Draft Environmental Impact Statement

Infrastructure Improvements at the Yap International Airport and the Yap Seaport

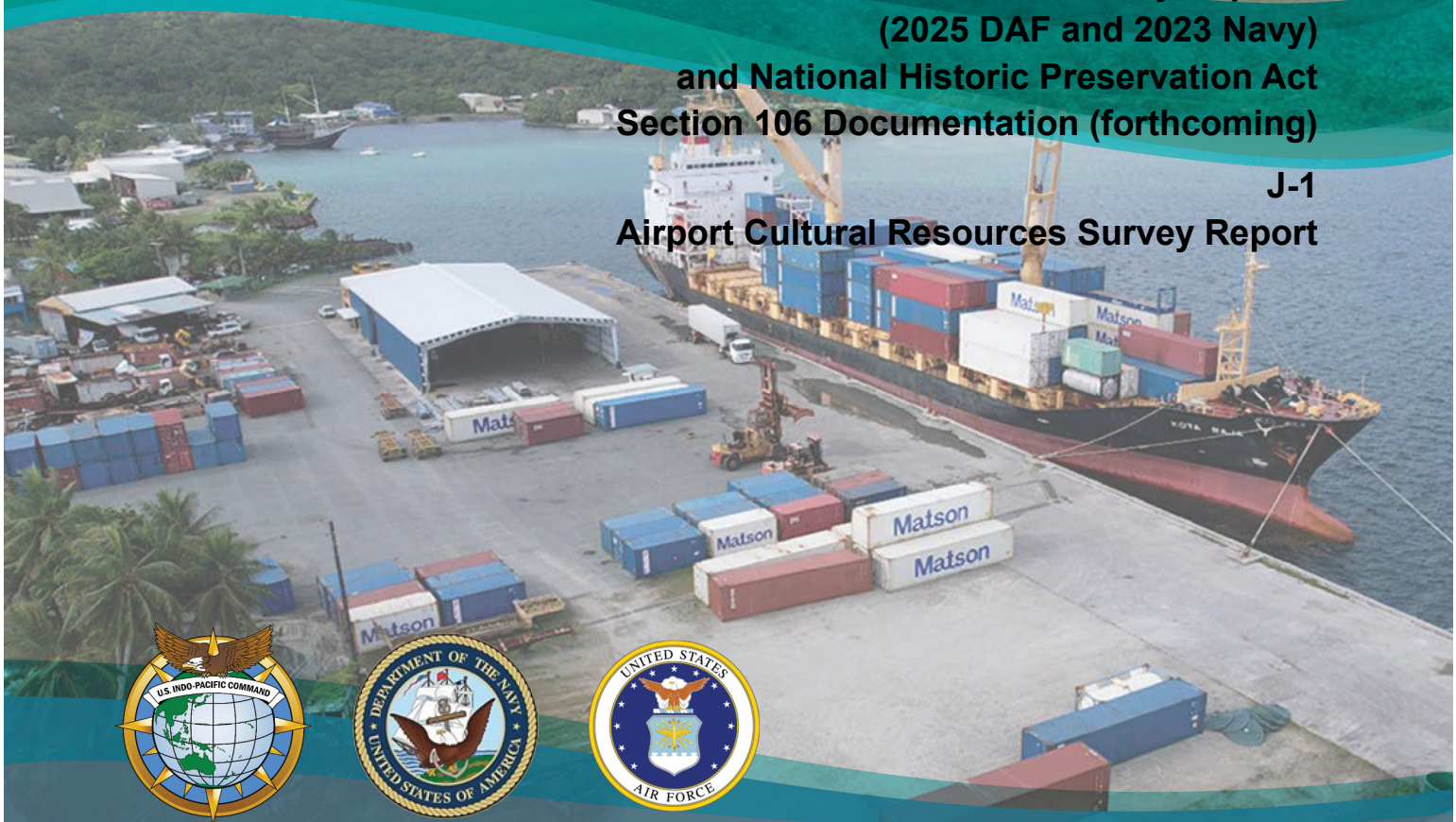
Yap State, Federated States of Micronesia

ID# EISX-007-USN-1775813621

APRIL 2026

Appendix J
Cultural Resources Survey Reports
(2025 DAF and 2023 Navy)
and National Historic Preservation Act
Section 106 Documentation (forthcoming)

J-1
Airport Cultural Resources Survey Report



FINAL—CULTURAL RESOURCES SURVEY IN SUPPORT OF AN ENVIRONMENTAL IMPACT STATEMENT FOR THE YAP INTERNATIONAL AIRPORT IMPROVEMENT PROJECT, YAP STATE, FEDERATED STATES OF MICRONESIA

Air Force Installation Mission Support Center Detachment 2
Combined Cultural Resource Survey Report

Combined Report Prepared By:

Jason Stolfer, MA, RA
Scott Bierly, MA

Acknowledgements:
Kleinfelder Personnel:
Cacilie Craft, MA, RPA
Kylie A. Tuitavuki, MA
Chase Young, BA
Amanda E. Sims, BA
Kai Ablog, BA

Date: November 24, 2025

ABSTRACT

At the request of Element Environmental, LLC, and on behalf of the United States Army Corps of Engineers (USACE) and the U.S. Department of the Air Force (DAF), Kleinfelder, Inc. (KLF) conducted a cultural resources survey of 919 acres in support of an Environmental Impact Statement (EIS) for the Yap International Airport Improvement Project on the Island of Yap, Yap State, Federated States of Micronesia (FSM). The proposed project aims to enhance the airport's capacity for divert landing, joint military exercises, and humanitarian and disaster relief efforts on Yap. Headquarters, Pacific Air Force (HQ PACAF) is the project proponent and lead for the proposed action, with the National Environmental Policy Act (NEPA) Division at the Air Force Civil Engineer Center (AFCEC/CZN), PACAF, Joint Region Marianas (JRM), and Pacific Fleet N46 (PACFLT) serving as NEPA Cooperating Agencies. This document presents the combined results of the cultural resources survey, encompassing both KLF's initial 2024 survey and the supplemental 2025 in-fill survey conducted by the U.S. Air Force and AFIMSC Detachment 2.

The primary objective of the cultural resources survey was to assess the presence and potential for cultural resources within the project area, supporting federal agencies in the planning stages of the proposed airport improvements. The investigation was conducted in three phases: 1) background research, 2) field survey and oral history collection, and 3) synthesis results and report preparation. The KLF field survey, conducted between January 8 and March 15, 2024, covered 919 acres, while AFIMSC Det 2 surveyed an additional 389 acres within that same area in 2025 to fill in gaps in the original dataset

KLF's 2024 survey uncovered significant findings related to Traditional Yapese mortuary practices and World War II-era military sites. These findings expanded understanding of Yapese settlement patterns, particularly the dichotomy between coastal habitation and inland mortuary zones. KLF spatially analyzed these results and identified five site complexes reflecting the deeply modified cultural landscape of Yap's inland mortuary zones. This dataset is crucial for understanding the archaeological context of Yapese traditional practices, as these mortuary areas are underrepresented in existing archaeological literature. The survey also recorded sixteen (16) World War II sites, including Japanese prospecting tunnels, military defense positions, and artifact scatters.

In 2025, AFIMSC Det 2 conducted a follow-up survey to address gaps in the original dataset and ensure comprehensive documentation of the project area. The in-fill survey focused on GPS-recording all traditional and modern graves, traditional Yapese structures, and World War II features across five designated zones. This supplemental survey recorded 167 traditional Yapese graves, 9 Yapese structures, 57 World War II-era features, including 12 aircraft wrecks, 35 bomb craters, and several Japanese revetments and anti-aircraft gun emplacements. Other significant cultural materials identified during the survey include a porcelain rim sherd and a taro patch.

The combined findings from the KLF and AFIMSC Det 2 surveys confirm the presence of an extensively modified cultural landscape, encompassing both Traditional Yapese mortuary and structural features and World War II-era remains. These results underscore the continued cultural sensitivity of the project area, highlighting the need for ongoing cultural resource management and mitigation planning as the airport improvement project progresses.

ACKNOWLEDGEMENTS

The Kleinfelder, Inc. (KLF) team wishes to thank Mr. Jeffrey Marbey, Yap State Historic Preservation Officer, and the staff of the Yap State Historic Preservation Office (HPO) who assisted the team in the field and with the collection of Traditional cultural knowledge. HPO staff who contributed to the study include Mr. Aloysius Guchbuw, Mr. J-Dwain Fanoway, Mrs. Angela Yafangney Thelman, and Mr. Magmay Magmay. The team also wishes to thank Mr. John Noph and numerous other local informants for providing important contextual knowledge. KLF respectfully takes ownership for any errors in the transcription of this knowledge.

The KLF team also extends our thanks to the staff of the ESA Bay View Hotel who tolerated muddy, rain-drenched, and hungry archaeologists for several months. The team also thanks our local connection and her family for their hospitality.

Lastly, the lead author thanks the KLF team for their perseverance and hard work on this project.

Kamagar!

AFIMSC Det 2 Acknowledgements

The AFIMSC Det 2 team would like to thank Ms. Josephine Libian, the Department of Defense (DoD) liaison for the project, whose coordination with local stakeholders was instrumental in facilitating access to critical survey areas. We would also like to express our appreciation to the Manta Ray Bay Hotel for their warm hospitality and excellent accommodations during our monthly stays on Yap, which made our extended fieldwork and data analysis much more manageable.

Additionally, we thank the many local community members for their cooperation and support throughout the survey process,

The AFIMSC Det 2 team also wishes to acknowledge the contributions of our colleagues, especially **Jason Stolfer** and **Scott Bierly**, for their dedicated efforts in the field. Their perseverance and professionalism were vital in ensuring the success of this project.

Kamagar!

LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
AFCEC/CZN	Air Force Civil Engineer Center
AFIMSC Det 2	Air Force Mission Support Center, Detachment 2 - Environmental
BA	Bachelor of Arts
BP	Before Present
CFR	Code of Federal Regulations
CST	Calcareous Sand-Tempered ware
DAF	U.S. Department of the Air Force
EIS	Environmental Impact Statement
FSM	Federated States of Micronesia
GIS	geographic information system
GPS	global positioning system
HPO	Yap State Historic Preservation Office
HSR	Human Skeletal Remains
HQ PACAF	Headquarters, Pacific Air Force
ISO	isolated objects
JRM	Joint Region Marianas
KLF	Kleinfelder, Inc.
MA	Master of Arts
NEPA	National Environmental Policy Act
PACFLT	Pacific Fleet
RA	Registered Archaeologist
RF	Representative Feature
RPA	Register of Professional Archaeologists
TSN	temporary site number
TTPI	Trust Territory of the Pacific Islands
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDA NRCS	United States Department of Agriculture Natural Resources Conservation Service

GLOSSARY OF NON-ENGLISH TERMS

Non-English Term	Definition
ayuw	Care for
beagiyu	Woven textiles made from banana fiber
chamog	Traditional structures
dayif/daf	House foundation/platform (hexagonal-shaped)
dapal	Menstruation house
faluw	Men's meeting house
Ga'an or Gilemray	Group of patrilineally related males
galesam	Technique of layering or differentiating surface areas of the *wunbey* through the construction of separate stone platforms or cobble alignments
kanaawa'	Stone-paved pathway
kengin e dagif	Central stone house foundation
liib	Making senit cord
liyoer	Respect for
magrey	Upright stone backrest
malang	Burial/grave
mil'ay	Agricultural complex (farm/garden)
mitmit	Large public events
mu'ut	Wetland taro patch
namako	Sea slug
pebaey	Community meeting house
piiluung	High caste
pimilngaey	Low class
rai	Stone money
sawei	Gift exchange system
taliw	Cemetery
tethil	Battlegrounds
tibnaw	Individual dwelling houses
wunbey	Meeting platform

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1 INTRODUCTION

At the request of Element Environmental, LLC, on behalf of the United States Army Corps of Engineers (USACE) and the U.S. Department of the Air Force (DAF), Kleinfelder, Inc. (KLF) conducted a cultural resources survey of 919 acres in support of an Environmental Impact Statement (EIS) being prepared for the Yap International Airport Improvement Project on the Island of Yap, Yap State, Federated States of Micronesia (FSM) (Figure 1). The proposed action is intended to support divert landing, joint military exercise, and humanitarian and disaster relief efforts on Yap. Headquarters, Pacific Air Force (HQ PACAF) is the project proponent and lead for the proposed action, with the Air Force Installation and Mission Support Center, Detachment 2- Environmental (AFIMSC Det 2) also serving as a project proponent, overseeing cultural resource management efforts, including a 2025 supplemental in-fill survey of 389 acres within the original 919-acre project area. The AFIMSC Det 2 survey focused on GPS-recording traditional Yapese graves, modern graves, traditional structures, and World War II-era features to address gaps in the KLF dataset and provide a more comprehensive spatial record of cultural resources in the project area. The National Environmental Policy Act (NEPA) Division at the Air Force Civil Engineer Center (AFCEC/CZN), PACAF, Joint Region Marianas (JRM), and Pacific Fleet N46 (PACFLT) are NEPA Cooperating Agencies (40 CFR 1508.5).

This document presents the results of the cultural resources survey along with project methodology and background information to contextualize the project area and results.

1.1 PROJECT OVERVIEW

DAF proposes to expand and improve the Yap International Airport to support a combination of military support activities in the region. An EIS is currently being prepared to analyze potential environmental impacts associated with the development of facilities and infrastructure that are required to support a combination of cargo and fighter aircraft and associated support personnel for periodic divert landings, joint military exercises, and humanitarian assistance/disaster relief efforts at Yap International Airport. The improved facilities are intended to support one 5-day exercise twice a year which may be performed jointly with other allied nations. Approximately 200 U.S. Airman are expected to deploy to Yap to participate in the proposed exercises. The EIS will incorporate and analyze PACFLT infrastructure improvements planned for Yap International Airport. The EIS will also include the full joint requirements of PACAF and PACFLT for Yap International Airport infrastructure improvements.

To support development of the EIS, KLF conducted a cultural resources survey to identify and record Pre-Contact and/or historic resources within the 919-acre project area.

1.2 PROJECT LOCATION

The project area is located on the Island of Yap, at the western extent of the Federated States of Micronesia (FSM), bordering the Republic of Palau to the southwest and Guam to the north. The project area is centered around Yap International Airport, situated at the southwest extent of the island, and encompasses a broad buffer area around the airport, totaling approximately 919 acres (Figure 2 and Figure 3). This includes about 826 acres of the airport and surrounding area, as well as 93 acres of road leading from the project area to the Yap's port.

All proposed airport improvements, including construction support areas, laydown areas, and staging areas, are located within the defined 919-acre project area. The Kleinfelder 2024 survey and the 2025 AFIMSC Det 2 in-fill survey collectively provide cultural resources coverage for the entirety of this footprint. The 389-acre in-fill survey represents supplemental documentation within the original project boundary and does not reflect a reduction in total survey coverage.

1.3 PURPOSE AND SCOPE

The main objective of the cultural resources survey was to determine the presence of or potential for cultural resources within the project area, the results of which are intended to assist the various federal agencies involved in preliminary design planning for the proposed airport improvement project.

Two approaches were used to complete the field survey:

1. An intensive-level transect survey within the main portion of the project area, consisting of 826 acres within and surrounding the current Yap International Airport, conducted by Kleinfelder, Inc. (KLF).
2. A "windshield" survey along approximately 93 acres of road connecting the current airport and main project area with the port.

In 2025, AFIMSC Det 2 conducted a supplemental in-fill survey covering an additional 389 acres within the original 919-acre project area. The in-fill survey followed the same methodology as the initial survey, with fieldwork conducted alongside UXO technicians who cleared areas of concern prior to the cultural resource inspection. The CR team proceeded in linear transects, following the UXO technician's path, to ensure comprehensive coverage of previously unexamined or under-represented zones.

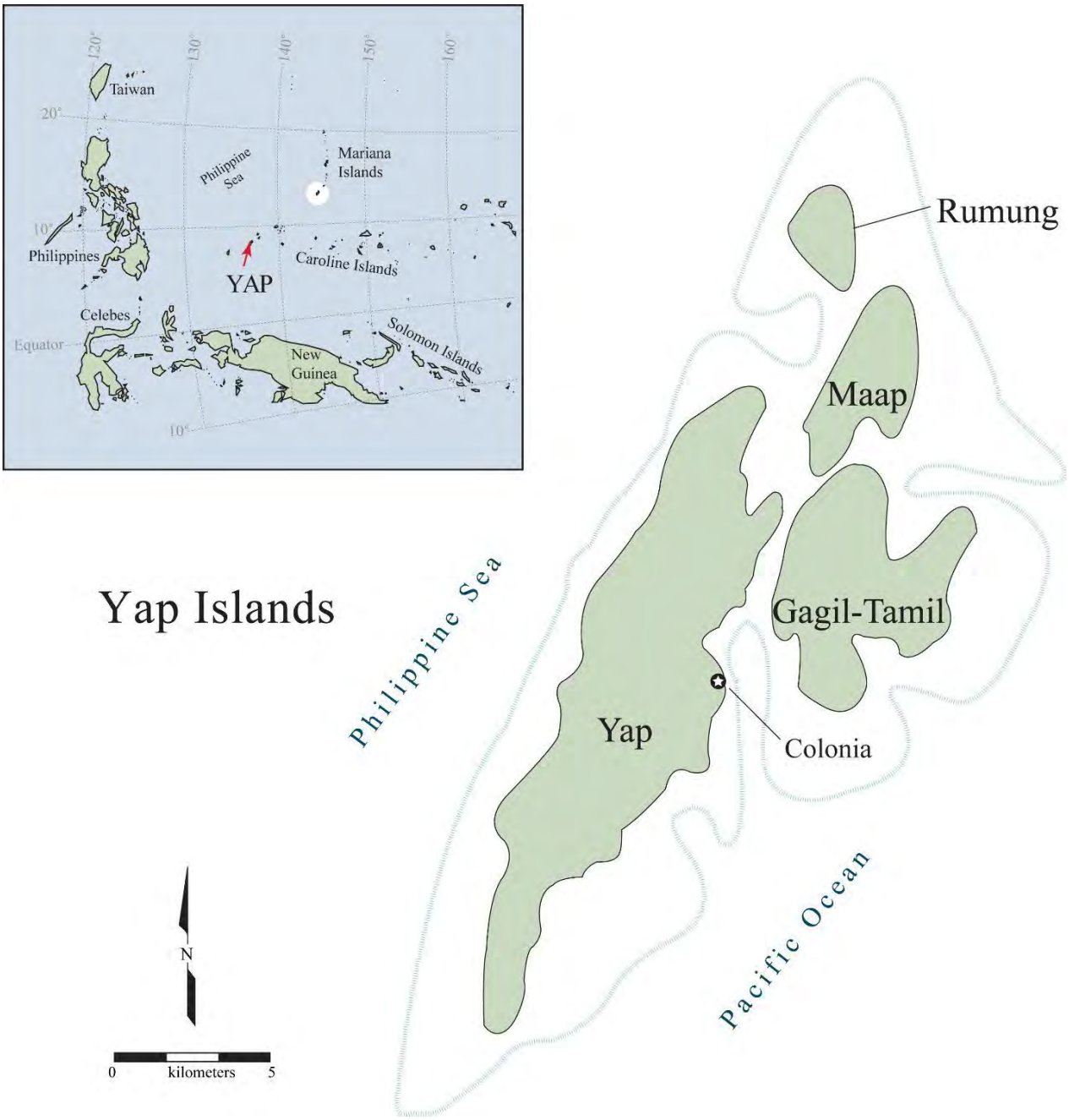


Figure 1. Yap Island within Yap State and Western Micronesia.

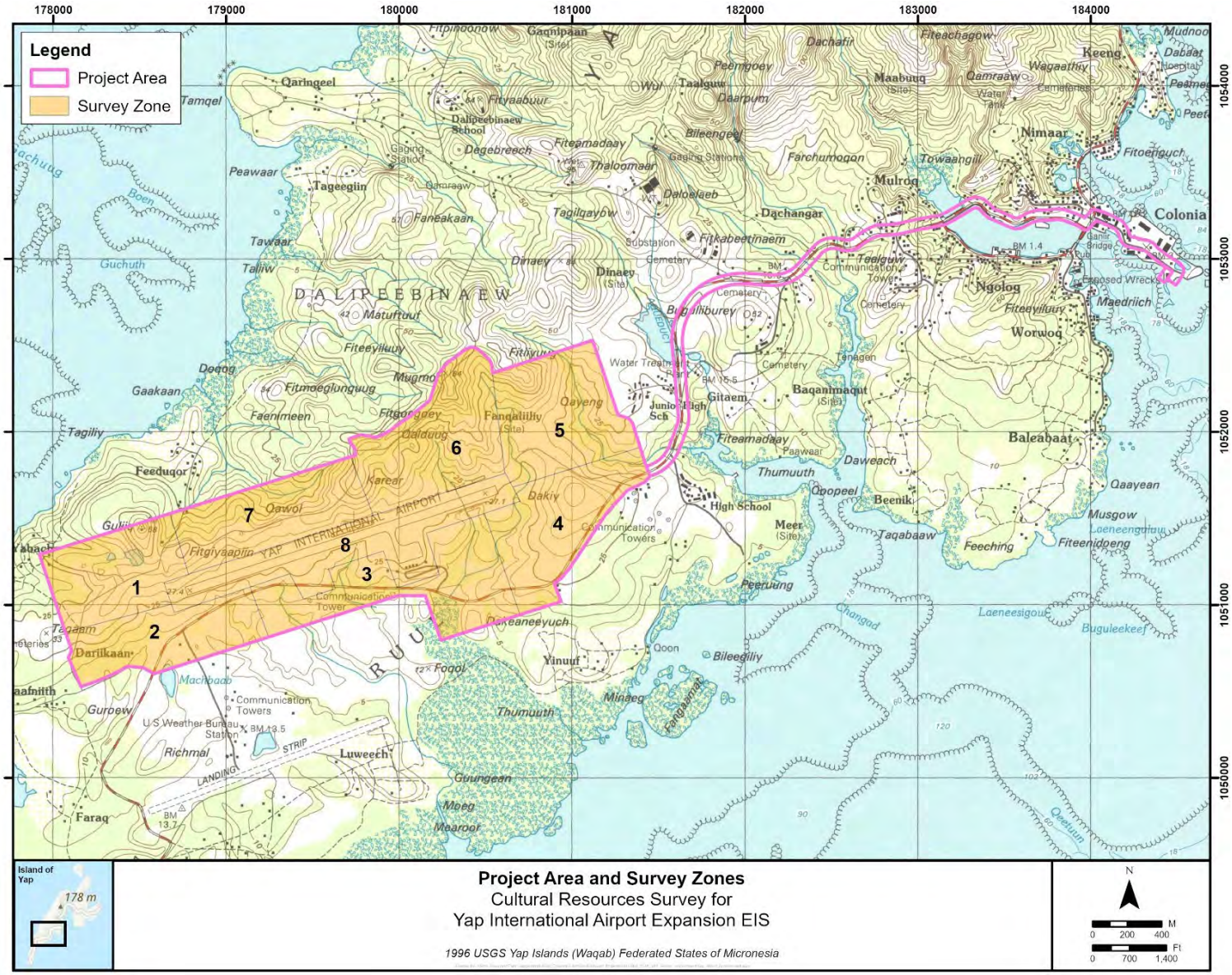


Figure 2. Project area and survey zones depicted on 1996 USGS quadrangle map.

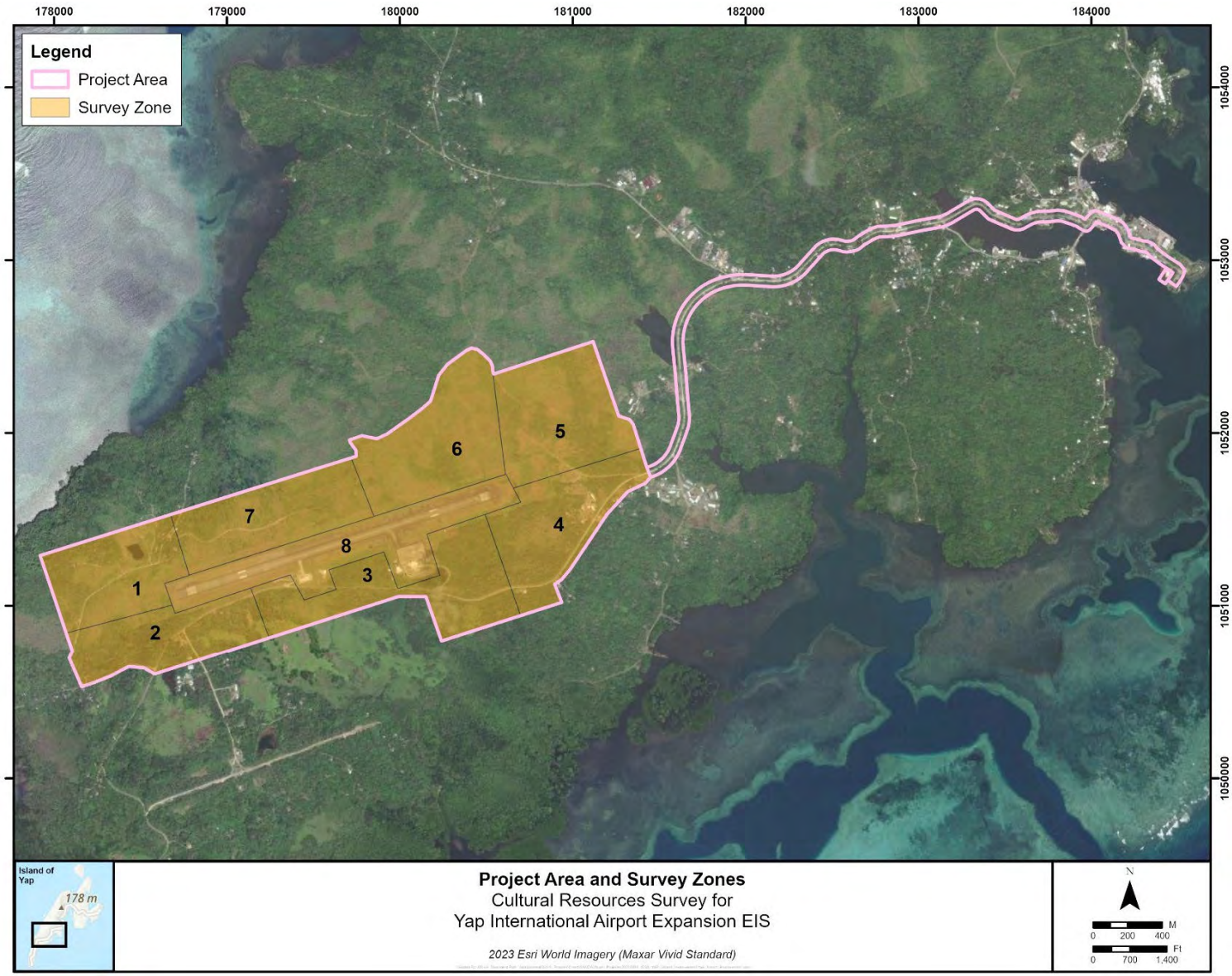


Figure 3. Project area and survey zones depicted on 2023 Esri World Imagery.

1.4 DETAILS OF INVESTIGATION

All fieldwork adhered to the USACE-approved work plan for the project (Element Environmental, LLC 2023; finalized December 2023). The pedestrian surveys occurred between January 8 and March 15, 2024, and were conducted by personnel listed in Section 1.4.1.

All field notes and other raw data created during the Kleinfelder (KLF) investigations are stored in hardcopy at KLF's Tomhom, Guåhan and Honolulu, Hawai'i offices and in digital form on KLF's cloud-based digital platform, which adheres to federal security standards.

The in-fill survey conducted by AFIMSC Det 2 occurred between July 29 and August 18, 2025, and was led by personnel listed in Section 1.4.1.

All field notes and other raw data created during the AFIMSC Det 2 investigation are stored in hardcopy at PACAF Headquarters Building at Joint Base Pearl Harbor Hickam and in digital form on AFIMSC Det 2's cloud-based digital platform, which also complies with federal security standards.

1.4.1 Project Personnel

All archaeological work was conducted under the supervision and direction of KLF Principal Investigator, Cacilie Craft (Master of Arts [MA], Register of Professional Archaeologists [RPA]). Ms. Craft meets the professional qualifications for Archaeologist found in the Secretary of the Interior's *Historic Preservation Professional Qualifications Standards* (Federal Register 62 [119]:33712–33713; June 20, 1997).

Kylie Tuitavuki (MA) served as Project Director and supervised all fieldwork, site collection protocols, and reporting for the project. She meets the professional qualifications for Archaeologist in the Secretary of the Interior's *Historic Preservation Professional Qualifications Standards* (Federal Register 62 [119]:33712–33713; June 20, 1997).

Chase Young (Bachelor of Arts [BA]) led the field survey and assisted in research and writing as the project Field Director. Mr. Young was supported by a field team of qualified archaeological field technicians (i.e., BA degree and Pacific Island archaeological experience), including Jenal Ligow (BA), Alea Dugan (BA), Mark Epstein (BA), and Angelina Pangelinan (BA).

In-Fill Survey Personnel

All archaeological work for the 2025 AFIMSC Det 2 in-fill survey was conducted by Jason Stolfer (Master of Arts [MA], Registered Archaeologist [RA]) and Scott Bierley (Master of Arts [MA]). Both Mr. Stolfer and Mr. Bierly meet the professional qualifications for Archaeologists found in the Secretary of the Interior's Historic Preservation Professional Qualifications Standards (Federal Register 62 [119]:33712-33713; June 20, 1997).

2 BACKGROUND RESEARCH

The background information presented in this section provides an environmental, historical, and archaeological context of the project area. This information provides a contextual framework within which cultural resources identified during the survey are interpreted.

2.1 ENVIRONMENTAL CONTEXT

Yap State consists of a group of high islands in the Western Pacific, approximately 840 kilometers southwest of Guam and roughly 1,850 kilometers east-southeast of the Philippines (Nedachi et al. 2001). The island group comprises four main islands connected by narrow waterways: Yap Proper (Marbaaw), Maap, Rumung, and Gagil-Tamil, the latter of which was created in 1901 when the German Administration dredged a 300-meter-long channel on the north side of Marbaaw (Jeffery and Pitmag 2010:3). In addition to the four main islands, there are 16 smaller islands and atolls, 11 of which are inhabited. Total land area, including the main and outer islands, includes about 95 square kilometers. According to the 2010 U.S. Census, two-thirds of the population resides on Yap Proper (U.S. Department of Health and Human Services 2024). Most villages are in coastal and rural areas. Modern and historical maps note there are approximately 129 villages on Yap, each utilizing a variety of coastal and inner terrestrial landscapes (Hunter-Anderson 1983). The project area is in the central low hills of the main Island of Yap, away from the higher population centers.

2.1.1 Climate

Yap's proximity to the equator (9 degrees north) results in a tropical marine environment with an average annual temperature of 27 degrees Celsius (Britannica 1998). Yap's wet season typically occurs from June to October, with approximately 3,600 millimeters of rainfall per year (Britannica 1998). The dry season usually occurs from November to May, which can bring droughts and trade winds.

2.1.2 Geology

The islands that comprise Yap State are primarily of metamorphic and volcanic rock formations surrounded by fringing coral reefs and intertidal mangrove forests (Nedachi et al. 2001). Yap is part of a series of islands formed by an "intra-oceanic arch trench system" that extends from Palau in the south to the Commonwealth of the Northern Marianas in the north (Descantes 2005:18). This trench system separates the Philippine Plate in the west from the Pacific Plate in the east, creating a geological divide where andesitic volcanic island chains mixed with submerged continental rock formations are situated to the west, and submerged volcanic mountains and volcanic ocean uplift are situated to the east. These geologic formations determine the composition of parent material available for anthropogenic use on these islands (Descantes 2005:20).

Five geological formations fall within the project area: 1) Yap formation (pTy), 2) Tomil volcanics (Tv), 3) Alluvium (Qal), 4) Mangrove swamp deposits (Qm), and 5) Made land (ML) (Figure 4). The Yap formation, which comprises most of the project area, is a pre-Tertiary metamorphic basement composed primarily of greenschists, amphibolites, and intrusive ultramafic rocks (Johnson et al. 1960:61). This material often weathers to clays and is found across the central portion of the island. Greenschist is important in Traditional Yapese contexts, as it was used along with coral blocks to construct stone platforms, paved walking areas, and other stone structures. The Tomil volcanics are a volcanic geological unit within the southern part of the project area and are composed of "andesitic and basaltic volcanic

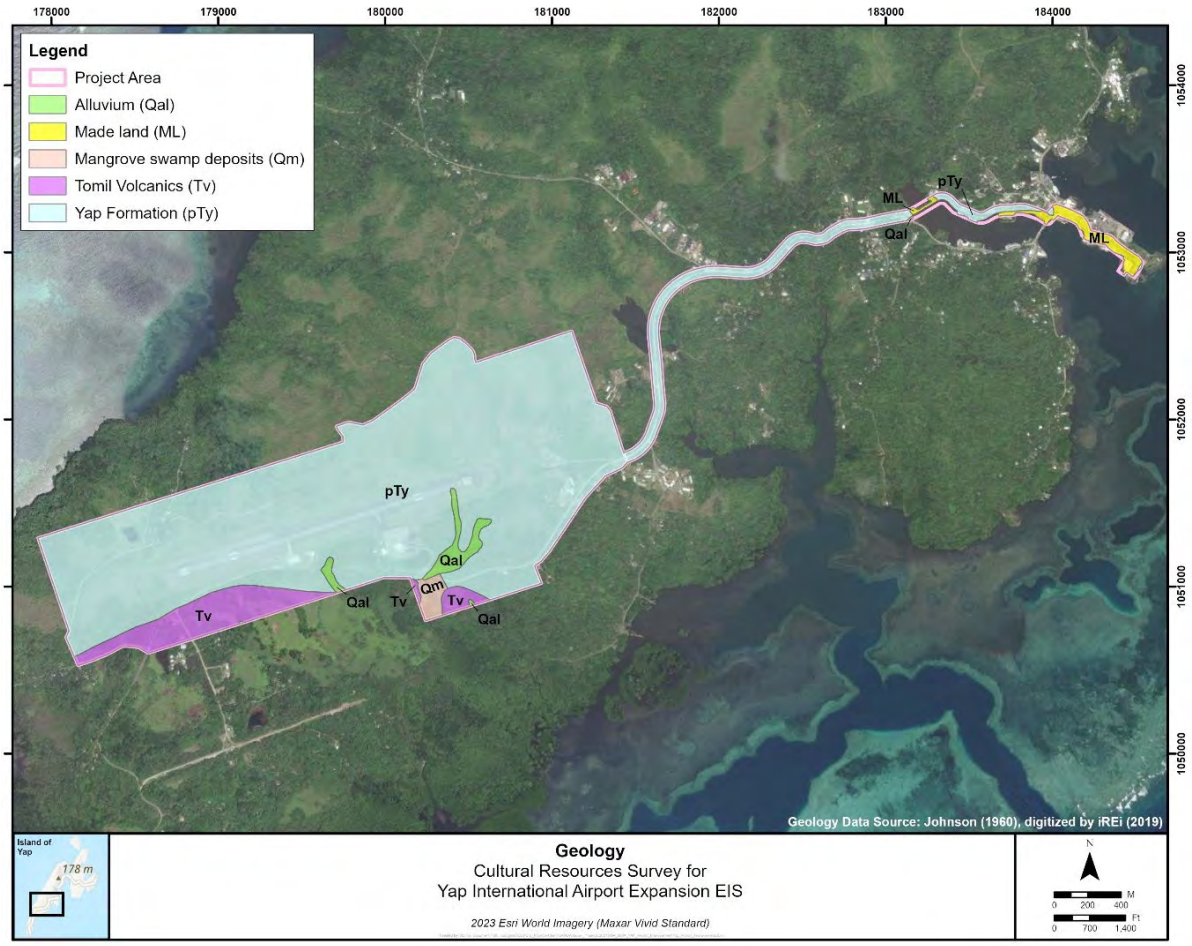


Figure 4. Geological formations within project area, overlain on 2023 Esri World Imagery.

breccias, conglomerates, lava flows, and tuffs" (Johnson et al. 1960:75). Alluvium is found in marshy environments in the southern part of the project area. Johnson et al. (1960:80) describe this unit as predominantly clay and "high in organic content". Also found in the southern project area is an area of Mangrove swamp deposits, which contain organic-rich soils composed of muck, sand, silt and clay (Johnson et al. 1960:82). Near the port is an area of Made land, which is described by Johnson et al. (1960:82) as being composed of limestone, gravel, coral, and varying amounts of clay that was dredged from the nearby Tamil Harbor during the Japanese and German administrations to create reclaimed land.

2.1.3 Soils

The main body of the survey area comprises seven soil series, with varying slope degrees (Figure 5). The remaining road portion of the survey area consists primarily of paved roadways. Soil series within the main survey area, from most to least prevalent, include the following:

- Gitam very gravelly silty clay loam, 0 to 12 percent slopes
- Rumung-Weloy complex, 12 to 50 percent slopes
- Gagil silty clay loam, 2 to 30 percent slope
- Dechel mucky silt loam, 0 to 2 percent slopes

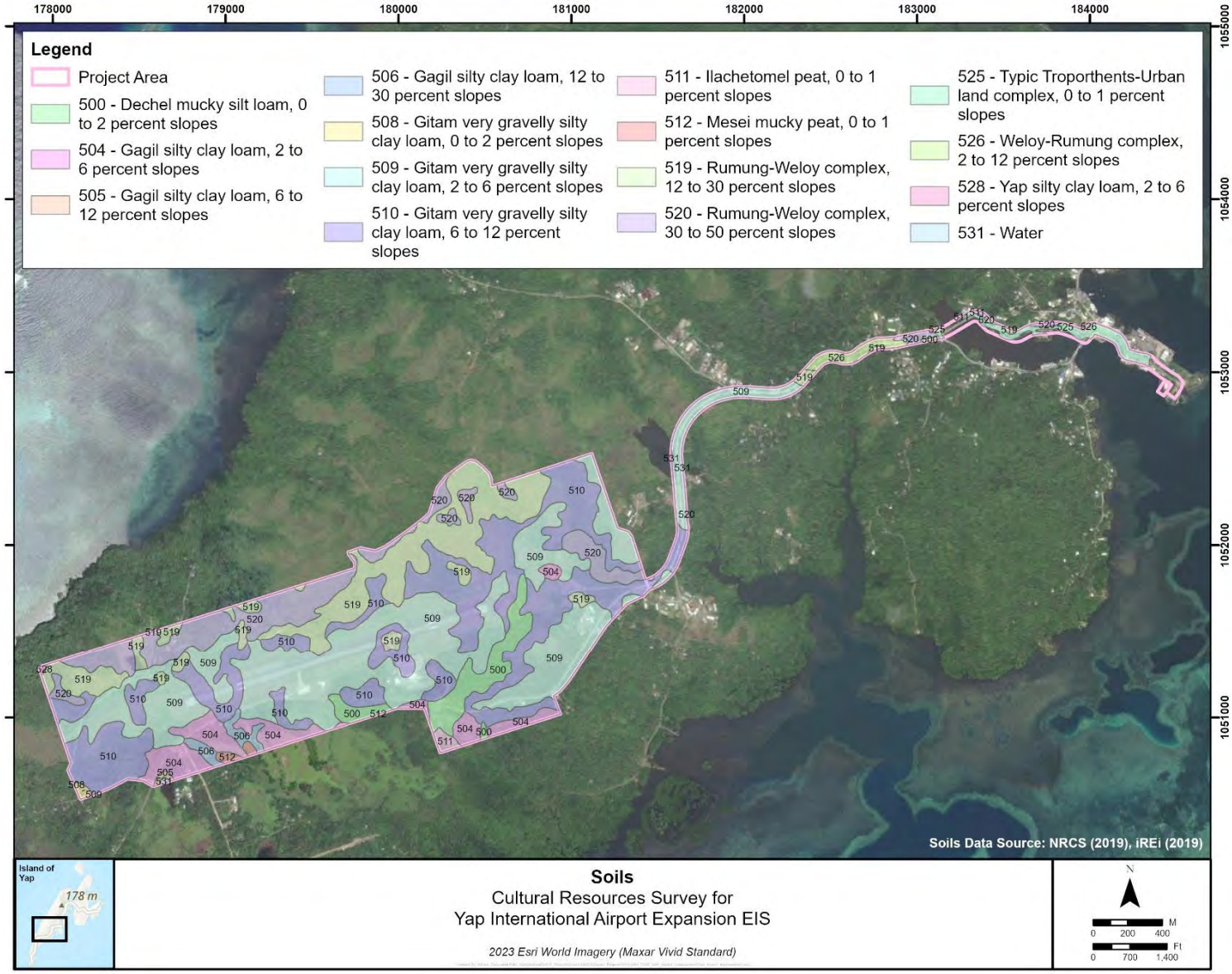


Figure 5. USDA mapped soils within the project area overlain on 2023 Esri World Imagery.

- Mesei mucky peat, 0 to 1 percent slopes
- Ilachetomel peat, 0 to 1 percent slopes
- Yap silty clay loam, 2 to 6 percent slopes

Gitam very gravelly silty clay loam, 0 to 12 percent slopes, comprises the most prevalent soil series in the main survey area (Figure 5). This moderately deep and somewhat poorly drained soil is formed on plains in materials derived from schist (USDA NRCS 2024:18–19). Depth to solid bedrock is typically 90 centimeters (35 inches) (USDA NRCS 2024:18–19).

The Rumung-Weloy complex, 12 to 50 percent slopes, is present on low-lying foothills within the northern portion of the survey area and in small pockets in the central portion of the survey area (Figure 5) (USDA NRCS 2024:23). It comprises 45 percent Rumung gravelly silt loam and 35 percent Weloy gravelly silty clay loam. Rumung and Weloy soils formed in residuum derived from schist and are well-drained. Rumung soil is typically shallow (25 to 30 centimeters to bedrock), while Weloy soil is moderately deep (50 to 62 centimeters to bedrock).

Gagil silty clay loam, from 2 to 30 percent slopes, is mapped along the southern boundary of the survey area (Figure 5). The Gagil series formed in highly weathered volcanic breccia and tuff on central uplands and is very deep and well drained (USDA NRCS 2024:14).

Dechel mucky silt loam, 0 to 2 percent slopes, is found in the southcentral and eastern portions of the survey area (Figure 5). This soil series formed in alluvium from volcanic rock and schist and is found on valley floors (USDA NRCS 2024:11). It is very deep (80 centimeters to bedrock) and poorly drained (USDA NRCS 2024:11).

Mesei mucky peat, 0 to 1 percent slopes, is found in a small pocket along the southern boundary of the survey area (Figure 5). It is formed in organic deposits overlying alluvium on bottom lands and is very deep (80 centimeters to bedrock) and very poorly drained (USDA NRCS 2024:20).

Ilachetomel peat, 0 to 1 percent slopes, is present in a small pocket in the southern portion of the survey area (Figure 5). This soil formed in decomposing mangrove roots and litter in intertidal zones and is very deep and very poorly drained (USDA NRCS 2024:19–20).

Yap silty clay loam, 2 to 6 percent slopes, is present in the northwest corner of the survey area (Figure 5). The soil series formed in material derived from volcanic breccia and tuff, is very deep and well drained, and found on ridges (USDA NRCS 2024:31).

2.1.4 Hydrology

Yap Island features several small streams, none of which are perennial and most of which provide no more than 50 gallons of water per minute and exhibit decreased or nonextant flows from February to April (Johnson et al. 1960:24). A 1960 U.S. Army study describes the following Traditional methods for procuring water (Johnson et al. 1960:23):

> The natives of Yap use very little freshwater; cooking constitutes almost their entire need for water, as they seldom bathe in fresh water and only occasionally drink it.

> Green coconuts are the chief source of drinking water. Rainwater caught from roofs or from the trunks of coconut palms is the other main supply; the water is stored in oil drums, glass fishnet floats, Japanese rice-wine bottles, or milk cans. During the Japanese administration of Yap, concrete reservoirs of various sizes (mostly about 6 x 6 x 8 feet, with a spigot at the base) were built in most villages, but few if any are now in use. The reservoirs were filled by rain catchment from the roofs of police or administrative offices.
>
> At some places, water from springs is used, and commonly caried to more convenient places in bamboo pipes or troughs. Water from streams is used very little.
>
> There are shallow dug wells in all villages, but they are used mainly as a place for retting the fibers of coconut husks rather than as a supply of fresh water for cooking, drinking, or bathing. The Japanese dug shallow wells on the coastal flats to augment the water supplies of many villages. These wells are lined with stone and curbed with concrete…

2.1.5 Vegetation

Much of the landscape on Yap Proper is converted to agroforestry, secondary growth vegetation, and savanna areas (Falanruw 2015). This development has left Yap with the smallest percent of terrestrial native forest in the entire FSM. Vegetation in the project area mostly consists of upland tropical broadleaf tree forests and upland savanna, both of which have been heavily modified and comprise a mixture of native, agroforest, secondary, and introduced species (Falanruw et al. 1987:3). Moving away from the island interior are coconut groves along the coastal flats and adjacent hillsides, marshes along the backshore areas of the coast, and extensive mangrove swamps bordering the coastlines.

Common tree species in the upland forest within the project area include, but are not limited to, breadfruit (*Artocarpus altilis*), banyan (*Ficus* spp.), mango (*Mangifera indica*), Tahitian chestnut (*Inocarpus fagifer*), tamani (*Calaphyllum inophyllum*), coconut palm (*Cocos nucifera*), betel nut palm (*Areca catechu*), sea hibiscus (*Hibiscus tiliaceus*), and pandanus (*Pandanus* spp.). The project area also contains disturbed upland savanna that includes dense thickets of *Gleichenia linearis* fern, pandanus, and other grasses and shrubs.

2.2 TRADITIONAL CULTURAL CONTEXT

This section provides a contextual framework for understanding the Traditional Yapese cultural context. This provides a backdrop for interpreting cultural resources recorded in Yap, the island traditionally known as Waab.

2.2.1 Subsistence

Traditional Yapese subsistence involved intensive agricultural production of tubers, such as yam (*Dioscorea* sp.) and taro (*Cyrtosperma* sp.); other major cultivars include breadfruit (*Artocarpus altilis)*, coconut (*Cocos nucifera), adid* (*Atuna racemose),* betel nut palm (*Areca catechu),* and Tahitian chestnut (*Inocarpus fagifer*) (Hunter-Anderson 1983). Hunter-Anderson (1983:3) writes that many of the terraced hillslopes in Yap were used for yam gardens, with large irrigation channels used to manager water for agriculture in lower elevation areas. These irrigation channels are seen in many villages today.

Villages with coastal access relied on fish weirs, stones, nets, and traps made from stone and bamboo to gather coastal resources (Hunter-Anderson 1984). Fish weirs were designed for specific coastal environments, allowing for Yapese to utilize all aspects of coastal environments (shoreline, lagoons, reef

crests). While many of these fishing weirs were destroyed during the Japanese Colonial Period, many of them remain and still play an active role in Yap today.

2.2.2 Village Composition

Yapese villages were connected by stone-paved paths, and each village was composed of several Traditional structures (*chamog),* including full community meeting houses (*pebae*y), men's meeting houses (*faluw*) (communal men's meeting houses and meeting houses for young/old men), and other meeting structures for participating in Traditional activities like making senit cord (*liib)* or canoe houses for canoe building (Intoh and Leach 1985:10). Community meeting houses were located at the center of each village, surrounded by stone-paved sitting platforms and raised dancing areas that were lined with *rai* (stone disk money). *Faluw* were situated between individual dwelling houses (*tibnaw)* and the coastline; they were a first line of defense against outside threats (Napolitano et al. 2021; Nunn et al. 2017). *Tibnaw* were built on hexagonal-shaped platforms (*dayif*/*daf*) on either side of the stone-paved paths (*kanaawa'*) (Intoh and Leach 1985:10). These primary *tibnaw* were often surrounded by secondary dwelling structures, including stone-paved terraces, cooking houses, young girls' sleeping areas, and menstruation houses (*dapal*). Traditional burial areas were often located within the village, surrounding individual houses, or near the coastline; however, western style burials in cemeteries became increasingly popular with more frequent western contact (Intoh and Leach 1985:10).

2.2.3 Social Organization and Exchange Networks

Yap's political system integrates both Traditional Yapese social dynamics and western political structures. The Traditional power structure, known as the Council of Pilung, consists of the 10 highest-ranking chiefs from across the various municipalities as well as the mayor of Rull. This acting system has the power to veto legislation or propose legislation that does not align with Yap's Traditional customs or values (Descantes et al. 1993). The Western-style political structure in Yap has an acting Governor and Lieutenant Governor in place of a sitting President and Vice President.

Yap is organized into a caste style social system, with villages being grouped into high caste (*piiluung*) or low class (*pimilngaey*). This caste system is very similar to a parent-child relationship with *piiluung* acting as the "parent" to their *pimilngaey* "children", providing them with food, land, and goods (Descantes 2005:14). The parent-child metaphor encompasses villages on Yap Proper and the surrounding outer islands, with one village or group of high caste villages acting as "parents" for lower caste villages on Yap Proper, as well as all villages on Yap Proper acting as high caste villages for the outer islands, including some atolls being linked to specific villages on Yap Proper (Descantes 2005:14). While outer islands offer tribute to higher caste individuals or villages on Yap Proper, those higher caste groups would be obligated to house any outer island visitors, providing them with food and shelter during their time on Yap Proper.

This relationship of reciprocity is deeply rooted in Yapese history and cultural practice, extending not just deep into time but also to outer islands within the Western Caroline Islands. This long-distance exchange network extends from Palau (the westernmost extent of this exchange network, approximately 280 miles southwest of Yap) to the Poluwat (formerly Puluwat) and Namonuito atolls, roughly 800 miles east of Yap and the easternmost extent of the Caroline Islands (Kirch 2000:191). This network is often referred to as the "Yapese Empire" and encompasses both the *sawei* gift exchange system and the *rai* (stone money) exchange system.

2.2.3.1 *Sawei* Gift Exchange System

The *sawei* gift exchange system was a formalized mutual exchange system between Yap, their western Pacific Island neighbors, and the remaining members of the Caroline Islands (Throop 2010:19). This system took place between 300–800 AD and was an "elaborately interlinked exchange relationship stretching over 1000 miles across the Western Pacific" (Kirch 2000:192). The relationships between Yap and the outer islands involved in the *sawei* exchange systems were based on gifts and tributes, with lower caste islands paying tribute and the higher caste islands returning gifts (Throop 2010:20). This system was arranged as a chain of hierarchically caste linkages between islands, progressing from lower ranking atolls in the east to the higher ranking atolls in the west. Higher caste islands exchanged goods out of *ayuw*, or care, for the lower caste islands, sending gifts of bamboo, turmeric, food items and other natural resources that were highly abundant on the higher caste islands or difficult to find on lower caste islands. Lower caste islands exchanged goods out of *liyoer*, or respect, for the higher caste islands, paying tributes of shell belts, *beagiyu* (woven textiles made from banana fiber), and coconut fiber ropes (Throop 2010:20). The *sawei* exchange system required extensive knowledge of sophisticated navigational skills, which originated on the outer islands and were passed to the high-caste villages of Gachpar and Wanyann in the Gagil Municipality. This navigational knowledge helped Gagil maintain power and control over the *rai* (stone money) exchange system, which decreased along with the *sawei*, after German colonial efforts to limit Traditional interisland voyaging. Major voyaging efforts were effectively ended during Japanese control of the Western Caroline Islands after outer island laborers were forced to work in areas traditionally deemed to be taboo for them. These acts broke long-standing tribute protocols, eroding the integrity of long-standing Yapese traditions (Alkire 1981).

2.2.3.2 *Rai* (Stone Money) Exchange System

The *rai* stone money exchange system is another well-known exchange system used throughout the Western Pacific. This network involved the quarrying of limestone from Palau, approximately 280 miles southwest of Yap, to make *rai*. The production and transportation of *rai* are noted as some of the heaviest portable objects transported over open ocean by Pacific voyagers (Hazell and Fitzpatrick 2006). *Rai* are disks carved by splitting off slabs of limestone rock using fire and shell adzes. These *rai* carving events often took place in caves, with no less than 100 Yapese participating in the manufacturing and transportation of these stone money disks (Decantes 2005). After carving the *rai*, holes were drilled into the center of the limestone disk using reef stones as fire drills (de Beauclair 1971:188). Yapese tradition notes that after the first stone was brought back to Yap from Palau, they became highly prized, creating a high demand for more. Traditional methods for quarrying stone money were transformed after European contact when metal tools and European ships allowed for easier production and transportation of *rai* to Yap (de Beauclair 1971:185). The higher presence of stone money on Yap made earlier *rai* carved and transported by Traditional methods more valuable than Historic Period stone money. Value of each *rai* was determined by size, shape, quality, and effort expended to create each disk.

Access to limestone quarries was granted by Palauan villages who had pre-existing relationships with Yapese villages. Exchange gifts of exotic food goods, glass beads, and other valuables which were part of the Palauan money system were often used to negotiate use of these quarries (de Beauclair 1963). Determining when quarrying of limestone for *rai* first began is difficult due to large complex stratigraphy and large quantities of limestone debitage present in archaeological sites in Palau (Fitzpatrick 2001). Ethnographic data and evidence gathered from archaeological sites in Palau and Yap suggest that quarrying began approximately 400 years ago. Stone money is considered highly valuable and is often still used today; while the physical disks are no longer moved, ownership of stone disks can be transferred.

2.3 CHRONOLOGICAL HISTORY

The following sections present an overview of Yap's chronological history as it relates to the project area. Much of this history is still in development and requires further study.

2.3.1 Pre-Contact Period

Yap's early colonization sequence is unclear due to limited archaeological research and conflicting data from archaeological, linguistic, and paleoenvironmental information (Napolitano et al. 2019). According to Napolitano et al. (2019:103), early radiocarbon dates from archaeological sites in Pemrang and Rungluw near Yap's southern coast indicate settlement around 2000 cal BP, approximately 1,000 years later than Palau and the Marianas; however, the collection methods of the radiocarbon sample are unclear and should be taken with caution. Recent work by Napolitano et al. (2019:103–106) sourced radiocarbon dates from Pemrang going back as far as 2400–2100 cal BP. Other estimates for the colonization of Yap span over a millennium, with palynological and paleoenvironmental data suggesting first human arrival around 3300 BP (Dodson and Intoh 1999). This data comes from paleoenvironmental cores which use large-scale environmental changes as proxies for human induced landscape modifications, like forest destruction and mass-controlled burning events that are often associated with early human migration events (Kirch 2000:173). Paleoenvironmental information, however, does not provide data to support the introduction of canoe plants (taro, breadfruit) or other human-introduced plant taxa. Environmental data being used as proxy evidence for human arrival should be used cautiously when assessing early human settlement. Further work on early settlement sites and paleoenvironmental data may help refine this sequence.

Investigations by Cordy (1986), Hunter-Anderson (1983), and Intoh and Leach (1985) have focused on settlement distribution within Yap, concluding that village organization was structured according to environmental zones. Yap is divided into four different environmental zones (Cordy 1986): shoreline, flatlands with gradual slopes, grassy savannah areas, and interior mountains with second growth forest. These environmental zones are not present in all villages but are visible in most villages across Yap Proper (Intoh and Leach 1985). Archaeological evidence demonstrates that communal and domestic structures were located slightly inland from the shoreline and along the gradual slopes, with gardens and irrigation infrastructures along the gradual slopes and grassy savannah areas.

Gifford and Gifford (1959) provided the earliest modern archaeological investigation on Yap, investigating a total of 26 sites across Yap Proper. The earliest radiocarbon dates for human settlement on Yap come from this study, specifically from composite charcoal samples from Pemrang in southern Yap, which placed human arrival at 1780 +/- 250 years BP. Takayama (1982:91) re-excavated Gifford and Gifford's Pemrang site and reported an earlier date of 2310 +/- 80 BP from a *Trochus* shell found three meters below the surface of the site. More recent archaeological investigations provided radiocarbon dates of ca. 2,200 years ago (Intoh and Leach 1985; Napolitano et al. 2021); discrepancies in radiocarbon dates regarding early human arrival on Yap stem largely from the limited number of synthesized archaeological investigations focused on identifying initial contact deposits.

Extensive analysis of pottery sherds initially observed by Gifford and Gifford (1959) and later re-analyzed by Intoh and Leach (1985) developed a Yapese ceramic sequence that includes three types, 2 sub-types, and nine different rim styles. Gifford and Gifford (1959) initially classified observed pottery sherds into tempered ware and untempered laminated ware (Descantes 2005:40). Tempered ware is often found in older assemblages and chiefly sites in southern Yap, while untempered laminated ware pottery sherds are common and found in younger, island-wide deposits. Gifford and Gifford (1959:182) also defined nine

different rim types, five of which were common in both tempered and untempered laminated pottery sherds; the remaining four rim types were exclusive to older tempered ware pottery sherds. Intoh and Leach (1985) expanded the classifications developed by Takayama (1982) and Gifford and Gifford (1959) by including three main types and two subtypes of pottery and noting temper material, texture, and shaping methods as characteristics for classification. The pottery classes assigned by Intoh and Leach (1985) include Calcareous Sand-Tempered ware (CST), Plainware, and Laminated ware.

CST pottery assemblages are most common in early Micronesian archaeological contexts; these are the oldest cultural material observed on Yap to date. This pottery is constructed with clay mixed with calcareous sand temper using reef shells, coral, and foraminifera that is then shaped out of coils or slabs (Descantes 2005:40). There is no distinct end date for the use of this pottery type, and the lifespan of this technology is believed to have persisted for nearly 1,400 years (Descantes 2005:40). Plainware assemblages are constructed without calcareous sand temper or other lamination methods and exhibit a wide vessel range. Plainware assemblages include two sub-types: Iron Oxide Tempered pottery and Quartz Tempered pottery. Iron Oxide Tempered pottery is often speckled with red hematite grains, which are naturally occurring inclusions from eroded latosol parent material (Intoh 1988:95). Quartz Tempered pottery contains quartz and feldspar inclusions; this tempering method was assumed to be intentional given the angularity of inclusions but could also be naturally occurring inclusions from other weathered residual clays. CST and Plainware pottery assemblages are assumed to be contemporaneous, with a decline in use occurring approximately 600 years ago when Laminated ware pottery assemblages become more prominent in the archaeological record (Intoh 1988:132).

Laminated ware is the youngest and most common pottery type found on Yap, often observable on the surface of sites and in village areas. Laminated ware pottery is characterized by extremely hard walls, no temper, clear laminations visible in wall sections, and a uniform incurved bowl ideal for cooking (Intoh and Leach 1985:98). While these pieces were not intentionally tempered, naturally occurring rounded feldspar and metavolcanic detritus inclusions are observed in the pottery sherds; this combined with more controlled and advanced techniques from years of production, created durable and highly valued vessels. Intoh (1988:134) suggested Laminated ware pottery was an advanced adaptation that "closely correlated with the disadvantage of the technology involved in CST pottery" production. The integrity of Laminated ware pottery quickly made it the dominant pottery type, with the production and use of this pottery technology continuing until World War II (Descantes 2005:41).

Other archaeological material present in Yapese assemblages include shell tools, stone stools, foreign artifacts, as well as unlaminated pottery identified as Spoehr's Marianas Plainware from Saipan and Tinian in the Northern Marianas Archipelago (Descantes 2005:40). Gifford and Gifford (1959) identified several different shell tools, including fishhooks, taro peelers made from *Cassis* sp., knives made from *Conus* sp., and *Fasciolaria filamenosus* shells and trumpets. Adzes were made from multiple species, primarily *Tridacna* sp., *Hippopus* sp., and *Terebra* sp. Shell species diversity and size range suggest that different species and sizes were used for different tasks. *Cyprea* sp. shells were often used as tools for shaping the inside of pottery vessels and for smoothing the outer surface of a vessel (Descantes 2005:40). Adornments (bracelets, necklaces, and rings) were also crafted from a variety of shell species, including *Rochi nilotica, Spondylus* sp., and *Pinctada sp.* (pearl shell), which were also used as forms of money in other areas of Micronesia.

Prior to European contact, the Indigenous population of Yap is estimated at approximately 26,000 (Hunter-Anderson 1983). Population numbers would drop considerably following European contact, which introduced foreign diseases on an otherwise unprotected population.

2.3.2 Historic Period

The Historic Period is characterized by increasing influence from colonial powers during four waves: Spanish, German, Japanese, and American administrations (Throop 2010:19).

2.3.2.1 Early European Encounters (1525–1885 AD)

The earliest recorded interaction between Yap and Europe occurred in 1525 when the Spanish ship *Florida* stopped to trade with the local population (Hezel and del Valle 1972). Most early interactions between the Spanish and Yapese focused on trade and exchange (Descantes 2005). These interactions were short and sporadic, often resulting in hostility and violence between Europeans and Carolinians.

Missionary endeavors began in the region in the 17th century as Spanish Jesuit missionaries stopped along the island chain during voyages to Island Southeast Asia (Descantes 2005). These missions are some of the first recorded accounts of Carolinian sailing practices throughout the archipelago. A report from Friar Paul Klein mentions great navigational achievements of a Carolinian fleet that landed on Samar in the Philippines while attempting to return from Fais Island. Friar Klein also contributed maps of the region (Figure 6).

According to Hezel and del Valle (1972:29), there were "no fewer than nine different Carolinian landings in the Philippines between 1664-1696" representing only a portion of the actual excursions over the course of several decades. While no formal exchange system was documented between the Philippines and the Caroline Islands, these accounts support outside interactions between the Western Pacific and the rest of the world. The first European account of a possible *sawei*-type voyage comes from Friar Cantova, who mentions a fleet of 35 Carolinian canoes travelling from Ulithi to Woleai, which was struck by a storm in 1725 while attempting to return to Yap (Carrasco 1881).

An English trading captain Andrew Cheyne attempted to establish a *namako* (sea slug) operation in the Tamil Municipality in 1843 (Hezel 1983:182); the arrival of Captain Cheyne resulted in one of the earliest recorded influenza epidemics in the region, which resulted in a significant decline in the Yapese population. This downward trend continued well into the mid-1900s.

More frequent visits from European traders during the late 1800s caused further unrest and feuds between competing municipalities in Yap, particularly between Gagil and Rull. During the mid-1860s, Gagil held a monopoly on outer island prestige goods as well as foreign European goods. Rull, attempting to shift the power dynamics between the two regions, opened trade and strengthened interactions with European explorers. The arrival of Irish American trader David Dean O'Keefe to Yap around 1871 continued to strengthen Rull's influence. O'Keefe further strengthened the municipality by establishing the largest copra trading post in the entirety of Micronesia (Hezel 1983:266). Unlike previous foreign traders, O'Keefe supported Yapese traditions, especially the Yapese desire for interactions with Palau and the production of stone money (*rai*).

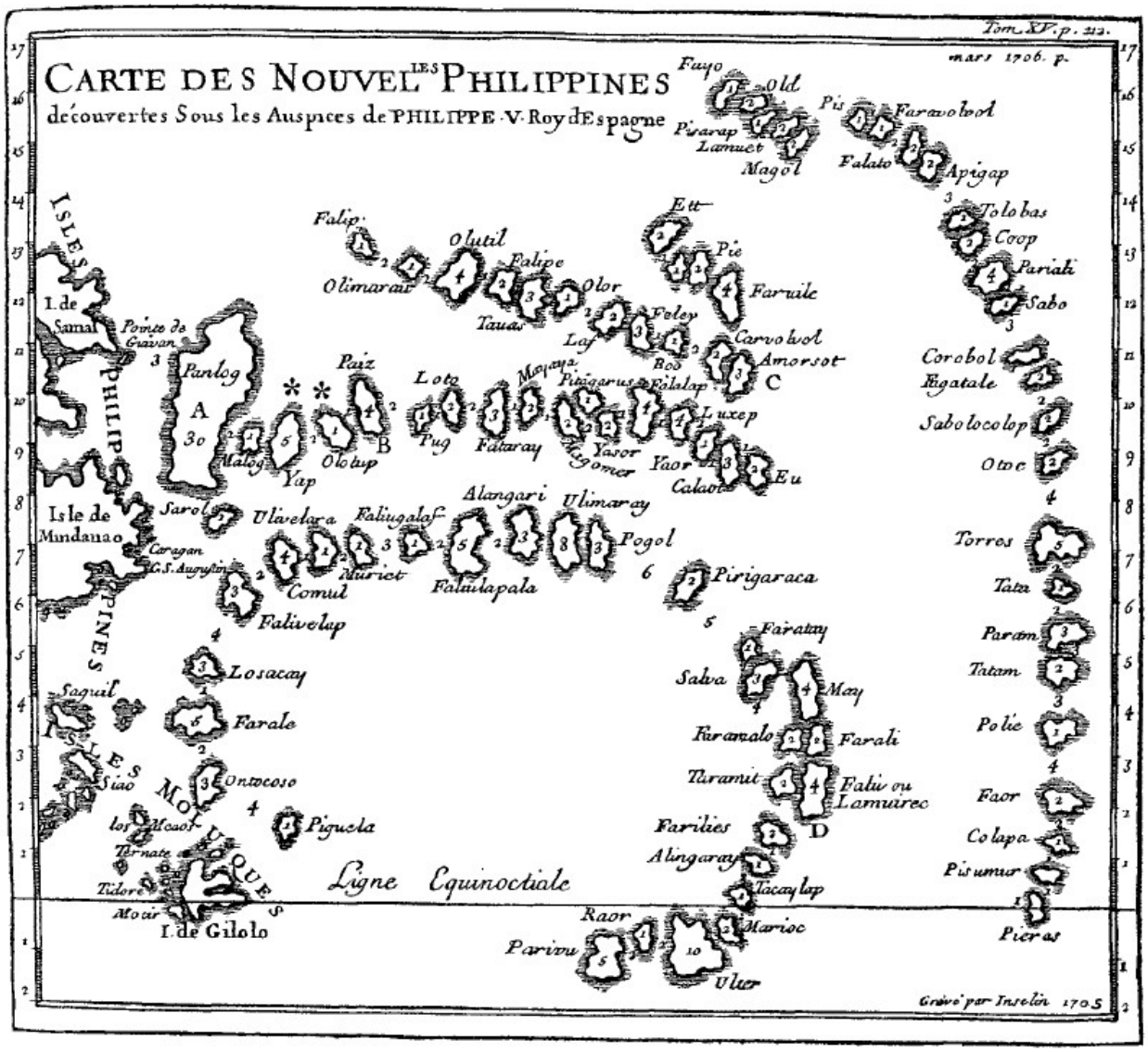


Figure 6. Early missionary map of the Western Pacific, showing Yap and Ulithi (marked by asterisks) (from Descantes 2005:31).

2.3.2.2 Spanish and German Colonial Period (1885–1919 AD)

Although the Spanish were present in the Caroline Islands for centuries, Spain had not formally colonized the Western Carolines and did not claim Yap until 1874. With competing Spanish and German trading interests, Spain sent two warships to Yap in 1885 to assert its territorial claims (Jeffery and Pitmag 2010:6). Spain's interest in the Caroline Islands, however, remained largely passive, with no interest to further develop the area aside from the desire to convert the Indigenous population to Christianity (Christmann et al. 1991:175). Foreign interest in the islands continued in the pursuit and trade of copra and the use of the island as a coaling station.

Germany purchased Yap from Spain in 1899 after the Spanish-American War, with the intention of building up the local economy by limiting inter-village wars and improving local infrastructure. Ethnographers and anthropologists began to visit Yap during the German Period, which provided many of the first secular accounts of events in the Western Carolines (Descantes 2005:35). The German administration opened the

island's first hospital and established municipal medical stations and a communication station (van der Brug 1983). The German administration also built the first dam on Yap, an 8-foot high by 100-feet long earthen dam built over Tamaney Stream (van der Brug 1983:38). The German administration divided Yap into ten municipal areas: Gagil, Tamil, Rull, Rumung, Maap, Fanif, Weloy, Kanifaey, Gilmaen and Dalipeebinaew, which were ruled by ten municipal chiefs, who became the Council of Pilung (Jeffery and Pitmag 2010:6). German colonization of Yap lasted only 20 years before it was acquired by Japan.

2.3.2.3 Japanese Colonial Period (1919–1941 AD)

Japan was gifted Germany's oceanic colonies as compensation for participation in the 1919 Treaty of Versailles (Peattie 1988:43). United States policymakers and military officials disapproved of Japan's control over Yap due to its uncomfortable proximity to the Philippines, ability to anchor military vessels, and extensive undersea cable network. Japan later annexed the islands for inclusion in its expanding empire following the country's exit from the League of Nations in 1935 (van der Brug 1983:3). Tensions between the United States and Japan increased leading up to World War II, as Japan solidified a strong military presence in the Pacific.

When Japan annexed Yap, 392 Japanese were on the island (van der Brug 1983:3). This number grew as Japanese administrators and troops arrived to manage Yap's population and its resources. According to Jeffery and Pitmag (2010:6), the Japanese administration "changed Yapese social and cultural practices to suit their own endeavours [sic] and amongst other things, they burnt canoes to stop Yapese using them, destroyed the *faluw* (men's meeting house), and removed a large number of stones found on the many *aech* for their own needs (Lukan, James 2008 pers. comm.)."

Japanese development on Yap was more minimal than other Micronesian islands. Still, the Japanese government invested in whatever resources it could get from the small island group. Mining operations sought to exploit Yap for its mineral ores, especially as war plans intensified, which necessitated metals for military equipment. The Engineer Division, Commerce and Industry Section of the South Sea Islands Government began looking for minerals on Yap in 1937, beginning with nickeliferous iron ore deposits (Johnson et al. 1960:86). Later in 1937, the Japanese government ordered the Mitsui Mining Company to begin searching for bauxite, the ore from which aluminum is made, which is formed in tropical laterite soils from intense chemical weathering (Johnson et al. 1960:86). Prospect mining occurred in the general proximity of the current project area; a military geology study from 1960 attests to bauxite mineral deposits south of the current airport (Figure 7) (Johnson et al. 1960:94). The mining company mapped deposits and collected samples but found that the bauxite on Yap was only present in small amounts, which were also high in silica, so nothing more was pursued (Johnson et al. 1960:86,94). The Japanese government continued other mining operations in Yap until 1943 when work was ceased due to increased conflict and disruptions in shipping (Johnson et al. 1960:86).

2.3.2.4 World War II Period (1941–1945 AD)

Yap was used as a non-primary Japanese air base during the World War II Period. Japanese forces were never stationed there in large numbers, and the United States never officially invaded the island group; however, the United States did perform air raids against the Japanese airbase on Yap in the summer of 1944.

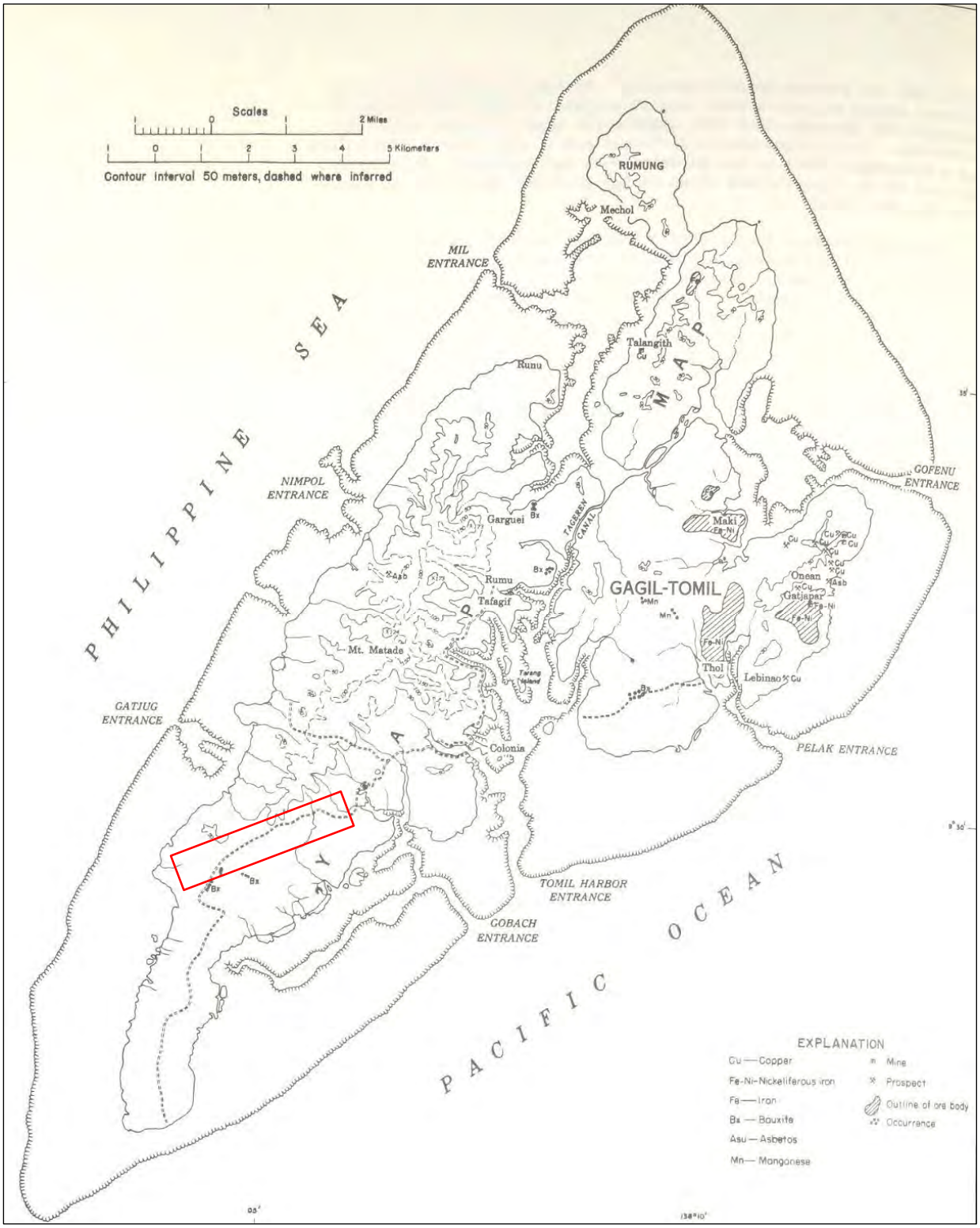


Figure 7. Mapped mineral deposits and Japanese mines on Yap (from Johnson et al. 1960:88). Red box indicates approximate extent of main project area.

The only substantial Japanese military buildup on Yap during World War II appears to be the construction of an airfield in Lamer, south of the current Yap International Airport (Figure 8 and Figure 9). The airfield consisted of a single, 1,417-meter long by 61-meter wide landing strip, with taxiways, hardstands, and revetments (Johnson et al. 1960:20). U.S. military sorties of the island in early April 1944 reported the airfield was still unfinished but nearly complete (Dunn 2006:1). According to Johnson et al. (1960:21), the runway and taxiway were surfaced with 30 centimeters of iron oxide coated gravel and coralline limestone dredged from the reef on the east side of Yap Island, but the taxiways and other features were never completely graded.

By May 1944, Admiral Michio Sumikawa, Japanese commander of the 22nd Air Flotilla at Chuuk, issued orders for the 2nd Attack Force and other air groups to be stationed on Yap, while ground troops were to remain on Chuuk (Dunn 2006:1–2). U.S. military sorties later reported 24 Japanese fighter aircraft, six dive bombers, two medium bombers, and six night fighters on Yap (Dunn 2006:3). By June 11, 1944, U.S. carrier bombardment of the Mariana Islands had commenced; Japanese air groups stationed on Yap launched counter strikes, with many Japanese fighters damaged by U.S. fire (Dunn 2006:3).

U.S. bombardment of Yap commenced a few days after the naval and air bombardments of the Marianas. To counter the raids, Japanese forces sent additional fighter aircraft to Yap around mid-June 1944, as Yap became a key target of B-52s from the 5th and 13th U.S. Air Forces (Dunn 2006:5). According to Dunn (2006:7), ground defenses on Yap included several 12.7-centimeter and 8-centimeter guns manned by the Japanese Navy guard and four 75-millimeter guns manned by Japanese Army units.

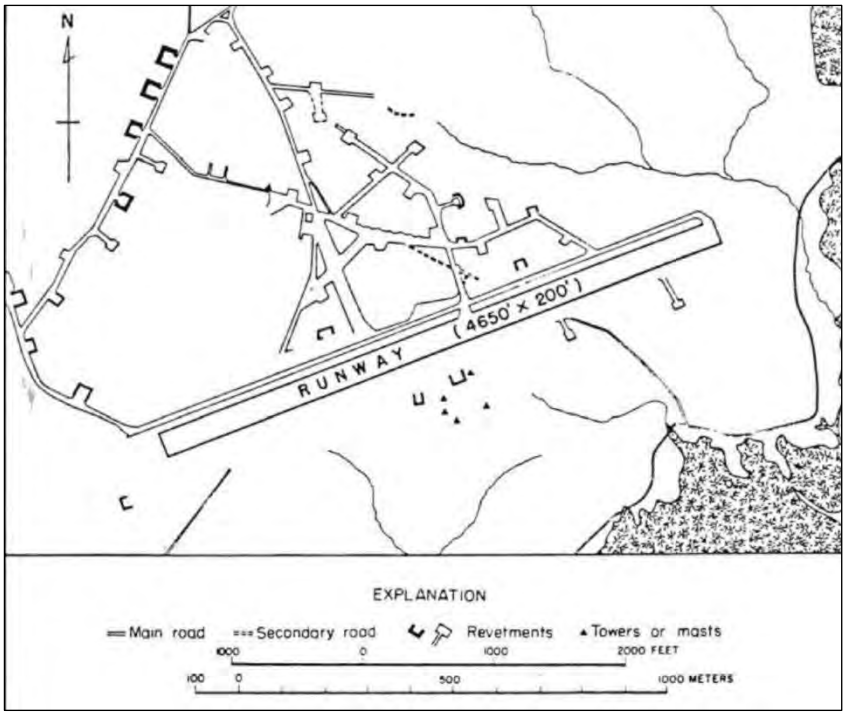


Figure 8. Schematic rendering of the World War II Japanese runway on Yap Island (from Johnson et al. 1960:22). Project area is to the north.

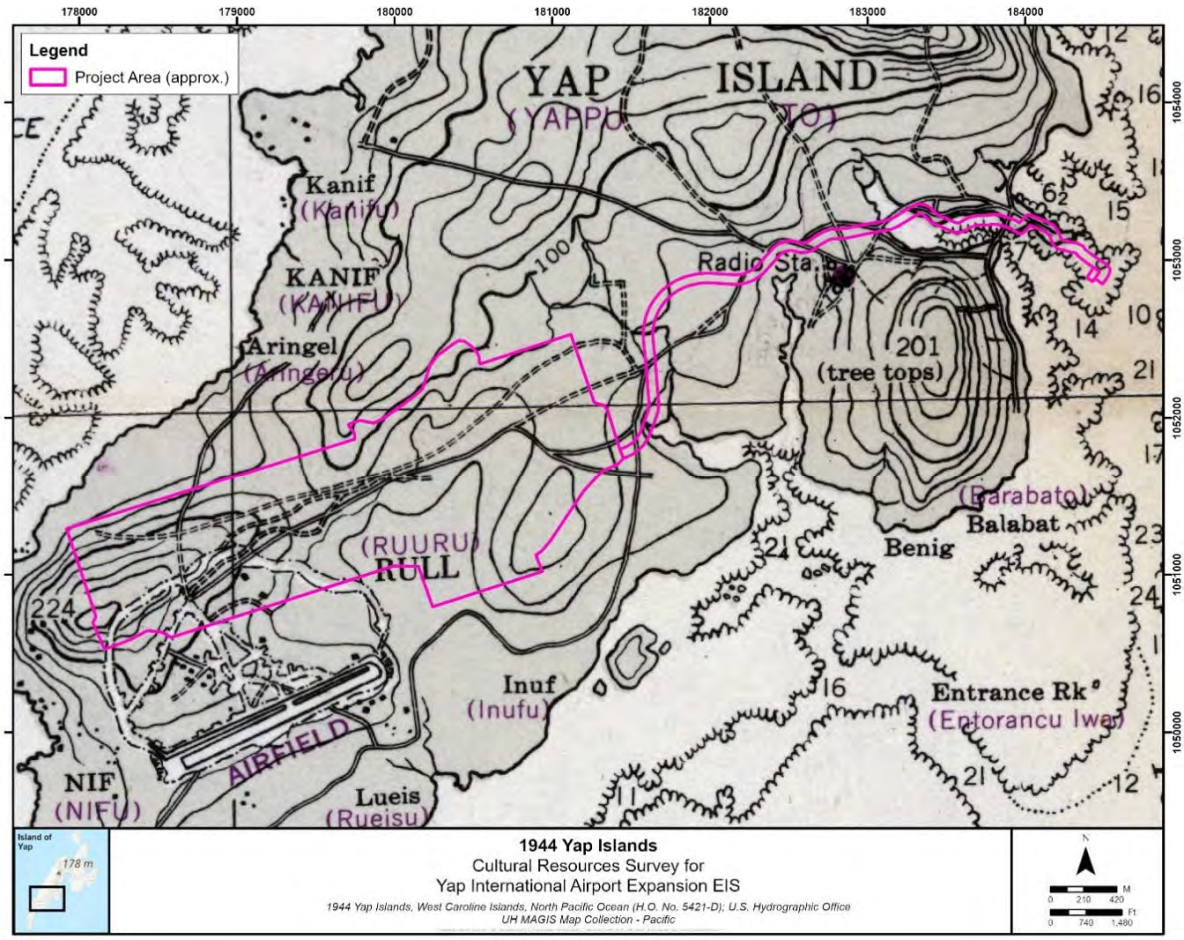


Figure 9. Portion of 1944 U.S. Hydrographic Office map of Yap Island showing surfaced and unsurfaced roads through the project area and the Japanese airfield to the south (from Government Maps and Documents Collection, University of Hawai'i).

After initially targeting Japanese warships and cargo vessels, U.S. air raids began targeting the airfield, with bombardments continuing intermittently over the next several months. In mid-July 1944, Japanese Lieutenant Naoshi Kanno, who had only received pilot's wings in September 1943, took over air defense of Yap; few experienced Japanese pilots remained on the island by this time (Dunn 2006:13). According to Dunn (2006:13), "most of Kanno's pilots…had only graduated from an abbreviated pilot training course at the end of 1943 and had been sent to the Central Pacific with sketchy operational training in March 1944." Despite the inexperience, U.S. air forces were met with intermittently fierce attacks by Japanese fighters stationed on Yap.

Nonetheless, by late summer 1944, the United States had greatly limited Japan's ability to resupply troops on Yap, especially after dropping 23 tons of bombs on Yap's airfield on July 21, 1944 (Dunn 2006:15). Japanese troops were forced to take shelter in bunkers and trenches built into the hillsides, and Kanno and his air group were withdrawn from Yap to join its parent unit in the Philippines (Dunn 2006:17). When U.S. carrier planes conducted air raids of Yap in September and October 1944, they found most land targets destroyed and no aerial opposition (Dunn 2006:17). The United States had planned a land invasion of Yap, but plans were changed, and it never occurred; instead, intermittent air strikes occurred throughout the remainder of the war with no further major air battles over the island (Dunn 2006:17).

In September 1944, the U.S. military seized control of Ulithi Atoll, which had served as a base and advancement outpost for the U.S. invasion of Okinawa and the Philippines (Lessa 1968:353). Japan surrendered Yap to the United States in September 1945, one month after the atomic bomb was dropped on Hiroshima.

2.3.2.5 Post-World War II Period (1945–1986 AD)

After World War II, the Trust Territory of the Pacific Islands (TTPI) replaced the United Nations strategic-area trusteeship, which consisted of over 2,000 islands scattered throughout the Western Pacific (Britannica 1998). In 1951, the United Nations granted control over the Yap District and Yap's Outlying Islands to the United States (Britannica 1998). The United States invested in education and healthcare during this time, making English one of the national languages of the state. The United States became the major colonial power in the region, making large financial and educational investments. The Yap District gained statehood with the FSM in 1979.

The World War II-era Japanese airfield had been severely damaged during U.S. air raids. According to Johnson et al. (1960:21), "most of the surfacing had been blasted away by bombs or, by 1948, had been washed away by rains," and that the airfield was "so densely pitted with bomb craters, and surfacing materials are so difficult to procure that it has bever been considered economically feasible to rehabilitate…" (Figure 10). Instead of rehabilitating the Japanese airfield, U.S. federal funding was expended in the 1970s to assess two locations for a new airport, with Kirch (1978) conducting the associated archaeological reconnaissance survey.

The current airport location was chosen, and Naval Facilities Engineering Command, Pacific Division contracted Lyon Associates, Inc. for the design of the new airport (Figure 11). The clearing plan for the project, shown in Figure 11, proposes a borrow pit northwest of the runway. The design plans also note a significant archaeological site recorded by Kirch (1978), Orothin's Tomb, which was to be completely fenced and not disturbed during airport construction. The new Yap International Airport was completed in the 1980s (Figure 12) and continues in service today.

Figure 10. Aerial view of bombed Japanese airfield on Yap with extensive impact craters, 1944 (from http://www.missingaircrew.com/images/micr/index1.asp).

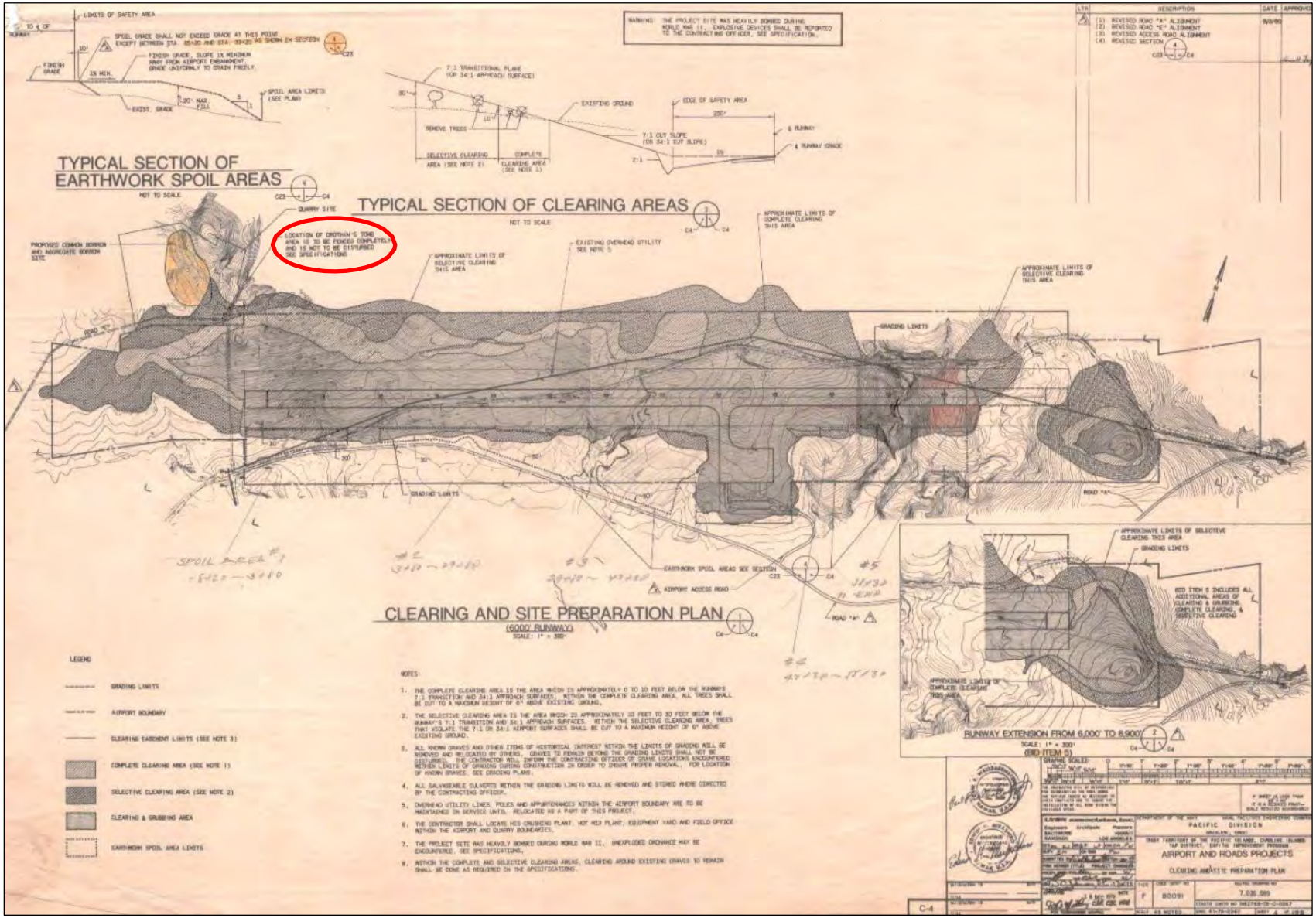


Figure 11. U.S. Navy clearing and site preparation plan for new airport (provided by DAF). See red circle for note on Chief Orothin's tomb.

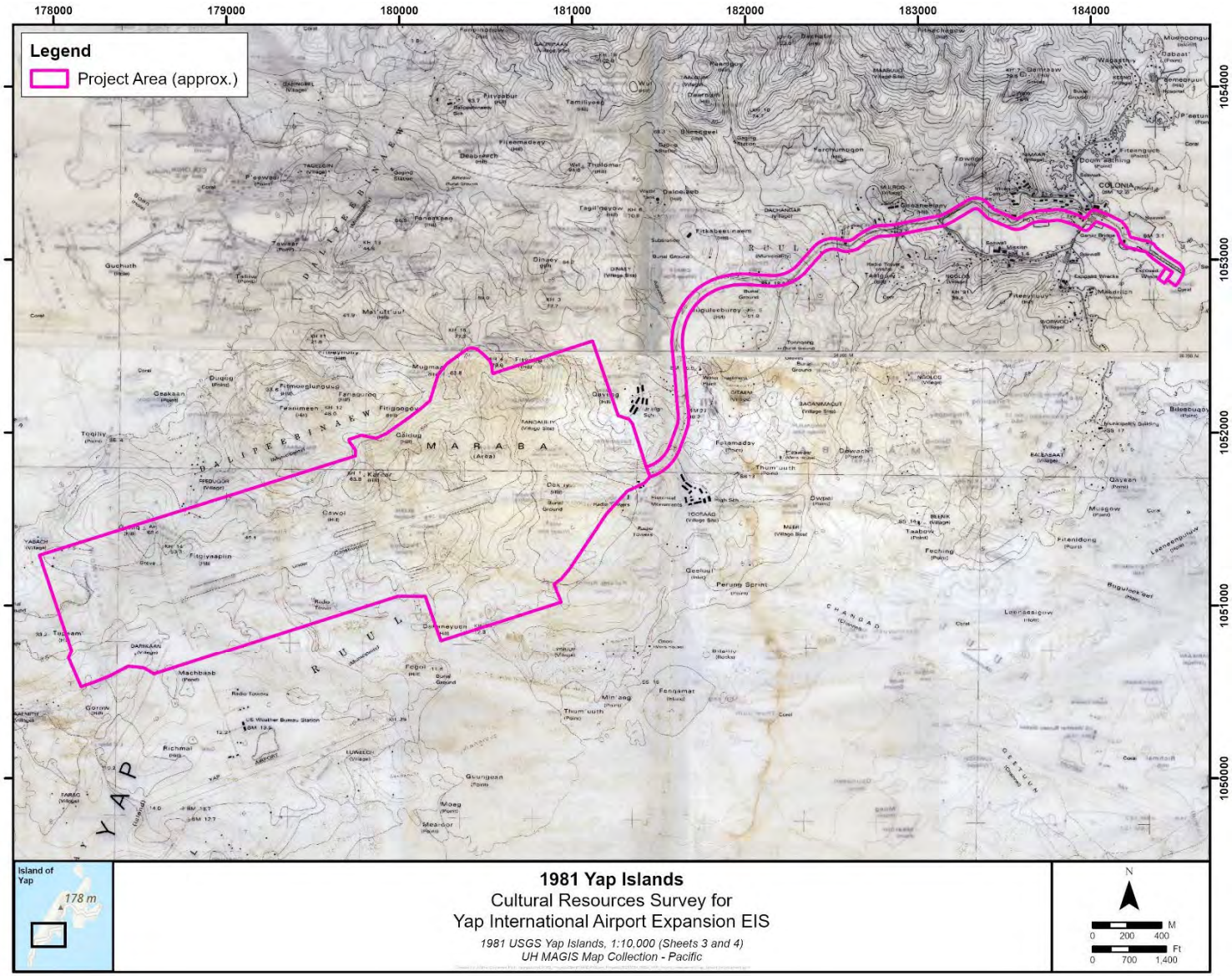


Figure 12. Portion of 1981 USGS quadrangle map of Yap Island showing new airport under construction (from Government Maps and Documents Collection, University of Hawai‘i).

2.3.2.6 Modern Period (1986 AD–Present)

In 1986, the FSM entered a Compact of Free Association with the United States, which provided citizens with financial and social resources, disaster relief, and other limited citizenship benefits, such as the ability to travel within the United States and serve in the U.S. military (Congressional Research Services 2023). In 2003, the FSM renewed its compact with the United States for 20 years, followed by another 20-year renewal in October 2023 (Congressional Research Services 2023).

Development within the current project area during this period has been limited to airport maintenance and management as well as low-density village settlement in and around the airport property.

2.4 PREVIOUS ARCHAEOLOGICAL RESEARCH

Archaeological studies in the vicinity of the project area are limited, and only one study (Kirch 1978) included a project map that can be directly tied to the current project area (Table 1; Figure 13). A second study was conducted by Gifford and Gifford (1959) within the general vicinity of the current project area; however, exact locations are unknown.

E.W. and D.S. Gifford, from the Museum of Anthropology at the University of California Berkeley, conducted one of the first archaeological investigations in Yap Proper (Gifford and Gifford 1959) (Table 1). The excavation project commenced in five of the ten municipalities on Yap Proper, of which three municipalities are within the current project area: Ruuway in Rull, Penin in Kanif Village in Dalipebinaw, and Boldanig in Kanifay. Gifford and Gifford (1959) recorded middens, pottery scatters, multiple cookhouses, sacred houses, shrine areas, dancing areas, stone-paved pathways, and various house or meeting platforms. They also collected a plethora of cultural artifacts ranging from zoological specimens, shell tools and adornments, and lithic artifacts and tools. Unfortunately, a map of the excavation locations is not included in the original report, making it difficult to ascertain exactly where each of these sites are located. Since the exact locations are unknown, Gifford and Gifford (1959) and their findings are not included on Figure 13.

*Table 1. Summary of Previous Archaeological Studies within Project Area**

Reference	Study Type	Location	Archaeological Findings
Gifford and Gifford 1959	Excavation	Tamil, Rull, Dalipebinaw, Kanifay, and Galiman	Chiefs' dwellings, cooking houses, stone platforms, dancing depressions, middens, spiritual mounds, shrines, cairn offering areas.
Kirch 1978	Survey	Rull, Yap Airport	Historic cemetery, house platforms, pottery scatters, Traditional burial sites, stone platforms, men's house, midden, World War II remnants.
Pacific Studies Institute	Survey	Rull, Yap Airport	Traditional burial sites, World War II remnants, agricultural ditches
Gordon, Claire C.	Survey, excavation	Rull, Yap Airport	Mortuary sites

**Five other archaeological studies have been conducted in the project vicinity, but reports for these studies have not been located and are therefore not summarized in this report: Cordy (1979); Cordy and Kugfas (1980); King (1978); Pickering et al. (1980); Price et al. (1978).*

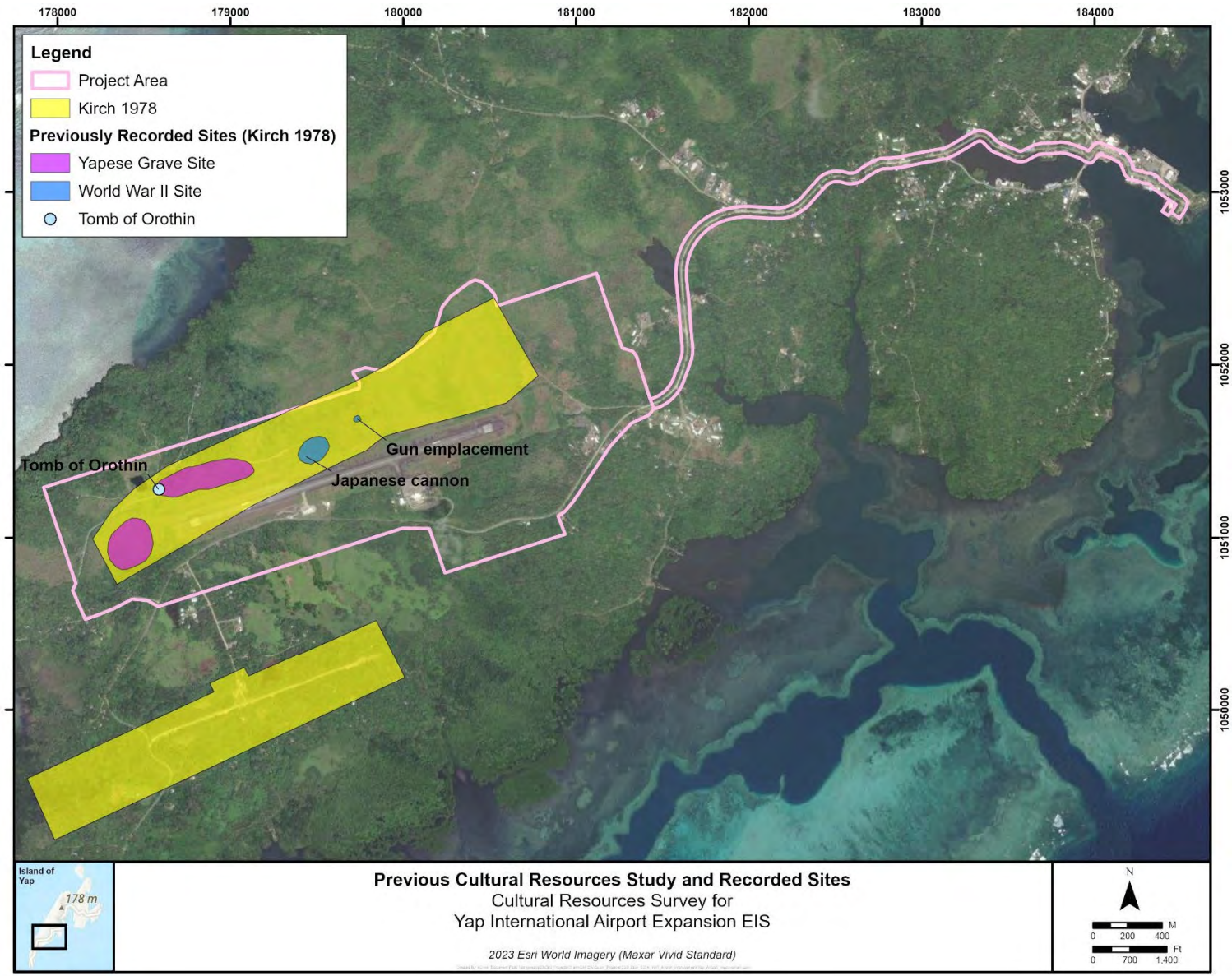


Figure 13. Previously conducted archaeological study and recorded sites in project area.

Kirch (1978) conducted an extensive 640-acre archeological survey within the central hills in Yap, including in and around the current project area (Figure 13; Table 1). Kirch (1978:6) surveyed two separate areas proposed for the new Yap International Airport: "Site C, Air Force Site Alignment," located within the project area in Rull and Dalipebinaw municipalities, and "Alignment A-4, Alternate 1" located to the southwest of Site C. Site C was chosen as the location to construct the airport. Within Site C, Kirch (1978:9) recorded Traditional Yapese cultural sites, including agricultural mounds, irrigation ditches, pyramidal graves as well as World War II era military sites, including four large anti-aircraft cannons and a small gun emplacement for an anti-aircraft gun. Kirch (1978) observed at least 150 clustered pyramidal graves along the west end of the Site C project area, although he posited more may be present within the dense vegetation. No site numbers were designated, and specific feature locations are unclear. The clustered graves included three pyramidal tombs for Chief Orothin in Dalipebinaw Municipality (Figure 14) and Chief Yaloth of Lamer (no information was provided for the owner of the third tomb). According to Kirch (1978:9), Chief Figrag of Lamer informed him the tombs were constructed in the late-19th century and were at least 80 years old. Kirch (1978:9) describes both tombs as earthen mounds with carved steps faced with cobbles and capped with a concrete crypt.

Although Kirch's (1978) survey of the second project location at Alignment A-4 is outside the current project area (approximately 0.25 miles south), results from this area indicate a preponderance for different Traditional site types. Compared to mortuary zones, Kirch (1978:10) recorded domestic areas comprising house platforms, meeting platforms, men's houses, stone paths, and several pottery scatters and midden areas. The most notable feature in this area is the house platform of Gildbung, who was an important figure in Fara Village history and Yapese traditions, as he is credited as the creator of the *pawpaw* canoe. Several historical to modern cemeteries were also present within the Kirch (1978) southern survey area.

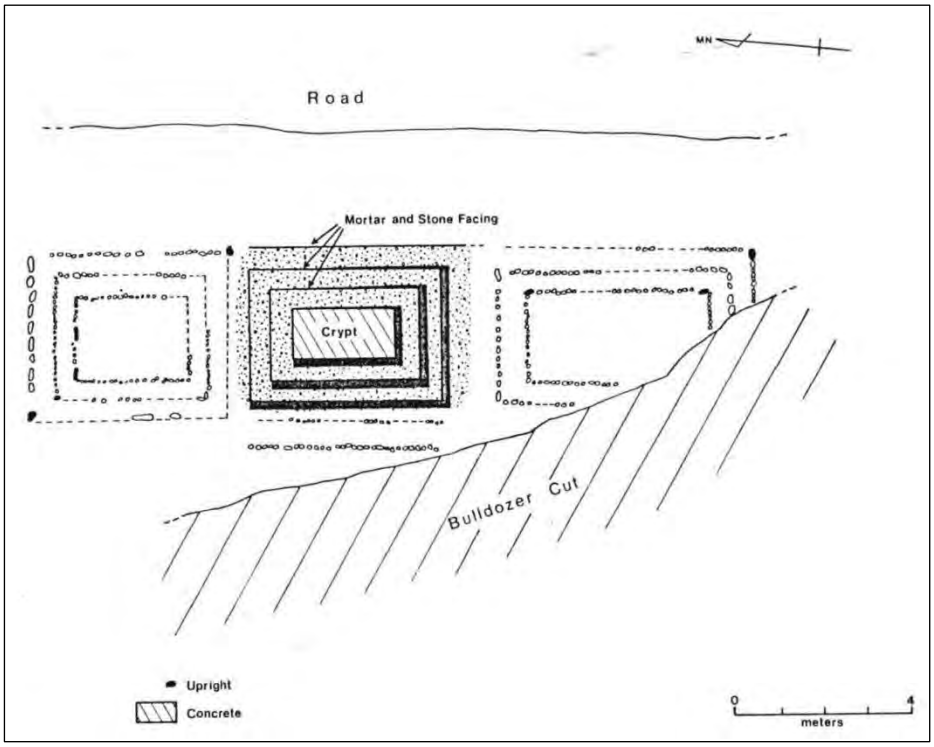


Figure 14. Kirch's (1978:29) planview of Orothin's tomb.

Pacific Studies Institute (PSI) (1979) conducted an archaeological survey of 330 acres on the ridgeline just northwest of the original Yap Airport. The PSI team coordinated with Mr. Luke Moon of the Yap Preservation Committee and arranged for YACC volunteers to work side by side with the survey team across the project area. The surveyed area consisted of a schist and clay ridgeline, gentle rolling hills which were interrupted by numerous ditches and gullies (PSI 1979:1). Within the entirety of the project area, the PSI team identified a total of 346 graves, which consisted of raised bed features, single tier faced burials, and multi-tiered faced burials (PSI 1979:4). Many of the tiered stone burials identified consisted of earthen built structures with little to no stonework, some features with brown cobbles and pebbles, some with larger stones on the periphery lining the burial features, several upright stones identified on the top tiers of single and multi-tiered burials, and some feature with observable soil depressions in the center. Specific measurements for each of the burials identified were recorded in a table provided by PSI (1979:5). A map was noted to be included with the final submission to HPO but was not included in the version available.

Claire C. Gordon of Pacific Studies Institute (PSI) conducted an additional survey of the Yap Airport alignment 6-6000'which identified approximately 91 mortuary sites for a total for a total of 1157 graves (Gordon 1980). Gordon noted that "83% of the burial features observed were in organized small cemeteries (>20 graves) as opposed to small grave clusters (<20 graves) and isolated grave features (Gordon 1980:1). Over half of all observed grave features were low rubble features, which were difficult to identify due to intense vegetation coverage. The general distribution of feature types observed in this survey were: complex graves (tiered graves and tombs with organized cemeteries as opposed to small grave clusters and isolated grave sites), organized cemeteries and prominent geographic features (such as hilltops and ridge tops), and complex graves that possibly represent multiple communities (Gordon 1980:2). Gordon surveyed and mapped 5 of the largest cemeteries in the project area and made the following observations: 1) individual graves vary in orientation with burials on flat areas typically being oriented East-West and graves located on agricultural terraces running parallel to the terrace itself, 2) complex graves are often spatially separated from simple graves while other sites lack organization based on grave type, 3) the ratio of complex to simple graves varies widely between sites, and 4) upright stones are more frequently associated with tiered graves than non-tiered graves (1980:2).

Gordon conducted subsurface testing at three different mortuary sites: 46SE:1, 46SW:21, and 45SW:1. Site 46SE:1 had a total of 134 recorded grave sites, 36 of which were excavated and 8 of which has human skeletal remains (HSR) recovered. The HSR that were recovered consisted of 20 whole tooth crows, tooth fragments, and smaller bone fragments (1980:3). Excavated burial sites at 46SE:1 were constructed in a 3-part fashion, starting with a subsurface burial pit, a schist capstone atop of the burial pit, and some type of surface feature. Site 46SW:21 was selected for subsurface testing because it was scheduled for destruction to do its location in the direct area of impact, a presence of features that were not observed in other areas of the survey, and because it appeared to be older than other surrounding sites. The features excavated included piled cobble graves, low-rubble graves identified as earthen depressions (no visible surface stones), and low-rubble tombs identified as earthen depressions (no visible surface stones). Excavations revealed minimal HSR with only the presence of fragmentary tooth crowns, a lack of capstone covers on the burial features that were primarily earthen depressions with minimal stone surface features, and that piles graves often possessed a capstone element (Gordon 1980:3). Site 45SW:1 was the final mortuary site excavated by Gordon. This site was selected for subsurface testing at the request of several family members as there were more "recent" known burials in the area and because of its close proximity to the airport runway. A total of three features were excavated from this site, all of which exhibited the 3-part grave construction technique also observed at Site 46SE:1 (1980:4). HSR was observed in 2 of the 3 excavated

features: one grave yielded sizable bone fragments and complete teeth, while the other contained the remains of at least 3 individuals, suggesting that the grave feature was possibly reused. Based on the presented information and supplemental ethnographic data presented by Pickering suggested that no other recent burials were likely to be disturbed by future airport constriction (Gordon 1980:4). Soil studies of the area and the results presented by Gordon concluded that “preservation of human skeletal remains is so poor in the project area, that further excavations were not warranted” (1980:3). Gordon notes that the human skeletal remains identified from sites 46SE:1 and 46SW:21 were presented to Governor John Mangefel on May 5, 1980; remains from site 45SW:1 were presented to the direct relatives on April 29, 1980.

A specific site map for the area surveyed was submitted to the Yap Heritage Preservation Office (HPO) but was unavailable in the accessible version of the report; exact locations of recorded mortuary sites can be found at Yap HPO.

3 METHODS

The following subsections detail the methodology and protocols employed during the cultural resources survey, including procedures for documenting previously recorded and newly identified archaeological sites/features and the inadvertent discovery of burials or skeletal remains.

3.1 BACKGROUND RESEARCH

Background research was conducted prior to entering the field to better understand the project area in terms of its environmental context, land use history, and previous archaeological context. Environmental research included reviewing the geological, pedological, and overall environmental context of the project area to understand natural factors that may contribute to archaeological site development as well as post-depositional processes that may impact resources.

Prior land use history considered Pre-Contact to recent historical developments in or near the project area and the physical elements it potentially left on the landscape as well as impacts it possibly had on preceding land use. Previous archaeological studies and their findings are crucial for the information they provide on known archaeological deposits in the area; this information helped generate expectations for encountering newly identified cultural resources during the current field investigations. Unfortunately, prior archaeological studies are rare on Yap, which limited the amount of background data available.

Research on land use history and previous archaeological studies was mostly compiled using KLF's in-house library. Much of this data was curated from publicly available monographs, cultural resources management literature, and the following repositories:

- Micronesian Area Research Center: secondary source material, map and photography collection.
- Government Maps and Documents Collection, University of Hawai‘i: historical aerial photography and maps collection.
- Digital Atlas of Micronesia-Island Research & Education Initiative; Water and Environmental Research Institute of the Western Pacific; and FSM Department of Environment, Climate Change and Emergency Management: geographic information system (GIS) data and map collections.

Since the archaeological context of Yap is still understudied, the research team relied on valuable resources provided by the Yap State Historic Preservation Office (HPO). Additionally, previously recorded cultural resource sites and burial areas in the project vicinity were identified and located using the Digital Atlas of Micronesia, a digital atlas repository sponsored in part by the FSM.

All research material was synthesized and compiled into Section 2.0 of the current document.

3.2 FIELD SURVEY METHODS

Archaeological fieldwork included intensive archaeological survey of the airport and surrounding buffer zone and a "windshield" survey of a modern road.

The 2025 AFIMSC Det 2 in-fill survey was conducted to address gaps in the original survey and to verify the locations of previously recorded features. Fieldwork occurred between July 29 and August 18, 2025, focusing on 389 acres within the original 919-acre project area. The in-fill survey employed linear transects, following the path of UXO technicians who cleared areas of concern prior to cultural resource inspection. This approach ensured comprehensive coverage of previously underrepresented areas. The primary focus

was to document and GPS-record traditional Yapese graves, modern graves, traditional Yapese structures, historic features, and World War II-era bomb craters.

3.2.1 Intensive Survey

The 826-acre main project area, which included the airport and surrounding buffer zone, was separated by the EIS team into eight survey zones and received intensive-level archaeological survey (see Figure 2). The intensive-level approach involved a team of field archaeologists walking parallel transects across the landscape, with transects spaced at a minimum of 10 meters apart, to gain systematic coverage of the survey area and to locate and record any surface archaeological resources. The ground surface was inspected, where visible, for the presence of potential archaeological resources in the form of structural remains, artifacts, sediment stains, and other cultural deposits. If archaeological resources were encountered, GPS data was recorded for the identified resource. Due to the high presence of Traditional Yapese archaeological features identified, only 10 percent of the Traditional Yapese features were recorded in full. Full recordation in the field included a site description, preliminary boundary delineation, environmental context, photography, global positioning system (GPS) recording utilizing a sub-meter handheld Trimble GPS unit, and collecting notes on potential function, temporal association, and cultural affiliation, where possible to ascertain from surface evidence. Select archaeological sites were mapped with tape and compass to produce hand-drawn maps that were digitized for inclusion in this survey report.

3.2.2 Windshield Survey

A windshield survey was conducted for the 93-acre road portion of the project area, which extends from the main body of the project area to the port of Yap to the east. The windshield survey comprised a reconnaissance approach where the field team drove along the road and stopped every 50 to 100 meters, exited the vehicle, and visually inspected the sides of the road for any evidence of cultural resources.

3.3 RECORDATION METHODS

Standards of archaeological survey documentation, recording, and analysis of identified archaeological resources were conducted in accordance with the Secretary of the Interior's *Standards and Guidelines for Archaeological Documentation* (Federal Register 48 [190]:44734–44737; September 29, 1983). Specific recording parameters are described below.

Both the Kleinfelder (KLF) and AFIMSC Det 2 surveys adhered to these standards, with careful attention to documentation, data quality, and consistency. However, AFIMSC Det 2 employed a more detailed classification system for graves based on the Gordon 1980 Yap Island Mortuary Project Preliminary Report, which classifies Yapese graves in more specific categories than the system used by KLF. This distinction in classification systems was made to provide a more nuanced understanding of Yapese mortuary practices, especially for multi-tiered graves, which are central to the region's cultural heritage. **Field Documentation**

The KLF survey used a more general classification for graves, including categories such as burial platform, burial mound, and burial. These categories were based on broad structural remains and observable features. While the classification system used by KLF was not as detailed as Gordon 1980, it provided sufficient data for documenting and understanding the general layout and features of Yapese graves across the surveyed area.

Field Documentation for AFIMSC Det 2 In-Fill Survey

For the AFIMSC Det 2 in-fill survey, the classification of graves followed the Gordon 1980 classification system, which includes the following types of graves:

- Low rubble graves

- Platform graves, which include:
    - One-tier
    - Two-tier
    - Three-tier
    - Four-tier
    - Five-tier
- Undetermined platform graves
- Tombs

This more detailed classification enabled a refined understanding of Yapese mortuary practices, specifically distinguishing between different grave types and their associated cultural significance. The AFIMSC Det 2 survey's classification provided a more comprehensive typology of platform graves, particularly multi-tier graves, than what was achieved in the original survey.

Both the KLF and AFIMSC Det 2 surveys recorded GPS data for each identified grave, ensuing accurate spatial positioning. The AFIMSC Det 2 survey, with its more detailed classification, enabled a refined understanding of the spatial distribution of different grave types within the surveyed data.

3.3.1 Site Recordation

Archaeological sites were designated based on the presence of structural remains, culturally affected sediments (e.g., midden, fire-affected sediment stains), and artifact scatters (containing more than 10 artifacts in a square meter area; anything less was designated an isolated occurrence). Newly encountered cultural resource sites identified during the surveys were assigned a temporary KLF site number, e.g., KLF-TSN-01 (TSN=temporary site number). Site numbers were numbered sequentially. Due to the amount of Traditional Yapese sites encountered, a 10 percent representative sample was recorded. All World War II and historical archaeological sites were recorded in full. For each recorded site, the field team documented its location and boundaries, critical characteristics, and other descriptive data. Where feasible from available evidence, the field team collected data necessary for determining age, nature, cultural affiliation, condition, and depositional history of encountered sites. Digital photographs were also taken of each site and included a scale, photo board, and a north arrow, when appropriate (e.g., a photo board is not always used in an overview/landscape photo). Site points and polygons were collected with a sub-meter accurate Trimble GPS receiver; GPS data was post-processed to ensure accuracy.

For the AFIMSC Det 2 in-fill survey, all findings were documented as points, with GPS coordinates recorded using high-precision GPS units. Unlike the KLF survey, no site polygons were created. Instead, the field team recorded the exact location of each identified feature using high-precision GPS points to ensure accurate spatial documentation. These points were added to the QGIS and later transferred to ArcGIS Pro for spatial analysis and integration with KLF's original dataset.

Following field recordation, all data from the in-fill survey were uploaded to AFIMSC Det 2's cloud-based GIS platform for quality control and storage.

3.3.2 Isolated Occurrences

Isolated (less than 10 artifacts in a square meter radius) cultural material encountered on the ground surface—or isolated objects (ISOs)—were GPS-recorded and documented in the field. Such material may include human-modified coral and/or lithic objects, historical artifacts, isolated concrete elements, and other non-site associated, isolated material. The material was assigned an ISO number, e.g., ISO-001, and minimally analyzed, recorded in the field, and left in place.

3.4 DENSITY ANALYSIS

Due to the high volume of Traditional Yapese features encountered and the impracticality of recording each feature during the time allotted for the survey, KLF conducted a kernel density analysis of recorded Traditional Yapese feature locations using Esri ArcGIS Pro software. The objective of the analysis was to develop preliminary boundaries for extensive site complexes comprising hundreds of individual features encountered during the survey. A kernel density analysis was used to calculate the density of features within an area; for this study, 700 features were included in the analysis for the 826-acre survey area within and around the airport (note, there are additional features on the landscape that were not recorded due to time restrictions). After running the analysis, the Natural Breaks (Jenks) classification method was used for classifying the calculated feature densities into seven data classes, based on natural groupings inherent in the data. The class breaks were created in a way that best groups similar calculated feature densities together and enhances the differences between classes. The results of the kernel density analysis were used, together with ethnographic information, to develop the five site complexes discussed in Section 4.1.

3.5 POST-FIELD REPORT PREPARATION

All aspects of the archaeological investigations were assessed, synthesized, and presented in this technical report in accordance with the Secretary of the Interior's *Standards and Guidelines for Archaeological Documentation, Reporting Results* (Federal Register 48 [190]:44736–44737; September 29, 1983). The report includes recommendations on significance, when possible, based on sufficient surface-visible evidence to evaluate cultural resources. All GIS data, including file geodatabases (Esri ArcGIS .gdb), will be provided as part of the final deliverables for this project.

3.6 Supplemental In-Fill Survey (2025)

Following completion of the initial cultural resources survey, the U.S. Air Force Installation and Mission Support Center (AFIMSC) Detachment 2 conducted a supplemental in-fill survey in 2025 to verify previously recorded features, document unrecorded areas, and address data gaps identified during review of the original dataset. The in-fill effort aligned with the field and documentation standards established in the initial investigation while incorporating additional safety and data-management protocols required under Department of the Air Force procedures.

3.6.1 Field Coordination and Safety Protocols

All in-fill survey work across the five designated zones was conducted in coordination with unexploded ordnance (UXO) technicians, who systematically cleared areas of concern prior to cultural resource inspection. The cultural resources (CR) team advanced only after the UXO technician confirmed that an area was safe for entry. This safety-first approach occasionally limited daily survey productivity but ensured full personnel protection while allowing systematic coverage of all accessible terrain within the defined Area of Potential Effects (APE).

3.6.2 Survey Methods and Data Collection

The in-fill survey focused on systematically GPS-recording all traditional and modern graves, traditional Yapese structures and features, historic-period features, artifacts, and bomb craters within the five designated zones. Pedestrian survey proceeded in linear transects, consistent with the intensive-level methodology established by the previous investigation. The CR team visually inspected exposed ground surfaces for cultural materials or structural remains, and each identified feature was documented with photography and descriptive field notes.

Spatial data were collected using a Garmin GPSMAP 67 unit configured to the World Geodetic System 1984 (WGS 84) datum, providing sub-meter positional accuracy. Each feature was assigned a unique identifier under the AFIMSC Det 2 numbering and classification schema, developed to ensure data integrity and compatibility with Air Force cultural resource databases. Observations on vegetation density, ground visibility, and disturbance were recorded in daily logs to provide context for data quality and potential visibility limitations.

3.6.3 Data Management and Mapping

At the end of each field day, GPS data and field notes were uploaded into a QGIS project database. Attribute tables were standardized, and feature symbology was coded by type (e.g., traditional grave, modern grave, traditional feature, historic feature, artifact, or bomb crater). Daily cumulative maps were generated to track survey coverage and progress. Every three to four days, updated progress maps were shared with the Joint Program Management Office (JPMO) for use in briefings to the Yap Utilities Modernization Office (YUMO) Task Force.

Upon completion of fieldwork, all spatial data were transferred to ArcGIS Pro for post-processing, quality assurance, and integration with the original KLF dataset. The consolidated GIS geodatabase now serves as the authoritative spatial record for ongoing cultural resource management, avoidance, and mitigation planning throughout the project area.

3.6.4 Analytical Consistency and Integration

The supplemental in-fill data were reviewed and standardized to ensure full compatibility with Department of the Air Force cultural resource data-management protocols. Because discrepancies were identified in the original contractor's site numbering and feature classification, the AFIMSC Det 2 team implemented an independent numbering and classification schema to maintain consistency and traceability within the Air Force's cultural resource framework.

The primary objective of the in-fill effort was to systematically document and GPS-record all traditional and modern graves, traditional Yapese features and structures, historic-period features, artifacts, and bomb craters. All symbology and attribute fields were standardized to align with USAF mapping conventions. Feature categories were assigned consistent color schemes and attribute codes to enhance interpretability across GIS platforms. The resulting dataset provides a uniform, authoritative spatial record that supports refined analysis of resource distribution, cultural landscape relationships, and management planning, as discussed in Section 4.0 (Results).

4 RESULTS

KLF performed archaeological survey of approximately 919 acres from January 8 to March 15, 2024. The intensive-level survey of the main project area commenced in Survey Zone 5 and continued throughout the survey zones per coordination with the natural resources survey that was conducted concurrently for the same EIS project. Survey transects were variously oriented across the survey area depending on topography and the shape of the area surveyed. The field team used roads and other landmarks for horizontal control of transects. While the center of the main project area is thoroughly developed with an active airstrip and associated airport facilities, the surrounding survey zones are largely undeveloped and sparsely populated with small outlying villages. The windshield survey along the road to the port passes through more developed areas, especially as it nears Colonia. Ground visibility ranged considerably throughout the survey area, from zero visibility in dense tropical forest to 100 percent visibility in recently machine-cleared areas and along primary roadways. Ground visibility averaged 20 percent in dense vegetation. Field conditions were often wet from frequent rains, which further obscured the ground surface from rain-drenched and matted vegetation.

Due to limited archaeological studies in the area, archaeological expectations prior to the survey were relatively unknown, although intermittent World War II sites and some Traditional grave sites were expected. While the 93-acre windshield survey along the road to the port did not encounter any cultural resources, the intensive coverage of approximately 826 acres within the main project area resulted in considerable findings of an extensively modified Traditional cultural landscape comprising Yap Island's inland Traditional mortuary zone. KLF designated five site complexes to capture the density of individual features encountered, as detailed in Section 4.1.

In addition to Traditional Yapese findings, Japanese Colonial Period and World War II Period sites were also encountered across the main body of the survey area. In total, 16 TSNs were designated for Japanese prospecting sites, defense positions, and artifact scatters. These are discussed in Section 4.2.

Thirty-eight (38) isolated occurrences were also plotted across the main survey area. These primarily consist of isolated (non-site related) artifacts from the World War II Period and are discussed in Section 4.3.

Following completion of the 2024 Kleinfelder survey, a supplemental in-fill cultural resources survey was conducted by the AFIMSC Det 2 in 2025 to address remaining data gaps and verify selected features within the original APE. The in-fill survey focused on GPS-recording traditional Yapese graves and structures, modern graves, historic-period features, artifacts, and bomb craters across five designated zones. This targeted effort provided comprehensive spatial documentation of mortuary and structural features that were only partially represented in the 2024 dataset.

All newly recorded features were assigned unique identifiers under the AFIMSC Det 2 classification system to ensure data integrity and alignment with Air Force cultural resource management standards. The in-fill team also standardized feature symbology and attribute fields to create a consistent color-coded GIS framework for both traditional and historic-period features. This harmonized dataset supports cross-comparison between the 2024 and 2025 surveys and refines the overall understanding of resource distribution, density, and condition within the airport's cultural landscape.

The in-fill survey confirmed the high density of Traditional Yapese mortuary and structural features within the inland cultural landscape and expanded the mapped extent of burial areas and associated features. Several historic-period features—including remnants of Japanese and World War II–era infrastructure—

were also identified and georeferenced. Collectively, the 2025 AFIMSC Det 2 results reinforce the interpretation of Yap International Airport as a multi-period cultural landscape encompassing Traditional, Japanese Colonial, and World War II components.

Table 2 and Figure 15 below present the findings from the 2024 Kleinfelder survey. The supplemental AFIMSC Det 2 results are discussed in Section 4.4 to maintain the distinction between the original contractor's dataset and the subsequent in-fill survey.

Table 2. Overview of Survey Results

Description	Count	Associated Number Designations
Traditional Yapese Site Complexes	5	KLF-TSN-17 through -21
Historic Period Sites	16	KLF-TSN-01 through -16
Isolated Occurrences	38	ISO-001 through -038

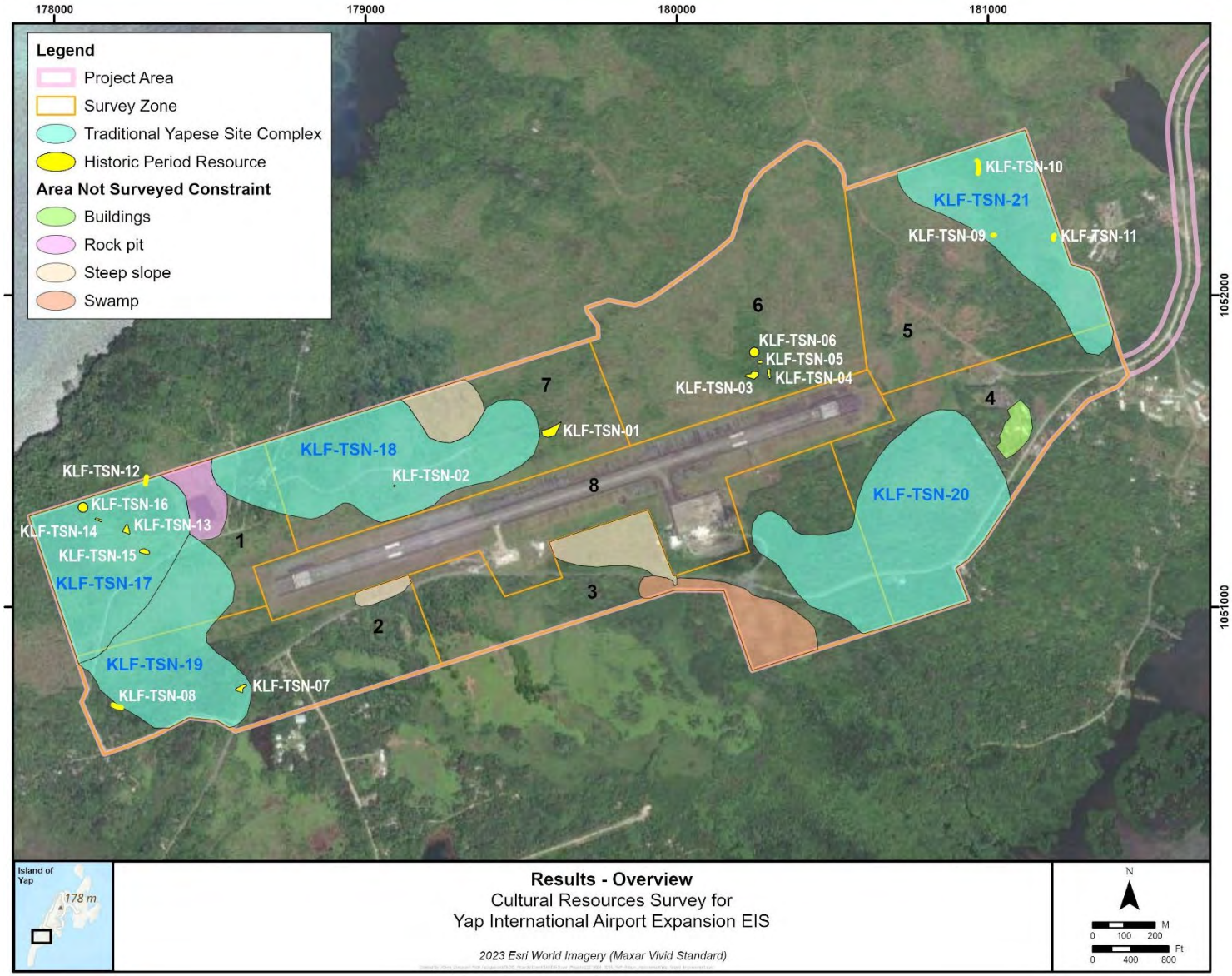


Figure 15. Overview of Traditional Yapese site complexes and Historic Period sites recorded by KLF during the survey, as well as areas not surveyed.

4.1 TRADITIONAL YAPESE SITE COMPLEXES

The project area overlaps with areas traditionally used for Yapese mortuary practices. Traditional mortuary practices on Yap Island are physically expressed as culturally modified landscapes (e.g., earthen mounds, ditches, terraces) and stonework structures used for interments. These features and associated practices largely occurred in the island interior, whereas habitation and settlement occurred closer to the coast. According to local informants, each village maintained a *taliw* (cemetery), which was located inland and upland from the village. The *taliw* encountered during the survey are extensive, from 16 to 35 hectares (39 to 87 acres) and comprise well over one hundred individual features in each *taliw*. Due to the high volume of mortuary features encountered (appproximately 700) and the impracticality of recording each feature during the time allotted for the survey, KLF spatially analyzed feature density (see Section 3.4) and conferred with local informants to designate five Traditional site complexes (Figure 16 and Figure 17). The following five site complexes were designated and are used to structure the results of this section:

- KLF-TSN-17: Yabach Traditional Cultural Area
  - 17 Representative Features (RFs) recorded.
- KLF-TSN-18: Taliw u Fedoor
  - 12 RFs recorded.
- KLF-TSN-19: Taliw u Lamer
  - 10 RFs recorded.
- KLF-TSN-20: Taliw u Dakiy
  - 12 RFs recorded.
- KLF-TSN-21: Taliw u Fanqalily
  - 5 RFs recorded.

KLF recorded a 10 percent sample of representative features within each Traditional Yapese site complex to illustrate the range of features observed; these representative features are designated "RF" indicating "Representative Feature." Fifty-six (56) RFs were recorded and are described in the sections below. Representative features generally include the following feature types.

- *Malang*
  - A burial or grave, classified in this study into three subtypes (Figure).
    - Small earthen *malang*: less than 10 square meters, square- or rectangular-shaped earthen mound, sometimes outlined by small cobbles; most often an individual interment.
    - Small stonework *malang*: less than 10 square meters, square- or rectangular-shaped earthen mound topped by one-, two-, or three-tiered stonework platform; most often an individual interment.
    - *Malang* complex: Large (more than 10 square meters) rectangular earthen and/or stonework platform topped by multiple stonework platforms with multiple tiers and interior platforms; multiple interments for family group and/or high-ranking individual.
- *Wunbey*
  - Large (more than 10 square meters) stonework platform used for community gatherings and meetings; often features interior platforms for a meeting house as well as *magrey* (stone backrests) and *rai* (stone money).

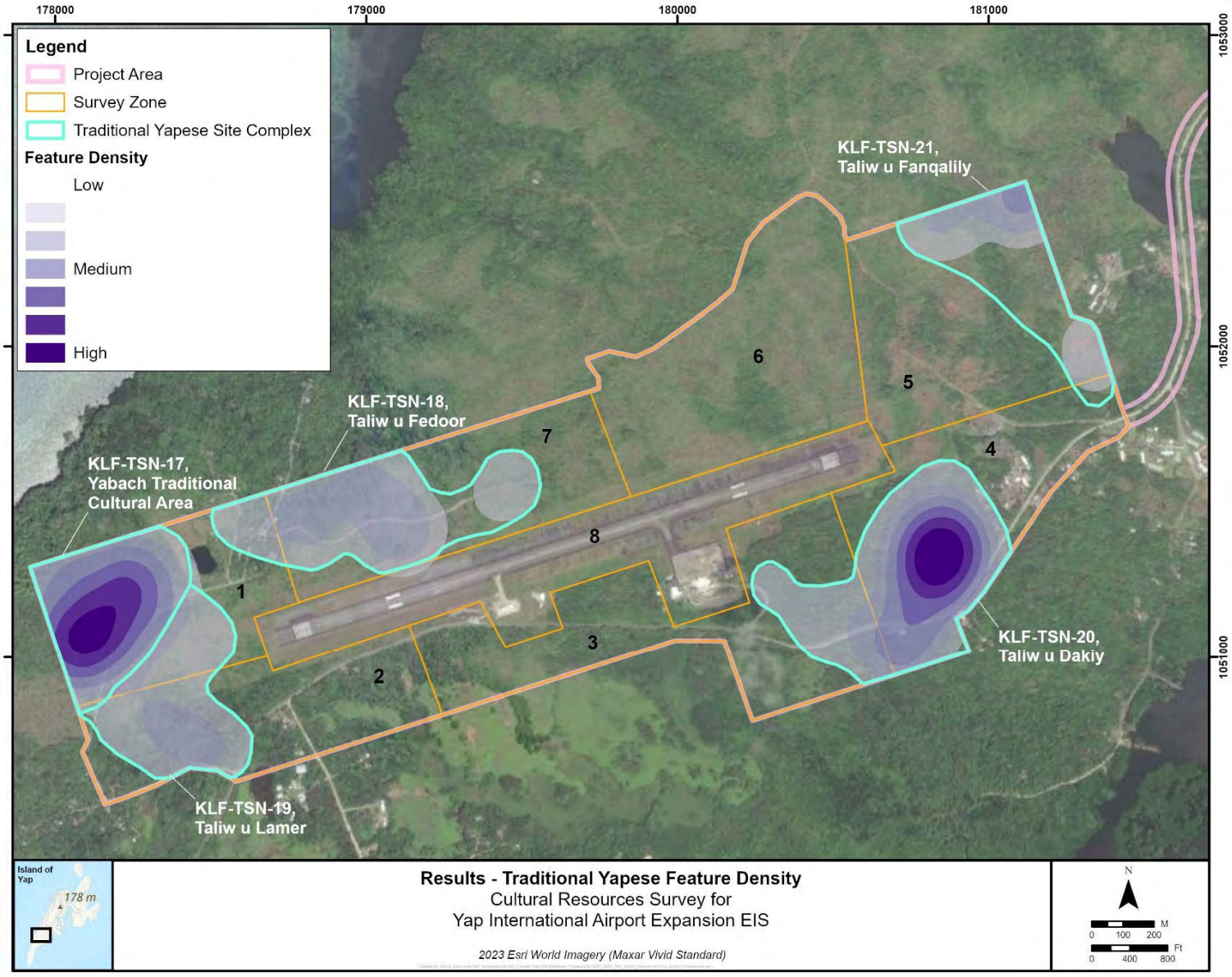


Figure 16. Traditional Yapese site complexes and density analysis of KLF-recorded features.

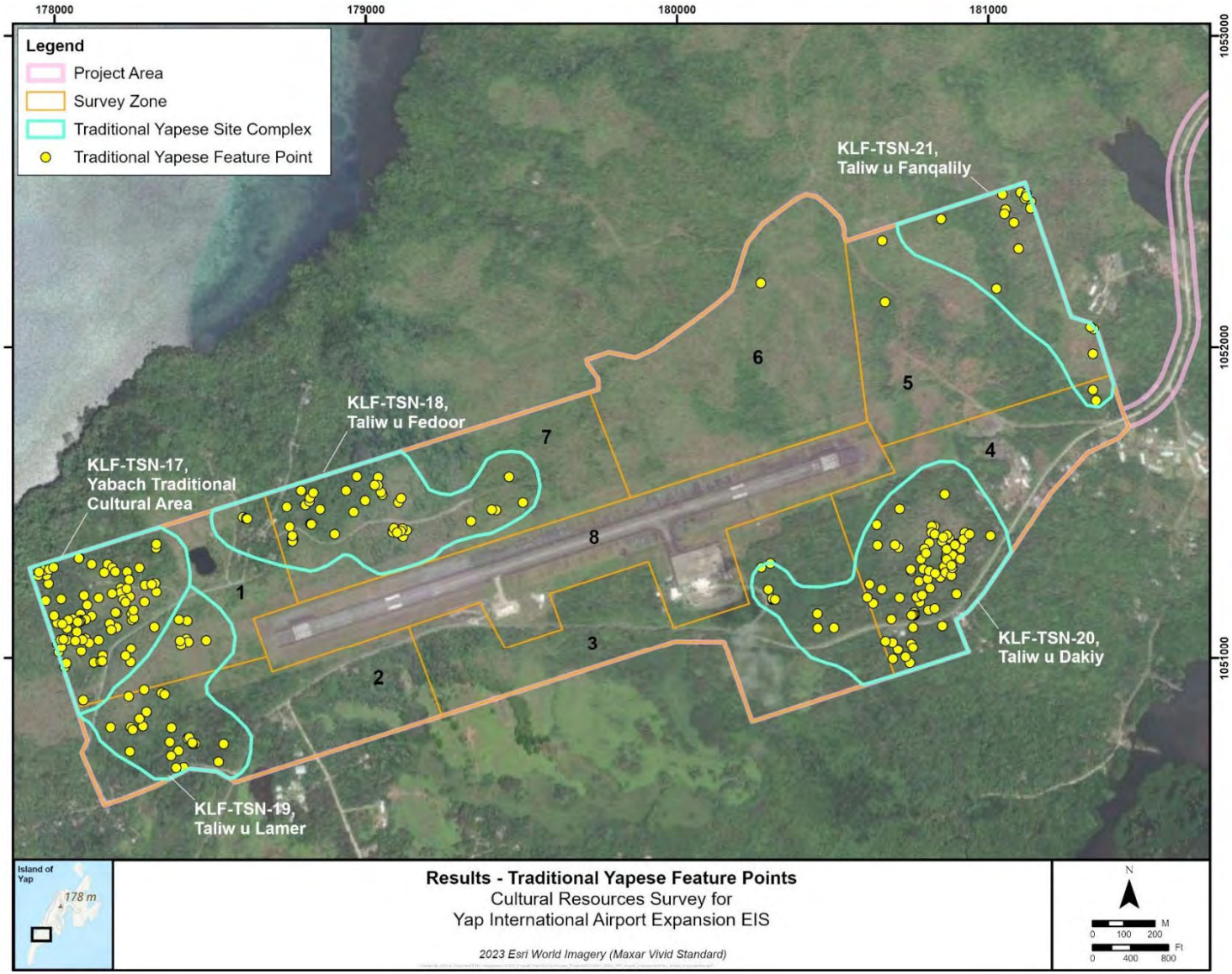
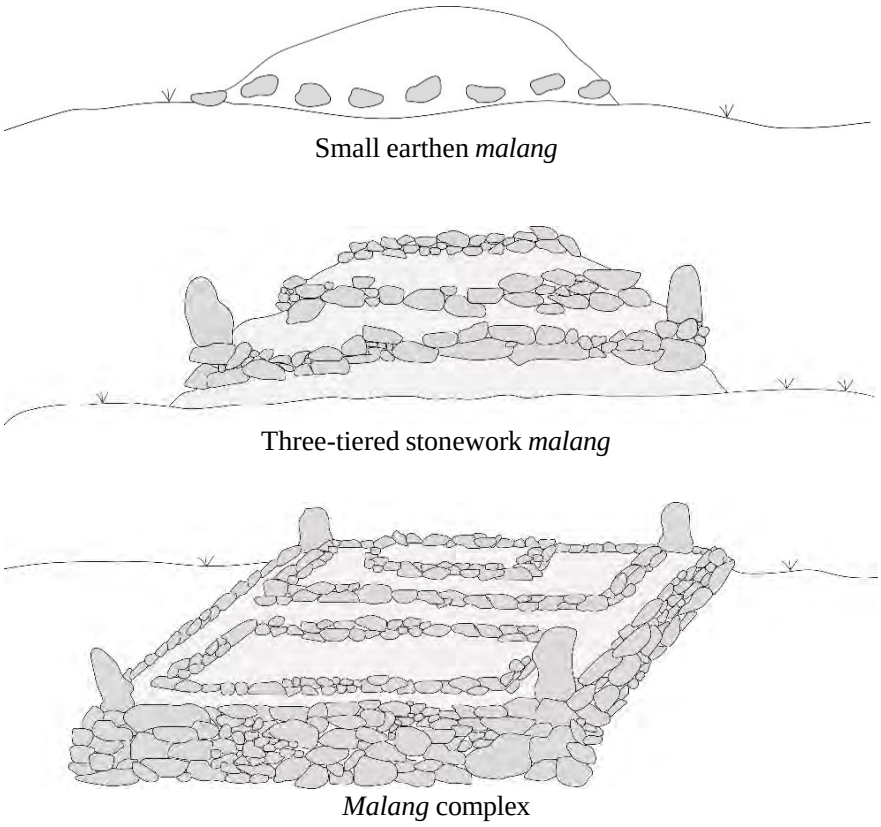


Figure 17. Traditional Yapese feature points used for kernel density analysis and designating site complexes (note, each point may represent up to eight individual features).



Small earthen *malang*

Three-tiered stonework *malang*

Malang complex

Figure 18. Schematic illustrations of malang types.

- *Dayif*/*Daf*
  - Stonework house platform, sometimes built on top of *wunbey* to support a community meeting house (*pebaey*) or men's house (*faluw*).
- *Kanaawa'*
  - Stone-paved pathway typically constructed with tabular greenschist paving stones and often part of a larger network of paths within a village setting.
- *Mil'ay*
  - Agricultural complex (farm or garden), used in this study to denote terraced hillsides for growing yam and taro.

4.1.1 KLF-TSN-17, Yabach Traditional Cultural Area

Yabach Traditional Cultural Area, comprising 18.5 hectares (45.6 acres), is in the northwest corner of the survey area in Survey Zones 1 and 2 and extends outside the survey boundaries to the northwest (Figure 16). "Yabach" is a more recent village name and may not be the Traditional name once used for the area. The complex is composed of two distinct zones: the Traditional stone village situated closer to the coast and the mortuary zone (*taliw*) situated inland from the village. The layout of these two zones is representative of Traditional Yapese settlement patterns and associated mortuary zones within Yap Island. These two zones are discussed further in the following sections.

4.1.1.1 Yabach Stone Village

Yabach Stone Village consists of a Traditional Yapese village with stone platforms, an extensive network of paved-stone pathways, large *rai* (stone money), terraced hillsides, and agricultural areas. Over 100 features were encountered throughout the Traditional village area; nine RFs were recorded to illustrate the range of features encountered (Table 3).

Table 3. Representative Features Recorded within Yabach Traditional Cultural Area, Stone Village

RF-	Type	Maximum Dimensions	Description
A	W*unbey* (meeting platform)	14.0 by 40.0 meters	Multi-tiered, dry-stacked schist platform used as a community meeting area
B	*Dayif/Daf* (house platform)	4.0 by 10.0 meters	Single-tier, dry-stacked schist platform
C	*Dayif/Daf* (house platform)	4.15 by 10.0 meters	Single-tier, dry-stacked schist platform
D	*Dayif/Daf* (house platform)	5.0 by 11.5 meters	Single-tier, dry-stacked schist platform
E	*Mil'ay* (agricultural complex)	512 square meters	Culturally modified landscape with stone-lined terraces and modified stream bed
F	*Malang* (grave)	3.0 by 3.0 meters	Square-shaped alignment of small schist cobbles
G	*Kanaawa'* (stone-paved pathway)	2 meters wide	Stone-paved village walking path
H	*Kanaawa'* (stone-paved pathway)	2 meters wide	Stone-paved village walking path
I	*Kanaawa'* (stone-paved pathway)	2 meters wide	Stone-paved village walking path

RF-A and -B, *Wunbey* (Meeting Platform)

RF-A is a large rectangular dry-stacked stone meeting platform measuring 14.0 meters from north to south by 40.0 meters by east to west and 0.3 meter high (Figure). The platform is approximately six to seven courses high with various sized and shaped greenschist cobbles used in the construction. Three *rai* are displayed on the surface of the platform.

RF-B is a smaller schist platform erected in the northeast corner of RF-A (Figure). This interior platform measures 4.0 meters from north to south, 10.0 meters from east to west, and 0.2 meter high. The western end of the platform is slightly pointed or triangular, typical of other platforms observed throughout the survey area. Two *rai*, ranging in size from 50 to 75 centimeters in diameter, are situated on top of the platform.

According to HPO staff, the platform complex would have served as a Traditional meeting platform (*wunbey*) with the main platform (RF-A) serving as the main location for community gatherings, while the interior platform (RF-B) may have supported a superstructure for a meeting house (*dayif, daf*).

Figure 19. Yabach Stone Village: RF-A, wunbey overview and facing close up, view to south (left) and RF-B, dayif overview, view to north (right).

RF-C and -D, Possible *Dayif*/*Daf* (Possible House Platform)

RF-C and -D are smaller dry-stacked stone platforms within the Traditional village area. RF-C measures 4.15 meters from north to south and 10.0 meters east to west, with a height of 0.3 meter. The platform features larger greenschist cobbles at the base of the platform with smaller and flatter cobbles inserted as fill between the larger cobbles (Figure). The top of the platform is paved with flat greenschist cobbles of varying sizes. A single upright backrest stone (*magrey*), 47 centimeters tall, is set into the southeast corner of the platform.

RF-D is a 30-centimeter-high dry-stacked greenschist platform measuring 5.0 meters from north to south and 11.5 meters east to west (Figure). The platform uses larger cobbles for the first one to three courses and smaller, flatter cobbles for the remaining six to seven courses. The top of the platform is partially paved with flat schist slabs. A single *rai*, about 50 centimeters in diameter, sits on top of the platform.

According to HPO staff, RF-C and -D may be foundational platforms for domestic dwellings (*dayif*/*daf*). No associated artifacts were observed, so further investigation would be needed to confirm the function of these smaller platforms.

Figure 20. Yabach Stone Village: RF-C, possible dayif, views to west (left) and northwest (right).

Figure 21. Yabach Stone Village: RF-D, possible dayif, view to south (left) and associated rai, view to northeast (right).

RF-E, *Mil'ay* (Agricultural Complex)

RF-E is a culturally modified landscape in the northwest portion of the village, about 165 meters south of RF-G (stone-paved pathway). The 512-square-meter complex is centered on a small stream next to a terraced hillside. The stream bed is also modified with stonework dams and a possible irrigation channel (Figure). The retaining wall on the lower stream bed extends about 4.0 meters across the stream and is 0.96 meter wide by 0.56 meter, or three to four courses, high. The wall features a one meter-long gap near the center of the wall, presumable to permit water flow. The channel is 2.0 meters wide by 1.25 meters deep and terminates at a second retaining wall, 4.6 meter long, from which water is dammed. The channel appears to be a naturally formed water channel that has been reinforced and lined with dry-stacked schist cobbles.

An upslope terrace system is situated southeast of the modified stream and comprises four stone-faced earthen terraces cut into the hillside (Figure). The lower terrace (closer to the stream) measures 14.0 meters long by 0.9 meter deep by 0.25 meter high. The lower-middle terrace is 13.0 meters long by 2.75 meters deep by 0.4 meter high. The upper-middle terrace is the most intact and measures 18.0 meters long by 4.0 meters deep by 0.6 meter high. The upper terrace measures 20.0 meters long by 2.2 meters deep by 0.4 meter high. A small dry-stacked schist platform (RF-F) is situated on the upper-middle terrace.

The site complex was likely a productive agricultural zone or *mil'ay* with terraced hillsides for growing yam (*Dioscorea* sp.) and taro (*Cyrtosperma* sp.) (Hunter-Anderson 1983), with an irrigation system modified from the existing stream bed. The use of retaining walls to create freshwater pools may have been suitable for wetland taro production. The complex's proximity to the stone village indicates this may have been the primary agricultural zone for the village. Terraced hillsides like RF-E were encountered throughout the survey area and sometimes featured burial mounds at the top of the terraced hillslope. Remnant taro patches (*mu'ut*) were also often observed in these areas.

RF-F, Small *Malang* (Grave)

RF-F consists of a 3.0- by 3.0- meter, square-shaped alignment of schist cobbles on the west end of a terrace in RF-E, the agricultural complex described above (Figure). The cobble alignment is marking a burial and is distinct from other burials that are marked by tiered platforms or earthen mounds.

Figure 22. Yabach Stone Village: RF-E, mil'ay, agricultural terraces, views to southwest (top left, top right) and modified stream, views to southeast (bottom left, bottom right).

Figure 23. Yabach Stone Village: RF-F, small malang and terrace, views to southwest (left, right).

RF-G, -H, and -I, *Kanaawa'* (Stone-Paved Pathways)

RF-G, -H, and -I are three stone-paved pathways or *kanaawa'* recorded by the field team as representative examples of similar pathways observed throughout the Yabach Village area.

RF-G comprises the main pathway through the village area (Figure). The 2-meter-wide path extends off from a dirt road and runs from the southeast to the northwest through the village. The pathway is constructed from flat, medium to large schist paving stones. The pathway appears to still be maintained, although some areas are missing paving stones or covered in vegetation. Several other stone-paved pathways, such as RF-H and -I, extend off in various directions from this main thoroughfare. Stonework platforms and *rai* are evident on either side of the path along its length.

RF-H branches off the main village pathway (RF-G) and extends from the southwest to the northeast through the eastern portion of Yabach Stone Village (Figure). The path is about 2.0 meters wide and features medium to large, flat schist paving stones with smaller cobbles used as infill. RF-I is similar in construction to RF-H but runs through the west portion of the village (Figure).

Figure 24. Yabach Stone Village: RF-G, kanaawa' entering Yabach Village, view to west (top left); RF-G, kanaawa' on northwest corner of Yabach Stone Village, view to southeast (top right); and RF-H, kanaawa', view to southwest (bottom).

4.1.1.2 Taliw u Yabach (Yabach Cemetery)

Taliw u Yabach extends inland from the associated Yabach Stone Village, illustrating the Traditional settlement pattern of coastal habitation bordered by an inland and upland mortuary zone. Over 100 burial features were observed in this area, which ranged from earthen mounds, multi-tiered stone platforms, and simple stone alignments. The eight RFs discussed below were recorded to show the range of feature types encountered (Table 4).

Table 4. Representative Features Recorded within Yabach Traditional Cultural Area, Cemetery

RF-	Type	Maximum Dimensions	Description
A	*Malang* (grave)	2.25 by 2.25 meters	Single-tier, dry-stacked schist platform
B, C, D	*Malang* complex (grave complex)	7.5 by 11.3 meters	Earthen mound with three subfeature stonework *malang*
E, F	*Malang* complex (grave complex)	8.0 by 15.0 meters	Dry-stack stonework platform topped by single-tier and multi-tier subfeature *malang*
G	*Malang* (grave)	7.1 by 3.8 meters	Multi-tier, dry-stacked schist platform
H	*Wunbey* (meeting platform)	25.0 by10.5 meters	Multi-tier, dry-stacked schist platform with *rai* and *magrey*

RF-A, Small Stonework *Malang* (Grave)

RF-A is a square-shaped, dry-stacked stone platform constructed from greenschist measuring 2.25 by 2.25 meters with a maximum height of 0.3 meter. A 38-centimeter-tall *magrey* sits at the northeast corner of the platform. Modern glass beverage bottles were observed in the vicinity. According to a local informant, square-shaped burial platforms are the oldest style of burial platform used, with rectangular shapes used later, possibly after the arrival of Spanish missionaries (A. Yafangney Thelman, personal communication, March 2024). A local informant also mentioned that *magrey* position on the burial platform often indicated a landowner or an individual of higher status is buried there (A. Yafangney Thelman, personal communication, March 2024).

RF-B, -C, and -D, *Malang* (Grave) Complex

RF-B, -C, and -D are all situated on a large, elevated earthen mound, measuring 7.5 by 11.3 meters (Figure). All three associated burial platforms are rectangular shaped with varying numbers of tiers.

RF-B is a rectangular-shaped earthen mound topped with a dry-stacked, single-tier schist platform measuring 2.4 by 3.2 meters and ranging in height from 30 to 75 centimeters.

RF-C is a rectangular-shaped earthen mound topped with a multi-tiered, dry-stacked schist platform (Figure). The lower tier measures 1.8 by 2.4 meters by 0.15 meter tall. This tier is topped by a second tier measuring 1.30 by 1.55 meters by 0.17 meter tall. This is topped by an even smaller platform measuring 0.55 by 0.60 meters. According to a local informant, multi-tiered burial platforms like RF-C belonged to a higher class of individuals (A. Yafangney Thelman, personal communication, March 2024).

RF-D is a rectangular-shaped, single-tiered, dry-stacked schist platform, directly north of RF-C (Figure). It measures 1.8 by 2.1 meters with a maximum height of 0.1 meter.

Figure 25. Taliw u Yabach: RF B–D, malang complex overview, view to east (top); RF-C, earthen mound with dry-stacked schist platform, view to west (bottom left); and RF-D, dry-stacked schist platform, view to south (bottom right).

RF-E and -F, *Malang* (Grave) Complex

RF-E and -F are two individual burial platforms on top of a larger, shared platform (Figure). The base platform comprises three dry-stacked schist tiers, with the bottom tier measuring 8.0 meters north-south by 15.0 meters east-west. The second tier measures 5.75 by 14.0 meters and the third tier measures 4.5 by 13.25 meters. The tiers range in height from 40 centimeters on the bottom tier to 25 centimeters on the top.

RF-E sits at the west end of the base platform and measures 4.5 by 6.5 meters by 0.3 meter high. It is a single-tier platform constructed from flat schist cobbles about five to seven courses high (Figure). A single *magrey* is placed at the southwest corner of the platform.

RF-F sits at the opposing end from RF-E and comprises a two-tiered, dry-stacked schist platform measuring 5.5 by 8.0 meters on the bottom tier and 5.5 by 7.5 meters on the top tier (Figure). Each tier is 25 centimeters tall. A *magrey* sits at the southwest corner of the bottom tier.

A local informant told the field crew that multiple burial platforms situated together, as seen with these features, likely belonged to multiple individuals from the same family and may have belonged to a higher class (A. Yafangney Thelman, personal communication, March 2024). These multi-burial platforms were seen across the Yabach mortuary area and the wider survey area.

Figure 26. Taliw u Yabach: RF-E and -F, malang complex overview, view to northeast (top); RF-E, malang stacked stone facing, view to east (bottom left); and RF-F, malang stacked stone facing, view to east (bottom right).

RF-G, Small Stonework *Malang* (Grave)

RF-G is a rectangular-shaped, three-tiered, dry-stacked schist platform (Figure). The bottom tier measures 7.1 by 3.8 meters by 0.35 meter tall. The middle tier is 2.4 by 4.4 meters by 0.2 meter high, while the uppermost tier is 2.0 by 3.8 meters by 0.2 meter tall. A *magrey* is positioned at the southeast corner of the lower tier, possibly indicating a landholder is buried here.

RF-H, *Wunbey* (Meeting Platform)

RF-H is a large, multi-tier, dry-stacked schist meeting platform 15 meters north of RF-E, -F, and -G (burial platforms). The feature comprises a larger, faced platform with a smaller platform perched on its eastern edge (Figure –Figure). The larger, main platform is rectangular shaped and measures 25.0 meters north-south by 10.5 meters east-west with a height of 0.9 meter. The western perimeter is faced with flat greenschist cobbles. The second tier is 19.5 meters north-south and 9.5 meters east-west with an overall height of 0.5 meter. This tier is also faced along its western perimeter. The second tier is paved with flat greenschist cobbles. Fifteen *magrey*, which likely served as backrests or seating positions, are placed in two rows along the west side of the platform. The upright stones are spaced about 2.5 to 3.5 meters apart and range in height from 85 to 95 centimeters tall.

Figure 27. Taliw u Yabach: RF-G, small malang overview, view to northeast (top); RF-G, small malang west wall, view to east (bottom left); and RF-G, small malang north wall, view to southwest (bottom right).

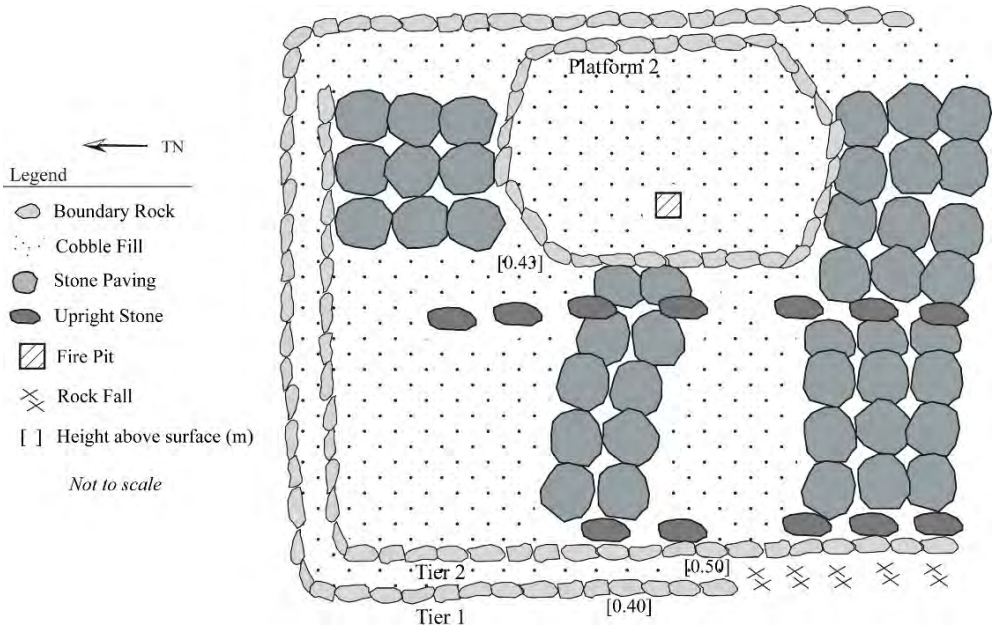


Figure 28. Taliw u Yabach: RF-H, wunbey, planview.

Figure 29. Taliw u Yabach: RF-H, wunbey overviews, views to east (top), southwest (bottom left), and southeast (bottom right).

Figure 30. Taliw u Yabach: RF-H, wunbey inner platform, view to southeast (left) and fire pit overview within inner platform (right).

A second, smaller platform is constructed on the eastern edge of the main platform's second tier. This inner platform is rectangular shaped with pointed or triangular north and south ends. The platform measures 9.0 meters north-south by 3.5 meters east-west by 0.43 meter high and features an inner construction of smaller cobbles lined by larger, exterior cobbles. The top of this inner platform is paved with flat greenschist cobbles and also features a stone-lined fire pit, or firebox (Figure) (Hunter-Anderson 1983:62–63).

RF-H resembles meeting platforms from Traditional village contexts. Larger platforms like this one, with paved surfaces, *magrey*, and inner triangular-shaped platforms were occasionally encountered within the more densely packed mortuary areas throughout the survey area. They may have served as communal areas for family groups to carry out mortuary practices within the family cemetery. Like meeting platforms from village contexts, the inner platform may have supported an enclosed superstructure constructed from perishable materials, which did not survive in the archaeological record.

4.1.2 KLF-TSN-18, Taliw u Fedoor (Fedoor Cemetery)

Taliw u Fedoor, situated north of the west end of the airport runway in Survey Zones 1 and 7 (Figure 16), was originally recorded by Kirch (1978). The current survey noted a much more extensive site complex than previously recorded with at least 200 burial features extending over an area measuring 25.3 hectares (62.6 acres). As with other site complexes recorded in this study, more burial features are likely present but are obscured by erosion and dense vegetation. Prior recordation and HPO records designated the site complex as "Chief Orothin"; however, after discussions with the community, the site complex was given the name Taliw u Fedoor after the village in which it is located.

Twelve RFs were recorded to show the range of features encountered within the complex (Table 5). These were noted in three distinct sub-areas within the mortuary area: RF-A comprises the main burial complex recorded by Kirch (1978); RF-B through -G are on the eastern side of the main, central cluster; and RF-H through -L are in the western portion of the mortuary area on a hillside in the village of Fedor.

Table 5. Representative Features Recorded within Taliw u Fedoor

RF-	Type	Maximum Dimensions	Description
A	*Malang* complex (grave complex)	251 square meters	Culturally modified landscape with earthen mound and four multi-tiered dry-stacked schist platforms (A.1 to A.3)
B	*Malang* (grave)	2.1 by 3.8 meters	Single-tier, dry-stacked schist platform
C	*Malang* (grave)	3.7 by 3.8 meters	Multi-tier, dry-stacked schist platform
D	*Malang* (grave)	2.0 by 2.3 meters	Earthen berm with cobble outline
E	*Malang* (grave)	1.7 by 2.5 meters	Single-tier, dry-stacked schist platform
F	*Malang* (grave)	1.0 by 1.2 meters	Single-tier, dry-stacked schist platform
G	*Malang* (grave)	2.2 by 3.4 meters	Single-tier, dry-stacked schist platform
H	*Malang* (grave)	1.9 by 2.3 meters	Single-tier, dry-stacked schist platform
I	*Malang* (grave)	1.4 by 2.5 meters	Multi-tier, dry-stacked schist platform
J	*Malang* (grave)	1.0 by 1.3 meters	Single-tier, dry-stacked schist platform
K	*Malang* (grave)	0.75 by 2.00 meters	Single-tier, dry-stacked schist platform
L	*Malang* (grave)	0.75 by 2.00 meters	Multi-tier, dry-stacked schist platform

RF-A, *Malang* (Grave) Complex

RF-A comprises a 251-square-meter extensive culturally modified landscape in the center portion of the Taliw u Fedoor (Figure). Landscape modifications expand across the ridgeline that extends south of the airport fence line and include earthen terraces, ditches, and mounds, with stone burial platforms topping the mounds. RF-A.1 through -A.4 were recorded as representative subfeatures within this area. They are clustered in a row, similar to other clustered burial features in the larger burial complex.

Figure 31. Taliw u Fedoor: RF-A, malang complex overview, view to southeast.

RF-A.1 is a square-shaped earthen mound capped by a two-tiered, dry-stacked stone platform constructed from greenschist cobbles (Figure). The lower tier measures 2.2 by 2.2 meters and is 20 centimeters high. Large flat greenschist slabs are placed along the corners of the lower tier with rounded cobbles used as infill. The second tier features similar construction and measures 1.65 by 1.65 meters with a maximum height of 20 centimeters. The center of the second tier is slightly depressed in the center, which according to a local informant, is often observed following body decomposition within the tomb (A. Yafangney Thelman, personal communication, March 2024).

RF-A.2 is 50 centimeters south of RF-A.1 and features a similar construction type and style (Figure). The lower tier measures 2.4 by 3.5 meters and is more rectangular shaped than RF-A.1. The second tier measures 1.8 by 2.4 meters. Both tiers are 35 centimeters above the ground surface.

RF-A.3 is situated next to RF-A.2 and features similar construction as the previous two subfeatures, except with a three-tier stone platform cap (Figure). The first tier is heavily eroded and partially buried; the exposed portion measures 2.4 by 3.1 meters. The second tier measures 1.9 by 2.7 meters and the third tier measures 1.3 by 2.0 meters. The second and third tiers are 37 centimeters above the eroded ground surface.

RF-A.4 is the fourth burial mound in this row of burials and features similar construction and style as the previous subfeatures (Figure). It includes a two-tiered platform with the first platform measuring 3.5 by 4.5 meters and the second tier measuring 2.5 by 3.3 meters with a maximum height of 45 centimeters.

Figure 32. Taliw u Fedoor: RF-A.1, malang complex, view to south (top left); RF-A.2, malang complex, view to southeast (top right); RF-A.3, malang complex, view to northeast (bottom left); and RF-A.4, malang complex, view to southeast (bottom right).

RF-B through -G, Small Stonework *Malang* (Graves)

These six RFs comprise small (less than 10 square meters) earthen mounds capped by one to two-tiered, dry-stacked stone platforms (Figure). All are constructed from tabular to rounded greenschist cobbles. They comprise a representative sample of numerous similar feature types across the larger burial complex.

RF-B is a rectangular-shaped earthen mound topped by a single-tier, dry-stacked stone platform measuring 2.1 by 3.8 meters by 0.5 meter high. *Magrey* are situated along the eastern edge of the platform. Several stones appear to have been removed and possibly repurposed for Japanese World War II defense in the area (see KLF-TSN-15 in Section 4.2). There are also physical impacts from recent mechanical ground disturbance in the area.

RF-C is a rectangular-shaped earthen mound topped by a two-tier, dry-stacked stone platform measuring 3.7 by 3.8 meters by 0.2 meter high on the first tier and 2.0 by 3.4 meters by 0.15 meter high on the top tier. The top tier is split into two individual grave markers with the one on the south measuring 1.2 by 1.2 meters and the one on the north measuring 1.0 by 1.0 meter.

Figure 33. Taliw u Fedoor: RF-B–G, two of six small stonework malang, views to west (left, right).

RF-D is a square-shaped earthen berm with some cobble outlining but no distinct stonework platform. The mound measures 2.0 by 2.3 meters by 0.25 meter high. Earthen mound burial markers are prevalent across the survey area and can be easily missed, especially when highly eroded or obscured by thick vegetation; therefore, more burial features like RF-D are likely present in the survey area than directly observed by the survey team.

RF-E is a rectangular-shaped earthen mound with a single-tier stonework platform on top. The platform is minimally constructed with larger cobbles lining the edge of the platform and smaller cobbles used as infill. The mound measures 1.7 by 2.5 meters and is 0.25 meter above the ground surface.

RF-F is directly adjacent to RF-E. It is a rectangular-shaped earthen mound topped by a single-tier, dry-stacked stone platform measuring 1.0 by 1.2 meters by 10 centimeters tall. According to a local informant, this smaller mound may be for a child who was related to the individual placed in RF-E (A. Yafangney Thelman, personal communication, March 2024).

RF-G is a rectangular-shaped earthen mound topped by a single-tier, dry-stacked stone platform measuring 2.2 by 3.4 meters by 0.25 meter high. A cobble alignment bisects the top of the platform, which seems to have been used to delineate two interments.

RF-H through -L, *Malang* (Grave) Complex

RF-H through -L are individual burial features that appear to be associated, possibly belonging to the same family group, as they are all positioned on the same rectangular-shaped earthen mound base (Figure). The complex is well-maintained as families from Fedor Village still tend to the area.

RF-H is a single-tier, dry-stacked stone platform measuring 1.9 by 2.3 meters by 0.25 meter high, located on top of a rectangular-shaped earthen mound (Figure). RF-I sits to the east of RF-H on the same larger earthen mound base. RF-I is a two-tier stonework platform constructed of small greenschist cobbles at the base of the platform that tapers into smaller cobbles near the top (Figure). The first tier measures 1.4 by 2.5 meters with a maximum height of 0.4 meter. The second tier measures 0.8 by 1.7 meters and is only 8 centimeters above the first tier. Marine shells, traditionally used for currency in Yap (J. Ligow, personal communication, March 2024), are present on the surface of the platform.

Figure 34. Taliw u Fedoor: RF-H–L, malang complex, view to southeast (top); RF-H, malang complex, view to south (bottom left); and RF-I, malang complex, view to south (bottom right).

RF-J sits on the same earthen mound base as RF-H and RF-I and is constructed with small, irregularly shaped cobbles in a single-tier platform measuring 1.0 by 1.3 meters by 0.3 meter high. A modern cross and other recent offerings were observed on the surface of the feature indicating it is still visited by the community and may also be a newer burial constructed in the Traditional style.

RF-K is the fourth burial feature on the larger foundational earthen berm and consists of a single-tier stonework platform measuring 0.75 by 2.00 meters and only 15 centimeters above the foundation berm.

RF-L is the fifth closely associated burial feature in this complex and consists of a two-tier stonework platform measuring 0.75 by 2.00 meters by 15 centimeters tall.

The overall site type—a larger foundational berm topped with multiple individual burial features—was observed throughout the survey area.

4.1.3 KLF-TSN-19, Taliw u Lamer (Lamer Cemetery)

Taliw u Lamer is a dense concentration of Traditional mortuary features encountered off the west end of the airport runway in Survey Zones 1 and 2, immediately south of and distinct from the Yabach Traditional Cultural Area to the north (Figure 16). This *taliw* covers an area measuring 18.3 hectares (45.2 acres). After discussions with the community, the site complex was designated the Taliw u Lamer after the village in which it is located. Ten RFs were recorded to characterize the range of features encountered within the Traditional mortuary area (Table 6).

Table 6. Representative Features Recorded within Taliw u Lamer

RF-	Type	Maximum Dimensions	Description
A	*Wunbey* (meeting platform)	7.0 by 11.0 meters	Multi-tier, dry-stacked schist platform
B	*Dayif* (house platform)	7.0 by 15.0 meters	Multi-tier, dry-stacked schist platform with *rai* and *magrey*; modified for military use
C	*Wunbey* (meeting platform)	9.0 by 20.0 meters	Multi-tier, dry-stacked schist platform with *rai* and *magrey*
D	*Malang* complex (grave complex)	6.0 by 10.0 meters	Multi-tier, dry-stacked schist platform
E	*Malang* (grave)	2.8 by 3.0 meters	Multi-tier, dry-stacked schist platform
F	*Malang* (grave)	2.1 by 2.7 meters	Multi-tier, dry-stacked schist platform
G	*Malang* (grave)	4.3 by 8.0 meters	Single-tier, dry-stacked schist platform
H	*Malang* (grave)	2.4 by 3.2 meters	Multi-tier, dry-stacked schist platform
I	*Malang* (grave)	2.3 by 3.6 meters	Multi-tier, dry-stacked schist platform
J	*Malang* (grave)	0.85 by 1.45 meters	Single-tier, dry-stacked schist platform

RF-A, *Wunbey* (Meeting Platform)

RF-A is a rectangular-shaped stonework meeting platform located off a heavily used foot path (Figure). The overall platform measures 7.0 by 11.0 meters with a total height of 0.5 meter above the ground surface. An inner, tiered platform sits atop the main platform. The lower tier is constructed of large (40 centimeters long), tabular and blocky greenschist cobbles with smaller (8–10 centimeter) cobbles used as infill; it measures 7.0 by 11.0 meters by 0.35 meters high. The second tier is much smaller, measuring 1.1 by 2.8 meters, and is constructed from neatly stacked tabular greenschist up to 15 centimeters high. The south side of both tiers are faced. Seven *magrey* are placed at the corners of the two platforms.

The meeting platform is within a culturally modified landscape consisting of earthen berms, ditches, and remnant taro patches within a larger *taliw*. According to HPO staff (personal communication, March 2024), house and meeting platforms are often located in burial areas and were used by those who tended to the graves.

Figure 35. Taliw u Lamer: RF-A, wunbey, views to northeast (left) and northwest (right).

RF-B, *Dayif* (House Platform)

RF-B is a rectangular-shaped stonework platform constructed on a terrace hillslope north of a small creek (Figure and Figure). The platform measures 7.0 by 15.0 meters and stands 55 centimeters above the ground surface. It is constructed from medium to large, tabular and block-shaped greenschist. A smaller, rectangular-shaped platform with pointed or triangular short ends is constructed on the south end of the main platform. Two *rai* rest in front of the smaller, interior platform with several other *rai* displaced and scattered about the surface of the main platform.

The eastern edge of the platform appears to have been excavated out sometime after construction (Figure). The excavated portion is rectangular in shape and measures 3.0 by 4.0 meters by 1.0 meter deep. Greenschist cobbles from the original platform seem to have been removed and stacked four to five courses high inside the excavated area. Small (5 centimeters wide), corroded metal bars extend over the surface of the excavation, including three bars running north-south crisscrossed by four metal bars running east-west. Three metal barrels are position at the southern edge of the excavation and twisted metal wiring and other metal debris are scattered throughout the area. These modifications were likely made by Japanese soldiers attempting to construct a defensive location.

RF-C, *Wunbey* (Meeting Platform)

RF-C is a large (9.0 by 20.0 meters by 0.6 meter high) stonework platform immediately west of RF-B (Figure –Figure). Like other meeting platforms encountered in the survey area, the main platform supports a smaller, rectangular-shaped interior platform whose two short ends are pointed like a triangle. This smaller, interior platform measures 4.2 meters from north to south and 12.0 meters from east to west and sits 45 centimeters high. A small (0.5 by 0.6 meter) pit is set into the interior platform, which according to a local informant, served as a fire/cooking pit (Figure) (J. Ligow, personal communication, March 2024).

The main platform features 10 *magrey* spaced evenly in two rows along its southern edge. Six *rai*, ranging in size from 35 to 75 centimeters in diameter, are also positioned along the southern edge of the main platform (Figure). Cut and dressed stone steps lead to the main platform and interior platform.

Modern disturbances are indicated by scattered automobile parts, rusted metal tracks, and various other metal debris scattered across the platform and the surrounding area.

Figure 36. Taliw u Lamer: RF-B; wunbey and rai, view to northeast (left) and modified portion of wunbey, view to southeast (right).

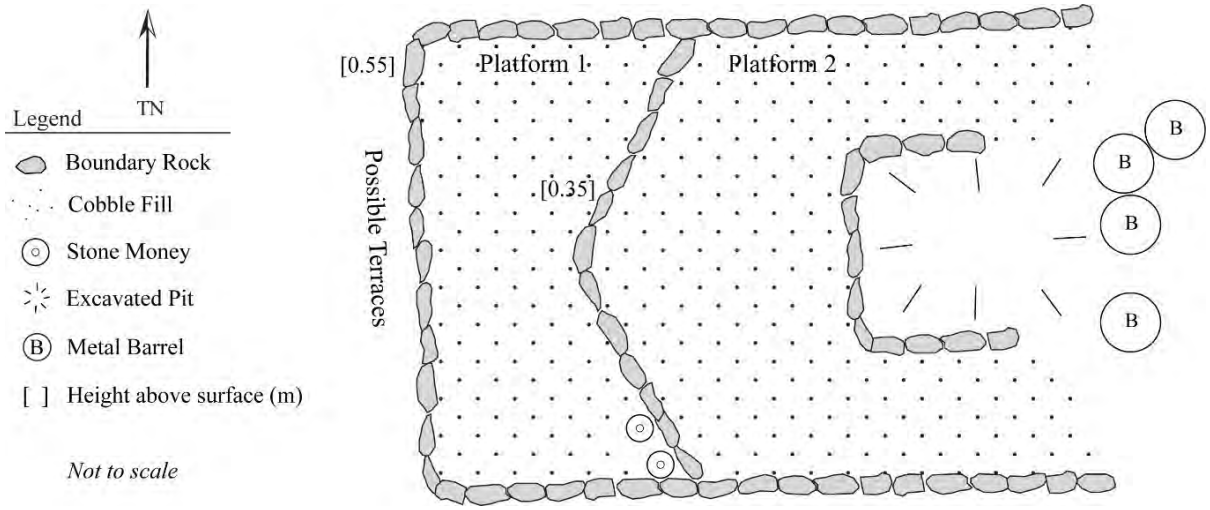


Figure 37. Taliw u Lamer: RF-B, dayif, planview.

Figure 38. Taliw u Lamer: RF-C; wunbey interior platform, view to north (left) and overview of fire pit within interior platform (right).

Figure 39. Taliw u Lamer: RF-C; wunbey, rai, and metal debris, view to north (top); wunbey and multiple rai, view to west (bottom left); and wunbey and rai, view to north (bottom right).

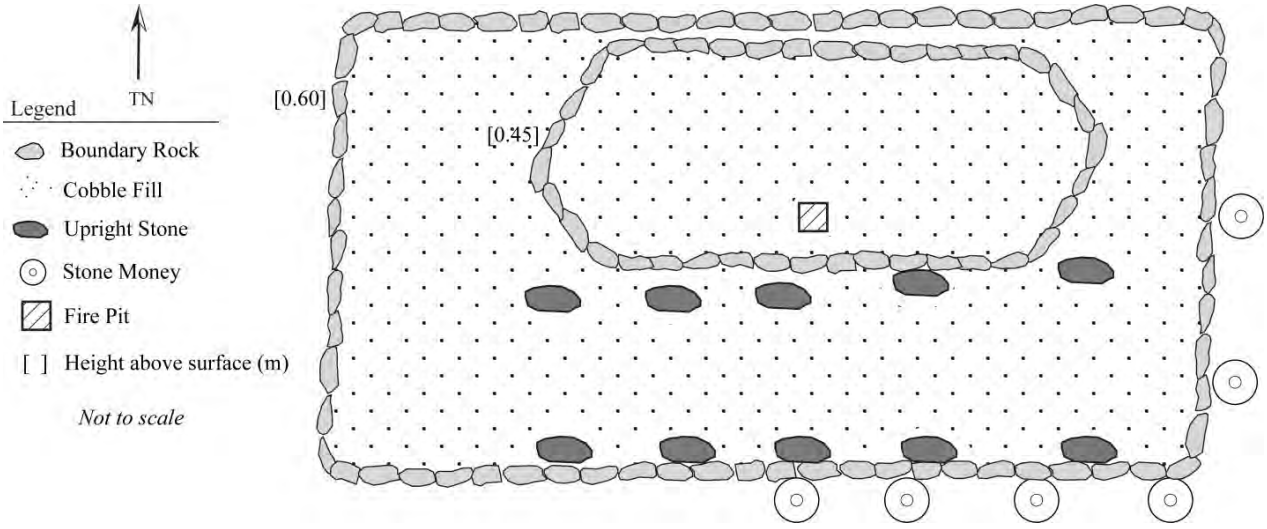


Figure 40. Taliw u Lamer: RF-C, wunbey, planview.

RF-D, *Malang* (Grave) Complex

RF-D is a multi-tiered stonework burial platform complex consisting of a main foundational platform measuring 6.0 by 10.0 meters and an inner tier measuring 5.0 by 9.0 meters (Figure). The combined tiered platform is 40 centimeters above the ground surface. Four *magrey* are situated on the north and west sides of the main platform area. Two smaller, inner platforms are constructed on the second tier. These appear to be later additions to the burial complex. Both inner platforms measure 1.2 by 2.5 meters and are 15 centimeters high. The multi-tiered structure with multiple interments suggests a family group of possibly higher status.

RF-E through -J, Small Stonework *Malang* (Graves)

Six smaller burial platforms were recorded within Taliw u Lamer as examples of the myriad similar burial types across the site complex.

RF-E a rectangular-shaped earthen berm capped by a two-tiered stonework platform measuring 2.8 by 3.0 meters by 0.4 meter above the ground surface (Figure).

RF-F is a three-tiered stonework platform measuring 2.1 by 2.7 meters at its base, which is partially buried due to erosion. Each tier is constructed of small to medium greenschist cobbles about three to four courses high.

RF-G is a rectangular-shaped earthen mound capped by a single-tier stonework platform measuring 4.3 by 8.0 meters by 0.88 meter high (Figure). The stonework platform measures 2.2 by 4.5 meters by 0.37 meter high. The platform is faced on one side, with four to five courses of medium-sized greenschist cobbles. *Magrey* were observed on top of the platform.

RF-H is a three-tiered stonework platform measuring 2.4 by 3.2 meters by 0.35 meters high. Inner platforms were eroded and not individually measured.

RF-I is a two-tiered stonework platform measuring 2.3 by 2.6 meters by 0.6 meter high (Figure). *Magrey* were observed on the platform corners.

RF-J is a single-tier stonework platform constructed over an earthen mound. The stonework platform is constructed of two to three courses of greenschist cobbles measuring 0.85 by 1.45 meters by 15 centimeters high. The center of the platform is partially collapsed. Ornamental plants were observed at the southeast corner of the feature.

Figure 41. Taliw u Lamer: RF-D, malang complex, view to south.

Figure 42. Taliw u Lamer: RF-E, small stonework malang, view to northwest (top); RF-G, small stonework malang, view to east (bottom left); and RF-I, small stonework malang, view to west (bottom right).

4.1.4 KLF-TSN-20, Taliw u Dakiy (Dakiy Cemetery)

Taliw u Dakiy is a concentrated area of over 100 Traditional mortuary features encountered southeast of the airport runway in Survey Zones 3 and 4 (Figure 16). This *taliw* comprises an area measuring 31.6 hectares (78.2 acres). After discussions with the community, the site complex was designated the Taliw u Dakiy after the village that maintains the area. The area comprises both Traditional and modern burial features, some of which are actively maintained by the community. Considerably more burial features may be present but are obscured by dense vegetation. Ten RFs were recorded to characterize the range of features encountered within this mortuary area, as described below (Table 7).

Table 7. Representative Features Recorded within Taliw u Dakiy

RF-	Type	Maximum Dimensions	Description
A	*Malang* complex (grave complex)	9.0 by 13.0 meters	Multi-tier, stacked stone burial platform (A.1 and A.2); single-tier, stacked stone burial platform (A.3)
B	*Malang* (grave)	1.6 by 2.4 meters	Multi-tier, dry-stacked schist platform
C	*Malang* (grave)	2.6 by 3.2 meters	Multi-tier, dry-stacked schist platform
D	*Malang* (grave)	2.6 by 3.2 meters	Multi-tier, dry-stacked schist platform
E	*Malang* (grave)	3.0 by 4.2 meters	Single-tier, dry-stacked schist platform
F	*Malang* (grave)	2.3 by 3.2 meters	Multi-tier, dry-stacked schist platform
G	*Malang* (grave)	1.7 by 2.7 meters	Multi-tier, dry-stacked schist platform
H	*Malang* (grave)	1.3 by 2.0 meters	Single-tier, dry-stacked schist platform
I	*Malang* complex (grave complex)	8.0 by 10.0 meters	Large, single-tier dry-stacked schist burial platform topped by single-tier platforms (RF-I.1 and .2)
J	*Malang* (grave)	1.0 by 2.7 meter	Single-tier, dry-stacked schist platform
K	Mil'ay (agricultural complex)	~16 by 35 meters	Cut terraces in hillside
L	*Malang* (grave)	2.8 by 3.0 meters	Multi-tier, dry-stacked schist platform

RF-A, *Malang* (Grave) Complex

RF-A is a large (9.0 by 13.0 meters by 0.5 meter high) rectangular-shaped stonework platform with multiple individual burial platforms constructed on top of the main platform (Figure).

A smaller, inner platform sits atop the west side of the main foundation and features a *magrey* at its southwest corner. This inner platform, which measures 5.2 by 6.4 meters by 0.17 meter high, in turn supports two, individual two-tiered stonework platforms indicating at least two interments. RF-A.1, designated for the southern of the two inner platforms, measures 1.9 by 2.8 meters at its base tier and 1.7 by 2.3 meters at its second tier. *Magrey* are positioned on the corners of the first tier. The northern of the two inner platforms, RF-A.2, measures 2.2 by 2.7 meters on its base and 1.5 by 2.3 meters on its second tier. On the east end of the foundation platform sits RF-A.3, a third inner single-tier platform measuring 2.5 by 3.4 meters by 0.3 meter high.

Figure 43. Taliw u Dakiy: RF-A, malang complex overview, views to southwest (left) and northeast (right).

The complexity of this feature indicates multiple interments of a higher status family group. The foundation platform seems to have been used over time as interments were added to the feature.

RF-B through -H, -J, -L, Small Burial Platforms

These nine features include small (less than 6 square meters) burial platforms with no more than two tiers (Figure). These feature types are prevalent across the survey area, comprising the greatest percentage of feature types observed during the entire survey.

RF-B is a two-tier, dry-stacked schist platform atop an earthen mound directly west of RF-A, possibly indicating the individual buried here was associated with the RF-A family group. According to a local informant, smaller burial platforms next to larger platform complexes may have belonged to a lower class individual who was associated with the family group from the larger complex and, therefore, chose their burial location to be close to the associated family group (A. Yafangney Thelman, personal communication, March 2024). RF-B measures 1.6 by 2.4 meters by 0.2 meter high, while the second tier measures 1.1 by 1.8 meters with a maximum height of 0.15 meter.

RF-C, -D, and -E are small burial platforms arranged in a line, oriented east-west. RF-C is a two-tier platform measuring 2.6 by 3.2 meters at the base and 1.7 by 2.2 meters on the second tier. The second tier is placed off-center and to the northwest of the main platform. The overall structure is 20 centimeters above the ground surface. Seven *magrey* are positioned at the corners of the second tier. A local informant advised the field team that the family may have planned to place additional graves on the platform since the interior platform is placed off-center, but this may have been disrupted by a change in practice or relocation of the family (A. Yafangney Thelman, personal communication, March 2024).

RF-D is a multi-tiered platform constructed with flat tabular greenschist and irregular cobbles. The first tier measures 2.6 by 3.2 meters with a maximum height of 0.2 meter. The second tier measures 1.8 by 2.5 meters with a maximum height of 0.2 meter. Six *magrey* sit atop the second tier.

RF-E is a single-tier platform composed of large flat tabular greenschist with irregular-shaped greenschist cobbles (Figure). The platform measures 3.0 by 4.2 meters with a maximum height of 0.35 meter.

Figure 44. Taliw u Dakiy: RF-E, small burial platform, view to southwest (left) and RF-J, small burial platform, view to southwest (right).

RF-F is a traditionally constructed, two-tiered stonework platform situated amid modern poured concrete graves. The lower tier measures 2.3 by 3.2 meters by 0.25 meter high. The second tier measures 1.0 by 2.3 meters by 0.2 meter high. Eight *magrey* are present at each of the four corners and center edges of the first tier, while eight additional *magrey* are present in similar locations on the second tier. The center of the platform is depressed and seems to have partially caved in. The feature overall is in very good condition with very little vegetation growing on the structure, which is distinct from many of the small burial platforms encountered across the project area.

RF-G is directly northwest of RF-F and of a similar construction type and style, including eight *magrey* positioned at the corners and center edges of the platform. The feature, however, is smaller than RF-F and measures 1.7 by 2.7 meters overall. Like RF-F, the top of the platform is depressed in the center.

RF-H is a single-tier, dry-stacked platform measuring 1.3 by 2.0 meters with a maximum height above ground surface of 0.25 meter. According to a local informant, single-tiered, small platforms such as this one likely belong to lower-ranked individuals (A. Yafangney Thelman, personal communication, March 2024).

RF-J is a small, 1.0- by 2.7-meter single-tier burial platform indicating another potentially lower-ranked individual (Figure). The feature is, however, partially buried from erosion and could be larger.

RF-L is a square-shaped, two-tiered, dry-stacked platform situated just south of RF-H. The lower tier measures 2.8 by 3.0 meters by 0.15 meter high, and the second tier measures 1.9 by 2.0 meters by 0.1 meter high. Four *magrey* are present on the south, west, and east corners of the first tier, while seven *magrey* are present in the center of the second tier and on each corner, except for the southwest corner.

RF-I, *Malang* (Grave) Complex

RF-I is a large, single-tier, dry-stacked platform measuring 8.0 by 10.0 meters by 0.2 meter high with two smaller, inner platforms built on top of the main platform on its north and south ends (Figure). Both inner platforms are single tier and measure 2.2 by 3.0 meters (south platform) and 1.0 by 2.4 meters (north platform). These inner platforms range in height from 15 to 20 centimeters above the main platform. The north, inner platform features flat paving stones on its surface.

Figure 45. Taliw u Dakiy: RF-I, malang complex, view to east.

RF-K, *Mil'ay* (Agricultural Complex)

RF-K comprises a modified cultural landscape consisting of five L-shaped earthen terraces cut into an east-facing hillslope, functioning as a *mil'ay* or agricultural complex (Figure). The terraces are situated over an area approximately 16 by 35 meters, just below RF-I, the burial platform complex discussed above. The terraces are overgrown with dense vegetation and eroding slightly from the hillside. Remnant taro patches (*mu'ut*) are present at the base of the slope. The terraces follow the natural curve of the slope and vary in size:

- Terrace 1: 3.0 meters east-west by 35.0 meters north-south with maximum height of 0.4 meter.
- Terrace 2: 4.0 meters east-west by 30.0 meters north-south with maximum height of 0.8 meter.
- Terrace 3: 3.0 meters east-west by 15.0 meters north-south with maximum height of 0.8 meter.
- Terrace 4: 2.2 meters east-west by 35.5 meters north-south with maximum height of 0.6 meter.
- Terrace 5: 3.0 meters east-west by 30.0 meters north-south with maximum height of 0.7 meter.

Figure 46. Taliw u Dakiy: RF-K, mil'ay, view to northwest.

4.1.5 KLF-TSN-21, Taliw u Fanqalily (Fanqalily Cemetery)

Taliw u Fanqalily is situated in the northwest corner of the survey area in Survey Zones 4 and 5 and comprises about 17.6 hectares (43.6 acres) (Figure 16). It exclusively features a mortuary zone comprising burial mounds and platforms and does not appear to contain any portion of a Traditional village or habitation area. It also appears to be contained within the current survey area and does not extend outside it. After discussions with the community, the site complex was designated Taliw u Fanqalily after the village in which it located. At least 50 burial features were observed during the survey; more are likely present due to dense vegetation cover that severely limited ground visibility. Five RFs were recorded, which characterize the range of features present within Taliw u Fanqalily (Table 8).

Table 8. Representative Features Recorded within Taliw u Fanqalily

RF-	Feature Type	Maximum Dimensions	Description
A	*Malang* (grave)	0.4 by 0.6 meters	Single-tier, dry-stacked stone platform
B	*Malang* (grave)	1.5 by 1.9 meters	Single-tier, dry-stacked stone platform
C	*Malang* (grave)	1.1 by 2.2 meters	Single-tier, dry-stacked stone platform
D	*Malang* (grave)	4.0 by 8.0 meters	Multi-tier, dry-stacked stone platform
E	*Malang* (grave)	2.0 by 4.0 meters	Earthen mound

RF-A through -C, Small Burial Platforms

Three of the RFs (RF-A, -B, and -C) are small, rectangular-shaped, dry-stacked stone platforms, or *malang*, comprising a single tier and measuring from 0.4 to 1.5 meters wide by 0.6 to 2.2 meters long and up to 15 centimeters in height (Figure). RF-A and -B are in the survey area's northeast corner, while RF-C is along the eastern boundary of the survey area. RF-A features a small, rectangular cobble alignment in the center of the platform measuring 15 centimeters north-south by 20 centimeters east-west. RF-B features two larger stones at the two west corners of the platform, which may have been used for single burials. This feature type is prevalent across the survey landscape.

All three of these features are in poor condition, like many of the small burial platforms in this site complex. They exhibit extensive root damage from the encroaching tropical forest that has dislodged cobbles and affected the physical integrity of the structures. Cobbles may also have been removed from RF-C and other platforms in the area for possible use in nearby Japanese defenses. A local informant noted these small platforms are typical for the area and all would have been lined with cobbles; additionally, if cobbles are missing, the stones were likely removed and repurposed by the Japanese (A. Yafangney Thelman, personal communication, March 2024).

RF-D, Large Burial Platform

RF-D is a comparatively large burial mound in the survey area's southeast corner. This feature includes a rectangular earthen mound topped with three tiers of dry-stacked stone platforms (Figure). The area on which the mound is constructed appears slightly leveled with the mound constructed to account for a five percent slope. The dry-stacked, tiered platform is situated in the southwest corner of the mound. The lower tier measures 4.0 by 8.0 meters by 0.75 meter high, the second tier measures 3.2 by 7.0 meters by 0.35 meter high, and the third tier measures 1.7 by 4.5 meters by 0.25 meter high. The third tier is divided into

Figure 47. Taliw u Fanqalily: RF-A, small burial platform, view to north (left) and RF-C, small burial platform, view to north (right).

Figure 48. Taliw u Fanqalily: RF-D, large burial platform, views to east (top), northeast (bottom left), and north (bottom right).

two portions by two small cobble alignments. The western corners of the top tier also feature two *magrey* 0.3 meter tall. The size of cobbles used to build the platform varies by tier, with small boulders used to construct the lower tier and smaller cobbles used to create the top tier. Like many of the burial features in the area, the feature is in fair condition. Two large trees, a pandanus and a banyan tree, are growing out of the feature and their roots have displaced cobbles causing physical impacts to the structure.

RF-E, Earthen Burial Mound

RF-E is a Traditional Yapese earthen burial mound about 320 meters northwest from the airport fenceline. The feature measures 2.0 by 4.0 meters by 0.6 meter high and is topped by several courses of dry-stacked schist cobbles. The center of the structure has collapsed, which was commonly observed for similar features during the survey.

4.1.6 Discussion

The Traditional Yapese site complexes recorded in this study represent Traditional cultural landscapes. Traditional cultural landscapes are the physical expression of an Indigenous group's cultural practices and beliefs at a landscape level, comprising both cultural and natural resources and feature groupings that connect the group to a specific area. These may include broad areas beyond the conventional designation of an archaeological "site" (ACHP 2016:2), which makes defining the Traditional "site complexes" designated in this study difficult. The associated traditional cultural landscapes observed in the current study also likely extend beyond the project area boundaries and will require further study to fully understand.

The Yabach Traditional Cultural Area (KLF-TSN-17) provides a preliminary case study for Traditional cultural landscapes within the project area, as it includes a coastal-oriented stonework village, agricultural complexes, and an inland and upland mortuary zone or *taliw*—all the major components of Traditional Yapese settlement (Hunter-Anderson 1983). Our understanding of Traditional settlement patterns on Yap Proper derives from several previous studies (Descantes 2005; Hunter-Anderson 1982, 1983, 2014; Kirch 1978; Lingenfelter 1975; and Nagaoka 2017), with Hunter-Anderson (1982, 1983) providing seminal observations through case studies of Nlul and Toruw villages in northern Yap. Hunter-Anderson (1983:6) explains that "[n]early all villages have a coastal portion and extend several tens of meters into the interior," with the interior characterizing the current project area. The zones in Hunter-Anderson's settlement pattern (also described by Lingenfelter 1975) include the following (Hunter-Anderson 1983:92) (Figure):

> [t]he shore zone should have the *faluw* (young men's house(s)); the village proper should have the *pebaey* (council house(s); also called the community center or old men's house) and numerous residential structures; the uplands should have graves, menstrual houses and features (*dapal*), and rest areas (sitting platforms near paths).

Within the village, Hunter-Anderson (2014:3) notes elevated stone-paved meeting platforms called *wunbey* that "provide a dry, mud-free surface for sitting." Hunter-Anderson (2014:3) also describes the process of *galesam* ("layering") or differentiating surface areas of the *wunbey* through the construction of separate stone platforms or cobble alignments, a technique seen in the Yabach Stone Village *wunbey*. *Magrey*, upright stone backrests, are then positioned on the surface of the *wunbey*, often in rows. According to Hunter-Anderson (2014:4), they mark the seating positions for representatives of the chiefly estates, with two or more rows "indicating the village has hosted large public events (*mitmit*)," which was observed on at least one *wunbey* at Taliw u Yabach (KLF-TSN-17, RF-H).

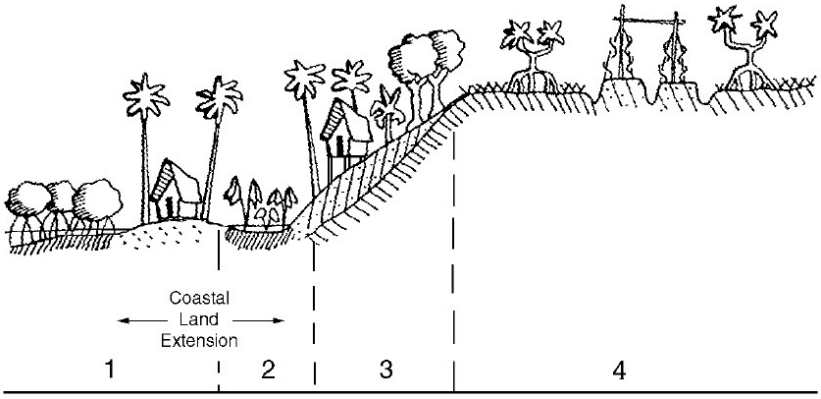


Figure 49. Lingenfelter's (1975:7) adaptation of an older landscape model developed by Barrau (1961:28) with numbered zones indicating land uses. Note, Zones 3 and 4 include the upland mortuary zones, which are not indicated on this illustration.

Lingenfelter (1975:20–21) adds residential context to the village setting:

> The Yapese estate may consist of several nonlocalized house and garden plots, parcels of taro patches, sections of lagoon for fishing, and ideally includes all important resources. The Yapese consider these associated land and sea resources as a single unit centered around a stone house foundation on the main house site of the estate. This stone foundation is called *kengin e dagif*, "central foundation." It is extremely important because within it reside the ancestral spirits who have lived on the land, to whom the members of the group pray, from whom children come, and after whom parents name children. The central foundation is also the seat of all authority and political rights that by definition belong to that estate.

In contrast to village patterns, the inter- and intra-site patterning of Traditional mortuary zones in the island interior appear to be somewhat understudied in archaeological literature, as the focus is typically on stone villages. An early German study by Müller (1917), cited in Hunter-Anderson (1983:24), explored customary mortuary practices, relaying that "some chiefs and all fallen warriors were buried in their own villages among the residences; others were buried in cemetery areas in the interior hills." This was corroborated by HPO staff (personal communication, February 2024).

A cultural anthropological study by Lingenfelter (1975) in the 1970s makes several mentions of Traditional burial customs and locations. Lingenfelter (1975:83) specifies that some places that are set apart from the main village, such as ceremonial grounds, men's houses, menstrual areas, and burial grounds, are all for community use. According to Lingenfelter (1975:88), menstrual houses were in the hills above the village, where women often brought their youngest children along with them; "to the young children it was very frightening because it was up on the hills away from the main village, near the burial grounds" where one might hear and see ghosts.

In her study of Traditional Yapese settlement patterns, Hunter-Anderson (1983:21) elaborates on this upland environment:

> On the slopes and hilltops behind the densely built part of the village were the many gardens and wood lots belonging to individual estates. In this interior area were located

> cemeteries (also called *teliu* [*taliw* as used in this study]), *dapal* (areas used by women during their menstrual periods and during childbirth), battlegrounds (*tethil*), play areas for the youth of adjacent villages, and inter-village pathways with occasional sitting platforms for resting along the way.

Lingenfelter (1975:89,168) describes how one may be defiled for a time after visiting a burial place and that the low caste were responsible for burying the dead and thus viewed as contaminated. In discussions with local informants during the current study, it was relayed that a specific individual from the associated village was tasked with burying the dead as well as maintaining the broader *taliw*. It is this individual who also maintains the knowledge of the *taliw* and may have lived in the *taliw*. According to Hunter-Anderson (1983:21,85), house platforms within the *taliw* may have belonged to the *taliw* caretaker, although they may have also supported venerated skulls of Traditional Yapese priests. Small villages may be present in the *taliw*, often at a stream head, where lower caste villagers or *taliw* caretakers resided (Hunter-Anderson 1983:21).

In his use of the term *taliw* (or *tiliw*), Lingenfelter (1975:83) makes the following observation:

> Certain lands are also designated for religious purposes. Each village has one or more *tiliw* "sacred place" where prayers and magic are made for the benefit of the people of the village. These sacred places are privately owned by the priest and practitioner of the religion. Magic places and other areas are set aside for the production of herbs and the recitation of magical formulas. Generally every household also has its plot for raising medicinal herbs.

The *wunbey* situated among burial complexes may have been the location for such practices in addition to potential communal gatherings during mortuary rituals. Further study is recommended to determine the function of *wunbey* within the mortuary zone.

Individual mortuary features within each *taliw* range in size, number, and complexity. As seen in the features recorded in this study, individual grave features are often small (2 by 3 meter), square- or rectangular-shaped earthen mounds with only a single-course cobble alignment or one-, two-, and three-tiered stone platforms capping the mound. These individual features can, however, be clustered together within an extensively modified cultural landscape. Some areas of the survey featured rows of raised burial mounds capped by stonework platforms with earthen ditches about a meter or more deep in between each mound (Figure). These mounds were in rows stretching into the dense jungle for at least 30 meters in one direction. While extensive agricultural mounds and ditches for yams are documented in the upland hills (Hunter-Anderson 1983:3), the presence of stone platforms indicates these are burial features, which was corroborated by HPO staff (personal communication, February 2024).

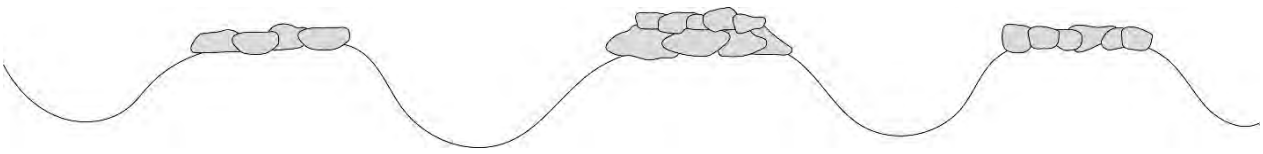


Figure 50. Schematic illustration of ditches and earthen mounds topped by stone burial platforms.

Larger grave complexes consist of a larger (8 by 10 meter) rectangular-shaped stone platform with multiple tiered platforms on its surface. According to HPO staff (personal communication, February 2024), *malang* complexes like the ones recorded in Taliw u Yabach (KLF-TSN-17, RF-B through -F) represent family burial plots. Each family in the village has generational burial platforms. The individual burial was chosen based on the best condition of the platform. Being the first platform placed to the west also held significance. Hunter-Anderson (1983:85) describes clusters of graves indicating a group of patrilineally related males, called *Ga'an* or *Gilemray*. Hunter-Anderson (1982:58) calls the process of adding platforms laterally onto an already built platform for additional interments as "segmentation." This indicates:

> …multiple burials of members of the same overlord family. Both women and men could be buried in separate parts of the same grave. Reburial was also described, wherein an original burial would be removed, condensed and wrapped in a burial mat, and repositioned to accommodate another burial in the same compartment of the grave. Thus, even single segment graves might contain more than one burial but certainly multiple segment graves do. [Hunter-Anderson 1982:58]

Larger graves with more elaborate tiered structures on their surface were also meant to communicate the memory of the deceased. According to oral history collected by Hunter-Anderson (1983:85), "such prominent features were built in the past to inspire or remind later generations of the deceased, and to try to do as well in their own projects." Discussions with HPO staff (personal communication, February 2024) also emphasized that higher ranking individuals might have more elaborately constructed burial platforms or more tiers to the platform, although more tiers do not always correlate to higher ranking and platforms were never more elaborate than the highest-ranking individual already buried in the *taliw*.

Some *taliw* recorded during the study are still in use, such as Taliw u Dakiy (KLF-TSN-20). Others are no longer maintained and appear to have been partially forgotten (KLF-TSN-17). According to HPO Jeffrey Marbey (personal communication, February 2024), the residents of Yabach Village were relocated to another village by the German Administration and so the mortuary traditions of that community area have been lost. Current burial practices seem to trend toward interments within or around (mainly in front of) the homestead. Numerous poured concrete, rectangular platforms and crypts were observed during the survey, often within the homestead or nearby. Current habitation also appears to be more dispersed, in contrast to localized Traditional settlement patterns.

4.2 HISTORIC PERIOD SITES

Sixteen (16) archaeological sites dating from the Japanese Colonial Period through World War II Period were recorded during the survey. These sites include prospecting tunnels, pits, and trenches; military defense positions; and artifact scatters (Table 9; Figure).

Table 9. Historic Period Sites Recorded During Survey

Temp. Site No. (TSN)	Description	Estimated Age	Associated Artifacts
KLF-TSN-01	Japanese defense position	World War II Period	Metal barrels and debris, gravestone, glass shards, and two large artillery guns.
KLF-TSN-02	Possible Japanese prospect pit	Japanese Colonial to World War II Period	None.
KLF-TSN-03	Bottle scatter	Japanese Colonial/World War II Period	Glass beverage bottles, glass beaker, and metal debris.
KLF-TSN-04	Artifact scatter	Japanese Colonial to World War II Period	Glass beverage bottles, ceramics, and canteen.
KLF-TSN-05	Japanese prospecting site	Japanese Colonial to World War II Period	Glass beverage bottles, metal barrels, and metal debris.
KLF-TSN-06	Artifact scatter	Japanese Colonial to World War II Period	Glass beverage bottles and marine shell.
KLF-TSN-07	Airplane junkyard	Post-World War II Period	Discarded Japanese military aircraft parts.
KLF-TSN-08	Concrete aqueduct	Unknown	None.
KLF-TSN-09	Japanese prospecting site	Japanese Colonial to World War II Period	Glass bottles and metal barrels.
KLF-TSN-10	Japanese prospecting site	Japanese Colonial to World War II Period	Glass bottles and metal debris.
KLF-TSN-11	Japanese defense position	World War II Period	Japanese military gun mount, glass bottles, and metal debris.
KLF-TSN-12	Japanese prospecting site	Japanese Colonial to World War II Period	Metal rail and glass beverage bottle.
KLF-TSN-13	Japanese prospecting site	Japanese Colonial to World War II Period	Metal debris and remnants of anti-aircraft gun.
KLF-TSN-14	Excavated pits	Unknown	None.
KLF-TSN-15	Japanese defense position	World War II Period	None.
KLF-TSN-16	Japanese prospecting site	Japanese Colonial to World War II Period	None.

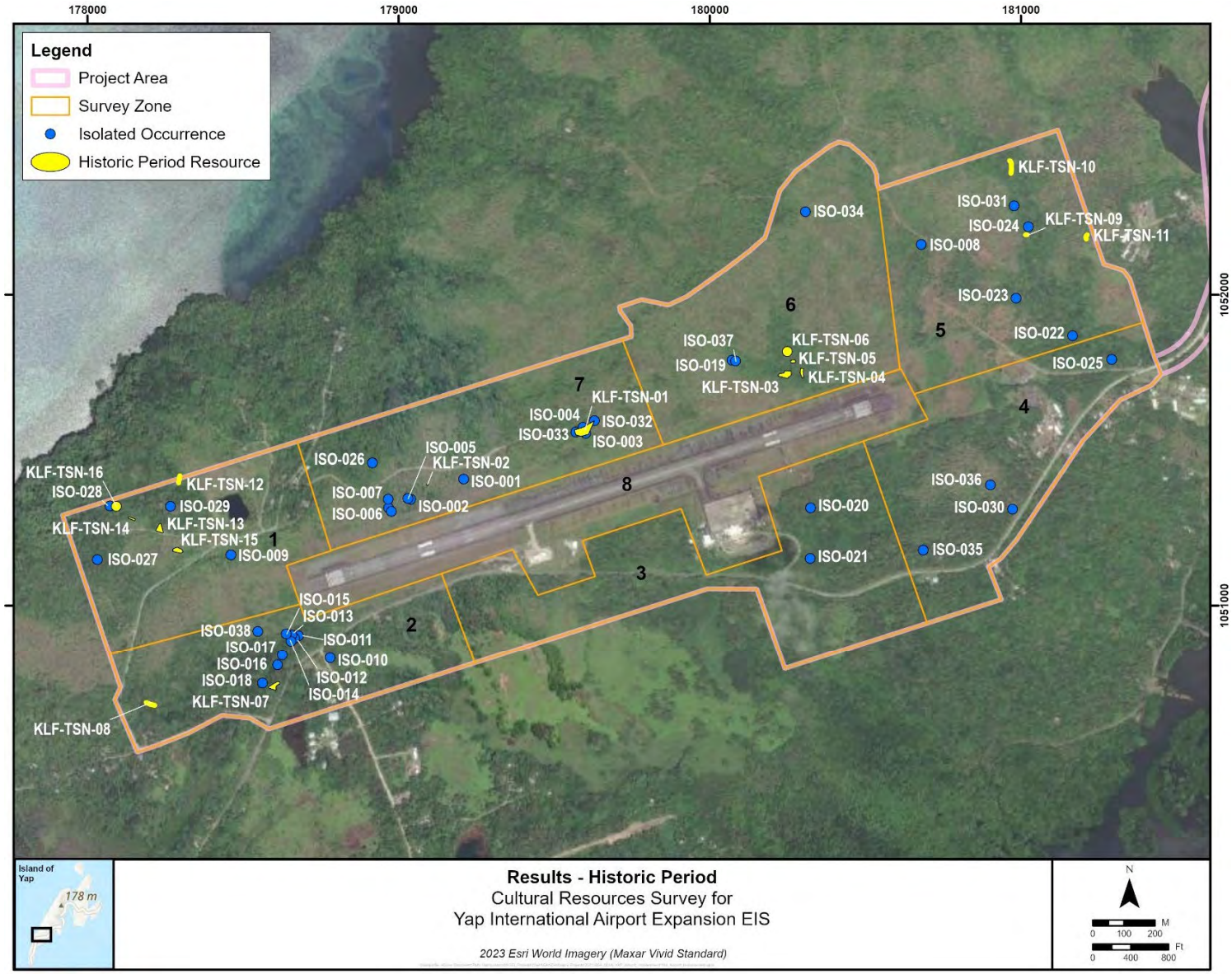


Figure 51. Historic Period sites and isolated occurrences recorded by KLF during the survey.

4.2.1 KLF-TSN-01, Japanese Defense Position

KLF-TSN-01 is a Japanese military World War II defense position on a ridgeline north of the airport in Survey Zone 7 (Figure). It was previously recorded by Kirch (1978:5–6) and covers an area about 300 meters east-west along the ridgeline and about 100 meters wide. The survey team encountered two standing coastal defense guns, over 100 partially buried metal barrels, machine parts, and a Japanese gravestone (Figure). Kirch's (1978) original recording included features not encountered during the current survey and likely removed, such as additional machinery parts and gravestones. This may be due to recent machine disturbance in the area as well as roadways that have been constructed through the area since its original recording over 40 years ago. Anti-aircraft gun remnants noted during Kirch's study were stamped with a date code of 1943, corresponding with a period of increased military defenses on the island. The defense position commands a view over the lowland hills and the old Japanese airfield to the south of the current runway.

4.2.2 KLF-TSN-02, Possible Japanese Prospect Pit

KLF-TSN-02 is a large pit measuring 15 meters in diameter and up to 2.5 meters deep (Figure). It was encountered in moderately dense vegetation on undulating terrain about 50 meters south of the airport access road in the northwest portion of the survey area in Survey Zone 7 (Figure). An excavated trench, measuring at least 5 meters long, 2 meters wide, and 2 meters deep, extends from the west side of the pit. Erosion and dense vegetation might have obscured the full extent of the excavated trench. No associated artifacts were encountered with the feature.

KLF-TSN-02 may be a Japanese bauxite prospect pit and trench from the 1937 to 1943 Japanese mining period on Yap. Alternatively, it may have supported an anti-aircraft gun and served as a defense position (Figure). Additional investigations, such as subsurface testing, in the area may help confirm the site's function and temporary/cultural association.

4.2.3 KLF-TSN-03, Bottle Scatter

KLF-TSN-03 is a concentration of over 30 Japanese glass beverage bottles scattered over a 25- by 45-meter area along a ridgeline overlooking a small stream in Survey Zone 6 (Figure). Kirin, Sakura, and Dai Nippon maker's marks were encountered on several of the bottles, while others were plain brown bottles with no markings (Figure). A clear glass beaker was also observed.

The bottles were generally noted as machine-made, beer and beverage bottles. The presence of Sakura and Dai Nippon bottles, which stopped being manufactured in 1943 and 1949, respectively (Ross 2009:9), indicates the bottle scatter is from the late Japanese Colonial to World War II Period.

4.2.4 KLF-TSN-04, Artifact Scatter

KLF-TSN-04 is a concentration of Japanese glass beverage bottles, a jar, ceramics, and a canteen in the northeast portion of the survey area in Survey Zone 6 (Figure and Figure). The artifact scatter was encountered in a recent bulldozer cut through the dense jungle that had scattered the artifacts across 35 meters. The scatter was likely more contained prior to this disturbance. Ceramic sherds from the northern extent of the bulldozer cut articulate with sherds from the southern extent of the scatter.

Figure 52. KLF-TS-01, Japanese coastal gun, view to northeast.

Figure 53. KLF-TS-02, possible Japanese prospecting pit, views to west (left) and south (right).

Figure 54. Japanese 75-millimeter anti-aircraft gun within excavated pit, 1945 (from http://www.missingaircrew.com/images/micr/index2.asp).

Figure 55. KLF-TS-03, bottle scatter.

Figure 56. KLF-TS-04, artifact scatter; canteen (left) and ceramics (right).

Ceramics observed in the artifact scatter consisted of three sherds of white earthenware and three pieces of blue on white painted earthenware fragments (Figure). Nineteen (19) glass bottles were encountered, including four aqua-colored glass bottles with no maker's marks, four colorless (clear) glass bottles with embossed *kanji*, two amber glass Dai Nippon Beer Company bottles, two green-colored and one amber-colored Sakura Beer bottles, two amber Kirin Beer bottles, an amber wine bottle, a single green-colored glass bottle with no identifying characteristics, a single seafoam-colored glass jar, and an amber bottle stopper with *kanji*. The presence of Sakura and Dai Nippon bottles, which stopped being manufactured in 1943 and 1949, respectively (Ross 2009:9), indicates the bottle scatter is from the late Japanese Colonial to World War II Period.

4.2.5 KLF-TSN-05, Japanese Prospecting Site

KLF-TSN-05 is a Japanese prospecting site in the northeast portion of the survey area in Survey Zone 6 (Figure and Figure). The site straddles a small east-west oriented stream (Figure). The west bank of the stream ascends rapidly up a small tail slope of a greenschist escarpment. An excavated tunnel is present about midway up the slope before the escarpment climbs vertically to the plateau above. The tunnel opening, part of which has collapsed, measures 0.4 by 1.1 meters and continues for at least 10 meters into the hillside. No artifacts were observed inside the tunnel, although it has likely flooded over time resulting in sediment accumulation that may have buried artifacts. Metal barrels are aligned in an arc in front of the pit (Figure). On the opposing, east side of the stream, there is a small (about 2- by 3-meter area) scatter of five Japanese glass beverage bottles, an old battery, and unidentified metal debris. Japanese glass beverage bottles included a single brown cork-top bottle with "GA/8" on the base, a small brown screw top bottle with "7308-A/6 2" on the base, a dark green bottle with "12" on the base, a broken green bottle with no identifying features, and miscellaneous broken and partially buried glass shards. Another excavated pit is located on the east side of the stream but is completely collapsed and eroded.

Several other excavated tunnels and small scatters of Japanese bottles and miscellaneous refuse were observed in this area. Most of the tunnels are partially collapsed and unsafe to enter.

KLF originally interpreted KLF-TSN-05 as a Japanese defense site, but the tunnel, originally interpreted as a defense cave, appeared much too unstable to serve as an adequate hideout. The tunnels and trenches in the laterite soils indicate Japanese bauxite prospecting, which occurred in the area from 1937 to 1943 (see Section 2.3.2.3). The arc of metal barrels, originally interpreted as a defensive wall often seen fronting Japanese defensive caves in Guam and other islands, may instead have functioned as a foundation platform or soil catchment in front of the prospecting pit. The west-facing bank appears to contain spoils from the nearby excavations which has partially buried the scatter of Japanese bottles and other refuse encountered there.

4.2.6 KLF-TSN-06, Artifact Scatter

KLF-TSN-06 is a Japanese World War II artifact scatter consisting of at least 10 whole glass beverage bottles and broken shards with some marine shell distributed over a 10- by 10-meter area (Figure). It is on a small knoll about 30 meters north of KLF-TSN-05 in Survey Zone 6 (Figure). Bottles consist of a single aqua-colored *sake* bottle, two medium-sized aqua bottles with no maker's marks, two small aqua-colored bottles with a "3" embossed on the bases, a single olive green bottle with a "B" embossed on the base, a single green bottle with a "13" embossed on the base, an amber-colored Dai Nippon Beer Company bottle, a slim amber bottle with "R. KONDO & CO/TOKYO" embossed on the side and a triangle embossed on the base, and a single amber Kirin Beer bottle with "KB" symbol embossed on the base. Marine shell included over 20 pieces of gastropods and bivalves. More artifacts may be present but buried under eroded sediments. The presence of beverage bottles and marine shell, which was likely harvested and eaten, indicates a small band of Japanese soldiers may have camped out in this area during World War II and represents a broader array of Japanese military activity in the area. In addition, the presence of Dai Nippon bottles, which stopped being manufactured in 1949 (Ross 2009:9), indicates the bottle scatter is from the late Japanese Colonial to World War II Period.

Figure 57. KLF-TS-05, Japanese prospecting site; cave escarpment overview (left) and metal barrels in front of pit (right).

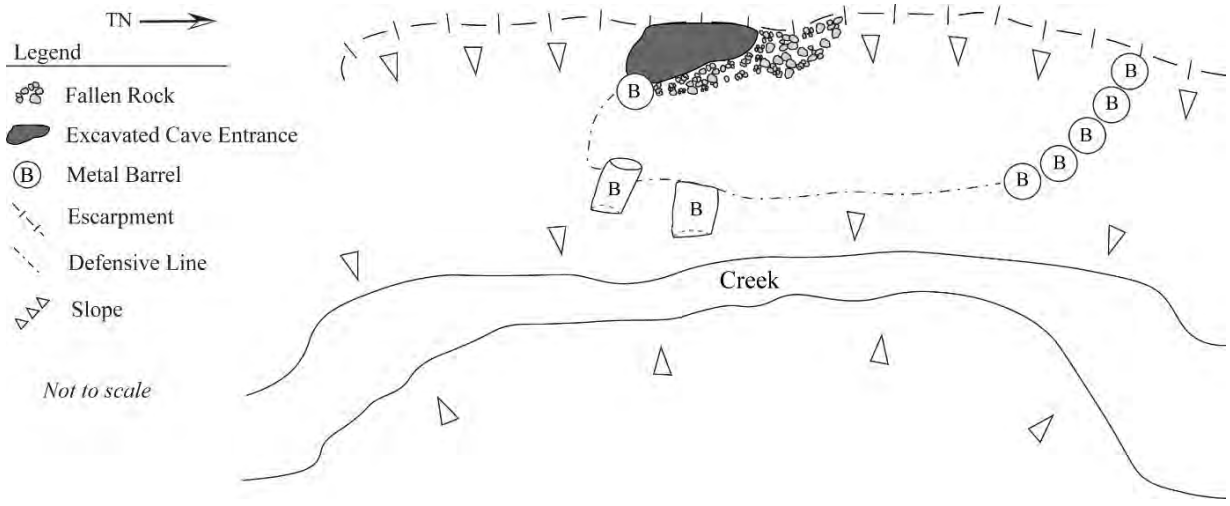


Figure 58. KLF-TSN-05 planview.

Figure 59. KLF-TS-06, artifact scatter; site overview (top), bottles (bottom left), and marine shells (bottom right).

4.2.7 KLF-TSN-07, Airplane Junkyard

KLF-TSN-07 is an airplane junkyard encountered in the southwest portion of the survey area in Survey Zone 2 (Figure). The site is bounded by a square-shaped earthen berm measuring 33 by 33 meters. The berm is 3.0 meters thick and 2.5 meters above the ground surface. The ground surface inside the berm-enclosed area appears to have been cleared and graded to construct the berm enclosure. Japanese military aircraft parts are distributed within the enclosure and include three aircraft tails, four engines, a fuel tank, and four wings, three of which have landing gear attached (Figure). The four wings all contain bullet holes on their surfaces. A bulldozer machine blade was also observed in the northwest corner of the enclosure.

The enclosure and junkyard may have been constructed by occupying U.S. forces after World War II or by the United States or Yapese government before the modern airport was constructed.

Figure 60. KLF-TS-07, airplane junkyard, views to north (left) and south (right).

4.2.8 KLF-TSN-08, Concrete Aqueduct

KLF-TSN-08 is a concrete aqueduct encountered in the southwest corner of the survey area in Survey Zone 2 (Figure and Figure). Only a 30-meter-long remnant of the aqueduct remains, most of which is collapsed and in poor condition. It is 70 centimeters wide and 85 centimeters above the ground. The interior of the aqueduct measures 50 centimeters wide by 50 centimeters deep. An earthen mound transects the aqueduct remnant on its southern end. The mound measures 15 meters long by 3.3 meters wide by 0.76 meter high.

No artifacts were encountered in the area. The aqueduct was potentially used for irrigation during the Japanese Colonial Period; further archaeological investigation would be needed to determine full temporal and cultural associations of the site.

4.2.9 KLF-TSN-09, Japanese Prospecting Site

KLF-TSN-09 is a Japanese prospecting site extending over a 26- by 30-meter area from east to west in the northeast portion of the survey area in Survey Zone 5 (Figure). The site includes an excavated tunnel, a modified stream bank, three glass bottles, and metal barrels (Figure). The excavated tunnel is partially collapsed, leaving a 3-meter-wide by 1-meter-deep opening. The tunnel appears to extend at least 3.5 meters into the hillside and was originally 10 or more meters long before it collapsed. The bottles encountered at the site include a Kirin Beer bottle, a forest-green bottle embossed with a “14” on the base, and an aqua bottle with a “1” embossed on its base. Additional artifacts may be present but buried under the collapsed tunnel.

KLF-TSN-09 is part of a moderate density of Japanese prospecting tunnels scattered across this portion of the project area. The prospecting mission may have been looking for bauxite, which was prospected in the area from 1937 to 1943 but never resulted in sufficient supply.

4.2.10 KLF-TSN-10, Japanese Prospecting Site

KLF-TSN-10 is a large (75 by 200 meter) Japanese prospecting site situated along a small stream in the northeast corner of Survey Zone 5; the site may extend outside the survey area (Figure). The site includes the remnants of an aqueduct or channel, two excavated pits with tunnels, and various other excavations and spoil mounds (Figure). Two of the pits were recorded in detail to illustrate the range of features present

Figure 61. KLF-TS-08, concrete aqueduct, views to east (left) and northwest (right).

Figure 62. KLF-TS-09, Japanese prospecting site; overview, view to west (left) and collapsed cave, view to west (right).

Figure 63. KLF-TS-10, Japanese prospecting site; trench, view to west (top left); collapsed pit, view to northwest (top right); and associated bottles overview (bottom).

at the site. Pit 1 is an almost completely collapsed pit, the current opening of which measures 1.65 by 2.25 meters across. A deep trench, about 40 meters long, extends out from the current pit opening and may represent the original tunnel length before collapse. Many of the excavated pits in this area have since collapsed due to the weak substrate in which they were excavated. Similarly, Pit 2 was situated at the end of an 8-meter-long trench measuring 2.25 meters wide by 1.5 meters deep. The trench may be the original tunnel that has since collapsed. The intact portion of the pit features an opening 1.4 by 1.7 meters across and extends a few meters into the hillside before taking a 90-degree turn to the south. This portion was not explored further due to safety concerns with the stability of the tunnel ceiling. Several glass beverage bottles and metal debris were encountered in the vicinity (Figure).

The site appears to be a Japanese prospecting site, with pits and trenches used to search for bauxite, which occurred in the current airport vicinity from 1937 to 1943 (see Section 2.3.2.3).

4.2.11 KLF-TSN-11, Japanese Defense Position

KLF-TSN-11 includes the remnants of a Japanese anti-aircraft gun mount, metal barrels, glass beverage bottles, and various metal debris (Figure). The site components are distributed over an area measuring 7 by 17 meters in the northeast portion of the survey area in Survey Zone 5 (Figure). The Japanese anti-aircraft mount was observed on top of 11 partially buried metal barrels that were just visible beneath the surface. Observed glass bottles include one short-neck amber colored bottle, a single seafoam-colored jar, a colorless rum bottle, and a thick piece of brown-colored bottle glass. An unknown metal mechanism, possibly a radiator or other associated piece of machinery, was observed approximately 2 meters from the gun stand.

Ground defenses on Yap during World War II included several 12.7-centimeter and 8-centimeter guns manned by the Japanese Navy guard and four 75-millimeter guns manned by Japanese Army units (Dunn 2006:7). Exact positions of these guns are unknown, but some appear to have been entrenched within the current project area.

4.2.12 KLF-TSN-12, Japanese Prospecting Site

KLF-TSN-12 is a Japanese prospecting site encountered in the northwest portion of the survey area and along the project area boundary in Survey Zone 1 (Figure). The site includes a collapsed tunnel, two earthen mounds, Kirin Beer bottle, and a metal cart rail (Figure). The tunnel was at least 10 meters long and may continue further into the hillside. The current entrance to the tunnel is 5.0 meters wide by 1.5 meters high. The two earthen mounds appear to be the spoils from the tunnel construction. The first mound sits in front of the now-collapsed tunnel opening and measures 2.5 by 4.0 meters across and 1.3 meters above the ground surface. The second mound is downslope from the first mound and measures 2.6 by 3.6 meters across and is 1.0 meter above the ground surface.

Aside from the Kirin Beer bottle and metal cart rail, no other artifacts were encountered in the site area. Additional artifacts may be buried under the tunnel collapse or long since collected by passersby (the site is within an agroforest currently maintained by the surrounding community).

Although collapsed, the tunnel appears similar to other Japanese prospecting tunnels and pits in the vicinity, which were using to mine for mineral ore, including bauxite, from 1937 to 1943.

Figure 64. KLF-TS-11, Japanese defensive position, views to east (left) and west (right).

Figure 65. KLF-TS-12, Japanese prospecting site, view to northeast.

4.2.13 KLF-TSN-13, Japanese Prospecting Site

KLF-TSN-013 is a Japanese prospecting site encountered in the northwest portion of the survey area on a ridgeline in Survey Zone 1 (Figure). The site includes a collapsed tunnel and trench, the remnants of an anti-aircraft gun, parts of a mining cart and associated rails, and an impact crater (Figure). The impact crater measures approximately 3.0 by 3.0 meters in size with a maximum depth of 1.0 meter. The partially collapsed tunnel measures 4.0 meters across with a height of 2.15 meters and a maximum cave depth of 1.5 meters. The associated trench runs north, downslope from the tunnel, and measures 6.25 meters in length, 1.0 meter across at its widest point, and has a maximum depth of 0.70 meter from the bottom of the trench to the surrounding ground surface.

The collapsed tunnel, trench, and mining cart remnants indicate this is a Japanese prospecting site, likely used to search for bauxite. The presence of the anti-aircraft gun suggests this site was used close to the termination of mining operations in 1943, when military activities increased in the region. Alternatively, it may have been repurposed as an anti-aircraft defense site during the U.S. air raids on the island in the summer of 1944.

Figure 66. KLF-TS-13, Japanese prospecting site, views to northeast (left) and south (right).

4.2.14 KLF-TSN-14, Excavated Pits

KLF-TSN-14 comprises two excavated pits on a terraced hillslope in the northwest corner of the survey area in Survey Zone 1 (Figure and Figure). The site covers a 6- by 22-meter area. Each depression measures 2.5 meters across and 1 to 2 meters deep. The sediment in the features appears to be excavated rather than dispersed by an impact (i.e., not an impact crater). The depressions seem too open and shallow to be prospecting pits and may be foxholes used by Japanese soldiers during World War II. No associated artifacts were encountered on the surface. Additional investigations, such as subsurface testing, in the area may help confirm the site's function and temporary/cultural association.

4.2.15 KLF-TSN-15, Japanese Defense Position

KLF-TSN-15 is a Japanese defense position recorded on a hilltop in the northwest portion of the survey area in Survey Zone 1 (Figure). Site components include an anti-aircraft gun within an excavated depression (Figure). The depression measures 3.0 meters across and is 2.0 meters deep. The gun stands 1.6 meters above the base of the depression. An excavated trench about 2.5 meters across by 1.7 meters deep extends from the side of the depression and continues downslope for about 10 meters before disappearing into the hillside. A small (50 centimeters thick by 30 centimeters tall) dry-stacked rock wall is constructed in front of the depression. The rocks from this wall were likely removed from nearby Traditional Yapese burial platforms, of which there are at least 10 burial features within 20 meters of the defense position. No associated artifacts were encountered within the site, although material may be buried under eroded sediment and dense vegetation.

The site appears to be one of the Japanese military's anti-aircraft positions during World War II, which were needed during U.S. air raids on the island in the summer of 1944. The lack of associated artifacts may indicate the gun was never used, or that artifacts have been collected from the area.

4.2.16 KLF-TSN-16, Japanese Prospecting Site

KLF-TSN-16 is a collapsed tunnel encountered in the northwest corner of the survey area in Survey Zone 1 (Figure). The intact portion of the tunnel entrance measures 1.3 meters across by 0.5 meter high (Figure). An 8.0-meter-long by 1.4-meter-wide trench extends from the entrance of the tunnel. The trench is 1.5 meters deep. While no associated artifacts were encountered in the area, the collapsed tunnel appears similar to other excavated tunnels recorded in the survey area and is likely associated with Japanese bauxite prospecting in the area from 1937 to 1943.

Figure 67. KLF-TS-14, excavated pits, views to east (left) and northwest (right).

Figure 68. KLF-TS-15, Japanese defense position, view to northwest.

Figure 69. KLF-TS-16, Japanese prospecting site, tunnel entrance, view to southeast.

4.2.17 Discussion

The 16 historical sites recorded during the survey generally seem to date to an eight-year period (1937–1944) from the end of Japanese colonialism to the height of military activities during World War II. Seven recorded sites (KLF-TSN-02, -05, -09, -10, -12, -13, and -16) are associated with the Japanese government's efforts to prospect for mineral ore on the island from 1937 to 1943. The excavated pits, tunnels, and trenches encountered in the survey area with Japanese beverage bottles, metal barrels, remnants of mining carts, and various metal debris appear to be related to the specific search for bauxite, which was eventually abandoned due to the minimal presence of bauxite and high silica content (see Section 2.3.2.3). Additional historical sites recorded during the survey may also be related to Japanese prospecting activities in the survey area, such as KLF-TSN-03, -04, -06, and -14, but further archaeological investigation would be needed to determine the temporal range of these sites.

Japanese military defense also occurred in the survey area during the World War II Period, as evidenced by anti-aircraft mounts and other remnants of military activity (KLF-TSN-01, 02, -11, -13, -15); however, these sites only occur intermittently. Military fortifications on Yap appear to have been minimal, as the Japanese military focused on defending other Micronesian islands.

Although never invaded by U.S. ground troops, Yap sustained considerable impact from U.S. air raids in the summer of 1944, as evidenced by the numerous small depressions or impact craters encountered throughout the survey area. Further evidence of military activity consists of isolated artifacts and occurrences, such as aircraft parts, gun mounts, and small bottle scatters.

4.3 ISOLATED OCCURRENCES

Thirty-eight (38) isolated occurrences were recorded throughout the survey area, all dating to the 20th century. These comprise isolated artifacts or occurrences (i.e., less than 10 artifacts in a square meter radius), such as World War II impact craters, military equipment, mining equipment, and isolated to small concentrations of artifacts and other refuse. These are listed in Table 10, shown on Figure , and summarized below.

4.3.1 World War II Impact Craters

Numerous earthen pits or circular depressions were encountered throughout the survey area. Seventeen (17) of these were GPS-recorded as a representative sample (ISO-001, -002, -004, -006, -009, -011 through -019, -022, -025, and -035) (Figure ; Table 10). Most of the depressions were encountered in Survey Zones 2 and 7, although depressions were still observed in Survey Zones 1 and 4–6. The pits range in size from 4 to 15 meters in diameter and are 1 to 3 meters deep.

These are likely impact craters from bombs dropped during U.S. air raids during the summer of 1944 (Figure). U.S air raids targeted the Japanese airfield further south of the project area, although bombs often missed the target and impacted the broader area, as seen in Figure 10 in Section 2.3.2.5. While World War II bomb impacts are the likely origin of most of these pits, other possible associations cannot exclusively be ruled out. Some pits, for example, may be associated with 20th century Japanese prospecting or Traditional food fermentation pits. Further investigation would be needed to confirm the origin and association of each pit.

4.3.2 World War II Military Equipment

Five occurrences of World War II military equipment were observed during the survey within Survey Zones 2, 3, and 7 (Figure ; Table 10). These include isolated remnants of Japanese military gun mounts and tripods (ISO-003, -010, and -020), an airplane engine (ISO-005), and a small concentration of various airplane components (ISO-007).

Further study may be able to identify the temporal and cultural association of the airplane engine and components. Both were heavily corroded and damaged. It is unclear if they are associated with United States or Japanese World War II aircraft or with more recent airport operations, including dumping of old parts.

The gun remnants speak to Japanese anti-aircraft defenses during World War II U.S. air raids on the island. It is unclear, however, if these occurrences indicate the original position of the associated gun or if they have been moved over time (e.g., ISO-010, mobile mount).

4.3.3 Japanese Mining Equipment

The field team observed five isolated occurrences of Japanese mining equipment during the survey within Survey Zones 4, 5, and 7, including metal machinery (ISO-023), metal rails (ISO-030), metal picks (ISO-031), isolated metal drums (ISO-032 and -033), and a concrete aqueduct remnant (ISO-038) (Figure ; Table 10).

Table 10. Isolated Occurrences Recorded During Survey

ISO. No.	Type	Description	Estimated Age
ISO-001	Impact crater	Circular depression (N=1); 10-meter diameter by 2.0 meters deep	World War II Period
ISO-002	Impact crater	Circular depression (N=1); 15-meter diameter by 2.5 meters deep	World War II Period
ISO-003	Anti-aircraft gun mount	Gun stand and mount; stand is 2.0 meters wide by 1.5 meters tall, base diameter is 1.6 meters	World War II Period
ISO-004	Impact crater	Circular depression (N=1); 15-meter diameter by 1.5 meters deep	World War II Period
ISO-005	Aircraft engine housing	Heavily damaged housing for aircraft engine (N=1); 0.9-meter diameter by 1.2 meters tall	Possible World War II Period
ISO-006	Impact craters	Circular depressions (N=2); 8.0-meter diameter by 1.5 meters deep and 15-meter diameter by at least 2.0 meters deep	World War II Period
ISO-007	Aircraft components	Unidentifiable aircraft debris; scattered over 2.0-meter x 4.0-meter area	World War II Period
ISO-008	Glass bottle	Large aqua-colored glass bottle (N=1)	Japanese Colonial to World War II Period
ISO-009	Impact crater	Circular depression (N=1); 4.0-meter diameter by 1.1 meters deep	World War II Period
ISO-010	Anti-aircraft mount	Mobile tripod gun mount (N=1)	World War II Period
ISO-011	Impact crater	Circular depression (N=1); 6.0-meter diameter by 1.6 meters deep	World War II Period
ISO-012	Impact crater	Circular depression (N=1); 5.0-meter diameter by 1.4 meters deep	World War II Period
ISO-013	Impact crater	Circular depression (N=1); 6.0-meter diameter by 1.5 meters deep	World War II Period
ISO-014	Impact crater	Multiple connecting circular depressions; 10.7 meters north-south by 6.9 meters east-west by 1.6 meters deep	World War II Period
ISO-015	Impact crater	Circular depression (N=1); 6.6-meter diameter by 2.2 meters deep	World War II Period
ISO-016	Impact crater	Circular depression (N=1); 8.0-meter diameter by 2.5 meters deep	World War II Period
ISO-017	Impact crater	Circular depression (N=1); 6.6-meter diameter by 1.7 meters deep	World War II Period
ISO-018	Impact crater	Circular depression (N=1); 8.0-meter diameter by 3.0 meters deep	World War II Period
ISO-019	Impact crater	Circular depression (N=1); 7.0-meter diameter by 2.0 meters deep	World War II Period

Table 10 (cont.)

ISO. No.	Type	Description	Estimated Age
ISO-020	Anti-aircraft gun mount	Anti-aircraft gun mound (N=1)	World War II Period
ISO-021	Glass bottle	Aqua-colored glass bottle (N=1)	Japanese Colonial to World War II Period
ISO-022	Impact crater	Circular depression (N=1); 6.0-meter diameter by 2.5 meters deep	World War II Period
ISO-023	Machine parts	Various metal machinery parts	Japanese Colonial to World War II Period
ISO-024	Glass bottle	Aqua-colored glass bottle (N=1)	Japanese Colonial to World War II Period
ISO-025	Impact craters	Circular depressions (N=2); 5.3-meter diameter by 1.7 meters deep and 6.3-meter diameter by 2.2 meters deep	World War II Period
ISO-026	Glass bottles	Akadama port wine (N=1), green-colored *sake* bottle (N=1), large seafoam-colored *sake* bottle (N=1), and Sakura Beer bottles (N=2)	Japanese Colonial to World War II Period
ISO-027	Glass bottle	Amber-colored Kabuto Beer bottle (N=1)	Japanese Colonial to World War II Period
ISO-028	Glass bottles and ceramic	Whiteware ceramic cup (N=1) and Dai Nippon Beer bottles (N=2)	Japanese Colonial to World War II Period
ISO-029	Glass bottle	Aqua-colored *sake* bottle (N=1)	Japanese Colonial to World War II Period
ISO-030	Metal rails	Metal mining rails	Japanese Colonial to World War II Period
ISO-031	Pickaxes	Metal pickaxes	Japanese Colonial to World War II Period
ISO-032	Metal barrels	Partially buried metal barrels (N=3)	Japanese Colonial to World War II Period
ISO-033	Metal barrel	Partially buried metal barrel (N=1)	Japanese Colonial to World War II Period
ISO-034	Glass bottle	Brown-colored glass bottle with “46” on base (N=1)	Japanese Colonial to World War II Period
ISO-035	Impact crater	Circular depressions (N=2); 6.0-meter diameter by 1.5 meters deep	World War II Period
ISO-036	Glass bottle	Brown-colored glass bottles (N=2)	Japanese Colonial to World War II Period
ISO-037	Glass bottles	Brown-colored glass bottles (N=5)	Japanese Colonial to World War II Period
ISO-038	Concrete aqueduct	Remnant of a concrete aqueduct (N=1)	Japanese Colonial to World War II Period

Figure 70. Example of World War II impact crater (ISO-012).

Figure 71. Bomb crater on Yap in 1965 (photograph by Lowell Boothe, from http://www.missingaircrew.com/yap.asp).

Figure 72. Example of World War II military equipment, various metal machine parts (ISO-023).

Figure 73. Example of Japanese mining equipment, metal rails (ISO-030).

Some of these were observed outside of but in the general proximity of recorded Japanese prospecting sites (see Section 4.2) and match objects observed near prospecting pits and tunnels around the survey area. Japanese prospecting occurred on Yap from about 1937 to 1943, and bauxite was the likely mineral searched for in the project area.

4.3.4 Isolated Bottles and Ceramics

Isolated Japanese glass beverage bottles were observed throughout the survey area and were too numerous to individually record during the survey. Ten instances of small, non-site associated scatters and isolated bottles were recorded as representative examples from Survey Zones 1 and 3–7: ISO-008, -021, -024, -026 through -029, -034, -036, and -037 (Figure ; Table 10). Bottle types include large aqua-colored *sake* bottles, seafoam- and green-colored *sake* bottles, brown-colored beer bottles, a port wine bottle, and numerous other unmarked beverage bottles. Manufacturers include Sakura Beer Company, Dai Nippon Beer Company, Kabuto Beer, Kirin Beer, and Akadama.

Isolated ceramics were rarely observed. ISO-028 is one example of a blue-and-white whiteware cup (Figure). No manufacturing details were evident on the cup. It was observed with two Dai Nippon Beer bottles.

Figure 74. Example of isolated Japanese glass bottles (ISO-026, left) and isolated ceramics (ISO-028, right).

4.4 Supplemental In-Fill Survey Results (2025)

In 2025, the U.S. Air Force Installation and Mission Support Center (AFIMSC) Detachment 2 conducted a supplemental in-fill cultural resources survey to document previously unrecorded or under-represented cultural features within five designated zones totaling approximately 369 acres. The purpose of the in-fill effort was to obtain accurate GPS data for all traditional and modern graves, traditional Yapese structures and features, historic-period remains, artifacts, and World War II bomb craters. All features were recorded using the AFIMSC Det 2 classification schema described in Section 3.6, ensuring standardized identifiers, attribute fields, and symbology across the dataset.

Survey Coverage

Zone	Location / Description	Acreage Surveyed
1	Additional Laydown Area	16 acres (plus two unsurveyed sub-areas totaling 38.91 acres)
2	Potential Life Support Area	47 Acres
3	East and Southeast Runway Extensions	250.5 acres (199 + 51.5)
4	West Runway Extension	89 acres (78 inside / 11 outside boundary)
5	North and Northwest of Runway	37 acres (19 + 18)

Zone Results

Zone 1 – Additional Laydown Area

Sixteen acres were surveyed in the northern and southern sections of the area. The northern portion comprised a young, navigable jungle; the southern savanna was densely overgrown and largely impassable without mechanical clearing. Recorded features included one large taro patch, one World War II anti-aircraft (AA) gun, and two Japanese Zero aircraft wrecks. Two adjacent laydown areas (38.91 acres) remained unsurveyed because of dense vegetation and access constraints; local officials and landowners confirmed no known cultural resources within those tracts. The findings demonstrate both traditional subsistence use and preserved World War II features, highlighting the multi-period importance of this location.

Figure 75: Additional Laydown Area

Figure 76: Japanese Zero Plane

Figure 77: Japanese Zero Plane

Figure 78: Japanese AA Gun

Zone 2 – Potential Useable Area

Approximately 47 acres were surveyed under favorable conditions in open jungle. Documented features include 22 traditional Yapese low-rubble graves, seven World War II bomb craters, and one large Japanese revetment. The concentration of mortuary features corresponds with earlier observations that low-rubble graves are often under-represented in reconnaissance surveys, emphasizing the cultural sensitivity of this zone.

Figure 79: Potential Useable Area

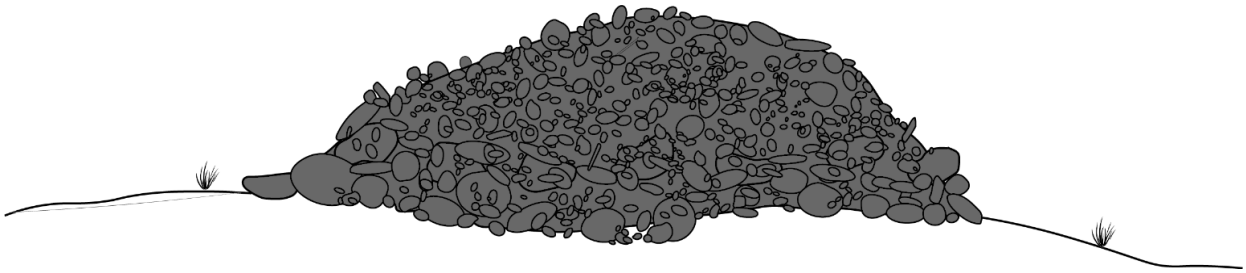


Figure 80: Representative Yapese grave form (low-rubble), Zone 2, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

Zone 3 – East and Southeast of the Runway

Two areas (199 acres east of the runway and 51.5 acres southeast) were surveyed for a combined 250.5 acres. Terrain ranged from sloped in the east to relatively flat in the southeast. Three local guides, including Yap Historic Preservation Office representatives, accompanied the field teams. Recorded resources include 24 low-rubble graves; two one-tier, six two-tier, two three-tier, and one five-tier platform graves; one grave of undetermined tier; four traditional structures; a porcelain rim sherd; and three World War II artifacts (a radio, an electric motor component, and vehicle wreckage). Findings demonstrate a diverse range of Yapese mortuary architecture and co-located historic features indicative of long-term landscape use.

Figure 81: East Runway Extension Area

Figure 82: Southeast of Runway

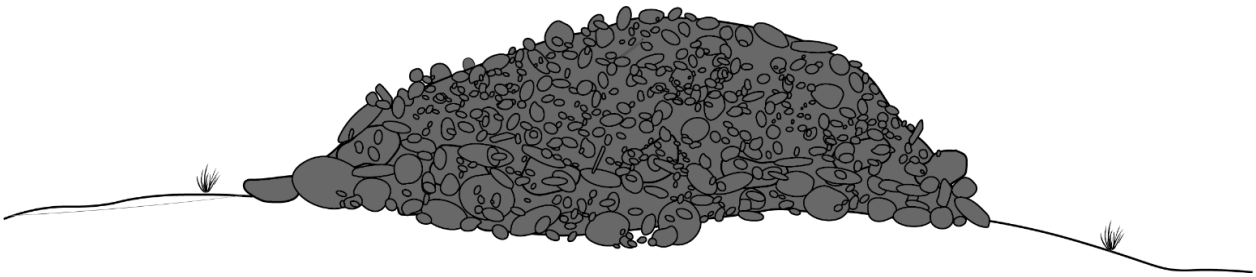


Figure 83: Representative Yapese grave form (low-rubble), Zone 3, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

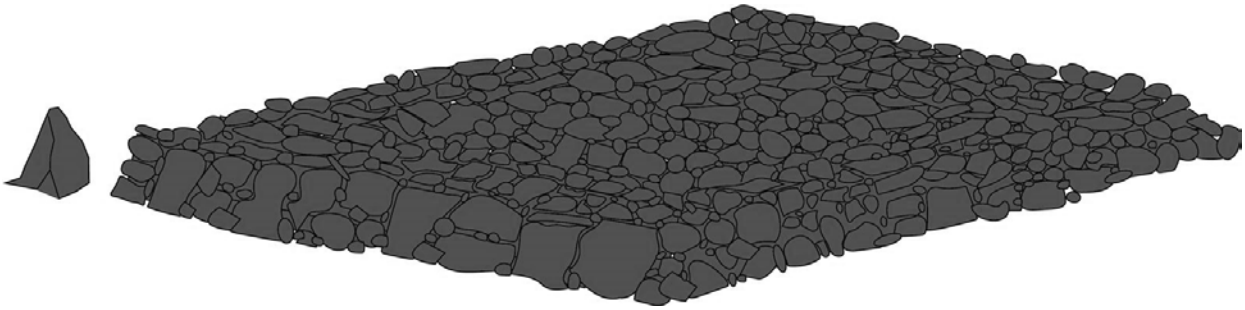


Figure 84: Representative Yapese grave form (one-tier), Zone 3, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

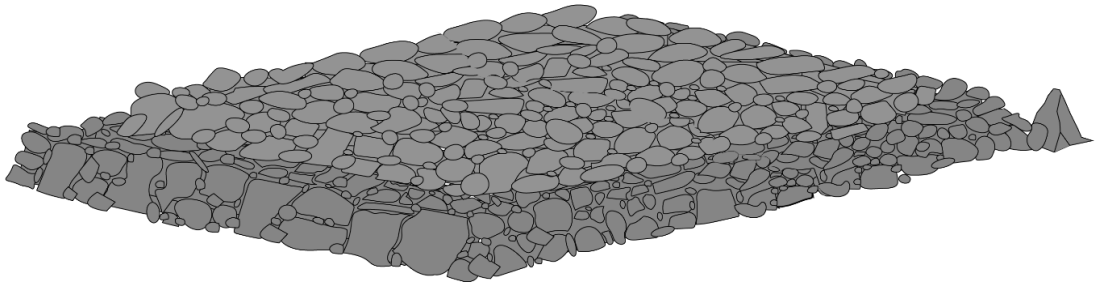


Figure 85: Representative Yapese grave form (two-tier), Zone 3, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

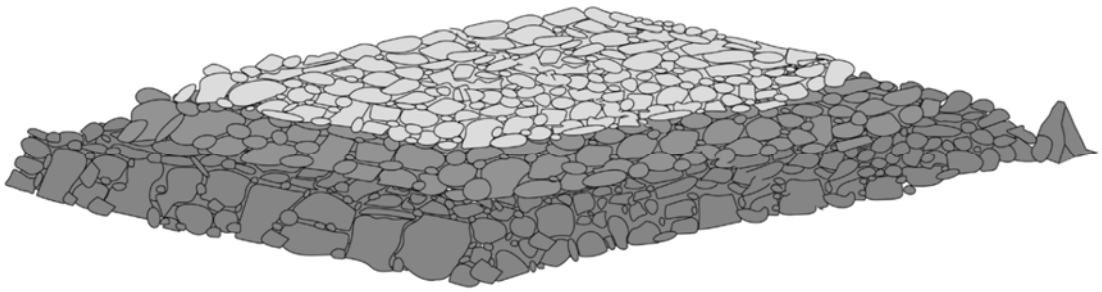


Figure 86: Representative Yapese grave form (three-tier), Zone 3, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

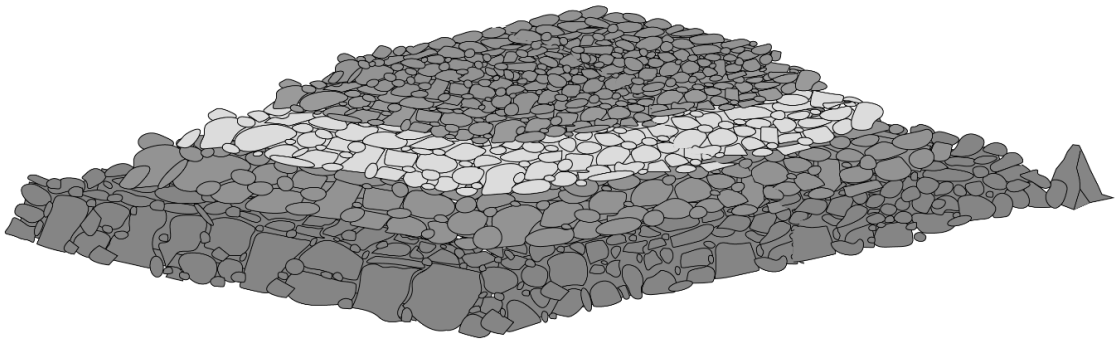


Figure 87: Representative Yapese grave form (five-tier), Zone 3, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

Zone 4 – West Runway Extension

Eighty-nine acres were surveyed (78 inside the project boundary and 11 outside). Vegetation density varied from light in the outer area to thick in the interior. Recorded features include seven low-rubble graves, two one-tier, five two-tier, and two five-tier graves; two traditional structures (one with a rai stone); two Japanese revetments; seven aircraft wrecks; one metal fragment (possibly from a mounted machine gun); and 22 bomb craters. The assemblage illustrates the close association of traditional mortuary features with World War II remains, demonstrating both cultural continuity and later military modification of the landscape.

Figure 88: West Runway Extension Area

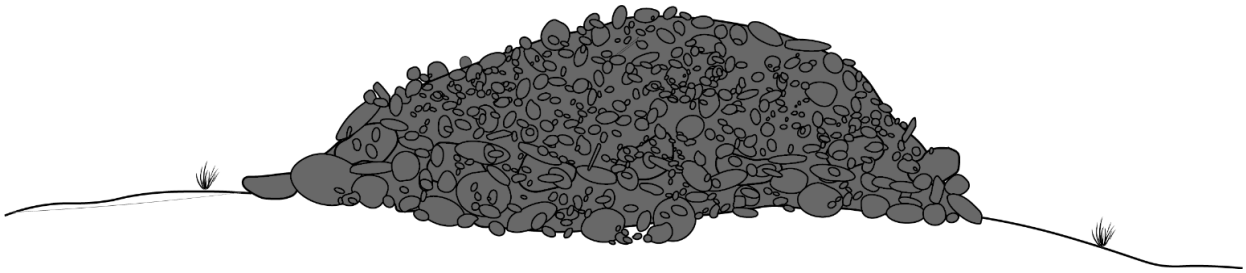


Figure 89: Representative Yapese grave form (low-rubble), Zone 4, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

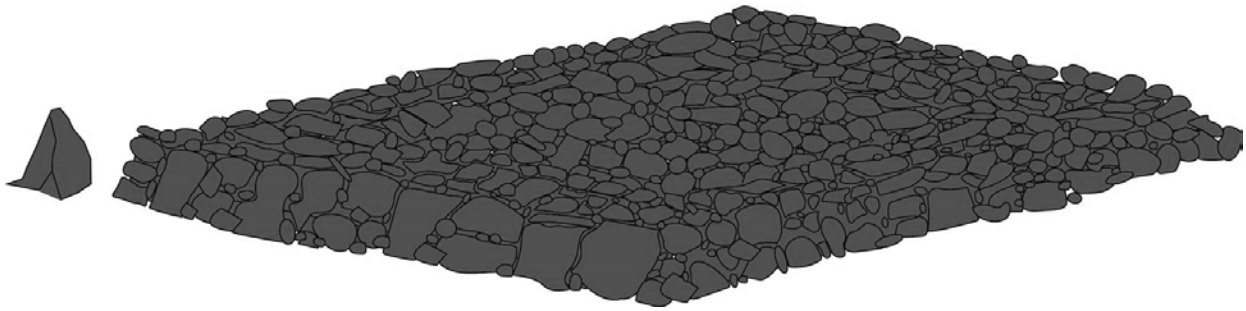


Figure 90: Representative Yapese grave form (one-tier), Zone 4, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

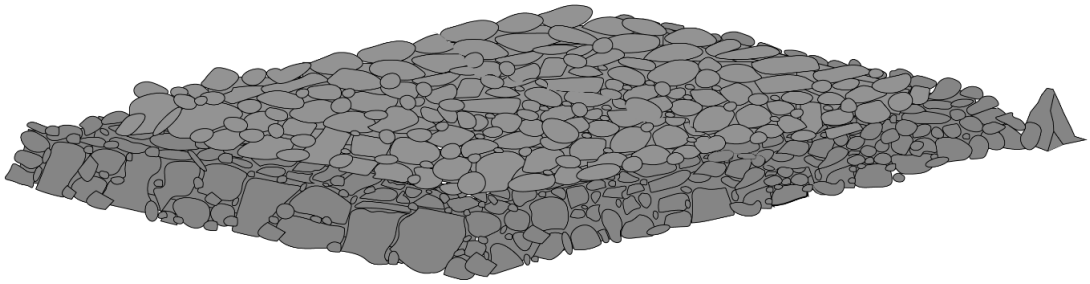


Figure 91: Representative Yapese grave form (two-tier), Zone 4, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

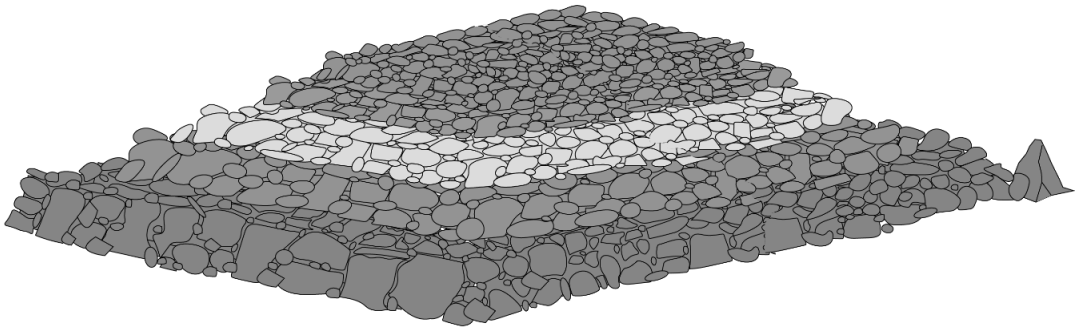


Figure 92: Representative Yapese grave form (five-tier), Zone 4, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

Zone 5 – North and Northwest of the Runway

Thirty-seven acres were surveyed (19 northwest and 18 north). Vegetation density and weather conditions varied, with most findings concentrated north of the former fence line on terraced slopes. Documented resources include 50 low-rubble graves; eight one-tier, 12 two-tier, six three-tier, and four four-tier graves; 13 graves of undetermined tier; one traditional structure; two low rock alignment walls; two aircraft wrecks; two AA gun emplacements; and six bomb craters. Zone 5 contains the highest concentration of traditional Yapese mortuary features documented during the survey and is considered a zone of exceptional cultural and historical sensitivity.

Figure 93: Northwest of the Runway

Figure 94: North of Runway

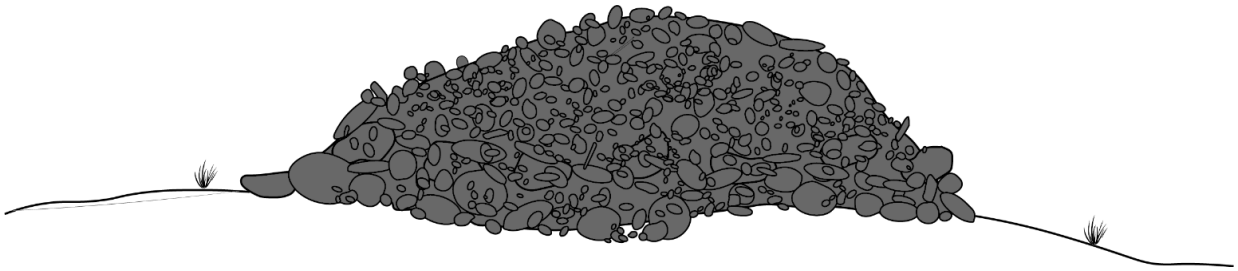


Figure 95: Representative Yapese grave form (low-rubble), Zone 5, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

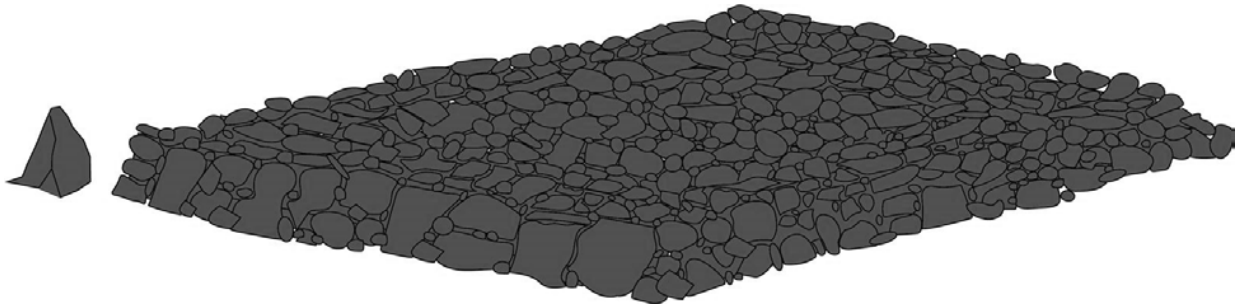


Figure 96: Representative Yapese grave form (one-tier), Zone 5, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

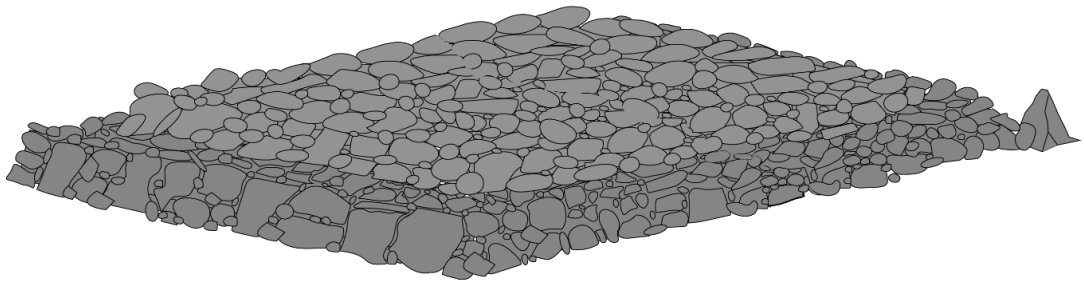


Figure 97: Representative Yapese grave form (two-tier), Zone 5, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

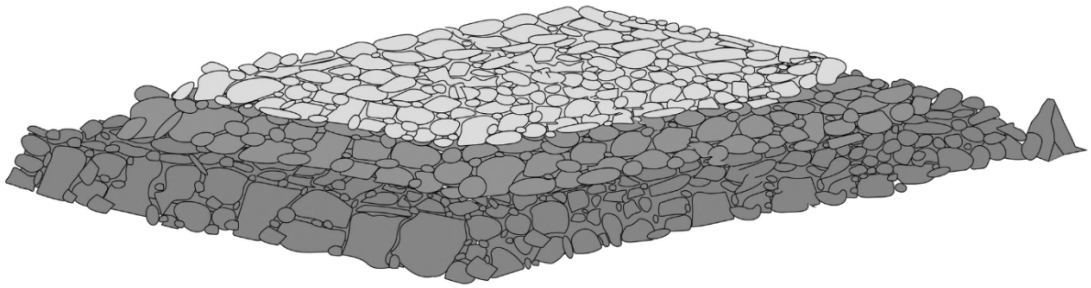


Figure 98: Representative Yapese grave form (three-tier), Zone 5, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

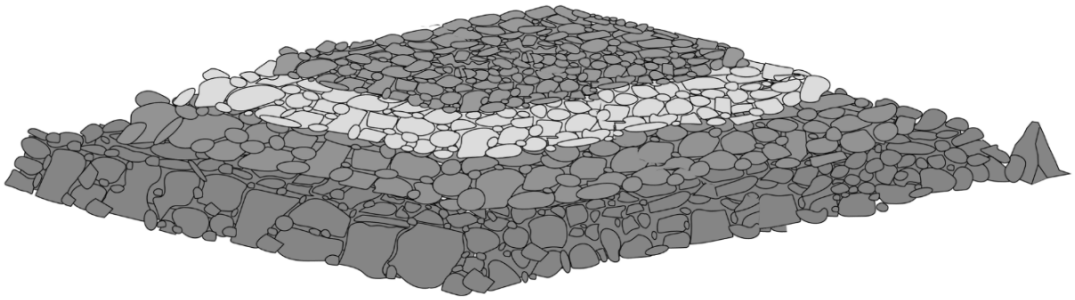


Figure 99: Representative Yapese grave form (four-tier), Zone 5, Yap International Airport, Yap State. (Diagram is illustrative and not a depiction of an actual grave recorded in the project area)

Summary of Findings (All Zones)

Category	Type	Count
Traditional Yapese Graves	***Low Rubble***	***103***
	One-tier	***12***
	Two-tier	***23***
	Three-tier	***8***
	Four-tier	***4***
	Five-tier	***3***

	Undetermined tier	***14***
Total Graves		***167***
Traditional Yapese Structures	***Structures***	***6***
	With rai stone	***1***
	Rock alignment walls	***2***
Total Structures		***9***
World War II Features	***Aircraft wrecks***	***12***
	AA gun emplacements	***3***
	Japanese revetments	***3***
	Bomb craters	***35***
	Other artifacts (radio, motor, vehicle wreckage, metal fragment)	***4***
Total WWII Features		***57***
Other Cultural Material	***Porcelain rim sherd***	***1***
	Taro patch	***1***

Across the 369 acres surveyed, the AFIMSC Det 2 team documented 167 traditional Yapese graves, nine traditional structures, and 57 World War II features. These results underscore the combined cultural and historical sensitivity of the project area and demonstrate the continuing interaction between Yapese heritage landscapes and 20th-century military remains. The findings provide a comprehensive spatial baseline for future management, avoidance, and mitigation planning within the airport project area.

The supplemental in-fill survey substantially enhances the spatial resolution and contextual understanding of the Yap International Airport cultural landscape. By systematically documenting both Traditional Yapese mortuary features and World War II-period remains, the 2025 investigation provides a more complete dataset to support management decisions, avoidance planning, and consultation with the Yap State Historic Preservation Office and other stakeholders. The integrated results from the 2024 Kleinfelder and 2025 AFIMSC Det 2 surveys collectively form the most comprehensive record of cultural resources within the airport project area to date. These findings form the analytical foundation for the evaluations and management recommendations presented in Section 5.0.

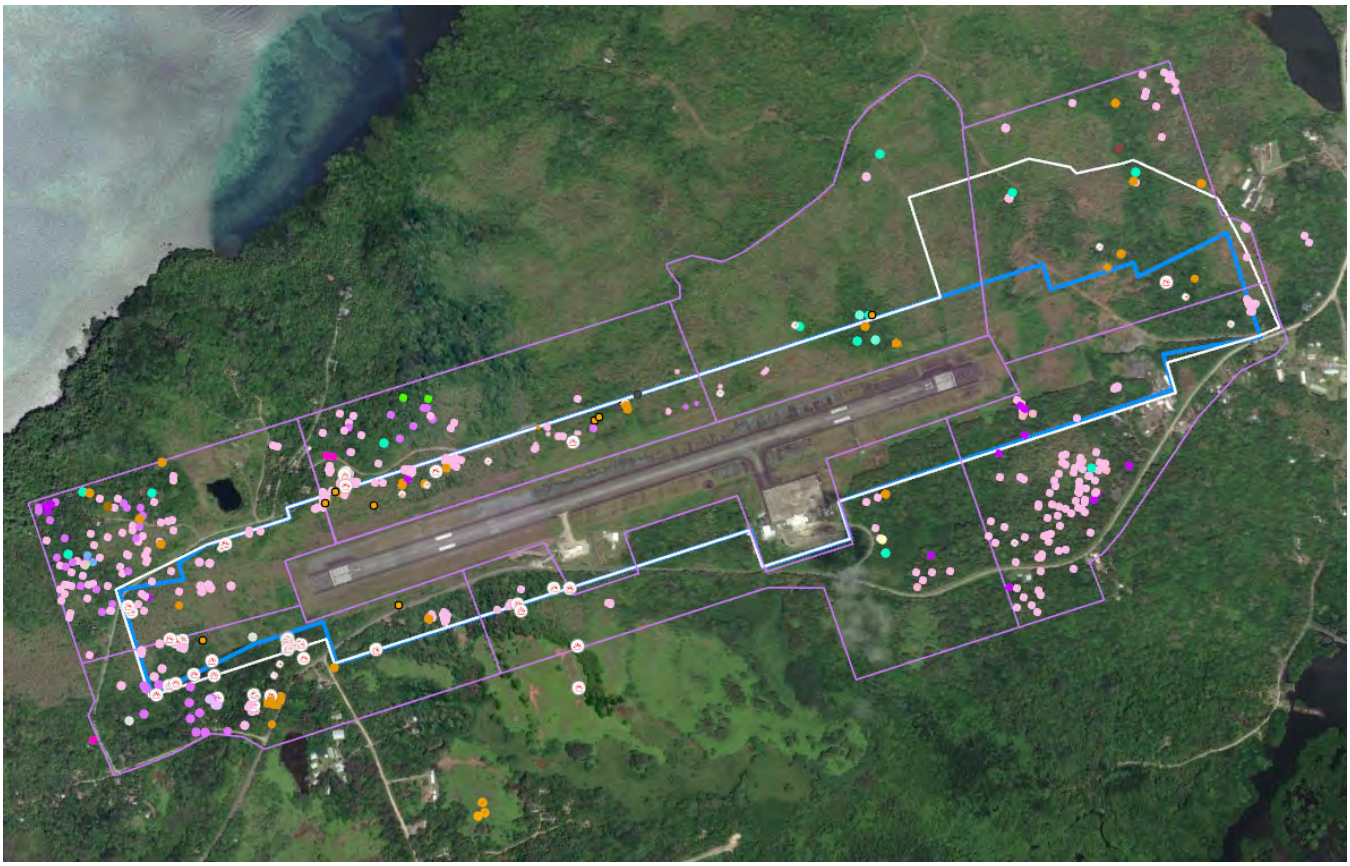


Figure 100: Results from the combined cultural resources surveys conducted around Yap International Airport.

5 CONCLUSION AND RECOMMENDATIONS

This report presents the results of cultural resources surveys conducted for the Yap International Airport Improvement Project in Federated States of Micronesia (FSM). These surveys, carried out by Kleinfelder, Inc. (KLF) in 2024 and AFIMSC Det 2 in 2025, were conducted to support the Environmental Impact Statement (EIS) for the proposed airport improvement project. The primary objective was to assess the presence the potential for cultural resources within the project area, which will inform planning and mitigation efforts.

The surveys were performed in two phases:

1. Background research
2. Field survey and documentation
3. Synthesis of findings and recommendations

Key Findings

The surveys resulted in the identification of an extensively modified cultural landscape associated with Traditional Yapese mortuary practices and World War II-era features. The area represents a multi-period

cultural landscape that includes:

- Traditional Yapese mortuary zones: These features remain culturally significant and continue to reflect Yapese burial and ceremonial traditions that persist today.
- World War II-era sites: These sites, while historically relevant, are largely eroded, and their contribution to our understanding of military activities in Yap is limited.

Site Complexes and Spatial Analysis

Both surveys documented numerous Traditional Yapese graves, structures, and World War II remains. The combined surveys cover an area of 919 acres, with 389 acres surveyed by AFIMSC Det 2 to address gaps in the original KLF dataset. Notably, AFIMSC Det 2 resurveyed identified grave features and structures to refine the spatial precision of the cultural inventory.

The surveys have contributed to a more comprehensive understanding of the Traditional Yapese settlement pattern, which includes the previously underdocumented upland mortuary zone.

Recommendations

Based on the results of both surveys, the following recommendations are made to ensure the protection and management of identified cultural resources:

5.1 Traditional Yapese Site Complexes

The Traditional Yapese site complexes recorded during the surveys are integral to understanding Yapese cultural heritage. These complexes represent both cultural and natural resources that continue to connect the Yapese community to their ancestral lands. Given the significant potential for human skeletal remains within the mortuary zones, it is crucial that:

- Future construction or ground-disturbing activities near these zones incorporate avoidance buffers, archaeological monitoring, and consultation with the Yap State Historic Preservation Office (HPO) and local leadership. Where avoidance is not feasible, efforts should be made to minimize and mitigate impacts to the cultural resources in accordance with established guidelines.
- Archaeological excavation should be considered to further assess soil preservation and the presence of human remains, particularly in areas where graves are suspected to be impacted by soil acidity.

5.2 World War II and Japanese Colonial Sites

The 16 World War II and Japanese Colonial sites identified in the survey contribute valuable historical context to the region's 20th-century history. However, due to erosion and the collapsed state of many of these features, they offer limited information for historical analysis. The following is recommended:

- Additional documentation may be necessary for certain sites where physical remnants remain, but these are not expected to provide significant new insights into Japanese defense or prospecting activities.
- While these sites are of historical interest, they do not appear to hold significant archaeological value in their current form. However, continued monitoring and protection efforts should be made during future construction, especially for features like bomb craters and aircraft wrecks.

5.3 Supplemental In-Fill Survey Conclusion (2025)

In alignment with the recommendations for future research, the 2025 AFIMSC Det 2 in-fill survey was conducted to supplement the 2024 KLF survey and verify previously documented features. This effort significantly enhanced the spatial accuracy and completeness of the cultural resource inventory for Yap International Airport project area. The survey confirmed the presence of both Traditional Yapese mortuary zones and World War II-era sites, further solidifying the multi-period importance of this landscape.

The in-fill survey also provided an opportunity to refine the classification and spatial distribution of the Yapese graves, particularly the multi-tiered platform graves, ensuring that the final dataset is comprehensive and accurate for cultural resource management and mitigation planning.

5.4 Future Research and Monitoring

To continue building on these findings, the following research and monitoring efforts are recommended:

- Ethnoarchaeological research: Further studies on Yapese mortuary practices, including ethnographic interviews with community members responsible for maintaining the taliw (cemetery) complexes, would contribute to understanding how these practices align with archaeological feature types.
- Mapping and recording of taliw complexes (cemeteries) should be undertaken to document spatial patterns and features that have yet to be fully explored in the archaeological literature.
- Excavation at key sites, with the community's permission, could help refine our understanding of the malang (burials) and mortuary features within the project area.

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