vessel (WT11-7).

The vessel did not have any serious structural damage, indicating it was not directly struck by a bomb or artillery shell. It was probably sunk by near misses of bombs or artillery fire, possibly strafed, and through whatever means, caught fire and sank at

anchor. Shards of glass were found with burn indications (Photo WT11-8), and the remaining hull wood and surrounding sand showed indications of fire (Photo WT11-9).

Other artifacts on the site included a brass (Photo WT11-10), bottles (Photo WT11-11), and many small pieces of ship hardware and personal items. Marine life was limited but included a black lip pearl oyster (Photo WT11-12). The site also had un-exploded bomb nearby (Photo WT11-13), and another un-exploded 5 inch US artillery round.

. COMMENTS AND CONCLUSIONS

This vessel, like the small vessel at MI-WT-LG-007, has not been stripped of small artifacts, which still lie around the vessel and in the sand. This feature makes it a wonderful dive, as many items can be uncovered and photographed. The site has little marine life, but seems to have better visibility than other Wotje anchorage sites.

This site should be buoyed nearby, watched, and protected by the local community.

PHOTO SECTION OF WOTJE SITE REPORT 11.

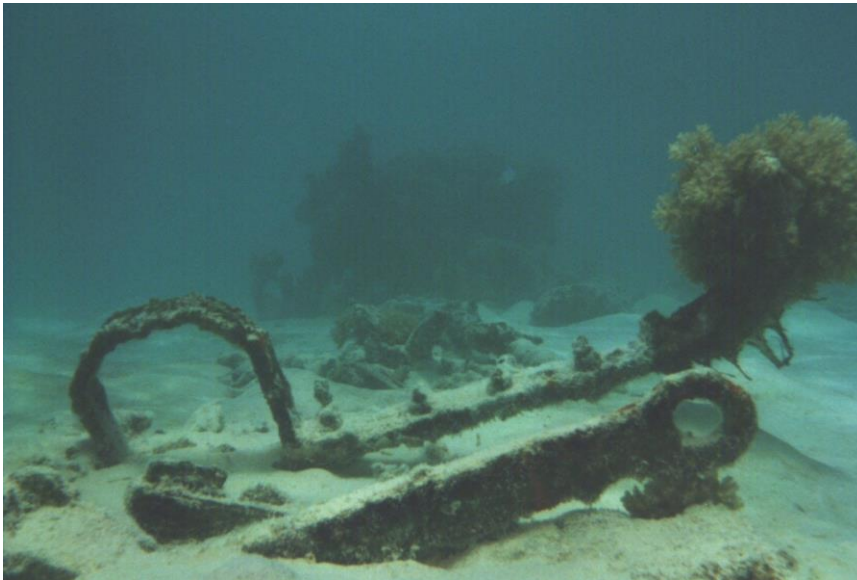


Photo WT11-1. Bow spirit remains on Southern Vessel Wreckage.



Photo WT11-2. Remains of starboard side of the bow.



Photo WT11-3. Hull bottom with thru hull fittings.



Photo WT11-4. Main engine on starboard side facing the stern.



Photo WT11-5. Air tanks to start main engine and/or generators.



Photo WT11-6. Kitchen stove near stern of vessel.



Photo WT11-7. Emergency anchor at stern area of vessel, port side.



Photo WT11-8. Glass shard with burn indications, probably from running lights, found on port side near the bow.



Photo WT11-9. Hull lumber with possible fire damage.

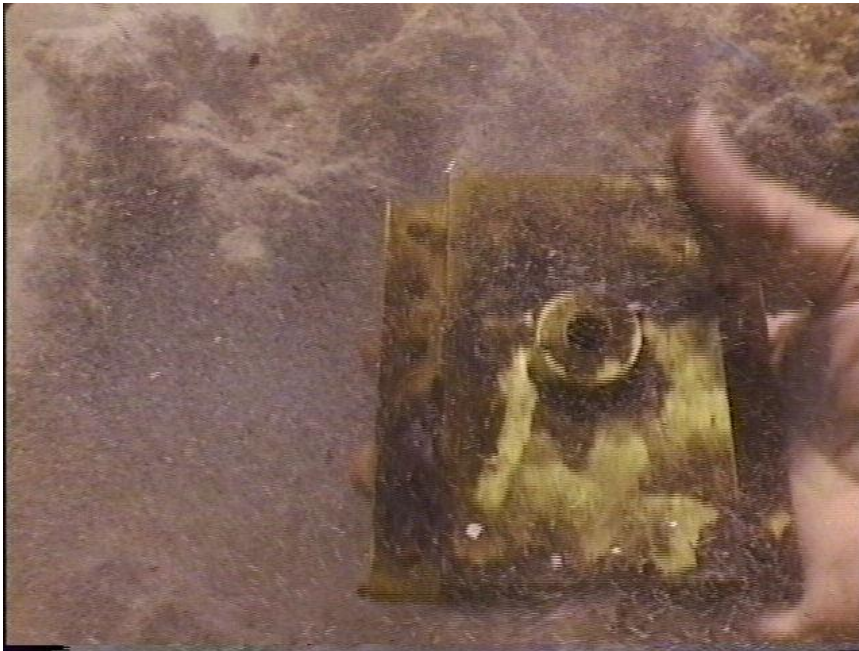


Photo WT11-10. Brass lock found in sand and debris on port side mid-ship.



Photo WT11-11. Bottle in sand near vessel.



Photo WT11-12. Marine life was limited, this black lip pearl oyster surviving near the main engine.

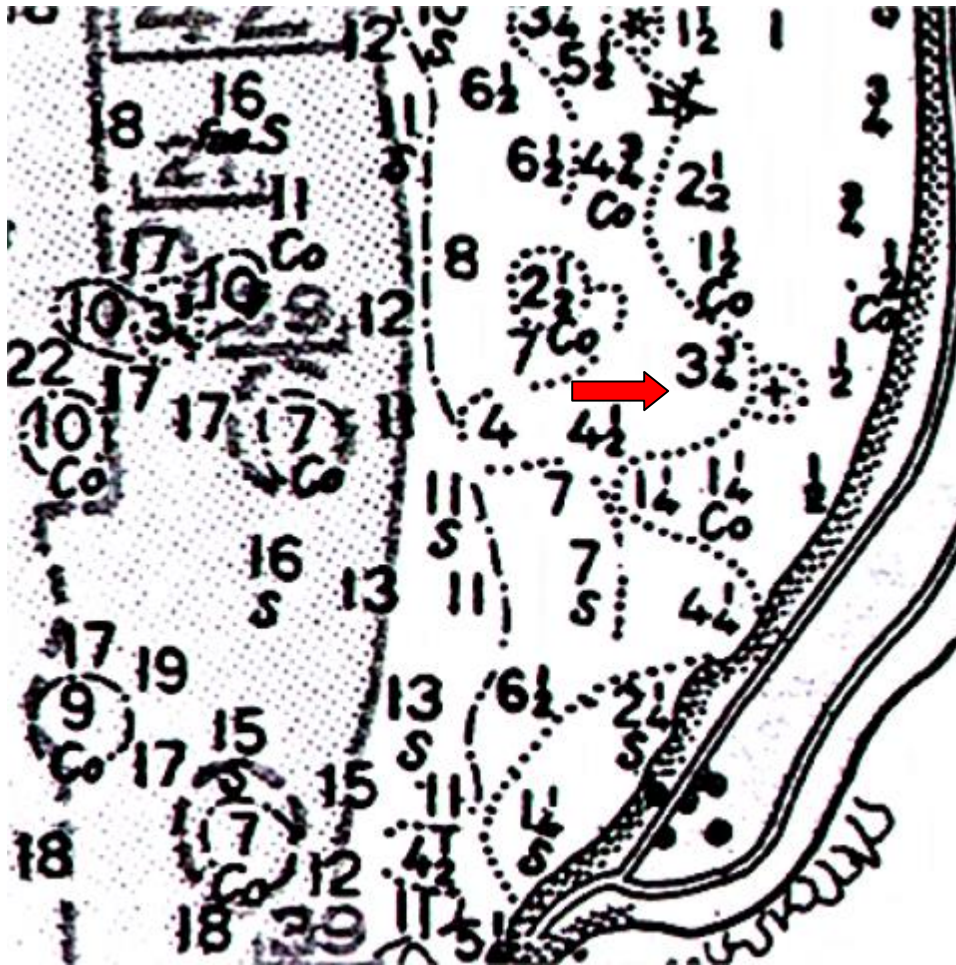


Photo WT11-13. This large, probably 250 pound US bomb lies un-exploded nearby.

MAP OF WOTJE SITE REPORT NUMBER 11.

Site is identified on the Map by the red arrow.

The Map was scanned from the US Department of the Navy Oceanographic Office Chart 6018, Eastern Wotje, revised in June 1968.



WOTJE SITE 12 REPORT

NAME: BORUDOU MARU WRECK
RMIHPO Site Number MI-WT-LG-012

GENERAL DESCRIPTION AND LOCATION

The Japanese vessel Borudou Maru was sunk at anchor in 123 feet of water, resting with the port side on the bottom, on a heading of apx. 120 degrees magnetic.. The vessel is apx. 2,000 yards from the southern dual purpose gun position and apx. 2,200 yards from the deep end of the Main Shipping Dock. This site is way out in the anchorage, far from shore, and difficult to locate without the positions listed below or a depth-finding device. The site was murky, with moderate but typical 50 foot visibility in the anchorage. There was various pelagic marine life, including sharks, schools of jacks, and groupers watching our survey. The ship had only a moderate amount hard coral and virtually no soft coral, indicating very little light penetration to the depths of the vessel. A map of the site, MapWT12, follows the photo section of this report.

GPS Position range: See RMIHPO.

Wheelhouse at: See RMIHPO.

Compass Courses from the Wheelhouse GPS spot:

Xxx degrees magnetic to center of small island.

Xxx degrees magnetic to wreck of Toyotsu Maru.

Xxx degrees magnetic to SW end of Wotje.

Xxx degrees magnetic to "Lead House" near South Dual purpose guns.

Xx degrees magnetic to end of Japanese Dock.

Xx degrees magnetic to end of Seaplane Ramp.

Xx to xx degrees to North end of Wotje Island.

DETAILS

The Borudou Maru was a freighter, listed as having 6,566 gross revenue tons, with a length of 415 feet, 53 foot beam, with a draft of 28 feet. It was built in 1923 and operated by Kawasaki Kisen Kaisha before being used by the Japanese Navy. It is one of the largest Japanese merchant vessels sunk in Micronesia during the war. A drawing of the vessel is Photo WT12-1.

First, it should be noted, the vessel has been reportedly sunk in 2 different locations, by 2 different Naval groups, and additionally may have been struck by a third entity who did not even claim to sink it. These mistakes have been partially corrected, but these partial corrections have caused the new errors to become even harder to correct. The vessel was partially identified in the initial *US Navy War Chronicles, February 1942*, whose information became the prime research source for many authors and their following books and reports.

To add to the difficulties, the vessels name has been incorrectly spelled in every US document, and misspelled differently. The Borudou Maru is the correct spelling listed by Japanese military loss records of merchant vessels after the war (a Japanese document, "*Losses of Japanese Naval and Merchant Vessels in WW2*", with an unknown author). The vessel is known in other documents as the Borgouis Maru, Bordouis Maru, Bordeaux Maru, Bourdeaux , Borudo Maru, and maybe a few more. The correct spelling starts here.

The Borudou Maru was sunk in the Wotje Anchorage on February 1, 1942, eventually claimed and most probably by US Navy aircraft from the Carrier Enterprise. Three attacks were made on Wotje during the day. The first by 6 F4F "Hellcats" of VF-6 in the morning, armed with 2 100 pound bombs each.. The next attack was made by the Naval Bombardment Group of 2 Heavy Cruiser and a Destroyer. The third attack was by 8 SBD "Dauntless" of VB 6 and VS 6, and 9 TBD "Devastators" of VT 6 in the afternoon, carrying either 100 or 500 pound bombs, and no aerial torpedoes where used (*Lundstrom, 1984:66,72*). It is not known if it was sunk in the morning or afternoon carrier raids, or from damage from both. Other reports list all ships sunk by the time the afternoon raiders arrived, with the exception of 1 beached vessel, (probably the Toyotsu Maru, Site MI-WT-LG-013). and another smaller vessel afire (possible the Southern Vessel Wreckage, Site MI-WT-LG-011). To make the story even more difficult, it is possible it was additionally damaged or even sunk by naval shelling from the bombardment group, which claimed to have and was credited with sinking the Toyotsu Maru. This cause of sinking seems the most likely to the author, and will be discussed later in this report.

I was told about a large shipwreck in Wotje years ago by Mr. Steve Achen, the Trust Territory explosive expert who worked in Wotje destroying dangerous remaining WW2 ordinance. The ship was rumored by *Bailey, 1982*, in the his first edition of his book "*The Wrecks of Kwajalein and Truk Lagoons*", that the vessel was possibly in Wotje. *Spennemann* in (*HPO 1991/7:31-33*), included this information in his report, and scanned in the ship drawing (Photo WT12-1). In *Miller, 1991:4 and 119 "In the Arms of the Sea"*, he also listed the vessel in his book as possible lost in Kwajalein.

Kwajalein divers re-discovered the vessel a few years ago in Wotje Anchorage, and reported the vessel was already missing key items such as builders plaque, wheel, bell, and such. Local rumors are that early an early Peace Corp Volunteer, Mr. Steve Achen, Kwajalein yacht visitors and the like have already stripped the vessel, except for one room. This is probably the ships stores hold, of which everyone on Wotje knows the story of and presumes is full of goodies, and may have collectable bottles and the like.

We located the vessel with a depth-finder after a morning of first finding 5 shallow coral heads for GPS reference points (we called these A,B,C, D, and E noted on the Wotje Anchorage site map, Map WT12) which created a coral box around the suspected location of the vessel.. These coral heads enclosed deep water and gave us a smaller anchorage area we felt no large vessel Captain would anchor out of. We were correct,

and found the vessel after a few hours of searching. The entire bottom area from bow to stern was a little over 120 feet deep.

We chose a GPS position we estimated was mid-ship and went down our anchor line exactly...on the bridge. Other GPS points are listed to give the apx. positions of the bow and stern. Depth to the starboard side of the deck at the hull near the wheelhouse is about 76 feet deep.

Starting the report from the bow, one first notices the older style straight bow from the deck to the keel (Photo WT12-2). The port anchor and chain was used to anchor the vessel. The chain was massive, completely encrusted with coral, and disappeared into the sand (WT12-3). No attempt was made to locate the position of the port anchor, but the starboard anchor was still mounted on the hull (Photo WT12-4). A massive forest of whip coral grows towards the surface from under the bow, hiding clouds of juvenile silversides, which are eagerly being eaten by a squadron of groupers nearby on the vessel.

Also noted was severe damage to the bow of the vessel, and not from bombing or from colliding head on with another vessel, as the bow lines were perfect and undamaged. It looks as though the vessel was struck by another large vessel just behind the bow on the starboard side, tearing the hull and crushing the main deck downward (Photo WT12-5). Additional damage occurred the windlass mount and bend the deck down underneath it. No apparent repairs were made, so it must have been late in the vessels life.

Moving back from the bow, Photos WT12-6 and WT12-7 look back and show the bow from on the starboard side of the vessel and looking from the center of the vessel. The number 1 hold is shown in Photo WT12-8, and the crows nest on the mast between number 1 and 2 holds is Photo WT12-9.

The bridge area is intact, but being made primarily with wood, has decayed away. Photo WT12-10 shows the bridge area, with portholes, and the overhanging walkways. The bridge area was completely decayed and stripped, with only the binnacle for the wheel left hanging by its ' base (Photo WT12-11). A few ceramic items were found here, as the vessel had ceramic light reflectors and sockets for the ships deck lighting.

Behind the bridge there was a small hold, probably listed as number 3, and then the engine room spaces. A bomb or artillery round hole was found on the starboard hull just forward of the engine room, probably 6 feet under the waterline, and measured apx. 3 square feet of `damage (Photo WT12-12). This was the largest damage found on the hull. The engine room skylights were open (Photo WT12-13), and a limited visit only showed catwalks and plumbing, as the vessel was steam/boiler driven. Back on the deck the davits were empty but photogenic (Photo WT12-14), as was a nurse shark sleeping in the walkway (Photo WT12-15). The funnel, and another feature to identify the ship, had fallen off and crushed itself, eliminated this ID feature, but the funnel base remained (Photo WT12-16).

Moving back to the stern, another small hole was located in the stern area, apx. 80 feet from the end of the vessel, and near the waterline (Photo WT12-17). The stern of the vessel and railing is in Photo WT12-18, and the massive rudder was shown in Photo WT12-19. A pilfered Japanese bottle sits on the starboard hull mid-ship (WT12-20), and the author inspects the propeller for identifying marks in Photo WT12-21.

The only issue left is the question of who sank the vessel. Unless a major hole is on the port side, unseen, and not noticed during our survey, I feel the vessel was sunk by damage from artillery fire from the bombardment group. The hole mid-ship probably flooded the engine spaces, crippling any emergency repair attempts, and the small stern hole flooded the 2 rear holds, taking the vessel down by the stern. No bomb damage was found anywhere on the vessel. Without any other information, this seems to be the cause.

COMMENTS AND CONCLUSIONS

The Borudou Maru is a massive vessel, probably the last large undocumented Japanese merchant vessel sunk at SCUBA depths in Micronesia during World War Two. Its' discovery in Wotje makes a wonderful tourist attraction, and adds a wonderful asset to the Marshall Islands.

Unfortunately, it was not an artifact rich vessel to start with, and even the limited plundering by SCUBA divers has removed most artifacts. The site is murky, but with dives planned to low tides, the vessel is an impressive site, and has many photographic opportunities. The site should be marked with underwater and surface buoys, and local rules and regulations made to protect this valuable site.

PHOTO SECTION OF WOTJE SITE REPORT 12

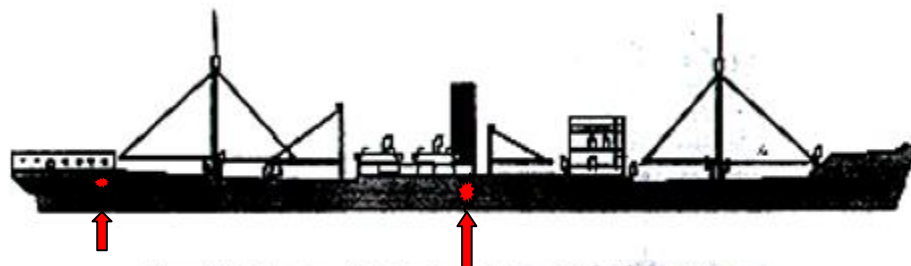


Figure 21. Side plan of the Borudou Maru (after Bailey 1982)

Photo WT12-1. Scanned drawing of the Borudou Maru from *Bailey, 1982*. Red arrows and red explosion marks show location of two holes in the starboard side of the vessel. These holes are shown on Photos WT12-12 and WT12-17, later in photo section.



Photo WT12-2. Bow of the Borudou Maru. Notice the straight lines of the bow, and the diver highlighting the damaged starboard bow area.

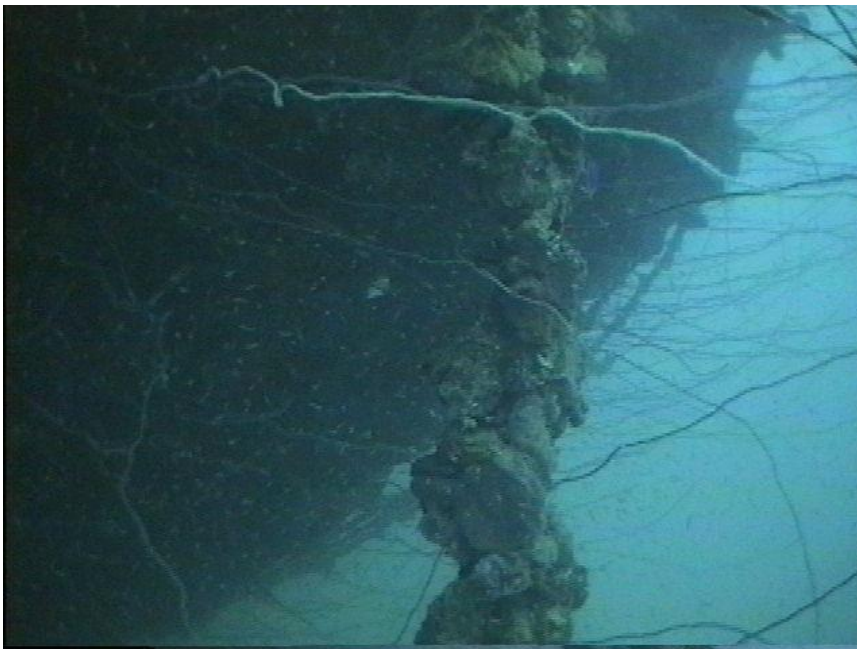


Photo WT12-3. Massive anchor chain is completely encrusted with coral and marine growth.



Photo WT12-4. Vessels starboard anchor is still in place.



Photo WT12-5. Starboard bow damage. Note un-damaged front of vessel.



Photo WT12-6. Facing towards the bow on the starboard side of the vessel.

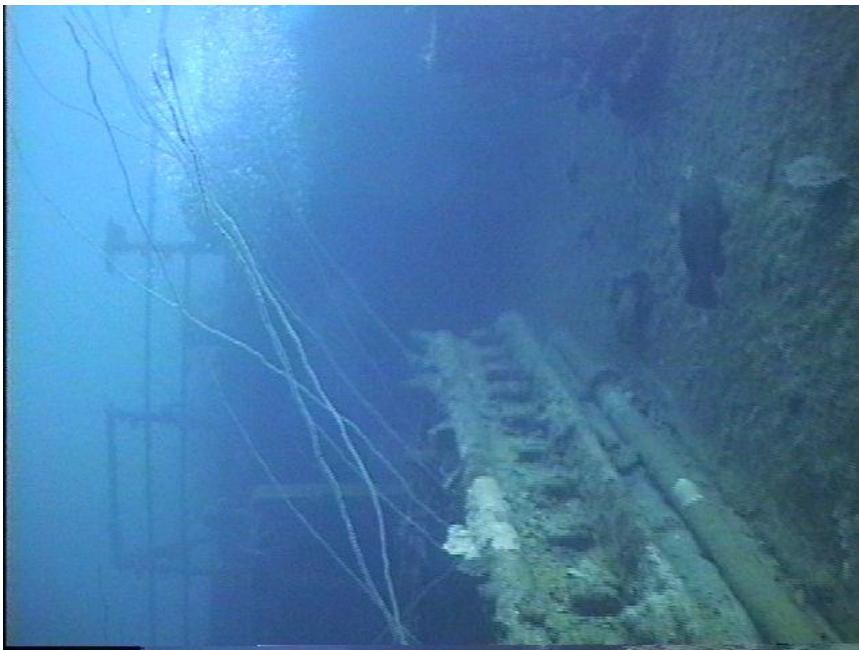


Photo WT12-7. Towards the bow on the main deck, with the number 1 hold to the left of the photo.



Photo WT12-8. The number 1 hold.



Photo WT12-9. The crows nest atop the number 1 mast.



Photo WT12-10. The ships bridge area behind the portholes.



Photo WT12-11. The base of the binnacle, missing the ships wheel, hanging off the steering cables and plumbing.



Photo WT12-12. Bomb damage or artillery round hole in the starboard side, just forward of or just in the engine room spaces. Hole measured apx. 3 square feet of area.



Photo WT12-13. Open engine room skylights.



Photo WT12-14. Empty life-raft davits with coral growth.

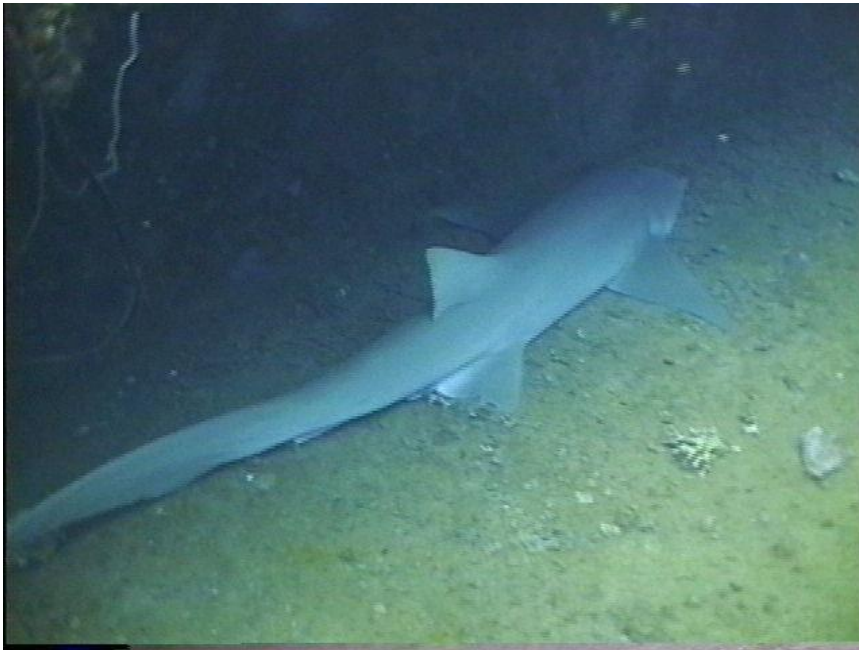


Photo WT12-15. Nurse shark resting near the engine room spaces on the main deck area.

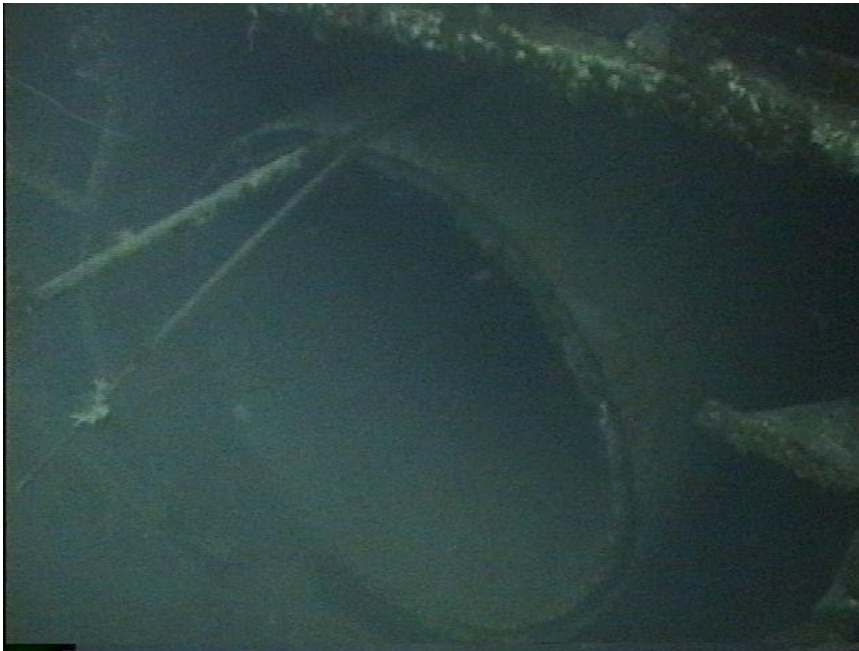


Photo WT12-16. Funnel base; funnel had fallen off and crushed itself.



Photo WT12-17. Small hole in stern on starboard side, probably from Naval artillery shell.



Photo WT12-18. Stern and railing of Borudou Maru.



Photo WT12-19. Massive rudder of Borudou Maru.



Photo WT12-20. Pilfered bottle left standing on the starboard hull mid-ships.

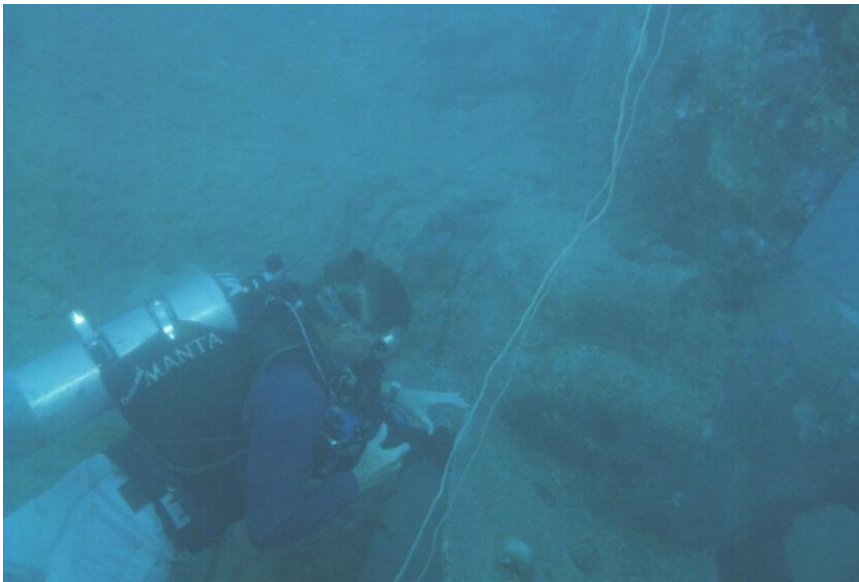
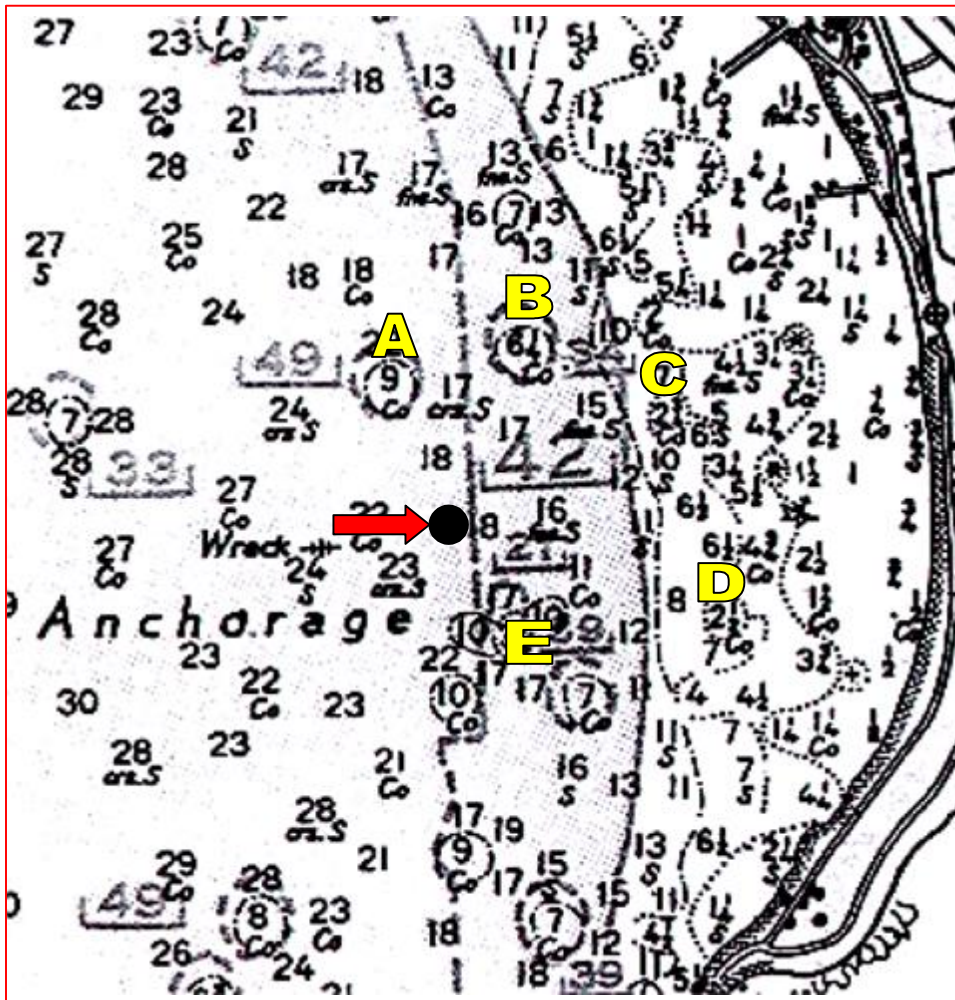


Photo WT12-21. The author inspecting the propeller for identifying marks or features.

MAP OF WOTJE SITE NUMBER 12 REPORT.

Site is identified on the Map by the black spot at the red arrow. Yellow letters identify the shallow coral head areas which box in the deep anchorage area.

The Map was scanned from the US Department of the Navy Oceanographic Office Chart 6018, Eastern Wotje, revised in June 1968.



WOTJE SITE 13 REPORT

NAME: TOYOTSU MARU WRECK
RMIHPO Site Number MI-WT-LG-013

GENERAL DESCRIPTION AND LOCATION

The Wreck of the Toyotsu Maru is the remains of a large steel cargo vessel beached on a sandy bottom lagoonside of Egmedio Island, located apx. 6 miles south west of the Wotje Airbase. The vessel was intentionally run aground at an apx. 30 degree angle to the beach after being damaged by US attacks in February 1942. The bow of the ship is in 8 to 12 feet of water, with the stern, blown off to the keel, resting in 45 feet of water. The site has good to excellent visibility, with abundant marine life of all descriptions. A map of the site, Map WT13, follows the photo section of this report.

GPS Position: (At Stern) N 09.23.870 x E 178.12.777

DETAILS

The Toyotsu Maru lies off the northern end of Egmedio Island after being struck by Naval gunfire from the US Heavy Cruisers Northhampton (CA-26) and Salt Lake City (CA-25) during the raid of February 1, 1942. (*US Navy Chronicles: February 1942*). US Naval aircraft also initially claimed to have damaged the vessel by bombing, causing it to be beached by the Captain and crew rather than allowing it to sink (*Karig, 1944:263*). An aerial photo of the site, Photo WT13-1, shows the vessels position off Egmedio island. Photo WT13-2 shows the current condition of the vessel above the waterline.

It was additionally, but erroneously, listed with other Japanese vessels as possibly sunk in Kwajalein Atoll during the February 1, 1942 raid (*Bailey, 1968*), and (*Miller, 1991:119*), and this survey of Wotje lagoon provides the most definite proof yet that this is the Toyotsu Maru. A drawing of the vessel is included as WT13-3.

The vessel was listed as 2,930 tons, 305 feet long, with a 45 foot beam and draft of 26 feet, manufactured in 1937 with a riveted steel hull. It was owned by Settu Syosen Kisen Kaisha at the time of its loss. It had a central wheelhouse, was steam driven, probably coal fired, a had 4 holds and 2 masts with dual booms. It was apparently converted to a gunboat of sorts, and listed as such in all military records reviewed for this report.

The vessel was first identified, although misspelled, as the Goyotsu Maru, sunk in Wotje Atoll in 1942 by the U.S. Strategic Bombing Survey after the war (*USSBS, 1947:85*). The vessel was also surveyed and listed as site H805 in the 1994 HPO land survey, and referenced to twice, with 2 different mis-spellings, during that survey. (*Christiansen, 1994:37 & 41*).

I have never understood why there has been such mis-identification of the vessel, but the Toyotsu Maru, like the Borudou Maru, has had some confusion in the spelling and sound of its' name. It has been mis-spelled Touotsu Maru, Goyotsu Maru, and Kyotsu Maru, and mistakenly called a ghost sister ship of itself, being presumed as another vessel similar in construction, (*Spennemann, 1991:24-27*).

I have not found any other information on the existence of any other vessel(s) with this or any other spelling or design.

Facts supporting the **Toyotsu Maru** aground at Egmedio are quite persuasive. First, there is a bereavement monument placed by Japanese relatives of the crew on the south end of Wotje island for those lost on the "Toyotsu Maru" (PhotoWT13-4) The GPS position of this monument is N 9.26.271 x E 170.13.965. This was also listed as Memorial Site C731, Photos 5-17 and 5-18 in *Christiansen, 1994*, but was apparently not translated at time. Besides the *US Navy Chronicles, February 1942*, reporting quoting the vessel, simply, this ship meets the specifications of the Toyotsu Maru, was in service in the this area of the Marshall's during the war, and fits all the physical characteristics of the vessel listed as the Toyotsu Maru in all U.S. sources. An untitled Japanese book of *Japanese Losses of Merchant Vessels during WWII*. also lists the vessel, spelled Toyotsu Maru, with the same physical specifications, with date and Wotje as place of loss A "beached gunboat" was also described in the interrogations of Japanese from Wotje after their surrender. (*USSBS, 1947 Annex 1, Wotje, Interrogation of Lt. Jiro Sakurai, IJN:66-68*).

The vessel is in a poor overall condition, having been repeatedly attacked, probably as practice for US pilots, after its' initial damage and grounding. This has caused so much damage after the initial attack, it is speculative to pinpoint the original cause of its' beaching. Moderate damage has occurred to the more exposed bow area, from additional strafing and bombings after the beaching of the vessel. If this damage had occurred while at anchor, it would have never made the beach. Bomb blast damage in the bow is visible in Photos WT13-5, showing a large hole in the port side, and WT13-6, showing a large hole in the starboard side. There was no aerial torpedo damage to the vessel, as stated in prior reports, as no aerial torpedoes were used during the 1942 raid (*Lundstrom, 1984:66,72*).

It should also be mentioned the US Navy claimed at the time to have sunk 7-9 vessels, caused one to be beached (probably this vessel), left another on fire, and bombed the island, setting fires, all with just 6 F4F Wildcats armed with 2 100 pound bombs each during the morning raid of February 1, 1942. Obviously, they could not have caused all of this damage with 12 small bombs. The afternoon raid on the same day by all research accounts found no ships left in the lagoon, so they used their 46 bombs carried on 17 aircraft to only bomb the island (*Karig, 1944:260, 262-263*). Thus, it seems to verify that US cruiser and destroyer naval gunfire caused a much greater share of the Japanese shipping losses of this raid, and Photo WT13-7 shows a hole from possibly an artillery round on the starboard side into the number 2 hold.

The repeated bombing, and 50 years of salt water and weather, have caused the ship to seriously decay. This damage has also weakened the bow, now collapsing dangerously under its ' own weight. Artifacts, such as bottles and ships equipment, lay in the holds in this area, as seen in Photo WT13-8. Care must be taken diving in this area.

Mid-ship above the waterline, the vessel is riddled with holes of all caliber and bomb fragments.. Underwater, the idea that the initial damage was light and the Captain and crew had time to get underway and beach the vessel is re-enforced by the discovery of the port anchor was dropped and set on the approach to the beach. This would have allowed the Captain to reverse off the beach much easier if the vessel was repaired.

Unfortunately, the vessel was probably struck at this site in the stern by large bomb(s), as from behind the engine room, including the last 2 holds, is a pile of steel debris. Repeated and/or large bomb blasts have shredded the vessel to its keel. Photos WT13-9 and Photos WT13-10 show this damage. The final portion of the vessel has a segment of hull still attached from the keel to the underside of the stern, supporting the rudder, which is still attached, and actually a danger to passing boats.

The propeller is massive and intact, (Photo WT13-11), and a close-up shows a manufacturer and date cast into each of the 4 blades (Photo WT13-12). This casting has a Mitsubishi "3 Diamond" emblem and reads "KOBE WORKS MAY 1937, No. 210" Smaller ID reads "DIA 4.000m by PITCH 4.638m (not clear) ". Also on ID was numbers 12-3-22, indicated Japanese 12th Year of Showa, meaning 1937, March 22nd. Two other blades had dates of June 1937, with blade number 211 and 213. The last one was over-growth with heavy coral. This verifies the date the Toyotsu Maru was built and launched.

The deck gun was apparently added to the vessel, creating the title of "Gunboat" for the vessel. A mount was located on the vessels bow and is Photo WT13-13. This gun was removed by the Japanese and placed on Egmedio Island as a defensive site. It was removed after the war and placed on Wotje island, and was listed as Site D793 in the *Christiansen, 1994 HPO Land Survey*, and was shown as Photo 5-86. Photo WT13-14 shows the gun today.

Marine life on the site is diverse and large, with schools of most common reef fish accumulating at the port (Photo WT13-15) and near the starboard stern area. (Photo WT13-16). Sharks also frequent the area, and are only curious unless spear-fishing is attempted.

COMMENTS AND CONCLUSIONS

The Toyotsu Maru is one of the few vessels that has had its' history extended into modern times by the placement of a bereavement memorial on Wotje by the family and relatives of the men lost on the ship during the American attacks on Wotje. The site of the monument is located on the southern end of Wotje island, and described the vessel and its' losses.

The vessel is well deteriorated, and has dangerous areas due to the possibility of steel panels or heavy sheets of rust falling on divers or surface visitors in the bow areas. The mid-ship area underwater can be carefully visited, but is very restrictive in size. The stern area is a debris field of twisted metal, and should also be carefully visited under the panels.

There are artifacts, such as bottles and hardware, within the number one and two holds. Additional artifacts are probably buried under the debris throughout the vessel. Areas above and at the water line mid-ship, and the areas below this, were not visited during the survey. Other items have been listed and removed, such as the naval deck gun, which can also be viewed on Wotje island.

The vessel is a incredible dive due to the large amount of marine life at the site. The free standing rudder and propeller, and the ease of carefully diving through the debris make multiple photographic possibilities. Visibility is typically good but not excellent, but worth taking a camera underwater.. Spear-fishing here attracts sharks, so care should be taken by novice divers.

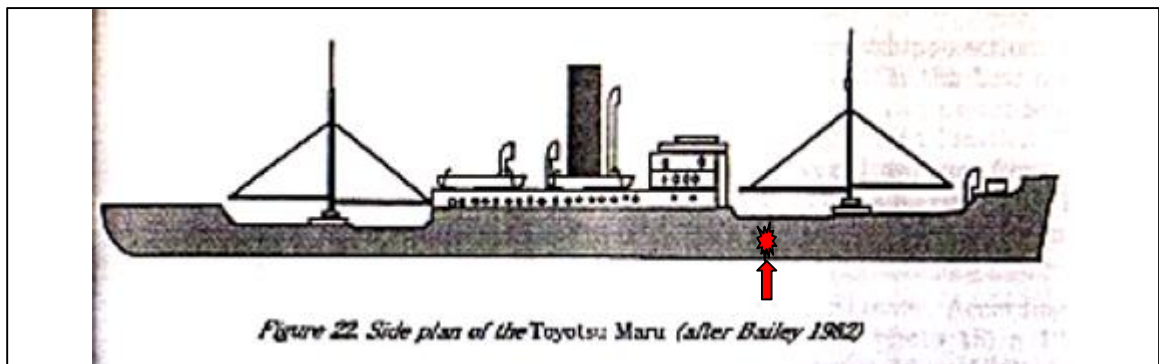
PHOTO SECTION OF WOTJE SITE 13 REPORT



Photo WT13-1. Aerial view of the Toyotsu Maru beached lagoonside of Egmedio Island.



Photo WT13-2. Surface photo of the wreckage of the Toyotsu Maru.



WT13-3 Drawing of the Toyotsu Maru scanned from *Bailey, 1982*. Red arrow points to red explosion mark indicating the site of the hole from an artillery round, also seen on Photo WT13-x.



Photo WT13-4. Photo of Japanese bereavement memorial monument for crew who died during attack on Toyotsu Maru.

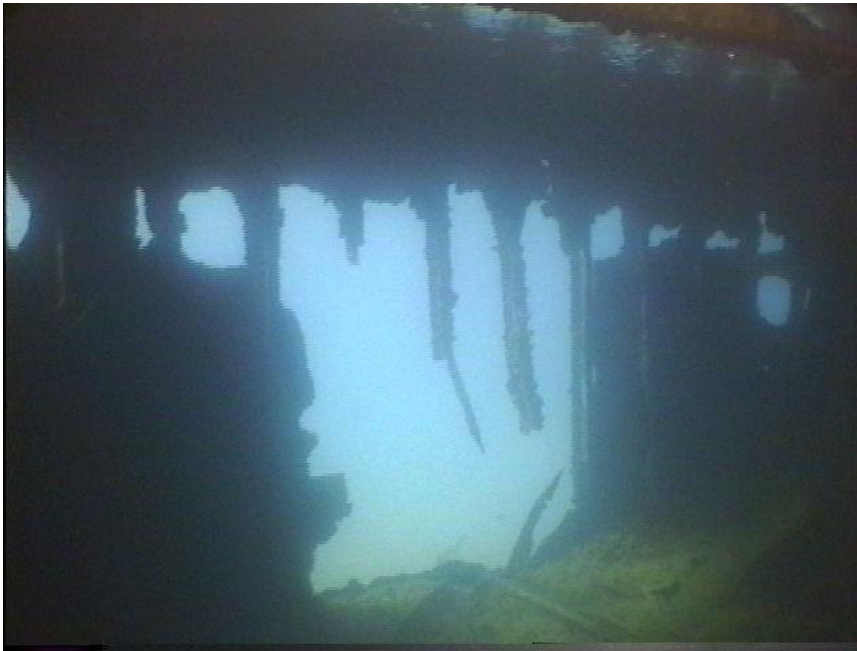


Photo WT13-5. Hole in port side of bow from probable near bomb miss.



Photo WT13-6. Inside bow looking to starboard damage. This damage is probably from the weight of the bow crushing the underwater structure, but could also be from near bomb misses.



Photo WT13-7. Hole likely from artillery shell, but also possible damage from a near bomb explosion.



Photo WT13-8. Bottle buried in the bottom of the number 2 hold.



Photo WT13-9. Stern debris, with winch and king-post lying on remains of a section of the port side deck.



Photo WT13-10. Stern debris.



Photo WT13-11. Photo of massive propeller, rudder behind, with visiting diver.



Photo WT13-12. Propeller manufacture cast into individual blades. This casting has Mitsubishi "3 Diamond" emblem and reads "KOBE WORKS MAY 1937, No. 210" Smaller ID reads "DIA 4.000m by PITCH 4.638m (not clear) ". Also on ID was numbers 12-3-22, indicated Japanese 12th Year of Showa, meaning 1937, March 22nd.



Photo WT13-13. Empty bow gun position on beached vessel Toyotsu Maru.



Photo WT13-14. Bow gun from Toyotsu Maru, removed from Egmedio island and placed on the Wotje airbase after the war. Gun was listed on *Christiansen, 1994* Report, and part of an earlier Marshall Islands Historic Preservation Office project.



Photo WT13-15. Marine life at port side of vessel.

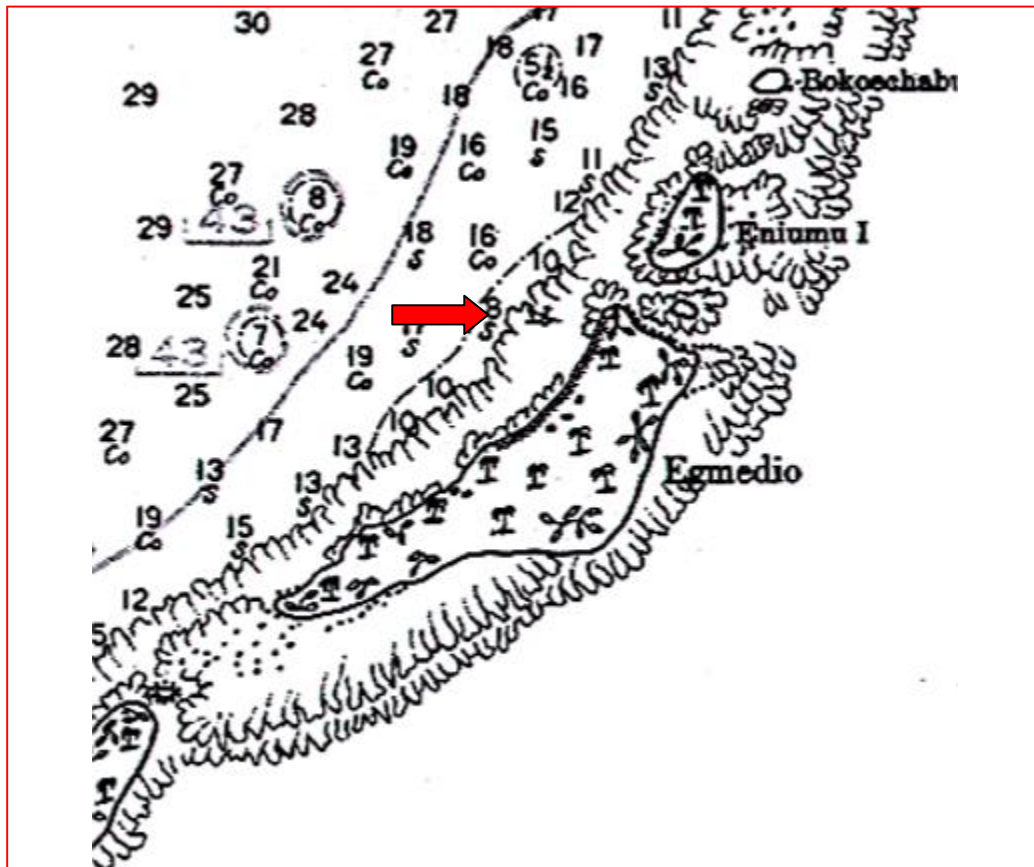


Photo WT13-16. Marine life at stern debris.

MAP OF WOTJE SITE NUMBER 13 REPORT

Site is identified on the Map by the red arrow.

The Map was scanned from the US Department of the Navy Oceanographic Office Chart 6018, Eastern Wotje, revised in June 1968.



WOTJE SITE 14 REPORT

NAME: TOTON ISLAND WRECKAGE
RMIHPO Site Number MI-WT-LG-014

GENERAL DESCRIPTION AND LOCATION

The Toton Island Wreckage was not seen during the survey but was reported by knowledgeable sources (Mr. Budason Kiosa of Ormed Island), as existing on the western island reef exposure of the island.

He estimates the vessel size, from the remains, to be over 60 feet long, but less than 100, with an apx. 20 foot beam. He reported a main diesel engine and propeller amongst the debris, and other steel remains. I assumed it was a wooden vessel, from other small Naval Guard vessels present on Wotje, but he described a larger steel hulled wreck, aground on the west-southwest side of the island. The area is difficult to approach, but can be approached with normal weather from the northwestern lagoonside beach by small boat. The channel area typically has surf which would drive any damaged or incapacitated vessel onto the Toton island oceanside reef and wash any debris around upon that beach. A map of the site, Map WT14, follows the photo section of this report. GPS Position: Not Taken.

DETAILS

The Toton Island Wreckage is probably the remains of two of the Wotje Naval Auxiliary Guard Ships. The first was listed as being attacked on January 9, 1944, by Navy PB4Y Bombers of VB-109. A small Patrol Boat was listed as strafed and finally sunk by Commander Millers gunners of his aircraft "Thunder Mug" of that squadron (*Carey, 1999:25*). The vessel attacked was listed as East of Meichen Island, one of the islands in the Wotje channel group and West of Toton Island. Wotje channels were mined (with 28 Mark 47 air dropped mines) on the same day by VB-109 and its' sister Squadron VB-108, which is probably why they spotted the vessel. It is unknown which vessel this wreckage is, as a number of the Guard vessels are unaccounted for .

Additionally, a second smaller vessel was sunk while tied up to the "hulk" of the first wreck, as reported in the *Marine Corp Action Report No. 215*, of the VMSB-231 squadron dated 23 February, 1944. This vessel was listed as strafed and destroyed by F4U-1D "Corsairs" who described the second vessel as a 50 foot wooden patrol boat.

The Japanese garrison had look-outs, soldiers, and a radio on Toton island for most of the war, and performed guard duty with patrol boats at the channel entrance to the lagoon. They received their supplies by boat, and the second vessel was caught by the Marine Corp pilots. From reading many of the Aircraft Action Reports and Mission Reports, aircraft seemed to fly over the channel islands on many of their air-raids upon

Wotje, both as a reference point, and to search the area for small craft fishing in the channel area to feed the garrison..

COMMENTS AND CONCLUSIONS

The information of this wreckage was discovered while searching out additional aircraft or vessel wreckage at the end of the Wotje survey. and we did not have time to visit this site. The wreckage may have deteriorated into one debris field. A detailed look at the wreckage on Toton Island may provide the exact identity of the vessels, possibly from markings on the main engine or propeller, but these identifying features may be already lost to time.

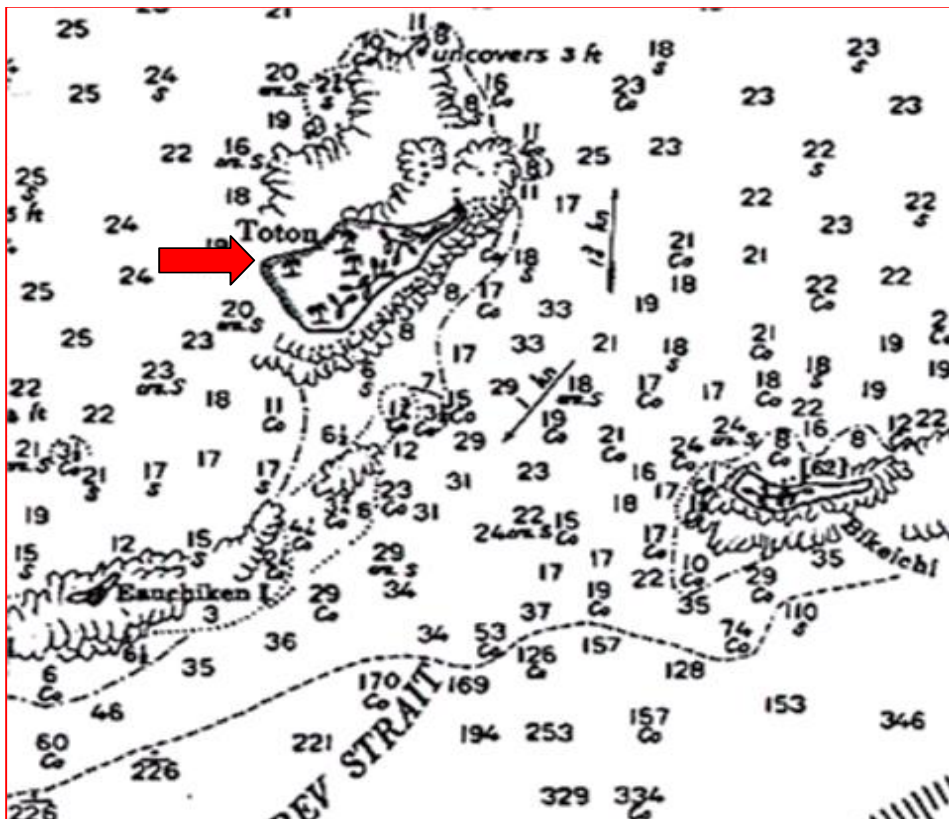
PHOTO SECTION OF WOTJE SITE REPORT 14

No photos were taken of this site, as it was not visited during this survey.

MAP OF WOTJE SITE REPORT 14.

Site is identified on the Map by the red arrow.

The Map was scanned from the US Department of the Navy Oceanographic Office Chart 6018, Eastern Wotje, revised in June 1968.



OTHER WOTJE SITES

OTHER WOTJE SITES INTRODUCTION

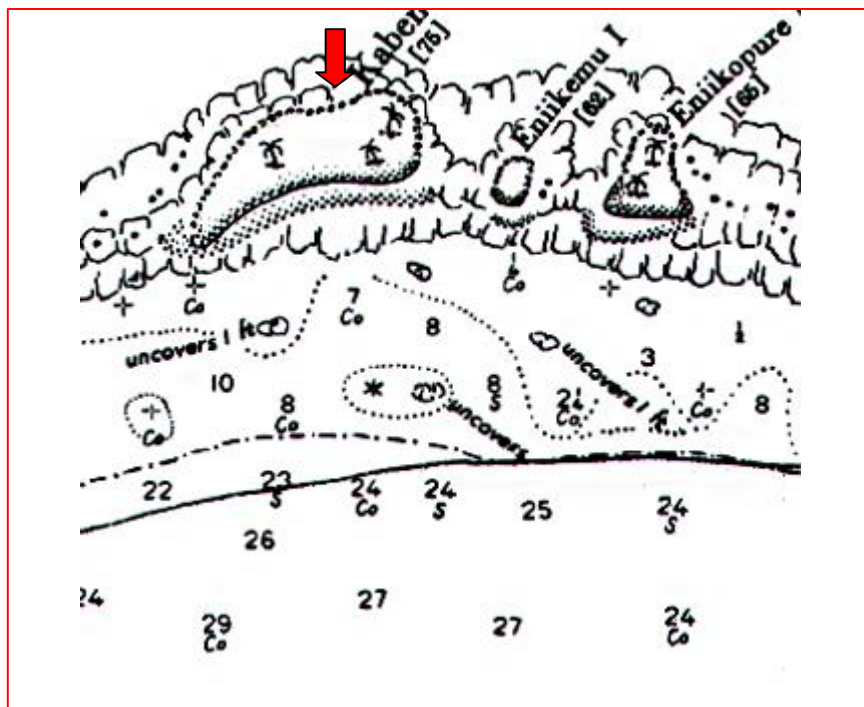
The Other Wotje Sites listed below are a collection of the following:

- A. Sites of reported UW wrecks or aircraft but not visited during this survey.
- B. Sites visited and searched without finding the reported UW site.
- C. Sites that have minor assets that may lead to other major sites.
- D. Sites that have assets that were modern that may be reported as older assets.
- E. Sites that were dove on during the survey that had no assets and with no need to search the same area again.

These sites shall be give a number system of WO-"X", where "X" is the number of the Other Site. All other information, photos, drawings and references are made in a similar fashion to the Wotje Site Reports.

SITE DESCRIPTIONS AND INFORMATION

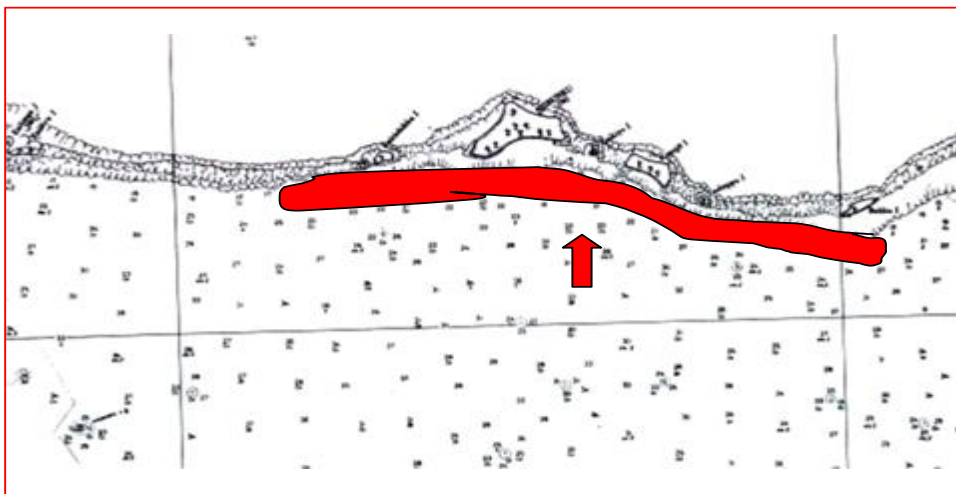
WO-1 Kabin Island Wreck. The WO1 site is the remains of a pre-war Japanese vessel wrecked on the oceanside reef and tidal area of Kabin Island, located in the Northwest corner of Wotje Atoll. The only information is that the vessel did exist and there is currently wreckage in a debris field, but no other details. A map of Kabin Island, Map WO-1, is below, with the site indicated by the red arrow.



WO-2. Japanese landing craft wreckage. A large Japanese landing craft was reported strafed and sunk by US planes on the lagoonside of the north side of the atoll, somewhere between Enirichikku and Bokku island. The landing craft was carrying apx. 40 Japanese soldiers on a mission to kill all the Marshallese in the Kabin to Kaijen island areas that were preparing to escape by sailing canoes to nearby Erikub Atoll. US forces, who were assisting and monitoring the Wotje evacuation to Erikub, saw the approaching vessel and sunk it near the northern reef, and many Japanese escaped to walk back to the airbase. This occurred sometime in March, 1945, and a archival photo was found of the evacuation and added to the report as the Photo WO-2-1 below. A Map of the area, Map WO-2, is also below, with the red zone indicating the apx. area..



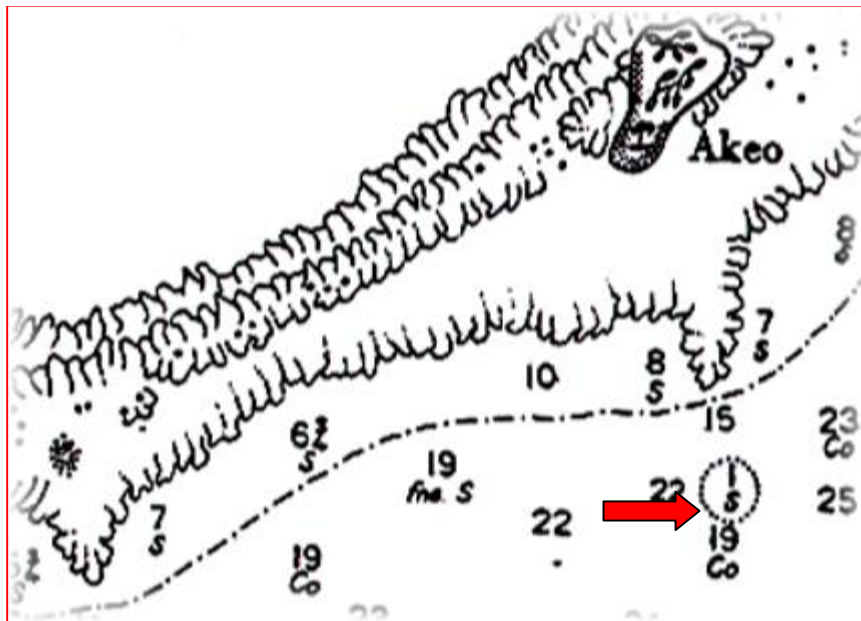
Photo WO-2-1. Marshallese sailing canoe during evacuation of Wotje atoll.



WO-3 Akeo Island Lagoonside Coral Head. The Akeo island area was first brought to my attention as a possible dive site for the remains of a Japanese vessel by Mr. Budason Kiosa, a local resident of Ormed. Over the last few years, Yachts from Kwajalein have anchored off the island and done many SCUBA dives of the area. We asked for his assistance to show us where they went diving, and he identified an area surrounding a very conspicuous coral head lagoonside and south of the islands reef extension into the lagoon as the primary area of diving. The coral head was a ship killer, coming up from over 100 feet deep to 6 feet of the surface in less than 100 yards of travel. We made a search dive around the entire coral head, the area was searched around the coral head to apx. 110 feet deep, in an apx. a 250 yard diameter circle, with no indications of any wreckage, artifacts, humanity, or even trash.

I would have ignored the site completely, but noticed in the USSBS, 1947, Annex 1 Wotje, page 61, in the interrogation of Lt. Takeji Sinohara, he listed troops as stationed at Kaizen Island, correctly identified later as Akeo Island. It is possible the Japanese forces did in fact have a supply or guard vessel lost off the island, and we were in the wrong location for our search. With additional information, it may be worth future searches.

It is a wonderful site for diving, full of marine life, but no archaeological artifacts or resources were found. A map of the search area, Map WO-3, is shown below, with the coral head identified with the red arrow.



WO-4. This site was another site reportedly well dove by groups of visiting Kwajalein divers, who have camped out on Enibin island. We made numerous passes with the depth-finder, and dove on one area which turned out to be a long, stepped edged section of coral. Dives were made out to 90 feet deep, and apx. 250 yards off the lagoonside shoreline. No artifacts or related items of any nature were found. If the area was re-searched, it would have to be into deeper water. A Map of WO-4 near Enibin island is shown below, with the area searched near the red arrow.



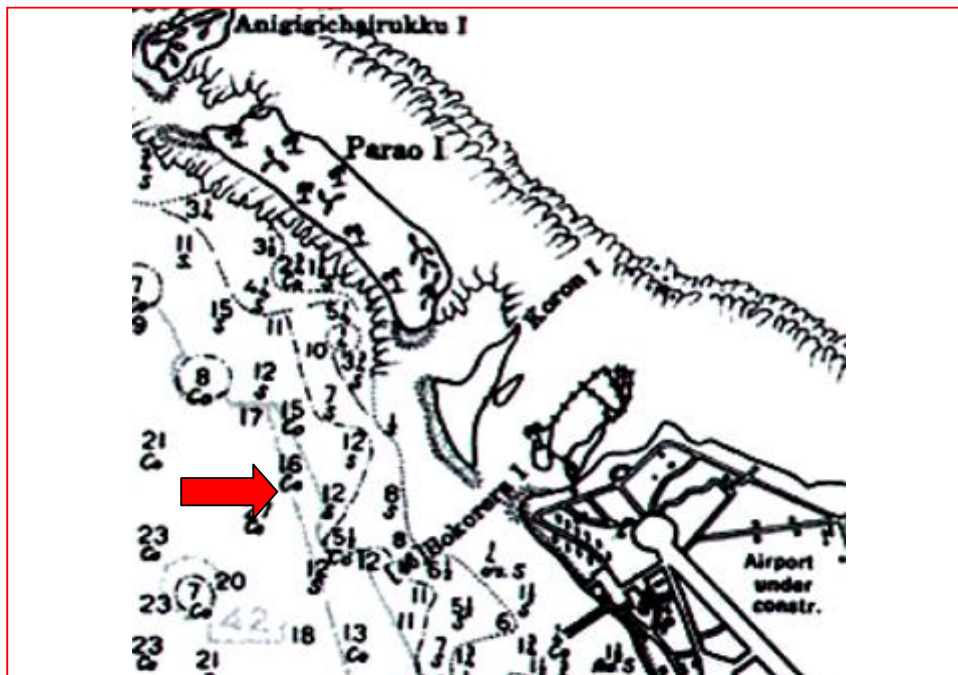
WO-5. Oceanside wreckage near Kechaien Island. The wreckage found on the oceanside are some major components of a steel hulled cargo vessel among a debris field. The vessel reportedly went aground in the early 1970's on the oceanside reportedly after an engine failure. The vessel is not part of this survey, but was included to avoid future confusion. The site location is located at the red arrow on the Map WO-5 below.



WO-6. Local rumor has a story of a small ship or barge sunk off the small islands between the north end of Wotje Island and the next major island, Parao. We did not have this information until after the survey was completed. An aerial photo of the area was taken and included as Photo WO-6-1, and followed by a map of the area, Map WO 6, and the apx. site location indicated by the red arrow, all on the next page.



Photo WO-6-1. The area in the lagoon near these islands reportedly hides another sunken Japanese vessel.



Map WO-6. Red arrow indicates are of site.

CONCLUSION

The Wotje Survey has shown that measurable sites and artifacts do exist in Wotje Atoll. They include one of the larger sunken vessels in the Marshall Islands, and a collection of smaller, but noteworthy vessels and aircraft. There are less sites than the massive Kwajalein Lagoon, but are generally less molested by artifact collecting divers. These sites are the back-bone of future historical underwater tourism, and need protection and the education of the Wotje community of their unmolested value

The history of Wotje atoll during the war has already created a viable but undeveloped land package for tourism. The amount of war relics on the old airbase can easily keep the visitor busy for days. The known underwater sites before this survey were limited and difficult to find. This survey can easily change this, and allow the development of tourist diving in the atoll.

Unfortunately, this development generally leads to the stripping of the sites, even under the best of operators. The local Wotje government must be educated in these facts, and create dive operators, guides, and diving conditions that are protective, and rules and punishments that will hold these assets in Wotje for the future.

It has also been mentioned that the development of a local museum may be a way to protect some of these sites and artifacts. This is a great idea if successful, although it would be difficult, but not impossible, to acquire the money and curator talents needed for such a venture. Many entities can be contacted for assistance, either for funds or talent, and this idea should be considered..

My main recommendations would be to mark and buoy various sites to avoid anchor damage from commercial vessels and tourist visitors alike, and to provide education to the local community to pursue the advantages of small scale tourism. Further attempts to educate the community on the impact of trash and debris on the developing tourism sites would also be wise. It seems the community only listens when money is involved, so if tourism develops and money flows, then possibly these sites will be protected in the future by the vested interest of these increased revenues.

All the other worthy comments have been said before, it is again up to the leaders of the local Wotje community and Republic to decide the future of its' own past history.

Matt Holly
Majuro, Marshall Islands
2000

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1. Spennemann, 1991/7:27.

Wotje Site 4, MI-WT-LG-004.

1. Christiansen, 1994/Vol. 2 :43.

Wotje Site 5, MI-WT-LG-005.

1. Angelucci, & Matricardi, 1979:178, 179.
2. Carey, 1999:21, 184.
3. Christiansen, 1994/Vol.2. :44.
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2. JICPOA Bulletin No. 57-43, Dec. 15, 1943:21.
3. Spennemann, 1994/7:23, 24.
4. USSBS, 1947:70, Map item 39.

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1. Spennemann, 1994/7:24.

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3. Karig, 1944:260, 262-263.
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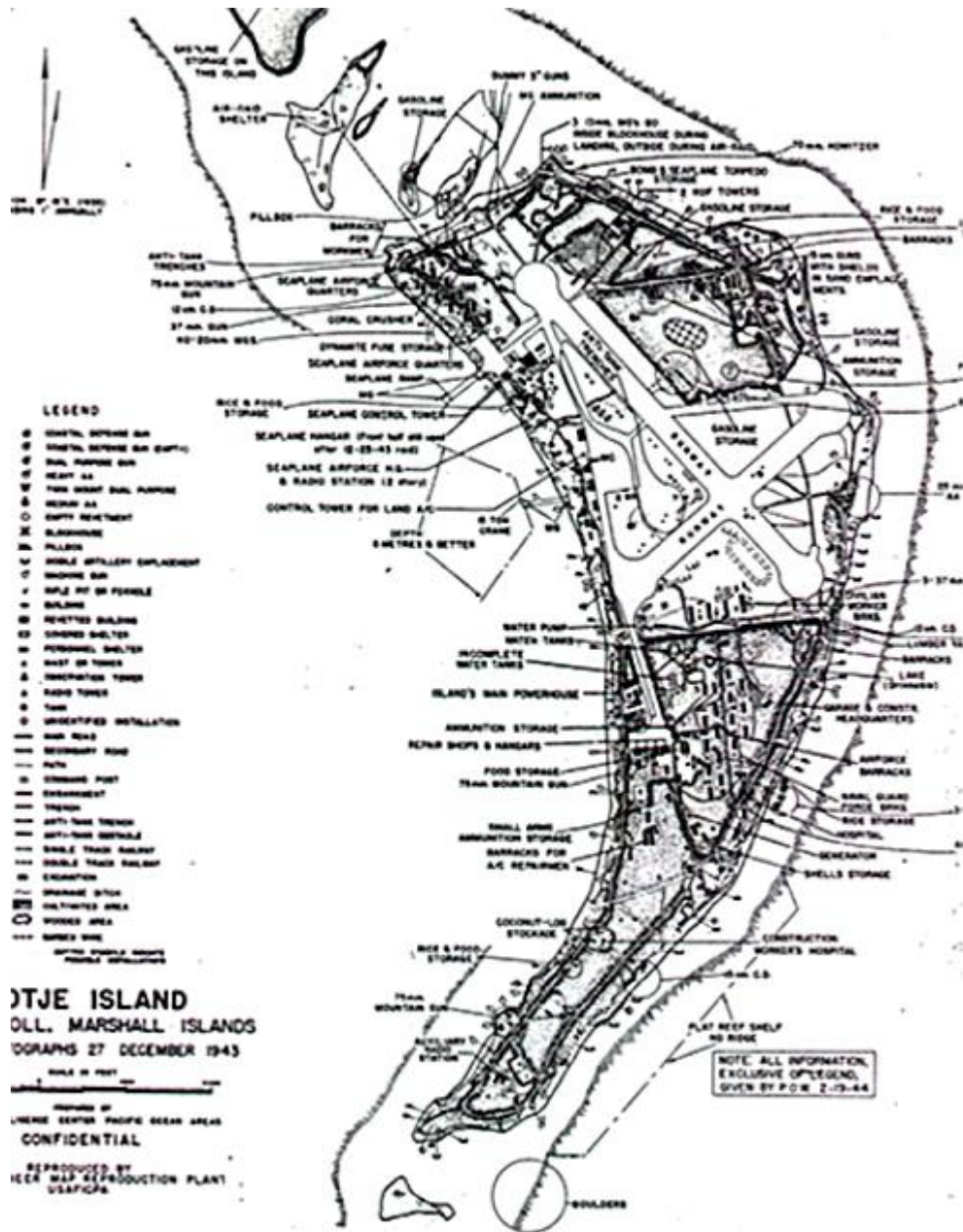
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APPENDIX 1

MILITARY DOCUMENTS

Document 1
Detailed Wotje Base Map.
Page 1 of 1.



JAPANESE YEAR DATES AND METHOD OF NUMBERING MODELS

To eliminate possible confusion arising from the reference to Japanese antiaircraft artillery by type and by model, the following information is presented herewith.

1. Japanese year dates:

<u>Year of Meiji</u>	<u>Year of Our Lord</u>
1st	1868
44th	1911
45th	
<u>Year of Taisho</u>	1912
1st	
2nd	1913
3rd	1914
4th	1915
5th	1916
6th	1917
7th	1918
8th	1919
9th	1920
10th	1921
11th	1922
12th	1923
13th	1924
14th	1925
15th	
<u>Year of Showa</u>	1926
1st	
2nd	1927
3rd	1928
4th	1929
5th	1930
6th	1931
7th	1932
8th	1933
9th	1934
10th	1935
11th	1936
12th	1937
13th	1938
14th	1939
15th	1940
16th	1941
17th	1942

NOTE: When Japanese year dates are given the year may be found as follows:-

- In the Meiji period, add the Japanese year date to 1867
- In the Taisho period, add the Japanese year date to 1911
- In the Showa (present) period, add the Japanese year date to 1925

FORWARD ECHELON
 HEADQUARTERS VII BOMBER COMMAND
 APO # 240 (W)

27 December 1943

MISSION REPORT

MISSION No. 41
Strike Against WOTJE, 24 December 1943
 (West Longitude Date)

1. Eighteen B-24 airplanes of the 11th Bombardment Group (H), VII Bomber Command carried out a daylight bombing strike against Wotje Island, Wotje Atoll on 24 December 1943 (West Longitude Date).
2. Twenty airplanes - 10 of the 431st Bombardment Squadron (H) and 10 of the 98th Bombardment Squadron (H) proceeded from Nukufetau (98th) and Funafuti (431st) to staging base, Betio Island, Tarawa Atoll on the afternoon of 23 December 1943 (West Longitude Date). From Tarawa take off was accomplished by 20 B-24's between 242015Z and 242047Z, with the 431st Squadron leading. Airplane #027 (98th) blew a cylinder on #4 engine about half way to the target and turned back, landing at Tarawa at 250300Z. Airplane #010 (98th) turned back because of illness of the co-pilot, landing at Tarawa at 250300Z. Airplane #187 (431st) was delayed in taking off and later joined the first flight of the 98th Squadron, replacing airplane #010 which turned back.
3. Route out was flown in formation from 8,000 to 12,000 feet to Makin, then on course 004° True to 10° N, 173° E, then on course 260° True to the target. Approach was made between 10,000 and 17,000 feet and target was first sighted from 25 to 45 miles. Bomb runs were made from 12,000 to 15,000 feet on headings of 125°, 160°, 120° and 240° True.

431st Squadron		<u>BOMB SUMMARY</u>			
A/E No.	Pilot	Bombardier	Bomb Load	Hits	How Dropped
257	Capt. Hamrin	Lt. Bauer	12x500 lb GP	12	100' Train
016	Lt. Rowe	Lt. Short	12x500 lb GP	11	11 - 250' Train, 1 salvood
006	Lt. Lundy	Lt. Burke	12x500 lb GP	12	salvood
029	Lt. MacArthur	Lt. Drenon	12x500 lb GP	12	150' Train
831	Lt. Royce	Lt. Baber	12x500 lb GP	12	150' Train
155	Lt. Darby	Lt. Luzon	12x500 lb GP	12	150' Train
013	Lt. Osborne	Lt. Deer	12x500 lb GP	12	11 - 170' Train, 1 - salvood
244	Lt. Davis	Lt. Peck	12x500 lb GP	12	9 - 125' Train, 3 salvood
962	Lt. Malmgren	Lt. Bogachoff	12x500 lb GP	12	100' Train
187	Lt. Crowell	Lt. Weinstein	12x500 lb GP	12	8-150' Train 4 - salvood
98th Squadron		<u>NUKU</u>			
136	Capt. Cornwell	Lt. Brazemore	12x500 lb GP	12	150' Train
008	Lt. Hindersinn	Lt. Green	12x500 lb GP	0	Jettisoned
004	Capt. Kethley	Lt. Beach	12x500 lb GP	12	150' Train
153	Lt. McCleskey	F/O Lauber	12x500 lb GP	0	170' Train
154	Lt. Morse	Lt. Carpon	12x500 lb GP	9	150' Train
009	Lt. Dwyer	Lt. Becker	12x500 lb GP	0	160' Train
496	Lt. Suojanen	Lt. Nummi	12x500 lb GP	12	175' Train
938	Lt. Cartwright	Lt. Webb	12x500 lb GP	0	140' Train
027	Lt. Jordansk	Lt. Ward	12x500 lb GP	0	Jettisoned
010	Lt. Esmond	Lt. C.E. Smith	12x500 lb GP	0	Bomb returned to Tarawa

-1-

C O N F I D E N T I A L

4. 164 x 500 pound G.P. bombs were estimated to have hit on the island in or near the assigned target area - hangar, servicing, and radio station areas on the west side of Motje Island. Bombs were away between 250100Z and 250108Z. Four fires were observed, one of which was large and emitted red flame, black smoke, and explosions. It was visible 15 miles at 11,000 feet until clouds obscured the target. Damage was seen in the building area on the north part of the island, on the NW-SE runway, and among buildings and installations in assigned target area. A near miss was observed on a 4-engine flying boat and a harbor craft. One 4-engine flying boat was destroyed in the lagoon. A possible hit was made on an AA position near the northeastern tip of the island.

5. AA fire from heavy and medium guns was meager and inaccurate. There was no interception.

6. One large and one medium AK were observed in the lagoon and several barges, lighters and small harbor craft were seen. Two EMILYS were seen in the lagoon and one on the seaplane ramp. Three or four fighters and one two-engine plane were seen on the runways. The crew of airplane #027 which turned back with engine trouble before reaching the target observed a BETTY Airborne about 40 miles south of and apparently headed for MILLE.

7. Our planes returned to Tarawa at 9500 to 12,000 feet, landing between 250418Z and 250442Z. One B-24 landed at Makin due to excessive fuel consumption of #1 engine and returned to Tarawa later. Nine planes of the 98th Squadron returned to Nukufetau the night of 24 December (West Longitude Dato). Airplane #027 (98th) remained at Tarawa for an engine change. Three planes of the 431st Squadron returned to Funafuti the night of 24 December (West Longitude Dato). The other seven returned to Funafuti the next day.

8. 5/10 scattered cumulus was encountered enroute and a weak front was observed near Mille. Over the target there was 3/10 to 5/10 cloud cover. On return the weather was similar to that encountered enroute.

9. A total of approximately 2800 statute miles from home base to staging base to target and return was flown by each airplane on this mission. Distance flown from staging base to target and return was approximately 1175 statute miles.

For the Commanding General:

L. W. Higbie
L. W. HIGBIE,
1st Lt., Air Corps,
Intelligence Officer.

DISTRIBUTION:
5 cys - 11th Gp
5 cys - 41st Gp
3 cys - 30th Gp
1 cy - 392nd Sq
1 cy - 531st F1-Bomb Sq
1 cy - 819th Sq
1 cy - R.E. A-2, VII BC
2 cys - F.E. A-2, VII BC
27 cys - C.G. 7th AF (A-2)

REPRODUCED AT THE NATIONAL ARCHIVES

FORM 10-23
 1-5-44

UNIT REPORTING: VMSB-231 (b) Based on or at: Majuro Atoll (c) Report No. 215

TAKE OFF: Date 23 February, 1945 (LZT) 0800 M. (Zone); Lat 07-05-35N Long 171-22-40E

MISSION: Search Wotje and Maloelap Atolls. (f) Time of Return: 1120M. (Zone)

RECORDED 1945
 SERIALIZED 1945
SECRET
 572

I. OWN AIRCRAFT OFFICIALLY COVERED BY THIS REPORT.

TYPE	SQUADRON	NUMBER	ATTACHED	ARMAMENT	FUEL SYSTEM
P4U-1D	VMSB-231	2	0	2 planes: 2x AN-VY-47, Depth Bombs	Nose: Inst. Mid-ships: 25 lbs Hydrostatic. Tail: None.

III. OTHER U. S. OR ALLIED AIRCRAFT EMPLOYED IN THIS OPERATION.

TYPE	SQUADRON	NUMBER	BASE	TYPE	SQUADRON	NUMBER	BASE
None.							

IV. ENEMY AIRCRAFT OBSERVED OR ENGAGED (By Own Aircraft Listed in II Only).

TYPE	NO. OBSERVED	NO. ENGAGED	TIME ENCOUNTERED	LOCATION OF ENCOUNTER	BOMBS, TORPEDOS, CARBON, DUNG OBSERVED	CANALS, AGE AND MARKING
None.						

(k) Apparent Enemy Mission(s): _____

Did Any Part of (l) Encounter(s) Occur in Clouds? _____ If so, Describe Clouds _____ (BASE IN FEET, TYPE AND TEXTURE OF COVER)

Time of Day and Brilliance _____ (1) Visibility _____ (MILES)

V. ENEMY AIRCRAFT DESTROYED OR DAMAGED IN AIR (By Own Aircraft Listed in II Only).

TYPE	DESTROYED OR DAMAGED BY	PILOT OR GUNNER	GUN USED	WHERE HIT, ANGLE	REMARKS
None.					

VMSB-231
 TOLON ISLAND
 WOTJE
 SHIP ATTACK
 50' BOAT
 NEXT TO "HULK"

SECRET

REF ID: A66328

AIRCRAFT ACTION REPORT

(OMIT THIS SHEET IF NO ATTACK WAS MADE)

REPORT No. 215

XL ATTACK ON ENEMY SHIPS OR GROUND OBJECTIVES (By One Aircraft Listed in II Only).

(a) Target(s) and Location(s): 50 foot power boat off western tip of Toton Island, Wotje Atoll. (b) Time Over Target(s) 0940 H. (Zone)

(c) Clouds Over Target: 2000, cumulus 7/30

(d) Visibility of Target: Clear (e) Visibility: Unlimited.

(f) Bombing Tactics: Type _____ Bomb Sight Used _____
 Bombs Dropped per Run _____ Spacing _____ Altitude of Bomb Release _____

(g) Number of Enemy Aircraft Hit on Ground: Destroyed 0 Probably Destroyed 0 Damaged 0

(a) AIMING POINT	(b) DIMENSIONS OR TONNAGE	(c) NO. A/C ATTACKING (d) SQUADRON	(e) BOMBS AND AMMUNITION EXPENDED EACH AIMING POINT	(f) NO. HITS ON Aiming Point	(g) DAMAGE (None, slight, serious, destroyed or sunk)
1 50 foot power boat off western tip of Toton Island, Wotje Atoll.	50' x 15'	2 F4U-1D VMSB-231.	2 planes: 2200 rounds of .50 cal. ammo.	Numerous.	Destroyed.
2					
3					
4					
5					
6					
7					
8					

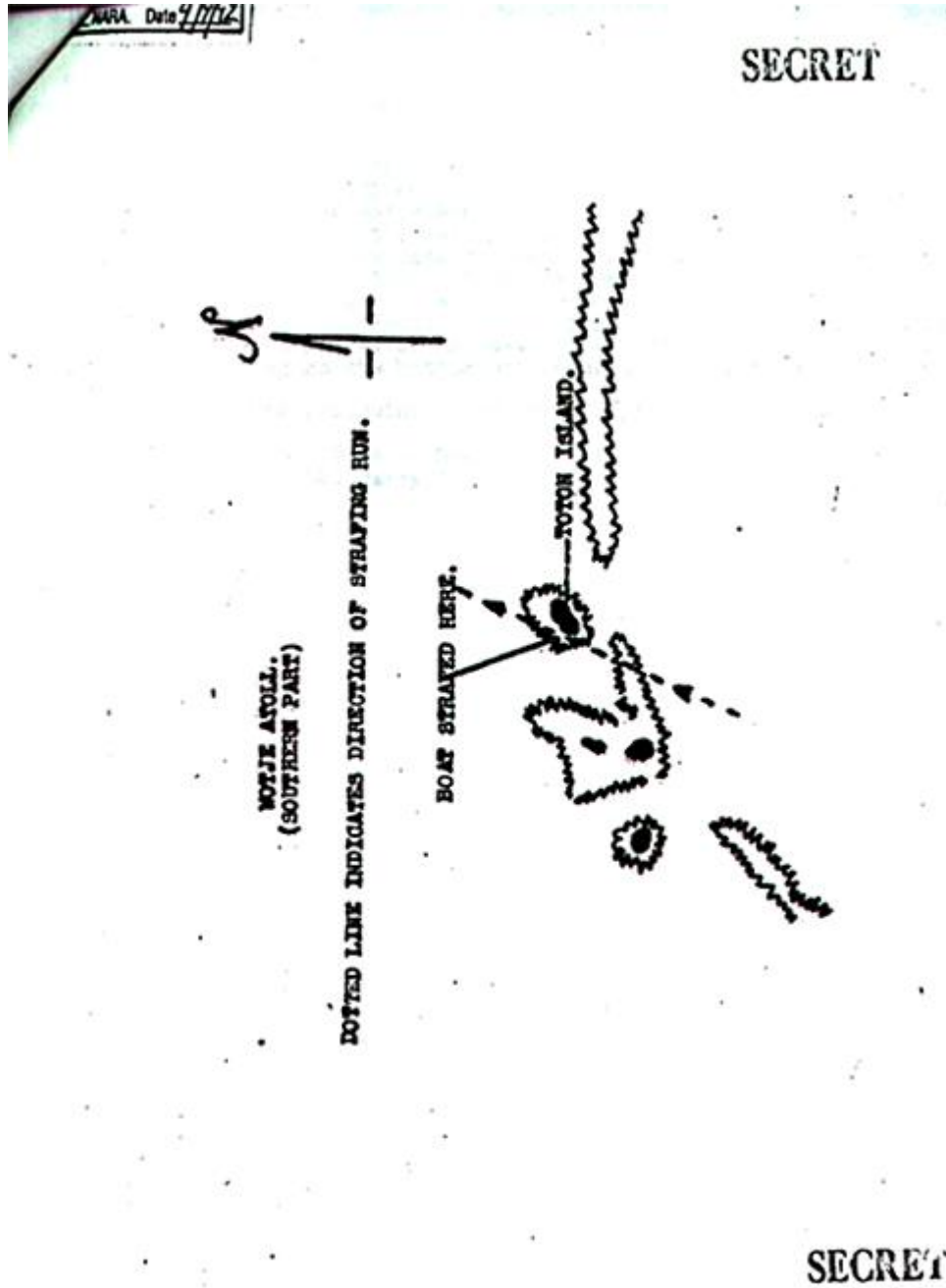
(g) RESULTS: For all hits claimed on ship targets and for land targets of special interest, draw diagram, top or side view or both, as appropriate, showing type and location of hits. For all targets give location and extent of hits, and identify by numbers above. Use additional sheets if necessary.

1. Two planes, on the regular evening search of Wotje and Maloelap Atoll strafed and destroyed a 50 foot power boat off the western tip of Toton Is. Wotje Atoll. Later observation showed that the boat's propeller had been blown off and that there were numerous large holes in the hull.

SECRET

(g) Were Photographs Taken? _____ Photographs of Damage, When Taken, Should Be Attached By Staple.

No.



Document 4

Marine Corp VMSB-231 Aircraft Action Report No. 215.

Page 4 of 4.

NAVY ARCHIVES
AIRCRAFT ACTION REPORT

SECRET

REPORT No. 215

OPERATIONAL DATA. (Narrative and comment. Describe action fully and comment freely, following applicable items in check list at left. Use additional sheets if necessary.)

The two regular morning search planes to Wotje and Malcelep Atolls (21 and 24 V 311) while reconnoitering the southern part of Wotje Atoll, observed an operational 80 foot power boat off the western tip of Toton Island, tied to a bulk. The planes made two runs from southwest to northeast at 500 feet. A large oil slick appeared as a result of the first strafing run, and as a result of the second run a sizable explosion occurred mid-ships. Later observation showed that the propeller had been blown off and that the boat was resting on the bottom with numerous large holes in the hull.

The following pilots participated in this search:

SCHWENDIMANN, Henry M., 1stLt., USNCR.
REYILL, Harry E., 1stLt., USNCR.

3 **AIRCRAFT ACTION REPORT** RESTRICTED
Excluded from automatic
downgrading and
declassification

(OMIT THIS SHEET IF NO ATTACK WAS MADE)

X. ATTACK ON ENEMY SHIPS OR GROUND OBJECTIVES (By Own Aircraft Listed in II Only).

(a) Location of Target(s) E-2, on lagoon shore of Noije Island (b) Time Over Target(s) 150300 GCT

(c) Weather and Clouds Over Target 5/10 Cumulus, 3500' to 6000'

(d) Sun or Moon Sun approximately overhead (e) Visibility Unlimited

XI. TARGETS, RESULTS OF ATTACK.

(1) DESCRIPTION OF TARGET (List All Ships in Group, Whether or Not Individually Attacked)	(2) A/C ATTACKING (1st SQUADRON)	(3) BOMBS AND AMMUNITION EXPENDED, EACH TARGET	(4) ALTITUDE OF RELEASE	(5) HITS
1 3 medium AA gun emplacements at E-2, Noije Island	12 F4U-1 VMF-224	12 x 500 GP	2500' to 3000'	8
2 Heavy CD gun emplacements at E-1	4 F4U-1 VMF-224	9000 rds. .50 cal.	-	-
3 Raas on reefs	2 F4U-1 VMF-224	3000 rds. .50 cal.	-	-
4				
5				
6				
7				
8				

(a) RESULTS: (FOR SHIP TARGETS DRAW DIAGRAM, TOP OR SIDE VIEW OR BOTH, AS APPROPRIATE, SHOWING TYPE AND LOCATION OF HITS. FOR ALL TARGETS GIVE LOCATION AND EFFECT OF HITS, WITH DIAGRAMS OR CHARTS WHERE DESIRABLE. DESCRIBE TARGETS FULLY IN 1a, AND IN REPORTING DAMAGE OR DESTRUCTION, IDENTIFY BY NUMBERS AT LEFT. USE ADDITIONAL SHEETS IF NECESSARY).

Plot of bomb hits on E-2 is shown at right. Major Harrison apparently obtained a direct hit on the southern emplacement and Captain Tucker and Lt. Knapp apparently obtained direct hits on the middle emplacement. Lts. Montagne, Ford and Sperow obtained near misses. Lt. Word's bomb hitting the fire control structure. Grouping was among the best results yet achieved by this squadron. Close observation after attack showed both the southern and the middle emplacements to be destroyed.

2. Strafing results unobserved.

SECRET

(h) Were Photographs Taken? Yes. Photographs of Damage, When Taken, Should Be Attached None taken of target after bombing attack.

XIII TACTICAL DATA

ATTACK - OWN TACTICS

The flight crossed the southern end of Motje Island, then peeled off in 180° diving turns and went into dives from 8000'. Target was medium AA battery at E-2. Planes attacked singly, at close interval and direction of attack was generally East to West. Average dive angle was 70°, and releases were at about 2500' - somewhat higher than usual with this squadron.

After bombing attack Major Morrison's division strafed the medium AA battery at E-1, from north to south ahead of the accompanying PV-1 which dropped a string of 500 lb. bombs on E-2. Next, Captain Tucker's division made a similar strafing run ahead of the PV's second attack on E-1. Then Lt. Agnew's division strafed E-1 ahead of the PV's photo run.

After completion of the above phases of the attack Captain Tucker and Lt. Knapp strafed personnel observed to be lying out on the reef off the NE tip of Motje Island. It was on this run, while flying north to south at about 200', off the NE turning circle of runway Able that Captain Tucker's plane was hit on the under side of the fuselage by what was probably a 20 mm. explosive shell - forcing a landing in Motje lagoon.

Captain Tucker reports that the shell apparently entered the lower side of the fuselage, in the engine or accessory section, near the port wing root. Source of the fire was not observed. At the time he was making 320 to 330 knots. Oil started immediately to pour out of the engine, and Lt. Knapp observed much black smoke or oil spray. Plane started vibrating roughly and in 45 seconds oil pressure was at zero. There was no fire. Captain Tucker cut his switches and made a successful water landing in the west end of Motje lagoon. When he landed the prop was turning slowly. Landing was made down wind, using 50° flaps. Hood was jettisoned in ample time. Swells were running about 5 feet in the lagoon, and aircraft skipped three times before settling. Landing was made in nose high attitude.

No trouble was experienced in getting out of aircraft, but boat was lost - sinking before being inflated. Gas West inflated satisfactorily. Dye marker was used. IFF not detonated, but plane sank in deep water in between 20 and 30 seconds.

ANTI-AIRCRAFT

Large muzzle flashes observed from the lagoon shore of "D" area, the G-4 area and the B-11 area.

One burst was observed at 2000' over east end of Motje lagoon.
White tracers from Ena Cheratakku Island.

SECRET

Document 5.
Marine Corp VMF-224 Aircraft Action Report No. 63, June 15, 1944.
Page 5 of 5.

PILOTS PARTICIPATING

Major Morrison and Captain Tucker and Lts. Burns, Bruce, Sperow,
Knapp, Ford, Newkirk, Agnew, Irwin, Montagne, and Donaldson.

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1000 GPO

PREPARED BY: *Melson* **APPROVED BY:** *A.A. Davis*

Melson **Capt. AGIO** *A.A. Davis* **Maj USMC 24 00 20 June 1944**
Melson **D. D. 18418**

SECRET

APPENDIX 2

LIST OF JAPANESE WW2 ERA VESSELS KNOWN TO BE ATTACHED TO OR VISITING WOTJE ATOLL AND POSSIBLY LOST THERE DURING WW2.

JAPANESE NAVY VESSELS

65 th SUBCHASER DIVISION	Status	Date
1. Kyo (or Kyou) Maru No. 6	Ran Aground Namorik	Nov. 27, 1943
2. Kyo Maru No. 7	Unknown	
3. Uji Maru	Sunk Kwajalein Atoll	Jan. 28, 1944

NAVAL AUXILIARIES

MAIN FORCE

NAME	MILITARY NUMBER		
4. Shonan Maru No. 5 *(as No. 10)	41	Sunk Wotje	Feb. 1, 1942
5. Shonan Maru No. 6	42	Sunk Gehh Island, Kwajalein Atoll	Jan 30, 1944

CONVERTED VESSELS CALLED "PATROL VESSELS" OR "GUARD SHIPS".

6. Higashi Nippon Maru	401	Unknown	
7. Kompira Maru	402	Unknown	
8. Nichiei Maru	405	Unknown	
9. Sumiyoshi Maru No. 8	406	Sunk Likiep Lagoon	Jan. 17, 1944
10. Eifuku Maru No. 2 GO	407	Unknown	
11. Kaza Maru	408	Unknown	
12. Kaza Maru No. 3	409	Unknown	
13. Kaza Maru No. 5	410	Unknown	

The names on the above list were taken from research documents quoted from *Christiansen, 1994:16,21*, citing an intercepted Japanese radio message translated and listed as the "*Marshall Area Defense Force Secret Operational Order # 3-44*", from Jan 5, 1944. (*JICPOA "Joint Intelligence Central Pacific Operational Area" translation #5757, US National Archives, record group 38. Entry POA, box 61*).

VISITING VESSELS

14. Bourgouis Maru	Sunk Wotje Lagoon Wotje Site MI WT-LG-012	Feb. 1, 1942
15. Toyotsu Maru	Beached Wotje Lagoon Wotje Site MI-WT-LG-013	Feb. 1, 1942

SUMMARY OF KNOWN WOTJE VESSELS

After collecting information from all sources, it appears that Wotje had 13 vessels attached to its garrison and at least 2 other larger vessels visiting the atoll unloading cargo during the war, totaling 15 vessels as potential sites. Five vessels were located in Wotje Lagoon during this survey with 2 positively identified. Four were known lost in other areas, 3 with known locations and identities, with the last named one known to be sunk in Likiep atoll but at an unknown location. Two others were known lost at Toton island in Wotje, but were not visited or identified by name during this survey. One more was listed as sunk outside the lagoon by the Destroyer Dunlap in the February 1942 raid, without a identifying name. This leaves 3 other vessels not located by site or research from the total of 15.

Only 6 of the 15 vessels physically located are positively identified by name, leaving the 5 of the remaining located vessels and 4 vessels not located without positive identification by vessel name. Some or all of these un-identified vessels may be on this appendix list, and all known details of each vessel are described below for future reference.

It is also possible there were more vessels visiting Wotje, more losses in Wotje than listed, or even none of the remaining vessels sunk in Wotje atoll. Some or all of the missing vessels may have been sunk at Kwajalein or in other places during the pre-invasion attacks, as some of the vessels were described as damaged and in Kwajalein for repairs. Likiep atoll also lists 2 additional small vessels sunk there, which may have been vessels from Wotje, which serviced the atoll.

This list does not include the 2 archaic wrecks oceanside of Kabin or Ormed islands, nor the modern wreck oceanside of Kechaien island.

DETAILS OF KNOWN WOTJE VESSEL LIST.

Vessel 1. Kyo (or Kyou) Maru No. 6.

This vessel ran aground at Namorik Atoll, November 27, 1943, possibly after an air attack or by accident (*Christiansen 1994:16*). Namorik Atoll has an enclosed lagoon, and no where to anchor or enter, thus difficult to stand offshore and transport people to and from the atoll. It is possible the crew was stranded there until the US Marines liberated the island on 23-24 March, 1944. During the Marine landing, a firefight ensued, and 2 US Marines, Pfc. John Nelson and Pvt. Theodore Miller were killed (provided from the *Marine Corp Historical Center, 1999*), as were 17 Japanese soldiers and civilians (*Heinl & Crown, 1954:155*). The vessel is currently steel debris only on the eastern reef.

Vessel 2. Kyo (or Kyou)Maru No. 7.

I found no details of any type on this vessel, other than being listed in *Christiansen, 1994:16*, as a vessel attached to Wotje.

Vessel 3. Uji Maru

The only information is the ship is that it was listed as sunk in Kwajalein on Jan. 28, 1944 (*Miller, 1991, 119*), and listed on the Wotje Japanese Naval ship list as a Sub-Chaser of the 65th Naval Sub-Chaser Division. (*Christiansen, 1994:16*).

Vessel 4. Shonan Maru No.5.

A vessel was identified in the *US Navy Chroniciles: February 1942*, as the Shonan Maru No. 10, sunk on February 1, 1942 at Wotje Atoll. It was listed as sunk by naval gunfire from Destroyer Dunlap (DD-384), which claims to have sunk a patrol vessel outside that morning. It is also possible the ship number was listed incorrectly. The Shonan Maru No. 5 was given the Japanese Naval Auxillary number "41" (*Christiansen, 1994:16*), and presumably had the same specifications as the Shonan Maru No. 6, which was apx. 135 feet long, and displaced 350 tons..

Vessel 5. Shonan Maru No. 6.

The vessel was given the Japanese Naval Auxillary number "42" (*Christiansen, 1994:16*). A photograph in *Miller, 1991, page 71*, shows the vessel aground on Gehh Island with the number 42 painted on the side of the wheelhouse. This identifies this vessel as the Shonan Maru No. 6. The Army initially listed the vessel as a tugboat, with a small barge nearby, after they had accidentally landed on the wrong island (*Crowl & Love, 1955:290-291*). There were more Japanese soldiers on the island than expected, and a firefight between the ships crew, island defenders, and US Army lasted 2 days, in which over 116 men were listed as killed (*Miller, 1991:70*). The importance of this battle and the vessels capture became apparent when the inspection of the vessel discovered the first navigational charts of Kwajalein and other parts of Micronesia, complete with mined locations. It is said this information aided future invasion operations.



Photo Appendix 2-1. Scanned photo of Shonan Maru No. 6 from (*Miller, 1991:71*).

Vessel 6. Higashi Nippon Maru, also known as Guard Ship 401.

The vessel was given the Japanese Naval Auxillary number 401 (*Christiansen, 1994:21*). The only information known about the vessel was that it was a converted fishing boat. It was used to transport a Korean laborer, Hasu Hwang, from Wotje to Kwajalein on January 15, 1944, arriving the next day, and presumably went back to Wotje (*JICPOA Preliminary Interrogation Report No. 27:2,8*). During his interrogation he estimated the vessel to be apx. 400 tons. It is also possible it stayed in Kwajalein and was lost there. It was not recovered after the war, and presumed most likely sunk in Wotje. It is possibly it was the demolished steel wreckage site MI-WT-LG-009 we located and surveyed in the Wotje anchorage but is without positive identification.

Vessel 7. Kompira Maru.

The vessel was given the Japanese Naval Auxillary number 402 (*Christiansen, 1994:21*). The only information known about the vessel was that it was a converted fishing boat. It was not recovered after the war, and presumed most likely sunk in Wotje, and possibly one of the 3 sunken vessel located in Wotje but are without identification.

Vessel 8. Nichiei Maru.

The vessel was given the Japanese Naval Auxillary number 405 (*Christiansen, 1994:21*). The only information known about the vessel was that it was a converted fishing boat. It was not recovered after the war, and presumed most likely sunk in Wotje, and possibly one of the 3 sunken vessel located in Wotje but are without identification.

Vessel 9. Sumiyoshi Maru No. 8.

The vessel was given the Japanese Naval Auxillary number 406 (*Christiansen, 1994:21*). The vessel was identified as sunk in Likiep Atoll by a reference to the number 406 painted in white on the bow of the hull of the vessel, and by local knowledge of the older Marshallese who remember the name of the vessel. The local Marshallese believe the Japanese sent the vessel to Likiep to kill the local population.

The vessel was spotted at anchor by Commander Norman Miller of VB-109 on January 16, 1944, who made bombing runs on the vessel with his PB4Y named "Thunder Mug", the Navy version of a B-24 Heavy Bomber. The vessel was described as single stack and had the numbers 406 painted in white on both sides of the bow (*Carey, 1999:29*). The vessels number 406 was listed in the Archeology of WW2 in the Marshall's by (*Christiansen, 1994:21,27*) as the identifying Japanese military number of the converted vessel Sumiyoshi Maru No. 8.

The vessel was reported by Commander Miller as armed with two 20mm machine guns, bow and stern, and camouflaged with palm leaves. His second attack scored a direct hit on the superstructure, the vessel blew up, leaving nothing more than a floating piece of the section of the bow. The vessel was listed as a 500 ton freighter by Miller (*Carey, 1999:165*), the tonnage indicating a 130 to 150 foot long vessel.

The vessels wreckage is currently located in the Likiep anchorage, commonly known to local residents . I dove on this spot, and found the wreckage of another smaller vessel. Two other smaller vessels are listed as sunk in the anchorage, but the bow section of the Sumiyoshi Maru, with 1 gun, reportedly floated to the western end of the island and lies on the reef..

Vessel 10 Eifuku Maru No. 2 GO.

The vessel was given the Japanese Naval Auxillary number 407 (*Christiansen, 1994: 21*). The only information known about the vessel was that it was a converted fishing boat. It was not recovered after the war, and presumed most likely sunk in Wotje, and possibly one of the 3 sunken vessel located in Wotje but are without identification.

Vessel 11. Kaza Maru.

The vessel was given the Japanese Naval Auxillary number 408 (*Christiansen, 1994: 21*). The only information known about the vessel was that it was a converted fishing boat. It was not recovered after the war, and presumed most likely sunk in Wotje, and possibly one of the 3 sunken vessel located in Wotje but are without identification.

Vessel 12. Kaza Maru No. 3.

The vessel was given the Japanese Naval Auxillary number 409 (*Christiansen, 1994: 21*). The only information known about the vessel was that it was a converted fishing boat. It was not recovered after the war, and presumed most likely sunk in Wotje, and possibly one of the 3 sunken vessel located in Wotje but are without identification.

Vessel 13. Kaza Maru No. 5.

The vessel was given the Japanese Naval Auxillary number 410 (*Christiansen, 1994: 21*). The only information known about the vessel was that it was a converted fishing boat. It was not recovered after the war, and presumed most likely sunk in Wotje, and possibly one of the 3 sunken vessel located in Wotje but are without identification.

Vessel 14. Borudou Maru.

This vessel was surveyed as Wotje Site MI-WT-LG-012, and details are found in that section.

Vessel 15. Toyotsu Maru.

This vessel was surveyed as Wotje Site MI-WT-LG-013, and details are found in that section.

APPENDIX 3

LIST OF AMERICAN AIRCRAFT KNOWN OR SUSPECTED TO BE LOST AT WOTJE ATOLL DURING WW2.

DATE OF LOSS, WITH ALL KNOWN DETAILS.

1.

February 13, 1944.

The US Navy in their early operations in the Marshall's area used land-based long-range PB4Y heavy bombers for reconnaissance and bombing missions. These were basically Navy versions of the Army B-24 bomber. On February 13, 1944, only a few days after the capture of Kwajalein, a photo mission was scheduled for Wotje Atoll. The plane and its crew departed and never returned. Searches were made for a few days afterwards, with no results.

The story would end, except, "Tokyo Rose", who harassed the US forces with derogatory radio messages, announced the loss of a bomber over Wotje on the day after their mission, and listed the names of 10 of their crew presumably lost in the raid. The paradox of the story, is that the crew announced was not on the aircraft, that in fact another crew captained by Captain Heron flew the photo mission in this borrowed plane. The names read by "Tokyo Rose" had been written on the inside of the aircraft by the regular crew, thus, the Japanese had to have seen the aircraft, and thus the aircraft must have crashed somewhere in Wotje.

A search for the aircraft during the survey, and the questioning of all local Marshallese at this time failed to locate the aircraft. This is an on-going mystery. The crews photo is below.



Photo Appendix 3-1. Scanned photo of PB4Y crew from Carey, 1999:

2.

June 15, 1944.

The Marine Corp lost a F4U-1 "Corsair" over Wotje due to anti-aircraft fire on June 15, 1944. The aircraft was based at Dyess Field, Roi, Kwajalein, with VMF-224, and given the task with 11 other Corsairs and a PV-1 to bomb and strafe medium Anti-Aircraft positions on the island. The aircraft was struck during a strafing run, flew west until the engine seized, and the pilot, Captain Tucker, landed the aircraft in the lagoon.

He safely abandoned the plane, and was picked up by a rescue PBY-5, and returned to his squadron. His aircraft was lost in a vast open area of the western lagoon, and no attempt was made to locate it during this survey. No local Marshallese witnessed the incident, nor have heard any stories about seeing a plane in the water in this area. A Marine Corp Mission Report, No. 63, is included in Appendix 1.

APPENDIX 4

LIST OF NIKONOS STILL PHOTOS OF WOTJE SITES

ROLL 1

ID Number 16376009

Site MI WT LG 012 , Borudou Maru

Starts with number 3.

3. Butterfly fish near bow.
4. Bow rail and vent in overhanging bow area
5. Winch or Capstan on bow.
6. Fitting on bow.
7. Coral growth under bow.
8. Porthole in bow section.
9. Starboard anchor on bow.
10. Whip coral under bow.
11. Fittings near number 1 hold.
12. Ladder with multicolored coral growth.
13. Deck fitting near hold winches.
14. Matt Holly in wheelhouse porthole.
15. Fittings on deck behind wheelhouse.
16. Mast extending out from main deck.
17. Open porthole behind wheelhouse.
18. Fire-hose reel with red coral growth.
19. Davits for lifeboat.
20. Coral growth on fitting.
21. Jacobs ladder mid-ship.
22. A passing school of jacks.
23. Stern railing.
24. Butterfly fish at stern.
25. More butterfly fish at stern.
26. Diver Aki Mike with dinner.

ROLL 2.

ID Number 16376013

Site MI WT LG 012, Borudou Maru, followed by Site MI WT LG 009, Steel vessel wreckage.

Roll starts with photo number 3.

3. Wotje anchorage at dusk.
4. Tying underwater marking buoy line.
5. Same.
6. Abyss of number one hold.
7. Silhouette of mast structure.

8. Inside wheelhouse.
9. Wheelhouse windows.
10. Ships davits.
11. Sleeping nurse shark on main deck.
12. Coral growth on mid-ship structure.
13. Ships davits near number 3 hold.
14. Winch structure near number 4 hold.
15. A school of jacks swim past.
16. Stern railing and coral growth.
17. Stern railing.
18. Matt Holly inspecting propeller.
19. Matt Holly on decompression stop.
20. Same.

Site MI WT LG 009, Steel vessel wreckage.

21. Bow wreckage with chain tube in foreground.
22. Main engine.
23. Generator flywheel.
24. Central keel section.
25. Steel bow mast post.
26. Main engine cylinders.

ROLL 3.

ID number 16376015

Site MI WT LG 011; Southern wreckage, Site MI WT LG 007; Central vessel wreckage, and Site MI WT LG 013; Toyotsu Maru wreckage.

Roll starts with number 2.

2. Diver Aki Mike.
3. 5 Inch US artillery round.
4. Bow spirit.
5. Bow section.
6. Fishing deck gear.
7. Boat Davits.
8. Generator flywheel.
9. Main engine.
10. Main engine and gearbox.
11. Emergency anchor.

Site MI WT LG 007, Central vessel wreckage.

12. Propeller from port side.
13. Propeller from starboard side.
14. Generator flywheel.
15. Niigata main engine.

16. Bow with cement repairs.

Site MI WT LG 013, Toyotsu Maru.

17. View up to main mast from inside hold.
18. Hole in number one hold, starboard side.
19. Collapsed debris in number one hold.
20. Jackknife fish near stern.
21. Matt Holly at propeller.
22. Close-up view of propeller, "Kobe Works June 1937".
23. Propeller with debris.
24. Debris at stern.
25. Inside number one hold.
26. Hole in number one hold at port side.

ROLL 4

ID Number 16376019

Site MI WT LG 005 Kawanishi H8K Flying Boat.

Roll starts from number 3.

3. Wing segment.
4. Wing Ailerons.
5. Fuselage fuel Tank.
6. Front section of Flying Boat.
7. Aircraft debris field.
8. Number 3 engine, front.
9. Number 3 engine, side view.
10. Wing with engine mount.
11. Top 20mm ball turret.
12. Mid-fuselage debris.
13. Aircraft structure.
14. Rear of aircraft engine.
15. Tail turret.
16. Tail turret area.
17. Rear fuselage.
18. Aircraft debris.
19. Probable oil tank.
20. Wing fuel tank.
21. Fuselage fuel tank.
22. Wing fuel tank near wing.
23. Inside wing structure.
24. Wing structure.
25. Wing and engine mount area.
26. Engine mounting area.

APPENDEX 5

UNDERWATER VIDEO RAW FOOTAGE OF ALL SITES WITH TITLES FOR IDENTIFICATION

Site Number	TIME	TOTAL
Site Number 1 American Aircraft Wreckage, Ormed.	24:39 Minutes 0:00 to 24:39	24:39
Site Number 2 Oceanside Wreckage Ormed	0 Minutes No Video Taken.	24:39
Site Number 3 Lagoonside Ormed Site.	0 Minutes No Video Taken.	24:39
Site Number 4 Japanese Seaplane Ramp.	17:32 Minutes 24:39 to	42:19
Site Number 5 Japanese Flying-Boat Debris.	33:35 Minutes 42:19 to	1:16:06
Site Number 6 Japanese Docks.	31:37 Minutes 1:06:06 to	1:47:50
Site Number 7 Central Vessel Wreckage.	16:23 Minutes 1:47:56 to	2:04:19
Site Number 8 Aircraft Dump.	23:32 Minutes 2:04:28 to	2:28:00
Site Number 9 Demolished Steel Vessel Debris.	24:24 Minutes 2:28:06 to	2:52:30
Site Number 10 Japanese Engine Parts.	7:57 Minutes 2:52:43 to	3:00:40
Site Number 11 Southern Vessel Wreckage.	21:22 Minutes 3:00:48 to	3:22:10
Site Number 12 Borudou Maru	54:17Minutes 3:22:16 to	4:16:23
Site Number 13 Toyotsu Maru	1:26:21 Minutes 4:16:29 to	5:42:50

Site Number 14.
Toton Island Wreckage.

No Video Taken.

Total Time:

5:42:50

APPENDIX 6

EQUIPMENT LIST

This is a list of personal equipment used to dive on, film, edit, and create this survey report for the RMI Historical Preservation Office.

SCUBA EQUIPMENT

Aluminum 80 and steel 95 SCUBA tanks, normal breathing air. Scubapro MK5/MK10 - G250 regulator with standard gauges, or a Oceanic Delta/Omega Piston regulator with Oceanic Prodigy computer with standard gauges, with additional oceanic compass and extra Scubapro LS1 hand-held compass. Seatec Manta Buoyancy Compensator with standard power inflator or Scubapro Air 2 system. Back-up Sherwood Pony bottle and regulator as needed. Scubapro web pocket weight belt, with Scubapro mask, snorkel, fins, boots.

BOATS AND EQUIPMENT

20 foot open fiberglass boat with 40HP motor, Raytheon Color Depth Finder, Scubapro hand held personal dive sonar. Japanese style plastic floats and miles of 6mm tarred dacron line. Rolls of PVC 100 yard colored disposable survey tape.

CAMERA AND VIDEO EQUIPMENT

Nikon VN760 Hi8 Video Camera in a Bentley Marine Housing with monitor, Underwater Kinetics 1200 Video lights, Underwater Kinetics R800 Flashlight, Oceanic 101 Flashlight, Toshiba 132 Flashlight. Nikonos 5 UW Camera with 28mm lens. HP Digital Camera.

Sony MaviCap Digital Still Image Capture system. JVC Character Generator. Vidicraft Video enhancer/editor. JVC Color Monitor and JVC SVHS video recorders. Panasonic S-VHS Video Cassette Recorder.

COMPUTER EQUIPMENT

Compaq Presario Pentium with 200mhz , 40MB Ram, 8MB Video Ram, 6.5 HD. HP CD Disc writer, Visioneer Paper Port Scanner, Umax Flat Scanner, Lexmark Z51 Printer. (Report printed B&W on HP Laser Printer) Microsoft Word, Picture It, Cakewalk Audio and OCR Software.