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RESTRICTED

ALLIED GEOGRAPHICAL SECTION

Southwest Pacific Area

TERRAIN HANDBOOK 57

JOLO GROUP

(Philippine Series)

IMPORTANT

a. This document contains information of value to the enemy.

b. It will be destroyed if in danger of falling into enemy hands.

12 FEBRUARY 1945

RESTRICTED

ALLIED GEOGRAPHICAL SECTION

Southwest Pacific Area

Allied forces.

TERRAIN HANDBOOK 57

JOLO GROUP

(Philippine Series)

12 FEBRUARY 1945

General Headquarters,
Southwest Pacific Area,
12 February 1945.

This Handbook contains geographical information on Jolo Group as defined in the Orientation Map.

It is intended to provide basic topographical information of military interest for the use of officers in forward areas.

The maps included are intended as guides only, to be used in conjunction with operational maps.

By command of General MacARTHUR.

R. K. SUTHERLAND,
Lieutenant General, U.S.A.,
Chief of Staff.

Official:

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Brigadier General, G.S.C.,
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As different reductions have been used in the printing of vertical photographs, elevations and focal lengths of photographs cannot be used to determine the scale. Approximate graphic scales are inset on each picture.

MAPS

JOLO GROUP
(P1 Series)

SECTION 1

INTRODUCTION AND GENERAL DESCRIPTION

1. LOCATION AND BOUNDARIES (See Orientation Map):

Area described in this Handbook is Jolo I and satellite islands which lie between 5° 46′ N and 6° 16′ N, and 120° 44′ E and 121° 30′ E.

2. GENERAL DESCRIPTION:

Jolo Group lies approx halfway between Zamboanga Pen (Mindanao) and Borneo. Jolo I, largest island in the Sulu Archipelago, is of volcanic origin as are some of the smaller off-lying islands. Other satellites are of coral formation.

Jolo I is 345 sq mls in area; E/W is approx 40 mls, N/S 9 mls. It consists of numerous mountains and extinct craters separated by undulating lowlands. Much of shoreline is composed of coral reefs and mangrove swamps. Beaches are of coral and often have coral rocks scattered under water close inshore, making landings difficult. In places, particularly along north coast, good landing areas are found. Vegetation is principally *cogon* grass or cultivation, with coconut groves and orchards on lowlands and rain forest and secondary growth on lower slopes of mountains. Drainage is generally toward the coast. Rivers are generally shallow, mangrove fringed and unimportant for navigation.

Winds at Jolo are fairly regularly divided into four stages, one from the NE quadrant, one from the SW quadrant, another almost equally divided between the two remaining quadrants; the fourth stage calm.

Cyclonic storms or typhoons are rare. Yearly average temperature is 79.6° F with an average max of 86.1° F. Rainfall is fairly evenly distributed through the year; average annual rainfall at Jolo is 78.07ins.

3. DEVELOPMENT:

Area is poorly developed. Inhabitants grow sufficient foodstuffs for own requirements. There were no industries.

On Jolo there are about 100 mls of good surfaced roads and 30 mls of unsurfaced, but graded, roads. Good trails are plentiful.

4. MILITARY IMPORTANCE (Map 1):

i. Locations of Particular Significance:

Jolo I has one operational airfield (Zettel A/F) and also some potential sites. Island and its airfields can command the two channels in the chain of islands separating Sulu Sea and Celebes Sea

(Sibutu Passage to SW and Tapiantana Chan to NE, south of Basilan 1).

Some bays, such as Dalrymple Hr and Capual Chan, appear excellent possibilities for seaplane runs.

ii. **Enemy Development:**

A pre-war landing field on Jolo Plain has been enlarged by enemy and is now Zettel A/F (operational). No details are known of additional development by the enemy.

iii. **Approaches:**

Jolo 1 lies on the SE edge of the "shelf" of Sulu Archipelago. Its SE coastline is fronted by the deep waters of Celebes Sea. In almost all other directions it is surrounded by adjacent islands.

Air approaches are from over sea; over the island, heights of up to 2,600ft must be crossed.

iv. **Movement** (Map 2):

In general MT movement is easy. The soil, basically volcanic, is firm and well drained. This, combined with the relatively small, evenly distributed rainfall, is suitable to cross-country movement except where mountains or forest are obstacles. Where large areas are under *cogon* grass MT movement is practicable. Movement by foot troops away from the roads is always feasible.

v. **Weather** (See also Sec 10):

Weather is good. Rainfall is fairly evenly distributed through the year and should not present handicaps to overland movement since the ground absorbs water rapidly. Highest average monthly rainfall is 9.07ins in Oct. Cloud cover is high in all months (min in Apr).

5. DISTANCES FROM JOLO:

To Allied Bases:

	Stat Mls	*Geog Mls*
Manila	600	520
Tacloban	460	400
Morotai	575	500
Palau	930	810
Manokwari	1010	880
Hollandia	1470	1280

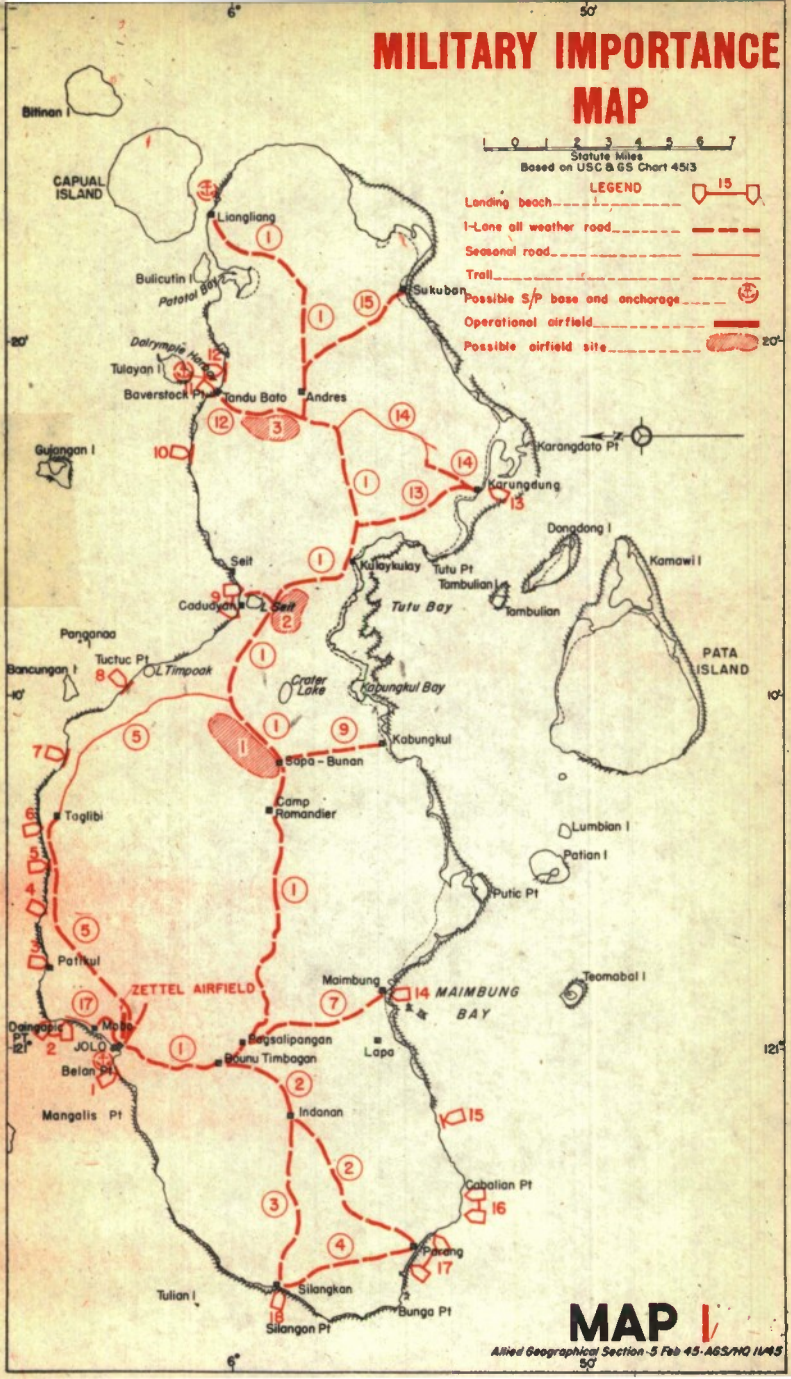
To Enemy Bases:

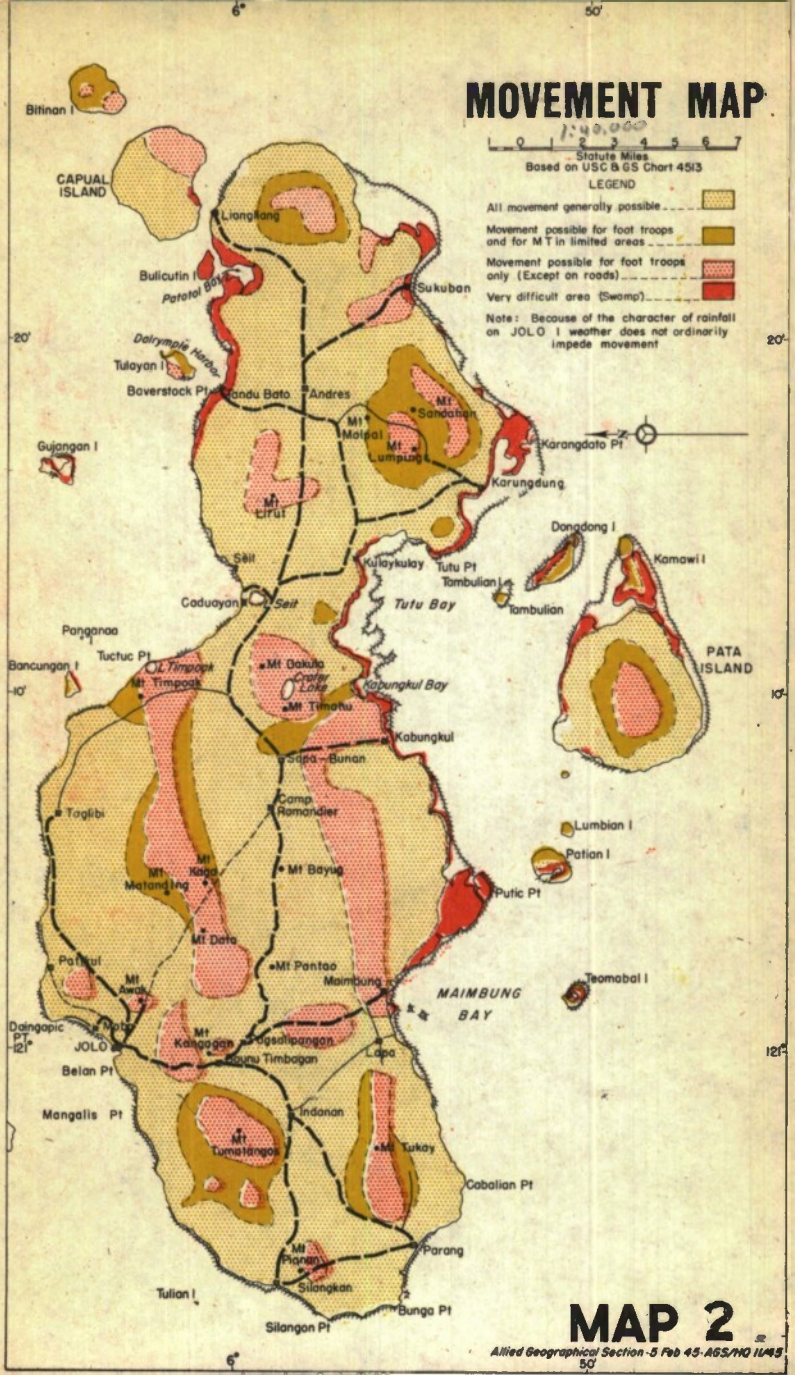
Zamboanga	100	87
Davao	320	280
Makassar	800	695
Saigon	1000	870
Soerabaja	1100	955

6. GEOGRAPHICAL NAMES:

a. **Spelling of Place Names:**

Spelling of geographical names in this Handbook is in accordance with that being used in current mapping of Philippines. To obtain uniformity, names are derived in order of priority from


MILITARY IMPORTANCE MAP
Statute Miles
Based on USC & GS Chart 45/3
LEGEND
Landing beach
1-Lane all weather road
Seasonal road
Trail
Possible S/P base and anchorage
Operational airfield
Possible airfield site
Bilinan I
CAPUAL ISLAND
Liangliang
Bulicutin I
Patotal Bay
Sukuban
Dalrymple Hd
Tulayan I
Baverstock Pt
Tandu Bato
Andres
Gulangan I
Karangdato Pt
Karungdung
Dongdong I
Kamawi I
Seit
Kulaykulay
Tutu Pt
Tambulian I
Tambulian
Cadudyan
Seit
Tutu Bay
Pangonao
Tuctuc Pt
Timpook
Bancungan I
PATA ISLAND
Crater Lake
Kapungkul Bay
Kabungkul
Sapa - Bunan
Camp Romandier
Taglibi
Lumbian I
Patian I
Putic Pt
Patikul
ZETTEL AIRFIELD
Maimbung
MAIMBUNG BAY
Teomabal I
Daingpic Pt
Mabe
JOLO
Belan Pt
Bagsalipangan
Bounu Timbagan
Lapa
Mangalis Pt
Indanan
Cabalian Pt
Pakong
Silangkan
Tulian I
Bunga Pt
Silangon Pt
MAP I
Allied Geographical Section 5 Feb 45 AGS/HQ 11/45


MOVEMENT MAP
1:40,000
0 1 2 3 4 5 6 7
Statute Miles
Based on USC & GS Chart 4513
LEGEND
All movement generally possible
Movement possible for foot troops and for M T in limited areas
Movement possible for foot troops only (Except on roads)
Very difficult area (Swamp)
Note: Because of the character of rainfall on JOLO I weather does not ordinarily impede movement
Bitinan I
CAPUAL ISLAND
Liongkang
Bulicutin I
Patotal Bay
Sukuban
Dalrymple Harbor
Tulayan I
Baverstock Pt
Bandu Bato
Andres
Mt Sandahan
Mt Matbal
Mt Lumpung
Karangdato Pt
Gujangan I
Karungdung
Mt Liruf
Dongdong I
Kamawi I
Sail
Kulaykulay
Tutu Pt
Tambulian I
Tambulian
Caduayan
Sail
Tutu Bay
Panganao
Tuctuc Pt
PATA ISLAND
Bancungan I
Mt Timpook
Mt Dakula
Crater Lake
Kabungkul Bay
Mt Timahu
Kabungkul
Sapa-Bunan
Taglibi
Camp Romandier
Lumbian I
Patian I
Mt Matanding
Mt Kagay
Mt Bayug
Putic Pt
Mt Data
Patikul
Mt Pantao
Maimbung
Mt Awak
MAIMBUNG BAY
Teomabal I
Daingapic Pt
Mt Kalanggan
Ogsalipangan
Bonu Timbagan
Lapa
JOLO
Belan Pt
Indanan
Mangalis Pt
Mt Tumatangos
Mt Tukay
Cabalian Pt
Mt Pianon
Parang
Tulian I
Silangkan
Bunga Pt
Silangon Pt
MAP 2
Allied Geographical Section -5 Feb 45-AGS/HQ ILAS

following principal sources prescribed by US Board on Geographical Names.

i. Latest editions of USC&GS nautical charts.

ii. Populated places not on charts from Census of the Philippines, Manila, 1940.

iii. USC&GS Topographic Maps (1:200,000, except Mindanao —1:600,000).

A copy of Directions appears in AGS Terrain Study 80.

b. **Recurrence of Names:**

i. *Duplication*: In the Philippines a place name is often found to be repeated, sometimes within few miles. Names such as Bagacay, San Isidro and San Jose recur numerous times (in some cases more than 100 times).

ii. *Changes in Names of Rivers*: In the case of some rivers it will be found that name changes over various sections. Name sometimes changes three times over 10 mls.

iii. *Avoidance of Confusion*: In view of factors mentioned in paras i. and ii. above, special care should be taken, where there is possibility of confusion, to quote map sheet and grid references or geographical co-ordinates when referring to place names in communications or reports.

c **Words of General Application:**

Many Tagalog and Spanish words have been adopted by white population of Philippines, resulting in little use of English equivalent. Some are:

Adobe: Consolidated volcanic ash, used for building stone.

Bangas: Fresh or salt water fish maturing in three months, generally in artificial ponds.

Barrio: Village. A political subdivision of a municipality.

Baguio: Typhoon.

Bodega: Warehouse.

Banca: Canoe made by hollowing out a log.

Batil: Small sailing boat with decking but no cabin; 10-15 tons.

Carromata (*Carramatta*): High two-wheel, horse-drawn carriage for two passengers. Generally with upholstered seat and highly decorated.

Calesa: High two-wheel, horse-drawn carriage for four passengers. About same size as a *carromata*, but has two wooden seats along the side.

Casco: Flat-bottomed barge, 30 tons, 3-6ft draft. (Seldom used outside Manila area).

Colla: Local squalls (Luzon).

Cogon: Native grass similar to *kunai* grass of New Guinea.

Dango: Unit of length, the span of the outstretched palm.

Depa: Unit of length, the distance between the outstretched arms, about 6ft (Luzon).

Estero: A navigable canal.

Kaingan (*Caingin*): Farmland prepared by burning off grass or forest.

Larcha (*Lorcha*): Large wooden vessel with decking and cabin. 60-100 tons, 6ft draft.

Mano: Right (hand).

Mestizo: A person of mixed blood, i.e., Spanish *mestizo*, American *mestizo*, Chinese *mestizo*.

Muscovado: Crude raw sugar with a high molasses content, manufactured in old-type sugar mills.

Norte: North.

Palay: Unhusked rice.

Poblacion: Municipal capital.

Poto: A native sweetened rice cake (Luzon).

Sawali: Mats woven from split and shaved bamboo, used for drying *palay*, carpets, flooring, walls of houses and baskets.

Silia: Left (hand).

Sitio: A small group of houses within a *barrio*.

Sur: South.

Tubig: Water (drinking).

Viray: Hollow log keel and built-up sides with outriggers. Up to 20 tons. 6ft draft. (North Luzon).

Llave (*pronounced Yabe*): Tool, particularly a wrench.

English equivalents for native fruits and vegetables are given in Sec 8, para 2.

7. STANDARD TIME: MEASUREMENTS: CURRENCY:

Standard time is that of 120° Meridian of East Long—8 hrs ahead of GMT.

Metric system is standard in Philippines.

Following measurements are used in this Handbook:

Standard nautical mls and fms where referring to sea measurements; statute mls and yds for land distances. Road distances in mls and kms; elevations in ft above sea level.

Peso is main item of coinage—worth $0.50. (See also Appendix "E").

8. MAGNETIC VARIATION:

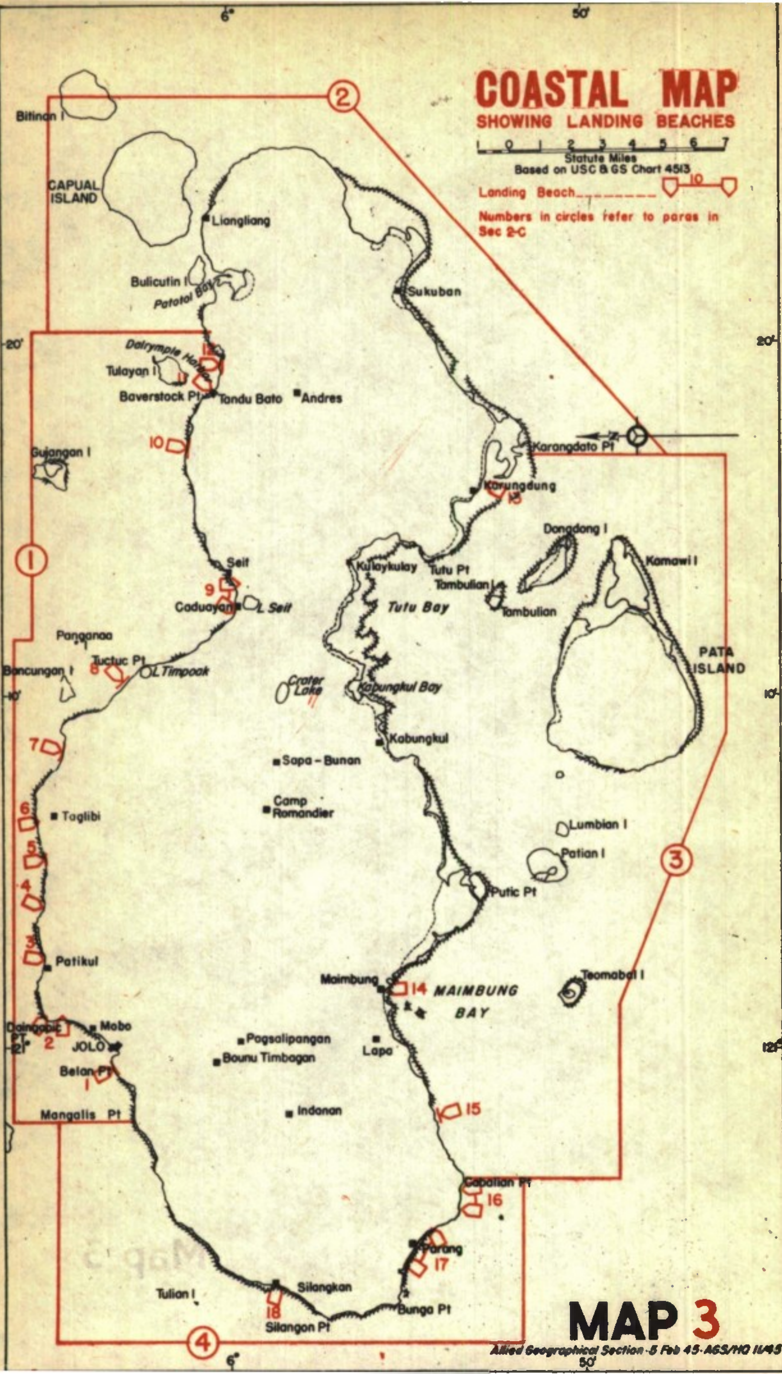
Variation in 1944 on Jolo was 2° 15′ E with annual increase of 2′.

9. WATER:

Developed water sources are available, but lack of rivers and streams, together with a relatively small, evenly distributed rainfall affects the quantity. Such water as is available from wells is usually brackish. All water for drinking should be treated.

10. MAPS:

Area is well mapped. In addition to USC&GS Charts showing the plotted positions of inland features (mountains and lakes), there are also extensive charts and detailed maps made by the US Naval Survey in 1936.


COASTAL MAP
SHOWING LANDING BEACHES
Statute Miles
Based on USC & GS Chart 4513
Landing Beach
Numbers in circles refer to paras in Sec 2-C
Bitinan I
CAPUAL ISLAND
Liangliang
Bulicutin I
Patotol Bay
Sukuban
Dalrymple Harbor
Tulayan I
Baverstock Pt
Tandu Bato
Andres
Gujangan I
Karangdato Pt
Karungdung
Dongdong I
Kamawi I
Seit
Caduayan
L. Seit
Kulaykulay
Tutu Pt
Tambulian I
Tambulian
Tutu Bay
PATA ISLAND
Panganaa
Tuctuc Pt
L Timpoak
Bancungan I
Crater Lake
Kabungkul Bay
Kabungkul
Sapa - Bunan
Camp Romandier
Taglibi
Lumbian I
Patian I
Putic Pt
Patikul
Maimbung
MAIMBUNG BAY
Teomabal I
Daingapic Pt
Mobo
JOLO
Pagsalipangan
Bounu Timbagan
Lapa
Belan Pt
Indanan
Mangalis Pt
Cabalian Pt
Parang
Tulian I
Silangkan
Bunga Pt
Silangon Pt
MAP 3
Allied Geographical Section · 5 Feb 45 · AGS/HQ II/45

Map 3

SECTION 2

COASTAL INFORMATION

A—OFFSHORE CONDITIONS

1. GENERAL:

Jolo is one of largest and most centrally situated islands in Sulu Archipelago. Its SE coastline is washed by extremely deep waters of Celebes Sea, but elsewhere it is surrounded by adjacent islands.

2. REEFS AND DEPTHS:

Island is, generally speaking, easily approached from seaward by open channels. A comparatively small number of reefs and shoals exists in vicinity. In many places coast is fringed with reef, widest sections being in SE of island.

3. WEATHER AND VISIBILITY:

Percentage of calms is higher at Jolo than anywhere else in Sulu Archipelago. It is remarkable that NW winds at Jolo are more frequent than easterlies.

A rainless winter or spring month is on record, but some rain always falls in each month from Jul to Oct. Thirty consecutive rainless days (Jan / Feb) have been experienced at Jolo town. Visibility is generally good and seas relatively calm.

Typhoons (tropical cyclones) are rare.

4. TIDES AND TIDAL STREAMS:

Jolo (Port):

Higher high water interval—8 hrs 25 mins (to be added to time of moon's upper transit for south declination and to the lower transit for north declination).

Higher High Water Height	2.8ft
Lowest Tide	—1.5ft
Sounding Datum	Mean Lower Low Water

The tides are chiefly diurnal and times and heights are predictable. (See Pacific Island and Philippine Tide Tables, published by US Coast and Geodetic Survey).

Tidal streams are generally strong and demand due caution in navigation. Cause of this is the movement of large bodies of water across the Archipelago "shelf" between the deep Sulu and Celebes Seas. General direction of these streams near Jolo I is flood setting NE, ebb SW, with surface velocities up to 5 knots.

5. CHARTS:

The area is well charted; covered by USC&GS Charts 4513, 4517, 4541.

B—PORTS (DEVELOPED)

JOLO—6° 03′ N, 121° 00′ E. (Map 4):

a. **General Description:**

Jolo is in small indentation on NW coast of Jolo I. There is no defined harbor and vessels are protected from offshore winds only. Unlimited anchorage is available. Approaches are clear.

The concrete pier has a box-shaped end permitting medium-large vessels to berth on three sides in depths from 9-30ft.

Rough Chinese pier, SW of main pier, is small and unsuitable for berthing.

b. **Capacity:**

Offshore—anchorage unlimited.

Seaward face of the box-shaped wharf was 280ft long with 30ft of water; the NE side was 245ft. with depths of 27ft (outer end) to about 12ft (inner end); SW side was 162ft with depths of 38ft (outer end) to 16ft (inner end). Opening on SW side 162ft from outer end permits small boats to berth on inner sides of pier in depths of 7-12ft. Water at approach-ramp is shallow.

c. **Shelter:**

Anchorage is protected from southerly and easterly winds. About 6 mls out protected anchorage in 10-20 fms is in small harbor formed by the islands Cabucan, Bubuan, Hegad, Pangasinan and Marungas.

d. **Approach:**

Approach to anchorage at pier is direct, although 3fm line projects out beyond the line of the end of pier 300 yds NE, and 225 yds SW of pier, preventing wide sweeping approaches for vessels drawing more than 18ft. Deep water is found off end of pier for an arc of slightly over 90°. Best approach is from NE.

e. **Tides and Currents:**

Higher High Water	2.8ft
Lowest Tide	—1.5ft

No currents are indicated off Jolo. Tide rips are experienced off southern end of Cabucan I and in entrance to shelter of which Cabucan I forms NW side.

f. **Port Facilities:**

Main pier is designed for a live load of 400 lb per sq ft and to take a 10-ton road roller. No warehousing facilities on wharf, but about 20,000 sq ft of wide NE deck of pier is available for temporary open storage. The SW 162ft of dock is 12ft wide, the seaward, 280ft, is 40ft wide and the NE, 245ft, is 120ft wide. Small utility shed was on landward face of pier.

There are no cranes or weight-handling equipment on wharf. Cargo was formerly handled by running trucks on to pier and loading direct. Estimated max daily handling capacity of pier was reported as 225 short tons.

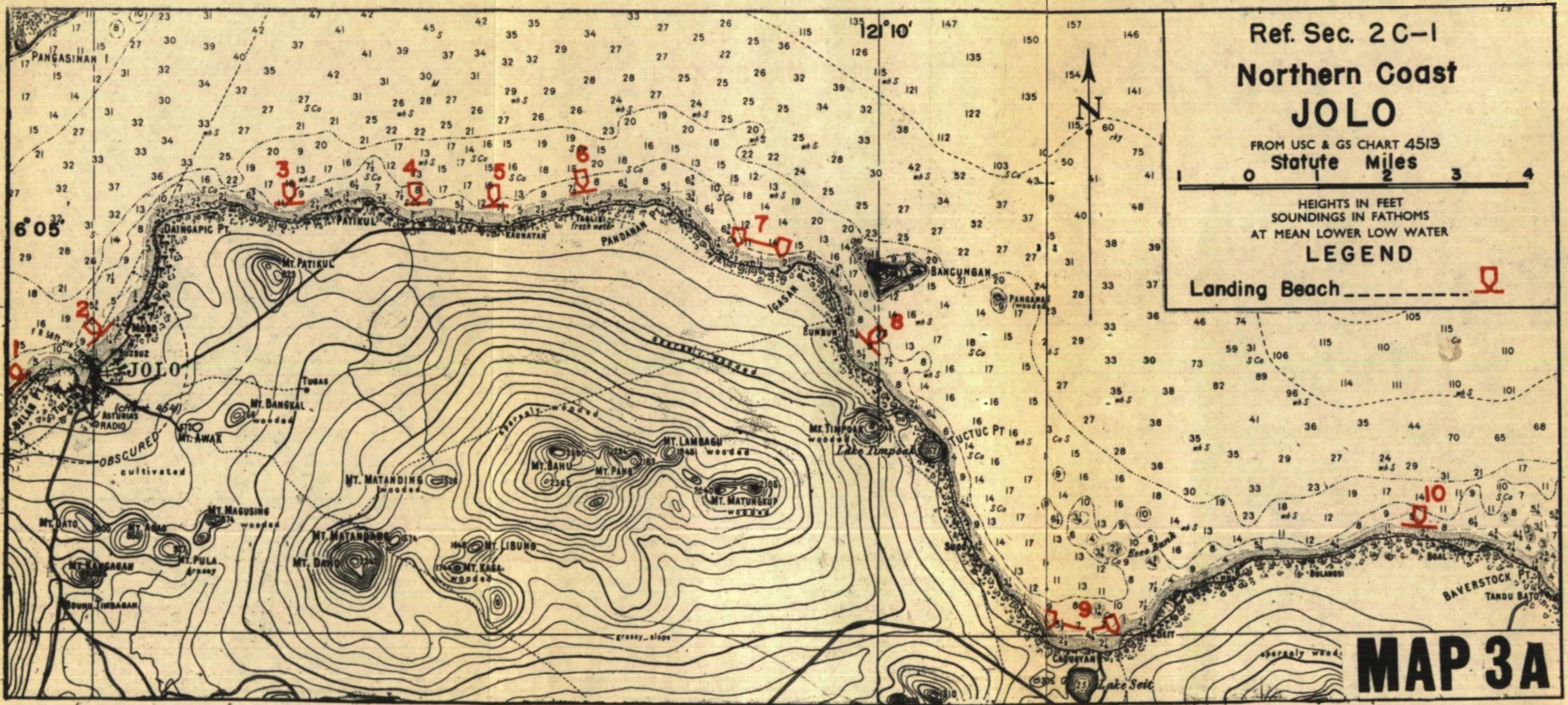
Bodegas (warehouses) stood along shore SW from pier. Post office and customs house are on NE shore. Estimated 30,000 tons of covered storage space. Most of *bodegas* are one or two-storey. Many solidly built.

Fresh water was piped to pier from city water system. (A 6in main brought water from large spring in hills 2 mls east of Jolo).

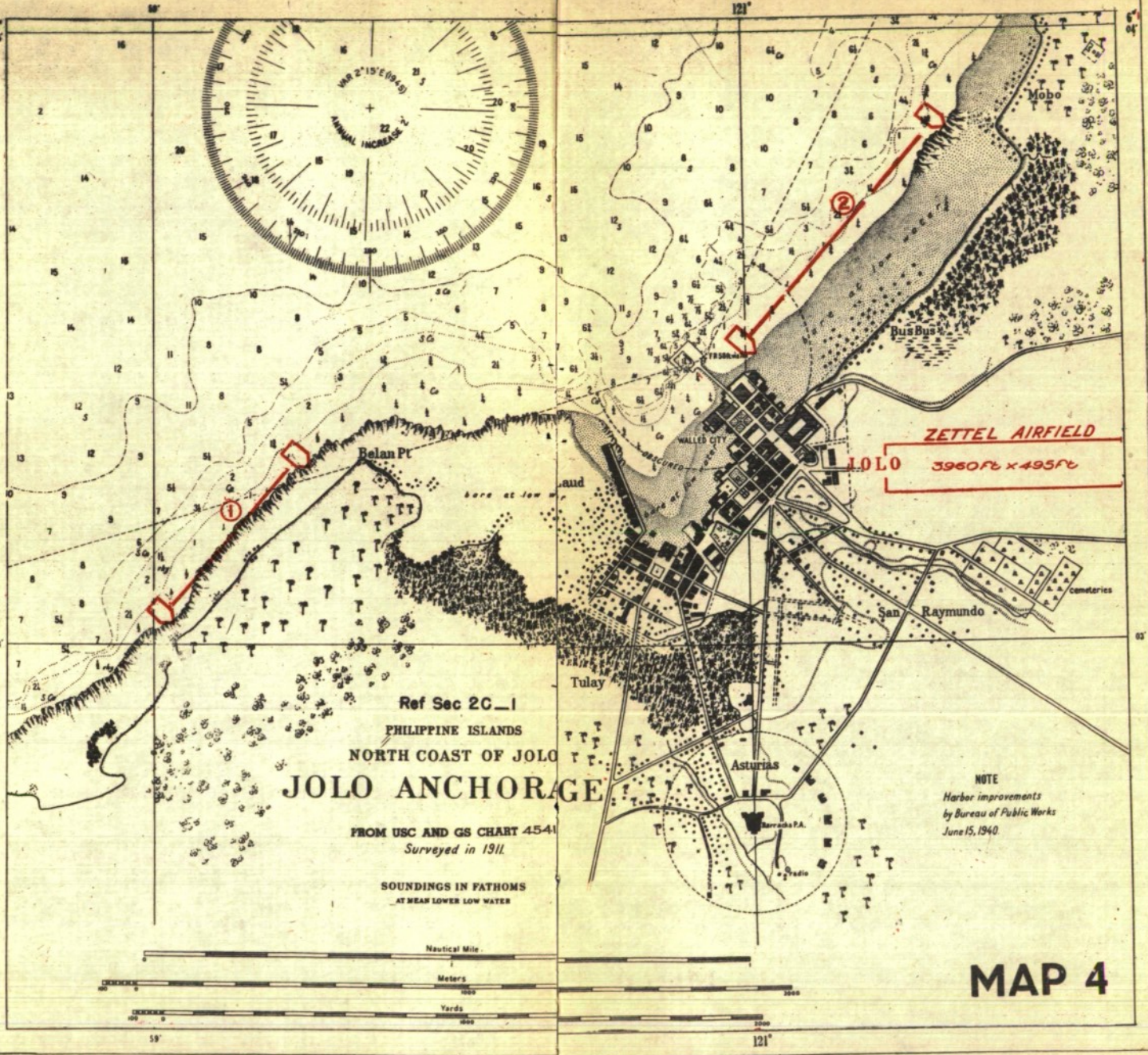
Supplies of food not available. Small quantities of gasolene, fuel oil and lubricating oil were available in drums. No coal. An ice plant (9 tons daily) with cold-storage room of 1,000 cu ft, was adjacent to power plant.

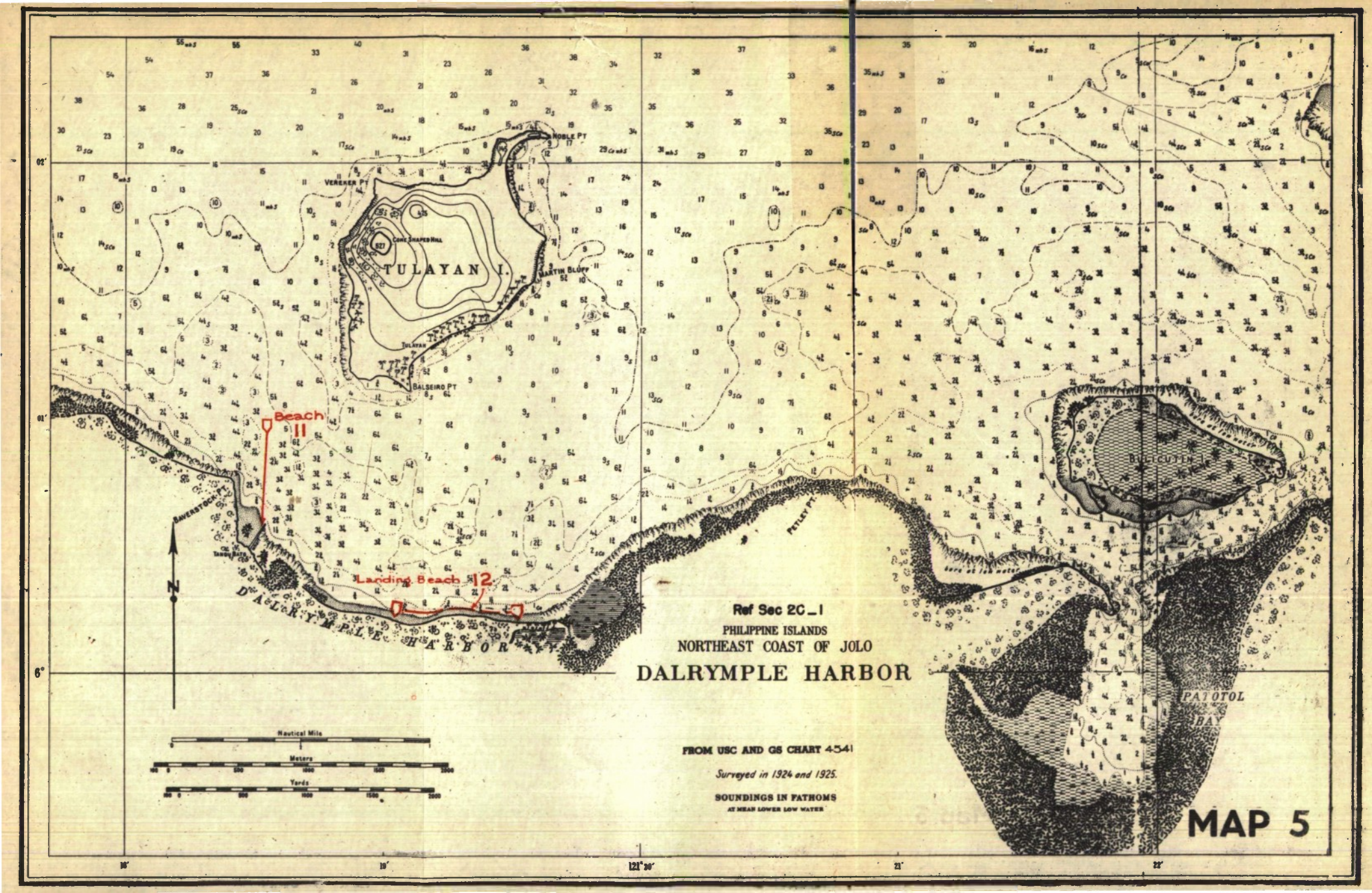
g. Harbor Transport:

Only boats available were small private launches and native outriggers.



Ref. Sec. 2 C-1
Northern Coast
JOLO
FROM USC & GS CHART 4513
Statute Miles
1 0 1 2 3 4
HEIGHTS IN FEET
SOUNDINGS IN FATHOMS
AT MEAN LOWER LOW WATER
LEGEND
Landing Beach
121°10'
6°05'
N
PANGASINAN I
DAINGAPIC PT.
PATIKUL
MT. PATIKUL
JOLO
MT. BANGKAL
MT. AWAK
OBSCURED
cultivated
MT. MATANDING
MT. MAGUSING
MT. DATO
MT. PULA
MT. KANGAGAN
MT. MATANDANG
MT. DAHO
MT. LIBUNG
MT. KABA
MT. BAHU
MT. PANG
MT. LAMBAGU
MT. MATUNGKUP
MT. TIMPOAK
Lake Timpoak
TUCTUC PT
PANDANAN
IGASAN
BANCUNGAN
PANGASAK
CAUSUYAN
Lake Seit
BAVERSTOCK PT.
TANDU BATO
Baco Bank
grassy slope
sparsely wooded
1
2
3
4
5
6
7
8
9
10
MAP 3A


Belan Pt
Tulay
Mobo
Bus Bus
WALLED CITY
ZETTEL AIRFIELD
JOLO 3960ft x 495ft
San Raymundo
cemeteries
Asturias
Barracks P.A.
Radio
Ref Sec 2C—1
PHILIPPINE ISLANDS
NORTH COAST OF JOLO
JOLO ANCHORAGE
FROM USC AND GS CHART 4541
Surveyed in 1911.
SOUNDINGS IN FATHOMS
AT MEAN LOWER LOW WATER
NOTE
Harbor improvements
by Bureau of Public Works
June 15, 1940.
Nautical Mile.
Meters
Yards
MAP 4



Ref Sec 2C_1

PHILIPPINE ISLANDS

NORTHEAST COAST OF JOLO

DALRYMPLE HARBOR

FROM USC AND GS CHART 4541

Surveyed in 1924 and 1925.

SOUNDINGS IN FATHOMS

AT MEAN LOWER LOW WATER

MAP 5

C—COASTLINE DESCRIPTION

(Maps 3-9, 15; Photos 1-9)

Coastline has been divided into:

i. Mangalis Pt to east coast of Dalrymple Hr.
ii. East coast of Dalrymple Hr to Karangdato Pt.
iii. Karangdato Pt to Cabalian Pt.
iv. Cabalian Pt to Mangalis Pt.

1. MANGALIS PT—6° 03′ N, 120° 58′ E—TO EAST COAST OF DALRYMPLE HR—6° 01′ N, 121° 20′ E (Maps 3-5; Photos 1-6):

The only good landing beaches are along north shore. Eseo bank and reefs of Dalrymple Hr are offshore hazards, but they are visible.

a. Anchorages:

Anywhere within ½ ml offshore. Jolo and Caduayan (at Lake Seit) anchorages are best protected.

i. JOLO:

See Sec 2, B—Ports.

ii. BETWEEN TUCTUC PT AND CADUAYAN:

Anchorage, sheltered from west, south and SE, in 11-14 fms, ½ ml offshore. (Entrance from NW of Eseo Bank).

iii. DALRYMPLE HR—6° 01′ N, 121° 19′ E (also known as Port Tulayan):

Anchorage is between Tulayan I and Jolo shore. Several 1¾-2¾ fm shoals off Jolo coast.

Best anchorage (but exposed from NE) is SE of Tulayan I in 8-9 fms, coral-sand. This anchorage was considered suitable for seaplane anchorage by an American Naval Reconnaissance Survey in 1936. At Tandu Bato is small, stone landing.

b. Beaches and Coastline:

There are several good landing beaches. Generally there are extensive reefs along shore, backed by mangrove swamp for much of the distance. (See Landing Beach Summary).

BEACH 1 (Maps 3, 3A, 4; Photo 1):

This beach extends for approx 700 yds SW from Belan Pt just west of Jolo Anch. Considered to be a poor beach suitable only for a limited amphibious landing using amphibious vehicles for an attack upon Jolo from west.

BEACH 2 (Maps 3, 3A, 4, 15; Photo 1):

This beach extends for 900 yds NE from end of seawall running NE of large pier at Jolo. At HW small LC could use this beach for discharging troops and mechanized equipment for direct attack upon Jolo town and A/F. Extent of landings for MT would be limited by swampy ground inland from NE half and native houses congesting SW half.

BEACH 3 (Maps 3, 3A, 15; Photo 3):

This 400yd beach is approx 2 mls east of Daingapic Pt. It is a fairly good beach and could be used by all types of LC at HW and small LC at any tide for access to Route 6, which leads to Jolo.

BEACH 4 (Maps 3, 3A, 15; Photo 4):

This 350yd reef-free beach is approx 1,000 yds east of Patikul Pt. It is considered an excellent beach for fairly small-scale landings for access to Route 5. Suitable for all types of LC at any tide.

BEACH 5 (Maps 3, 3A, 15; Photo 4):

Extends 600 yds west from Kaunayan *barrio* (approx 2¼ mls west of Pandanan Pt). It would be a fairly good beach for small-scale landings for access to Route 5. Suitable for all types of LC at any tide upon the reef-free west half and possibly suitable at HW for small LC on reef-fringed east half.

BEACH 6 (Maps 3, 3A, 15; Photo 4):

Along waterfront of Taglibi *barrio* there is a coral sand beach approx 1,000 yds long. It is considered generally a fairly poor beach for large-scale landings for access to Route 5 at that point. It is suitable only for amphibious vehicles except at three 50-100yd openings in the fringing reef through which small LC could reach the beach at any tide.

BEACH 7 (Maps 3, 3A, 15; Photo 2):

Approx 1,000 yds west of Igasan Pt there is an excellent landing beach 1,300 yds long suitable for all types of LC at any tide. Fairly easy cross-country access could be had to Route 5, 500-800 yds inland from this beach.

BEACH 8 (Maps 3, 3A, 15):

Extends for approx 500 yds SE from a point 1¾ mls SE of Igasan Pt. It is considered a poor beach for large-scale operations for reaching Route 5 because of difficult intervening terrain. All types of LC should be able to use this narrow reef-fringed beach at HW and small LC should be able to use it at any tide.

BEACH 9 (Maps 3, 3A, 15; Photo 5):

This 1ml beach is at head of large inlet just north of L Seit. Considered a fairly good beach suitable for large-scale landings for obtaining access to Route 1 in vicinity of L Seit. Could be used by small LC at any time and large LC at HW.

BEACH 10 (Maps 3, 3A, 15; Photo 6):

This 850yd beach is approx 1⅛ mls west of Baverstock Pt. Considered only a fair beach for a large-scale landing for purpose of moving inland to Route 12. Would be suitable for small LC at any tide at west end and possibly for small LC at HW for remainder.

BEACH 11 (Maps 3, 5, 15; Photo 6):

Beach at Tandu Bato is not suitable for landing operations because of rugged character of fringing reef and the swamp just

inland. However, LSTs could perhaps discharge MT on to end of the 840ft stone pier (10ft wide) with a min amount of preliminary engineer work. A min of 5ft of water is reported off end at LW. This jetty connects directly on to Route 12.

BEACH 12 (Maps 3, 5, 15; Photo 6):

This 970yd beach is 1,300 yds east of stone pier at Tandu Bato. Considered a fair beach for large-scale landings for inland access to possible A/F site 3. Would be suitable for small LC at any tide with possibility of large LC at HW. Movement inland would be very difficult.

c. **Off-Lying Islands:**

NW of Jolo town are several small islands with no apparent military importance. They are low, wooded and, in most instances, have extensive swamp areas.

Group includes:

CABUCAN I:

Largest, is flat, with fringing coral reef, backed by mangroves around ⅔ of island. Southern third is indicated as having low swampy shoreline fronted by sandy beach and patches of coral. The only native *barrios* are on this beach. Interior is not surveyed—appears to be heavily wooded (possibly swampy) with max height to treetops of 50ft.

PANTOCUNAN I:

A small swamp island 4 mls NW of Cabucan I. Has wide fringing reef and cannot be approached by boats. Tree heights are about 52ft.

BUBUAN I:

Low, flat; has one sharp, 291ft peak on north tip from which sharp cliffs drop to water. Peak is too steep to climb and has no significance. Mangrove swamp covers south coast; reef fringes north half.

MINIS I:

Small, entirely swampy except for the strip where a *barrio* stands.

HEGAD I:

Swamp island with large lagoon in center.

PANGASINAN I:

Has sharp 405ft peak on south coast, from which terrain falls away to mangrove swamp covering rest of island. Shallow lagoon is in south half of island. Depth (or use by Moros) unknown. Island has no cultivation.

MARONGAS I:

Small, reef-free island, largely swamp, marked by 210ft peak and some other high ground along south coast. Some coconuts grow along shore. Beach can be reached by boats. Sharp cliffs face seaward of the 210ft peak.

BANCUNGAN 1:

Has 508ft peak almost vertical on north and west. Island is heavily wooded. Landing on its steep shores would be hazardous. Reef fringes the beaches. There may be good timber on mountain slopes.

PANGANAA 1:

Very small, heavily wooded. No significance.

GUJANGAN 1:

About 6 mls NW of Dalrymple Hr; rugged. Has mangroves around SE end; 400ft peak on north end. Several prominent small peaks. A large lagoon, bare at LW, covers much of island and is open to east side.

TULAYAN 1:

Forming north boundary of Dalrymple Hr; is high, well populated. A 527ft peak is in NW, and drop is abrupt to north and west shores. Slope to south and east is less steep. Large native *barrio* on narrow coastal plain along SE. Small patches of cultivation and coconuts are along coastal plain and on slopes behind *barrio*. Reefs and cliffy terrain would prevent landings anywhere but at *barrio*. Island is not heavily wooded, but steep terrain limits its military usefulness.

d. **Landing Facilities:**

Apart from Jolo town, only known landing along north coast (or any of off-lying islands) is at Tandu Bato in Dalrymple Hr. End of the road is an 840ft stone mole about 10ft wide, at the end of which are submerged piles of destroyed wooden pier.

e. **Hinterland:**

Marked by low mountains from 500ft to 2,600ft. Much of north coast of Jolo is cultivated. There are a few timber patches, usually on slopes of mountains.

Soil is well-drained, loose, firm; water is absorbed rather than drained off. MT movement off roads is practicable where terrain is open and grades not too steep.

Slopes from coastline along north shore are first gradual then rise more sharply 1 ml inland. MT should be able to proceed directly inland at most places for 1 to 1½ mls, then grades would make winding roads necessary. Road construction should present few problems anywhere along north shore.

f. **Rivers:**

None named. Rivers are small, often dry, and culverts are generally used for crossings. Such streams as do have water continuously are spring-fed and usually sources of fresh water. Only streams with extensive mangrove around their mouths may be military obstacles. In Dalrymple Hr area several river channels wind through mangrove swamp, but do not extend inland.

Approx N

500 0 500 1000 1500

Yards (Approx)

MOSAIC BY A.G.S.

Daingapic Pt

To Pototan

Edge of Reef

Large Cargo Ship (Beached)

Mobor

To Taglibi

Beach No2 900yds Small LC at HW

Beach No1 700 Yds Suitable for Buffaloes only

Belan Pt

Concrete Pier

Swamp

Steep Terrain

Buildings

Barracks

3960 x 459 Ft

To Trujas

Swamp

Edge of Reef

Swamp

Steep Terrain

Dispersal Area

To Jolo River

1. Mosaic of Jolo City and Zettel Field. 20 Oct 44

2. Mosaic — coastal area west of Igasan Pt. 20 Oct 44

3. Patikul area, showing Landing Beach 3. 20 Oct 44

4. Mosaic—Patikul area. Showing Landing Beaches 4, 5 and 6. 20 Oct 44

5. Mosaic—Lake Seit area. Showing Landing Beach 9 and hinterland. 30 Dec 44

g. **Barrios:**

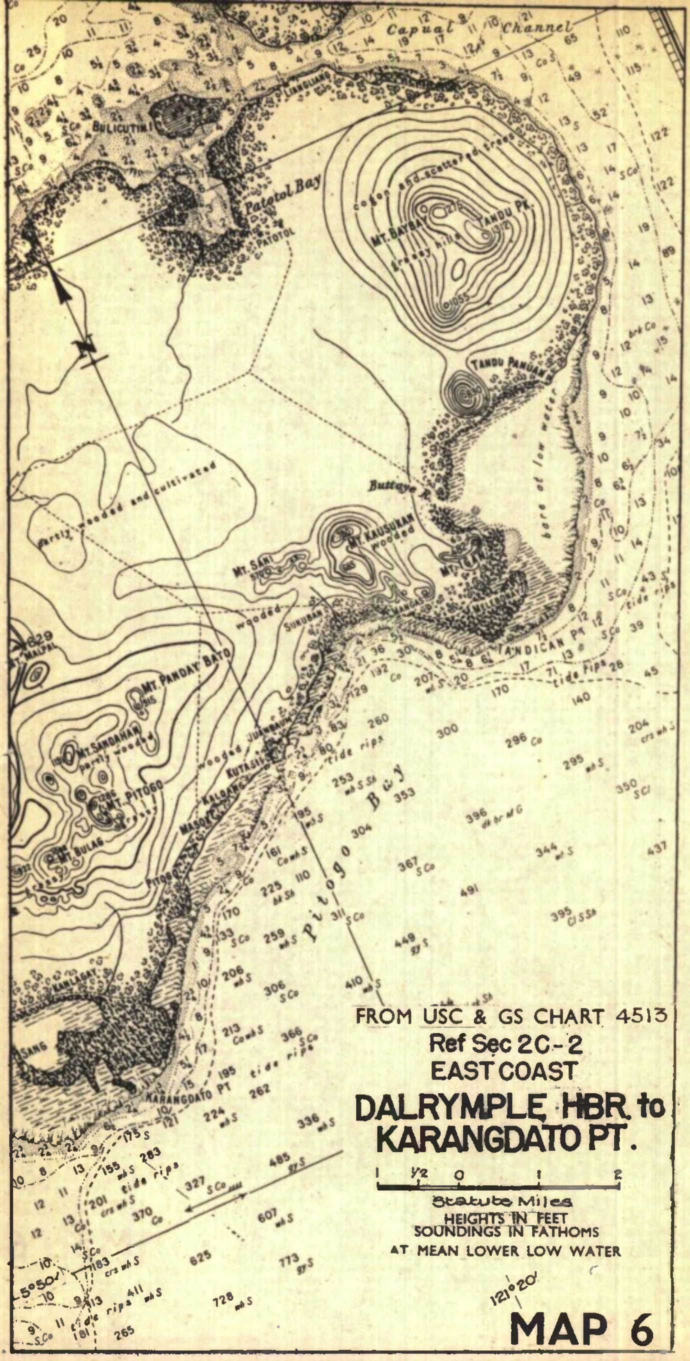
Moro *barrios* dot shoreline, but seldom obstruct good landing beaches. Inland, agricultural Moros do not generally colonize in specific places, but where the Government had established municipal centers and schools small settlements have risen.

h. **Roads:**

This section of coast has access to road net of island and new roads could be made almost anywhere. Route 1, main arterial road of island, is within 1 ml of Beach 9 at Caduayan. (See Sec 3—Roads).

i. **Resources:**

Timber, coral-sand, basalt (volcanic rock) and coral are available in area. Coconuts, a few fruits and garden produce are grown.


FROM USC & GS CHART 4513
Ref Sec 2C-2
EAST COAST
DALRYMPLE HBR. to
KARANGDATO PT.
Statute Miles
HEIGHTS IN FEET
SOUNDINGS IN FATHOMS
AT MEAN LOWER LOW WATER
MAP 6
Capual Channel
BULICUTIN
LIANGLIANG
Patotol Bay
PATOTOL
MT. BAYBAY
TANDU PT.
coqon and scattered trees
grassy hills
TANDU PANUAN
bare at low water
Buttaye R.
partly wooded and cultivated
MT. KAUSUKAN
wooded
MT. SARI
SUKUBAN
TANDICAN PT.
tide rips
MT. MALPAL
MT. PANDAY BATO
MT. SANDAHAN
partly wooded
MT. PITOGO
MT. BULAG
grassy
wooded
JUANBAUN
KUTASIVE
KALBANG
MASOLA
PITOGO
Pitogo Bay
KANLAGAY
KARANGDATO PT
5°50'
121°20'

2. EAST COAST OF DALRYMPLE HR—6° 01′ N, 121° 20′ E—TO KARANGDATO PT—5° 52′ N, 121° 17′ E (Maps 3, 6, 15):

This inhospitable section of coast is marked by Tandu Peak (1,312ft) and Mt Baybay (1,275ft) on the east end of Jolo. Several peaks from 500ft to nearly 1,300ft are from 1-2 mls inland along SE coast behind Pitogo B.

a. **Anchorages:**

i. PATOTOL B:

Anchorages for small vessels are in the bay. Approaches are around Bulicutin I and have greatest depth of 2¾ fms. Bay is surrounded by dense mangrove. Depths within bay are from ½-7 fms—deepest water in center toward the mouth.

ii. CAPUAL CHAN:

Poor anchorage (due to tidal streams and rips) in 4-19 fms.

iii. ANCHORAGE OFF EAST COAST:

From Capual Chan southward to 1 ml north of Tandu Panuan *barrio* anchorage in 5-10 fms is possible anywhere 100-200 yds offshore. It is exposed from north through east to south.

b. **Beaches and Coastline:**

No suitable landing beaches.

Coastline around Patotol B and east to Liangliang *barrio* is mangrove swamp.

At Liangliang, and for 1 ml east and SE, coast is fringed by coral reef. ESE of this point mangrove swamp, 200-300 yds wide, extends along coast for another mile.

From end of this swamp around eastern tip of Jolo I to Tandu Panuan *barrio* coastline is rugged, and shores are steep and heavily wooded.

From Tandu Panuan to Tandican Pt extensive drying coral reef is found. Reef is backed by fringing mangrove swamp.

From Tandican Pt SW to Karangdato Pt is marshy reef area 400-700 yds wide. Most *barrios* of eastern end are located here.

c. **Off-Lying Islands:**

BULICUTIN I:

Small swamp island at entrance to Patotol B. A crescent of firm ground along west and north sides has some native huts. Island is surrounded by shoal water.

CAPUAL I:

One of larger islands. It is hilly (to 976ft) and steep in SE part. Island is well wooded, but also has *cogon* grasslands and some coconut cultivation. Some game and cattle have been reported.

Coastline has little fringing reef. Landing could probably be made anywhere except at swamps along south coast west of the hills, and at 1 ml section around westernmost tip of island, which is reef-fringed. Best landing place is on east coast north of hills. Here is a wide sandy beach about ½ ml long, free of reef. Landing craft could beach here.

Terrain behind beach is firm and planted with coconuts along shore. *Cogon* grass and timbered areas are farther inland. Short tidal streams extend inland in some places.

Island has no roads or development. Population (in 1939) 427 in coastal areas.

BITINAN I:

Small island NE of Capual I. It is free of offshore dangers and may have some landing beaches around northern end. Southern two-thirds is high and has three prominent peaks. Northern third is low and wooded.

Channel between Bitinan I and Capual I is deep, but tide rips are experienced.

d. **Landing Facilities:**

Nil.

e. **Hinterland:**

Mostly rolling to mountainous. Some undulating terrain is found back of Patotol B and Pitogo B.

Area as a whole is about equally divided between wooded patches, *cogon* grasslands, cultivated lands. Peaks are steep (up to 30°) near tops. Soil is mostly volcanic, well drained, and trafficable off roads where open and dry.

f. **Rivers:**

Details are lacking. Several short rivers drain from peaks along SE coast. Most have tidal influence. Mangrove swamps for short distances up some of streams may impede MT.

g. **Barrios:**

Moro coastal *barrios* are found, mainly along Pitogo B. Luuk, an inland town, is most important in area and is municipal capital for east end of Jolo I.

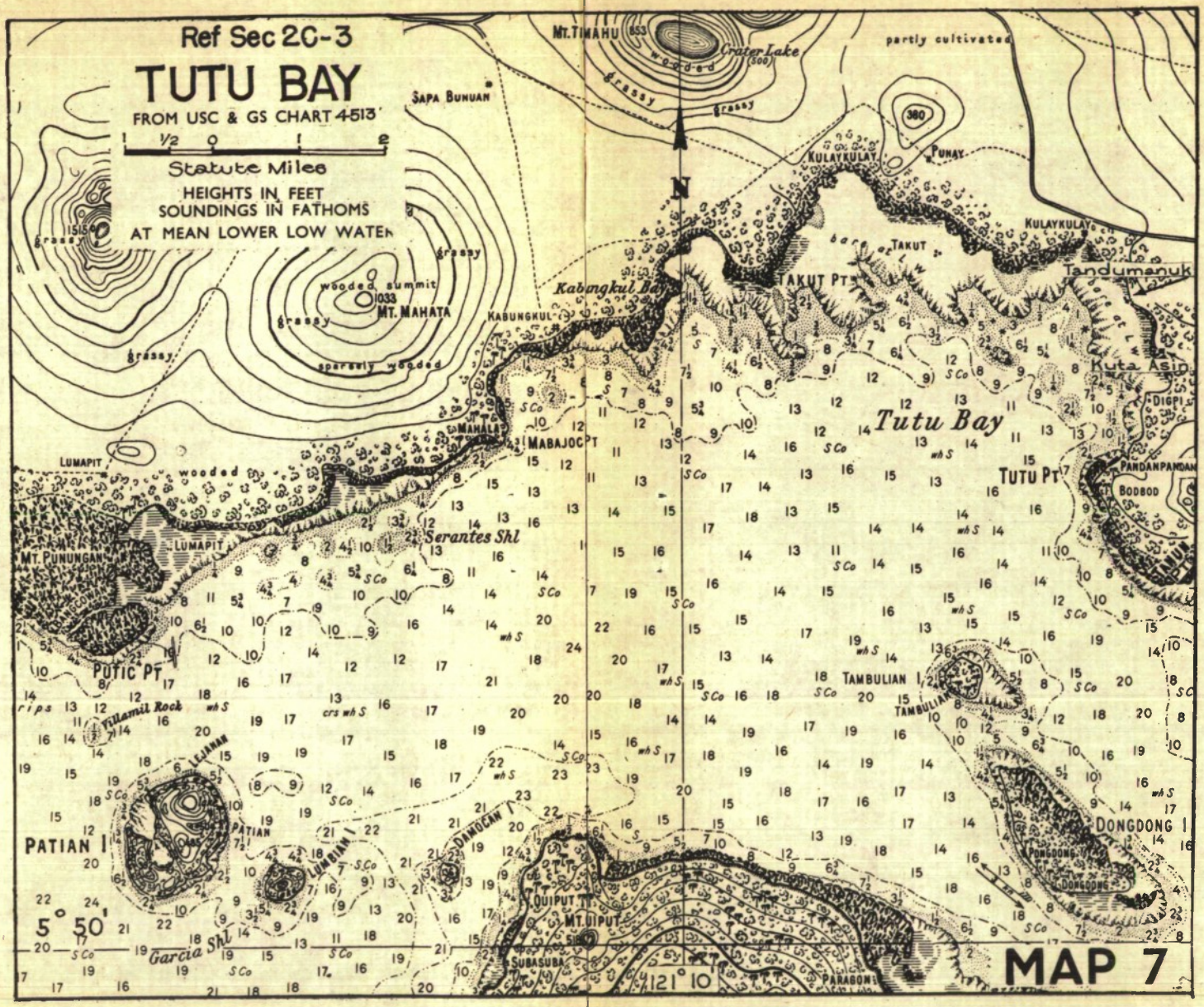
h. **Roads:**

Route 1 from Jolo town runs through area to Liangliang. Route 15 (Andres to Sukuban), only other road, branches south from Route 1 about ½ ml east of Andres *barrio*. (See Sec 3—Routes, 1, 15).

i. **Resources:**

There is probably some good timber in vicinity of Mt Baybay and Tandu Peak. Much of area is cultivated, but no surplus of food can be expected.

Coral-sand, coral, basalt, coconuts and some fruits are available.


Ref Sec 20-3
TUTU BAY
FROM USC & GS CHART 4513
1 1/2 0 1 2
Statute Miles
HEIGHTS IN FEET
SOUNDINGS IN FATHOMS
AT MEAN LOWER LOW WATER
MT. TIMAHU 853
Crater Lake (500)
wooded
grassy
partly cultivated
SAPA BUNUAN
380
KULAYKULAY
PUNAY
N
TAKUT
TAKUT PT
Tandumanuk
Kabungkul Bay
KABUNGKUL
wooded summit
1033
MT. MAHATA
sparsely wooded
Kuta Asin
DIGPI
Tutu Bay
MAHALA
MABAJOC PT
LUMAPIT
wooded
TUTU PT
PANDANPANDAN
BODBOD
Serantes Shl
MT. PUNUNGAN
PUTIC PT
Tillamil Rock
rips
crs wh S
TAMBULIAN I
PATIAN I
LEJANAN
PATIAN
LUMBIAN I
DAMOCAN I
DONGDONG I
PONGDONG
QUIPUT PT
MT. QUIPUT
SUBASUBA
PARAGON
5° 50'
Garcia Shl
121° 10
MAP 7

Ref Sec 20_3

PHILIPPINE ISLANDS

SOUTH COAST OF JOLO

MAIMBUNG BAY

FROM USC AND GS CHART 4541

Surveyed in 1925.

SOUNDINGS IN FATHOMS

AT MEAN LOWER LOW WATER

Nautical Miles

Kilometers

Yards

121°

121°05'

5° 55'

5° 50'

MT. TALIPAD 1165 crater

MT. MABIGTANG 1443

MT. SILANGAN 1086

MT. TUKAY 2034

MAIMBUNG

LUBANG PT.

LEMONO

MABASAN

CABALIAN PT.

Dry Bank

Marban Bank

Bakolaqui Bank

MT. UMUNGAN

PUTIC

PATIAN I.

TEOMABAL I.

strong currents and tide rips

tide rips

VAR 2°30' E (1945)

ANNUAL INCREASE 2'

MAP 8

3. KARANGDATO PT—5° 52′ N, 121° 17′ E—TO CABALIAN PT—5° 53′ N, 120° 56′ E (Maps 3, 7, 8, 15; Photos 7, 8, 9):

Almost continuous mangrove swamp and wide drying coral reef limit possible landing places to three unattractive areas.

a. **Anchorages:**

i. TUTU B:

Excellent anchorage. Depths are regular and from 10-20 fms over sand and coral. It is sheltered from all prevailing winds and can accommodate a large fleet in area of 25 sq mls. Some shoals are well charted.

ii. MAIMBUNG B (Photos 8, 9):

Is open to winds and heavy seas from south. Marban Bank, Dry Bank and Batolaqui Bank are prominent navigational dangers. Anchorage up to 20 fms, sand and coral.

b. **Coastline and Beaches:**

Shore is lined with fringing coral reef and almost unbroken mangrove from Karangdato Pt to Putic Pt.

From Tutu Pt around the head of Tutu B to Mabajoc Pt reef is sometimes 1 ml wide and mangrove is continuous.

From Mabajoc Pt to Putic Pt fringing coral reefs front mangrove swamps. Mabajoc Pt itself is free of coral or swamp, and is one of the few places where boats can approach shore.

Putic Pt is a coral extension of the mangrove shoreline. Swamp is exceptionally dense and impenetrable. Mt Punungan (144ft) rises on west side of point.

Around Maimbung B similar conditions of fringing coral reefs and mangrove exist, except for 2 mls between Marasan *barrio* and Cabalian Pt.

BEACH 13 (Maps 3, 8, 15):

At Karungdung there is no suitable beach. The coastline on either side of the town is thick with mangrove and fringed by wide shallow reefs. At HW it may be possible for a few small landing craft to follow the shallow channel that twists across the wide reef and reach small waterfront at the *barrio*. Highest period of tide would probably have to be used for discharging MT, as the shallow bottom is reported to be soft mud. There is an MT road inland from this town connecting with the main island road net.

BEACH 14 (Maps 3, 8, 15):

At Maimbung there is no landing beach suitable for any large-scale operation. Coastline in vicinity is fringed with heavy mangrove swamp and wide fringing reefs. However, it should be possible for a few small LC to nose into the small boat landing at immediate waterfront. Offshore water is shallow with only 1½ fms approx 500 yds offshore, indicated by the chart. Many fishtraps are offshore. It is reported that there is a small boat channel leading to this landing place from the bay. A 1-lane all-weather MT road (Route 7) runs north to Jolo.

BEACH 15 (Maps 3, 9, 15):

Extends west from Marasan *barrio* for approx 500 yds. It would be a fair beach for small-scale landings. At HW only small LC would be able to use this beach. It is possible that large LC could be used at the reef opening near east end.

c. Off-Lying Islands:

South of Tutu B is a group, largest of which is Pata I.

PATA I:

Is high (1,385ft); unimportant other than protecting Tutu B from south.

Except NW corner, shoreline is fringed with coral reefs and backed by mangrove swamps. Behind shore the land rises abruptly to about 40ft, then slopes more gradually to peak in center of island. Ground on north is open, free of underbrush and about 70% under cultivation. South is open, lightly timbered, 50% under cultivation. Population (in 1939) was 6,077. Pisakpisak *barrio* is municipal seat of government. There is a store, small dispensary and a school.

No landing beaches are known. The natives approach island at HW over coral reefs.

Water is scarce, wells run dry and natives are reported to bring water from Jolo I. A 120ft well was drilled some years ago; no water was found.

There are no roads, but numerous paths. Terrain is open and cross-country movement easy.

No suitable construction timber is found. Coral sand and crushed basalt are available in quantity.

KAMAWI I:

Small unimportant island east of Pata I and separated by narrow channel. Two hills over 200ft high; lowlands are heavy mangrove swamp.

DONGDONG I:

Small; about 1½ mls north of Kamawi I. Completely surrounded by coral reef and NE half of island is mangrove swamp.

TAMBULIAN ISLET:

Unimportant; about ¾ ml NW of Dongdong I. Surrounded by reef.

PATIAN, LUMBIAN AND DAMOCAN Is:

Three small, hilly islands NW of Pata I. They have no apparent military value.

TEOMABAL I:

Low, reef-bound, mangrove and scrub island 6 mls west of Pata I.

d. Landing Facilities:

Nil.

6

Noble Pt

Tulayan Is

Very large native village 200 huts

Small LC at any tide Possible for LCT

Beach No10-850Yds Small LC at Highest HW

Edge of Reef

Balseiro Pt

Swamp

Boal Borrio

Swamp

Baverstock Pt

DALRYMPLE HARBOR

Good stone Jetty 10'x840Ft Probably suitable for unloading LST

Edge of Reef

Beach No12 970yds Small LC at any tide Possible for LST at HW

Terrain Firm Generally Suitable for Cross Country MT

Tandu Bato

1 Lane AW road 10Ft surfacing

Approx

Swamp

For Ground Photo See Picture II

Unimproved track through Swamp

Swamp

Firm Terrain Suitable for MT

500 0 500 1000 1500

Yards (Approx)

MOSAIC BY A.G.S.

To Jolo

6. Mosaic—Dalrymple Hr, coast and Landing Beaches. 20 Oct 44

7

To Silangkan 4½ Miles

To Jolo 14 Miles

1 Lane A.W. Gravel Road

2 Lane A.W. Road

Swamp

Coconut Plm

Jeep Track

Seasonal Road

To Lapa

Parang

Edge of Reef

Jeep track

Beach 17 1½ Miles for small LC at HW possible places for large LC at HW Springs

Steep Slope

Lijaosang Pt

Tubingantan Pt

Beach 16 550 Yds All types of LC at any tide

N Approx

500 0 500 1000

Yards (Approx)

MOSAIC BY A.G.S.

7. Mosaic—Parand area. Coast and Landing Beaches. 20 Oct 44

8. Maimbung. Town and hinterland. Looking west. Pre-war

9. Hinterland NW of Maimbung B.
Looking SE from Mt Tukay. 1928

e. **Hinterland:**

South coast is particularly hilly and undulating. Most of cultivated areas are on rolling ground. Forested areas are generally on mountain slopes. In places land behind shore stays fairly level with slopes (up to 10%) for 1 ml inland; thereafter terrain rises in 30-35% grades.

f. **Rivers:**

Maimbung R is navigable for native boats only for about ½ ml.

g. **Barrios:**

Karungdung, Kabungkul, Lumapit, Maimbung and Lapa are most important *barrios* in this section. All but Lumapit are road termini. They are built out over water. Inland *barrios* are usually well spaced and open. Maimbung, largest *barrio*, has houses grouped tightly along Maimbung R which is main transportation avenue.

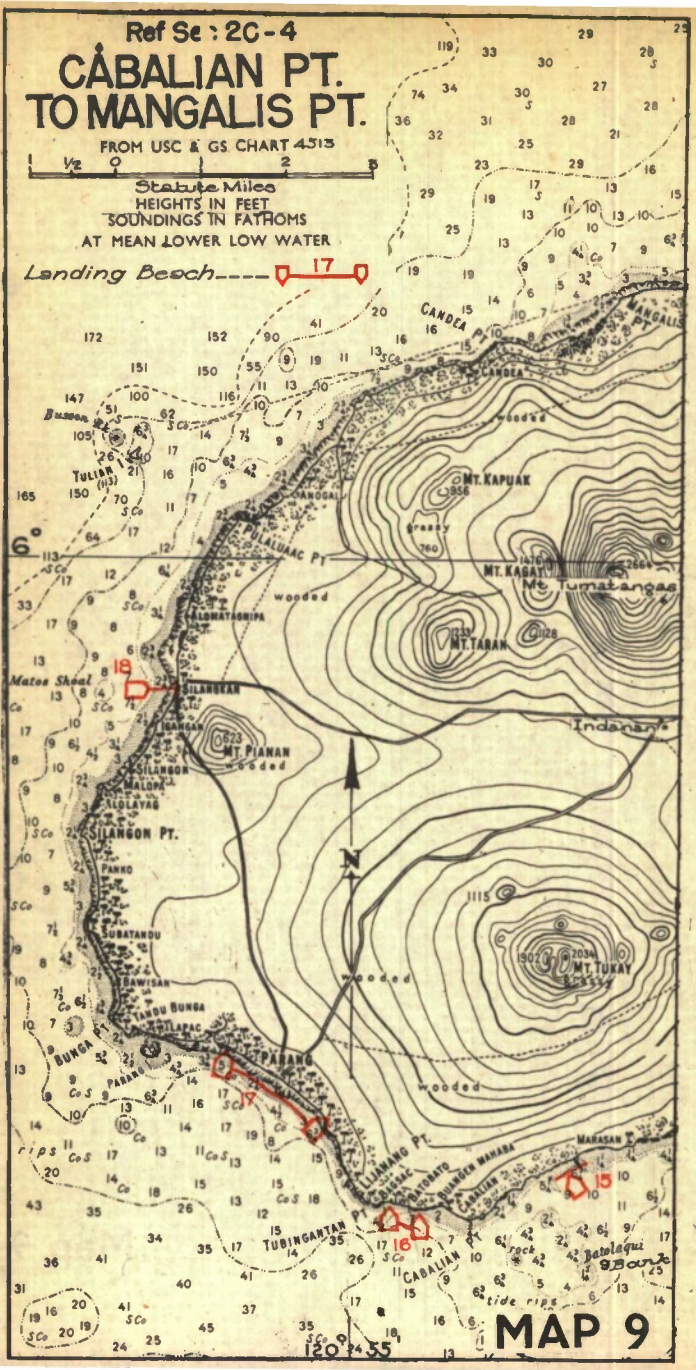
h. **Roads:**

Route 1 (Jolo to Liangliang) runs through central Jolo; Routes 7, 9, 13, 14, 16 run from various south coast *barrios*. (See Sec 3—Roads and Trails).

None of these roads is 2-lane. Generally they average 9-14ft width. Some are surfaced, others partially surfaced or just graded earth.

i. **Resources:**

Similar to other areas. Coral sand, basalt for crushing and timber. Foodstuffs are not plentiful. There are scattered coconut trees along coast. Water can be obtained from wells (about 150ft depth), hillside springs and from Crater Lakes. Patian 1 and Lumbian 1 have small fresh-water lakes.


Ref Se : 2C-4
CABALIAN PT.
TO MANGALIS PT.
FROM USC & GS CHART 4313
½ 0 2 3
Statute Miles
HEIGHTS IN FEET
SOUNDINGS IN FATHOMS
AT MEAN LOWER LOW WATER
Landing Beach---- 17
CANDEA PT.
CANDEA
MANGALIS PT.
MT. KAPUAK
1856
MT. KAGAT
2664
Mt. Tumatangas
MT. TARAN
1128
PULALUAAC PT.
wooded
Matos Shoal
18
SILANGAN
MT. PIANAN
623
SILANGON
SILANGON PT.
Indanan
N
1115
1902
2034
MT. TUKAY
PARANG
BUNGA
wooded
MARASAN
MARASAN PT.
CABALIAN
TUBINGANTAN PT.
15
16
17
rocks awash
tide rips
MAP 9

4. CABALIAN PT—5° 53′ N, 120° 56′ E—TO MANGALIS PT—6° 03′ N, 120° 58′ E (Maps 9, 15; Photo 7):

This coast section embraces most populous part of Jolo I. Good landing beaches are few. From Cabalian Pt to Tubingantan Pt there are no reefs, but elsewhere a coral reef fringes shore.

a. **Anchorages:**

None protected. Good open anchorage is available anywhere around coast within ½ ml from shore in 3-20 fms. A few offshore dangers are well charted.

b. **Coastline and Beaches:**

From Cabalian Pt west to Tubingantan Pt shore is cliffy in places. From there NW to Parang, thence westerly to Bunga Pt and NNE to Mangalis Pt coastline is fairly regular and low.

BEACH 16 (Maps 3, 9, 15; Photo 7):

Extends east for 550 yds from Tubingantan Pt. Considered a good landing beach for fairly large-scale landings for inland movement along the coast to Parang. Excellent for all types of LC at any tide.

BEACH 17 (Maps 3, 9, 15; Photo 7):

This 1¼ml beach extends for approx 1,200 yds to each side of Parang town. Considered a fair beach for extensive landing operations for attacking Jolo from the south along Route 2. Reliable reports indicate that small LC could cross the reef at many places at HW. Photos indicate a few places where large LC could probably be used at HW.

BEACH 18 (Maps 3, 9, 15):

At Silangkan (west coast) there is reported to be a sandy beach along the town waterfront. Beach is reported suitable for landing troops from small LC. (No photo coverage or other confirmation is available). From the town there are good MT roads to Jolo and south to Parang.

c. **Off-Lying Islands:**

PARANG I:

Very small, unimportant coral islet, sparsely wooded, lying just off coast, 1½ mls west of Parang.

SULADE I:

Mangrove swamp island surrounded by coral reef. Fringed by a narrow belt of firm sandy terrain.

d. **Landing Facilities:**

Nil.

e. **Hinterland:**

Cultivation and inland farms. Along shore large areas are under coconut cultivation. Back of shore terrain is rolling and well cultivated. Coconut trees are numerous; other timber is sparse and

scattered. Inland terrain rises to two main peaks, Mt Tukay (2,034ft) and Mt Tumatangas (2,664ft). Slopes near shore are gradual, but at ½-1 ml inland grade becomes steeper.

f. **Rivers:**

Nil.

g. **Barrios:**

Small *barrios* are numerous. Most important are Parang and Silangkan, each at terminus of improved roads. Neither had landing facilities. Parang is municipal center and has a market, Chinese stores, municipal building and school.

h. **Roads:**

Route 2 (Parang to Jolo) and Route 3 (Silangkan to Indanan) were used for trucking produce to Jolo. Route 4, narrow, well-surfaced, connects Parang with Silangkan, traversing level country. (See Sec 3—Roads and Trails).

i. **Resources:**

Large numbers of coconut trees are in area. Good timber is scarce. Third and fourth-grade lumber could probably be found in sufficient quantities for rough construction purposes. Coral-sand and basalt available in quantity. Water can be obtained from wells by drilling to about 150ft. Springs on hillsides are reported to supply natives with water.

Area is predominantly agricultural, but foodstuffs estimated to be sufficient for native population only.

LEGEND	
A/F	Airfield
Amph	Amphibious
fm(s)	Fathom(s)
HW	High Water
LC	Landing Craft
LW	Low Water

LANDING BEACH SUMMARY with Handbook No 57

This Summary covers all landing beaches considered to be tactically important. For further description of these beaches and detailed description of coastline, see Sec 2.

INFORMATION COMMON TO ALL BEACHES

All depths given at Mean Lower LW.
Depths offshore are measured from the HW line unless otherwise stated.
Distances and depths offshore were obtained from USC & GS Charts and Informants.
Tidal Ranges: See Misc Information

Amph Vehicles	LVTs and DUKWs
Small LC	LCVs and LCMs
Large LC	LCTs, LSMs, LCIs, LSTs

BEACH ORIENTATION Map and Photo Ref	BEACH 1 Maps 3, 3A, 4, 15; Photo 1	BEACH 2 Maps 3, 3A, 4, 15; Photo 1	BEACH 3 Maps 3, 3A, 15; Photo 3	BEACH 4 Maps 3, 3A, 15; Photo 4	BEACH 5 Maps 3, 3A, 15; Photo 4	BEACH 6 Maps 3, 3A, 15; Photo 4	BEACH 7 Maps 3, 3A, 15; Photo 2	BEACH 8 Maps 3, 3A, 15	BEACH 9 Maps 3, 3A, 15; Photo 5
OBJECTIVE	Jolo town and A/F	Jolo town and A/F	Access to Route 6 leading to Jolo from east.	Coastal Highway to Jolo (Route 5)	Coastal Highway to Jolo (Route 5)	Access to Coastal Highway (Route 5) at Taglibi *barrio*.	Coastal Highway to Jolo (Route 5)	Coastal Highway (Route 5)	Caduayan *barrio* and access to Route 1 and possible A/F site "2"
APPROACH FROM SEA	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear except for coral shoal patches (Eseo Bank) approx 1 ml offshore
DEPTHS OFFSHORE (At Mean LLW)	1 fm approx 200 yds offshore 3 fm approx 220 yde offshore	1 fm approx 250 yds offshore 3 fm approx 440 yds offshore	2 fm approx 150 yds offshore 5 fm approx 325 yds offshore	2 fm approx 150 yde offshore 5 fm approx 300 yds offshore	5 fm approx 375 yds offshore	1½fm approx 200yds offshore 3 fm approx 350 yds offshore	2½fm approx 150yds offshore 5 fm approx 250 yde offshore	3 fm approx 200 yds offsbore	2 fm approx 200 yde offshore 3 fm 300-400 yds offsbore
DIMENSIONS: Length Width LW Width HW	700 yds Not known 25 yds approx	900 yds 30-60 yds reported 15 yds approx	400 yds (approx) Not known 15-20 yds	350 yds Not known 15 yds	600 yds Not known Not known	1,000 yds Not known Narrow	1,300 yds 15-25 yds 10-20 yds	500 yds 10-25 yds 5-15 yds	1 ml (approx) 25-50 yds 10-25 yds
SLOPE at LW line HW line	Gradual Gradual	Gradual Reported 1%-2%	Fairly steep at end sections. Steep at end sections.	Steep Steep	Shallow east half; fairly steep west half. Not known east half; fairly steep west half.	Gradual, but fairly steep at openings through reef. Gradual, but steep at openings tbrough reef.	Fairly steep Steep	Fairly gradual Fairly steep	Fairly gradual Fairly steep
SURF CONDITIONS	Reported very little except during local squalls.	Reported very little except during local squalls.	Moderate surf at times in NE season.	Moderate surf at times in NE season.	Moderate surf at times in NE season.	Moderate surf at times in NE season.	Moderate to high surf at times in NE season.	Reported periods of fairly high ground swells and surf during NE season.	Reported periods of heavy ground swells and surf during NE season.
BEACH OBSTRUCTIONS for Landing Craft	Rugged fringing reef-flat 100-150 yds wide SW/NE ends. Rough surface covered with sand and mud. Numeroue deep boles.	Reef-flat 150-200 yds wide. Covered with muddy sand and coral rock. Reported fairly smootb near HW line.	Fringing reef section for 175 yds in center of beach.	None	Wide reef on east half that shelves fairly steeply. Reef-free on west half.	Interrupted fringing reef over 100 yds wide. There are 3 50-100yd openings tbrough this reef.	None	Shelving coral reef approx 25 yds wide.	Fringing reef patch in center of beach 500 yds long, 100-200 yds wide.
CHARACTER OF BEACH SOIL: Suitability for MT	White coral sand, probably suitable for MT	Beach bottom reported suitable for MT near HW line.	White coral sand, probably suitable for MT.	White coral sand, probably suitable for MT.	White coral sand, probably suitable for MT.	Coral sand, suitable for MT.	White coral sand, probably suitable for MT.	Coral sand, probably suitable for MT.	White coral sand, reported suitable for MT.
ACCESS TO ROAD SYSTEM	Good MT road approx 1,000 yds inland from beach to SE. Jeep tracks connect from beach.	MT road behind steep low bluff which must be ascended to reach road, except at south end of beach.	Route 6 is 1½ ml inland to SE. No MT tracks. Trails lead to road from beach.	Route 5 approx 150 yds inland from beach.	Route 5 just inland from beach.	Route 5 just inland from beacb easily accessible for MT.	Coastal Highway 500-800 yds offshore west/east ends.	Route 5 approx 1,100 yds inland. Grade probably too steep for MT and limits movement to foot troops.	Jeep track from small *barrio* 800 yde inland from east end leade to Route 1. Trails lead inland from beach.
HINTERLAND: Typa of soil, terrain and vegetation, with relation to movement and dispersal.	Coconut grove behind beach. Open grassland between coconuts and highway. A few swamp patches. Impassable swamp fringes Tulay basin.	Low swampy ground inland from NE half of beach not suitable for MT. Native houses, built out over beach at SW end, restrict movement inland.	Beach fringed with coconuts backed by undulating, well-drained ground covered with cultivated fields and secondary growth.	Firm, well-drained flat terrain between beach and road, covered witb dense coconuts.	Firm, flat, partially vegetated area between beach and road just inland.	Coconuts border beach. Probably heavy underbrush between beach and road just inland.	Well-drained rising terrain covered with coconut groves and open cultivated fields. Should be suitable generally for MT.	Steeply rising rugged terrain, heavily wooded. MT movement probably limited to narrow coastal plain.	Swamp just inland from center section. Firm, open, grassy, gently-eloping terrain inland around both sides of Lake Seit as far as Route 1, generally suitable for MT.
MISC INFORMATION	W of this beach impassable swamps fringe coastline. Tidal Range: Higher HW Heigbt 2.8ft, Chart Datum 0.0, Lowest Tide —1.5ft	Excellent protected anchorage and dock facilities. Tidal Range as for Beach 1.	Tidal Range approx as for Beach 1.	Tidal Range approx as for Beach 1.	Tidal Range approx as for Beach 1.	Tidal Range approx as for Beach 1.	Tidal Range approx as for Beach 1.	Tidal Range: Higher HW height 2.6ft app Chart Datum 0.0 Lowest Tide —1.5ft	Tidal Range: Higher HW height 2.6ft app Chart Datum 0.0 Lowest Tide —1.5ft
LANDING SUITABILITY and REMARKS	Poor beach. Suitable for amph vehicles only. Doubtful if small LC could discherge MT even at HW.	Fair beach. Small LC could discharge MT at HW.	Fairly good beach for small-scale operation. All types of LC could use east and west sections at HW through openings in reef. Smell LC could use them at any tids.	Excellent beach for smell-scale landings. Suitebia for all types of LC at eny tide.	Fairly good beech for small-scals landings. Suitabla for all types of LC on west half at any tide, possibly small LC at HW on east half.	Ganarally feirly poor baach for largs-scala oparations. Suitabia only for amph vshicles, except at openings through reef, whera small LC could beech at any tida.	Suitabia for largs-scale landing operations. Excellent landing beach for all types of LC at any tide.	Poor beach for large-scale oparations. Probably suitabia for all types of LC at HW and small LC at any tide.	Fairly good landing beech for largs-scala operation. Suitabia for small LC at any tida and largs LC at HW.

[CONTINUED OVERLEAF

LEGEND	
A/F	Airfield
Amph	Amphibious
fm(s)	Fathom(s)
HW	High Water
LC	Landing Craft
LW	Low Water

LANDING BEACH SUMMARY with Handbook No 57

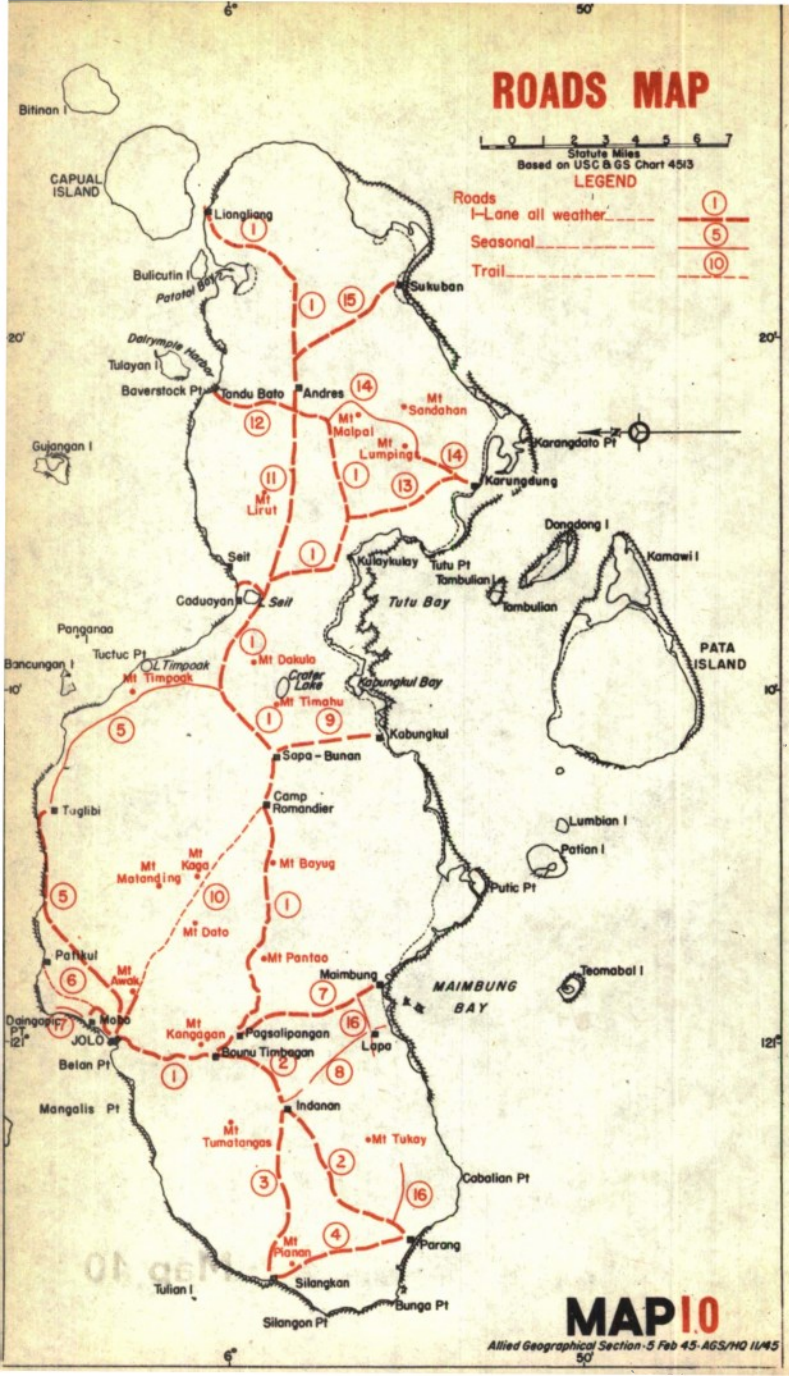
(Continued from Overleaf)

INFORMATION COMMON TO ALL BEACHES

All depths given at Meen Lower LW.
Depths offshore are measured from the HW line unless otherwise stated.
Distances and depths offshore were obtained from USC & GS Charts and Informants.
Tidal Ranges: See Misc Information

Amph Vehicles	LVTs and DUKWs
Small LC	LCVs and LCMs
Large LC	LCTs, LSMs, LCIs, LSTs

BEACH ORIENTATION Msp and Photo Ref	BEACH 10 Maps 3, 3A, 15; Photo 6	BEACH 11 Meps 3, 5, 15; Photo 6	BEACH 12 Msps 3, 5, 15; Photo 6	BEACHES 13 & 14 Meps 3, 8, 15	BEACH 15 Maps 3, 9, 15	BEACH 16 Meps 3, 9, 15; Photo 7	BEACH 17 Maps 3, 9, 15; Photo 7	BEACH 18 Maps 3, 9, 15
OBJECTIVE	Access to Route 12 inland from Tandu Bato to possible A/F site "3"	(Not considered a suitable beach for landing operations. See Sec 2 C, para 1)	Tandu Bato landing and possible access inland to A/F site "3"	(These beaches are considered not suitable for landing operations. See Sec 2 C, para 3)	Inland access to Maimbung to east and Parang to west along coast.	Access to Parang and Route 2 by movement along coast.	Parang and Route 2 to Jolo	Access to Route 3 (leading to Jolo) in vicinity of Silangkan.
APPROACH FROM SEA	Clear		Clear channels around either side of Tulayan I. Numerous shoals offshore.		Obstructed by numerous rocky shoals approx 1 ml offshore to south.	Clear	Clear	Clear
DEPTHS OFFSHORE (At Mean LLW)	2½ fm approx 175yds offshore 5 fm 300 yds offshore		1 fm approx 60 yds offshore from LW line 3 fm approx 225 yds offshore from LW line		3 fm approx 400 yds offshore	3 fm 50-200 yds offshore east to west end.	2½ fm approx 300yds offshore 5 fm 500-600 yds offshore	3 fm approx 400 yds offshore
DIMENSIONS: Length Width LW Width HW	850 yds Not known 10-20 yds		970 yds 50-80 yds wide 10-20 yds wide		500 yds Not known 20 yds	550 yds 20-30 yds 15-20 yds	1½ ml Not known 15-40 yds	Not known Not known Not known
SLOPE at LW line HW line	Shallow. Fairly steep at west end. Fairly shallow. Steep at west end.		2½%-4% 1%-2%		Not known Not known	Steep Steep	Reported shallow Reported fairly steep in places	Not known Not known
SURF CONDITIONS	Moderate surf at times in NE season.		Little surf in NE season.		Reported little to none at any time except during local squalls.	Reported little surf at any time except during local squalls.	Little or none, except during squalls (reported).	Reported only moderate surf along this coast at times during both seasons.
BEACH OBSTRUCTIONS for Landing Craft	Irregularly-surfaced reef that dries for approx 100 yds and then shelves very steeply. 40-50yd opening at west end.		Gradual-sloped sand beach bottom. Shallow sand bar on west half. Reported drying coral patch off center of beach.		Rugged coral reef 200-250 yds wide, with deep depressions inshore from outer fringe.	None	Coral reef-flat, 100-200 yds wide, covered with sand.	Chart indicates 150yd wide fringing reef along this section of coastline.
CHARACTER OF BEACH SOIL: Suitability for MT	White corsl sand, probably suitable for MT.		White coral sand, probably suitable for MT.		White coral sand, probably suitable for MT.	White coral sand, probably suitable for MT.	Reported suitable for MT.	Reported sandy beach.
ACCESS TO ROAD SYSTEM	Good MT road 1½ ml inland to SE.		Only exit through wide swamp inland is by single track that would need improvement for MT.		No known coastal tracks. Movement east to Maimbung would probably be limited to coastal plain.	No known coastal tracks. Movement to Parang would best be made along coast.	Jeep track, just inland from beach, parallel to shore along entire beach. MT road inland to Jolo.	Accessibility to Routes 2 and 3 st village from beach not known.
HINTERLAND: Typs of soil, terrein and vegetation, with relation to movement and dispersal.	Good, firm, flat terrain partly covered with coconuts and partly open cultivated fields.		150-200 yds of coconut plantations backed by wide dense swamp. Firm MT terrain approx ½ ml inland.		Firm ascending terrain from coast. Dense coconuts fringe beach backed by open cultivated fields covering rising ground.	Fairly flat ground 100-200 yds inland covered with dense coconuts. Further inland ground ascends fairly steeply, covered with numerous open cultivsted fields. Firm, suitable for MT.	Coconut plantations fringe coastline. Cultivated open fields farther inland suitable for MT cross-country. Terrain slopes upwsrd from beach.	Reported dense coconuts inland from beach. Ground fairly flat inland from coast along this section.
MISC INFORMATION	Tidal Range: Higher HW height 2.4ft Chart Datum 0.0 Lowest Tide —1.5ft		Tidal Range: Higher HW height 2.4ft Chart Datum 0.0 Lowest Tide —1.5ft		Tidal Range: Higher HW height 3.9ft Chart Datum 0.0 Lowest Tide —1.5ft	Tidal Range approx as for Beach 15.	Tidal Range: Higher HW height 3.9ft Chart Datum 0.0 Lowest Tide —1.5ft	Tidal Range: Higher HW height app 3.0ft Chart Datum 0.0 Lowest Tide —1.5ft
LANDING SUITABILITY and REMARKS	Fair beech for lerge-scale lendings. Suiteble for small LC et any tide et west end end possibly for small LC et HW for remainder.		Fair beech for large-scale operetions. Suiteble for smell LC at any tide, with possibility of larga LC et HW. Very restricted inlend movement.		Fair beach for smell-scale lendings. Probebly suiteble for smell LC et HW only. Possibly suitable for lerge LC near east end through break in reef at HW.	Good landing beech for fairly lerge-scale operetion. Excellently suited for ell types of LC at any tide.	Fair beach for extensive landing operations. Probebly suiteble for small LC at HW. A few possible pieces for large LC at HW.	Reported suiteble for lending foot troops from smell LC.


ROADS MAP
0 1 2 3 4 5 6 7
Statute Miles
Based on USC & GS Chart 45/3
LEGEND
Roads
1-Lane all weather
Seasonal
Trail
1
5
10
Bitinan I
CAPUAL ISLAND
Liongliang
Bulicutin I
Patatal Bay
Sukuban
Dalrymple Harbor
Tulayan I
Baverstock Pt
Tandu Bato
Andres
Mt Sandahan
Mt Malpal
Mt Lumping
Karangdato Pt
Gujangan I
Karungdung
Mt Lirut
Dongdong I
Kamawi I
Seit
Kulaykulay
Tutu Pt
Tambulian I
Tambulian
Caduayan
Seit
Tutu Bay
Panganao I
Tuctuc Pt
Bancungan I
Timpook
Mt Timpook
Mt Dakula
Crater Lake
Mt Timahu
Kabungkul Bay
PATA ISLAND
Kabungkul
Sapa - Bunan
Camp Romandier
Tuglibi
Lumbian I
Patian I
Mt Kaga
Mt Matanding
Mt Bayug
Putic Pt
Mt Dato
Mt Pantao
Pattikul
Mt Awak
Maimbung
Teomabal I
MAIMBUNG BAY
Daingan Pt
Mato
Mt Kangagan
Pagsalipangan
Lapa
JOLO
Bounu Timbagan
Betan Pt
Indanan
Mangalis Pt
Mt Tumatangas
Mt Tukay
Cabalian Pt
Mt Planan
Parang
Silangkan
Tulian I
Bunga Pt
Silangon Pt
MAP 10
Allied Geographical Section-5 Feb 45-AGS/HQ ILAS

SECTION 3

ROADS AND TRAILS

(Map 10; Photos 10, 11)

A—ROADS

1. GENERAL:

On Jolo I were approx 100 mls of surfaced roads and 30 mls of unsurfaced roads. They were well maintained and in good condition in 1941.

Cross-section of the surfaced roads shows a graded, rolled, natural soil with 6in foundation of coarse basalt rock and 3in surfacing of small crushed stone, pumice, or coral limestone.

Roads are 10-12ft wide, not considering shoulders and ditches along either side.

Recent photographic coverage (Oct 44) of portions of north and south coastal roads is available. Information on roads inland and extreme east and west coasts dates from 1941.

2. DESCRIPTION OF ROADS:

ROUTE 1—Jolo to Liangliang, via Seit and Kulaykulay (38 mls):

A good 1-lane AW surfaced road, with an average width of 8-10ft; in places up to 12ft.

Miles	
00	JOLO. Flat coastal plain for 1 ml. Swampy on outskirts of town, then cultivation and coconut groves.
1.0	Road climbs gradually for 1½ mls skirting western side of Mt Dato (800ft).
3.0	Top of saddle 500ft ASL. Mt Kangagan (1,095ft) ½ ml east of road. Downgrade from here.
4.2	BOUNU TIMBAGAN *barrio*. Road junction—Route 2 for 10 mls south and SW to Parang; Route 3 leaves Route 2 at Indanan to run west 10 mls to Silangkan.
4.7	PAGSALIPANGAN *barrio*. Road junction of Route 7 which runs southerly to Maimbung (7½ mls).
7.2	MT PANTAO (941ft), ½ ml south of road. Rolling cultivation and grassland on either side.
10.5	MT BAYUG (500ft) to south of road.
12.0	Bilaan Constabulary Post (Camp Romandier). Road junction with Route 10 for about 12 mls NW to Jolo through mountains.
15.3	SAPA BUNUAN is just south of this junc. Route 9 goes south to Kabungkul (4½ mls) and Route 1 turns NE and skirts Mt Timahu (853ft) and Mt Dakula (1,310ft).

18.0 Road junc—Route 5 (seasonal road) runs north, then west to Taglibi and thence back to Jolo as 1-L AW road.

18.6 Road runs east and follows slope of Mt Dakula.

21.2 Road junc—short route runs north and skirts east of L Seit to Caduayan (1 ml).

22.4 Road junc—Route 1 turns south and Route 11 continues east across mountains to Andres (6 mls).

24.4 KULAYKULAY.

25.8 Road junc—Route 13 branches south to Karungdung (4½ mls).

29.3 Road junc—Route 14 (seasonal; becoming 1-L AW) runs SW to Karungdung (5 mls).

31.6 CAMP ANDRES CONSTABULARY post. Road junc—Route 12 runs north to Tandu Bato (3 mls).

31.6 Road junc—Route 15 goes SE to Sukuban (4 mls).

36.0 East shore of Patotol B.

37.9 LIANGLIANG.

ROUTE 2—Bounu Timbagan to Parang (10 mls):

Branches off Route 1 (4.2 mls from Jolo). Route is said to be good 1-L AW surfaced road. It runs through rolling country east of Mt Tumatangas, and in places is cut into the hillside. At Indanan junc with Route 3 (west to Silangkan) it turns SW and runs at elevation of 600-700ft along slopes of Mt Tukay (2,034ft). At Parang, Route 4 runs NNW to Silangkan (4½ mls).

ROUTE 3—INDANAN TO SILANGKAN (5½ mls):

At Indanan good 1-L AW surfaced road branches west from the Bounu Timbagan-Parang road (Route 2) and runs south of Mt Tumatangas at elevation of 500ft to Silangkan. From Silangkan Route 4 runs to Parang (4½ mls).

ROUTE 4—SILANGKAN TO PARANG (4½ mls):

A good gravel-surfaced 1-L AW road. There are gates for traffic to pass. From Silangkan road climbs gradually for about 1 ml around the west side of Mt Pianan (623ft), then eases down to fairly level terrain. No bridges.

ROUTE 5—Jolo to Taglibi (8¼ mls), **thence to Route 1** (total 17 mls):

A good 1-L AW macadam road, 10-12ft wide, through intensive cultivation—coconut groves, orchards, gardens—to Taglibi. Between Taglibi and junction with Route 1 it is 1-L unsurfaced, 8-10ft wide.

Leaving Jolo, Route 5 passes along southern side of Zettel A/F, then turns NE. It skirts eastern slopes of Mt Patikul (823ft) 3½ mls farther on.

East of Patikul *barrio* road parallels coast about 400 yds inland. From Taglibi it continues east as a seasonal road, skirts the west side of Mt Timpoak (1,045ft) and joins Route 1 about 18 mls out of Jolo.

On Route 5, between Jolo and Mt Timpoak, are several timber bridges, with concrete abutments, capable of supporting 5-ton loads. Details:

From Jolo	*Bridge Dimensions*
2 mls	16ft x 253ft
6 „	14ft x 112ft
6½ „	10ft x ?
9½ „	10ft x 49ft
Between 10-11 „	7ft x 15ft 10ft x 28ft 10ft x 18ft
12 „	10ft x 30ft
12½ „	10ft x 30ft
to 13 „	10ft x 24ft 10ft x 30ft 10ft x 28ft

ROUTE 6—Jolo to Mobo (1¾ mls):

A 1-L AW road. Follows waterfront NE of Jolo for 400 yds before turning inland, climbs through coconut groves, skirting large swamp area near coast. At 400 yds SE of Mobo coastal *barrio*, a trail 8-9ft wide, probably passable to jeeps, branches NE and follows coastal plain to Patikul *barrio*.

ROUTE 7—PAGSALIPANGAN TO MAIMBUNG (7½ mls)—Photo 10:

Good 1-L AW surfaced road which branches SE from Jolo-Liangliang road (Route 1) at Pagsalipangan *barrio*. It runs through undulating and rolling cultivated country to Maimbung.

ROUTE 8—Indanan to Lapa (5 mls):

Seasonal unsurfaced road, averaging 10ft wide, which branches SE from Indanan on Jolo-Parang road (Route 2). It runs through gently undulating cultivated terrain.

ROUTE 9—Sapa Bunuan to Kabungkul (4½ mls):

Branches south from Route 1 near Sapa Bunuan; crosses a flat cultivated valley to Kabungkul on NW shore of Tutu B. No details of width or surfacing are available.

ROUTE 10—Jolo to Bilaan Constabulary Post (Camp Romandier)—about 12 mls:

Road is 1-L AW for 1½ mls from Jolo to Mt Awak (572ft), where it narrows to 6-8ft trail. It passes through coconut groves for some mls, then climbs to approx 1,800ft elevation between Mt Daho (2,247ft) and Mt Matandang (1,574ft). Trail stays at more than 1,000ft to beyond Mt Kaga (1,744ft). The last 2 mls to Camp Romandier are downgrade through sloping grassland.

ROUTE 11—Lake Seit to Camp Andres (6 mls):

Runs east from junction to Route 1 near L Seit, whence Route 1 runs south to Kulaykulay. Route 11, of recent construction, passes through undulating to hilly grassland, crossing a saddle south of Mt Lirut (1,500ft) at approx 700ft elevation. It rejoins Route 1 at Andres. No details of surfacing or width are available.

ROUTE 12—Andres to Tandu Bato (3 mls):

A 1-L AW surfaced road, 10ft wide. It branches north from Route 1 about ½ ml west of Andres and runs through flat or gently sloping grasslands to end of causeway at Tandu Bato (Dalrymple Hr). Terrain west of road is reported suitable for airfield construction. (See Sec 4—Airfields).

ROUTE 13—From Route 1 to Karungdung (4½ mls):

Partially surfaced. It turns south from Route 1 at a point 25.8 mls from Jolo and runs through undulating, cultivated or wooded terrain to Karungdung. About ½ ml north of Karungdung a similar road (Route 14) branches NE to rejoin Route 1 about 1 ml south of the junction west of Andres.

ROUTE 14—Karungdung to Route 1 (5 mls):

From junction ½ ml north of Karungdung this 1-L dirt road, 10ft wide, branches NE through mountainous country. For 1½ mls from the junction north of Karungdung it is surfaced. Thence it continues as a dirt road. It climbs steeply for 2½ mls and passes through a saddle (elevation 500ft) between Mt Sandahan (1,191ft) and Mt Lumping (978ft). About 1 ml on it passes close to Mt Malpal (829ft). From there north is an easy downgrade to junction with Route 1 south of Andres. Terrain is partly cultivated, with small patches of timber, secondary growth and coconut groves.

ROUTE 15—Andres to Sukuban (4 mls):

A 1-L seasonal road, approx 8-10ft wide, through partly wooded and partly cultivated rolling terrain. In dry weather it is probably passable to MT.

ROUTE 16—Parang to Maimbung (8 mls):

A seasonal dirt road, 12ft wide, branches east from Indanan-Parang road (Route 2) ½ ml NE of Parang and continues eastward for 2 mls. Here the road ends abruptly, but movement by foot is most likely possible to Lapa *barrio*, 4 mls to east. From Lapa a seasonal dirt road, 12ft wide, continues east for 2 mls, where it joins main Jolo-Maimbung road (Route 7) ½ ml NW of Maimbung.

ROUTE 17—Mobo to Daingapic Pt (1¼ mls):

An unsurfaced dirt road leads north from Mobo *barrio*, paralleling the coast about 100 yds inland; extends for 1 ml to just north of Daingapic Pt.

B—TRAILS

(Photo 11)

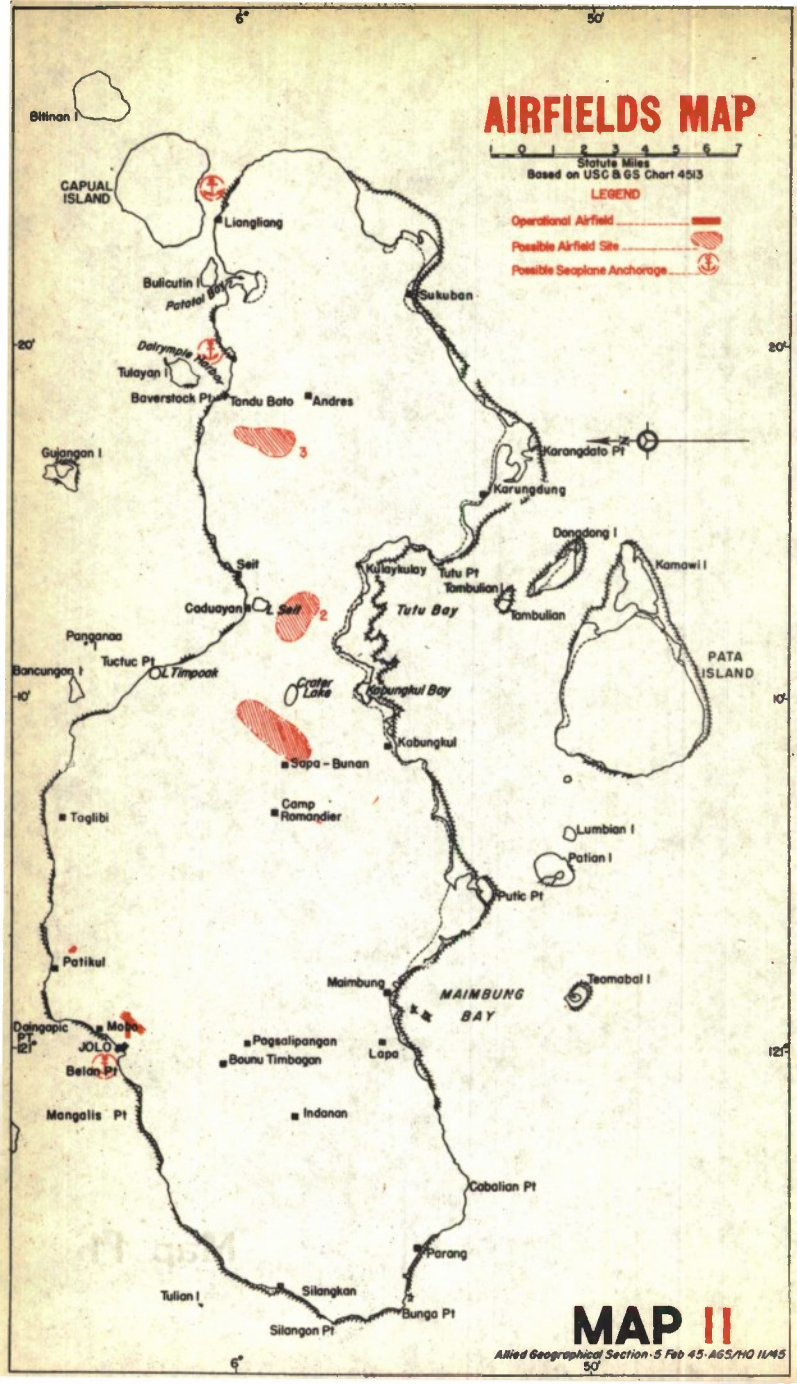
Good trails link practically all settlements on island. Many would be passable to jeeps except in some wooded areas. In many cases beaches provide an easy route between coastal *barrios;* they are much used by Moros.

Information on trails is generally not available.

10. Jolo - Maimbung road.
(Route 7. Pre-war

10

11. Unimproved track through mangrove swamp, Dalrymple Hr. Looking north. Pre-war


AIRFIELDS MAP
0 1 2 3 4 5 6 7
Statute Miles
Based on USC & GS Chart 4513
LEGEND
Operational Airfield
Possible Airfield Site
Possible Seaplane Anchorage
Bitinan I
CAPUAL ISLAND
Liangliang
Bulicutin I
Patatal Bay
Sukuban
Dalrymple Harbor
Tulayan I
Baverstock Pt
Tondu Bato
Andres
Guiangan I
Karangdato Pt
Karungdung
Dongdong I
Kamawi I
Seit
Kulaykulay
Tutu Pt
Tambulian I
Tambulian
Caduayan
Seit
Tutu Bay
Panganaa I
Tuctuc Pt
Bancungan I
L. Timpook
Crater Lake
Kabungkul Bay
PATA ISLAND
Kabungkul
Sapa - Bunan
Camp Romandier
Toglibi
Lumbian I
Patian I
Putic Pt
Patikul
Maimbung
MAIMBUNG BAY
Teomabal I
Daingapic
Mogo
JOLO
Belan Pt
Pagsalipangan
Bounu Timbagan
Lapa
Mangalis Pt
Indanan
Cabalian Pt
Parang
Tulian I
Silangkan
Bunga Pt
Silangon Pt
MAP II
Allied Geographical Section - 5 Feb 45 - AGS/1110 11/45

SECTION 4

AIRFIELDS, POSSIBLE SITES, POSSIBLE SEAPLANE ANCHORAGES

(Map 11; Photos 12, 13)

A—AIRFIELDS AND POSSIBLE SITES

1. GENERAL:

Only operational airfield in area is Zettel A/F. Jolo has some areas which are considered suitable for the construction of airfields.

2. OPERATIONAL AIRFIELDS:

Zettel Airfield—6° 03′ N, 121° 00′ E (Map 11; Photos 12, 13):

East of Jolo town near coast. Pre-war ELG. Occupied by enemy in Jan 41. Transport planes used field during latter part of 1944.

Runway:

One runway, E/W, 3,950ft x 459ft, with grassy, clay loam surface and with a downgrade of 2.25% toward western end.

Dispersal Revetments and Installations:

Dispersal, approx 2,500ft x 300ft, is at SE corner of field. Dispersal loops feed 23 fighter and two bomber revetments. Buildings within dispersal loop at SE corner of field may be barracks. No hangars or workshops are seen on recent photographs.

Extension:

Eastern end can possibly be extended 500ft. Area lends itself to the construction of a grass strip.

Approaches:

Over sea from west; over foothills from east.

Engineer Materials:

Sand, gravel and lava rock in vicinity. Timber available from nearby hills; coral from reef along shore; water from Jolo town.

Communications:

Field is adjacent to town which is in road communication with entire island. (See Sec 3—Roads). Field is ½ ml from Jolo port. Radio and telephone were available in Jolo town.

3. POSSIBLE SITES:

Three sites were recommended as potential sites by US Naval Surveyors in 1936.

AREA 1 (4½ mls north of Kabungkul): Area is clear; no obstructions to approaches or take-off. Natural drainage is good. Area is suitable for construction of two fields, both NE/SW.

US Naval Survey measured the west field of 3,000ft x 4,000ft separated by 1,000 yds from east field measuring 2,500ft x 3,500ft.

Little grading and filling would be required to join these two sites, making an area of 3,000ft x 10,500ft.

Water obtainable from two rivers. Timber available from southern mountains.

AREA 2 (1 ml south of L Seit, north-central part of Jolo): A relatively level area, 2,500ft x 3,500ft, would be available. Drainage is natural and good. Water is available from L Seit or from Crater Lake. Field is probably too short. Runway would be NE/SW.

AREA 3 (2 mls SE of Tandu Bato): Appears suitable for N/S field 4,300ft x 2,600ft. Drainage is natural and good. Area mostly under cultivation. Water and timber available.

On off-lying islands some locations may be found. Information scarce. Cabucan I, almost 8 mls NW of Jolo town, is low (highest elevation 50ft to top of trees). A NE/SW length of 3 mls might be suitable for runways. Island is bordered by mangrove and salt-water swamps. Nothing is known about vegetation.

B—POSSIBLE SEAPLANE ANCHORAGES

1. **Dalrymple Hr**—6° 01′ N, 129° 19′ E:

South shore of Dalrymple Hr is considered to be the only area suitable for seaplane base. Offshore depth is satisfactory for anchorage. No appreciable swell or surf. Beach slopes gradually and is reef-free. There would be unlimited take-off and landing areas in every direction.

Beach would require long slipways, and only a limited number of hangars and installations could be constructed on high ground adjacent to beach. Balance of buildings would have to be erected inshore from mangrove which backs beach. Timber is not available locally. Coral, beach sand and lava rock are abundant. Water is available at Boal, 1½ mls west of Tandu Bato, where springs supply 300,000 gals in 24 hrs. Water would require treatment.

2. **Jolo Hr**—6° 03′ N, 121° 00′ E:

Anchorage and mooring area is available for approx 12 seaplanes close to beach, NE of wharf, in 1-5 fms, sand. Jolo was surveyed in 1936 and classified poor because exposed to weather and heavy ground swell. Unlimited landing and take-off area in all directions available.

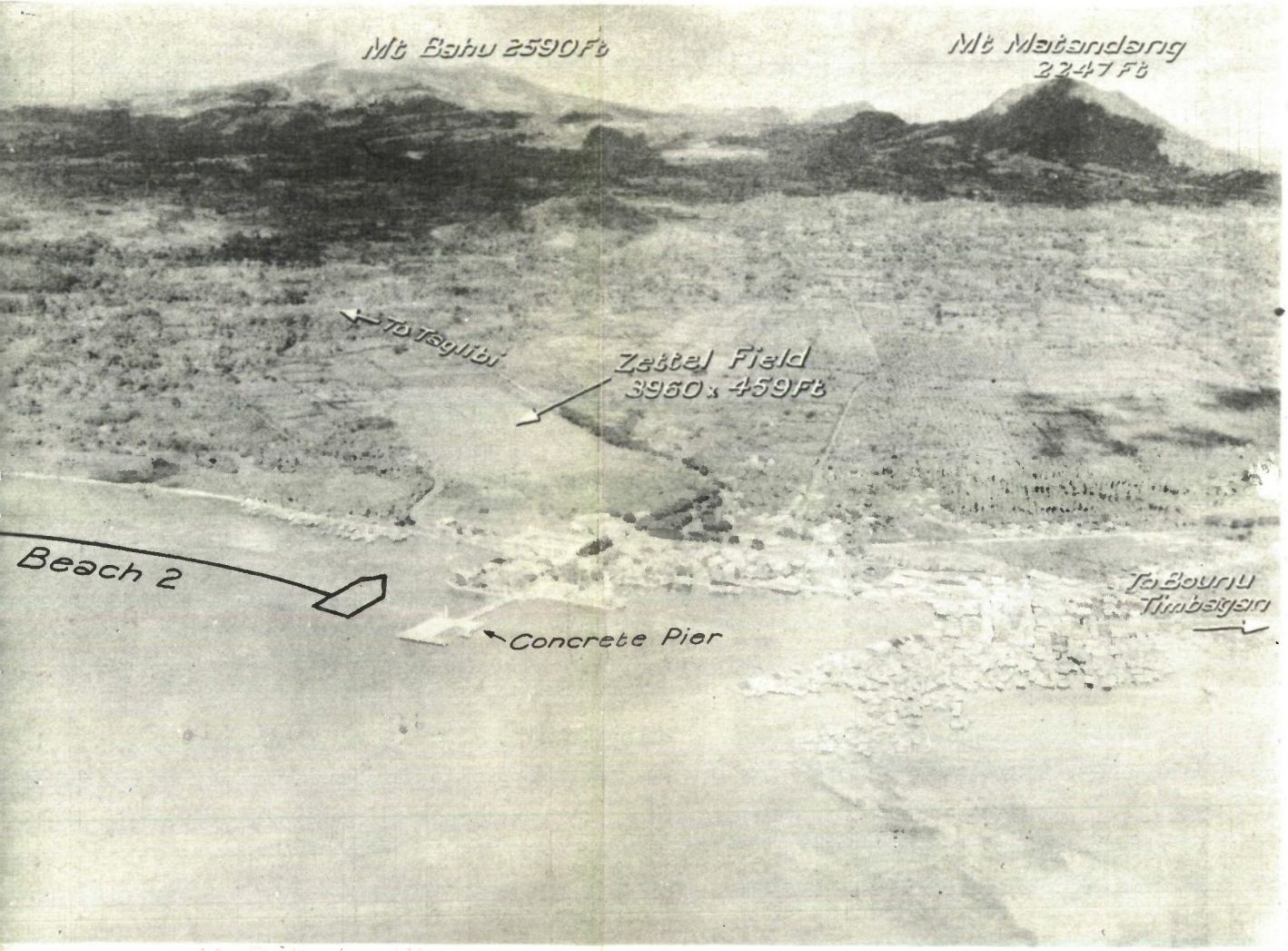
3. **Capual Chan**—6° 01′ N, 124° 24′ E:

Anchorage and mooring area available in channel adjacent to Liangliang in 1-5 fms, sand and gravel bottom. Tidal currents are strong. Good shelter from winds from all directions except SE. Landing and take-off, ESE/WNW, about 3 mls long, somewhat restricted by shoals extending from western shore.

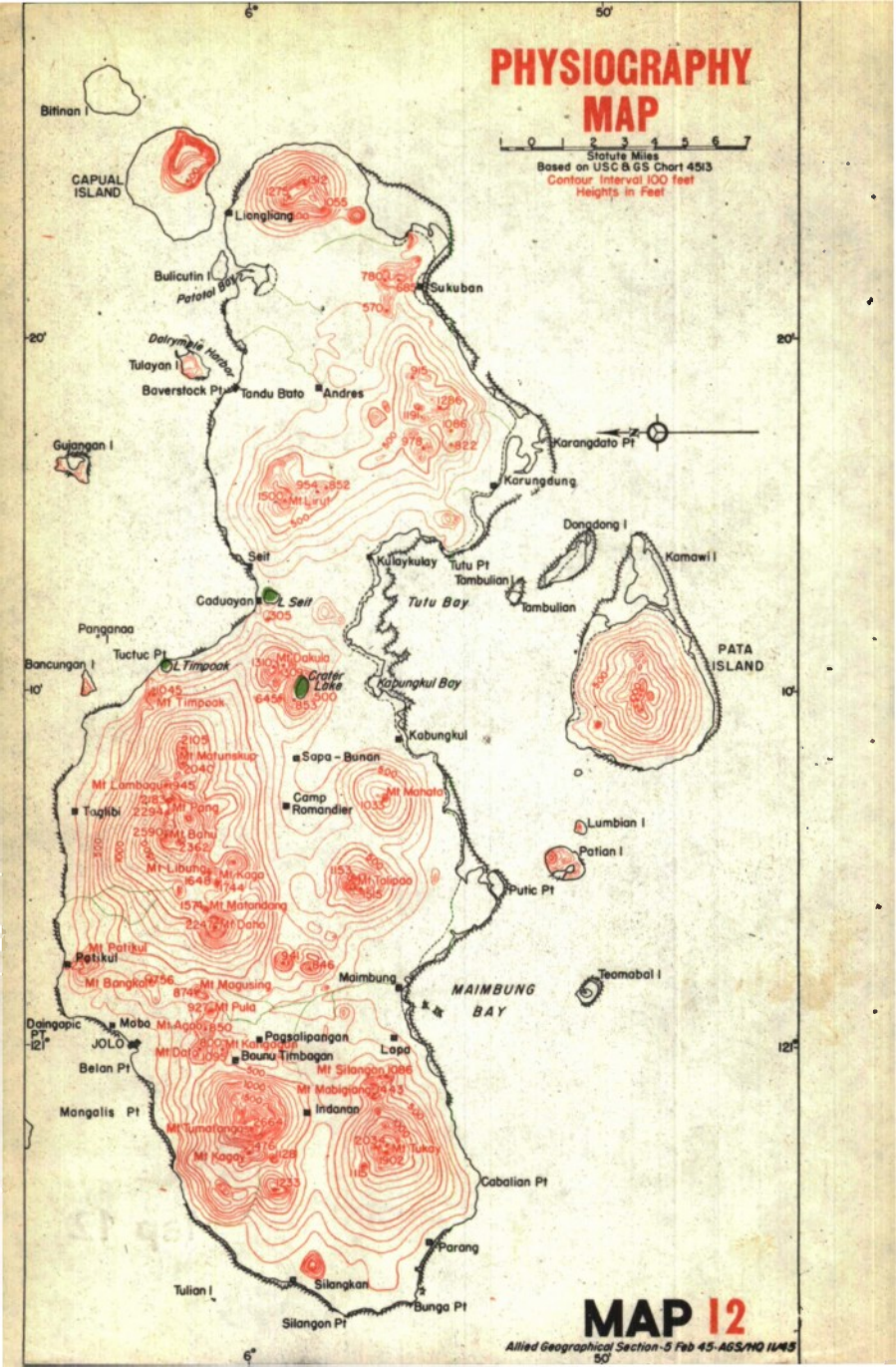
(12)

12. Zettel Airfield.
Looking west. 1938

13

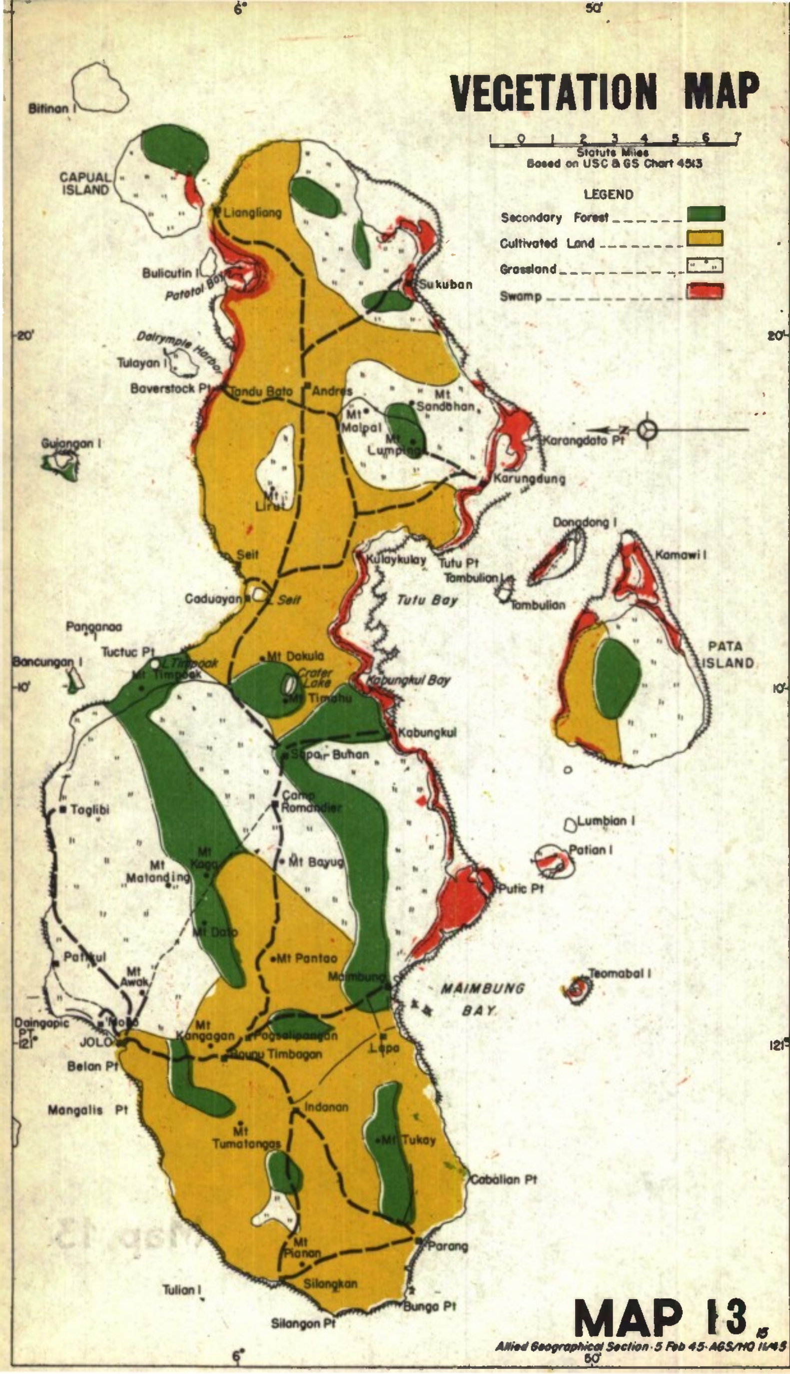


13. Jolo town and Airfield. Looking SE. 1935



MAP 12

Allied Geographical Section-5 Feb 45-AGS/HQ 11/45



VEGETATION MAP
0 1 2 3 4 5 6 7
Statute Miles
Based on USC & GS Chart 4513
LEGEND
Secondary Forest
Cultivated Land
Grassland
Swamp
Bitinan I
CAPUAL ISLAND
Liangliang
Bulicutin I
Patotol Bay
Sukuban
Dalrymple Harbor
Tulayan I
Baverstock Pt
Tandu Bato
Andres
Mt Sandbhan
Mt Malpal
Mt Lumping
Karangdato Pt
Karungdung
Guiangan I
Mt Lirut
Dongdong I
Komawi I
Seit
Kulaykulay
Tutu Pt
Tambulian I
Tambulian
Caduayan
L Seit
Tutu Bay
Panganaa I
Tuctuc Pt
L Timpook
Mt Timpook
Mt Dakula
Crater Lake
Mt Timahu
Kabungkul Bay
Bancungan I
PATA ISLAND
Kabungkul
Sapa Buhan
Taglibi
Camp Romandier
Lumbian I
Patian I
Mt Kaga
Mt Matanding
Mt Bayug
Putic Pt
Mt Dato
Patikul
Mt Pantao
Maimbung
Mt Awak
MAIMBUNG BAY
Teomabal I
Daingapic PT
Jolo
Mt Kangagan
Pogsalipaagan
Lapa
Belan Pt
Bauno Timbagan
Mangalis Pt
Indanan
Mt Tumatangas
Mt Tukay
Cabalian Pt
Parang
Mt Pianan
Tulian I
Silongkan
Bunga Pt
Silangon Pt
6°
50'
20'
10'
121°
MAP 13
Allied Geographical Section · 5 Feb 45 · AGS/HQ 11/43

SECTION 5

PHYSIOGRAPHY AND VEGETATION

(Maps 12, 13, 15; Photos 14, 15)

1. PHYSIOGRAPHY: (Maps 12, 15):

Island has general farm-like appearance with much open country, a great deal of which is under cultivation. Rolling terrain is broken by numerous extinct volcanic peaks and hills rising singly from gently rising slopes. Peaks vary from about 400ft to over 2,000ft, highest being Mt Tumatangas (2,664ft) in western part of island. Other prominent peaks are Mt Bahu (2,590ft) in north-central portion; Mt Tukay (2,034ft) in SW portion; Mt Talipao (1,515ft) in south-central portion; and Tandu Pk (1,312ft) at eastern extremity. Many peaks have crater lakes at summit.

Island is drained by small streams, largest being Maimbung R on south coast, which has narrow flood plain. Larger streams are perennial and subject to flash floods after heavy rain.

Wide passes and grassy valleys between peaks are followed by roads which provide free movement for troops and MT throughout most of island. Mountain peaks and wooded gullies on high slopes are the only obstacles to cross-country movement.

2. VEGETATION (Map 13):

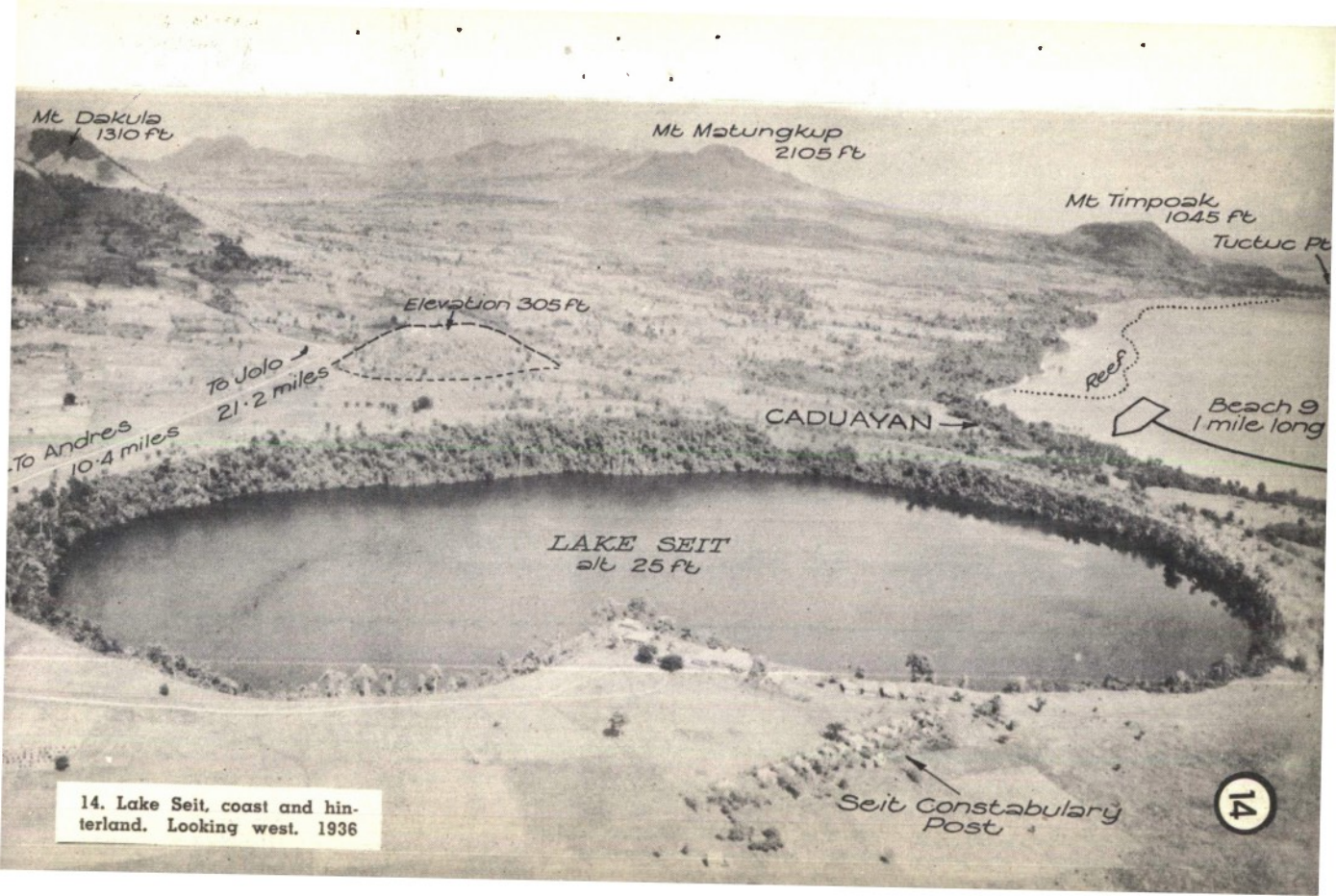
Mainly cultivation and grassland with sparse timber on the higher slopes and summits of mountain peaks. Teak forest reserve is on NW coast west of Jolo City.

Cultivation consists mainly of *abaca, cassava,* corn, coconuts and upland rice. Fields are well laid out and separated by lines of brush or local patches of secondary growth. Most intensively cultivated areas are around Jolo, Maimbung, Parang and Seit near the coast, and around Talipao in interior.

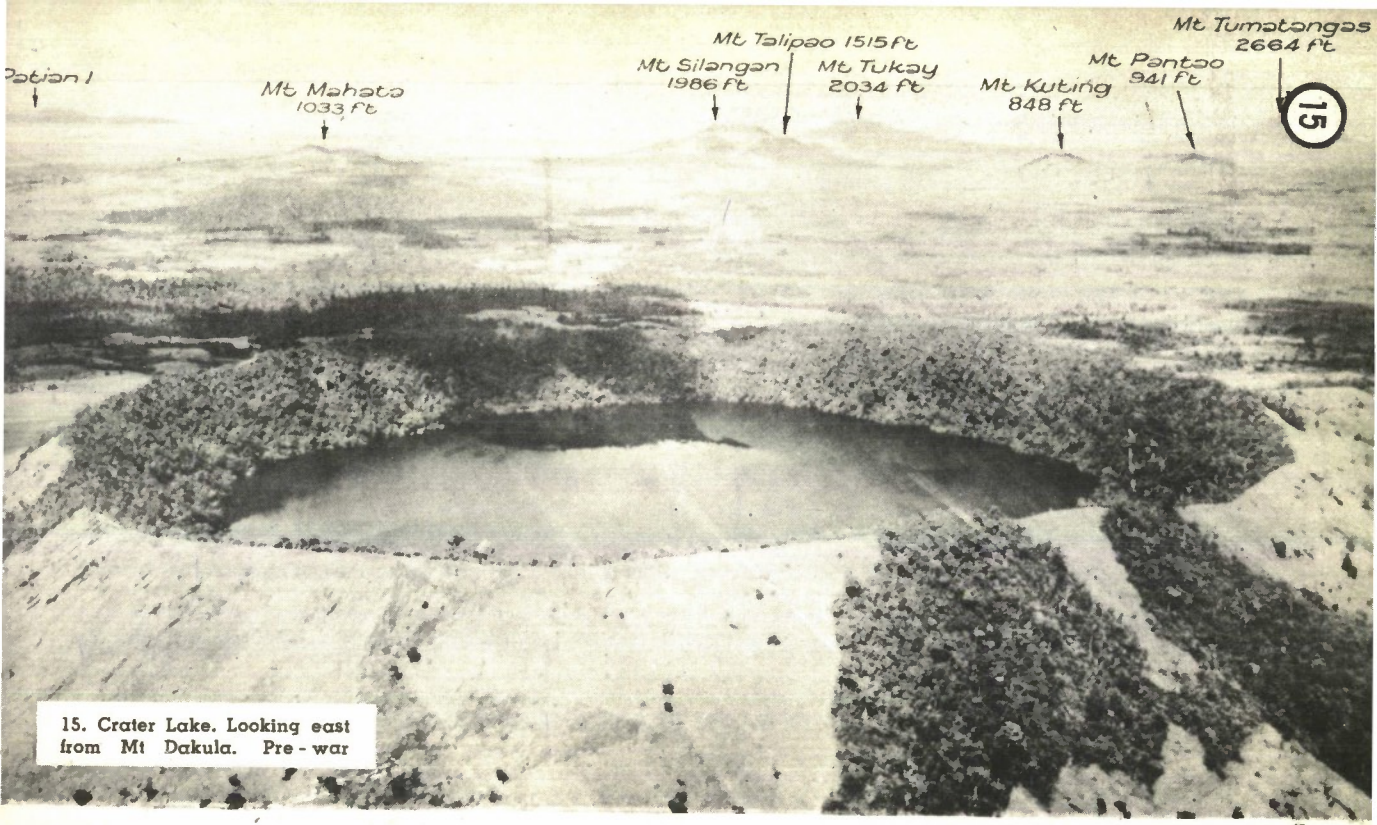
Large areas of open country are covered in *cogon* grass, particularly along the coast east of Jolo town, across the central portion, and in much of the eastern portion of the island.

Mangrove swamps fringe coastline at intervals, particularly on south coast at Putic and Karangdato Pts.

Vegetation generally will offer no serious impediment to movement of troops and MT.



14. Lake Seit, coast and hinterland. Looking west. 1936



15. Crater Lake. Looking east from Mt Dakula. Pre - war

SECTION 6

POPULATION, ADMINISTRATION AND TOWNS

A—POPULATION

1. GENERAL:

Sulu Archipelago had a population of 247,117, of whom more than 90% were non-Christian Moros. Jolo Group had 143,258 inhabitants. Jolo town (6,272) was biggest town in archipelago. The few whites in area were mainly in Jolo town. Chinese constituted most of large foreign group and every town or *barrio* of any size has a Chinese settlement.

2. WHITE RESIDENTS:

There were 31 Americans and 18 Europeans in the Sulus. Fifteen of the Americans and 15 of the Europeans lived in Jolo town.

3. ASIATICS:

In the Sulu Archipelago were 1,294 Chinese and 34 Japanese; of these 987 Chinese and 33 Japanese lived in Jolo Group. Japanese were engaged mainly in domestic trade and fishing. Chinese handled most of the retail trade.

4. NATIVES:

a. **Numbers:**

There were 244,707 Filipinos in the Sulu Archipelago, of whom 141,407 lived in Jolo Group.

b. **Languages, Religion, Loyalties:**

Moros on Jolo I (Joloanos) speak a different language from Moro language of Mindanao or Borneo. Some English is understood by 20,000 Moros.

Moros are generally disunited. The Sultan of Sulu in Jolo was the supreme potentate to whom the various chiefs reported. They are pagans and generally neither pro-Japanese nor pro-American, but it is believed they would prefer Americans to Japanese because Americans treated them better; they would probably prefer Americans to Christian Filipinos because Americans have defeated them in battle and they respect the stronger.

B—ADMINISTRATION

1. PRE-WAR:

Before Japanese occupation government of the Philippines was republican in form, with official seat at Manila. The National Government was divided into executive, legislative and judicial powers. Local government consisted of 48 provinces (Sulu Archipelago is one) and 12 chartered cities. Provinces were divided into municipalities consisting of *poblacion* (central village) and several *barrios* (secondary villages). Each province has a Provincial Board —a provincial governor and two members elected by the people.

2. SINCE ENEMY OCCUPATION:

Japanese High Command established a Philippines Executive Commission, with Japanese "advisers." The Commission carried on the work of government from 23 Jan 42 to 14 Oct 43. In Dec 42 Japanese sponsored an organization known as *Kalibapi*, whose main function was to conduct propaganda.

On 18 Jan 43 the Japanese sponsored a preparatory commission which drafted a report on the new puppet republic. This was ratified without recourse to the people by a *Kalibapi* convention, and on 14 Oct 43 the "New Republic" came into being.

The President is now elected by National Assembly and not by public plebiscite; powers vested in him are far greater than previously.

Although the pattern of local government is the same, control is more nationalized, and provincial governors are now presidential appointees, and not elected by the people.

Japanese have appointed mayors, but there are no reports of organized municipal governments in this area.

C—TOWNS

(Map 15; Photos 16-21)

JOLO—6° 03' N, 121° 00' E (Photos 16, 17, 18, 19):

Capital of Sulu Prov and only important town in Group. Situated on NE coast of Jolo I. Center of trade and base of pearling fleet. Exports are copra, hemp and a variety of hardwood. Rice was imported.

Terrain SE and east of town is fairly level, planted with coconuts, interspersed with other cultivation. Inland terrain rises to Mt Bangkal (756ft) 4,000 yds to east, and south of town to various heights of over 800ft and lying about 5,000 yds away. Terrain to west of town is fairly large patch of low swamp ground behind which are coconuts and cultivated plots.

i. *Population* (in 1939):

Poblacion, 6,272; municipality, 12,571. Included in the above figures were: Moros 11,780, Japanese 30, Chinese 731, Americans 15.

ii. *Description*:

Town is laid out in three or four surfaced streets partially surrounded by wall (*intramuros*). Principal buildings are: Sulu Public Hospital, Constabulary Barracks, Governor's Residence, Grade and High School, Roman Catholic Church and Convent, Post Office and Power Plant, Municipal Building, some one- and two-storey warehouses.

Electric light and power plant (240 KW) driven by two 100 hp diesel engines, supplied 562 houses with electric light.

Good concrete pier with wooden face. Fresh water is piped to the pier. There was a small marine railway on pier for unloading.

iii. *Industries*:

Center of pearling industry. Chinese did a fair trade in boat repairs. A small sawmill, a machine shop for minor auto repairs and an ice plant (daily capacity 9 tons) are reported to have been removed by Japanese.

iv. *Water Supply*:

Water was piped through a 6in main with a daily capacity of 600,000 gals from a spring in the hills 2 mls east of the city to a 130,000 gals reservoir in the town. Shallow wells were also used; rainwater was caught.

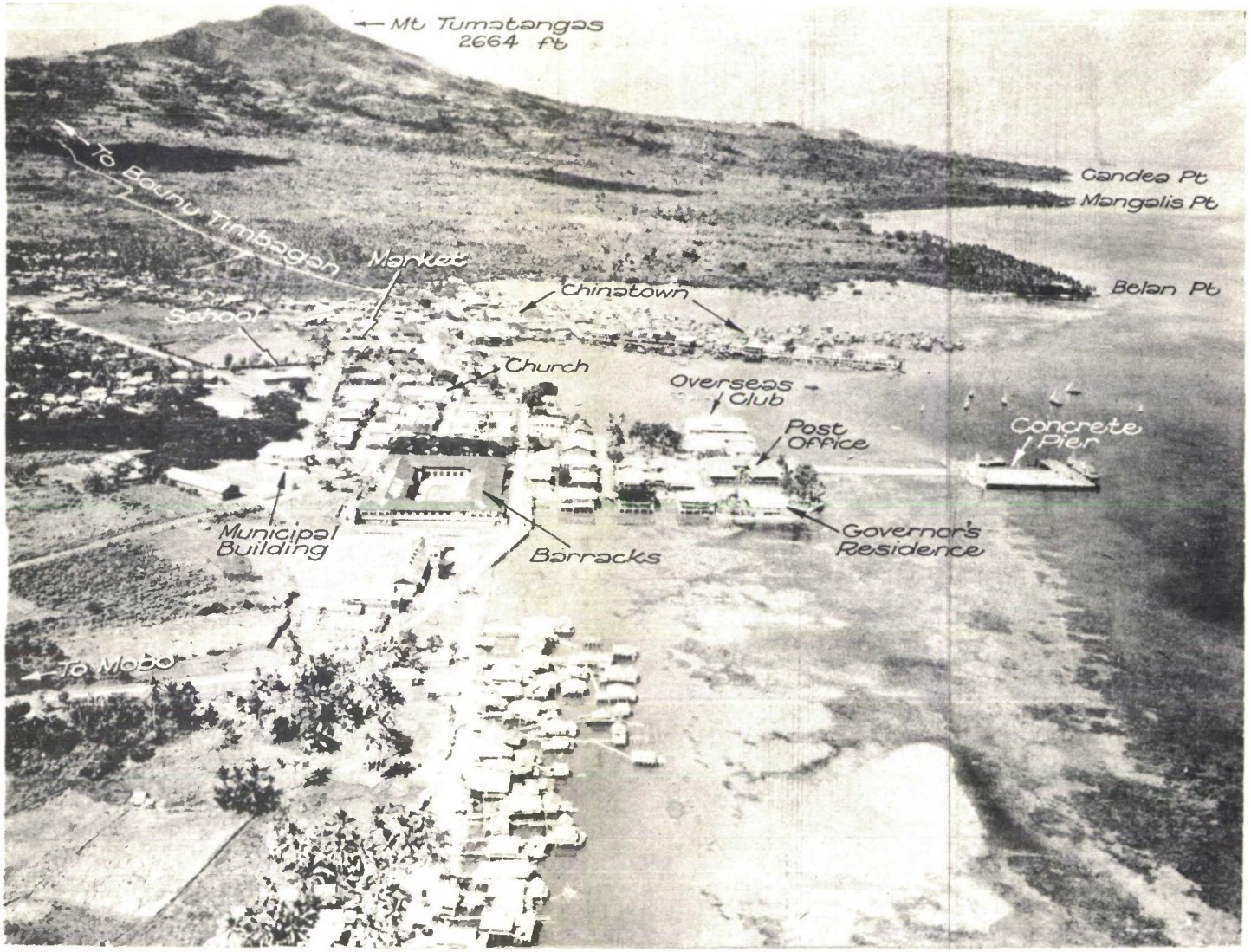
v. *Communications*:

Jolo had regular steamship communication with all parts of Philippines and intermittent communication with Borneo and Singapore. Bureau of Posts operated a radio station employing a 2 KW Marconi 600 and 1,200-1,900 meters frequency. Philippine Army operated a radio station. A manual telephone system connected principal towns on island.

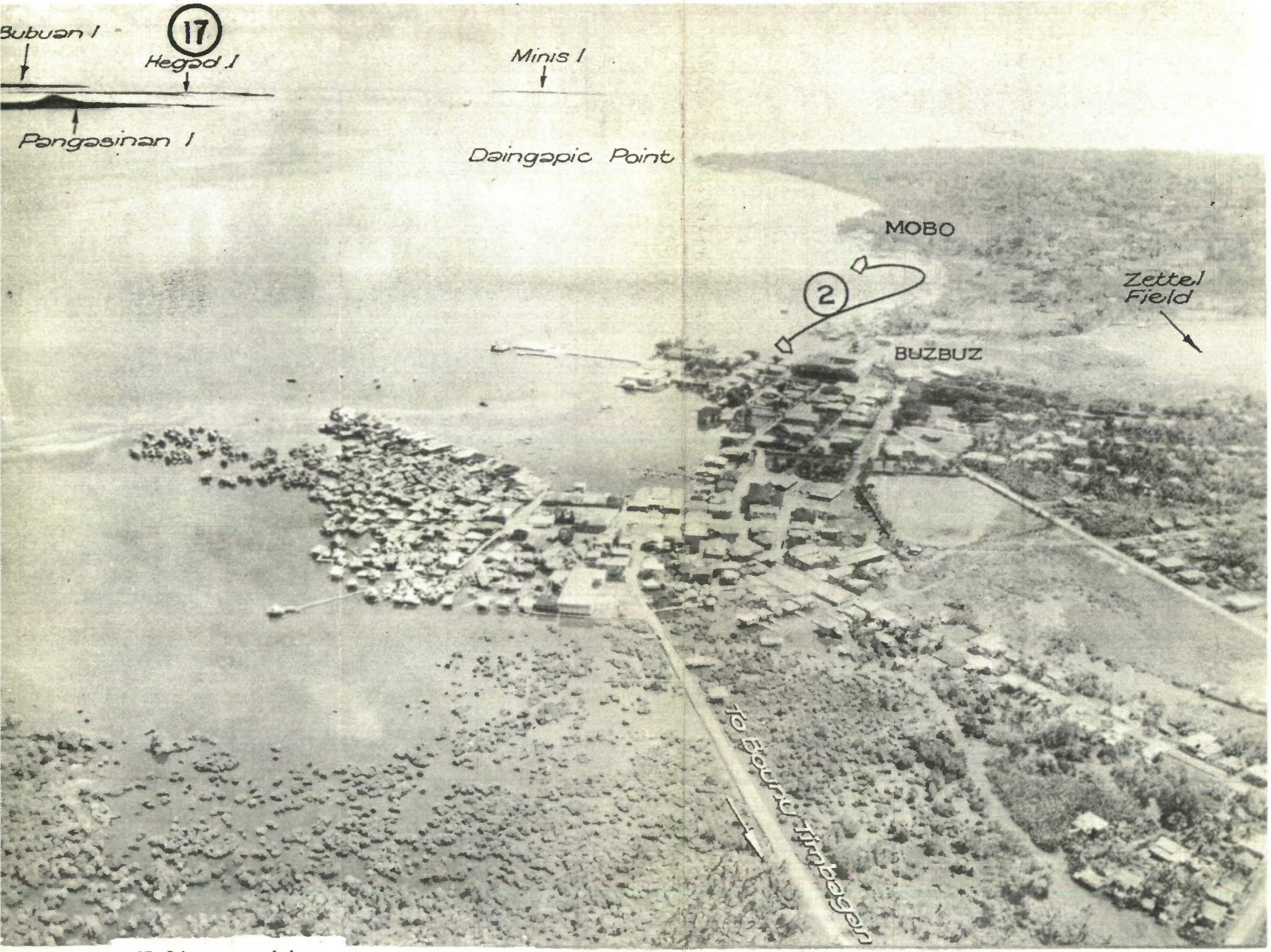
vi. *Port Facilities*:

See Sec 2B—Ports (Developed).

16



16. Jolo town and foreshore. Looking west. 1936



17. Jolo town and foreshore. Looking NE. 1935

18. Jolo wharf. Looking WNW. Pre-war

18

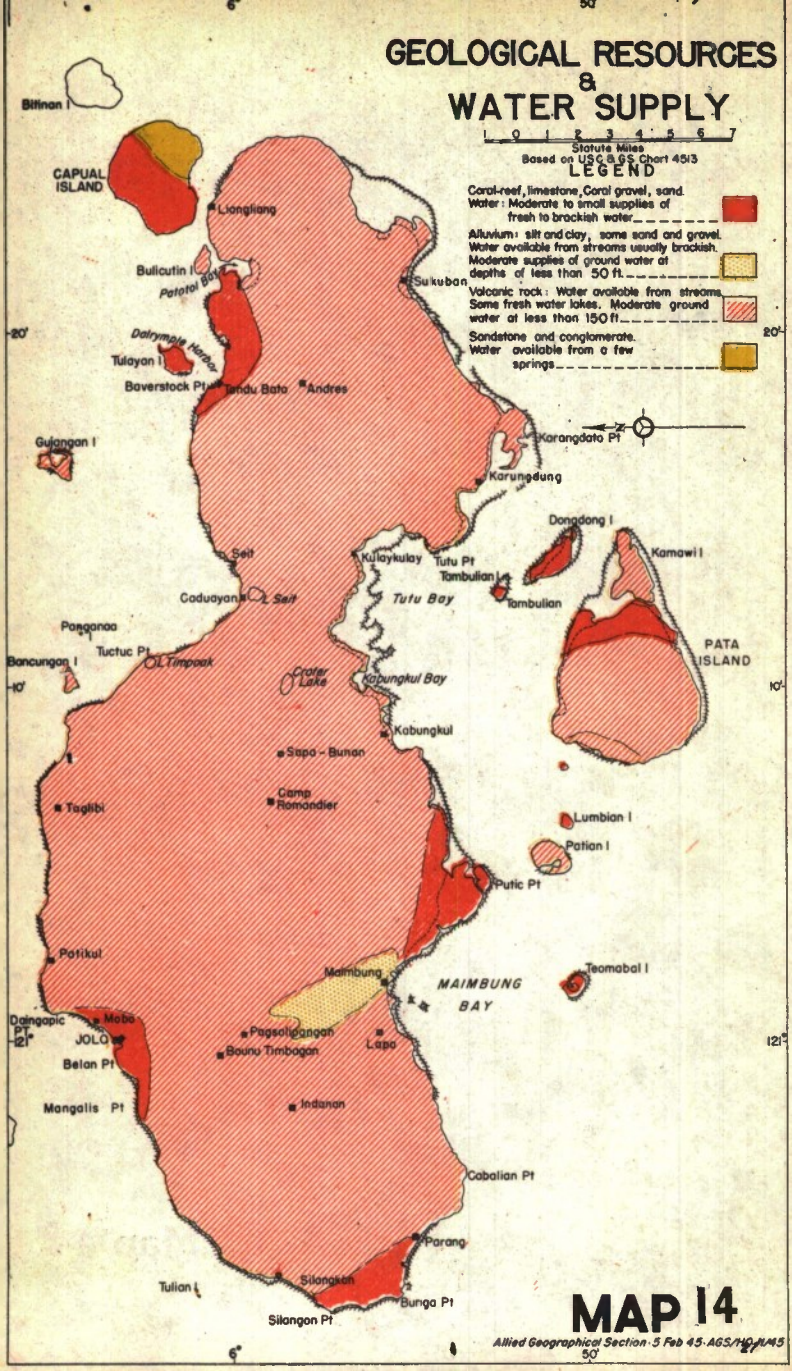
19. Chinese pier, Jolo. Locking south. Pre-war

19

20. Typical Moro village, built on coastal reef. 1936

20

21. "Streets" in typical Moro villages


GEOLOGICAL RESOURCES
&
WATER SUPPLY
1 0 1 2 3 4 5 6 7
Statute Miles
Based on USC & GS Chart 4513
LEGEND
Coral-reef, limestone, Coral gravel, sand.
Water: Moderate to small supplies of fresh to brackish water
Alluvium: silt and clay, some sand and gravel.
Water available from streams usually brackish.
Moderate supplies of ground water at depths of less than 50 ft.
Volcanic rock: Water available from streams.
Some fresh water lakes. Moderate ground water at less than 150 ft
Sandstone and conglomerate.
Water available from a few springs
Bilfinan I
CAPUAL ISLAND
Liongliong
Bulicutin I
Pototot Bay
Sukuban
Dalrymple Harbor
Tulayan I
Baverstock Pt
Tandu Bata
Andres
Gulangan I
Karangdato Pt
Karungdung
Dongdong I
Kamawi I
Seit
Kulaykulay
Tutu Pt
Tambulian I
Tambulian
Caduayan
L. Seit
Tutu Bay
Pangonoa I
Tuctuc Pt
Bancungan I
L. Timpoak
Crater Lake
Kabungkul Bay
PATA ISLAND
Kabungkul
Sapa - Bunan
Taglibi
Camp Romandier
Lumbian I
Patian I
Putic Pt
Patikul
Maimbung
MAIMBUNG BAY
Teomabal I
Daingapic Pt
Moba
JOLO
Pagsoliongan
Bounu Timbagan
Lapo
Belan Pt
Mangalis Pt
Indanan
Cabalian Pt
Parang
Tulian I
Silangkan
Bunga Pt
Silangon Pt
20°
121°
10°
6°
50'
MAP 14
Allied Geographical Section 5 Feb 45 AGS/HQ/M45

SECTION 7

RESOURCES, TRANSPORT, COMMUNICATIONS

(Map 14)

A—RESOURCES

1. GENERAL:

Area is essentially agricultural. Food surplus usually does not exist because natives raise only what they require. Rice usually has to be imported.

2. FOOD CROPS:

Food crops were grown wherever natives lived.
Principal native fruits and vegetables are:

Ubi: Red root vegetable, similar to sweet potato. Used cooked as vegetable and in making ice cream.

Cassava: Root from which tapioca is made. Some forms poisonous if not properly prepared.

Gabe: Small root vegetable similar to potato.

Camote: Sweet potato.

Ampalaya: Bitter, cucumber-like vegetable. Reported to have anti-malarial value. Bitterness can be removed by proper cooking.

Upo: Vegetable similar to squash.

Tugue: Yam.

Jackfruit: Type of breadfruit eaten green as vegetable, ripe as fruit.

Kalamansi: Small citrus fruit used in making jam and drinks.

Lanzones: Small fruit. Grows in clusters like grapes.

Santolo: Fruit eaten raw.

Siniguelas: Tree-growing fruit similar to yellow plum.

Atis: Custard apple.

Tamarinds: Tree-growing fruit used in making drinks.

Kamias: Edible root.

Caimitos: Egg-shaped, tree-growing fruit eaten raw.

Sinkamas: Plant resembling string bean, but with turnip-like root, which is eaten raw as a fruit, or a vegetable.

Makopa: Pink, spongy, tree-growing fruit eaten raw.

Pili: Oily nut similar to almond.

Camatis: Tomato.

Patola: Long yellow squash.

Saguing: Eating banana.

Saba: Cooking banana.

Cassava and rice were the largest crops, but only *cassava* was sufficiently produced for local demands. Importation of rice depended largely on economic conditions. If no money were available the natives switched over to *cassava*.

3. FOODSTUFFS—MEAT, FISH, POULTRY, DAIRY:

Fish and beef were relatively abundant in Jolo. Jolo 1 is reported to have about 500 head of wild cattle and wild deer are found in timber areas of NE Jolo.

4. FORAGE:

There are many good grazing areas on Jolo, consisting primarily of *cogon* and other grasses on which only native animals subsist.

5. FUEL:

All fuel (except wood) was imported.

6. CONSTRUCTION MATERIALS:

Timber, coral, sand, bamboo, thatching materials and crushed rock are available. There is no gravel for concrete aggregate. Long, straight, durable piles for wharf and dock construction are available on north and east slopes of Mt Timpoak. (An estimate included about 15,000 40-50ft piles with 12-14in butts). Northern slope of Mt Mahata (south shore of Jolo west of Tutu B) is thickly wooded. Also on the slopes of an old crater at SE end of Capual 1 an estimated 2,000 piles 40-50ft long, 12-16in diameter, may be obtained. Scattered coastal patches of bamboo and sago are indicated on Jolo 1. Coral-sand can be found around nearly all the coast.

7. WATER:

Many springs and streams and three crater lakes supply fresh water. At Jolo town a 6in main brings water by gravity from the hills. (See Sec 6C).

8. MINERALS:

No mineral deposits are known.

9. REPAIR FACILITIES:

The only repair facilities were in Jolo town (hand tools only). Power plant, ice plant and some other small shops had sufficient hand tools to make minor mechanical repairs. Marine slipway east of Jolo pier could take small launches and native boats.

10. NATIVE LABOR:

Native labor may be a problem. Moros generally are inclined to be hostile and indifferent except for their own requirements. There is no skilled labor other than in primitive agriculture and boat building (*vintas*).

Chief method of obtaining labor is *pakiao* system, whereby a native boss acts as sub-contractor, providing and supervising labor at an agreed price.

Wages and Hours:

In the Philippines an 8-hr work-day, 6-day week, was standard before the war except for domestic and agricultural laborers whose work-day was 8-10 hrs. *Siesta*, from 1200 to 1400 hrs, was customary.

Average rates of daily pay (in US dollars) were: Blacksmiths, 0.54; bus drivers, 0.56; carpenters, 0.75; electricians, 0.90; chauffeurs, 0.57; painters, 0.64; laborers, 0.50. Foremen received 30-75 dollars a month. Overtime pay was at rate of plus 25% of day's pay.

B—TRANSPORT

1. ROADS:

Jolo had extensive road net. (See Sec 3—Roads and Trails). There were about 30 buses in operation between the main towns. In addition there were 34 trucks and 35 automobiles.

2. RAILROADS:

A short marine railway on the pier at Jolo was the only form of railroad/tramway service on the island.

3. RIVER TRANSPORT:

Shallowness of streams prevented extensive use being made of river transport.

4. INTER-ISLAND TRANSPORT:

Before the war Jolo had regular steamship communication with all ports of the Philippines, and intermittently with Borneo and Singapore. The bulk of inter-island trade and transport was carried by *vintas*. These boats are usually about 24ft long, 4ft wide, with a draft of 12-15ins. There were several pearling boats 50-60ft long, 12ft wide.

C—COMMUNICATIONS

1. TELEGRAPH AND CABLES:

Nil.

2. TELEPHONE:

On Jolo was a telephone system with 18 stations containing 131 mls of pole line.

3. RADIO:

There were two radio systems in Jolo town. One was a 2 KW radio with RCA spark transmitter. The other belongs to the Philippine Army of which details are not known.

4. POSTAL SERVICE:

Mails were handled by Bureau of Posts, usually by bus service to the municipal post offices.

SECTION 8

MEDICAL PROBLEMS

1. GENERAL:

Climate is tropical with mean annual minimum temperature of 68° and mean annual maximum of 93°. There is short dry season about Feb-Mar.

2. DISEASES:

Malaria:

Occurs throughout area, both tertian and subtertian being common.

Splenic indices are: Maimbung 36%, Jolo 16%.

Anopheline mosquitoes recorded in area are: *A barbirostris, A litoralis, A minimus* var *flavirostris, A pseudo-barbirostris, A subpictus* var *indefinitus, A vagus* var *limosus.*

A minimus var *flavirostris* is most widespread and most dangerous. It breeds in small clear streams, wells and seepages.

Dengue:

Dengue occurs. Vectors *Aedes aegypti* and *Aedes albopictus* are found.

Filariasis:

Sporadic cases of filariasis and elephantiasis occur. Usual form of filaria in Philippines is *Wuchereria bancrofti.* (The vector is usually *Culex fatigans*). In Sulu Archipelago *W malayi* is also common, and *A barbirostris* and *mansonioides* carry it.

Dysentery:

Both bacillary and amoebic types are common; former is more prevalent. Increase is reported.

CHOLERA:

There are no reports that 1943 outbreak has reached the area, but possibility of serious epidemic remains. Troops must maintain the highest practicable standards of hygiene, including the sterilization of water.

Typhoid and Paratyphoid Fever:

Although less prevalent than dysentery, these diseases are still common.

Yaws (Framboesia):

Disease is prevalent in Sulu Archipelago.

Scabies:

Scabies is commonest skin disease. Caused by itch mite, *Sarcoptes scabiei.*

Fungus Infections of Skin:

Ringworm is common. Tinea, seborrhoea and pityriasis are frequent.

Tropical Ulcer:

Small cuts and abrasions are liable to form rapidly-spreading tropical ulcers.

Leprosy:

Leprosy occurs. Special treatment center for the disease was at Jolo.

Venereal Disease:

Gonorrhoea is commonest.

Respiratory Infections:

Influenza, bronchitis, broncho-pneumonia and lobar pneumonia were common.

Tuberculosis:

Tuberculosis was leading cause of death before the war. Situation may have worsened.

Smallpox:

Smallpox was practically eradicated.

Plague:

Plague has not been reported.

Malnutrition and Deficiency Disease:

Malnutrition has always occurred. Beri-beri and Vitamin A deficiency reported to have increased under Japanese occupation.

Worm Infestation:

Ascariasis (infestations with *Ascaris lumbricoides*) is commonest.
Hookworm is also common.
A number of other worms is also met.

3. HOSPITAL FACILITIES:

The following hospitals were located in the area:

Hospital	*Location*	*Type*	*Beds*
Sulu Private Hosp	Jolo, Sulu	General	46
Sulu Treatment Sta	Jolo, Sulu	Leper	40

4. PESTS AND DANGEROUS ANIMALS:

Mosquitoes, flies, cockroaches and leeches occur.
Snakes are not numerous.
Some fish are poisonous, e.g., "Puffer" (*Tetraodon*). Others have poisonous spines, e.g., Stingrays and catfish, etc.
Some shellfish and jellyfish give severe stings.

SECTION 9

METEOROLOGICAL CONDITIONS

1. CLIMATIC TYPES:

Island of Jolo, 37 mls E/W and 14 mls N/S, has four mountain series ranging between 2,250ft and 2,850ft, and these mountains influence the local climate. Main air streams over Philippines are:

a. Northers (NE monsoon).

b. Trades, coming from easterly direction; and—

c. Equatorial air (SW monsoon).

General directions of these winds are:

a. From north to east (northers and trades) during Oct-Jan.

b. From east to SE (trade winds) from Feb-Apr; and—

c. For the remaining months of the year, southerly directions, mainly SW (SW monsoon and influence of typhoon centers).

Air currents from NW and west are generally of cyclonic origin. Horizontal temperature differences are small and rainfall differences vary greatly due to combined influence of topography and air stream direction. Hence rainfall is used as a basis for climate classification in the Philippines. Four climatic types may be identified. Only one (Type "D") is present in the Sulu Archipelago —no dry season and no very pronounced maximum rain period.

2. TYPHOONS:

Typhoons are rare—only 1% of all typhoons occur south of lat 8° N. They are most likely to be experienced from Nov to Jan. Rare typhoons occur in the Sulu Sea, most likely in Nov and Dec.

In the neighbourhood of typhoon centers, persistent gales and heavy squalls, and torrential rains from widespread overcast low cloud and disturbed seas are experienced.

3. WIND:

The winter, or NE monsoon, prevails from Nov to Apr. North to NE winds, tending more easterly toward the close of the season, are experienced. It is best developed during Jan. NE monsoon is steady but not so strong as in more northerly latitude. Freshening winds are less frequent and of shorter duration as NE monsoon draws to close. Interruptions to the monsoon are more common here than elsewhere.

The summer, or SW monsoon, is established by Jun, after a transition period of variable winds, and continues till Oct. It is steadiest in Jul and Aug. Transition period then precedes NE monsoon.

Squalls are somewhat prevalent during SW monsoon, often associated with thunderstorms. Strong and squally SW or westerly winds (*collas*) sometimes blow for several consecutive days in summer and early autumn. They generally bring much rain. Land and sea breeze effect is well marked along coast.

[SECTION 9]

Details concerning prevailing wind and its speed in mph at Jolo:

Jan	Feb	Mar	Apr	May	Jun
NNE	N	NE	NE	NE	SW
9	9	9	9	7	8
Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
W	NE	W	SW	NNE	WNW
9	9	7	8	9	9

During one-fourth of the year winds blow from NE quadrant, during another fourth from SW quadrant, another fourth is divided between the two remaining quadrants, and the last fourth is calm.

4. RAINFALL:

Average fall (in inches) at Jolo is:

Jan	Feh	Mar	Apr	May	Jun	
4.6	4.1	4.2	5.4	7.5	8.5	
Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Year**
6.4	6.8	7.1	8.8	7.8	6.8	78.2

In exceptional circumstances a winter or spring month may be rainless. Some rain always falls in each month from Jul to Oct. At Jolo, 30 consecutive rainless days (Jan-Feb) have been experienced. Monthly rainfall amounts in excess of 20ins have been reported at Jolo in Jan, Feb, Jun and Nov. Feb and Apr have been rainless months. Rain days average not less than 10 in Spring and exceed 15 from Jun to Sep. Serious floods sometimes follow thunderstorms, during which 2ins have been known to fall in little more than 5 mins. At Jolo 10ins of rain have fallen in 24 hrs in Jun.

5. CLOUD:

Cloudiness is high in all months, and mainly follows rainfall; is at a minimum in spring. Mean monthly cloud amounts (in tenths) at Jolo are:

Jan	Feb	Mar	Apr	May	Jun	
7.2	7.2	6.8	6.6	6.9	7.4	
Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Year**
7.7	7.4	7.5	7.5	7.5	7.4	7.3

The normal frequency of clear (1), partly cloudy (2), and cluody days (3) at Jolo is given in the table below.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3	3	4	6	3	5	3	3	3	3	5	0
2	13	11	18	12	12	10	9	12	11	7	10	6
3	15	14	9	12	16	15	19	16	16	21	15	25

Cloudiness tends to increase with southerly warm moist winds. When SW winds blow uninterruptedly for several days, overcast skies with low bases (1,000ft to 3,000ft) and poor visibility result.

6. VISIBILITY:

Generally good. Morning mist is not unusual inland during fine weather.

7. TEMPERATURE:

Temperature is moderately high and equable. Difference between the mean temperatures in the hottest and coolest months is not more than 2° F. Mean monthly temperatures at Jolo are:

	Jan	Feb	Mar	Apr	May	Jun
Max	84	84	84	85	84	84
Min	76	74	74	75	75	75

	Jul	Aug	Sep	Oct	Nov	Dec
Max	83	84	85	85	84	83
Min	74	74	75	75	76	75

Temperature seldom exceeds 95° F or falls below 65° F at coastal stations.

8. HUMIDITY:

Annual average humidity is more than 80%. Mean monthly figures in percentage at Jolo are:

Jan	Feb	Mar	Apr	May	Jun	
84	84	85	85	85	85	
Jul	Aug	Sep	Oct	Nov	Dec	Year
83	82	84	84	85	85	84

9. MISCELLANEOUS PHENOMENA:

Thunderstorms are frequent over and near the land in May and Oct. Generally accompanied by severe squalls and heavy rain.

Severe seismic disturbances have been reported..

Around Jolo the sea is usually calm—high swell and high seas are rare.

APPENDIX "A"

SUN AND MOON TABLES

1. TIMES OF SUNRISE AND SUNSET, FEB - DEC 45

JOLO TOWN—6° 03′ N, 121° 00′ E

Times shown are Standard for Philippines (8 hrs ahead of GMT)

	Sunrise	Sunset		Sunrise	Sunset
Feb 1	0613	1806	Aug 2	0552	1813
8	0613	1808	9	0552	1811
15	0612	1809	16	0553	1809
22	0610	1809	23	0551	1807
Mar 1	0608	1809	30	0550	1804
8	0606	1808			
15	0603	1808	Sep 6	0549	1801
22	0600	1807	13	0548	1758
29	0557	1806	20	0546	1754
Apr 5	0554	1804	27	0544	1751
12	0551	1804			
19	0548	1803	Oct 4	0543	1747
26	0546	1803	11	0542	1744
May 3	0544	1802	18	0540	1741
10	0542	1803	25	0541	1739
17	0542	1803			
24	0541	1804	Nov 1	0541	1738
31	0541	1805	8	0542	1737
Jun 7	0542	1807	15	0544	1737
14	0543	1809	22	0546	1739
21	0545	1810	29	0548	1740
28	0546	1811			
Jul 5	0547	1813	Dec 6	0551	1742
12	0549	1813	13	0555	1744
19	0552	1814	20	0558	1748
26	0553	1813	27	0601	1751

Dates given are Thursdays of each week

2. TIMES OF MOONRISE, FEB - DEC 45

JOLO TOWN—6° 03′ N, 121° 00′ E

Date	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2118	1955	2049	2114	2243	2310	—	0100	0141	0253	0301
2	2201	2040	2136	2206	2334	2358	0021	0156	0234	0337	0344
3	2243	2123	2226	2259	—	—	0114	0251	0322	0420	0428
4	2326	2206	2318	2354	0023	0046	0208	0345	0410	0503	0514
5	—	2253	—	—	0111	0134	0305	0437	0454	0547	0603
6	0013	2340	0011	0046	0201	0226	0402	0526	0539	0631	0653
7	0059	—	0105	0137	0250	0320	0457	0613	0621	0718	0745
8	0150	0032	0200	0228	0341	0416	0552	0657	0705	0806	0836
9	0245	0127	0255	0318	0436	0515	0643	0740	0748	0856	0928
10	0340	0222	0348	0409	0532	0612	0732	0824	0834	0948	1019
11	0438	0317	0440	0502	0631	0708	0818	0907	0920	1040	1107
12	0535	0414	0532	0555	0729	0801	0902	0951	1009	1131	1155
13	0631	0509	0624	0651	0826	0852	0946	1037	1100	1221	1241
14	0726	0603	0717	0749	0922	0940	1029	1126	1152	1311	1329
15	0817	0656	0813	0848	1012	1024	1112	1216	1246	1400	1418
16	0909	0748	0908	0946	1101	1108	1158	1308	1338	1449	1509
17	0959	0840	1005	1040	1146	1151	1245	1403	1430	1539	1604
18	1050	0933	1101	1132	1230	1234	1334	1457	1521	1631	1703
19	1140	1025	1156	1221	1313	1318	1427	1551	1612	1725	1803
20	1232	1120	1248	1307	1356	1404	1522	1645	1702	1823	1906
21	1325	1215	1338	1350	1440	1454	1617	1736	1754	1924	2005
22	1419	1308	1425	1434	1525	1545	1712	1827	1848	2024	2102
23	1512	1401	1509	1517	1612	1640	1804	1918	1944	2125	2155
24	1605	1452	1553	1600	1703	1734	1858	2010	2042	2221	2244
25	1654	1540	1635	1644	1755	1831	1948	2103	2142	2315	2331
26	1743	1627	1719	1730	1850	1924	2038	2158	2241	—	—
27	1829	1711	1802	1818	1945	2014	2128	2254	2337	0004	0015
28	1912	1754	1847	1910	2039	2107	2219	2351	—	0052	0058
29		1838	1933	2002	2131	2156	2311	—	0031	0136	0141
30		1920	2026	2056	2221	2244	—	0048	0121	0219	0224
31		2004		2139		2332	0004		0209		0310

Times shown are Standard for Philippines (8 hrs ahead of GMT)

3. TIMES OF MOONSET, FEB - DEC 45

JOLO TOWN—6° 03′ N, 121° 00′ E

Date	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0900	0747	0817	0831	0959	1036	1203	1345	1423	1520	1516
2	0940	0817	0859	0921	1053	1127	1258	1440	1511	1558	1556
3	1019	0857	0945	1013	1146	1220	1355	1535	1556	1637	1638
4	1059	0936	1034	1108	1239	1313	1451	1626	1639	1717	1723
5	1140	1018	1125	1202	1332	1408	1550	1714	1719	1758	1809
6	1223	1102	1219	1257	1426	1503	1647	1758	1759	1840	1858
7	1309	1150	1315	1352	1520	1602	1740	1840	1837	1925	1949
8	1359	1241	1412	1447	1618	1701	1831	1920	1917	2013	2042
9	1453	1335	1508	1541	1716	1801	1918	1959	1959	2102	2135
10	1551	1431	1605	1638	1817	1857	2002	2040	2042	2153	2228
11	1649	1529	1701	1735	1917	1950	2044	2120	2128	2246	2319
12	1748	1627	1758	1834	2015	2039	2124	2200	2217	2339	—
13	1846	1725	1855	1935	2110	2125	2203	2243	2307	—	0011
14	1944	1824	1954	2035	2201	2208	2242	2330	2359	0032	0101
15	2039	1920	2053	2134	2248	2248	2323	—	—	0125	0154
16	2134	2017	2152	2229	2331	2328	—	0021	0054	0218	0248
17	2229	2113	2250	2321	—	—	0007	0116	0148	0312	0346
18	2323	2210	2346	—	0013	0006	0053	0211	0243	0408	0446
19	—	2307	—	0009	0052	0047	0142	0308	0338	0505	0549
20	0018	—	0038	0054	0131	0129	0235	0404	0434	0606	0652
21	0113	0003	0127	0136	0210	0214	0329	0500	0530	0708	0754
22	0207	0059	0213	0216	0252	0303	0426	0556	0627	0812	0851
23	0302	0152	0257	0255	0336	0354	0524	0651	0727	0913	0943
24	0354	0242	0337	0333	0422	0448	0620	0748	0827	1110	1031
25	0444	0330	0416	0414	0511	0544	0715	0845	0928	1103	1114
26	0531	0414	0455	0455	0604	0641	0810	0942	1028	1153	1156
27	0615	0456	0534	0530	0659	0737	0904	1041	1126	1238	1235
28	0657	0537	0615	0627	0753	0831	0958	1139	1220	1319	1314
29		0616	0658	0717	0848	0924	1053	1236	1310	1359	1353
30		0655	0743	0810	0943	1017	1151	1331	1356	1437	1435
31		0735		0904		1110	1247		1439		1519

Times shown are Standard for Philippines (8 hrs ahead of GMT)

4. PHASES OF THE MOON, FEB - DEC 45

JOLO TOWN—6° 03′ N, 121° 00′ E

Times shown are Standard for Philippines (8 hrs ahead of GMT)

	Last Quarter	New Moon	First Quarter	Full Moon	Last Quarter
Feb	5	12	19	27	—
Mar	7	14	20	28	—
Apr	5	12	19	27	—
May	5	11	18	27	—
Jun	3	10	17	25	—
Jul	2	9	17	25	31
Aug	-	8	16	23	30
Sep	–	6	14	21	28
Oct	–	6	14	21	27
Nov	–	4	12	19	26
Dec	–	4	12	19	26

APPENDIX "B"

DIAGRAM OF TIDES, SUNLIGHT AND MOONLIGHT - JOLO

EXPLANATION OF FOLLOWING DIAGRAMS

a. GENERAL:

Two diagrams which follow show rise and fall of tides and changing relationship between times of tide and daylight, twilight, moonlight, and darkness at Jolo for Feb - Mar 45. The diagrams are applicable to area covered by this Handbook, subtracting half a foot from heights of high tides.

The astronomical data is for sea level.

b. TIME USED:

Times on the diagrams are for 120° Meridian of East Longitude eight hours ahead of GMT.

c. DATES:

Each day from midnight to midnight is represented on "Rise and Fall of Tide" section of the diagrams by a space between two lines.

In the lower part of diagrams, "Time of Tides, Sunlight, Moonlight and Darkness," where the days are represented by vertical lines covering period from noon of one day to noon of next, the dates at bottom differ from those at top because the date changes in passing through midnight.

d. TIDES:

Times of tides are shown by curves in lower part of each diagram. By noting the sequence of tides during a day, the height of any particular tide can be found from upper part of each diagram.

e. TWILIGHT:

Three types of twilight are shown. *Civil twilight* starts at sunset and ends when sun is 6° below horizon. Objects can be readily distinguished and a newspaper can be read. At the end of civil twilight, brightness of sky is still about 20 times as great as when full moon is at zenith. Civil twilight is followed by *nautical twilight*, which ends when sun is 12° below horizon. All brighter stars are visible, general outlines can be distinguished, but horizon will usually be indistinct. End of nautical twilight may appear to be beginning of solar darkness, but a small amount of light from sun may still be refracted or reflected until end of *astronomical twilight*, when sun is 18° below horizon.

In the morning twilights occur in reverse order.

f. MOONLIGHT:

During astronomical twilight and solar darkness, periods of moonlight and dim moonlight are shown. During period of moon-

light, intensity of light will vary between brightness of full moon at zenith and about one-third of this value. During period of dim moonlight, the intensity varies from about one-third to one-tenth of brightness of full moon at zenith.

g. MOON'S PHASES:

Phases of moon are shown below the day on which they occur.

h. TEMPERATURES:

Average monthly temperatures of air and sea water in vicinity are shown below each diagram.

i. WINDS:

A wind rose is given showing for the month the average frequency and strength of winds. Top of the rose is north. Length of the arrow, measured from outside of circle and compared with scale to the right, shows percentage of observations during which the wind has blown from direction indicated. The number of feathers shows average force of the wind on Beaufort scale. The figure in circle gives percentage of calms.

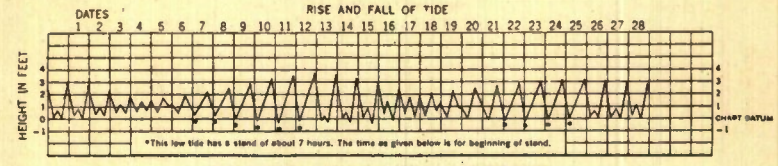
j. SOURCES:

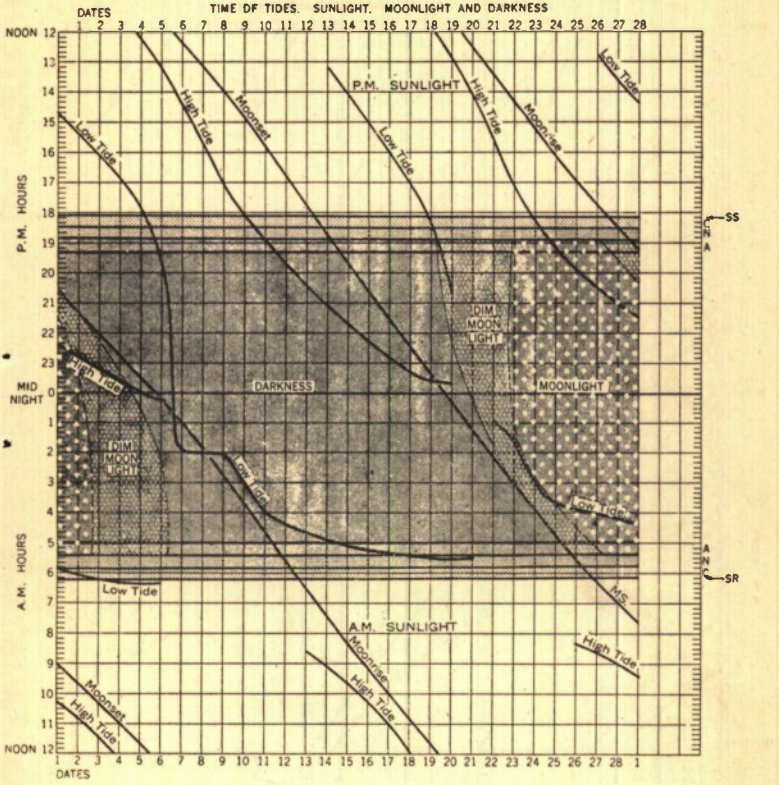
Tide predictions are from the annual or special tide tables issued by US Coast and Geodetic Survey. Other data are obtained from publications of US Navy Department, British Admiralty, and other sources.

DIAGRAM OF TIDES. SUNLIGHT AND MOONLIGHT

JOLO, JOLO ISLAND, P. I.‡ TIME MERIDIAN 120°E **FEBRUARY 1945**

LAT 6°04'N. LONG. 121°00'E. SUNLIGHT AND MOONLIGHT DATA COMPUTED FOR LAT 6°N LONG 121°E





LAST QUARTER NEW MOON FIRST QUARTER FULL MOON

MEAN TEMPERATURE AIR 79° F. SEA 81° F.

0 10 20 30 40 50 60 70 80 90 100

PERCENTAGE SCALE OF WIND FREQUENCIES

A – ASTRONOMICAL TWILIGHT
N – NAUTICAL TWILIGHT
C – CIVIL TWILIGHT
SS – SUNSET
SR – SUNRISE.

‡ This diagram, with the changes indicated, is also applicable to the following places:
LAMATLAMAT ISLAND: Subtract 35 minutes from times of high and low tides.
PANGUTARAN ISLAND: Add 1 hour and 25 minutes to times of high and low tides; add ½ foot to heights of high tides.
TULAYAN ISLAND: Subtract 1 hour and 55 minutes from times of high and low tides; multiply heights of high and low tides by 0.9.

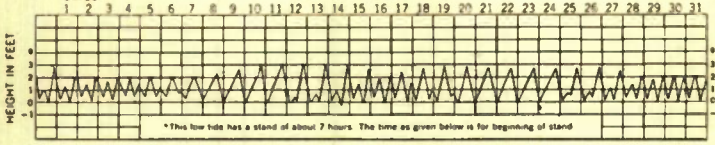
U. S. COAST AND GEODETIC SURVEY

DIAGRAM OF TIDES. SUNLIGHT AND MOONLIGHT

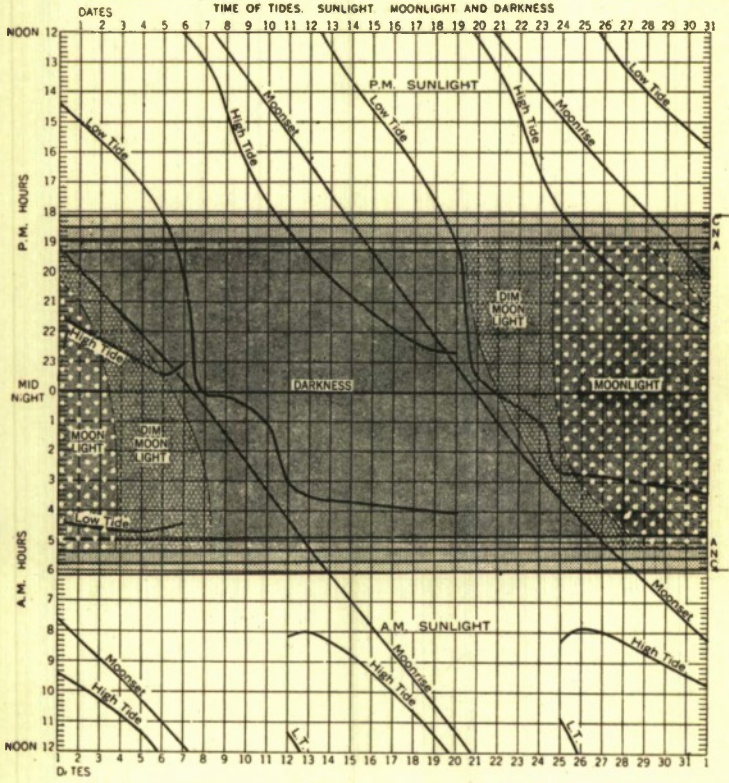
JOLO, JOLO ISLAND, P. I.[1] TIME MERIDIAN 120°E. **MARCH 1945**

LAT 6°04'N LONG 121°00'E. SUNLIGHT AND MOONLIGHT DATA COMPUTED FOR LAT 6°N LONG 121°E

RISE AND FALL OF TIDE



TIME OF TIDES. SUNLIGHT. MOONLIGHT AND DARKNESS



LAST QUARTER ● NEW MOON ◐ FIRST QUARTER ○ FULL MOON

MEAN TEMPERATURE AIR 80° F. SEA 82° F

PERCENTAGE SCALE OF WIND FREQUENCIES

A – ASTRONOMICAL TWILIGHT
N – NAUTICAL TWILIGHT
C – CIVIL TWILIGHT
SS – SUNSET
SR – SUNRISE

[1] This diagram, with the changes indicated, is also applicable to the following places:
LAHATLAHAT ISLAND. Subtract 38 minutes from times of high and low tides.
PANGUTARAN ISLAND. Add 1 hour and 25 minutes to times of high and low tides; add ½ foot to heights of high tides.
TULAYAN ISLAND. Subtract 1 hour and 56 minutes from times of high and low tides; multiply heights of high and low tides by 0.8.

U. S. COAST AND GEODETIC SURVEY

APPENDIX "C"

GAZETTEER OF PLACE NAMES

Place names are oriented from Jolo. All distances shown are air distances in statute miles.

Name	Distance from Jolo	Bearing
ANDRES, CAMP	22	106°
ANOGAL *Barrio*	7	245°
AWAK, Mt	1½	120°
BAGSAC *Barrio*	12	204°
BAHU, Mt	7	100°
BANCUNGAN I	11	82°
BATOLAQUI BANK	12	194°
BAVERSTOCK Pt	21	98°
BAWISAN *Barrio*	12	223°
BAYUG, Mt	8	132°
BILAAN *Barrio*	9	123°
BOAL *Barrio*	20	97°
BOUNU TIMBAGAN *Barrio*	3½	188°
BUBUAN I	9	350°
CABALIAN Pt	12	200°
CABINGAAN I	26	173°
CABUCAN I	8	318°
CABUCAN *Barrio*	8	322°
CADUAYAN *Barrio*	15	106°
CAMP ANDRES	22	106°
CAMP ROMANDIER	9	123°
CANDEA *Barrio*	5	250°
CANDEA Pt	4	253°
CAPUAL I	26	92°
CAPUAL CHAN	27	96°
CRATER LAKE	13	115°
DAHO, Mt	5	125°
DAINGAPIC Pt	2	21°
DAKULA, Mt.	13	110°
DAKUT, Mt	24	196°
DALRYMPLE Hr	22	99°
DONGDONG I	21	132°
DRY *Bank*	10	173°
ESEO *Bank*	15	100°
GUJANGAN I	19	83°
HEGAD I	8	360°
IGASAN Pt	10	81°
INDANAN *Barrio*	6	200°
KABUNGKUL *Barrio*	13	130°
KABUNGKUL *Bay*	14	125°
KAGA, Mt	6	118°
KANGAGAN, Mt	3	181°
KARANGDATO Pt	24	124°
KARUNGDUNG *Barrio*	22	123°
KULAYKULAY	15	117°
LAPA *Barrio*	10	180°
LIANGLIANG *Barrio*	27	95°
LIRUT, Mt	19	105°
LUMAPIT *Barrio*	11	153°
LUMPING, Mt	22	116°
MABAJOC Pt	14	135°
MAHATA, Mt	12	136°
MAIMBUNG *Barrio*	9	169°
MAIMBUNG *Bay*	10	175°
MALPAL, Mt	22	111°
MANGALIS Pt	3	254°
MARASAN *Barrio*	11	195°
MARONGAS I	5	327°
MATANDANG Mt	5	119°
MOBO *Barrio*	1	30°

Name	Distance from Jolo	Bearing
PAGSALIPANGAN *Barrio*	4	180°
PANGANAA I	13	84°
PANGASINAN I	5	347°
PANTAO Mt	5½	152°
PARANG *Barrio*	12	213°
PATA I	18	145°
PATIAN I	15	156°
PATIKUL *Barrio*	4	56°
PATIKUL Pt	5	56°
PATOTOL	26	100°
PATOTOL Bay	25	98°
PIANAN Mt	9	230°
PITOGO Bay	27	112°
PITOGO Mt	23	116°
PITOGO *Barrio*	24	118°
SAPA BUNUAN *Barrio*	11	122°
SANDAHAN, Mt	23	114°
SEIT, Lake	15	107°
SEIT *Barrio*	16	104°
SILANGKAN *Barrio*	9	235°
SILANGON Pt	11	231°
SUKUBAN *Barrio*	26	111°
SUOC *Barrio*	13	101°
TAGLIBI *Barrio*	8	71°
TALIPAO, Mt	9	145°
TANDU BATO	22	99°
TANDU PANUAN *Barrio*	29	105°
TANDU Pk	29	102°
TIMAHO, Mt	12	106°
TIMPOAK, Lake	12	95°
TIMPOAK, Mt	11	93°
TONGTONG *Barrio*	9	303°
TUBINGANTAN Pt	12	206°
TUKAY Mt	9	200°
TULAYAN I	22	95°
TULIAN I	9	250°
TUMATANGAS Mt	5	214°
TUTU Pt	19	122°
TUTU Bay	17	120°

APPENDIX "D"

JAPANESE EQUIVALENTS OF PLACE NAMES

Allied Translator and Interpreter Section, SWPA, supplies the following list of Japanese equivalents of place names in the Sulu Archipelago area:

Name	*Phonetic*	*Japanese*
ANDRES	ANDORESU	アンドレス
ALICE CHANNEL	ARISU KAIKYU	アリス海峡
BALIMBING	BARINBIN	バリンビン
BASBAS PT	BASABASU MISAKI	バサバス岬
BATU BATU B	BATSUBATSU WAN	バツバツ湾
BAVERSTOCK PT	BABERUSUTOKKU MISAKI	バベルストック岬
BILATAN I	BIRATAN JIMA	ビラタン島
BOAL	BOARU	ボアル
BONGAO PORT	BONGAO MINATO	ボンガオ港
BOUNU TIMBAGAN	BOUNU CHINBAGAN	ボウヌ チンバガン
BUBUAN I (TAPUL GROUP)	BUBUAN JIMA	ブブアン島
BUD BAS MT	BADOBASU YAMA	バドバス山
BUGUT LAPIT PT	BUGUTO RAPITO MISAKI	ブグト ラピト岬
BUNBUN	BUNBUN	ブンブン
BUSBUS PT	BUSUBUSU MISAKI	ブスブス岬
CABALIAN PT	KABARIAN MISAKI	カバリアン岬
CABANCAUAN I	KABANKAUAN JIMA	カバンカウアン島
CABUCAN	KABUKAN	カブカン
CADUAYAN	KADOAYAN	カドアヤン
CANDEA PT	KANDEA MISAKI	カンデア岬

Name	*Phonetic*	*Japanese*
CAP I	KAPPU JIMA	カップ島
CAPUAL I	KAPUARU JIMA	カプアル島
CHONGOS B	CHIONGOSU WAN	チオンゴス湾
CRATER LAKE	KUREITORU KO	クレイトル湖
DAINGAPIC PT	DAINGAPIK MISAKI	ダインガピク岬
DALRYMPLE HR	DARURINPURE MINATO	ダルリンプレ港
DATU BATO I	DATSUBATO JIMA	ダツバト島
DONGDONG I	DONGUDONGU JIMA	ドングドング島
DUNGUN R	DONGUN GAWA	ドングン河
ERNESTINE LAKE	ERUNESUCHINE KO	エルネスチネ湖
GALLO MALLO CHAN	GARO MARO KAIKYU	ガロ マロ海峡
GORRO MT	GORO YAMA	ゴロ山
GUNBOAT HR	GANBOTTSU MINATO	ガンボーツ港
IGASAN PT	IGASAN MISAKI	イガサン岬
INDANAN	INDANAN	インダナン
JOLO	HORO	ホロ
JURATA B	HURATA WAN	フラタ湾
KULAKULA CHAN	KURAKURA KAIKYU	クラクラ海峡
KULAYKULAY	KURAIKURAI	クライクライ
LAMINUSA I	RAMINUSA JIMA	ラミヌサ島
LANGUYAN PORT	RANGUYAN MINATO	ランゲヤン港
LAPAC I	RAPOKKU JIMA	ラポック島
LOOG	RUUGU	ルーグ
MABAJOC PT	MABAHOKKU MISAKI	マバホック岬

Name	*Phonetic*	*Japanese*
MAIMBUNG	MAINBONGU	マインボング
MANALIK CHAN	MANARIKU KAIKYU	マナリク海峡
MANGALIS PT	MANGARISU MISAKI	マンガリス岬
MANIACOLAT I	MANIAKORATTO JIMA	マニアコラット島
MANUK MANKA I	MANUKKU MANUKU JIMA	マヌック マヌク島
MARANING B	MARANIN WAN	マラニン湾
MERIDIAN CHAN	MERIJIAN KAIKYU	メリジアン海峡
MOBO	MOBO	モボ
NEW BATU BATU	NIYU BATSU BATSU	ニユ バツ バツ
NORTH LAGOON	KITA RAGUUN	北ラグーン
NORTH UBIAN I	KITA UBIAN JIMA	北ウビアン島
PAGASINAN	PAGASHINAN	パガシナン
PANGUTARANG PASSAGE	PANGUTARAN KAIKYU	パングタラン海峡
PARANG	PARAN	パラン
PATA I	PATA JIMA	パタ島
PATIKUL	PACHIKURU	パチクル
PATOTOL B	PATOTORU WAN	パトトル湾
PITOGO B	PITOGO WAN	ピトゴ湾
ROMANDIER CAMP	KIYANPU ROMANJIERU	キヤンプ ロマンジエル
SANGA SANGA I	SANGA SANGA JIMA	サンガ サンガ島
SEIT LAKE	SEITTO KO	セイット湖
SIASI I	SHIASHI JIMA	シアシ島
SIBANKAT MT	SHIBANKATTO YAMA	シバンカット山
SIBUTU I	SHIBUTSU JIMA	シブツ島

Name	*Phonetic*	*Japanese*
SIMUNUL I	SHIMUNURU JIMA	シムヌル島
SINGUAN LAKE	SHINGUAN KO	シングアン湖
SITANKI I	SHITANKI JIMA	シタンキ島
SOUTH LAGOON	MINAMI RAGUUN	南ラグーン
SOUTH UBIAN I	MINAMI UBIAN JIMA	南ウビアン
SUOC	SUOKKU	スオック
TAGLIBI	TAGURIBI	タグリビ
TANDUBATO I	TANDOBATO JIMA	タンドバト島
TAPAAN I	TAPAN JIMA	タパン島
TAPUL I	TAPURU JIMA	タプル島
TAVOTAVO PT	TABOTABO MISAKI	タボタボ岬
TIJITIJI IS	CHIJICHIJI SHOTO	チジチジ諸島
TIMPOAK LAKE	CHINPOAKKU KO	チンポアック湖
TUBIG	TSUBIGU	ツビグ
TUBIG INDANGAN	TSUBIGU INDANGAN	ツビグ インダンガン
TUMINDAO REEF	TSUMINDAO SHO	ツミンダオ礁
TUTU B	TSUTSU WAN	ツツ湾
TONQUIL I	TONKUIRU JIMA	トンクイル島

APPENDIX "E"

CONVERSION TABLES

FEET TO METERS

Feet	Meters	Feet	Meters	Feet	Meters
1	0.30	100	30.5	1000	304.8
2	0.61	200	61.0	2000	609.6
3	0.91	300	91.4	3000	914.4
4	1.22	400	121.9	4000	1219.2
5	1.52	500	152.4	5000	1524.0
6	1.83	600	182.9	6000	1828.8
7	2.13	700	213.4	7000	2133.6
8	2.44	800	243.8	8000	2438.4
9	2.74	900	274.3	9000	2743.2

METERS TO FEET

Meters	Feet	Meters	Feet
1	3.33	100	328.1
2	6.66	200	656.2
3	9.99	300	984.0
4	13.12	400	1312
5	16.40	500	1640
6	19.68	600	1968
7	22.97	700	2297
8	26.25	800	2625
9	29.53	900	2953

MILES TO KILOMETERS (KM)

Mls	Km	Mls	Km	Mls	Km	Mls	Km
0.1	0.16	1	1.61	10	16.1	100	160.9
0.2	0.32	2	3.22	20	32.2	200	321.9
0.3	0.48	3	4.83	30	48.3	300	482.8
0.4	0.64	4	6.44	40	64.4	400	643.7
0.5	0.80	5	8.05	50	80.5	500	804.7
0.6	0.96	6	9.66	60	96.6	600	965.6
0.7	1.13	7	11.27	70	112.7	700	1126.5
0.8	1.29	8	12.87	80	128.7	800	1287.4
0.9	1.45	9	14.48	90	144.8	900	1448.4

KILOMETERS TO MILES

Km	Mls	Km	Mls	Km	Mls	Km	Mls
0.1	0.06	1	0.62	10	6.2	100	62.1
0.2	0.12	2	1.24	20	12.4	200	124.2
0.3	0.19	3	1.86	30	18.6	300	186.3
0.4	0.25	4	2.48	40	24.8	400	248.4
0.5	0.31	5	3.10	50	31.0	500	310.5
0.6	0.37	6	3.73	60	37.3	600	376.6
0.7	0.43	7	4.35	70	43.5	700	434.7
0.8	0.50	8	4.97	80	49.7	800	496.8
0.9	0.56	9	5.59	90	55.9	900	558.9

1 nautical mile = 1.528 statute miles.

1 statute mile = .8676 nautical mile.

APPENDIX "F"

CURRENCIES, WEIGHTS AND MEASURES

1. Value of Coins and Currencies:

Unit	*Material*	*Value US Dollar*
1 Centavo	Copper	0.005
5 Centavo	Nickel	0.025
10 Centavo	Silver	0.05
20 Centavo (peseta)	Silver	0.10
50 Centavo	Silver	0.25
1 Peso	Silver	0.50
1 Peso	Paper	0.50
2 Peso	Paper	1.00
5 Peso	Paper	2.50
10 Peso	Paper	5.00
20 Peso	Paper	10.00
50 Peso	Paper	25.00
100 Peso	Paper	50.00
500 Peso	Paper	250.00

2. Weights and Measures:

1 chupa = $\frac{1}{8}$ ganta = 375 cubic centimeters.

1 ganta = 8 chupas = 3 liters = 3,000 cc.

In some areas 9 chupas = 1 ganta, or 3 chupas = 1 liter. A chupa of uncooked rice is considered $\frac{1}{3}$ of a rice ration or sufficient for one meal.

1 kilo = 1,000 grams = 2.205 lb = 35.274 ozs.

1 M ton = 1,000 ko = 2,204.62 lb = 1.102 short tons = .984 long ton.

1 lb. = .4536 ko.

1 S ton = 2,000 lb = .89 long ton = .907 metric ton.

1 L ton = 2,240 lb = 1.12 short tons = 1.016 metric tons.

1 sq yd = .836 sq meter.

1 acre = 4,046.873 sq meters = 0.404 hectare.

1 sq ml = 640 acres = 258.9 hectares.

1 sq meter = 10.76 sq. ft.

1 hectare = 11,959.8 sq yds = 10,000 sq meters = 2.47 acres.

Unit	*Item*	*Volume*		*Weight*	
		Metric	*US*	*ko*	*lb*
Ganta	*Palay*	3 liters	0.084 bu	1.72	3.784
Ganta	Rice	3 liters	0.084 bu	2.30	5.06
Ganta	Shelled corn	3 liters	0.084 bu	2.34	5.148
Ganta	Shelled peanuts	3 liters	0.084 bu	1.10	2.42
Ganta	*Mungos*	3 liters	0.084 bu	2.34	5.148
Arroba	Rice	16 liters	0.45 bu	12.26	26.97
Cavan	*Palay*	25 ganta	2.13 bu	43.0	94.60
Cavan	Rice	25 ganta	2.13 bu	57.5	126.5
Cavan	Shelled corn	25 ganta	2.13 bu	58.5	128.7
2.05 cavans *palay* = 1 cavan cleaned rice					
2.47 cavans corn on cob = 1 cavan shelled corn					
Quintal	Rice	64 liters	1.80 bu	49.04	117.8
Quintal	Tobacco			46	101.2
Picul				63.25	139.15

SUBSTITUTE MEASURE:

10 leche (condensed milk can) = 1 ganta.
6 salmon (std salmon can) = 1 ganta.
1 kerosene (5 gallons square can) = 6 gantas.
1 fresco (square face gin bottle) = 1,400 cc.
4 beer bottles = 1 fresco.

JOLO GROUP

FROM USC & GS CHART 4513

Statute Miles

· LEGEND ·

One Lane All Weather Road — Landing Beach

One Lane Seasonal Road — Operational Airfield

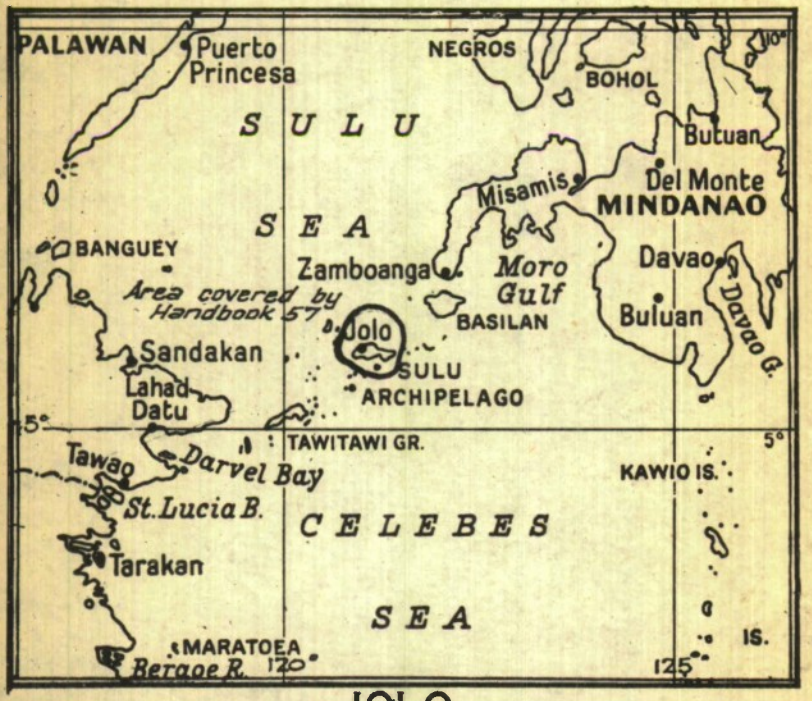
Trail — Possible Airfield Site

Possible Seaplane Base & Anchorage

Numbers along Coastline refer to parcs in Section 3

SOUNDINGS IN FATHOMS
AT MEAN LOWER LOW WATER
HEIGHTS IN FEET

MAP 15



JOLO
ORIENTATION MAP

0 100 200 300 400 500

Statute Miles at Equator