TRUK LAGOON AREA STUDY

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Background and Purpose

In August 1978 the United States enacted Public Law 95-348 establishing the War in the Pacific National Historical Park on Guam. The park's purpose was "to commemorate the bravery and sacrifice of those participating in the campaigns of the Pacific theater of World War II" and to preserve and interpret select battle sites related to the recapture of Guam during World War II.

Public Law 95-348 also required the Secretary of the Interior to conduct a study of other areas and sites associated with the Pacific campaign of World War II. Section 6(h) of that law directed:

> Within five years from the date of enactment, the Secretary, through the Director of the National Park Service, shall conduct and transmit to the Committee on Energy and Natural Resources of the Senate and the Committee on Interior and Insular Affairs of the House of Representatives a study of additional areas and sites associated with the Pacific campaign of World War II. The study shall contain a description and evaluation of each area or site, and an estimated cost of acquisition, development, and maintenance of the area or site, if appropriate, together with such additional authority as may be needed to enable him to implement his recommendations. The Secretary shall concentrate his study within Guam and the Northern Mariana Islands, but shall also investigate additional areas and sites within the Trust Territory of the Pacific Islands to the extent possible and may include other areas and sites in the Pacific area if practicable.

The General Management Plan for War in the Pacific National Historical Park (April 1983) identifies additional sites on Guam. A historic resources study, *Historic Resources, War in the Pacific National Historical Park, Guam* (1984) by National Park Service historian Erwin N. Thompson identifies and summarizes NPS knowledge of other World War II sites on Guam. The general management plan and the historic resources study form the resource base for responding to Section 6(h) of Public Law 95-348 with regard to additional sites on Guam.

For those additional areas and sites outside Guam, the National Park Service has carried out a national historic landmark theme study of World War II in the Pacific. This study, also by historian Thompson, describes and evaluates theme related resources in more than 50 separate areas. The study was subdivided into four general subthemes:

Figure 1. The Pacific Ocean

(1) Japanese Expansion in the Pacific, (2) The United States Home Front, (3) Alaska and the Aleutians, and (4) The United States' Central Pacific Drive. The geographic area surveyed consisted of United States territory in the states of Alaska, Hawaii, California, Oregon, and Washington, as well as Midway and Wake islands; and the area encompassing the former Trust Territory of the Pacific Islands, from which four political entities have recently emerged: the Commonwealth of the Northern Marianas, the Republic of the Marshall Islands, the Federated States of Micronesia, and the Republic of Palau. The study determined that within this expanse there were certain theme-related areas and sites which were of national significance and possessed sufficient integrity to warrant being nominated for designation as national historic landmarks. Most of these have since been designated National Historic Landmarks by the Secretary of the Interior.

The purpose of this study is to examine those areas nominated for national historic landmark designation -- i.e., judged to be of national significance -- within the two subthemes, United States' Central Pacific Drive and Japanese Expansion in the Pacific, and to determine whether any of these nationally significant areas and sites are feasible for inclusion within the national park system. Those considered were Kwajalein, Republic of the Marshall Islands; Roi?Namur, Republic of the Marshall Islands; Enewetok, Republic of the Marshall Islands; Truk Lagoon, Federated States Micronesia; Ulithi, Federated States of Micronesia; selected sites on Saipan, Commonwealth of the Northern Marianas; sites on Tinian, Commonwealth of the Northern

Marianas; Peleliu, Republic of Palau; Hickam Air Force Base, Wheeler Field, Kaneohe Naval Air Station, Fort Shafter (Palm Circle), and CINCPAC Headquarters, all in the State of Hawaii; and Midway and Wake islands, both U. S. Possessions. Of these only three appeared to meet the criteria as potential additions to the national park system: Peleliu, Truk Lagoon, and a site on Saipan. The others presently are active military bases and denied public access and consequently judged to be infeasible at this time. This report deals with Truk Lagoon.

Study Setting

The Federated States of Micronesia (FSM) extend over a vast ocean area for more than 1,500 miles, taking in all of many archipelagos which comprise the Caroline Islands except for Palau. The nearly one thousand volcanic and coral islands, atolls, and reefs, however, comprise only about 435 square miles of land scattered over an ocean area encompassing well over one million square miles.

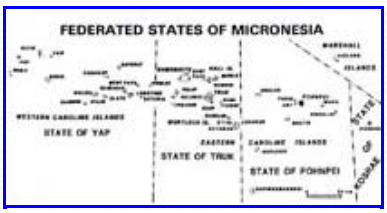

Figure 2. Truk State, Federated States of Micronesia

The Government of the FSM has been patterned after the U. S. federal system. FSM adopted its constitution in May 1979. Under it, a national government was established consisting of a 14-member Congress who choose a president and vice-president from among its members. Congress consists of one member at large elected from each of the four states for a four-year term and ten members who serve two-year terms and are apportioned according to population as follows: Truk, 5 members; Ponape, 3 members; Kosrae, 1 member; and Yap, 1 member. The judicial branch of the national government is headed by a Chief Justice of the Supreme Court. The national capital is located on Ponape. Each state elects its own governor and legislature, and like the national government, has executive, legislative, and judicial branches.

The Constitution establishes the territory of the FSM as "the waters connecting the islands of the archipelago are internal waters regardless of dimensions, and jurisdiction extends to a marine space of 200 miles measured outward from appropriate baselines, . . . any any other territory or waters belonging to Micronesia by historic right, custom, or legal title." By law, the marine boundary between adjacent states is to be determined using the principle of equidistance.

The Constitution incorporates a bill of rights. It also provides for the protection of traditional rights under Article V which states that "nothing in this Constitution takes away a role or function of a traditional leader as recognized by custom and tradition, or prevents a traditional leader from being recognized, honored, and given formal or functional roles at any level of government as may be prescribed by this Constitution or by statute."

The islands which comprise the land area of the four states of FSM -- Ponape, Yap, Kosrae, and Truk -- each have their own distinct character and geography. Ponape consists of a large (accounts for nearly one-half of the total FSM land area), mountainous, lushly vegetated volcanic island plus several outlying atolls; the small islands of Yap are lower, sedimentary in structure and mostly atolls; Kosrae is a single jungle-covered volcanic island; and Truk is composed of 11 volcanic islands lying within an immense lagoon plus several outlying atolls and low islands. The islands of the lagoon comprise more than three-quarters of the total land area of Truk State.

Figure 3. Truk Lagoon

The principal islands within Truk Lagoon -- Tol, Moen, Fefan, Udot, Uman, and Dublon -- plus several smaller islands and islets, are all enclosed by a great 140-mile long barrier reef, one of the largest and longest in the world. The barrier reef is a nearly circular ring of limestone rock, rubble, and sand -- the accumulated growth of corals, algae, and other limestone-forming organisms. The reef encloses a sapphire-blue lagoon covering more than 1,300 square miles. Within the lagoon are believed to be the wrecks of more than 50 Japanese ships of World War II vintage, nearly all of them sunk by U. S. Navy carrier aircraft during Operation Hailstone in February 1944.

The islands within Truk Lagoon are volcanic in origin and similar in appearance: narrow coastal flats and steep interior uplands. The coastal portions of the islands generally consists of mangrove swamp, hibiscus, and other low, spreading tree species. Coconut, breadfruit, and pandanus are also found along the coast. The vegetation here is tropical and lush. Secondary forests cover the lower slopes of the uplands. On the more heavily populated islands these slopes are dominated by planted gardens and groves of breadfruit, coconut, and banana. There is usually a shrub or grassy understory in these planted areas.

These high islands are the remnants of a much larger, eroded shield volcano composed of basalt, andesite, and trachyte lava flows. These flows have been cut by dikes and interbedded with pyroclastic rocks and conglomerates. Sediments consisting of alluvium, slope wash, and marsh and swamp deposits lie on top of the volcanic rocks.

Soils of the islands of Truk are thin, often eroded, and only moderately fertile. More than three-quarters of the plant nutrients are contained in the vegetation, making constant recycling necessary to sustain or permit new plant growth.

Truk's climate is tropical -- warm and humid throughout the year. The mean annual temperature is about 81 degrees F and the relative humidity is usually in excess of 75 percent. From November through June the tradewinds blow in from the east or northeast; from July through October the winds are light and variable. Truk is north and west of the major typhoon track, so typhoons are not common in the vicinity. Truk's most destructive typhoon on record occurred in 1971. In November 1987, Tropical Storm Nina hit Truk causing extensive property damage, particularly on Moen.

The annual rainfall in Truk averages about 160 inches, ranging from a little less than 100 to more than 200 inches. Geographic location makes for distinct variations in the amount of rainfall. During the months of January through March, the monthly rainfall averages 6 to 9 inches; from April through June the monthly average is about 12 inches; from July through December it is more than 12 inches per month.

The population of the FSM, particularly Truk State, is growing at a rapid rate. In 1955 Truk's population was 11,200. By 1973, less than 20 years later, it had increased to 31,609, nearly tripling. The 1980 census figure for what is now the FSM was 73,160 with Truk (district) accounting for 37,488 -- about half of the total. About 80 percent of these people live on the islands within Truk Lagoon. According to projections developed by the FSM Office of Planning and Statistics, Truk's population will be about 54,800 by 1990 and 77,200 by the year 2000.

POPULATION (by island)

	1955	1973	1977	1980	1985	1988
Moen	2,395	9,568	10,977	10,351	14,218 [3]	
Dublon	1,320	2,558	2,820	3,223	N.A.	
Tol	2,996	5,439	6,480	6,705	N.A.	
Fefan	1,392	2,478	3,028	3,076	N.A.	
Udot	613	930	1,146	1,082	N.A.	
Umon	N.A.	1,891	1,925	2,298	N.A.	
All others	8,745	8,745	10,186	10,753	N.A.	
TOTAL	11,200 [1]	31,609 [2]	36,562 [2]	37,488 [2]		

[1] Population census, Truk district, Trust Territory of the Pacific Islands, 1957

[2] 1986 Truk Statistical Yearbook

[3] U. S. Department of State 38th Annual Report to the U. N.

People from the other islands in the lagoon have come to Moen in search of better job opportunities and educational facilities. The population density of Moen is presently about 2,200 people/square mile and projected to be in excess of 3,000/square mile by the year 2000. Most of Moen's population increases have come from migrations from the other islands. Due to the steepness of the terrain, the amount of land suitable for residential or commerical development is very limited.

In addition to the rapid growth rate, the population is very young -- about half is under the age of 15.

Truk's large population (relative to the land area) has greatly modified the native vegetation of the larger islands. More of the vegetation on these islands is second growth; i.e., it is now or has at some time in the past been used for subsistence agriculture. Those areas not now under cultivation are covered by small trees, shrubs, vines, and grasses. The rainforest of the interior uplands has been greatly intruded upon by population pressure and is now mostly agroforest (mixture of food-producing trees, such as coconut, bananas, and breadfruit interspersed with open areas of taro patches and other useful and ornamental species). The small amount of native rainforest which remains is confined to the more inaccessible mountaintops and rocky ridges.

The island of Moen is the commercial, transportation, administrative, and educational center for Truk. It is also the most heavily developed island with a commercial center, airport, port, government administrative facilities, and schools -- all located primarily on the western side of the island. Dublon was once the site of the largest Japanese naval installation outside of the home islands. Not only did Dublon contain fleet headquarters, it also was the location of a large Japanese community of stores, restaurants, a civilian hospital, and geisha houses. Little of this remains today. Most of the facilities and buildings were destroyed by bombing and are now abandoned or used for other purposes. The more substantial structures have been adapted for uses such as residences, schools, etc. In 1986 a cold storage facility was completed on Dublon and the drydocking facility is nearly completed. Plans to develop a large fish cannery on Dublon never materialized despite the construction of a large wharf on the south coast. Development on Tol and Fefan, the other large islands, is limited and consists of traditional villages.

As with the rest of FSM, Truk State receives most of its revenue through U. S. grants and assistance programs. The government is the largest employer. More than half of the tax-paying wage earners work directly for the government. Nearly all of the remaining wage earners rely to

some degree on spending by either the government directly or by government employees. Unemployment is high. The number of people engaged in subsistence farming and fishing is declining. There is little production and income is low. A small amount of income is derived from tourism, fishing, and copra production. A great deal has been accomplished in Truk State in the area of health services. Health facilities, however, remain substandard; an adequately staffed hospital, a safe and dependable water supply, and sewage disposal system are all still lacking (in 1982-1985, there was a serious outbreak of cholera).

Compact of Free Association

The agreement between the U. S. and the FSM to implement the Compact of Free Association was signed by the two parties in November 1986. With the signing, the trustee relationship with the U. S. ended and the FSM became self-governing. The agreement constituted the final step, coming after the signing of the Compact and its subsequent approval by the U. S. Congress and the President in September 1986. Earlier, in June 1983, a national plebiscite was held resulting in 79 percent of the total FSM electorate voting in favor of the Compact.

The Compact constitutes both a law and an international agreement for the U. S. The agreement brings into force the provisions of the Compact and terminates the Trusteeship Agreement between the U. S. and the FSM.

The Compact provides for the FSM to be fully self-governing, while retaining close ties with the U. S. The U. S. is to provide for economic assistance for a period of 15 years. This assistance will be in the form of block grants and program assistance, tax and trade benefits such as duty free treatment of goods from FSM. Some U. S. programs such as airport safety and the post office will continue, and the U. S. is to continue to have responsibility for FSM's defense in the form of military rights. FSM is treated as a State or Territory in regard to receiving U.S. appropriations for historic preservation.

Tenure

Land tenure in Truk, as in most of the Pacific, was based on and associated with subsistence activities where a community's lands and waters were the source of its food, shelter, clothing, and other necessities. Land also was the basis for social organization (hierarchy), culture, and religion. Today, traditional land tenure still exerts an influence on land use. The people of Truk continue to place a high value on land, both economically and in terms of the social status it brings. Land on the islands of Truk Lagoon is a very valuable reosurce and in short supply; consequently, the Trukese are reluctant to part with it.

Although real property may be owned individually (during the German and Japanese periods, small amounts of land were acquired by the government, missionaries, corporations and individuals), most of the lands in Truk are family or lineage lands, considered to be "owned" in common by all the members of the extended family. Lineage is usually based on female descent -- i.e., is matrilineal -- but patrilineal and bilateral lineage exist as well. Rights to lands are held by a kinship group who have inherited them from a common ancestor. Traditionally, the eldest male generally apportioned the land among the members and directed its use. The sale of land in Truk to outsiders (non-Trukese) is uncommon, having occurred only on the island of Moen. Places on Moen like the airport, the government center, schools, the port, are publically owned; all of the other lands with minor exception are communally owned. The Catholic Church owns a parcel of land on Moen and the Continental Hotel is on leased lands.

The types of real property traditionally recognized in Truk include not only land but mangrove swamp, submerged reef areas, and even isolated coral heads. The use of a particular area of land or reef may be restricted by the decree of the traditional chief; for example, following the death of someone who was associated in some way with such an area.

Land tenure is normally characterized by many kinds of rights -- the right to clear and cultivate, build houses, hunt, fish, fetch water, have access across (transit), or obtain particular resources such as firewood, salt, clay, etc. These rights vary in their strength and permanence -- several people can hold rights over the same piece of land and the whole group is involved in making decisions, while in other cases, decisions are concentrated in the hands of a chief. In some instances the rights to individual trees or to cultivate or harvest breadfruit may be held separately from the land. Generally, the rights to use lands which are located in or near a village or community are more defined and individualized compared with those lands further away -- i.e., rights (and boundaries) become more vague and belong more to the group away from areas of permanent settlement.

With regard to marine tenure, in the traditional system a village could claim exclusive rights of use to a particular water area. Usually, the boundaries of these submerged reef areas were extensions of the village -- i.e., the use rights to the reef or ocean areas would be based on the rights associated with the adjacent lands. Outsiders would be excluded or could gain access to fish in these areas only with the permission of the village clans. Today, villages still claim ownership rights to the adjacent reef. Village chiefs and clan members are aware of boundaries. As a matter of protocol, non-villagers still obtain permission to fish or otherwise utilize the reef area. The government, since Trust Territory days, has claimed ownership of marine areas, but customary and traditional use rights are still recognized.

The importance of land (and waters) in Truk means that there are generally strict controls on any permanent transfer out of the kinship group. Extensive consultation involving large numbers of people is needed; foremost in importance are the village chiefs and councils, as well as the heads of clans that may have different rights to a particular parcel.

A land registration program to determine ownership was begun in Truk several years ago. It is estimated that these are about 15,000 parcels of real estate in Truk. The program was begun on the island of Moen, then extended to Dublon, Udot, Eot, and later to Uman and Fefan. The program is scheduled for completion by the end of 1989.

Consultation and Coordination

During November 1986, a National Park Service planning team from Honolulu, accompanied by Mr. Mike Gawel, Chief of the Division of Marine Resources, FSM, spent a week in Truk conducting an on-site reconnaissance of World War II sites and features found on the islands of Moen, Dublon, and Eten. Mr. Kayo Noket, historic preservation officer for Truk State, acted as guide on the trips to Dublon and Eten.

At that time meetings were also held with representatives of Truk government agencies, including Mr. Joe Suka of Resources and Development to obtain information and data and to brief them on the goals and objectives of the Park Service study.

The Park Service planning team also had the opportunity to meet with Mr. Kimino Aisek, Truk's most knowledgeable and experienced commerical dive operator (and a 17year old eyewitness to the 1944 attack on the Japanese ships in the lagoon). Mr. Aisek revealed a deep personal concern over the inadequacies in the existing protection of the sunken wrecks. They are, according to Mr. Aisek, being systematically looted. The looting is apparently coming from two sources: unescorted recreational divers looking for souvenirs and fishermen and others looking for unexploded ordinance. Mr. Aisek maintains that the other operators are too few in numbers to keep track of all the divers who seek to explore the sunken wrecks.

In 1981 the National Park Service Submerged Cultural Resources Unit visited Truk. During that visit reconnaissance dives were made on the sunken wrecks.

Tourism

There is direct air service to Truk three times/week. These flights originate in Honolulu and terminate in Guam, with a stop at Truk (Moen), along with stops at Majuro and Kwajalein in the Republic of the Marshall Islands and Ponape in the FSM.

Although presently only a small source of revenue, tourism in Truk appears to have great potential. One of the most important attractions for visitors is the underwater fleet in Truk Lagoon. Most of the tourists who visit Truk come to scuba dive on the sunken wrecks. The diving here is world-class. There are several commercial dive operators located on Moen.

According to available statistics, tourism on Truk has increased by about 35 percent over the past decade or so. The long-term trend appears to be upward, although significant fluctuations downward occurred in 1981, 1983, and 1984.

VISITORS TO TRUK

1975 - 1985

	[1] 1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Visitors	4,026	3,900	5,229	5,749	6,110	5,235	6,521	6,477	4,238	5,191	6,364
Tourist Earnings (000)	[2] $290	$357	$430	--	$439	--	$569	--	--	--	$532
Visitors by Country of Origin											
USA	--	--	--	--	51%	52%	42%	52%	44%	59%	--
Japan	--	--	--	--	25%	25%	22%	28%	36%	33%	--
Other	--	--	--	--	24%	23%	36%	20%	20%	8%	--

[1] Includes tourists, business people, missionaries, and expatriates.

[2] Tourist expenditures, based on fisal year.

Source: 1986 Truk Statistical Yearbook

As noted, the principal draw for tourists is the opportunity to dive on the sunken wrecks in the lagoon. It is estimated that well over 1,000 sport divers come each year. There are three dive shops, all on Moen, which have equipment for divers to rent and provide guides and boats to dive sites as well.

Land Use and Vegetation

On the high lands of Truk Lagoon the natural landscape has been greatly modified by man. Evidence of human activities, present and past, is apparent to varying degrees on all these islands. These human activities have been in the form of:

- -- extensive clearing of vegetation for crops
- -- fires
- -- the introduction of noxious weeds and alien plants and animals

The depletion of Truk's native forest has gone on for centuries. However, during World War II, the process of reducing the native vegetation was accelerated with the arrival of large numbers of Japanese and imported laborers who carried out large construction projects in the form of

military facilities. The U. S. military, after February 1944, greatly exacerbated the situation by cutting off the islands from Japanese supplies. This forced the Japanese (numbering about 35,000) and the Trukese (about 10,000) to put more pressures on the available land and water resources in order to survive. All available lands were put under cultivation resulting in a further depletion of the native vegetation. After the war's end the U. S. military added more construction, encroaching even more on the native vegetation.

As a result of these activities, the native vegetation of these islands has been extensively disturbed and largely replaced. This is particularly true on the islands of Moen and Dublon. What remains here of the native forest is confined to a few mountain tops and rugged cliffs.
Moen, with its dense population, is the most developed and is where the natural landscape has been most severely altered. Even though most of the people live along the flat areas paralleling the shoreline, the steeply sloped interior lands are greatly modified and utilized extensively and intensively for subsistence agriculture. Dublon, though supporting a considerably smaller population than Moen, also has had its natural vegetation substantially reduced. Most of this occurred during World War II.

The other large islands -- Tol (including Pata and Polle), Fefan, Uman, and Udot -- although less developed, have had their natural vegetation greatly modified too. Much of the coastal marshes are under wetland taro cultivation. Scattered over the lowlands and on the interior slopes are abundant tree crops such as breadfruit, mango, coconut; along with smaller though more intensively cultivated plots of banana, dryland taro, pineapple, yams, sweet potatoes, papaya, and other vegetables.

Land use and vegetation on the islands of Truk Lagoon can be divided into five major categories:

Disturbed areas. Where man's activities, past and present, have altered the natural landscape to varying degrees. These areas consist of (1) those which were disturbed in the recent past and are now overgrown with secondary vegetation composed of small fast-growing trees (commonly *Hibiscus tiliaceus* and *Macaranga carolinensis*), shrubs, vines (usually weedy invaders), and grasses; (2) those now under cultivation, typically planted with a mixture of food-producing trees (predominantly banana), some ornamental, with an overstory of coconut and breadfruit and interspersed with open areas of taro; and (3) those covered almost exclusively with grasses and the result of the destruction of the forest vegetation by fire (subsequent fires here have prevented tree species from returning).

Wetlands. These are dominated by grasses, sedges, and herbs growing in standing water. On Moen and Dublon these are freshwater marshes located above sea level landward of the mangrove forest. They commonly contain tall, reed-like grasses and many are partially cultivated with taro, the taro often being intermixed with secondary vegetation. The ivory nut palm commonly grows at the edge of these freshwater marshes. A few small freshwater marshes are located in the uplands.

Mangrove forest. The most distinctive and uniform vegetation type on Moen and Dublon. *Rhizophora* spp. and *Bruginera gymnorhiza* are the most common species present; less common are *Sonneratia alba* and *Xylocarpus granatum*. Along the landward edge of the forest *Heritiera litoralis*, *Nypa fruticans*, and *Achrostichum aureum*, a large fern, are found. The mangrove forests of Moen and Dublon have been damaged by landfill operations and during World War II by oil spills.

Primary forest. The remnants of a unique forest flora that before the advent of man covered all but the coastal fringes of these two islands. Today these forests are confined to small, relatively inaccessible stands located in the uplands on mountaintops and rocky ridges. These upland forests contain several endemic species: *Garcinia ponapensis* var *trukensis*, *Pentaphalangium carolinense*, *Astronidium carolinense* (Kaneh.) Mgf., *Eugenia trukensis* Hosok, *Macropsychanthus carolinensis* Kaneh and Hosok, and *Hoya trukensis*

Hosok.

Developed areas. Those now covered by man-made impervious surfaces -- buildings, paved roads, airport runway, tanks, towers, docks, ramps, etc. -- and generally lacking any sort of vegetative covering, except for small gardens or weeds.

Land Use and Vegetation on the Islands in Truk Lagoon (in Acres)

Primary Forest	± 1,670
Mangrove	± 750
Wetlands	± 580
Disturbed and Developed Areas	± 7,300
	± 10,300

Land Use Categories in Acres

	Moen	**Dublon**	**Eten**
Primary Forest	± 890	± 190	± 20
Mangrove	± 370	± 170	-
Wetlands	± 320	± 160	-
Disturbed and Developed Areas	± 3,020	± 1,980	± 120
	± 4,600	± 2,500	± 140

Figures 4 and 5 show existing land use patterns on the islands of Moen, Eten, and Dublon, where the great majority of the remaining World War II sites and features have been located.

Figure 4. Land Use, Island of Moen

Figure 5. Land Use, Islands of Dublon and Eten

Figure 6. Truk Lagoon is one of the great protected anchorages in the world.

World War II Resources of Truk

The great lagoon of Truk provides one of the best natural anchorages in the world. The Japanese military realized this when Truk first came under their control in 1914, but made no attempt to build any fortifications there for quite some time. It was not until the 1930's that Imperial Japan began to build the large navy which would eventually use Truk Lagoon as its most important advanced base.

Due to its great natural advantages Truk Lagoon was easily developed into a large naval base. The barrier reef encompasses a protective lagoon approximately 140 miles in circumference with only a few navigable breaks in the reef to allow ships to enter. The lagoon was large enough to easily accommodate the entire Japanese Imperial Fleet. It was easily defended; ships attempting to attack the fleet by entering the lagoon would have to enter through one or more of the four main passes which could be easily defended by fortifying the small islands and islets located along the reef. The protecting barrier reef allowed ships anchored within the lagoon to be outside the range of all but the guns of large battleships. Even those ships within range could be protected by the high islands. Truk Lagoon, prior to February 1944, was perceived by the U. S. as an impregnable fortress.

Truk's development as a naval base did not reach its peak until 1943. It was not until January 1944 that the Japanese Army began preparations for an expected invasion by the U. S. By that time the military installations spread over the larger islands of the lagoon consisted briefly of the following facilities and defensive fortifications:

Dubon: ship repair, docks, seaplane base, submarine base, fleet headquarters, a 2,500-ton floating drydock, torpedo storage dumps, torpedo boat base, hospital, aviation repair and supply station, fuel storage, coastal communication center, coastal defense, and anti-aircraft guns.

Moen: bomber field, seaplane and fighter base, torpedo storage, torpedo boat base, radio communications center, and coastal and anti-aircraft batteries.

Fefan: supply center, piers, warehouses, barracks, ammunition dumps, and dual-purpose guns.

Etan: fighter base, hangars, administration building, barracks, dual-purpose guns.

Param: bomber base, coastal defense and anti-aircraft guns.

Tol: torpedo boat base, coastal defense and anti-aircraft guns.

Ulalu: radio direction finder station, barracks, and warehouses.

Udot Island: Coastal and anti-aircraft defenses.

Work on these fortifications had not been completed when the U. S. carrier forces attacked Truk in February 1944.

By February 1944, there were nearly 7,000 Japanese army troops at Truk brought there to bolster defensive capabilities. These were in addition to the several thousand naval personnel who manned the ships and controlled air operations. Japanese aircraft at Truk consisted of 11 different types of aircraft and totalled more than 360 planes.

U. S. intelligence had indicated that the ships of Japan's Combined Fleet operating out of Truk at the time consisted of 3 to 4 battleships, 4 carriers, 12 cruisers, several submarines, dozens of destroyers, plus more than 100 support vessels including transports, tugs, barges, and other smaller craft. A few weeks prior to the Hailstone operation, on February 4, an overflight by U. S. reconnaissance aircraft revealed the presence of the battleship, MUSASHI, 2 carriers, 8 heavy cruisers, 4 light cruisers, 20 destroyers, and 12 submarines.

Operation Hailstone was the first time carrier forces were put in enemy territory beyond the reach of land-based aircraft. Previously, U. S. carrier-based air strikes had been used primarily to provide protection and support for amphibious assaults. Hailstone's objective was through a series of coordinated attacks to completely neutralize Truk as a naval and air base.

The most significant remaining World War II resources of Truk are the sunken ships at the bottom of the lagoon. Nearly all of them are merchantmen. More than 40 years old, the exterior parts of many are now covered with soft corals and sponges. Most of the ships, when sunk, were loaded with military equipment -- tanks, howitzers, field pieces, anti-aircraft guns, ammunition, including 18-inch projectiles for the battleships, YAMATO and MUSASHI -- as well as gasoline, oil, machinery, tractors, medicine, and rice. All this material, except where disturbed or removed by divers (usually on the shallow, more accessible wrecks), remains intact.

The wrecks, most known and located, still lie where they were sunk more than four decades ago. The warm, clear, and relatively shallow lagoon waters, in combination with sunlight, have allowed these wrecks to be transformed into what is probably the largest man-made coral "reef" in the world. Thus, recreational divers can experience not only an incredible assemblage of World War II relics, but also a wonderland of underwater habitat containing countless and colorful marine life forms.

The importance of these wrecks has been long recognized by the people of Truk. Nearly 20 years ago attendees at the First Truk Marine Resources Conference agreed that the sunken wrecks had great potential to attract visitors and that Truk Lagoon should be preserved as a historic site. In 1971, the Truk District Legislature (Trust Territory) designated the sunken wrecks of Truk Lagoon as historical monuments and made the removal of any artifacts or marine life from the shipwrecks or planes illegal. More recently, the ocean area over the wrecks was designated the Truk Lagoon State Monument and by state law prohibiting of any artifact. Moreover, every visiting diver must obtain a wreck diving permit. In 1985, the Truk Lagoon Underwater Fleet was designated a U. S. national historic landmark.

Nearly all of the known wrecks lying within Truk Lagoon were sunk by U. S. carrier based planes

during Operation Hailstone during attacks made on February 16 and 17, 1944. These ships, mainly merchantmen and auxiliaries, were what remained of the Combined Fleet after the major warships had pulled out anticipating the coming attack by powerful carrier forces of the U. S. Navy. Apparently many had been forced to remain because of a fuel and water shortage and because strong winds earlier had prevented them from being unloaded while others were undergoing repairs (these had been damaged earlier by U. S. planes while ferrying supplies to Rabaul). The warships that did remain consisted of two light cruisers and eight destroyers. The battleship (the 64,000-ton MUSASHI), 2 aircraft carriers, 12 submarines, 4 of the 6 heavy cruisers, 2 of the 4 light cruisers, and 12 of the 20 destroyers, spotted two weeks earlier by U. S. reconnaissance aircraft, had all headed for safer waters.

Most of these ships that remained were subsequently sunk by U. S. torpedo bombers and dive bombers attacking Truk in several strikes, including one at night. The attacks on shipping were carried out only after U. S. carrier-based fighters had established air supremacy by destroying the Japanese planes sent up to challenge them and then U. S. torpedo bombers made the island airstrips unusable to prevent counterattacks on the nearby carriers.

The ships sunk within the lagoon consisted of 2 light cruisers, 4 destroyers (the other 4 were heavily damaged), about 30 merchantmen or merchant conversions, including 4 tankers, 3 subchasers, a motor torpedo boat, and a yacht. Nearly all merchantmen were sunk within the lagoon, many of them while at anchor. All of the warships were underway when sunk, one within the lagoon, another while attempting to enter North Pass, and the others outside of the lagoon trying to get away to the open ocean. A large submarine was also lost, not by the attacking U. S. forces, but apparently due to the negligence of her crew. Altogether, in two days and one night of almost continuous raids over 200,000 tons of shipping were sunk along with about 270 aircraft destroyed. Seventy aircraft were shot down, and 200 destroyed on the ground. The loss of these planes, particularly the 50 or 60 combat fighters, was more keenly felt by the Japanese than the loss of the shipping. Unfortunately, only two of the wrecks of these fighters have been located. No others are known to exist.

Other ships were sunk during subsequent attacks by U. S. forces. On April 21 and again on April 30, Truk was again attacked by U. S. carrier-based aircraft. The primary purpose of these later strikes was to destroy aircraft defensive installations and buildings; however, ships in the lagoon were also attacked. A cargo ship, 2 auxiliary subchasers, 2 small tugs, and about 18 other smaller craft were sunk.

Attacks by land-based U. S. heavy bombers took place following the carrier raids and continued periodically until the war's end. These attacks concentracted on aircraft and shore-based installations. In June 1945, carrier forces again attacked Truk -- this time by the British -- but caused little damage.

Most of these wrecks have been located and identified, some as recently as 1983. It is possible that new wrecks will be identified as divers continue to explore the waters of the lagoon.

Figure 7. The flat linear terrain near shoreline of Etan is the old air field, now tree covered.

Figure 8. The old Japanese operations building on Dublon is now used as a residence. Note the precision Japanese Naval Base rockwork of the seawall.

The build-up of Truk's defensive capabilities by the Japanese continued and was, in fact, accelerated after the air attacks of February and April 1944 despite the enormous hazards encountered by the Japanese in getting material and manpower past U. S. submarines. By April 1945, there were nearly 15,000 army personnel there and nearly 10,000 navy, plus more than 14,000 Japanese civilians.

The Japanese army troops were responsible for the construction of the fortifications. After Hailstone, many caves were dug and tunnels and bunkers constructed. These were used for living and duty quarters, ammunition and supply storage; a few caves were dug for aircraft. The Navy troops were primarily responsible for manning the large coastal defense guns and anti-aircraft positions. According to U. S. intelligence reports, Truk's defensive capabilities amounted to more than 101 army guns in 86 positions, 85 navy guns, and more than 300 smaller caliber automatic weapons.

The sites and features found today on the islands in the lagoon reflect the build-up of Truk by the Japanese military as a defensive base. These fortifications were never tested since Truk was bypassed and never invaded. Consequently, they are numerous and often in excellent state of preservation. After extensive on-the-ground surveys, it appears that the great majority of the sites and features which remain are found on the islands of Moen and Dublon. These two islands are today the most heavily developed and densely populated in the lagoon, and where adaptive uses of the more substantial of these World War II features is most apparent.

The tables on the following pages describe those World War II resources remaining in Truk which have been located; nearly all of them have been identified. More than 40 sunken wrecks are listed and there are undoubtedly more at the bottom of the lagoon waiting to be located and identified. The uniqueness of these wrecks, their site integrity, and often excellent state of preservation make them extraordinarily significant and worthy of additional protection.

The World War II features on the islands in the lagoon are varied, numerous -- nearly 100 are listed -- and have a high degree of site integrity. Nearly all of them are defensive installations,

structures, or military hardware built by the Japanese. Where feasible, they should be protected. Here, too, there are likely to be additional sites, objects, or features which have not yet been "discovered."

The World War II resources listed in this report were compiled by the Park Service and are based primarily on two publications, *World War II Wrecks of Kawjalein and Truk Lagoons* by Dan E. Bailey and *Field Survey of Truk: World War II Features* by D. Colt Denfeld. The Park Service planning team and the Submerged Cultural Resources Unit have made dives on several of the wrecks. In November 1986, the planning team conducted on-site inspections of many of the known World War II relics on the islands of Moen, Dublon, and Eten. To maintain consistency, the numbering of the sunken wrecks in this report follows Bailey and the numbering of sites and features found on the islands follows Denfeld.

The Denfeld publication was the result of extensive and intensive field work over a two-month period in January and February of 1979. A ground survey was conducted for the islands of Moen, Dublon, Tol, Eten, and two of the islets on the reef. Additionally an aerial survey was made on the islands of Eot, Fefan, Param, Udot, and Uman. Denfeld's ground and aerial surveys utilized available military reports and studies of Truk Lagoon by the U. S. Navy (CINCPAC) and the U. S. Strategic Bombing Surveys carried out in 1945 and 1947.

Bailey's publication and the accompanying wreck map were based primarily on innumerable dives made by the author and others, as well as historic research plus a personal association with other divers, both recreational and commercial. Foremost among the latter is Kimino Aisek whose knowledge and experience with regard to the wrecks of Truk Lagoon is unparalled and includes being an eyewitness to Operation Hailstone as a teenager.

A few of the wrecks not listed on the table have been located but not yet identified. There are still others, known from U. S. intelligence reports to have been sunk that have not been located. The destroyer, FUMITSUKI, hit by a bomb and sunk, has not yet been found by divers. As noted on Table A, another destroyer, OITE, is believed to lie somewhere in the vicinity of North Pass, but again no trace of her has yet been found. Similarly, the SAPPORO MARU and MINSEI MARU, sunk in April 1944, also have not been located, along with several subchasers.

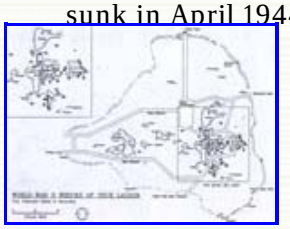

Figure 9. World War II Wrecks of Truk Lagoon

Figure 10. World War II Wrecks of Truk Lagoon (Detail)

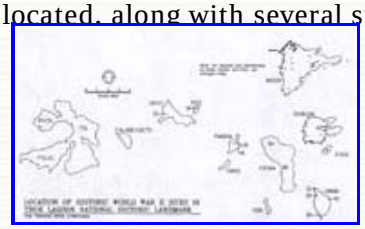

Figure 11. World War II Sites and Features on Dublon and Eten

Table A. World War II Shipwrecks of Truk Lagoon

Table B. World War II Aircraft Wrecks of Truk Lagoon

[Table C. World War II Sites and Features on Moen]

[Table D. World War II Sites and Features on Dublon]

[Table E. World War II Sites and Features on Eten]

[Table F. World War II Sites and Features on Tol]

[Table G. World War II Sites and Features on Eot]

[Table H. World War II Sites and Features on Fefan]

[Table I. World War II Sites and Features on Param]

[Table J. World War II Sites and Features on Udot]

Table K. World War II Sites and Features on Uman

Adaptive Uses of World War II Features

During the NPS on-site reconnaissance of the islands of Moen, Dublon, and Eten in 1986, it become apparent that the residents of those islands were making widespread and practical uses of many of the World War II relics there. Denfeld (pages 126-127) also notes the variety of uses which the Trukese were making of materials and structures on several more islands he visited in 1979.

Adaptive use (or reuse) of World War II equipment and buildings, American and Japanese, appears to be fairly commonplace on the islands of Truk, particularly on the densely populated and developed island of Moen but also is evident on Dublon and other islands. Buildings, particularly the more substantial ones made of concrete, are in use as homes, offices, commercial establishments, and schools. In the years following the end of World War II, the collection of scrap metal was an important economic activity in Truk. Consequently, many World War II artifacts left Truk in ships to be sold as scrap metal. Others were pushed into huge piles, then dumped into the lagoon. Still other artifacts, like the buildings, have been adapted by the Trukese into more practical uses. For example:

narrow guage rail stock (roof beams or planks)

Quonset hut metal frames (fence posts)

Marston mats (sheds or pen fencing)

tipple car wheels (foundation posts)

radio masts (support posts for buildings)

fuel tank plating (driveway ramps)

searchlight reflector glass (mirrors)

In addition, many of the large caves and tunnels are today utilized as shelters during typhoons.

It is important to protect what remains of the World War II relics found on the islands of Truk. Although much remains, much has already been lost. However, because of the very limited amount of land there, any historical park area that might be established should not unduly deprive the Trukese of making use of that land or of the improvements on it -- even if the improvements are wholly or partially of World War II vintage.

Natural Values Associated with the World War II Wrecks

The floor of Truk Lagoon is generally covered with a thick layer of sand and coral debris. Few corals occur on the loose bottom material of the lagoon; the dominating organism is usually the sand-forming green algae, *Halimeda*. The most common corals occurring on the floor of the lagoon are branching or staghorn species of *Acropora*. In the shallower portions of the lagoon, massive corals, usually *Porites*, as well as smaller branching hard corals, corals, mussels, sponges, etc. often occur. Those portions of the lagoon containing patch reefs (isolated coral areas that rise up from the floor to or near the surface) usually support more abundant and rich coral growth, as well as fish and other reef animals.

Within the barrier reef forming the lagoon is a significant fishery resource. The more common

species include:

Scientific Name (Family)	English	Trukese
Acanthuridae	surgeonfish	nangus
Apogonidae	cardinalfish	moson
Balistidae	triggerfish	ngungu
Carangidae	jack	
Chaetodontidae	butterflyfish	sanabob, nikereker
Labridae	wrasses	
Lethrinidae	snapper	
Mullidae	goatfish	
Pomacentridae	damsalfish	pachau
Scaridae	parrotfish	marau, ikenoch
Scombridae	tuna	esinou, angarap
Serranidae	groupers	kunufu
Signaidae	rabbitfish	umwune, nis, maramar, nawaw
Sphyraenidae	barracuda	sarau

In addition, the lagoon waters provide habitat for several species of seabirds, including petrels, shearwaters, tropicbirds, boobies, terns, and the great frigatebird. Occasionally, hawksbill and green turtles have been spotted in lagoon waters.

The outer edges of the fringing reefs around the islands in the lagoon support a rich coral growth and fish are also abundant here. The fringing reefs of the lagoon are the traditional fishing areas for the Trukese.

It is the man-made reefs of the lagoon, however, that have become Truk's most significant and impressive "natural" feature. The sunken wrecks, termed the earth's largest man-made reef, have become home for an incredibly rich and diverse display of marine organisms. The superstructures and hulls of these sunken ships have become not only richly productive with marine life, but also things of extraordinary beauty. Virtually every surface exposed to light has been covered with a thick layer of marine growth. Over the more than four decades which these wrecks have lain on the bottom of the lagoon, a complex food chain has evolved, ranging from coral, sponges, and algae, to plants, to small fish browsing on the algae. The small fish, in turn, provide the food source for larger fish such as barracuda, groupers, and sharks -- taken place since 1944.

The wrecks are of considerable interest to marine biologists -- as a living laboratory. Because the exact age of these artificial reefs is known, the growth rate of the attached marine life can be measured with a high degree of accuracy. In the past, measurements have recorded the growth rates of some coral species to be about two inches a year. In addition to their record growth rates, the marine life of the sunken wrecks includes a new genus of red algae, discovered there more than a decade ago, and several new plant species.

National Significance/National Register Listings

Based on study by NPS historians, the "underwater fleet" of Truk Lagoon was found to possess exceptional significance to the history of the United States and nominated to the National Register of Historic Places as a national historic landmark. In February 1985, the Secretary of the Interior formally designated the Truk Lagoon Underwater Fleet National Historic Landmark. Documentation of the historic significance of this site has been included as an appendix to this

study report.

In addition to the national historic landmark, the following World War II related sites and features have been studied and because of their historic importance listed on the National Register:

Japanese Army Headquarters, Roro, Dublon Island (9/76)

Japanese Radio Station (now the St. Xavier Academy), Moen Island (9/76)

Tonotan Guns and Caves, Moen Island (9/76)

Tonnachau Mountain, Iras, Moen Island (9/76)

More recently, Truk State has expressed interest in nominating the Japanese lighthouse at Sapuk on Moen to the National Register.

Boundaries for the Truk Lagoon Underwater Fleet National Historic Landmark were identified several years ago as part of the nominating process. The boundaries then suggested consisted of all waters within the lagoon enclosed by the barrier reef. The islands within the lagoon were not included within the landmark boundary. Since that time, NPS has learned more about marine tenure in the lagoon. Consequently, in order to minimize the possibilities of landmark designation being perceived as interferring with any traditional uses rights on the nearby reef or lagoon waters, it is recommended that the landmark boundary be tightened so as to include only the following areas:

- Combined Fleet Anchorage/Combined Fleet Repair Anchorage. Located to the north of Fefan and to the west of Dublon.

- Fourth Fleet Anchorage. Located east of Dublon.

- Sixth Fleet Anchorage. Located near Uman.

These boundaries should include the waters above and in the general vicinity of the sunken wrecks; but they should not, if possible, extend over to the fringing reefs of the nearby islands or otherwise interfere with established, traditional marine tenure.

Truk Lagoon Historical Park

The World War II sunken wrecks of Truk Lagoon are utterly unique. They are significant not only because of their historic value but also in terms of the rich and colorful array of marine life they have become host to. Nowhere else in the world can one find as many wrecks in a single locality in such clear water and so accessible to divers. While a few of the wrecks are rusting, silt-covered hulks, most are in an excellent state of preservation. Others have been transformed into living reefs composed of soft and hard corals and sponges. These "reefs" provide habitat for thousands of marine organisms. In some instances, these artificial reefs appear to be more diverse, supporting more organisms than even the best natural reefs. Marine biologists, as yet, have been unable to explain this phenomenon.

The facilities, fortifications, and equipment of World War II vintage built by the Japanese on the islands of Truk because they were not subjected to ground assault, remain numerous and often in good to excellent condition. Noteworthy are the number and condition of large coastal defense guns, several substantial concrete structures, and what is believed to be a very rare type of Japanese World War II aircraft.

For the sunken wrecks, the establishment of a historical park or reserve seems to be particularly appropriate in light of the long-standing concerns over looting and vandalism of commercial dive operators and their very limited capabilities of dealing with these problems. It appears that a

park-managing agency needs to be established, funded, and staffed to provide the needed protection.

Such a park-managing agency could be established at either the state level (by Truk State) or at the national level (by FSM). Due to the national significance of the resources involved and the increased capability of funding opportunities at the national level, it appears that the national park agency would be a more appropriate managing entity. Varying degrees of involvement by the U. S. National Park Service are possible under the "free association" relationship that now exists between these two nations as spelled out in the Compact of Free Association.

Historical park boundaries on the waters of Truk Lagoon should consist of the same areas recommended in this report for national historical landmark boundaries. A historical park to protect the integrity of the sunken wrecks should take in areas in the immediate vicinity of the sunken wrecks, generally encompassing the areas known as the Combined Fleet Anchorage/Combined Fleet Repair Anchorage, Fourth Fleet Anchorage, and Sixth Fleet Anchorage. The HANAKAWA MARU, the sunken wreck located outside of these areas off the southeast coast of Tol is not proposed for inclusion in the historical park.

Despite the presence of numerous significant World War II sites and features on the islands of Moen, Dublon, and Eten, there are compelling reasons that may override the establishment of any historical parks to protect these important resources. The setting aside of large areas containing these sites and features for park purposes is, we believe, largely untenable due to the scarcity of land on these islands and the adaptive uses to which many of the World War II structures have been put. A striking example of the latter is the Japanese radio station building on Moen. In terms of size and the excellent state of preservation, this structure is perhaps the most impressive World War II remnant in all of Micronesia. Despite its significance, the now Jesuit-owned St. Xavier school probably should not be within any historical park area because of its present important use as a school. Another example is the operations building for the Japanese seaplane base on Dublon. Again, a most impressive structure in an excellent state of preservation. However, its present use as a home precludes its being used for park purposes. Similarly, other important sites and features, because of their existing use or their location near other non-park uses, could not easily be set aside within a park or reserve. It is hoped that the owners of these important structures will continue to recognize their historic character and not make any modifications to them which would adversely affect their integrity.

Notwithstanding the above constraints, there is potential for setting aside World War II historic sites and features on Moen. These would be at sites are located in areas apart from any developments or active agricultural uses and where no adaptive uses have been made of any of the features there. The following sites provide both a sampling of the many defensive fortifications built by the Japanese on Truk and are among the most significant and well preserved:

1. the summit area of Mt. Tonachau plus the two turreted guns on the slopes below;

2. the saddleback area in the uplands of northeast Moen containing a complex of defensive emplacements; and

3. the lighthouse and the four turreted guns in the vicinity of Sapuk.

4. the MYRT aircraft wreck lying in the wetlands west of the hospital.

The Mt. Tonachau historic site would encompass no more than one acre and consist primarily of the summit area containing the remains of the Japanese lookout (M15). The site is part of the larger area listed on the National Register as Tonachau Mountain. This site, due to its central location, would be an excellent place for a scenic lookout, covered and housing outdoor exhibits to illustrate the various types of defensive fortifications built by the Japanese on Moen and on the other islands within Truk Lagoon. Since the mountain is also the source of several local myths, wayside exhibits to interpret these aspects of the park would be appropriate here also. The high

ground of Mt. Tonachau was the location for a major concentration of defensive fortifications built by the Japanese.

The vegetation here, originally upland forest, is now composed of grasses and shrubs. No agroforest or crops are present. Access to the site is via about one-half mile of trail. Connected to the summit area by means of a battery road are the two turreted naval guns (M30). The guns remain in an excellent state of preservation and should also be included in the historic site to protect an example of the planned defense of Truk by the Japanese. The historic battery road would connect the two sites. The guns plus the fire control cave would encompass less than one acre.

The second site, containing features M38, M39, M40, and M41, would preserve in one location both anti-aircraft and coastal defense guns plus other defensive emplacements all connected by a battery road. The vegetation like the previous site has been disturbed and is now composed of grasses and shrubs. This site would encompass about 10 acres. A trail exists to the site from the village of Peniesene. However, access is somewhat difficult, involving a hike of about three-qua elevati feet.

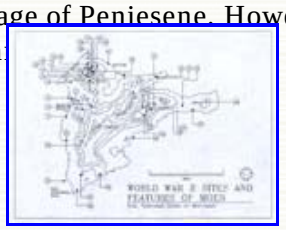

Figure 12. Potential Historic Sites, Island of Moen

Figure 13. World War II Sites and Features on Dublon and Eten

Figure 14 Suggested Boundaries, Truk Lagoon National Historical Park

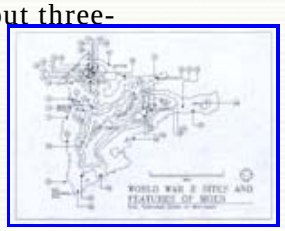

Figure 15. Potential Historic Sites, Island of Moen

The third site would set aside the Japanese lighthouse and the four large turreted guns (M45 and M46). The fortified lighthouse is in good condition and the four guns are in excellent condition. Both of these features are exceptional and should be protected. The site should encompass the other World War II features located nearby -- altogether less than ten acres. Portions of the site are in agroforest with an understory weedy trees, shrubs, and grasses.

A short trail exists to the fourth site, the MYRT aircraft (M2), making it readily accessible to visitors. The wreck appears to be in the spot where it crashed more than forty years ago. Despite damaged and missing parts, it is in good condition. It is theonly World War II aircraft found so far on land in Truk and of the more than 360 Japanese aircraft at Truk, only 16 were MYRTs. Located in a Japanese wetland, a railed wood boardwalk could be built to and around the wreck to allow visitors a close look, while keeping them from climbing over it. The area site aside would consist of the crash site plus the trail access.

As noted, these sites do not appear to be used for any non-park purpose at this time. Setting them aside as historic sites would not unduly disrupt or preclude any existing uses. However, including them in any park or reserve area would first require obtaining the permission from the local residents or owners. Ultimately, it would require some sort of formal arrangement for allowing public access and park management.

These sites could be included as units of a national historical park made up of the underwater fleet, or they could be set aside, managed, and protected as separate components by Truk State.

Another important aspect of the historical park concept is not associated with any tangible resource -- be it a sunken ship, large coastal defense gun, airplane remains, or a large military structure -- but is nonetheless extremely important and altogether worthy of preservation. This is the story of the Trukese and other island people, and how the historic events they got caught up in

-- Operation Hailstone and the occupation by the Japanese military -- affected them. Unfortunately, nothing tangible remains of this aspect of World War II except the graves of Nauruans on Tol. What does remain, however, are the memories, attitudes, and traditions of those individuals who, like Kimino Aisek, were there during the historic period and experienced things like Hailstone and the occupation first-hand. The establishment of a historical park provides a means to preserve these intangibles and, through interpretation, pass them on to others.

As part of the historical park entity, the development of a visitor center/museum would be needed so that park visitors -- divers, non-divers, residents, and non-residents -- could learn more about the sunken wrecks, defensive fortifications, the effect of World War II on island people and other park themes. Interpretation would be in the form of exhibits, appropriate relics, photos, maps, models, oral history videos, etc., in addition to talks given by park rangers, interpreters, some of whom may be resident eyewitnesses to the historic events of the park.

A site in the vicinity of the Continental Hotel at the southern tip of the island would appear to be the most ideal location to construct the facility. It is also near to where most of the commercial dive operators are located.

Management Concepts for a Truk Lagoon Historical Park

The purpose of establishing an historical park is to ensure that the sunken wrecks and the unique artifacts they contain will be there for future generations to appreciate, understand, and enjoy. Any historical park though would be more than just an impressive array of historical and natural resources. The sunken wrecks are, of course, tombs and in a sense memorials to the many Japanese sailors who were killed during the attacks of World War II. Thus, any historical park would have some of the aspects of a memorial too. The park's purpose would be accomplished through education of the visitor and on-site management of the resource. The designation of the underwater fleet first as a historical monument in 1971, then as a state monument by Truk State, and most recently as a national historic landmark in 1985 were all important benchmarks in the recognition of this significant resource. However, the shortcomings associated with merely designating have become all too apparent, both to Truk State and to the commercial dive operators in Truk. There needs to be on-site management and adequate protection of the resource too.

Resource management within the historical park should be limited primarily to monitoring. Basically, there should be no actions taken by park staff to either stabilize or preserve or otherwise disturb the wrecks themselves or the artifacts and burials they contain. No salvage should be allowed. Any large-scale disturbance would risk releasing the massive amounts of fuel still believed to be contained within some of the wrecks (small amounts of fuel leakage has apparently been going on continually since 1944 and do not appear at this time to be doing damage to the marine life.)

In addition to the fuel, some wrecks are known to contain unexploded ordnance, while others emit caustic substances. These are all potential hazards to visitors (i.e., recreation divers) and the fuel leakage a potential hazard to the marine life and should be continually monitored by park staff.

Management objectives for the historical park should consist of:

a. the active and continual monitoring and protection of the wrecks;

b. the maintaining of open relationships with all commercial dive operators;

c. the practice and enforcement of a conservation ethic; and

d. the consistent, fair, and strict enforcement of laws, directives, policies, and regulations dealing with historic resources.

Park management should be governed always by what is in the best interests of the resources and

their long-term enjoyment by visitors. There should be a partnership forged between the historical park and the sport-diving community as represented by the commercial dive operators. The commercial dive operators of Truk have long recognized the economic benefits associated with the protection of the sunken wrecks. These divers have long held a preservation ethic.

Any historical park established should be funded and staffed to permit the acquisition, operation, and maintenance of a patrol craft (or crafts) capable of regularly covering park waters to prevent looting or vandalism of the sunken wrecks. Park staff should include individuals who are capable of diving on the wrecks so that management objectives related to monitoring can be carried out. Park divers need to be adequately trained in the management of diving accidents. The park must have a capability of responding to diving accidents, if they happen.

It is likely that in the future the remains of more ships will be located at the bottom of Truk Lagoon. This may be accomplished by the park managing agency, dive operators, or by visitors. Discovering new wrecks would be in the best interest of the historical park because it would ensure their protection from vandalism. Park management should make it clear that when a new wreck is located, they should be the first to be notified.

As noted, there is potential for setting aside as historic sites some of the more significant World War II features found on the islands of Truk. The four potential World War II historical park sites on Moen would have as their purpose to protect and interpret for visitors of a sampling of the fortifications set up by the Japanese for their defense of the "Gibralter of the Pacific."

Management objectives for these sites should consist primarily of:

a. protection of the features they contain within their historical setting,

b. interpretation for visitors of the many other defensive fortifications and structures found on the islands of Truk Lagoon using those located on-site as representative samples,

c. fostering a close relationship and cooperation within the chiefs and village councils on whose lands are located.

Table L. Effects of Park Management Options

Park Protection Alternatives

Existing laws and regulations providing protection to the sunken wrecks of Truk Lagoon and the World War II features on the islands within the lagoon include the following:

> Section 401 of Chapter 4 (Protection of Artifacts) of Title 26 (Historical Sites and Antiquities) of the Code of the FSM which prohibits (1) the destruction, transportation, or exportation of historic artifacts and (2) the willful defacement, disfigurement, disturbance, or destruction of any historic property or artifact ("hisotric" is defined as an object produced by human beings 30 or more years previously).
>
> Article VII, Section 4 of the Truk State Charter which gives the state "the power to conserve and develop...natural beauty, objects, places of historic or cultural interest, sightlines and physical good order and for that purpose private property shall be subject to reasonable regulation by law."

Despite the existence of law and regulation at the state and national levels, the sunken wrecks of Truk Lagoon are not adequately protected. Truk State has indicated that it is unable to protect the wrecks against vandalism (the State Marine Police Force, whose function it is to patrol lagoon waters, lacks the manpower and equipment and is inadequately funded). In 1986 Truk State requested financial assistance from the Park Service (Historic Preservation Fund) to control vandalism of the underwater fleet. Apparently fund monies to assist Truk State in this effort are

not available in the amounts needed.

Establishing a historical park or reserve to manage and protect the sunken World War II wrecks of Truk Lagoon would not have any major effects on the traditional system of marine tenure which exists over lagoon waters. The sunken wrecks are already regarded as public domain. No clan or village has made claims of ownership or use rights to the wrecks.

During Truk Territory times the sunken wrecks were recognized and provided with protection through designation as a historicl monument. Later, enactment by the legislature of Truk State prohibiting the removal of any artifacts from the wrecks provided additional legal proteciton. Historical park or reserve designation would essentially provide for the establishment of a managing agency enpowered to patrol lagoon waters to protect the wrecks against vandalism, to ensure visitor safety, and provide visitor services not already provided by the commerical dive operators. The park managing agency should also be empowered to conduct research (resource monitoring) aimed primarily at obtaining baseline information relevant to the long-term management of the sunken wrecks.

Based on the above mission of the park managing agency, it would not be necessary to acquire any ownership of use rights over the sunken wrecks and enforce laws prohibiting vandalism. The authority to manage and protect the wrecks would reside in the government (Truk State and/or FSM) setting aside (dedicating) the previously indentified areas specifically for park purposes and enpowering an agency with the needed management authority.

With regard to protection alternatives for the historic side proposed for park or reserve status, traditional land tenure would need to be accommodated. There appear to be several options for acquiring the right to use these lands for park purposes:

-- By covenant or lease whereby the government and the owners of the land would enter into a legal agreement which would be binding on future owners to allow public use of that land and to agree not to change the basic uses to which the land is to be put. Provisions would be included for some sort of appropriate payment or other consideration by the government.

-- By easement. Would be similar to the above, but restricted to a single purpose -- like access, etc. Compensation could also be included.

-- By having the owners declare the site a public area. Statutory provisons would be created for the owners to declare portions of their lands available for public use. Under this option control remains with the owners and the arrangement could be cancelled at their request.

Leasing of land for public purposes appears to be an acceptable method in Truk. Most of the schools are on privately-owned lands leased by the state or municipal governments.

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Appendices

Appendix A. "Statement of Significance, National Register of Historic Places Inventory -- Nomination Form, "*Truk Lagoon Underwater Fleet, Truk Atoll*, by Erwin N. Thompson, Historian, National Park Service.

Truk Lagoon is one of the best anchorages in the world. It was an excellent and formidable Japanese advanced naval base, if not as heavily defended as allied forces presumed. From July 1942 to February 1944, Japan's Combined Fleet operated out of Truk, extending its power into the southeast and southern Pacific. The threat of an American attack in early February 1944 caused the Combined Fleet to withdraw from Truk on February 10, never to return. The U. S. Navy's carrier strike on February 17 and 18, 1944, coordinated with an assault on Enewetak Atoll in the Marshall Islands, seriously impaired Truk's air force, destroyed virtually all Japanese shipping in the lagoon, and heavily damaged land installations. Truk was now virtually defenseless and the United States decided an invasion was unnecessary. The successful attack allowed plans to be made to bypass Truk and to strike at Japan's inner defenses in the Marianas. The legend of Truk's invulnerability had been destroyed. American carrier strikes had matured into a fierce force; and a pattern had been set for future Pacific carrier attacks.

The Japanese at Truk, 1940-1944

Japan's Fourth Fleet was organized in 1939, its mission being the protection of the mandated islands of Micronesia. Headquartered at Truk in 1940, the Fourth Fleet established naval base forces in the Carolines, Marianas, and Marshalls. When Japan captured Wake Island in 1942, the Fourth Fleet established a base force there. At Truk, seaplane bases were developed on Dublon and Moen islands; land plane fields were constructed on Moen, Eten, and Param; and naval facilities were established on Dublon and other islands to replenish the fleet at anchor. No major docking or drydocking facilities were constructed, thus Truk was not the Japanese Pearl Harbor that American intelligence presumed it was.[1] Supplies, petroleum products, and ammunition were lightered from Dublon to ships anchored in the lagoon.

In August 1942, Admiral Isoroku Yamamoto, commander in chief of the Combined Fleet (First, Second, and Third Fleets and the Sixth Submarine Fleet) arrived at Truk, maintaining his headquarters on board the giant battleship, YAMATO.[2] When Admiral Yamamoto's plane was shot down near Rabaul on April 18, 1943, by American aircraft in an ambush attack, he was replaced by Admiral Mineichi Koga, whose flagship at Truk was the mighty MUSASHI.

Although the Imperial Navy established coastal and anti-aircraft defenses at Truk, ground defenses were not intensified until the arrival of the first elements of the Army's Fifty-second Division between November 1943 and January 1944.[3]

Ground defenses -- air raid shelters, bomb-proof tunnels, and alternate gun emplacements -- were not completed until August 1944, well after the United States had decided to bypass Truk.

[1] The Japanese had a 2,500-ton floating drydock at Truk. It was capable of taking vessels up to the size of a destroyer.

[2] YAMATO and her sister ship, MUSASHI, were armed with the world's largest naval guns, 18.1 inches in diameter. YAMATO was so large, it was called the Yamato Hotel. See Hiroyuki Agawa, The Reluctant Admiral (Tokyo: Kodansha, 1979), p. 326.

[3] The balance of the division did not arrive at Truk until after the February raid.

American Advances, 1944

In early February 1944, U. S. Marine and Army troops captured Kwajalein Atoll in the Marshall Islands, 955 miles east of Truk. The battle for Kwajalein was carried out so swiftly and successfully that Admiral Chester W. Nimitz, Commander in Chief Pacific, concluded to speed up the Central Pacific campaign. He

directed the immediate invasion of Enewetak Atoll, also in the Marshalls, which had originally been set for May 1. Because Enewetak was only 670 miles from Japan's Gibraltar of the Pacific, Truk, Nimitz decided that a strong attack on Truk to neutralize Japanese forces there was a necessary adjunct to the Enewetak assault, now scheduled for February 17, 1944.

American intelligence knew little about Truk except its alleged invulnerability. On February 4, a U. S. Marine Corps "Catalina" flying boat flew over the atoll on a photographic mission. This reconnaissance showed that a Japanese battleship (MUSASHI), two carriers, ten cruisers, twenty destroyers, twelve submarines, and a large number of transports were in the lagoon. Japanese planes rose to the attack, but the flying boat evaded interception and returned safely to base with the important information. At Truk, the Japanese correctly judged this overflight presaged an enemy attack. Admiral Koga ordered the fleet to weight anchor. On February 10, led by MUSASHI, Japanese warships sailed for the Western Pacific, never to return to Truk. The battleship steamed toward Japan. Other warships withdrew to the Palau Islands and to the Philippines. About forty vessels, some undergoing repair, others loading or unloading cargo, remained in the lagoon.

Before dawn on February 17,[4] Vice Admiral Raymond A. Spruance, on board the battleship NEW JERSEY, sailed toward Truk. Under him, Rear Admiral Marc A. Mitscher, YORKTOWN,

commanded Task Force 58, consisting of nine carriers, six battleships, cruisers, and destroyers. Nine patrol submarines accompanied the force. Japanese search planes on the previous days had failed to detect the approaching fleet and on this morning the Japanese were unprepared for the coming onslaught. Mitscher's first objective was to gain air superiority, as the Japanese had done on their surprise attack on Pearl Harbor. At sunrise, 72 American fighters from five fast carriers struck. Some 90 Japanese planes took to the air but over thirty of them were shot down. The American "Hellcats" then hit the airfields on Moen, Eten, and Param, destroying forty more planes. Only four "Hellcat" fighters failed to return to the carriers. Next, Avenger torpedo bombers hit the airstrips with fragmentation and incendiary bombs, again with few casualties. Eten was particularly easy pickings; aircraft were parked nose to tail awaiting ferry pilots to fly them to forward areas.

[4] February 10th in Hawaii.

Mitscher's aircraft, including torpedo planes, dive bombers, and escort fighters next attacked enemy shipping. Although disappointed that the Japanese fleet was no longer present, the American pilots made 30 separate attacks throughout the day. They wiped out the few naval ships in anchorage and most of the 30 or so merchant ships, for a total of 200,000 tons sunk. Meanwhile, Spruance's surface ships cruised around the atoll in pursuit of escaping Japanese ships. By evening they had sunk a cruiser, destroyer, trawler, and another small vessel.

During the night of February 17-18, a Japanese torpedo plane managed to approach carrier INTREPID and loosed a torpedo, striking the carrier on her starboard quarter and causing casualties and damage. INTREPID limped from the scene and eventually reached San Francisco for repairs. Also on that night, Mitscher launched the first night time bombing attack in American carrier operational history. Guided by radar, the highly trained bomber crews succeeded in making eleven direct hits on enemy vessels (and on two small islets).

When carrier strikes resumed on the morning of February 18, not a single Japanese plane rose in protest. The American planes paid particular attention this day to land installations, blasting airstrips and fuel and ammunition dumps. At noon, Admiral Mitscher gave the order for retirement. The naval historian, Samuel Eliot Morison, wrote that as a result of this attack, Truk's "usefulness as a fleet anchorage and advanced naval base was gone after 18 February 1944. And the myth of Truk the Impregnable was shattered. Never again did the eight-rayed flag of Commander in Chief Combined Fleet meet the rising sun in Truk Lagoon."[5] Not only did Truk's shipping lay at the bottom of the lagoon, less than 100 of Truk's 365 aircraft remained operational.

[5] Samuel Eliot Morison, Aleutians, Gilberts, and Marshalls, June 1942 - April 1944, History of United States Naval Operations in World War II, Vol. 7 (Boston: Little, Brown and Company, 1975), p.331.

Truk, 1944-1945

While the Japanese Navy never returned to Truk in force, for a time after the February raids, the defenses of the atoll continued to be improved. Additional army troops arrived, underground defenses were constructed, mines were laid in the passes to the lagoon, and antisubmarine nets were emplaced. All these endeavors were for naught. On March 12, 1944, the American Joint Chiefs of Staff decided that because of the successful February attack, Truk need not be invaded. They abandoned a plan that called for over five American divisions to be employed against the atoll. On April 30 and May 1, a second American fast carrier task force hit Truk. Of the 103 operational Japanese aircraft at the beginning of the attack, twelve survived. The few ships at anchor were destroyed. Land installations, the major objective of the strike, were battered.

Beginning in March 1944, the Seventh and Thirteenth Army Air Forces' B-24 "Liberator" bombers, based in newly won Kwajalein and Enewetak, began a series of raids on Truk, their primary objective being to keep the airfields inoperable, especially during the American campaign in the Marianas in the summer of 1944. When the Marianas were taken, huge airfields were constructed on Saipan, Tinian, and Guam for the B-29 Superfortress bomber. Before these planes were prepared to form the vast armadas for the long-range bombing of Japan, the air crews required further training to refine their techniques. Truk was selected as one of the targets for

these training missions. Until the end of World War II, fresh B-29 air crews made routine missions over Truk. There was little of significance to bomb.

The surviving Japanese forces at Truk, starved for food and medical attention, formally surrendered aboard a United States destroyer on September 2, 1945.

Today, the "underwater fleet" at Truk, festooned with an infinite variety of marine life and containing the honored remains of Japanese warriors, is one of the world's underwater wonders.

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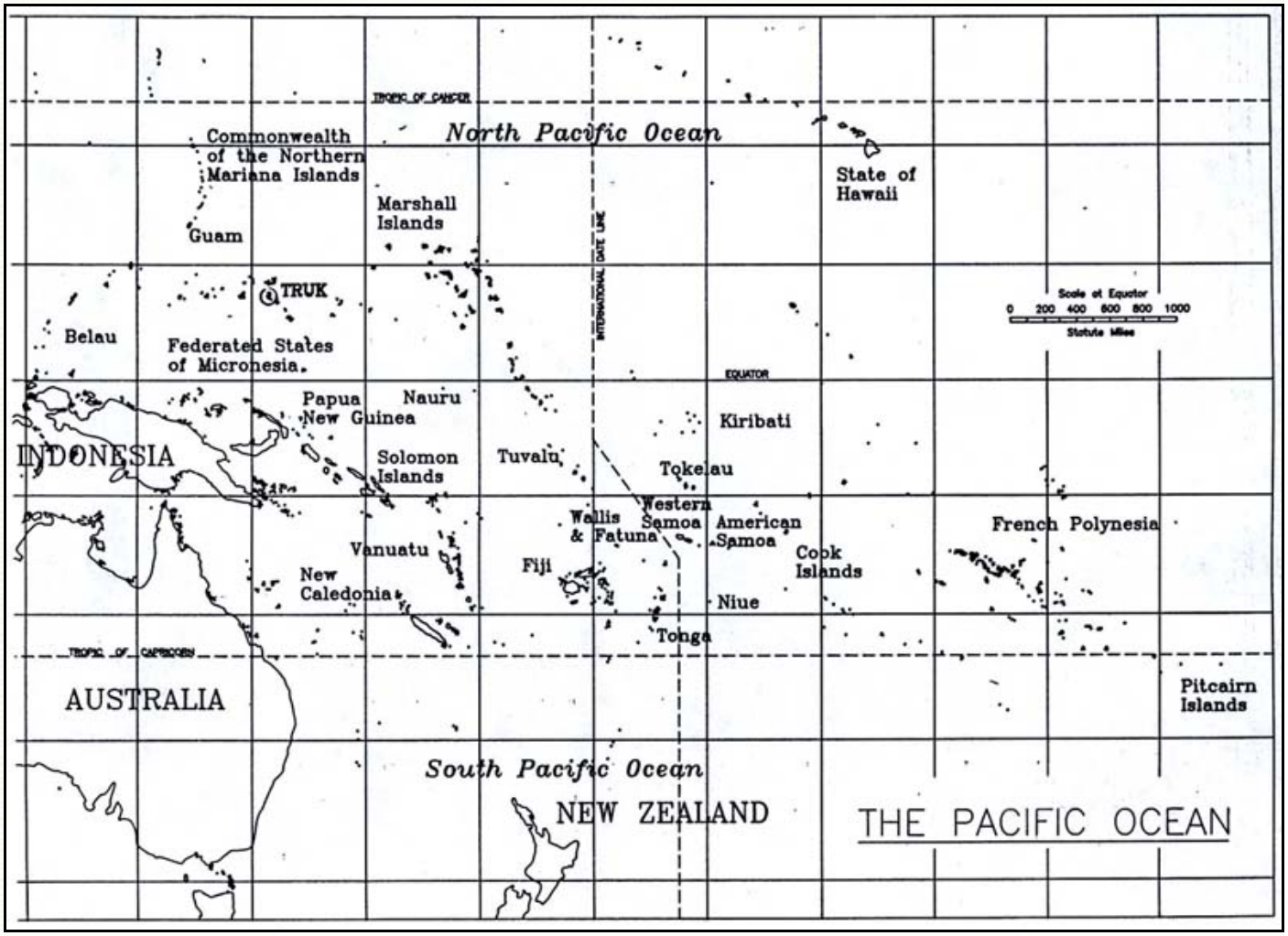

Figure 1. The Pacific Ocean

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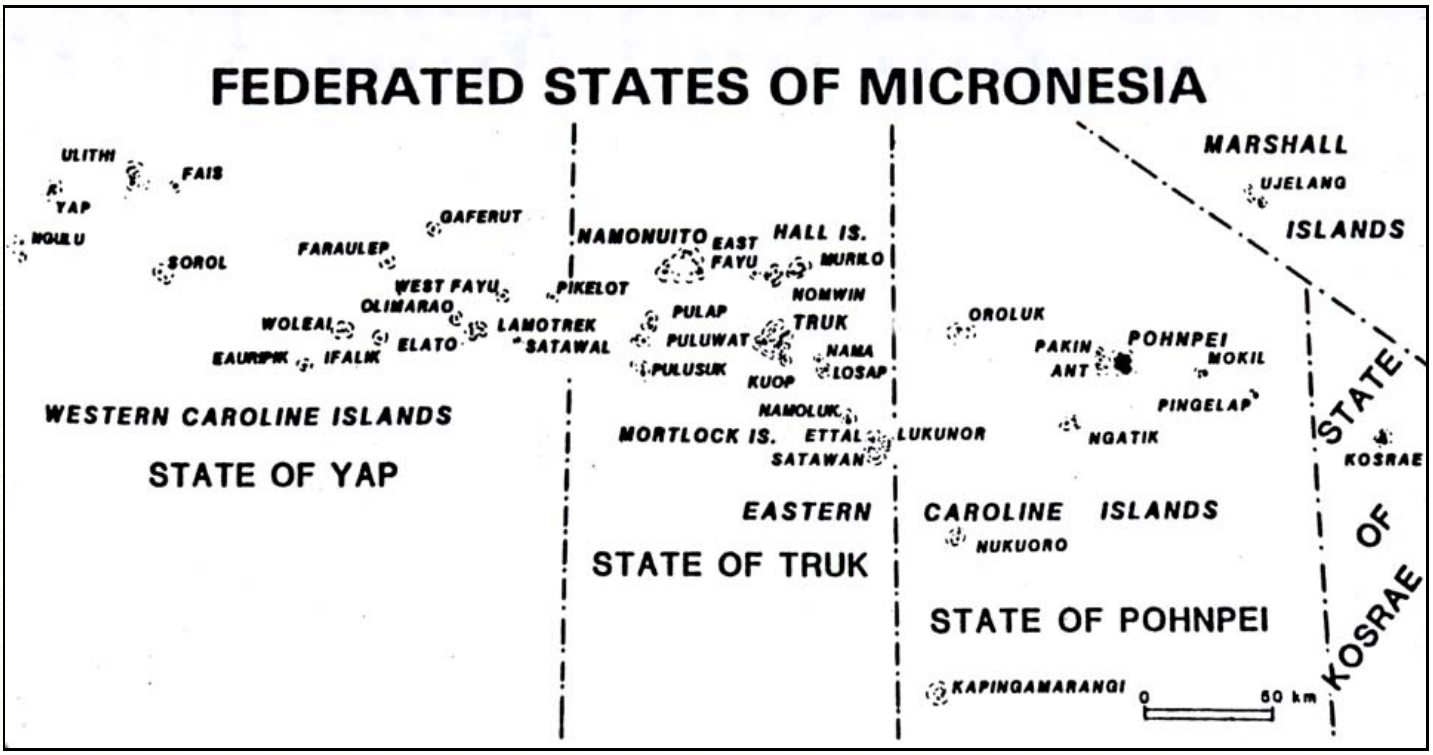

Figure 2. Truk State, Federated States of Micronesia

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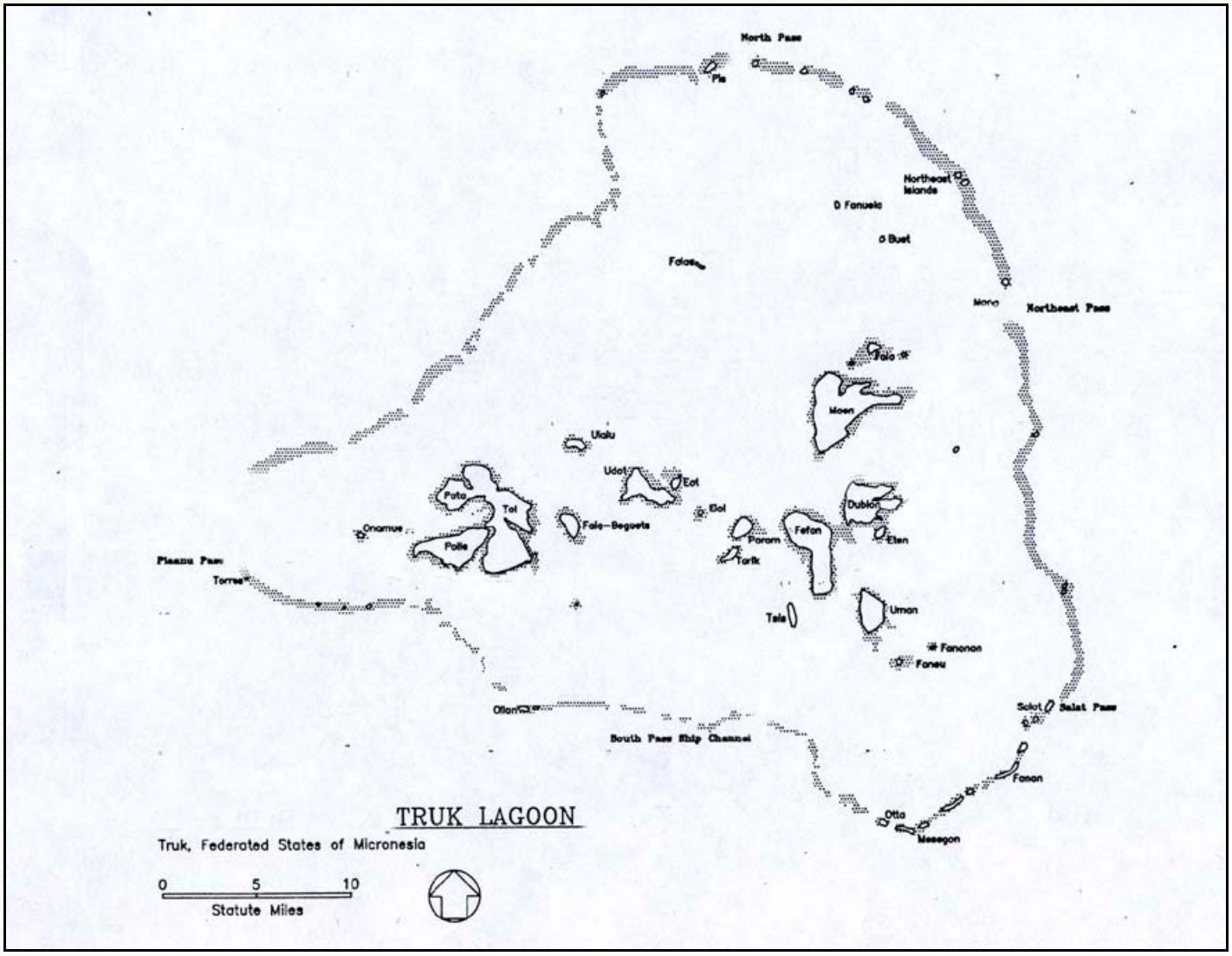

Figure 3. Truk Lagoon

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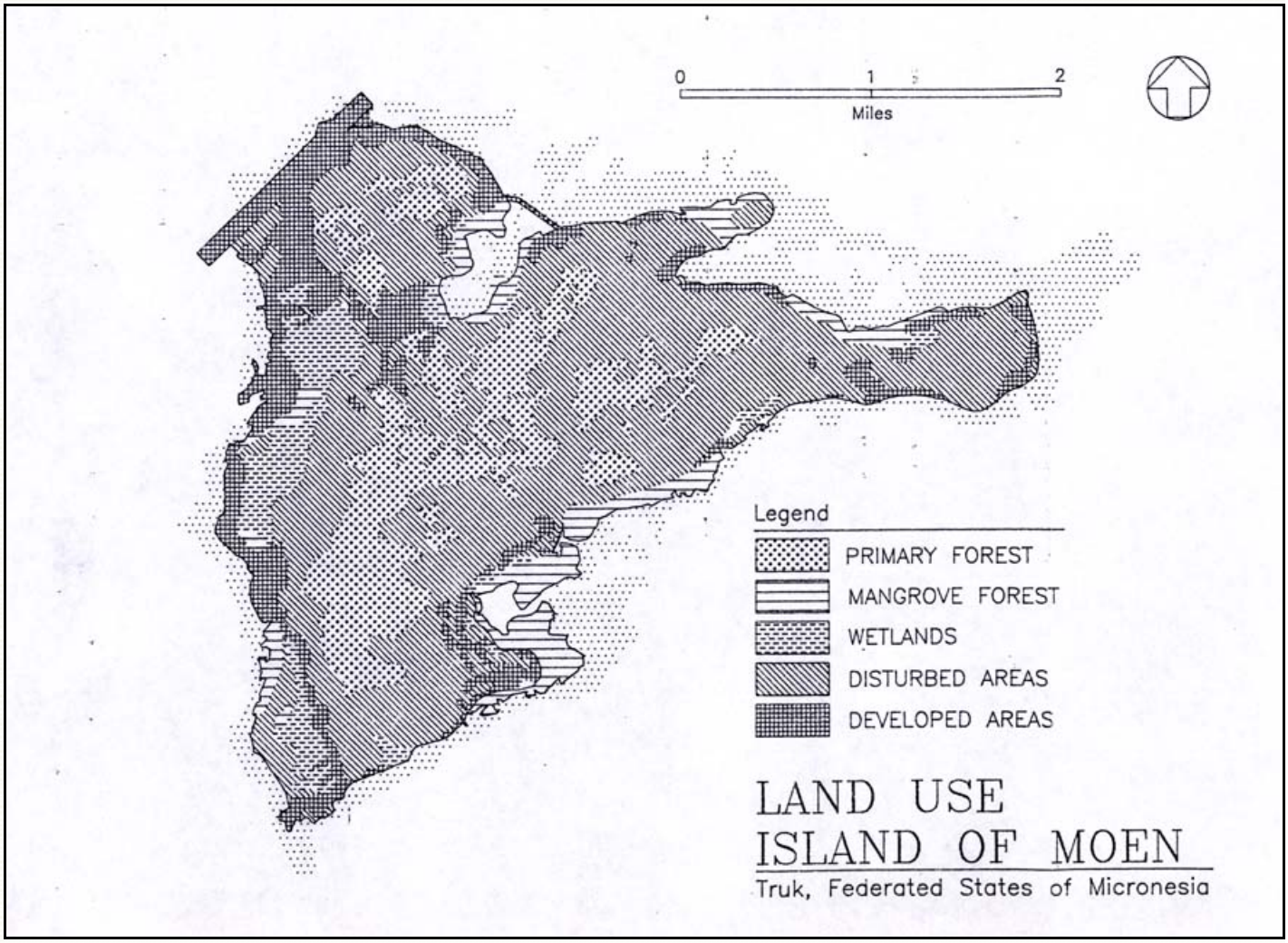

Figure 4. Land Use, Island of Moen

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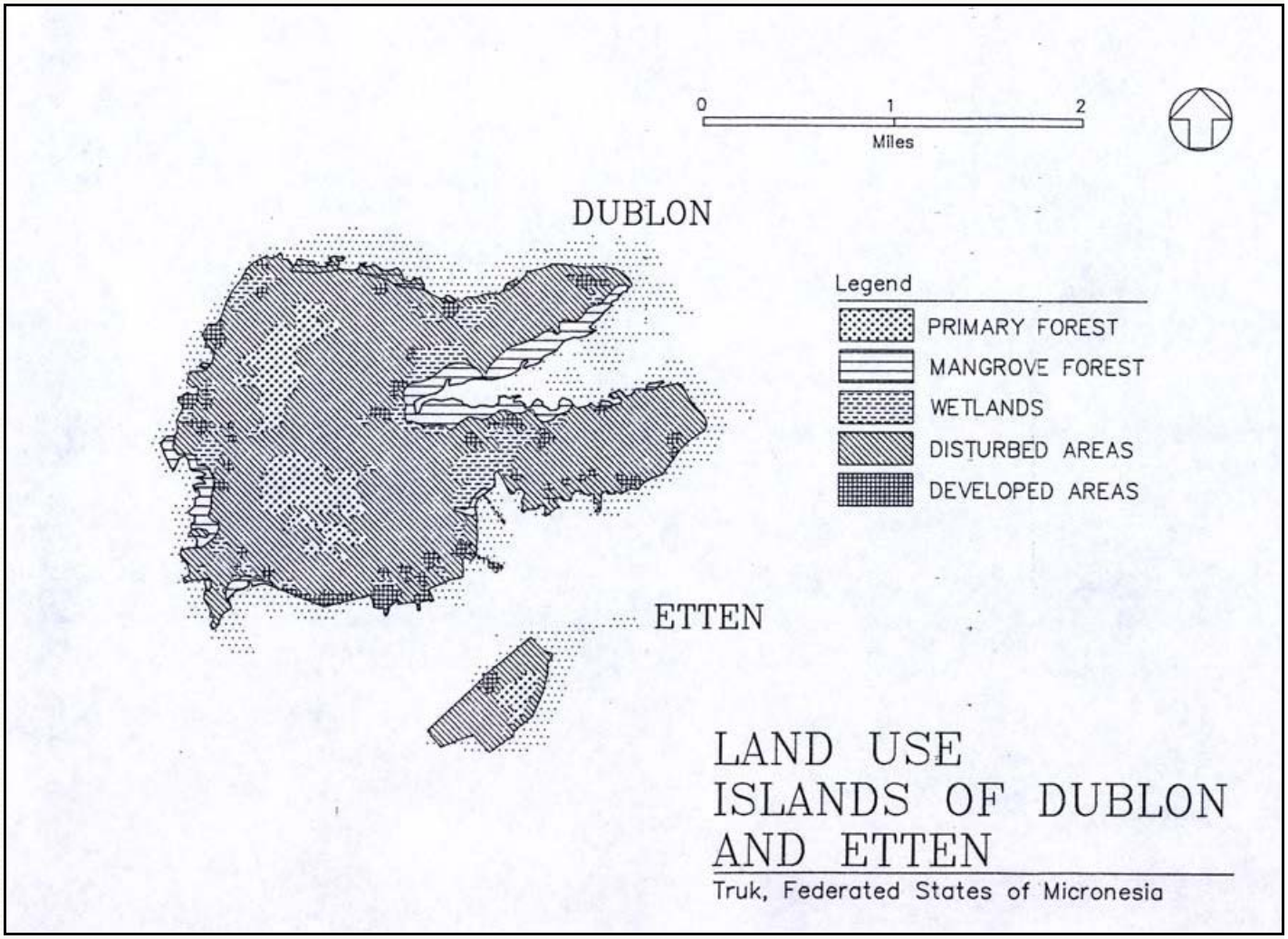

Figure 5. Land Use, Islands of Dublon and Eten

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TABLE C. WORLD WAR II SITES AND FEATURES ON MOEN ISLAND

SITE/ FEATURE NO.	BRIEF DESCRIPTION	LOCATION
M1	Caves, tunnels, and naval gun. Access to gun cave is via tunnel. Gun is a Vickers 150mm Mk H. The gun is accessible and visited by tourists. Tunnel continues on to an ammunition cave. Two additional caves (connecting) are located nearby. One contains the base plate for a Vickers type coastal defense gun, plus a second chamber for ready ammunition storage.	Near Moen Center above government housing
M2	Nakajima CGNI MYRT Navy Carrier Reconnaissance Plane. Remains in good condition; propeller missing, left wing ripped apart, and tail fin missing. This type of World War II aircraft is extremely rare.	West of Truk hospital, resting in the mangrove swamp
M4	Pillbox. One of the standard domed machine gun pillboxes built by the Japanese, constructed of aggregate concrete. This one is surrounded by homes.	Moen District Center
M5	Pillbox. Aggregate concrete domed machine gun pillbox, now partly submerged.	Moen District Center at the southern end of the agricultural station
M6	Pillbox. Another example of the domed machine gun pillbox made of aggregate concrete.	Moen District Center, next to movie house
M7	Pillbox. Domed roof type but this one made of reinforced concrete; appears to be in better condition than others of this type found on the island.	Moen District Center, south of the pill storage depot
M9	Road. Constructed by the Japanese, leads to an underground torpedo storage cave (now sealed). Road is overgrown with vegetation.	Moen District Center
M10	Japanese workshop area (shops and warehouses)/U. S. Marine base camp. Remains consist of powerhouse water cooling tanks (in workshop area) and large Quonset huts (marine base camp). Huts are being used as offices and stores. Much of the workshop area is now planted with taro.	Moen District Center, across from Baker Dock
M11	Site of U. S. built POW compounds and stockade. No remains are visible at the site.	Moen District Center
M14	Bomb storage bunker.	Moen Airfield, northeast end
M151	Japanese lookout fortifications. Dug out of the ground, reinforced with concrete walls and covered with steel plating, concrete and rock. Observation slots on the north, west, and south sides of lookout.	Atop Mt. Tonachau
M161	Workshop caves. Used by the Japanese in connection with the nearby airfield.	Slopes and cliffs of Mt. Tonachau
M171	Gun caves. Two caves, each built to house a Japanese 75mm Mountain Type 94 gun.	Slopes of Mt. Tonachau
M181	Bomb Craters. These are large and were likely caused by bombs dropped by B-24s or B-29s.	Slopes of Mt. Tonachau
M191	Ranger finder emplacement.	Slopes of Mt. Tonachau
M201	Foxholes. Three interconnected star-shaped foxholes.	Slopes of Mt. Tonachau
M211	Fire trench complex.	Slopes of Mt. Tonachau
M221	Bunker. Concrete ammunition bunker with steel doors.	Slopes of Mt. Tonachau
M231	Kitchen.	Slopes of Mt. Tonachau
M241	Shelter caves.	Slopes of Mt. Tonachau
M251	Antiaircraft gun base.	Slopes of Mt. Tonachau
M261	Magazines.	Slopes of Mt. Tonachau
M271	Cave and gun. Housing 75mm Mountain Type 94 gun. Contains concrete floor blocks.	Slopes of Mt. Tonachau
M281	Truck chassis. Nissan Model 180 cargo truck.	Slopes of Mt. Tonachau
M291	Gun emplacement. Constructed of earth for an antiaircraft gun.	Slopes of Mt.

		Tonachau
M301	Mechitiu guns, road, and trenches. Two caves, each containing a turreted naval gun, a battery road, and fire trenches. Guns are 140 mm, 50 caliber. Though the breech plates, telescopic sites and recoil springs have been removed and the barrels loosened, the guns remain in good condition. Caves are connected by a tunnel with an observation/fire control cave in between. Several objects including a range-finder, remain within the third cave. The battery road is constructed of basalt and nearly 750 feet of it remains.	Slopes of Mt. Tonachau
M31	Road. This is the only remaining road constructed by the Japanese in 1945 which is still in use.	Northwest end of Moen
M32	Causeway. Built by the Japanese for the circulating road across Puu Bay, it measures nearly 1,600 feet.	Northwest end of Moen
M33	Causeway. Constructed of rock, it connects Upwein, an islet, to the main coast of Moen.	Northwest end of Moen
M34	Japanese stone land marker. Contains an inscription. Few of these stones exist in Truk today.	Northwest end of Moen
M35	Stone and concrete dam. Provides an outstanding example of skilled stone work and is in excellent condition. On Witchen River in the north of Moen	Northwest end of Moen
M36	Battery road. Leading to guns at M38.	Moen saddleback
M37	Gun pits. Dug for small caliber anti-aircraft guns and infantry defense.	Moen saddleback
M38	Anti-aircraft guns. Five Model 10 anti-aircraft guns with ready machine guns with ready magazines. Placed in an open circle about 650 feet in diameter. A command post is nearby.	Near center of Moen saddleback
M39	Fire trenches and shelter caves.	Moen saddleback
M40	Coastal defense guns and caves. Guns are Vickers 150 mm.	
M41	Concrete and steel base for radar.	Moen saddleback
M42	Searchlight. Remains consist of metal casing which has rusted; the glass is missing.	Moen saddleback
M442	Radio station building. This is the most substantial structure of World War II vintage in all of Truk. The building measures about 350 by 90 feet; its walls and roof are of reinforced concrete up to a yard thick. The exterior doors are made of double sheetmetal more than 4 inches thick. Despite sustaining several bomb hits in 1944, the building remains in excellent condition. Constructed in 1942 and 1943, it was one of three radio communication centers in Truk. The building is owned by the Jesuits and is operated and maintained as a high school, St. Xavier.	East end of Meon
M45	Lighthouse. The lighthouse, constructed in 1937, was fortified with reinforced walls and also used as on observation post. Now abandoned, the structure remains in good condition. Sections of the tiling on the floor and walls remain well-preserved, as is a portion of the light's rotating mechanism. There are the remains of other structures and equipment in the immediate vicinity.	Sapuk, on the east end of Moen
M46	Turreted guns. Four 200 mm turreted guns lie in open revetments protected by the armor plates of turrets (the guns and turrets had been ll of the guns are in excellent conditon. These were the only Japanese defensive guns in Truk with a range long enough to reach the reef. The gun battery also contains reveted magazines, range finder installations, command posts, and searchlight caves. Two machine gun emplacements are nearby.	East end of Moen
M47	Torpedo boat station and gun positions. A horseshoe-shaped rock wall appears to be the only visible remains of the torpedo boat station. A small pillbox is nearby. A short distance away (50 yards and 100 yards) are two casements. One contains the barrel of a 120 mm coastal defense gun, recoil springs, and a 200 mm projectile. Another pillbox is located several hundred yards away. This one has a house built on top of it.	East end of Moen
M48	Pier and intake basins. Pier contained large diameter pipeline to transport fresh water from intake basins onto ships. The pier and the basins remain.	Southeast shore of Moen
M49	Seaplane cave. Cave 100 feet long, more than 20 feet wide, and about 12 feet high was utilized by the Japanese in connection with the seaplane base. Later used by the U. S. to store ordnance prior to disposal.	Southwest end of Moen
M50	Seaplane base. Remains of the base consist of a munitions revetment, pillboxes, caves, including one used as a radio station, a section of narrow gauge rail, and two seaplane ramps. The foundations of a large Quonset hut and a boat shop (U. S.) also remain.	Southwest corner of Moen
M52	Caves. Three caves used by the Japanese as workshops and for storage. The largest, a tunnel more than 100 yards long, was used as a navy radio receiving station and contains equipment remains.	Southwest corner of Moen
M53	Japanese Prison Site. No remains of the actual prison built by the U. S. exist. It was used to house Japanese prisoners put to work on the airfields and other installations after the war. Two nearby buildings are thought to be associated with the prison: a large house and a small concrete building.	Near Moen District Center
M543	Caves. Contained no artifacts; thought to be used to house a 75mm Mountain Gun, Type 94.	Mt. Tonoken
---------- --		
	1 Site and/or feature a portion of the National Register of Historic Places listing, Tonnachau Mountain	
	2 Listed on the National Register of Historic Places as St. Xavier Academy	
	3 Site and/or feature a portion of the National Register of Historic Places listing, Tonotau guns and caves	

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TABLE D. WORLD WAR II SITES AND FEATURES ON DUBLON ISLAND

SITE/ FEATURE NO.	BRIEF DESCRIPTION	LOCATION
D1	Pillboxes. Used to house 37 mm and 75 mm guns.	Northwest corner of Dublon
D2	41st Garrison area. Site of the guard house where U. S. aircrews were held prisoner. Foundation of guard house (all that now remains) has a home on it. Other features of the site include an air raid shelter, the home of the Japanese general, and the administration building. The foundations are all that remain of the latter two and a church now sits on the site of the administration building.	Northwest end of Dublon
D3	Caves. Hillside here contains caves that were associated with the nearby submarine base.	West side of Dublon
D4	Submarine base site. Few traces of the base remain.	West side of Dublon
D5	Caves. Used by the Japanese to store and replenish torpedoes.	West side of Dublon
D6	Foundations of Japanese buildings. Here and at other places around the island these concrete pads now serve as house foundations.	West side of Dublon
D7	Site of shops and barracks. The 4th Ship Repair and Nanyo Area Dock were located here. No remains have been found.	Southwest corner of Dublon
D8	Radio mast sections. Possibly from the 4th Communications Station. They are now being used to support the Nukan municipal building.	West side of Dublon along south shore
D9	Road. Considered the best constructed and preserved remains of a Japanese road left in Truk (more than 100 yard section); constructed in 1941.	West side of Dublon along south shore
D10	Pillbox shelters and foundations. Pillbox housed a machine gun, the shelters are air raid shelter bunkers, and the foundations are from the seaplane base.	Westside of Dublon along shouth shore
D11	Operations building for the seaplane base. This reinforced concrete building is probably the best preserved and the most significant intact Japanese above ground structure on the island. It is being used as a home.	West side of Dublon along south shore
D12	Seaplane ramps and runway. Remains consist of two concrete ramps. The old runway has been taken over by a school and playground. Nearby are fine examples of Japanese stonework revetting the shoreline.	West side of Dublon along south shore
D13	Generator building. Two pads for the generators are inside this concrete building.	West side of Dublon along south shore
D14	Pier and hammerhead crane. Pier is constructed of stone and concrete. Off the tip of the pier is a partially submerged 10-ton crane.	West side of Dublon along south shore
D16	Fuel tanks. The largest, a huge underground tank here has been converted to a water reservoir. Remains of three smaller ones are nearby; these were damaged during U. S. bombing. Earth revetments around tanks are visible.	South shore of Dublon
D19	Coastal defense gun. Gun is a 15 mm, 40 caliber, type 41. It is housed on the northeast end of a 280-foot long cave.	On lower west side of Mt. Tonomwan
D21	Air raid shelter/ammunition storage bunker. Standard Japanese design found throughout the Pacific.	Dublon central bay, in front of Sino Memorial School
D22	Communications Center. Underground concrete tunnel used to house radio equipment (intercepted Admiral Yamamoto flight plan was sent from here).	Dublon central bay
D23	Causeway. A stone causeway nearly 1,400 feet long with concrete retaining walls.	Dublon central bay
D24	Generator tunnel. Concrete lined generator facility.	Dublon central bay
D264	Army Command Post. Complex of concrete lined tunnels dug out of basalt rock. Three rooms are located off the tunnels; they were used for staff, planning, and communications.	Central Dublon

D28	Caves and gun emplacements.	Northwestern end of Dublon
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D29	Navy Command Post. Concrete lined tunnel.	Northwestern end of Dublon
D30	Anti-tank ditches. More than 100 meters long, nearly three feet deep, and about 4 feet wide, with a back wall more than 6 feet high. These are the only anti-tank ditches so far found in Truk.	Northwestern end of Dublon
D31	Coastal defense guns and caves. Two concrete lined connecting caves each housing two 120 mm coastal defense guns.	Near summit of Mt. Foukenau
---------- ---		
	4 Listed on the National Register of Historic Places as Japanese Army Headquarters.	

TABLE E. WORLD WAR II SITES AND FEATURES ON ETEN ISLAND

SITE/ FEATURE NO.	BRIEF DESCRIPTION	LOCATION
E1	Sea Wall. The cut stone seawall extending along most of the island's perimeter is an extraordinary example of Japanese stone masonry. Although sections appear to be deteriorating, much of it remains in good condition.	Eten
E2	Airbase. The runway which measured 3,500 by 260 feet is now covered with coconut palms. This airbase was one of the first to be built by the Japanese in Truk. The seawall described in E1 revetted the earth fill for the runway quarried from the nearby hill.	Eten
E3	Administration building. This three-story concrete structure with its steel doors and windows was heavily damaged by aerial bombs despite its 6-inch thick ceiling. The building is mostly in ruins.	Cut into the hillside on the eastern side of the island
E4	Caves and buildings. The reinforced caves are among the most substantial in Truk. They have been reformed with concrete and have steel doors at their entrances. They were used for ammunition storage. The buildings were used as barracks. They are in good condition.	Cut into the hillside on the eastern side of the island

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TABLE F. WORLD WAR II SITES AND FEATURES ON TOL ISLAND

SITE/ FEATURE NO.	BRIEF DESCRIPTION	LOCATION
T1	Gun caves. Three interconnecting caves, each one housing 150 mm Stabilimento-Armstrong-Puzzuoli guns.	Northern end of Tol
T2	Nauruan graves. A few grave stones remain out of the hundreds of Nauruans who perished on Tol after being transported there in 1943 to work in forced labor camps. Nauruans have visited the site.	?

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TABLE G. WORLD WAR II SITES AND FEATURES ON EOT ISLAND

SITE/ FEATURE NO.	BRIEF DESCRIPTION	LOCATION
O1	Gun sites. Four 120 mm Dual Purpose Ten Year type guns.	On island high point
O2	Cave. One-man torpedo station cave.	50 meters west of the boat deck

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TABLE H. WORLD WAR II SITES AND FEATURES ON FEFAN ISLAND

SITE/ FEATURE NO.	BRIEF DESCRIPTION	LOCATION
F4	Guns. Two 150 mm Stabilimento-Armstrong-Puzzuoli guns.	Northern Fefan
F12	Gun. A single 150 mm Stabilimento-Armstrong-Puzzuoli gun.	Central Fefan on the slopes of Mt. Chukusou

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TABLE I. WORLD WAR II RELICS ON PARAM ISLAND

SITE/ FEATURE NO.	BRIEF DESCRIPTION	LOCATION
P1	Coastal defense gun position. A 120 mm type gun.	North central Param
P2	Coastal defense gun position. A 120 mm type gun.	Eastern side of Param
P3	Airfield. Remains of 5,500-foot runway.	Along south coast

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TABLE J. WORLD WAR II SITES AND FEATURES ON UDOT ISLAND

SITE/ FEATURE NO.	BRIEF DESCRIPTION	LOCATION
U1	Gun position. A 75 mm mountain gun.	Western side of Udot

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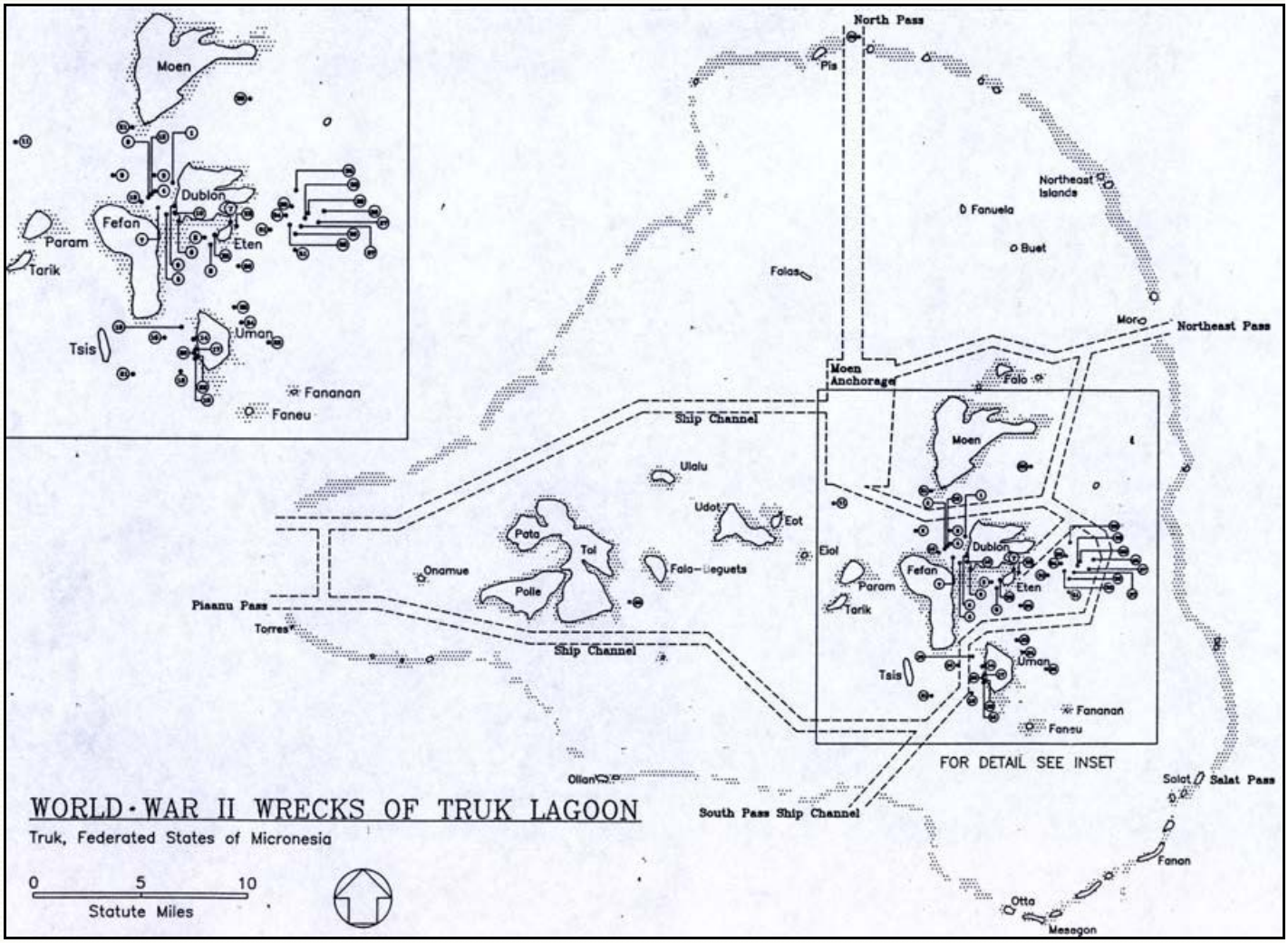

Figure 9. World War II Wrecks of Truk Lagoon

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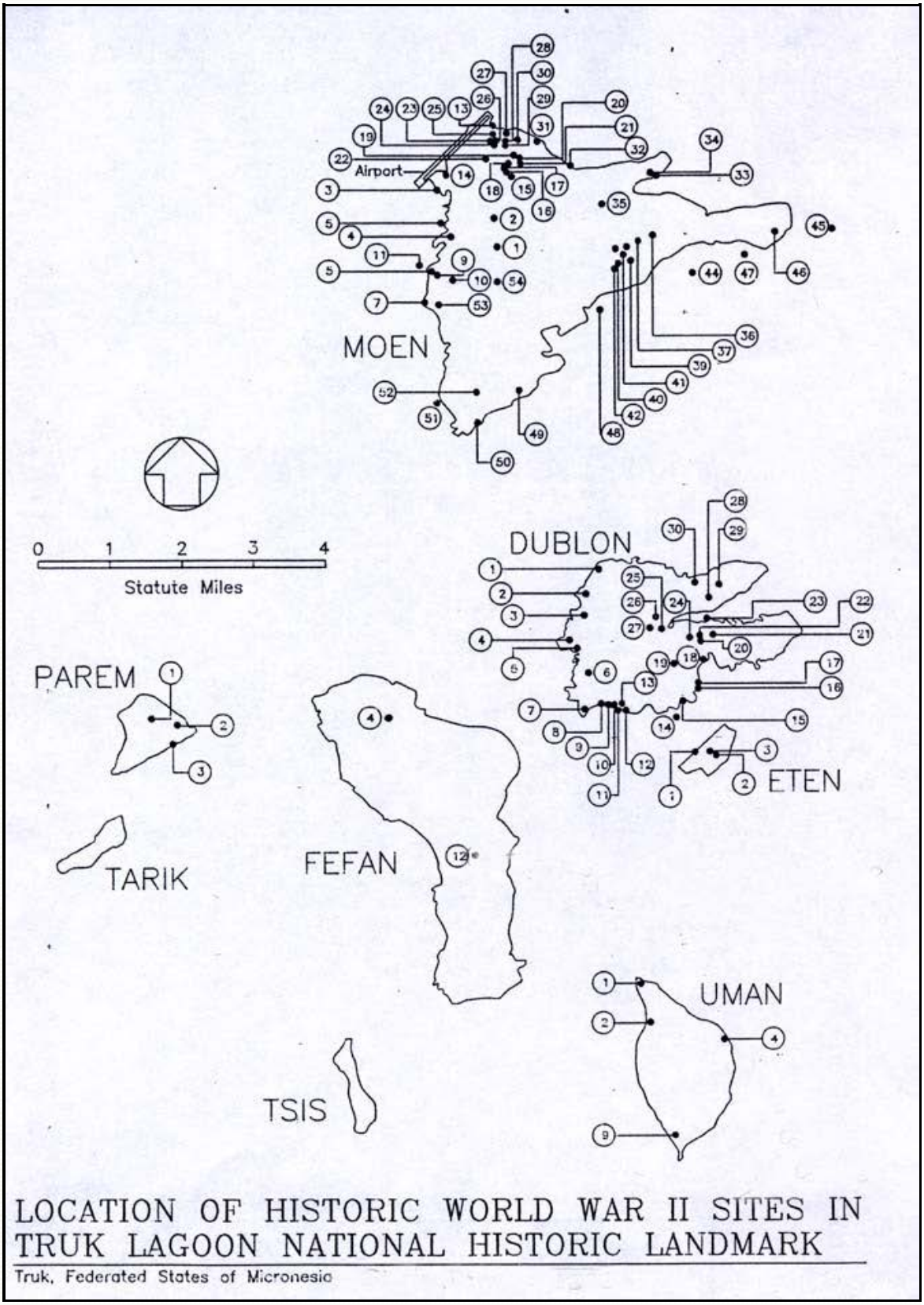
Figure 10. World War II Wrecks of Truk Lagoon (Detail)



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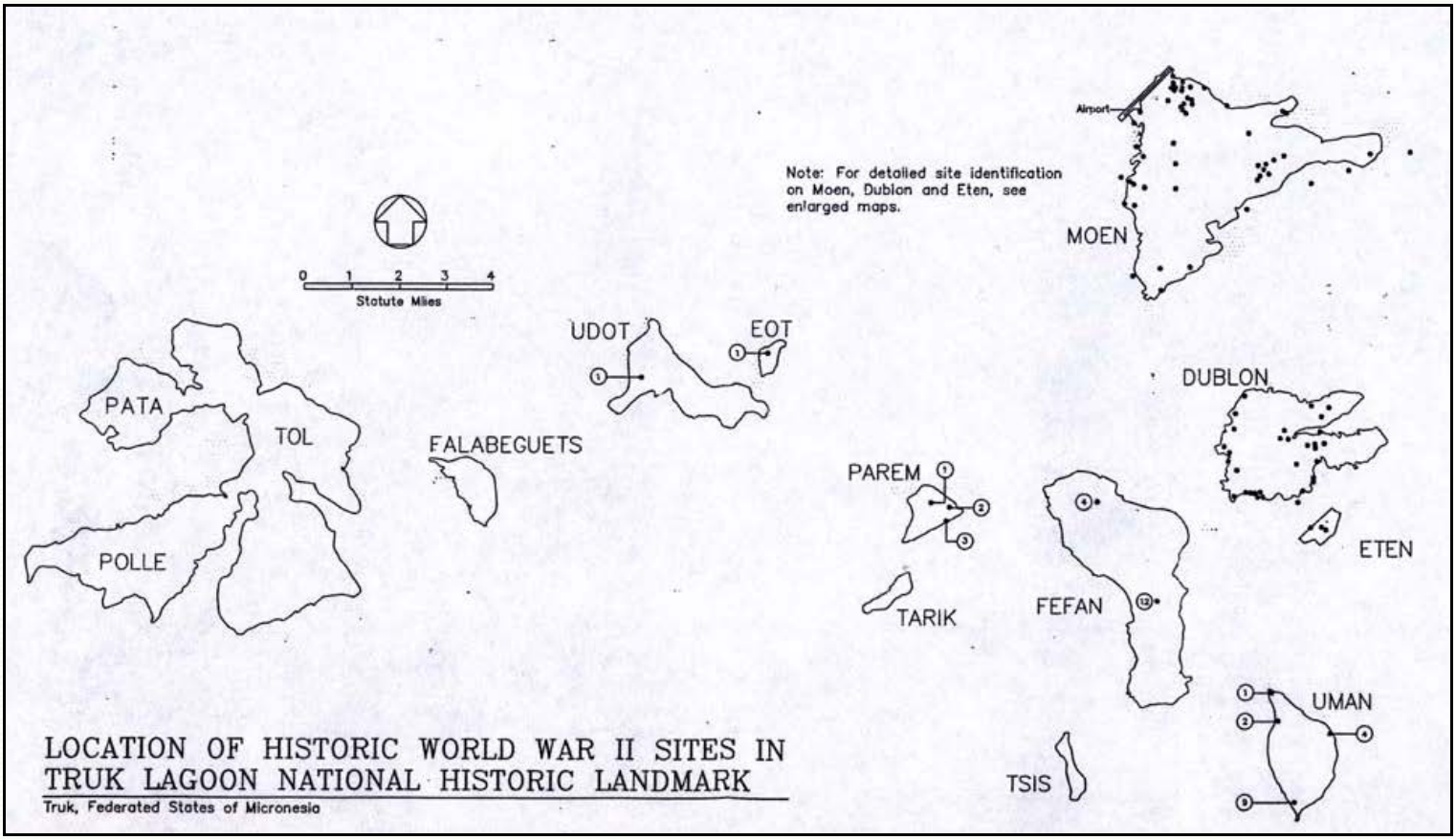

Figure 11. World War II Sites and Features on Dublon and Eten

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Table A. World War II Shipwrecks of Truk Lagoon, page 1 of 4

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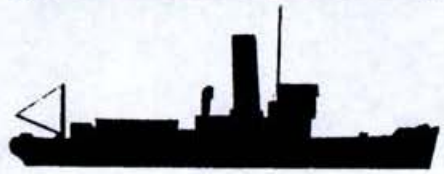
	WRECK NUMBER	DATE SUNK	BRIEF DESCRIPTION	LOCATION
	1	2/44	HEIAN MARU, converted submarine tender (11,614 tons, 510-foot length, 66-foot beam); lies on its port side at 110 feet, bow is 50 feet from the surface. This is the largest wreck in the lagoon. Large deck gun on the stern.	500 yards west of Dublon.
	2	2/44	I-169, submarine (1,400 tons, 322-foot length, 27-foot beam); lies at a depth of 140 feet at a 30° list to port; stern hatch is 120 feet from the surface. Located in 1971. Due to cramped conditions, this wreck is considered dangerous to enter.	West of Dublon.
	3	2/44	YAMAGIRI MARU, passenger-cargo transport (6,438 tons, 439-foot length, 58-foot beam); lies on its portside at 110 feet, starboard side is 50 feet from the surface. Hold contains 18-inch warheads for the guns of the battleships, MUSASHI and YAMATO. Sea fans and soft corals cover the bridge.	North-northwest of Fefan.
	4	2/44	TONAN MARU NO. 3, converted tanker used as a whale factory prior to the war (19,209 tons, 535-foot length, 75-foot beam); only remnants, including stack, remain; the wreck was raised and salvaged after the war.	Northern part of the Fefan-Dublon channel anchorage.
	5	2/44	HOYO MARU, oil tanker (8,691 tons, 475-foot length, 61-foot beam); lies upside down at 75 feet, keel is 10 feet from surface. Visibility is poor because of silt. Ship is dangerous for divers to enter.	400 yards north of Fefan.
	6	7/44	SUSUKI PATROL BOAT NO. 34, converted patrol boat/subchaser (770 tons, 275-foot length, 26-foot beam); lies upright 20° list to port at 50 feet, deck is 10 feet from the surface.	Between Fefan (northeast) and Dublon (southwest).
	7	2/44	KIYOZUMI MARU, converted armed merchant cruiser, later reconverted to a transport (8,613 tons, 453-foot length, 61-foot beam); resting on its port side in 120 feet of water, starboard side is 40 feet from surface. Wreck is still leaking oil; slick usually visible at surface.	600 yards north of Fefan.
	8	2/44	KANSHO MARU, passenger-cargo (4,862 tons, 384-foot length, 52-foot beam); lies upright with a 20° list to port on a 130-foot bottom, top of bridge is 60 feet from surface. Considered to be one of the best wreck dives -- many artifaicts. Located in 1980.	North of Fefan.
				

9	Unknown	Harbor tug (110 tons, 85-foot length, beam unknown), lies on bottom in silt at a depth of 50 feet, deck is 35-feet from surface. Presence of silt makes for poor visibility.	200 yards off west side of Dublon.



10	Unknown	Fleet tug (150 tons, 125-foot length, beam unknown), lies on its portside (45° list) in 90 feet of water, top of bridge is 60 feet from surface, top of stern at 35 feet. Visibility poor.	500 yards off southwest end of Dublon.

11	2/44	SHINKOKU MARU, oil tanker (10,200 tons, 500-foot length, 65-foot beam); lies upright in 130 feet of water, top of bridge is 40 feet from surface. Wreck remains in excellent condition; contains many artifacts; forward deck covered in soft coral; and marine life is particularly abundant. Located in 1971.	3.5 miles southwest of Moen.

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12		Unknown MARU	West of Dublon.

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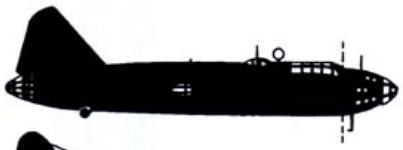
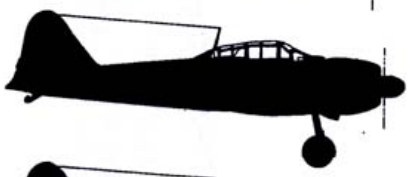
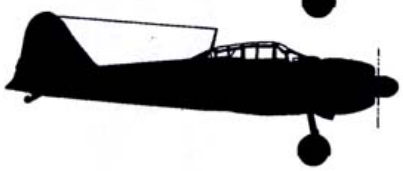
	WRECK NUMBER	DATE CRASHED	BRIEF DESCRIPTION	LOCATION
	B	Unk.	Mitsubishi G4M BETTY bomber (twin engines, 82-foot wing span, 64-foot length, 19 1/2-foot high tail); lies upright in 50 feet of water. Wreck is relatively free of marine growth and in good condition despite missing engines.	150 yards southwest of Eten.
	E	Unk.*	Kawanishi H8K EMILY flying boat (four engines, 125-foot wing span, 92-foot length, 30-foot high tail); lies upside down in 50 feet of water; wreck is in poor condition.	Several hundred yards off the southwest end of Dublon.
	J	Unk.	Yokosuka D4Y Suisei JUDY dive bomber/reconnaissance/night fighter (single engine, 37 1/2-foot wing span, 33 1/2-foot length, 12-foot high tail); lies upright in shallow water; a propeller blade breaks the surface of the water. Wreck is in good condition, but broken into three sections.	100 yards offshore of the northeast end of Eten.
	Z2	2/44?	Mitsubishi A6M Reisen ZEKE fighter (single engine, 36-foot wing span, 30-foot length, 11 1/2-foot high tail); lies upside down in shallow water with a propeller blade protruding out of the water. Wreck is in poor conditon.	100 yards off the northeast end of Eten.
	Z3	2/44?	Mitsubishi A6M Reisen ZEKE, fighter (single engine, 36-foot wing span, 30-foot length, 11 1/2-foot high tail); lies upside down in about 35 feet of water, fuselage is broken in two.	Off the southwest end of Eten.

* Denfeld (p. 49) notes that an EMILY was reported to be at Truk on April 27, 1945.

Table B. World War II Aircraft Wrecks of Truk Lagoon

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TABLE K. WORLD WAR II SITES AND FEATURES ON UMAN ISLAND

SITE/ FEATURE NO.	BRIEF DESCRIPTION	LOCATION
N1	Radio station.	Northern tip of Uman
N2	Coastal defense gun position. Houses a 150 mm Stabilimento-Armstrong-Puzzuoli gun.	Northern end of Uman, above west coast
N3	Coastal defense gun position. Houses a 150 mm Stabilimento-Armstrong-Puzzuoli gun.	Northeast end of Uman
N4	Coastal defense gun position. Houses three 150 mm turreted guns.	Southern end of Uman

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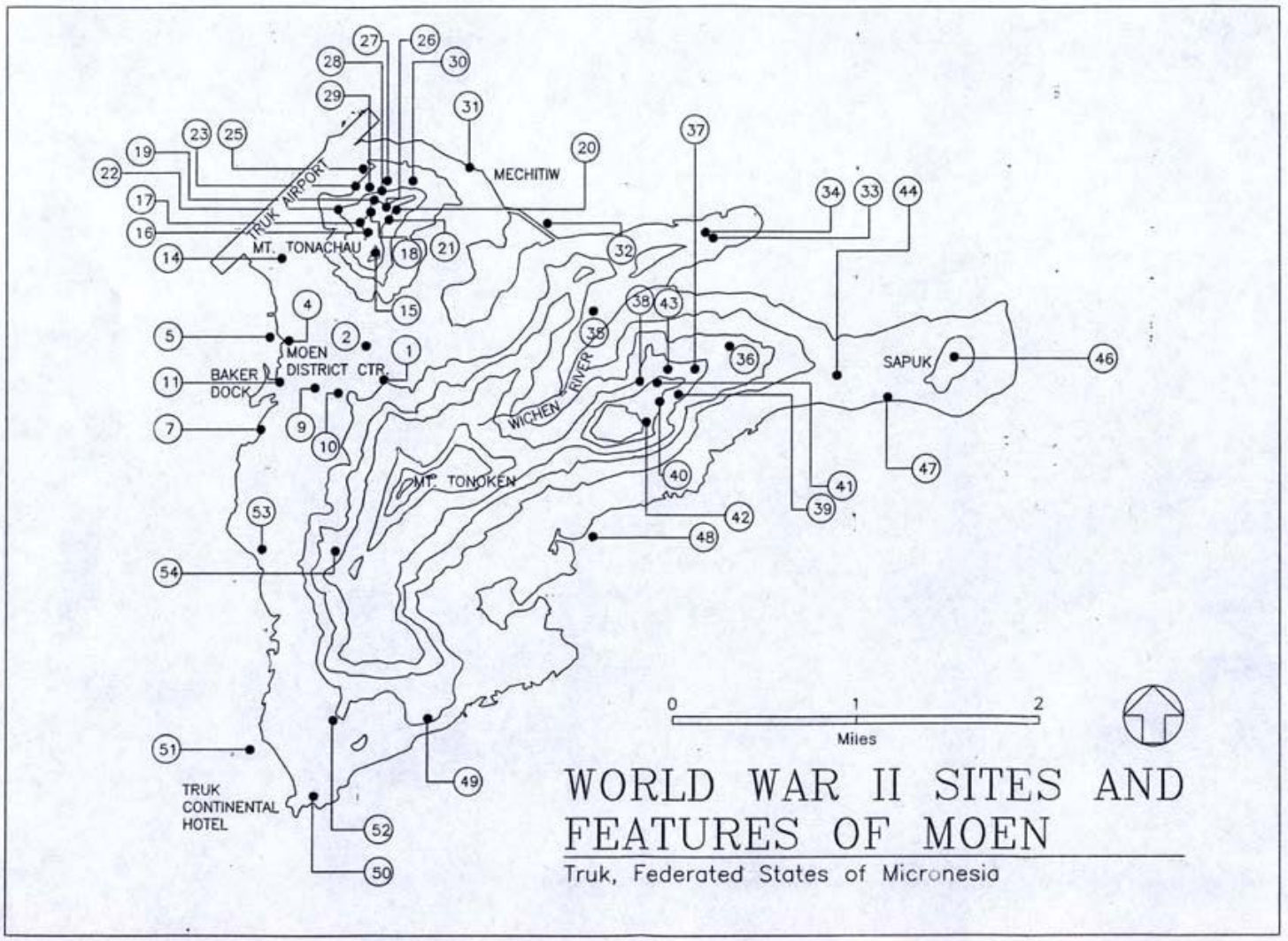

Figure 12. Potential Historic Sites, Island of Moen

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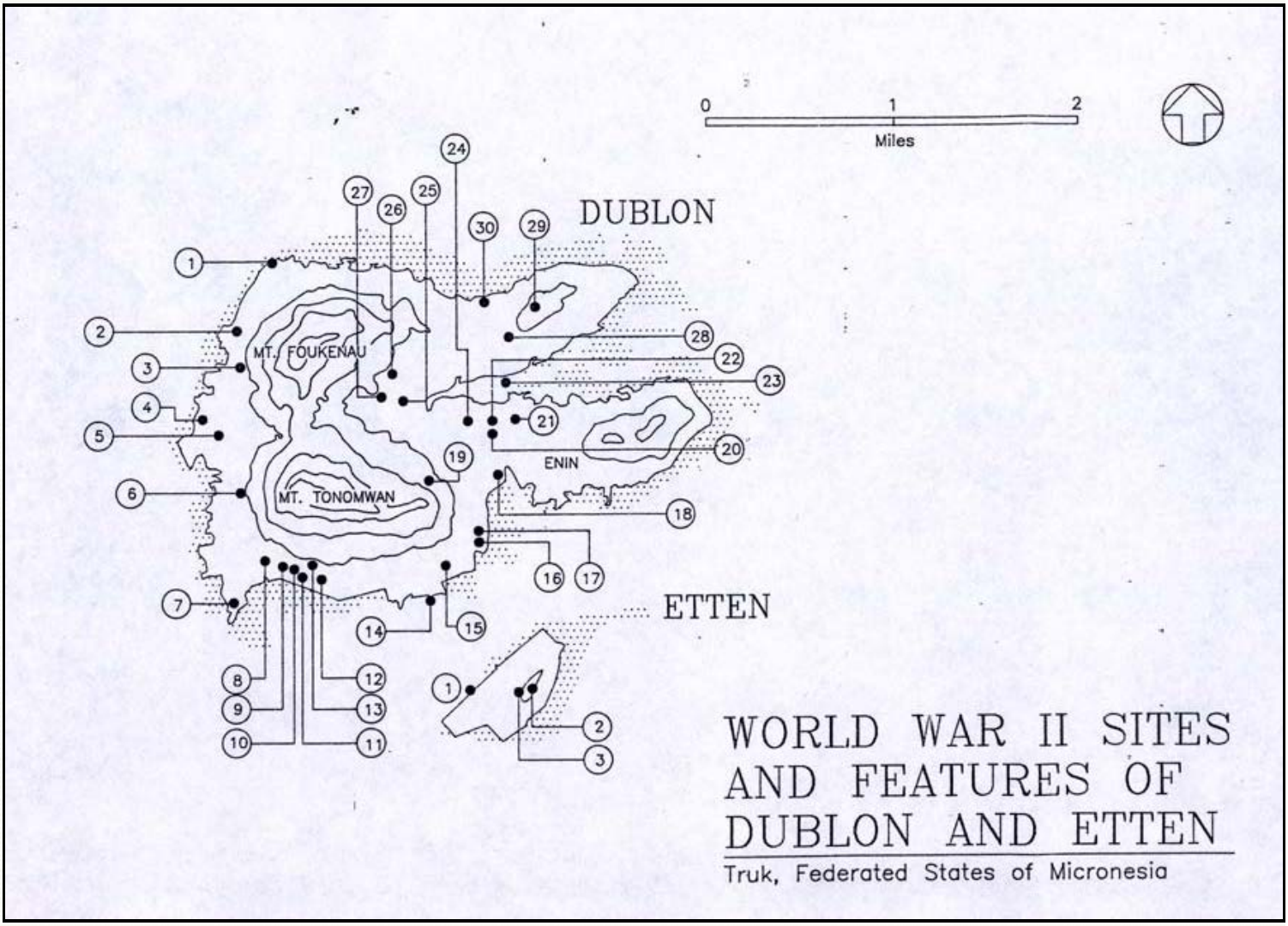

Figure 13. World War II Sites and Features on Dublon and Eten

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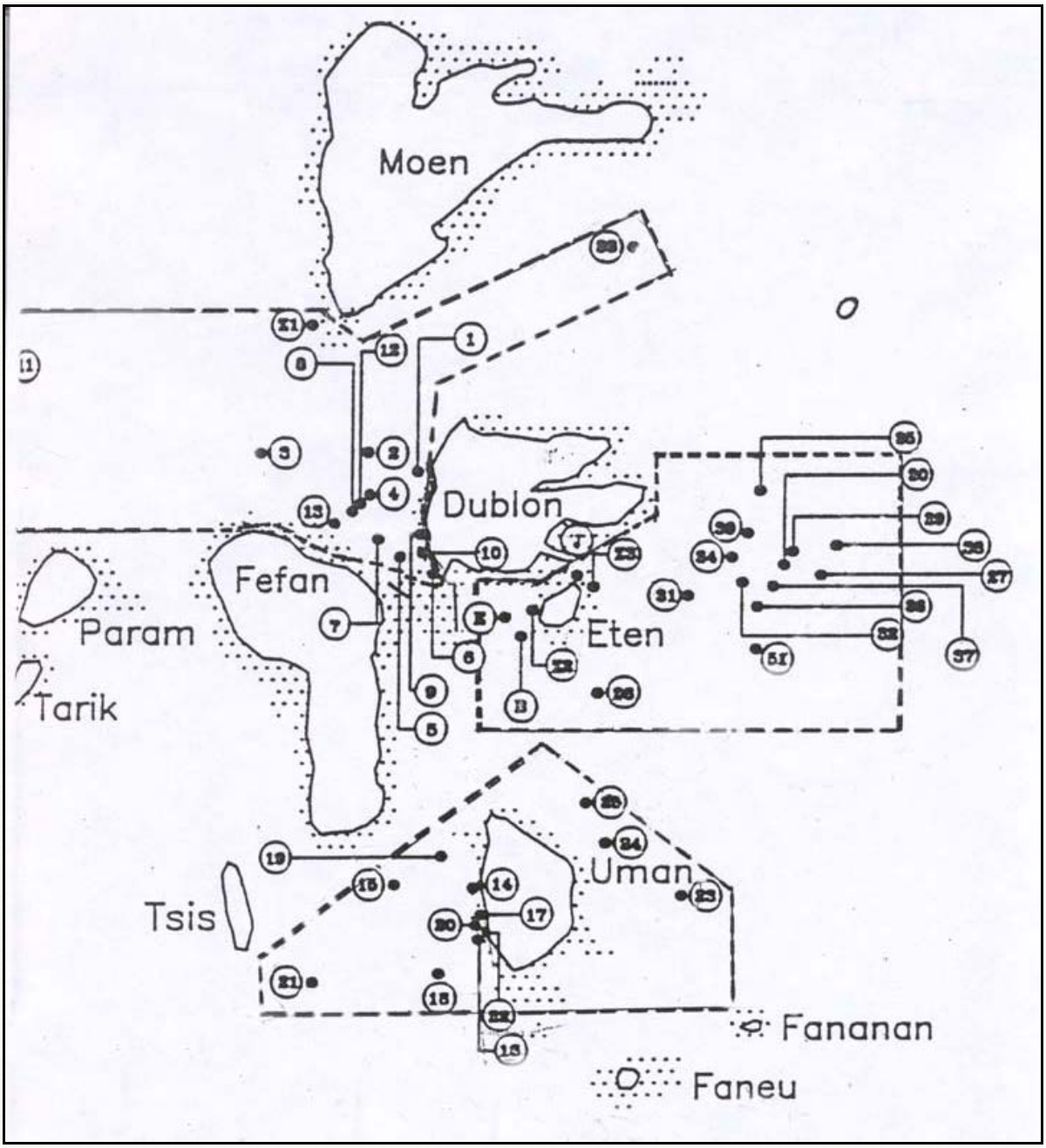
Figure 14. Suggested Boundaries, Truk Lagoon National Historical Park



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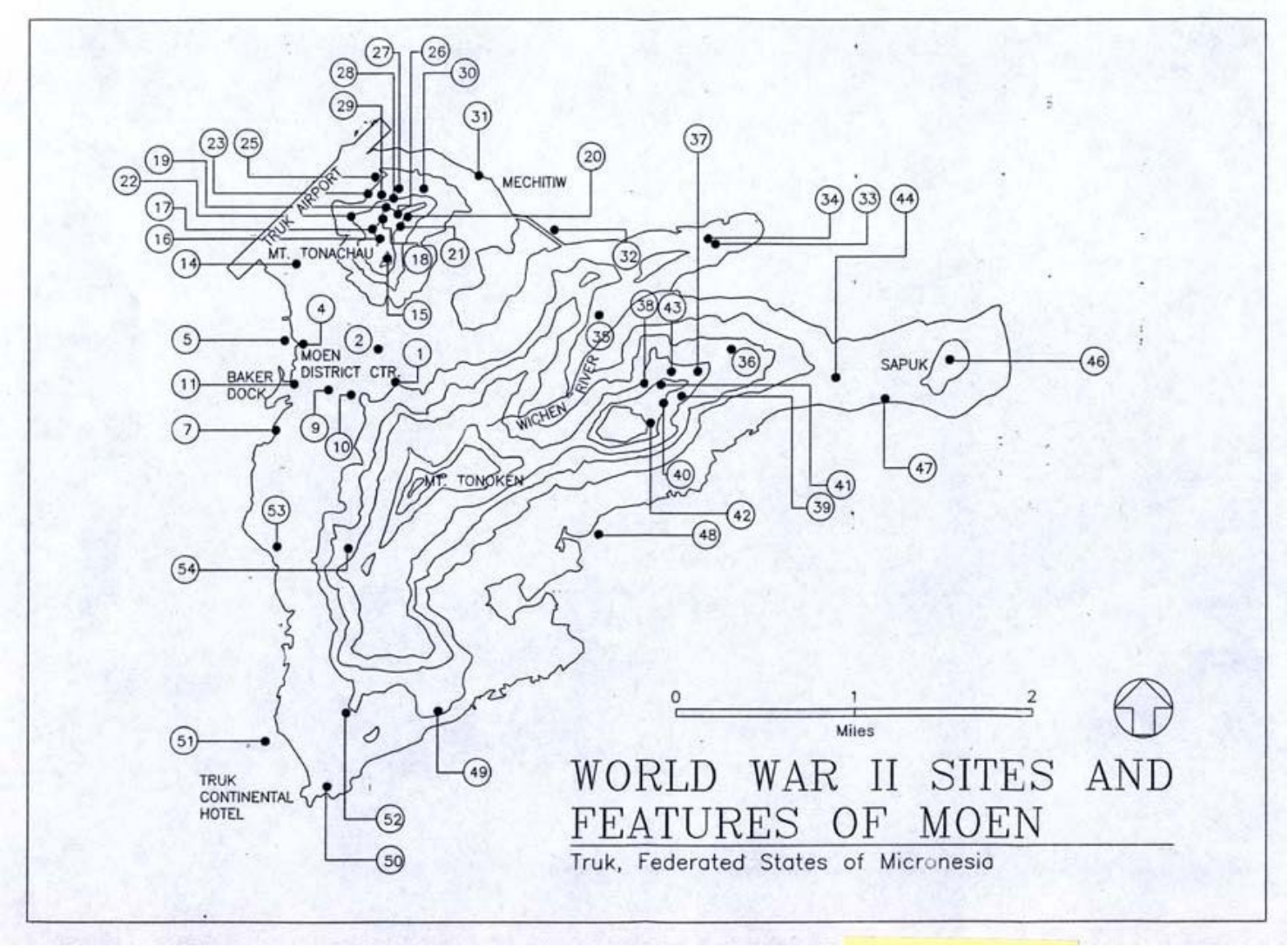

Figure 15. Potential Historic Sites, Island of Moen

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TABLE L. EFFECTS OF PARK MANAGEMENT OPTIONS TO PROTECT THE WRECKS OF TRUCK LAGOON AND OTHER WORLD WAR II RELATED SITES

	National Historic Landmark (No Park Established)	Park Option A	Park Option B	Park Option C	Park Option D	Park Option E
	Modify existing Truk Underwater Fleet National Historic Landmark boundary to include only the lagoon waters in the immediate vicinity of the sunken wrecks.	Utilize the modified national historical landmark boundary to establish Truk Lagoon State Historical Park administered by Truk State.	Utilize the modified national historical landmark boundary to establish a Truk Lagoon Historical Park administered by the national government of the Federated States of Micronesia (with the concurrence of Truk State).	Utilize the modified national historical landmark boundary to establish a Truk Lagoon State Historical Park in association with the U. S. National Park Service.	Add to national historic park area examples of significant World War II features found on the islands within Truk Lagoon and establish a Truk Lagoon National Historical Park administered by the national government of the Federated States of Micronesia.	Add to national historic park area examples of the most significant World War II features found on the islands within Truk Lagoon in association with the U. S. National Park Service.
=======	=======	=======	=======	=======	=======	=======
Protection of nationally significant historic area	All undertakings within the newly defined landmark boundary funded by U. S. or FSM must be reviewed to mitigate any potential damage to the landmark.	State park designation would likely add an additional level of protection to the area.	National park status and management is known world-wide as the best guarantee to preserve significant historic areas in perpetuity.	National park status and management is known world-wide as the best guarantee to preserve significant historic areas in perpetuity.	National park status and management is known world-wide as the best guarantee to preserve significant historic areas in perpetuity.	National park status and management is known world-wide as the best guarantee to preserve significant historic areas in perpetuity.
Protection of terrestrial resources	Not applicable.	Not applicable.	Not applicable.	Not applicable.	National park status and management is known world-wide as the best guarantee to protect historical resources.	National park status and management is known world-wide as the best guarantee to protect historical resources.
Protection of marine resources	No effect (unless directly related to sunken wrecks).	State park designation would likely specify that marine resources must also be protected.	National park status and management is known world-wide as the best guarantee to preserve marine resources.	National park status and management is known world-wide as the best guarantee to preserve marine resources.	Not applicable.	Not applicable.
Education, interpretation, or explanation of underwater fleet to residents and visitors	None. To the extent they are willing and able, commercial dive operators would provide this service.	State park guides would offer some visitor interpretation and orientation.	National park history guides would offer visitor interpretation.	National park history guides would offer visitor interpretation.	National park history guides on Moen, Dublon, and Eten would offer visitor interpretation.	National park history guides on Moen, Dublon, and Eten would offer visitor interpretation.
Tourism	Identifies nationally significant historic sites for protection. Designation draws some visitors to Truk and entice all to stay longer.	Designates a visitor attraction and provides additional information to tourists. Results in some people staying longer to visit.	Designates a visitor attraction and provides information to tourists. Results in some people visiting Truk and others staying longer to visit the national park.	Designates a visitor attraction primarily for divers and snorkelers; provides information, interpretive services to tourists. Results in some people visiting Truk and others staying longer to enjoy the national park.	Designates a national park which attracts visitors who are not only interested in diving on sunken wrecks, but in exploring World War II sites and features remaining on the islands of Truk. Results in more people visiting Truk and the FSM.	Designates a national park which attracts visitors who are not only interested in diving on sunken wrecks, but in exploring World War II sites and features remaining on the islands of Truk. Results in more people visiting Truk and the FSM.
U. S. financial assistance for park operations	No potential	No potential	No potential	If the Federated States of Micronesia, with the concurrence of Truk State, would agree to establish a national park in association with NPS to preserve a place of great importance in U. S. history, then a compelling case can be made for the U. S. to assist with operations costs.	No potential	If the Federated States of Micronesia, with the concurrence of Truk State, would agree to establish a national park with their lands in association with the NPS to preserve a place of great importance in U. S. history, then a compelling case can be made for the U. S. to assist with operations costs.
Historic preservation fund grant assistance from U. S.	The Truk Lagoon Underwater Fleet National Historic Landmark, a national register site, is eligible for grant funding.	This national historic landmark, a national register site, is eligible for grant funding.	This national historic landmark, a national register site, is eligible for grant funding.	This national historic landmark, a national register site, is eligible for grant funding.	No effect.	
Financial assistance from FSM national government for park operations	None	Unlikely	High potential for some financial assistance.	High potential	High potential	High potential
Removal of artifacts from World War II sunken wrecks	No effect.	State park designation would increase the possibility of funding park personnel to patrol the park area.	Establishment of a national park by FSM would likely mean some funding to permit occasional patrolling of the park area.	Establishment of a national park in association with the U. S. National Park Service would likely result in funding to permit regular patrolling of the park area.	Establishment of a national park by FSM would mean these sites and features would receive additional protection.	Establishment of a national park in association with the U. S. National Park Service would mean these sites and features would receive additional protection.
Existing recreation use	No effect.	No effect.	Some effect. Commercial dive operators would continue to provide this service. National Park regulations would be developed to protect park resources and ensure visitor safety.	Commercial dive opertors would receive assistance in regulating recreation use of the park area.	Park designation for these sites would likely mean more visits by tourists.	Park designation for these sites would likely mean more visits by tourists.
Job	No effect.	This would create a	This would create several jobs for	This would create several jobs for local people.	This would create more jobs for local	This would create more jobs for local people.

opportunities for local residents		few jobs for local people and provide some intermittent pay for local guides.	local people.		people.	
Subsistance fishing by local people	No effect.	Probably no effect.	No effect; although some guidelines might be developed to ensure subsistence fishing craft and commercial dive operators not interfere with each other.	No effect; although guidelines would be developed to ensure that the safety of park visitors and subsistence fishermen not be jeopardized.	No effect.	No effect.
Building construction - -residential or commercial structures	Not applicable.	Not applicable.	Not applicable.	Not applicable.	Buildings and structures for non-park purposes within a park are not normally allowed.	Buildings and structures within a park and unrelated to the park master plan are not normally allowed.
National pride	Landmark designation of Truk Lagoon has called attention to the significance of this place.	A park of this stature merits substantial local pride for residents.	A national park merits substantial pride for FSM.	A park of this stature merits substantial local pride for FSM.	A park to protect the integrity of the sunken World War II wrecks and preserve war ruins on the islands of Moen, Dublon, and Feten would be a source of great pride for all FSM citizens.	A national park to preserve a sampling of the war ruins on the islands of Moen, Dublon, and Eten would be a source of great pride for all FSM citizens.
Permanence or long-term stability of this option	May be redesignated or abolished by Historic Prese	May be abolished by the government of	Can only be abolished by the national government of the Federated ndent upon future funding by the national government.	National park status is known to provide the greatest assurance of permanence.	Can only be redesignated or abolished by the national government and dependent upon future funding by the national government.	National park status is known to provide the greatest assurance of permanence.

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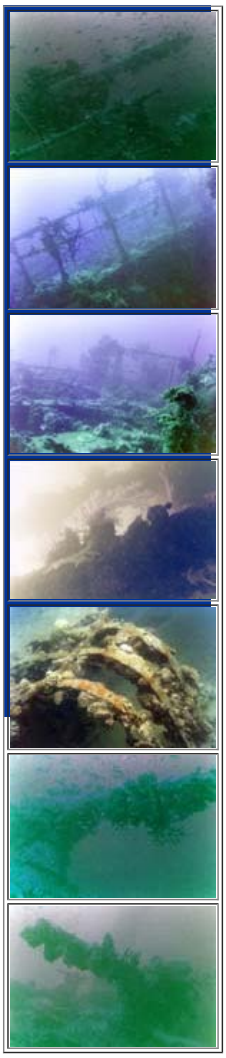

PRELIMINARY DRAFT **TRUK LAGOON AREA STUDY** PRELIMINARY DRAFT

The findings and recommendations herein should not be construed as representing either the approval of disapproval of the Secretary of the Interior

TRUK LAGOON AREA STUDY

July 1989

Preliminary Review Draft

Prepared by the
Federated States of
Micronesia,
the State of Truk, and the
National Park Service

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