United Nations Educational, Scientific and Cultural Organization

The Protection of the Underwater Cultural Heritage

Sustainable Development Goals

SAFEGUARDING UNDERWATER CULTURAL HERITAGE IN THE PACIFIC

REPORT ON GOOD PRACTICE IN THE **PROTECTION** AND **MANAGEMENT** OF WORLD WAR II-RELATED **UNDERWATER CULTURAL HERITAGE**

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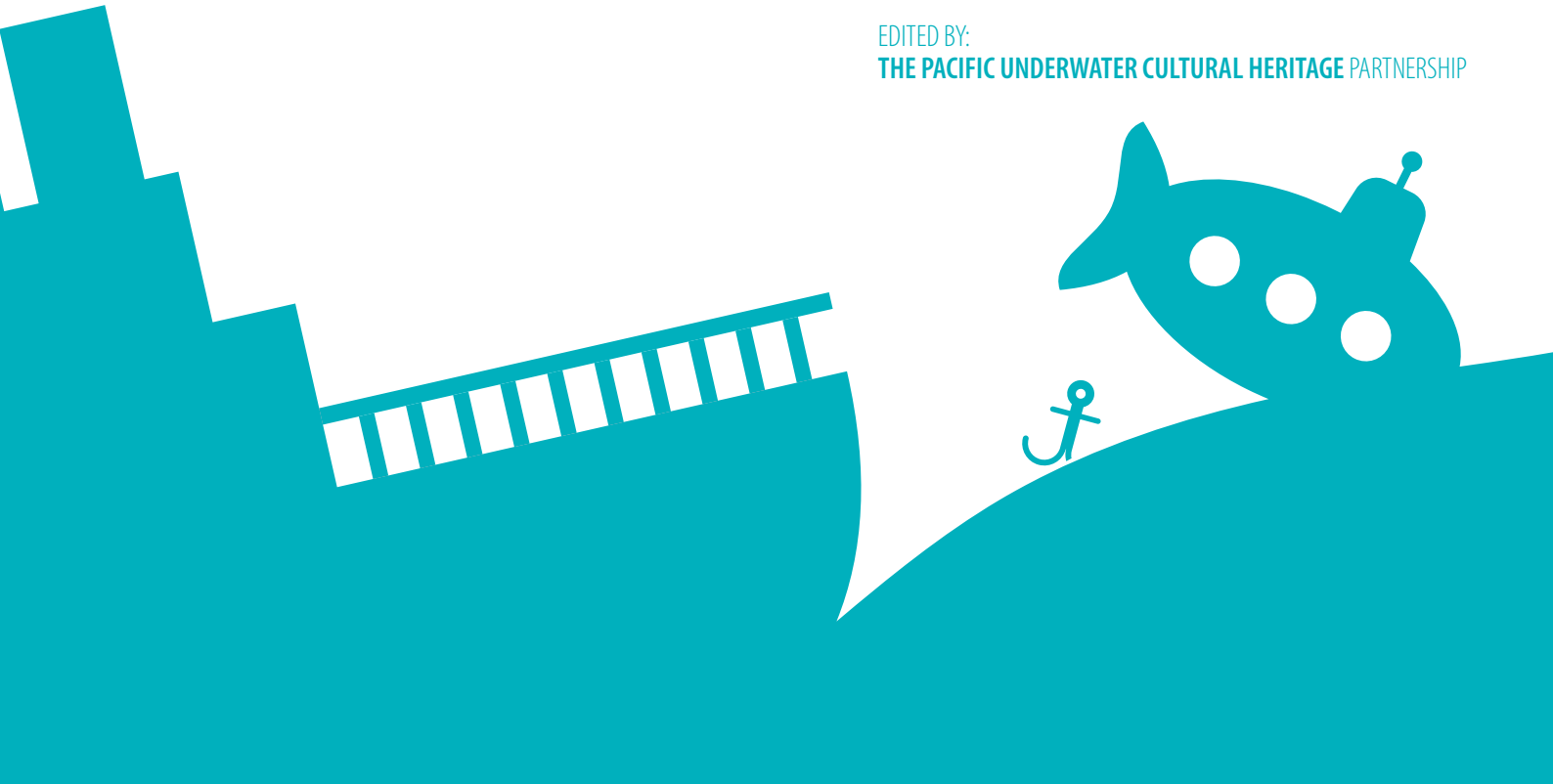
EDITED BY:
THE PACIFIC UNDERWATER CULTURAL HERITAGE PARTNERSHIP



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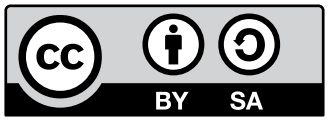

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TOKAI
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PREFACE

I am pleased to present this publication on safeguarding underwater cultural heritage (UCH) of the Second World War (WWII) in the Pacific region. This publication not only outlines good management practices but also explores how the protection of WWII UCH can benefit local communities and contribute to sustainable development in the region.

The Pacific region covers about one-third of the total surface area of the Earth and has a long history of human migration and settlement. Beneath the waters of the Pacific Ocean lie traces of human existence that span across the centuries. These sites include ancient sunken villages, traditional fish traps of indigenous communities, and shipwrecks of missionaries and explorers. There is also a large number of shipwrecks and aircraft dated from WWII when the Pacific Ocean became the theatre of some of the fiercest battles of that time. Some of these sites are the final resting place of many lives and remain a sombre reminder of tragedies that wars bring upon people. Today many of these sites have become popular diving sites for tourists. However, some of the WWII-related UCH are slowly degrading with increasing risk of oil pollution, particularly in the event of severe storms.

In response to the request of Pacific Member States who are increasingly concerned about marine pollution and its potential impacts on the ocean health and community life, UNESCO's Cluster Office for the Pacific States launched a research project to develop an understanding of WWII-related UCH management issues and assist Pacific Island countries develop appropriate risk reduction strategies. Leading experts and members of the Pacific UCH Partnership (PUCHP) were called upon to contribute papers for this publication which highlights the multiple values that WWII-related UCH holds for a diverse range of communities. Calling for enhanced cooperation among stakeholders, the publication outlines good practices in protection and management. It promotes a balanced approach between safeguarding WWII heritage and protection of the environment.

UNESCO hopes that government officials, policymakers, academics and communities engaged in UCH and broader ocean management issues will use this work as a resource to develop guidelines for the effective and sustainable management of WWII-related UCH in the Pacific. This publication was made possible by financial assistance from the UNESCO Heritage Emergency Fund and Tokai University, Japan.

NISHA
Director and Representative to the Pacific States
UNESCO Office for the Pacific States

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ACRONYMS

Amtrac: Class of amphibious vehicles introduced in the Second World War

ANCODS: Australian and Netherlands Committee on Old Dutch Shipwrecks

APCONF: Asia Pacific Regional Conference on Underwater Cultural Heritage

ANSDB: Australian National Shipwrecks Database

CGD: Cleared Ground Demining

CILHI: Central Identification Laboratory Hawaii

CNMI: Commonwealth of the Northern Mariana Islands

CRM: Division of Coastal Resource Management, Saipan

DEQ: Division of Environmental Quality, Saipan

DLNR: Department of Land and Natural Resources, State of Hawaii

DPAA: Defense Prisoner of War/Missing in Action Accounting Agency, US Department of Defense

ERW: explosive remnants of war

EW: Earthwatch Institute

FSM: Federated States of Micronesia

GICHD: Geneva International Centre for Humanitarian Demining

GIS: Geographical Information System

HPO: Historic Preservation Office

HURL: Hawaii Undersea Research Laboratory

IJN: Imperial Japanese Navy

IMO: International Maritime Organization

IUCN: International Union for Conservation of Nature and Natural Resources

JANAC: Joint Army-Navy Assessment Committee, USA

JMAS: Japan Mine Action Service

LDC: least-developed country

LVT: Landing Vehicle Tracked

MHLW: Ministry of Health, Labour and Welfare, Government of Japan

NAGPRA: North American Graves Repatriation Act

NAS: Nautical Archaeology Society

NHL: National Historic Landmark

NOAA: National Oceanic and Atmospheric Administration, United States Department of Commerce

NPS: National Park Service, United States

ODA: Official Development Assistance, Government of Japan

OHA: Office of Hawaiian Affairs, United States of America

ONMS: Office of National Marine Sanctuaries, NOAA

PACPOL: Pacific Ocean Pollution Prevention Programme

PIF: Pacific Island Forum

PHH: Pacific Heritage Hub

PNC: Palau National Code

POW/MIA: Prisoner of War/Missing in Action

PUCHP: Pacific Underwater Cultural Heritage Partnership

SIDS: small island developing States

SMCA: Sunken Military Craft Act

SOPAC: Pacific Islands Applied Geoscience Commission

SPREP: South Pacific Regional Environmental Programme

UCH: underwater cultural heritage

UNCLOS: UN Convention of the Law of the Sea

UNESCO: United Nations Educational, Scientific and Cultural Organization

US: United States

USA: United States of America

USSBS: United States Strategic Bombing Survey

USTCES: United States Army Technical Centre for Explosives Safety

UH: University of Hawaii

UXO: Unexploded Ordnance

WWI: First World War

WWII: Second World War

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1. BACKGROUND AND OBJECTIVES

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Background

Underwater cultural heritage (UCH), undisturbed *in situ,* is often better preserved than land-based cultural heritage, holding invaluable information for historians, archaeologists and scientists to reconstruct past cultures. The UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001) broadly defines UCH as 'all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years'. The Convention aims to protect UCH from being commercially exploited for trade or speculation through a protection regime for UCH by maritime zones determined by United Nations Convention on the Law of the Sea (UNCLOS).

The Pacific UCH Programme was launched at a UNESCO regional workshop on Pacific underwater cultural heritage held in the Solomon Islands in 2009. One of the outcomes of this workshop was UNESCO's publication *Underwater cultural heritage in Oceania* (2010) which presents an overview of UCH in the Pacific spanning history from the Stone Age to the Atomic Era. The diversity of UCH, ranging from traditional fish weirs, explorer ships and the Second World War, demonstrate the strong connection of the people of the Pacific to the ocean, and significance for a wide range of communities. Following the launch of the Pacific UCH Programme, UNESCO extended its assistance to several capacity building workshops and provided support to international conferences in the field of maritime archaeology.

Regional cooperation in the management of Second World War underwater cultural heritage

The management of WWII-related UCH has specific issues such as repatriation of human remains, unexploded ordnances (UXO), and potential pollution by oil spills. The Pacific community has been addressing these issues through studies focusing on both specific geographic areas and more regionally. For example, in 1999, at the request of the Government of the Solomon Islands, the Pacific Islands Applied Geoscience Commission (SOPAC) conducted a risk assessment study of WWII-related UCH in Iron Bottom Sound in Solomon Islands (SOPAC, 1999). The study recommended that further studies be concentrated in the shallow near-shore and coastal areas as these areas are the zones of high biological productivity and concentration of marine biota and are also most accessible to people.

At the regional level, the South Pacific Regional Environmental Programme (SPREP), in cooperation with the International Maritime Organization (IMO), launched the Pacific Ocean Pollution Prevention Programme (PACPOL) in 1999 in response to concerns caused by an oil spill in the Federated States of Micronesia (FSM) due to the disturbance of a WWII wreck, USS *Mississinewa*. The aim of PACPOL is to maintain, protect and enhance the quality of coastal and marine environments in the Pacific Islands region by minimizing ship-sourced marine pollution (SPREP, 1999). Within the framework of PACPOL, SPREP developed a comprehensive database of WWII-related UCH. This database contains information on 3,855 WWII wrecks, some of which may still contain large quantities of oil.

More recently, the Pacific Islands Forum (PIF) Leaders Meeting in 2011 called on relevant international bodies and development partners to assist in addressing UXO in the region, following a study on WWII UXO, including sea mines in four Pacific Island countries (PIF, 2011).

Notable progress in awareness-raising of UCH was achieved through activities organized during the 3rd United Nations International Conference on Small Island Developing States (SIDS) in Samoa in 2014. This included a partnership with PIF to join the Pacific Ocean Alliance to reinvigorate the commitment to and implementation of the Pacific Island Regional Ocean Policy, identifying six areas of cooperation including culture and identity. A new network, Pacific UCH Partnerships (PUCHP), was also established at the conference. PUCHP is an open-ended network fostering partnerships with universities, regional intergovernmental agencies, specialized institutions, NGOs and other civil society organizations who work in areas related to UCH protection and management.

Importantly, the SIDS Conference also developed the outcome document, *Samoa Accelerated Modality of Action (SAMOA) Pathway,* which reaffirms that SIDS remain a special case for sustainable development, recognizing SIDS's ownership and leadership in overcoming challenges specific to SIDS (UN, 2014). The *SAMOA Pathway* paragraph 54 supports SIDS's efforts to conserve their UCH and paragraph 58 (j) supports States to consider becoming parties to the UCH Convention.

International context

The international community adopted the 2030 Agenda for Sustainable Development in 2015. This landmark global framework for action recognizes the transversal role of culture to sustainable development and identifies seventeen Sustainable Development Goals (SDGs). The document states in its preamble 'We pledge to foster intercultural understanding, tolerance, mutual respect and an ethic of global citizenship and shared responsibility. We acknowledge the natural and cultural diversity of the world and recognize that all cultures and civilizations can contribute to, and are crucial enablers of sustainable development' (UN, 2015).

Culture directly concern three goals, notably, cultural and natural heritage under SDG 11 Sustainable cities and communities; education and appreciation of cultural diversity under SDG 4 Quality education; and the oceans and seas under SDG 14 Life below water. SDG target 14.5 states that by 2020, at least 10 per cent of coastal and marine areas should be conserved, consistent with national and international law, and based on the best available scientific information, while SDG target 14.7 states that by 2030, the economic benefits to SIDS and least-developed countries (LDC) from the sustainable use of marine resources should be increased, including through sustainable management of fisheries, aquaculture and tourism.

Objectives of the research project

With increasing international and regional recognition of the Pacific region's UCH, and at the request of Pacific Member States, UNESCO launched a research project in 2015 with the following objectives:

1. to have a better understanding of issues surrounding WWII remains in the Pacific;
2. to identify good practices in the protection and management of these remains to reduce the impact on the environment and human safety; and
3. to identify areas of international cooperation.

This publication draws together current management practices and research in five countries of the Pacific region – Australia, Commonwealth of the Northern Mariana Islands (Saipan), Federated States of Micronesia (Chuuk, Kosrae, Yap, Pohnpei), Republic of Palau and the United States of America (Guam, Hawaii). Each chapter highlights good practices in the protection and management of WWII UCH, as well as the potential risk to the environment and the public without active management.

Research team members

The core members of the research team were the following PUCHP members: Sunny Ngirmang, Director, Historic Preservation Office, Bureau of Cultural and Historical Preservation, Ministry of Community and Cultural Affairs of Palau; Calvin T. Emesiochel, Deputy Director, Historic Preservation Office, Bureau of Cultural and Historical Preservation, Ministry of Community and Cultural Affairs of Palau; Dr Bill Jeffery, Assistant Professor, Division of Humanities, College of Liberal Arts and Social Sciences, University of Guam; Dr Jun Kimura, Junior Associate Professor, Department of Maritime Civilizations, School of Marine Science and Technology, Tokai University, Japan; Dr Jennifer F. McKinnon, Associate Professor, Department of History, Program in Maritime Studies, East Carolina University, USA; Dr Hans K. Van Tilburg, Maritime Heritage Coordinator, National Oceanic and Atmospheric Administration (NOAA) Office of National Marine Sanctuaries, US Department of Commerce; and Mr Andrew Viduka, Historic Heritage Section, Department of the Environment and Energy, Government of Australia.

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2. SECOND WORLD WAR UNDERWATER CULTURAL HERITAGE MANAGEMENT IN THE REPUBLIC OF PALAU

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GOOD PRACTICE

National policy and framework for UCH management - UXO Strategy and Action Plan

Title 19 of the Palau National Code (PNC) protects cultural heritage, including historical and cultural sites both on land and underwater from destruction, removal, damage or alteration. The Historic Preservation Office (HPO) at the Bureau of Cultural and Historical Preservation oversees its implementation and is responsible for the assessment of project proposals that might affect Palau's cultural heritage. The HPO also issues regulations regarding the appropriate treatment of cultural heritage. Within this context, the Government of Palau has established a UXO Working Group with representatives from the Ministry of State, Bureau of Public Safety, and HPO, in order to develop a national UXO Strategy and Action Plan. This Strategy and Action Plan addresses the risks of investigation, identification, marking and reporting relating to UXO clearance on land and underwater. This inter-agency mechanism, with the HPO as core member, plays a key role in developing legislative frameworks, raising awareness and developing international cooperation projects with overseas agencies specializing in UXO clearance.

Introduction

This chapter presents the results of short-term fieldwork conducted in 2015 in the Republic of Palau to evaluate the country's approaches to effective protection and promotion of wartime cultural remains beneath the waters. Palau's waters encompass a considerable sunken cultural heritage related to WWII, consisting of shipwrecks, vehicles, and aircraft. While these remains are not defined as underwater cultural heritage according to the hundred-year time limit in Article 1 of the UNESCO Convention on the Protection of the Underwater Cultural Heritage, the country fully recognizes the historical significance of relics from this period. A legal framework for the protection of cultural heritage is applied to WWII-related UCH. Government agencies' missions include the safeguarding of war heritage beneath the sea.

However, Palau still faces difficulty in the implementation of appropriate management of WWII wrecks due to the rapid increase in site visitors and wreck divers, whose behaviour can damage the sites and, in some cases, disturb site stability. In addition, the finding (or relocation) of war heritage sites by non-professionals still occurs and whether or how private explorations report their findings is controversial. Moreover, as the Republic of Palau was a battlefield, clearance of unexploded ordnance (UXO) on land as well as underwater at identified and unidentified wrecks is still needed (Ngirmang and Emesiochel, 2014).

Objectives and activities

In 2015, the Palau Historic Preservation Office (HPO) of the Bureau of Cultural and Historical Preservation under the Ministry of Community and Cultural Affairs requested the Department of Maritime Civilizations, School of Marine Science at Tokai University, to provide policy advisory services related to the management and protection of WWII wreck sites in the Palau Republic, as part of the UNESCO-sponsored study on WWII-related UCH in Pacific countries. The objectives of these advisory services were: i) to review Palau's policy and national system for WWII wreck sites that have been opened to the public; and ii) to assess Palau's mitigation strategies and actions against the risks of UXO present in sunken WWII vessels. In September 2015, Jun Kimura met with government officials to collect information on the status of WWII shipwrecks, including their sustainable use and preservation, and a diving inspection was conducted at the Helmet Wreck site, which still contained UXO.

The development of Palau regulations on cultural heritage, human remains and UXO

According to Title 19 of the Palau National Code (PNC), the HPO ensures that cultural heritage, including historical sites and properties on land and underwater, are protected from destruction, removal, damage, or alteration. Title 19 authorizes the HPO to implement a permit programme for all projects that may adversely affect Palau's cultural heritage. The Bureau of Cultural and Historical Preservation is responsible for the assessment of project proposals (Ngirmang and Emesiochel, 2014). The detailed procedures for assessment were first developed with reference to Section 106 of US National Historic Preservation Act and are in accordance with Title 19 of the PNC. Overall, it follows the following review process, as outlined in Figure 2-1.

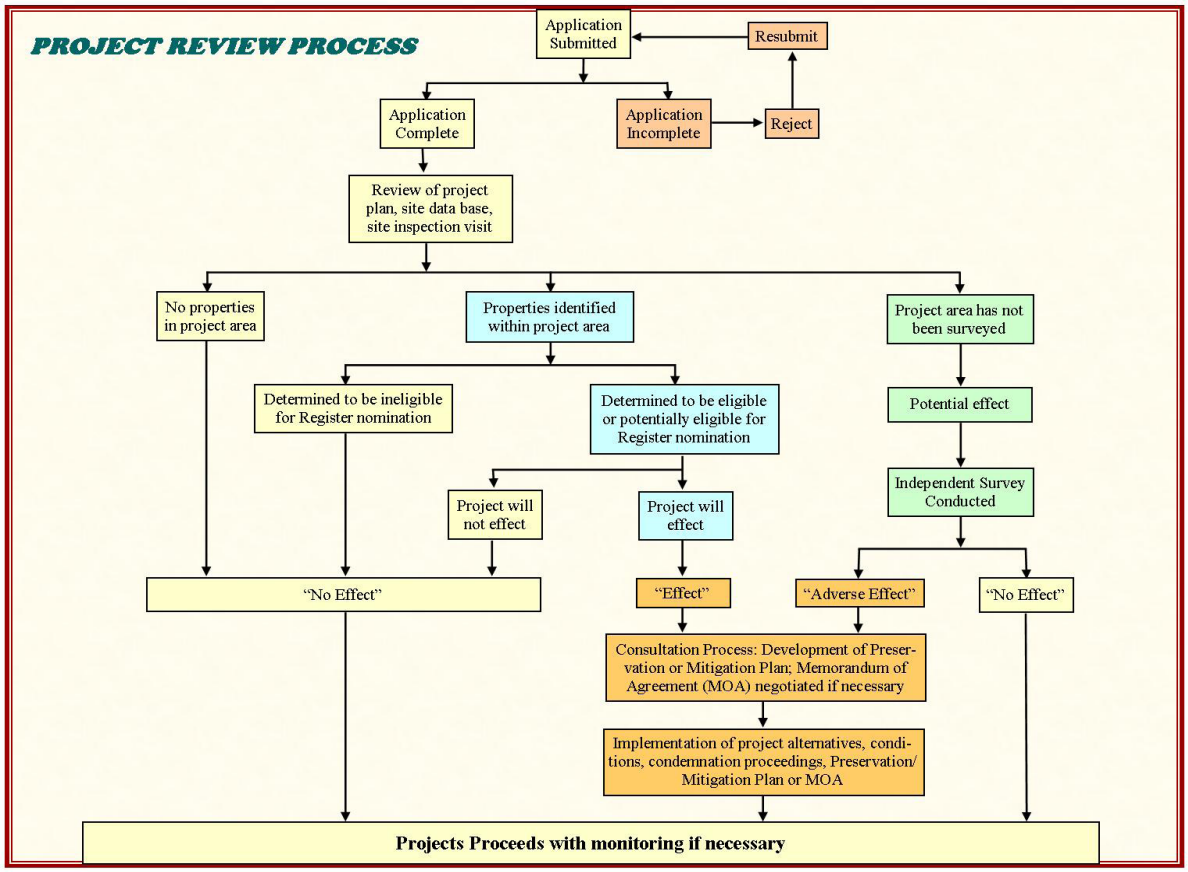


Figure 2-1. Approval processes of a project application involving possible impacts on Palau cultural relics protected by Title 19 of the Palau National Code.

To accomplish this, HPO has issued regulations concerning the appropriate treatment of artefacts and human remains at sites:

Regulations regarding Palau Cultural and Historical Artefacts (2005)
The regulations consist of five sections composed of several clauses concerning the scope and generic provisions of regulations in relation to Title 19 of PNC, procedures for removing artefacts from a site, artefact ownership, penalties, and artefact repository.

Regulations Regarding the Treatment and Disposition of Human Remains and Burial Furnishings (2005)
The development of the regulations was based on the nature of cultural prohibitions and respect for ancestral spirits in Palau. The aim is to prevent damage to burial sites, human remains and associated burial furnishings during authorized disturbance work. Thirteen sections address the protection and treatment of human remains during site development work, consultative processes to deal with human remains and burial furnishings, consideration of human remains at both known sites and areas suspected to contain human remains, sensitivity about exhibiting human remains, and penalties for breaching regulations.

The Palau Government recognizes that *in situ* UXO from WWII are widely present on the islands and in the surrounding waters. The explosive remnants of war (ERW) are substantial threats to the public and may affect the country's development. As the country has not yet been able to identify and dispose of all UXO, Palau's strategic plan seeks international cooperation and support. On 19 November 2007, Palau ratified the Ottawa Treaty, or the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines (Mine Ban Treaty). The Convention provides a framework for receiving funding assistance for clearing and demining of UXO. According to Palau's Statement on Clearance at the meeting of the Convention in Geneva in 2010, it was reported 'US military records show that 2,800 tons of ordnance was fired, and with failure at 20–30 per cent'.[1]

Given the circumstances, the Palau Government commissioned the British non-profit organization, Cleared Ground Demining, to evaluate the extent of UXO problems and clear unexploded anti-personnel mines in Peleliu and Angaur States. By 2010, an explosive ordnance disposal team cleared 8,415 items weighing about eight tonnes.

The Palau Government is taking an inter-agency approach to maximize its ability to address the UXO problem. To develop a national UXO strategy, the UXO (Mine Action) Working Group was established in 2011 and included representatives from the Ministry of State, Bureau of Public Safety and HPO. Given that the number of UXO removal projects are increasing in the country, developing new regulations for UXO clearance is an urgent matter. In 2015 Palau was in the final processes of formulating Palau's Mine Action Plan. As *in situ* UXO endangers cultural activities and personnel working at historical monuments and sites, HPO plays a key role in developing the regulations. Given the substantial number of UXO in sunken vessels and in the surrounding seabed, the regulations do not separate the issues of UXO in the water from landmines and anti-personnel mines left on the islands. These regulations will be important guidelines for explosive ordnance clearance in seawater environments with a scope that covers investigation, locating, marking, identification, and reporting.

Overview of WWII-related UCH issues in Palau

A number of sunken military craft in Palau waters are associated with the Imperial Japanese Navy (IJN). Palau was once an economic and political centre for the Japanese colonies in the Pacific. From the end of WWI, Japan was entrusted with the administration of Micronesia (Micronesia Islands of Japanese Mandated Territory) including the modern Northern Mariana Islands, Federated States of Micronesia (FSM), Marshall Islands, and the modern Republic of Palau. The South Pacific Mandates (*Nanyocho*) were established with Koror as the headquarters of several mandates to rule the Japanese Mandated Territory in the Pacific region. Towards the end of WWII, Palau became an important anchorage in strategic military terms, following the withdrawal of the main IJN naval force from Chuuk Lagoon (Truk Lagoon) after the loss of the Marshall Islands. The IJN fleet, including the battleship *Musashi,* was assembled in Palau, but the IJN moved the major battleships to the Philippines, leaving many oil tankers, merchant ships, repair ships, and supply ships in Palau Harbour. On 30 and 31 March 1944, an intensive US air raid was carried out on Palau Harbour. While many Japanese soldiers were lost on the Palau islands, it is said that more than 60,000 conscripted sailors mainly engaged in ship transportation were seriously injured and lost during the raid. The number of conscripted sailors lost was greater than that of combatants of the IJN.

1 http://www.apminebanconvention.org/fileadmin/APMBC/MSP/10MSP/day4/10MSP-Item11b-2Dec2010-Palau-en.pdf

The exact number of Japanese vessels lost and sunk is disputed. Ishimura (2011) listed more than forty Japanese vessels sunk in the waters of Palau during WWII (Table 2-2.). Ishimura's research revealed that most of the sunken Japanese vessels were not battleships of the IJN or Army but converted vessels originally built for non-combat purposes. The depth of the wrecks range from 2–3 m to more than 30 m. Salvage missions were attempted at some of these wrecks after WWII. The ship *Akashi* (9,000 tons), a repair ship of the IJN, was sunk during the US air raid in the shallow waters of North Urukthapel Anchorage at a depth of 12 m. More than 700 combatants and non-combatants were on board. In 1957 a salvage operation for the recycling of iron was undertaken during which 201 human remains were recovered.

No.	Name of Vessel	Type	Affiliation	Tonnage	Length	Destroyed Date	Depth	State
1	Akashi	Navy repair ship	Combined Fleet	9000	158.5	44.03.30	12	SDF
2	Iro	Navy oil tanker	Combined Fleet	14050	143.48	44.03.30	43	SP
3	Sata	Navy oil tanker	4th Fleet	14050	143.48	44.03.30	35	SP
4	Ose	Navy oil tanker	Combined Fleet	7987	138.9	44.03.30	Unknown	SDF
5	Wakatake	Navy destroyer	No. 1 convoy fleet	1113	84	44.03.30	30	SDF
6	Samidare	Navy destroyer	No. 2 destroyer flotilla	2075	105.8	44.08.26	9	SDF
7	LST Type 1	Navy first-class carrier	Combined Fleet	1500	96	44.07.27	35	SP
8	Asashio Maru	Navy first-class oil tanker	Combined Fleet	5141	118.1	44.03.30	40	S
9	LST Type 150	Navy SB carrier	Unknown	950	70.9	Unknown	Unknown	SDF
10	Amatsu Maru	Navy oil tanker (converted)	Nihon Kaiun	10567	153	44.03.30	40	SP
11	Urakami Maru	Navy repair/salvage ship (converted)	Fukuyo Kisen	4317	109.73	44.03.30	35	SP
12	Kamikaze Maru	Navy minelayer (converted)	Yamashita Kisen	4918	111.5	44.03.30	35	SP
13	Chuyo Maru	Army carrier (converted)	Toyo Kisen	1941	82.3	44.03.30	35	SP
14	Nagisan Maru	Navy carrier (converted)	Mitsui Senpaku	4391	110	44.03.30	35	SP
15	Bichu Maru	Army carrier (converted)	Nihon Yusen	4667	112	44.03.30	35	SP
16	Gozan Maru	Navy carrier (converted)	Kuribayashi Shosen	3213	91.5	44.03.30	18	SDF
17	Shoei Maru	Army carrier (converted)	Sanko Kisen	1878	81.5	44.03.30	Unknown	SDF
18	No. 5 Nissho Maru	Navy general-purpose vessel (converted)	Marusho Kaiun	782	54	44.03.30	Unknown	SDF
19	No. 18 Shinsei Maru	Navy oil tanker (converted)	Hara Shoji	2711	96.4	44.03.30	Unknown	S
20	No. 2 Unyu Maru	Army oil tanker (converted)	Tojo Kisen Kogyo	634	53	44.03.30	Unknown	S
21	Raizan Maru	Navy general-purpose vessel (converted)	Tsurumaru Kisen	2838	98	44.03.30	35	SP
22	Kibi Maru	Army carrier (converted)	Hinode Kisen	2759	93	44.03.30	30	SP
23	Teshio Maru	Army carrier (converted)	Mitsui Senpaku	2840	93	44.03.30	30	SP
24	Ryuko Maru	Navy carrier (converted)	Taiyo Kogyo	2764	93	44.03.30	35	SP
25	Goshu Maru	Navy carrier (converted)	Kawasaki Kisen	8592	132.9	44.03.30	20	SDF
26	Akebono Maru	Navy oil tanker (converted)	Nihon Kaiun	10182	151.4	44.03.30	Unknown	S
27	Hokutai Maru	Army carrier (converted)	Kitagawa Sangyo Kaiun	5220	120.1	44.03.30	unknown	SDF
28	Daihatsu landing craft	Landing craft	Unknown	17	14.88	unknown	2	SP
29	Daihatsu landing craft	Landing craft	Unknown	unknown	unknown	unknown	7	SP
30	Buoy #6 Wreck	Submarine chaser (ex- bonito fishing boat)	Unknown	unknown	ca. 30	unknown	25	SP
31	Helmet Wreck	Minelayer	Unknown	unknown	ca. 58	44.03.30	35	SP
32	Unknown	Unknown (ex- whaling boat)	Unknown	ca. 300	ca. 36	unknown	10	SDF
33	Unknown	Unknown	Unknown	unknown	unknown	44.03.30	unknown	S
34	Unknown	Unknown (ex- cargo ship)	Unknown	>1000	>60	44.03.30	15	SP
35	Unknown	Unknown (former cargo-passenger boat)	Unknown	unknown	unknown	44.03.30	10	SP
36	Unknown	Unknown (submarine chaser or patrol boat)	Unknown	unknown	unknown	44.03.30	12	SDF
37	Unknown	Unknown (ex- cargo-passenger boat)	Unknown	>1000	unknown	44.03.30	6	SP
38	Unknown	Unknown (ex- cargo ship)	Unknown	unknown	ca. 40	unknown	27	SDF
39	Unknown	Unknown (ex- water tanker)	Unknown	unknown	ca. 36	unknown	12	SP
40	Unknown	Unknown (cargo ship or patrol boat)	Unknown	unknown	ca. 30	44.07.25	3	SP
41	Tugboat Wreck	Unknown	Unknown	unknown	unknown	unknown	2	SDF
42	Unknown	Unknown	Unknown	ca. 3000	unknown	44.08.22	3	SDF

State: S=Salvaged completely SP=Salvaged partially SDF=Salvaged completely; debris field

Table 2-2. Japanese vessels sunk in Palau's waters (Ishimura, 2011)

On a Japanese Government mission, Ishimura (2010a; 2010b) reported the recovery of human remains from the *Iro,* an oil supply ship that sank to the depth of more than 40 m in West Urukthapel Anchorage. The body recovery mission was initiated by a team from Japan's Ministry of Health, Labour and Welfare (MHLW), with a survivor of the *Iro* and an archaeologist but no human remains were identified. MHLW is a Japanese government agency responsible for various matters related to post-war processes including the task of recovering war dead and assisting groups and individuals who are engaged in the collection of Japanese war dead remains. MHLW reports that there are approximately 3,000 sunken military craft of the IJA in the Asian and Pacific regions and more than 300,000 human remains inside these vessels.

Under accepted international maritime law and practice, sunken military vessels remain the property of their sovereign countries irrespective of location or the passage of time. Thus, the Japanese Government could assert ownership control of these wrecks and the human remains through customary maritime law. The US Sunken Military Craft Act provides legal protection for sunken military vessels and aircraft, and associated contents located around the world from unauthorized disturbance.

Ishimura (2011) pointed out that sunken vessels are under threat from souvenir hunters. Illegal activity at the freighter *Chuyo Maru* was reported. The *Chuyo Maru* was requisitioned by the Japanese Imperial Army, and she was sunk by US bombing with nine soldiers and twelve crew members. The ship was relocated at a depth of 40 m by wreck hunters. In May 2006, a British man took some relics from the shipwreck, and this was reported as an important incident contravening the country's cultural heritage legislation.

UXO clearance operations at the Helmet Wreck site

A UXO clearance operation at an unidentified shipwreck, now called the Helmet Wreck, by the Japan Mine Action Service (JMAS), a non-profit organization specializing in explosive ordnance disposal, is a benchmark example of aid for *in situ* disposal of UXO in an underwater environment. More than 165 depth charges remain at the Helmet Wreck. The full history of the Helmet Wreck has not yet been clarified, but the ship was used by the IJN as a freighter and possible minelayer, given the presence of many depth charges, before it was sunk in the air raid and torpedo attack on 30–31 March 1944. The well-preserved hull was relocated in Malakal Harbour in 1990 by Dan E. Bailey, a wreck hunter who has detected several WWII submerged vessels in Palau's waters (Bailey, 1991). The length of the hull measures approximately 58 m. It sits on the seabed with a cant; depth around the bow is 35 m, while the stern lies at a depth of 15 m. The shipwreck was named for the large number of helmets scattered under the upper portside deck, and pillage at the wreck appeared to have caused substantial loss of helmets and other miscellaneous artefacts. The ship has three holds; the first hold is a cargo room where engines for Mitsubishi A6M Zero aircraft remain, and the second and third holds are loaded with arms and antisubmarine depth charges. There is a large opening on the starboard side around the aft third hold, where a torpedo hit the ship. The ribs are exposed at the opening and a number of depth charges are scattered, while many are still aligned in their original positions inside the second and third holds.

The work of NGOs

Two non-profit organizations, JMAS and Cleared Ground Demining (CGD), have been involved in UXO clearance at the Helmet Wreck - the removal of *in situ* fused depth charges and the leakage of explosive composites from depth charges in the holds.

JMAS, established in 2001 and having conducted several ERW clearance missions mostly in Asian countries, was primarily in charge of the removal of the fused depth charges and mitigation of the leakage. Operations were conducted between 2012 and 2014 with financial aid from the Japanese Government's Official Development Assistance (ODA). JMAS's operational reports are available online in Japanese on the website of the Ministry of Foreign Affairs of Japan[2].

Depth charge clearance operations

The Government of Palau referred further assessment of the hazards of depth charges to the Geneva International Centre for Humanitarian Demining (GICHD), resulting in publication of the technical report *Assessment Report: Depth Charges at the 'Helmet Wreck' in Koror Harbour (*Tollefsen and Hovik, 2013*)*. The GICHD assessment report provides a comprehensive overview of the JMAS operations as well as a technical perspective on the hazard level of the remaining depth charges before and after the clearance operations. In terms of risk assessment with ERW expertise, GICHD has classified fused depth charges as falling into a moderate risk category, while the unfused charges fall into a low risk category. It was concluded that 'by only removing the two fused depth charges from the wreck, the risk from the explosive hazards will be dramatically reduced'. Both the JMAS operational reports and the GICHD assessment report are important resources for addressing how the UXO problem at a WWII shipwreck in a Pacific country was approached.

The JMAS underwater operations were divided into two major parts: i) preventing the toxic explosive chemicals from spilling, and ii) removing depth charges with fuses that sit in the starboard and portside drop racks. JMAS reported that a total of 165 depth charges remain at the Helmet Wreck (GICHD identified 167). GICHD pointed out that these depth charges are almost equivalent to a net explosive quantity of 27 metric tonnes of high explosives (Tollefsen and Hovik, 2013). In the GICHD report, the major type of charges at the Helmet Wreck has been identified as the Type II depth charge, while their explosive components have been specified as a Type 98 explosive used by the IJN (Tollefsen and Hovik, 2013). Type 98 consists of a mixture of trinitroanisole (60 per cent and hexanitrodiphenylamine (40 per cent), and it is known that Type 98 was used for *kaiten* (manned torpedoes for suicide attacks). Trinitroanisole and hexanitrodiphenylamine form picric acid. The JMAS operational report does not specify either the type of depth charge or the explosive substance, but the leaking substance from the cracks of the deteriorated depth charges has been identified as picric acid. Picric acid is toxic for humans and natural environments. JMAS has identified 77 leaking depth charges which have caused substantial water pollution and damage to marine life in the area.

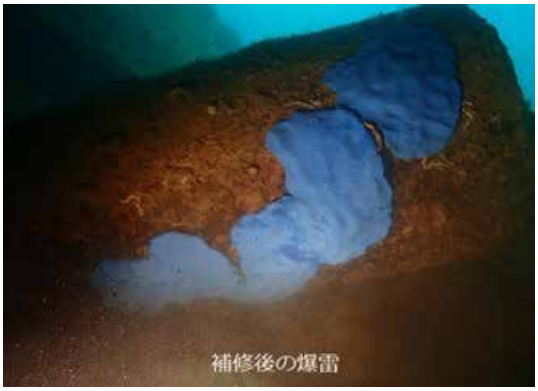
The workflow of the JMAS operation for sealing seams and cracks is presented in Figure 2-3 (a-f). Leakage of a large amount of picric acid is clearly visible and has heavily polluted the water, endangering divers in a toxic and low visibility working environment. JMAS mainly used epoxy resins for sealing cracks which GICHD reported is an environmentally safe and effective method (Tollefsen and Hovik, 2013). The JMAS operation began in April 2014 and by February 2015 the water condition was substantially improved with pH levels reduced to normal.

2 http://www.mofa.go.jp/mofaj/gaiko/oda/data/zyoukyou/ngo_m/pacific/palau/121204.html.

a. Crack along the welding seam

b. Sealing operation by JMAS diver

c. Exposed crack before sealing



d. After sealing with epoxy resins

e. Water condition in April 2014

f. Water condition in February 2015

Figure 2–3. Sealing operations at the Helmet Wreck site. ©JMAS/ Palau HPO

As noted, two depth charges had been fused to be ready for use and were sitting in the drop racks. The JMAS operation workflow for removal of these two depth charges is presented in Figure 2-4 (a-h). The fused depth charges were trapped in the rack, which had been heavily colonized by marine organisms. Use of an underwater air hammer drill to remove dead hard corals started in May 2014. The operation was completed in July 2015, and the depth charges removed were dispatched to a demolition ground. It is assumed Cleared Group Demining (CDG) is to play an active role in destroying the depth charges.

a. A rack covered by coral

b. Coral cleaning with an air hammer drill

c. Rack after cleaning

d. Exposed fused depth charge inside

e. Removal work with an air saw

f. Depth charge lifted from the rack

g. Charge covered with plastic wrap

h. Extra sealing with epoxy resins

Figure 2–4. Removal process for fused depth charges ©JMAS/Palau HPO

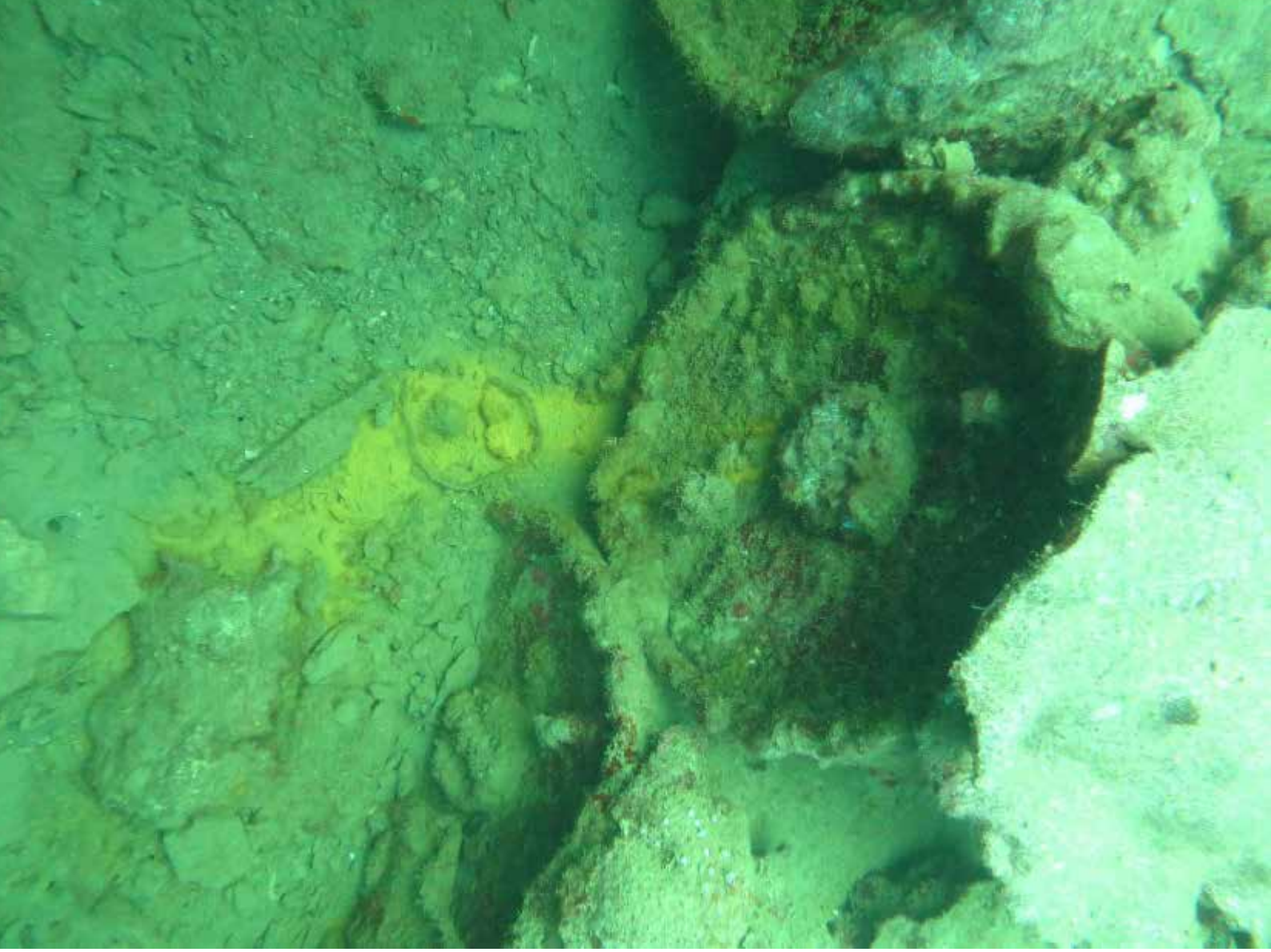


Figure 2-5. Picric acid leaking observed during 2015 diving investigation. Photo by Jun Kimura. ©Kimura/HPO

In 2015, with authorization from HPO, the authors inspected the condition of the Helmet Wreck. While the site was closed during the JMAS operations, access to the site was not prohibited after completion of the work. In establishing an appropriate site access policy, HPO takes into consideration an increase in risks from disturbance by divers. It was observed that the explosive chemical substance was still leaking continuously (Figure 2-5). The deteriorated depth charge shell would easily be damaged by any physical contact.

During the 2015 fact-finding mission, at a meeting with the Bureau of Tourism under the Ministry of Natural Resources, Environment and Tourism, the Palau Visitor Authority was informed about a certification program for tour guides established by the Koror State Government. The *Tour Guide Certification Program Manual* is a publication that certified tour guides are encouraged to follow, and much of its content covers diving regulations. However, the lack of governance over diving activities at the WWII wreck sites remains an issue.

CONCLUSION

The Palau Government has adopted a holistic approach to the protection and sustainable management of sunken WWII vessels. Major issues include raising awareness of the archaeological and historical significance of the WWII-related UCH among the public and visitors; sensitivity surrounding human remains; and remaining UXO. All these issues have been identified and addressed at a national level through inter-agency workshops and regular communication. Regulations to address the issues are already in effect or in the process of being issued. The HPO is one of the key stakeholders, with expertise in preserving cultural resources beneath the waters. Active HPO engagement with development of the legislative framework is evident.

On the other hand, despite the efforts of national agencies, the sunken WWII vessels still face some threats. There is a lack of understanding of UCH legal protection. Despite being a leader in the protection of UCH in the Pacific, Palau should consider further efforts to raise awareness about UCH, targeting the local community, divers and international tourists. In order to achieve this, it is recommended:

- To publish a rule book and dive leaflet explaining the heritage significance of sunken WWII vessels; and
- To cooperate further with the local diving industry to promote safe and enjoyable diving at the wreck sites, in conjunction with a scheme for increasing appropriate wreck diving tourism and monitoring of wrecks.

HPO, as a government agency responsible for locating, investigating, recording, and managing UCH, should seek opportunities for:

- improving the inventory of identified and unidentified UCH in territorial waters and adjacent waters;
- disseminating the concept of UCH to clarify further the significance of the WWII-related UCH; and
- developing professional skills for recording and monitoring the sunken WWII vessels, such as photogrammetry recording techniques. Continue surveys of leakage to evaluate the real threats for divers and the environment.

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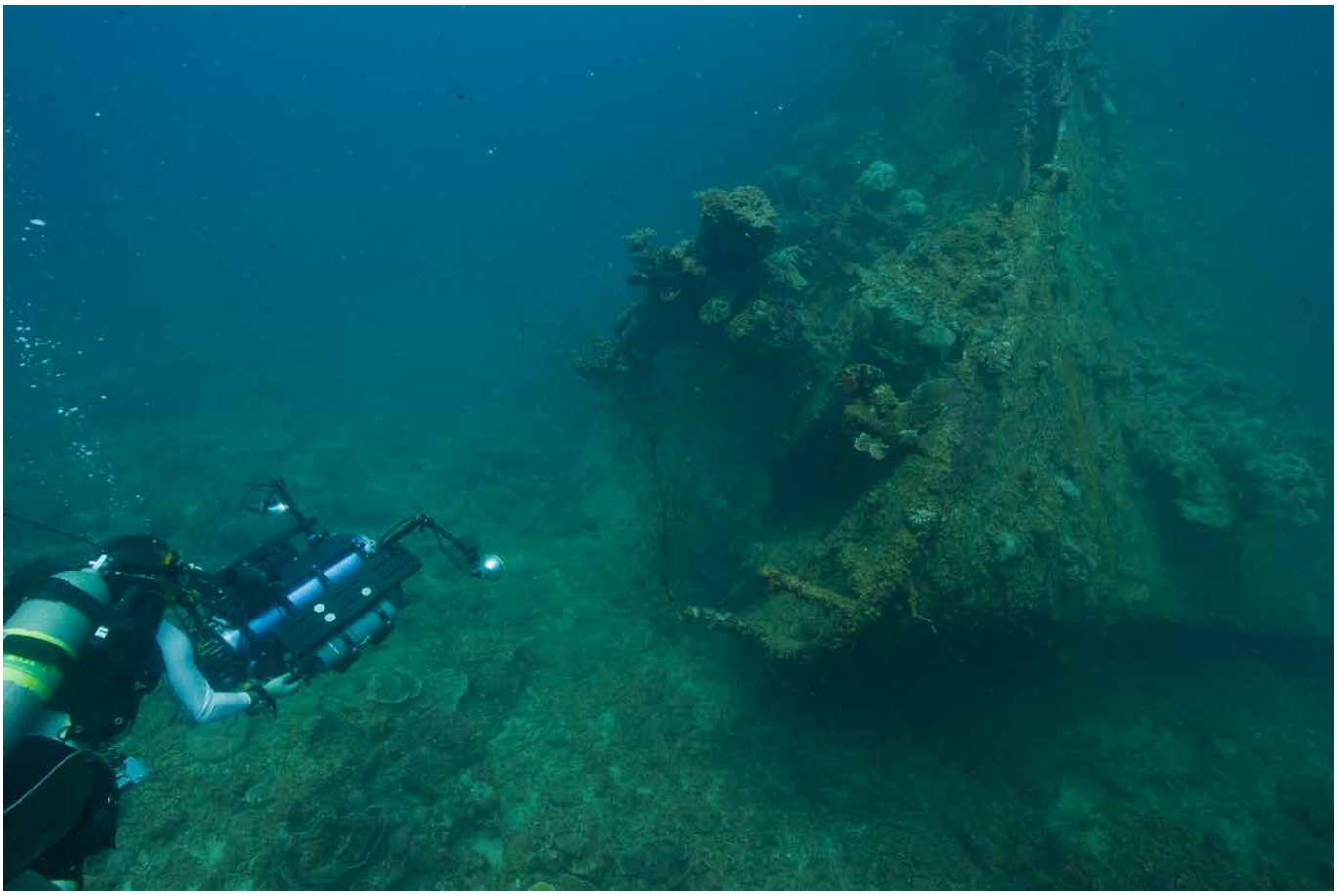
Documentation of the Japanese cargo ship Teshio Maru.
National Park Service photo by Brett Seymour.

An Aichi E13A-1 Japanese Navy Seaplane, code named "Jake", rests in 50ft of water. National Park Service photo by Brett Seymour.



Japanese cargo ship Teshio Maru. National Park Service photo by Brett Seymour.

3. SECOND WORLD WAR UNDERWATER CULTURAL HERITAGE MANAGEMENT IN SAIPAN

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GOOD PRACTICE

WWII Maritime Heritage Trail and public outreach activities as inclusive and collaborative efforts in Saipan

Maritime heritage trails are one of the ways to interpret and present UCH. Heritage trails allow scuba-divers and snorkelers to visit and better understand submerged heritage sites. In Saipan, the WWII Maritime Heritage Trail consists of nine stops with a total 12 vehicles of US and Japanese origin. It was developed in 2009 and aims to protect WWII-related UCH against the adverse impacts of an already existing tourism market. The trail has been developed within the framework of UCH tourism in Saipan and conceptualized as an inclusive and collaborative effort among government agencies, academia, diving industry and the local community. The development of the trail has contributed to ongoing research on the sites. The printed materials and interpretative films were also produced and made available as public outreach products.

Introduction

Saipan is the capital and one of the fifteen islands of the Commonwealth of the Northern Mariana Islands (CNMI), part of the larger Micronesian archipelago called the Mariana Islands.

In June and July of 1944, the Battle for Saipan was one of the largest amphibious invasions launched by the USA during the Second World War in the Pacific. Prior to the development of the WWII Maritime Heritage Trail: Battle of Saipan in 2009–2011, no organized underwater cultural heritage tourism existed in Saipan. Of all the WWII sites available in Saipan's Garapan Lagoon, only two were frequented with any regularity by tourist divers – a Japanese freighter *Shoan Maru* and a Kawanishi H8K Japanese seaplane. The Kawanishi was misidentified, or at least misnamed regularly by divers as 'the B29.' This misnomer and several others were corrected when the interpretative and historical materials for the trail were produced and distributed.

The development of UCH tourism in Saipan was conceptualized as an inclusive and collaborative effort to include academia, non-profit organizations, government agencies, and the local community in the study of Saipan's WWII submerged heritage. By taking this approach, it was hoped that more could be accomplished with fewer resources and a sense of stewardship for long-term preservation would take hold of the island community.

The WWII Maritime Heritage Trail: Battle of Saipan consists of nine stops with a total of twelve vehicles. Three US Sherman tanks, two Japanese landing craft, a Japanese Aichi E13A aircraft, a Japanese Kawanishi H8K aircraft, a US PBM Martin Mariner Aircraft, a US Avenger aircraft, a possible Japanese submarine chaser, a US Landing Vehicle Tracked (LVT), and a Japanese freighter comprise the trail. Their locations vary from very nearshore in shallow water (1 m) up to 9 m of water on the barrier reef. Some of the sites can be accessed from

shore via snorkel, making it accessible to those who are not scuba certified. Site selection was guided by consultation with the diving industry as well as diversity in vehicle type and ethnic association (i.e. Japanese and American) (McKinnon, 2015a).

Two types of public outreach products were created as part of a larger plan to aid in the preservation and protection of UCH sites that were already being affected through diver visitation - printed handout materials consisting of posters and underwater dive guides that visitors could take with them or download from the internet and an 18-minute interpretative film, which is shown at the National Park Service visitor centre. The printed materials were produced in English and Japanese languages (McKinnon, 2015a).

Tourism on UCH remains unregulated and unrecorded. No permits or licences are needed by dive operators or divers to visit sites, numbers of visitors are not kept and site inspections by the Historic Preservation Office (HPO) are not undertaken. This is mostly due to a lack of regulatory requirements, staff and funding. In what may be a unique problem, the majority of impacts to Saipan's submerged sites are a direct result of visitation, specifically anchor or mooring damage, looting, moving artefacts, and acts of vandalism (McKinnon, 2015b). This presents a challenge for managers who have limited staff, time and funding.

Within the Mañagaha Marine Conservation Area where there are restrictions on anchoring, steps to prevent damage have been underway since the heritage trail was developed in 2009. The Division of Coastal Resource Management (CRM) office is in the process of installing mooring buoys at the more heavily visited sites including the Kawanishi H8K aircraft site (which now has two moorings) and repairing and replacing moorings on the Japanese merchant ship. Plans are currently in the works for installing more moorings on heritage trail sites within the conservation area (McKinnon *et al*., 2014a).

However, for those sites outside of the Marine Conservation Area there is no mandate or support for installing moorings and anchor damage is a greater risk. Conversations with a local boat driver disclosed that a TBM Avenger aircraft landing gear is regularly used as a boat mooring for local surfers (Sheldon Preston, personal communication, 2010). The effects of mooring are seen on the landing gear where exposed metal is obvious. Continued use of the landing gear as a mooring will eventually cause severe damage if the boats collide with the aircraft or break the landing gear during rough swell conditions (McKinnon *et al*., 2014a).

Looting and the movement of artefacts on site are probably the most common and destructive impacts. By their very nature, modern war-related sites have a considerable amount of associated small portable objects. For many years divers have been removing artefacts or simply rearranging them on site. Because this activity impacts the historical and archeological context or fabric of a site, it can make identification more difficult and also affects the information that can be learned from the way in which the site was created (i.e. crashing, sinking, and dumping). Of the nine sites on the trail, four have had some form of looting or movement of artefacts (McKinnon *et al*., 2014a).

Vandalism, whether intentional or unintentional, also impacts submerged sites. Local tour boats frequent the Sherman tanks and banana boats carry passengers for a closer look. Tour operators were observed demonstrating how to climb on the tanks and/or swing off the gun barrels, a dangerous and destructive activity. Graffiti has been etched into the mucilaginous layer on the aluminum surface of the Kawanishi H8K aircraft on the wing of the aircraft and the gun turret (McKinnon *et al*., 2014a).

The process of memorialization affects the sites in Saipan through the addition of outside material, aggregation of moveable objects, potential damage to buried artefacts, and altering the overall integrity and 'feeling' of a site. Two monuments on the Kawanishi wreck site are dedicated to those lost during the battle (McKinnon *et al*., 2014a).

Other tourist services have a direct impact on UCH sites. The WWII US Sherman tanks are subjected to an enormous amount of traffic when jet skis and banana boats pass nearby. These vehicles typically

create wakes that wash over the tanks causing a cyclical pattern of wetting and drying. This affects the immediate site environment by increasing oxidization levels in the water that in turn increase corrosion (McKinnon *et al*., 2014a).

Unsightly rubbish, while not a serious impact, is found at UCH sites. Because the Sherman tanks are located just offshore from several large resorts and locally popular picnic beaches, rubbish including plastic bags, beer and soda cans, plastic forks and fishing line accumulate. Not only can trash present hazards to snorkellers and divers, but they certainly have an impact on marine life. Turtles and fish may ingest pieces of plastic; an adverse impact that is well documented elsewhere (McKinnon *et al*., 2014a).

Another tourism service that affects both the environment (i.e. marine organisms) and cultural heritage is the operation of the local tourist submarine. The ship *Shoan Maru* is on the tour and as the submarine moves towards the shipwreck it disperses large quantities of fish feed, including rice, to attract fish to the wreck. No information is available on the impacts of repeated discharges of rice or other non-marine organics into the water in the vicinity of the wrecks. Does this lead to higher rates of pollution and therefore deterioration? More concerning are the submarine's thrusters that blow onto the shipwreck as it makes its turn. Because the thrusters are powerful enough to move portions of the iron plating up and down, this will almost certainly lead to increased deterioration in those areas and significant impacts (McKinnon *et al*., 2014a).

Unexploded ordnance

Underwater unexploded ordnance (UXO) in Saipan appears to be less of a safety problem for divers than it is in other areas of the Pacific. Because the sites are in shallow water, it is assumed that much of the UXO that might have been underwater was recovered during post-battle salvage operations. Only one site is known to have UXO on the site – the possible Japanese submarine chaser – which has three or four unexploded shells. The UXO was reported in 2009 to CRM and Division of Environmental Quality (DEQ) when located on the site during an archaeological survey in the Tanapag Lagoon. A second large UXO projectile was located on the seabed during a tow board survey and subsequently reported to CRM and DEQ. Unfortunately, it is not known what deep shipwrecks occur outside of the lagoon and whether they contain UXO.

Human remains repatriation

Human remains on Saipan UCH sites are rarely found, mainly due to exposure to the marine elements in the lagoons which can have negative impacts on human remains survival. No underwater excavations have taken place, thus it is not known if the conditions are conducive to preservation in a buried environment. However, there is one known site which held human remains – the site of a Japanese LVT in intertidal waters. Local people reported the site to the HPO and the human remains were removed from the site. It is not known what happened to the remains and whether they were turned over to the Japanese 'bone collection' missions, which frequent Saipan regularly.

In 1952, the Japanese Government established teams to visit major battlefields to collect the human remains of the Japanese war dead; these are known as 'bone missions' in the Pacific. The Japanese Ministry of Health, Labor, and Welfare (MHLW) is the organization responsible for various matters related to post-war processes, including the human remains recovery effort. The Planning Division of the Social Welfare and War Victims' Relief Bureau is the primary contact and the agency that collects information about Japanese remains. MHLW carries out the Memorial Projects for War Dead[3] which consists of five major components including DNA analysis on the remains of war dead abroad, pilgrimages for memorial services and visits to burial sites, friendship and goodwill memorial projects, erection of monuments to the war dead, and recovery of remains of the war dead (McKinnon *et al*., 2014b). MHLW provides assistance to groups and individuals who are engaged in the collection of Japanese human remains. The formal missions started in 1952 after the San Francisco Peace Treaty came into effect. As of 2013, approximately

[3] Annual Health, Labour and Welfare Report 2009–2010. Available at http://www.mhlw.go.jp/english/wp/wp-hw4/08.html

Figure 3-1. Conducting a corrosion survey of aircraft in Saipan. Photo by Jon Carpenter.

1,260,000 bodies out of 2,400,000 reported war dead abroad, along with those who died in Iwo Jima and Okinawa, have been collected.

When human remains are recovered they are cremated on the island from which they are recovered. The ceremony takes place outside and the mass cremation is conducted using firewood. The ashes are brought back to Japan, and most of the ashes are placed into the Chidorigafuchi National Cemetery, which was the national Japanese cemetery for unidentified human remains of WWII. The body recovery missions have presented unresolved problems for the Japanese Government because most of the remains are not identified. DNA analysis on recovered human remains only began very recently in Japan. The first government meeting on this issue was announced by MHLW on 11 June 2001 in a press release[4]. As all the remains recovered from Saipan were cremated during the MHLW missions, no individuals have ever been identified by the DNA analysis. No identified human remains from an underwater context are known to have been collected or repatriated.

[4] http://www.mhlw.go.jp/houdou/2003/06/h0623-1a.html

Research

Much of the UCH research conducted in Saipan has been undertaken specifically on WWII sites. The first report to mention WWII in Saipan was conducted as a result of a US National Park Service survey in the late 1980s and served as the baseline for what we know about WWII sites in the Pacific (Carrell, 1991). Remote sensing surveys comprise the bulk of the remaining 'research' into UCH sites; although, these surveys were mostly driven by regulatory needs for harbour improvement and do not necessarily reflect a research-driven framework (Burns, 2008a; Burns, 2008b; Lord and Plank, 2003; Miculka *et al*., 1984; Miculka *et al*., 1983; Pacific Basin Environmental Consultants, 1985; Thomas and Price, 1980).

The largest research project to date has been undertaken by researchers from Flinders University, South Australia, and Ships of Exploration and Discovery Research, Inc., a US non-profit organization, during the development of the WWII Maritime Heritage Trail. As a result of the university and non-profit partnership with the HPO and other regulatory bodies on the island, several publications (book, book chapters, articles, theses) and presentations have been produced and presented at academic and public forums. However, there is much more research to be conducted.

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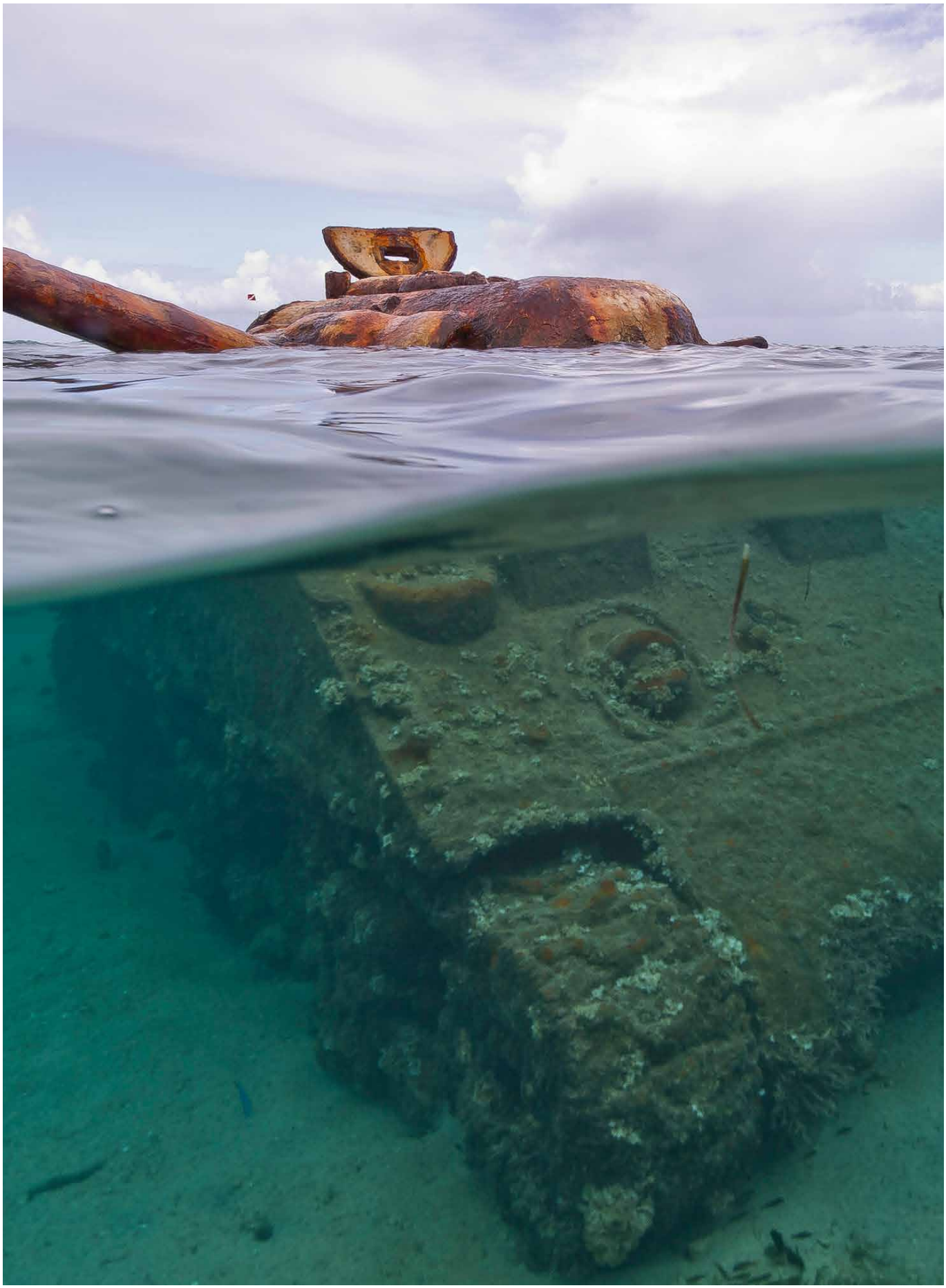
An engine from the Japanese Kawanishi H8K "Emily" flying boat located in Siapan's Tanapag lagoon. National Park Service Photo by Brett Seymour.

Coastal fortification on Tanapang Lagoon, Saipan. National Park Service Photo by Brett Seymour.

A Daihatsu Class Japanese landing craft used by the Special Naval Landing Forces located in Tanapag Lagoon, Saipan. National Park Service Photo by Brett Seymour



One of three partially submerged US M4 Sherman tanks located off Susupe and Chanlan Kanoa beaches in Saipan. National Park Service photo by Brett Seymour.

A diver films a Japanese Navy Aichi E13A "Jake" long-range reconnaissance seaplane located in Tanapag Lagoon, Saipan. National Park Service photo by Brett Seymour.

4. SECOND WORLD WAR UNDERWATER CULTURAL HERITAGE ISSUES IN HAWAII

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GOOD PRACTICE

Maritime Heritage Program and three Rs approach to UXO

NOAA's Office of National Marine Sanctuaries initiated its Maritime Heritage Program in 2002. This programme aims to discover, interpret and protect America's submerged heritage resources. The programme provides training in maritime archaeology based on best practices featuring collaboration with the public in a citizen-scientist model, and it can also designate significant sites as parts of National Marine Sanctuaries. The important WWII site USS Arizona is the focus of an ongoing monitoring programme within the framework of the US National Park System (NPS).

General guidelines on unexploded ordnance (UXO) were promulgated statewide by the US Army Technical Center for Explosives Safety (USATCES). These guidelines recommend the three Rs approach to the public: 'Recognize' – recognize when you may have encountered a munition; 'Retreat' – do not touch, move or disturb it, but carefully leave the area; 'Report' – immediately notify the policy if on land, or the US Coast Guard, if at sea. In case it should be found at sea, the guidelines recommend to provide your boat's position, or if the position is unknown, give the location's 'popular' name, coordinates, or a range and bearing; activity (e.g. fishing) you were conducting and estimated water depth. They further recommend to leave the munition or suspect munition where it is, not to approach, touch, move or disturb it. If a munition is inadvertently brought on board, carefully and gently put it back in the water. Explosives safety education guides addressing different needs (e.g. maritime industry, outdoor recreation and kids) are available online.

Hawaii has a long history of intensive maritime activity beginning with the original discovery some 1,500 years ago or more by Polynesian voyagers followed by sandalwood and whaling enterprises, inter-island commerce on schooners and plantation era steam ships, and military activities. And yet, despite this activity, Hawaii possesses few natural harbours or safe anchorages, and therefore possesses large potential for UCH. The majority of UCH sites consist of submerged aquaculture sites (stone fish ponds and fishing sites), commercial inter-island sailing and steam vessels (plantation era), and military vessels (ships, submarines and aircraft). The UCH cultural landscape in Hawaii also includes submerged stone structures such as the Hawaiian heiau (temples), ko'a (fishing structures), navigational aids, pier and wire rope landings, anchorages, communication cables and so on. With the high energy marine environment dominant in the central north Pacific Ocean, many shallow water sites in Hawaii are broken and scattered, and sometimes difficult to access due to rough water. Deep water sites tend to be relatively intact.

Maritime archaeology provides the tools for the systematic interpretation of these cultural properties, revealing the skills of the shipwrights and the evolution of nautical technology, as well as patterns of cargo and trade; and details of seafaring life. The UCH field, however, is much more interrelated and intertwined with multiple issues in the marine environment than just the evaluation of individual wreck sites. The following discussion explores some of these connections in Hawaii.

Tourism and Second World War-related underwater cultural heritage in Hawaii

Pearl Harbor, Hawaii, is home to the wreck site of the battleship USS *Arizona,* sunk during the 7 December 1941 attack with the loss of 1,177 casualties. Today the *Arizona* visitor centre, run by the US National Park Service (NPS), draws more than 1.8 million visitors each year, but no public diving is allowed. The *Arizona* is the focus of an ongoing maritime archaeology site deterioration monitoring program, led by the NPS Submerged Resources Center. This ongoing study is providing data on WWII site deterioration and impacts to the immediate environment. Management practices dictate that diving archaeologists do not penetrate the wreck out of respect for the site's war grave status. The NPS Submerged Resources Center, based in Denver Colorado, provides all maritime archaeology expertise for the wrecks of the USS *Arizona* and the USS *Utah* in Pearl Harbor (part of the WWII Valor in the Pacific National Monument), as well as the other national parks throughout the NPS system.

Intensive naval aviation training activities took place in Hawaii during WWII. Over 1,485 naval aircraft have sunk in the vicinity of the Hawaiian archipelago and dozens of these have been located. Many of these crash sites may also be war graves and UXO may be present. Identifying these aircraft has become a popular pursuit for local sport and technical divers, particularly as diving technology has advanced, allowing the public to access deeper sites. Multiple landing craft and amphibious assault vehicles were also lost during intensive amphibious training operations near Hawaiian beaches during the war, and many of these are known dive sites as well. Establishing a trusting relationship with dive shops and local divers has led to collaboration in identifying many of these sites.

NOAA's Office of National Marine Sanctuaries (ONMS) initiated its Maritime Heritage Program in 2002, aiming to discover, interpret and protect America's submerged heritage resources. Maritime Heritage Program staff teach introductory courses in maritime archaeology aimed at recreational public divers. The curriculum, designed by the Nautical Archaeology Society (NAS) in the United Kingdom, provides an international training standard in the theory and practice of maritime archaeology and is an example of best management practices featuring collaboration with the public in a 'citizen-scientist' model.

Figure 4-1. USS *Arizona* lies beneath the memorial at Pearl Harbor. National Park Service

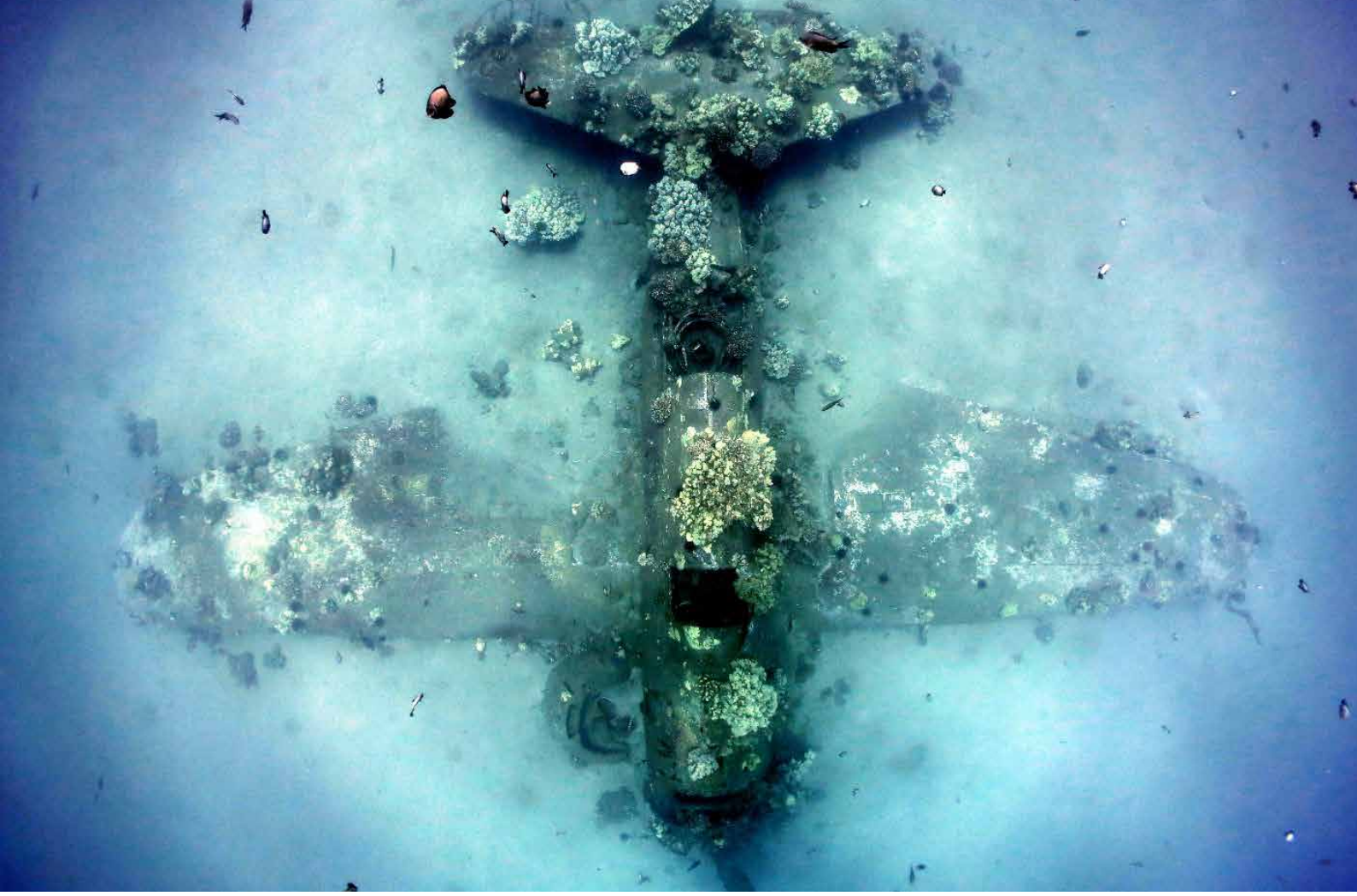

Figure 4-2. SB2C-1 Helldiver aircraft, ditched during combat training in August 1944. The site is now a tourist destination. ©NOAA ONMS

The Maritime Heritage Program is also considering eight WWII landing craft/aircraft sites near the island of Maui as a possible WWII Maritime Heritage Trail. These sites have been surveyed and inventoried, and are in the process of being evaluated for suitability as part of an enhanced national marine sanctuary. Shipwreck trails provide interpretative materials and coordination among participating diving operations, and have the advantage of being relatively simple to implement, though they may lack the greater capacity for hands-on engagement found in some larger underwater archaeological parks.

Although the US is not a signatory to the UNESCO 2001 Convention on the Protection of the Underwater Cultural Heritage, NOAA's Office of National Marine Sanctuaries supports the Convention's Annex rules as a working set of best management practices. The Annex describes practical guidelines for all activities aimed toward underwater cultural heritage, including guidance on *in situ* preservation, research design, environmental impacts, required expertise, funding, conservation, curation and publication.

The Papahānaumokuākea Marine National Monument, encompassing low Pacific atolls across the northwestern Hawaiian Islands, is today a World Heritage Site of combined natural and cultural heritage values. Remote Midway Atoll is part of the Monument. The atoll served as a naval air station and submarine base during WWII, and there have been a number of recent discoveries of WWII-related UCH. The Monument has plans for Midway Atoll to become the entry point to the area for the public.

With the exceptions of the USS *Arizona* and some sport diver interest in identifying submerged WWII wrecks, Hawaii is actually not very well known as a tourist destination for WWII-related UCH. Other vessels sunk as artificial reefs, along with the

natural ecosystem features, are the predominant diving locations due to easier accessibility. The vast majority of WWII heritage tourism is land-based. Connecting land heritage to UCH sites is therefore an important challenge to best manage the resources.

Figure 4-3. Seaplane in murky water. Sometimes significant WWII-related UCH sites do not possess the environmental qualities needed for a popular recreational location. ©NOAA ONMS

Submerged military properties in Hawaii are protected by the Sunken Military Craft Act 2004 (SMCA). The US Navy's UCH resource managers reside at the Washington DC Naval Yard, under the Naval History and Heritage Command. Damaging or looting sunken military craft sites is strictly prohibited, but diving such sites in a non-invasive manner is permissible. NOAA and the Department of the Navy have recently entered into an interagency agreement providing for coordinated site research and management.[5]

Some sport divers in Hawaii remain unaware of the federal laws which protect sunken military craft and some looting has occurred. Enhancing UCH protection through community awareness (dive shops, clubs etc) is one approach. Establishing clear preservation regulations and addressing enforcement remains critical to management. The diving operations which do take tourist divers to submerged aircraft sites provide general briefings on prohibited activities.

Unexploded ordnance in Hawaii

UXO in the ocean, either lost on sunken vessels or aircraft or intentionally dropped during training exercises or disposed as obsolete material, is an important issue in the Hawaiian Islands. Snorkellers and divers have found UXO in near shore settings, including 50-calibre ammunition, mortar rounds, and other types of ordnance. Some sites are commonly known locally for the presence of UXO (e.g. 'Ordnance Reef').

Research diving agencies such as NOAA have established internal regulations for NOAA divers requiring safety buffer zones around UXO when they are discovered underwater. The US Army Technical Center for Explosives Safety's general guidelines recommend the three Rs approach to the public: 'Recognize (recognize when you may have encountered a munition), Retreat (do not touch, move or disturb it, but carefully leave the area) and Report (immediately notify the police if on land, or the US Coast Guard, if at sea)'. Notification of the property owner, appropriate resource management agency and Hawaii State Department of Land and Natural Resources is recommended.[6]

[5] Draft EIS/Management Plan for Hawaiian Islands Humpback Whale National Marine Sanctuary ('Maritime Heritage Action Plan') http://hawaiihumpbackwhale.noaa.gov/management/mpr_documents.html

[6] Defense Ammunition Center USATCES Explosives Safety Guide for Hawaii.

Figure 4-4. Unexploded battleship shells, disposed at sea, litter the sea floor. ©NOAA ONMS

Figure 4-5. Amphibious vehicles (Amtrac) exercise, Maui 1944. Beaches around the islands were once used for intensive training during WWII. ©US National Archives

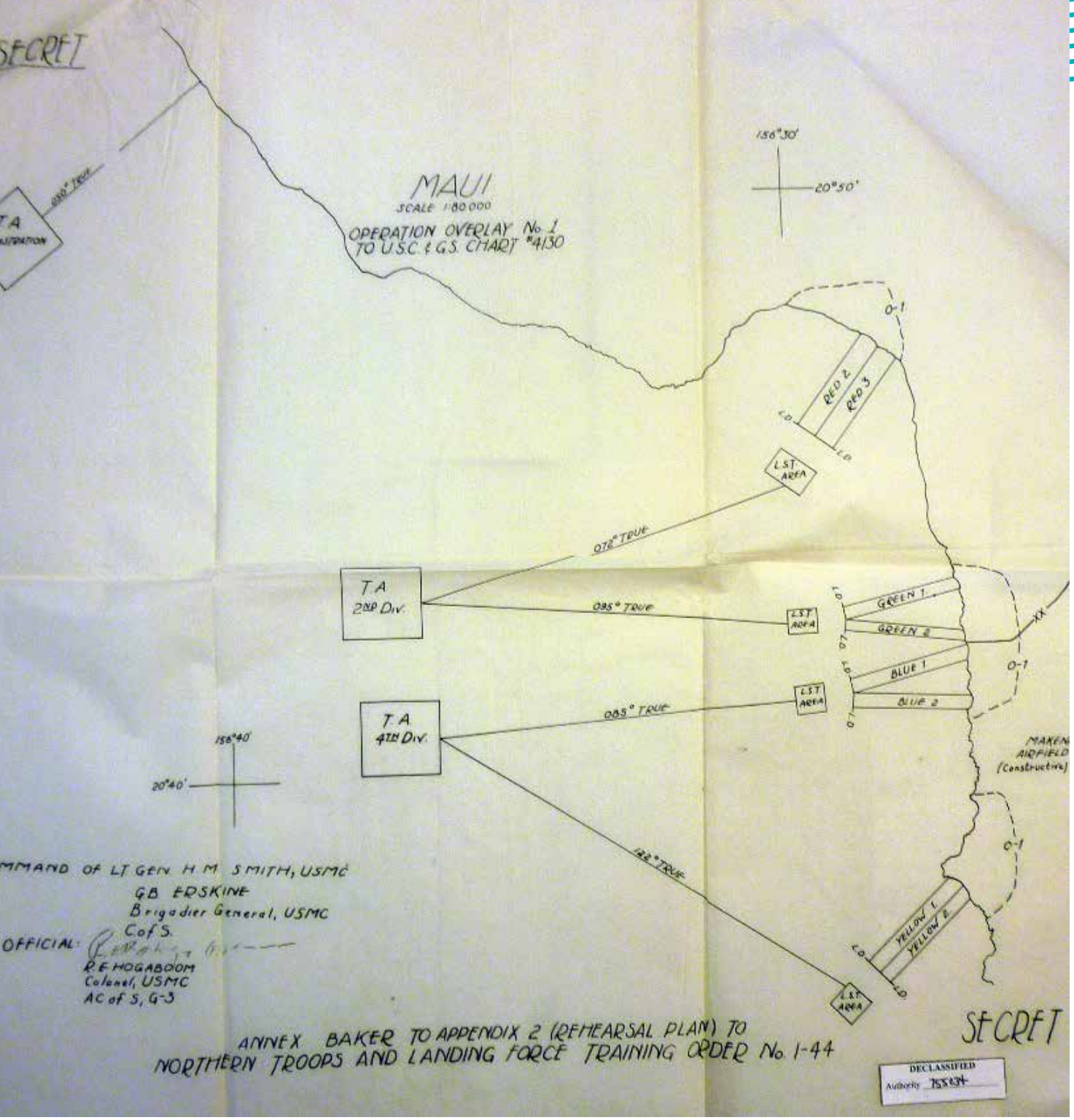

Figure 4-6. Maui amphibious training map (1944), showing the deployment and assault lanes for the training exercise. These are the areas where UCH, and UXO, can sometimes be found. ©US National Archives

Human remains repatriation

Recovery and identification of the remains of US servicemen falls to the Defense Prisoner of War (POW)/Missing in Action (MIA) Accounting Agency (DPAA) (formerly Joint POW/MIA Accounting Command) at Joint Base Pearl Harbor Hickam on the island of O'ahu. DPAA's mission includes fulfilling its national obligation to maximizing the number of missing personnel accounted for while providing timely, accurate information to their families.

Human remains, particularly native Hawaiian remains, have a special significance in Hawaii. The North American Graves Repatriation Act (NAGPRA) regulates the return of human remains to the native communities from which they originated. In Hawaii, Hui Malama I Na Kupuna O Hawaii Nei ('Group Caring for the Ancestors of Hawaii') and Office of Hawaiian Affairs (OHA) are two groups which may receive iwi kūpuna (ancestral remains). The state government has established five island burial councils, which play a crucial role in the care of iwi kūpuna found in native Hawaiian burial sites. Island burial council members meet on a monthly basis to:

- determine whether previously identified native Hawaiian burial sites will be preserved in place or relocated.
- assist the Department of Land and Natural Resources (DLNR) and its State Historic Preservation Division in developing an inventory of native Hawaiian burial sites.
- make recommendations regarding appropriate management, treatment, and protection of native Hawaiian burial sites, and on any other matters related to native Hawaiian burial sites.

It is the practice of UCH resource management agencies such as the NPS and NOAA to avoid undue disturbance to human remains on UCH sites (UNESCO Convention Annex rule #5), and not distribute or otherwise publicize images of human remains. Acting with 'due proper respect' towards human remains is an important protocol and considered carefully on a case-by-case basis. Though the regulations governing UCH generally do not offer clear guidance with respect to human remains found at UCH sites, specific projects have defined some procedures for the archaeological recovery of human remains. NOAA, together with the US Army's Central Identification Lab Hawaii (CILHI), established specific best management practices during the recovery of materials from the USS *Monitor* site (Hershey, 2012).

Research and WWII-related UCH

The NPS and NOAA are two resource management agencies which have supported UCH research in Hawaii for years, focusing on marine areas of national parks and national marine sanctuaries respectively, as well as specific projects in other state and federal waters. Additionally, the University of Hawaii Marine Option Program and the University's Hawaii Undersea Research Lab have conducted numerous shallow water and deep water maritime archaeology projects. Resource management, education and research make up the template for UCH efforts in the state. The majority of research activities have been conducted as joint UCH management/education projects between NOAA's Office of National Marine Sanctuaries and the University of Hawaii (UH). Basing UCH management and research strongly in education allows site inventory work and UCH capacity-building to be achieved simultaneously.

The UH Marine Option Program provides hands-on marine education experiences for undergraduate students from any field of study, operating across the ten-campus university system. The Program's maritime archaeology component was initiated in 1987 as a local maritime archaeology symposium. In 1996 the university launched a larger graduate certificate program (minor degree) in maritime archaeology and history, led by an instructor trained at East Carolina University's Maritime Studies Program. The certificate program ended in 2002, but the maritime archaeology initiative at UH continues today as a two-week diving field survey class for university students taught by a NOAA maritime archaeology instructor. This NOAA/UH partnership continues inventory work

throughout the main Hawaiian Islands (19 site projects conducted to date), and supports the annual Symposium on the Maritime Archaeology and History of Hawaii and the Pacific, now in its 27th year[7]. In 2014, NOAA and UH hosted the Second Asia Pacific Regional Conference on Underwater Cultural Heritage (APCONF) in Honolulu. Providing public and professional venues highlighting UCH is an important part of enhancing local voluntary preservation efforts, and creating a working relationship with local divers.

Deep water UCH survey is often prohibitively expensive but a collaborative and interdisciplinary approach can often reveal opportunities to add a UCH component to other compatible research plans. The UH Undersea Research Lab, with two three-person submersibles Pisces IV and Pisces V (rated to 2,000 m depth), must conduct annual test and training dives prior to each season of research. During these test dives, HURL pilots 'economically' survey deep ocean aircraft, landing ships, and even Japanese WWII submarines, and share these opportunities with NOAA's Maritime Heritage Program, which assists in archaeological interpretation and in publicizing these discoveries. The test dives and opportunistic surveys are compatible. In a similar fashion, side scan and multibeam data gathered on seafloor mapping missions can be equally of interest to archaeologists. Best management practices should include multidiscipline collaboration to make maximum use of limited funding.

[7] Symposium series abstracts may be found at http://www.mahhi.org/previous_abstracts.html.

Figure 4-7. LVT-4 personnel carrier, lost near Maui, being documented by University of Hawaii students. ©NOAA ONMS

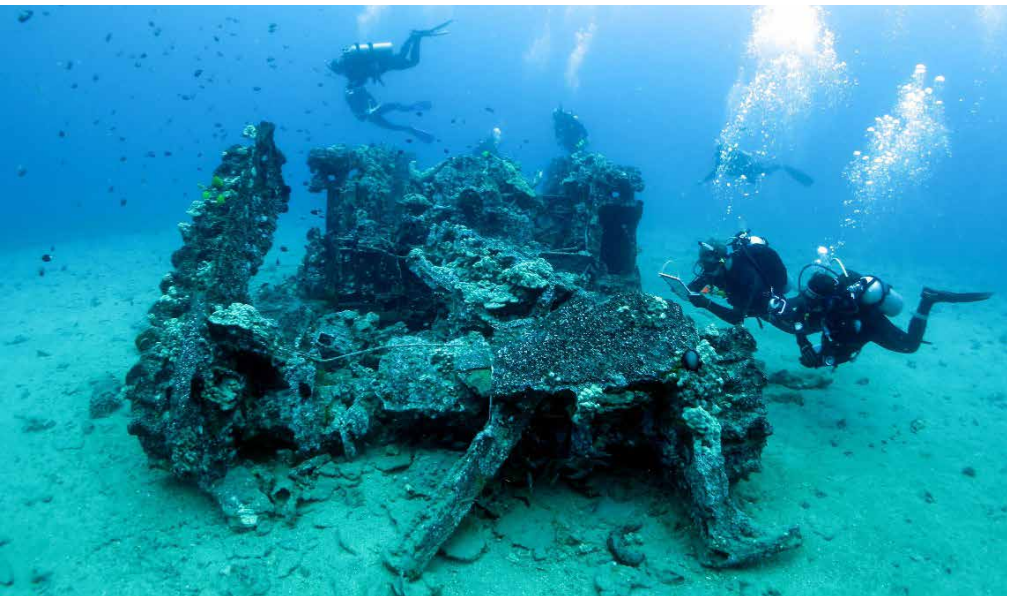

Figure 4-8. LVT(A)-4 armoured assault vehicle, lost near Maui, being documented by University of Hawaii students. ©NOAA ONMS

Figure 4-9. PBY-5 flying boat, strafed and sunk on 7 December 1941, Kaneohe Naval Air Station (now Marine Corps Base Kaneohe). ©UH Marine Option Program

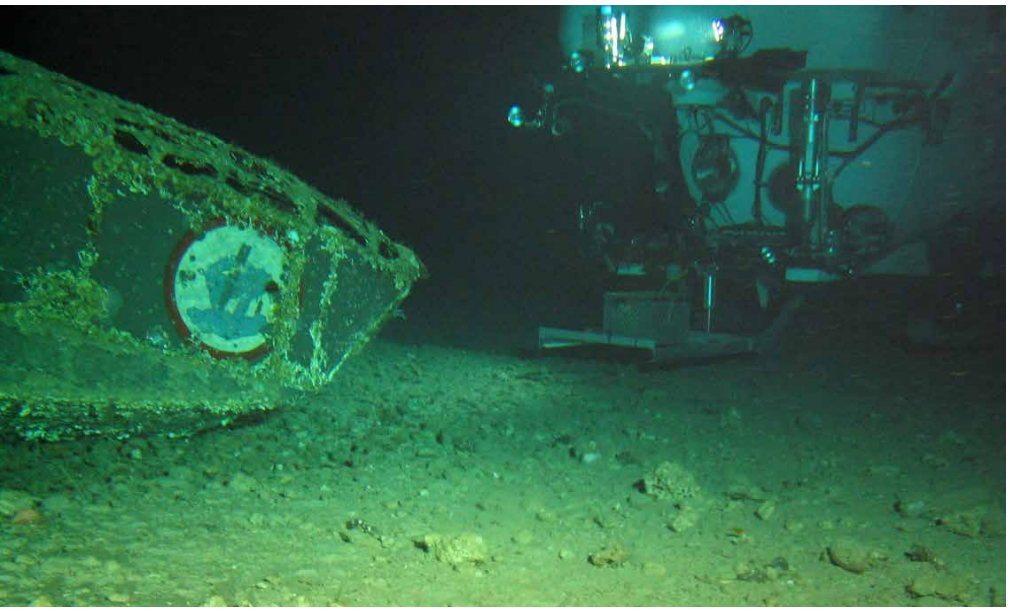

Figure 4-10. Seaplanes from the 1930s discovered by the UH Undersea Research Laboratory (HURL) submersibles. ©HURL

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5. SUBMERGED SECOND WORLD WAR SITES IN CHUUK, GUAM, POHNPEI AND YAP

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GOOD PRACTICE

Taking a locally inclusive approach to the development of bilateral and multilateral agreements to cooperatively manage UCH sites

It is important to recognize that not every Pacific nation or nation state, or even individual island, will view the WWII shipwrecks as UCH having the same values or significance. It can depend on a number of issues, such as the level of impact of the war on local people and their islands, the continued impact of foreign interests, and the local political and social environments. It is also well known that communities with limited resources can have less regard for preserving heritage sites as they struggle to survive, and particularly when their own indigenous cultural heritage has been destroyed and/or is being marginalized. It is therefore important to take a locally inclusive approach to the management of sites, and to manage them in context with the broader cultural heritage of the nation/state/islands. The natural heritage of the sites should also be included as an important attribute in the value of the sites. Local people are the most important site managers, and they should be supported by foreigners or those with a vested interest. The UCH sites in Chuuk are in need of cooperative management, involving the Governments of Japan, US, Chuuk and the FSM, in a similar manner to that used in managing the seventeenth and eighteenth century Dutch shipwrecks in Australia, through the Australian and Netherlands Committee on Old Dutch Shipwrecks (ANCODS).

Introduction

This chapter is primarily focused on the submerged WWII sites in Chuuk Lagoon (formerly Truk Lagoon), which represents the largest number of sites in Micronesia (in addition to those in Palau). Other significant sites in Micronesia including Pohnpei, Yap and Guam are addressed briefly.

The main objective of this chapter is to consolidate the current knowledge of the submerged WWII sites in Chuuk Lagoon, taking into account some 'new' sites that have been investigated, and others that are alluded to in historic documents. A number of submerged WWII sites have also been investigated in regard to their condition and corrosion, and their health as artificial reefs. Another issue that raises questions about the future of the sites is the oil that has been leaking from some of them. Oil and gasoline have leaked from the ships since the day they were sunk. Evidence from modern shipwrecks and faulty oil wells in other parts of the world show considerable ecological damage, bringing into sharp focus the possible consequences of oil leaking in Chuuk Lagoon.

Pohnpei and Yap

The Pohnpei and Yap sites both had Japanese bases and airstrips and were regularly bombed by US aircraft (Pohnpei by naval bombardment as well), but do not contain significant shipwrecks that are sought after by divers. Some Japanese aircraft remains can be found on both islands, and a number of aircraft are known to exist in deep water off the Yapese reef flat but are not regularly dived. In Ulithi Atoll, an outer island of Yap, the remains of USS *Mississinewa* can be found. The vessel was carrying 3.78 million gallons of oil when the Japanese sank it on 20 November 1944. In April 2001, sport divers located the shipwreck and shortly after oil began to leak into the lagoon. From January to March 2003, the US Navy recovered 1.95 million gallons from the vessel. The oil was sent to Singapore, where it was sold and reused. The shipwreck is located in 30–40 m of water and it is unknown if it continues to be visited by sport divers.

Guam

The island of Guam saw considerable action during the war and contains a number of WWII-related UCH. It is also the only place in Micronesia that contains the WWI shipwreck, SMS *Cormoran*, a German raider that was scuttled by its crew on 7 April 1917 after spending nearly three years interned by the US Government (Ward, 1970). It lays adjacent to and in contact with a Japanese WWII shipwreck *Tokai Maru*.

Site databases and surveys of Guam's UCH, and in particular WWII-related UCH, have been carried out by the US NPS Submerged Resources Center from 1983 until 1989 (Carrell, 1991; Jeffery and Moran, 2007; Jeffery and Drew, 2007). In the desktop survey conducted in 2007, a total of 118 UCH sites were identified by Jeffery and Moran (2007) and these sites have been added to Guam's Historical Preservation Office (HPO) GIS database of all Guam's cultural heritage sites. A total of 24 UCH sites were identified from WWI and WWII. The Japanese WWII shipwrecks *Tokai Maru* and *Aratama Maru*; the WWI ship SMS *Cormoran*, an American Amtrac, and a Japanese midget submarine (on display at the NPS War in the Pacific National Historic Park Guam Visitor Center) are listed on the US National Register of Historic Places.

The desktop and site investigations of 2007 acted as a catalyst for the implementation of four maritime archaeology field schools funded by the Guam Preservation Trust (GPT) from 2009 to 2012, in which a number of WWII-related UCH were surveyed, with one outcome being the US National Register listing of the Amtrac (Jeffery, 2012). Surveys included other shipwrecks, aircraft remains and areas of dumped materials such as the 'Seabee Junkyard'. This latter site spreads over an area of 1 hectares in 12 m of water in Apra Harbor and includes tractors, an Amtrac, pontoon outboard propulsion units, vehicles, large pipes and construction materials. It is a very popular recreational dive site that can be dived under many weather conditions and a number of historical, site and management issues have been discussed for this site by Jeffery and Applegate Palmer (2017). The 'Seabee Junkyard' is one of many sites that have come about from dumping of war materials, including the dumping of munitions, of which some are very popular dive sites. Anecdotal information suggests a large quantity of munitions have been recovered from the sea, including phosphorus bombs. According to Eyerman (1945), Guam became 'the greatest forward port area in the world ten months after its reoccupation' and when it came time to demobilize, the large quantity of machinery and munitions gathered in Guam were dumped at sea.

With the significant economic benefit that is reported to be gained by the scuba diving industry in Guam – over US$56 million in 2015 is attributed to the scuba diving tourism industry (P. Laguaña, personal communication, 2017)[8]– there would seem a need to secure the management and promotion of the value of WWII-related UCH sites in Guam. The GPT continues to financially support maritime archaeology through the implementation of capacity building programs, which provides a significant link to the Guam community. This is complemented with the

[8] Pilar Laguaña, Director of Global Marketing, Guam Visitors Bureau

employment of an Assistant Professor to teach maritime archaeology at the University of Guam from 2015. However, current legislation does not encourage protection of sites but rather financial reward for those who recover historical objects '…provide[s] for the fair compensation to the permittee in terms of a percentage of the reasonable cash value of the objects recovered or a fair share of the objects recovered…'.[9] This needs to change so that all Guam's UCH is seen as cultural heritage material to be protected and promoted for the benefit of all of the Guam community.

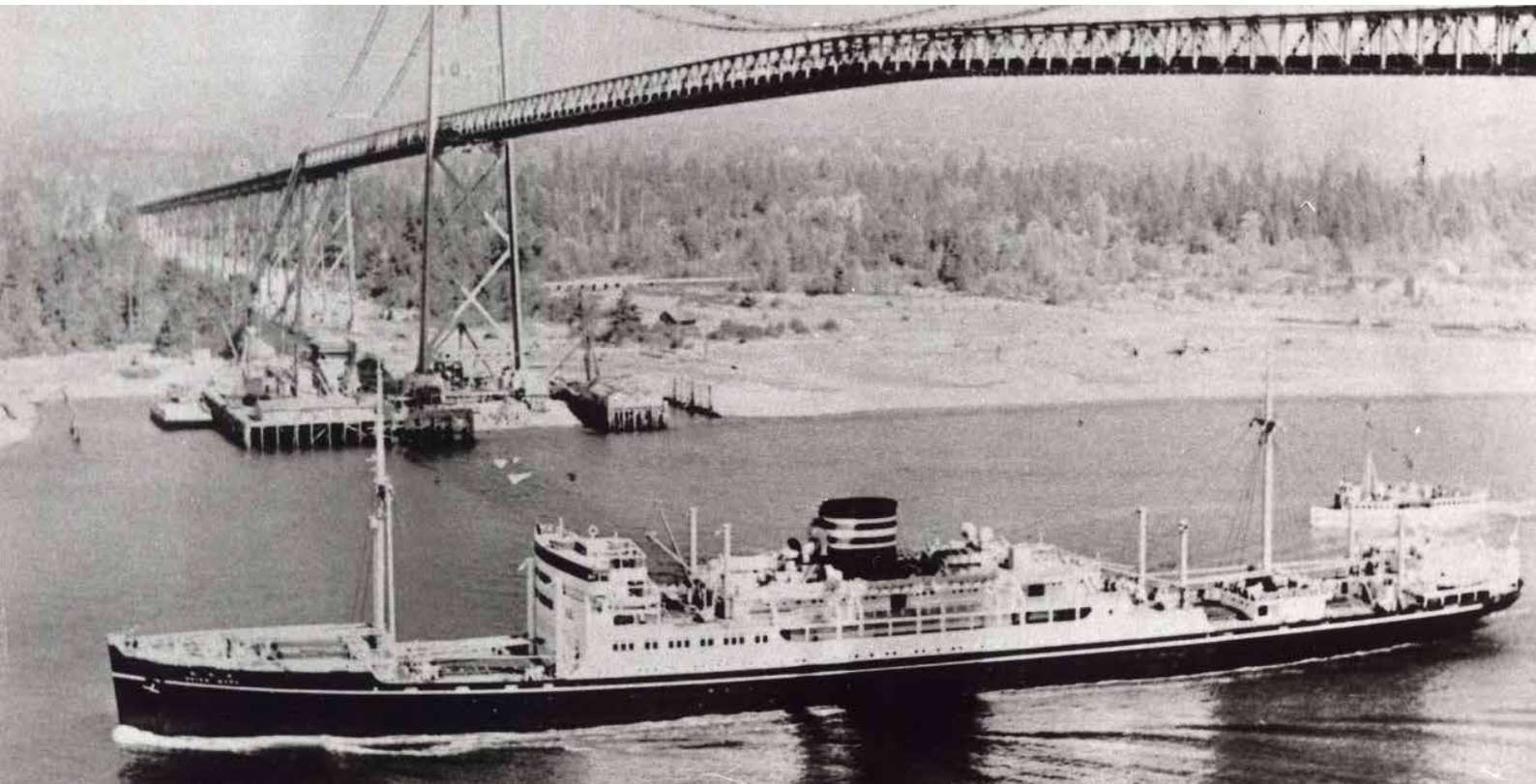
Chuuk Lagoon

Chuuk Lagoon is well known amongst shipwreck diving enthusiasts, Japanese war survivors, and US military historians. The 50+ shipwrecks, many retaining considerable integrity, located in a lagoon of warm, clear water have become a diver's paradise and are advertised as such through numerous websites, publications and films. They are also the final resting place for about 4,000 Japanese war dead. The shipwrecks also contain many munitions, including torpedoes, sea mines, thousands of small calibre ammunition, and many larger calibre artillery shells of various size. To the US, the shipwrecks are important historic sites associated with the US pushing back the Japanese military on their way to finalizing the War in the Pacific in 1945. They are a major economic resource to many Chuukese through dive tourism, dynamite fishing and artefact souveniring which causes much conflict in UCH management. These conflicts are a result of the different cultural values and uses of the sites in addition to past colonialism and neo colonialism issues (Jeffery, 2007).

Although the Chuuk State of Federated States of Micronesia (FSM) has specific legislation to protect and manage submerged WWII sites since 1971, and additional support from the US NPS Historic Preservation Fund, site management has not been effective. This is not surprising given the ever-changing issues associated with the sites but it is indicative of how site management should be more dynamic and capable. Some suggestions on how this could be implemented are summarized in the conclusion.

[9] *21 GCA Real Property: Chapter 76 Historical Objects and Sites, Section 76306.*

Figure 5-1. The largest vessel sunk in Chuuk Lagoon, the 11,600-ton *Heian Maru* was drafted from NYK line, shown here passing under the Lions Gate Bridge, Vancouver in 1930. ©Captain Nozaki, NYK Museum



During WWII, Chuuk was a strategic advance base for supplying Japanese ships, aircraft, stores and military personnel for the Japanese south-east expansion as well as a major communication centre for the region.[10] It was a vital base outside of the Japanese homeland and the US Navy considered Chuuk the 'strongest naval base in the Pacific with the exception of Pearl Harbor' (United States Strategic Bombing Survey (USSBS), 1947).

On 17–18 February 1944, the US attacked Chuuk with aircraft launched from a fleet of four carriers. Supported by about 70 ships, they sank over 50 Japanese ships, destroyed over 300 aircraft and many of the land military facilities including five airfields. A total of 1,250 aircraft attacks were flown, followed on 30 April and 1 May 1944 with a further 2,200 aircraft attacks from the same naval fleet (Carrell, 1991; USSBS, 1947). In conjunction with the continual bombing of the base from B-24 and B-29 aircraft with over 6,000 tons of bombs, the Chuuk base was taken out of the war, without any amphibious assault and major loss of American life. As a comparison, the Japanese attack on Pearl Harbor launched over 350 aircraft which sank or damaged 21 vessels, destroying 75 per cent of US aircraft, and killing over 2,500 Americans. The US promoted the bombing of Chuuk as a payback for the Japanese bombing of Pearl Harbor[11]. The US air raids killed and injured over 5,000 Japanese (about 4,000 in the ships) and 123 Chuukese, although more than 1,000 Chuukese were killed during the war (Denfeld, 1980). The US considered dropping the atomic bomb on the Japanese fleet in Chuuk but decided against it when conventional warfare was found to have been successful (Delgado *et al*., 1991; Stewart, 1989).

Many of the ships sunk in Chuuk were merchant ships. The naval vessels, including the 62,000-ton battleship *Musashi,* were aware that an attack was imminent and departed on 10 February 1944. Chuuk was one of the three main bases used by the merchant marine to supply materials and personnel during the war. The loss of 266,083 tons of merchant marine ships in February 1944 was the second greatest monthly loss during the entire war, virtually cutting off the access of personnel and equipment to other parts of Micronesia, the Solomon Islands and Rabaul in New Guinea (Parillo, 1993). Morison (1975) who compiled the official history of the US Navy in WWII stated that 'the strike on Truk demonstrated a virtual revolution in naval warfare; the aircraft carrier emerged as the capital ship of the future, with unlimited potentialities'.

The WWII shipwrecks and aircraft located in Chuuk Lagoon are not unique. Over 3,000 Japanese Navy and merchant ships (10,583,755 tons) were sunk during WWII and the majority are scattered throughout the Pacific (United States Joint Army-Navy Assessment Committee (JANAC), 1947). The terrestrial WWII sites are also not unique. The Marshall Islands, Pohnpei, Palau and others have terrestrial sites related to WWII. What is distinctive about the underwater and terrestrial sites in Chuuk is their exceptional quantity and quality. Denfield (1980) found that Chuuk 'has *in situ* as many guns as all of Europe' and prominent cinematographer Al Giddings (in Lindemann, 1982) stated that the Chuuk Lagoon shipwrecks are 'one of the great undersea wonders of the world'.

What contributes to the value of the Chuuk Lagoon shipwreck sites is that they are located in an environment that has provided them with considerable natural protection and made them easily accessible to divers. When diving the shipwrecks, the nature of the remaining material and the damage inflicted from the US bombing is evident and one can gain a strong sense of what happened when the ships were sunk. It is possible to envision the massive explosions that caused them to sink, and to examine what material the Japanese needed and carried on-board. There is no more dramatic way to appreciate the power, devastation and tragic nature of war than viewing these shipwrecks and there are probably no other sites on land or underwater anywhere else that can do this. In addition, the rich and diverse (and potentially unique) marine flora and fauna adds to the great appeal as an underwater spectacle. These values caused the author to investigate whether they meet the criteria for World Heritage Site listing (Jeffery, 2004).

[10] Chuuk is located about 3,700 km south-east of Tokyo and about 4,000 km north of Sydney.

[11] *Naval Aviation News,* October 1, 1945: 10

Figure 5-2. The 7,000-ton aircraft transport vessel *Fujikawa Maru*. © Greg Adams 2002

The war was a terrible time for Chuukese. They were forced out of their homes, away from the land and islands and pressed into working for the Japanese war effort. They suffered the greatest loss of life in the Caroline Islands from the almost daily bombing (Poyer *et al*., 2001). Turner and Falgout (2002) concluded 'Those who experienced the intense suffering during the Japanese military build-up and the American campaign describe it as the greatest hardship they ever endured'. Similarly, Poyer *et al*. (2001) found that 'WWII in Micronesia meant, in short, both terrible suffering and momentous change. Nothing would ever be the same again'. Chuuk has been home to indigenous people for about 2,000 years. Traditions, customs, cultural practices, the extended family, land, food, magic and folklore are very important aspects of Chuukese life (Ashby, 1985; Gladwin and Sarason, 1953; Hezel, 1992; King and Parker, 1984). For Chuukese, traditional sites and intangible heritage are more important than most WWII sites, although the terrible suffering associated with terrestrial WWII sites can invoke a 'sense of belonging' to these sites. This has caused conflict in the management of the submerged WWII sites. To some Chuukese involved in the tourism industry, they are regarded as a valuable tourism resource, but in terms of significant sites in their history, they play a minor role, if any at all, to most Chuukese. The sites are also dynamite fished and are a source of souvenirs; in other words they are a valuable economic resource. Arimichy Rudolph, a Chuukese colleague from Chuuk Historic Preservation Office (HPO), explained that the submerged WWII sites 'tell us about the bad time in the history of Chuuk' and the terrestrial WWII sites are significant 'because they tell about the hardship our parents went through at that time' (Jeffery, 2007). This is an interesting distinction between the two types of WWII sites, the terrestrial sites have a more personal, family connection and therefore providing a 'sense of belonging' for many Chuukese.

Figure 5-3. Artefacts collected and stacked in *Shinkoku Maru* in 1978. ©Colin Hodson

Figure 5-4. Artefacts collected and stacked in the same area in *Shinkoku Maru* in 2000. ©Colin Hodson

The Japanese also have a different view of the sites; they regard them as 'war graves', and a 'continual source of national sorrow' since the shipwrecks are 'open war graves' (Bailey, 2000). Japanese groups have recovered some human remains but some still exist on the shipwreck sites. Although the Japanese Government acknowledge that the shipwreck tourism industry is a valuable source of revenue for Chuuk, many Japanese are not happy with it. Some believe that there is still the need for 'end of war processes' such as the recovery of personal effects and human remains, the 'holding of services, consoling of souls and the need to promote recovery'.[12] A number of Japanese war veterans and younger folk also believe the submerged WWII sites have value in interpreting the futile and tragic nature of war for the benefit of younger Japanese so similar things do not happen in the future (Jeffery, 2007).

To the US the submerged WWII sites are important sites associated with the victory of WWII, and a valuable diving destination. In the nomination for National Historic Landmark (NHL) designation, the significance assessment focused on the historic significance of the Japanese shipwrecks and aircraft, their destruction by the US Navy's carrier fleet and aircraft, and how the 'legendary invulnerable Truk' was destroyed (NPS, 1985). The NHL nomination included a statement about its value to dive tourism, 'the 'underwater fleet' at Truk, festooned with an infinite variety of marine life and containing the honoured remains of the Japanese warriors, is one of the world's underwater wonders' and a 'Mecca for divers worldwide' (NPS, 1985).

[12] From an interview conducted by Mohri, Yachiyo of a war veteran who stated, 'In our Buddhist thought, unless cremating those that die, their spirits lose their way to nirvana so they would be wondering around forever' (Mohri, Yachiyo 2004 personal communication).

Chuuk proclaimed legislation to protect the submerged WWII sites in August 1971. The legislation has been amended three times, the last time in February 2000 when it was incorporated into the Draft Chuuk State Code, Title 25, Maritime and Marine Resources and documented as Chapter 8, Chuuk Lagoon Monument. The law has changed only marginally; it has essentially remained a law prohibiting the removal of artefacts and with a provision that allows for funds to be collected through a mandatory dive guide and the payment of a US$30 (US$50 in 2017) annual fee per diver (Jeffery, 2007). The US Government placed the sites on the National Register of Historic Places in 1976, and declared the sites to be a NHL in 1985, one of 2,300 sites throughout the US and its territories, and one of only two NHL sites in the FSM. The submerged WWII sites have therefore been recognized as significant shipwreck sites at a FSM state and US federal level. In 2002, the submerged WWII sites were given a threatened status by US NPS because of 'significant deterioration, vandalism and looting'.[13]

As previously stated, the conflicts in the uses, values and management of the submerged WWII sites have been explored elsewhere by the author (Jeffery, 2007). In 1989, the US did explore different approaches to management through an investigation into establishing an FSM National Park but this does not appear to have been acted upon (NPS, 1989). Another consideration could be to incorporate the management of the Chuuk Lagoon submerged WWII sites or its Park into the War in the Pacific National Park based in Guam, given its role in managing and interpreting all sites associated with the War in the Pacific. These issues are further discussed in the conclusion, in the light of new developments and research regarding the condition and longevity of many of the known sites.

13 See http://tps.cr.nps.gov/nhl/detail.cfm?ResourceId=1708&ResourceType, Accessed 8 June 2012

Figure 5-5. Photo-mosaic of the bridge face of *Fujikawa Maru* showing the impact of dynamite fishing. This area should be totally covered with corals and sponges but many have been killed by dynamite fishing which also greatly weakens the iron structure and renews corrosion. In 2012, Dianne Strong, a frequent visitor to Chuuk reported that the bridge collapsed in the middle. ©Bill Jeffery 2006

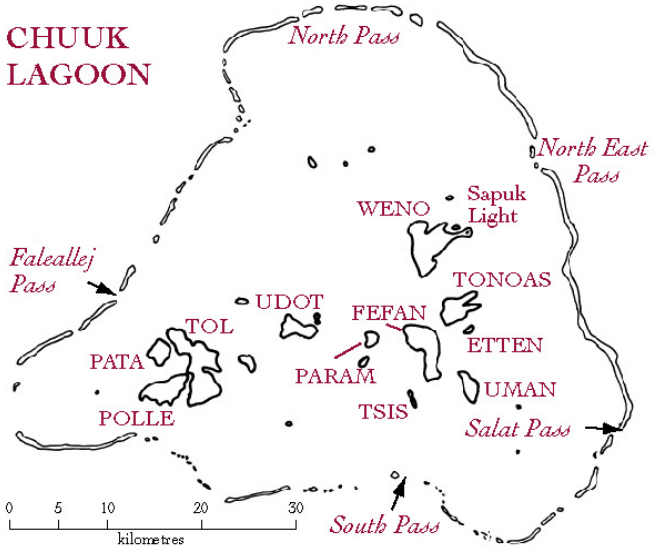


Figure 5-6. Chuuk Lagoon showing some of the major islands and the passages through the barrier reef. ©Judi Francis

Site documentation and surveys

Research carried out by the author (using four primary and four secondary historical sources) and field surveys, in conjunction with additional information obtained from oral histories, produced an up-to-date list of the submerged WWII sites in Chuuk Lagoon (Appendix one) in 2007. A number of new sites, or additional site information are included, namely: the ship *Sapporo Maru,* 'Unknown D' site, No. 47 (comprising four landing craft, vehicle and aircraft remains), Gunboat ('Unknown E' site, No. 48), 'Unknown F' site, No. 49 (unidentified wreckage at 70 m), converted bonito fishing vessel ('Unknown G', No. 50) and *Muraki Maru.*

The discovery of the Sapporo Maru

The discovery of the *Sapporo Maru* and the recovery of the vessel's bell is an example of what can happen with the discovery of a new site in Chuuk. In February 2002, a search for *Sapporo Maru* was conducted in an area of about one square km to the south-west of *Kiyosumi Maru*. Toward the end of the survey, a shipwreck site was found which a diver survey confirmed was the *Sapporo Maru* (Green, 2002).

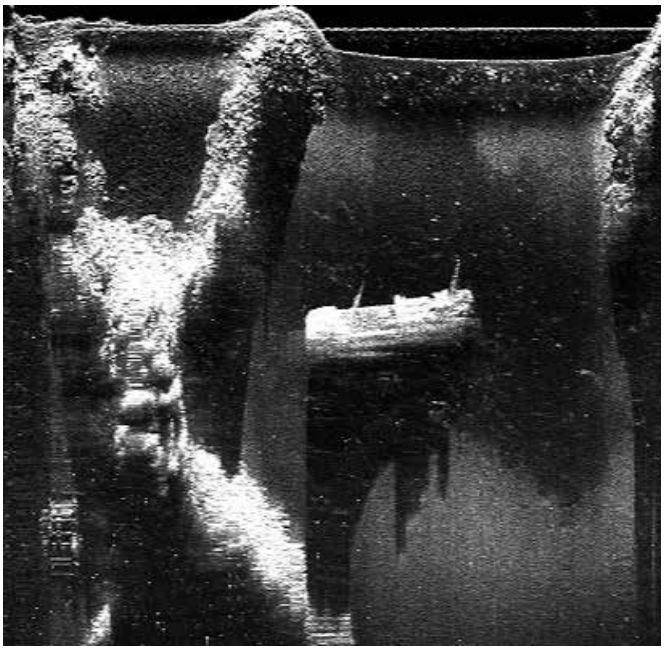


Figure 5-7. *Sapporo Maru* can be seen to the right of middle in this side scan sonar image. The vessel is sitting upright and intact with a slight list to starboard (right). The bow is to the left, forward and stern masts can be seen lying to starboard, and the start of the bridge is clearly evident about half way back along the vessel. The relief of the vessel has caused the seabed to the left of the vessel to be in shadow. Other seabed features (in white) are natural reef. ©Jeremy Green

The vessel was a small ship, 44 m in length, 7.3 m in breadth, 361 tons, built in 1930 as a refrigerated fish carrier, and used by the Japanese Navy as a deep-sea fishing trawler (*Lloyd's Register of Shipping 1940–41)*.

Figure 5-8. *Sapporo Maru* bell ©Dan Bailey, 2004

During a second dive on the site on 19 February with Ansito Walter (Governor of Chuuk), Dan Bailey and others located the ship's bell in its original position on the outside of the bridge. Within 24 hours of this inspection, the bell was taken from its position on the bridge, damaging part of the bridge in the process. Police investigations revealed that a Chuukese dive guide had taken it, but they concluded there was no breach of the law as it was still located (hidden) on the site which was verified by the author during a dive on the site. It was subsequently ascertained that the dive guide took the bell off the bridge to keep it from falling into the hands of a foreign diver and therefore leaving the country. The bell has since been recovered and found its way into a local collection that is planned to be exhibited. The bell reveals the name of the vessel, *Sapporo Maru* and its date of construction.[14]

Chuuk Lagoon's submerged WWII aircraft

From primary and secondary documents, it is believed that 453 Japanese aircraft from WWII were damaged and many could remain in Chuuk today (Jeffery, 2007). Many of the aircraft remains could be located in the lagoon waters, on the islands or outside of the lagoon. It has also been ascertained that 37 American and one to four British aircraft were lost during the fighting (Jeffery, 2007).[15] At the commencement of the author's 2001 survey, seven Japanese aircraft remains were known within the lagoon. While some anecdotal information alluded to a number of other aircraft that might be located in the lagoon, the only site investigated was of a US aircraft which was investigated in association with the Underwater Archaeology Branch of the US Navy Historical Center, in Washington. It was identified it as a Douglas SBD-5 Dauntless.[16]

[14] Mohri, Yachiyo translated the text on the bell, being: 'Sapporo Maru' and 'Shouwa 5 nenn 11 gatsu' (November in the 5th year of Shouwa period. i.e. November, 1930).

[15] A British carrier fleet attacked the base in June 1945, inflicting little damage but serving as training exercise for the new units of the fleet.

[16] Details of this site came from Chuuk State Historic Preservation Officer, David Welle, who as a child used to sit in the cockpit and he described US markings on the fuselage.

Figure 5-9. The bow showing the bowsprit, sponsons on the port side and the bandstand on 'Unknown G' site. ©Bill Jeffery, 2006

Figure 5-10. *Tubastrea micantha* coral © Bill Jeffery, 2006

Corrosion survey

An aim of this survey was to ascertain the current state of corrosion and estimate the longevity of the submerged WWII sites. The primary metal of the sites is iron, steel and/or aluminium. Ferrous metals are highly prone to corrosion in a marine environment and although concretion can build-up to slow down corrosion rates, natural and human related interference can change and accelerate it, leading to structural collapse. This collapse may be a justified part of site management, if based on the values of a site in association with a conservation assessment. This is an ongoing issue under investigation with the USS *Arizona* in Hawaii (Lenihan, 2001). Given the diverse values and issues inherent in some of the submerged WWII sites in Chuuk and throughout the Pacific (war graves, tourism, oil pollution), allowing vessels to collapse as part of their management, needs to be considered comprehensively and critically assessed.

Figure 5-11. Taking corrosion measurements on the hull of *Kensho Maru*. This part of the vessel was in poor condition as can be seen by the corrosion plume that was produced by drilling into the hull. © Bill Jeffery, 2007

Data collected from corrosion surveys can also play a role in technical and scientific research. Surveys have become a standard approach worldwide, in order to understand rates of corrosion and what is influencing site conditions. Through these studies, it is possible to ascertain site stability and longevity – an important issue for diving tourism and protection of the environment from oil leakage. It is unknown how much oil is still trapped in the lagoon sites, or if it has dissipated gradually over the last 60+ years as is suggested by Earle and Giddings (1976). While renewed metal corrosion is visible in areas of dynamite fishing, it is not known to what degree this is accelerating and diminishing the integrity of the ship's structure. Corrosion surveys allow this to be measured and monitored. Coupled with the impacts from infrequent typhoons, the potential collapse of some ships is real and if oil is released in large quantities, it could have a devastating impact on the marine environment.

An initial corrosion survey of ten shipwrecks and four aircraft was conducted by MacLeod in 2002 (MacLeod, 2003; 2005; 2006a; 2006b). The methods used in the survey, the analysis and findings can be found in Macleod's 2003 report. Some of his key findings were:

> Based on this provisional estimate of perforation times, many of the wrecks in Chuuk Lagoon will retain their existing integrity for only the next ten to fifteen years before they begin to undergo significant collapse. This has major implications for the management of the sites and for the safety of divers undertaking penetration dives. Analysis of the corrosion behaviour on the wrecks has shown up irrefutable evidence of the damaging effects of episodic changes to the microenvironment of the wrecks. Such changes are consistent with major microenvironment damage that is consistent with physical impact of either shockwaves from dynamite fishing or from massive tropical storms. The periodic shedding of the protective layers of marine concretion cannot be allowed to continue, since this will inevitably result in an increased rate of decay of the shipwrecks.

The corrosion analysis was achieved through determining the annual corrosion rate of the metals (depth of graphitization of a cast iron object divided by the number of years a vessel had been submerged). This algorithm has a direct relationship with corrosion potential or voltage (relative to a reference electrode) which can be measured from other metals such as wrought iron and steel. Through investigating the thicknesses of various metals found in ship's specifications in *Lloyds Register*, and measuring their corrosion potential, it is possible to determine their corrosion rate. MacLeod (2003) found *Fujikawa Maru* structurally intact and in the best condition in relation to overall corrosion damage compared to the 13 other shipwrecks and aircraft. He also found that the Chuuk submerged WWII sites are 'corroding at 26–30 per cent slower than the open ocean wrecks at the same depth' (MacLeod, 2003).

Earthwatch Institute project 2006–2008

The Earthwatch Institute project implemented a multi-disciplinary investigation of the submerged WWII sites through the involvement of various specialists supported by volunteers from around the world and a renewed and increasing involvement with Chuuk Government agencies, particularly the Department of Marine Resources which is the key agency administering the Chuuk legislation protecting the submerged WWII sites. The project allowed for further collaboration with Ian MacLeod, and initiated collaboration

with a marine ecologist, Maria Beger; marine biologists, Mandy Hengeveld and Mike Emslie; and conservation scientist, Vicki Richards.[17] The project had a number of research questions, but a major aim was to assist the Chuuk Government with information on the tangible values, health and longevity of the sites, all of which would be useful in their management. The Earthwatch (EW) project was also considered some recompense for the help many Chuuk Government and dive shop staff provided in the earlier research that commenced in 2001. The project allowed the investigation of such issues as evidence of leaking oil and the structural integrity of the shipwrecks, which could support the Chuuk Government in soliciting funds and support for remedial work. Maria Beger and Mandy Hengeveld proposed in the EW Project to investigate:

> The coral reef communities, diversity and health in Chuuk, although considered very rich, is poorly documented. For instance, while the expected number of scleractinian corals is 391, only 92 are presently recorded in the IUCN-WCMC database for the Federated States of Micronesia (Spalding *et al.*, 2001). Practically no speci c coral reef data exist. The most recent 'Status of Coral Reefs of the World' report describes Chuuk as the largest exporter of commercial reef sh species, and notes that destructive shing practices with explosives from the shipwrecks have caused reef damage in the lagoon (Wilkinson, 2002). No information about coral reef health or the status of the artificial reefs, the shipwrecks, was presented. By comparing reef communities and diversity on natural reefs with those on the shipwrecks, predictions about colonization processes, human impacts and future marine resource development can be made. Conservation of coral reef communities will be of great benefit to maintain economic values of sites and biophysical function of the ecosystem. There has been no recent survey of the current status and diversity of coral reefs in Chuuk, thus this survey will provide much needed data to local and regional authorities for management.

Marine biologist Sylvia Earle made similar comments on the value of the marine biology and the need for further studies during a 1975 survey of the submerged WWII sites (Earle and Giddings, 1976).

Site surveys commenced in July 2006 and five teams (each containing six EW volunteers and team leaders) implemented biological and corrosion surveys on 11 selected sites (Jeffery, 2007a). Tangible outcomes included the compilation of a marine invertebrate and vertebrate species databases (including a comparison with island reefs and the barrier reef). A total of 266 species from 33 families of reef fishes were recorded and surprisingly two of the shipwrecks, *Kensho Maru* and *Fujikawa Maru,* had the highest density of reef fishes from the ten sites (including three natural reefs) surveyed (Emslie *et al.*, 2007). The reef around the South Pass (channel through the barrier reef) revealed the lowest density of any site surveyed, although it was found this reef had the greatest variety of species. While *Kensho Maru* and *Fujikawa Maru* contained the largest number of reef fish in the transects surveyed, it was found that many species of larger fish normally found in reef communities did not exist on the shipwrecks. This is considered to be a consequence of over-fishing, most likely associated with dynamite fishing practices. Other issues of concern recorded by Emslie (*et al.*, 2007) were the numerous signs of damage from crown-of-thorns starfish (*Acanthaster planci*) to an extent that would be considered 'plague proportions on Australia's Great Barrier Reef', and a number of large *Lobophyllia* colonies that had been damaged, presumably by anchors. Comparative surveys were implemented on the barrier reef in regard to the impact of dynamite fishing in 2006 and 2008 and it was found many areas had been greatly affected and had large areas of dead coral (Mandy Hengeveld, personal communication, 2008).

[17] Jeffery, Berger and MacLeod were Principal Investigators of the Earthwatch project and a number of other maritime archaeologists, marine ecology and conservation specialists were involved in the project who supervised the EW volunteers.

On a more positive note, a rare scleractinian coral, *Acropora pichoni,* was found on *Fujikawa Maru*. Ten individuals were found at depths between 13–20 m which is significantly shallower than its purported depth range. Rare species are not common on artificial reefs and it 'highlights the potential of artificial reef habitat to act as a refuge for rare coral reef species, and also emphasizes the need of protecting the Chuuk wrecks for biodiversity conservation' (Beger and Richards, 2006). An investigation into the relationship of benthic material and metal corrosion on many of the submerged WWII sites, in which the rugosity (the roughness of growth on the concreted metal surfaces) influences corrosion was initiated in 2006 and continued during 2007 and 2008 (MacLeod *et al*., 2007). The increased surface roughness brings about increased water flow or turbulence over the wreck and this increases the flux of dissolved oxygen to the surface and thus the amount of corrosion increases (Emslie *et al*., 2007). During the 2007 fieldwork, MacLeod found the thickness of the concretion on the *Susuki* patrol boat and *Fujikawa Maru* to be significantly less and in combination with more acidic pH values (which reflected localized corrosion rates) concluded the sites had been affected by dynamite fishing, and were 17 per cent and 46 per cent respectively more corroded, since his initial survey in 2002. This work is the first quantification of the impact of dynamite fishing and diving tourism activities, such as tying off on wrecks and concretion damage/souveniring by divers (MacLeod *et al*., 2011). The summary paper also noted that increased corrosion rates observed shortly after dynamite fishing events recover relatively quickly and begin to revert to the long-term values as the damaged areas become once again covered by marine organisms. The work is leading to the development of corrosion and biodynamic interaction models that will further the understanding of the corrosion and longevity of the sites and assist in their future management (Emslie *et al*., 2007; MacLeod *et al*., 2007).

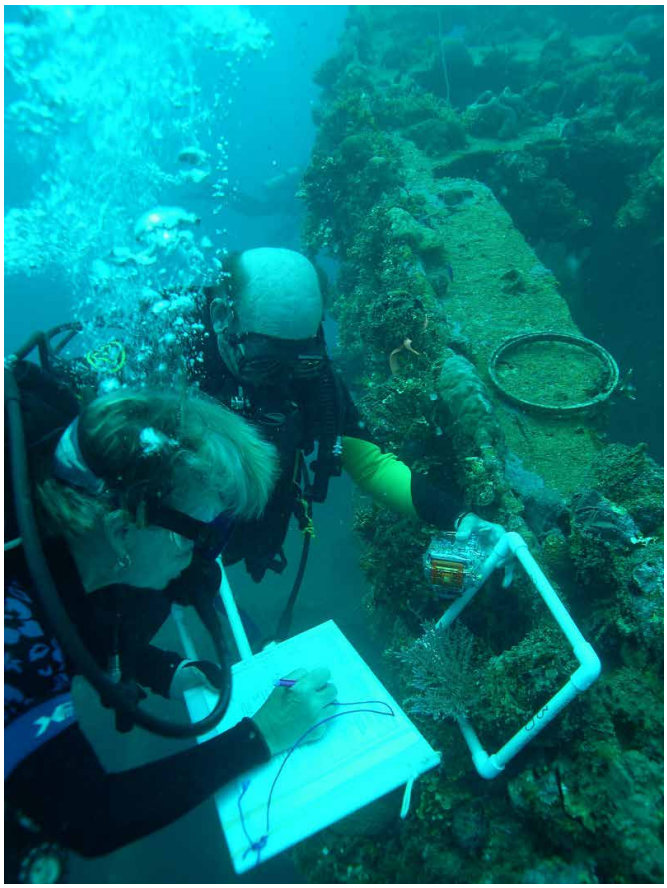


Figure 5-12. EW volunteers recording benthic material within a quadrant on *Kensho Maru*. ©Bill Jeffery 2007

The EW volunteers (the majority being Americans) were very keen to dive the submerged WWII sites, but they knew little about Chuuk, its people, and the many social and political issues they face today. Broadening the context of the sites, from symbols of US victory and unequalled dive destinations, to their social relevance to Chuukese and Japanese people during the war and today, were some of the other objectives of the EW project. From the personal comments received, and the discussions had with some of the EW volunteers, it was felt that this had been partly achieved as shown in the following formal EW feedback from two of the 2007 volunteers:

> I've gained a greater understanding of the people of Chuuk, and reasons for their indifference to the wealth of WWII shipwrecks in their lagoon. I've also gained an appreciation of how difficult it may be to preserve these wrecks, given the fact that the Chuukese in general do not regard

these as a resource or as treasure, but rather as reminders of a painful time during which they were innocent bystanders in a war between superpowers;

and

I have a much greater appreciation for the environmental, social and cultural issues facing Chuuk and the wrecks in Truk Lagoon. It is an extremely complicated issue that will take a multi-dimensional approach to finding a solution. This awareness will allow me to speak more intelligently to others interested in helping be a part of the solution.

The EW project followed a series of maritime archaeology capacity-building training programmes conducted by the author over a number of years in Chuuk with HPO staff from the four FSM states (Pohnpei, Kosrae, Yap and Chuuk). This culminated in an intensive programme in 2006 where the US Historic Preservation Fund provided additional funds to purchase diving, recording (GPS) and photographic equipment for each of the states. This work was enhanced in 2007 when the various specialists involved in the EW project developed an archaeological, ecological and conservation recording package to be used by FSM HPO staff (and volunteers) in recording and monitoring the values and health of underwater cultural heritage sites (Jeffery *et al*., 2007).[18] The package could be used on similar sites anywhere in the world with minor modifications and called 'UCHeck'.

During the 2007 EW field work, an investigation of a site (*Hoyo Maru)* reported to be leaking oil was conducted. Although no effects of oil pollution could be found on the site, a 1–2 km slick was witnessed being blown toward an area of mangroves on Tonoas. A water sample was collected and passed onto the Chuuk Department of Marine Resources, as was a full report on the project's findings (Emslie *et al*., 2007). In 2008, this slick was noticed again along with bubbles of oil rising from the shipwreck. This was filmed and documented in a report for the Chuuk and FSM Governments and US NPS. EW generated considerable international publicity about this issue and it continues to attract media interest given the worldwide concern for marine oil spills.[19] Despite initial concerns for the Chuuk tourism industry brought about by the media attention, Chuukese officials recognized that resources could be obtained to investigate the issue. The report showed that the oil leakage was a potential problem and that it should be more thoroughly investigated. Chuuk Lagoon contains three Japanese oil tanker wrecks (*Hoyo Maru*, *Fujisan Maru* and *Shinkoku Maru*) that have the potential to carry up to 32,000 tons of oil (Bailey, 2000). Preliminary research suggested that the oil from the other tankers was transferred to *Hoyo Maru*, the one now leaking (Takuya Nagaoka, personal communication, 2009). In 2008, Japanese interests asked a local diver in Chuuk to investigate the matter but it is unknown what he found or reported (Aisek Gradvin, personal communication, 2008). It is unknown if the US Government has investigated the matter. The Secretariat of the Pacific Regional Environment Program (SPREP) followed up with a Strategic Environmental Assessment, which was conducted 'to model the possible direction and impacts of any spills from the *Hoyo Maru*.' They concluded if oil was released from the shipwreck it could reach Fefan within one hour, 'thus allowing for limited response options' (Talouli *et al*., n.d). No one appears to have dived the site as part of this investigation and they recommended 'an in-depth assessment of the *Hoyo Maru* be carried out to determine extent of corrosion and amount of possible oil left on board' (Talouli *et al*. n.d). This had already partly been implemented during the EW project. Unfortunately communication between the authors of the SPREP report and the author of this report (and MacLeod and Richards) did not occur; otherwise the SPREP report would have been much more informative.

[18] This was also funded by the US Historic Preservation Fund

[19] New Scientist. http://www.newscientist.com/article/dn14645?DCMP=ILC-hmts&nsref=news1_head_dn14645. Australian Broadcasting Commission (ABC) Foreign Correspondent documentary. April 2011. http://www.abc.net.au/foreign/content/2011/s3189254.htm. Accessed 3 June 2012.

Oil leaking from the USS *Mississinewa* in Ulithi Atoll in Yap in August 2001 demonstrated the vulnerability of submerged WWII sites to corrosion and deterioration caused by storms (Monfils *et al*., 2006; Smith, 2004). Subsequently SPREP was commissioned to develop a regional strategy on the issues associated with oil release in an uncontrolled manner from submerged WWII sites throughout the Pacific and East Asia. Phase I of the study involved data collection and risk assessment of oil contamination. SPREP have developed a database of over 3,800 WWII shipwrecks lying throughout the Pacific and East Asia including 330 tankers and oilers (Monfils *et al*., 2006). Research suggests that the oil still contained in the WWII shipwrecks (worldwide) could vary from 2.5 to 20 million tonnes; as a comparison the Deepwater Horizon oil well in the Gulf of Mexico released about 1.2 million tonnes.[20] Phase II of the SPREP marine pollution strategy from WWII shipwrecks has not been developed; Talouli (*et al*., n.d) reported that SPREP 'would have no further action on the strategy, and that further developments be undertaken bilaterally between the flag state and the coastal state'.

On 23 September 2011, the President of the Federated States of Micronesia, H.E. Emanuel Mori appealed to the 66th United Nations General Assembly in New York for assistance in this matter:[21]

> Oil from some of the shipwrecks in my State of Chuuk has already started leaking. Any disaster could have a devastating effect on the environment, our food chain, and the surrounding reefs that serve as breeding grounds for many fish species. It will also adversely impact our tourism industry which depends largely on coral and shipwreck diving. In this respect, and to avoid a major environmental disaster, I am now appealing to the international community for immediate assistance.

[20] New Scientist article. http://www.newscientist.com/article/mg20727763.100-defuse-this-oil-time-bomb.html. Accessed online, 9 October 2015.

[21] http://www.fsmgov.org/fsmun/ga66_main.htm. Accessed 9 October 2015.

CONCLUSIONS

There is considerable conflict in the management of the Chuuk Lagoon shipwrecks. Dynamite fishing, tourism, potential oil pollution, and safeguarding of human remains are some of the main issues although it would appear many of the human remains have been recovered. However, some divers will pay the dive guides an additional fee if they can see a human skull, and a few have been hidden, to be revealed for such occasions.

Dynamite fishing is an illegal and totally destructive fishing practice, and while the scale of it in Chuuk has diminished, it nevertheless is still practiced. Dynamite fishing not only kills edible fish, but all living animals and in the case of the shipwrecks, it strips away the protective layer of marine concretion, renewing and accelerating corrosion (Macleod, 2003). Potentially other munitions, mines and bombs could also be seriously affected, possibly leading to their decay and detonation underwater. In 1976–77 explosions were heard on Uman Island and thought to have come from the *Gosei Maru*. This shipwreck contains a number of torpedoes and upon investigation it was found that the 'high pressure vessels inside the torpedo body were deteriorating to the point that they would rupture and the high pressure gas would be released' (Bailey, 2000). In 1977, intentional detonations were carried out on the remaining torpedoes but further explosions were reported to have occurred in 1998. Detonations were also carried out on the *Fujikawa Maru* in the 1970s for similar reasons to which Bailey (2000) laments: 'The resulting explosion was highly damaging to animal and plant life on the wreck; the amount of marine life today is only a fraction of the prolific growth that was present before'. There are many other types of munitions on many of the shipwrecks which could be equally as dangerous – not only for the fabric of the ship but also for all divers. There are different views on this though, some say the picric acid which the Japanese used to detonate the explosives is dissipating slowly into the sea rendering them harmless (Earle and Giddings, 1976). Others regard the munitions as potentially very dangerous. Another view is that the explosive material is still useable and they are not benign,

although the picric acid in sea water should crystallize and not detonate, unless knocked (Bill Utley, personal communication, 2007).

Dynamite fishing could eventually cause some ships to collapse, resulting in the destruction of habitats and the complete loss of edible fish, and it could lead to the demise of the tourism industry. Its value as an economic initiative is therefore short-lived with long-term consequences on other values of the sites and the broader marine environment. Dynamite fishers have greatly affected the integrity of *Fujikawa Maru*, *Nippo Maru* (which has lost all its sea mines) and *San Francisco Maru,* by recovering munitions to make small bombs for fishing (Hezel and Graham, 1997). An additional impact of dynamite fishing is that it is not limited to the shipwrecks – bombs are thrown onto the reefs killing everything in its sphere of influence. During the December 2006 EW expedition, marine biologist Mandy Hengeveld investigated a small section of the barrier reef near the North East Pass, and found the area to be greatly affected by dynamite (Amanda Hengeveld, personal communication, 2006). The Chuuk Government has legislation that prohibits dynamite fishing but enforcement does not appear to be reducing its operations. It is an activity that, although it provides considerable short term financial rewards, is in conflict with the safety, health and well-being of the Chuukese, and with the government and community who need to provide ongoing care to those injured.

In 2006, the Chuuk State Government began to consider World Heritage nomination of the cultural and natural heritage sites and values of Chuuk Lagoon and the adjacent Kuop Atoll. The major impediment in realizing this goal is the current ineffective management and the large impact of dynamite fishing on the marine flora and fauna throughout Chuuk Lagoon.

Any single country would find the effective management of 50+ shipwrecks and hundreds of aircraft related to WWII daunting. Given the wide range of values and uses of the site between the Chuukese, Japanese and Americans, a more collaborative and effective management approach is not only required but essential to address conflicts and concerns regarding the longevity of the sites and potential marine environment pollution. This can only work if all stakeholders join together with adequate resources. Chuuk and the Federated States of Micronesia do not have the resources. The US$50 diver fee appears not to have been used in site management. Instead, it seems to have been spent in employing Chuukese in government jobs, arguably a justifiable action when unemployment is about 22 per cent. Japan has formally declared an ongoing interest in their shipwrecks, and in collaboration with the US, the FSM and Chuuk, this would seem the most effective partnership in managing this important heritage (United States Department of State (US DS), 2004). It seems totally incongruous to have a small, developing country whose people were innocent bystanders in a war between two superpowers now wear the burden of their conflict.

In Australia, the Dutch shipwrecks located off Western Australia have been effectively managed through a cooperative arrangement between the Governments of Western Australia, Australia and the Netherlands. There are also a number of arrangements between countries in relation to particular shipwrecks, including the *Titanic*[22] and the American CSS *Alabama* which sank off France (Guerout, 1997). There will probably be many more given the current peak international agreement on managing underwater cultural heritage, the UNESCO Convention on the Protection of Underwater Cultural Heritage 2001, which encourages these types of bilateral and multilateral agreements (UNESCO, 2001).

The concept of the FSM National Park raised by the US NPS (1989) could be revisited as part of these considerations. It is, therefore, time for some serious multinational discussions on how the submerged WWII sites can be effectively managed for the benefit of all stakeholders and the broader international community. *In situ* site

[22] Negotiations about the management of the *Titanic* have been ongoing for several years and an agreement was signed by the UK (2003) and the USA (2004). http://www.gc.noaa.gov/documents/05varmer2006an.pdf

preservation of the submerged WWII sites in Chuuk Lagoon allows divers from all nations to view the tragedies and destruction caused by war, and stimulates them to think of the futility of war. They can also serve to help people understand how indigenous communities were impacted by the war and of their ongoing relations with various nations; issues that could be investigated not just in Chuuk but also throughout the Pacific. A determined effort into better management of these sites must be made, before it is too late.

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APPENDIX 1: A LIST OF SHIPWRECK SITES IN CHUUK LAGOON COMPILED BY JEFFERY, 2007

Site Name	Site No.	Recorded site length (m)	Measured site length (m)	Gross Tonnage	Latitude	Longitude
Aikoku Maru	1	152	Broken in two (106)	10,438	7°37′N	151°91′E
Amagisan Maru	2	137	133	7,620	7°29′N	151°86′E
CHA 29	3	49		420	7°51′N	151°84′E
CHA 46	4	26		130	7°43′N	151°92′E
CHA 66	5	26		130	7°40′N	151°85′E
Ei-sen No. 761	6	34	34	300	7°37′N	151°86′E
Fujikawa Maru	7	133	133	6,938	7°34′N	151°88′E
Fujisan Maru	8	150		9,524	7°42′N	151°89′E
Fumitzuki	9	97	95–100	1,590	7°41′N	151°73′E
Futagami	10	40	40	625	7°37′N	151°85′E
Gosei Maru	11	83	80	1,931	7°31′N	151°88′E
Hanakawa Maru	12	112		4,739	7°33′N	151°64′E
Heian Maru	13	156	160	11,614	7°38′N	151°85′E
Hino Maru No. 2	14	61	60	998	7°30′N	151°87′E
Hoki Maru	15	137	108	7,112	7°35′N	151°91′E
Hokuyo Maru	16	109	101	4,217	7°36′N	151°90′E
Hoyo Maru	17	144	146	8,691	7°37′N	151°84′E
I-169	18	103	99	1,785	7°38′N	151°84′E
Katsurigisan Maru	19	87		2,427	7°49′N	151°95′E
Kensho Maru	20	117	116	4,862	7°37′N	151°84′E
Kikukawa Maru	21	108	88	3,833	7°35′N	151°91′E
Kiyosumi Maru	22	138	143	8,614	7°37′N	151°84′E
Kotohira Maru	23			30?	7°41′N	151°83′E
Minsei	24	41		378	7°55′N	151°85′E
Momokawa Maru	25	108	55–74	3,829	7°37′N	151°90′E
Muraki Maru	26			15	7°12′N	151°95′E
Nagano Maru	27	105	151	3,824	7°36′N	151°91′E
Nippo Maru	28	108	93	3,764	7°38′N	151°91′E
Oite	29	100		1,523	7°61′N	151°83′E
Ojima	30	49	Debris field up to 200m	812	7°35′N	151°91′E
Reiyo Maru	31	122	106	5,446	7°36′N	151°91′E
Rio de Janeiro Maru	32	141	138	9,626	7°30′N	151°89′E
San Francisco Maru	33	117	132	5,831	7°36′N	151°90′E

Sapporo Maru	34	44	49	361	7°36′N	151°83′E
Seiko Maru	35	120	126	5,385	7°36′N	151°90′E
Shinkoku Maru	36	152	154	10,020	7°40′N	151°77′E
Shotan Maru	37	87	68	2,829	7°36′N	151°91′E
Susuki	38	84	72	935	7°37′N	151°85′E
Tachi Maru	39	82		1,891	7°37′N	151°80′E
Taiho Maru	40	98		2,827	7°30′N	151°85′E
Taijun Maru	41			1,278	7°44′N	151°83′E
Unkai Maru No. 6	42	101	104	3,220	7°31′N	151°88′E
Unknown A	43	39		350?	7°30′N	151°86′E
Unknown B	44			250?	7°30′N	151°87′E
Unknown C	45	30		90	7°30′N	151°86′E
Unknown D	46			?	7°36′N	151°85′E
Unknown E	47		19	20?	7°38′N	151°86′E
Unknown F	48		67	?	7°37′N	151°91′E
Unknown G	49		35	c.150	7°38′N	151°85′E
Yamagiri Maru	50	134	137	6,438	7°38′N	151°82′E
Yamakisan Maru	51	113	95	4,776	7°29′N	151°86′E
Yubae Maru	52	93	90	3,217	7°30′N	151°86′E

6. PROTECTION AND MANAGEMENT OF AUSTRALIA'S SECOND WORLD WAR UNDERWATER CULTURAL HERITAGE

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GOOD PRACTICE

Shared heritage management

Most, if not all, Australian states have limited human and financial resources to protect, document or practically manage UCH on a day-by day basis. Recognizing these constraints in Australia, early UCH management activities focused on developing community groups within each jurisdiction as one of a series of public engagement mechanisms to protect UCH sites. In many jurisdictions, successful site management and protection is directly related to local community groups' active engagement and knowledge. Recognizing that facilitating safe public access is best practice in UCH management, a focus of management activity should be on fostering the development of community-based advocacy groups who become knowledgable 'archaeologists' capable of supporting heritage management agencies in their activities. With the availability of the open source UNESCO or proprietary NAS-based UCH training courses, the capacity exists for SIDS to foster appropriate community engagement within an established international framework and standard.

Introduction

The protection of underwater cultural heritage in Australia begins in 1964. That year the West Australian Government legislated to vest control of shipwrecks off the coast of Western Australia in the Western Australian Museum (Henderson, 1986). In 1976 the Australian High Court found the Western Australian legislation invalid as a consequence of the introduction of the Commonwealth Seas and Submerged Lands Act 1973 (O'Keefe and Prott, 1978). The same year the Commonwealth Government of Australia introduced the Historic Shipwrecks Act 1976 (the Act) to protect all declared historic shipwrecks from the lowest astronomical tide along Australia's coastline out to the end of the exclusive economic zone, or continental shelf, whichever was further (Ryan, 1977).

Initially shipwrecks were individually assessed to be declared historic. Once declared a historic shipwreck, protection includes both the shipwreck and its associated relics from disturbance, damage or interference (Viduka, 2012). However, the process (of case by case assessment) was soon overwhelmed when more incidents of looting and interference were reported (Nutley, 2006) than could be processed by the number of officials involved. Recognizing the need for broader protection, on 1 April 1993 a blanket protection provision amendment (from 1985) was enacted (Cassidy, 1991). This protects all shipwrecks older than 75 years, whether located or un-located in jurisdictional waters, from damage, disturbance or interference without permit. Shipwrecks less than 75 years of age can still be protected by individual assessment and declaration. Today all

shipwrecks sunk before 1941 are protected by the Act. From 2016 until 2022, the entire assemblage of shipwrecks associated with WWII in Australian waters will be automatically protected (also including HMAS *Warrnambool* in 1947 who, while no longer on active duty, sunk as a result of WWII mine clearance operations).

Second World War heritage in Australian waters

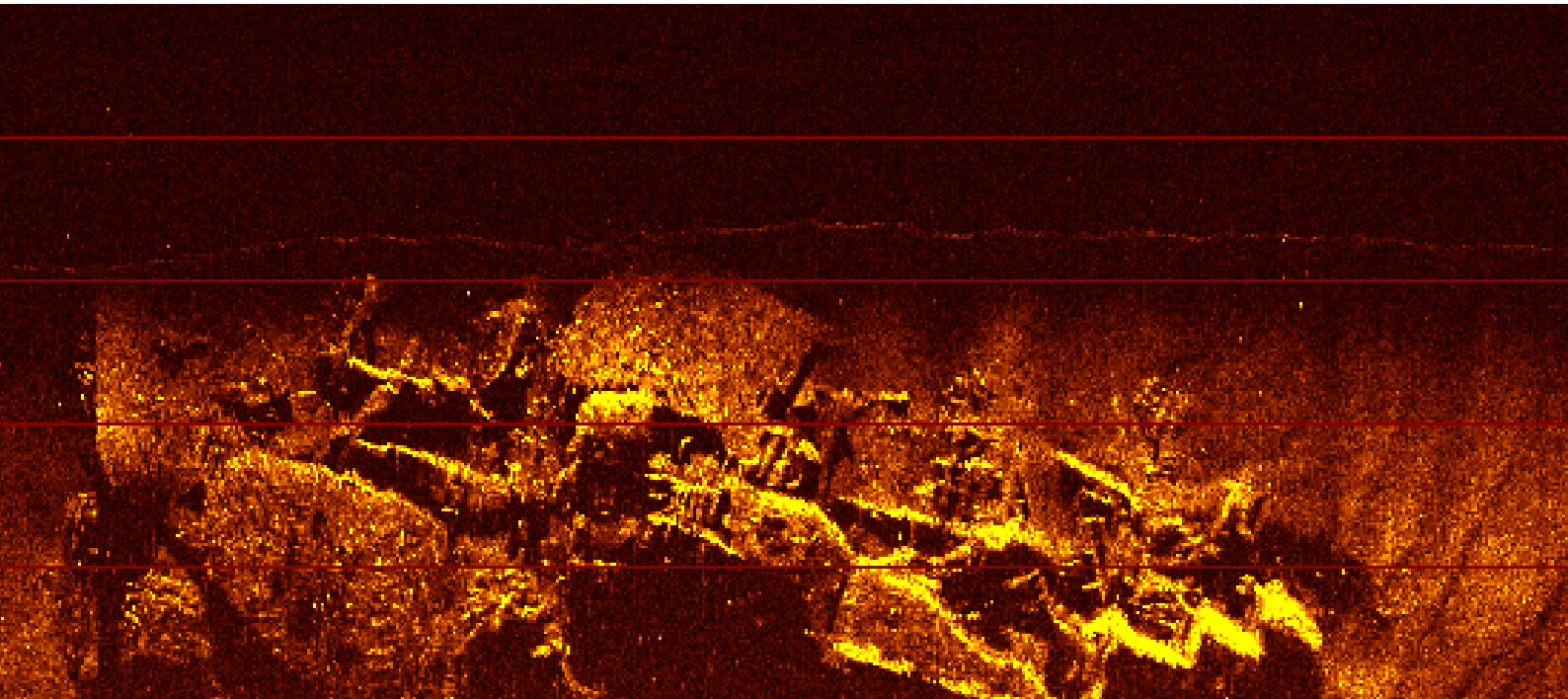
Unlike WWI (1914–1918) heritage, which is now beginning to fall under the framework of the 100-year date included within the UNESCO (2001) Convention on the Protection of the Underwater Cultural Heritage (the Convention), globally WWII underwater cultural heritage assemblage remains largely unprotected. In the Australian context, this is also true particularly because of the Act's inability to protect other types of underwater cultural heritage, apart from shipwrecks.

Since 1976 a number of WWII shipwrecks have been individually declared and are actively managed. In 1976 the first shipwreck ever to be individually declared under the Act was the Japanese submarine *I-124* (1942). Other sovereign vessels declared protected include the Japanese midget submarine *M24* (1942), the German raider HSK *Kormoran* (1941), US warships USS *Lexington* (1942), USS *Neosho* (1942) and USS *Sims* (1942).

Numerous vessels around the coastline sunk by mines, torpedoes, aerial bombardment and collision during WWII have been individually declared. While the most notable loss was the torpedoed Australian Hospital Ship (AHS) *Centaur* (1942), the vast majority of these ships were merchant vessels such as: MS *Don Isidro* (1942); SS *Florence D* (1942) (Figures 6.1 and 6.2); MV *City of Rayville* (1941); and SS *Cambridge* (1940) to name a few (Miles, 1999). Most of these have a shared heritage value which needs to be considered in their day-to-day management.

German raiders, Japanese warships and submarines operated around the Australian coastline from circa 1940. Wartime activity in or around Australia reached its height circa 1942–1943 with Japanese air raids on northern Australia, a midget submarine attack on Sydney Harbour and the torpedoing of numerous merchant vessels. However, one of Australia's most significant losses occurred in 1941 with the sinking of HMAS *Sydney* (II) by the German raider HSK *Kormoran*. As a consequence of the 1942–1943 period of intense WWII activity around Australia, the vast majority of WWII-related shipwrecks in Australian waters will become protected under the 75-year rolling date blanket protection provision from 2017–2018.

Figure 6-1. Side scan sonar image of the SS *Florence D* (1942). ©Heritage, Northern Territory Department of Lands, Planning and the Environment



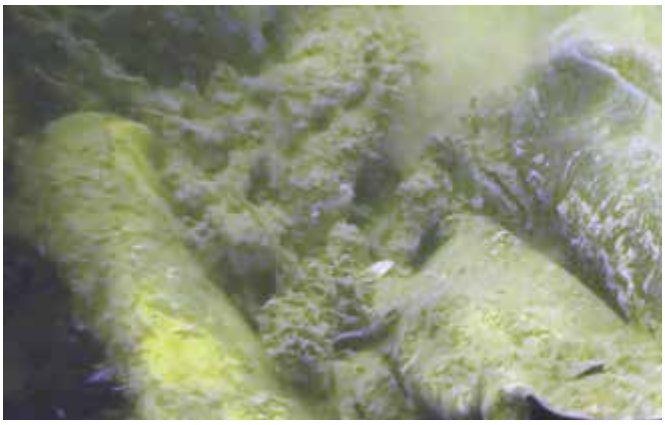


Figure 6-2. Three-inch artillery shells from the SS *Florence D* (1942). ©Heritage, Northern Territory Department of Lands, Planning and the Environment

The Australian National Shipwrecks Database (ANSDB) has recorded 251 shipwrecks and 164 aircraft as lost in Australian or New Zealand waters from 1939 to 1945. Certainly 117 vessels will become protected by the Act in 2017–2018, seven from the 19 February 1942 Bombing of Darwin. This assemblage includes another sovereign vessel the USS Peary (1942). The ANSDB records that 139 aircraft were lost over the same 1941–1943 period.

Australia has many other types of UCH associated with WWII. The accoutrements of war are liberally sprinkled across the north of Australia. Recent changes to the ANSDB allows for the recording of other UCH, however this section within the database remains largely unpopulated to date.

Australia's Historic Shipwrecks Program

Australia is a federation of states collectively known as the Commonwealth of Australia. To facilitate management of the Historic Shipwrecks Act, a cooperative management regime with the states was considered integral from the start (Ryan, 1977). Since 1976 the Commonwealth Government has worked in partnership with the states, Northern Territory and Norfolk Island to deliver the day-to-day management outcomes of the Act. The states have similar legislation protecting historic shipwrecks in their state/internal waters, and are the most appropriate body to manage the Commonwealth's day-to-day administration in their jurisdiction. In each jurisdiction, the Minister delegates certain powers to enable the day-to-day operation of the Act to proceed. Activities conducted by the delegates have been partially funded and coordinated by the Commonwealth Government under the banner of the Historic Shipwrecks Program. This includes biannual meetings of delegates and annual meetings of historic shipwrecks practitioners, usually the senior maritime archaeologist in each jurisdiction.

Approximately 8,000 Australian shipwrecks are recorded in the ANSDB. The ANSDB is a relational database with a public interface and separate secure login for statutory management. It enables all statutory management functions of the Act to be performed online (Luckman and Viduka, 2013). This gives greater accountability and ensures uniform, transparent and timely decision-making in the delivery of statutory and management decisions. Since 2014 the ANSDB has also been used by New Zealand as its register of underwater cultural heritage sites. As of April 2016, New Zealand has entered 2,195 site records. The use of the ANSDB as an online register of shipwrecks, relics, aircraft and other UCH is offered to small island developing States (SIDS) in the southern Pacific, as well as Papua New Guinea and Timor-Leste.

The Historic Shipwrecks Act 1976

The Act is now 40 years old. It is no longer in line with world's best practice as outlined in the Annex Rules of the Convention nor is it effectively linked into planning processes at the Commonwealth Government level. In 2010 an Australian Underwater Cultural Heritage Intergovernmental Agreement was put into place to enable Australia to consider ratification of the Convention (AUCH IGA, 2010). This consideration is ongoing. Issues associated with the Act and WWII heritage particularly revolve around the inability to declare classes of places other than shipwrecks protected and to specifically protect or identify human remains from other aspects of a site's assemblage.

Figure 6-3. ROV filming HMAS *Sydney II* (1941) at approximately 2.5 km depth during the 2015 Two Ships Project. ©Curtin University and the Western Australia Museum

Management of shipwrecks in Australia

The management of shipwrecks in Australia is guided through the Historic Shipwrecks Program, statutory requirements of the Act and policy documents. As noted above, state legislation protecting shipwrecks within internal waters is similar to the Act. This provides a high level of regulatory consistency and actual day-to-day management approaches to underwater sites around the country (Henderson, 1994; Australian Government, 1996; Viduka, 2012, 2014, 2015a, 2015b, 2015c).

The next section comprises a series of vignettes to elucidate particular approaches to WWII heritage, sites, issues or problems utilized by one or more jurisdiction.

Searching for shipwrecks

As with any major event that has happened within living memory, there is usually strong community sentiment about the event and often community and political support for activities that commemorate certain events. In Australia, community support translated to significant Commonwealth Government funding for two searches to locate HMAS *Sydney* II and HSK *Kormoran* in 2008 (solving one of Australia's most enduring maritime mysteries) (McCarthy, 2009a, 2009b, 2011; Mearns, 2009); and AHS *Centaur* in 2009 (AAP, 2009). The searches themselves became major national stories with enormous media coverage and resulted in the location of all three wrecks at depths between 1,950–2,500 m.

HMAS *Sydney* II and the German raider HSK *Kormoran* both sank after a battle on 19 November 1941. It was Australia's worst naval disaster with the loss of all 645 crew of the HMAS *Sydney* II. Around 80 German sailors also died in the battle. Following the discovery of the *Sydney* and *Kormoran* in 2008, field research was conducted in 2015 led by Curtin University and the Western Australian Museum (Curtin University, 2015; Pawsey Supercomputing Centre, 2015). Planning for the Two Ships Project involved extensive consultation with stakeholder groups particularly as the project included collecting scientific data from both wrecks to assist with informing the long-term management of the sites and understanding the local ecology. To assist with stakeholder consultation and to

mitigate any concerns of site interference by those groups, who perceive the sites as primarily a 'maritime military grave', a Cultural and Natural Heritage Sampling Protocol was drafted by the author. The guiding principle of this document was that any sampling to be carried out should avoid any physical contact with the main wreck. The exception to this was the corrosion science component which required minimal contact with discrete areas of the site (focused around the bow section) and debris field; and collection of bacterial growth 'rusticles' from metal surfaces. The natural science research required sampling the seabed and animals living on and around the wreck sites. All efforts were made not to inadvertently move cultural material for any type of physical sampling.

A primary outcome of the Two Ships Project was to conduct comprehensive photogrammetry of both sites with the intent to produce a virtual 3D immersive display. This display is proposed to be shown at the Western Australian Museum and at the Australian War Memorial, making Australia's most remote and inaccessible 2011 National Heritage listed sites publicly accessible (Figure 6.3).

One value noted in the National Heritage listing announcement was that the shipwreck sites of HMAS *Sydney II* and HSK *Kormoran* have a special association with the Australian community. This association is particularly strong for family and friends of the naval, air force and civilian personnel who died as a result of the battle as the sites are their final resting places and a tangible link to their memory.

More recently a search was proposed to locate the three US warships (USS *Lexington*, USS *Neosho* and US *Sims*) lost during the Battle of the Coral Sea in 1942 (Figure 6.4). This joint initiative of the Australian and United States Governments, universities and not-for-profit research institutions successfully secured sea time on the Australian Research Vessel (RV) *Investigator* (Viduka and Luckman, 2013) but failed to secure sufficient operational funding. The project has been delayed while other funding opportunities are sought.

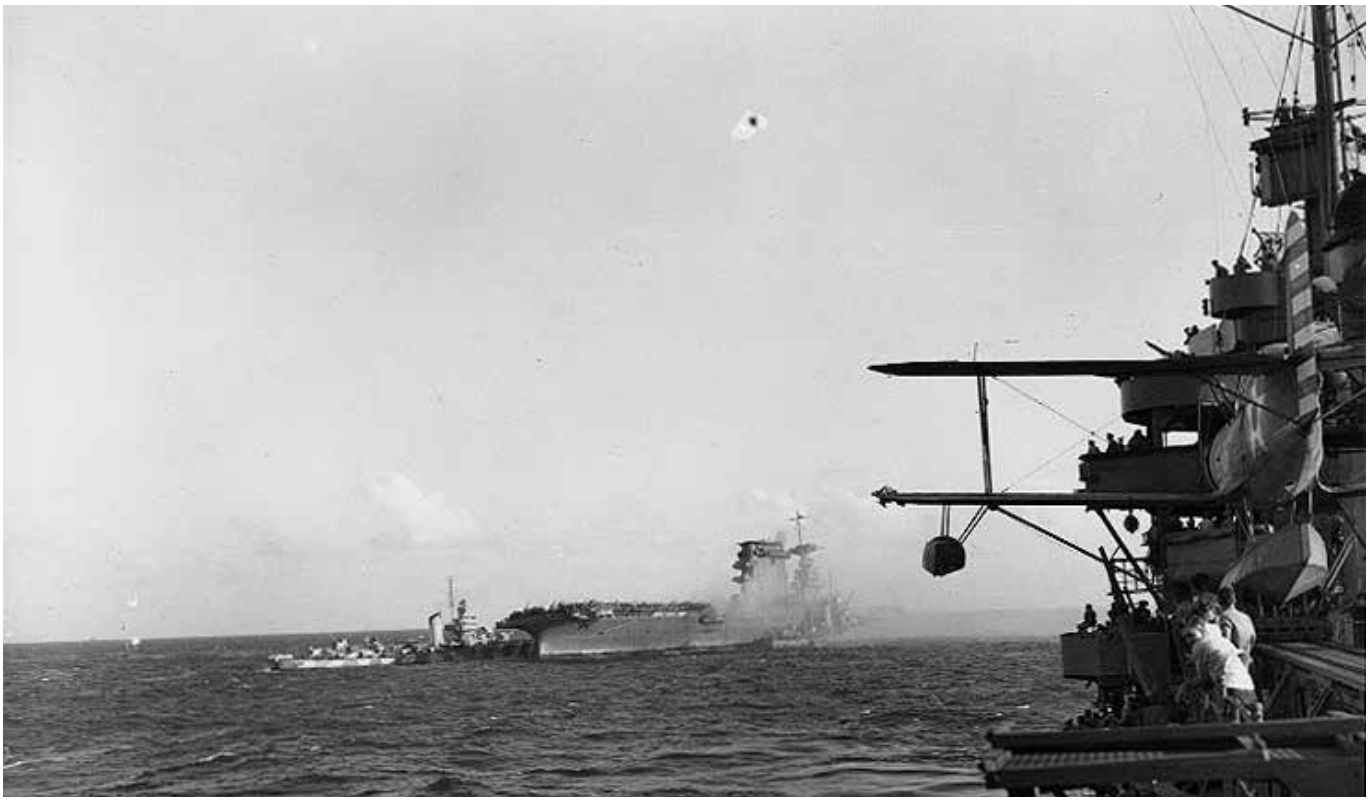


Figure 6-4. Abandonment of USS *Lexington* (1942) during the Battle of the Coral Sea. ©US Navy, National Archives

Figure 6-5. Tea ceremony being conducted over the remains of the Japanese midget submarine *M24*. ©Heritage Division, New South Wales Department of Environment and Planning

Commemoration

Commemorative events occur at numerous sites around Australia and often on ANZAC Day (25 April), Australia's national day of remembrance for those who served or died in war and on operational service. Commemorative events also occur at other times and these are usually linked to the specific day of an event. Most ceremonies incorporate wreath-laying near memorials or from vessels over a site, such as the at sea remembrance service for the 332 victims and survivors of the sinking of the *Centaur* on 24 September 2010. A commemorative plaque was also placed on site in 2009 when the *Centaur* wreck was discovered.

For Japanese wrecks, commemorative remembrance has taken the form of tea ceremonies such as the one held at the Japanese midget submarine *M24* site off Sydney on 7 May 2013 by the Japanese Tea Masters Association (Chado Urasenke Tankokai Inc) (Figure 6.5). All commemorative events conducted within designated protected zones that exclude access without permit are actively managed to reduce any possible impact with sites or contamination of the site.

Shared heritage management

A fundamental underpinning of the Act is the shared heritage management of the four Dutch shipwrecks located off Western Australia: *Batavia* (1629), *Vergulde Draeck* (1656), *Zuytdorp* (1712) and *Zeewyk* (1727). The bilateral agreement between Australia and the Netherlands concerning old Dutch shipwrecks (Australian and Netherlands Committee on Old Dutch Shipwrecks ANCODS) is included as a schedule to the Act. While the ANCODS agreement is considered by both parties a very successful model for shared heritage management, and a basis for shared heritage management in the Convention (Henderson and Viduka, 2014), more recent efforts to protect the Japanese submarine *M24* shared heritage site *in situ* have also been recognized. In 2009 those underwater cultural heritage management activities were given an award of distinction by UNESCO Asia-Pacific Heritage Awards for cultural heritage conservation. The award stated:

> The project is to be commended for setting a new global benchmark in the application of heritage law and conservation practice to protect shipwreck sites and demonstrating best practice in the application of UNESCO's guidelines for the protection of underwater cultural heritage.

A Commonwealth Government aspect of shared heritage management in Australia has been the development of bilateral memorandums of agreement with relevant state parties to underpin future fieldwork, site protection and day-to-day management. Australia's National Heritage-

listed site the British Sovereign vessel HMS *Sirius* (1791), as well as the other six British Admiralty wrecks in Australian waters have been managed in conjunction with the United Kingdom on the basis of a series of agreements culminating in the 1992 agreement detailing ownership of sites and recovered relics. In 2010, and renewed in 2014, the US National Oceanic and Atmospheric Administration (NOAA), Office of Marine Sanctuaries and the Department entered into a Memorandum of Agreement (MoA) for the Purpose of Collaboration in Underwater Cultural Heritage Resource Management Activities in the Pacific Region. A focus of this MoA is facilitating the discovery of the US ships lost in the Battle of the Coral Sea to commemorate the sacrifice of those engaged in the defence of Australia. The three US shipwrecks (*Lexington*, *Neosho* and *Sims*) were declared protected historic shipwrecks on the 70th anniversary of their loss on 7 May 1942. In 2015 the Australian Government entered into a MoU with the Indonesian National Center for Archaeology (ARKENAS) to assist in the protection of HMAS *Perth* (I) (1942) sunk in Indonesian territorial waters. A permit is currently being pursued by the Australian National Maritime Museum to conduct fieldwork.

Second World War regional surveys and site documentation

Though a comparatively small portion of the overall Australian shipwreck heritage assemblage, WWII shipwrecks and aircraft have been the focus of considerable study led by researchers such as Mack McCarthy (Western Australian Museum), Silvano Jung (Ellengowan Enterprises, Northern Territory), David Steinberg (Northern Territory Heritage Branch), Cos Coroneos (Cosmos Archaeology) and Tim Smith (Heritage Victoria, ex NSW Heritage).

Through the efforts of David Steinberg and colleagues, the seven WWII shipwrecks of Darwin Harbour have been archaeologically inspected and assessed as a precursor to their protection under the blanket protection rolling date provision of the Act in 2017 (Steinberg, 2009, 2015, 2016).

In Australia, one person stands out for the recognition of WWII aircraft. Silvano Jung has specialized in aircraft archaeology and documented sites in the Cocos Keeling Islands, Broome Western Australia, and Darwin Harbour. Other authors have also contributed to the growing canon of knowledge (Jung, 1996, 2004, 2006, 2007, 2009, 2013a, 2013b; Smith, 2004; Wilkinson, 2012; Souter, 2003; McCarthy, 2004).

Similarly, with submarines, one person stands out in their study: Tim Smith who led the survey, documentation, stakeholder engagement and commemoration ceremonies associated with the *M24* in conjunction with the Department of the Environment (Smith, 2006, 2008; McCarthy, 1998).

Other prominent practitioners include Mack McCarthy who led the enormous stakeholder engagement and archaeology of the *Sydney* II and *Kormoran;* as well the Japanese submarine *I-124* (McCarthy, 1990, 1998, 2009a, 2009b, 2011; McCarthy *et al*, 2010) and Cos Coroneos whose work in Darwin Harbour, documenting, and where required, recovering and reburying predominantly WWII heritage, remains the largest maritime archaeological consultancy job in Australia (Cosmos Archaeology, 2012; INPEX, 2011).

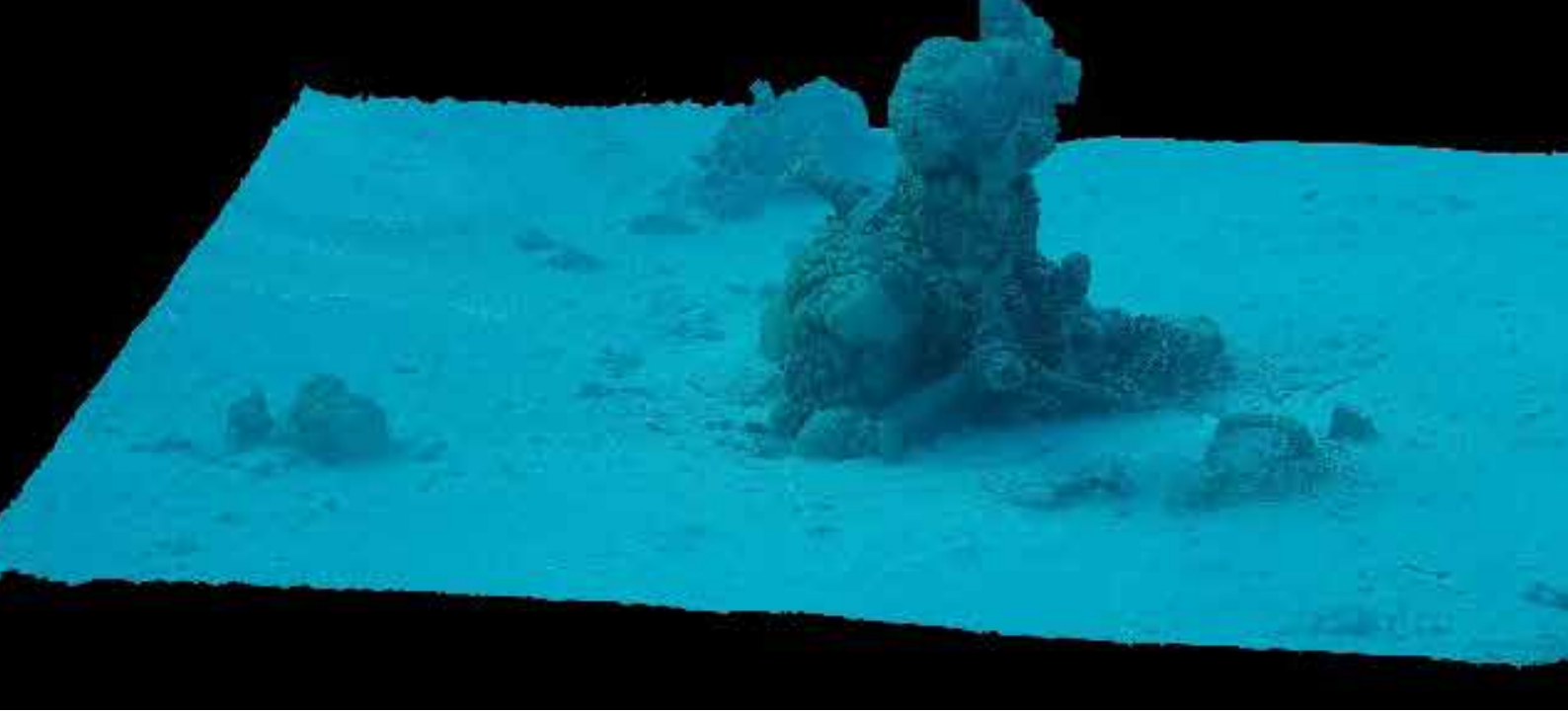


Figure 6-6. Remains of Catalina *JX435* (1945) wrecked within the lagoon at Cocos Keeling Islands. ©Wreck Check Inc.

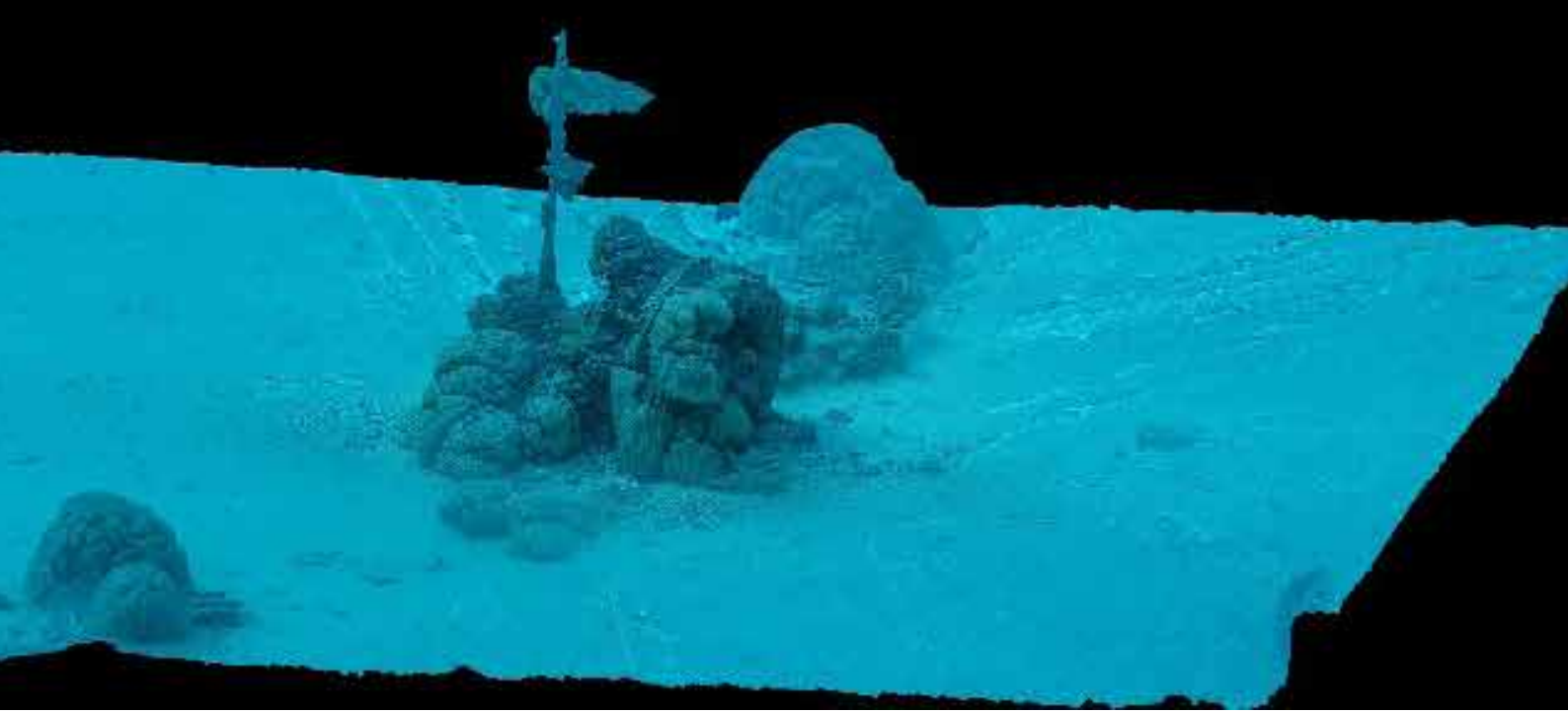
Tourism and site documentation

As a cultural heritage manager, it is intrinsically important to facilitate public access and engagement with heritage (Hosty, 1987; McCarthy and Garrett, 1998; Nutley, 1998; Smith, 2006; Steyne, 2010; Viduka and Raupp, 2008; Viduka, 2015a, 2015b). Of the approximately 8,000 shipwrecks in Australia, only 22 are located within protected zones requiring a permit to access the site. All the rest can be dived without permit. Included within the 22 sites limited to public access is a world-famous dive site SS *Yongala* (1911) (Viduka, 2006a, 2006b) and six WWII shipwrecks (HSK *Kormoran*, HMAS *Sydney II*, AHS *Centaur*, *I-124*, *Florence D* and *M24*) (Historic Shipwrecks Protected Zones, 2016). Protected zones have been declared around these WWII sites because of the danger of unexploded ordnance; or the site is managed principally as a maritime grave; and/or to enable cultural heritage managers better control over what happens on or near that site.

In Australia, we recognize the significant contribution that the public can make to documenting, monitoring and protecting heritage, and have taken a number of approaches to understand diver behaviour (Edney, 2011; Jewell, 2002) and engage the history buff and/or capture the citizen scientist. Various community engagement models have included developing maritime archaeological associations in Queensland, New South Wales (NSW), Victoria, Tasmania, South Australia, Western Australia and Norfolk Island; the Wreckspotter Program in NSW; shipwreck dive trails in Western Australia, Queensland, NSW, Tasmania and South Australia (Historic Shipwrecks Trails, 2016); and maritime archaeologists working with dive charter tourism in Queensland.

While not all these public engagement models have specifically focused on WWII heritage, most do or have included sites from this period. Only one location, Darwin Harbour, lends itself to a WWII-themed dive trail, however issues of water turbidity and the presence of crocodiles somewhat diminish the viability of this activity.

Dive tourism operators have a vested interest in protecting sites and supporting operators with information and advice is a long-established practice in Australian UCH management (Viduka, 2008). Going beyond desktop assistance, archaeologists have also worked on dive charter vessels engaging the public in shipwreck monitoring and encouraging them as citizen scientists (Viduka and Raupp, 2008). Remote sites such as HMAS *Warrnambool* (1947) have been dived, inspected and monitored over the years through this model of public engagement. Without aligning with tourism, sites like the *Warrnambool* would be largely inaccessible to cultural heritage



managers due to their remoteness and cost of access. Another type of tourism programme trialled to engage the public with WWII heritage is controlled diver access on the *M24* (NSW).

Community groups play an important role in Australia's maritime heritage management. Many groups have led the search for and discovery of shipwrecks around Australia, including a number of WWII wrecks. The Maritime Archaeological Association of Victoria (MAAV, 2016) led the documentation of HMAS *Goorgangai*, the first Royal Australian Navy vessel lost in WWII, which was subsequently declared a protected historic shipwreck under Victorian legislation on 16 November 1995 (Australian Government Department of Environment and Energy, 2016b; MAAV, 2016). The Sydney Project with its passion for technical diving led to the discovery of several wrecks lost during WWII, SS *Coast Farmer* (1942) at 130 m depth and SS *Wear* (1944) at 120 m depth (Sydney Project, 2016).

More recently, Wreck Check Inc (2016) completed documentation and corrosion surveys of several WWII sites: Catalina wreck *JX 435* at Cocos Island, and the *Eidsvold* (1942) and *Nissi Maru* (1942) sunk at Christmas Island. Wreck Check Inc (who is currently searching for a WWII Sunderland flying boat reported scuttled off Christmas Island) also undertook the first ever archaeological survey of the WWI SMS *Emden* (1914) wrecked at North Keeling Island.

For the non-diving public, management of sites includes researching or assisting research that will result in the dissemination of information in public exhibitions. The recent Two Ships Project with its focus on creating an immersive 3D experience of the *Sydney* II and *Kormoran* is an excellent example of this.

Archaeological conservation

A fundamental underpinning to Australia's protection and management of UCH has been the high standard of maritime archaeological conservation research and *in situ* practice. Excellence in research and practice is typified by the efforts of conservators and conservation scientists located at the Western Australian Museum.

As much of the WWII UCH assemblage is metallic, conservation of metal artefacts and their stabilization and monitoring is of critical importance for effective day-to-day management. Neil North, Colin Pearson and Ian MacLeod were, or in the case of MacLeod still are, significant contributors to the development of maritime archaeological metal conservation globally (North, 1982, 1989; Pearson, 1987). In the case of MacLeod, his efforts have led to the broad use of *in situ* corrosion potential measurements for the purposes of site management, conservation and documentation

with a large number of WWII vessels and aircraft included in his research (MacLeod, 1987, 1989a, 1989b, 1991, 1992, 1995, 1996a, 1996b, 1998, 2002, 2010). Sacrificial anodes have also been used to assist metallic objects to come into equilibrium with a new marine environment or to initiate their conservation *in situ* prior to recovery and full conservation (MacLeod, 1992, 1996a, 2010; MacLeod and Steyne, 2011; Steyne and MacLeod, 2011). The use of sacrificial anodes has also been used to protect sites, including the *M24* (Smith, 2008) amongst others.

Figure 6-7. Divers conducting a corrosion survey on the remains of the *Nissei Maru* (1942) in Flying Fish Cove, Christmas Island. ©Wreck Check Inc

Ian Godfrey and Vicki Richards have led Australia's wet organic object conservation and, in the case of Vicki Richards, *in situ* site stabilization, reburial trials and testing (Richards, 2001, 2011; Richards *et al,* 2014). Both MacLeod and Richards were key scientific contributors to the recently concluded Australian Historic Shipwreck Preservation Project (Veth *et al,* 2011, 2013, 2016). One of the aims of this project was to help develop policy and a national standard on the reburial and monitoring of wet archaeological artefacts. The need to develop a practice guideline underpinned by science was demonstrated when development in the Northern Territory required the removal and reburial of a large amount of WWII UCH, and other cultural heritage, from an area that was going to be dredged (INPEX, 2011).

Common issues around WWII shipwrecks

Three management issues are often linked with WWII sites: human remains and repatriation, UXO and potentially polluting wrecks.

Potentially polluting wrecks

As a party to the Convention for the Protection of Natural Resources and Environment of the South Pacific Region, 1986 (also known as the *Noumea Convention*) and the Agreement Establishing the South Pacific Regional Environment Programme, 1993 (SPREP), Australia has a responsibility in the Pacific in relation to the 21 Pacific Island States. Under the Pacific Islands Regional Marine Spill Contingency Plan (PACPLAN), a framework for co-operative regional responses to oil spills, Australia is the primary source of assistance for Papua New Guinea, Solomon Islands, Nauru, Tuvalu, Vanuatu and Kiribati. Along with the other non-island members (US, New Zealand and France), Australia is a 'secondary source of assistance' for the remaining island members.

While the Convention was ratified primarily to mitigate the ongoing danger of modern ships running aground and polluting the environment, a potentially significant role exists for the signatories to this Convention to assess and proactively mitigate any oil spill threat from WWII shipwrecks that would have a significant effect on tourism and fishing, key livelihoods in the Pacific.

In the Australian context, only one WWII vessel has so far been found to be leaking oil, the MV *Limerick* (1943). This spill was reported in 2012 off northern NSW by a fisherman. Follow-up research indicated that the spill was predominantly diesel; the site posed little environmental threat and remained substantially intact.

While the scale and potential threat to the environment posed by the Australian WWII assemblage currently appears limited, Papua New Guinea and the Solomon Islands (the location of Australia's flagship HMAS *Canberra* (I) (1942) sunk during the Battle of Savo Island) are identified as

two of the four Pacific Island States most threatened by the pollution risk from WWII shipwrecks. The number of WWII vessels in Australia's primary response area is reported to contain 449 wrecks, including five tankers or oilers. The amount of oil remaining in these wrecks is unknown. While not a pressing policy issue for the domestic front, input to protect the heritage values of these sites while mitigating the threat of oil pollution needs more active consideration.

Human remains and repatriation

Human remains are not referred to in the Act. They are, however, protected as associated relics. In line with the AUCH IGA, the Commonwealth Government is committed to world's best practice in relation to underwater cultural heritage management (recognized as the Annex rules to the Convention). In line with Article 2(9) of the Convention, State Parties shall ensure that proper respect is given to all human remains located in maritime waters. While a formal policy for human remains has not yet been drafted or approved by delegates, to meet the IGA requirements, delegates are asked to ensure that prior to permitting excavation and recovery of relics proponents consider:

- the presence or likelihood of human remains on a shipwreck/aircraft site;
- a contact list of relevant stakeholders and appropriate agencies (relatives, police, coroner and, if applicable, the Royal Australian Air Force or Royal Australian Navy);
- evidence of initial communication with the relevant appropriate agencies and their response has been incorporated into a submitted project plan;
- a strategy for physically dealing with the human remains if discovered and their subsequent storage is articulated; and
- that cultural sensitivities to human remains have been considered.

Unexploded ordnance

A significant quantity of UXO has been located in Australian waters. While there is no specific national shipwrecks policy, a national framework exists and involves personnel from the Australian Government Department of Defence and officers from the Australian Federal Police (Australian Government Department of Defence, 2016).

Three WWII shipwreck sites are actively managed for UXO, the *I-124*, *M24* and *Florence D*. The *I-124* is believed to contain sea mines (McCarthy, 1990) and is managed as a maritime military grave. No permits are issued for recreational diving on this site. NSW is currently completing an unexploded ordnance report for *M24* and dive access is restricted, in part for public protection.

The wreck of the *Florence D* was located in late 2008 in 10 m of water. The 2,600 tonne *Florence D* was a US vessel requisitioned during the war to take ammunition and supplies to US forces in Manila, but was sunk by Japanese bombers returning from the first of two air attacks on Darwin on 19 February 1942. The site includes a large amount of 75 mm artillery shell casings amongst other relics. Permits are issued to enter the protected zone but individuals are advised not to anchor.

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7. A WAY FORWARD

The papers included in this publication provide valuable case studies on the management of WWII-related UCH in different parts of the Pacific region. The report reveals that UCH in the Pacific not only hold invaluable information of historical, scientific, archaeological, social and cultural significance but also present the potential for further supporting community livelihoods and sustainable development. The report illustrates the past and ongoing efforts in addressing the risks of pollution, safety issues and identifies good practices to address these risks. This report will provide Pacific SIDS useful guidance for developing guidelines or modifying existing guidelines for the improved protection and management of WWII-related UCH in each respective country and the region.

Following consultations with the Pacific Underwater Cultural Heritage Partnership, the report further recommends that international and regional cooperation be promoted in the following areas;

1. Capacity building for WWII-related UCH management focusing on the development of risk management strategies in cooperation with UNESCO's University Twinning and Network Programme (UNITWIN) and through workshops to be held in Pacific SIDS.
2. Public engagement with WW-II related UCH management in order to create community-based groups in SIDS that can provide assistance.
3. Monitoring of the protection status of WWII-related UCH in the Pacific region through the existing network of focal points in culture/heritage government agencies in close cooperation with maritime/environment agencies in order to ensure rapid reporting and effective emergency response within regional frameworks such as Pacific Pacific Ocean Pollution Prevention Program (PACPOL).
4. Development of bilateral and multilateral agreements to assist in collaborative research and management, and implementation and enhancement of associated activities.
5. Promotion of the UNESCO Convention for the Protection of the Underwater Cultural Heritage for enhanced ratification by Pacific SIDS.

ANNEX: CONVENTION FOR THE PROTECTION OF UNDERWATER CULTURAL HERITAGE 2001

The General Conference of the United Nations Educational, Scientific and Cultural Organization, meeting in Paris from 15 October to 3 November 2001, at its 31st Session,

ACKNOWLEDGING the importance of underwater cultural heritage as an integral part of the cultural heritage of humanity and a particularly important element in the history of peoples, nations, and their relations with each other concerning their common heritage,

REALIZING the importance of protecting and preserving the underwater cultural heritage and that responsibility therefore rests with all States,

NOTING growing public interest in and public appreciation of underwater cultural heritage,

CONVINCED of the importance of research, information and education to the protection and preservation of underwater cultural heritage,

CONVINCED of the public's right to enjoy the educational and recreational benefits of responsible non-intrusive access to in situ underwater cultural heritage, and of the value of public education to contribute to awareness, appreciation and protection of that heritage,

AWARE of the fact that underwater cultural heritage is threatened by unauthorized activities directed at it, and of the need for stronger measures to prevent such activities,

CONSCIOUS of the need to respond appropriately to the possible negative impact on underwater cultural heritage of legitimate activities that may incidentally affect it,

DEEPLY concerned by the increasing commercial exploitation of underwater cultural heritage, and in particular by certain activities aimed at the sale, acquisition or barter of underwater cultural heritage,

AWARE of the availability of advanced technology that enhances discovery of and access to underwater cultural heritage,

BELIEVING that cooperation among States, international organizations, scientific institutions, professional organizations, archaeologists, divers, other interested parties and the public at large is essential for the protection of underwater cultural heritage,

CONSIDERING that survey, excavation and protection of underwater cultural heritage necessitate the availability and application of special scientific methods and the use of suitable techniques and equipment as well as a high degree of professional specialization, all of which indicate a need for uniform governing criteria,

REALIZING the need to codify and progressively develop rules relating to the protection and preservation of underwater cultural heritage in conformity with international law and practice, including the UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property of 14 November 1970, the UNESCO Convention for the Protection of the World Cultural and Natural Heritage of 16 November 1972 and the United Nations Convention on the Law of the Sea of 10 December 1982,

COMMITTED to improving the effectiveness of measures at international, regional and national levels for the preservation in situ or, if necessary for scientific or protective purposes, the careful recovery of underwater cultural heritage,

HAVING decided at its twenty–ninth session that this question should be made the subject of an international convention,

ADOPTS this second day of November 2001 this Convention.

Article 1 – Definitions

For the purposes of this Convention:

1. (A) 'Underwater cultural heritage' means all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years such as:

   i. sites, structures, buildings, artefacts and human remains, together with their archaeological and natural context;

   ii. vessels, aircraft, other vehicles or any part thereof, their cargo or other contents, together with their archaeological and natural context; and

   iii. objects of prehistoric character.

   (B) Pipelines and cables placed on the seabed shall not be considered as underwater cultural heritage.

   (C) Installations other than pipelines and cables, placed on the seabed and still in use, shall not be considered as underwater cultural heritage.

2. (A) 'States Parties' means States which have consented to be bound by this Convention and for which this Convention is in force.

   (B) This Convention applies mutatis mutandis to those territories referred to in Article 26, paragraph 2(b), which become Parties to this Convention in accordance with the conditions set out in that paragraph, and to that extent 'States Parties' refers to those territories.

3. 'UNESCO' means the United Nations Educational, Scientific and Cultural Organization.

4. 'Director-General' means the Director-General of UNESCO.

5. 'Area' means the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.

6. Activities directed at underwater cultural heritage' means activities having underwater cultural heritage as their primary object and which may, directly or indirectly, physically disturb or otherwise damage underwater cultural heritage.

7. 'Activities incidentally affecting underwater cultural heritage' means activities which, despite not having underwater cultural heritage as their primary object or one of their objects, may physically disturb or otherwise damage underwater cultural heritage.

8. 'State vessels and aircraft' means warships, and other vessels or aircraft that were owned or operated by a State and used, at the time of sinking, only for government non-commercial purposes, that are identified as such and that meet the definition of underwater cultural heritage.

9. 'Rules' means the Rules concerning activities directed at underwater cultural heritage, as referred to in Article 33 of this Convention.

Article 2 – Objectives and general principles

1. This Convention aims to ensure and strengthen the protection of underwater cultural heritage.

2. States Parties shall cooperate in the protection of underwater cultural heritage.

3. States Parties shall preserve underwater cultural heritage for the benefit of humanity in conformity with the provisions of this Convention.

4. States Parties shall, individually or jointly as appropriate, take all appropriate measures in conformity with this Convention and with international law that are necessary to protect underwater cultural heritage, using for this purpose the best practicable means at their disposal and in accordance with their capabilities.

5. The preservation in situ of underwater cultural heritage shall be considered as the first option before allowing or engaging in any activities directed at this heritage.

6. Recovered underwater cultural heritage shall be deposited, conserved and managed in a manner that ensures its long-term preservation.

7. Underwater cultural heritage shall not be commercially exploited.

8. Consistent with State practice and international law, including the United Nations Convention on the Law of the Sea, nothing in this Convention shall be interpreted as modifying the rules of international law and State practice pertaining to sovereign immunities, nor any State's rights with respect to its State vessels and aircraft.

9. States Parties shall ensure that proper respect is given to all human remains located in maritime waters.

10. Responsible non-intrusive access to observe or document in situ underwater cultural heritage shall be encouraged to create public awareness, appreciation, and protection of the heritage except where such access is incompatible with its protection and management.

11. No act or activity undertaken on the basis of this Convention shall constitute grounds for claiming, contending or disputing any claim to national sovereignty or jurisdiction.

Article 3 – Relationship between this Convention and the United Nations Convention on the Law of the Sea

Nothing in this Convention shall prejudice the rights, jurisdiction and duties of States under international law, including the United Nations Convention on the Law of the Sea. This Convention shall be interpreted and applied in the context of and in a manner consistent with international law, including the United Nations Convention on the Law of the Sea.

Article 4 – Relationship to law of salvage and law of finds

Any activity relating to underwater cultural heritage to which this Convention applies shall not be subject to the law of salvage or law of finds, unless it:

(A) is authorized by the competent authorities, and

(B) is in full conformity with this Convention, and

(C) ensures that any recovery of the underwater cultural heritage achieves its maximum protection.

Article 5 – Activities incidentally affecting underwater cultural heritage

Each State Party shall use the best practicable means at its disposal to prevent or mitigate any adverse effects that might arise from activities under its jurisdiction incidentally affecting underwater cultural heritage.

Article 6 – Bilateral, regional or other multilateral agreements

1. States Parties are encouraged to enter into bilateral, regional or other multilateral agreements or develop existing agreements, for the preservation of underwater cultural heritage. All such agreements shall be in full conformity with the provisions of this Convention and shall not dilute its universal character. States may, in such agreements, adopt rules and regulations which would ensure better protection of underwater cultural heritage than those adopted in this Convention.

2. 2he Parties to such bilateral, regional or other multilateral agreements may invite States with a verifiable link, especially a cultural, historical or archaeological link, to the underwater cultural heritage concerned to join such agreements.

3. This Convention shall not alter the rights and obligations of States Parties regarding the

protection of sunken vessels, arising from other bilateral, regional or other multilateral agreements concluded before its adoption, and, in particular, those that are in conformity with the purposes of this Convention.

Article 7 – Underwater cultural heritage in internal waters, archipelagic waters and territorial sea

1. States Parties, in the exercise of their sovereignty, have the exclusive right to regulate and authorize activities directed at underwater cultural heritage in their internal waters, archipelagic waters and territorial sea.

2. Without prejudice to other international agreements and rules of international law regarding the protection of underwater cultural heritage, States Parties shall require that the Rules be applied to activities directed at underwater cultural heritage in their internal waters, archipelagic waters and territorial sea.

3. Within their archipelagic waters and territorial sea, in the exercise of their sovereignty and in recognition of general practice among States, States Parties, with a view to cooperating on the best methods of protecting State vessels and aircraft, should inform the flag State Party to this Convention and, if applicable, other States with a verifiable link, especially a cultural, historical or archaeological link, with respect to the discovery of such identifiable State vessels and aircraft.

Article 8 – Underwater cultural heritage in the contiguous zone

Without prejudice to and in addition to Articles 9 and 10, and in accordance with Article 303, paragraph 2, of the United Nations Convention on the Law of the Sea, States Parties may regulate and authorize activities directed at underwater cultural heritage within their contiguous zone. In so doing, they shall require that the Rules be applied.

Article 9 – Reporting and notification in the exclusive economic zone and on the continental shelf

1. All States Parties have a responsibility to protect underwater cultural heritage in the exclusive economic zone and on the continental shelf in conformity with this Convention.

Accordingly:

(A) a State Party shall require that when its national, or a vessel flying its flag, discovers or intends to engage in activities directed at underwater cultural heritage located in its exclusive economic zone or on its continental shelf, the national or the master of the vessel shall report such discovery or activity to it;

(B) in the exclusive economic zone or on the continental shelf of another State Party:

i. States Parties shall require the national or the master of the vessel to report such discovery or activity to them and to that other State Party;

ii. alternatively, a State Party shall require the national or master of the vessel to report such discovery or activity to it and shall ensure the rapid and effective transmission of such reports to all other States Parties.

2. On depositing its instrument of ratification, acceptance, approval or accession, a State Party shall declare the manner in which reports will be transmitted under paragraph 1(b) of this Article.

3. A State Party shall notify the Director-General of discoveries or activities reported to it under paragraph 1 of this Article.

4. The Director-General shall promptly make available to all States Parties any information notified to him under paragraph 3 of this Article.

5. Any State Party may declare to the State Party in whose exclusive economic zone or on whose continental shelf the underwater cultural heritage is located its interest in being consulted on how to ensure the effective protection of that underwater cultural heritage. Such declaration shall be based on a verifiable link, especially a cultural, historical or archaeological link, to the underwater cultural heritage concerned.

Article 10 – Protection of underwater cultural heritage in the exclusive economic zone and on the continental shelf

1. No authorization shall be granted for an activity directed at underwater cultural heritage located in the exclusive economic zone or on the continental shelf except in conformity with the provisions of this Article.

2. A State Party in whose exclusive economic zone or on whose continental shelf underwater cultural heritage is located has the right to prohibit or authorize any activity directed at such heritage to prevent interference with its sovereign rights or jurisdiction as provided for by international law including the United Nations Convention on the Law of the Sea.

3. Where there is a discovery of underwater cultural heritage or it is intended that activity shall be directed at underwater cultural heritage in a State Party's exclusive economic zone or on its continental shelf, that State Party shall:

   (A) consult all other States Parties which have declared an interest under Article 9, paragraph 5, on how best to protect the underwater cultural heritage;

   (B) coordinate such consultations as 'Coordinating State', unless it expressly declares that it does not wish to do so, in which case the States Parties which have declared an interest under Article 9, paragraph 5, shall appoint a Coordinating State.

4. Without prejudice to the duty of all States Parties to protect underwater cultural heritage by way of all practicable measures taken in accordance with international law to prevent immediate danger to the underwater cultural heritage, including looting, the Coordinating State may take all practicable measures, and/or issue any necessary authorizations in conformity with this Convention and, if necessary prior to consultations, to prevent any immediate danger to the underwater cultural heritage, whether arising from human activities or any other cause, including looting. In taking such measures assistance may be requested from other States Parties.

5. The Coordinating State:

   (A) shall implement measures of protection which have been agreed by the consulting States, which include the Coordinating State, unless the consulting States, which include the Coordinating State, agree that another State Party shall implement those measures;

   (B) shall issue all necessary authorizations for such agreed measures in conformity with the Rules, unless the consulting States, which include the Coordinating State, agree that another State Party shall issue those authorizations;

   (C) may conduct any necessary preliminary research on the underwater cultural heritage and shall issue all necessary authorizations therefore, and shall promptly inform the Director-General of the results, who in turn will make such information promptly available to other States Parties.

6. In coordinating consultations, taking measures, conducting preliminary research and/or issuing authorizations pursuant to this Article, the Coordinating State shall act on behalf of the States Parties as a whole and not in its own interest. Any such action shall not in itself constitute a basis for the assertion of any preferential or jurisdictional rights not provided for in international law, including the United Nations Convention on the Law of the Sea.

7. Subject to the provisions of paragraphs 2 and 4 of this Article, no activity directed at State vessels and aircraft shall be conducted without the agreement of the flag State and the collaboration of the Coordinating State.

Article 11 – Reporting and notification in the Area

1. States Parties have a responsibility to protect underwater cultural heritage in the Area in conformity with this Convention and Article 149 of the United Nations Convention on the Law of the Sea. Accordingly, when a national, or a vessel flying the flag of a State Party, discovers or intends to engage in activities directed at underwater cultural heritage located in the Area, that State Party shall require its national, or the master of the vessel, to report such discovery or activity to it.

2. States Parties shall notify the Director-General and the Secretary-General of the International Seabed Authority of such discoveries or activities reported to them.

3. The Director-General shall promptly make available to all States Parties any such information supplied by States Parties.

4. Any State Party may declare to the Director-General its interest in being consulted on how to ensure the effective protection of that underwater cultural heritage. Such declaration shall be based on a verifiable link to the underwater cultural heritage concerned, particular regard being paid to the preferential rights of States of cultural, historical or archaeological origin.

Article 12 – Protection of underwater cultural heritage in the Area

1. No authorization shall be granted for any activity directed at underwater cultural heritage located in the Area except in conformity with the provisions of this Article.

2. The Director-General shall invite all States Parties which have declared an interest under Article 11, paragraph 4, to consult on how best to protect the underwater cultural heritage, and to appoint a State Party to coordinate such consultations as the 'Coordinating State'. The Director-General shall also invite the International Seabed Authority to participate in such consultations.

3. All States Parties may take all practicable measures in conformity with this Convention, if necessary prior to consultations, to prevent any immediate danger to the underwater cultural heritage, whether arising from human activity or any other cause including looting.

4. The Coordinating State shall:

   (A) implement measures of protection which have been agreed by the consulting States, which include the Coordinating State, unless the consulting States, which include the Coordinating State, agree that another State Party shall implement those measures; and

   (B) issue all necessary authorizations for such agreed measures, in conformity with this Convention, unless the consulting States, which include the Coordinating State, agree that another State Party shall issue those authorizations.

5. The Coordinating State may conduct any necessary preliminary research on the underwater cultural heritage and shall issue all necessary authorizations therefor, and shall promptly inform the Director-General of the results, who in turn shall make such information available to other States Parties.

6. In coordinating consultations, taking measures, conducting preliminary research, and/or issuing authorizations pursuant to this Article, the Coordinating State shall act for the benefit of humanity as a whole, on behalf of all States Parties. Particular regard shall be paid to the preferential rights of States of cultural, historical or archaeological origin in respect of the underwater cultural heritage concerned.

7. No State Party shall undertake or authorize activities directed at State vessels and aircraft in the Area without the consent of the flag State.

Article 13 – Sovereign immunity

Warships and other government ships or military aircraft with sovereign immunity, operated for non-commercial purposes, undertaking their normal mode of operations, and not engaged in activities directed at underwater cultural heritage, shall not be obliged to report discoveries of underwater cultural heritage under Articles 9, 10, 11 and 12 of this Convention. However States Parties shall ensure, by the adoption of appropriate measures not impairing the operations or operational capabilities of their warships or other government ships or military aircraft with sovereign immunity operated for non-commercial purposes, that they comply, as far as is reasonable and practicable, with Articles 9, 10, 11 and 12 of this Convention.

Article 14 – Control of entry into the territory, dealing and possession

States Parties shall take measures to prevent the entry into their territory, the dealing in, or the possession of, underwater cultural heritage illicitly exported and/or recovered, where recovery was contrary to this Convention.

Article 15 – Non-use of areas under the jurisdiction of States Parties

States Parties shall take measures to prohibit the use of their territory, including their maritime ports, as well as artificial islands, installations and structures under their exclusive jurisdiction or control, in support of any activity directed at underwater cultural heritage which is not in conformity with this Convention.

Article 16 – Measures relating to nationals and vessels

States Parties shall take all practicable measures to ensure that their nationals and vessels flying their flag do not engage in any activity directed at underwater cultural heritage in a manner not in conformity with this Convention.

Article 17 – Sanctions

1. Each State Party shall impose sanctions for violations of measures it has taken to implement this Convention.

2. Sanctions applicable in respect of violations shall be adequate in severity to be effective in securing compliance with this Convention and to discourage violations wherever they occur and shall deprive offenders of the benefit deriving from their illegal activities.

3. States Parties shall cooperate to ensure enforcement of sanctions imposed under this Article.

Article 18 – Seizure and disposition of underwater cultural heritage

1. Each State Party shall take measures providing for the seizure of underwater cultural heritage in its territory that has been recovered in a manner not in conformity with this Convention.

2. Each State Party shall record, protect and take all reasonable measures to stabilize underwater cultural heritage seized under this Convention.

3. Each State Party shall notify the Director-General and any other State with a verifiable link, especially a cultural, historical or archaeological link, to the underwater cultural heritage concerned of any seizure of underwater cultural heritage that it has made under this Convention.

4. A State Party which has seized underwater cultural heritage shall ensure that its disposition be for the public benefit, taking into account the need for conservation and research; the need for reassembly of a dispersed collection;

the need for public access, exhibition and education; and the interests of any State with a verifiable link, especially a cultural, historical or archaeological link, in respect of the underwater cultural heritage concerned.

Article 19 – Cooperation and information-sharing

1. States Parties shall cooperate and assist each other in the protection and management of underwater cultural heritage under this Convention, including, where practicable, collaborating in the investigation, excavation, documentation, conservation, study and presentation of such heritage.

2. To the extent compatible with the purposes of this Convention, each State Party undertakes to share information with other States Parties concerning underwater cultural heritage, including discovery of heritage, location of heritage, heritage excavated or recovered contrary to this Convention or otherwise in violation of international law, pertinent scientific methodology and technology, and legal developments relating to such heritage.

3. Information shared between States Parties, or between UNESCO and States Parties, regarding the discovery or location of underwater cultural heritage shall, to the extent compatible with their national legislation, be kept confidential and reserved to competent authorities of States Parties as long as the disclosure of such information might endanger or otherwise put at risk the preservation of such underwater cultural heritage.

4. Each State Party shall take all practicable measures to disseminate information, including where feasible through appropriate international databases, about underwater cultural heritage excavated or recovered contrary to this Convention or otherwise in violation of international law.

Article 20 – Public awareness

Each State Party shall take all practicable measures to raise public awareness regarding the value and significance of underwater cultural heritage and the importance of protecting it under this Convention.

Article 21 – Training in underwater archaeology

States Parties shall cooperate in the provision of training in underwater archaeology, in techniques for the conservation of underwater cultural heritage and, on agreed terms, in the transfer of technology relating to underwater cultural heritage.

Article 22 – Competent authorities

1. In order to ensure the proper implementation of this Convention, States Parties shall establish competent authorities or reinforce the existing ones where appropriate, with the aim of providing for the establishment, maintenance and updating of an inventory of underwater cultural heritage, the effective protection, conservation, presentation and management of underwater cultural heritage, as well as research and education.

2. States Parties shall communicate to the Director-General the names and addresses of their competent authorities relating to underwater cultural heritage.

Article 23 – Meetings of States Parties

1. The Director-General shall convene a Meeting of States Parties within one year of the entry into force of this Convention and thereafter at least once every two years. At the request of a majority of States Parties, the Director-General shall convene an Extraordinary Meeting of States Parties.

2. The Meeting of States Parties shall decide on its functions and responsibilities.

3. The Meeting of States Parties shall adopt its own Rules of Procedure.

4. The Meeting of States Parties may establish a Scientific and Technical Advisory Body composed of experts nominated by the States Parties with due regard to the principle of equitable geographical distribution and the desirability of a gender balance.

5. The Scientific and Technical Advisory Body shall appropriately assist the Meeting of States Parties in questions of a scientific or technical nature regarding the implementation of the Rules.

Article 24 – Secretariat for this Convention

1. The Director-General shall be responsible for the functions of the Secretariat for this Convention.

2. The duties of the Secretariat shall include:

   (A) organizing Meetings of States Parties as provided for in Article 23, paragraph 1; and

   (B) assisting States Parties in implementing the decisions of the Meetings of States Parties.

Article 25 – Peaceful settlement of disputes

1. Any dispute between two or more States Parties concerning the interpretation or application of this Convention shall be subject to negotiations in good faith or other peaceful means of settlement of their own choice.

2. If those negotiations do not settle the dispute within a reasonable period of time, it may be submitted to UNESCO for mediation, by agreement between the States Parties concerned.

3. If mediation is not undertaken or if there is no settlement by mediation, the provisions relating to the settlement of disputes set out in Part XV of the United Nations Convention on the Law of the Sea apply mutatis mutandis to any dispute between States Parties to this Convention concerning the interpretation or application of this Convention, whether or not they are also Parties to the United Nations Convention on the Law of the Sea.

4. Any procedure chosen by a State Party to this Convention and to the United Nations Convention on the Law of the Sea pursuant to Article 287 of the latter shall apply to the settlement of disputes under this Article, unless that State Party, when ratifying, accepting, approving or acceding to this Convention, or at any time thereafter, chooses another procedure pursuant to Article 287 for the purpose of the settlement of disputes arising out of this Convention.

5. A State Party to this Convention which is not a Party to the United Nations Convention on the Law of the Sea, when ratifying, accepting, approving or acceding to this Convention or at any time thereafter shall be free to choose, by means of a written declaration, one or more of the means set out in Article 287, paragraph 1, of the United Nations Convention on the Law of the Sea for the purpose of settlement of disputes under this Article. Article 287 shall apply to such a declaration, as well as to any dispute to which such State is party, which is not covered by a declaration in force. For the purpose of conciliation and arbitration, in accordance with Annexes V and VII of the United Nations Convention on the Law of the Sea, such State shall be entitled to nominate conciliators and arbitrators to be included in the lists referred to in Annex V, Article 2, and Annex VII, Article 2, for the settlement of disputes arising out of this Convention.

Article 26 – Ratification, acceptance, approval or accession

1. This Convention shall be subject to ratification, acceptance or approval by Member States of UNESCO.

2. This Convention shall be subject to accession:

   (A) by States that are not members of UNESCO but are members of the United Nations or of a specialized agency within the United Nations system or of the International Atomic Energy Agency, as well as by States Parties to the Statute of the International Court of Justice and any other State invited to accede to this Convention by the General Conference of UNESCO;

   (B) by territories which enjoy full internal self-government, recognized as such by the United Nations, but have not attained full independence in accordance with General Assembly resolution 1514 (XV) and which have competence over the matters governed by this Convention, including the competence to enter into treaties in respect of those matters.

3. The instruments of ratification, acceptance, approval or accession shall be deposited with the Director-General.

Article 27 – Entry into force

This Convention shall enter into force three months after the date of the deposit of the twentieth instrument referred to in Article 26, but solely with respect to the twenty States or territories that have so deposited their instruments. It shall enter into force for each other State or territory three months after the date on which that State or territory has deposited its instrument.

Article 28 – Declaration as to inland waters

When ratifying, accepting, approving or acceding to this Convention or at any time thereafter, any State or territory may declare that the Rules shall apply to inland waters not of a maritime character.

Article 29 – Limitations to geographical scope

At the time of ratifying, accepting, approving or acceding to this Convention, a State or territory may make a declaration to the depositary that this Convention shall not be applicable to specific parts of its territory, internal waters, archipelagic waters or territorial sea, and shall identify therein the reasons for such declaration. Such State shall, to the extent practicable and as quickly as possible, promote conditions under which this Convention will apply to the areas specified in its declaration, and to that end shall also withdraw its declaration in whole or in part as soon as that has been achieved.

Article 30 – Reservations

With the exception of Article 29, no reservations may be made to this Convention.

Article 31 – Amendments

1. A State Party may, by written communication addressed to the Director-General, propose amendments to this Convention. The Director-General shall circulate such communication to all States Parties. If, within six months from the date of the circulation of the communication, not less than one half of the States Parties reply favourably to the request, the Director-General shall present such proposal to the next Meeting of States Parties for discussion and possible adoption.

2. Amendments shall be adopted by a two-thirds majority of States Parties present and voting.

3. Once adopted, amendments to this Convention shall be subject to ratification, acceptance, approval or accession by the States Parties.

4. Amendments shall enter into force, but solely with respect to the States Parties that have ratified, accepted, approved or acceded to them, three months after the deposit of the instruments referred to in paragraph 3 of this Article by two thirds of the States Parties.

Thereafter, for each State or territory that ratifies, accepts, approves or accedes to it, the amendment shall enter into force three months after the date of deposit by that Party of its instrument of ratification, acceptance, approval or accession.

5. A State or territory which becomes a Party to this Convention after the entry into force of amendments in conformity with paragraph 4 of this Article shall, failing an expression of different intention by that State or territory, be considered:

(A) as a Party to this Convention as so amended; and

(B) as a Party to the unamended Convention in relation to any State Party not bound by the amendment.

Article 32 – Denunciation

1. A State Party may, by written notification addressed to the Director-General, denounce this Convention.

2. The denunciation shall take effect twelve months after the date of receipt of the notification, unless the notification specifies a later date.

3. The denunciation shall not in any way affect the duty of any State Party to fulfil any obligation embodied in this Convention to which it would be subject under international law independently of this Convention.

Article 33 – The Rules

The Rules annexed to this Convention form an integral part of it and, unless expressly provided otherwise, a reference to this Convention includes a reference to the Rules.

Article 34 – Registration with the United Nations

In conformity with Article 102 of the Charter of the United Nations, this Convention shall be registered with the Secretariat of the United Nations at the request of the Director-General.

Article 35 – Authoritative texts

This Convention has been drawn up in Arabic, Chinese, English, French, Russian and Spanish, the six texts being equally authoritative.

ANNEX: RULES CONCERNING ACTIVITIES DIRECTED AT UNDERWATER CULTURAL HERITAGE

I. General principles

RULE 1. The protection of underwater cultural heritage through in situ preservation shall be considered as the first option. Accordingly, activities directed at underwater cultural heritage shall be authorized in a manner consistent with the protection of that heritage, and subject to that requirement may be authorized for the purpose of making a significant contribution to protection or knowledge or enhancement of underwater cultural heritage.

RULE 2. The commercial exploitation of underwater cultural heritage for trade or speculation or its irretrievable dispersal is fundamentally incompatible with the protection and proper management of underwater cultural heritage. Underwater cultural heritage shall not be traded, sold, bought or bartered as commercial goods.

This Rule cannot be interpreted as preventing:

(A) the provision of professional archaeological services or necessary services incidental thereto whose nature and purpose are in full conformity with this Convention and are subject to the authorization of the competent authorities;

(B) the deposition of underwater cultural heritage, recovered in the course of a research project in conformity with this Convention, provided such deposition does not prejudice the scientific or cultural interest or integrity of the recovered material or result in its irretrievable dispersal; is in accordance with the provisions of Rules 33 and 34; and is subject to the authorization of the competent authorities.

RULE 3. Activities directed at underwater cultural heritage shall not adversely affect the underwater cultural heritage more than is necessary for the objectives of the project.

RULE 4. Activities directed at underwater cultural heritage must use nondestructive techniques and survey methods in preference to recovery of objects. If excavation or recovery is necessary for the purpose of scientific studies or for the ultimate protection of the underwater cultural heritage, the methods and techniques used must be as non-destructive as possible and contribute to the preservation of the remains.

RULE 5. Activities directed at underwater cultural heritage shall avoid the unnecessary disturbance of human remains or venerated sites.

RULE 6. Activities directed at underwater cultural heritage shall be strictly regulated to ensure proper recording of cultural, historical and archaeological information.

RULE 7. Public access to in situ underwater cultural heritage shall be promoted, except where such access is incompatible with protection and management.

RULE 8. International cooperation in the conduct of activities directed at underwater cultural heritage shall be encouraged in order to further the effective exchange or use of archaeologists and other relevant professionals.

II. Project design

RULE 9. Prior to any activity directed at underwater cultural heritage, a project design for the activity shall be developed and submitted to the competent authorities for authorization and appropriate peer review.

RULE 10. The project design shall include:

(A) an evaluation of previous or preliminary studies;

(B) the project statement and objectives;

(C) the methodology to be used and the techniques to be employed;

(D) the anticipated funding;

(E) an expected timetable for completion of the project;

(F) the composition of the team and the qualifications, responsibilities and experience of each team member;

(G) plans for post-fieldwork analysis and other activities;

(H) a conservation programme for artefacts and the site in close cooperation with the competent authorities;

(I) a site management and maintenance policy for the whole duration of the project;

(J) a documentation programme;

(K) a safety policy;

(L) an environmental policy;

(M) arrangements for collaboration with museums and other institutions, in particular scientific institutions;

(N) report preparation;

(O) deposition of archives, including underwater cultural heritage removed; and

(P) a programme for publication.

RULE 11. Activities directed at underwater cultural heritage shall be carried out in accordance with the project design approved by the competent authorities.

RULE 12. Where unexpected discoveries are made or circumstances change, the project design shall be reviewed and amended with the approval of the competent authorities.

RULE 13. In cases of urgency or chance discoveries, activities directed at the underwater cultural heritage, including conservation measures or activities for a period of short duration, in particular site stabilization, may be authorized in the absence of a project design in order to protect the underwater cultural heritage.

III. Preliminary work

RULE 14. The preliminary work referred to in Rule 10 (a) shall include an assessment that evaluates the significance and vulnerability of the underwater cultural heritage and the surrounding natural environment to damage by the proposed project, and the potential to obtain data that would meet the project objectives.

RULE 15. The assessment shall also include background studies of available historical and archaeological evidence, the archaeological and environmental characteristics of the site, and the consequences of any potential intrusion for the long-term stability of the underwater cultural heritage affected by the activities.

IV. Project objective, methodology and techniques

RULE 16. The methodology shall comply with the project objectives, and the techniques employed shall be as non-intrusive as possible.

V. Funding

RULE 17. Except in cases of emergency to protect underwater cultural heritage, an adequate funding base shall be assured in advance of any activity, sufficient to complete all stages of the project design, including conservation, documentation and curation of recovered artefacts, and report preparation and dissemination.

RULE 18. The project design shall demonstrate an ability, such as by securing a bond, to fund the project through to completion.

RULE 19. The project design shall include a contingency plan that will ensure conservation of underwater cultural heritage and supporting documentation in the event of any interruption of anticipated funding.

VI. Project duration – timetable

RULE 20. An adequate timetable shall be developed to assure in advance of any activity directed at underwater cultural heritage the completion of all stages of the project design, including conservation, documentation and curation of recovered underwater cultural heritage, as well as report preparation and dissemination.

RULE 21. The project design shall include a contingency plan that will ensure conservation of underwater cultural heritage and supporting documentation in the event of any interruption or termination of the project.

VII. Competence and qualifications

RULE 22. Activities directed at underwater cultural heritage shall only be undertaken under the direction and control of, and in the regular presence of, a qualified underwater archaeologist with scientific competence appropriate to the project.

RULE 23. All persons on the project team shall be qualified and have demonstrated competence appropriate to their roles in the project.

VIII. Conservation and site management

RULE 24. The conservation programme shall provide for the treatment of the archaeological remains during the activities directed at underwater cultural heritage, during transit and in the long term. Conservation shall be carried out in accordance with current professional standards.

RULE 25. The site management programme shall provide for the protection and management in situ of underwater cultural heritage, in the course of and upon termination of fieldwork. The programme shall include public information, reasonable provision for site stabilization, monitoring, and protection against interference.

IX. Documentation

RULE 26. The documentation programme shall set out thorough documentation including a progress report of activities directed at underwater cultural heritage, in accordance with current professional standards of archaeological documentation.

RULE 27. Documentation shall include, at a minimum, a comprehensive record of the site, including the provenance of underwater cultural heritage moved or removed in the course of the activities directed at underwater cultural heritage, field notes, plans, drawings, sections, and photographs or recording in other media.

X. Safety

RULE 28. A safety policy shall be prepared that is adequate to ensure the safety and health of the project team and third parties and that is in conformity with any applicable statutory and professional requirements.

XI. Environment

RULE 29. An environmental policy shall be prepared that is adequate to ensure that the seabed and marine life are not unduly disturbed.

XII. Reporting

RULE 30. Interim and final reports shall be made available according to the timetable set out in the project design, and deposited in relevant public records.

RULE 31. Reports shall include:

(A) an account of the objectives;

(B) an account of the methods and techniques employed;

(C) an account of the results achieved;

(D) basic graphic and photographic documentation on all phases of the activity;

(E) recommendations concerning conservation and curation of the site and of any underwater cultural heritage removed; and

(F) recommendations for future activities.

XIII. Curation of project archives

RULE 32. Arrangements for curation of the project archives shall be agreed to before any activity commences, and shall be set out in the project design.

RULE 33. The project archives, including any underwater cultural heritage removedand a copy of all supporting documentation shall, as far as possible, be kept togetherand intact as a collection in a manner that is available for professional and public access as well as for the curation of the archives. This should be done as rapidly as possible and in any case not later than ten years from the completion of the project, in so far as may be compatible with conservation of the underwater cultural heritage.

RULE 34. The project archives shall be managed according to international professional standards, and subject to the authorization of the competent authorities.

XIV. Dissemination

RULE 35. Projects shall provide for public education and popular presentation of the project results where appropriate.

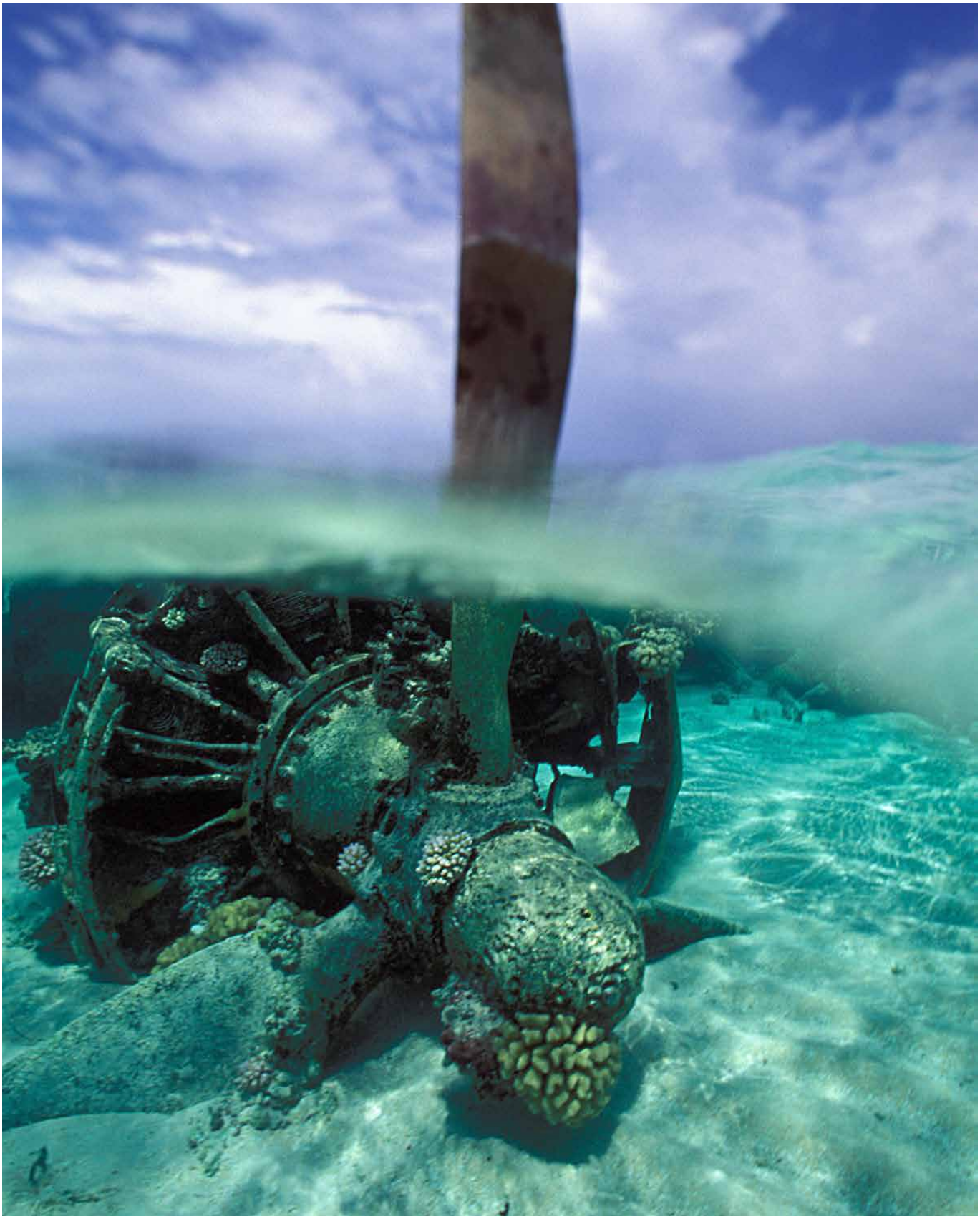
RULE 36. A final synthesis of a project shall be:

(A) made public as soon as possible, having regard to the complexity of the project and the confidential or sensitive nature of the information; and

(B) deposited in relevant public records.

Done in Paris this 6th day of November 2001 in two authentic copies bearing the signature of the President of the thirty–first session of the General Conference and of the Director-General of the United Nations Educational, Scientific and Cultural Organization, which shall be deposited in the archives of the United Nations Educational, Scientific and Cultural Organization and certified true copies of which shall be delivered to all the States and territories referred to in Article 26 as well as to the United Nations.

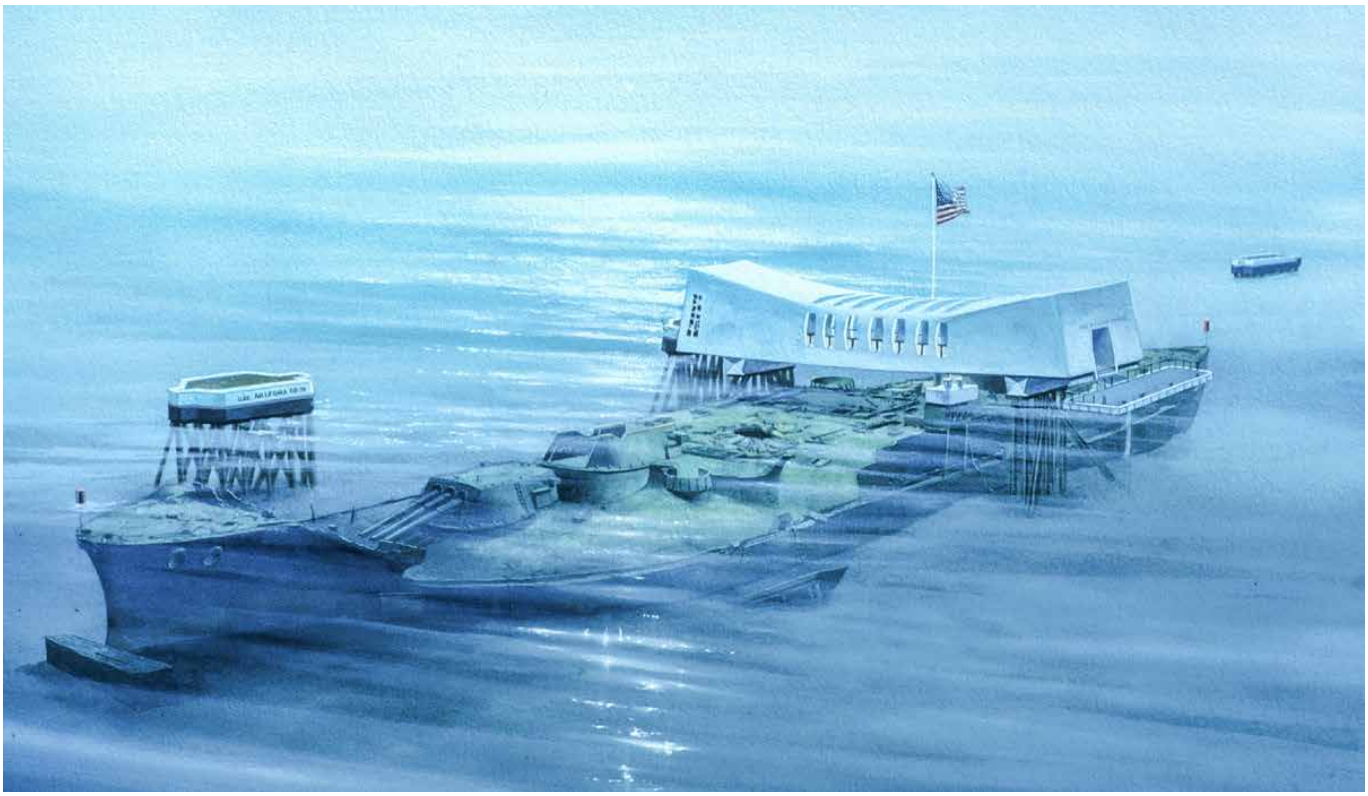
PHOTO GALLERY



Partially submerged WWII bomber engine located in Majaro. National Park Service photo.

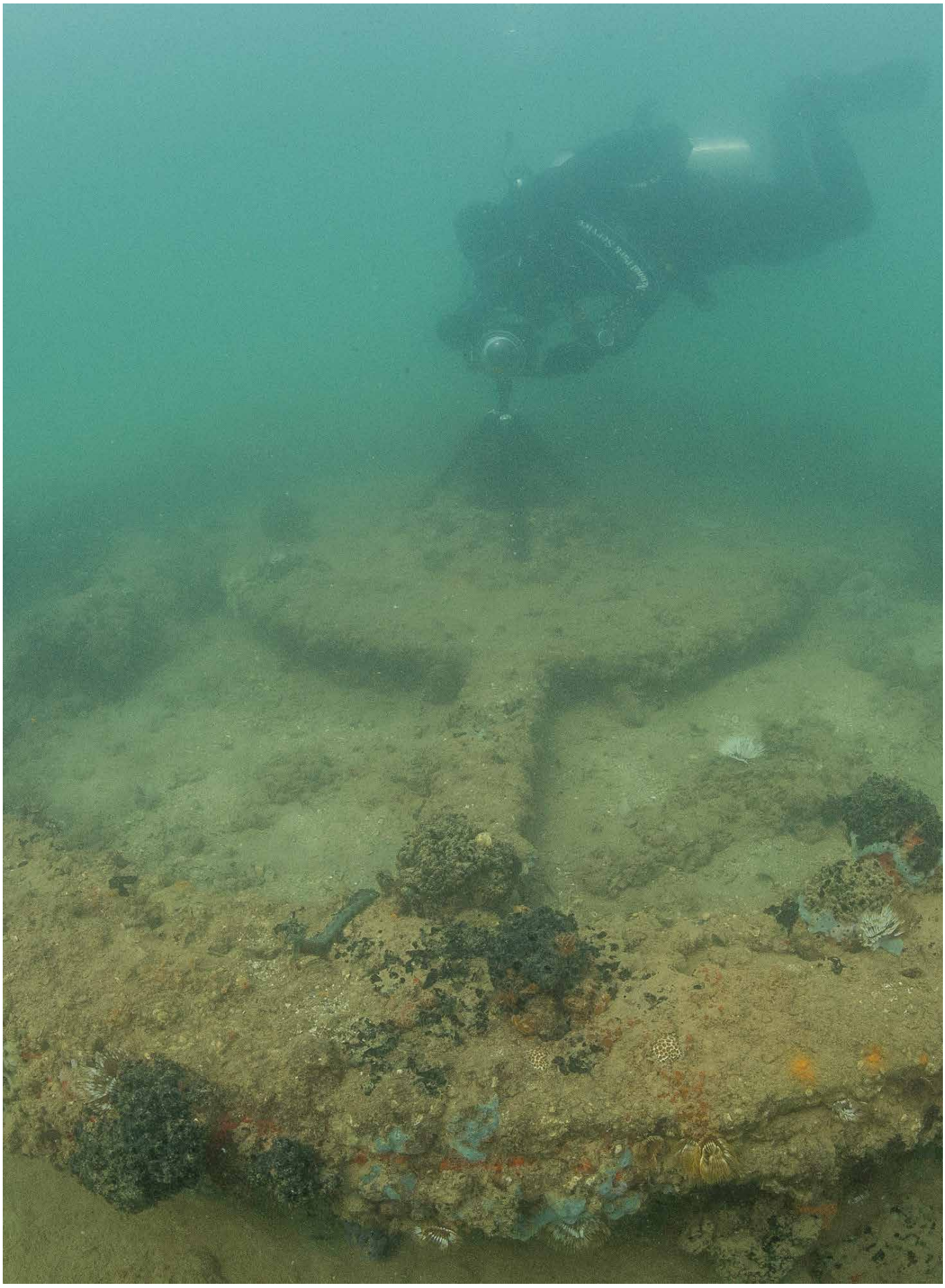
A diver examines a propeller from the Japanese battleship Nagato located in Bikini Atoll. National Park Service photo.

A National Park Service archaeologist maps the bridge of the USS Pilotfish in Bikini Atoll. National Park Service photo.



Artist Tom Freeman's painting of the USS Arizona and its memorial suspended above in Pearl Harbor, Hawaii. National Park Service Collection.

A custom built remotely operated vehicle (ROV) prepares to enter the USS Arizona during ongoing interior corrosion studies conducted by the National Park Service and partners. National Park Service photo by Brett Seymour.



A National Park Service diver photographs a large aircraft catapult base located on the stern of the USS Arizona. National Park Service photo by Brett Seymour

An National Park Service diver examines the 14" guns of the USS Arizona located in Pearl Harbor, Hawaii. National Park Service photo by Brett Seymour.

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