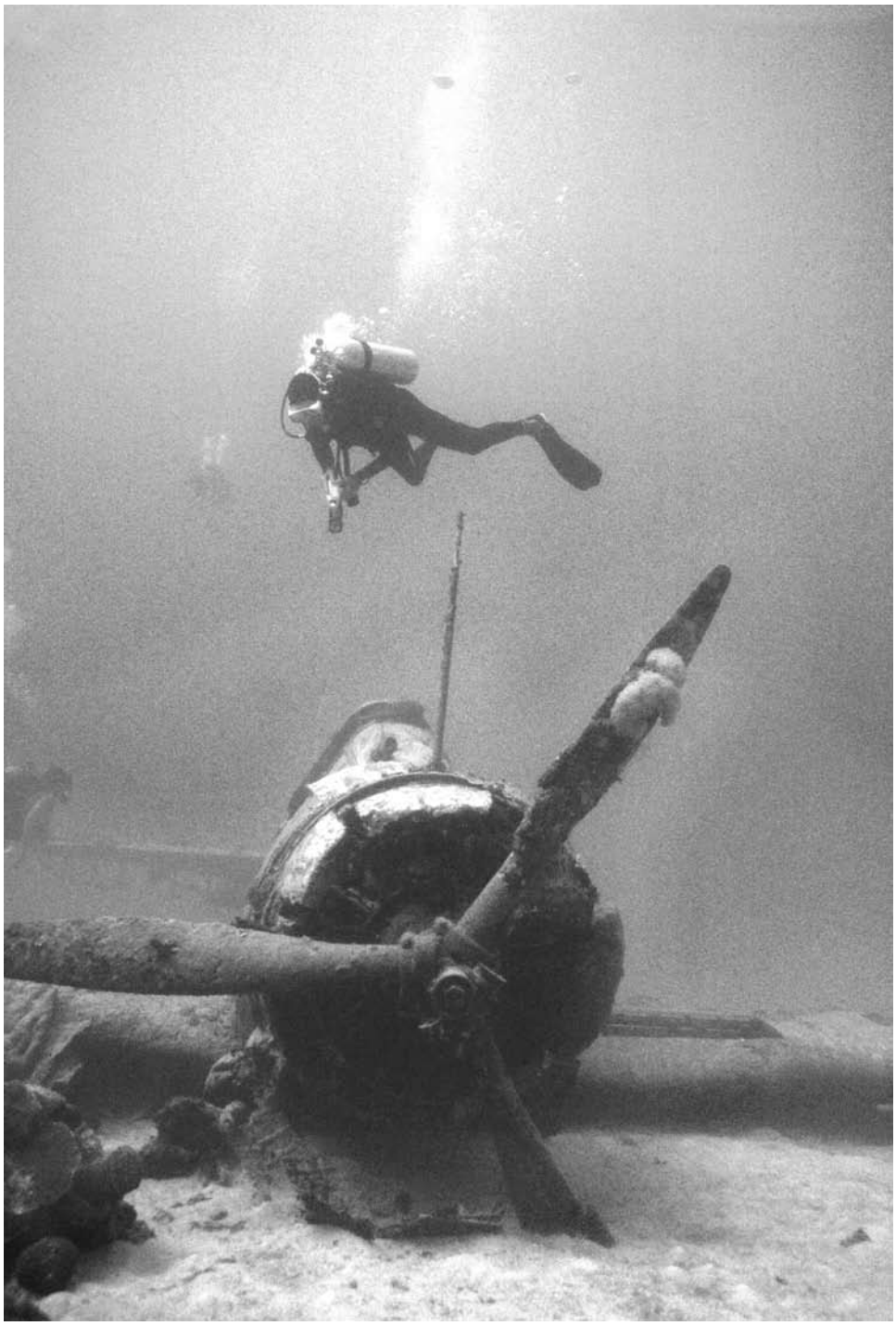
TIGHAR TRACKS

THE JOURNAL OF THE INTERNATIONAL GROUP FOR HISTORIC AIRCRAFT RECOVERY



2004

Volume 20

. . . that they might escape the teeth of time and the hands of mistaken zeal.

– John Aubrey
Stonehenge Manuscripts
1660

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About TIGHAR

TIGHAR (pronounced "tiger") is the acronym for The International Group for Historic Aircraft Recovery,a non-profit foundation dedicated to promoting responsible aviation archeology and historic preservation. TIGHAR's activities include:

- Compiling and verifying reports of rare and historic aircraft surviving in remote areas.
- Conducting investigations and recovery expeditions in co-operation with museums and collections worldwide.
- Serving as a voice for integrity, responsiblity, and professionalism in the field of aviation historic preservation.

TIGHAR maintains no collection of its own, nor does it engage in the restoration or buying and selling of artifacts.The foundation devotes its resources to the saving of endangered historic aircraft wherever they may be found,and to the education of the international public in the need to preserve the relics of the history of flight.

TIGHAR Tracks is the official publication of The International Group for Historic Aircraft Recovery. A subscription to *TIGHAR Tracks* is included as part of membership in the foundation (minimum donation $55.00 per year).The editors welcome contributions of written material and artwork. Materials should be addressed to: Editors, *TIGHAR Tracks*, 2812 Fawkes Drive, Wilmington, DE 19808 USA; telephone (302) 994-4410, fax (302) 994-7945; email tigharpat@mac.com. Photographs and artwork will be returned on request.

On the Cover

Asleep in the deep since 1942, an intact Douglas TBD-1 Devastator awaits recovery and preservation. Photo by J. Hoover.

On the Web

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TIGHAR Report: Jaluit Survey

This special issue of *TIGHAR Tracks* is the full report on our recent survey of historic aircraft wrecks in Jaluit lagoon as submitted to the Historic Preservation Office of Republic of the Marshall Islands. The report details the work performed and the data collected and also provides TIGHAR's recommendations for the management of the aircraft as cultural resources – including the recovery of the "deep TBD".

With principal funding generously provided by the Edward E. and Marie L. Matthews Foundation augmented by the all-important support of the TIGHAR membership, the Devastator Project has now moved into Phase Two with on-going research and continued discussions with the appropriate authorities in the Marshall Islands and in the United States toward the implementation of the recommendations described in the report.

Watch for updates on the Devastator Project and the latest Earhart Project news and research in the next issue of *TIGHAR Tracks.*

From May 8 to 11, 2004 TIGHAR conducted an archaeological survey of WWII aircraft wrecks in Jaluit lagoon in accordance with the purpose, scope and limitations set out in our proposal dated February 26, 2004 and with the contract awarded to Principal Investigator Dr. Thomas F. King by the Historic Preservation Office dated May 4, 2004. A $150 Access To Submerged Resources fee and a $1,000 refundable security deposit were paid. The HPO Assistant Archæologist Josepha Maddison-Hill accompanied the TIGHAR survey to Jaluit at TIGHAR's expense.

TIGHAR TBD Survey Team, l. to r.: Richard Gillespie, Russell Matthews, Rob Barrel, Mark Smith, Van Hunn, Brian Kirk, Dr. Tommy Love. TIGHAR photo.

The survey team was made up of:

Richard Gillespie – executive director of TIGHAR and expedition leader

Van Hunn – project coordinator and senior diver

Dr. Tommy Love – physician and diver

Russell Matthews – documentary field producer and diver

Rob Barrel – underwater cameraman

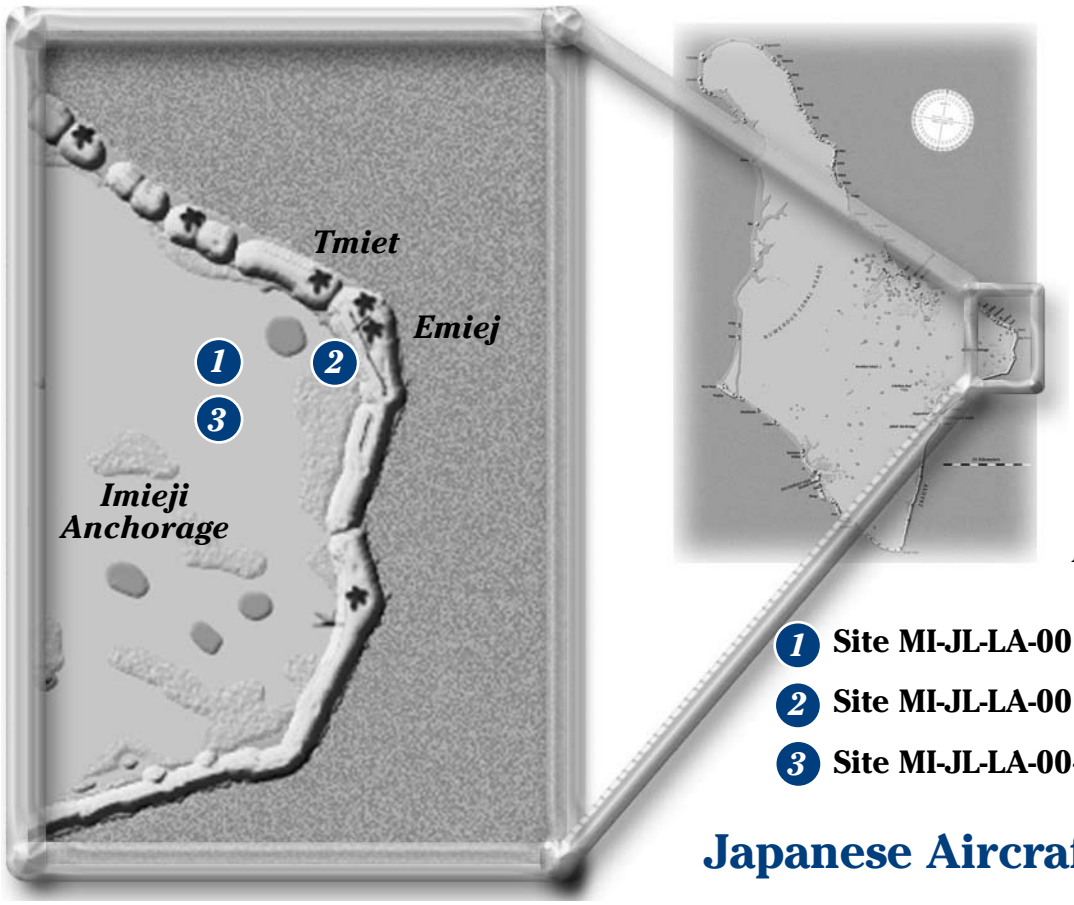
Mark Smith – topside cameraman

Dr. King was available for consultation via satellite telephone throughout the survey.

Dive support and guide services were provided by Brian Kirk of Consolidated Concrete Construction, Majuro. Specialized safety equipment and dive gear was provided by Bako Divers, Majuro. Security services were provided by Jaluit Police Chief Lee Jabuwe.

The TIGHAR survey examined and filmed each of the five underwater sites specified in the original proposal. No significant difficulties were encountered, there were no injuries, and all of the survey's objectives were accomplished. Numerous onshore sites were also filmed and several Jaluit residents and former residents were interviewed on camera about their wartime experiences. In addition, TIGHAR delivered a shipment of medical supplies to Jaluit Medical Officer Ken Jetton in Jabor and over a ton of educational supplies, courtesy of TIGHAR, arrived in Majuro, was apportioned for distribution to the atoll's various schools by the Ministry of Education, and was shipped to Jaluit on May 21, 2004.

Overview of Specific Sites Examined



Map 1.

1 **Site MI-JL-LA-001**

2 **Site MI-JL-LA-001a**

3 **Site MI-JL-LA-004**

Japanese Aircraft

Site MI-JL-LA-001

- Scattered wreckage of Kawanishi H8K in shallow water off Emiej (lagoon).
- GPS coordinates 06° 00.794´ North; 169° 43.005´ East
- The coordinates given in the 1997 NPS Survey are 06° 00.766´ North; 169° 43.020´ East.
- The slight discrepancy is probably due to the scattered nature of the wreckage.

This site was inspected and filmed on the afternoon of May 8, 2004 and was found to be generally as described in the 1997 survey. There does, however, appear to be evidence of attempted salvage. The wing has been flipped over and the engine nacelles now face aft of the cockpit area although the propellers remain on the lagoon bottom close to their original orientation (see Fig. 1, below). A heavy modern-type wire cable remains attached to one of the propellers and does not appear to be associated with a mooring.

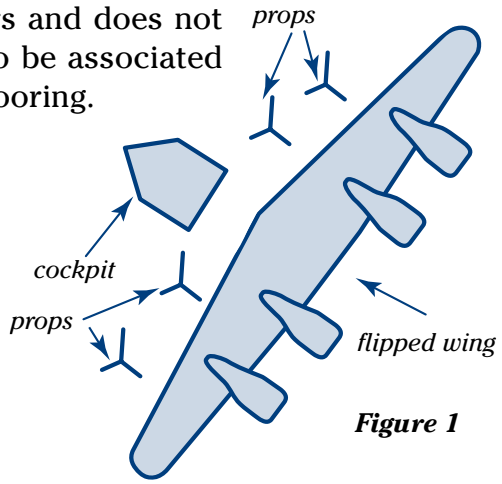


Figure 1

The Kawanishi H8K, Allied codename "Emily," was the most advanced flying boat design of the Second World War. From its introduction in 1941 the type served the Imperial Japanese Navy as an outstanding long-range patrol bomber and transport. Three H8Ks were based at Jaluit.

Specs:

Description:	4-engined long-range reconnaissance flying boat
Crew:	9
Power plant:	4 Mitsubishi MK4A Kasei 12 14-cylinder air-cooled radials, 1,530 hp at takeoff, driving 4-bladed propellers
Wingspan:	124´8˝
Length:	92´3˝
Height:	30´0˝
Cruise spd:	184mph at 13,145´
Range:	3,888nm

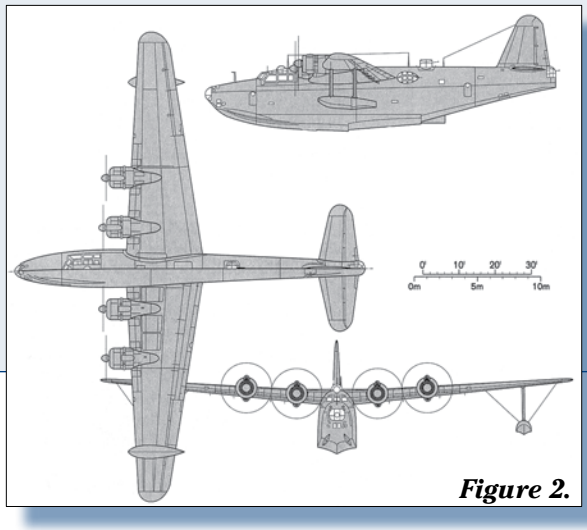


Figure 2.

Site MI-JL-LA-001a

Another potential site was identified on the lagoon shore at Emiej where one wingtip float of a Nakajima A6M2-N type 2 seaplane fighter (Allied code name "Rufe") projects vertically from the sand (see photo below). A portion of the wing to which it is attached was reportedly uncovered in 2002. It is unknown how much more of the aircraft may be present under the sand.

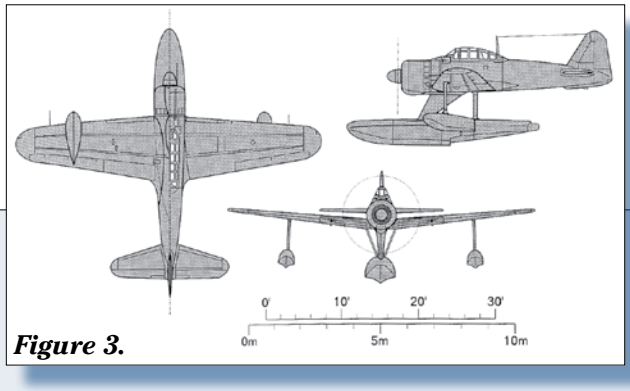


Figure 3.

TIGHAR photo by R. Gillespie.

The Nakajima A6M2-N Type 2 , Allied codename "Rufe," was the float seaplane variant of the Mitsubishi A6M2 "Zero" fighter. It was designed to provide fighter capability for island installations where the construction of an airfield was not practical.

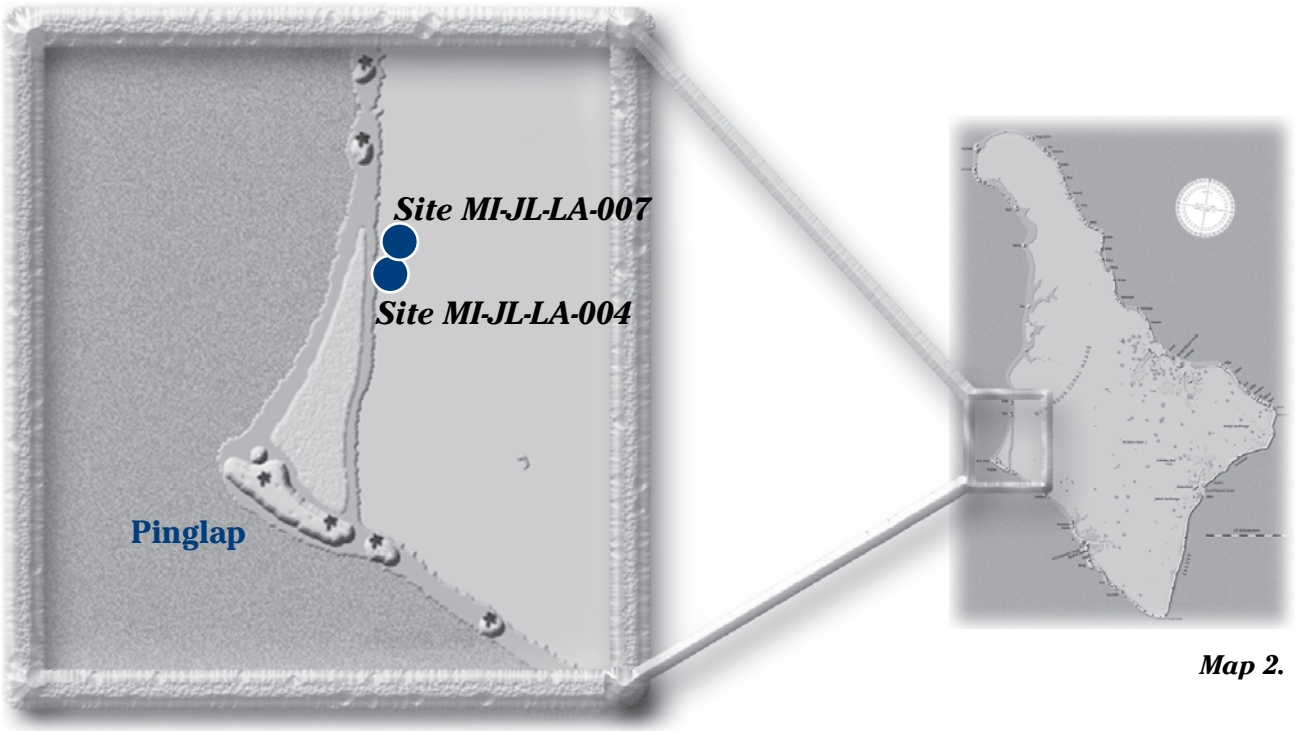
Description:	Single-engined single-seat float seaplane fighter.
Crew:	1
Power plant:	1 Nakajima NK1C Sakae 12 14-clyinder air-cooled radial, 940hp at takeoff, ddriving a 3-bladed propeller
Wingspan:	39´4˝
Length:	33´1˝
Height:	14´1˝
Cruise spd:	184mph at 16,405´
Range:	620nm

Site MI-JL-LA-002

- Intact wreckage of Kawanishi H8K in deep water
- GPS coordinates 06° 00.677´ North; 169° 42.982´ East
- The coordinates given in the 1997 NPS Survey – 06° 00.766´ North; 169° 43.020´ East– are the same coordinates given for the other Kawanishi H8K (Site MI-JL-LA-001) and are not correct for this site.

This site was inspected and filmed on the morning of May 8, 2004 and was found to be generally as described in the 1997 survey. The aircraft is largely intact although inverted and with the tail section detached. The immense size of the flying boat makes for an impressive wreck and the severed rear fuselage provides relatively safe access to the aircraft's cavernous interior.

American Aircraft



Map 2.

Site MI-JL-LA-004

- Intact wreckage of US Navy Douglas TBD-1 Devastator, aka "the shallow airplane", presumed to be U.S. Navy Bureau Number 0298.
- GPS coordinates 05° 58.657´ North; 169° 27.101´ East
- The coordinates given in the 1997 NPS Survey are 05° 58.651´ North; 169° 27.088´ East
- The slight discrepancy is probably due to GPS signal variation.

The Douglas TBD-1 "Devastator" was the U.S. Navy's first all-metal monoplane shipboard aircraft. Entering service in 1937, the three-man torpedo bomber was also the first to have main landing gear wheel brakes and power-operated folding wings. Although obsolete by the outbreak of the Pacific War, the type played pivotal roles in the Battle of the Coral Sea (May 1942) and the Battle of Midway (June 1942) despite horrific losses.

Description:	Single-engined three-seat torpedo bomber.
Crew:	3
Power plant:	One 900 hp Pratt & whitney R-1830-64 radial engine.
Wingspan:	50´
Length:	35´
Height:	15´1˝
Max. spd:	2006 mph
Range:	700nm

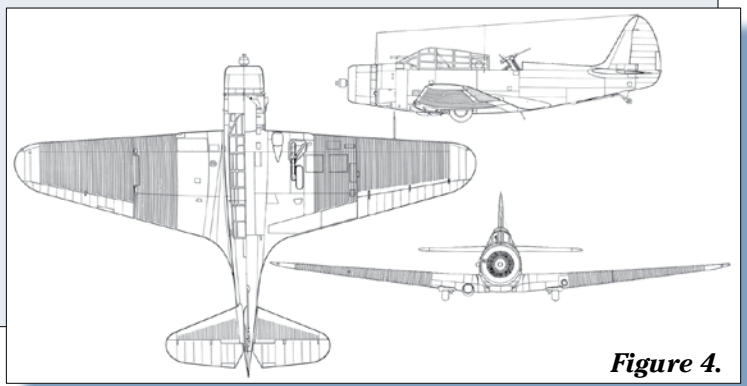


Figure 4.

This site was inspected and filmed during two dives on the morning and afternoon of May 9, 2004. With the port wingtip a mere 40 feet below the surface, the wreck can be seen from a boat on a calm day and viewed easily by anyone snorkeling on the surface. The aircraft is one of two Devastators resting in Jaluit lagoon about a mile and a half northeast of Pinglap Island. The other TBD is nearby but at a considerably greater depth so, as a matter of convention, we refer to the wrecks as the "shallow" airplane and the "deep" airplane.

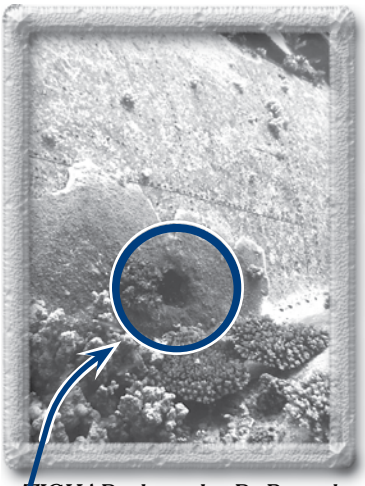
TIGHAR was able to determine the probable identity of the shallow aircraft as U.S. Navy TBD-1 Bureau Number 0298, assigned to Torpedo Squadron 5 aboard the aircraft carrier USS *Yorktown* (CV-5), and crewed on the morning of February 1, 1942 by pilot Lt. Harlan T. Johnson, bombardier ACMM Charles E. Fosha, and radioman/rear gunner RM1c James W. Dalzell. Fosha and Dalzell are still alive and have been interviewed by TIGHAR.

Photo by J. Hoover. Used by permission. All rights reserved.

Left to right: Pilot Lt. Harlan T. Johnson, bombardier ACMM Charles E. Fosha, and radioman/rear gunner RM1c James W. Dalzell. from "That Gallant Ship – USS Yorktown *(CV-5)" by Robert Cressman, Pictorial Histories Publishing Company, Missoula, MT. 1985. Used by permission. All rights reserved.*

The identification of the aircraft was accomplished without disturbing the site. U.S. Navy records show that the two TBDs that landed in Jaluit lagoon were Bureau Number 0298 (*Yorktown's* aircraft 5-T-7, radio call 77V44) and Bureau Number 1515 (*Yorktown's* aircraft 5-T-6, radio call 76V44).[1] By fortunate coincidence, Bu. No. 1515 was part of a late production batch of 15 airplanes (Bu. Nos. 1505 through 1519) ordered in August 1938 which differed from earlier TBDs in a few minor details.[2] Most notably, a small "bomber's compartment window" on each side of the fuselage just above the leading edge of the wing root was omitted in the later aircraft.

The windows are present on the shallow TBD (above right) and absent on the deep TBD (below, right) thus suggesting that the shallow airplane is Bu. No. 0298 and the deep airplane is Bu. No. 1515. As described below, further corroboration is provided by the absence of a rear machine gun on the shallow TBD.



TIGHAR photo by R. Barrel.

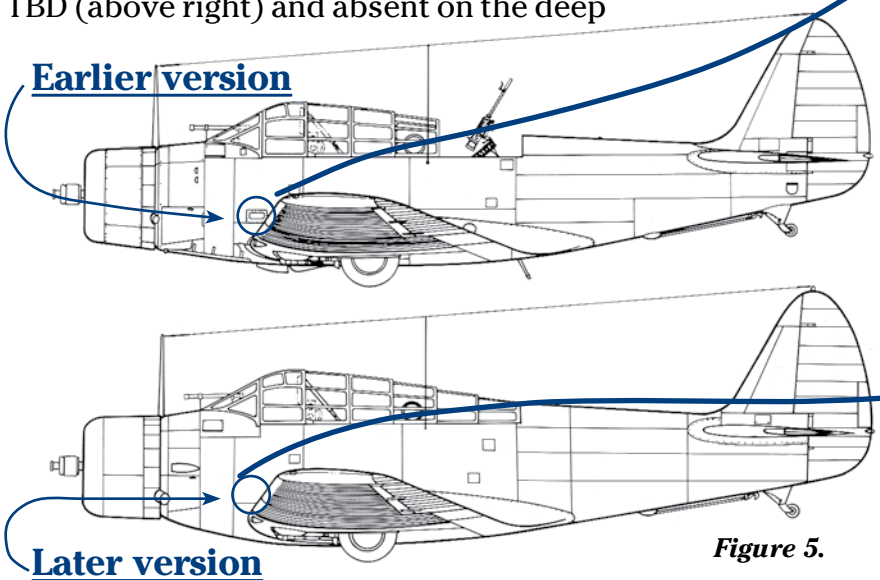


Figure 5.

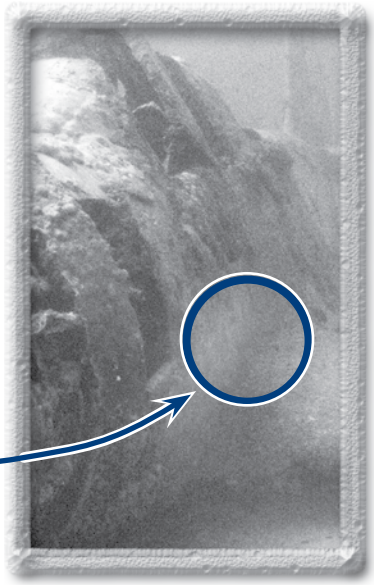


Photo by J. Hoover. Used by permission. All rights reserved.

Positive identification from serial numbers on data plates would require significant invasive action that was beyond the scope of this survey.

According to the 1997 report:

> The aircraft is intact other than the propeller and engine cowling that is *[sic]* separated and lying approximately 15 feet from the main body of the aircraft. The glass canopy is still intact however the forward pilot's window is broken.

TIGHAR found that the aircraft is intact in that no major structural components are missing. The doped cotton covering of the control surfaces is gone, as are all traces of paint or markings on the aircraft (below).

TIGHAR photo by R. Barrel.

There is a large growth of *Pocillopora Sp.* coral on top of the fuselage in front of the pilot's cockpit, and smaller coral lumps and sheets elsewhere, but the condition of the aircraft's aluminum skin appears to be remarkably free of corrosion. Rivet heads look tight and sound. The bare metal corrugated aluminum surface of the wings is shiny. As noted, the engine is separated from the airframe and lies just forward of the port wing. The propeller hub is 13. 5 feet from the center of the fuselage nose section (top right).

The engine appears to have been knocked off when the nose struck a coral ledge just before the airplane came to rest. As the fuselage settled onto an underwater hillside it slid backward a short distance until the port wing wedged against and somewhat under a large coral outcropping and the starboard wingtip jammed against a smaller coral boulder. The aircraft now lies in roughly a 30° bank, starboard wing low and nose high, on the reef slope (Figure 6).

Photo courtesy T. Praster.

Engine detail. Photo courtesy T. Praster.

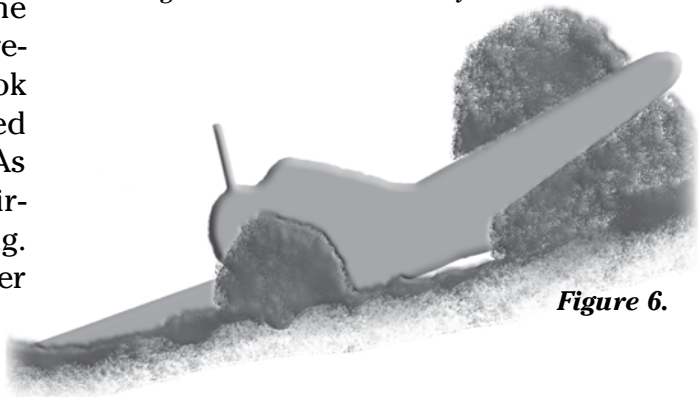
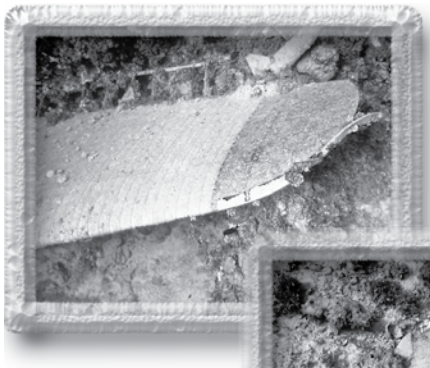


Figure 6.

There is minor structural damage to the wingtips and underside of the fuselage caused by the short rearward slide (below). Nothing in the suggested scenario explains the broken windshield.



Left wingtip. Photo courtesy T. Praster.

Right wingtip. Photo courtesy T. Praster.

It appears that the pilot's Mark III Model 2 telescopic gun sight and Mark XXIV, Model 3 torpedo director have been removed (see below). Photographs taken during the 1997 survey reveal that these items were missing at that time.

Above, broken windshield and missing gunsight. Photo courtesy T. Praster.

Installed gunsight. U.S. Navy photo.

The gun sight and torpedo director were incorporated in a single unit – a tube roughly 2.5 feet long and 3 inches in diameter – that was mounted on the centerline of the aircraft on top of the instrument panel in front of the pilot and projecting out through the windshield. The loss of these items is almost certainly associated with the broken windshield.

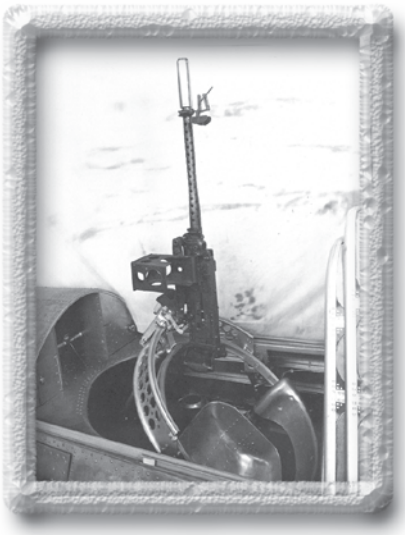
According to the 1997 report:

> There was no sign of any weapons – these may already have been removed. The plane was in such a position that it was impossible to see if a torpedo was still present. …

Standard armament for the Douglas torpedo bomber was a fixed, forward-firing Browning M2 .30 caliber (in some cases .50 caliber) machine gun mounted in the starboard side of the forward fuselage and firing through the propeller arc; and for rear defense, another M2 .30 caliber machine gun on a flexible mount aft of the radioman/gunner's position.

Nose gun installation. U.S. Navy photo.

Rear gun installation. U.S. Navy photo.



Contrary to the 1997 report, the forward-firing .30 caliber machine gun on this aircraft is, in fact, present (see below). Several panels on the starboard side of the nose are missing, possibly blown off by water pressure during the ditching.

Nose gun on shallow airplane. Photo courtesy T. Praster.

The rear gunner's weapon is missing (below) but Mr. James Dalzell, who was the radioman and rear gunner on Bu. No. 0298, has told us that after the aircraft landed in the lagoon he dismounted the machine gun thinking to take it ashore for defense against the Japanese but, upon realizing that the crew of the other TBD had accidentally punctured their inflatable rubber boat and that his plane's boat would have to accommodate the crews of both aircraft, he dropped the gun over the side. If his recollections are accurate, the gun should be on the lagoon bottom somewhere between the two aircraft.

Missing rear gun. Photo courtesy T. Praster.

U.S. Navy records indicate that for the February 1, 1942 raid all of USS *Yorktown's* TBDs were armed with 500 pound bombs, not torpedos. In the case of Bu. Nos. 0298 and 1515, due to low cloud and poor visibility the target was never located and the bombs were reportedly (and sensibly) jettisoned prior to ditching in the lagoon.[3] A limited visual inspection of the underside of the aircraft revealed no sign of ordnance.

The tail wheel is missing but this is believed to be damage that occurred during the ditching rather than due to theft. The deep airplane, which exhibits no sign of looting, is also missing its tail wheel.

This TBD, Bu.No. 0358, was ditched in Pensacola Bay, Florida on August 15, 1938. Note the nose-high attitude and extended flaps. U.S. Navy photo.

In accordance with recommended procedure, both aircraft apparently touched down nose high with wing flaps extended (observable on both wrecks) and carrying little or no power, as evidenced by a lack of any bending of the propeller blades on either aircraft (see photo below).

Photo courtesy T. Praster.

In such a landing the tail wheel is the first component of the aircraft to make contact with the water and, naturally, does so at a higher speed than any other surface. Because the structure was

designed to absorb compression rather than tension, separation of the wheel assembly from the spindle due to failure of the attaching pin (Douglas Part No. AC386-4-21) seems probable (see Fig. 7). This hypothesis is supported by the appearance of the remaining portion of the strut (see photo below) but confirmation would involve removal of the coral that presently covers the spindle.

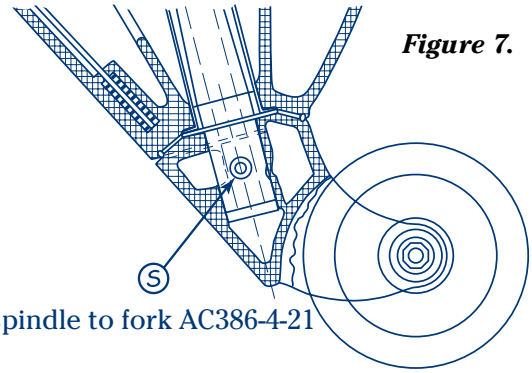
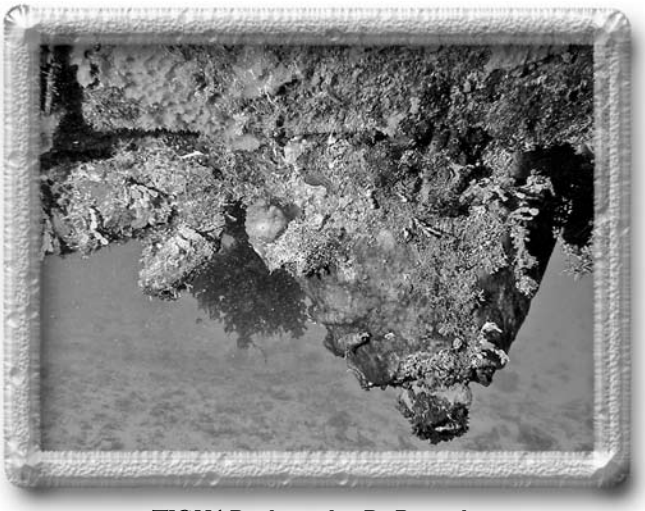


Figure 7.

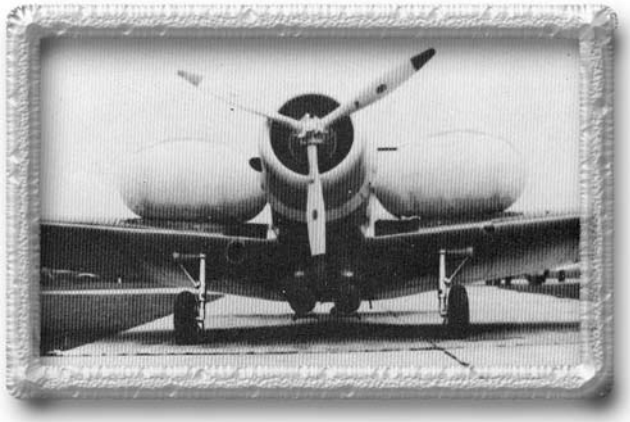
Pin – spindle to fork AC386-4-21



TIGHAR photo by R. Barrel.

On both TBDs, the panels that covered the wing bays in which the flotation airbags were housed are missing. This is consistent with the bags having been inflated after the ditching to keep the aircraft afloat while the crews deployed their rubber boats. According to Mr. Dalzell the bags were then shot with sidearms and slashed with a knife blade to prevent the aircraft being retrieved by the Japanese.

The 1997 survey reported that "coral-encrusted dials," the pilot's "joystick" [sic], and "foot peddles" [sic] were still in place. Given



Flotation bags inflated on TBD. U.S. Navy photo.

The empty bays where the flotation bags were housed on #0298. TIGHAR photo by R. Barrel.

our commitment not to disturb the wreck, subsequent increased coral growth made it impossible for us to confirm whether instruments, control stick or rudder pedals are still present. We were similarly unable to ascertain whether or not the Norden bombsight is still mounted in the belly compartment, but it would be surprising if the device is in the aircraft.

Mr. Charles Fosha, the bombardier on Bu. No. 0298, has said that the then-Top Secret bombsight was thrown over the side while the aircraft was still in flight. Mr. Dalzell, who was sitting behind Fosha, independently corroborates that recollection and adds that the bombsight was actually passed aft to him so that he could throw it clear of the wing.

Another item of equipment that remains in question is the direction-finding loop an-

tenna for the Bendix RDF-1 radio receiver that was normally mounted inside the canopy between the center and rear cockpits (see Fig. 8).

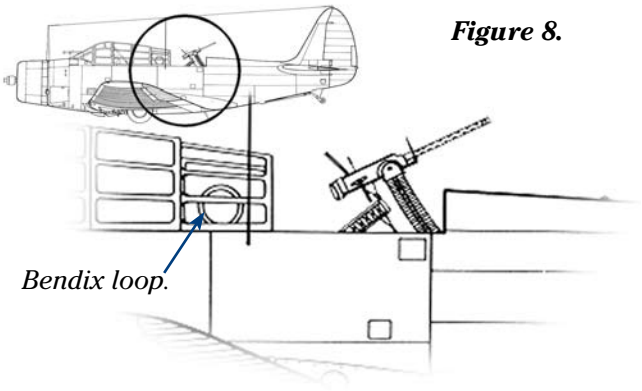


Figure 8.

No loop antenna is present on the aircraft now and photos taken in 1997 indicate that no antenna was present at that time either. However, historical photos suggest that not all TBDs carried this equipment and, according to Radioman Dalzell, by 1942 new technology had made the RDF obsolete. It is possible that the aircraft never had a loop antenna but there is an object laying in the pan of the rear gunner's seat which looks very much like a broken radio (below). If so, it could be debris left behind when someone forcibly removed the loop antenna.

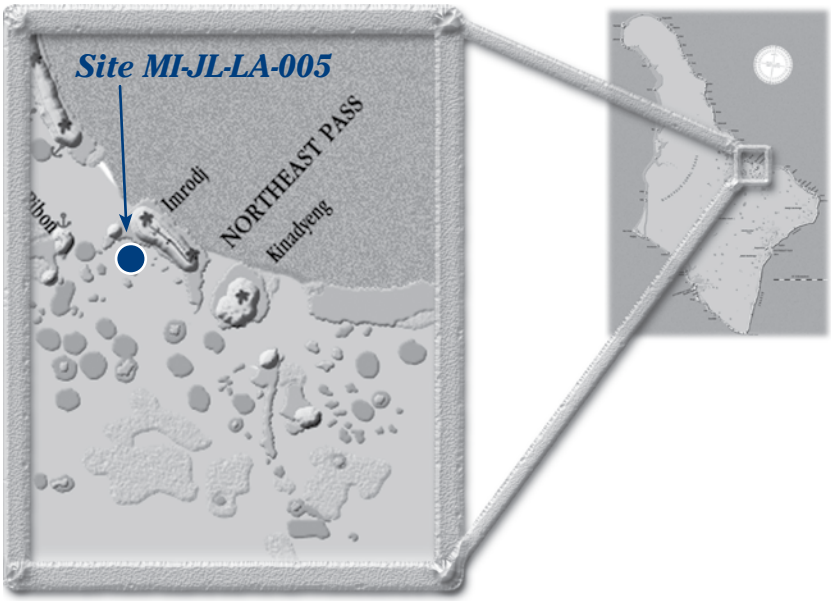
Photo courtesy T. Praster.

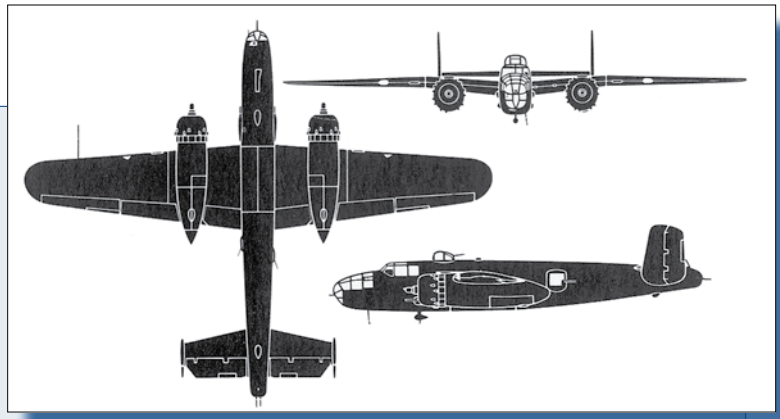
In summary, the aircraft has not been looted to the degree initially believed but it appears that at least one and perhaps two components were removed at some time prior to the 1997 survey. No further damage since then is apparent. Although the aircraft rests in relatively shallow water, its position – securely wedged into the eastern face of a reef on the western side of the atoll – has served well to protect it from storms but would also make any attempt to raise the aircraft extremely problematical.

Site MI-JL-LA-005

- Scattered wreckage of B-25 bomber.
- GPS coordinates 06° 04.108´ North; 169° 36.471 East
- The coordinates given in the 1997 NPS Survey are 06° 04.255´ North; 169° 36.471 East
- The north/south discrepancy is undoubtedly due to the readings being taken at opposite ends of the long debris field.

This site was inspected and filmed in the afternoon of May 11, 2004 and was found to be generally as described in the 1997 survey. TIGHAR does, however, take issue with that report's observation that "As the site is in such (poor) condition there is little interest to divers other than possible further investigation of the area with metal detectors for artifacts, etc." Aside from the lamentable encouragement of souvenir hunting, the comment fails to acknowledge that the scattered B-25 wreckage lies at the base of a truly spectacular reef whose profusion of *Porites sp.* corals make it a potentially popular sport diving destination in its own right.





The North American B-25 Mitchell was the most numerous Allied medium bomber of World War II. According to research done by Majuro-based amateur historian Matt Holly, the wreckage at Jaluit is the remains of B-25G USAAF serial number 42-54893 assigned to the 41st Bomb Group, 820th Squadron, 7th Air Force and crewed by:

1st Lt. Gerald J. Gavin – pilot
1st Lt. Charles F. Jennings – navigator
2nd Lt. John T. Moyer – copilot
Technical Sgt. Steven J. Miko – radioman/gunner
Staff Sgt. John W. Major – gunner
Corporal Samuel A. Bush – gunner

According to Mr. Holly's research, the aircraft was one of nine B-25s that made a low level attack on Japanese installations at Imrodj on January 2, 1944. The aircraft's right wing was reportedly shot off by anti-aircraft fire causing the Mitchell to crashed into the lagoon at high speed, disintegrating on impact. According to local witness Mr. Total Jimna, the bodies of the crew were recovered, stripped of papers and valuables, and sunk in the lagoon.

New Site MI-JL-LA-007

Photo by J. Hoover.

- Intact wreckage of US Navy Douglas TBD-1 Devastator, aka "the deep airplane," presumed to be U.S. Navy Bureau Number 1515 assigned to Torpedo Squadron 5 aboard the aircraft carrier USS *Yorktown* (CV-5), and crewed on the morning of February 1, 1942 by pilot Ensign Herbert R. Hein, Jr., bombardier AOM3c J. D. Strahl, and radioman/rear gunner SEA1c Marshall E. Windham. All members of this crew are now deceased.
- GPS coordinates [redacted]. *(Coordinates withheld to preserve security of site.)*

This aircraft's presence had been postulated since at least 1997 but it was not until June 6, 2002 that Majuro-based divers Brian Kirk and Matt Holly located the wreck in 125 feet of water roughly 100 yards from the shallow TBD. Since then a very limited number of people have visited the wreck.

This site was the subject of three dives, two on the afternoon of May 10 and one on the morning of May 11. The first dive illustrated how difficult the aircraft is to find, even with the help of a guide, and the complexities of working at greater depths. The boat was brought to the area over the site using GPS and sonar. The guide then dove down to anchor a marker float near the aircraft. The four-man survey/photography team entered the water shortly afterward and attempted to follow the guide's bubbles to the aircraft but, because the bubbles had drifted somewhat with the current, were unable to locate either the guide or the aircraft. After a suitable recovery period, a second dive followed the marker line and found the aircraft without difficulty. The buoy was left in place and, on the morning of May 11, the team once again followed the line to the aircraft and completed the survey and filming. The buoy and line were then retrieved.

The deep TBD rests level on the sandy bottom with the starboard wing and a portion of the fuselage supported by some flat coral growth. Aside from the flotation bag covers, fabric control surfaces, tailwheel and a few skin panels from the starboard side of the nose (some of which appear to be

L. to R.: Ensign Herbert R. Hein, Jr.; AOM3c J.D. Strahl, SEA1C Marshall E. Windham. From That Gallant Ship – USS *Yorktown* (CV-5). *Used by permission. All rights reserved.*

nearby and partially covered with sand) the aircraft is entirely intact. The lower engine mounts appear to be broken, probably from the aircraft settling to the bottom in a nose-down attitude resulting in the engine from the mounts forward being tilted 9° downward and 20° to starboard (below). The outer 2.5 feet of one propeller blade is buried in the sand. No excavation was attempted but the exposed remainder and the entire length of the other blades show no indication of damage (right).

Due to the much greater depth, coral growth on this aircraft is markedly different from that seen on the shallow TBD. Coral which in shallow water grows tall tends, at depth, to hug the bottom to maximize the area exposed to light so that its zooxanthellae can photosynthesize. This stunting effect reduces the visible distinctions among various types and makes the identification of deep corals difficult without collecting

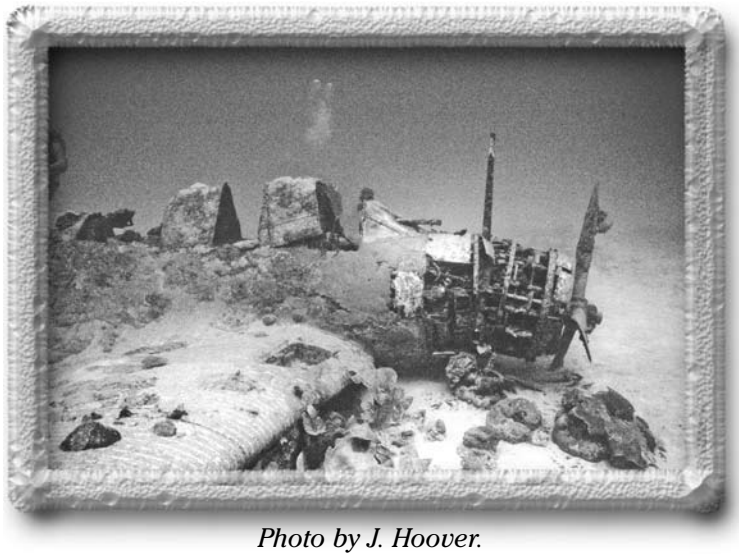


Photo by J. Hoover.

Photo by J. Hoover.

samples, which was not an option in this case. Rather than large but isolated clumps and sheets, the coral on the deep TBD forms a thinner but more uniform coating over much of the airframe (below).

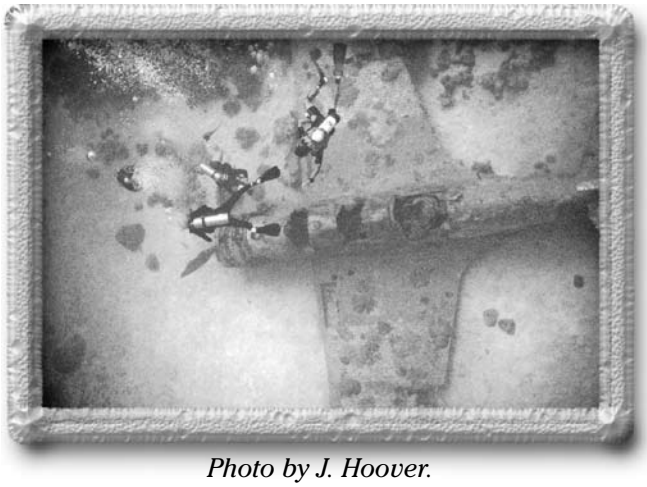


Photo by J. Hoover.

As a consequence, it is not apparent whether any paint survives under the coral but it was possible for the survey team to observe more interior detail, especially in the cockpit area, without disturbing the wreck and confirm that the aircraft exhibits no evidence of damage or pilferage since its arrival on the bottom 62 years ago. Both machine guns, the loop antenna, the cockpit controls and instruments, and all of the canopy elements are present and undamaged to the extent that can be determined without disturbing the site (below).

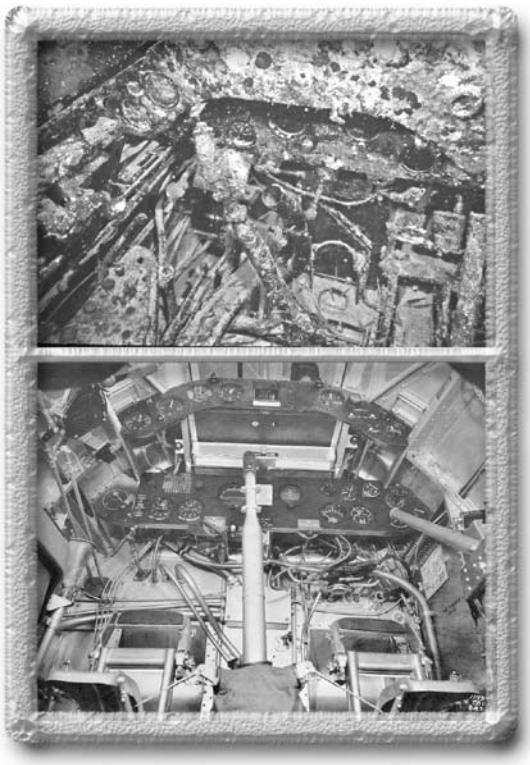


Photo by J. Hoover.

U.S. Navy photo.

Rear machine gun. Photo by J. Hoover.

Front machine gun and sight. Photo by J. Hoover.

Loop antenna. TIGHAR photo by T. Love.

The deep TBD in Jaluit lagoon represents that rarest of archaeological opportunities: a complete, virtually undamaged, remarkably well-preserved, undisturbed artifact that has both general and individual historical significance. Not only is it an intact example of an important aircraft type that survives in no museum or collection, but, as a casualty of the February 1, 1942 Marshall Islands raids, the individual aircraft is one of the very first American offensive combat losses of the Pacific war. The aircraft is most certainly eligible for inclusion on the U.S. National Register of Historic Places and any undertaking involving the site by any agency of the United States government would be subject to the Historic Preservation Act of 1966 and require a Section 106 review.

To date, the aircraft has been protected by two factors:

- Its very existence was only theoretical until recently. Only a handful of people today know its location.
- Although resources on Jaluit are capable of supporting sport diving to moderate depths, any significant bottom-time at the deep TBD requires technical support that must be brought in at considerable expense. TIGHAR's survey was accomplished with a boat, equipment, compressor, and specialized safety equipment ferried from Majuro 125 miles away. Our team included a physician whose specialty is dive medicine.

However, it would be foolish to suppose that the aircraft will remain in such pristine condition for long. It is accessible to sport divers who are willing to "bounce" dive for a brief stay at the greater depth and potential souvenirs like the gun sight, the control stick, the instruments, and even the rear gun are vulnerable to smash-and-grab tactics.

In TIGHAR's opinion, the only viable management option for this irreplaceable cultural resource is recovery under rigorous archaeological supervision followed by the application of expedient conservation measures and immediate transportation to a museum conservation facility for stabilization, restoration, and ultimately, exhibition. In TIGHAR's view, the most appropriate and only practical repository for the aircraft is the National Museum of Naval Aviation in Pensacola, Florida.

Our recommendation is based upon three observations:

- The NMNA has demonstrated high standards of expertise and ethics in the conservation, restoration and exhibition of historic aircraft recovered from underwater environments.
- The TBD will best serve the interests of historic preservation and education if presented in context as part of the NMNA's collection documenting the evolution of naval aviation.
- The U.S. Navy has adopted and aggressively defends the position that it still owns all the ships and aircraft it ever owned, regardless of age, condition or location, unless specifically conveyed to another owner. Regardless of the defensibility of the Navy's assertion in this case, from a purely practical standpoint, any attempt to direct the aircraft elsewhere would quickly become mired in litigation.

Legal concerns, practical considerations and ethics also dictate that any recovery of the TBD have the approval and full cooperation of the Historic Preservation Office of the Republic of the Marshall Islands, the owners of that part of the lagoon in which the airplane rests, and the four iroij of Jaluit atoll. This is an aspect of historic aircraft recovery that has, in the past, been too often neglected. Bribery, intimidation and outright theft of aircraft and artifacts by salvagers have left a sad legacy of distrust throughout the Pacific region that can present a formidable obstacle to legitimate preservation efforts. There is, in fact, a widely held belief among the residents of Jaluit that at some time in recent years an aircraft was stolen from the lagoon and taken

to Saipan. Whether true or not, the story fits the image of piracy that typifies, and is even embraced by, some aircraft salvagers.

TIGHAR is committed to the idea that an archæologically and ethically sound recovery of a TBD from Jaluit lagoon can benefit both the interests of historic preservation and the local community and set an example for future cooperative efforts worldwide. The happy coincidence of two TBDs in the lagoon means that the intact and complete deep airplane could be recovered and preserved while the more safely accessible shallow Devastator remains in situ to compliment the other historic ship and aircraft wrecks in the lagoon as tourist diving attractions. Of course, increased promotion of Jaluit as a WWII wreck-diving destination will require increased vigilance to prevent souvenir hunting but, in our experience, the worst looting occurs when a site is known to only a few enthusiasts who see it as a private treasure-trove. Daylight, in such cases, is the best disinfectant and it is our hope that the documentary film we're making about the aircraft at Jaluit will both promote increased tourism and help protect the wrecks as cultural resources.

NOTES

[1] Robert Cressman, *That Gallant Ship – USS* Yorktown *(CV-5)*. Pictorial Histories Publishing Company, Missoula, Montana, 1985.

[2] Al Adcock, *TBD Devastator In Action*. Squadron/Signal Publications, Carrollton, Texas, 1989.

[3] TIGHAR interview with James Dalzell, June 10, 2004.

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