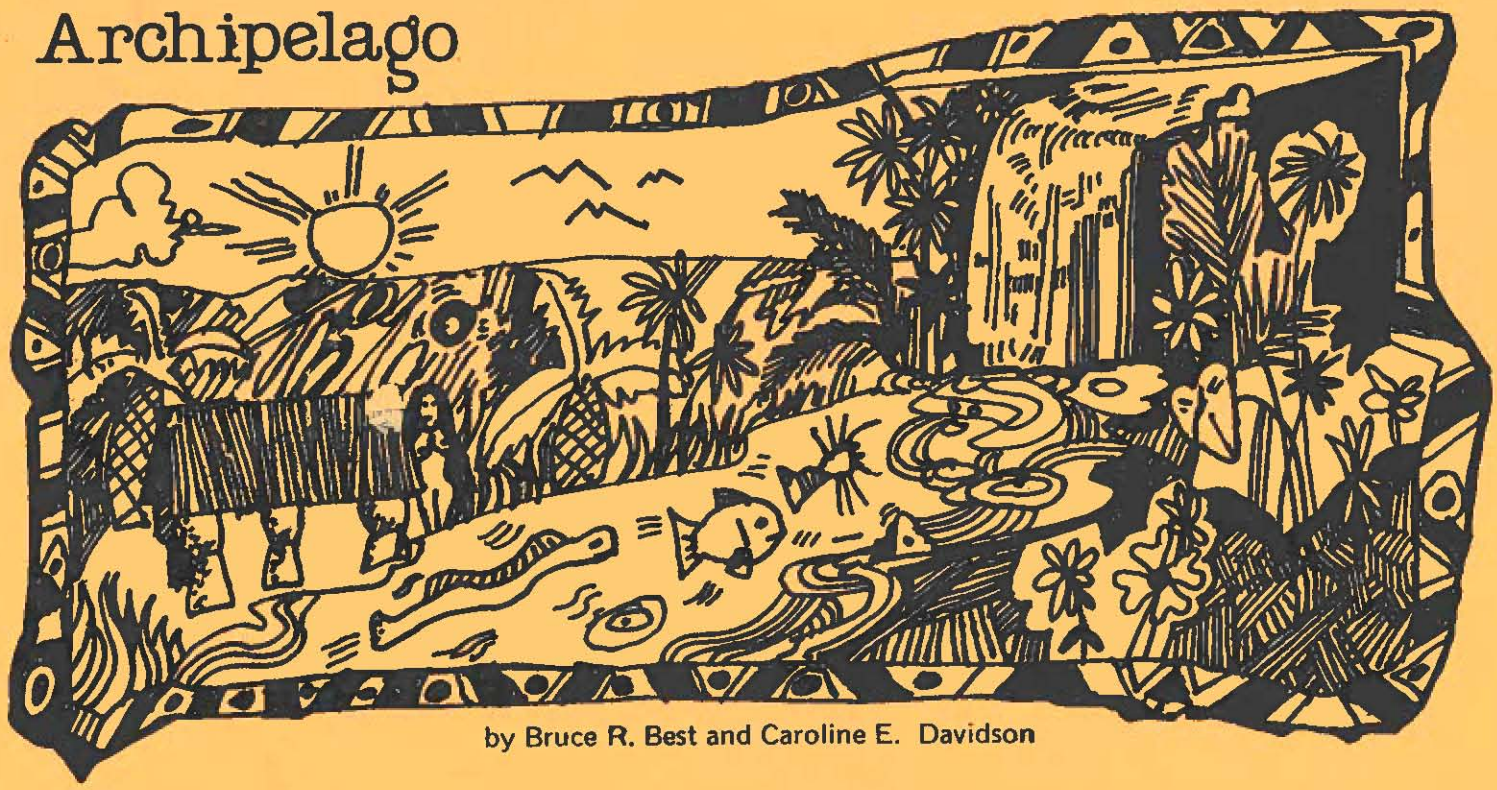
Inventory and Atlas of the Inland Aquatic Ecosystems of the Marianas Archipelago



by Bruce R. Best and Caroline E. Davidson

Submitted to
SEATTLE NATIONAL FISHERY RESEARCH CENTER
U.S. Fish and Wildlife Service
Department of Interior

UNIVERSITY OF GUAM MARINE LABORATORY
Technical Report 75
1981

PREFACE

The objectives of this project were to locate and catalogue freshwater literature (see Best 1981) and to consolidate and present a physical and biological inventory of the inland aquatic ecosystems of the Marianas Archipelago. The data presented in this report, except where noted, have not been verified through on-site checks because it was outside the scope of this project. Results indicate that, first, the biota in the streams of Oceania, with the possible exception of Hawaii, is little known. Secondly, much of the physical data for the streams has not been professionally rechecked since WWII. Some islands, Rota for instance, have not had their streams mapped. Thirdly, stream nomenclature is inconsistent and needs on-site local input.

It is the author's intent that this report will serve as a baseline from which significant Mariana freshwater research can proceed.

TABLE OF CONTENTS

INTRODUCTION

This inventory and atlas supplements the Marianas inland aquatic system bibliography: Best, B. R. 1981. Bibliography of inland aquatic ecosystems of the Marianas Archipelago. Univ. Guam Mar. Lab. Tech. Rept. 72.

Aquatic systems are catalogued as follows:

Each stream, lake, spring, wetland or river system (for the rivers with major tributaries) is designated by an inventory number at the top right hand corner of each page. The numbering system begins with a selected stream, wetland, etc., and continues, consecutively, around the island. On Guam, the Agana River System is number 1. Other streams which drain into the sea are numbered consecutively around the island in a counter clockwise direction. Following these in numerical sequence are the "landlocked" streams, lakes, and springs. Major tributaries are denoted by a system (i.e., Talofofo System) and a specific letter designation. For instance, the Ugum River is 48h; the 48 is the Talofofo River System designation and h for the specific tributary.

Coordinates are for the stream mouth or point of confluence for tributaries and for the middle of lakes, wetlands, springs, or wet caves. Lengths of perennial channels and tributaries were calculated from USGS maps for Guam, AMS maps for Saipan, and Sugawara (1934, reference 252 in Best 1981) for Rota. Lengths are given only for perennial portions unless otherwise noted (Saipan has no continuous-perennial streams, but lengths of main intermittent or interrupted channels are given). Elevations were noted for the highest perennial designation on the USGS quadrangle map (1:24,000 series) for Guam and from the above mentioned maps for Saipan and Rota. Coordinates are given for waterfalls because they pose physical barriers for upstream migration of some species. General information to the biologist or hydrologist is noted in the additional information section. Some man-induced physical changes--rechannelization, road crossings and riparian

developments--were not field checked.

Since this inventory is directed toward the biologist, a preliminary list of reported aquatic and aquatic-associated organisms is included in this inventory (Appendix). This list was composed primarily from technical and unpublished letter and survey reports. In addition, reported aquatic organisms are listed on individual stream pages. Some species designation may be incorrect but the lists provide a baseline from which more complete biological inventories can emerge. Ample space is given on each page for new entries. On-site verification was not within the scope of this project. Many sites are listed as "no record of the aquatic biota has been located" because their biota has not been inventoried and recorded in the literature that would be available to the aquatic researcher. For the most part, wetland birds are not included in this inventory. (For wetland bird checklists, refer to Tenorio and Associates, Inc. 1979. Reference 262.)

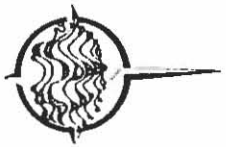
An alphabetized index, which notes other pertinent references, is included in this report. Reference numbers refer to Best (1981).

This inventory was funded by the U.S. Fish and Wildlife Service, Dept. of Interior, Contract No. 14-160009-81-016, to S. G. Nelson.

ACKNOWLEDGEMENTS

Thanks go to Dr. John Maciolek, Pacific Island Project Coordinator for the USFWS, and to Dr. S. G. Nelson for their comments and advice. An award for patience and self-control goes to Ms. Lucy Lacsamana for typing the many drafts.

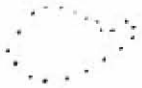
LEGEND FOR MAP SYMBOLS



Indicates TRUE north

Waterfall

Spring



Wetland

"Mountain" Peak

Water Cave

USGS Gaging Station

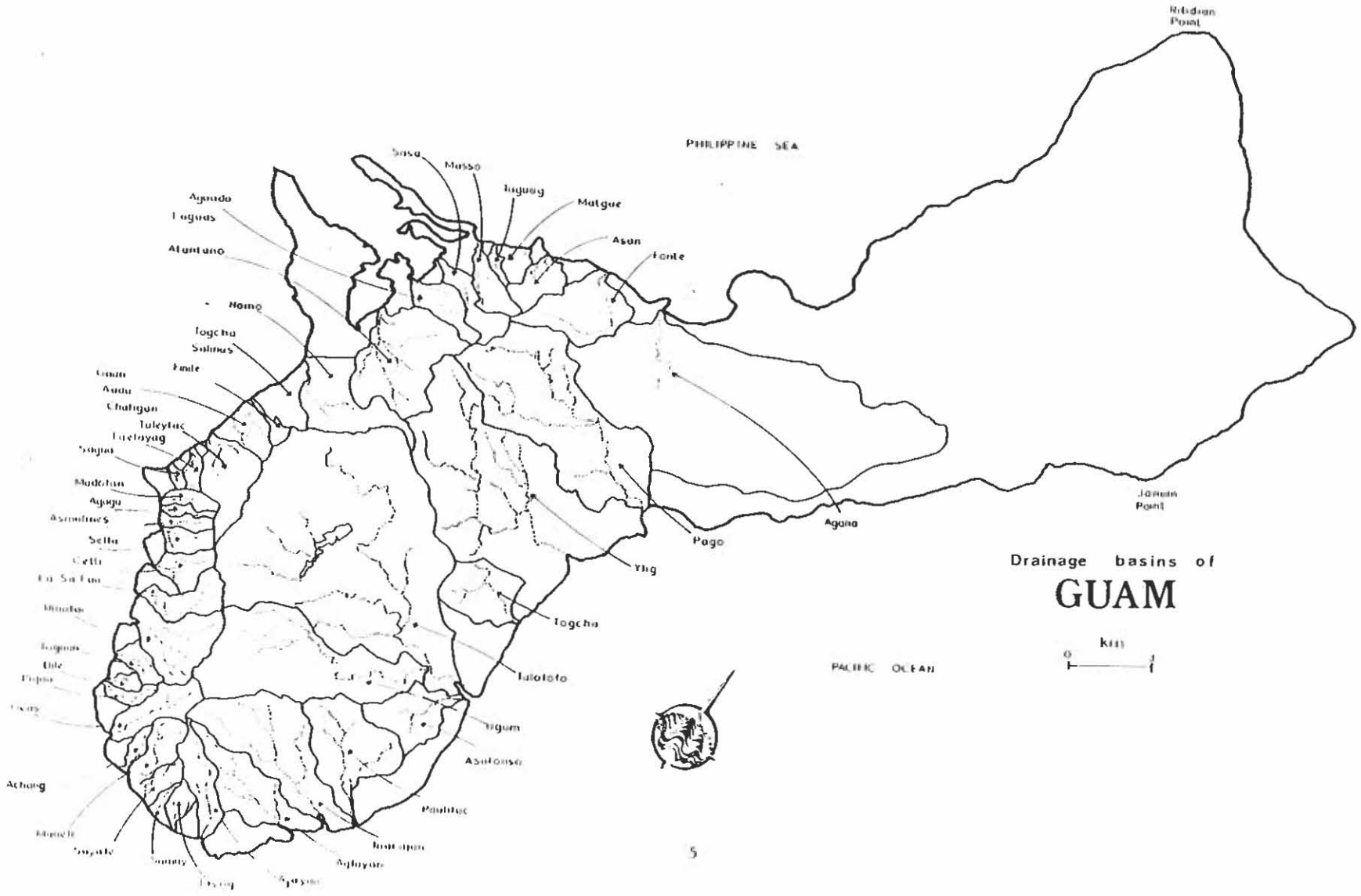
GUAM

The northern portion of Guam is a porous limestone plateau forming a Ghyben-Herzberg ground water lens. A few springs exist in the north but no lotic systems. The surface run-off in the volcanic southern sector supports approximately 50 streams and their numerous tributaries. This inventory presents information on these drainage systems as well as on water caves and freshwater ponds and springs which are named on the USGS quadrangle maps (1:24,000 series). Intermittent streams are mentioned only if they are named on the USGS maps.

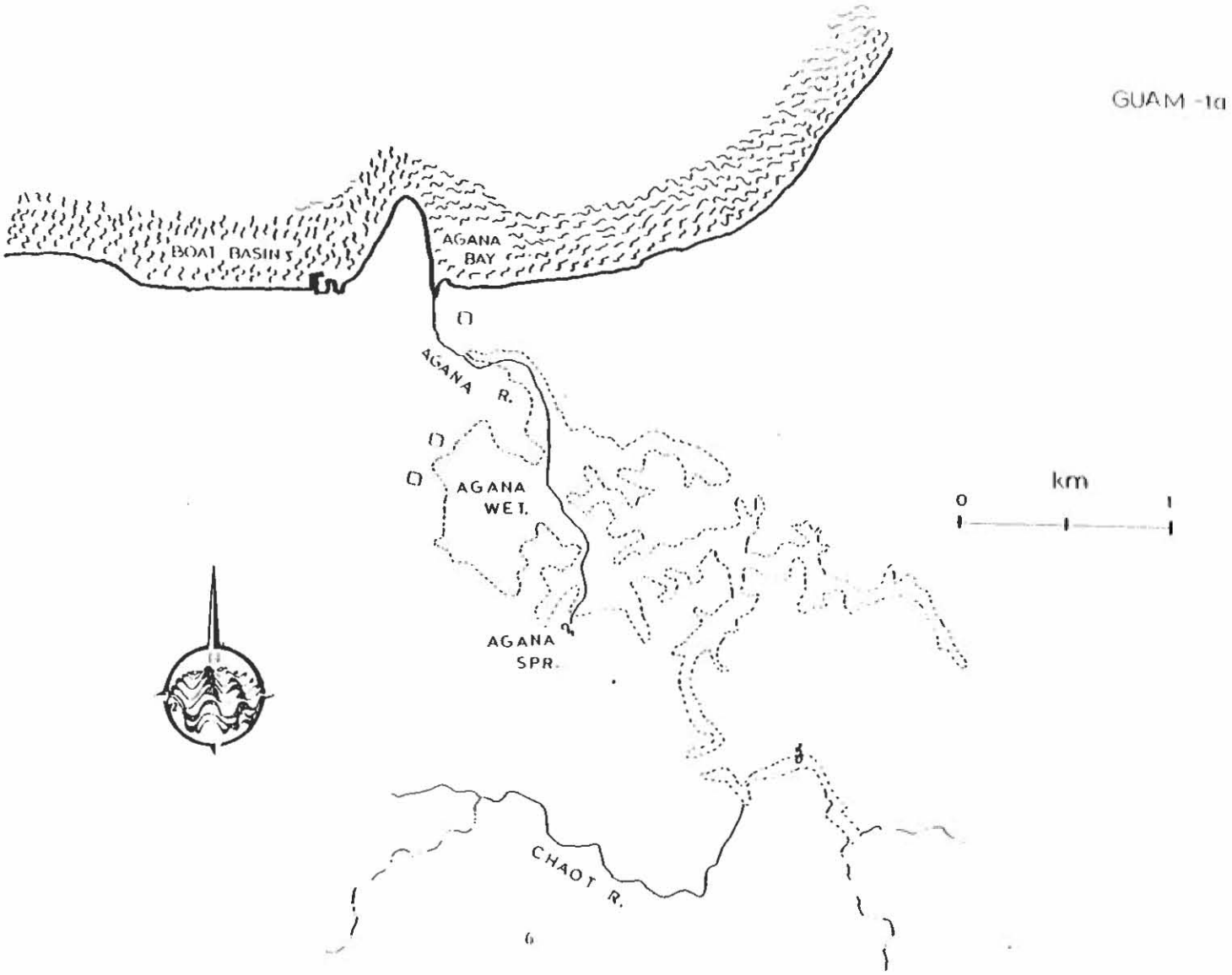
Consistency with the USGS designations of creeks, rivers, or streams was maintained even though sometimes inappropriate, i.e., intermittent streams were occasionally labeled "rivers." In this way, local names are left intact as much as possible. Chamorro words such as sadog, lichen and katan, for freshwater ravine, west and east, respectively, are used throughout this inventory.

The biological inventory sections are not exhaustive and are taken mainly from existing collections or from available printed reports. In general, a few algae, aquatic insects, Macrobrachium and atyid shrimps, neritid snails, gobioid fishes, Anguilla eels, and probably some flagtails (Kuhlia) can be found in all the major streams of Guam. The aquatic floral and faunal communities change with the seasons, with the incidence of illegal chlorine application and other man-induced pressures, and also in relation to natural barriers, such as waterfalls, which might restrict upstream migrations of kuhliid and eleotrid fishes.

Reported flow rates and drainage areas are from USGS yearly water resource data editions or the average of the estimates by Austin, Smith and Assoc., Inc. (1970) and Greenleaf, Telesca-Ahn (1971) (References 9 and 103 in Best 1981, see Introduction).


PHILIPPINE SEA
Ritidian Point
Sasa
Masso
Taguag
Matgue
Agueda
Lagnas
Asan
Afantano
Fonte
Nimo
Togcha
Salinas
Fonte
Umatac
Asadu
Chaligan
Tuleytac
Eneleyag
Sagua
Madofan
Agagu
Asmuftues
Sella
Cetti
Ea Sa Fan
Bonita
Talofofo
Ilgum
Asinfonso
Achang
Paulitac
Agfayan
Pago
Agana
Ylig
Togcha
Jonein Point
PACIFIC OCEAN
Drainage basins of
GUAM
km
0
1

GUAM -1a



Agana River, Guam 1a

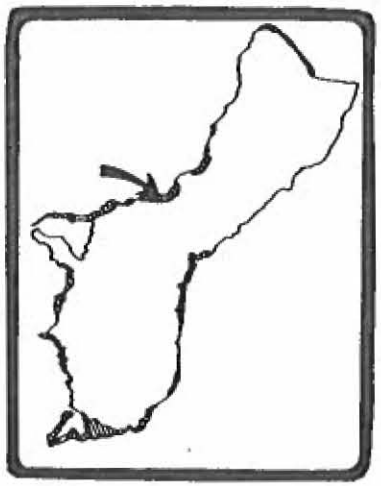
COORDINATES: Lat. 13° 28' 32" N
Long. 144° 45' 08" E

CHANNEL LENGTH: 1830 m

ELEVATION: 3 m

Additional Information:

1) Stream flows through Agana Wetland.
2) Estuary system extends 240 m inland from mouth.
3) Detailed sediment analysis, faunal and floral descriptions are in Randall and Tsuda, 1974 (reference 215).
4) Corps of Engineers propose flood control improvements for Agana River.

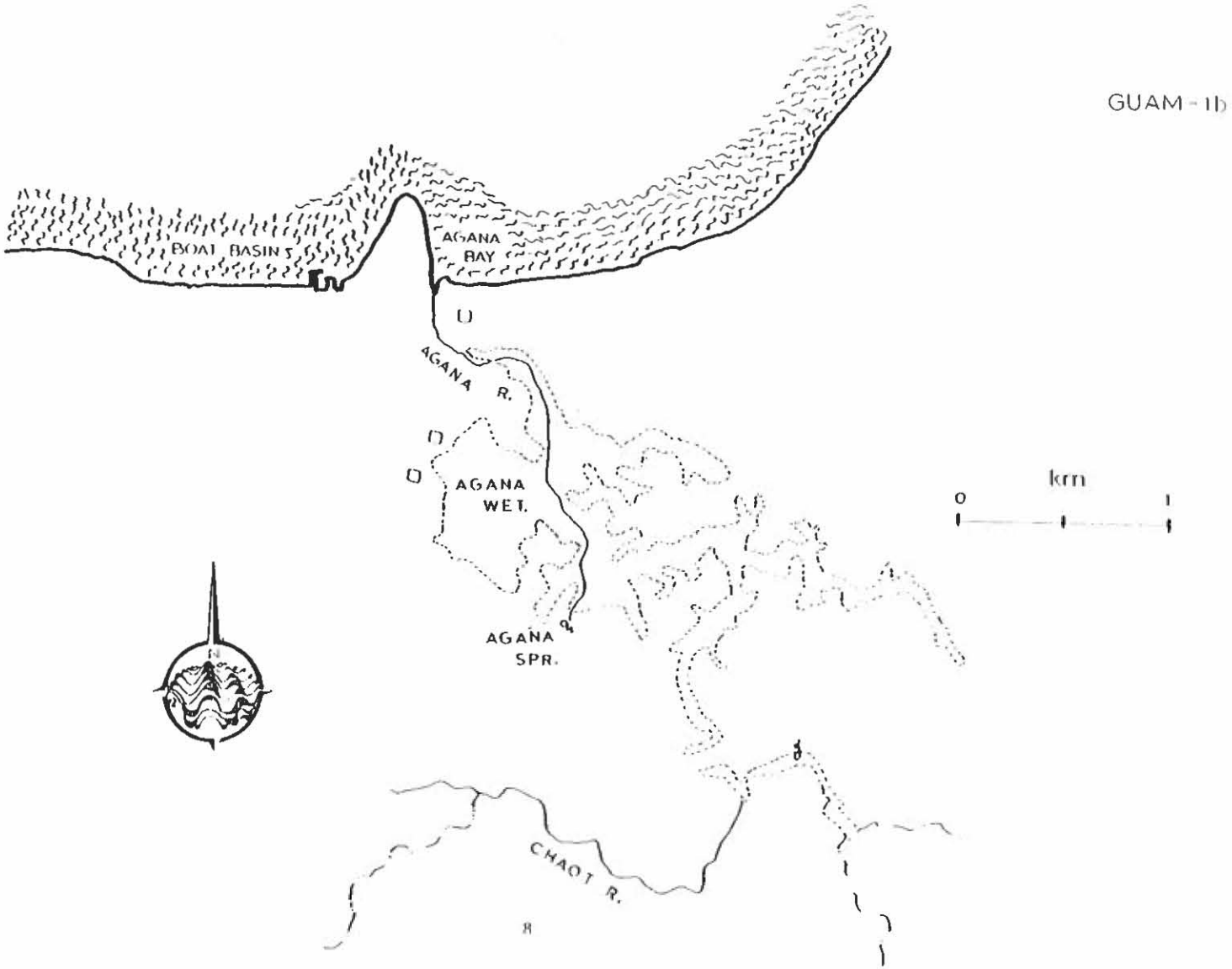


Reported Aquatic Organisms

Estuarine biota is listed in reference 215.

Non-saline biota listed under the Agana Wetland (Guam-1b).

GUAM - 1b



Agana Wetland-Swamp, Guam 1b

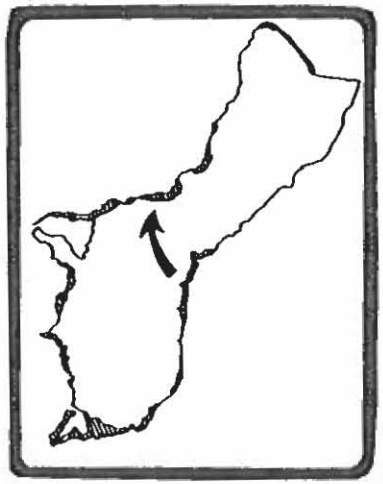
COORDINATES: Lat. 13° 27' 58" N
Long. 144° 45' 24" E

APPROXIMATE AREA: 71 ha

ELEVATION: 3 m

Additional Information:

1) There were plans to build a major tourist facility, however, presently this is a conservation zone.



Reported Aquatic Organisms

ANIMALS

Invertebrates:

Macrobrachium lar

Vertebrates:

Anguilla bicolor
Anguilla marmorata
Awaous guamensis
Clarias batrachus
Cyprinus carpio
Eleotris fusca
Gambusia affinis
Mugilidae sp.
Poecilia reticulatus
Stiphodon elegans
Tilapia mossambica
Tilapia zilli

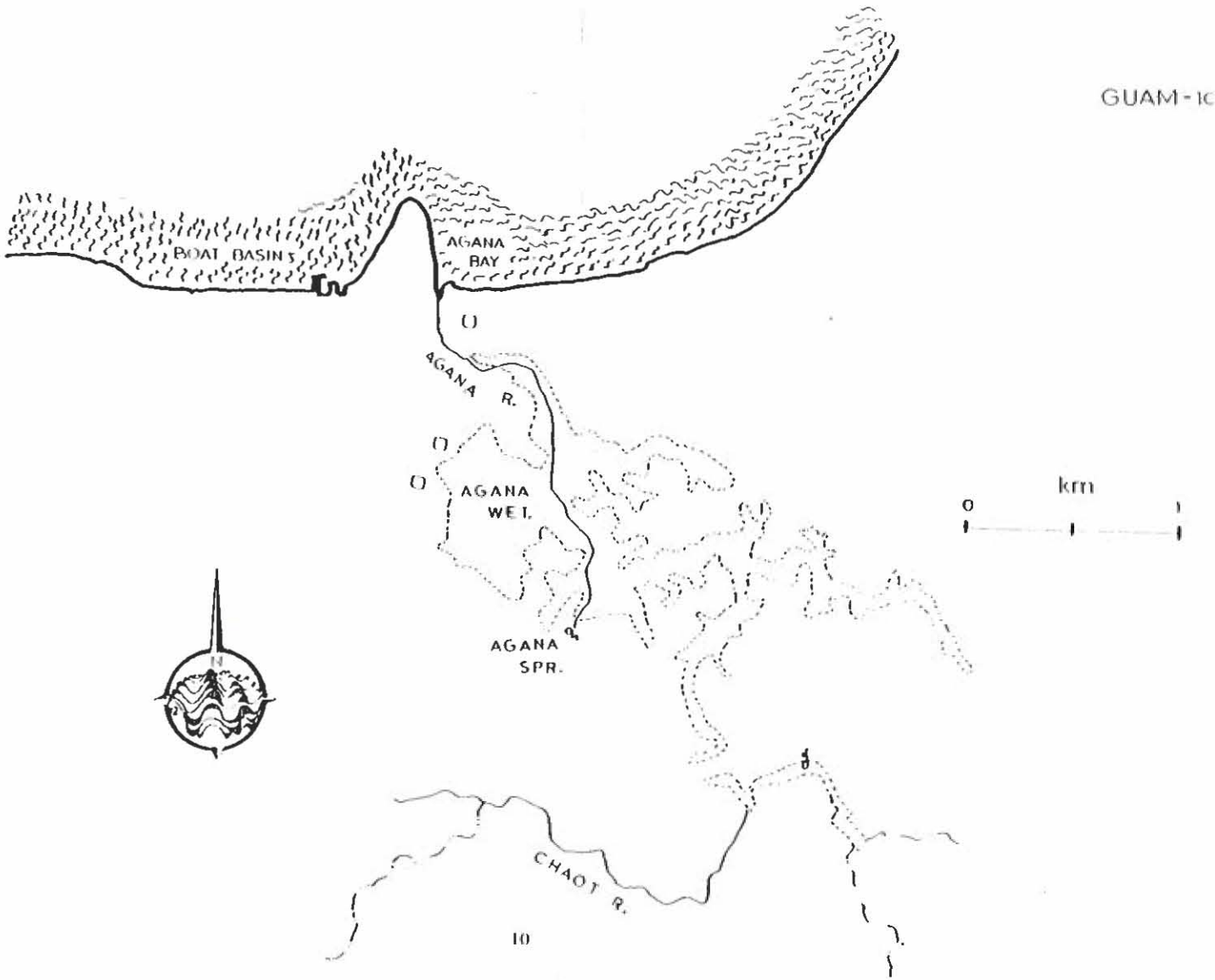
PLANTS

Eichhornia crassipes
Hibiscus tiliaceus
Hydrilla verticillata
Phragmites karka
Pistia stratiotes

See Appendix for additional biota

Information from references:

184, 188, 215


GUAM - 1c
BOAT BASINS
AGANA BAY
AGANA R.
AGANA WET.
AGANA SPR.
CHAOT R.
km
0
10

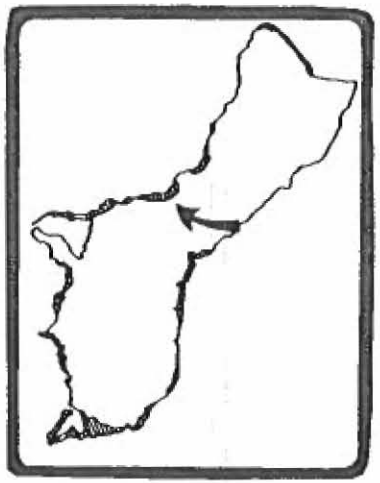
Agana Spring, Guam 1c

COORDINATES: Lat. 13° 27' 42" N
Long. 144° 45' 29" E

ELEVATION: 3 m

Additional Information:

1) A concrete reservoir was built in 1914.
2) Maximum depth is 3 m.
3) The area is used as a park and picnic ground.
4) Average flow rate: 3785 m^3/day.
5) See Appendix (Table 2) for physicochemical characteristics.



Reported Aquatic Organisms

ANIMALS

Vertebrates:

Tilapia mossambica
Gambusia affinis

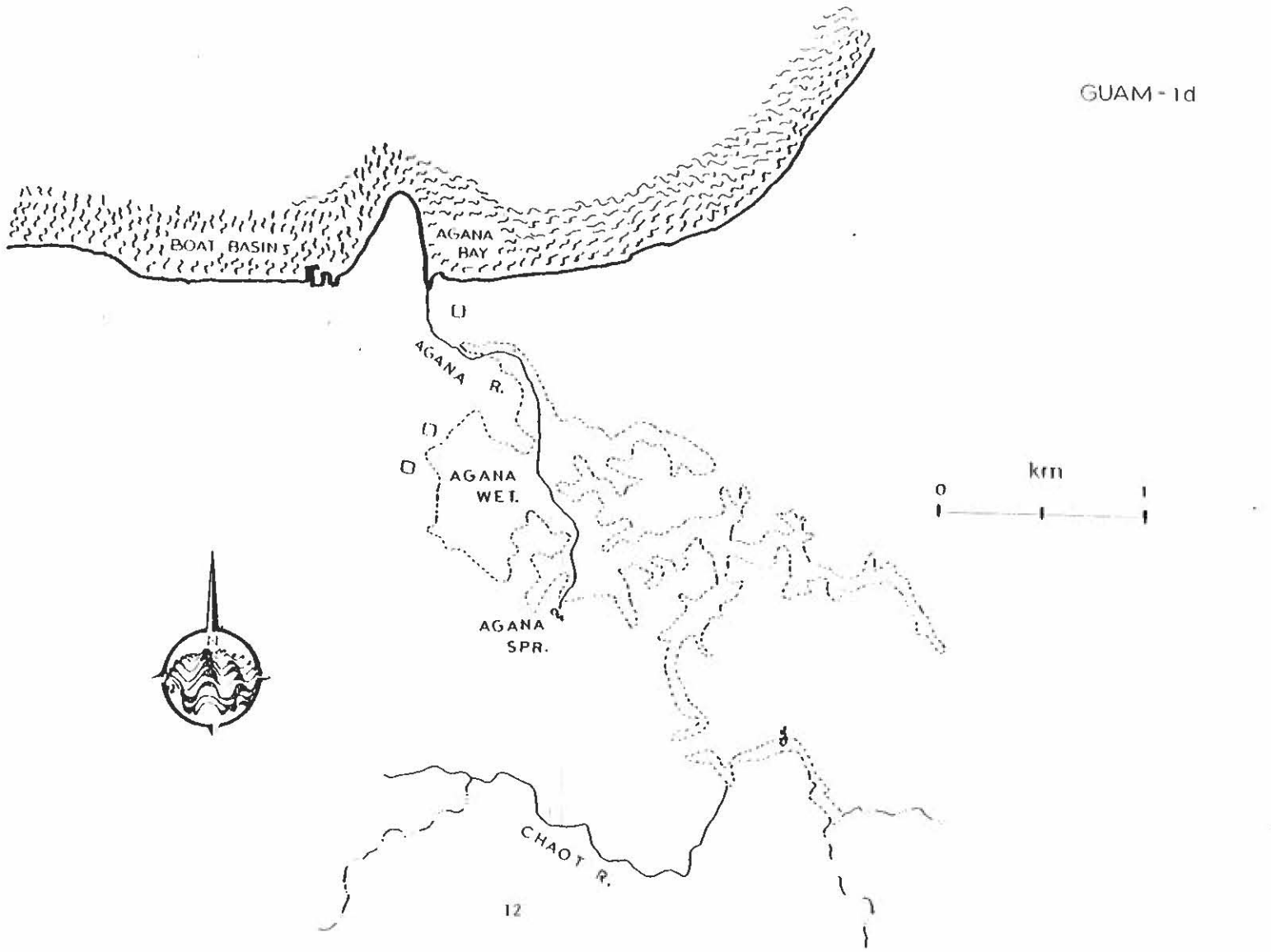
PLANTS

Eichhornia crassipes
Hibiscus tiliaceus
Hydrilla verticillata
Microspora sp.
Phragmites karka
Pistia stratiotes

Information from references:

184, 188, 215

GUAM - 1d


BOAT BASIN
AGANA BAY
AGANA R.
AGANA WET.
AGANA SPR.
CHAOT R.
km
0
12

AGANA RIVER SYSTEM

GUAM-1d

Chaot River, Guam 1d

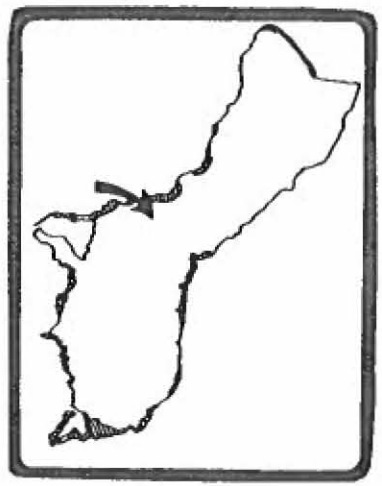
COORDINATES: Lat. 13° 27' 14" N
Long. 144° 45' 58" E

PERENNIAL CHANNEL LENGTH: 1,980 m

ELEVATION: 30 m

Additional Information:

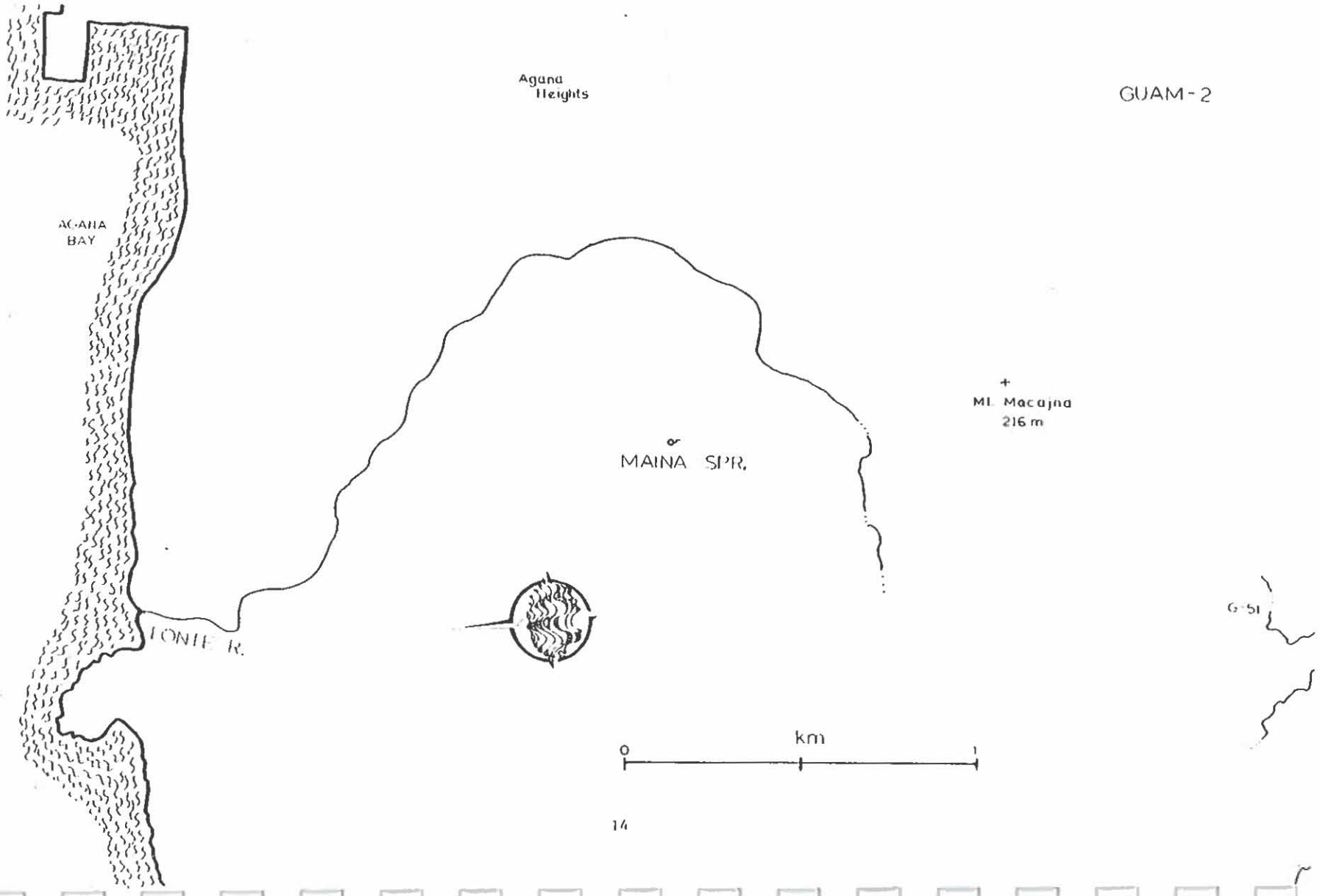
1) The Chaot drains into Agana Wetland System.



Flora and fauna continuous with Agana Wetland and River System.

Information from reference:

215


Agana
Heights
GUAM - 2
AGANA
BAY
Mt. Macajna
216 m
MAINA SPR.
TONTE R.
G-51
km
0
1

FONTE RIVER

Fonte River, Guam 2

COORDINATES: Lat. 13° 28' 23" N
Long. 144° 43' 45" E

PERENNIAL CHANNEL LENGTH: 3,017 m

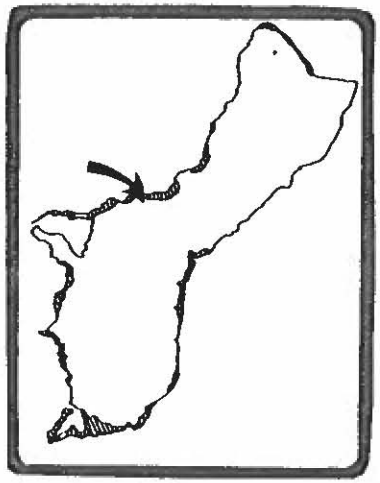
ELEVATION: 15 m

APPROXIMATE DRAINAGE AREA: 575 ha

AVERAGE SLOPE(Z): 3.6

Additional Information:

1) Fonte flows intermittently through the Nimitz Hill area.
2) It has no perennial tributaries.
3) Marina Spring:
   Lat. 13° 27' 49"
   Long. 144° 43' 58"
   Elev. 70 m



Reported Aquatic Organisms

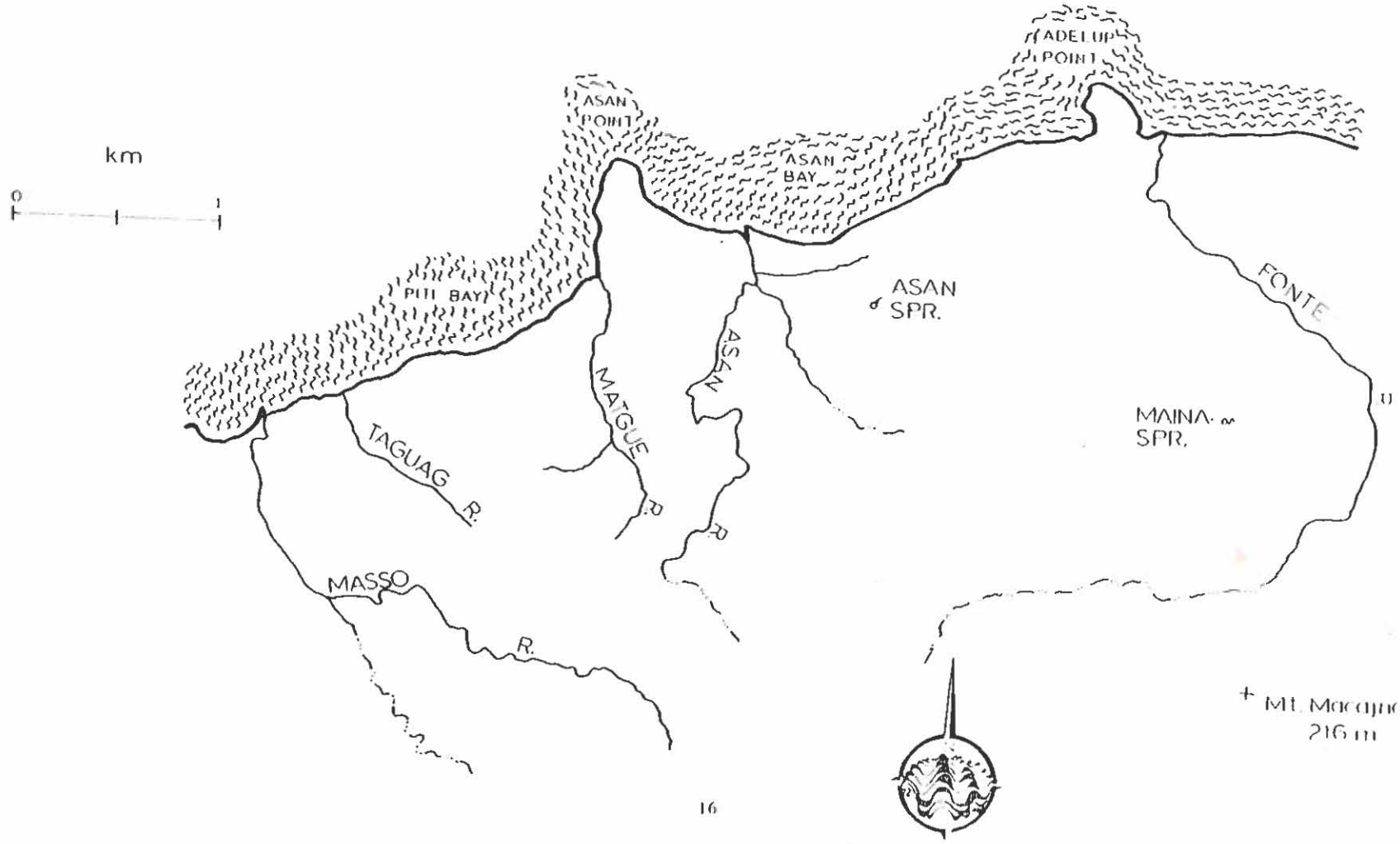
ANIMALS

Vertebrates:

Anguilla bicolor

Information from reference:

131


km
0
1
ADELUP POINT
ASAN POINT
ASAN BAY
PITI BAY
ASAN SPR.
FONTE
MAINA SPR.
TAGUAG R.
MATGUE R.
ASAN R.
MASSO R.
+ Mt. Maccajna
216 m

Asan River, Guam 3

COORDINATES: Lat. 13° 28' 20" N
Long. 144° 42' 39" E

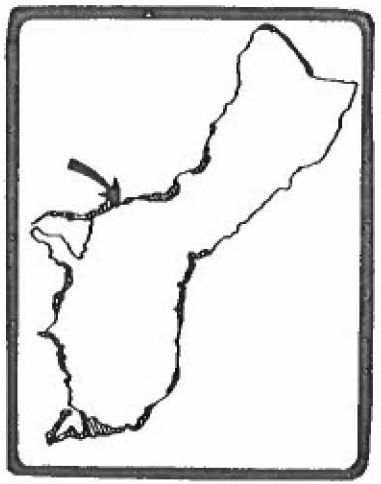
ELEVATION: 87 m

TOTAL RIVER SYSTEM DATA:

1) Length of longest continuous perennial channel: 2,040 m
2) Combined perennial channel lengths: 3,383 m
3) Approximate drainage area: 238 ha
4) Average slope (%) 6.0

Additional Information:

1) Asan Spring:
Lat. 13° 28' 09" N
Long. 144° 43' 02" E
Elev. 84 m
2) See Appendix (Table 2) for physicochemical characteristics of water samples from Asan Spring.
3) The Asan has one major tributary (the Calacage "River") and one minor tributary.



Reported Aquatic Organisms

ANIMALS

Invertebrates:

Caridina sp.
Macrobrachium lar
Macrobrachium sp.

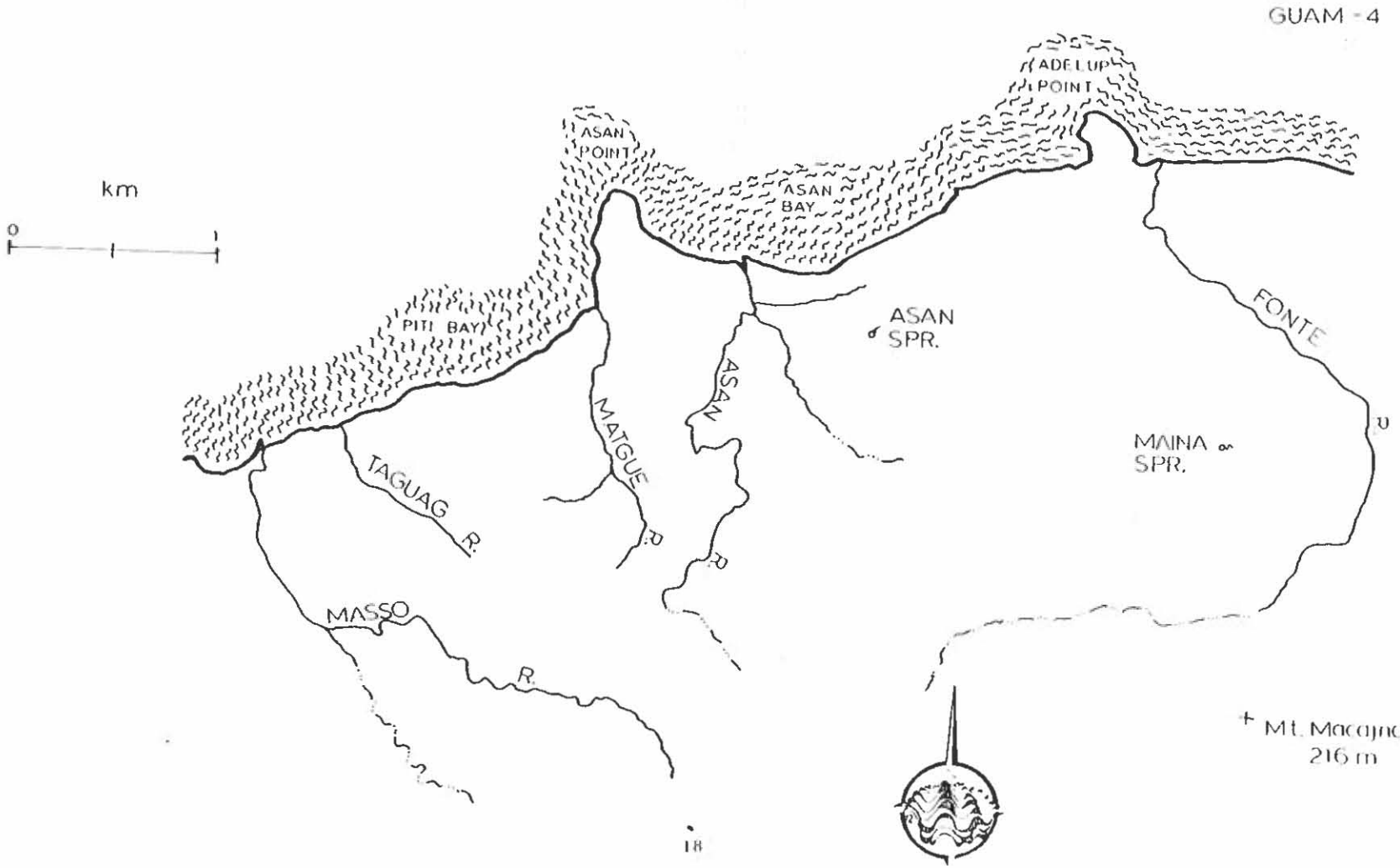
Melanid spp.
Septaria porcellana

Vertebrates:

Anguilla marmorata
Kuhlia sp.
Tilapia sp.

Information from references:

3, 260


GUAM - 4
km
0
1
ADELUP POINT
ASAN POINT
ASAN BAY
PITI BAY
ASAN SPR.
FONTE
ASAN
MATGUE R.
TAGUAG R.
MASSO R.
MAINA SPR.
Mt. Macajna
216 m
18

Matgue River, Guam 4

COORDINATES: Lat. 13° 28' 11" N
Long. 144° 42' 15" E

ELEVATION: 76 m

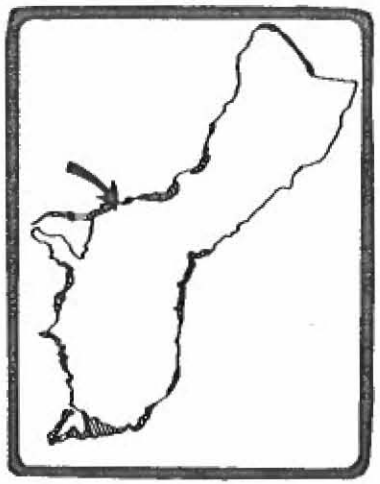
TOTAL RIVER SYSTEM DATA:

1) Length of longest continuous perennial channel: 1,465 m
2) Combined perennial channel lengths: 1,980 m
3) Approximate drainage area: 82 ha
4) Average slope (%): 7.1

Additional Information:

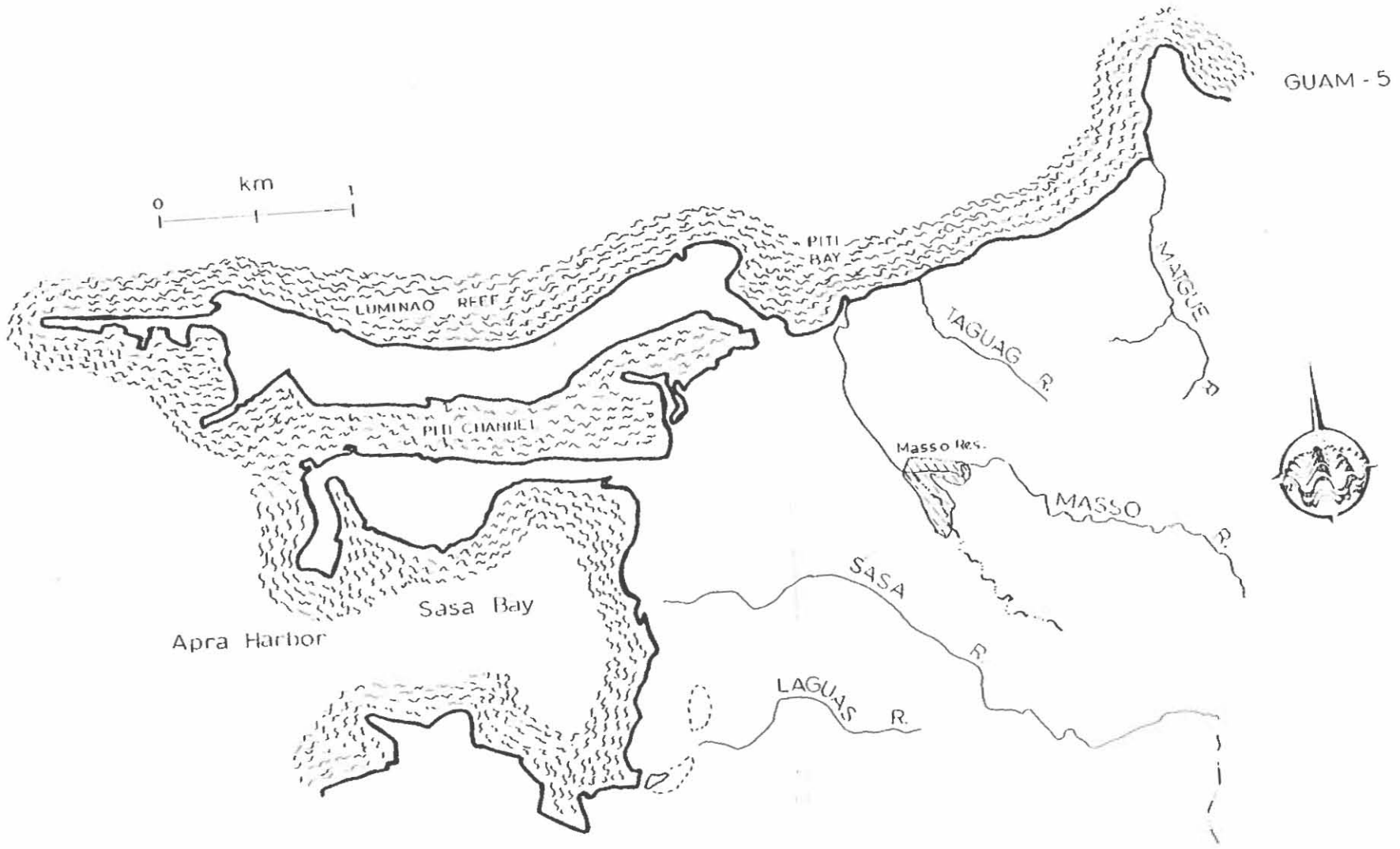
1) The Matgue has one perennial tributary.

MATGUE RIVER SYSTEM



GUAM-4

No record of the aquatic biota has been located.


GUAM - 5
km
0
1
PITI BAY
LUMINAO REEF
PITI CHANNEL
TAGUAG R.
MATGUE R.
Masso Res.
MASSO R.
SASA R.
Sasa Bay
Apra Harbor
LAGUAS R.

TAGUAG RIVER

GUAM-5

Taguag River, Guam 5

COORDINATES: Lat. 13° 27' 54" N
Long. 144° 41' 36" E

PERENNIAL CHANNEL LENGTH: 899 m

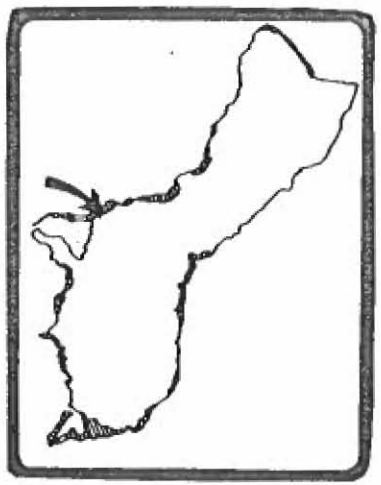
ELEVATION: 73 m

APPROXIMATE DRAINAGE AREA: 54 ha

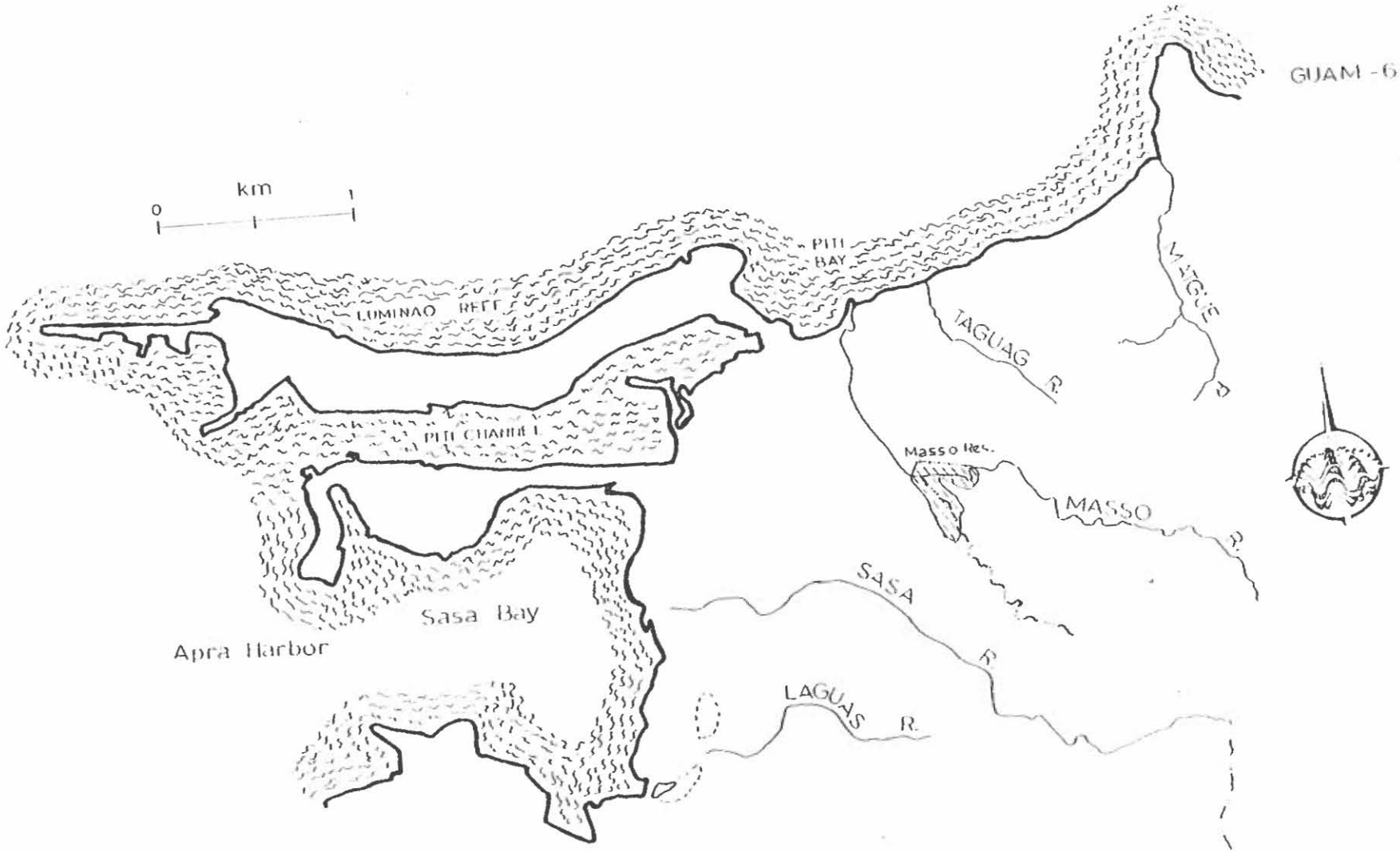
AVERAGE SLOPE (%): 7.8

Additional Information:

1) The Taguag has no perennial tributaries.



No record of the aquatic biota has been located.


GUAM - 6
km
0
1
PITI BAY
LUMINAO REEF
PITI CHANNEL
TAGUAG R.
MATAGUAC R.
Masso Res.
MASSO R.
SASA R.
Sasa Bay
Apra Harbor
LAGUAS R.

Masso River, Guam 6

COORDINATES: Lat. 13° 27' 45" N
Long. 144° 41' 20" E

PERENNIAL CHANNEL LENGTH: 3,048 m

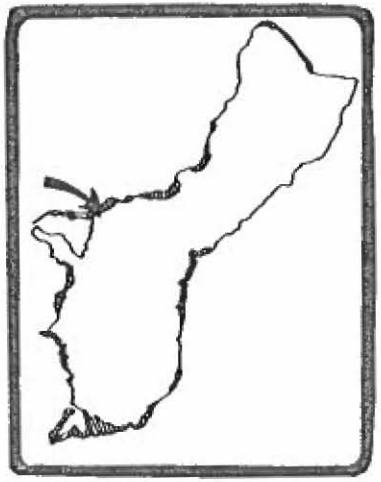
ELEVATION: 165 m

APPROXIMATE DRAINAGE AREA: 201 ha

AVERAGE SLOPE (Z): 6.9

Additional Information:

1) The Masso supports a one hectare man-made reservoir. The dam is silted to the crest.
2) Reservoir was stocked with *Tilapia* for public fishing. Recently, illegal fishermen cloroxed the reservoir, killing all fauna.



Reported Aquatic Organisms

ANIMALS

Invertebrates:

Atya sp.
Caridina sp.
Macrobrachium lar
Neritina pulligera

Vertebrates:

Anguilla sp.
Awaous guamensis
Clarias batrachus
Eleotris fusca
Sicyopterus macrostetholepis
Stiphodon elegans

PLANTS

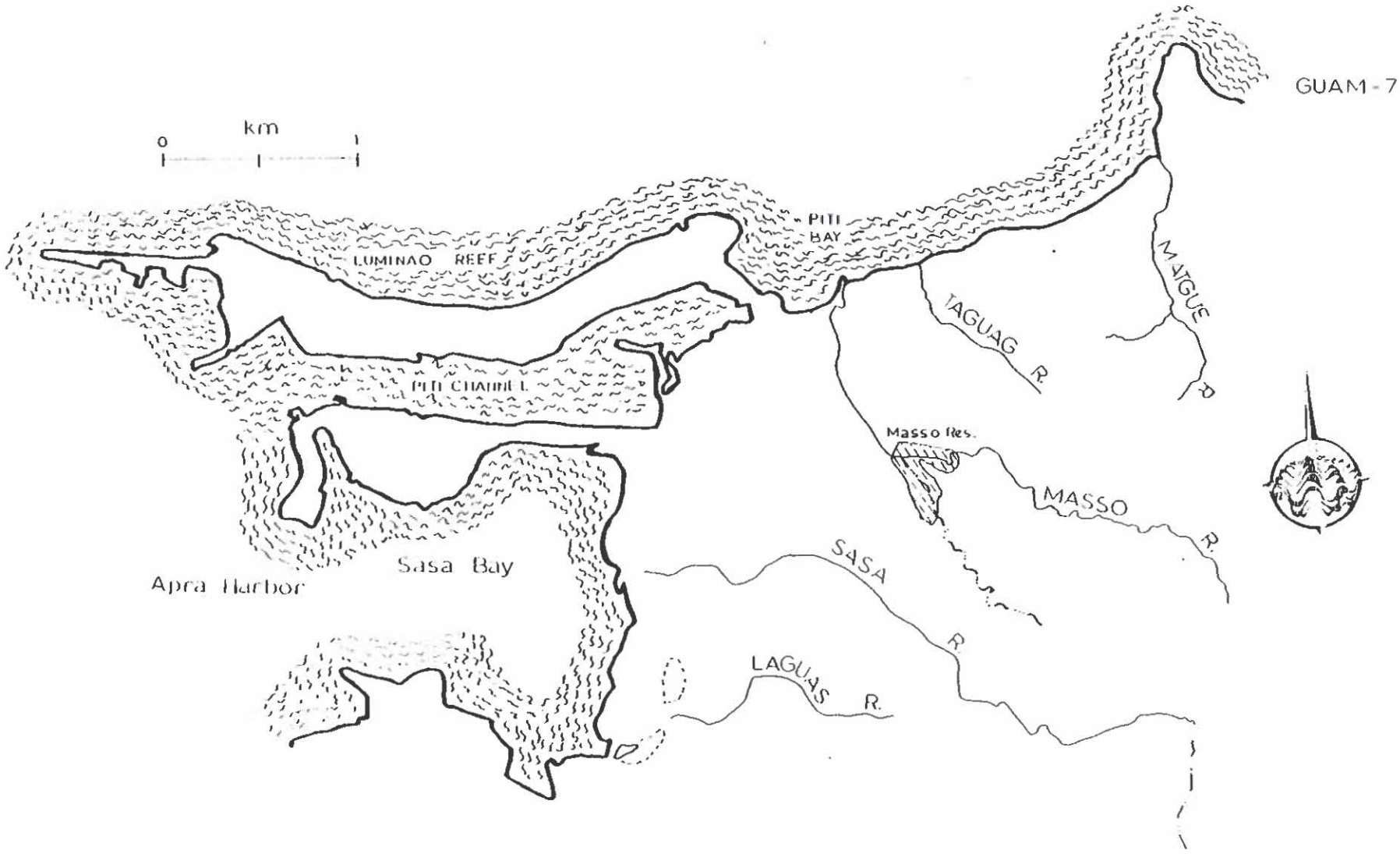
Algae:

Aulosira sp.
Chroococcus turgidus
Closterium venus
Oscillatoria sp.
Scenedesmus bijuga
Spirogyra sp.
Tolypothrix distota
Trentepohlia sp.

See Appendix for additional biota.

Information from references:

3, 137


GUAM - 7
km
0
1
LUMINAO REEF
PITI BAY
PITI CHANNEL
MATGUE R.
TAGUAG R.
Masso Res.
MASSO R.
SASA R.
LAGUAS R.
Sasa Bay
Apra Harbor

Sasa River, Guam 7

COORDINATES: Lat. 13° 27' 00" N
Long. 144° 40' 51" E

PERENNIAL CHANNEL LENGTH: 3, 290 m

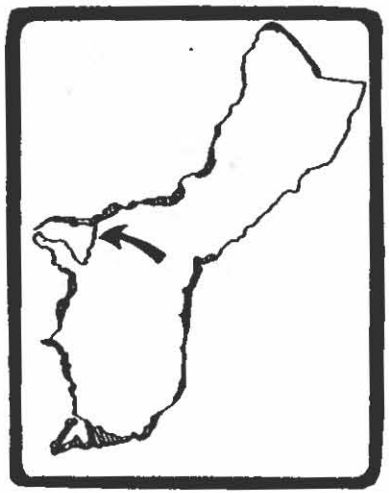
ELEVATION: 140 m

APPROXIMATE DRAINAGE AREA: 286 ha

AVERAGE SLOPE (%): 7.3

Additional Information:

1) The Sasa drains into Sasa Bay, Outer Apra Harbor.
2) Sasa Bay is a potential estuarine aquaculture site.



Reported Aquatic Organisms

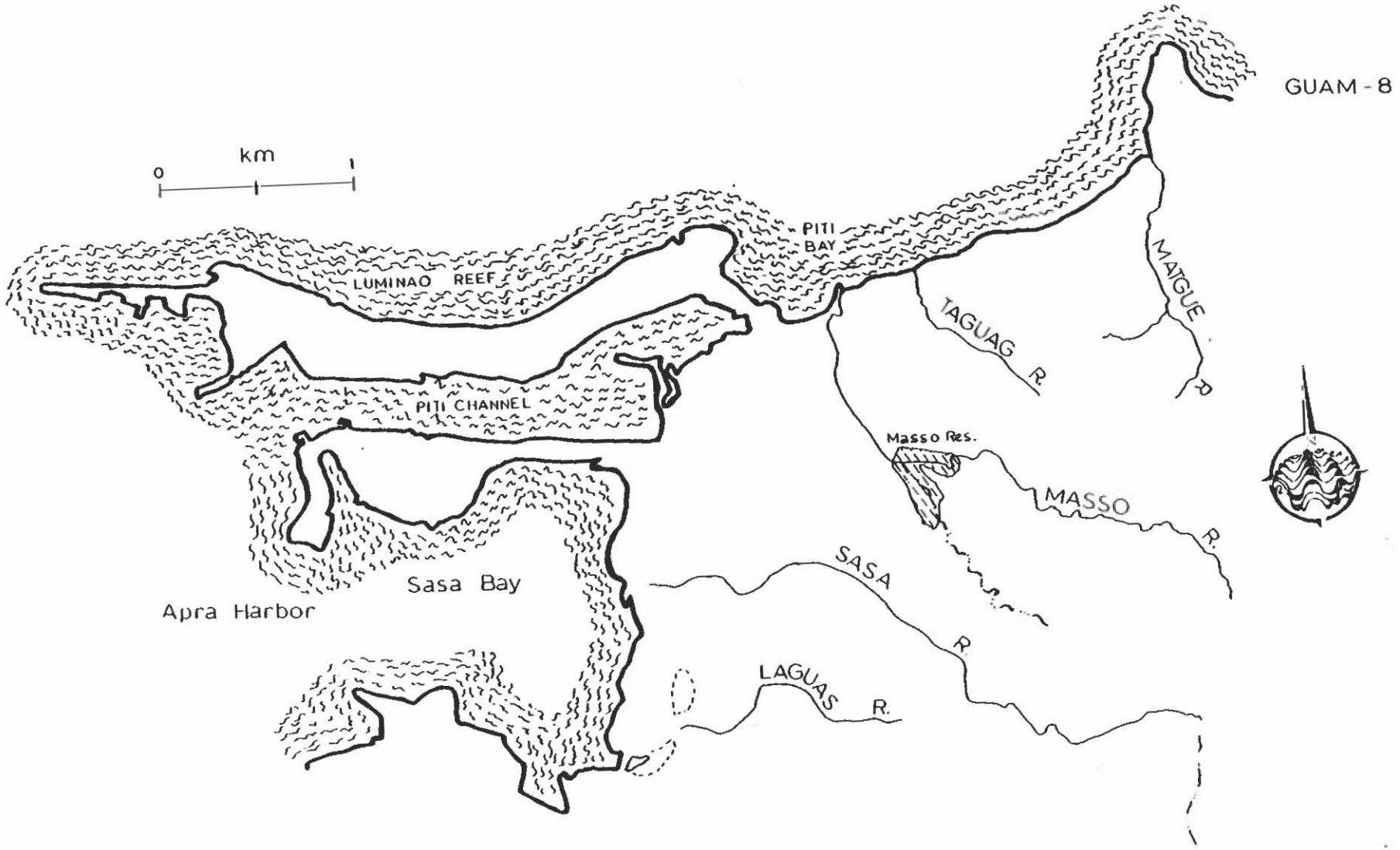
ANIMALS

Vertebrate:

Tamanka tagala

Information from reference:

132


GUAM - 8
km
0
1
PITI BAY
LUMINAO REEF
PITI CHANNEL
TAGUAG R.
MATGUE R.
Masso Res.
MASSO R.
SASA R.
Sasa Bay
Apra Harbor
LAGUAS R.

Laguas River, Guam 8

COORDINATES: Lat. 13° 26' 36" N
Long. 144° 40' 57" E

PERENNIAL CHANNEL LENGTH: 1,340 m

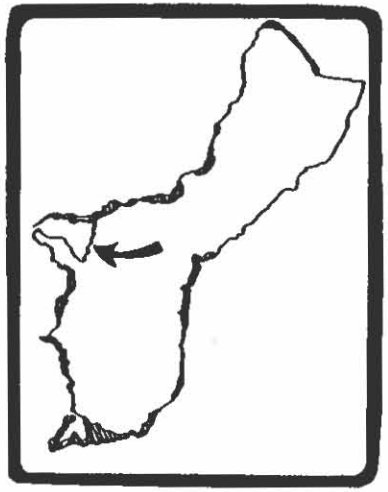
ELEVATION: 72 m

APPROXIMATE DRAINAGE AREA: 70 ha

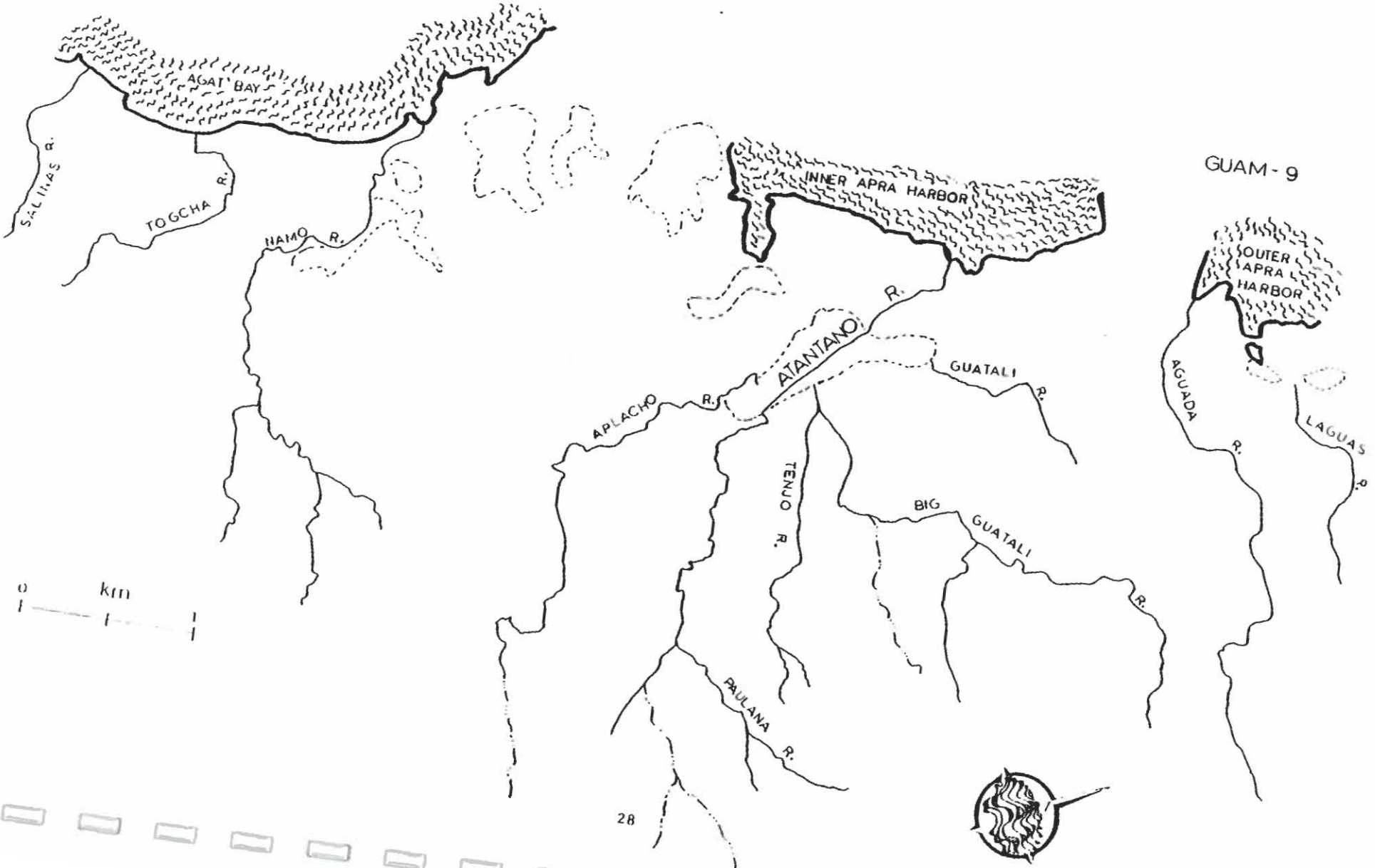
AVERAGE SLOPE (%): 4.5

Additional Information:

1) Laguas drains into Outer Apra Harbor Wetland System.
2) The channel is without tributaries.



No record of the aquatic biota has been located.


AGAT BAY
SALINAS R.
TOGCHA R.
NAMO R.
INNER APRA HARBOR
OUTER APRA HARBOR
ATANTANO R.
APLACHO R.
GUATALI R.
TENJO R.
BIG GUATALI R.
PAULANA R.
AGUADA R.
LAGUAS R.
0 km

GUAM - 9

Aguada River, Guam 9

COORDINATES: Lat. 13° 26' 21" N
Long. 144° 40' 38" E

PERENNIAL CHANNEL LENGTH: 3,385 m

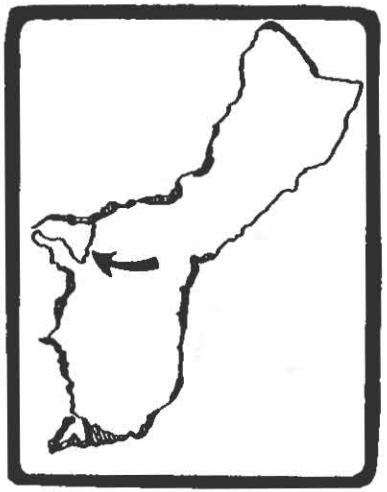
ELEVATION: 150 m

APPROXIMATE DRAINAGE AREA: 196 ha

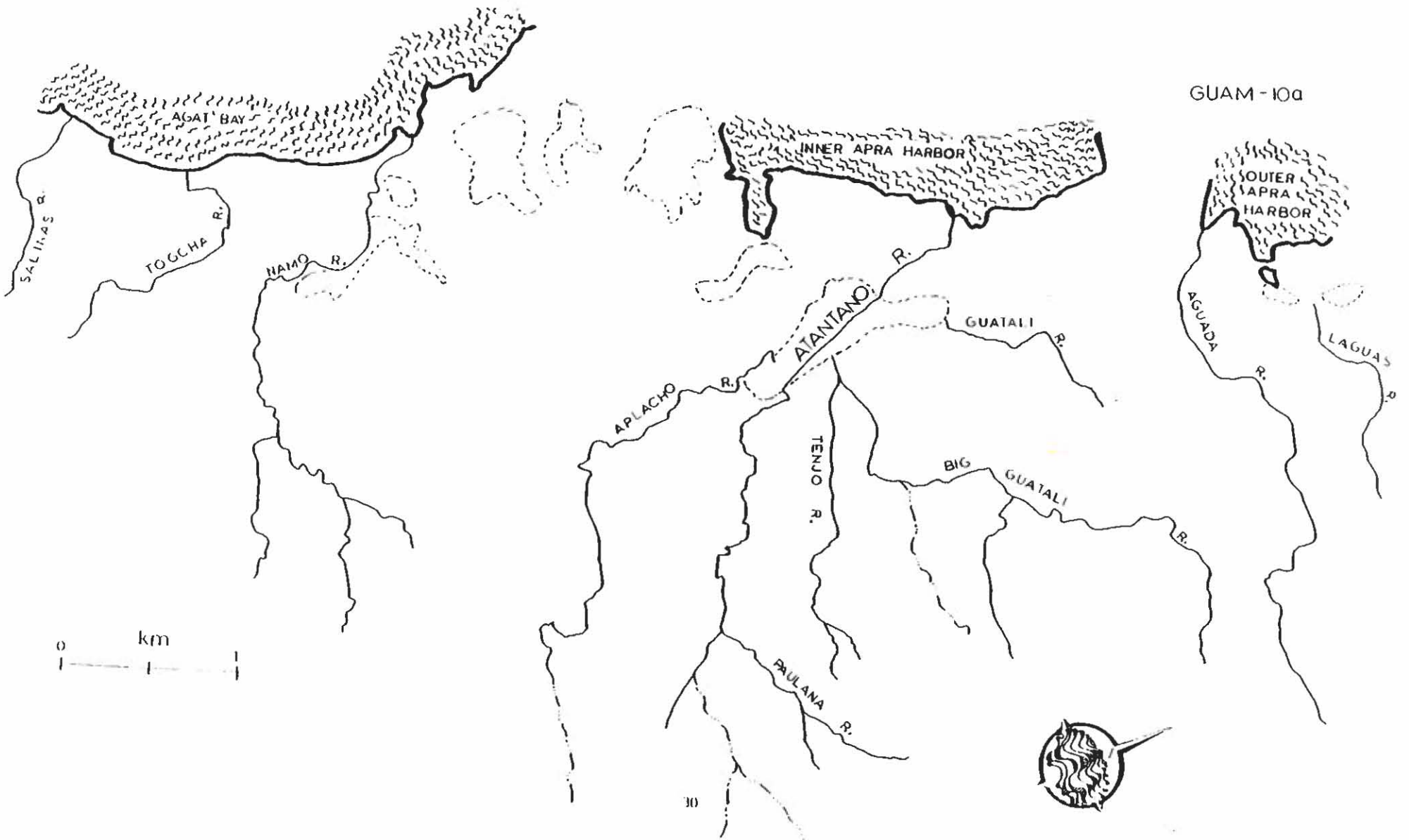
AVERAGE SLOPE (%): 7.4

Additional Information:

1) The Aguada drains into the Outer Apra Harbor Wetland System.



No record of the aquatic biota has been located.


GUAM - 10a
AGAT BAY
SALINAS R.
TOGCHA R.
NAMO R.
INNER APRA HARBOR
OUTER APRA HARBOR
ATANTANO R.
GUATALI R.
APLACHO R.
TENJO R.
BIG GUATALI R.
AGUADA R.
LAGUAS R.
PAULANA R.
0
km
30

Atantano River, Guam 10a

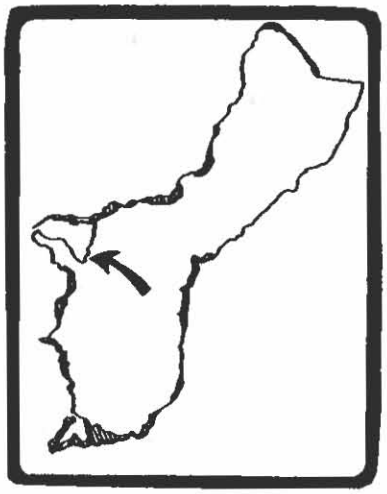
COORDINATES: Lat. 13° 25' 38" N
Long. 144° 40' 21" E

ELEVATION: 30 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	4,465 m
2)	Combined perennial channel lengths:	5,465 m
3)	Approximate drainage area:	1,240 ha
4)	Average slope (%):	5.8

LENGTH OF THE ATANTANO AND ITS UNNAMED PERENNIAL TRIBUTARIES: 3,010 m



Additional Information:

1) Best developed and largest mangrove swamp on Guam:
   a) *Avicennia alba*
   b) *Rhizophora apiculata*
2) The Atantano has been channelized due to road construction.
3) Shipping, docking, and oil refinery facilities pollute the area.
4) System has 6 perennial streams and many tributaries.
5) The wetland becomes an extensive flood plain during heavy rains.

Reported Aquatic Organisms

ANIMALS

Vertebrates:

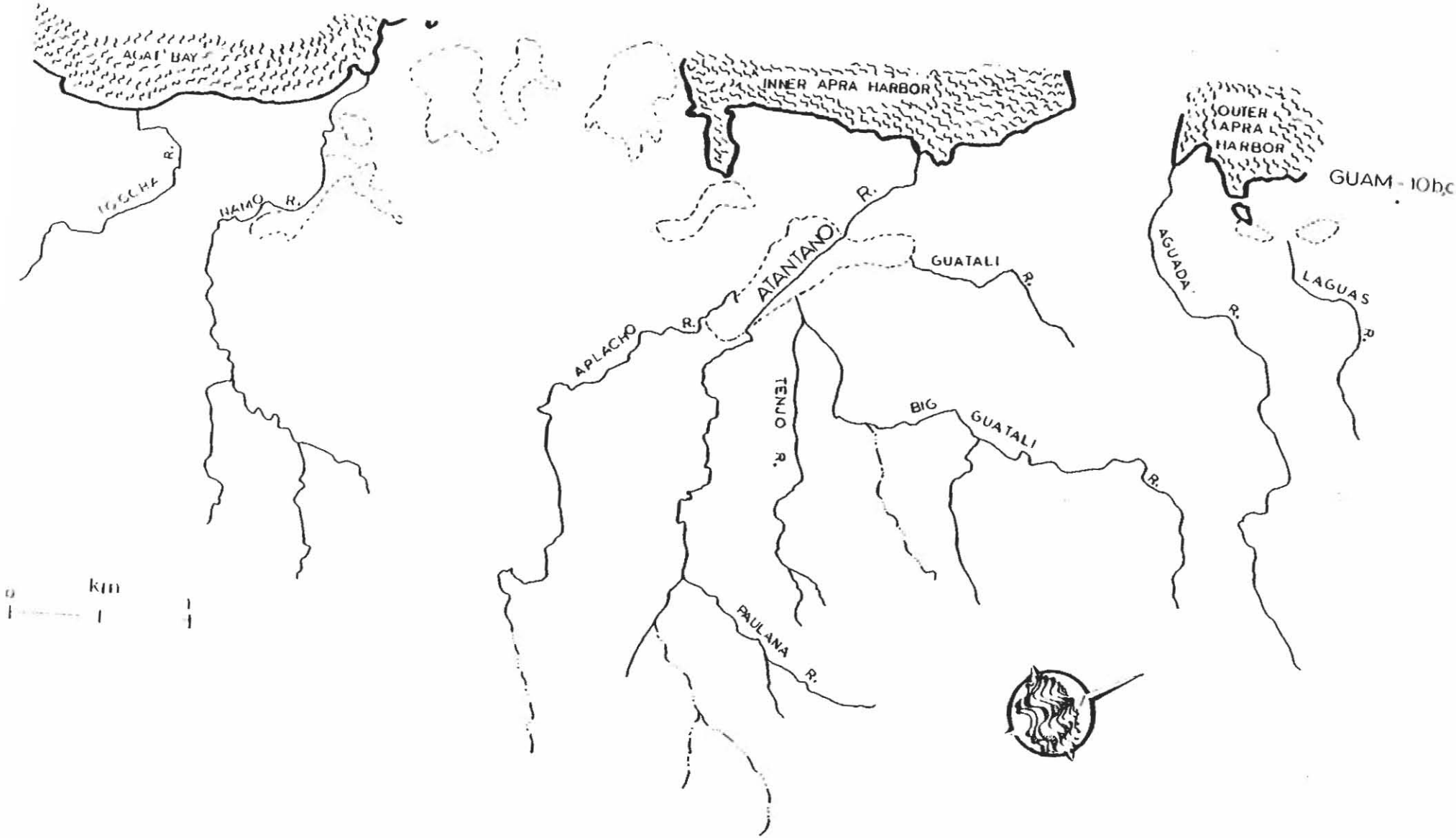
Gambusia affinis

PLANTS

Hibiscus tiliaceus
Phragmites karka

Information from references:

80, 184


AGAT BAY
INNER APRA HARBOR
OUTER APRA HARBOR
GUAM - 10b,c
NAIMO R.
ATANTANO R.
GUATALI R.
APLACHO R.
TENJO R.
BIG GUATALI R.
AGUADA R.
LAGUAS R.
PAULANA R.
km

Big Guatali, Guam 10b

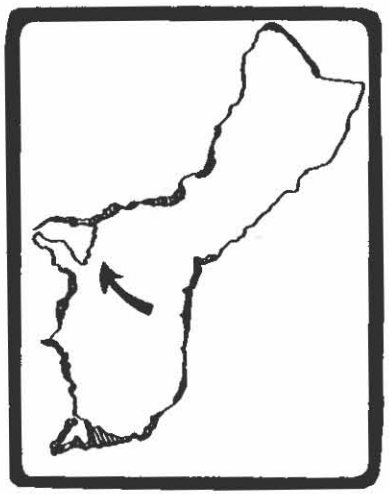
COORDINATES: Lat. 13° 25' 10" N
Long. 144° 40' 43" E

ELEVATION: 149 m

LENGTH OF THE BIG GUATALI AND ITS UNNAMED PERENNIAL TRIBUTARY: 4,328 m

Additional Information:

1) Stream has 1 perennial tributary and drains into the Atantano Wetland System.



Paulana River, Guam 10c

COORDINATES: Lat. 13° 24' 33" N
Long. 144° 41' 23" E

ELEVATION: 110 m

LENGTH OF THE PAULANA AND ITS UNNAMED PERENNIAL TRIBUTARY: 1,680 m

Additional Information:

1) River drains into the Atantano River and has one tributary.

Reported Aquatic Organisms

ANIMALS

Vertebrates:

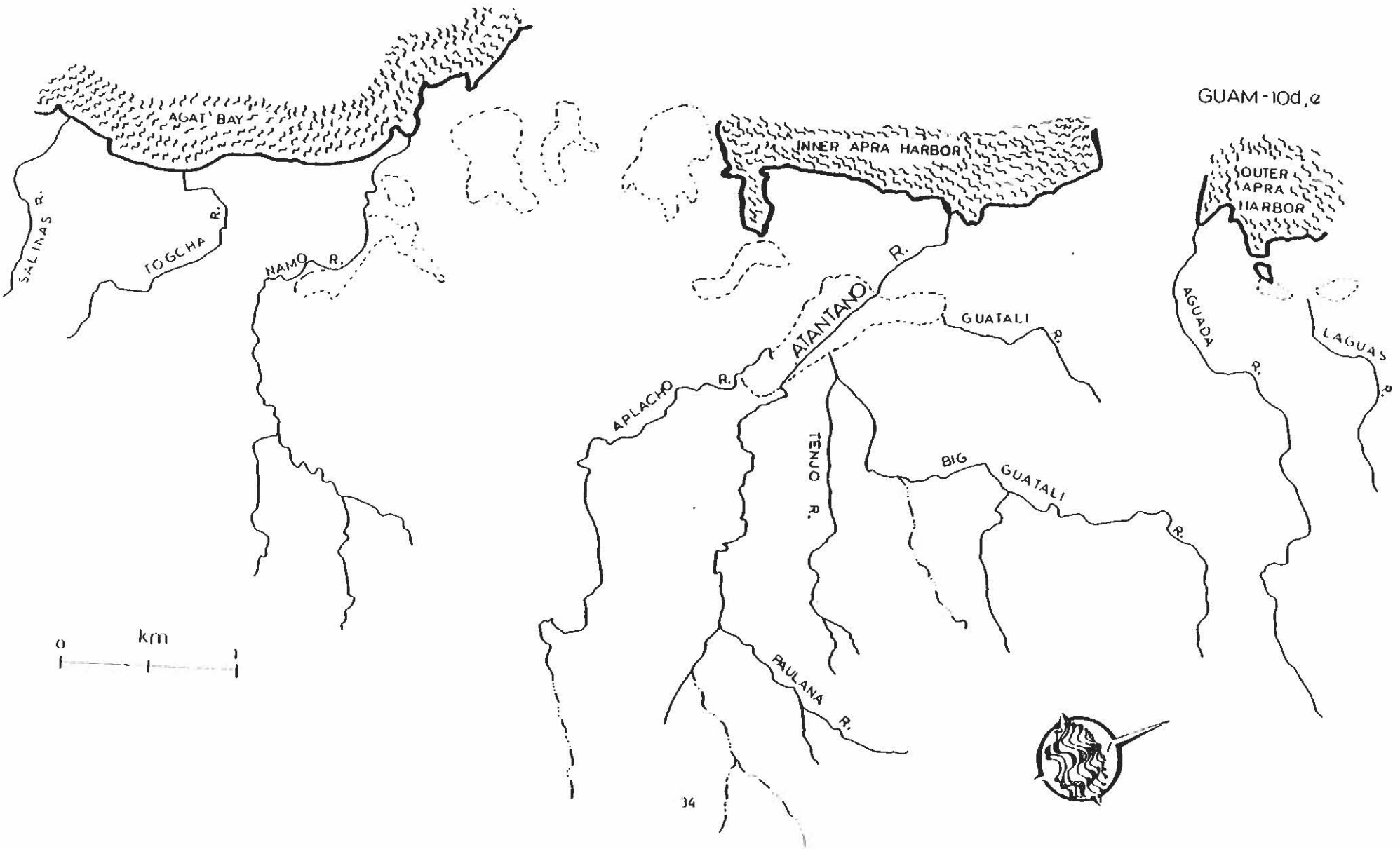
Tilapia mossambica

No record of the aquatic biota has been located.

See Appendix for additional biota.

Information from reference:

221


GUAM-10d,e
AGAT BAY
SALINAS R.
TOGCHA R.
NAMO R.
INNER APRA HARBOR
OUTER APRA HARBOR
ATANTANO R.
GUATALI R.
APLACHO R.
TENJO R.
BIG GUATALI R.
AGUADA R.
LAGUAS R.
PAULANA R.
0 km
34

Aplacho River, Guam 10d

COORDINATES: Lat. 13° 24' 58" N
Long. 144° 40' 37" E

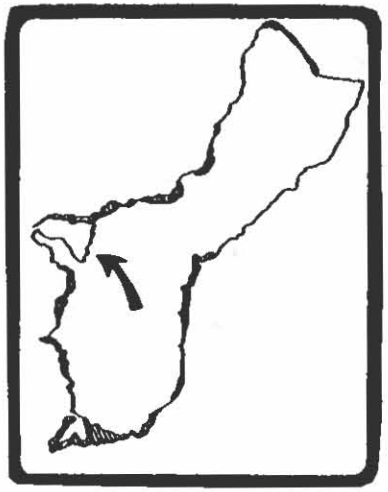
PERENNIAL CHANNEL LENGTH: 2,805 m

ELEVATION: 95 m

Additional Information:

1) The Aplacho drains into the Atantano Wetland.

No record of the aquatic biota has been located.



Guatali River, Guam 10e

COORDINATES: Lat. 13° 25' 31" N
Long. 144° 40' 41" E

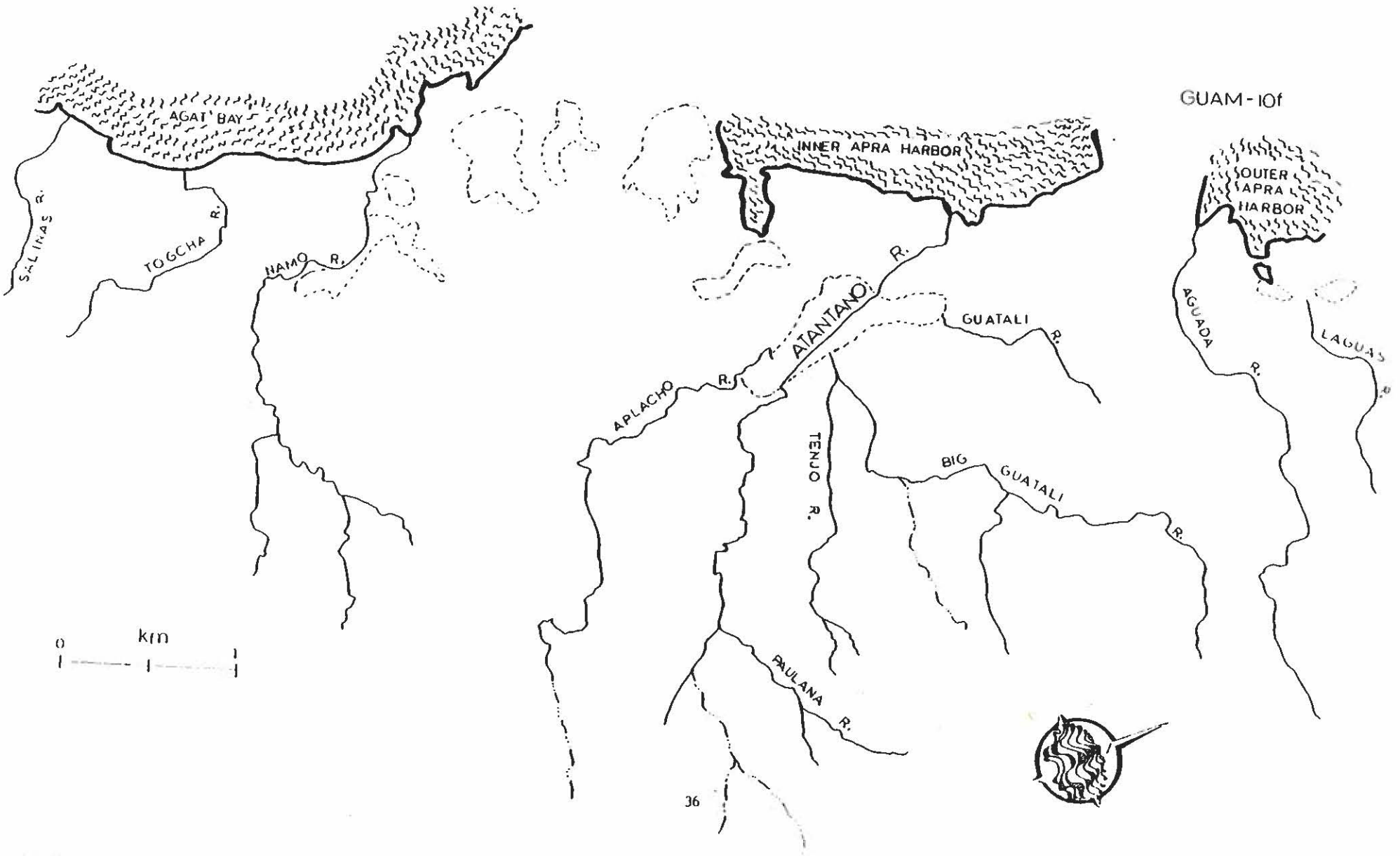
PERENNIAL CHANNEL LENGTH: 1,005 m

ELEVATION: 18.3 m

Additional Information:

1) The stream drains into the Atantano Wetlands.
2) All streams in the area have been rechannelized from road routing.

No record of the aquatic biota has been located.


GUAM - 10f
AGAT BAY
SALINAS R.
TOGCHA R.
NAMO R.
INNER APRA HARBOR
OUTER APRA HARBOR
ATANTANO R.
GUATALI R.
APLACHO R.
TENJO R.
BIG GUATALI R.
PAULANA R.
AGUADA R.
LAGUAS
0 km

Tenjo River, Guam 10f

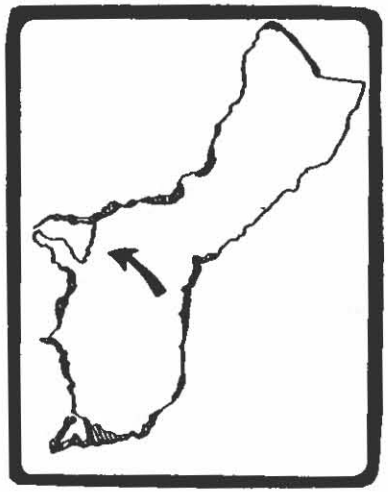
COORDINATES: Lat. 13° 25' 10" N
Long. 144° 40' 40" E

ELEVATION: 73 m

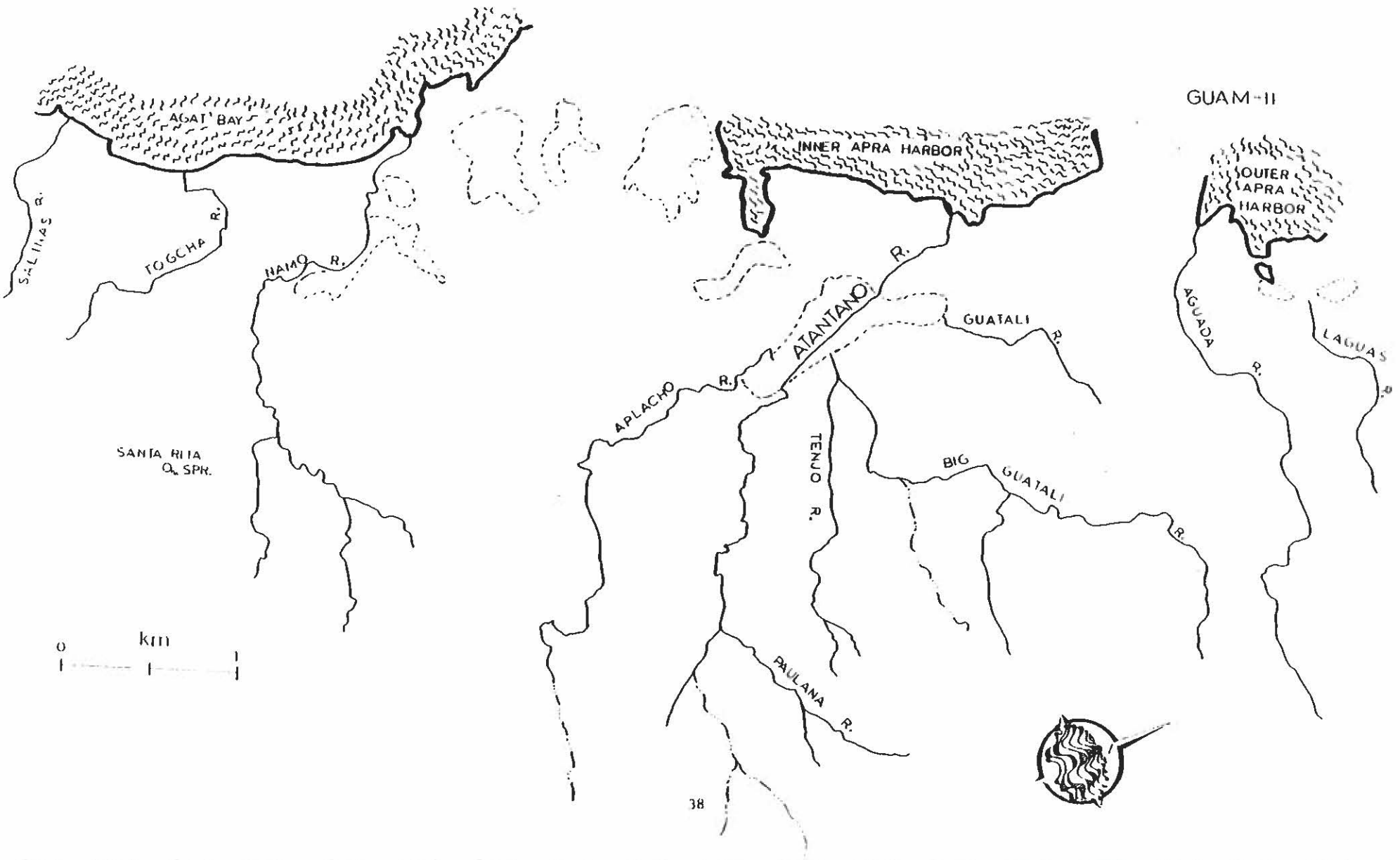
LENGTH OF THE TENJO AND ITS UNNAMED PERENNIAL TRIBUTARY: 2,270 m

Additional Information:

1) The stream drains into the Atantano Wetland and has one perennial tributary.



No record of the aquatic biota has been located.


GUAM-II
AGAT BAY
INNER APRA HARBOR
OUTER APRA HARBOR
SALINAS R.
TOGCHA R.
NAIAO R.
ATANTANO R.
GUATALI R.
AGUADA R.
LAGUAS R.
APLACHO R.
TENJO R.
BIG GUATALI R.
PAULANA R.
SANTA RITA Q. SPR.
0
km

Namo River, Guam 11

COORDINATES: Lat. 13° 24' 04" N
Long. 144° 39' 38" E

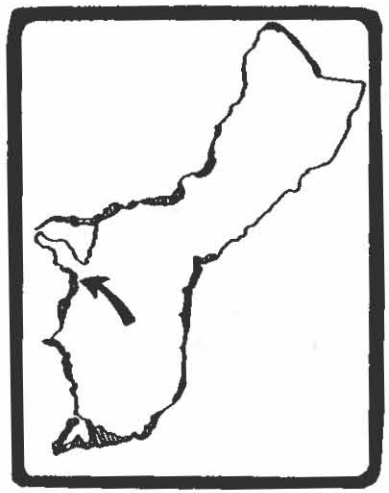
ELEVATION: 72 m

TOTAL RIVER SYSTEM DATA:

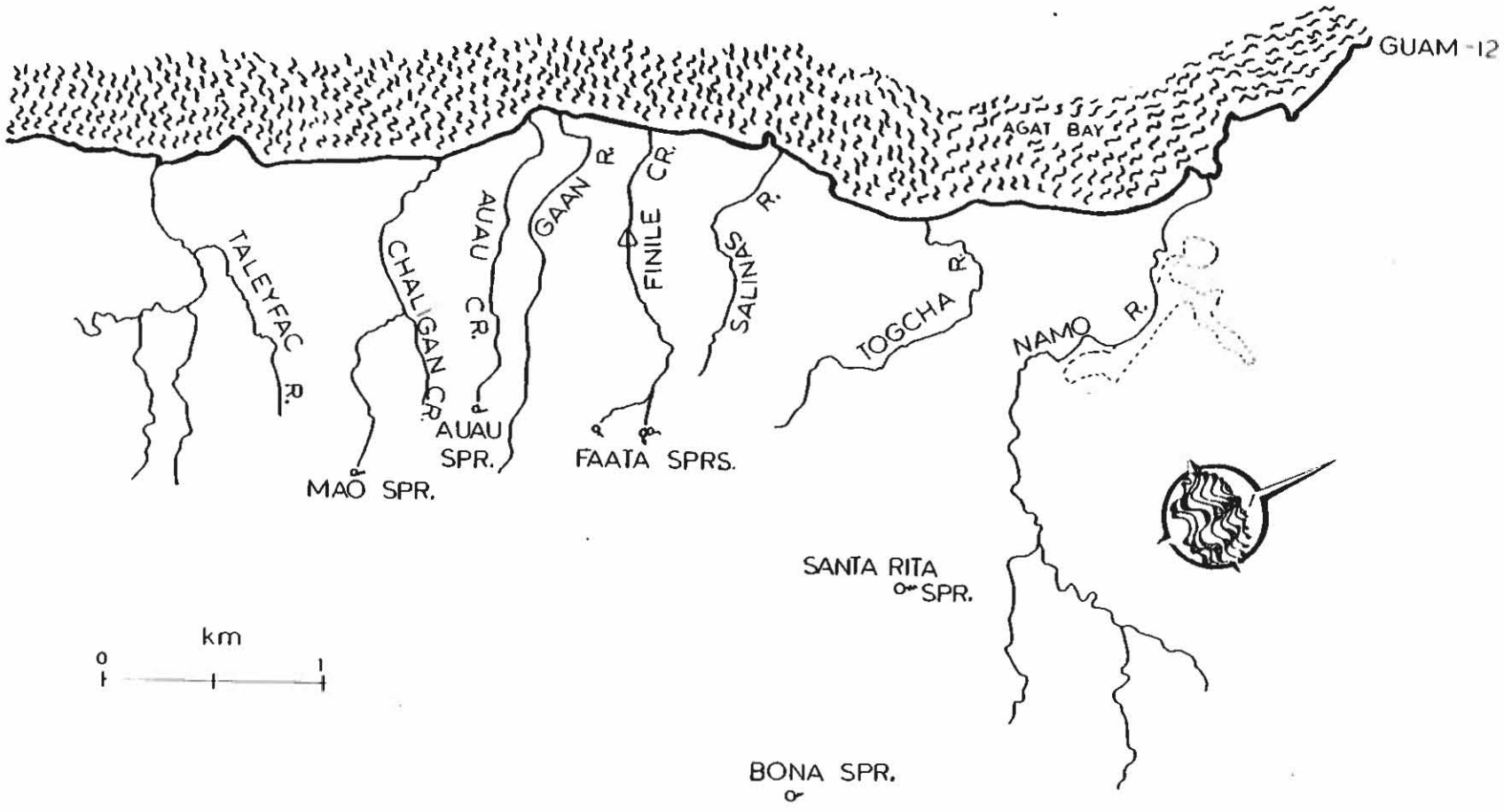
1)	Length of longest continuous perennial channel:	3,725 m
2)	Combined perennial channel lengths:	5,250 m
3)	Approximate drainage area:	500 ha
4)	Average slope (%):	5.3

Additional information:

1) The stream has 2 perennial tributaries.
2) A flood plain exists which is drained by a flood control channel.
3) The Namo drainage basin has been referred to as the Ayuga drainage area (ref. 103).



No record of the aquatic biota has been located.


GUAM 12
AGAT BAY
TALEYFAC R.
CHALIGAN CR.
AUAU CR.
GAAN R.
FINILE CR.
SALINAS R.
TOGCHA R.
NAMO R.
AUAU SPR.
MAO SPR.
FAATA SPRS.
SANTA RITA SPR.
BONA SPR.
km
0
1

Togcha River, Guam 12

COORDINATES: Lat. 13° 23' 23" N
Long. 144° 39' 31" E

PERENNIAL CHANNEL LENGTH: 1,707 m

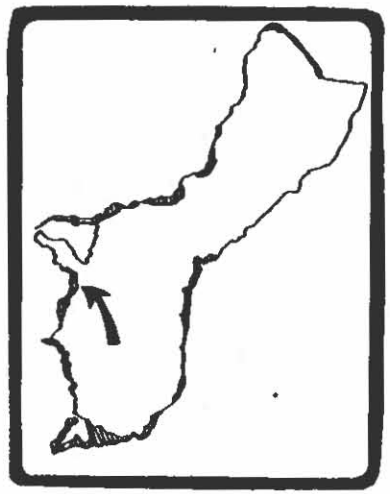
ELEVATION: 61 m

APPROXIMATE DRAINAGE AREA: 135 ha

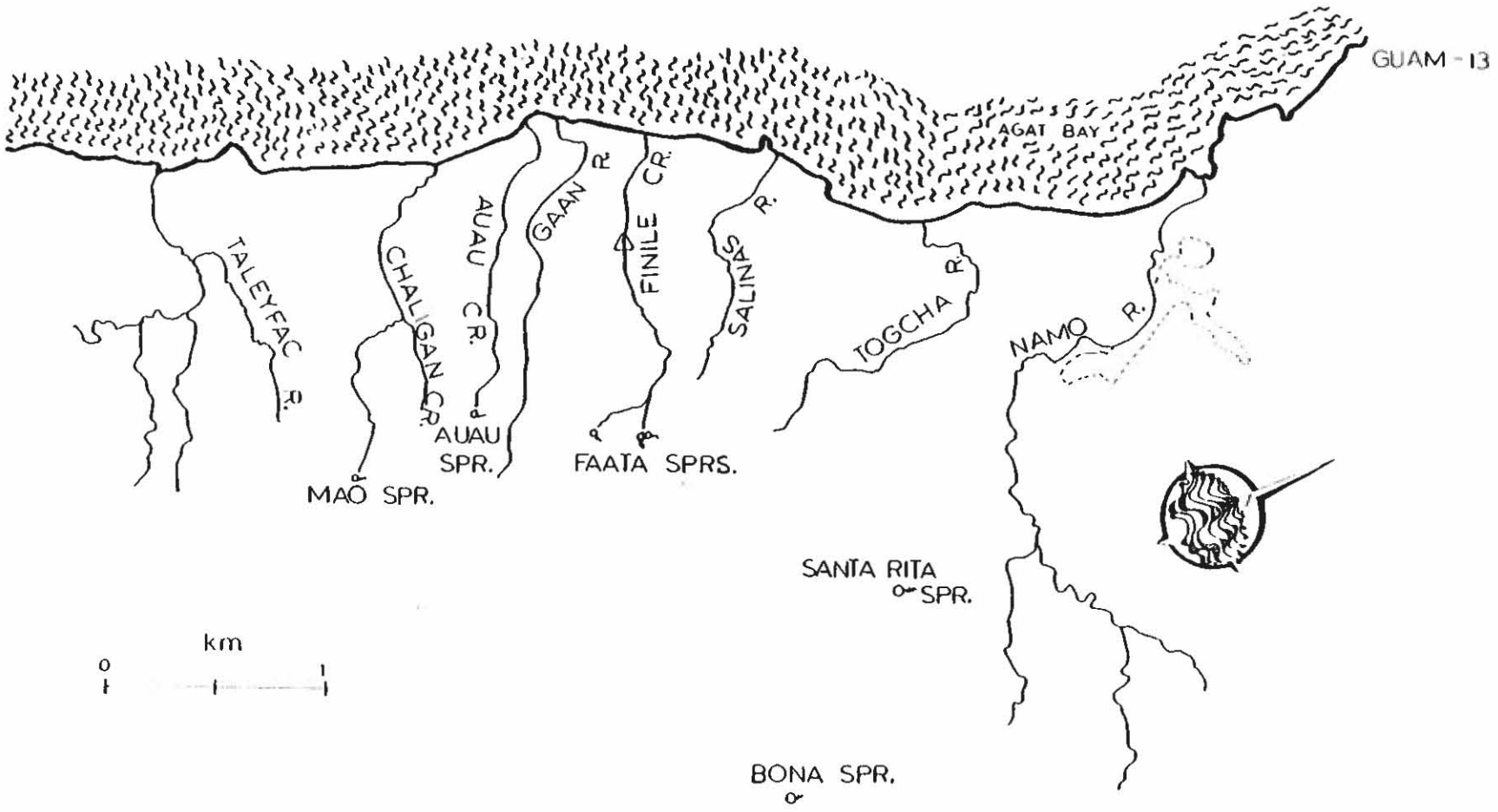
AVERAGE SLOPE (%): 10.6

Additional Information:

1) The stream has no perennial tributaries.



No record of the aquatic biota has been located.


GUAM - 13
AGAT BAY
TALEYFAC R.
CHALIGAN CR.
AUAU CR.
GAAN R.
FINILE CR.
SALINAS R.
TOGCHA R.
NAMO R.
AUAU SPR.
MAO SPR.
FAATA SPRS.
SANTA RITA SPR.
BONA SPR.
km
0
1

Salinas River, Guam 13

COORDINATES: Lat. 13° 23' 06" N
Long. 144° 39' 15" E

PERENNIAL CHANNEL LENGTH: 1,250 m

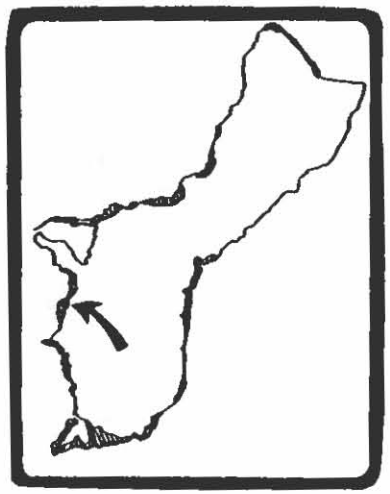
ELEVATION: 53 m

APPROXIMATE DRAINAGE AREA: 56 ha

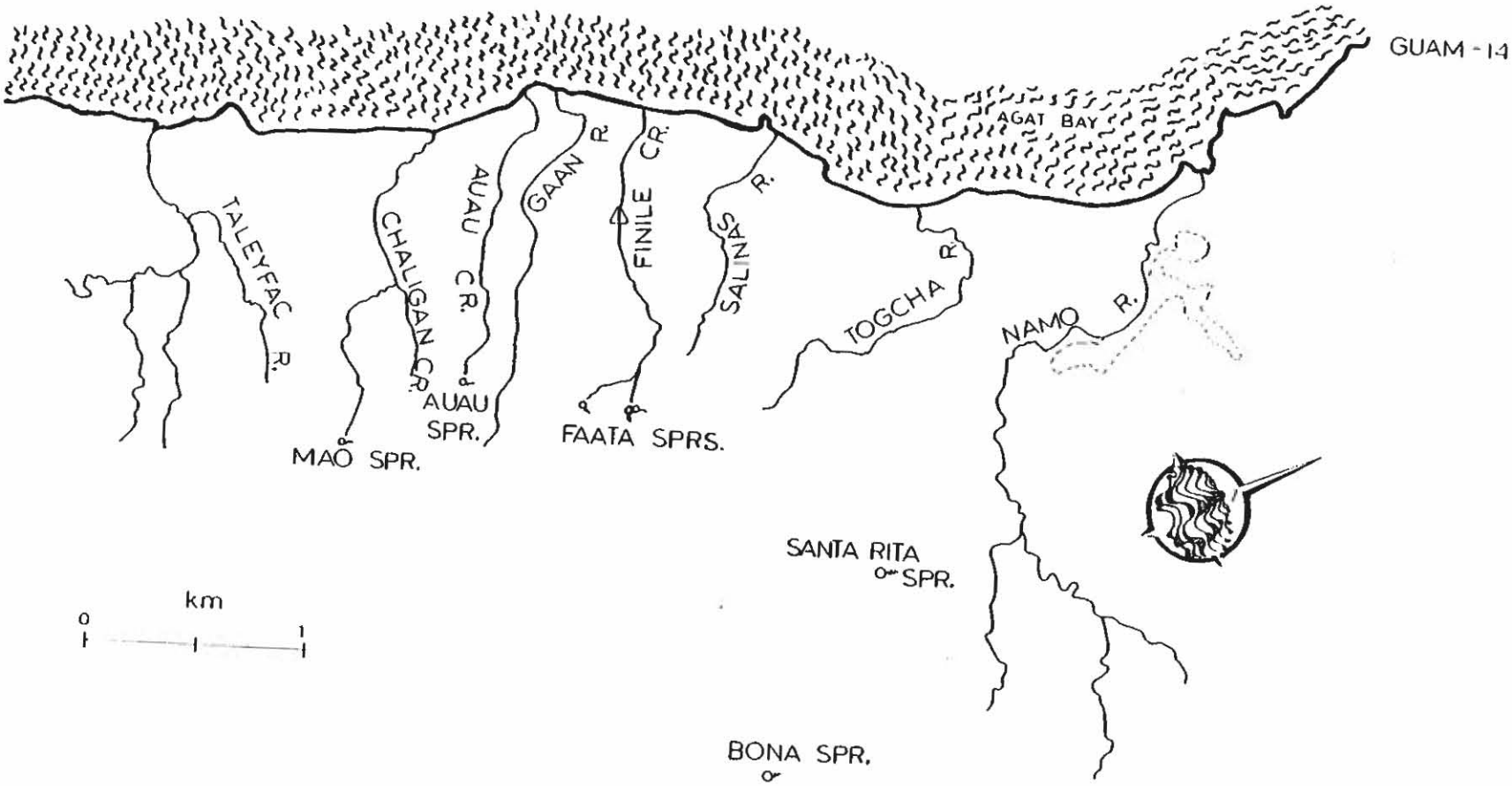
AVERAGE SLOPE (%): 11.9

Additional Information:

1) This stream has no perennial tributaries.
2) Channel bisects the village of Agat.



No record of the aquatic biota has been located.


GUAM - 14
AGAT BAY
TALEYFAC R.
CHALIGAN CR.
AUAU C.R.
GAAN R.
FINILE CR.
SALINAS R.
TOGCHA R.
NAMO R.
AUAU SPR.
MAO SPR.
FAATA SPRS.
SANTA RITA SPR.
BONA SPR.
km
0
1

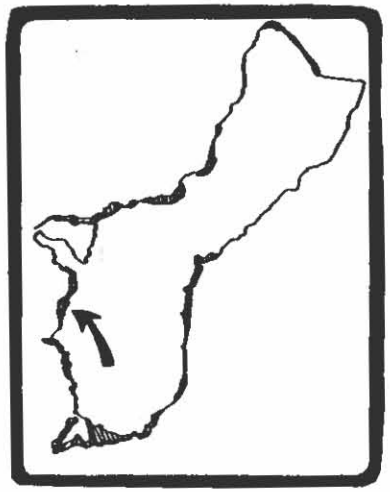
Finile Creek, Guam 14

COORDINATES: Lat. 13° 22' 48" N
Long. 144° 39' 06" E

ELEVATION: 102 m

TOTAL RIVER SYSTEM DATA:

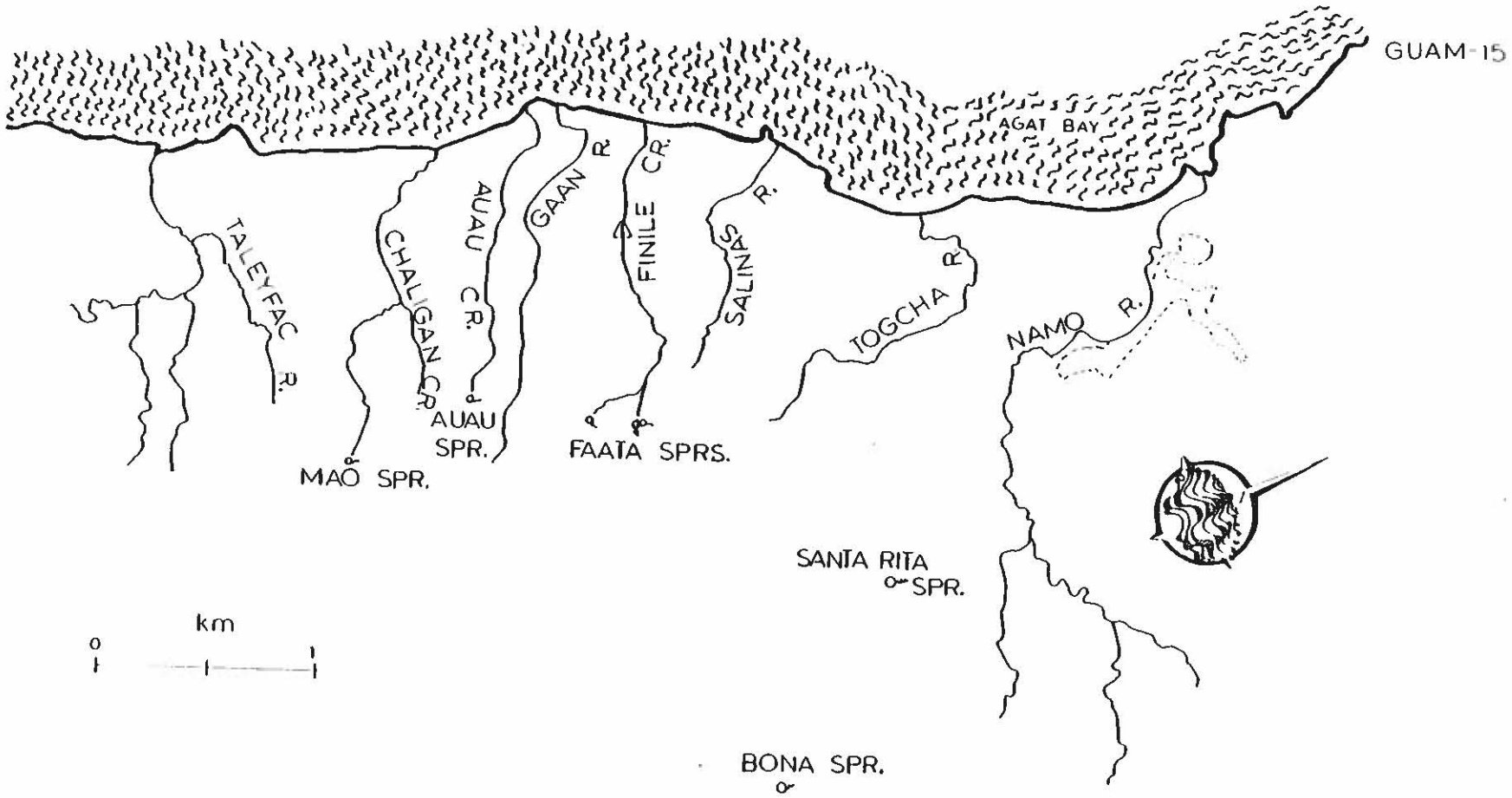
1) Length of longest continuous perennial channel: 1,585 m
2) Combined perennial channel lengths: 1,768 m
3) Approximate drainage area: 79 ha
4) Average slope (%): 12.2



Additional Information:

1) The Finile is spring fed by three springs, two of which are 0.5 kilometer north (A+B) of spring C.
2) Faata Springs:
   A+B Lat. 13° 22' 28" N
   Long. 144° 39' 49" E
   Elev. 88 m
   C Lat. 13° 22' 32" N
   Long. 144° 39' 44" E
   Elev. 102 m
3) A perennial tributary flows from each spring system.
4) The Finile is part of the Agat flood basin along with the Chaligan Auau and Gaan streams.
5) Gaging Station:
   Lat. 13° 22' 29" N
   Long. 144° 39' 26" E
   Elev. 6.1 m
   Average (20 yr) discharge: 0.04 m^3/s
6) See Appendix (Table 2) for physicochemical characteristics.

No record of the aquatic biota has been located.


GUAM-15
AGAT BAY
TALEYFAC R.
CHALIGAN CR.
AUAU C.R.
GAAN R.
FINILE CR.
SALINAS R.
TOGCHA R.
NAMO R.
AUAU SPR.
MAO SPR.
FAATA SPRS.
SANTA RITA SPR.
BONA SPR.
km
0
1

Gaan River, Guam 15

COORDINATES: Lat. 13° 22' 36" N
Long. 144° 38' 59" E

PERENNIAL CHANNEL LENGTH: 1,798 m

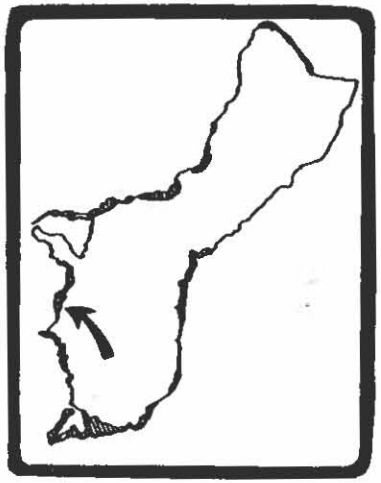
ELEVATION: 125 m

APPROXIMATE DRAINAGE AREA: 82 ha

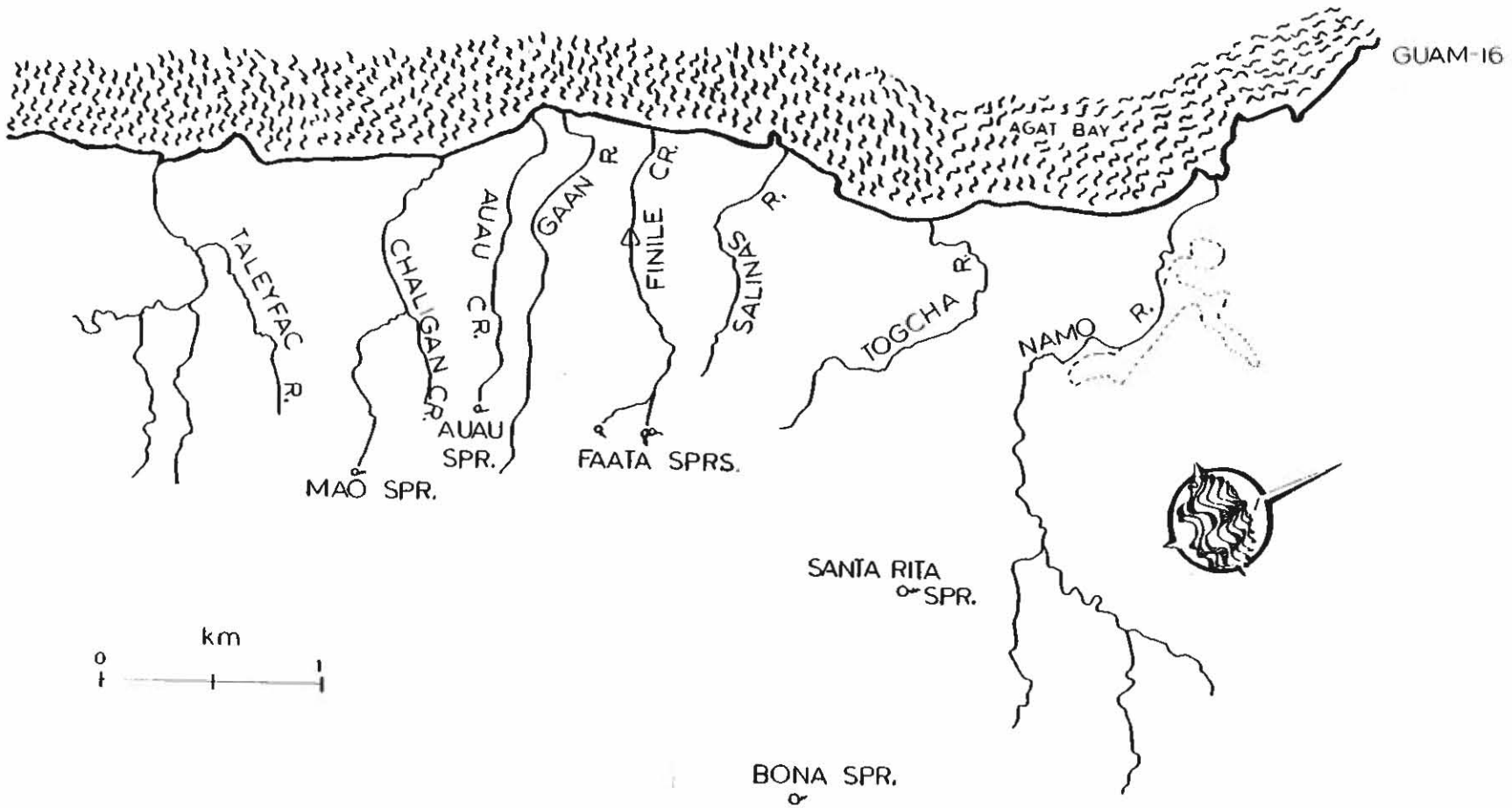
AVERAGE SLOPE (%): 10.0

Additional Information:

1) Gaan joins the Agat flood basin along with the Chaligan, Auau and Finile streams.



No record of the aquatic biota has been located.


GUAM-16
AGAT BAY
TALEYFAC R.
CHALIGAN CR.
AUAU CR.
GAAN R.
FINILE CR.
SALINAS R.
TOGCHA R.
NAMO R.
AUAU SPR.
MAO SPR.
FAATA SPRS.
SANTA RITA SPR.
BONA SPR.
km
0
1

AUAU STREAM

GUAM-16

Auau Creek, Guam 16

COORDINATES: Lat. 13° 22' 31" N
Long. 144° 38' 57" E

PERENNIAL CHANNEL LENGTH: 1,516 m

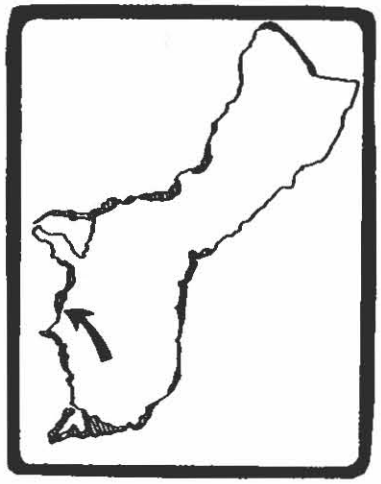
ELEVATION: 85 m

APPROXIMATE DRAINAGE AREA: 35 ha

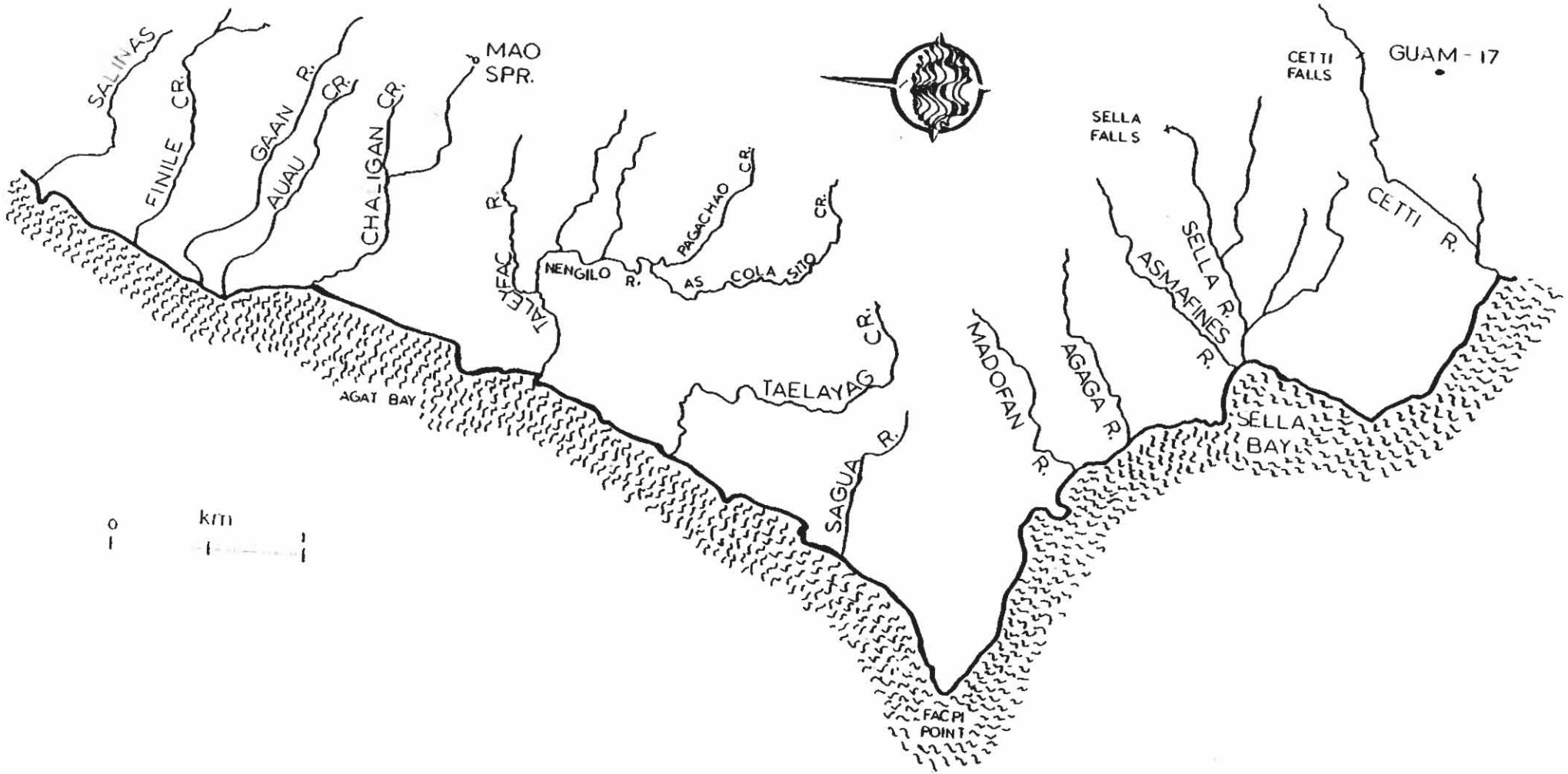
AVERAGE SLOPE (%): 9.5

Additional Information:

1) Auau Spring:
   Lat. 13° 22' 11" N
   Long. 144° 39' 38" E
   Elev. 88 m
2) This spring-fed perennial stream will join a common flood plain with the Chaligan, Gaan and Finile streams.



No record of the aquatic biota has been located.


SALINAS
FINILE CR.
GAAN R.
AUAU CR.
CHALIGAN CR.
MAO
SPR.
IYFAC R.
NENGILO R.
PAGACHAO CR.
AS COLA SITO CR.
TAELAYAG CR.
SAGUA R.
MADOFAN R.
AGAGA R.
ASMAFINES R.
SELLA R.
SELLA FALLS
CETTI FALLS
CETTI R.
GUAM - 17
AGAT BAY
SELLA BAY
FACPI POINT
0
km

Chaligan Creek, Guam 17

COORDINATES: Lat. 13° 22' 16" N
Long. 144° 39' 00" E

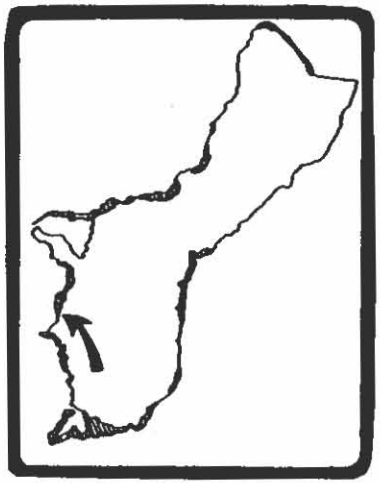
ELEVATION: 104 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	1,585 m
2)	Combined perennial channel lengths:	2,072 m
3)	Approximate drainage area:	73 ha
4)	Average slope (%):	13.5

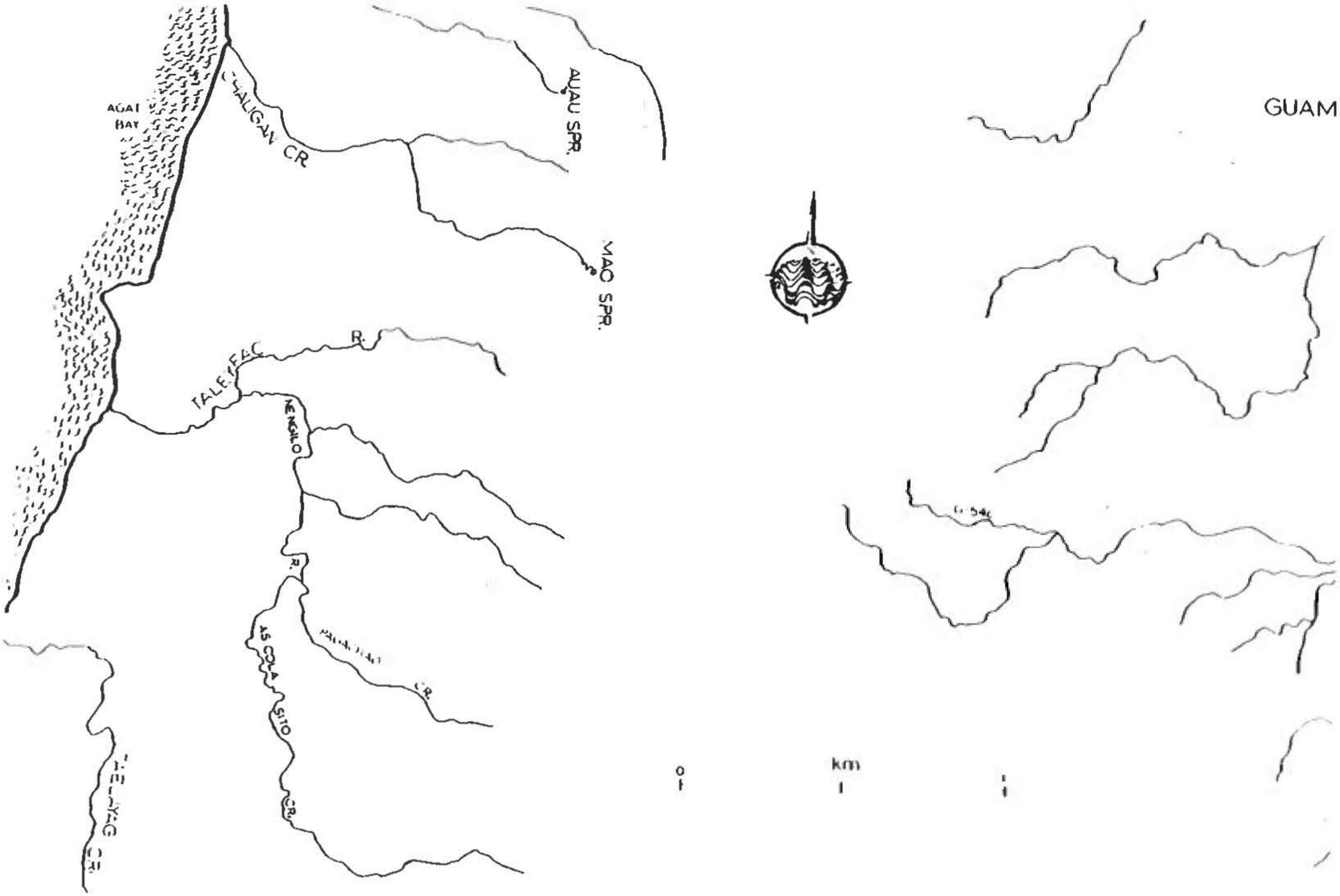
Additional Information:

1) Nao Spring:
   Lat. 13° 21' 51" N
   Long. 144° 39' 42" E
   Elev. 107 m
2) Joins a common flood plain with the Gaan, Auau and Finile streams.



No record of the aquatic biota has been located.

GUAM -18a



Taleyfac River, Guam 18a

COORDINATES: Lat. 13° 21' 37" N
Long. 144° 38' 47" E

ELEVATION: 42 m

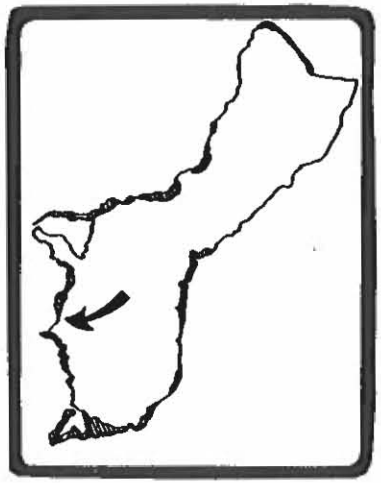
TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	2,896 m
2)	Combined perennial channel lengths:	5,822 m
3)	Approximate drainage area:	508 ha
4)	Average slope (%):	7.2

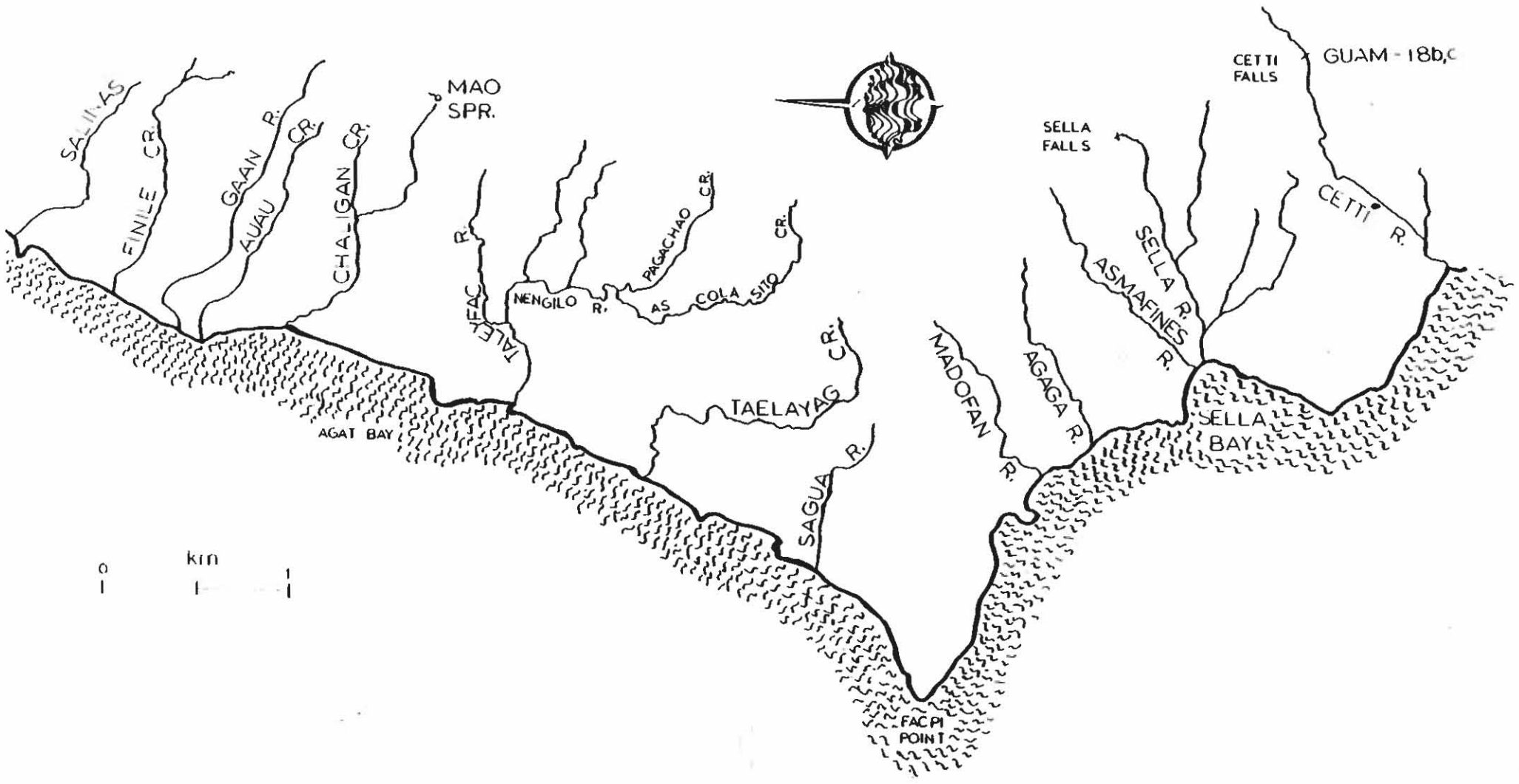
LENGTH OF THE TALEYFAC: 1,524 m

Additional Information:

1) The system has many perennial tributaries, including the As Cola Sito, Pagachao and Nengilo streams.
2) Local residents claim the (750 m) section between the confluence of the Taleyfac and the confluence of the Pagachao is called the Nengilao River.



No record of the aquatic biota has been located.


SALINAS
FINILE CR.
GAAN R.
AUAU CR.
CHALIGAN CR.
MAO
SPR.
TALEFAC R.
NENGILO R.
PAGACHAO CR.
AS COLA SITO CR.
AGAT BAY
TAELAYAG CR.
SAGUA R.
MADOFAN R.
AGAGA R.
SELLA FALLS
SELLA R.
ASMAFINES R.
CETTI FALLS
GUAM - 18b,c
CETTI R.
SELLA BAY
FACPI POINT
km
0
1
1

As Cola Sito Creek, Guam 18b

COORDINATES: Lat. 13° 21' 37" N
Long. 144° 39' 10" E

PERENNIAL CHANNEL LENGTH: 1,685 m

ELEVATION: 122 m

No record of the aquatic biota has been located.

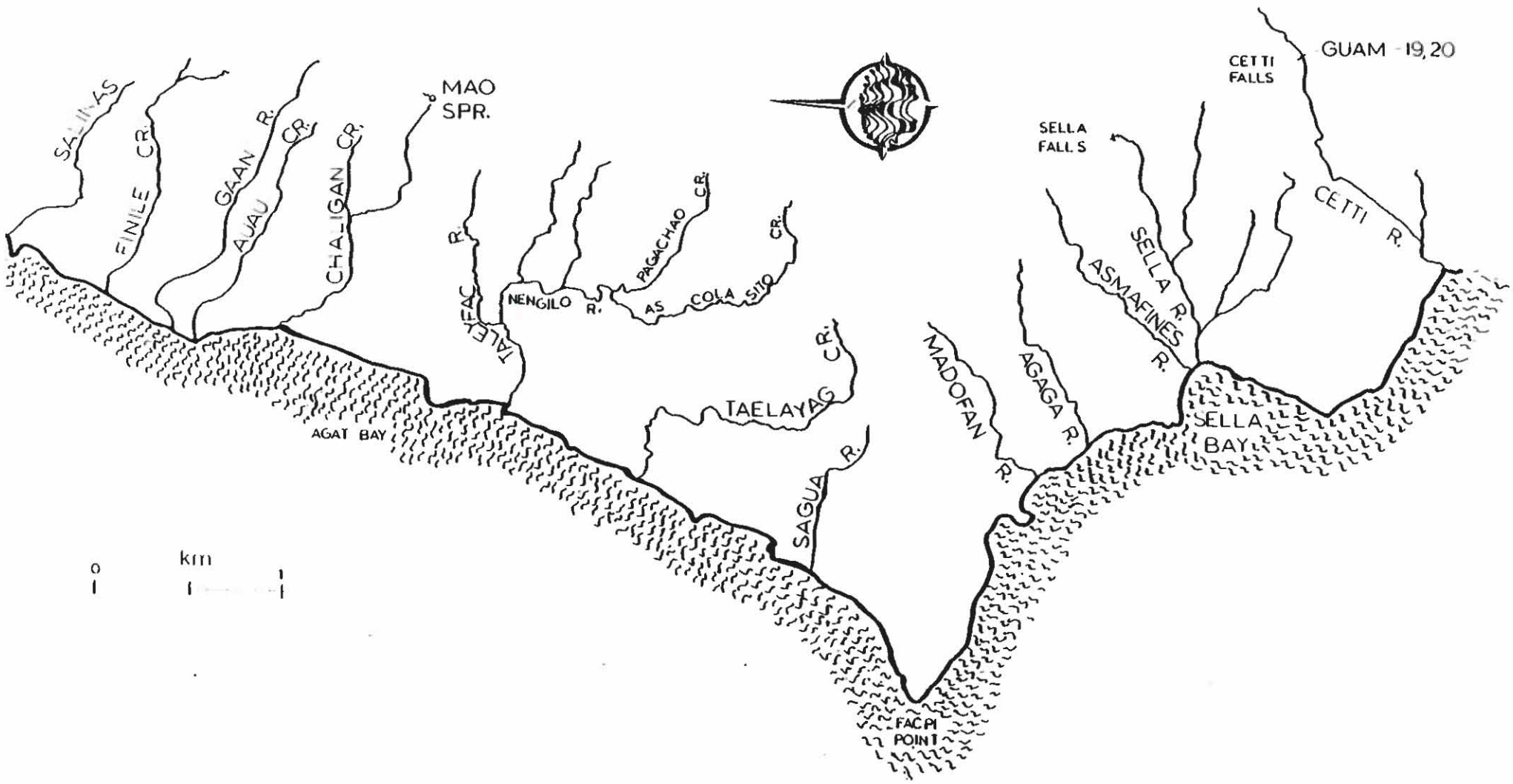
Pagachao Creek, Guam 18c

COORDINATES: Lat. 13° 21' 18" N
Long. 144° 39' 10" E

PERENNIAL CHANNEL LENGTH: 870 m

ELEVATION: 132 m

No record of the aquatic biota has been located.


SALINAS
FINILE CR.
GAAN R.
AJAU CR.
CHALIGAN CR.
MAO SPR.
LYFAC R.
NENGILO R.
PAGACHAO CR.
AS COLA SITO CR.
TALEYAG
AGAT BAY
TAELAYAG CR.
SAGUA R.
MADOFAN R.
AGAGA R.
ASMAFINES R.
SELLA R.
SELLA FALLS
CETTI FALLS
GUAM 19,20
CETTI R.
SELLA BAY
FACPI POINT
0
km
1

Taelayag Creek, Guam 19

COORDINATES: Lat. 13° 21' 14" N
Long. 144° 38' 35" E

PERENNIAL CHANNEL LENGTH: 2,027 m

ELEVATION: 85 m

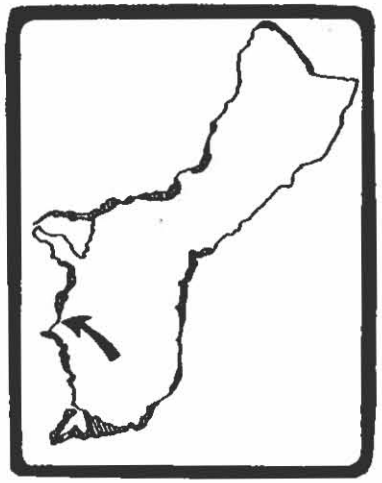
APPROXIMATE DRAINAGE AREA: 88 ha

AVERAGE SLOPE (%): 6.2

Additional Information:

1) This stream has no perennial tributaries.

No record of the aquatic biota has been located.



Sagua River, Guam 20

COORDINATES: Lat. 13° 20' 42" N
Long. 144° 38' 21" E

PERENNIAL CHANNEL LENGTH: 914 m

ELEVATION: 44 m

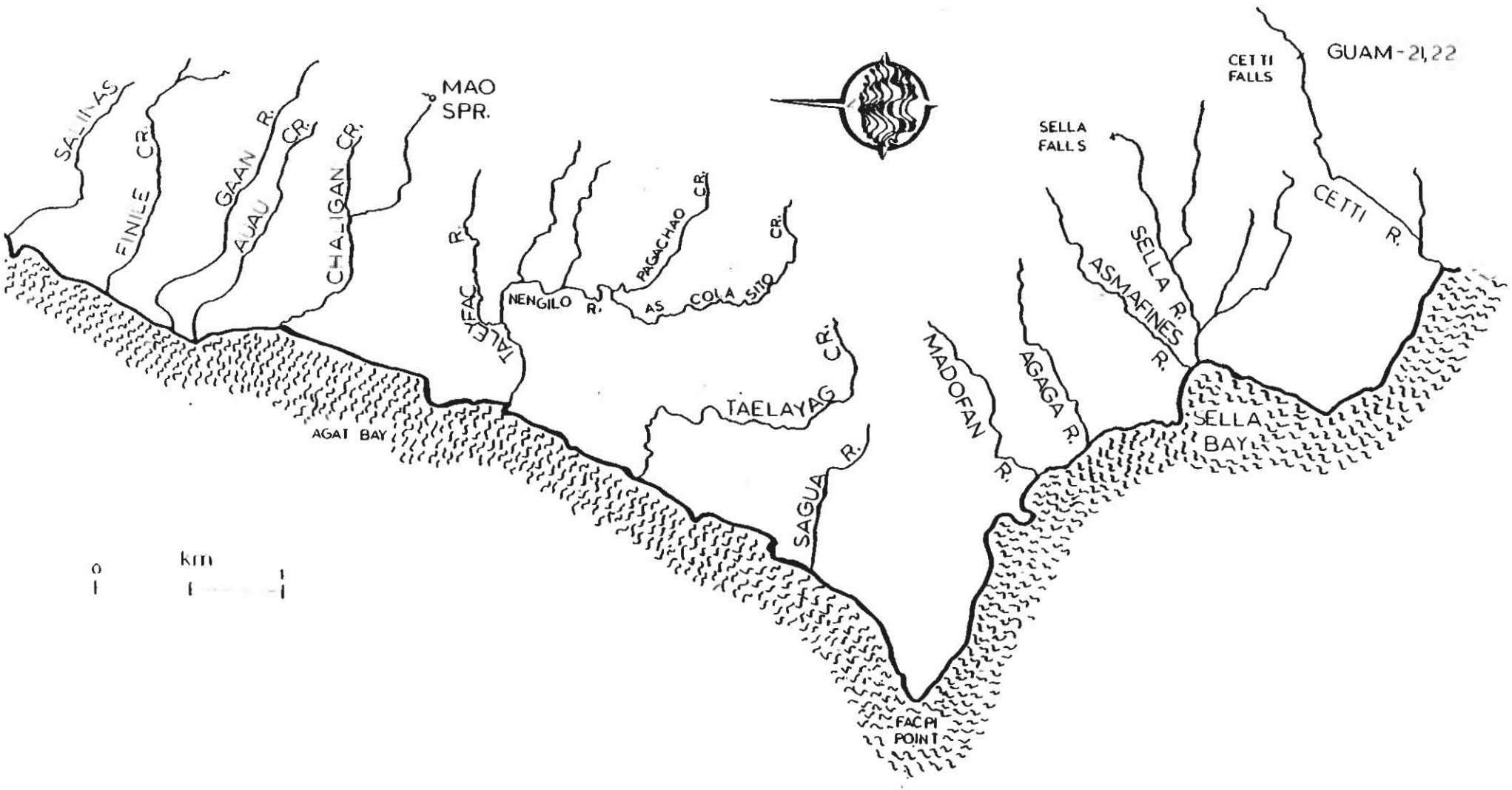
APPROXIMATE DRAINAGE AREA: 45 ha

AVERAGE SLOPE (%): 10.7

Additional Information:

1) Sagua drains just north of Facpi Pt. and has no perennial tributaries.

No record of the aquatic biota has been located.


SALINAS
FINILE CR.
GAAN R.
AUAU CR.
CHALIGAN CR.
MAO SPR.
LYFAC R.
NENGILO R.
PAGACHAO CR.
AS COLA SITO CR.
TAELAYAG CR.
SAGUA R.
MADOFAN R.
AGAGA R.
ASMAFINES R.
SELLA R.
SELLA FALLS
CETTI FALLS
CETTI R.
GUAM-21,22
AGAT BAY
SELLA BAY
FACPI POINT
0
1
km

Madofan River, Guam 21

COORDINATES: Lat. 13° 20' 04" N
Long. 144° 38' 39" E

PERENNIAL CHANNEL LENGTH: 1,128 m

ELEVATION: 73 m

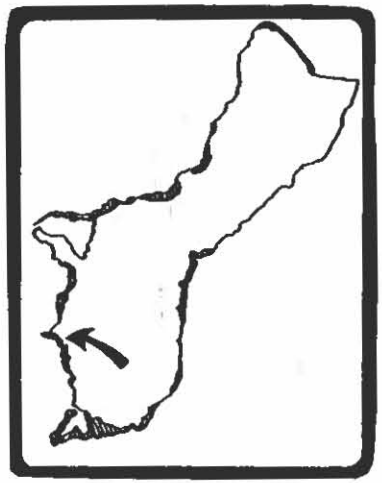
APPROXIMATE DRAINAGE AREA: 102 ha

AVERAGE SLOPE (%): 14.8

Additional Information:

1) The Madofan drains undeveloped land south of Facpi Pt.
2) There are no perennial tributaries.

No record of the aquatic biota has been located.



Agaga River, Guam 22

COORDINATES: Lat. 13° 19' 55" N
Long: 144° 38' 44" E

PERENNIAL CHANNEL LENGTH: 1,173 m

ELEVATION: 85 m

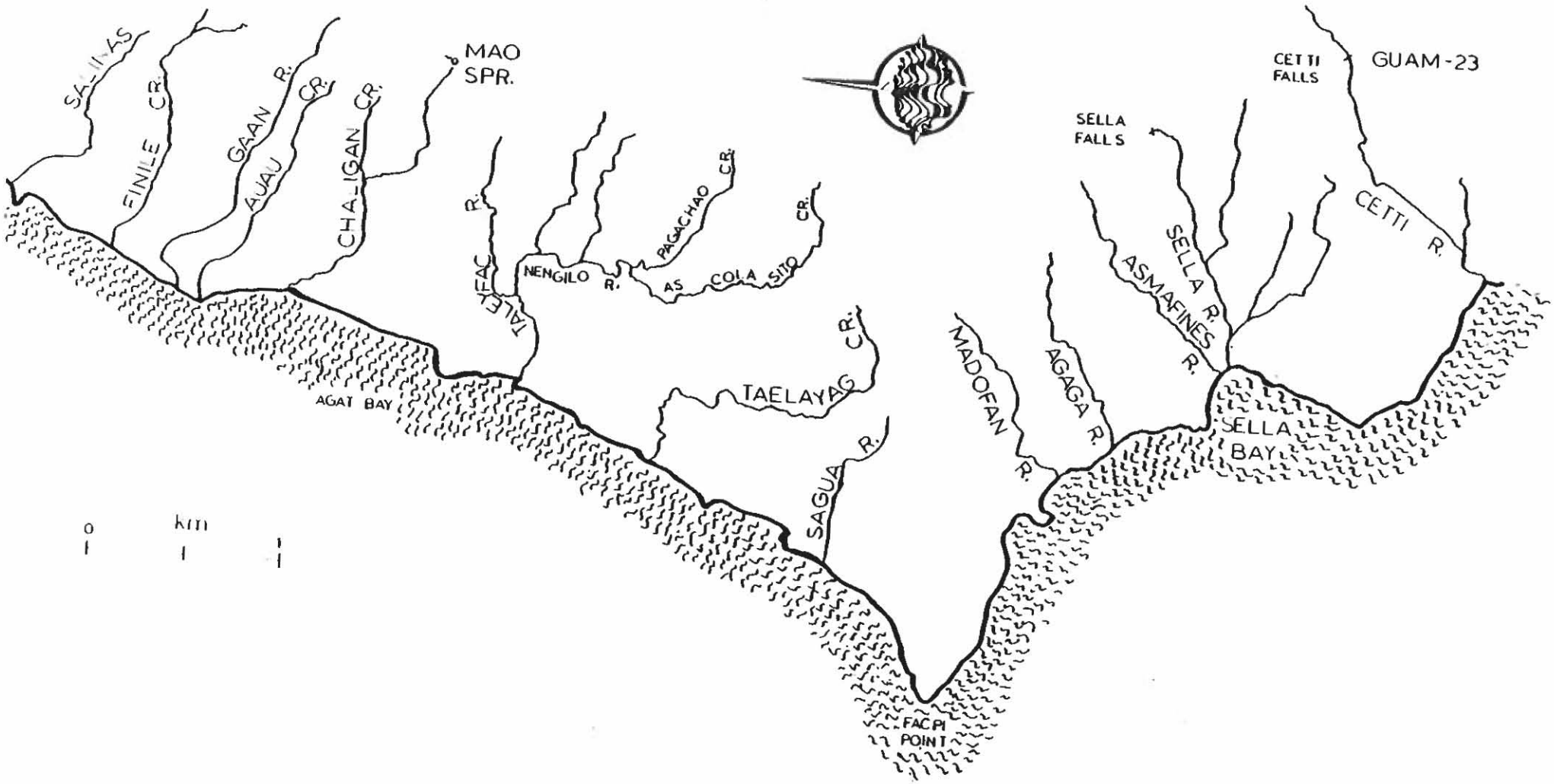
APPROXIMATE DRAINAGE AREA: 69 ha

AVERAGE SLOPE (%): 10.7

Additional Information:

1) Stream has no perennial tributaries.

No record of the aquatic biota has been located.


SALINAS
FINILE CR.
GAAN R.
AUAU CR.
CHALIGAN CR.
MAO
SPR.
LYFAC
TAI R.
NENGILO R.
PAGACHAO CR.
AS COLA SITO CR.
AGAT BAY
TAELAYAG CR.
SAGUA R.
MADOFAN R.
AGAGA R.
SELLA R.
ASMAFINES R.
SELLA FALLS
CETTI FALLS
GUAM-23
CETTI R.
SELLA BAY
FACPI POINT
0
km
1

ASMAFINES RIVER

GUAM-23

Asmafines River, Guam 23

COORDINATES: Lat. 13° 19' 37" N
Long. 144° 39' 03" E

PERENNIAL CHANNEL LENGTH: 1,341 m

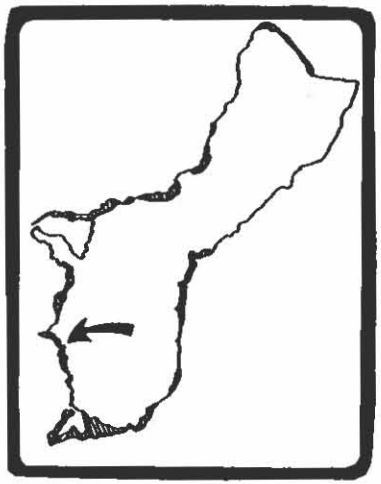
ELEVATION: 134 m

APPROXIMATE DRAINAGE AREA: 96 ha

AVERAGE SLOPE (%): 20.0

Additional Information:

1) Drains into Sella bay and has no perennial tributaries.



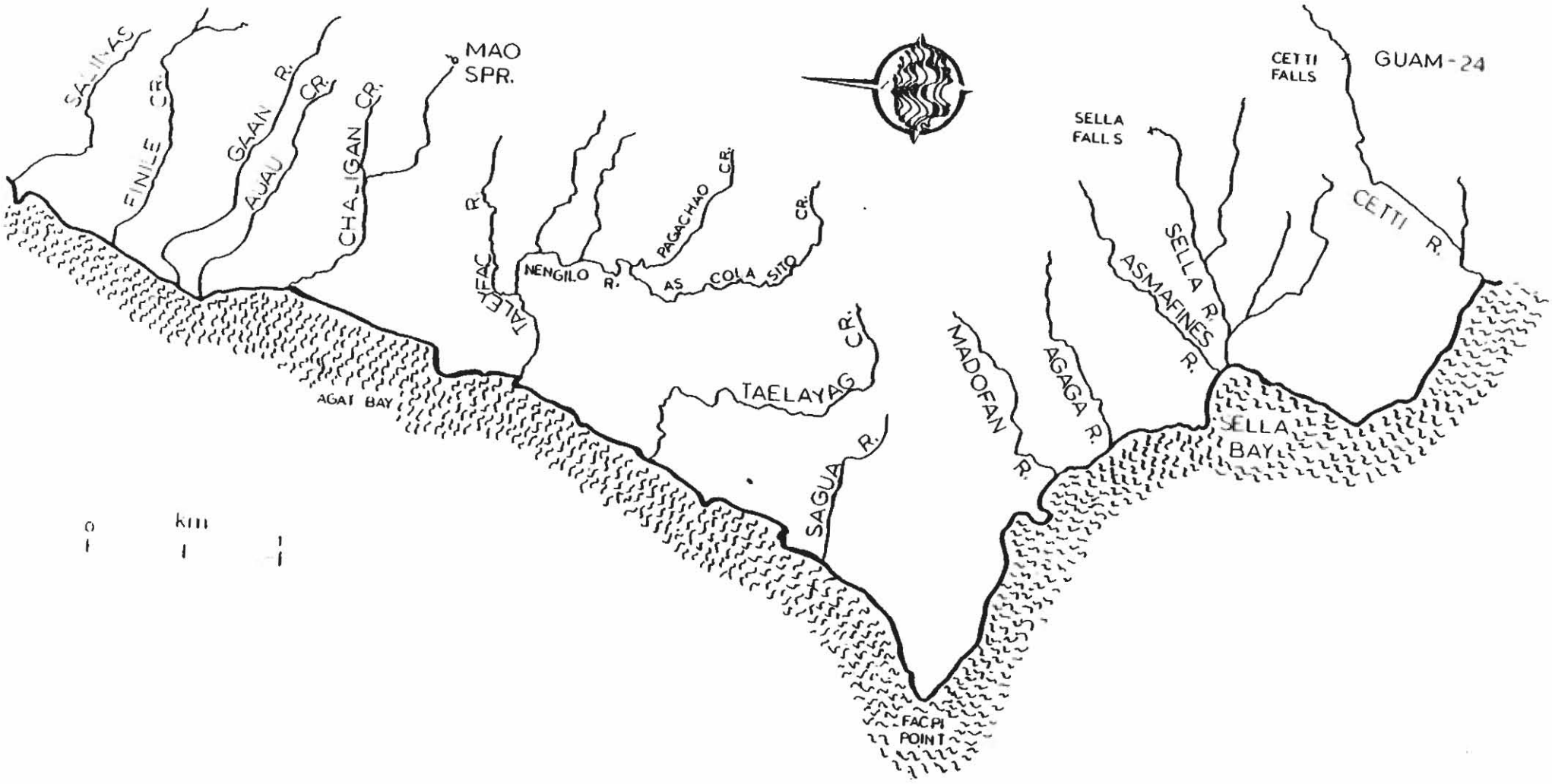
Reported Aquatic Organisms

ANIMALS

Invertebrates:

Macrobrachium lar

Information from UOGML project.


SAMAS
FINILE CR.
GAAN R.
AJAU CR.
CHALIGAN CR.
MAO
SPR.
TALEFAC R.
NENGILO R.
PAGACHAO CR.
AS COLA SITO CR.
TAELAYAG CR.
SAGUA R.
FACPI POINT
AGAT BAY
MADOFAN R.
AGAGA R.
SELLA FALLS
SELLA R.
ASMAFINES R.
CETTI FALLS
GUAM-24
CETTI R.
SELLA BAY
0
km
1

Sella River, Guam 24

COORDINATES: Lat. 13° 19' 35" N
Long. 144° 39' 05" E

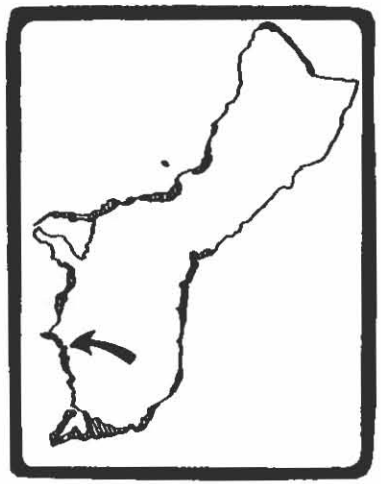
ELEVATION: 313 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	1,585 m
2)	Combined perennial channel lengths:	3,993 m
3)	Approximate drainage area:	158 ha
4)	Average slope (%):	17.0

Additional Information:

1) Sella Falls:
   Lat. 13° 19' 52" N
   Long. 144° 39' 43" E
   Elev. 207 m
2) The stream has two perennial tributaries.
3) Sella Bay is a popular recreation area.



Reported Aquatic Organisms

ANIMALS

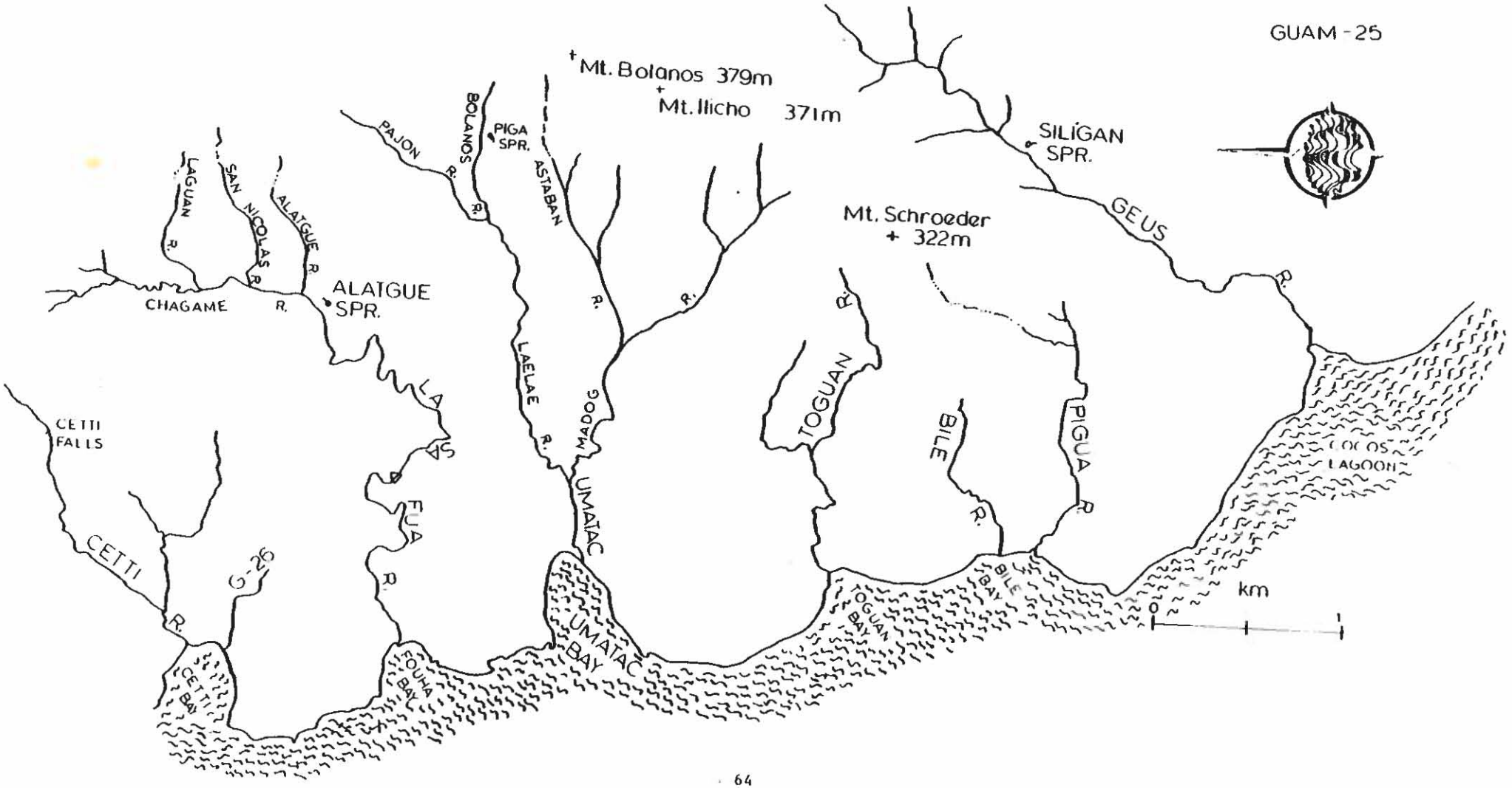
Invertebrates:

Macrobrachium lar

Vertebrates:

Anguilla spp.
Sicyopterus macrostetholepis
Stiphodon elegans

Information from a UOGML project and J. Ford.


GUAM - 25
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder + 322m
SILIGAN SPR.
PIGA SPR.
ALATGUE SPR.
PAJON R.
BOLANOS R.
ASTABAN R.
LAGUAN R.
SAN NICOLAS R.
ALATGUE R.
CHAGAME R.
LAELAE R.
MAOOG MAOOG R.
UMATAC
UMATAC BAY
GEUS R.
TOGUAN R.
TOGUAN BAY
BILE R.
BILE BAY
PIGUA R.
COCOS LAGOON
LAJAS
FUA R.
FOUHA BAY
CETTI FALLS
CETTI R.
CETTI BAY
G-26
km
0
1

Cetti River, Guam 25

COORDINATES: Lat. 13° 18' 55" N
Long. 144° 39' 22" E

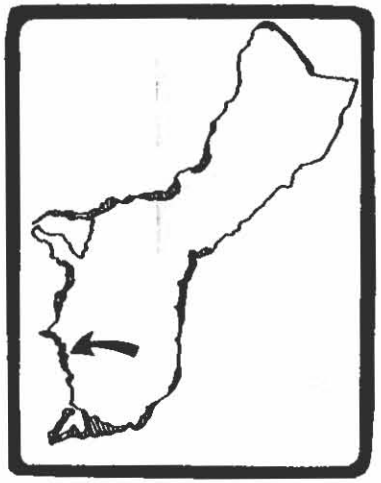
ELEVATION: 195 m

TOTAL RIVER SYSTEM DATA:

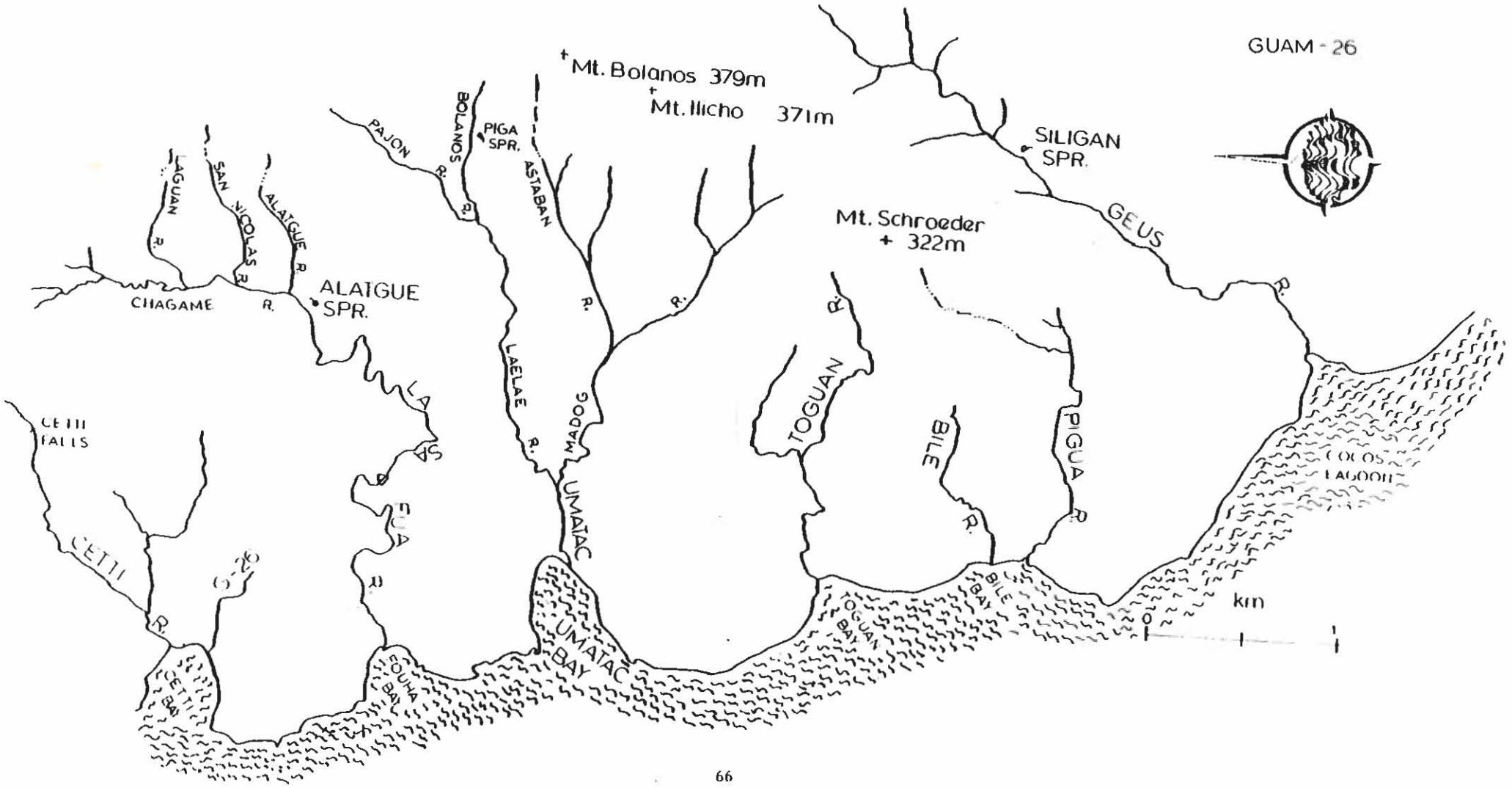
1)	Length of longest continuous perennial channel:	1,785 m
2)	Combined perennial channel lengths:	3,275 m
3)	Approximate drainage area:	207 ha
4)	Average slope (%):	16.6

Additional Information:

1) Cetti Falls:
   Lat. 13° 19' 20" N
   Long. 144° 39' 58" E
   Elev. 130 m
2) Stream has 1 perennial tributary which secondarily bifurcates.
3) River discharges into Cetti Bay.
4) See Appendix (Table 2) for physicochemical characteristics.



No record of the aquatic biota has been located.


GUAM - 26
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder + 322m
SILIGAN SPR.
PIGA SPR.
ALAIGUE SPR.
PAJON R.
BOLANOS R.
ASTABAN R.
LAGUAN R.
SAN NICOLAS R.
ALAIGUE R.
CHAGAME R.
LAELAE R.
MAOOG R.
UMATAC R.
TOGUAN R.
BILE R.
PIGUA R.
GEUS R.
LAJAS
CETTI FALLS
CETTI R.
CETTI BAY
FOUHA BAY
UMATAC BAY
TOGUAN BAY
BILE BAY
COCOS LAGOON
km
0
1

Unnamed Stream, Guam 26

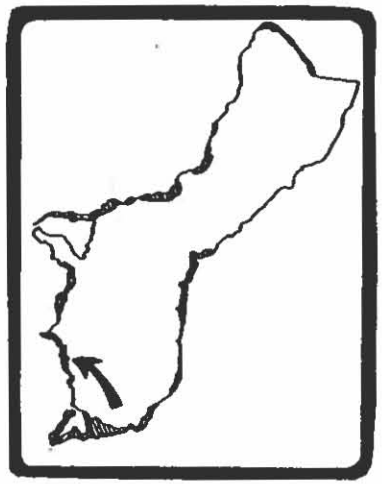
COORDINATES: Lat. 13° 18' 49" N
Long. 144° 39' 22" E

PERENNIAL CHANNEL LENGTH: 600 m

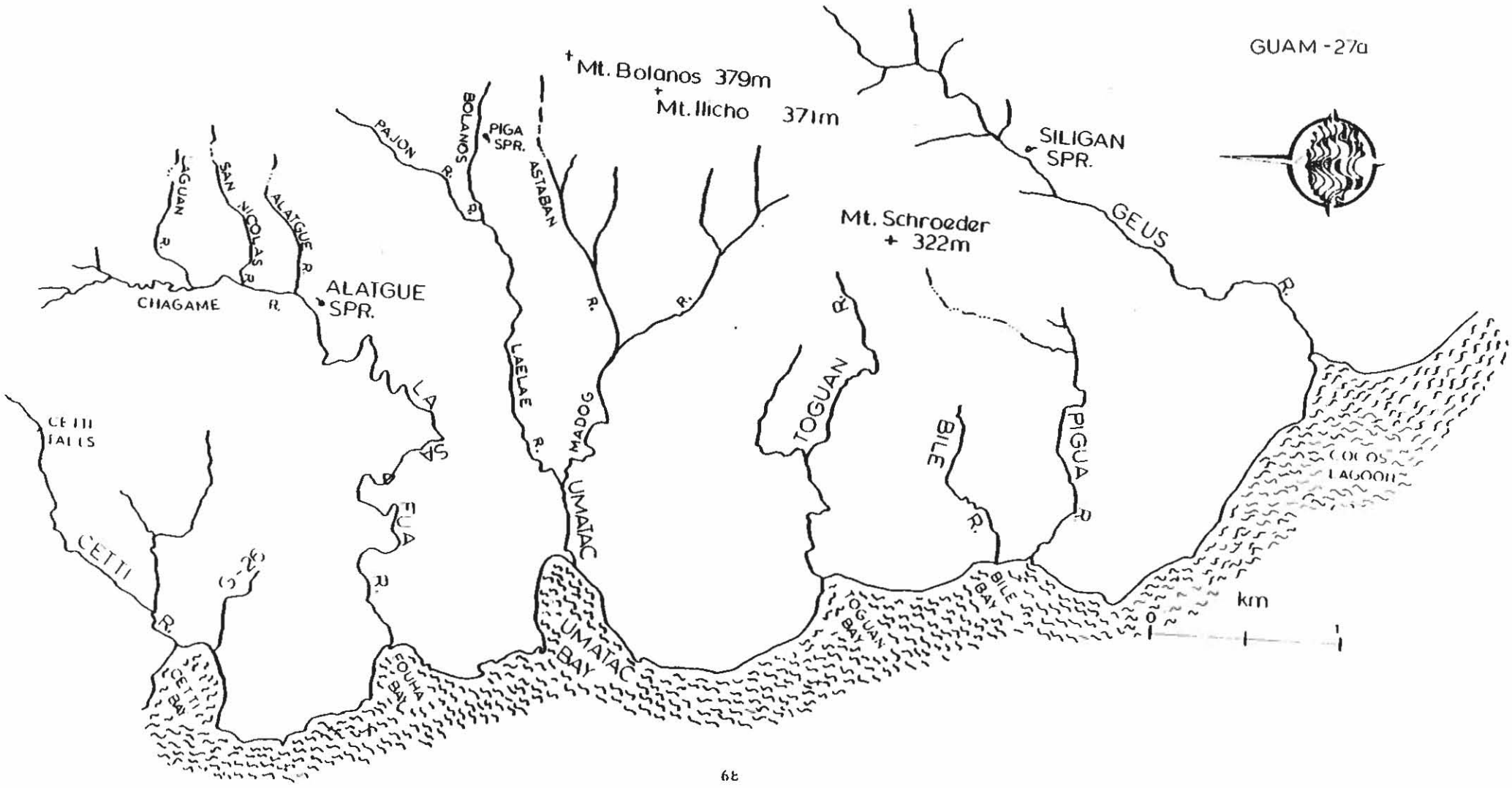
ELEVATION: 30 m

Additional Information:

1) Drains into Cetti Bay about 0.2 km south of Cetti River.
2) Has no perennial tributaries.



No record of the aquatic biota has been located.


GUAM - 27a
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder + 322m
SILIGAN SPR.
PIGA SPR.
ALAIGUE SPR.
BOLANOS R.
PAJON R.
ASTABAN R.
SAN NICOLAS R.
ALAIGUE R.
LAGUAN R.
CHAGAME R.
LAELAE R.
MAPOG R.
UMATAC R.
TOGUAN R.
BILE R.
PIGUA R.
GEUS R.
LAJAS R.
EUA R.
CETTI R.
CETTI FALLS
COCOS LAGOON
UMATAC BAY
TOGUAN BAY
BILE BAY
EOUMA BAY
CETTI BAY
km
0
1

La Sa Fua River, Guam 27a

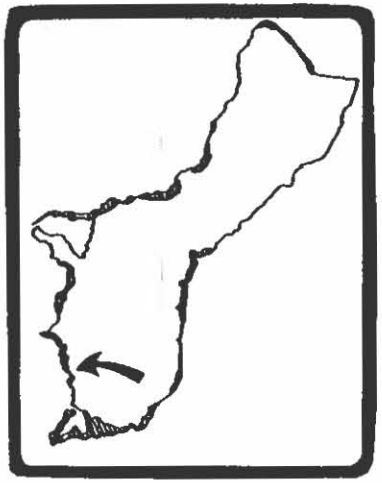
COORDINATES: Lat. 13° 18' 18" N
Long. 144° 39' 24" E

ELEVATION: 207 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	4,633 m
2)	Combined perennial channel lengths:	7,209 m
3)	Approximate drainage area:	318 ha
4)	Average slope (%):	6.8

LENGTH OF THE LA SA FUA: 3,261 m



Additional Information:

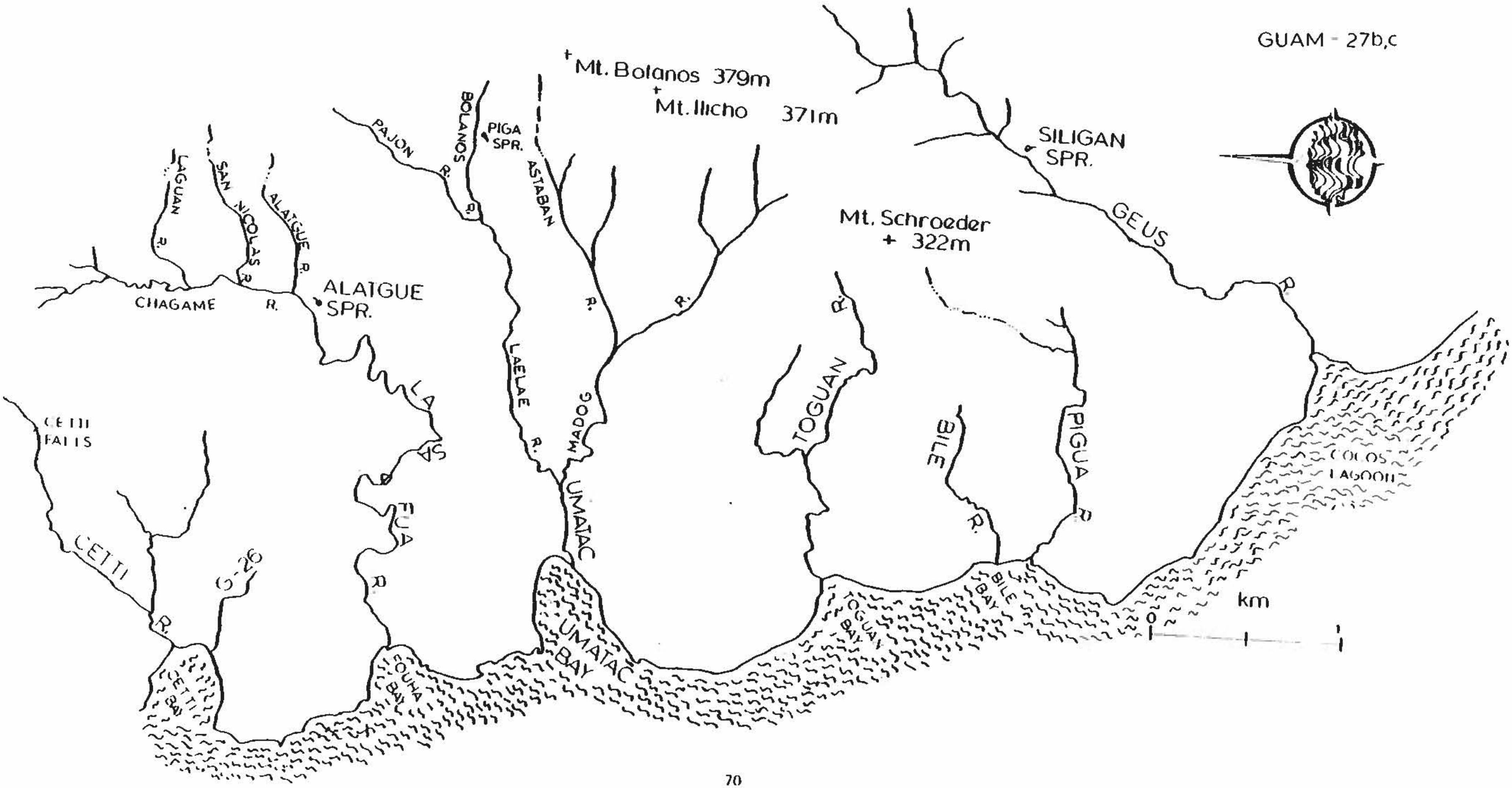
1) Has 5 major tributaries: The Alatgue, Chagame, Laguan and San Nicolas Rivers.
2) The system is spring and watershed fed and drains into Fouha Bay.
3) The system has been assessed as feasible for a small diversion dam.
4) Gaging Station:
   Lat. 13° 18' 23" N
   Long. 144° 39' 45" E
   Elev. 36.6 m
   Average (10 yr) discharge: 0.13 m^3/s.
5) See Appendix (Table 2) for physicochemical characteristics.

Reported Aquatic Organisms

See Appendix (Table 1) for a comprehensive list of diatoms found in the La Sa Fua Stream.

Information from reference:

350


GUAM - 27b,c
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder
322m
SILIGAN
SPR.
GEUS
R.
PIGA
SPR.
ALATGUE
SPR.
CHAGAME
R.
PAJON
R.
BOLANOS
R.
ASTABAN
R.
LAGUAN
R.
SAN NICOLAS
R.
ALATGUE
R.
LAELAE
R.
MADOG
UMATAC
LA SA FUA
R.
CETTI
FALLS
CETTI
R.
G-26
TOGUAN
R.
BILE
R.
PIGUA
R.
COCOS
LAGOON
CETTI
BAY
FOUHA
BAY
UMATAC
BAY
TOGUAN
BAY
BILE
BAY
km
0
1

Alatgue River, Guam 27b

COORDINATES: Lat. 13° 18' 37" N
Long. 144° 40' 21" E

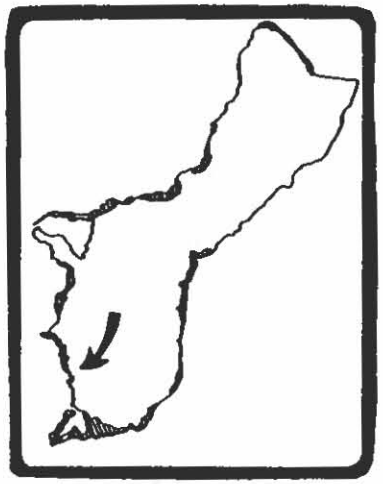
PERENNIAL CHANNEL LENGTH: 640 m

ELEVATION: 183 m

Additional Information:

1) Alatgue Spring:
Lat. 13° 18' 33" N
Long. 144° 40' 23" E
Elev. 104 m
2) The Alatgue drains into the La Sa Fua.

No record of the aquatic biota has been located.



GUAM-27b,c

Chagame River, Guam 27 c

COORDINATES: Lat. 13° 18' 37" N
Long. 144° 40' 27" E

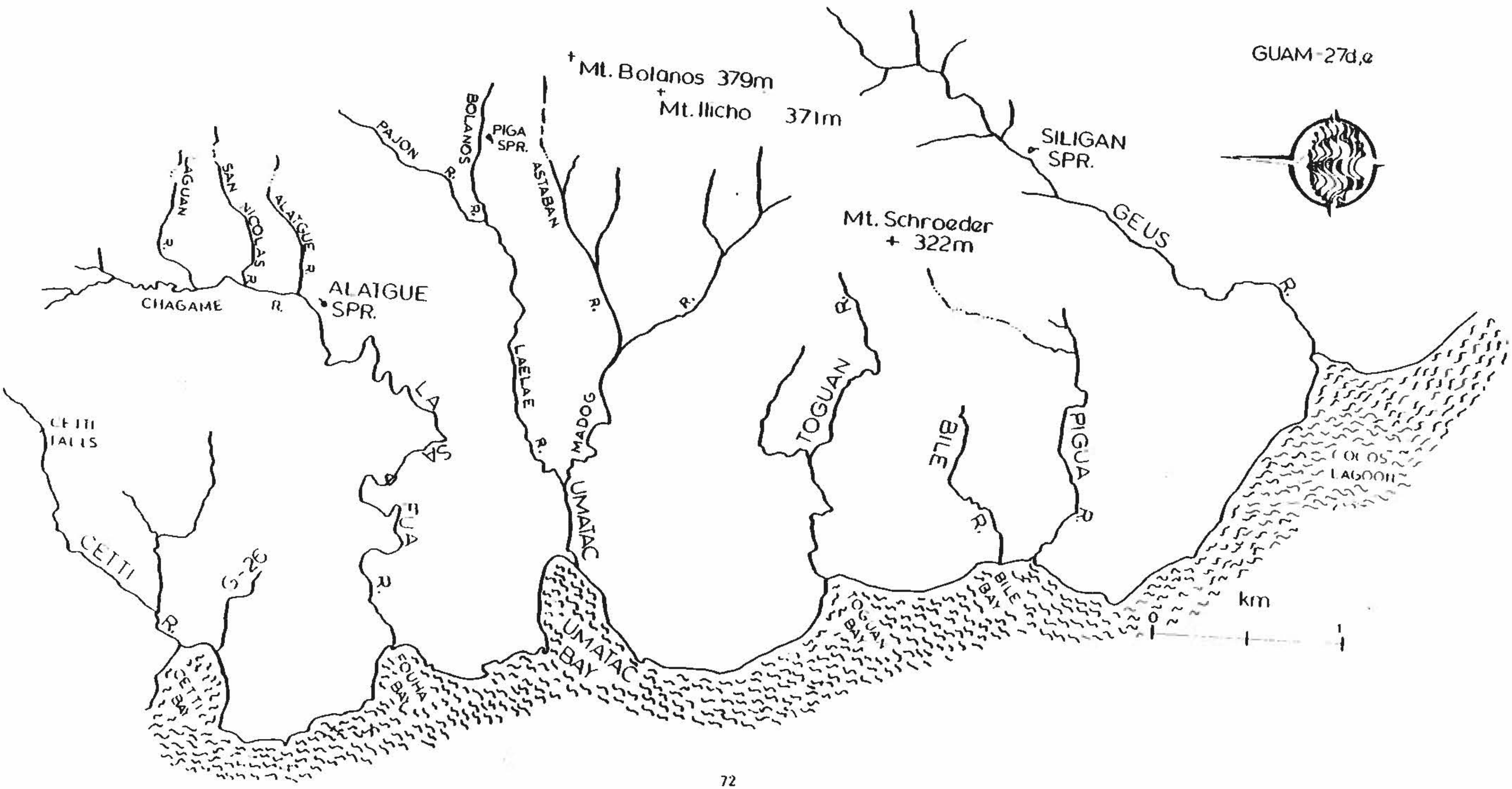
COMBINED PERENNIAL LENGTHS: 1,980 m

ELEVATION: 190 m

Additional Information:

1) Stream drains into the La Sa Fua River and has two minor perennial tributaries.

No record of the aquatic biota has been located.


GUAM-27d,e
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder
+ 322m
SILIGAN
SPR.
PIGA
SPR.
ALATGUE
SPR.
PAJON R.
BOLANOS R.
ASTABAN
LAGUAN R.
SAN NICOLAS R.
ALATGUE R.
CHAGAME R.
LAELAE R.
MADOG R.
UMATAC
TOGUAN R.
BILE R.
PIGUA R.
GEUS R.
CETTI FALLS
CETTI R.
G-26
LA SA FUA R.
UMATAC BAY
CETTI BAY
FOUHA BAY
TOGUAN BAY
BILE BAY
COCOS LAGOON
km
0
1

Laguan River, Guam 27d

COORDINATES: Lat. 13° 18' 56" N
Long. 144° 40' 20" E

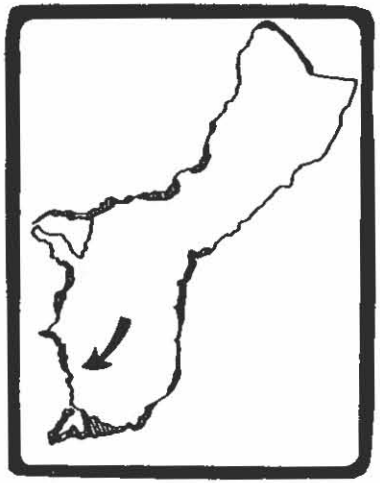
PERENNIAL CHANNEL LENGTH: 664 m

ELEVATION: 232 m

Additional Information:

1) The Laguan drians into the Chagame River and has no perennial tributaries.

No record of the aquatic biota has been located.



San Nicolas River, Guam 27e

COORDINATES: Lat. 13° 18' 47" N
Long. 144° 40' 22" E

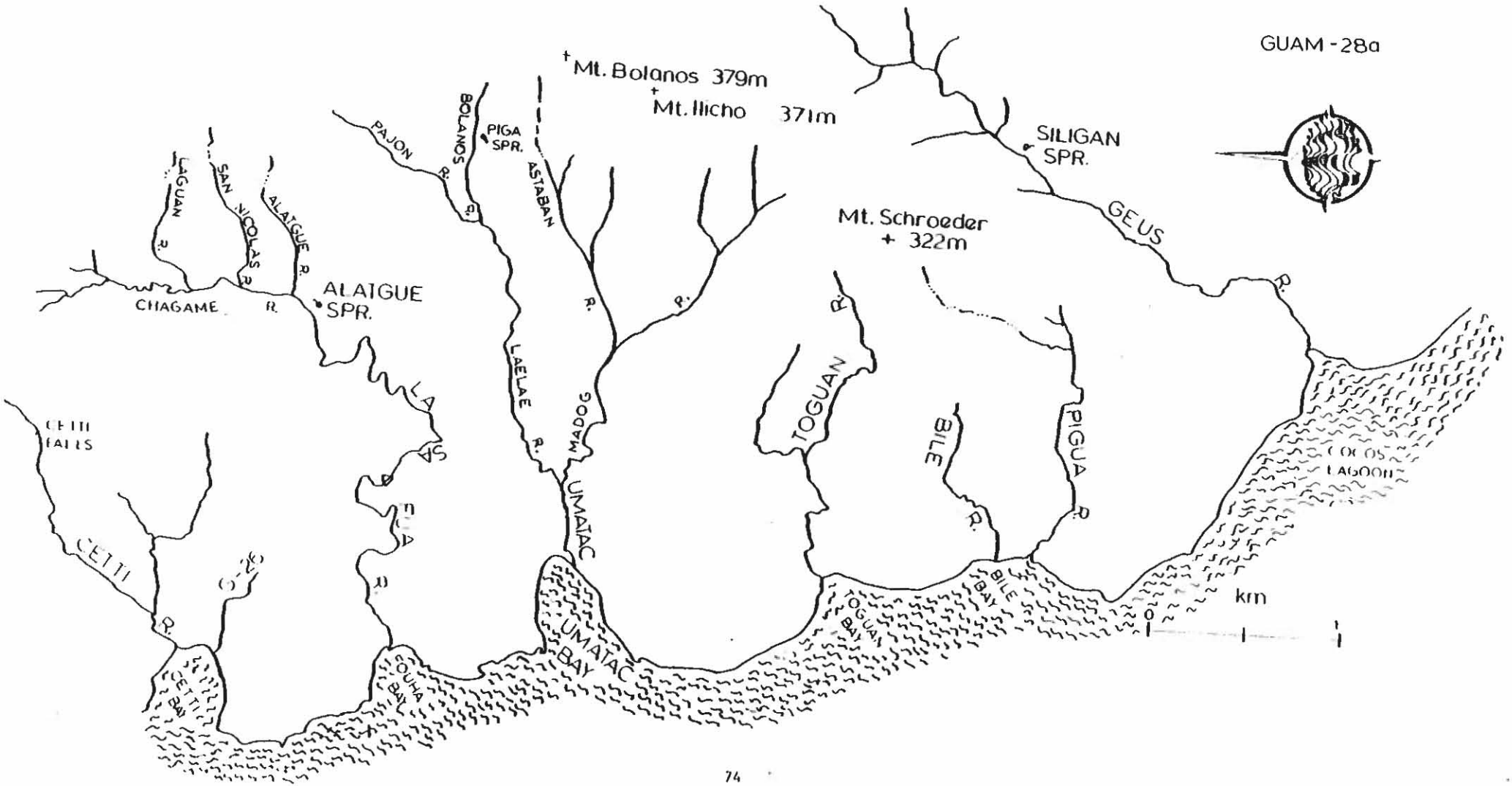
PERENNIAL CHANNEL LENGTH: 716 m

ELEVATION: 250 m

Additional Information:

1) Stream drains into the Chagame River and has no perennial tributaries.

No record of the aquatic biota has been located.


GUAM - 28a
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder + 322m
SILIGAN SPR.
PIGA SPR.
ALAIGUE SPR.
BOLANOS R.
PAJON R.
ASTABAN R.
SAN NICOLAS R.
ALAIGUE R.
LAGUAN R.
CHAGAME R.
LAELAE R.
MAGOG R.
UMATAC
UMATAC BAY
GEUS R.
TOGUAN R.
BILE R.
PIGUA R.
TOGUAN BAY
BILE BAY
COCOS LAGOON
GOUHA BAY
CETTI BAY
CETTI R.
CETTI FALLS
km
0
1

Umatac River, Guam 28a

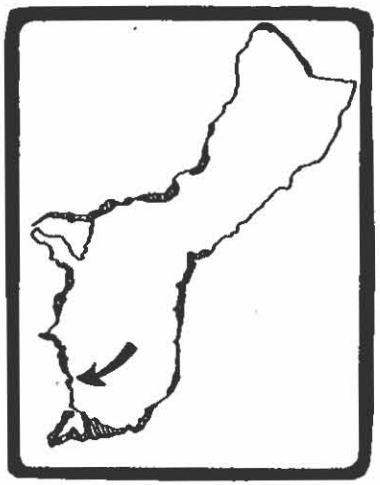
COORDINATES: Lat. 13° 17' 48" N
Long. 144° 39' 38" E

ELEVATION: 0 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	2,987 m
2)	Combined perennial channel lengths:	6,065 m
3)	Approximate drainage area:	544 ha

LENGTH OF THE UMATIC RIVER: 442 m



Additional Information:

1) The Umatac has two major tributaries: the Lteliac and Madog Rivers.
2) The area is under agriculture and grazing pressure.
3) A defunct monitoring station 100 m upstream recorded an average (13 yr) discharge rate of 0.24 m^3/s from a 530 hectares drainage area.
4) The Umatac drains into Umatac Bay.
5) See Appendix (Table 2) for physicochemical characteristics.

Reported Aquatic Organisms

ANIMALS

Invertebrates:

Atya sp.

Vertebrates:

Anguilla marmorata
Eleotris fusca
Kuhlia rupestris
Stiphodon eleyans

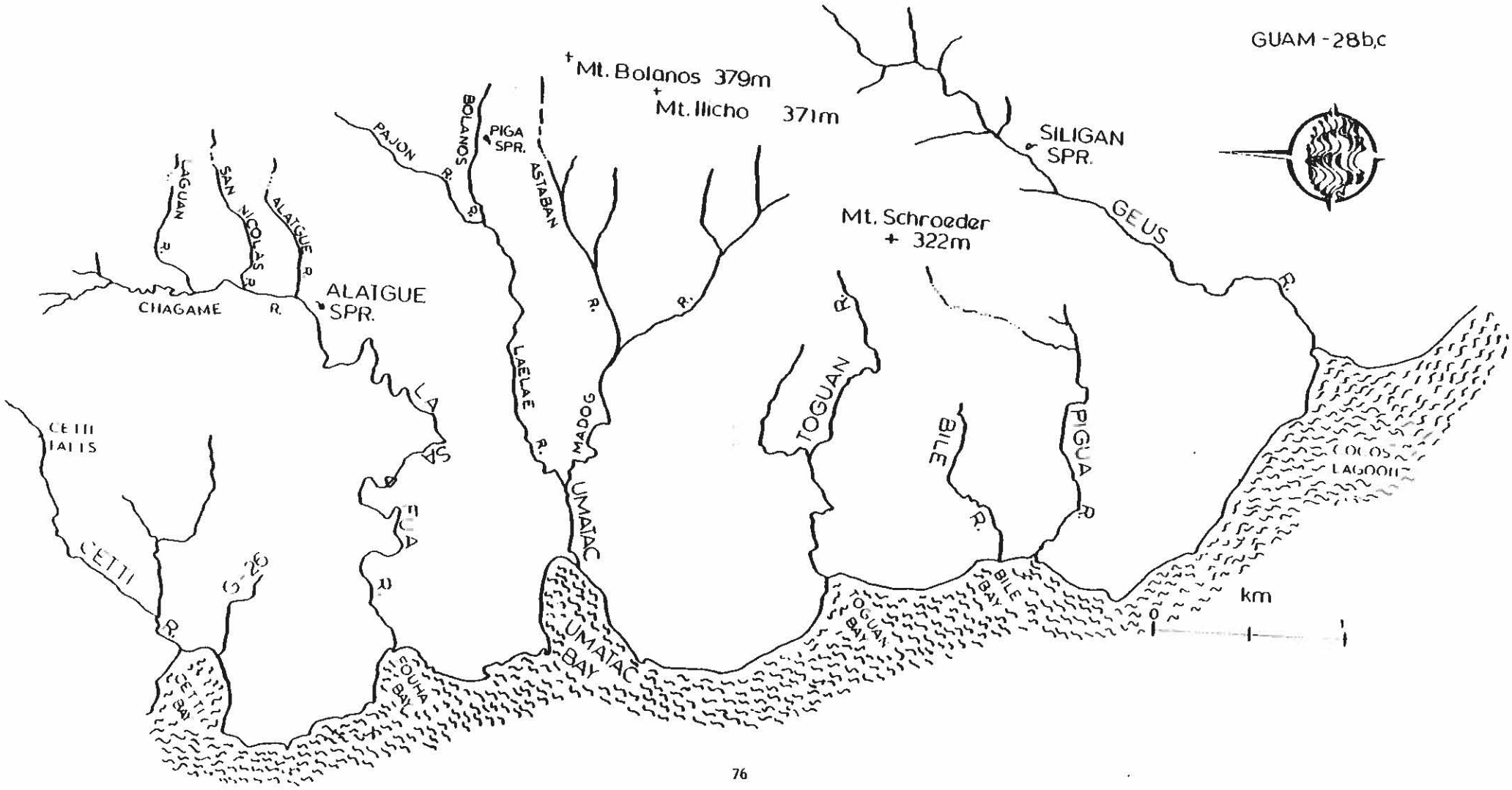
PLANTS

Cladophora sp.
Phragmites karka

See Appendix for blue-green algae and additional biota.

Information from references:

136, 137, 184, 270, 285


GUAM - 28b,c
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder + 322m
SILIGAN SPR.
PIGA SPR.
ALAIGUE SPR.
CHAGAME R.
JAGUAN R.
SAN NICOLAS R.
ALAIGUE R.
PAJON R.
BOLANOS R.
ASTABAN R.
LAELAE R.
MAOOG R.
UMATAC
UMATAC BAY
GEUS R.
IOGUAN R.
BILE R.
PIGUA R.
IOGUAN BAY
BILE BAY
COCOS LAGOON
km
0
1

Laelae River, Guam 28b

COORDINATES: Lat. 13° 17' 49" N
Long. 144° 39' 50" E

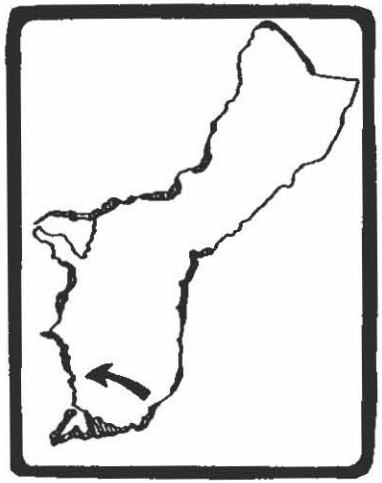
PERENNIAL CHANNEL LENGTH: 1,585 m

ELEVATION: 38 m

Additional Information:

1) The Laelae drains into the Umatac.
2) The two tributaries are: Pajon and Bolanos streams.

No record of the aquatic biota has been located.



Madog River, Guam 28c

COORDINATES: Lat. 13° 17' 49" N
Long. 144° 39' 50" E

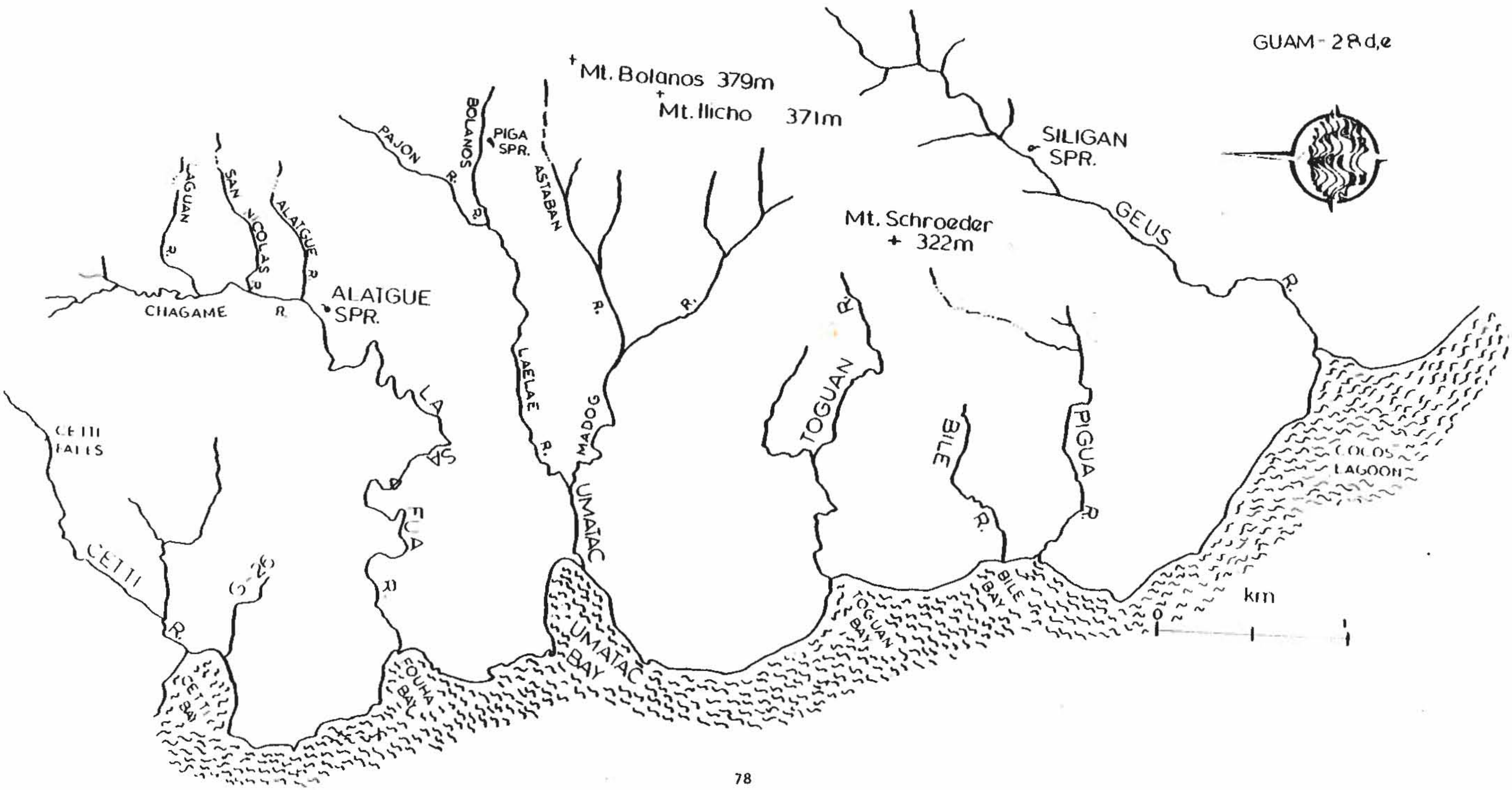
COMBINED PERENNIAL CHANNEL LENGTHS: 2,926 m

ELEVATION: 110 m

Additional Information:

1) The Madog drains into the Umatac and has one major tributary: Astaban stream.

No record of the aquatic biota has been located.


GUAM - 28 d,e
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder 322m
SILIGAN SPR.
PIGA SPR.
ALATGUE SPR.
PAJON R.
BOLANOS R.
ASTABAN R.
SAN NICOLAS R.
ALATGUE R.
CHAGAME R.
LA SA FUA R.
LAELAE R.
MADOG
UMATAC
UMATAC BAY
TOGUAN
TOGUAN BAY
BILE R.
BILE BAY
PIGUA R.
GEUS R.
COCOS LAGOON
CETTI FALLS
CETTI R.
CETTI BAY
FOUHA BAY
km
0

Astaban River, Guam 28d

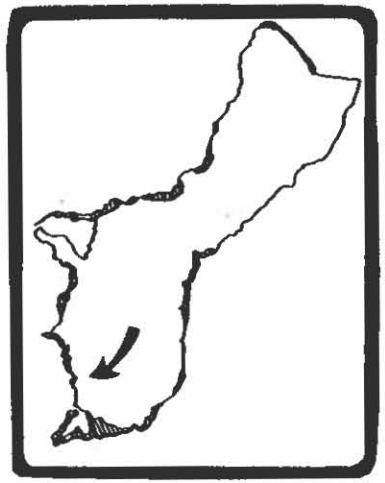
COORDINATES: Lat. 13° 17' 41" N
Long. 144° 40' 14" E

COMBINED PERENNIAL CHANNEL LENGTHS: 1,981 m

ELEVATION: 97 m

Additional Information:

1) The Astaban drains into the Madog and has 2 perennial tributaries.



No record of the aquatic biota has been located.

Bolanos River, Guam 28e

COORDINATES: Lat. 13° 18' 06" N
Long. 144° 40' 35" E

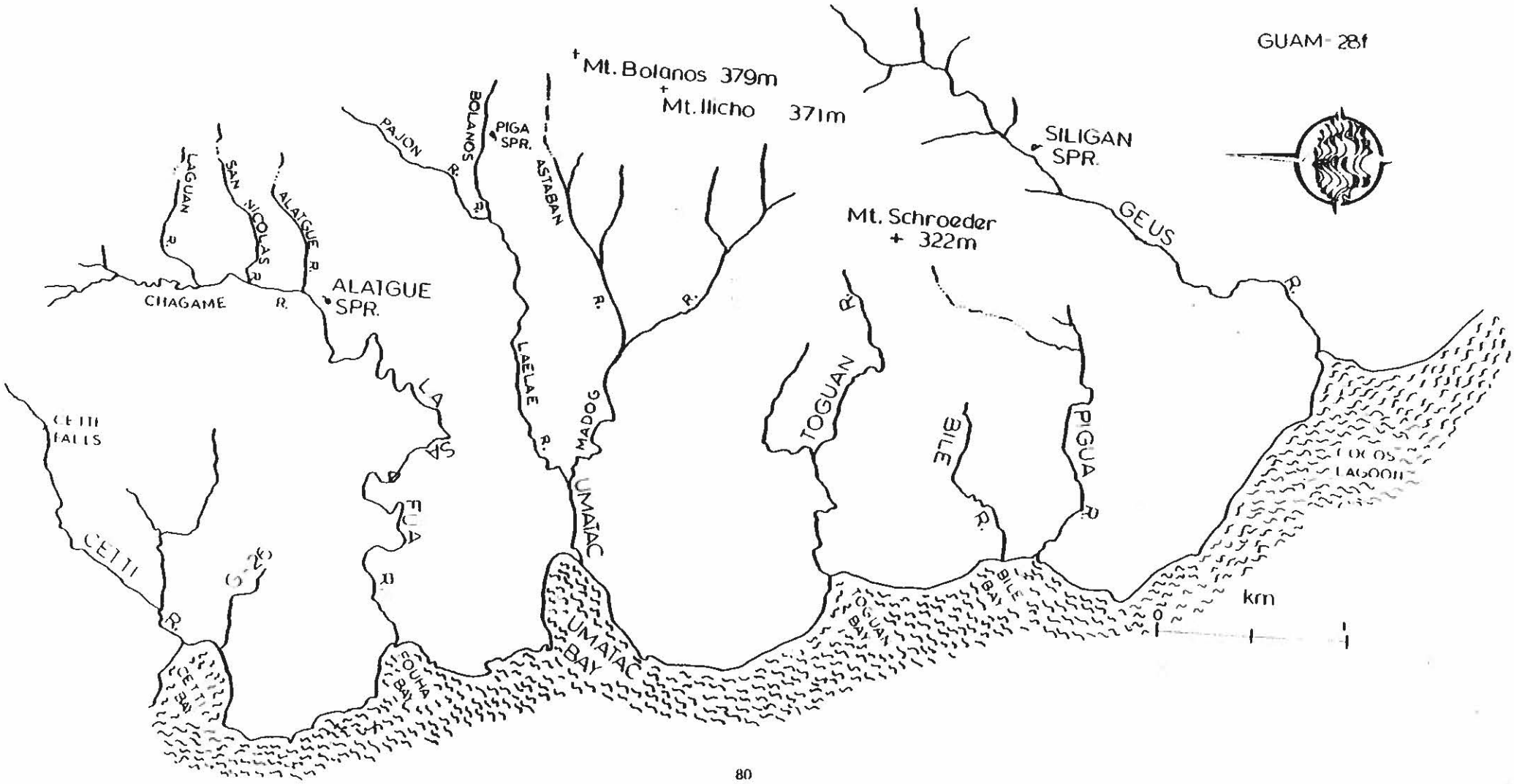
PERENNIAL CHANNEL LENGTH: 762 m

ELEVATION: 152 m

Additional Information:

1) Piga Spring:
Lat. 13° 18' 08" N
Long. 144° 40' 50" E
Elev. 90 m
2) The Bolanos drains into the Laelae and has no perennial tributaries

No record of the aquatic biota has been located.


GUAM - 28f
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder + 322m
SILIGAN SPR.
GEUS R.
PAJON R.
BOLANOS R.
PIGA SPR.
ASTABAN R.
LAGUAN R.
SAN NICOLAS R.
ALAIGUE R.
CHAGAME R.
ALAIGUE SPR.
LAELAE R.
MADOG MADOG R.
UMAÑAC BAY
TOGUAN R.
BILE R.
PIGUA R.
TOGUAN BAY
BILE BAY
CETTI FALLS
CETTI R.
CETTI BAY
FOUHA BAY
FUA R.
LAS
km
0
1

Pajon River, Guam 28f

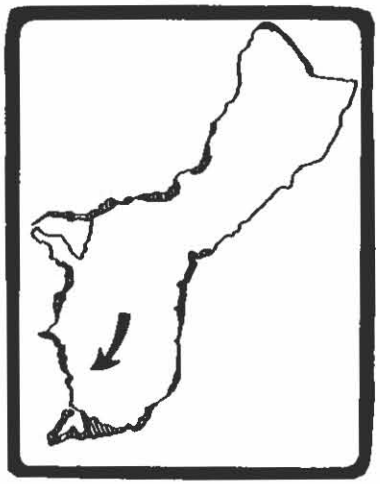
COORDINATES: Lat. 13° 18' 06" N
Long. 144° 40' 35" E

PERENNIAL CHANNEL LENGTH: 1,036 m

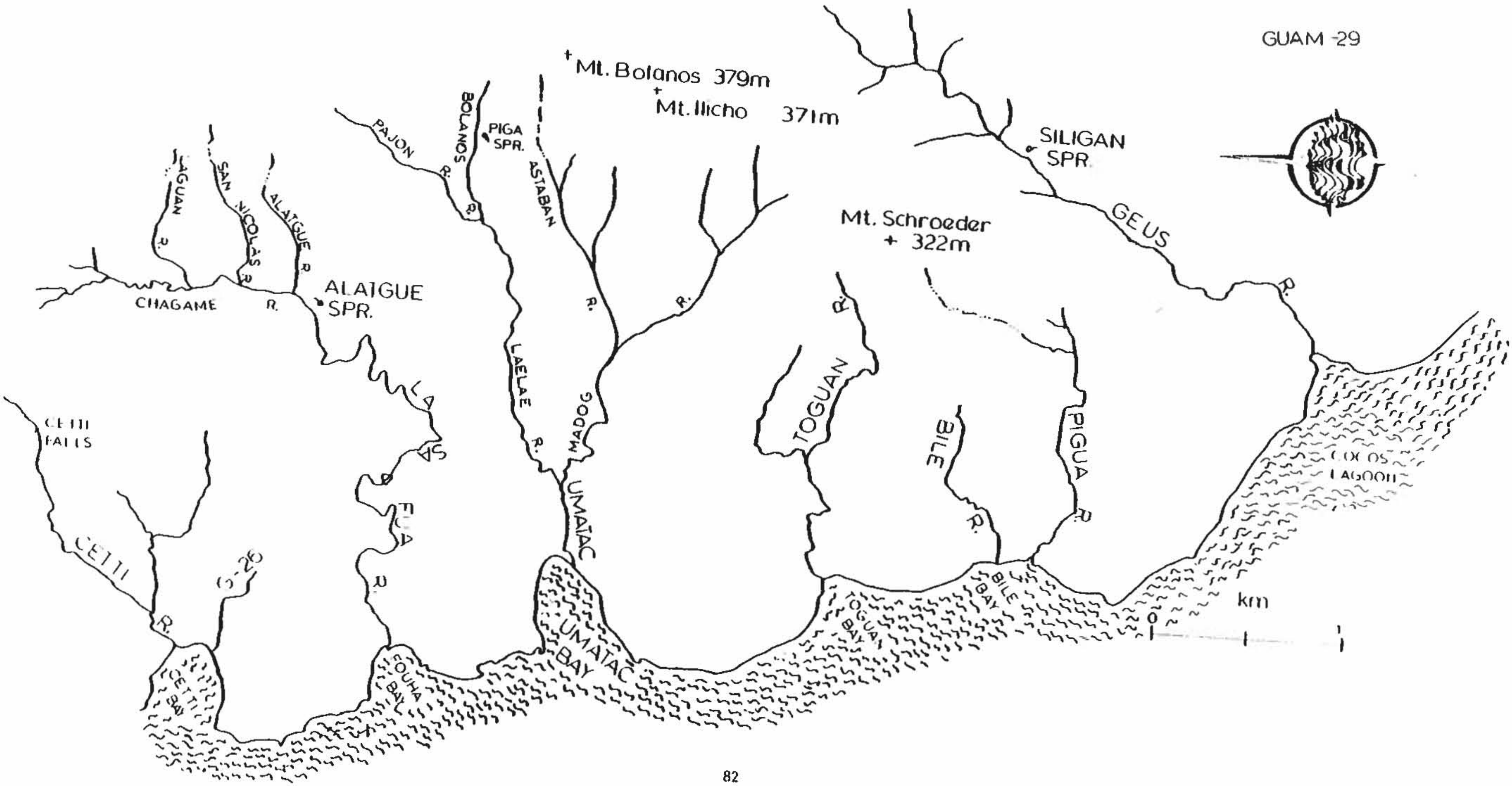
ELEVATION: 135 m

Additional Information:

1) The Pajon drains into the Laelae and has no perennial tributaries.



No record of the aquatic biota has been located.


GUAM -29
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder
322m
SILIGAN SPR.
ALAIGUE SPR.
PIGA SPR.
PAJON R.
BOLANOS R.
ASTABAN R.
SAN NICOLAS R.
ALAIGUE R.
CHAGAME R.
GEUS R.
LAELAE R.
MADOG
UMATAC
TOGUAN R.
BILE R.
PIGUA R.
LA SA FUA R.
CETTI FALLS
CETTI R.
G-26
CETTI BAY
FOUHA BAY
UMATAC BAY
TOGUAN BAY
BILE BAY
COCOS LAGOON
km
0
1

Toguan River, Guam 29

COORDINATES: Lat. 13° 17' 04" N
Long. 144° 39' 36" E

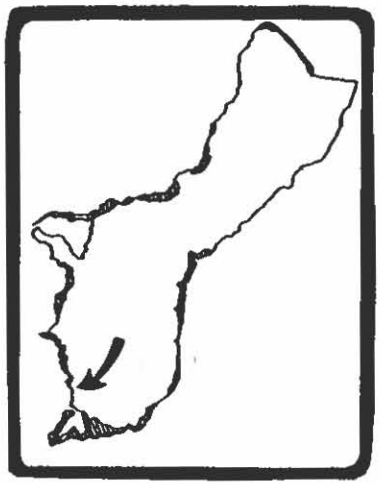
ELEVATION: 131 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	2,256 m
2)	Combined perennial channel lengths:	3,109 m
3)	Approximate drainage area:	137 ha
4)	Average slope (%):	11.7

Additional Information:

1) The stream has one perennial tributary and drains into Toguan Bay.



Reported Aquatic Organisms

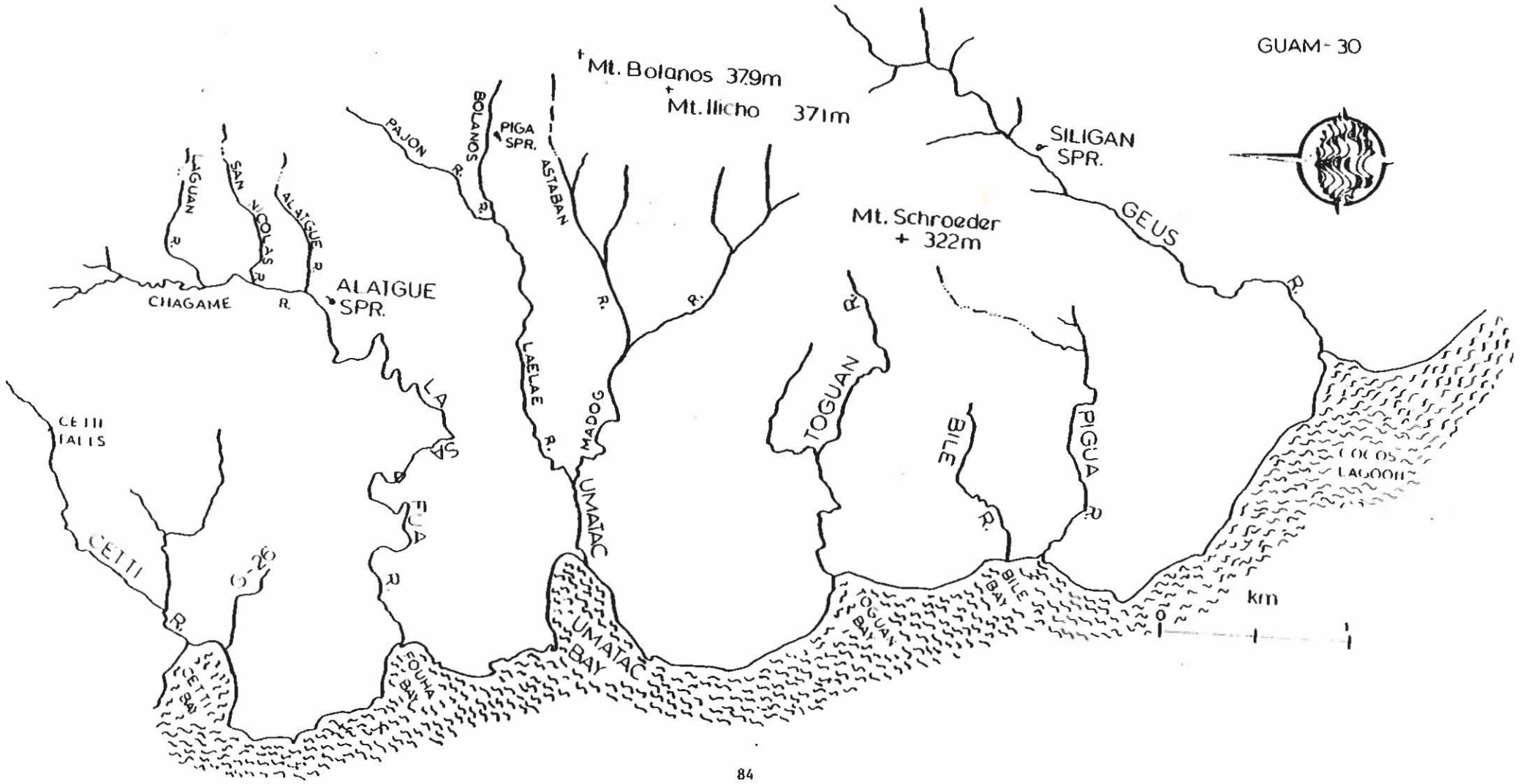
ANIMALS

Invertebrates:

Clithon brevispina
Septaria porcellana

Information from reference:

326


GUAM - 30
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder + 322m
SILIGAN SPR.
PIGA SPR.
ALAIGUE SPR.
PAJON R.
BOLANOS R.
ASTABAN R.
LAGUAN R.
SAN NICOLAS R.
ALAIGUE R.
CHAGAME R.
LAELAE R.
MAOOG R.
UMATAC R.
GEUS R.
TOGUAN R.
BILE R.
PIGUA R.
LAYA
TUA R.
CETTI FALLS
CETTI R.
CETTI BAY
FOUMA BAY
UMATAC BAY
TOGUAN BAY
BILE BAY
COCOS LAGOON
km
0
1

Bile River, Guam 30

COORDINATES: Lat. 13° 16' 33" N
Long. 144° 39' 41" E

PERENNIAL CHANNEL LENGTH: 950 m

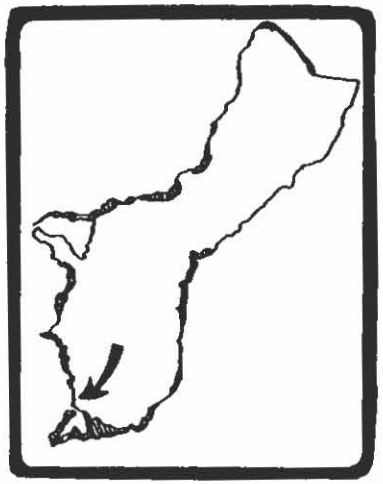
ELEVATION: 67 m

APPROXIMATE DRAINAGE AREA: 57 ha

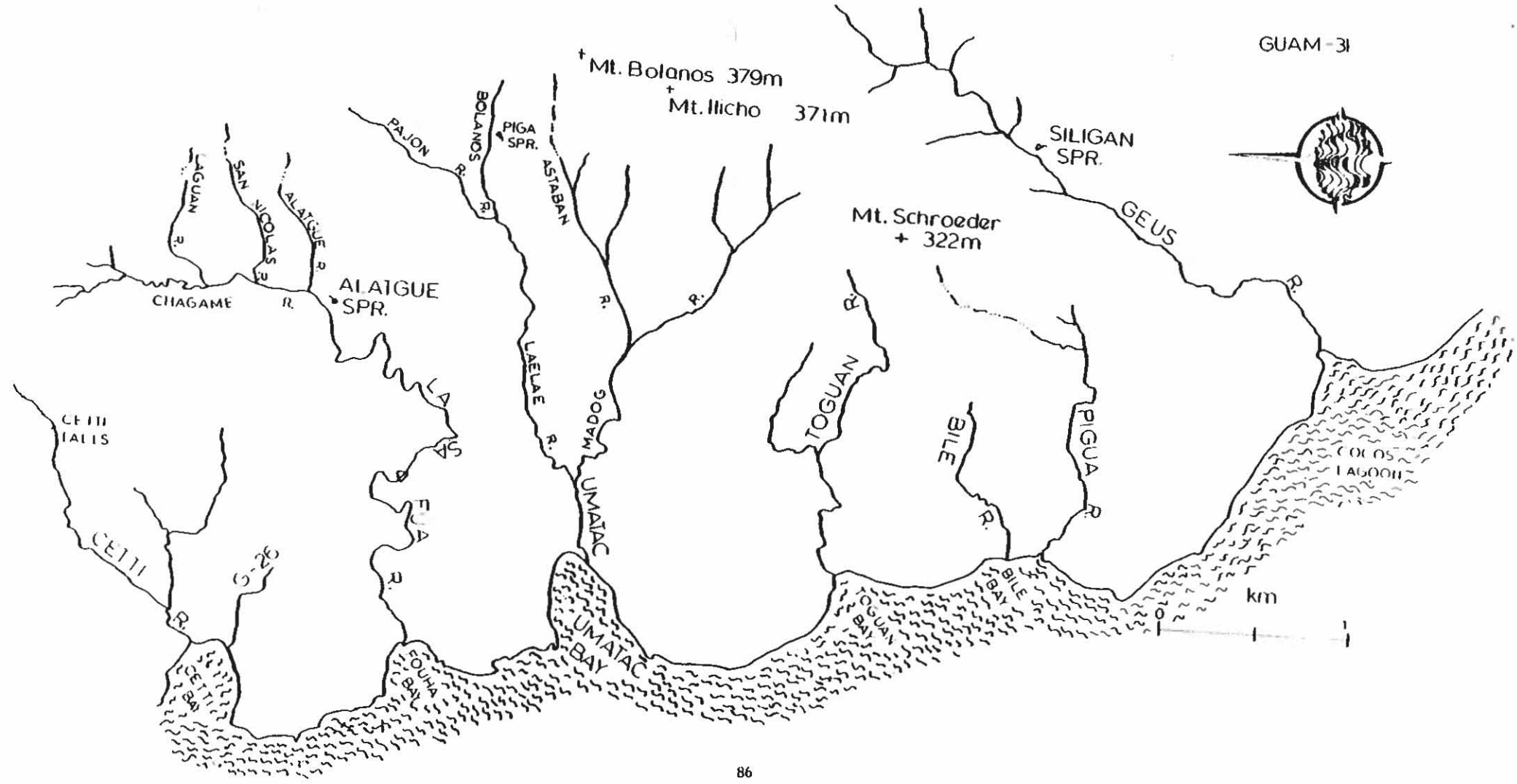
AVERAGE SLOPE (Z): 9.8

Additional Information:

1) The Bile has no perennial tributaries and drains into Bile Bay.



No record of the aquatic biota has been located.


GUAM - 31
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder + 322m
SILIGAN SPR.
PIGA SPR.
ALAIGUE SPR.
PAJON R.
BOLANOS R.
ASTABAN R.
SAN NICOLAS R.
ALAIGUE R.
AGUAN R.
CHAGAME R.
LAELAE R.
MADOG R.
UMATAC
UMATAC BAY
GEUS R.
TOGUAN R.
BILE R.
PIGUA R.
TOGUAN BAY
BILE BAY
COCOS LAGOON
FOUHA BAY
CETTI BAY
CETTI R.
S-26
km
0
1

Pigua River, Guam 31

COORDINATES: Lat. 13° 16' 27" N
Long. 144° 39' 42" E

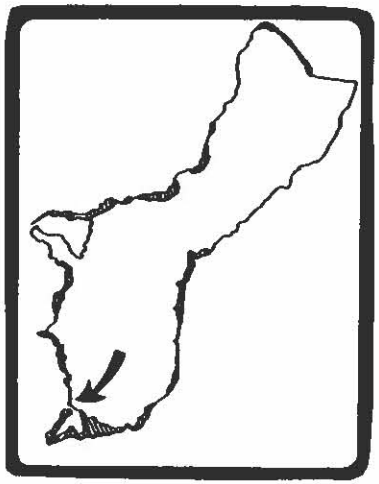
ELEVATION: 116 m

TOTAL RIVER SYSTEM DATA:

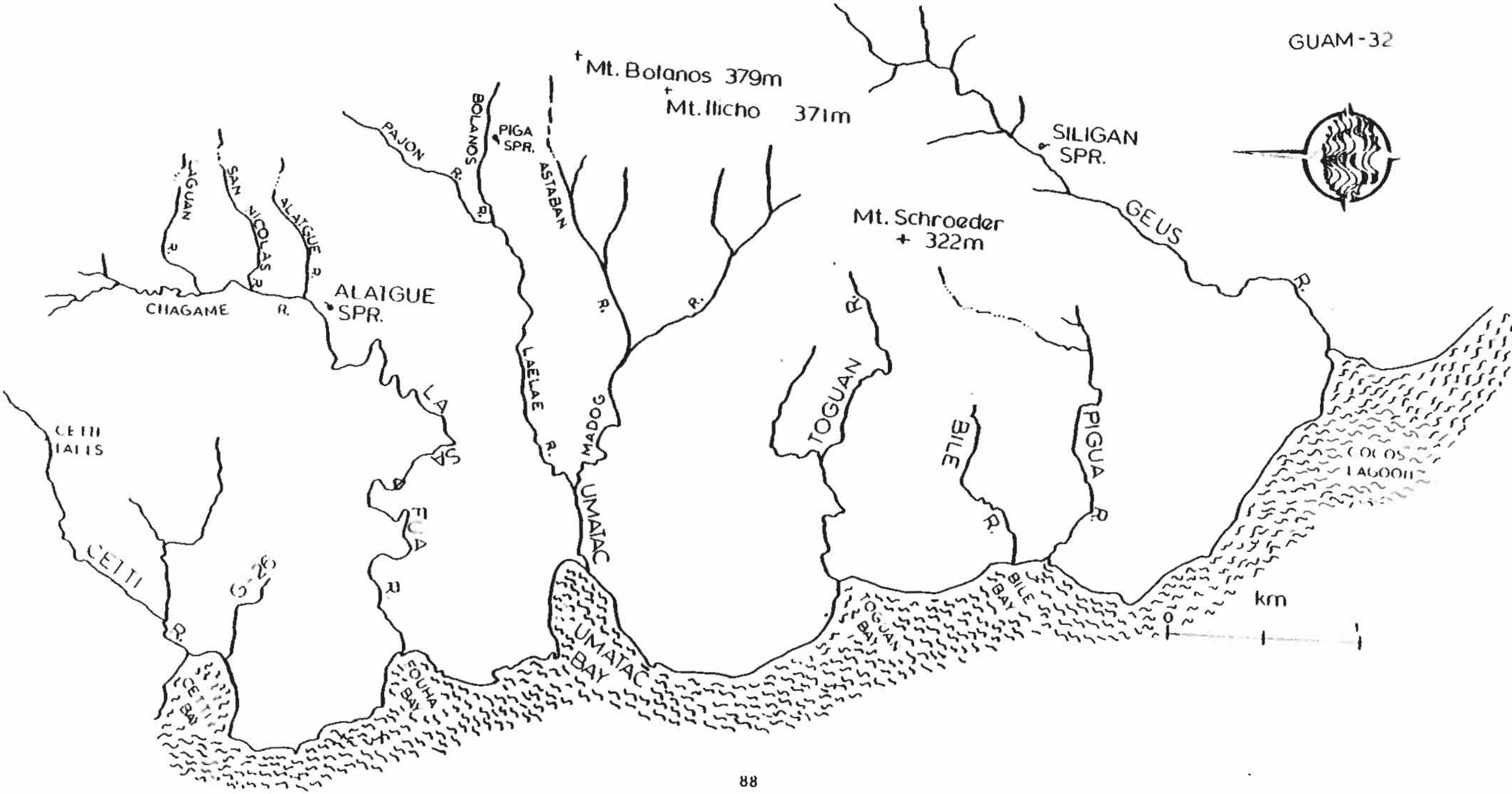
1)	Length of longest continuous perennial channel:	1,585 m
2)	Combined perennial channel lengths:	2,000 m
3)	Approximate drainage area:	99 ha
4)	Average slope (%):	11.9

Additional Information:

1) The Pigua has two perennial tributaries and drains into Bile Bay.



No record of the aquatic biota has been located.


GUAM-32
Mt. Bolanos 379m
Mt. Ilicho 371m
Mt. Schroeder
+ 322m
SILIGAN
SPR.
GEUS
R.
PIGA
SPR.
BOLANOS
R.
PAJON
R.
ASTABAN
R.
R.
SAN NICOLAS
R.
ALAIGUE
R.
ALAIGUE
SPR.
CHAGAME
R.
LA SA FUA
R.
LAELAE
R.
MADOG
UMATAC
UMATAC
BAY
TOGUAN
R.
TOGUAN
BAY
BILE
R.
BILE
BAY
PIGUA
R.
COCOS
LAGOON
CETTI
R.
G-26
FOUHA
BAY
km
0

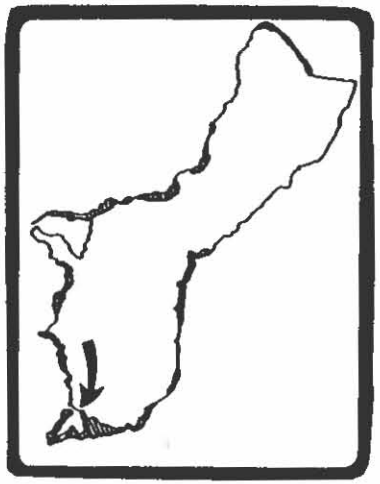
Geus River, Guam 32

COORDINATES: Lat. 13° 15' 40" N
Long. 144° 40' 21" E

ELEVATION: 150 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	3,840 m
2)	Combined perennial channel lengths:	5,616 m
3)	Approximate drainage area:	324 ha
4)	Average slope (%):	7.1



Additional Information:

1) Siligin Spring:
Lat. 13° 16' 32" N
Long. 144° 40' 51" E
Elev. 35 m
Average discharge : 190 m^3/day
2) The Geus has been altered by some dredge/fill construction related to a small boat channel at the river mouth.
3) Average daily discharge (ref. 133): 2,270 m^3. A small reservoir supplies potable water to Merizo Village.
4) See Appendix (Table 2) for physicochemical characteristics.

Reported Aquatic Organisms

ANIMALS

Invertebrates:

Atya sp.
Caridina spp.
Macrobrachium lar
Neritina pulligera

Vertebrates:

Anguilla marmorata
Awaous guamensis
Gambusia affinis
Kuhlia rupestris
Sicyopterus macrostetholepis
Stiphodon elegans
Tilapia mossambica

PLANTS

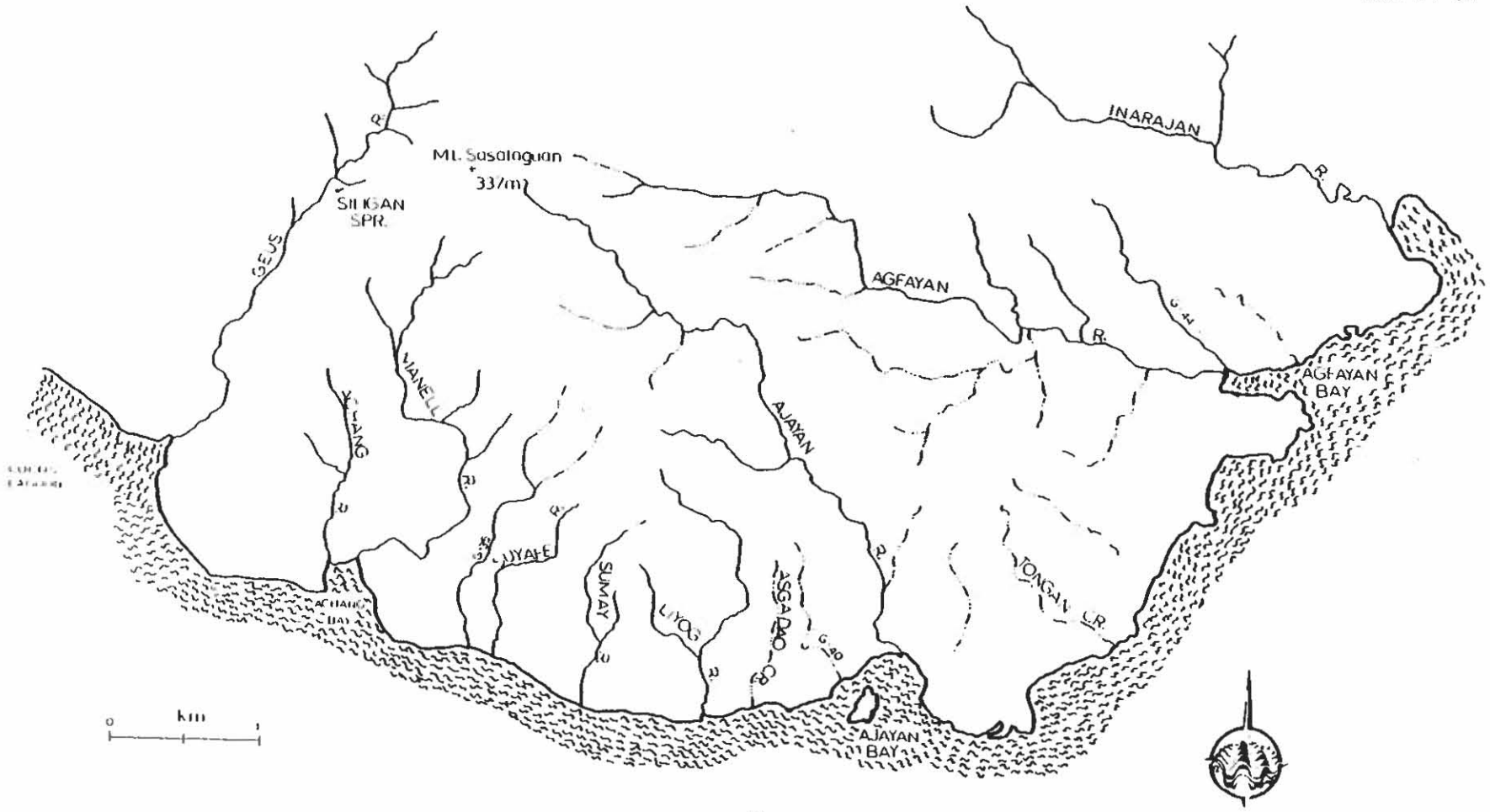
Hibiscus tiliaceus

See Appendix for additional biota.

Information from references:

133, 184, 280

GUAM -33


INARAJAN
R.
Mt. Sasalaguan
331m
SILIGAN
SPR.
GEUS
AGFAYAN
R.
AGFAYAN
BAY
MANELL
AJAYAN
R.
SUMAY
LIYOS
R.
ASGADAO
CR.
TONGAN CR.
AJAYAN
BAY
km
0
1

Achang River, Guam 33

COORDINATES: Lat. 13° 15' 15" N
Long. 144° 40' 56" E

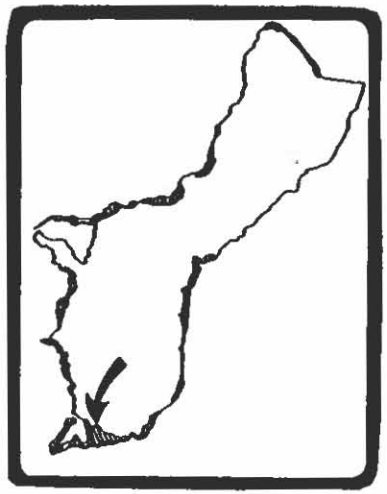
ELEVATION: 40 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	1,400 m
2)	Combined perennial channel lengths:	1,790 m
3)	Approximate drainage area:	82 ha
4)	Average slope (%):	6.5

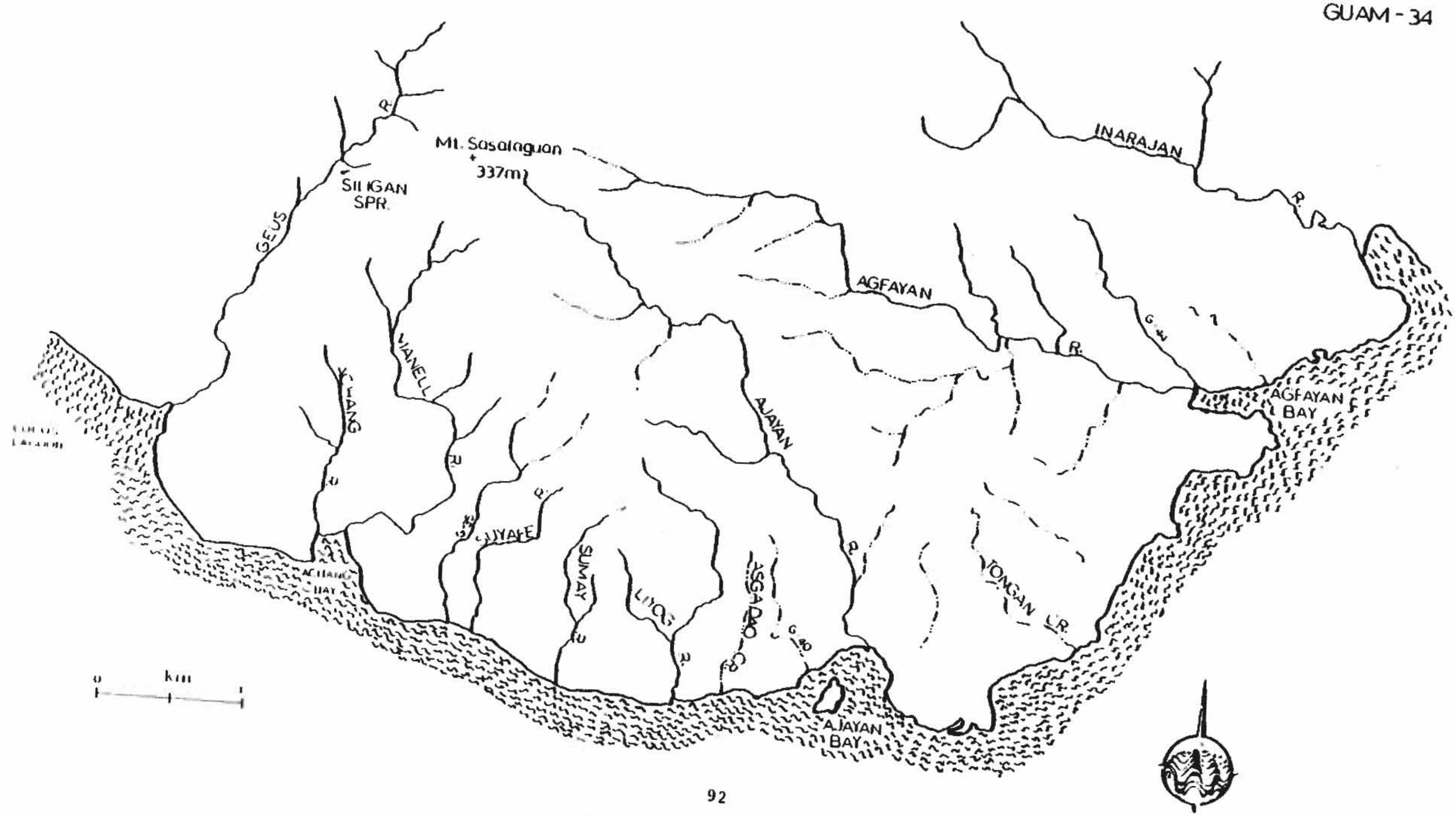
Additional information:

1) This stream, unnamed on USGS maps, has a perennial tributary and drains into Achang Bay.
2) This stream is also called the Julop (ref. 103).



No record of the aquatic biota has been located.

GUAM - 34


Mt. Sasalaguan
337m
SILIGAN
SPR.
GEUS
VIANELLI
CUYAFE
SUMAY
LIYOG
ASGADAO
CR.
AJAYAN
AJAYAN
BAY
TONGAN CR.
AGFAYAN
AGFAYAN
BAY
INARAJAN

Manell River, Guam 34

COORDINATES: Lat. 13° 15' 15" N
Long. 144° 41' 02" E

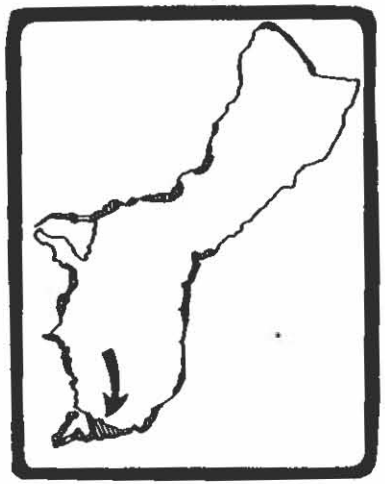
ELEVATION: 88 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	3,450 m
2)	Combined perennial channel lengths:	5,083 m
3)	Approximate drainage area:	253 ha
4)	Average slope (%):	8.1

Additional Information:

1) This stream has several perennial tributaries and the mouth is used as a boat launching area.



No record of the aquatic biota has been located.

GUAM -35
MANELL R.
G-35
SUYAFE R.
SUMAY R.
LIYOG R.
ASGADAO CR.
ASMAILE STR.
AJAYAN R.
AJAYAN BAY
km
0
1

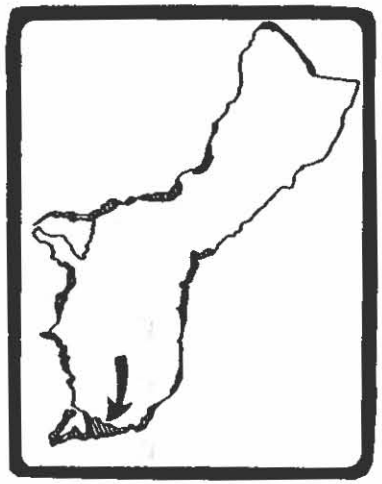
Unnamed Stream, Guam (between Manell and Sufafe Rivers) 35

COORDINATES: Lat. 13° 14' 56" N
Long. 144° 41' 27" E

ELEVATION: 98 m

TOTAL RIVER SYSTEM DATA:

1) Length of longest continuous perennial channel: 1,706 m
2) Combined perennial channel lengths: 1,783 m



Additional Information:

1) This stream has two short perennial tributaries and drains across Achang Reef.

No record of the aquatic biota has been located.

MANELL R.
G-35
SUYAFE R.
SUMAY R.
LIYOG R.
ASGADAO CR.
ASMAILE STR.
AJAYAN R.
GUAM - 36
AJAYAN BAY
0
km

Suyafe River, Guam 36

COORDINATES: Lat. 13° 14' 56" N
Long. 144° 41' 32" E

PERENNIAL CHANNEL LENGTH: 1,300 m

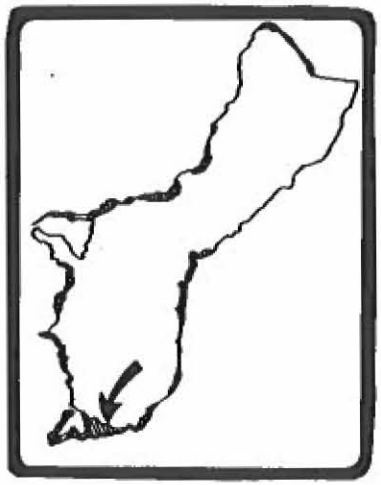
ELEVATION: 72 m

APPROXIMATE DRAINAGE AREA: 136 ha

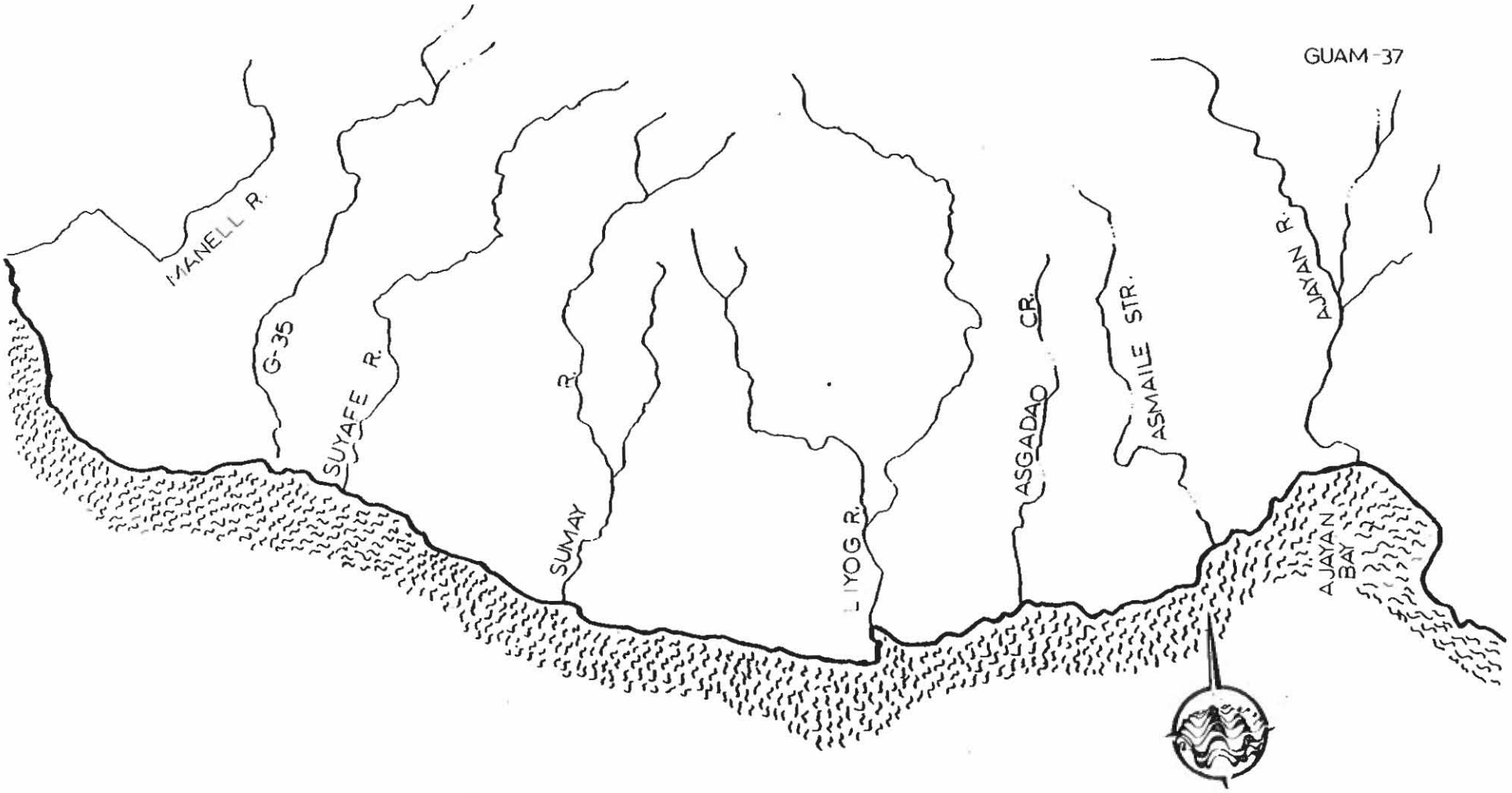
AVERAGE SLOPE (%): 8.4

Additional Information:

1) The Sufafe has no perennial tributaries.



No record of the aquatic biota has been located.


MANELL R.
G-35
SUYAFE R.
SUMAY R.
LIYOG R.
ASGADAO CR.
ASMAILE STR.
AJAYAN R.
AJAYAN BAY
0
km
1

SUMAY RIVER SYSTEM

GUAM-37

Sumay River, Guam 37

COORDINATES: Lat. 13° 14' 46" N
Lat. 144° 41' 51" E

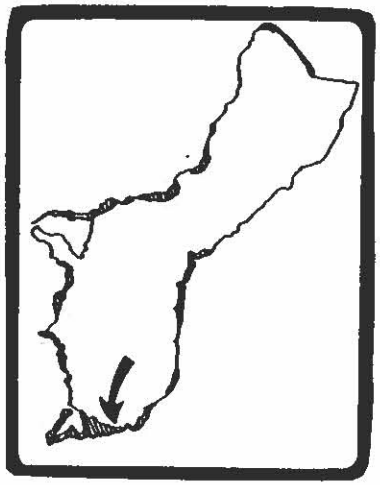
ELEVATION: 76 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	1,250 m
2)	Combined perennial channel lengths:	1,646 m
3)	Approximate drainage area:	50 ha
4)	Average slope (%):	9.5

Additional Information:

1) This stream has two perennial tributaries.



No record of the aquatic biota has been located.

GUAM-38
MANELL R.
G-35
SUYAFE R.
R.
SUMAY
LIYOG R.
ASGADAO CR.
ASMAILE STR.
AJAYAN R.
AJAYAN BAY
km
0
1
100

Liyog River, Guam 38

COORDINATES: Lat. 13° 14' 43" N
Long. 144° 42' 19" E

ELEVATION: 137 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	1,950 m
2)	Combined perennial channel lengths:	2,760 m
3)	Approximate drainage area:	108 ha
4)	Average slope (%):	8.0

Additional Information:

1) The Liyog has one perennial tributary.

No record of the aquatic biota has been located.

GUAM-39
MANELL R.
G-35
SUYAFE R.
SUMAY R.
LIYOG R.
ASGADAO CR.
ASMAILE STR.
AJAYAN R.
AJAYAN BAY
0
km
1

Asgadao Creek, Guam 39

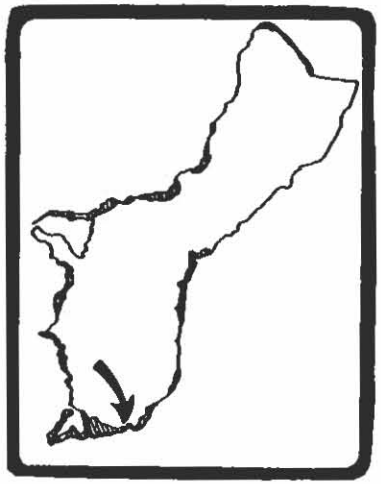
COORDINATES: Lat. 13° 14' 45" N
Long. 144° 42' 32" E

INTERMITTENT CHANNEL LENGTH: 952 m

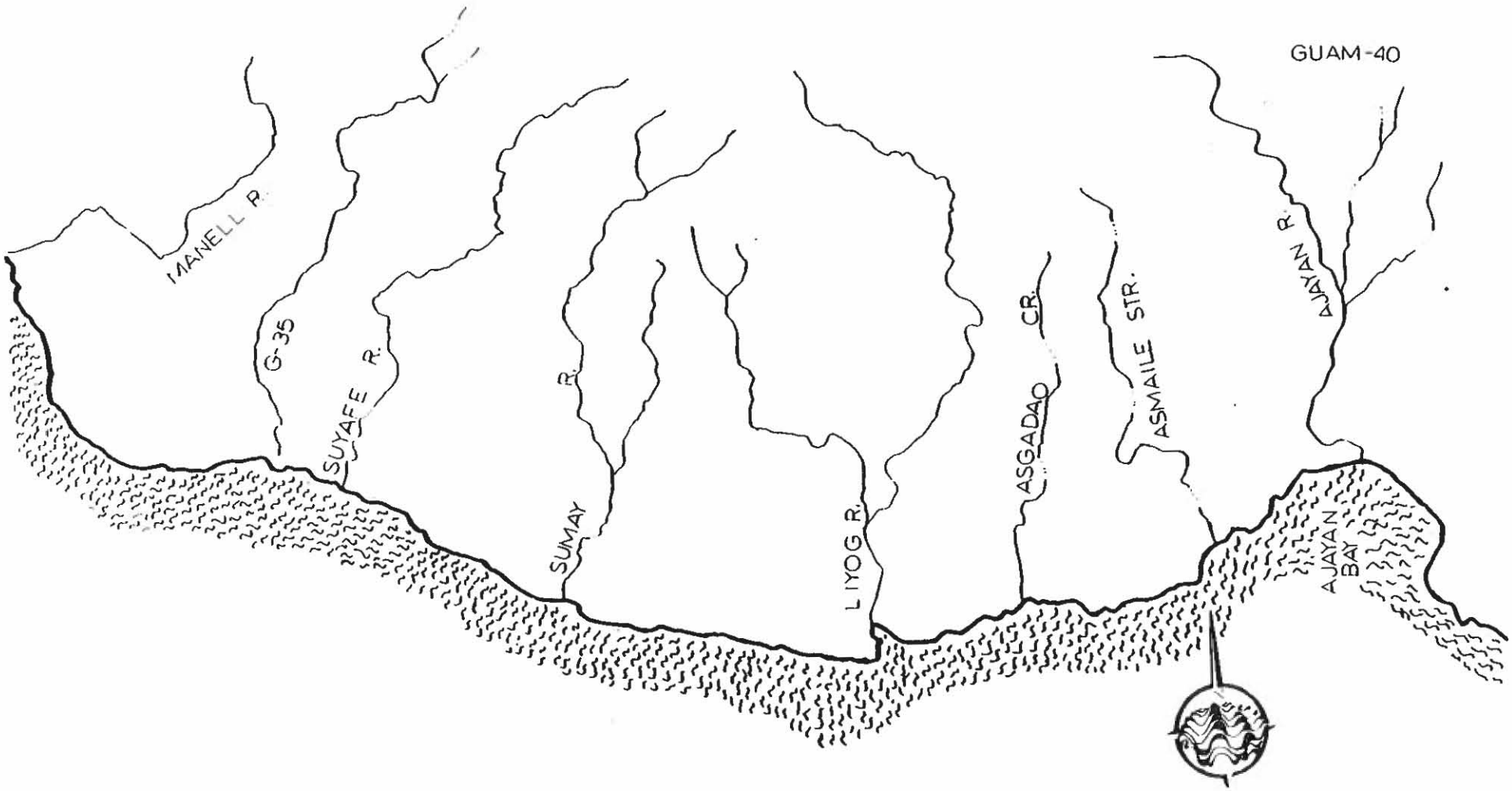
ELEVATION: 55 m

Additional Information:

1) This is an intermittent stream along the south coast.



No record of the aquatic biota has been located.


GUAM-40
MANELL R.
G-35
SUYAFE R.
SUMAY R.
LIYOG R.
ASGADAO CR.
ASMAILE STR.
AJAYAN R.
AJAYAN BAY
0
km
1

"Asmaile" Stream, Guam 40

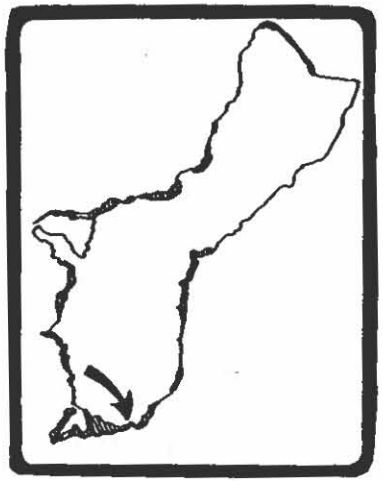
COORDINATES: Lat. 13° 14' 49" N
Long. 144° 42' 48" E

INTERMITTENT CHANNEL LENGTH: 1,000 m

ELEVATION: 67 m

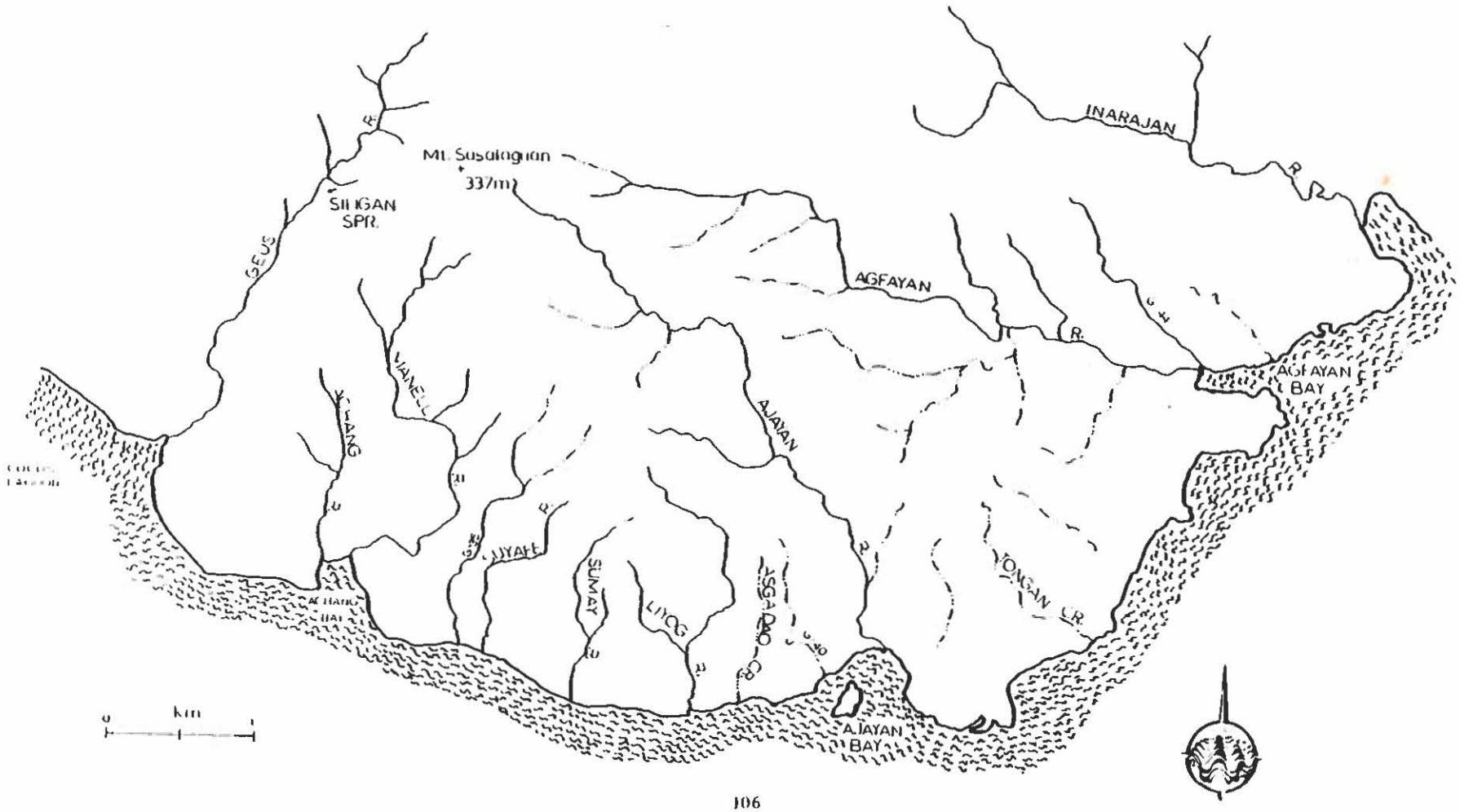
Additional Information:

1) This is an intermittent stream between Asgadao and Ajayan streams.
2) Unnamed on USGS maps, this stream flows to Asmaile Pt.



No record of the aquatic biota has been reported.

GUAM -41


Mt. Susalagian
337m
SIIGAN SPR.
INARAJAN R.
AGFAYAN R.
AGFAYAN BAY
AJAYAN
AJAYAN BAY
SUMAY
LINCG
YONGAN LR.
km

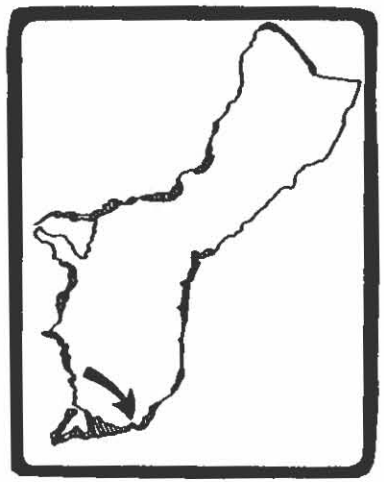
Ajayan River, Guam 41

COORDINATES: Lat. 13° 14' 58" N
Long. 144° 43' 01" E

ELEVATION: 183 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	4,465 m
2)	Combined perennial channel lengths:	5,882 m
3)	Approximate drainage area:	358 ha
4)	Average slope (%):	7.8



Additional Information:

1) This drainage basin was drastically affected by Typhoon Pamela (5-21-76); a narrow delta of alluvial deposits existed at the river mouth, but was destroyed by the typhoon.
2) This stream frequently clogs with silt due to grass fires.
3) The Ajayan has many small perennial tributaries. A defunct secondary monitoring station just above Ajayan Bay indicated a maximum dischcarge rate of 0.01 m^3/s and a minimum of 0.003 m^3/s.

Reported Aquatic Organisms

ANIMALS

Vertebrates:

Gambusia affinis
Tilapia sp.

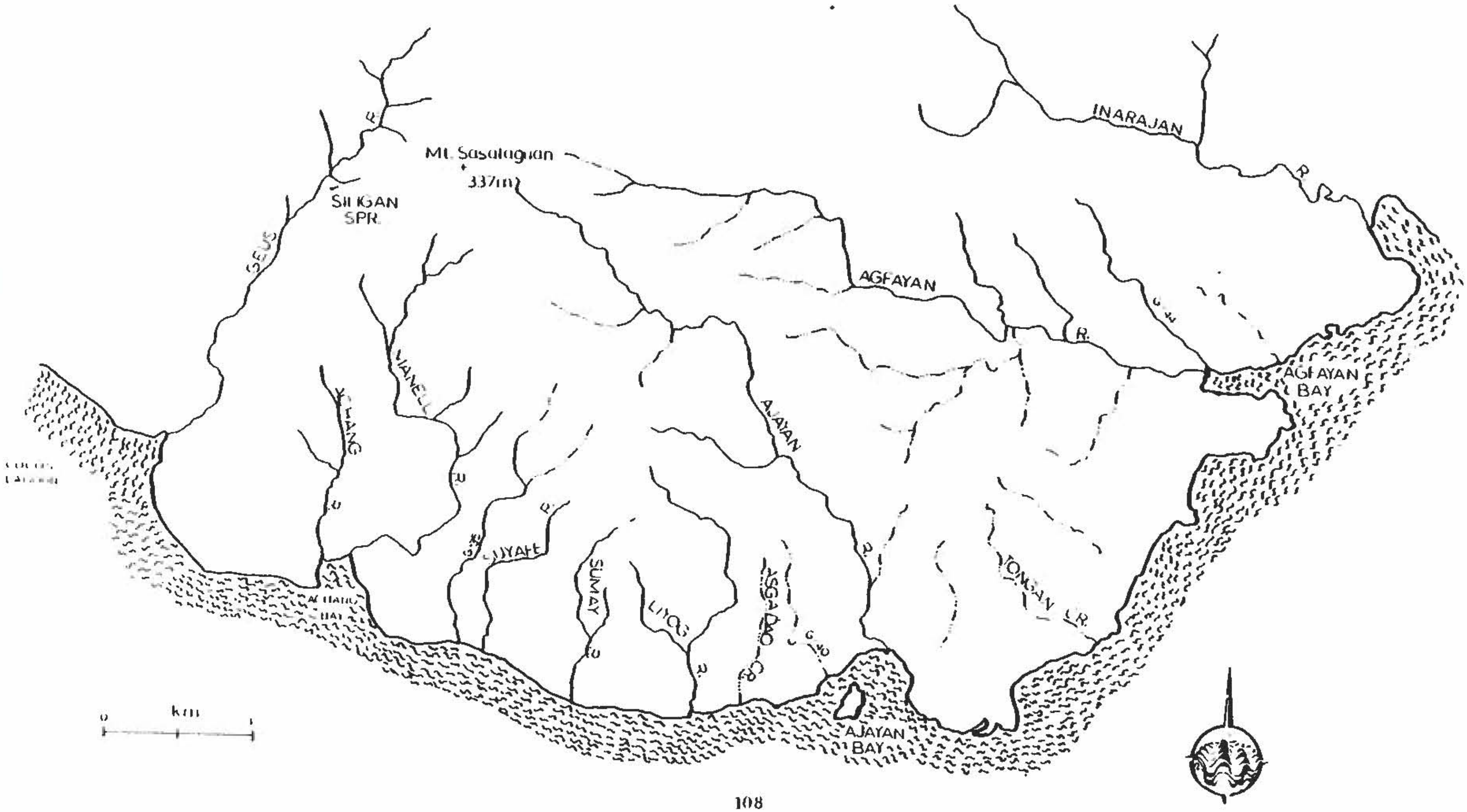
PLANTS

Hibiscus tiliaceus
Phragmites karka

Information from reference:

184

GUAM -42


Mt. Sasalaguan
337m
SILIGAN SPR.
GEUS
INARAJAN
R.
AGFAYAN
R.
AGFAYAN BAY
AJAYAN
R.
TONGAN CR.
SUMAY
LIYOG
R.
ASGADAO CR.
AJAYAN BAY
CUYAFE
MANELL
ACHANG
km

Tongan Creek, Guam 42

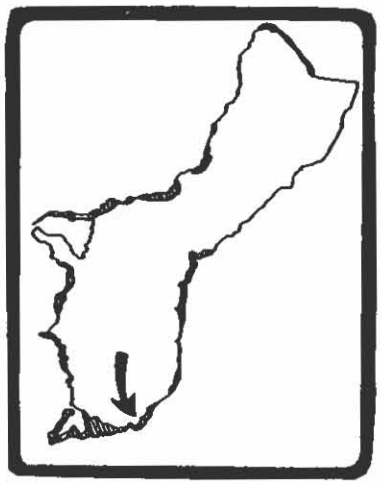
COORDINATES: Lat. 13° 15' 00" N
Long. 144° 43' 50" E

INTERMITTENT CHANNEL LENGTH: 1,225 m

ELEVATION: 49 m

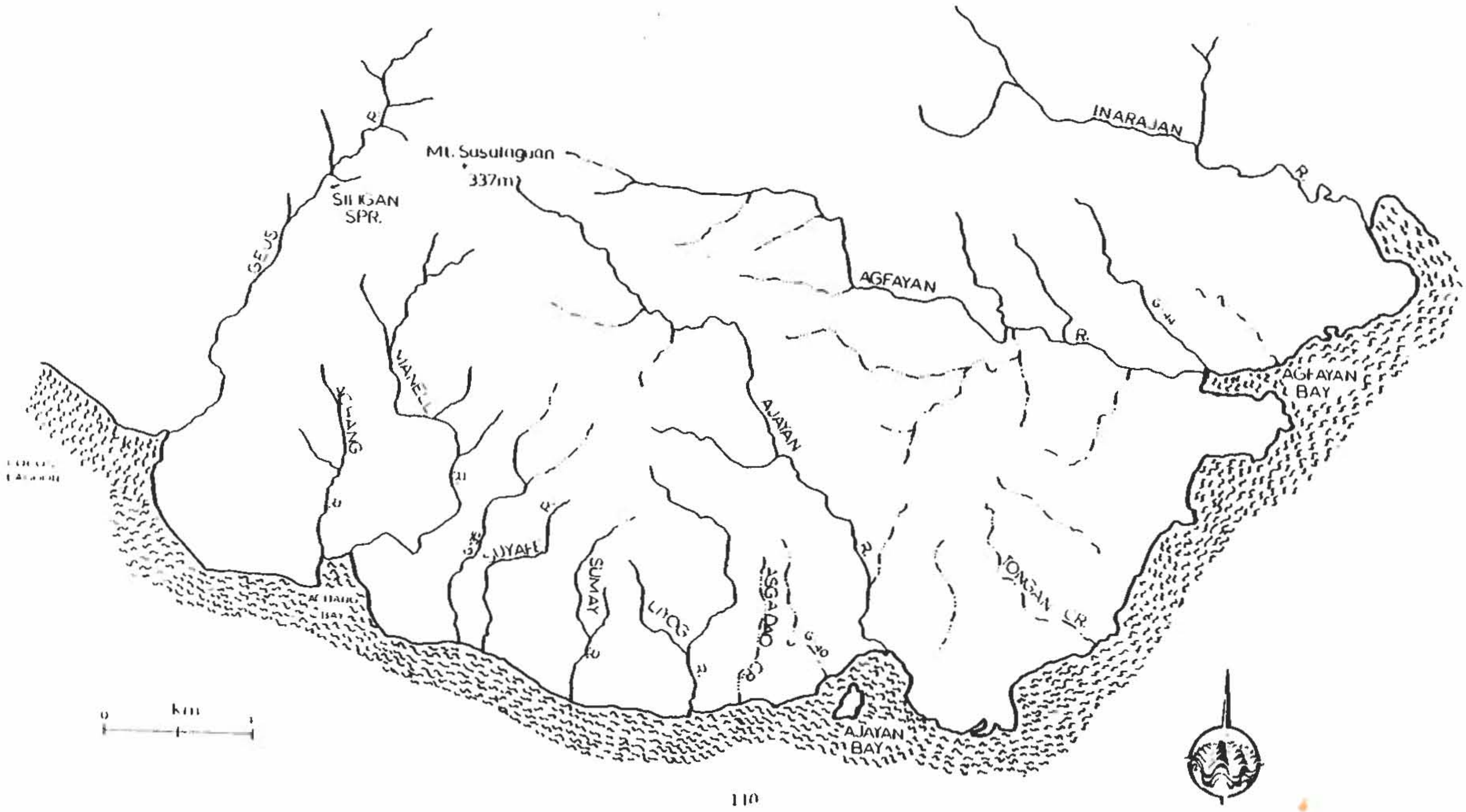
Additional Information:

1) This is an intermittent stream that discharges at Guijen Pt.



No record of the aquatic biota has been located.

GUAM-43


INARAJAN
R.
Mt. Susulaguan
337m
SILIGAN
SPR.
GEUS
AGFAYAN
R.
AGFAYAN
BAY
AJAYAN
R.
SUMAY
AJAYAN
BAY
Km
0
1

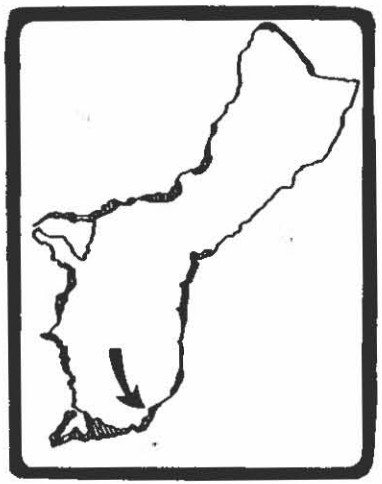
Agfayan River, Guam 43

COORDINATES: Lat. 13° 15' 59" N
Long. 144° 44' 10" E

ELEVATION: 146 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	5,060 m
2)	Combined perennial channel lengths:	7,200 m
3)	Approximate drainage area:	575 ha
4)	Average slope (%):	5.2



Additional Information:

1) The area has been affected by agricultural encroachment and dredge/fill intrusion related to active roadway and bridge construction along the river mouth area.
2) A presently defunct secondary monitoring site just above the river mouth indicated a high discharge rate of 0.01 m^3/s and a low discharge rate of 0.004 m^3/s during the years 1962-65.
3) The Agfayan supports *Anguilla*, *Macrobrachium* and finfish grow-out ponds.

Reported Aquatic Organisms

ANIMALS

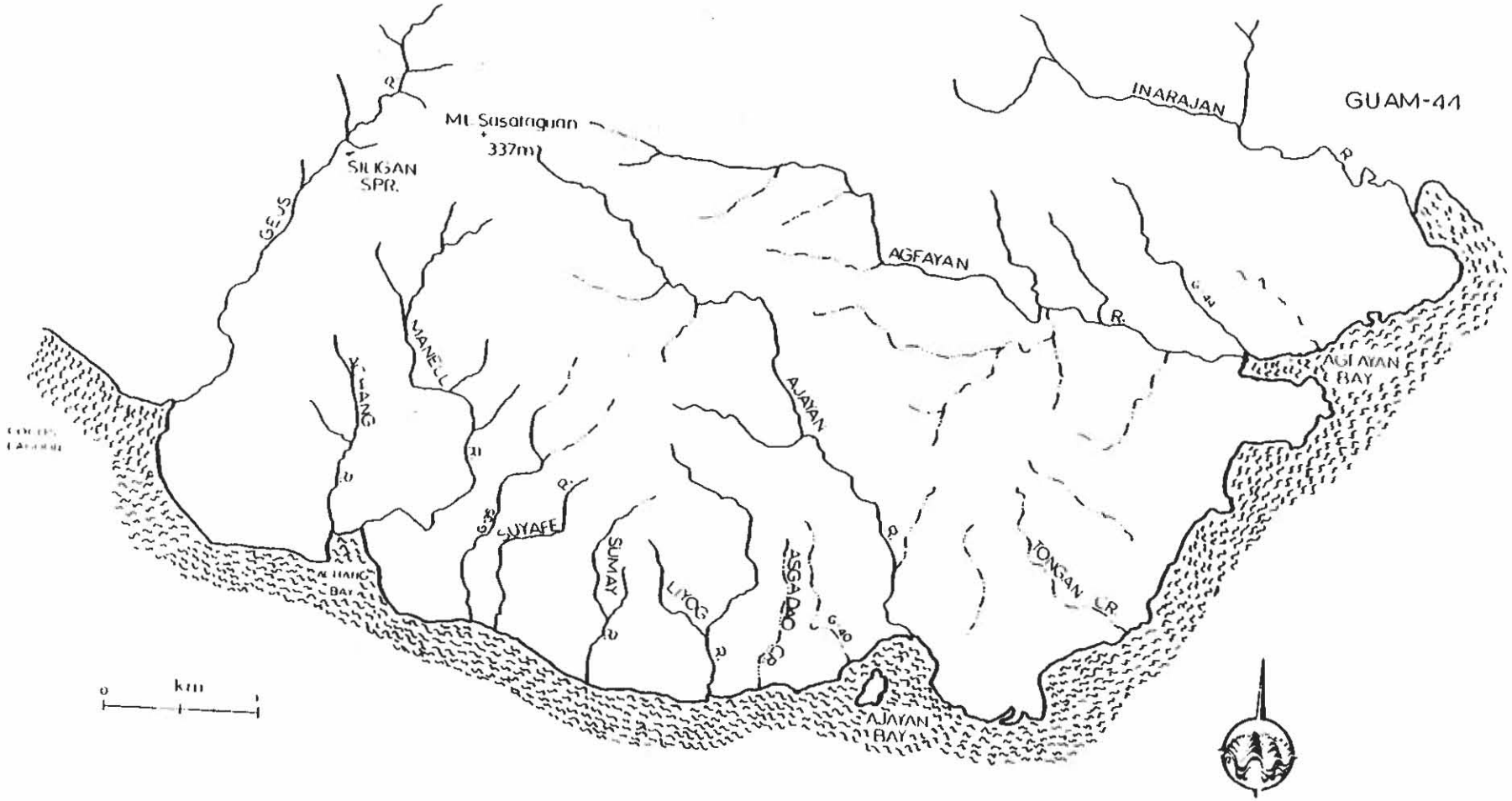
Vertebrates:

Anguilla sp.
Gambusia affinis
Oxyurichthys guibei
Stigmatogobius versicolor
Tilapia sp.

See Appendix for additional biota.

Information from references:

132, 184


GUAM-41
Mt. Sasalaguan
+
337m
SILIGAN
SPR.
GEUS
R.
INARAJAN
R.
AGFAYAN
R.
AGFAYAN
BAY
MANELL
YIENG
R.
SUYAFE
R.
SUMAY
R.
LIYOG
R.
ASGADO
R.
AJAYAN
R.
TONGAN
R.
AJAYAN
BAY
0
km
1

"Asdonao" Stream, Guam 44

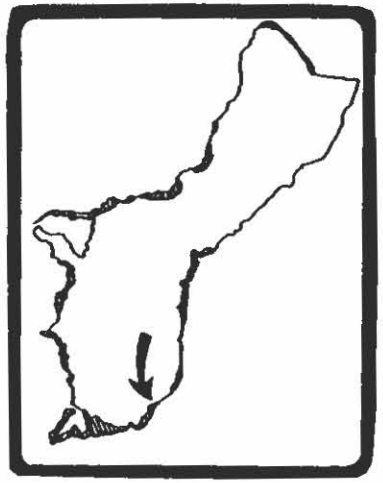
COORDINATES: Lat. 13° 16' 02" N
Long. 144° 44' 10" E

INTERMITTENT CHANNEL LENGTH: 1,455 m

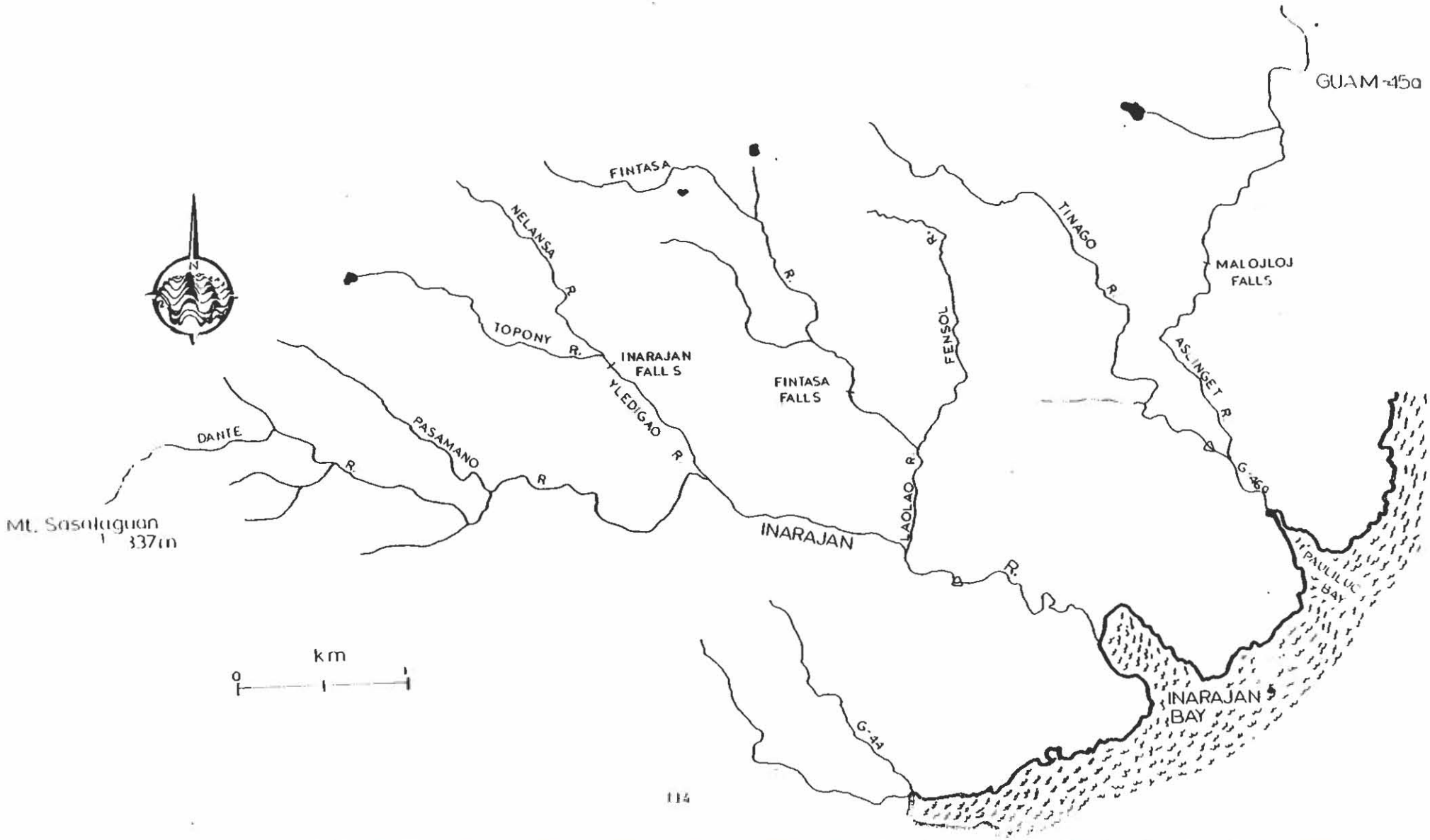
ELEVATION: 46 m

Additional Information:

1) This perennial stream discharges through Aspupong to Agfayan Bay.
2) Just north (500 m) is an intermittent drainage channel.
3) This stream is unnamed on USGS maps.



No record of the aquatic biota has been located.


GUAM
FINTASA
NELANSA R.
TOPONY R.
INARAJAN FALLS
YLEDIGAO R.
FINTASA FALLS
R.
FENSOL R.
TINAGO R.
MALOJLOJ FALLS
ASINGET R.
G-45a
DANTE R.
PASAMANO R.
Mt. Sasalaguan
337m
INARAJAN
LAOLAO R.
R.
PAULILUC BAY
INARAJAN BAY
G-44
N
km
0
1

Inarajan River, Guam 45a

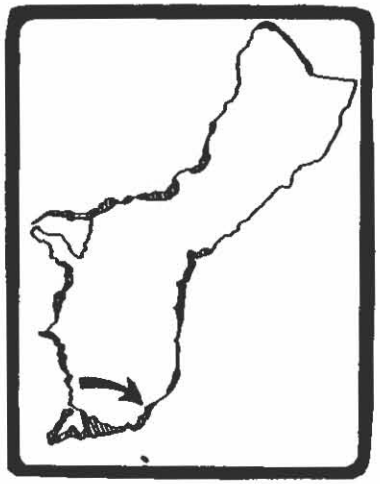
COORDINATES: Lat. 13° 16' 30" N
Long. 144° 44' 44" E

ELEVATION: 156 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	6,830 m
2)	Combined perennial channel lengths:	14,785 m
3)	Approximate drainage area:	1,301 ha
4)	Average slope (%):	4.6

LENGTH OF THE INARAJAN: 1,660 m



Additional Information:

1) Gaging Station:
   Lat. 13° 16' 41" N
   Long. 144° 44' 15" E
   Elev. 4.6 m
   Average (20 yr) discharge: 0.496 m^3/s
2) The flood plain is large and used extensively for pasturage and farming.
3) The Inarajan has 9 major tributaries and supplies domestic water for Inarajan Village.
4) See Appendix (Table 2) for physicochemical characteristics.

Reported Aquatic Organisms

ANIMALS

Invertebrates:

Atya serrata
Caridina nilotica
Macrobrachium lar

Vertebrates:

Anguilla sp.
Awaous guamensis
Gambusia affinis
Kuhlia rupestris
Sicyopterus macrostetholepis
Stiphodon elegans
Tilapia mossambica

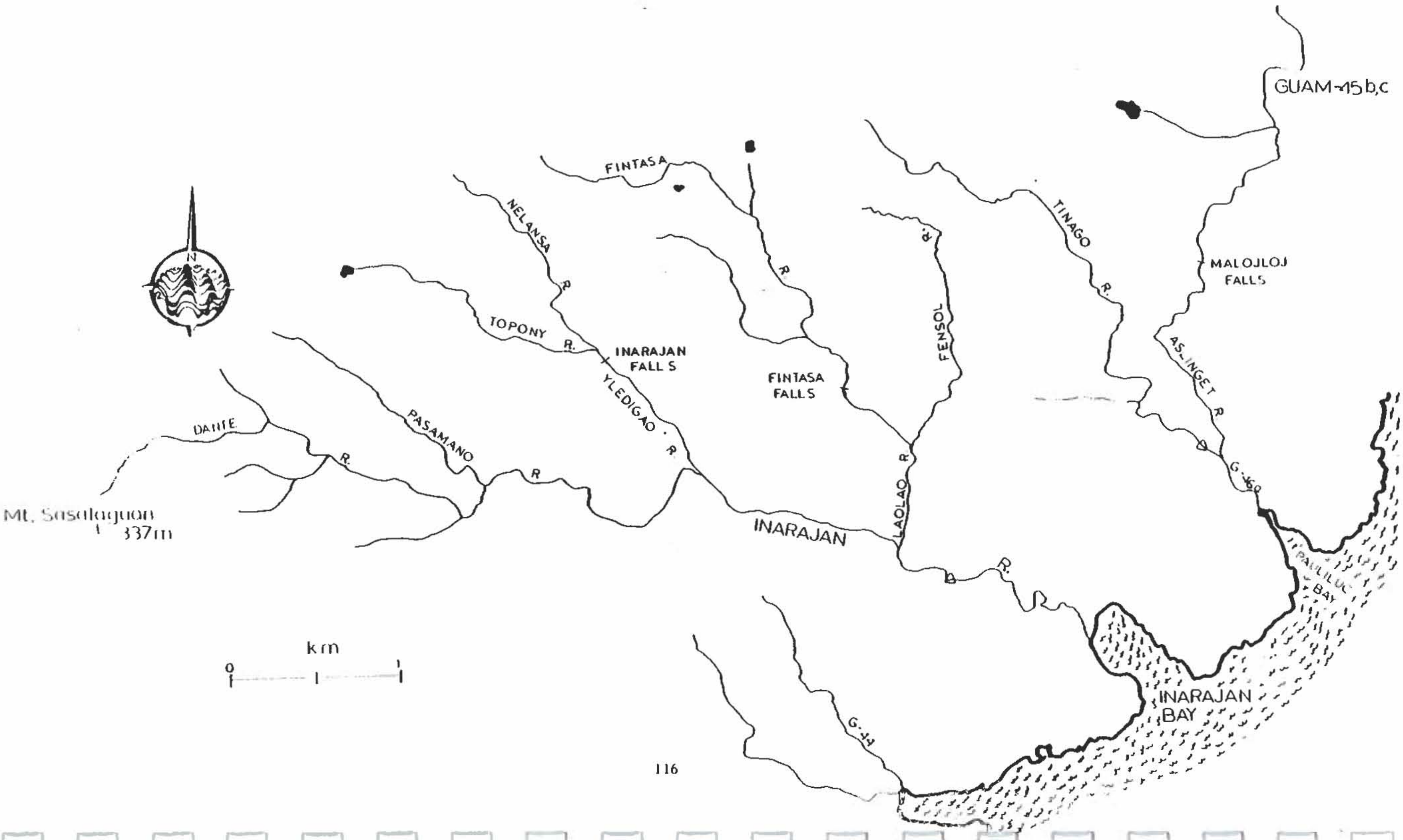
PLANTS

Spirogyra sp.

See Appendix for additional biota

Information from references:

3, 184


GUAM-15 b,c
FINTASA
NELANSA R.
TOPONY R.
INARAJAN FALLS
FINTASA FALLS
FENSOL
R.
TINAGO R.
MALOJLOJ FALLS
ASLINGET R.
DANTE R.
PASAMANO R.
YLEDIGAO R.
INARAJAN R.
LAOLAO R.
G-60
PAULILUC BAY
INARAJAN BAY
Mt. Sasalaguan
337m
km
0
1
G-44
N

Laolao River, Guam 45b

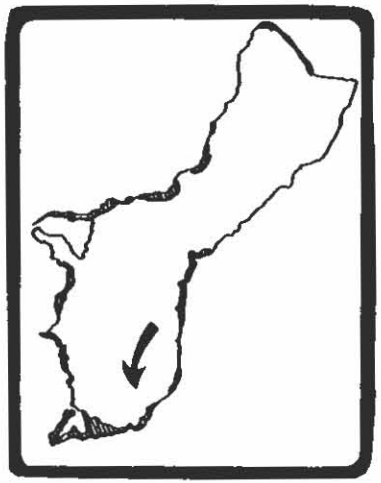
COORDINATES: Lat. 13° 16' 46" N
Long. 144° 44' 06" E

LENGTH OF THE LAOLAO: 650 m

ELEVATION: 37 m

Additional Information:

1) This stream drains into the Inarajan River and has 2 major tributaries: the Fintasa and Fensol.



No record of the aquatic biota has been located.

Fensol River, Guam 45c

COORDINATES: Lat. 13° 17' 06" N
Long. 144° 44' 08" E

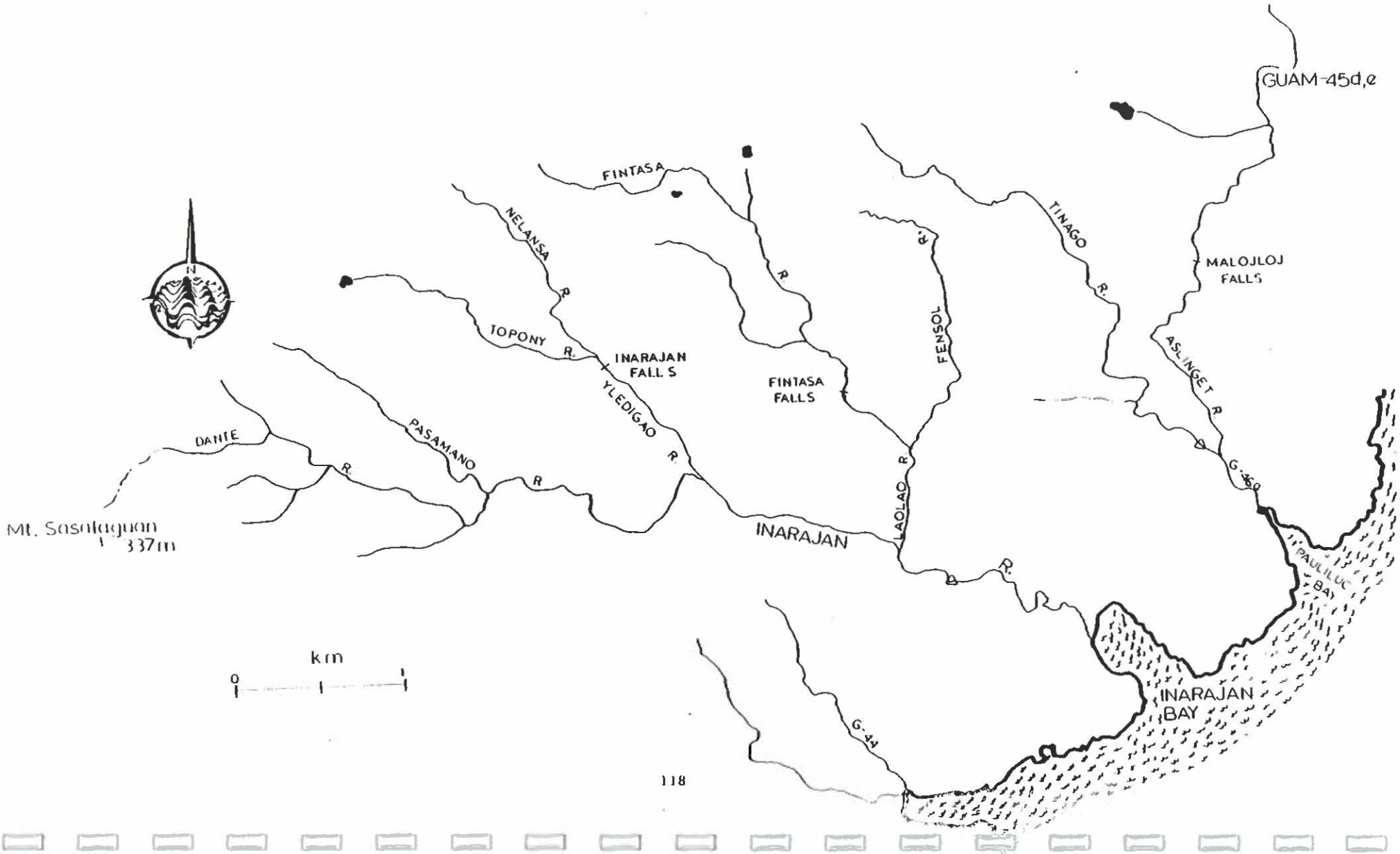
PERENNIAL CHANNEL LENGTH: 1,770 m

ELEVATION: 100 m

Additional Information:

1) This stream drains into the Laolao.

No record of the aquatic biota has been located.


GUAM-45d,e
FINTASA
NELANSA R.
TOPONY R.
INARAJAN FALLS
YLEDIGAO R.
FINTASA FALLS
FENSOL R.
TINAGO R.
MALOJLOJ FALLS
ASLINGET R.
G-46a
DANTE
R.
PASAMANO R.
Mt. Sasalaguan
337m
INARAJAN
LAOLAO R.
R.
PAULILUC BAY
INARAJAN BAY
G-44
N
km
0
1

Fintasa River, Guam 45d

COORDINATES: Lat. 13° 17' 06" N
Long. 144° 44' 08" E

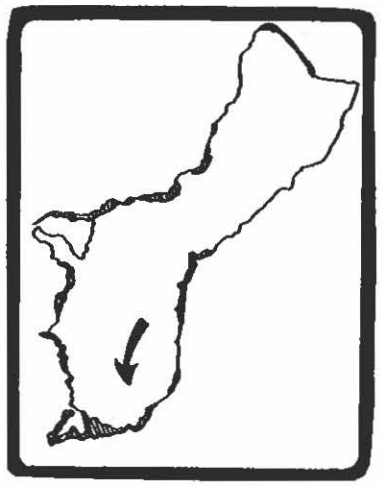
PERENNIAL CHANNEL LENGTH: 4,665 m

ELEVATION: 137 m

Additional Information:

1) Fintasa Falls:
Lat. 13° 17' 16" N
Long. 144° 43' 54" E
Elev. 64 m
2) This stream drains into the Laolao and has 2 tributaries.

No record of the aquatic biota has been located.



Yledigao River, Guam 45e

COORDINATES: Lat. 13° 16' 00" N
Long. 144° 43' 27" E

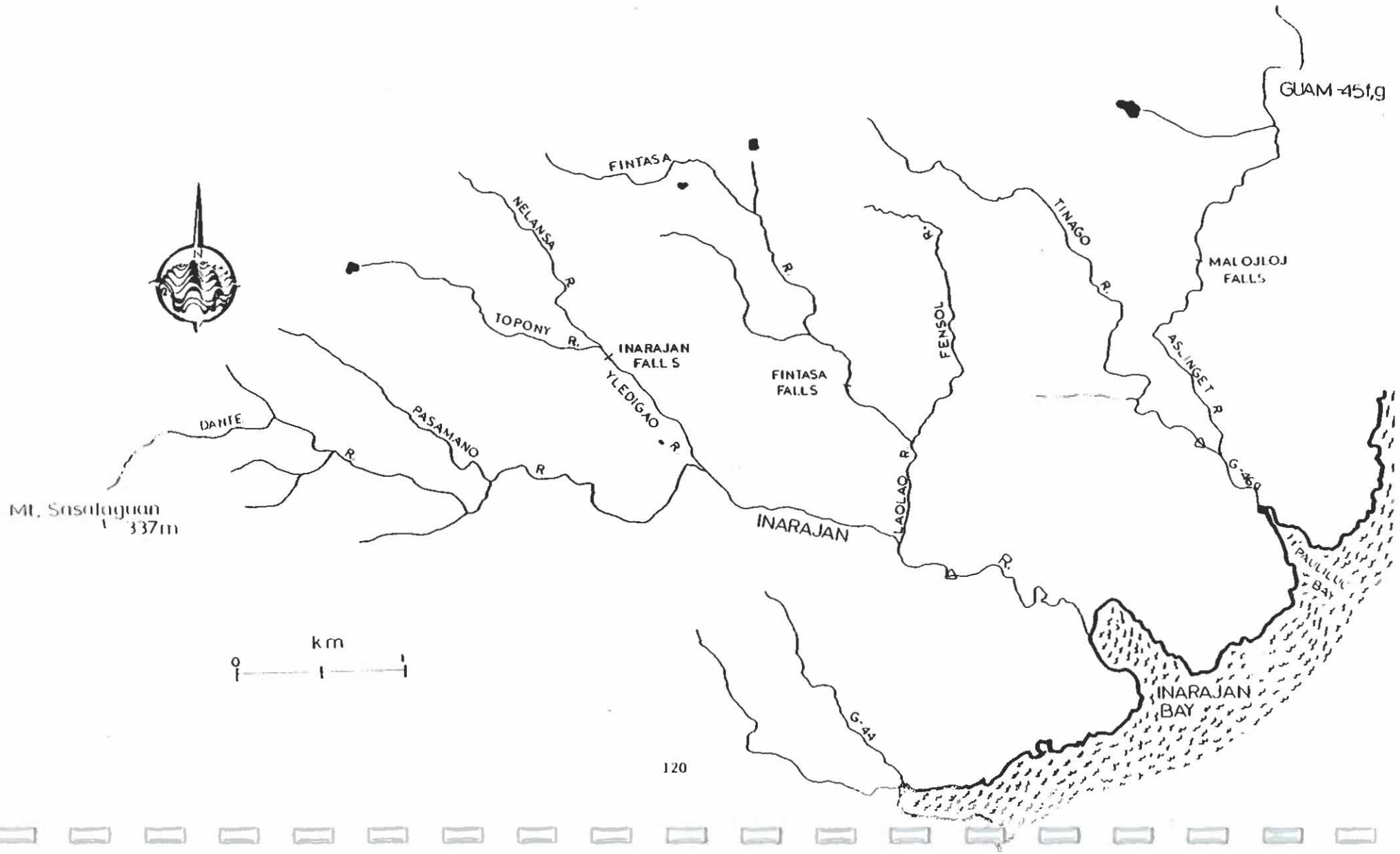
PERENNIAL CHANNEL LENGTH: 1,112 m

ELEVATION: 61 m

Additional Information:

1) Inarajan Falls:
Lat. 13° 17' 21" N
Long. 144° 43' 08" E
Elev. 53 m
2) This stream drains into the Inarajan channel.

No record of the aquatic biota has been located.


GUAM -451.9
FINTASA
NELANSA R.
TOPONY R.
INARAJAN FALLS
YLEDIGAO R.
FINTASA FALLS
FENSOL R.
TINAGO R.
MALOJLOJ FALLS
ASINGET R.
G-46.9
DANTE
PASAMANO R.
R.
Mt. Sasalaguan
337m
INARAJAN
LAOLAO R.
R.
PAULILUC BAY
km
0
1
G-44
INARAJAN BAY

Topony River, Guam 45f

COORDINATES: Lat. 13° 17' 23" N
Long. 144° 43' 06" E

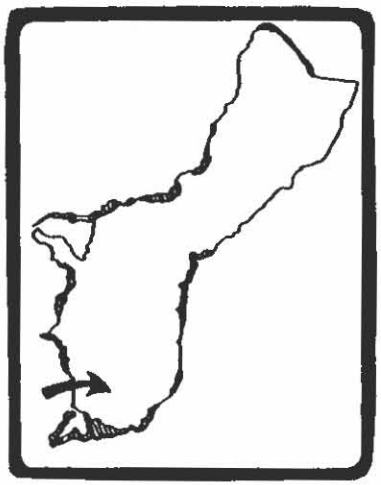
PERENNIAL CHANNEL LENGTH: 1,950 m

ELEVATION: 155 m

Additional Information:

1) The stream drains into the Yledigao.
2) A small pond is at the headwaters.

No record of the aquatic biota has been located.



Nelansa River, Guam 45g

COORDINATES: Lat. 13° 17' 23" N
Long. 144° 43' 06" E

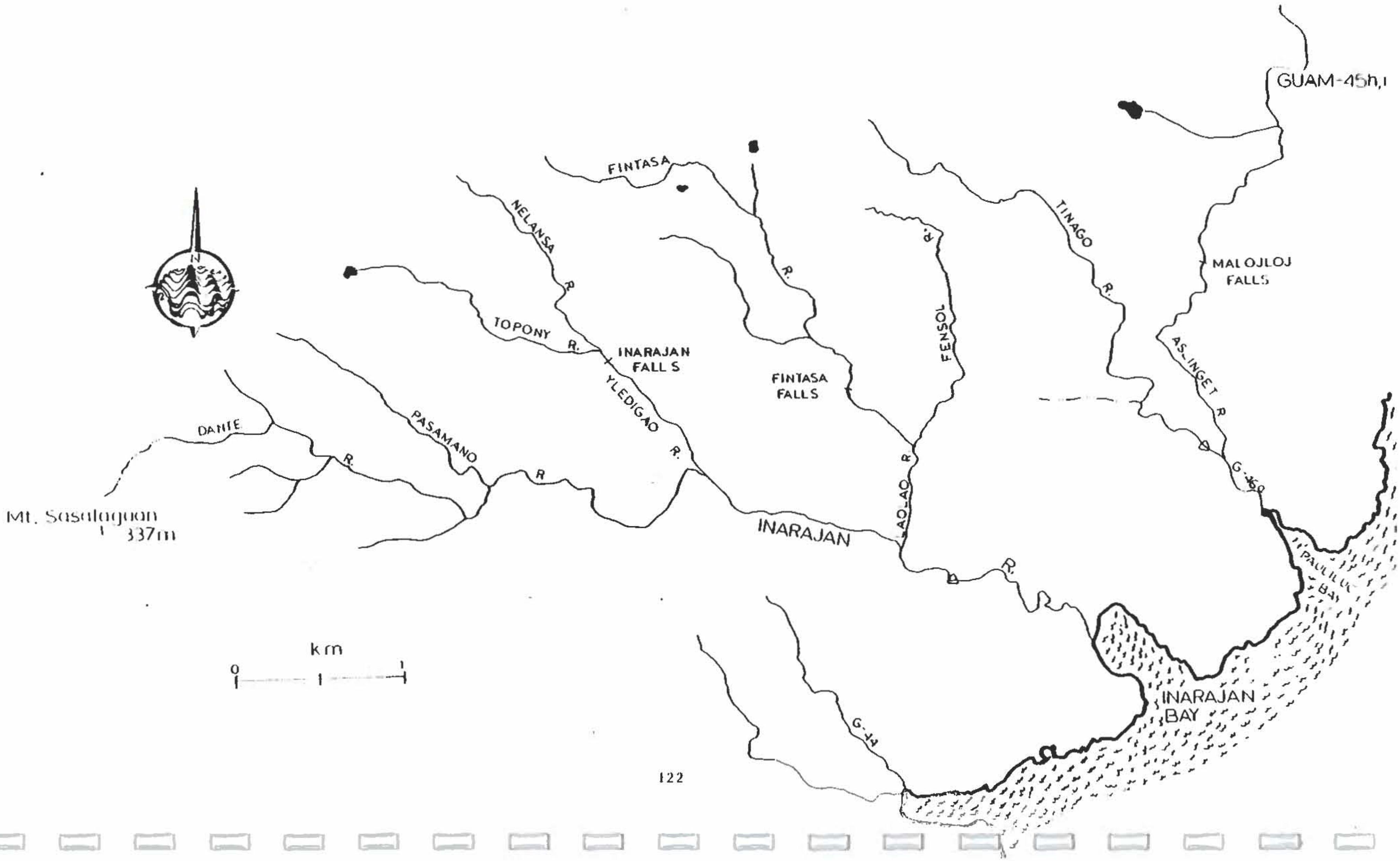
PERENNIAL CHANNEL LENGTH: 1,585 m

ELEVATION: 128 m

Additional Information:

1) This stream drains into the Yledigao.

No record of the aquatic biota has been located.


GUAM-45h,i
FINTASA
NELANSA R.
R.
TINAGO R.
MALOJLOJ FALLS
TOPONY R.
INARAJAN FALLS
FINTASA FALLS
FENSOL
YLEDIGAO R.
AS-INGET R
DANTE
PASAMANO
R.
R
LAOLAO R
G-160
INARAJAN
R.
Mt. Sasalaguan 337m
PAULUC BAY
km
0
1
INARAJAN BAY
G-44

Pasamano River, Guam 45h

COORDINATES: Lat. 13° 16' 00" N
Long. 144° 43' 27" E

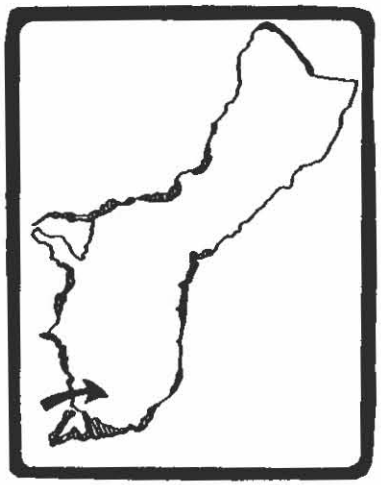
PERENNIAL CHANNEL LENGTH: 3,155 m

ELEVATION: 169 m

Additional Information:

1) This stream drains into the Inarajan and has 1 major tributary: Dante River.

No record of the aquatic biota has been located.



GUAM-45h,i

Dante River, Guam 45i

COORDINATES: Lat. 13° 16' 47" N
Long. 144° 42' 40" E

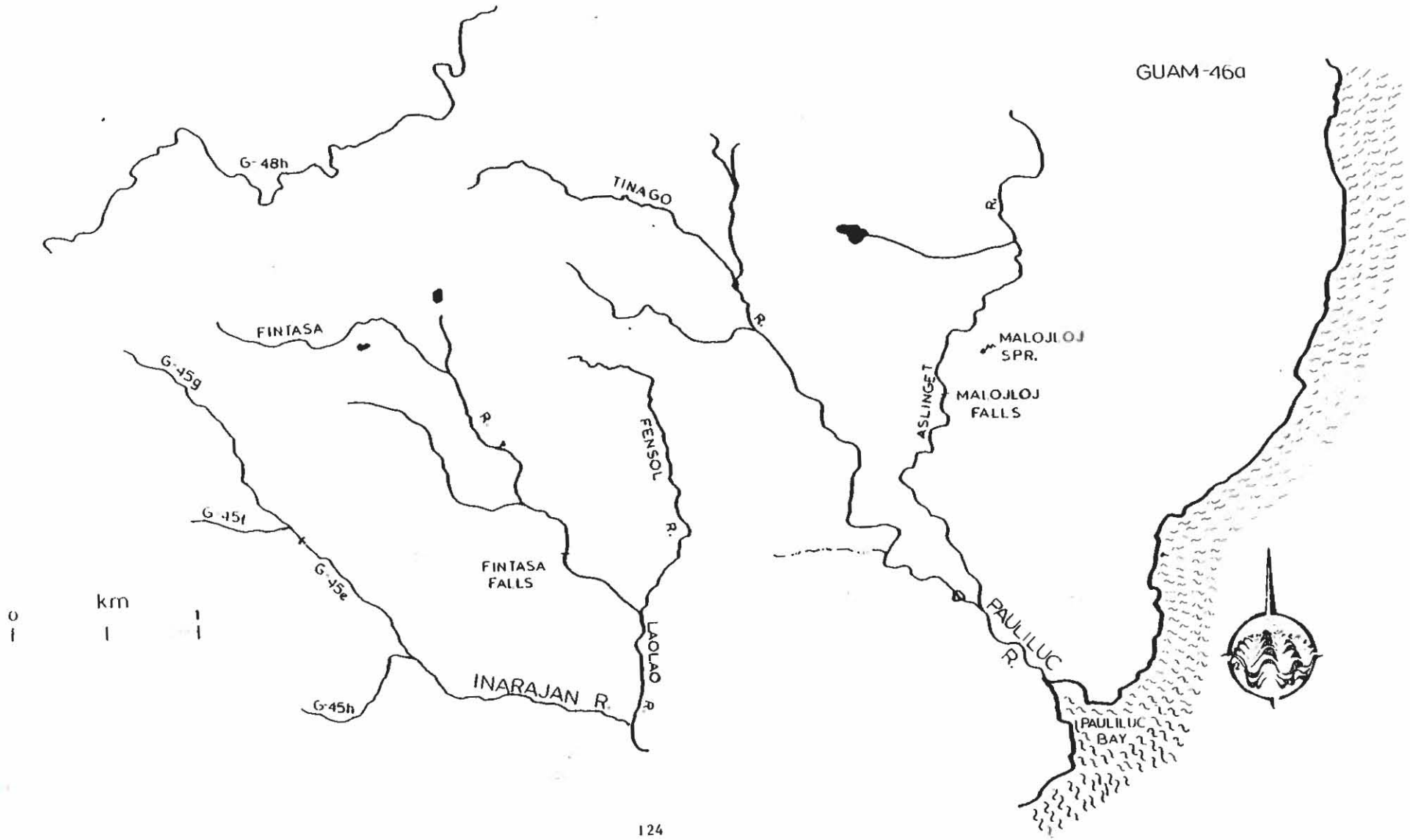
PERENNIAL CHANNEL AND TRIBUTARIES: 4,663 m

ELEVATION: 176 m

Additional Information:

1) The Dante drains into the Inarajan and has several perennial tributaries.

No record of the aquatic biota has been located.


GUAM-46a
G-48h
TINAGO
R.
FINTASA
G-45g
R.
FENSOL
R.
G-45f
G-45e
FINTASA
FALLS
LAOLAO
R.
INARAJAN R.
G-45h
ASLINGET
MALOJLOJ
SPR.
MALOJLOJ
FALLS
PAULILUC
R.
PAULILUC
BAY
km
0
1

Pauliluc River, Guam 46a

COORDINATES: Lat. 13° 16' 59" N
Long. 144° 45' 17" E

ELEVATION: 3 m

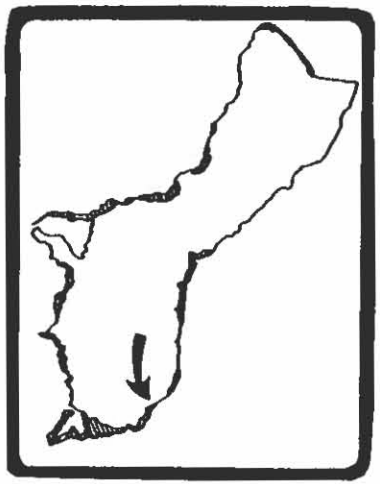
TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	4,389 m
2)	Combined perennial channel lengths:	6,157 m
3)	Approximate drainage area:	879 ha
4)	Average slope (%):	2.4

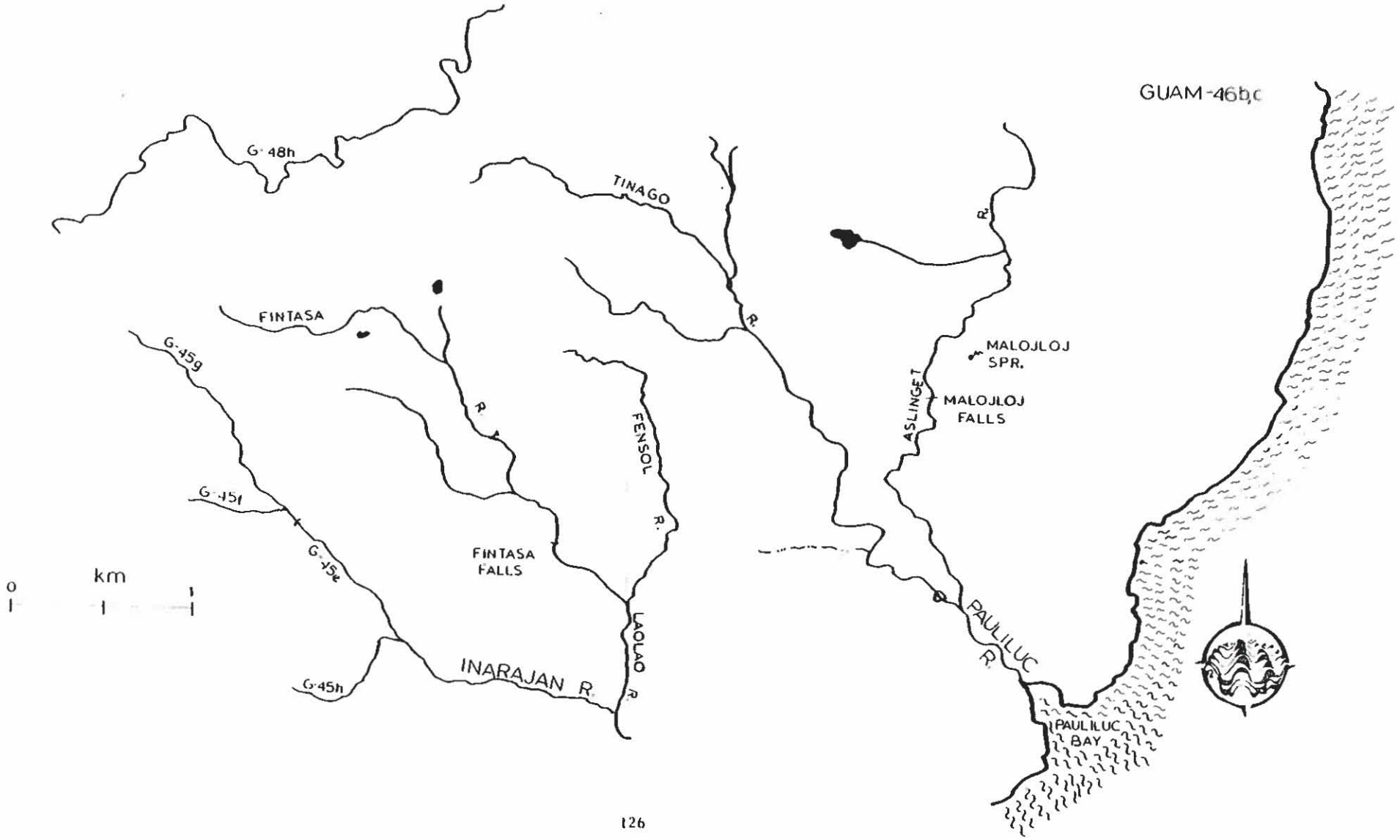
LENGTH OF THE PAULILUC RIVER: 500 m

Additional Information:

1) It has two major tributaries: the Tinago and Aslinget Rivers.
2) See Appendix (Table 2) for physicochemical characteristics.



No record of the aquatic biota has been located.


GUAM-46b,c
G-48h
TINAGO
R.
FINTASA
G-45g
R.
FENSOL R.
G-45f
G-45e
FINTASA FALLS
LAOLAO R.
INARAJAN R.
G-45h
ASLINGET
MALOJLOJ SPR.
MALOJLOJ FALLS
PAULILUC R.
PAULILUC BAY
0
km
1

Aslinget River, Guam 46b

COORDINATES: Lat. 13° 17' 07" N
Long. 144° 45' 09" E

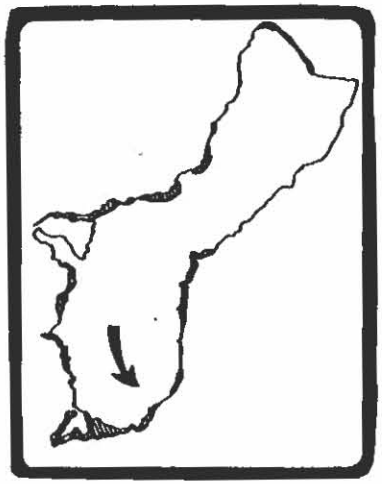
PERENNIAL CHANNEL AND TRIBUTARY LENGTH: 3,856 m

ELEVATION: 84 m

Additional Information:

1) This stream drains into the Pauliluc.
2) Malojloj Falls:
   Lat. 13° 17' 44" N
   Long. 144° 45' 02" E
   Elev. 55 m
3) Malojloj Springs:
   Lat. 13° 17' 51" N
   Long. 144° 45' 08" E
   Elev. 79 m

No record of the aquatic biota has been located.



Tinago River, Guam 46c

COORDINATES: Lat. 13° 17' 07" N
Long. 144° 45' 09" E

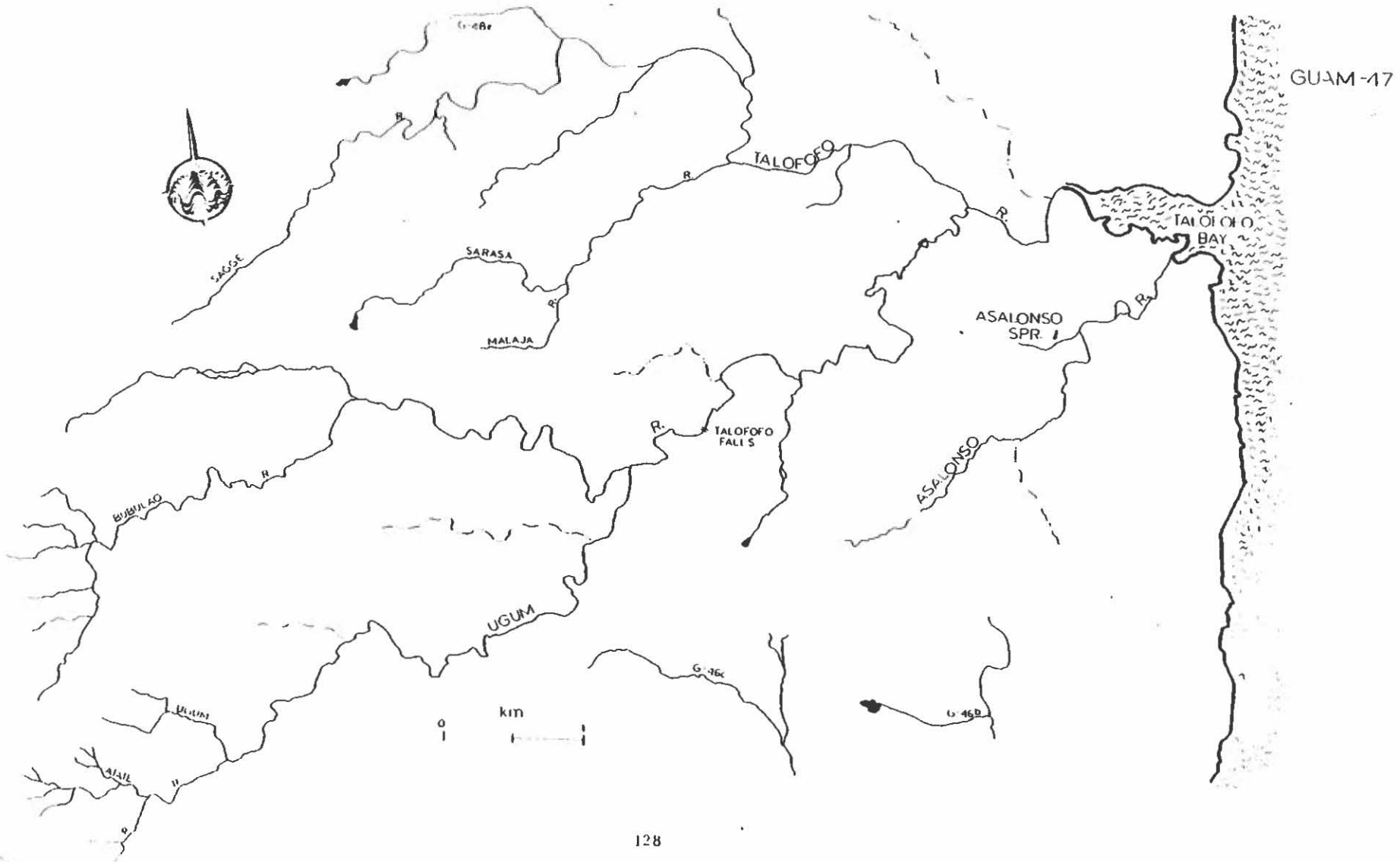
LENGTH OF PERENNIAL CHANNEL AND TRIBUTARIES: 6,200 m

ELEVATION: 84 m

Additional Information:

1) Gaging Station:
   Lat. 13° 17' 10" N
   Long. 144° 45' 04" E
   Elev. 4.6 m
   Average (28 yr) discharge: 0.16 m^3/s
2) The Tinago drains into the Pauliluc and has two tributaries.

No record of the aquatic biota has been located.


GUAM-47
TALOFOFO
TALOFOFO BAY
SAGUE
SARASA
MALAJA
ASALONSO SPR.
ASALONSO
TALOFOFO FALLS
BUBULAO
UGUM
km
0
1

Asalonso River, Guam 47

COORDINATES: Lat. 13° 19' 59" N
Long. 144° 45' 55" E

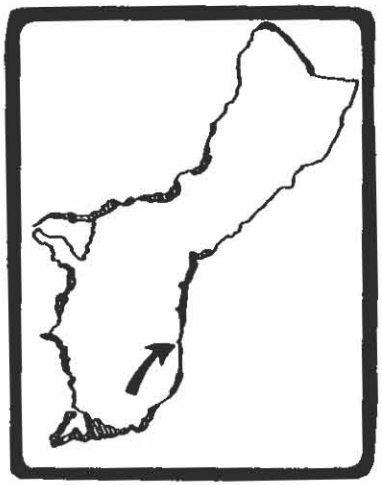
ELEVATION: 64 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	3,413 m
2)	Combined perennial channel lengths:	3,901 m
3)	Approximate drainage area:	481 ha
4)	Average slope (%):	2.1

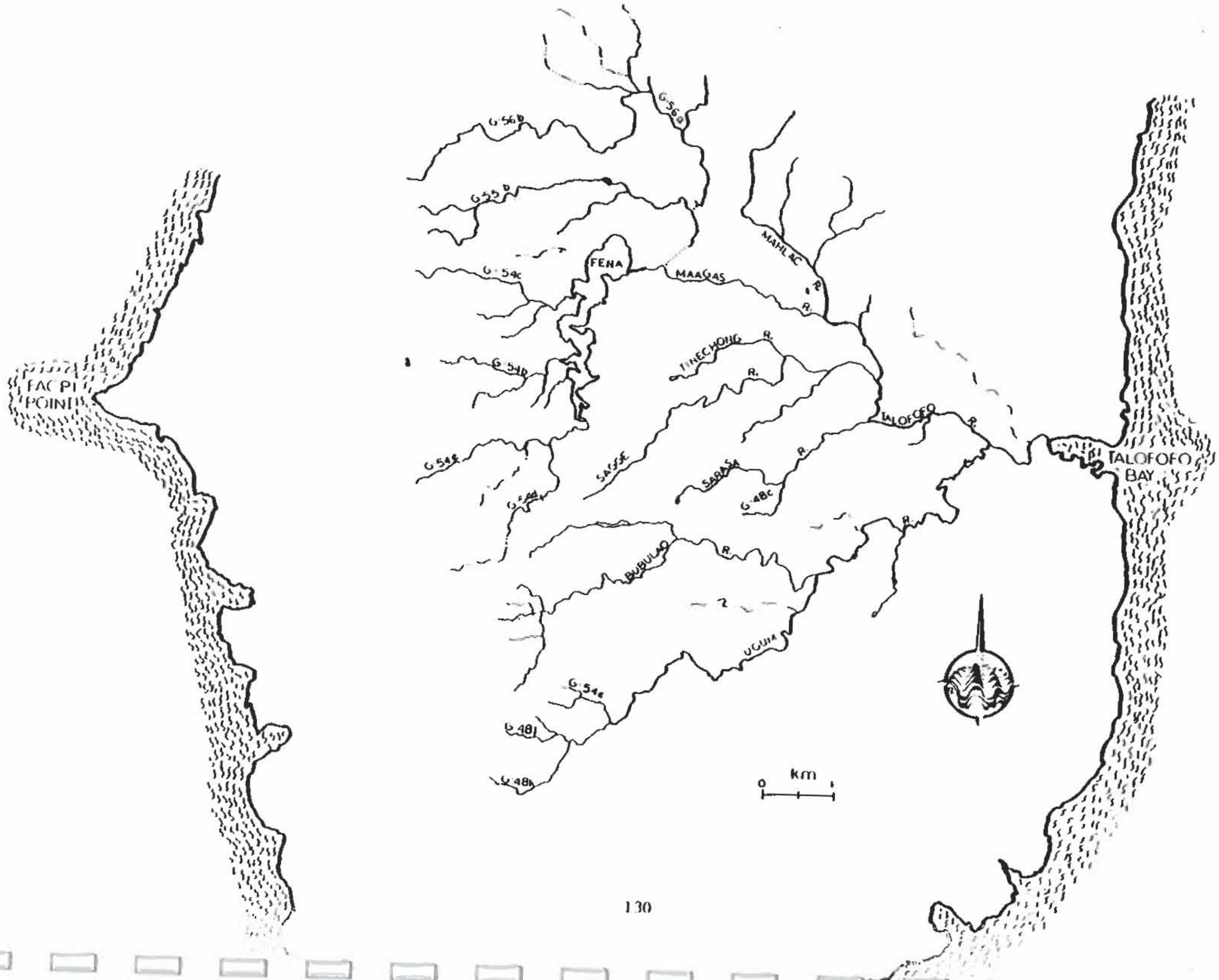
Additional Information:

1) The Asalonso has 2 perennial tributaries.
2) Asalonso Spring:
   Lat. 13° 19' 39" N
   Long. 144° 45' 32" E
   Elev. 49 m
3) The Asalonso drains into Talofofo Bay.



No record of the aquatic biota has been located.

GUAM-48a


FACPI POINT
TALOFOFO BAY
FENA
MAAGAS
MAHLAC R.
TINECHONG R.
TALOFOFO R.
SAGSE
SARASA R.
BUBULAO R.
UGUM
km

Talofofo River, Guam 48a

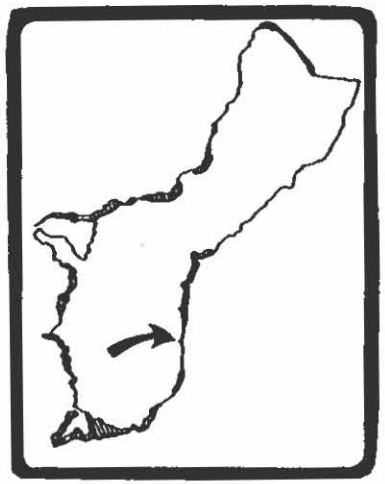
COORDINATES: Lat. 13° 20' 11" N
Long. 144° 45' 08" E

ELEVATION: 6 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	12,680 m
2)	Combined perennial channel lengths:	32,857 m
3)	Approximate drainage area (including Fena System):	7,284 ha

LENGTH OF THE TALOFOFO: 5,364 m



Additional Information:

1) Talofofo's major tributaries are the Sagge, Sarasa, Ugum, Mahlac and Maagas streams and the Fena Reservoir drainage system.
2) There is saltwater intrusion up to 800 m upstream, especially during high tide.
3) The Talofofo system supports many aquaculture ponds.
6) River mouth is frequently polluted (GEPA) after heavy rains.
7) See Appendix (Table 2) for physicochemical characteristics.

Reported Aquatic Organisms

ANIMALS

Invertebrates:

Spongillidae sp.

Atya serrata
Atya spinipes
Caridina nilotica
Caridina typus
Macrobrachium lar

Neritina pulligera
Neritina sp.

Vertebrates:

Anguilla marmorata
Awaous guamensis
Cichla ocellaris
Eleotris fusca
Gambusia affinis
Kuhlia rupestris
Sicyopterus macrostetholepis
Stiphodon elegans
Tilapia mossambica

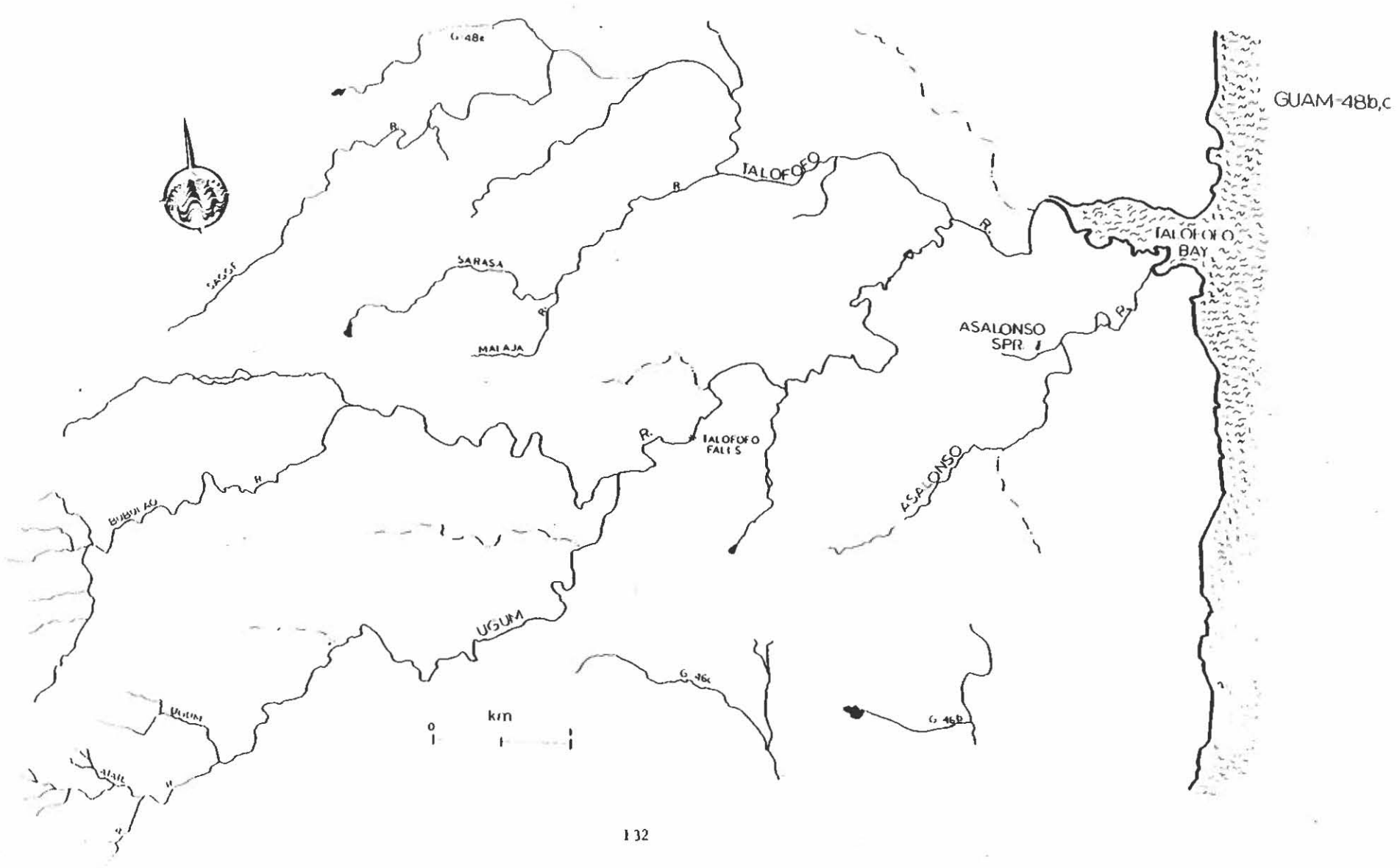
PLANTS

Chroococcus sp.
Spirogyra spp.

See Appendix for additional biota.

Information from references:

137, 184


GUAM-48b,c
TALOFOFO
TALOFOFO BAY
SABASA
MALAJA
ASALONSO SPR.
ASALONSO
TALOFOFO FALLS
UGUM
km
0

Sarasa River, Guam 48b

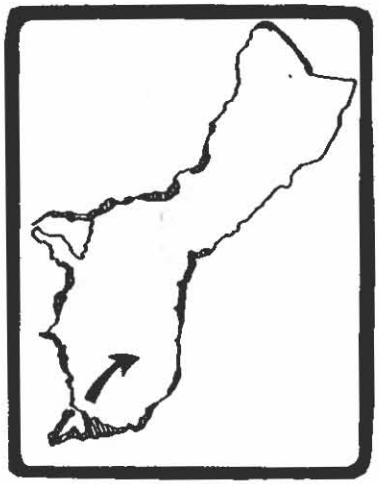
COORDINATES: Lat. 13° 20' 20" N
Long. 144° 44' 09" E

PERENNIAL CHANNEL LENGTH: 3,658 m

ELEVATION: 107 m

Additional Information:

1) The Sarasa, with one tributary, the Malaja, and a ponding basin at the headwaters, drains into the Talofofo River.



No record of the aquatic biota has been located.

Malaja River, Guam 48c

COORDINATES: Lat. 13° 19' 51" N
Long. 144° 43' 29" E

PERENNIAL CHANNEL LENGTH: 975 m

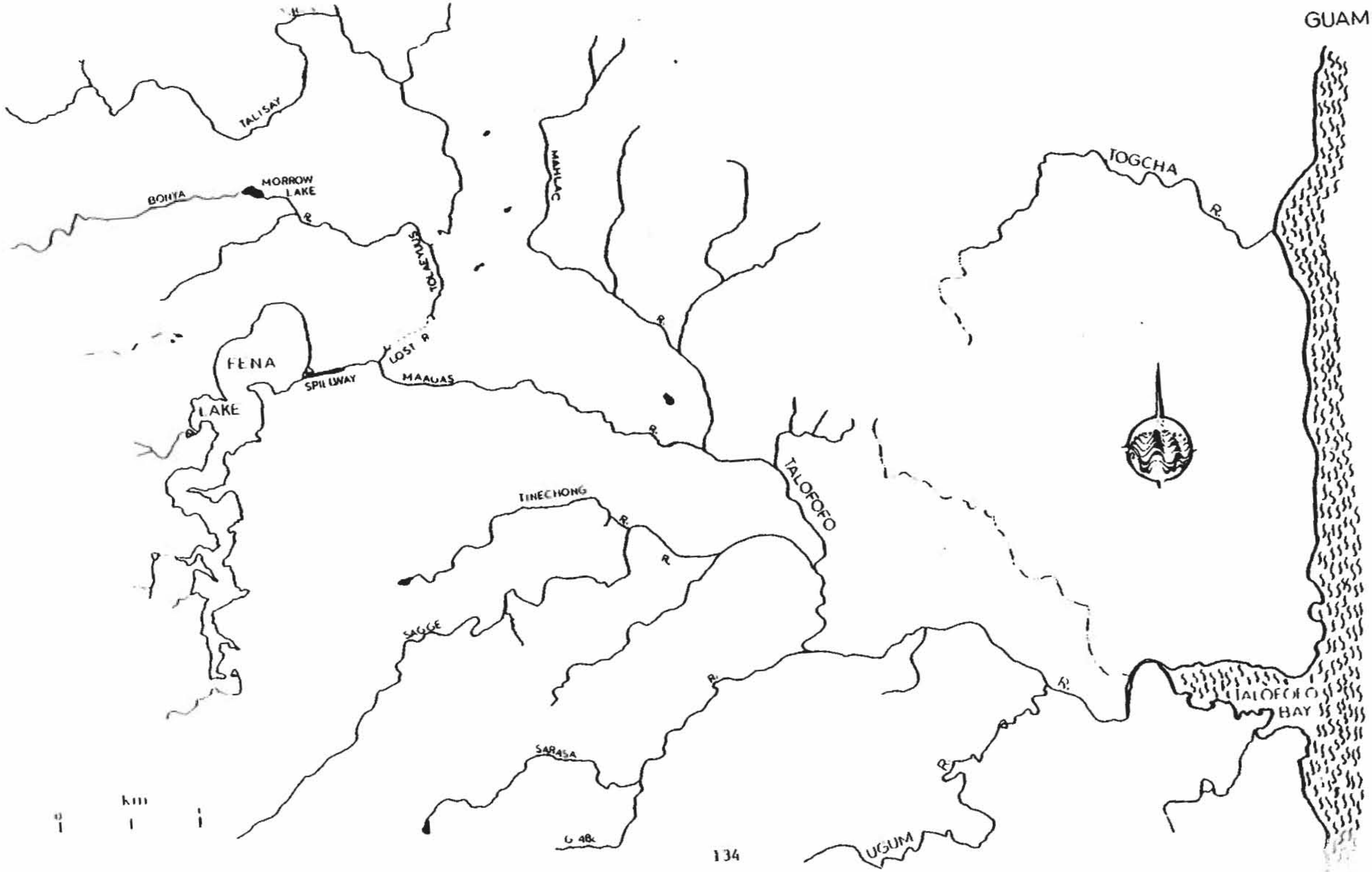
ELEVATION: 120 m

Additional Information:

1) The Malaja drains into the Sarasa.

No record of the aquatic biota have been located.

GUAM-48d,e


TALISAY
BONYA
MORROW LAKE
R.
TOLAEYUUS
FENA
LAKE
SPILLWAY
LOST R
MAAGAS
R.
MAHLAC
R.
TOGCHA
R.
TALOFOFO
TINECHONG
R.
R.
SAGGE
R.
SARASA
R.
R.
UGUM
TALOFOFO
BAY
km

Sagge River, Guam 48d

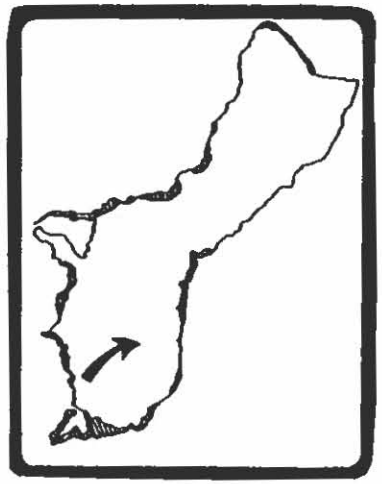
COORDINATES: Lat. 13° 20' 50" N
Long. 144° 44' 10" E

LENGTH OF PERENNIAL TRIBUTARIES AND MAIN CHANNEL: 7,560 m

ELEVATION: 131 m

Additional Information:

1) The Sagge drains into the Talofofo River.



No record of the aquatic biota has been located.

Tinechong River, Guam 48e

COORDINATES: Lat. 13° 20' 55" N
Long. 144° 43' 27" E

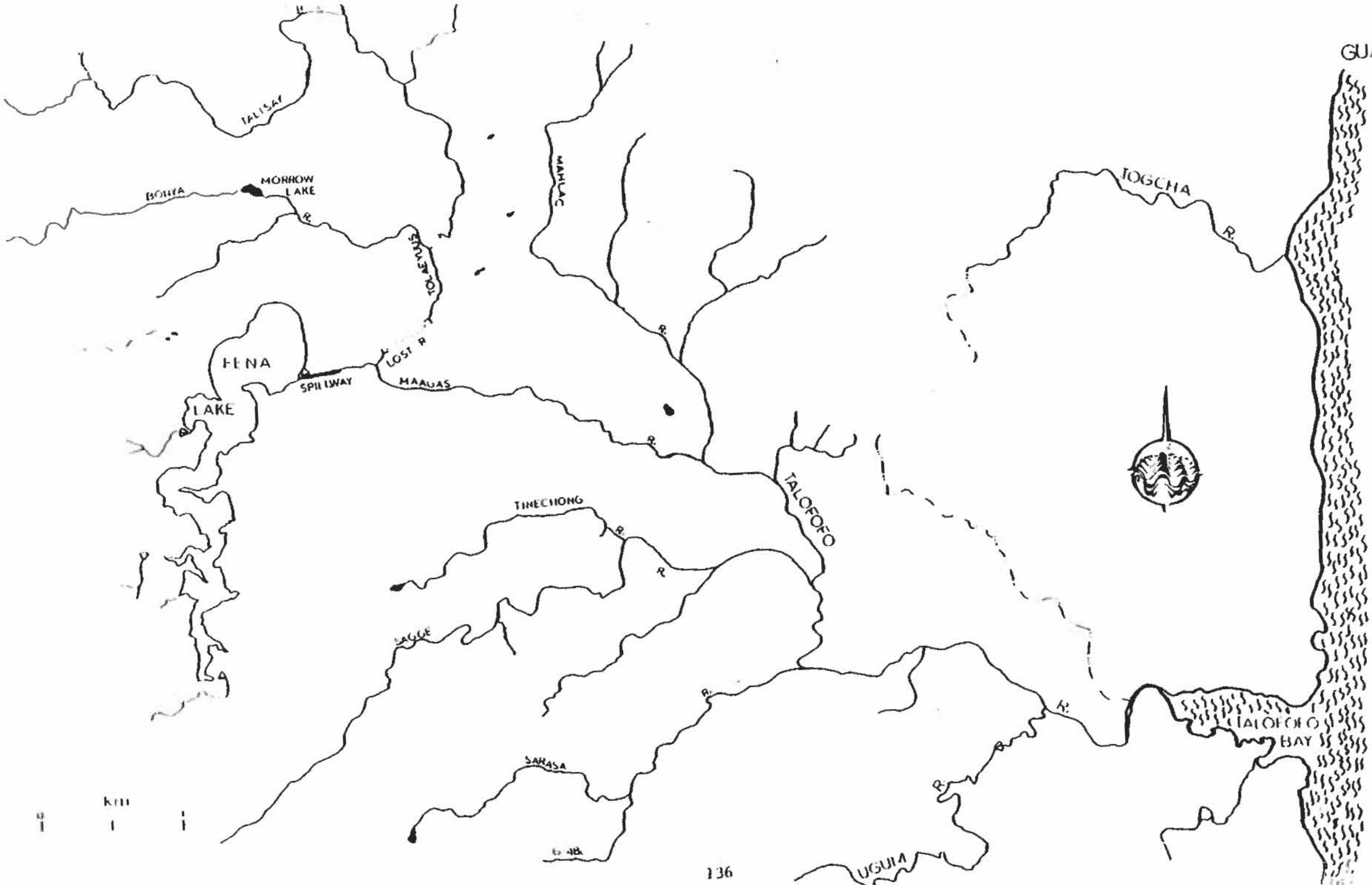
PERENNIAL CHANNEL LENGTH: 1,920 m

ELEVATION: 107 m

Additional Information:

1) The Tinechong drains into the Sagge River.

No record of the aquatic biota has been located.


TALISAY
MORROW LAKE
R.
TOLAEYUUS
LOST R.
FENA
LAKE
SPILLWAY
MAAGAS
R.
MAHLAC
R.
TOGCHA
R.
TALOFOFO
TINECHONG
R.
R.
SAGGE
SARASA
R.
R.
UGUM
R.
TALOFOFO
BAY
Km

Maagas River, Guam 48f

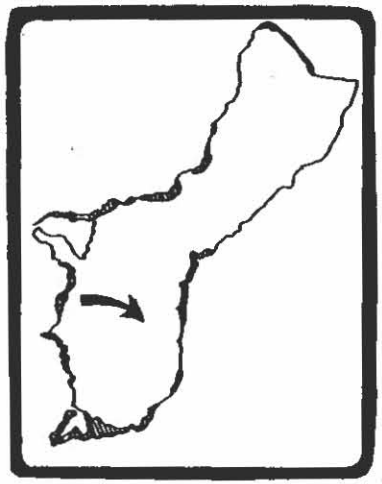
COORDINATES: Lat. 13° 21' 08" N
Long. 144° 43' 45" E

PERENNIAL CHANNEL LENGTH: 2,926 m

ELEVATION: 30 m

Additional Information:

1) The Maagas drains into the Talofofo River.
2) The Fena Reservoir drains, via the spillway, to the Maagas.
3) The Talaeyuus drains into the Maagas via a subterranean passage. This passage is called the Hidden or Lost River.
4) See Appendix (Table 2) for physicochemical characteristics.



Although biota has been collected at the spillway, no record of the aquatic biota has been located.

Mahlac River, Guam 48g

COORDINATES: Lat. 13° 21' 08" N
Long. 144° 43' 45" E

LENGTH OF PERENNIAL TRIBUTARIES AND MAIN CHANNEL: 8,108 m

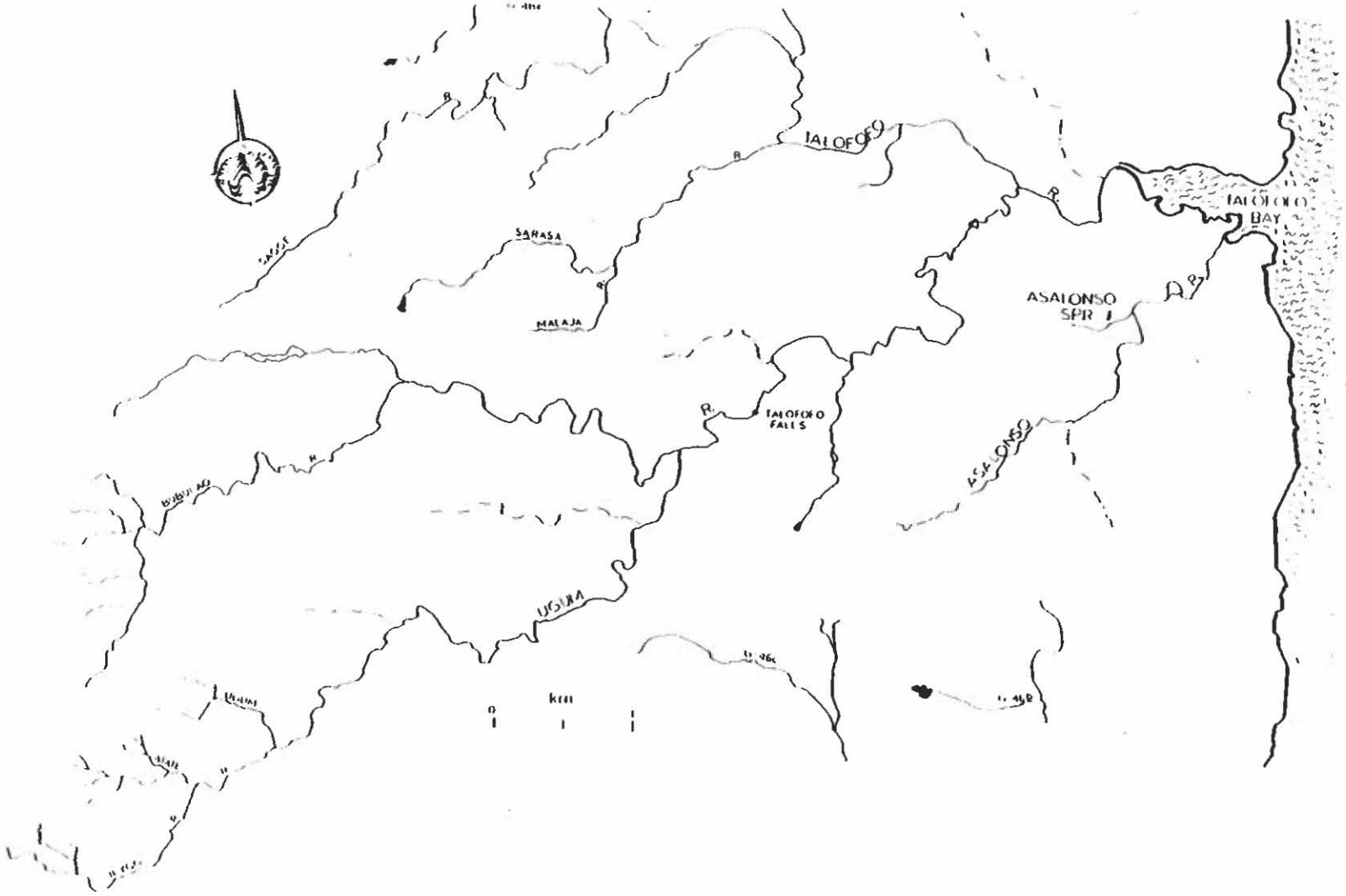
LENGTH OF MAIN CHANNEL: 3,962 m

ELEVATION: 67 m

Additional Information:

1) The Mahlac drains into the Talofofo River.
2) See Appendix (Table 2) for physicochemical characteristics.

No record of the aquatic biota has been located.


GUAM -48h, I
SARASA
MALAJA
IALOFOFO
IALOFOFO FALLS
IALOFOFO BAY
ASALONSO SPR
ASALONSO
UGUM
km
0
1

Ugum River, Guam 48h

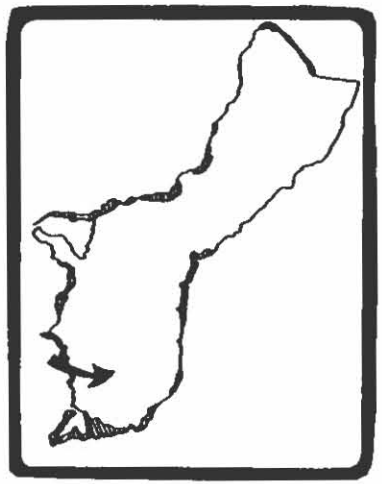
COORDINATES: Lat. 13° 20' 11" N
Long. 144° 45' 08" E

LENGTH OF PERENNIAL TRIBUTARIES AND MAIN CHANNEL: 24,338 m

LENGTH OF MAIN CHANNEL: 11,460 m

ELEVATION: 183 m

APPROXIMATE DRAINAGE AREA FOR THE UGUM AND ITS TRIBUTARIES: 1,893 ha



Additional Information:

1) Gaging Station:
   Lat. 13° 19' 16" N
   Long. 144° 44' 01" E
   Elev. 40 m
   Average (3 yr) discharge: 0.72 m^3/s
2) Talofofo Falls:
   Lat. 13° 19' 17" N
   Long. 144° 44' 53" E
   Elev. 30 m
3) It has 2 major tributaries: the Bubulao and Atate.
4) These (Ugum/Bubulao) streams are the most pristine on Guam.
5) The Ugum is the site of a proposed reservoir/dam (expected date: 2000)
6) See Appendix (Table 2) for physicochemical characteristics.

See Appendix for biota (Table 1).

Bubulao River, Guam 48i

COORDINATES: Lat. 13° 19' 09" N
Long. 144° 43' 45" E

LENGTH OF PERENNIAL TRIBUTARIES AND MAIN CHANNEL: 12,680 m

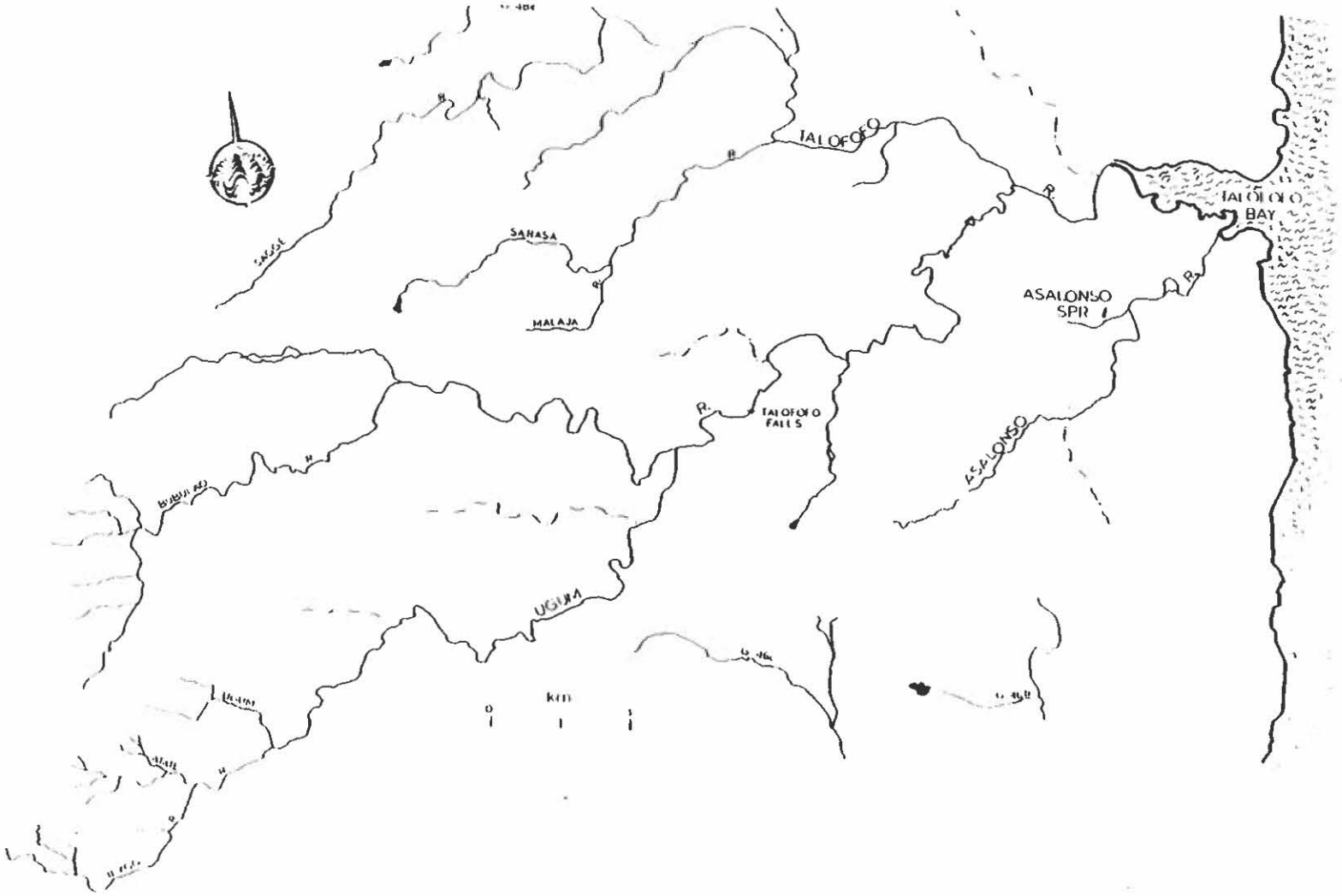
MAIN CHANNEL LENGTH: 6,828 m

ELEVATION: 206 m

Additional Information:

1) The Bubulao drains into the Ugum and has several tributaries.
2) The Bubulao area is remote and species rich (ref. 220).

No record of the aquatic biota has been located.


GUAM-48j,k
TALOFOFO
SANASA
MALAJA
TALOFOFO BAY
ASALONSO SPR
TALOFOFO FALLS
ASALONSO
UGUM
km

Atate River, Guam 48j

COORDINATES: Lat. 13° 17' 58" N
Long. 144° 42' 10" E

LENGTH OF PERENNIAL TRIBUTARIES AND MAIN CHANNEL: 3,125 m

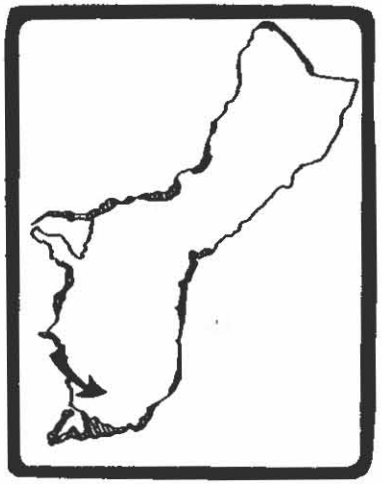
LENGTH OF MAIN CHANNEL: 1,783 m

ELEVATION: 220 m

Additional Information:

1) The Atate drains into the Ugum and has several perennial tributaries.

No record of the aquatic biota has been located.



Ieygo River, Guam 48k

COORDINATES: Lat. 13° 17' 49" N
Long. 144° 41' 52" E

LENGTH OF PERENNIAL TRIBUTARIES AND MAIN CHANNEL: 2,926 m

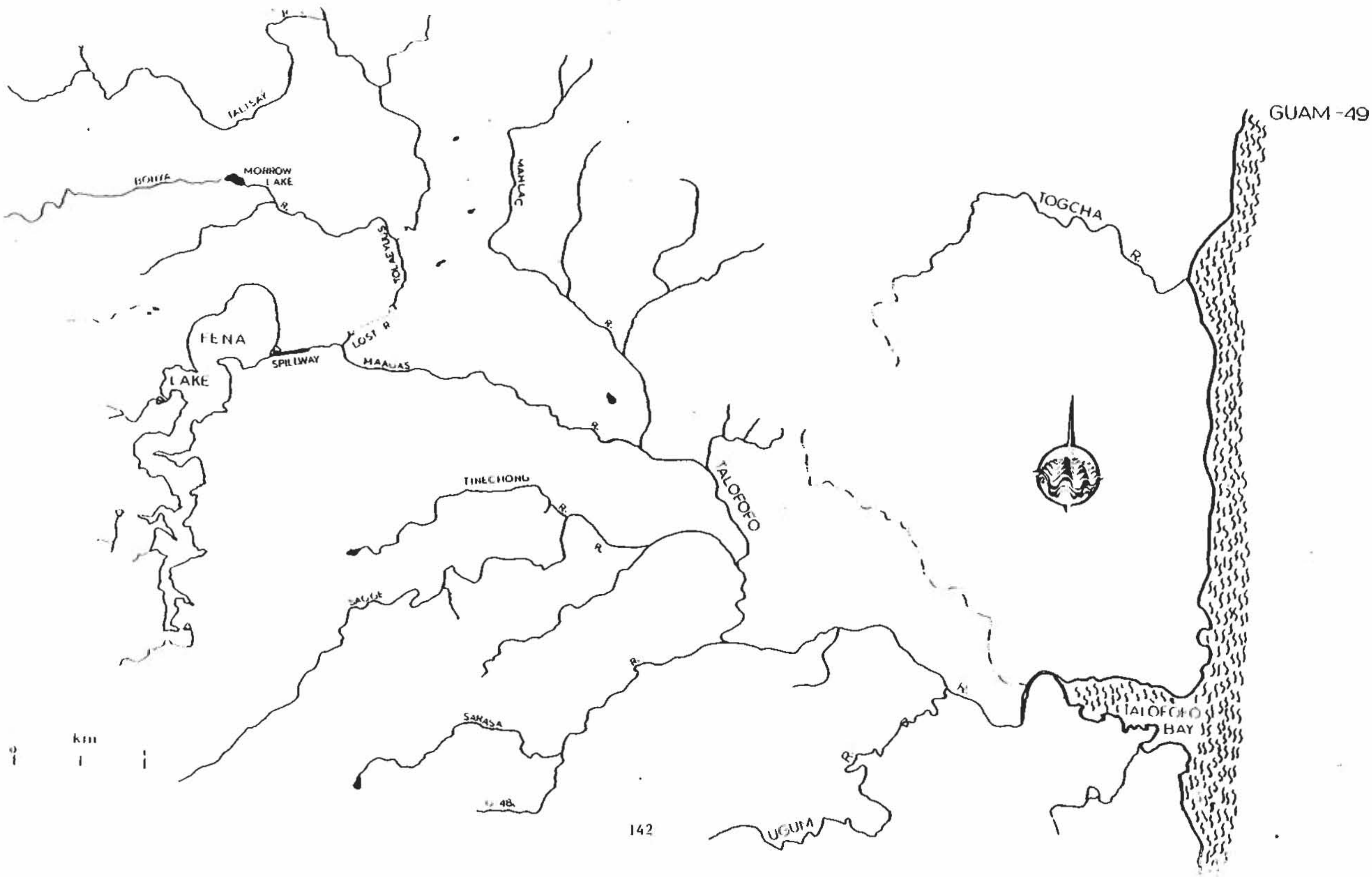
LENGTH OF MAIN CHANNEL: 2,004 m

ELEVATION: 317 m

Additional Information:

1) The Ieygo drains into the Atate and has several perennial tributaries.

No record of the aquatic biota has been located.


GUAM -49
TALISAY
MORROW
LAKE
MAHLAC
TOGCHA
R.
FENA
LAKE
SPILLWAY
LOST R.
MAAGAS
R.
TALOFOFO
TINECHONG
SARASA
UGUM
TALOFOFO
BAY
km

Togcha River, Guam 49

COORDINATES: Lat. 13° 21' 54" N
Long. 144° 46' 03" E

PERENNIAL CHANNEL LENGTH: 2,682 m

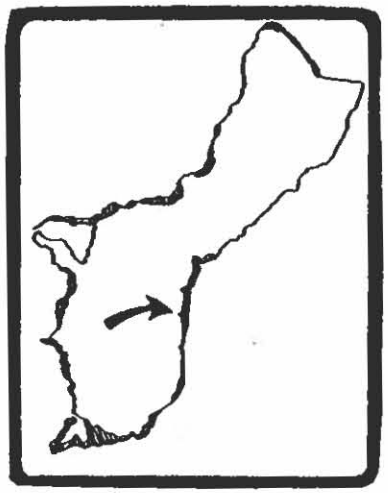
APPROXIMATE DRAINAGE AREA: 605 ha

AVERAGE SLOPE (%): 2.1

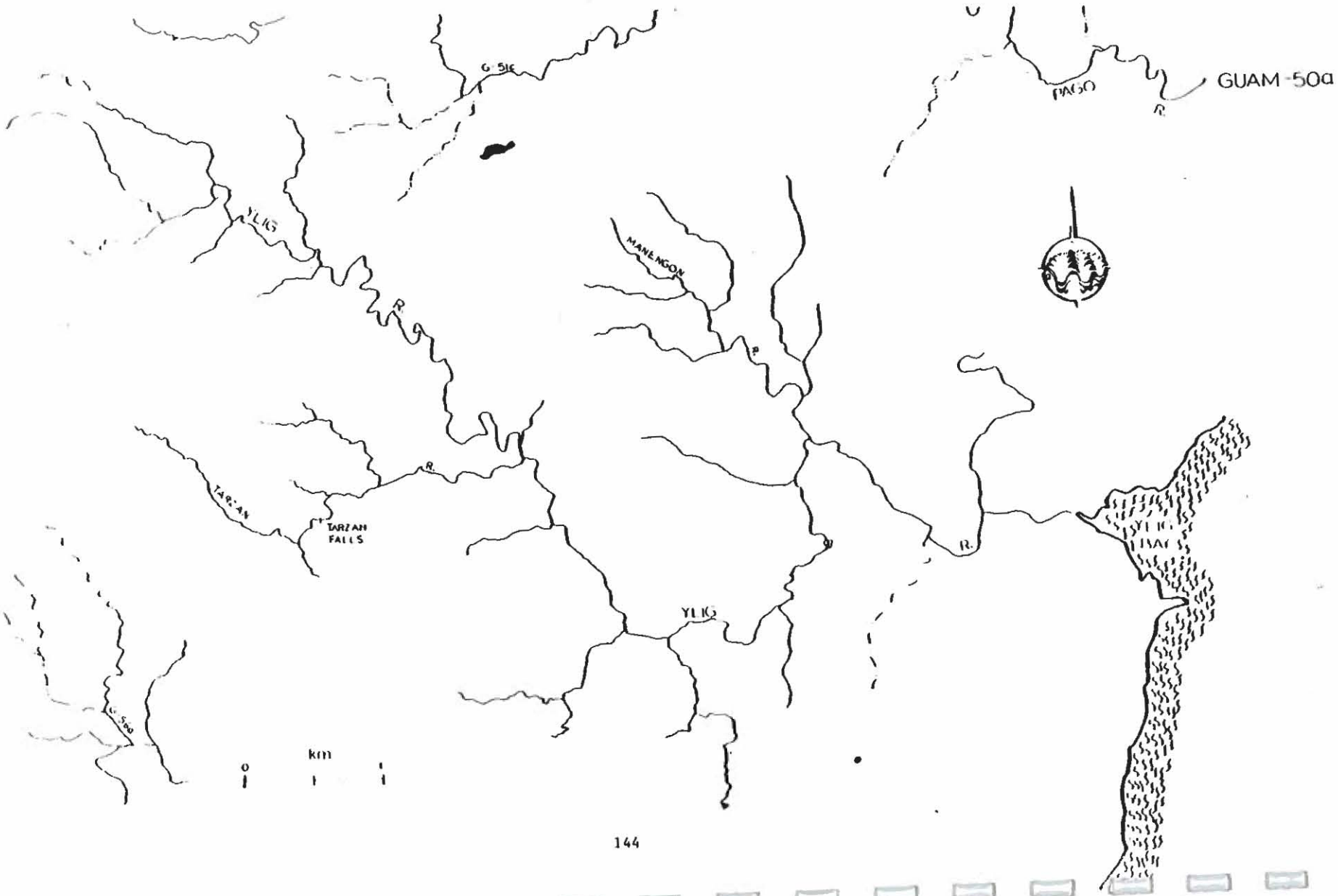
ELEVATION: 97 m

Additional Information:

1) The Togcha has no perennial tributaries and is enclosed by steep canyon walls which preserve its remoteness.



No record of the aquatic biota has been located.


GUAM 50a
PAGO
R.
G. SIE
YLIG
R.
MANENGON
R.
TARZAN
TARZAN FALLS
R.
YLIG
R.
G. 500
km
0
1

Ylig River, Guam 50a

COORDINATES: Lat. 13° 23' 33" N
Long. 144° 46' 08" E

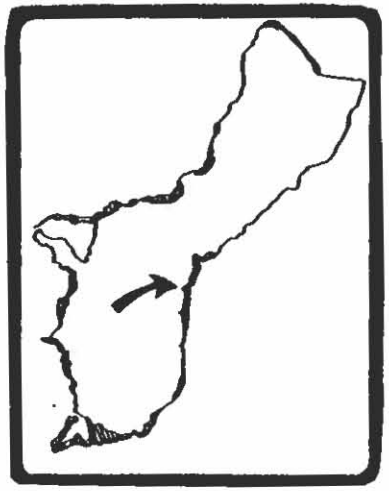
ELEVATION: 137 m

TOTAL RIVER SYSTEM DATA:

1) Length of longest continuous perennial channel: 11,994 m
2) Combined perennial channel lengths: 16,734 m
3) Approximate drainage area: 3,007 ha

Additional Information:

1) Gaging Station:
   Lat. 13° 23' 28" N
   Long. 144° 45' 06" E
   Elev. 6 m
   Average (28 yr) discharge: 0.81 m^3/s
2) The Ylig has 2 major tributaries: the Tarzan and Manengon.
3) Ylig system supplies Yona Village with drinking water.
4) See Appendix (Table 2) for physicochemical characteristics.



Reported Aquatic Organisms:

ANIMALS

Invertebrates:

Spongillidae sp.

Atya serrata
Atya spinipes
Caridina nilotica
Caridina typus
Macrobrachium lar

Melanid spp.
Neritina pulligera

Vertebrates:

Awaous guamensis
Kuhlia rupestris
Sicyopterus macrostetholepis
Stiphodon elegans
Tilapia mossambica

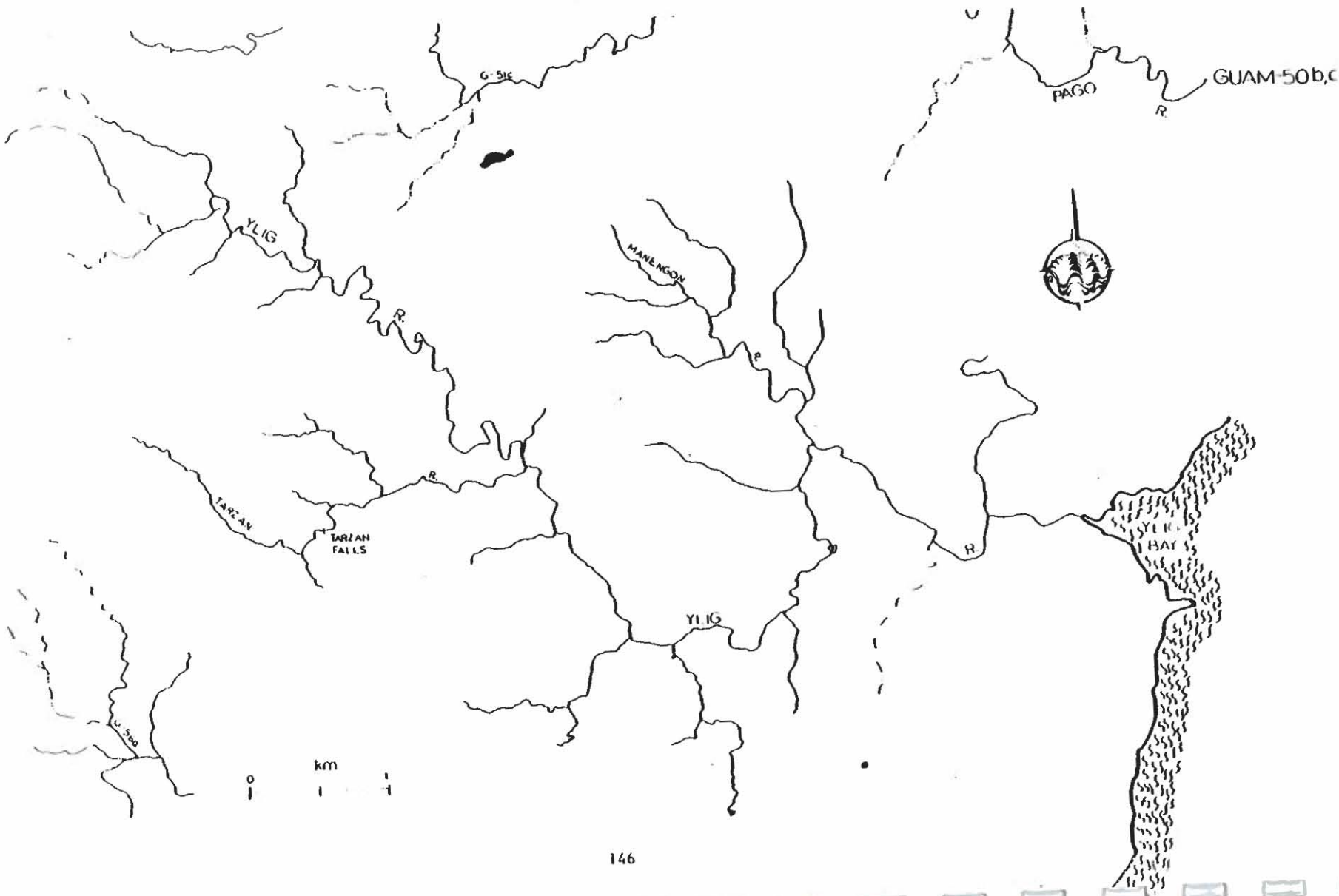
PLANTS

Cladophora spp.
Oscillatoria spp.
Phormidium valderianum

See Appendix for additional biota.

Information from reference:

137


GUAM 50b,c
PAGO
R.
G. 516
YLIG
R.
MANENGON
R.
TARZAN
TARZAN FALLS
R.
YLIG
R.
YLIG BAY
G. 569
km
0
1

Manengon River, Guam 50b

COORDINATES: Lat. 13° 23' 52" N
Long. 144° 45' 03" E

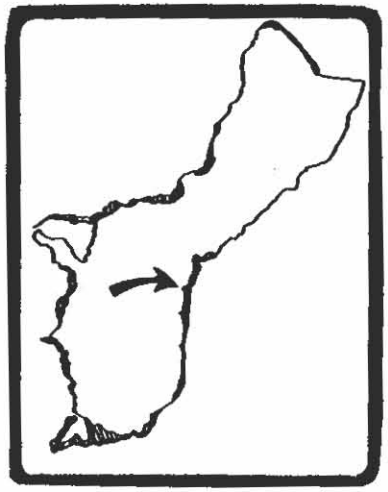
LENGTH OF PERENNIAL TRIBUTARIES AND MAIN CHANNEL: 7,727 m

LENGTH OF MAIN CHANNEL: 2,240 m

ELEVATION: 61 m

Additional Information:

1) The Manengon drains into the Ylig.



No record of the aquatic biota has been located.

Tarzan River, Guam 50c

COORDINATES: Lat. 13° 23' 51" N
Long. 144° 43' 54" E

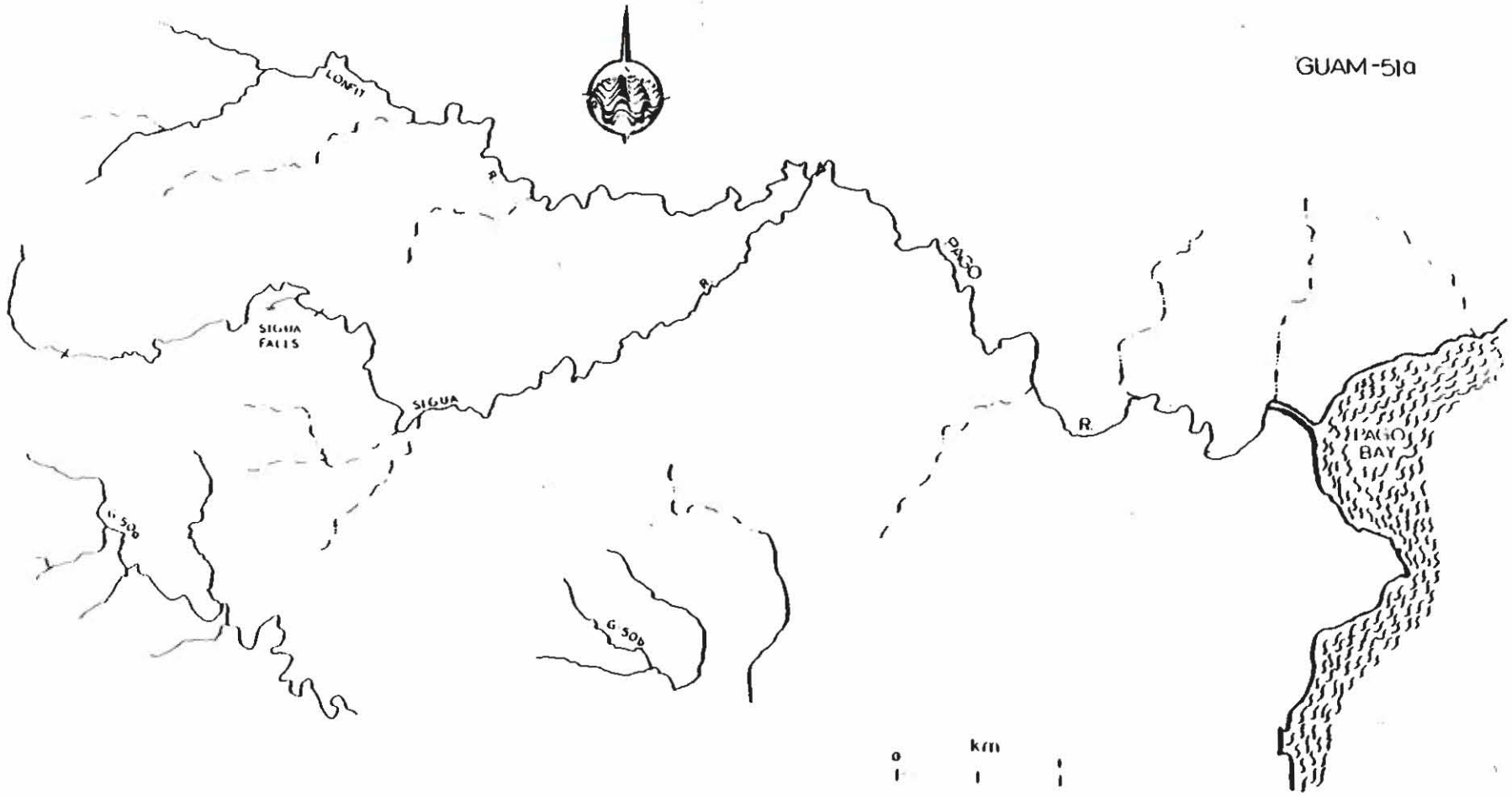
LENGTH OF PERENNIAL TRIBUTARIES AND MAIN CHANNEL: 5,182 m

ELEVATION: 119 m

Additional Information:

1) The Tarzan drains into the Ylig.
2) Tarzan Falls:
Lat. 13° 23' 39" N
Long. 144° 43' 07" E
Elev. 64 m

No record of the aquatic biota has been located.


GUAM-51a
LONFIT
R.
SIGUA FALLS
SIGUA
R.
PAGO
R.
PAGO BAY
G-50b
G-50b
km
0

Pago River, Guam 51a

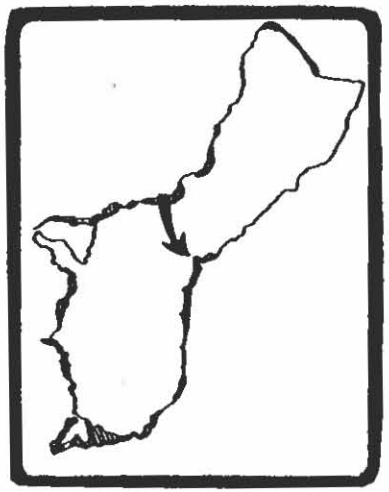
COORDINATES: Lat. 13° 25' 12" N
Long. 144° 46' 43" E

ELEVATION: 8 m

TOTAL RIVER SYSTEM DATA:

1)	Length of longest continuous perennial channel:	10,060 m
2)	Combined perennial channel lengths:	18,165 m
3)	Approximate drainage area:	2,334 ha

LENGTH OF THE PAGO: 3,870 m



Additional Information:

1) The Pago had an unauthorized sewage treatment facility which was closed by EPA.
2) The Pago has two major tributaries: the Sigua and Lonfit.
3) Gaging Station:
   Lat. 13° 26' 08" N
   Long. 144° 45' 14" E
   Elev. 7.6 m
   Average (29 yr) discharge: 0.74 m^3/s
4) See Appendix (Table 2) for physicochemical characteristics.

Reported Aquatic Organisms

ANIMALS

Invertebrates:

Atya spp.
Macrobrachium lar

Vertebrates:

Anguilla sp.
Gambusia affinis
Tilapia sp.

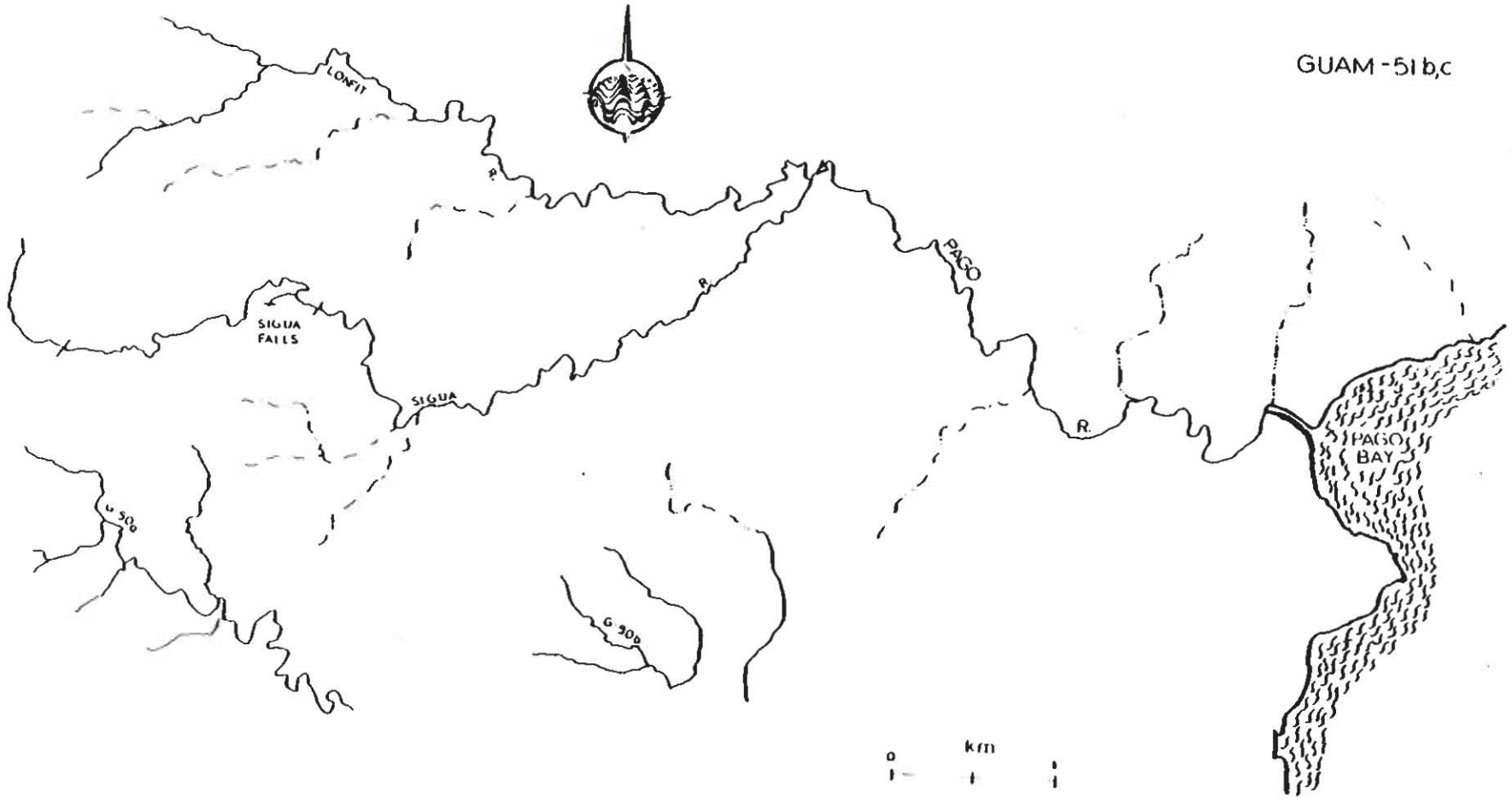
PLANTS

Hibiscus tiliaceus

See Appendix for additional biota.

Information from references:

7, 103, 184, 199, 288, 316


GUAM - 51 b,c
LONFIT
R.
SIGUA FALLS
SIGUA
R.
PAGO
R.
PAGO BAY
G 300
G 300
0
km

Lonfit River, Guam 51b

COORDINATES: Lat. 13° 26' 05" N
Long. 144° 45' 13" E

LENGTH OF PERENNIAL TRIBUTARY AND MAIN CHANNEL: 7,500 m

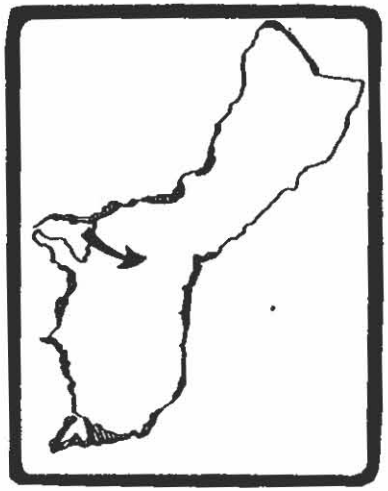
LENGTH OF MAIN CHANNEL: 6,706 m

ELEVATION: 200 m

Additional information:

1) The Lonfit drains into the Pago above the gaging station.
2) See Appendix (Table 2) for physicochemical characteristics.

No record of the aquatic biota has been located.



Sigua River, Guam 51c

COORDINATES: Lat. 13° 26' 04" N
Long. 144° 45' 13" E

LENGTH OF MAIN CHANNEL: 6,858 m

ELEVATION: 260 m

Additional Information:

1) Sigua Falls:
Lat. 13° 25' 42" N
Long. 144° 43' 29" E
Elev. 91 m
2) Sigua Falls:
Lat. 13° 25' 43" N
Long. 144° 43' 20" E
Elev. 122 m
3) Sigua Falls:
Lat. 13° 25' 35" N
Long. 144° 42' 37" E
Elev. 168 m
4) The Sigua drains into the Pago.

No record of the aquatic biota has been located.

MATAGUAC SPR.

GUAM-52

km

0 1 2 3

SANTA ROSA SPR.

Mt. Santa Rosa*
255m

MARBO CAVE

PAGAT POINT

JANUM SPR.

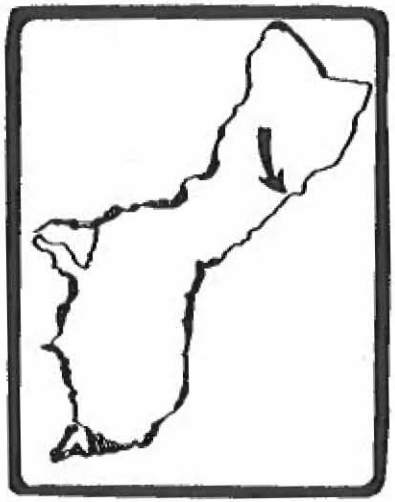
Marbo Cave, Guam 52

COORDINATES: Lat. 13° 29' 08" N
Long. 144° 51' 58" E

ELEVATION: 12 m

Additional Information:

1) Marbo is a spring-fed water cave on the northeast coast.



Reported Aquatic Organisms

ANIMALS

Invertebrates:

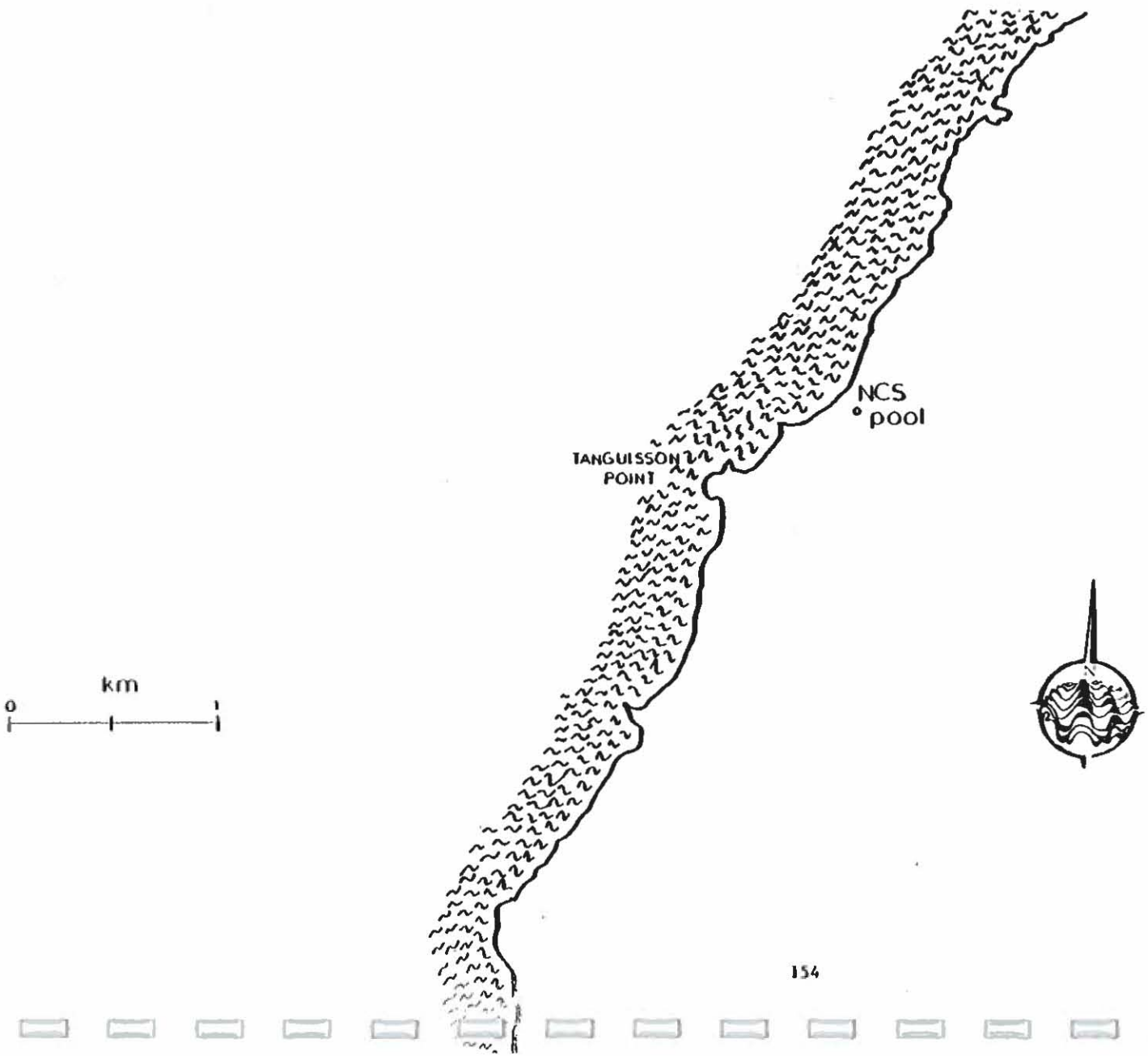
Macrobrachium lar

PLANTS

Bostrichia tenera
Chroococcus turgidus
Microcystis marginata
Trentepohlia aurea

Information from reference:

137


GUAM - 53
NCS
pool
TANGUISSON
POINT
km
0
1

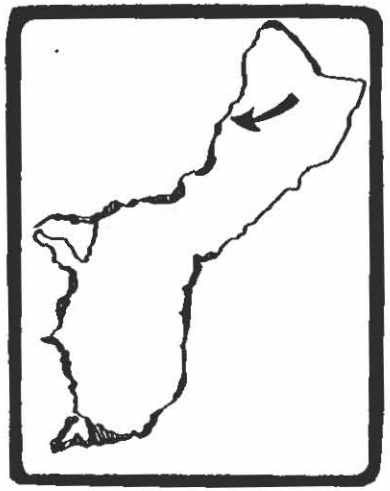
NCS Pool, Guam 53

COORDINATES: Lat. 13° 33' 22" N
Long. 144° 48' 54" E

ELEVATION: 0 m

Additional Information:

1) An "anchaline" pond; slightly haline, level of pool has a delayed rise and fall with the tide.
2) A favorite spot for domestic dumping of freshwater pets.
3) There is a coastal freshwater spring reported approx. 5-6 km north of NCS pool. Military dependents report shrimp in this spring.



Reported Aquatic Organisms

ANIMALS

Invertebrates:

Thiarid and neritid gastropods

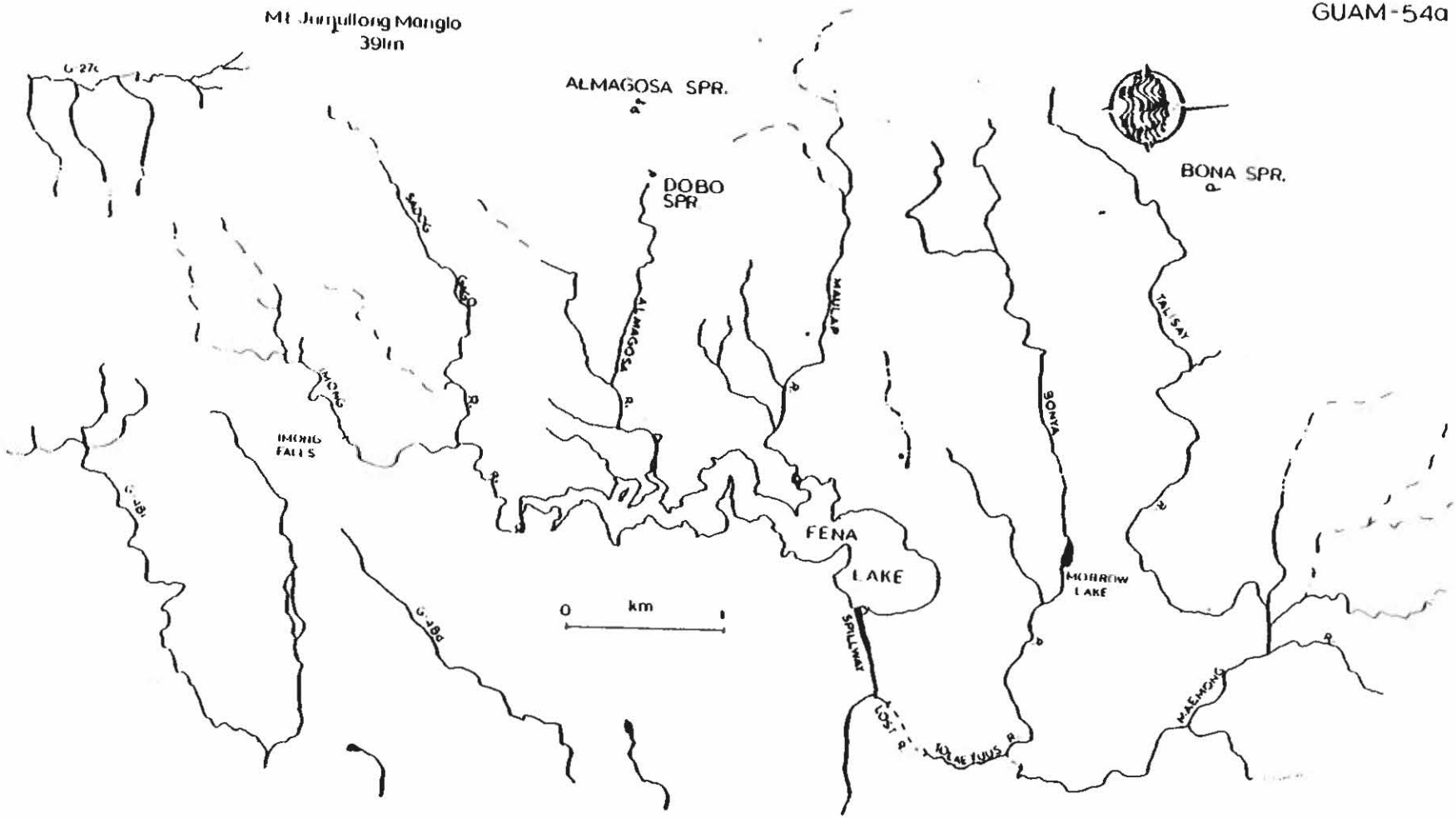
Grapsid sp.

Vertebrates:

Moringuid sp.
Poecilia latipinna
Poecilia reticulatus
Tilapia mossambica
Xiphophorus helleri

Information from reference:

3

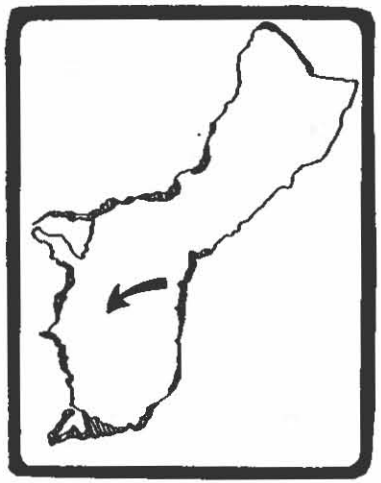

GUAM-54a
Mt Jumullong Manglo
391m
ALMAGOSA SPR.
DOBO
SPR
BONA SPR.
ALMAGOSA R.
MAULAP R.
BONA R.
TALISAY R.
IMONG R.
IMONG FALLS
FENA
LAKE
MORROW LAKE
SPILLWAY
MAEMONG R.
0 km

Fena Lake, Guam 54a

COORDINATES: Lat. 13° 21' 28" N
Long. 144° 42' 12" E

ELEVATION: 34 m

APPROXIMATE DRAINAGE AREA: 1,525 ha



Additional Information:

1) The Fena Valley, which includes the reservoir and all the supporting streams, is actually part of the Talofofo Drainage System. The reservoir drains to the Maagas via the spillway.
2) The maximum depth is approximately 18 m.
3) The entire valley is on a U.S. military reservation; area also used as an endangered and threatened species sanctuary and a source of potable water for southern Guam.
4) Gaging Station:
   Lat. 13° 21' 28" N
   Long. 144° 42' 12" E
   Elev. 34 m
   Average (20 yr) discharge: 0.51 m^3/s
5) See Appendix (Table 2) for physicochemical characteristics.

Reported Aquatic Organisms

ANIMALS

Invertebrates:

Anisoptera sp.
Coleoptera sp.
Corixid sp.
Craspedacusta sowerbyi
Culicid sp.
Mesovelia sp.
Zygoptera sp.

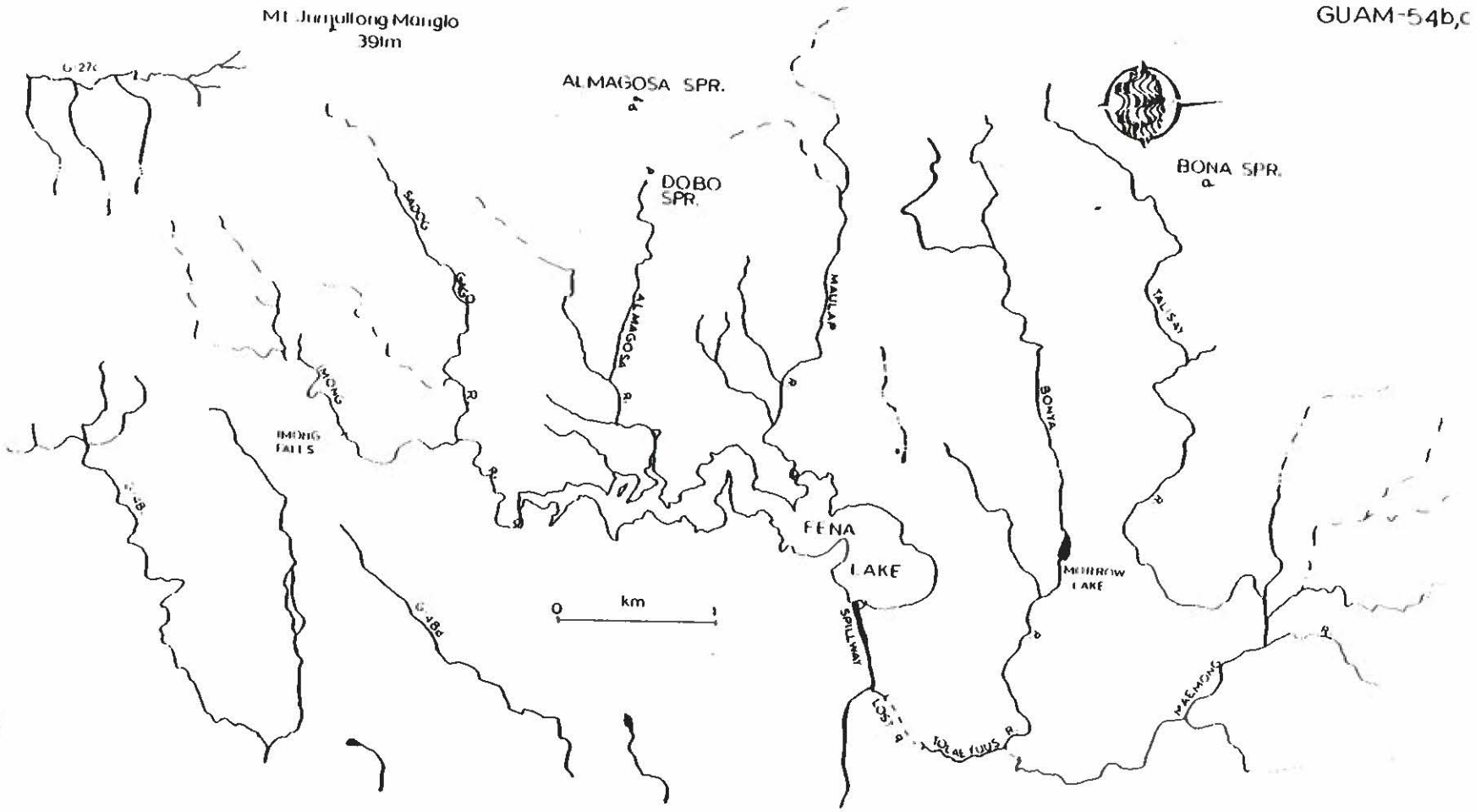
Vertebrates:

Anguilla marmorata
Awaous guamensis
Cichla ocellaris
Clarias batrachus
Gambusia affinis
Kuhlia rupestris
Sicyopterus macrostetholepis
Tilapia mossambica

See Appendix for additional biota.

Information from references:

17, 19, 131, 132, 135, 220


GUAM-54b,c
Mt Jumpallong Manglo
391m
ALMAGOSA SPR.
DOBO SPR.
BONA SPR.
SAGOG
ALMAGOSA R.
MAULAP
TALISAY
BONYA
IMONG
IMONG FALLS
FENA LAKE
MEHRROW LAKE
SPILLWAY
MAGMONG
0 km 1

Almagosa River, Guam 54b

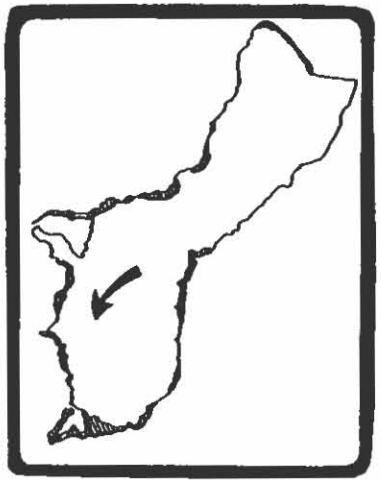
COORDINATES: Lat. 13° 20' 44" N
Long. 144° 41' 36" E

LENGTH OF PERENNIAL TRIBUTARIES AND MAIN CHANNEL: 3,660 m

LENGTH OF MAIN CHANNEL: 2,195 m

ELEVATION: 195 m

APPROXIMATE DRAINAGE AREA: 342 ha



Additional Information:

1) Almagosa Springs:
   Lat. 13° 20' 41" N Lat. 13° 20' 41" N
   Long. 144° 40' 29" E Long. 144° 40' 35" E
   Elev. 225 m Elev. 213 m
2) Dobo Springs:
   Lat. 13° 20' 43" N
   Long. 144° 40' 44" E
   Elev. 200 m
3) The Almagosa drains into Fena Lake.
4) Gaging Station:
   Lat. 13° 20' 43" N
   Long. 144° 14' 36" E
   Elev. 47 m
   Average (8 yr) discharge: 0.18 m^3/s.
5) See Appendix (Table 2) for physicochemical characteristics.

Reported Aquatic Organisms

ANIMALS

Vertebrates:

Cichla ocellaris
Tilapia mossambica
Tilapia zilli

Information from reference: 142

Maulap River, Guam 54c

COORDINATES: Lat. 13° 21' 14" N
Long. 144° 41' 44" E

LENGTH OF PERENNIAL TRIBUTARIES AND MAIN CHANNEL: 4,397 m

LENGTH OF MAIN CHANNEL: 2,438 m

ELEVATION: 181 m

APPROXIMATE DRAINAGE AREA: 298 ha

Additional Information:

1) The Maulap drains into Fena Lake and has several perennial tributaries.
2) Gaging Station:
   Lat. 13° 21' 14" N
   Long. 144° 41' 44" E
   Elev. 40 m
   Average (8 yr) discharge: 0.15 m^3/s.

Reported Aquatic Organisms

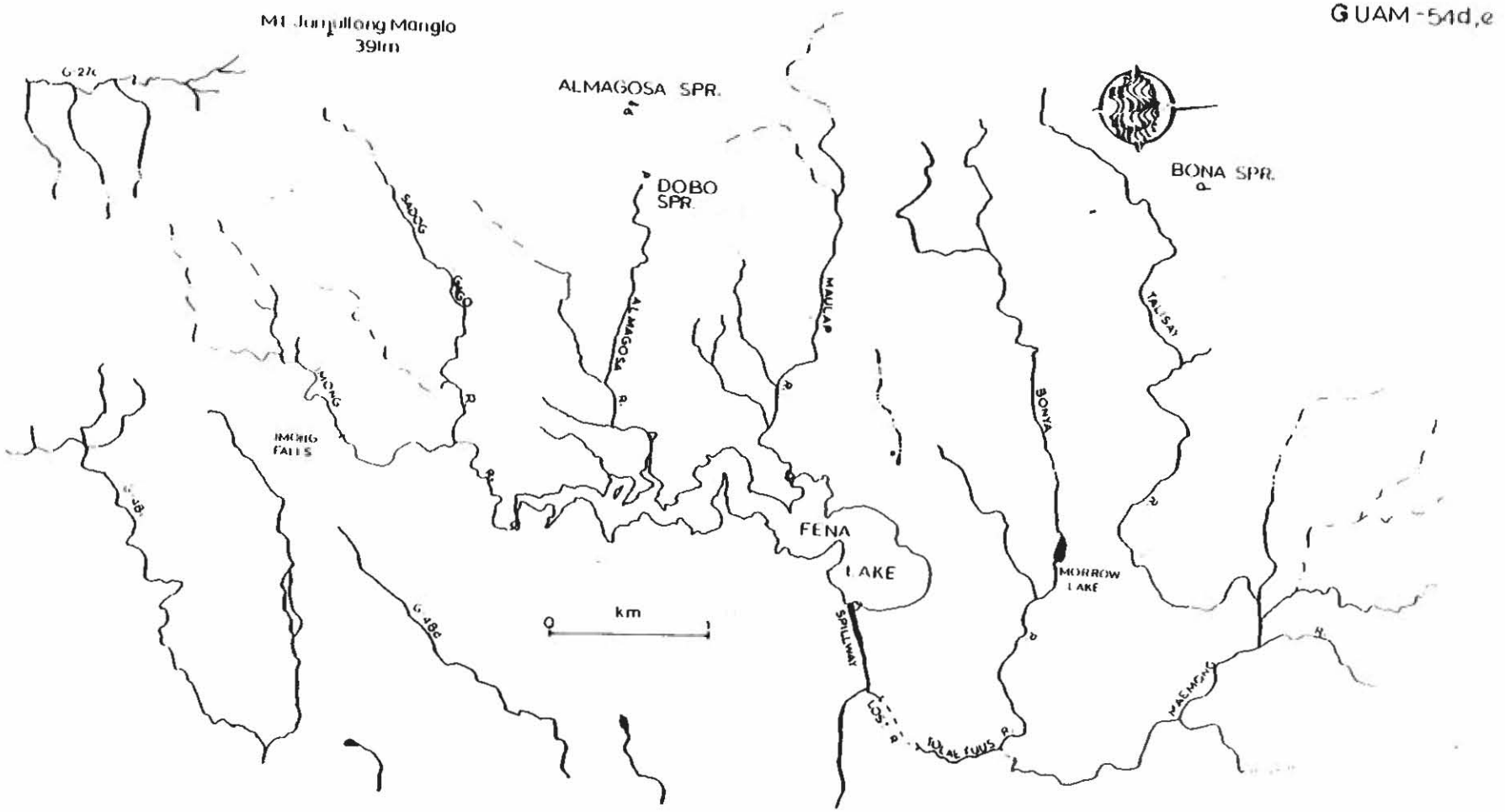
ANIMALS

Vertebrates:

Cichla ocellaris
Tilapia mossambica
Tilapia zilli

Information from reference:

142


GUAM-54d,e
Mt. Jumpilong Manglo
391m
ALMAGOSA SPR.
DOBO SPR.
BONA SPR.
SADDLE GAP
ALMAGOSA R.
MAULAP R.
TALISAY
BONA
IMORIG FALLS
IMONG R.
FENA LAKE
MORROW LAKE
SPILLWAY
MAGMOMO
km
0
1

Imong River, Guam 54d

COORDINATES: Lat. 13° 20' 17" N
Long. 144° 41' 55" E

ELEVATION: 183 m

TOTAL RIVER SYSTEM (Imong-Sadog) DATA:

1) Length of longest continuous perennial channel: 1,555 m
2) Combined perennial channel lengths: 2,858 m
3) Approximate drainage area: 505 ha

LENGTH OF THE IMONG AND ITS ADVANCED PERENNIAL TRIBUTARIES: 2,195 m

Additional Information:

1) Imong Falls:
Lat. 13° 19' 41" N
Long. 144° 41' 37" E
Elev. 90 m
2) The Imong drains into Fena Lake.
3) Gaging Station:
Lat. 13° 20' 17" N
Long. 144° 41' 55" E
Elev. 37 m
Average (19 yr) discharge: 0.29 m^3/s.

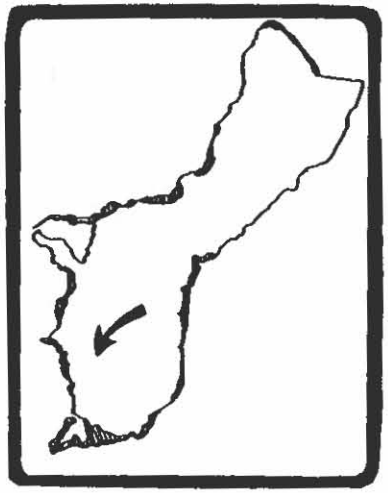
Reported Aquatic Organisms:

ANIMALS

Vertebrates:

Cichla ocellaris
Tilapia mossambica
Tilapia zilli

Information from reference: 142



Sadog Gago River, Guam 54e

COORDINATES: Lat. 13° 20' 05" N
Long. 144° 41' 38" E

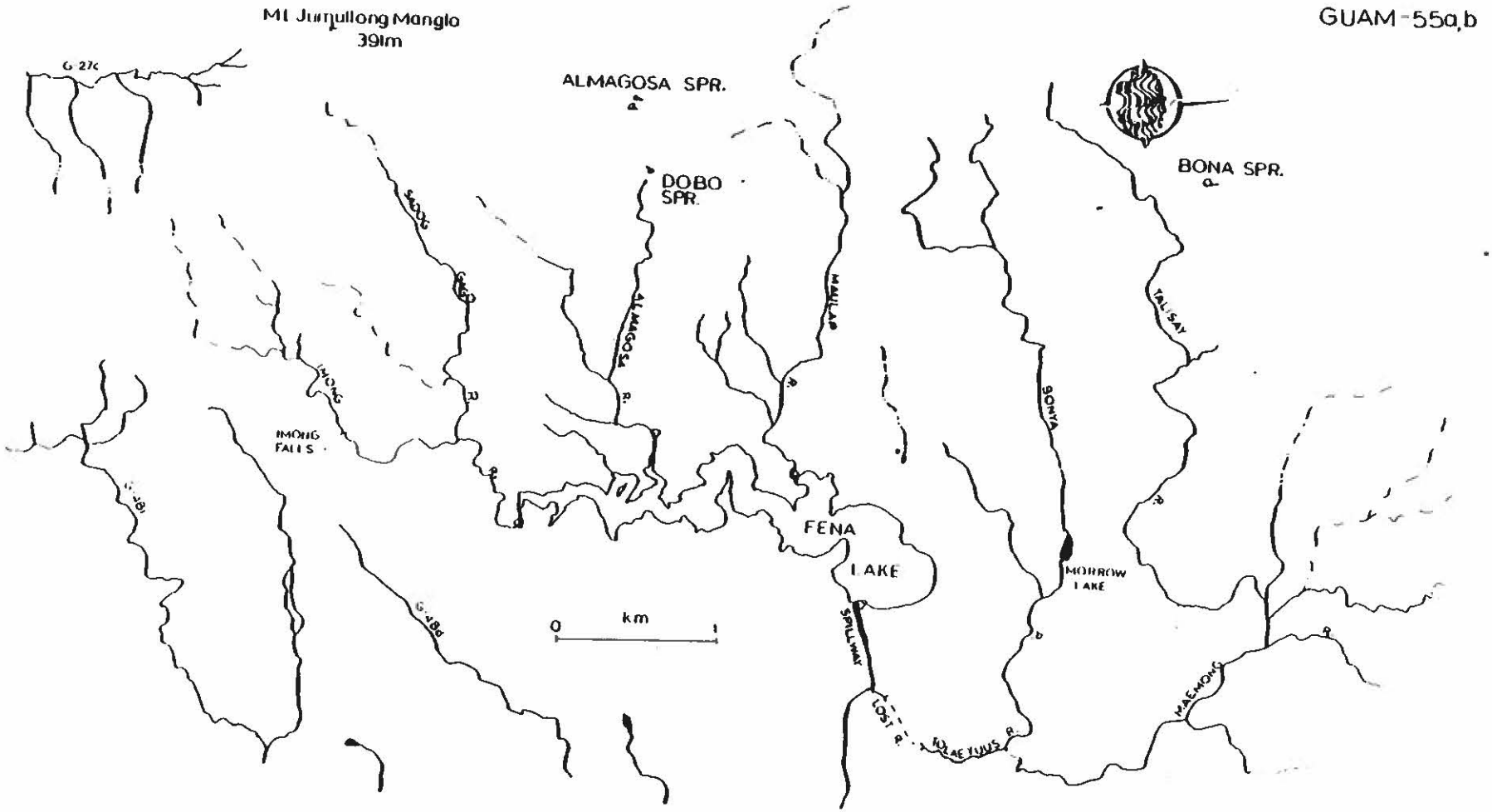
PERENNIAL CHANNEL LENGTH: 2,088 m

ELEVATION: 137 m

Additional Information:

1) The Sadog Gago drains into the Imong.

No record of the aquatic biota has been located.


GUAM-55a,b
Mt Jumpullong Manglo
391m
ALMAGOSA SPR.
DOBO SPR.
BONA SPR.
IMONG FALLS
IMONG
ALMAGOSA R.
MAULAP
SONYA
TALISAY
FENA LAKE
MORROW LAKE
SPILLWAY
LOST R.
MAEMONG
0 km 1

Bonya River, Guam 55a

COORDINATES: Lat. 13° 22' 01" N
Long. 144° 40' 37" E

LENGTH OF LONGEST CONTINUOUS PERENNIAL CHANNEL: 2,400 m

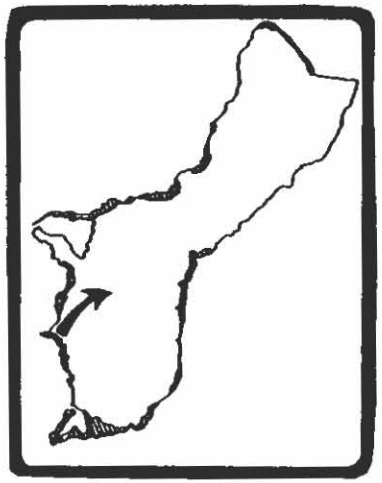
COMBINED PERENNIAL CHANNEL LENGTHS: 2,995 m

ELEVATION: 150 m

Additional Information:

1) The Bonya drains through Morrow Lake into the Tolaeyuus.
2) Early accounts call this area the Miemo River Valley (Ref. 115).
3) Morrow Lake:
   Lat. 13° 22' 10" N
   Long. 144° 42' 01" E
   Elev. 36 m
4) See Appendix (Table 2) for physicochemical characteristics.

No record of the aquatic biota has been located.



Tolaeyuus River, Guam 55b

COORDINATES: Lat. 13° 21' 39" N
Long. 144° 42' 43" E

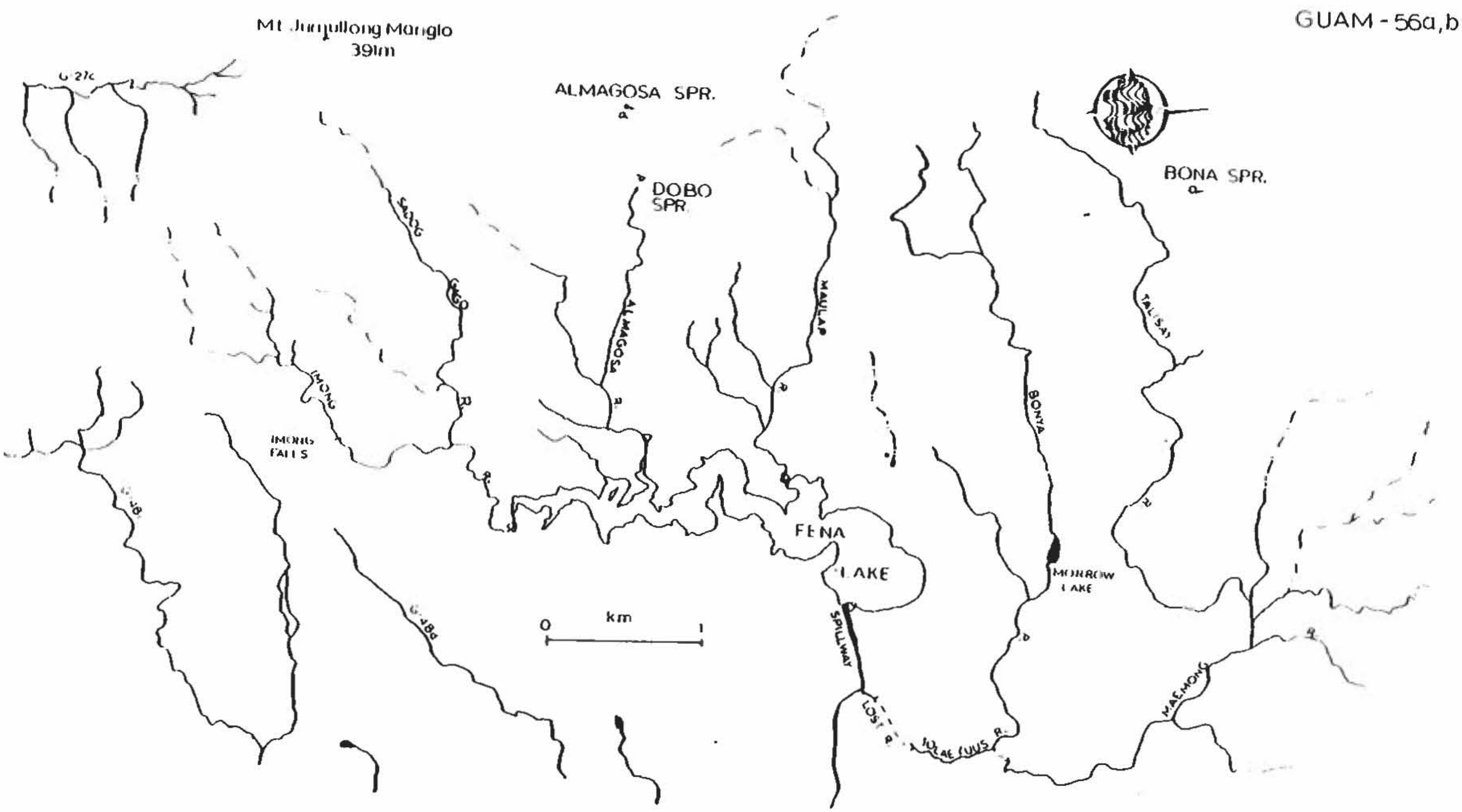
LENGTH OF PERENNIAL CHANNEL: 274 m

ELEVATION: 665 m

Additional Information:

1) This stream begins at the subterranean junction of the Maemong and Bonya streams.
2) Tolaeyuus drains into the Maagas via the Lost or Hidden River. This is an approximately 400 m subterranean passage.
3) See Appendix (Table 2) for physicochemical characteristics.

No record of the aquatic biota has been located.



GUAM - 56a,b
Mt Jumullong Manglo
391m
ALMAGOSA SPR.
DOBO
SPR.
BONA SPR.
ALMAGOSA
R.
MAULAP
R.
BONYA
TALISAY
IMONG
IMONG FALLS
FENA
LAKE
MORROW LAKE
SPILLWAY
MAEMONG
km
0
1

Maemong River, Guam 56a

COORDINATES: Lat. 13° 23' 25" N
Long. 144° 42' 13" E

ELEVATION: 73 m

TOTAL RIVER SYSTEM DATA:

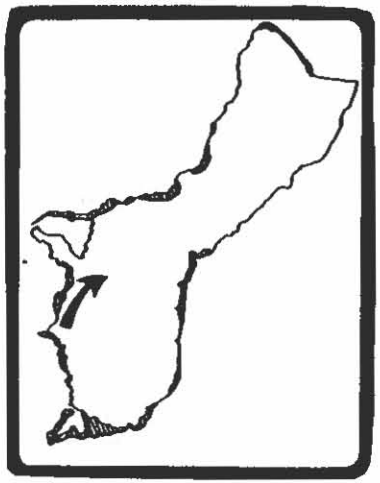
1) Length of longest continuous perennial channel: 6,800 m

LENGTH OF THE MAEMONG AND ITS UNNAMED PERENNIAL TRIBUTARIES: 4,500 m

Additional Information:

1) The Maemong has one major tributary; the Talisay River.

No record of the aquatic biota has been located.



Talisay River, Guam 56b

COORDINATES: Lat. 13° 22' 50" N
Long. 144° 40' 26" E

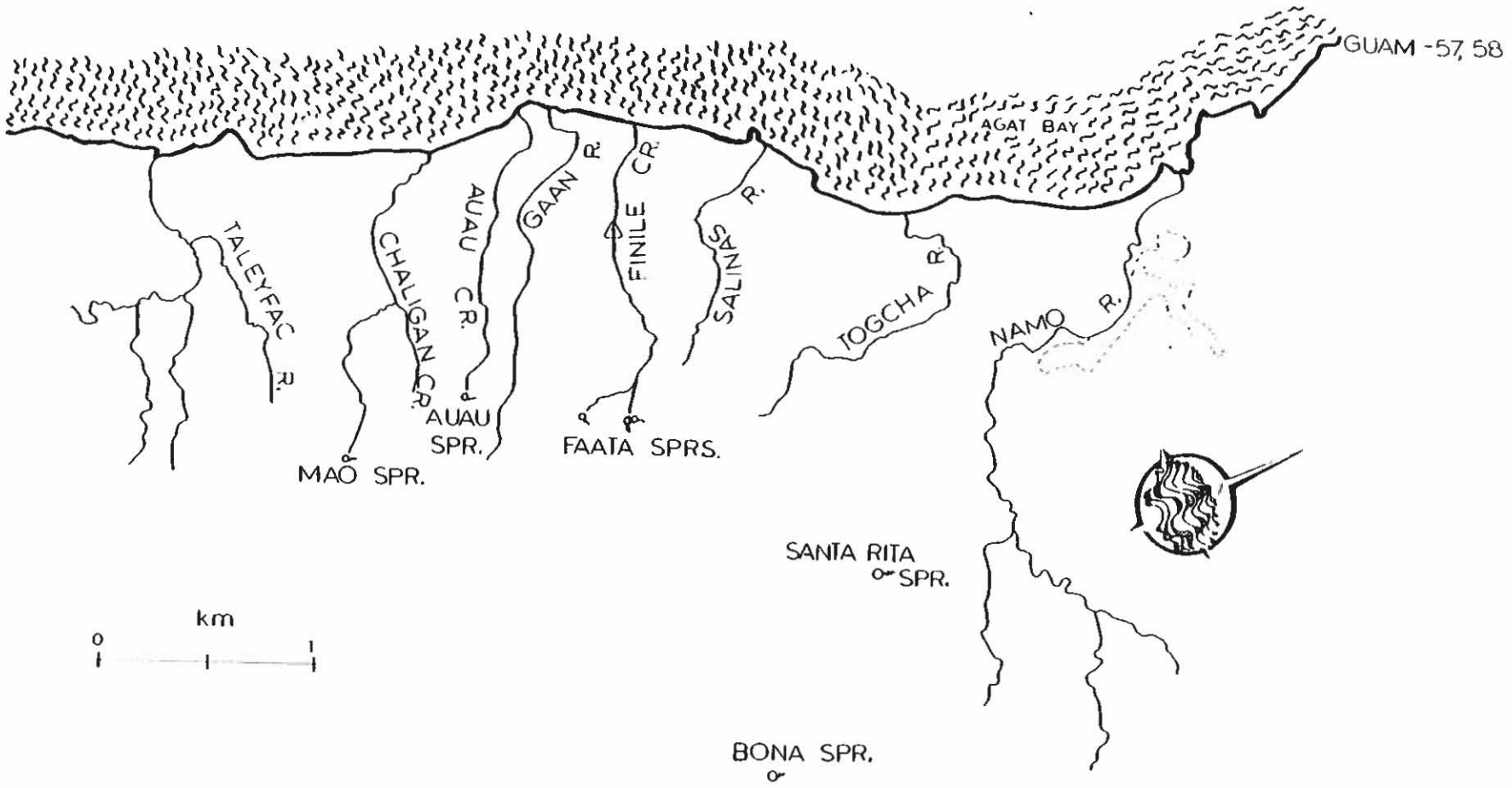
LENGTH OF PERENNIAL TRIBUTARIES AND MAIN CHANNEL: 6,200 m

ELEVATION: 158 m

Additional Information:

1) The Talisay drains into the Maemong River.

No record of the aquatic biota has been located.

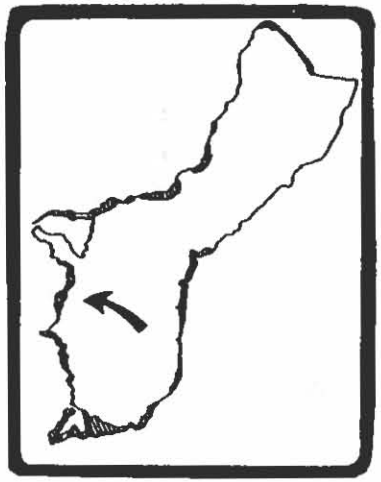

GUAM - 57, 58
AGAT BAY
TALEYFAC R.
CHALIGAN CR.
AUAU CR.
GAAN R.
FINILE CR.
SALINAS R.
TOGCHA R.
NAMO R.
AUAU SPR.
MAO SPR.
FAATA SPRS.
SANTA RITA SPR.
BONA SPR.
km
0
1

Santa Rita Spring, Guam 57

COORDINATES: Lat. 13° 23' 03" N
Long. 144° 40' 23" E

ELEVATION: 56 m

No record of the aquatic biota has been located.



Bona Spring, Guam 58

COORDINATES: Lat. 13° 22' 39" N
Long. 144° 40' 48" E

ELEVATION: 98 m

Additional Information:

1) The Bona feeds a pumping station on Naval Magazine.

No record of the aquatic biota has been located.

MATAGUAC SPR.

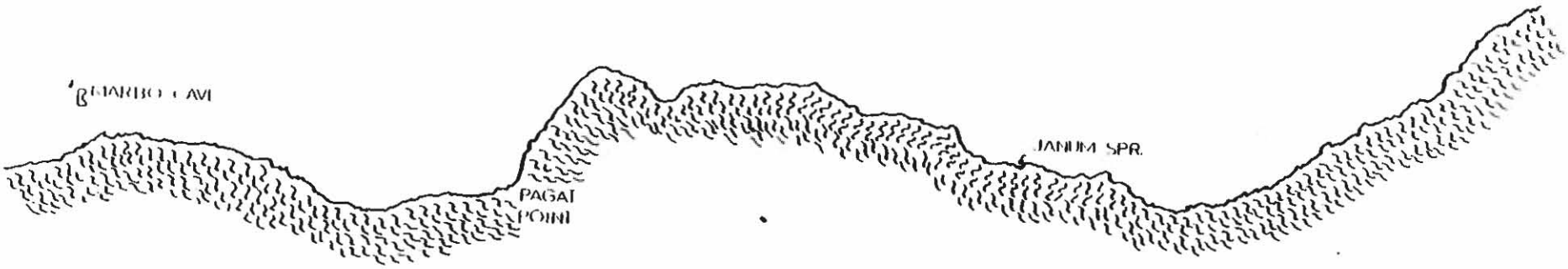
GUAM -59,60,61

Km

0 1 2

SANTA ROSA SPR.

Mt Santa Rosa*
254m



Janum Spring, Guam 59

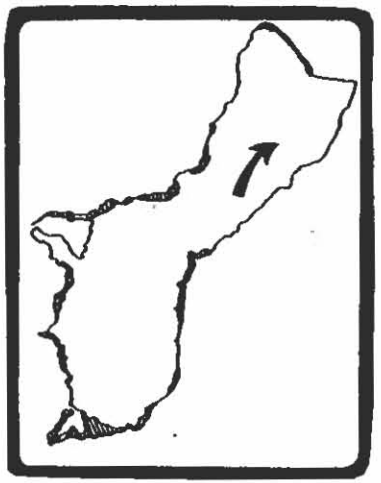
COORDINATES: Lat. 13° 31' 25" N
Long. 144° 54' 45" E

ELEVATION: 6 m

Additional Information:

1) The Janum discharges from a limestone water cave at the foot of a sea cliff.
2) See Appendix (Table 2) for physicochemical characteristics.

No record of the aquatic biota has been located.



Mataguac Spring, Guam 60

COORDINATES: Lat. 13° 32' 36" N
Long. 144° 52' 57" E

ELEVATION: 177 m

No record of the aquatic biota has been located.

Santa Rosa Spring, Guam 61

COORDINATES: Lat. 13° 32' 14" N
Long. 144° 54' 46" E

ELEVATION: 219 m

No record of the aquatic biota has been located.

THE NORTHERN MARIANAS

ROTA

Flowing from the southern limestone water caves of Rota are a few perennial streams. The physiography and biota are relatively unknown. In August 1981, the first author and Dr. J. Maciolek briefly surveyed the aquatic animals of a couple of these streams. A preliminary biota list accompanies the physical data in this section. No USGS series maps are available for Rota. Stream channel lengths, names, and locations are given as best-guess information from many sources and certainly are not positive. The estimated geographic positions of the streams follow that of Sugawara (1934; ref. 252).

Eldredge and Randall (1980; ref. 84) included names for the five streams on the south coast. They labeled and photographed the major stream as Babao, which coincides with our on-site investigation. However, their west-to-east sequence — Haofina, Babao, Lupog, Keko and Fatguan — does create difficulties in resolving the names of the other spring-fed streams. Sugawara (1934) described the "Babao" as the major stream but mapped the Haofina (labeled Haofuniya on his maps) as two streams originating from the Pepo water cave and the Babao as the middle of five streams draining the southern Sabana limestone terrace. Therefore, this report accepts the five streams shown by Sugawara and labels the major stream as Babao, but ignores the name "Lupog" and labels the eastern two streams as Keko and Fatguan. This situation exemplifies the need for a professional hydrological-physiographical survey.

TINIAN

No perennial streams exist on Tinian. Two lowland lentic systems are described. Coordinates and physical data are calculated from AMS maps.

SAIPAN

Saipan has no continuous-perennial streams, although some do contain enough perennial pools to support aquatic fauna. Lake Susupe is an important native and migratory waterbird habitat. The western coastal area contains many marsh areas.

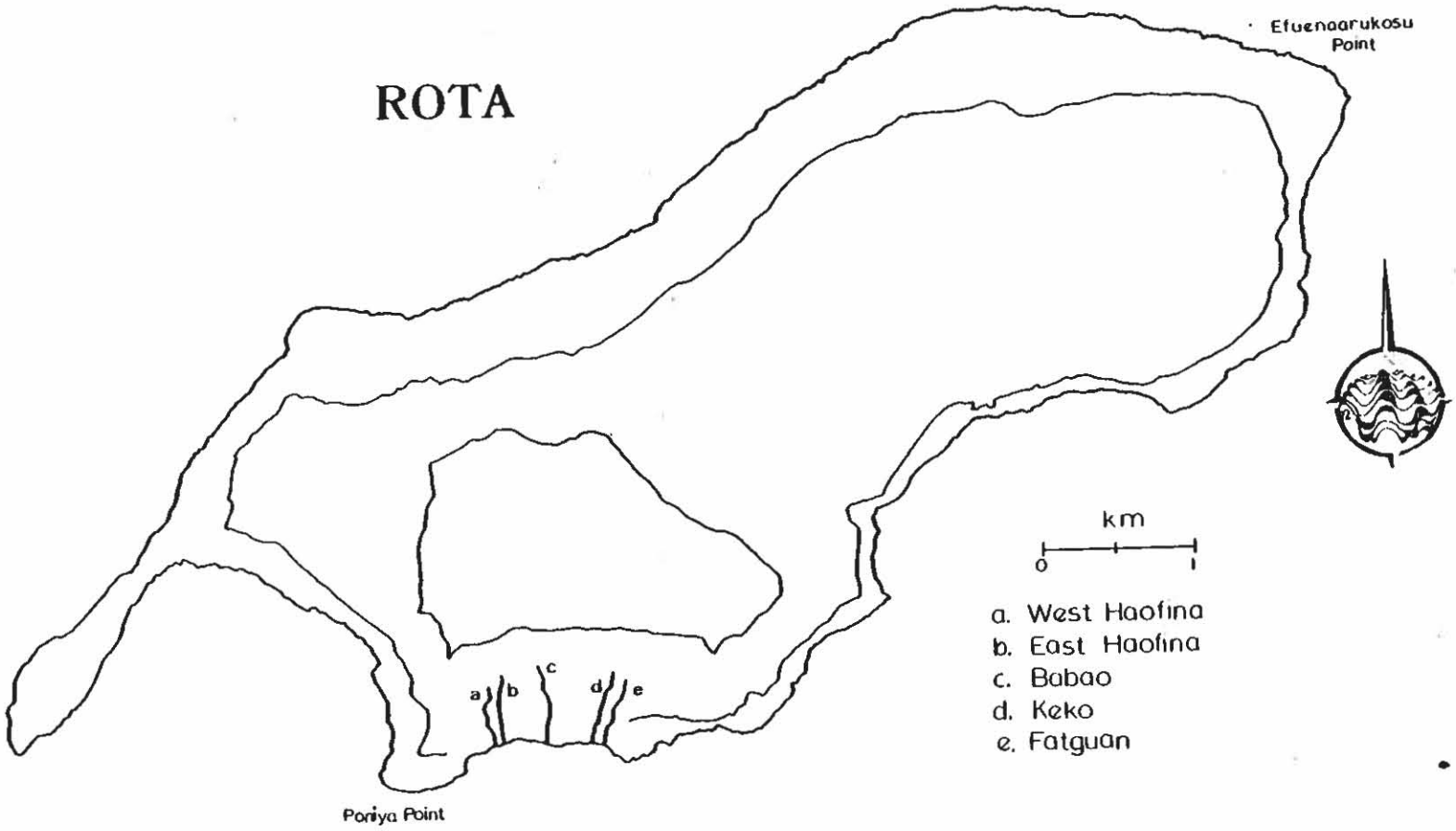
The main streams on the northeast section of Saipan are drawn in this atlas with "continuous perennial" designations, i.e., solid lines, although none are actually continuous throughout the dry season. There are many sections with perennial flow which support aquatic biota. Continuous perennial sections are denoted on page 188.

PAGAN

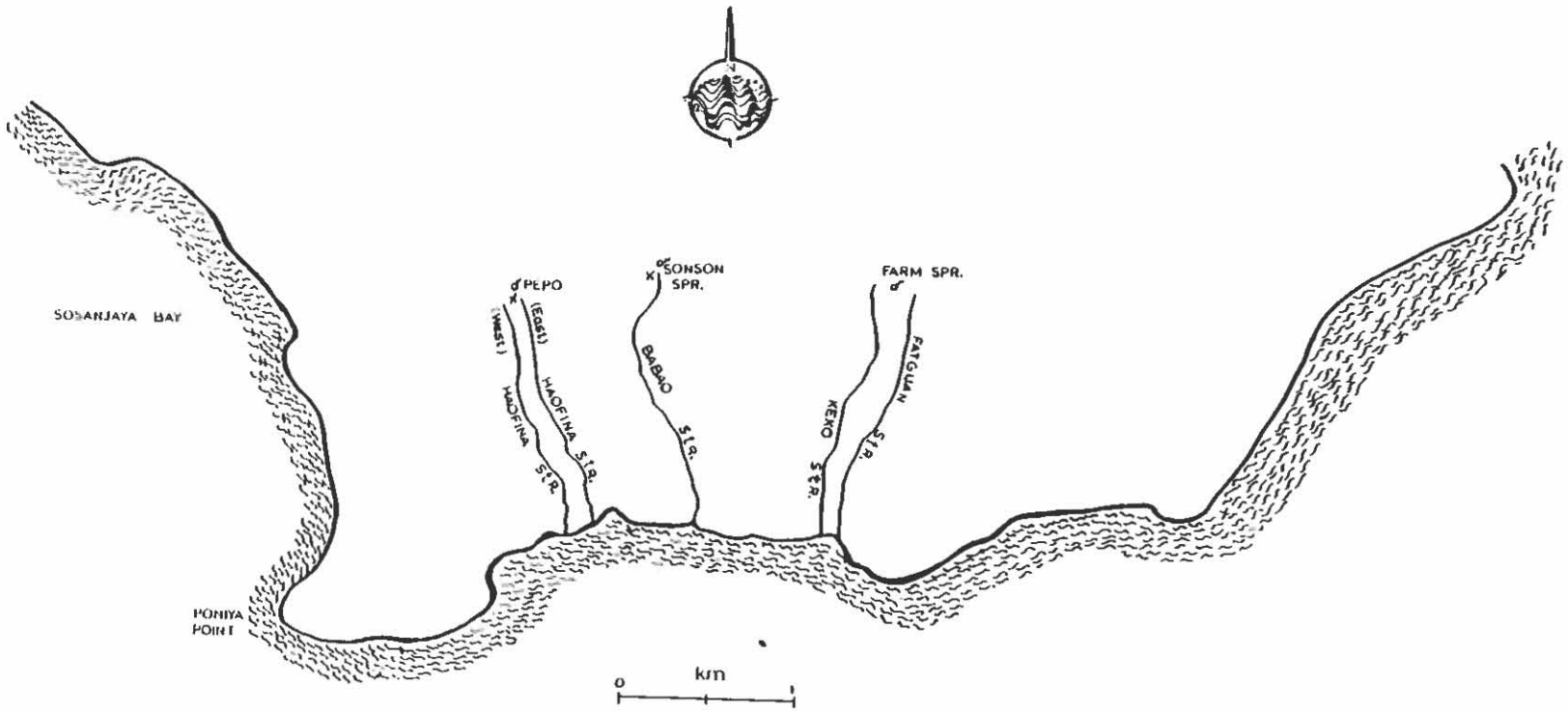
With two inland lakes, Pagan is the only other island in the chain with any perennial "freshwater" systems of biological importance. Both lakes are saline, although the inner lake is nearly fresh (2-5°/$_{oo}$). Both are spring fed. The recent (1981) volcanic eruption will probably have minimal long-term impact on the aquatic flora and fauna (Lynn Raulerson, personal communication).

OTHER ISLANDS IN THE MARIANAS CHAIN

The other high volcanic islands of the Marianas chain have many intermittent channels but, because of their steep slope, these islands have no perennial freshwater systems of biological significance.


ROTA
Efuenaarukosu Point
km
0
1
a. West Haofina
b. East Haofina
c. Babao
d. Keko
e. Fatguan
a
b
c
d
e
Poniya Point

ROTA - 1

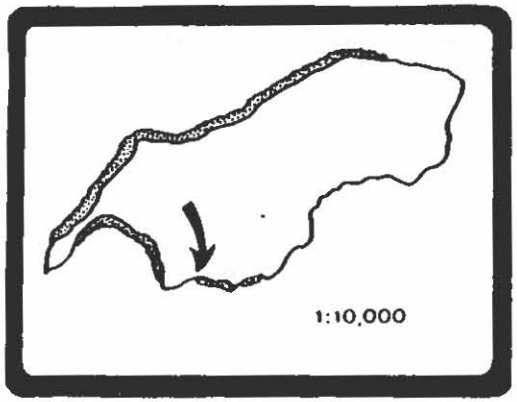

SOSANJAYA BAY
PEPO
SONSON SPR.
FARM SPR.
(WEST)
HAOFINA STR.
(EAST)
HAOFINA S.T.R.
BABAO STR.
KEKO STR.
FATGUAN STR.
PONIYA POINT
0
km
1

West Haofina Stream, Rota 1

*COORDINATES: Lat. 14° 06' 45" N
Long. 145° 11' 05" E

ESTIMATED CHANNEL LENGTH: 1,000 m

ELEVATION: 290 m



Additional Information:

1) The freshwater biology of the Rota streams is little known.
2) From on-sight observations, the Haofina seems to bifurcate at the headwaters.
3) No USGS maps or military geology available for Rota.
4) The Rota streams are spring-fed from hillside water caves. These caves are sources for irrigation and domestic water.
5) The Haofina, both the east and west channels, seems to be perennial-interrupted.

Reported Aquatic Organisms

ANIMALS

Invertebrates:

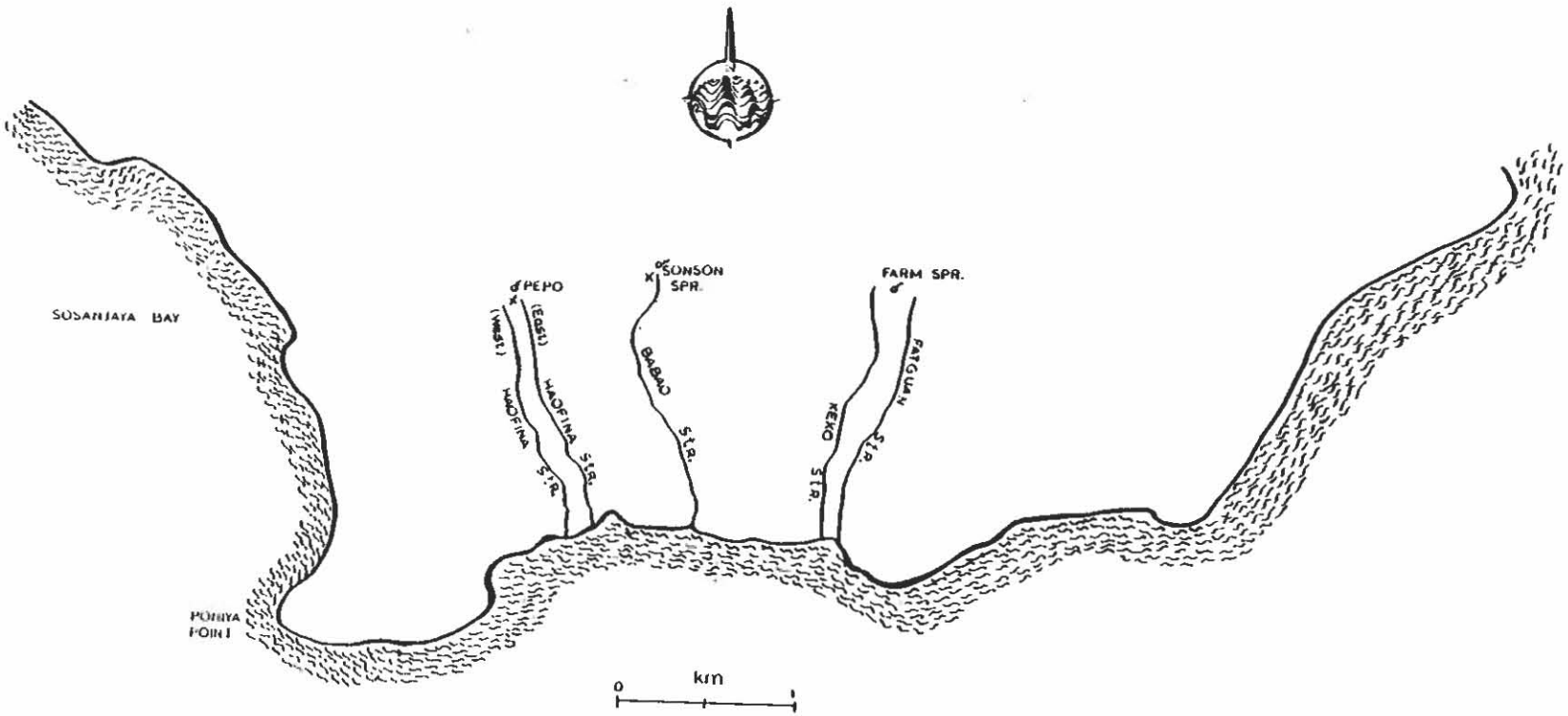
Atyid spp.
Macrobrachium lar

Thiarid and neritid gastropods

Aquatic organisms collected by J. Maciolek and B. R. Best (August 1981).

* Coordinates for Rota were taken from AMS maps. Elevation and channel length data were taken from Sugawara (1934). All physical data concerning Rota are tentative.

ROTA - 2


SUDANJAYA BAY
PEPO
SONSON SPR.
FARM SPR.
(EAST)
(WEST)
HAOFINA STR.
HAOFINA STR.
BABAO STR.
KEKO STR.
FATGUN STR.
PORIYA POINT
0
km
1

East Haofina Stream, Rota 2

*COORDINATES: Lat. 14° 06' 45" N
Long. 145° 11' 08" E

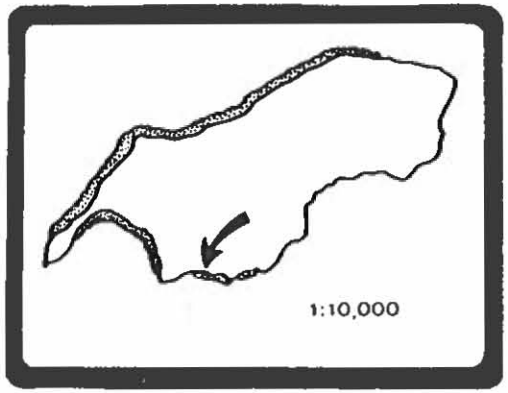
ESTIMATED CHANNEL LENGTH: 1,250 m

ELEVATION: 275 m

Lower reaches are uncollected.

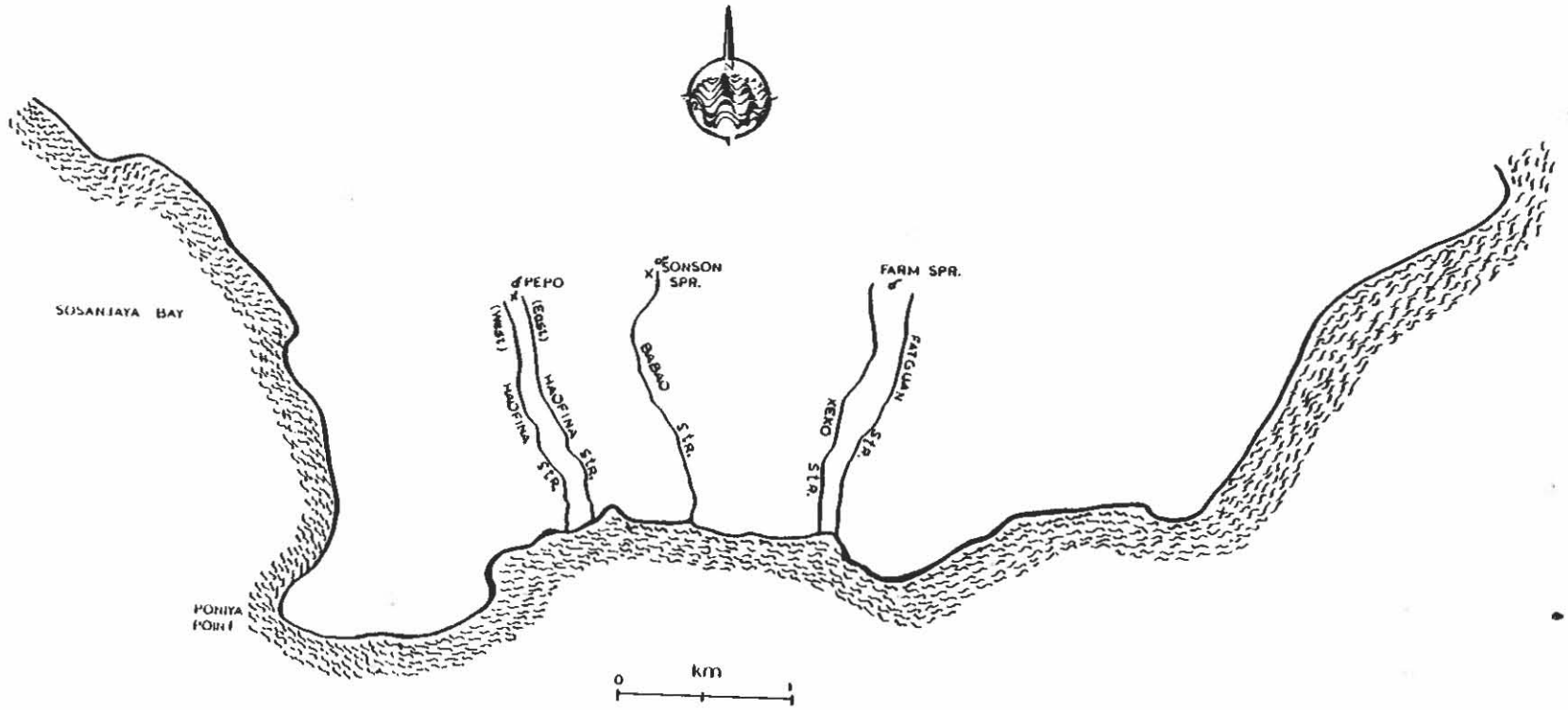
Additional Information:

1) Biology and physiography are little known.
2) This perennial-interrupted stream probably originates from the same water cave as the West Haofina.



* Coordinates for Rota were taken from AMS maps. Elevation and channel length were taken from Sugawara (1936). All physical data concerning Rota are tentative.

ROTA - 3


SOSANTAYA BAY
PEPO
SONSON SPR.
FARM SPR.
(WEST)
(EAST)
HAOFINA STR.
HAOFINA STR.
BABAO STR.
KEKO STR.
FATGUAN STR.
PONIYA POINT
0
km
1

Babao Stream, Rota 3

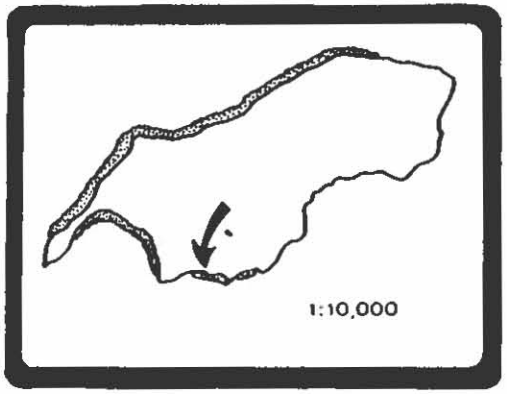
*COORDINATES: Lat. 14° 06' 45" N
Long. 145° 11' 28" E

ESTIMATED CHANNEL LENGTH: 1,400 m

ELEVATION: 290 m

Additional Information:

1) Biology and physiography are little known.
2) This stream is described as the one in the predominant valley (from aerial photos) of the south shore.
3) Many small (<10 m) waterfalls can be found along the stream.
4) Field research indicates this stream may also be known as the Ogok.
5) The Babao, fed by the Sonson water cave seems to be the only perennial-continuous stream on Rota.



Reported Aquatic Organisms

ANIMALS

Invertebrates:

Amphipods spp.
Atyid spp.
Macrobrachium lar

Thiarid and Neritid gastropods

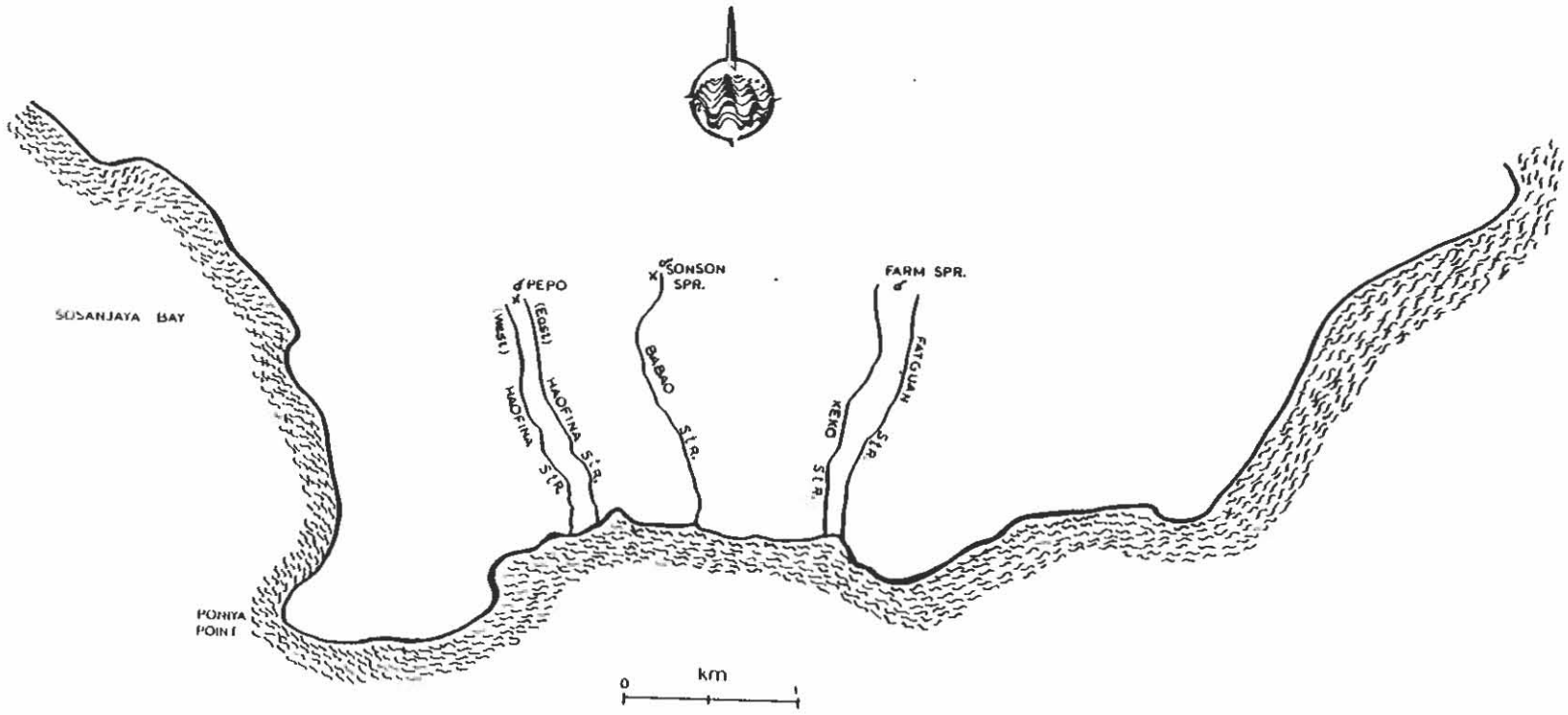
Vertebrates:

Anguilla sp.
Awaous guamensis
Eleotris fusca
Kuhlia sp.
Sicyopus leprurus
Stiphodon elegans

Aquatic organisms collected by J. Maciolek and R. R. Best (August 1981)

* Coordinates for Rota were taken from AMS maps. Elevation and length data were taken from Sugawara (1934). All physical data concerning Rota are tentative.

ROTA - 4


SOSANJAYA BAY
PEPO
(EAST)
(WEST)
HAOFINA S.I.R.
HAOFINA S.I.R.
SONSON SPR.
BABAO S.I.R.
FARM SPR.
KEKO S.I.R.
FATGUAN S.I.R.
PONYA POINT
0
km

KEKO STREAM

ROTA-4

Keko Stream, Rota 4

*COORDINATES: Lat. 14° 06' 40" N
Long. 145° 11' 49" E

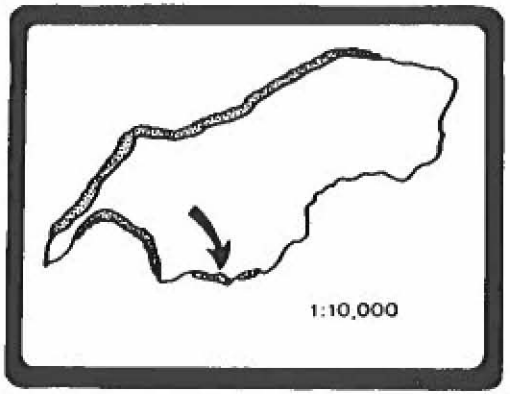
ESTIMATED CHANNEL LENGTH: 1,000 m

ELEVATION: 280 m

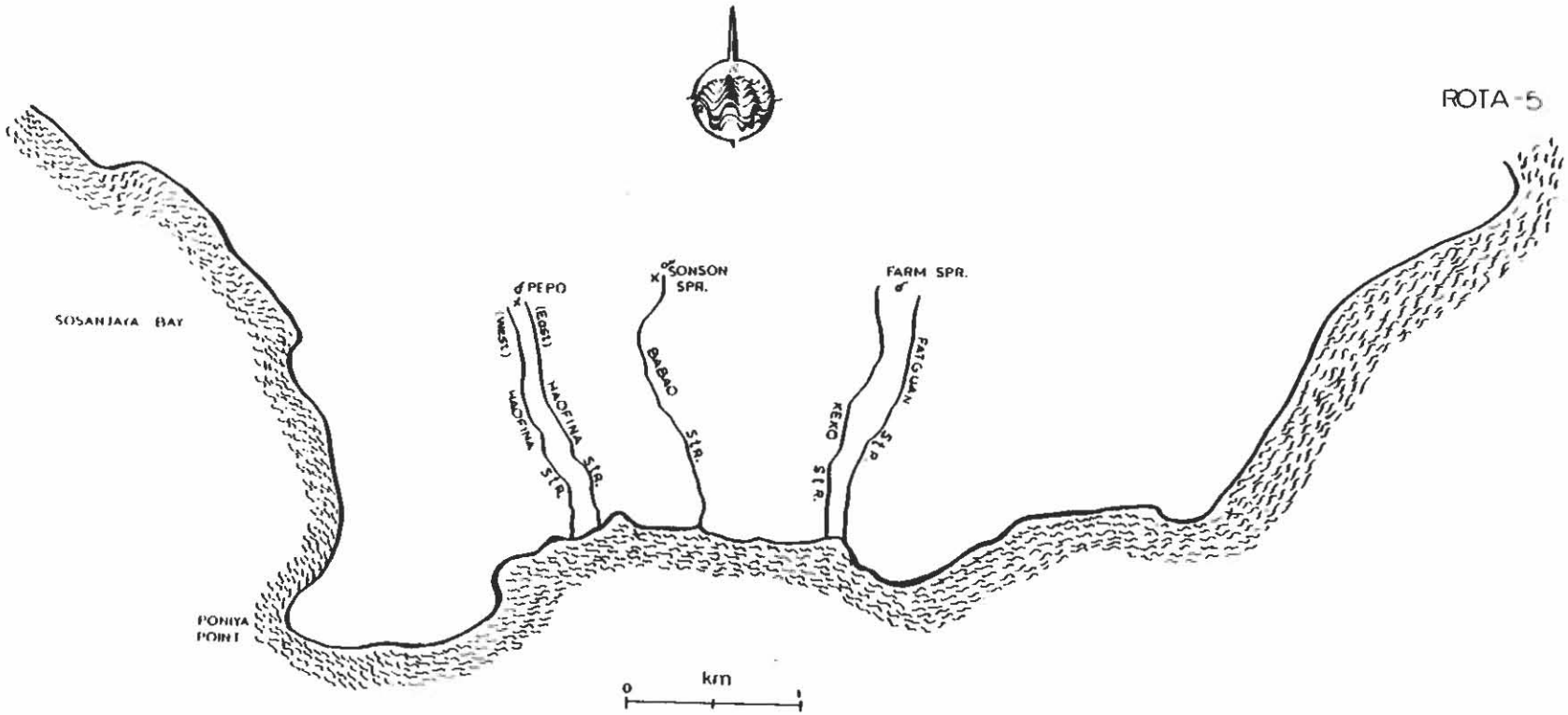
No record of the aquatic biota has been located.

Additional Information:

1) Biology and physiography are little known.
2) The Keko is a perennial-interrupted stream.



* Coordinates for Rota were taken from AMS maps. Elevation and channel length were taken from Sugawara (1934). All physical data concerning Rota are tentative.


ROTA-5
SOSANJAYA BAY
PEPO
(EAST)
(WEST)
MAOFINA STR.
MAOFINA STR.
SONSON SPR.
BABAO STR.
FARM SPR.
KEKO STR.
FAIGMAN STR.
PONIYA POINT
0
km
1

FATGUAN STREAM

ROTA-5

Fatguan Stream, Rota 5

*COORDINATES: Lat. 14° 06' 40" N
Long. 145° 11' 53" E

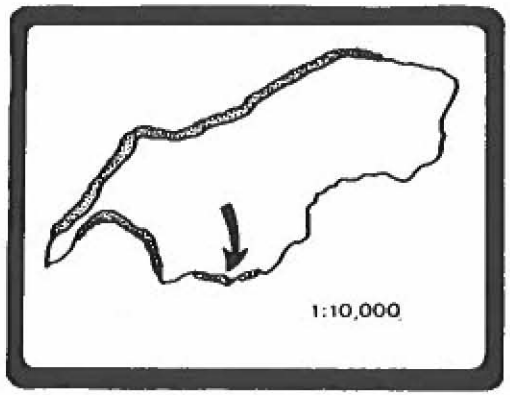
ESTIMATED CHANNEL LENGTH: 1,275 m

ELEVATION: 270 m

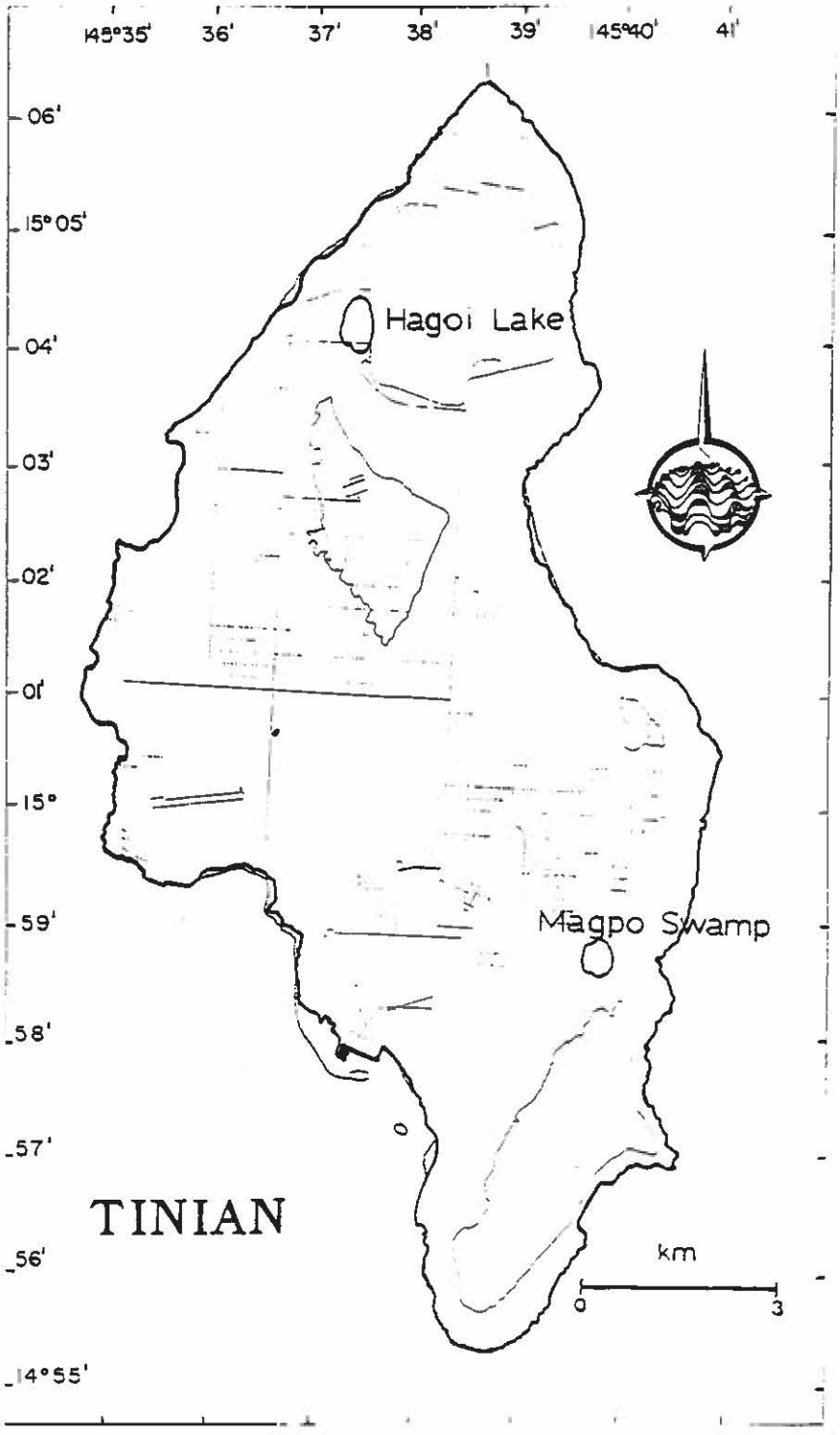
No record of the aquatic biota has been located.

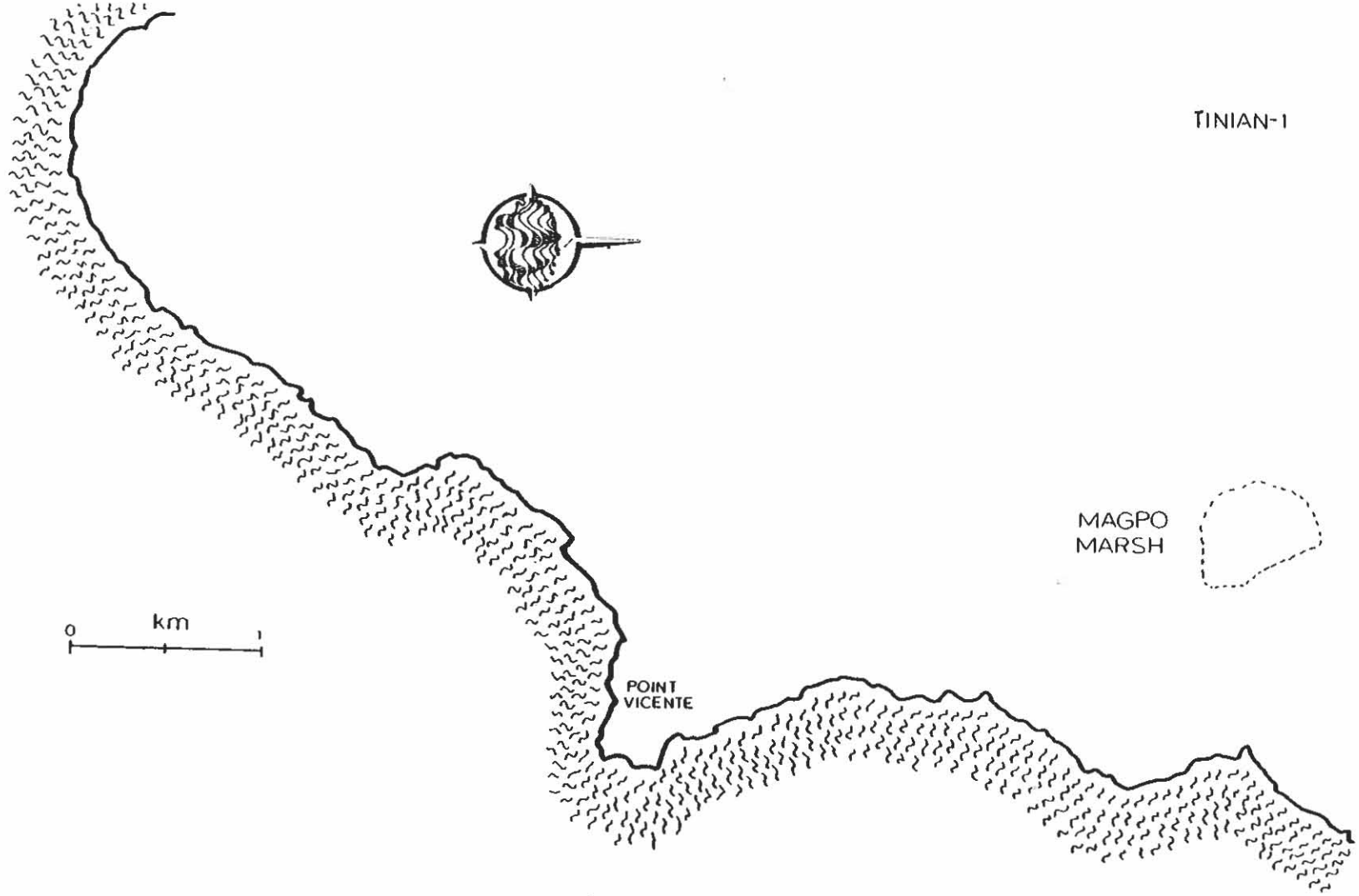
Additional Information:

1) Biology and physiography are little known.
2) The Fatguan is a perennial-interrupted stream.



* Coordinates for Rota were taken from AMS maps. Elevation and channel length were taken from Sugawara (1934). All physical data concerning Rota are tentative.


145°35'
36'
37'
38'
39'
145°40'
41'
06'
15°05'
04'
03'
02'
01'
15°
59'
58'
57'
56'
14°55'
Hagoi Lake
Magpo Swamp
TINIAN
km
0
3


TINIAN-1
MAGPO
MARSH
0
km
1
POINT
VICENTE

Magpo Marsh, Tinian 1
(also called Marpo)

COORDINATES: Lat. 14° 58' 45" N
Long. 145° 39' 16" E

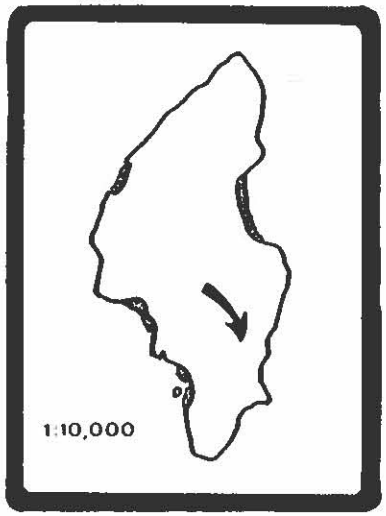
TOTAL AREA: 0.28 ha

DEPTH: 3 m

ELEVATION: 0 m

Additional Information:

1) This is an extensively cultivated area and has three pumping stations.
2) Little standing water remains.



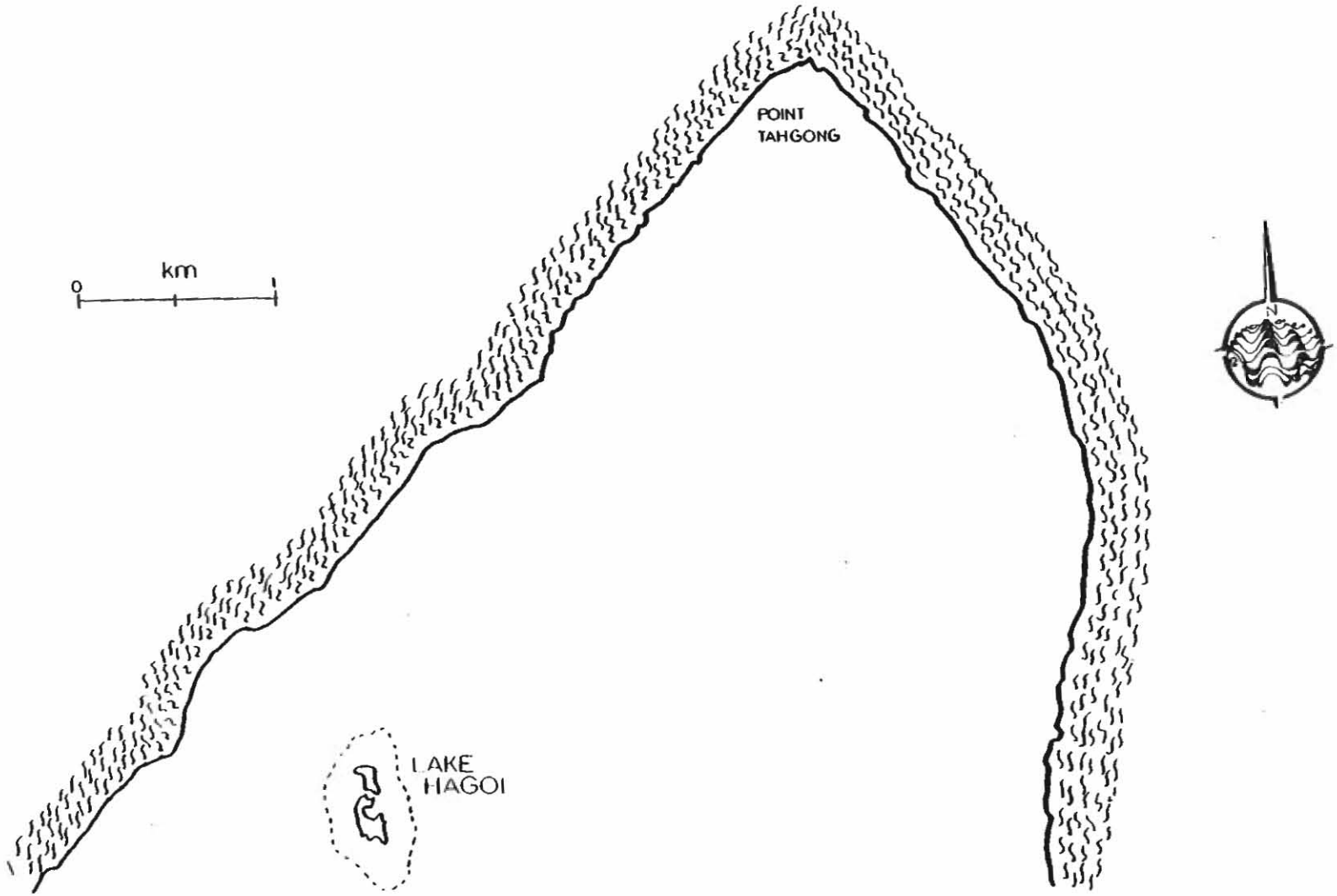
Reported Aquatic Organisms

PLANTS

Hibiscus tiliaceus
Phragmites karka

Information from references:
1, 25, 75, 184

TINIAN - 2



Lake Hagoi, Tinian 2

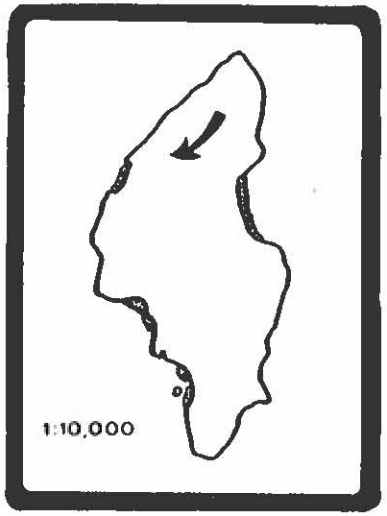
COORDINATES: Lat. 15° 04' 15" N
Long. 145° 37' 32" E

TOTAL AREA: 16.9 ha

ELEVATION: 5 m

Additional Information:

1) The adjacent marshes are heavily farmed and the entire area is slowly draining, thus becoming a marsh.
2) Lake is an important endangered waterbird habitat.



Reported Aquatic Organisms

ANIMALS

Invertebrates:

Galba viridis

Vertebrates:

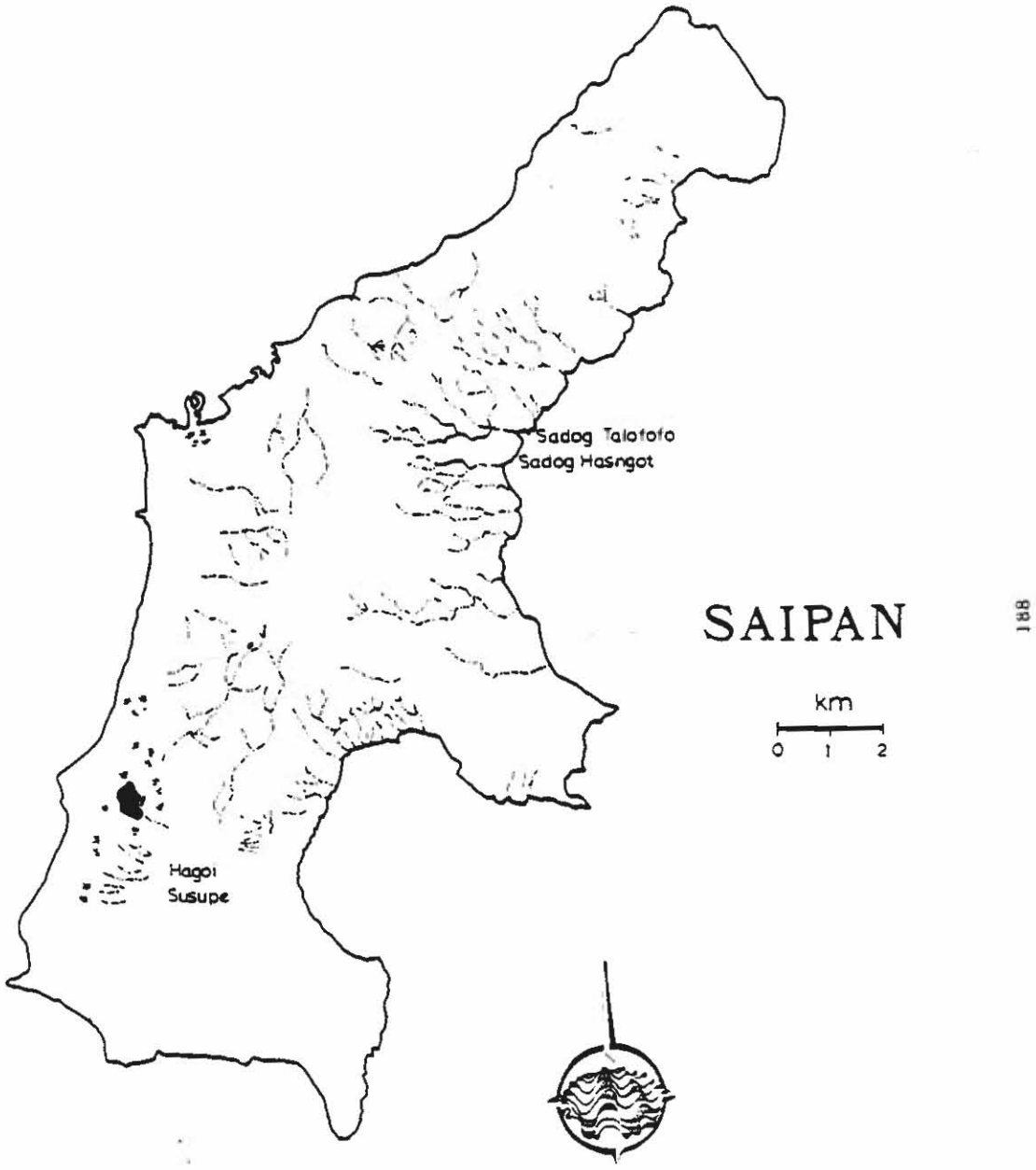
Anas oustaleti
Gambusia affinis

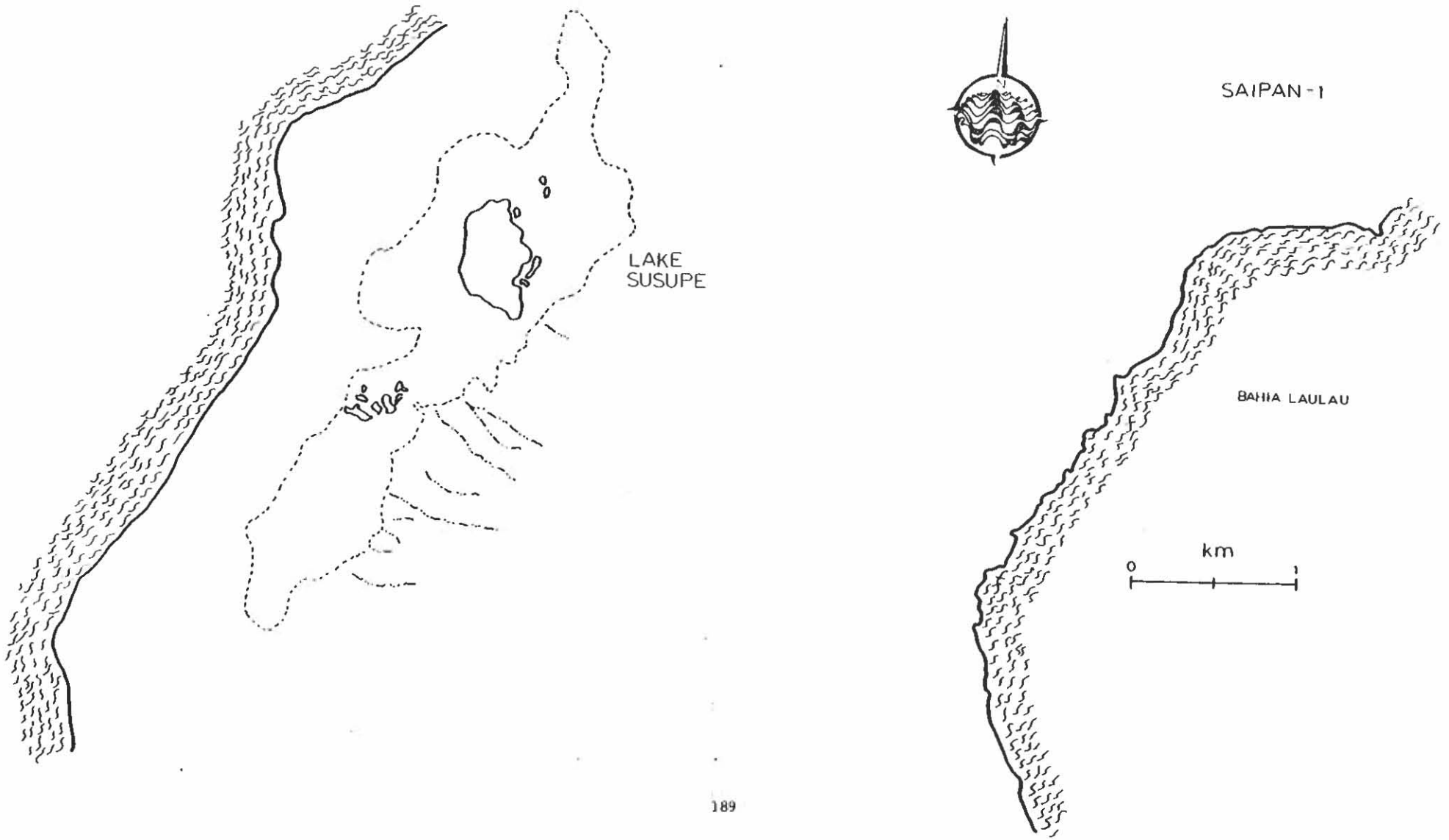
PLANTS

Hibiscus tiliaceus
Phragmites karka

Information from references:

1, 25, 75, 184


Sadog Talofofo
Sadog Hasngot
Hagoi
Susupe
SAIPAN
km
0 1 2


LAKE
SUSUPE
SAIPAN - 1
BAHIA LAULAU
km
0
1

Lake Susupe, Saipan 1

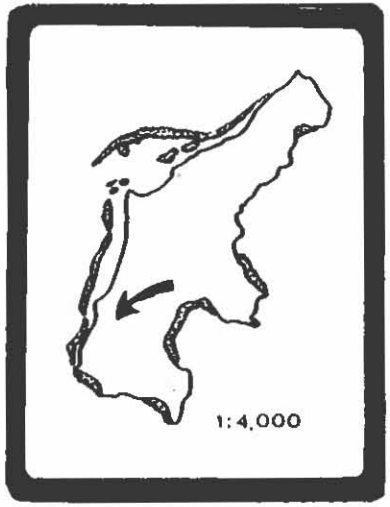
COORDINATES: Lat. 15° 09' 46" N
Long. 145° 42' 48" E

TOTAL AREA: 191 ha

DEPTH: 3 m

WIDTH: 1,000 m

ELEVATION: 0 m



Additional Information:

1) During the Japanese mandate, the marshes were used for rice cultivation.
2) Major modification of drainage patterns have been caused by roadway construction and urban development.
3) Serious overflow potential due to fluctuations (3 m) in water level during heavy rains.
4) Only area in Marianas Islands with an extensive waterbird community; both native and migratory.
5) The area provides a critical habitat for the rare endangered Marianas Mallard.
6) Lake is seasonally brackish. The main lake may vary from 0.5°/₀₀ to 4.2°/₀₀, with the nearby ponds reaching 6-8°/₀₀. Moore et al. (1977, ref. 184) reported 11°/₀₀ in Susupe.
7) Susupe is also called Charanka Lake.

Reported Aquatic Organisms

ANIMALS

Invertebrates:

Galba viridis
Neritina spp.
Thiara granifera

Palaemon debilis

Vertebrates:

Anas oustaleti
Gambusia affinis
Tilapia sp.

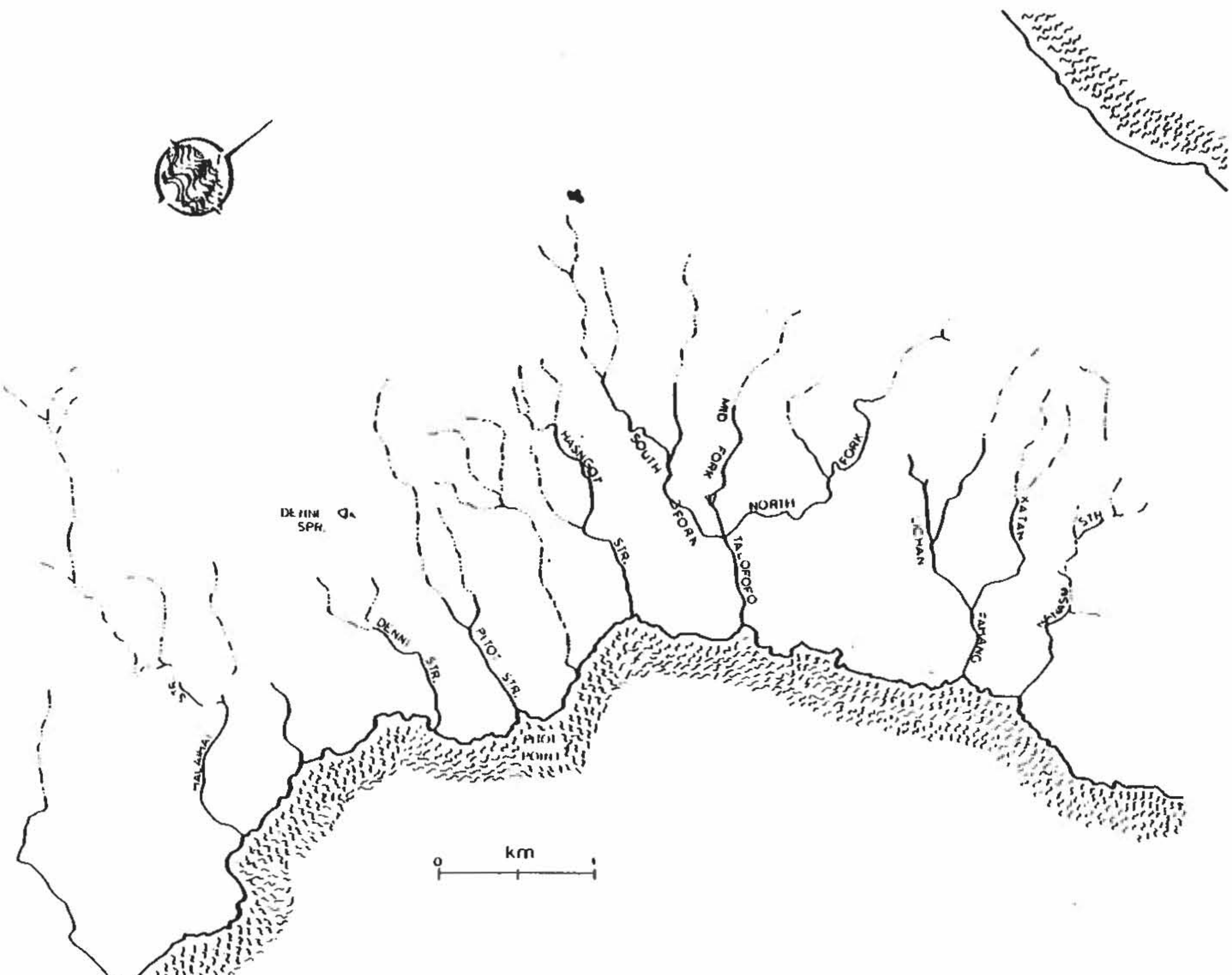
PLANTS

Acrostichum aureum
Hibiscus tiliaceus
Phragmites karka
Scirpus littoralis

Information from references:

1, 25, 26, 114, 184, 259

SAIPAN-2,3


SPR.
DENNI
STR.
SOUTH
FORK
MID
FORK
NORTH
FORK
TALOFOFO
STR.
km
0
1

HALAILAI AND DENNI STREAMS

Sadog Halaihai, Saipan 2

COORDINATES: Lat. 15° 11' 26" N
Long. 145° 46' 55" E

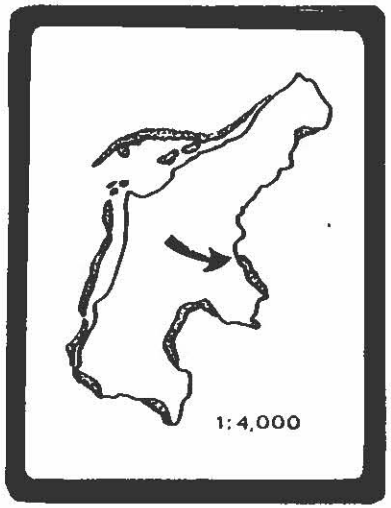
ESTIMATED CHANNEL LENGTH: 1,125 m

ELEVATION: 40 m

Additional Information:

1) This is an intermittent stream.

No record of the aquatic biota has been located.



SAIPAN-2, 3

Sadog Denni, Saipan 3

COORDINATES: Lat. 15° 11' 52" N
Long. 145° 46' 53" E

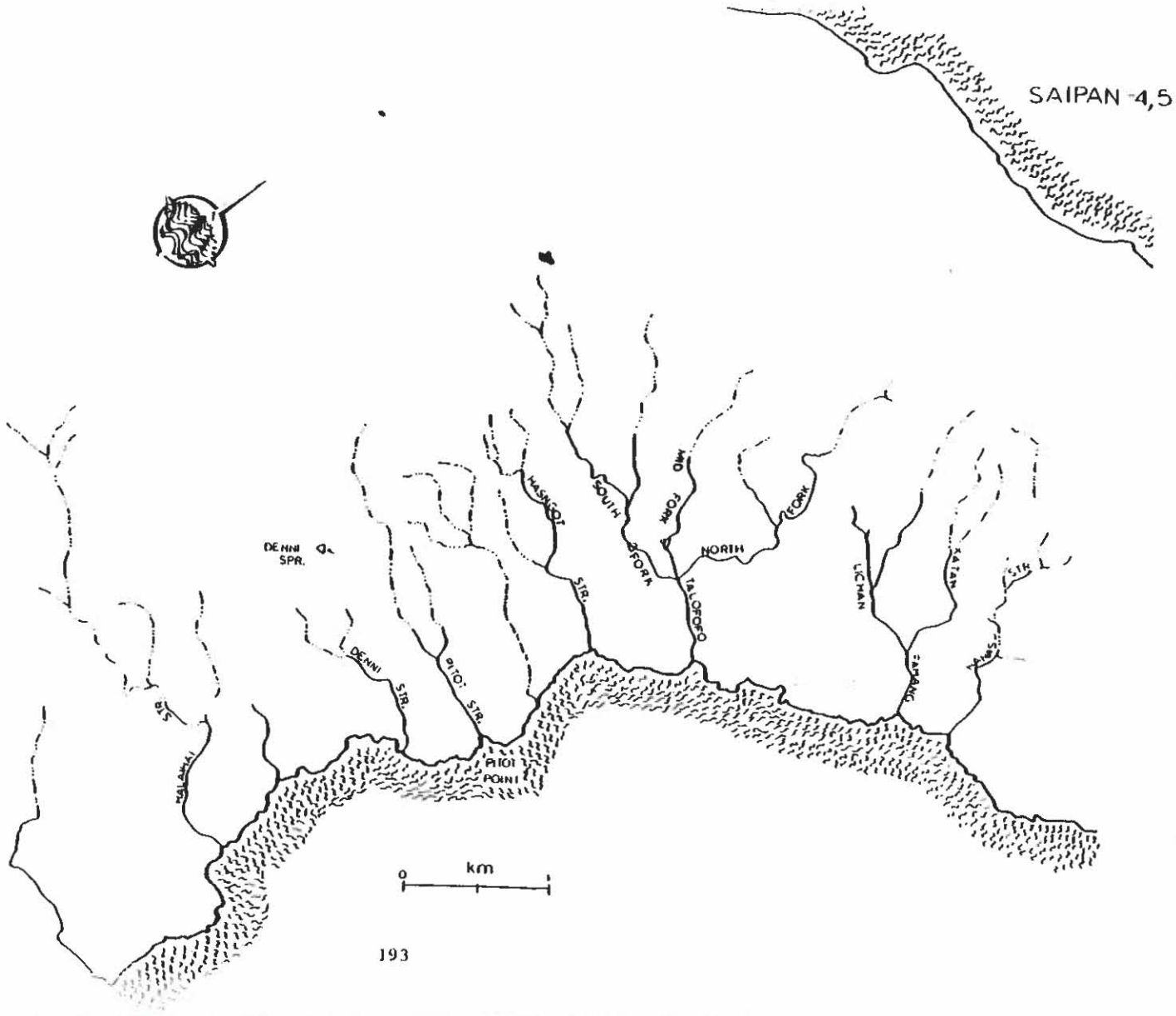
ESTIMATED CHANNEL LENGTH: 750 m

ELEVATION: 40 m

Additional Information:

1) Denni is an interrupted stream.
2) Denni Spring:
   Lat. 15° 11' 57" N
   Long. 145° 46' 05" E
   Elev. 80 m
3) Gaging Station:
   Lat. 15° 11' 57" N
   Long. 145° 46' 05" E
   Elev. 80 m
   Average (11 yr) discharge: 0.02 m^3/s.

No record of the aquatic biota has been located.


SAIPAN 4,5
DENNI SPR.
DENNI STR.
PITOI STR.
PITOI POINT
HASNGOI STR.
SOUTH FORK
NORTH FORK
TALOFOFO
LICHAN
0 km

PITOT AND HASNGOT STREAMS

Sadog Pitot, Saipan 4

COORDINATES: Lat. 15° 12' 11" N
Long. 145° 46' 57" E

LENGTH OF LONGEST CONTINUOUS CHANNEL: 915 m

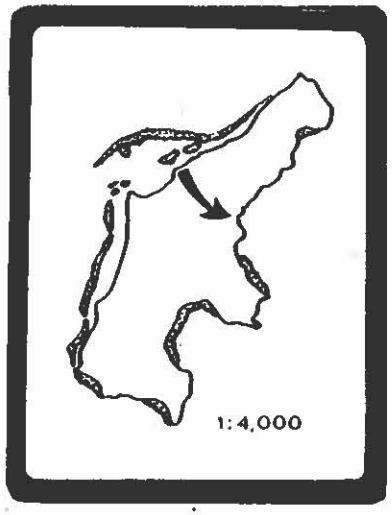
COMBINED CHANNEL LENGTHS: 1,160 m

ELEVATION: 130 m

Additional Information:

1) This is an intermittent system.

No record of the aquatic biota has been located.



SAIPAN-4, 5

Sadog Hasngot, Saipan 5

COORDINATES: Lat. 15° 12' 42" N
Long. 145° 46' 48" E

LENGTH OF LONGEST CONTINUOUS CHANNEL: 1.560 m

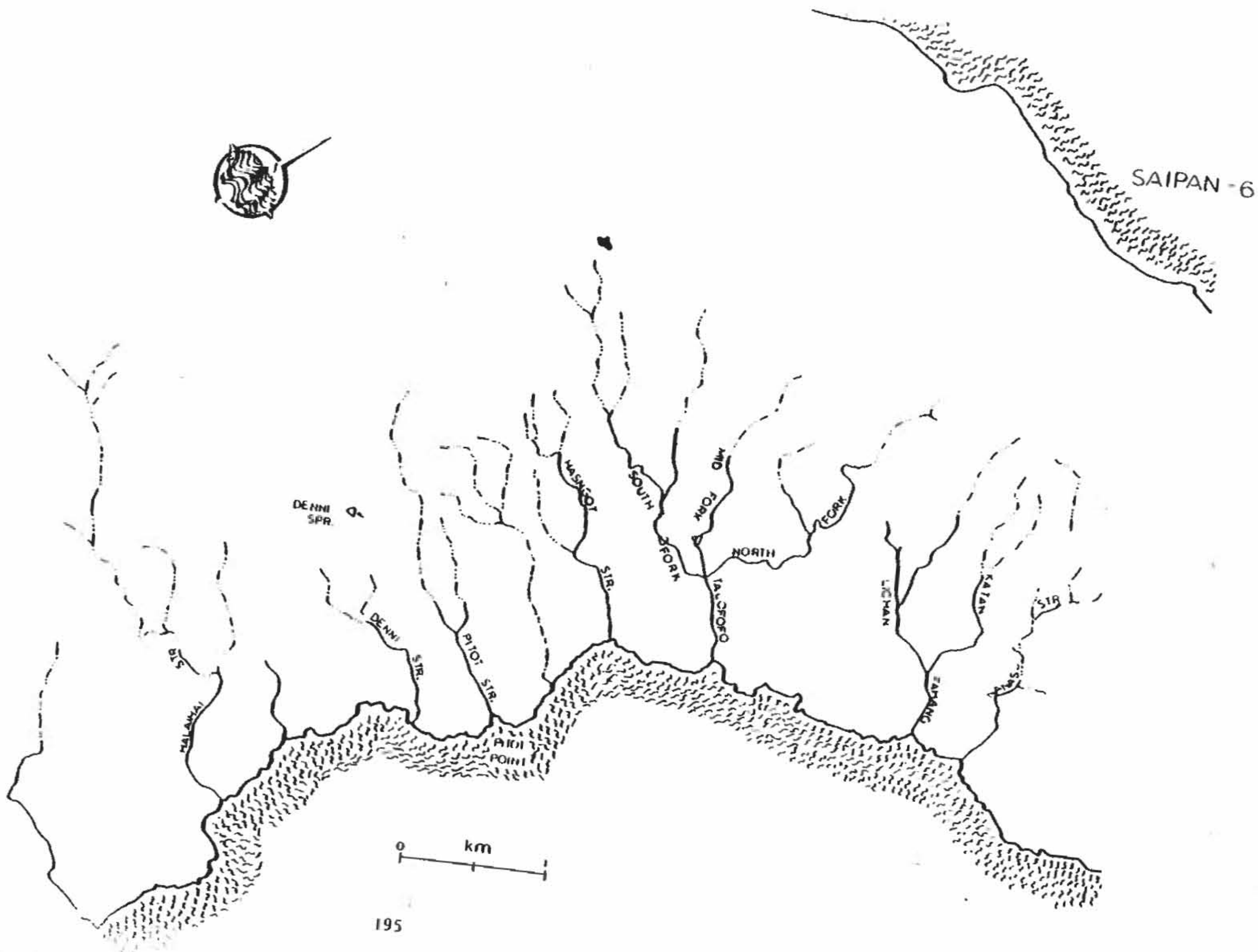
COMBINED CHANNEL LENGTHS: 1,720 m

ELEVATION: 150 m

Additional Information:

1) This is an intermittent system.

No record of the aquatic biota has been located.


SAIPAN -6
DENNI SPR.
DENNI STR.
PITOT STR.
PITOT POINT
STR.
SOUTH FORK
MID FORK
NORTH FORK
STR
0
km

Sadog Talofofo, Saipan 6

COORDINATES: Lat. 15° 12' 58" N
Long. 145° 47' 00" E

TOTAL STREAM SYSTEM DATA:

1) Length of longest continuous channel: 2,100 m

LENGTH OF INDIVIDUAL STREAM CHANNELS AND THEIR TRIBUTARIES:

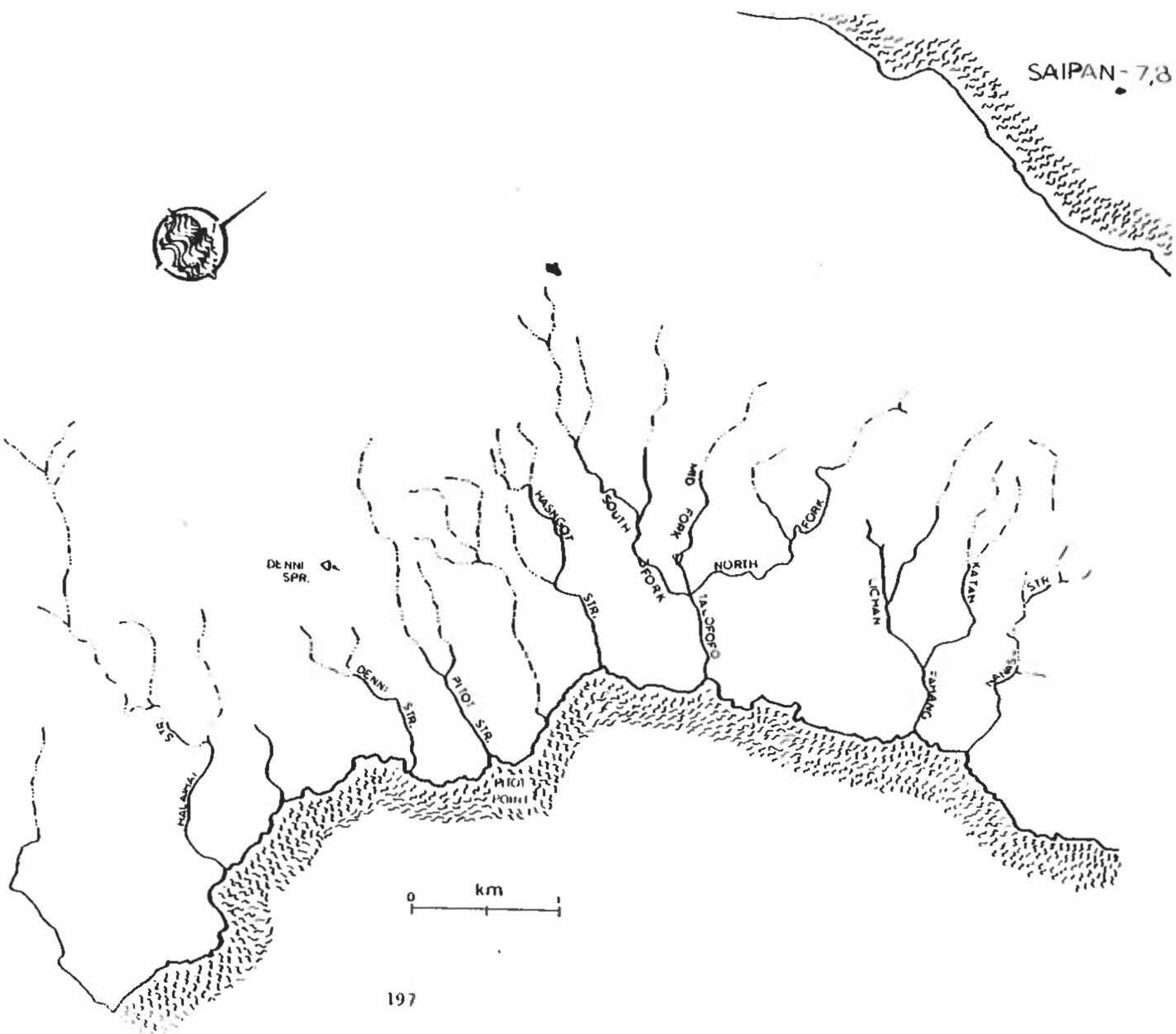
a) Lower Talofofo 645 m
b) South Fork: 1,290 m
c) Mid Fork: 885 m
d) North Fork: 1,770 m

ELEVATION: 190 m

Additional Information:

1) South Fork Gaging Station:
Lat. 15° 12' 58" N
Long. 145° 46' 31" E
Elev. 9.1 m
Average (8 yr) discharge: 0.04 m^3/s for 179 ha.
2) Mid Fork Gaging Station (210 m upstream from confluence):
Lat. 15° 13' 05" N
Long. 145° 46' 36" E
Elev. 7.6 m
Average (11 yr) discharge: 0.02 m^3/s for 91 ha.
3) The lower reaches are not perennial.

No record of the aquatic biota has been located.


SAIPAN - 7,8
DENNI SPR.
DENNI STR.
PITOT STR.
PITOT POINT
HASNGOT STR.
SOUTH FORK
MID FORK
NORTH FORK
TALOFOFO
LICHAN
KATAN
FAMANG
STR
0
km

Sadog Fahang, Saipan 7

COORDINATES: Lat. 15° 13' 36" N
Long. 145° 47' 31" E

TOTAL STREAM SYSTEM DATA:

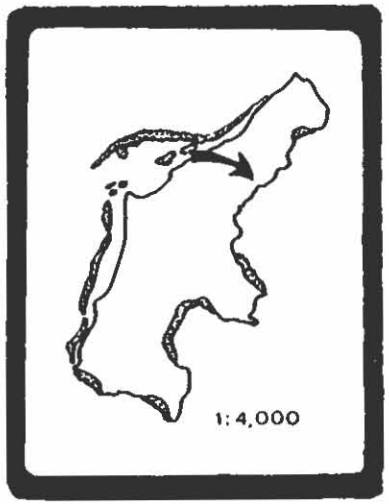
1) Length of longest continuous channel: 1,600 m
2) Combined channel lengths: 3,000 m

ELEVATION: 190 m

Additional Information:

1) The Fahang branches into Sadog Fahang Katan and Sadog Fahang Lichan.
2) This is an intermittent stream system.

No record of the aquatic biota has been located.



SAIPAN-7, 8

Sadog Nanasu, Saipan 8

COORDINATES: Lat. 15° 13' 44" N
Long. 145° 47' 40" E

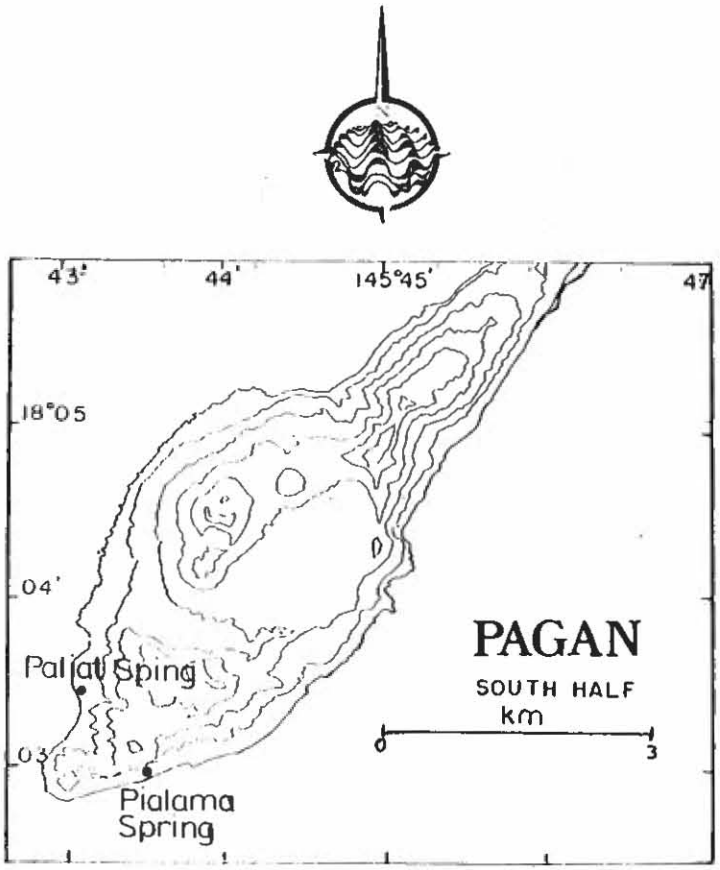
ESTIMATED CHANNEL LENGTH: 710 m

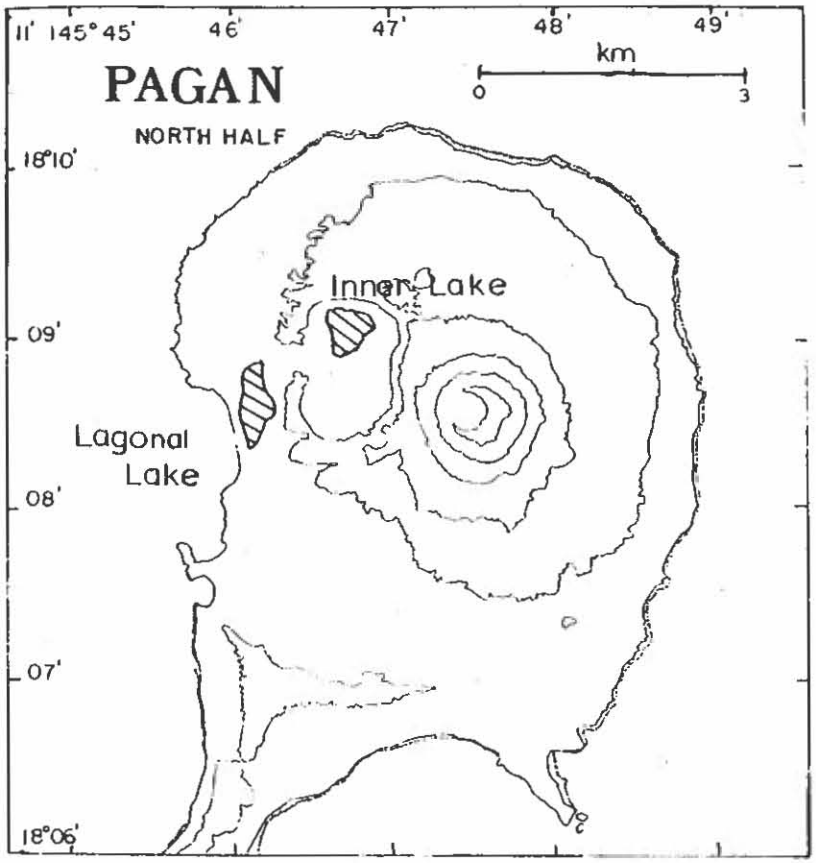
ELEVATION: 100 m

Additional Information:

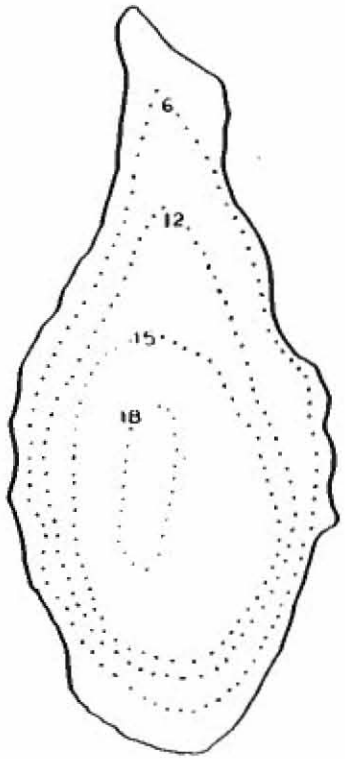
1) This is an intermittent stream.

No record of the aquatic biota has been located.


43'
44'
145°45'
47
18°05
04'
03'
Palial Spring
Pialama Spring
PAGAN
SOUTH HALF
km
0
3


11' 145°45'
46'
47'
48'
49'
km
0
3
PAGAN
NORTH HALF
18°10'
09'
08'
07'
18°06'
Inner Lake
Lagonal Lake

PAGAN - 1



Lagona Lake

scale 1:6200

Depth contours in meters

Lagona Lake, Pagan I

COORDINATES: Lat. 18° 08' 19" N
Long. 145° 46' 03" E

DEPTH: 16 m

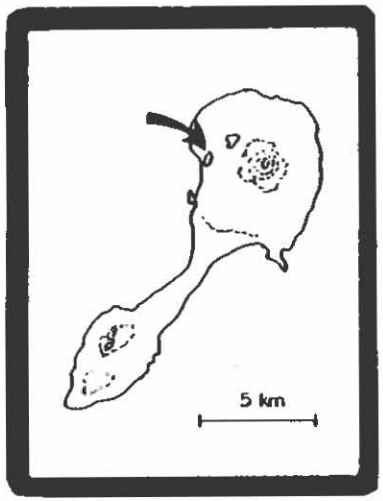
ELEVATION: 0 m

DIMENSIONS: 750 m x 310 m

APPROXIMATE VOLUME: 1.9×10^6 m^3

Additional Information:

1) It is a brackish water source (15°/$_{oo}$) for free-roaming livestock.
2) It has been discussed as a site for a possible resort development.
3) Remained intact following the recent eruption (1981).



Reported Aquatic Organisms

ANIMALS

Vertebrates:

Awaous guamensis
Gambusia affinis
Tilapia sp.

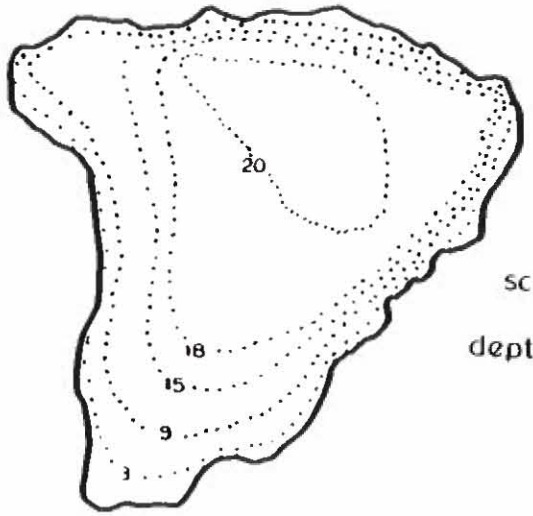
PLANTS

Hibiscus tiliaceus

Information from references:

56, 184

PAGAN-2



Inner Lake
scale 1:6200

depth contours in meters

Inner Lake, Pagan 2

COORDINATES: Lat. 18° 09' 52" N
Long. 145° 46' 39" E

TOTAL AREA: 29.8 ha

DEPTH: 20 m

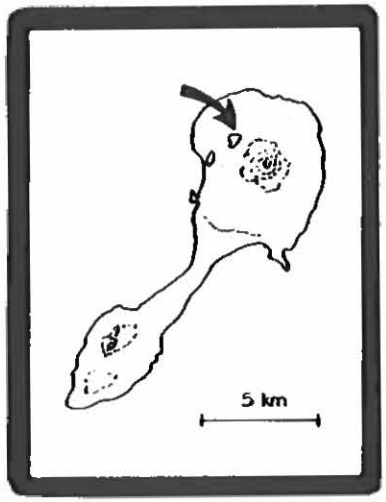
ELEVATION: 0 m

DIMENSIONS: 560 m x 525 m

APPROXIMATE VOLUME: 2.6×10^6 m^3

Additional Information:

1) There are several hot springs along the eastern shore, a possible tourist attraction.
2) Ecologically, a very young lake.
3) Recent (1981) lava flow stopped 50 m from lake.
4) Salinity is approx. 5‰.
5) The Inner Lake is also called Sinalung Lake.



Reported Aquatic Organisms

ANIMALS

Vertebrates:

Gambusia affinis
Tilapia sp.

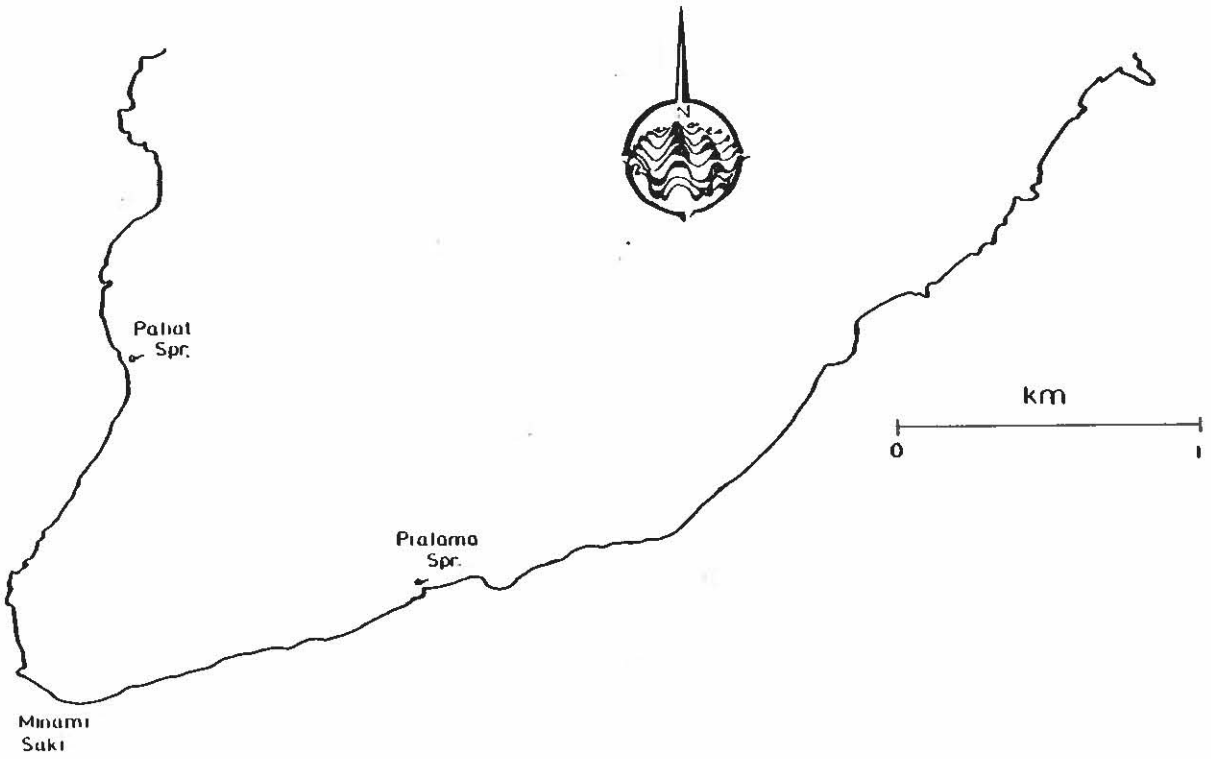
PLANTS

Acrostichum aureum

Information from references:

56, 184

PAGAN - 3



PIALAMA SPRING

PAGAN-3

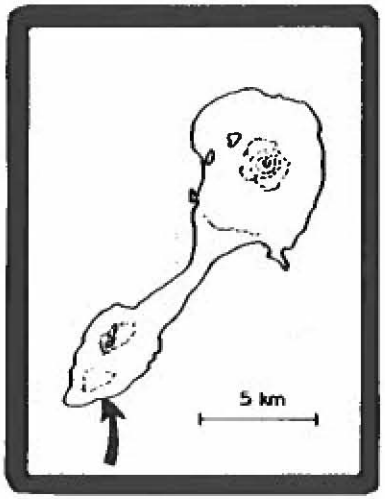
Pialama Spring, Pagan 3

COORDINATES: Lat. 18° 02' 59" N
Long. 145° 43' 28" E

ELEVATION: 10 m

Additional Information:

1) Many hot springs can be found along the west coast of Pagan but this is the only known cool, fresh spring flow.
2) Pialama is a source of potable water but the area is inaccessible except by boat on a calm day.



No record of the aquatic biota has been located.

INDEX FOR GUAM AND THE NORTHERN MARIANAS

Inventory Index	Inventory No.	Related References
Gaan River	Guam - 15	103
Gago River	Guam - 54e	
Guatali River	Guam - 10c	
Geus River	Guam - 32	7, 103, 133, 184, 270, 280
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Halaihai, Sadog	Saipan - 2	
Haofina River, West	Rota - 1	
Haofina River, East	Rota - 2	
Hasngot, Sadog	Saipan - 5	
Hidden River	Guam - 54b	220
Ieygo River	Guam - 48k	
Imong Falls	Guam - 54d	
Imong River	Guam - 54d	
Inarajan Falls	Guam - 45e	
Inarajan River	Guam - 45a	3, 7, 103, 184, 281, 316
Janum Spring	Guam - 59	103
Julog River	Guam - 33	
Keko River	Rota - 4	
Laelae River	Guam - 28b	
Laguan River	Guam - 27d	
Lagona Lake	Pagan - 1	
Laguas River	Guam - 8	184
Lake Hagoi	Tinian - 2	1, 25, 26, 75, 184, 259
Lake Susupe	Saipan - 1	1, 25, 26, 184, 259, 297
Laolao River	Guam - 45b	7, 103, 184
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Liyog River	Guam - 38	103
Lonfit River	Guam - 51b	7, 103, 184
Lost River	Guam - 55b	
Lupog River	Rota Introduction	84

Inventory Index	Inventory No.	Related References
Maagas River	Guam - 48f	7, 103, 184
Madofan River	Guam - 21	103
Madog River	Guam - 28c	
Maemong River	Guam - 56a	7, 103, 184
Magpo Marsh	Tinian - 1	1, 25, 75, 184
Mahlac River	Guam -48h	7, 103, 184
Maina Spring	Guam	
Malaja River	Guam - 48c	
Malojloj Falls	Guam - 46b	
Malojloj Spring	Guam - 46b	
Manengon River	Guam - 50b	
Mannell River	Guam - 34	103
Mao Spring	Guam - 17	
Marbo Cave	Guam - 52	137
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Masso River	Guam - 6	3, 103, 137
Mataguac Spring	Guam - 60	
Matgue River	Guam - 4	103
Maulap River	Guam - 54c	
Miemo River	Guam - 55a	
Morrow Lake	Guam - 55a	
Namo River	Guam - 11	78, 270, 274, 275, 276
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NCS Pool	Guam - 53	
Nelansa River	Guam - 45g	
Nengilo Stream	Guam - 18b	
Ogok River	Rota - 2	
Pagachao Creek	Guam - 18c	
Pago River	Guam - 51a	7, 103, 184, 199, 288, 315, 316
Pajon River	Guam - 28f	
Pasamano River	Guam - 45h	7, 103, 184
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Paulifuc River	Guam - 46a	7, 103
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Piga Spring	Guam - 28e	103, 285
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Santa Rosa Spring	Guam - 61	
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Togcha River (East Coast)	Guam - 49	103
Toguan River	Guam - 29	103
Tolaeyuus River	Guam - 55b	7, 103, 184
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Topony River	Guam - 45f	
Ugum River	Guam - 48h	60, 210, 254, 290, 295
Umatac River	Guam - 28a	136, 184, 270, 285
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Unnamed River	Guam - 36	
Water Cave, Rota	Rota Introduction	
Yledigao River	Guam - 45e	
Ylig River	Guam - 50a	7, 103, 137, 289, 316

APPENDIX

Table 1. Aquatic biota reported from the freshwater systems of the Marianas Archipelago. Freshwater system code numbers refer to system numbers in the top right hand corner of each page. Synonyms are indented from currently valid names. Reference numbers refer to: Best, B. R. 1981. Bibliography of inland aquatic ecosystems of the Mariana Archipelago. Univ. Guam Mar. Lab. Tech. Rept. 72.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
DIVISION CHRYSOPHYTA			
Achnanthes affinis Grun.	G-27	350	diatom
Achnanthes exigua Grun.	G-27, G-32	350	diatom
Achnanthes lanceolata (Breb.) Grun.	G-27	350	diatom
Achnanthes montana Krasske	G-27, G-32	350	diatom
Achnanthes sp.	G-51	349	diatom
Amphora coffeaeformis Ag.	G-27, G-32	350	diatom
Amphora ovalis (Kutz.) Kutz.	G-27	350	diatom
Amphora submontana Hust.	G-27	350	diatom
Caloneis ventricosa (Ehr.) Meist	G-27	350	diatom
Cocconeis placentula var. *lineata* (Ehr.) V.H.	G-27	350	diatom
Cocconeis placentula Ehr.	G-27, G-32, G-51	349, 350	diatom
Cocconeis scutellum Ehr.	G-27, G-32	350	diatom
Cyclotella meneghiniana Kutz.	G-32, G-51	349, 350	diatom
Cymbella turgidula Grun.	G-27, G-51	349, 350	diatom
Epithemia argus (Ehr.) Kutz.	G-27, G-32, G-51	349, 350	diatom
Gomphonema clevei Fricke	G-27	350	diatom
Gomphonema intricatum var. *vibrio* (Ehr.) Cl.	G-32	350	diatom
Gomphonema affine (Kutz.)	G-27	350	diatom
Gomphonema parvulum (Kutz.) Grun.	G-27	350	diatom
Gomphonema sp.	G-51	349	diatom
Mastogloia sp. 1	G-27	350	diatom

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
Navicula cryptocephala Kutz.	G-27	350	diatoms
Navicula cusipidata (Kutz.) Kutz.	G-27	350	diatoms
Navicula pupula Kutz.	G-27	350	diatoms
Navicula pygamea Kutz.	G-27	350	diatoms
Navicula sp.	G-27, G-51	349, 350	diatoms
Nitzschia amphibia Grun.	G-27	350	diatoms
Nitzschia clausii Hantz.	G-27	350	diatoms
Nitzschia fonticola (Grun.) Grun.	G-27	350	diatoms
Nitzschia gandersheimiensis Krasske	G-27	350	diatoms
Nitzschia linearis (Ag. ex Wm. Sm.) Wm. Sm.	G-27	350	diatoms
Nitzschia palea (Kutz.) Wm. Sm.	G-27	350	diatoms
Nitzschia sp.	G-27, G-51	349, 350	diatoms
Ochromonas sp.	G-51	349	diatoms
Rhopalodia gibba var. *ventricosa* (Kutz.) Müller	G-27, G-32	350	diatoms
Rhopalodia gibberula (Ehr.) Müller	G-27	350	diatoms
Rhopalodia sp.	G-51	349	diatoms
Synedra ulna var. *danica* (Kutz.) V.H.	G-27, G-32, G-51	349, 350	diatoms
Thalassiosira fluviatilis Hust.	G-27, G-32	350	diatoms
Tricreatium sp. 1	G-27	350	diatoms
DIVISION CRYTOPHYTA			
Cryptomonas sp.	G-51	349	diatoms

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
DIVISION CYANOPHYTA			
CYANOPHYCEAE			
Anabaena variabilis Kütting	G-32, G-1	137, 215	blue green algae
Anabaenoposis sp.	G-48h	137	blue green algae
Agmenellum sp.	G-51	350	blue green algae
Anacystis sp.	G-51	350	blue green algae
Aphanocapsa elachista	G-48h	137	blue green algae
Aphanotheca sp.		220	blue green algae
Aulosira sp.	G-6	137	blue green algae
Calothrix fusca Kützing Bornet et Flahault	G-48h	138	blue green algae
Calothrix marchica Jemmermann	G-48h, G-28a	137	blue green algae
Chroococcus minimus Keisscer Lemmermann	G-48h	137	blue green algae
Chroococcus turgidus var. *thermailis* Rabenhorst	G-52, G-6, G-28a	137	blue green algae
Chroococcus varius A. Braun	G-32, G-48h	137	blue green algae
Cylindrospermun muscicola Kützing	G-28a	137	blue green algae
Gloecocapsa sp.		220	blue green algae
Hormeothrix africana West G.S.	G-48h	137	blue green algae
Lyngbya putealis Montagne var. *pulealis*	G-32, G-51a	137, 315	blue green algae
Microchaete goeppertiana	G-48h	137	blue green algae
Microchaete themalis	G-48h	137	blue green algae
Microcystis marginata Meneghini Kützing	G-52	137	blue green algae
Nodularia spanigena var. *majjor* Kütz Bornet et Flahault	G-48h, G-28a	137	blue green algae
Nodularia spumigena Mertens var. *spumigena*		137	blue green algae

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
Nostoc carneum Agardh	G-48h	137	blue green algae
Nostoc commune	G-32	137	blue green algae
Oscillatoria anguina	G-48h	137	blue green algae
Oscillatoria angustissima	G-50a	137	blue green algae
Oscillatoria irrigua Kützing	G-32	137	blue green algae
Oscillatoria limosa Agardh	G-32, G-50a, G-48h, G-28a	137	blue green algae
Oscillatoria planctonica Woloszynska	G-50a	137	blue green algae
Oscillatoria princeps var. *minor*	G-50a	137	blue green algae
Oscillatoria sancta Kützing Gomont	G-6	137	blue green algae
Oscillatoria subbrevis Schmidle	G-32, G-48h	137	blue green algae
Oscillatoria sp.	G-51a	215	blue green algae
Phormidium ambiguum	G-6	137	blue green algae
Phormidium valderianum var. *valderianum*	G-50a	137	blue green algae
Scytonema crispum Ag. Bornet	G-32	137	blue green algae
Synechocystis aquatilis	G-32	137	blue green algae
Tolypothrix distota	G-32, G-6	137	blue green algae
DIVISION CHLOROPHYTA			
CHLOROPHYCEAE			
Cladophora crispata	G-32, G-48h, G-28a, G-50a	137	green algae
Cladophora glomerata L. Kuetzing	G-32, G-48h, G-28a, G-50a	137	green algae
Closterium lanceolatum Kützing	G-32, G-28a	137	green algae
Closterium moniliferum Bory Ehrenberg var. *moniliferum*	G-50a	137	green algae
Closterium parvulum Nägeli var. *parvulum*	G-50a	137	green algae
Closterium venus Kützing var. *venus*	G-6	137	green algae

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
Cosmarium impressulum	G-28a	137	green algae
Cosmarium meneghinii Brebisson var. *meneghinii*	G-48h	137	green algae
Cosmarium repandum Nordstedt f. minor W. et G.S. West	G-50a	137	green algae
Cosmarium undulatum var. *crenulatum* Nägeli Wittrock	G-32	137	green algae
Microspora sp.	G-1	215	green algae
Mougeotia sp.	G-50a, G-28a, G-48h	137	green algae
Oedogonium sp.	G-50a, G-32, G-1, G-28a, G-48h	137, 215	green algae
Pleurotaenium trabecula var. *vectum*	G-50a	137	green algae
Rhizoclonium riparium	G-32	137	green algae
Rhizoclonium viparium	G-28, G-48h	137	green algae
Roya sp.	G-50a	137	green algae
Scenedesmus arcuatus	G-28a, G-50a	137	green algae
Scenedesmus bijuga	G-6	137	green algae
Scenedesmus ovalternus Chodat var. *graevenitzii* Bernard Codat	G-50a	137	green algae
Spirogyra fluvialilis Hilse	G-32	137	green algae
Spirogyra sp.	G-32, G-48h, G-6, G-28a, G-50a	137, 136, 132, 220	green algae
Trentepohlia aurea Linnaeus Martius	G-32, G-52, G-6	137	green algae
CHAROPHYCEAE			
Chara sp.	G-50a, G-6	137, 136	stonewort

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
DIVISION RHODOPHYTA			
RHODOPHYCEAE			
Audouinella sp.	G-32, G-48h	137, 220	
Bostrichia tenera J. Ag.	G-52	137	
Thorea gaudichaudii C. Agardh	G-50a	137, 136	
DIVISION PTERIDOPHYTA			
ASPIDIACEAE			
Heterogonium pinnatum (Copel.) Holttum	G-1	215	
Thelypteris interrupta (Willd.) Iwatsuki		220	
HYMENOPHYLLACEAE			
Cephalomanes borbonicum (Kunze) van den Bosch	G-1	215	
PARKERIACEAE			
Ceratopteris thalictroides (L.) Brongniart	G-1	215	
Ceratopteris gaudichaudii Brongniart	G-54b	220, 250	Guafak-uhong
PTERIDACEAE			
Acrostichum aureum L.	G-1	215, 220	Langayao

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
DIVISION ANTHOPHYTA			
Dicotyledon			
COMPOSITAE			
Mikania scandens (L.) Willd.	G-1	215	
LABIATAE			
Hyptis sp.	G-1	215	
MALVACEAE			
Abelmoschus moschatus (L.) Medicus	G-1, G-48	215, 250	kamama
Hibiscus tiliaceus L.	G-1	215	pago
TILIACEAE			
Muntingia calabura L.	G-1	215	manzanilla
Monocotyledon			
ARACEAE			
Alocasia macrorhiza (L.) Schott	G-1	215	papao=atolong
Colocasia esculenta (L.) Schott	G-1	215	taro; suni
Pistia stratiotes L.	G-1	215	water lettuce

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
CERATOPHYLLIACAE			
Ceratophyllum demersum L.	G-1, G-48	215, 250	hornwort
CYPERACEAE			
Cyperus spp.	G-1	215	chaguan humatag
GRAMINEAE			
Eragrostis pilosa (L.) Beauvois	G-1	215	lovegrass
Phragmites karka (Retz.) Trin.	G-1	215, 220	karisso, giant cane
HYDROCHARITACEAE			
Hydrilla verticillata (L.f.) Royle	G-1, G-32, G-50	215, 136, 137	
NYMPHAEAECEAE			
Nymphaea cf. *lotus*	G-48	250	
PONTEDERIACEAE			
Eichhornia crassipes (Mart. & Zucc.)	G-1	215	water-hyacinth

NOTE: Additional wetland plant species can be found in Moore et al. 1977 (ref. 184) and in Stemmermann, L. 1981; A guide to Pacific wetland plants. U.S. Army Corps of Engineers, Honolulu, Hawaii. 117p.

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
PHYLUM PROTOZOA			
Class Ciliatea, unidentified spp.	G-10b	221	hypotrich & peristome ciliates
Vorticella sp.	G-1	215	ciliate
Class Flagellata, unidentified spp.	G-10b	221	flagellates
PHYLUM PORIFERA			
SPONGILLIDAE, unidentified spp.	G-50, G-48h	137	sponge
Heteromyenia (?) sp.	S-1	259	sponge
PHYLUM CNIDARIA			
Class Hydrozoa			
Craspedacusta sowerbyi Lankester	G-54	19	jellyfish
PHYLUM PLATYHELMINTHES			
Class Turbellaria, unidentified spp.	G-54	19, 220	planaria
PHYLUM ROTIFERA			
Class (?) Bdelloidea, unidentified sp.	G-10b	221	rotifer
PHYLUM ANNELIDA			
Class Oligochaeta, unidentified sp.	R-3, G-10b	267, 221	worm
Tubifex tubifex	G-54	142	tubeworm

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
PHYLUM MOLLUSCA			
Class Gastropoda			
Clithon brevispina (Lamarck)	G-28, G-29	220, 326	nerite snail
Galba viridis Quoy and Gaimard *Lymnaea ollula* Gould *Lymnaea pervia* von Martens	S-1, T-2	1	lymnaeid snail
Gyraulus helmantium Westerland *Gyraulus chinensis* Dunker *Gyraulus spirillus* Gould	Guam	224	planorbid snail
Mangilia interrupta Reeve	Guam	224	thiarid snail
Melanid spp.	G-3, G-45	3	pulmonate snail
Melania granifera Lamarck	Guam, S-1	224, 249	pulmonate snail
Melania patherina Bush	Guam	224	pulmonate snail
Melanoides tuberculatus Müller	Guam	224	thiarid snail
Neritina pulligera (Linneaus) *f. conglobata* von Martens	G-45, G-50	220, 326	nerite snail
Neritina squampicta Reeluz	G-28	326	nerite snail
Neritina spp.	Saipan	1	nerite snail
Septaria porcellana (Linnaeus)	G-1, G-3, G-29	215, 220, 326	nerite snail
Thiara granifera (Lamarck) *Tarebia granifera* H. and A. Adams	Guam, Saipan	1, 2, 224	thiarid snail

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
Thiara scabra Müller	Guam, Saipan	1, 224	thiarid snail
Thiarid sp.	G-50	220, 336	thiarid snail
PHYLUM ARTHROPODA			
Class Crustacea			
CLADOCERA			
Latonopsis australis Sars	G-54	17	cladocera
Macrothrix laticornis Jurine	Guam, temporary pond	17	cladocera
Moina australiensis Sars	Guam, temporary pond	17	cladocera
Moina microcopa macrocopa Straus	Guam, temporary pond	17	cladocera
Moina weismanni (Ishikawa)	Guam, temporary pond	17	cladocera
OSTRACODA			
Cypretta cf. tenuicauda Vavra	G-1, G-50	64	ostracods
Cypris cf. subglobosa (Sowerby)	Guam, temporary pond	64	ostracods
Darwinula cf. malayica Menzel	Guam, temporary pond	64	ostracods
Hemicypris sp.	Guam, leaf axle	64	ostracods
Heterocypris cf. megalops (Sars)	Guam, temporary pond	64	ostracods
Stenocypris malcomsoni (Brady)	Guam, temporary pond	64	ostracods
Strandesia spinulosa Bronstein	Guam, temporary pond	64	ostracods
COPEPODA			
Bryocyclops anninae (Menzel)	Guam, leaf axle	335	copepods

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
Mesocyclops leukarti (Claus)	G-1, G-51, G-54	335	copepods
Phyllognathopus viguieri menzeli (Chappuis)	Guam, leaf axle	335	copepods
AMPHIPODA			
Amphipod spp.	Rota		amphipods
DECAPODA			
ATYIDAE			
Atya spinipes Newport	G-32, G-48, G-50	57, 137	atyid shrimp, uhang
Atya serrata Bate	G-32, G-45, G-48, G-50	3, 57, 137	atyid shrimp, uhang
Caridina nilotica (P. Roux)	G-32, G-45, G-48, G-50	3, 57, 137	caridinid shrimp, uhang
Caridina serratirostris (de Man)	Guam	57	caridinid shrimp, uhang
Caridina typus H. Milne Edwards	G-32, G-40, G-48	57, 137	caridinid shrimp, uhang
GRAPSIDAE			
Cardisoma sp.	Guam	220	crab
Grapsid sp.	G-53	3	crab
Sesarma sp.	G-1	215	crab
Varuna cf. litterata (Fabricus)	G-1	215	crab
Varuna sp.	G-50	57	crab
PALAEMONIDAE			
Macrobrachium lar (Fabricus)	Guam, Rota, Saipan	215	Tahitian prawn, uhang

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
Palaemon sp.	G-1	215	shrimp, uhang
Palaemon debilis	S-1	114	shrimp, uhang
Leander gardineri Borradaile			
PORTUNIDAE			
Scylla serrata (Forskaal)	G-48, G-59, G-51	72	mangrove crab, akmangao
Class Insecta			
Order Odonata			
Anisoptera spp.	G-10, G-54	220, 221	dragonfly naiads
Pantala flavescens	S-1	259	dragonfly naiads
Zygoptera spp.	G-10, G-54	221, 220	damselfly naiads
Order Hemiptera			
Limnogonos sp.	G-10	220, 221	water strider
Mesovelia sp.	G-10, G-54	220	water strider
Order Coleoptera, unidentified sp.	G-54	220	whirligig beetle
Order Lepidoptera			
Pyralid sp.	G-48a		pyralid moth larva
Order Diptera			
Culex quinquefasciatus	Ubiquitos	21	mosquito larva
Culicid spp.	Ubiquitos		

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
PHYLUM TARDIGRADA			
Tardigrade sp.	G-10	221	waterbear
PHYLUM CHORDATA			
Class Osteichthyes			
AMBASSIDAE			
Ambassis marianus Gunther	Guam	268	
ANABANTIDAE			
Betta brederi Meyers	G-1	3	
ANGUILLIDAE			
Anguilla bicolor McClelland	Guam	131, 268	eel; hasule
Anguilla marmorata Quoy & Gaimard	Guam	3, 137, 142	eel; hasule
CICHLIDAE			
Astronotus ocellatus (Cuvier)		268	oscar
Cichla ocellaris (Bloch & Schneider)	G-54	142	tucunare
Tilapia mossambica (Peters) *Sarotherodon mossambica*	S-1, G-45, G-54	3, 142, 259	Mozambique tilapia
Tilapia zilli	G-45, G-54	3, 142	redbelly tilapia

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
CLARIIDAE			
Clarias batrachus (Linneaus)	G-1, G-54	142, 240	walking catfish; itot
CYPRINIDAE			
Cyprinus carpio Linneaus	G-1	215	common carp
ELEOTRIDAE			
Eleotris fusca (Bloch & Schneider)	G-1, G-54, R-1	3, 142	eleotrid; sleeper; atut
Eleotris miniatus Seale	Guam	268	eleotrid; sleeper; atut
GOBIIDAE			
Awaous guamensis (Valenciennes) *Chonophorus guamensis*	G-32, G-45, R-1	3, 133	goby; atot
Oxyurichthys guibei Smith	G-43	132	goby; atot
Oxyurichthys ophthalmonema (Bleeker)	G-43	132	goby; atot
* *Sicyopterus microstethotepis* (Bleeker)	G-28, G-32, G-45, G-48	3, 133, 137	goby; atot
Stigmatogobius versicolor Smith	G-43	132	goby; atot
Stiphodon elegans (Steindachner) *Microsicydium elegans*	R-3, G-28, G-32, G-48, G-50	3, 133, 137	goby; atot
Tamuka tagala Herre	G-7	132	goby;atot
* *Sicyopus lepturus*	R-3	J.A. Maciolek, pers. comm.	goby;atot

APPENDIX. Table 1 Continued.

	FRESHWATER SYSTEM CODE	REF. SOURCE NUMBER	CHAMORRO OR COMMON NAME
KUHLIIDAE			
Kuhlia rupestris (Lacepede)	G-28, G-32, G-48, G-50, R-1	137	kuhlia, flagtail; umatan
MURAENIDAE			
Thrysoidea macrurus (Bleeker)	G-48		moray eel
PERIOPHTHALMIDAE			
Periophthalmus koelreuteri (Pallas)	G-43	132	mud skipper; macheng
POECILIIDAE			
Gambusia affinis (Baird & Girard)	G-1, G-54	3, 142	mosquitofish
Poecilia latipinna (Le Sueur)	G-53	3	sailfin molly
Poecilia reticulatus (Peters)	G-1, G-53	3	guppy
Xiphophorus helleri (Bekel)	G-53	3	green swordtail
Class Reptilia			
TESTUDINIDAE			
Pseudemys scripta (Schoepf)	G-1	215	painted turtle
Unidentified turtle	S-1	259	water turtle; hanum hagan
Class Amphibia			
BUFONIDAE			
Bufo marinus (Linnaeus)	Guam, Rota, Tinian, Saipan		toad, tadpoles

APPENDIX

Table 2. Physicochemical characteristics of some freshwater systems on Guam. Analyses conducted in the laboratory of Layne International, Inc., Guam and is reported in: Austin, Smith & Associates, Inc. 1968. A report covering the surface water survey of the island of Guam. Prep. for Public Utility Agency, Guam. 78p.

	pH	Methol-Alk $CaCO_3$	Turbidity	Calcium hardness	F (ppm)	Total dissolved solids	Chlorides (ppm)	Total hardness	Fe (ppm)	B (ppm)	NO_3 (ppm)	SO_4 (ppm)	Dissolved O_2 (ppm)	CO_2 (ppm)	Micromhos	SiO_2 (ppm)	Mn (ppm)	PO_4 (ppm)	NH_3 (ppm)	CrO_4 (ppm)	As (ppm)	CO (ppm)
Paulilue (4/4/68)	7.45	48	16	3.0	0.6	148	18	4.3	0.72	0.075	0.04	3.5	7.5	26	150	40	0.075	0.22	< 0.01	< 0.05	< 0.05	0.125
Inarajan (4/5/68)	7.7	68	15	4.3	0.07	123	14	7.0	0.44	0.075	0.1	4.4	7.5	0.9	170	18.4	0.0125	0.11	< 0.01	< 0.05	< 0.05	0.10
Geus (4/4/68)	7.75	200	2.6	15.7	0.1	300	24	19.2	0.1	0.10	0.52	1.25	8.0	4.4	440	21.4	0.01	0.12	< 0.01	< 0.05	< 0.05	0.15
Umatac (4/4/68)	8.15	200	1.3	14.8	0.03	262	14	18.3	0.096	0.2	0.34	1.25	8.5	0.9	390	16.5	0.007	0.045	< 0.01	< 0.05	< 0.05	0.15
La Sa Fua (4/5/68)	8.4	156	2.6	10.9	0.02	206	10	14	0.096	0.155	1.0	2.4	7.5	0.9	310	126.6	0.004	0.054	< 0.01	< 0.05	< 0.05	<0.175
Cetti (4/4/68)	7.85	188	5.9	14.4	0.03	258	12	17.4	0.088	0.115	0.037	1.25	8.0	2.6	370	18.6	0.015	0.075	< 0.01	< 0.05	< 0.05	0.10
Finile (4/4/68)	7.85	144	5.0	13.9	0.02	185	16	15.2	0.108	0.155	0.73	4.0	8.0	1.8	330	16.5	0.005	0.052	< 0.01	< 0.05	< 0.05	0.175
Asan Spr. (4/4/68)	7.25	212	4.4	22.2	0.04	261	18	23.6	0.08	0.155	2.75	6.0	8.5	11	460	8.8	0.004	0.05	< 0.01	< 0.05	< 0.05	0.150
Inner Agana Spr. (4/4/68)	7.4	268	2.6	26.6	0.02	329	20	28.8	0.096	0.23	6.1	1.25	12.0	11	510	18.2	0.003	0.052	-	< 0.05	< 0.05	0.150
Outer Agana Spr. (1/30/68)	7.4	272	0.75	300	0	371	17	308	0.016	0.15	1.95	1.25	-	34	570	8.8	<0.05	0.095	-	0	-	0.05
Janum Spr. (4/25/68)	7.55	196	4.4	22.2	0.03	275	24	24.4	0.12	0.16	0.80	5.0	-	3.5	410	6.4	0	0.075	< 0.01	< 0.05	< 0.05	0.1

APPENDIX. Table 2 Continued.

	pH	Methol-Alk $CaCO_3$	Turbidity	Calcium hardness	F (ppm)	Total dissolved solids	Chlorides (ppm)	Total hardness	Fe (ppm)	B (ppm)	NO_3 (ppm)	SO_4 (ppm)	Dissolved O_2 (ppm)	CO_2 (ppm)	Microohos	SiO_2 (ppm)	Mn (ppm)	PO_4 (ppm)	NH_3 (ppm)	CrO_4 (ppm)	As (ppm)	Cd (ppm)
Pago (4/5/68)	8.0	176	2	13.5	0.04	225	16	15.7	0.07	0.085	0.35	2.0	7.5	3.5	310	31	0.0075	0.44	<0.01	<0.05	<0.05	0.125
Lonfit (4/5/68)	8	160	2.9	13	0.05	253	18	16.1	0.10	0.08	0.35	1.5	-	5.2	340	38	0.0025	0.04	<0.01	<0.05	<0.05	0.05
Ylig (4/5/68)	7.7	156	3.6	13.0	0.1	240	16	15.3	0.072	0.105	0.1	2.8	8.0	3.5	330	21	0.005	0.051	<0.01	<0.05	<0.05	0.10
Talofofo (1/30/68)	7.7	188	5.9	183	0.05	246	4.0	200	0.016	0.12	0.1	2.5	-	9	377.5	7.8	0.0013	0.12	-	0.001	-	0.21
Talofofo (4/5/68	7.7	208	6.7	17.9	0.01	263	18	21	0.21	0.106	0.1	4.0	6.5	2.6	410	22.6	0.021	0.04	<0.01	<0.05	<0.05	0.05
Maagas (1/5/68)	7.6	204	5.8	18.3	0.02	268	16	21.4	0.13	0.08	0.37	4.0	-	4.4	410	21.0	0.021	0.04	<0.01	<0.05	<0.05	0
Mahlac (4/5/68)	7.3	188	6.1	17.0	0.03	245	18	19.6	0.32	0.25	0.25	3.5	-	7.0	380	24	0.016	0.05	<0.01	<0.05	<0.05	0.05
Tolaeyuus (1/30/68)	7.9	216	2.3	200	0.04	276	14	238	0.006	0.9	0.9	3.5	-	10	445	8.0	<0.05	0.11	-	0	-	0.2
Fena Reservoir (1/30/68)	7.85	76	2.6	62.4	0.06	117	9.0	8.3	0.018	0.55	0.55	2.0	-	4	180	9.6	<0.05	0.07	-	0	-	0.02
Alamagosa Spr. (1/30/68)	8.3	132	1.95	141	0	213	11	154	0.002	0.48	0.48	0.75	-	6.0	310	1.4	<0.05	0.07	-	0	-	0.05
Ugum* (4/17/68)	7.75	52	7.4	3.9	0.02	99	10	4.8	0.39	0.035	0.035	2.0	-	1.76	120	27	0.005	0.05	<0.01	<0.05	0	0.125

*Sample from Talofofo Falls.