

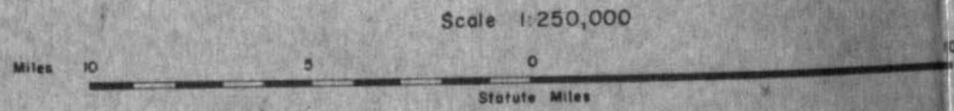
Malaysia

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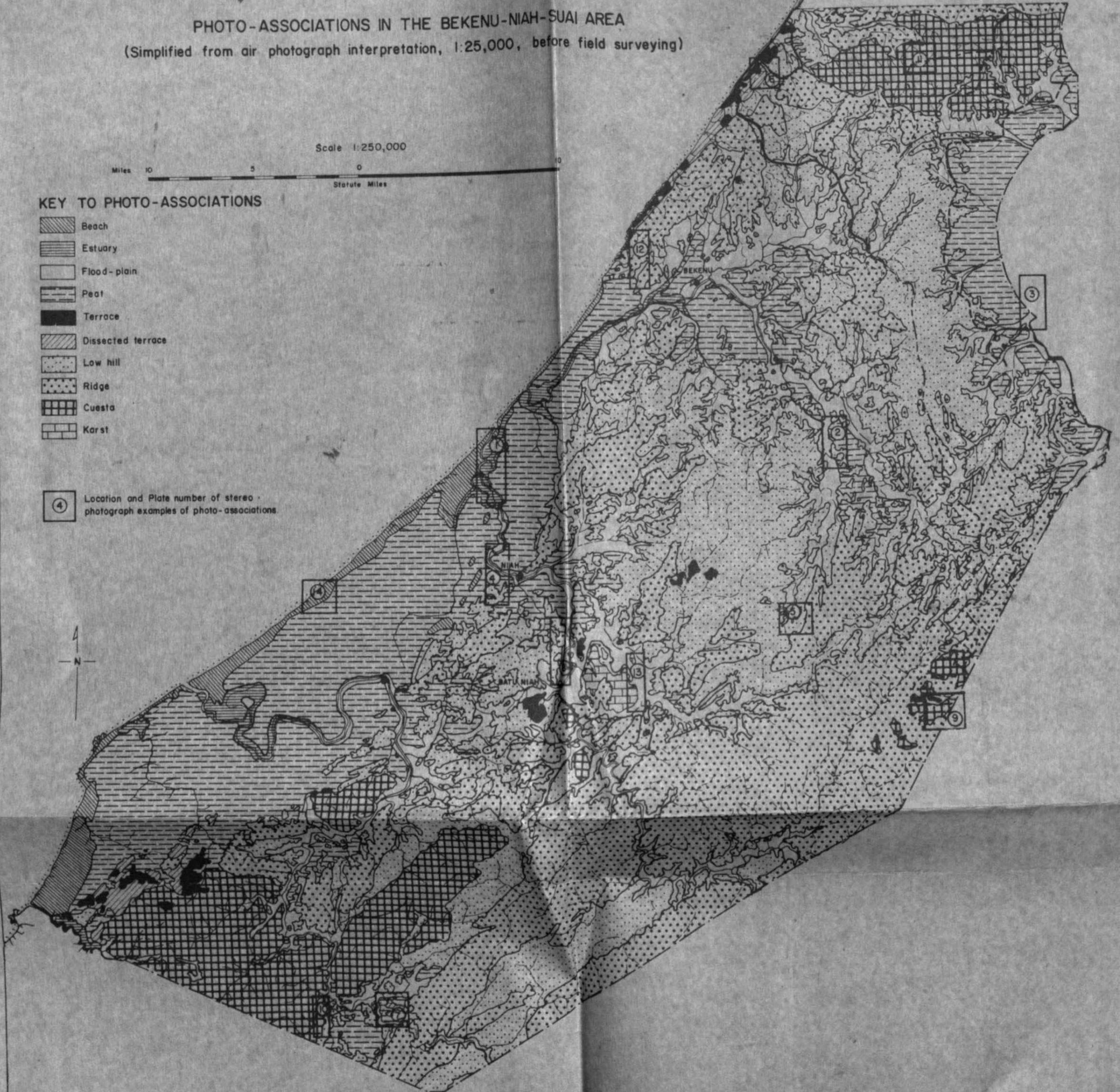
PHOTO-ASSOCIATIONS IN THE BEKENU-NIAH-SUAI AREA
 (Simplified from air photograph interpretation, 1:25,000, before field surveying)



KEY TO PHOTO-ASSOCIATIONS

-  Beach
-  Estuary
-  Flood-plain
-  Peat
-  Terrace
-  Dissected terrace
-  Low hill
-  Ridge
-  Cuesta
-  Karst

 Location and Plate number of stereo photograph examples of photo-associations

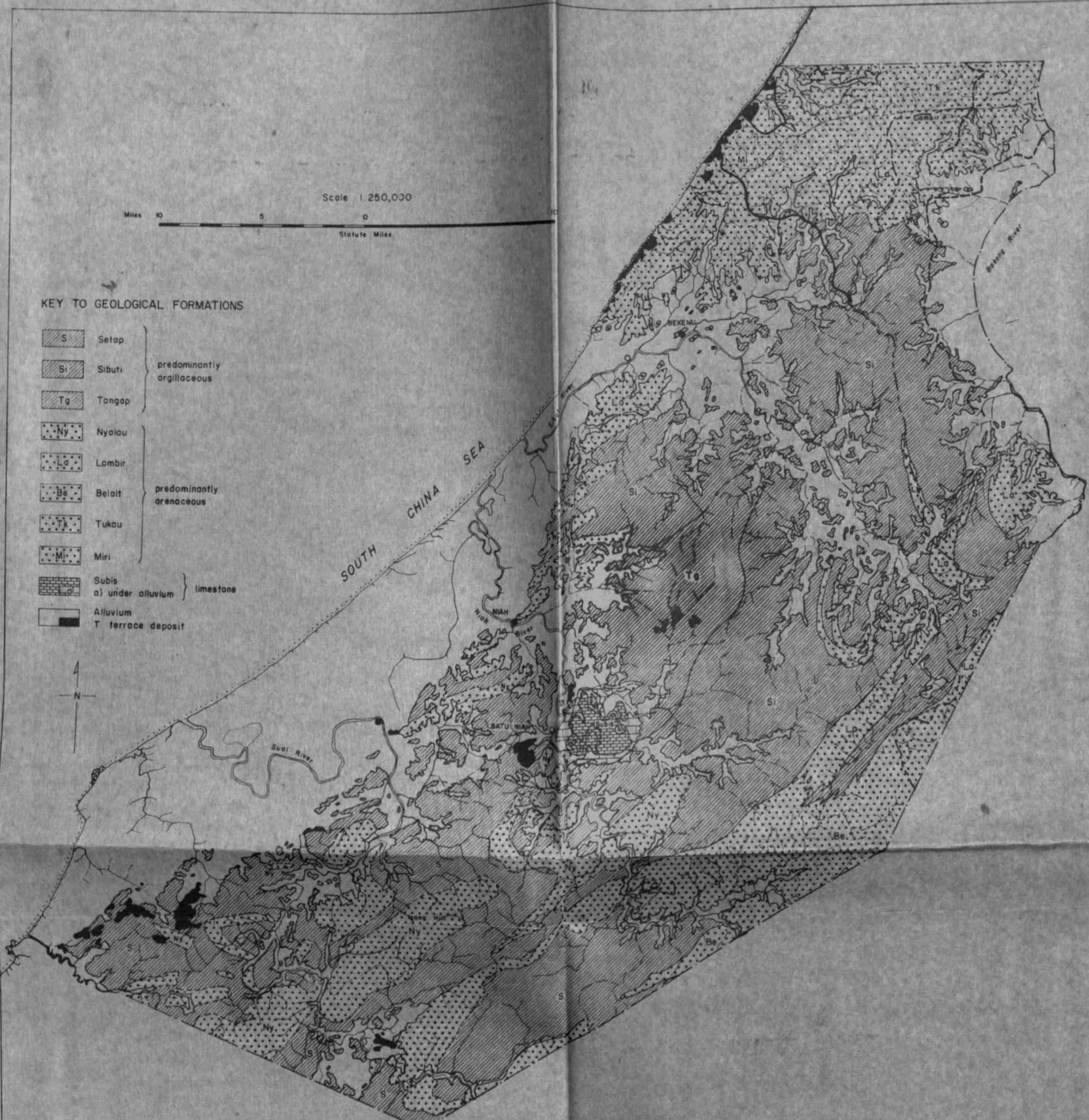


Map 3 Map showing the geological formations grouped into arenaceous, argillaceous and limestone rocks, terraces and other unconsolidated deposits.

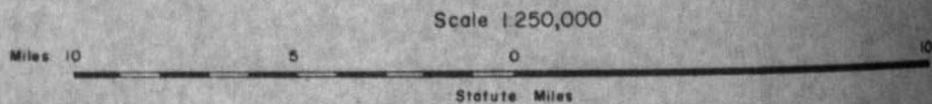
Scale 1:250,000
 Miles 10 5 0 10
 Statute Miles

KEY TO GEOLOGICAL FORMATIONS

- | | | |
|---|-------------------|------------------------------|
|  | Setap | } predominantly argillaceous |
|  | Sibuti | |
|  | Tanggap | |
|  | Nyalau | } predominantly arenaceous |
|  | Lambir | |
|  | Belait | |
|  | Tukau | |
|  | Miri | |
|  | Subis | } limestone |
|  | a) under alluvium | |
|  | Alluvium | |
|  | T terrace deposit | |



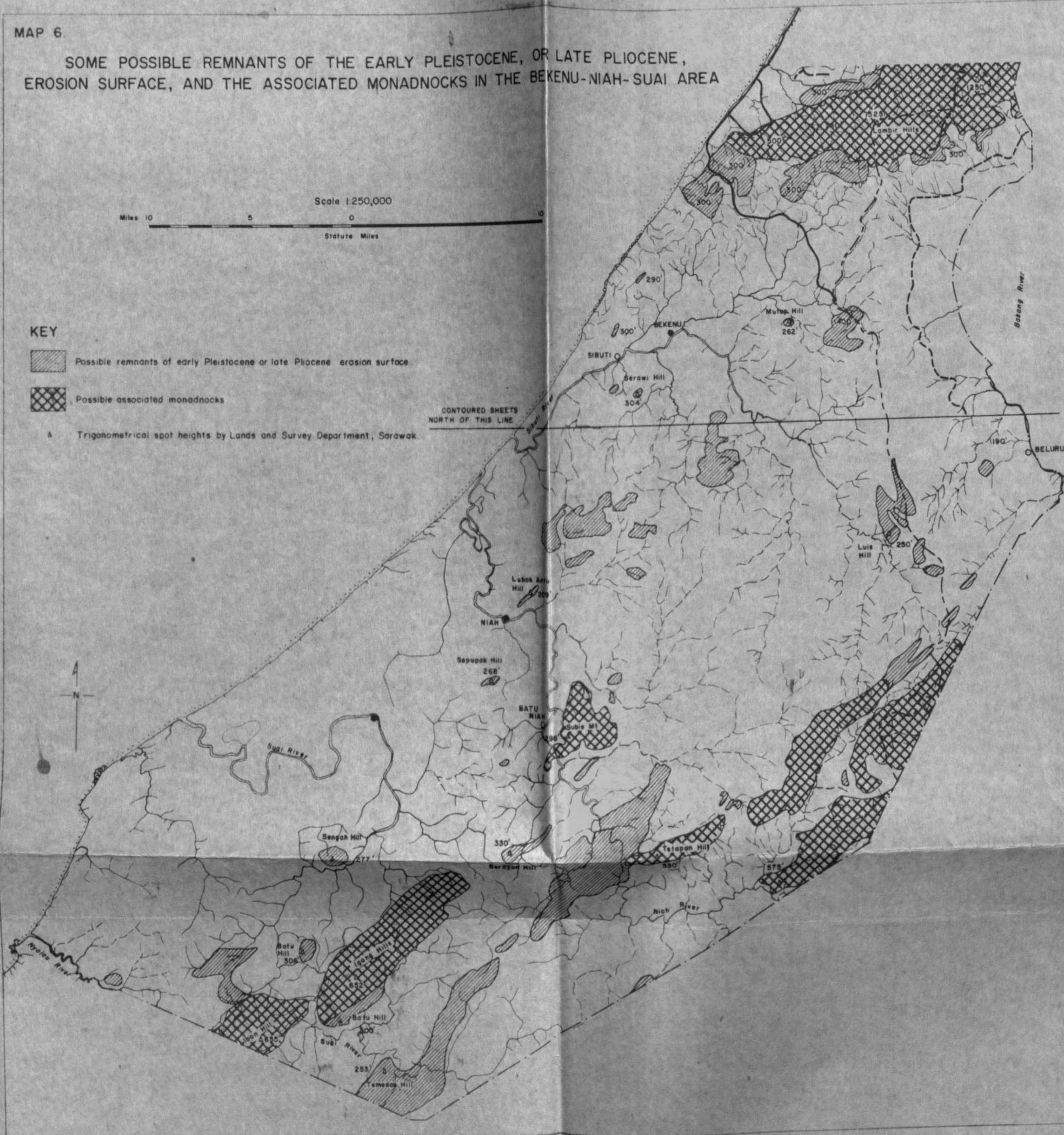
SOME POSSIBLE REMNANTS OF THE EARLY PLEISTOCENE, OR LATE PLIOCENE, EROSION SURFACE, AND THE ASSOCIATED MONADNOCKS IN THE BEKENU-NIAH-SUAI AREA



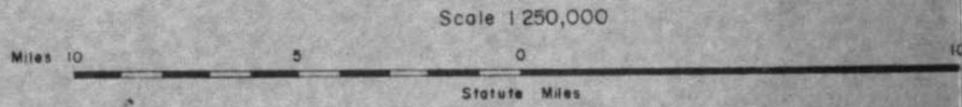
KEY

-  Possible remnants of early Pleistocene or late Pliocene erosion surface
-  Possible associated monadnocks

▲ Trigonometrical spot heights by Lands and Survey Department, Sarawak

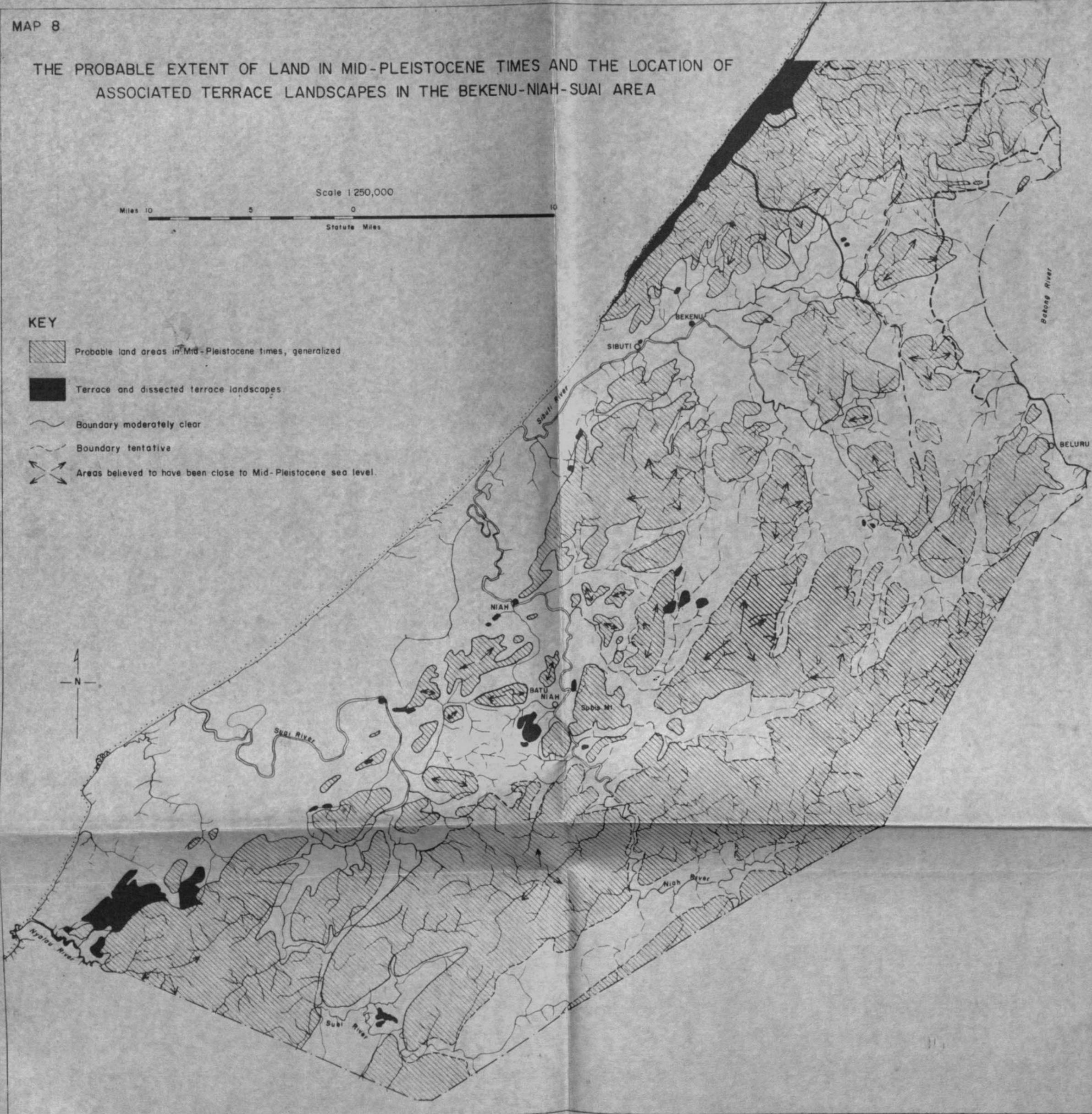


THE PROBABLE EXTENT OF LAND IN MID-PLEISTOCENE TIMES AND THE LOCATION OF ASSOCIATED TERRACE LANDSCAPES IN THE BEKENU-NIAH-SUAI AREA

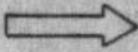


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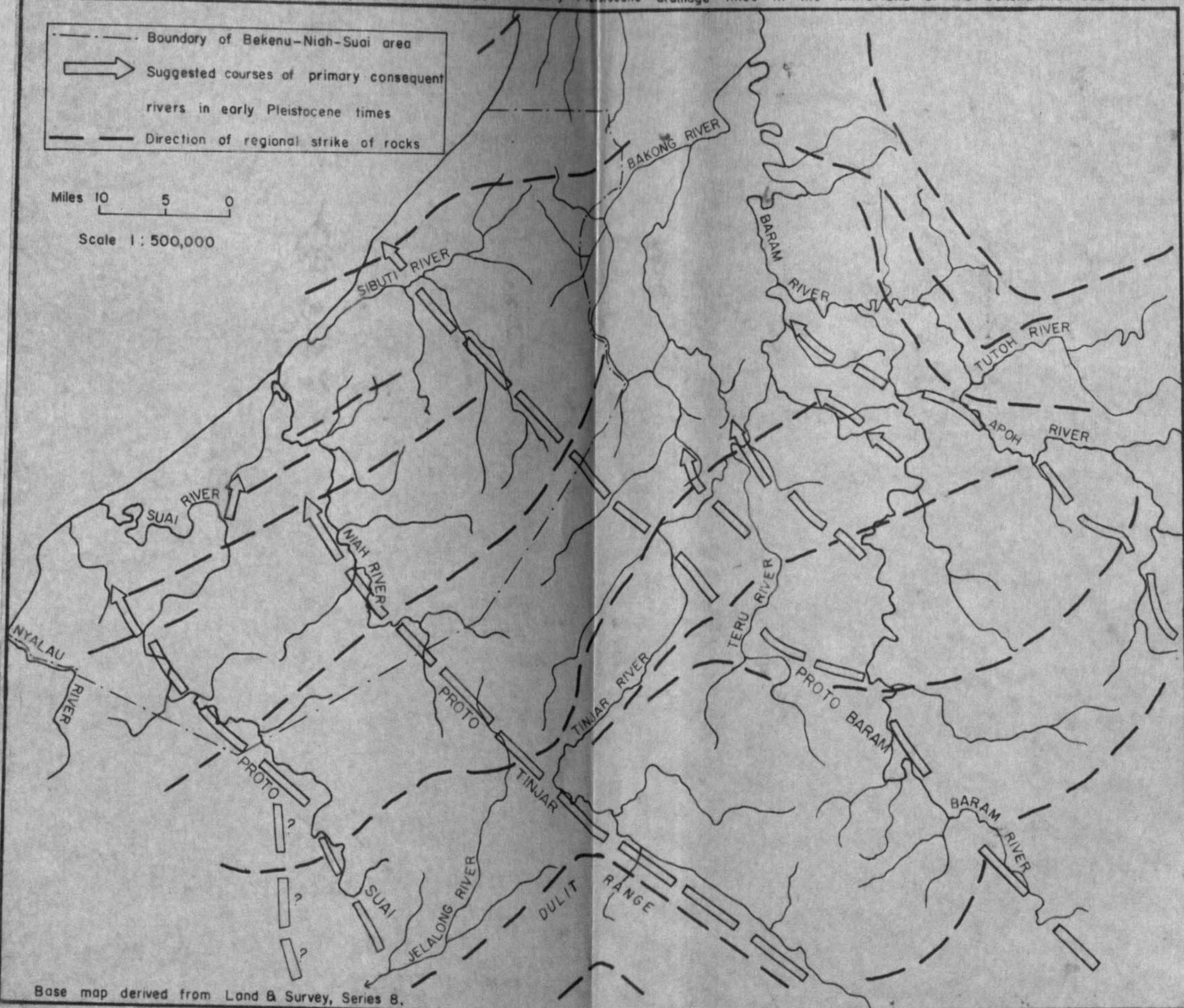
-  Probable land areas in Mid-Pleistocene times, generalized
-  Terrace and dissected terrace landscapes
-  Boundary moderately clear
-  Boundary tentative
-  Areas believed to have been close to Mid-Pleistocene sea level.



Map 7. The present main drainage patterns and suggested early Pleistocene drainage lines in the hinterland of the Bekenu-Niah-Suai area.

- - - - - Boundary of Bekenu-Niah-Suai area
 Suggested courses of primary consequent rivers in early Pleistocene times
 - - - - - Direction of regional strike of rocks

Miles 10 5 0
 Scale 1 : 500,000



Base map derived from Land & Survey, Series 8.

SCHEMATIC BROAD VEGETATION TYPE MAP OF THE BEKENU-NIAH-SUAI AREA

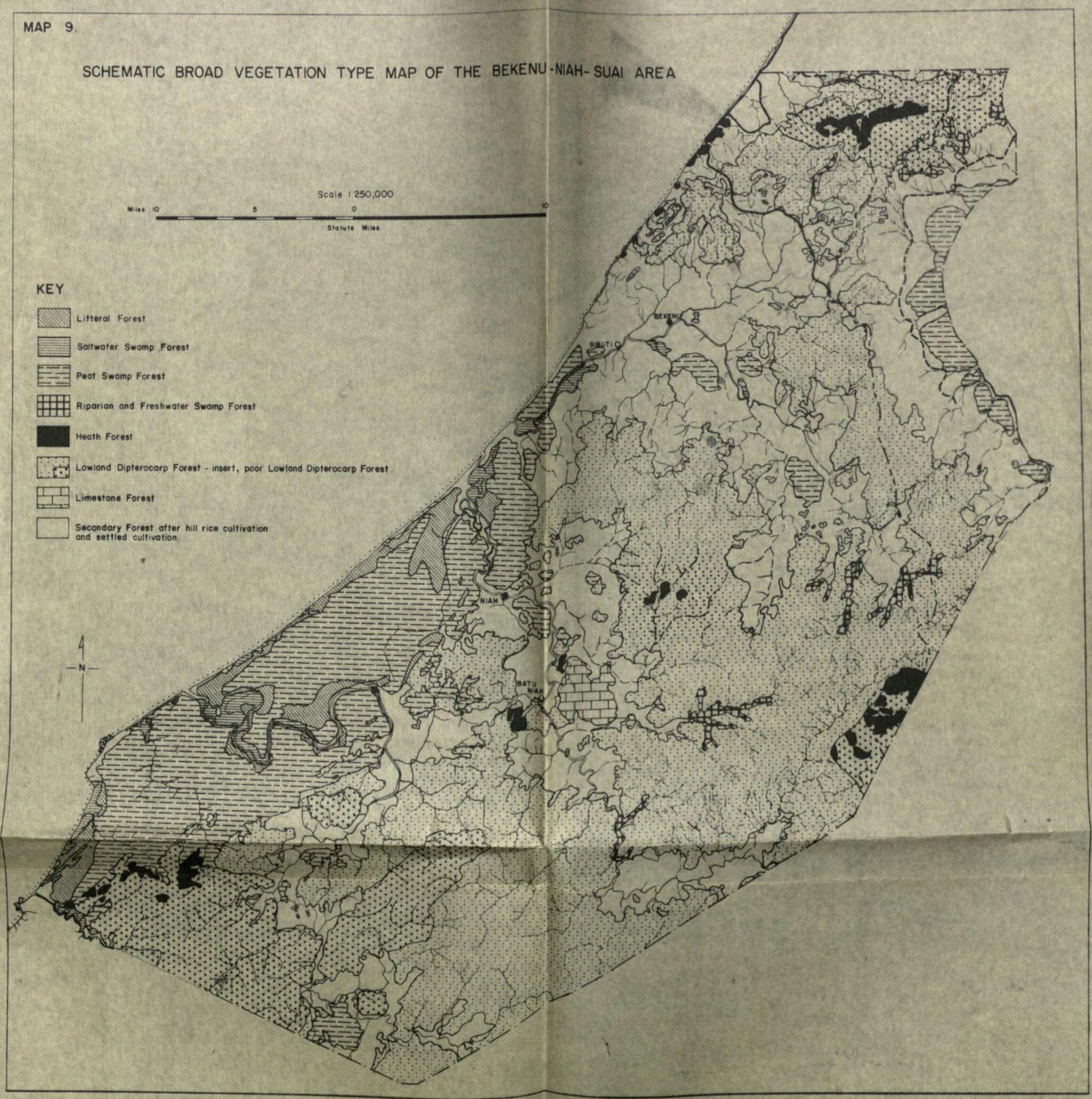
Scale 1:250,000

Miles 10 5 0 10

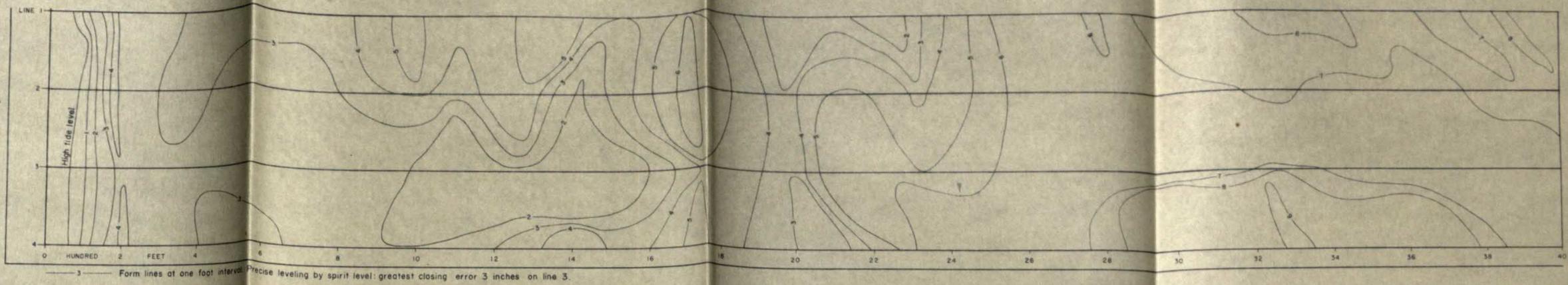
Statute Miles

KEY

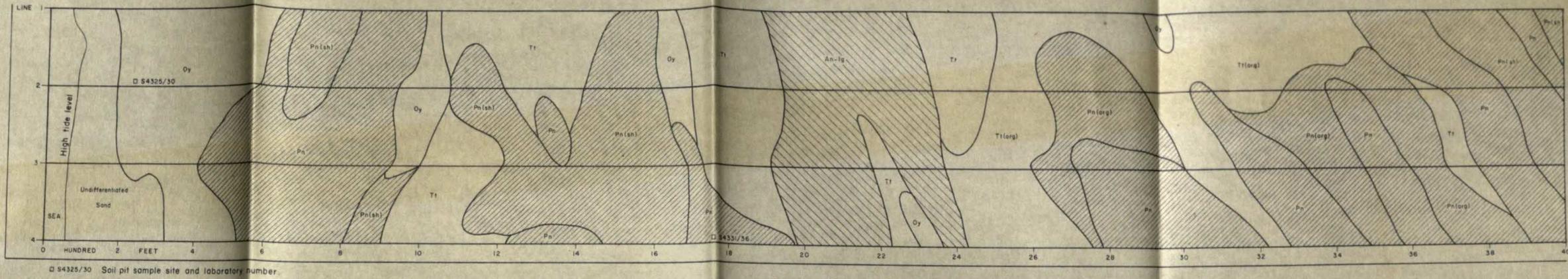
-  Littoral Forest
-  Saltwater Swamp Forest
-  Peat Swamp Forest
-  Riparian and Freshwater Swamp Forest
-  Heath Forest
-  Lowland Dipterocarp Forest - insert, poor Lowland Dipterocarp Forest
-  Limestone Forest
-  Secondary Forest after hill rice cultivation and settled cultivation.



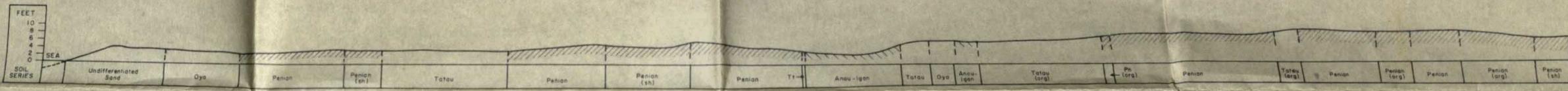
MAP IIa
TOPOGRAPHY



MAP IIb
SOILS



Line 4
Cross Section

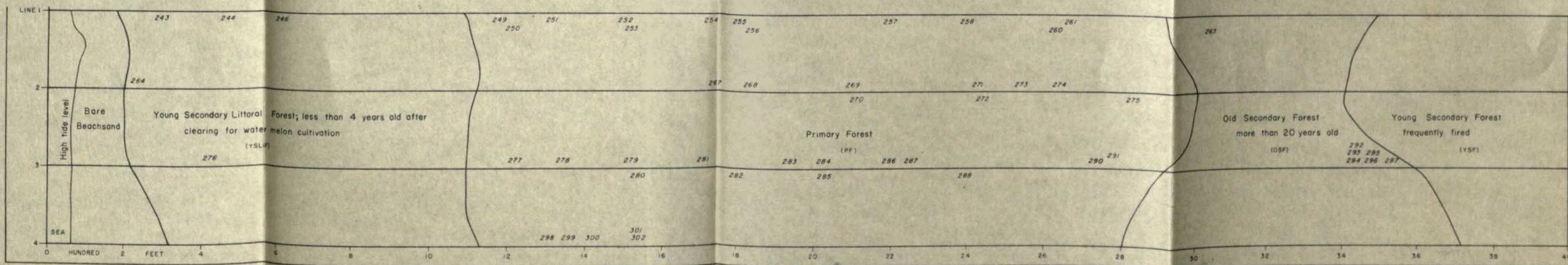


KEY TO
SOIL MAP

SOIL FAMILY	SOIL SERIES	MAIN CHARACTERISTICS	TOPOGRAPHY	PARENT MATERIAL	
KABONG	Oy	OYA	THIN DARK TOPSOIL OVER LOOSE LIGHT GREY SAND; IN PLACES MOTTLE STRONG BROWN CLOSE TO WATER TABLE MAINLY MODERATELY TO IMPERFECTLY DRAINED.	MOST RECENT STRANDLINES AND HIGHER PARTS OF OLD STRANDLINES	YOUNG QUATERNARY QUARTZ SAND
	Tt	TATAU	THIN TO THICK PEATY TOPSOIL OVER LIGHT GREY SAND. WATER TABLE PERMANENTLY CLOSE TO SURFACE.	SWALES BETWEEN, AND ON, SOME LOW STRANDLINES	
TATAU	Tt(org)	TATAU	ORGANIC PHASE. AS ABOVE, BUT UP TO 6 INCHES OF PEAT TOPSOIL.	SWALES BETWEEN OLD STRAND LINES AND ON MARGINS OF PEAT SWAMPS	ORGANIC DEBRIS AND YOUNG QUATERNARY QUARTZ SAND
	IGAN	IGAN	RAW, DARK BROWN PEAT, 6-36 INCHES THICK OVERLYING LIGHT COLOURED SAND.	SWALES BETWEEN OLD STRANDLINES AND ON MARGINS OF PEAT SWAMPS	
BUSO	Pn	PENIAN	THIN DARK TOPSOIL OVER LOOSE LIGHT GREY SAND, OVER OLIVE BROWN TO DARK BROWN SAND TO LOAMY SAND AT DEPTHS GREATER THAN 24 INCHES. WATER TABLE MAINLY MORE THAN 24 INCHES FROM SURFACE.	HIGHER PARTS OF OLD STRANDLINES	YOUNG QUATERNARY QUARTZ SAND
IGAN	Pn(sh)	PENIAN	SHALLOW PHASE. THIN TO THICK PEATY TOPSOIL OVER LIGHT GREY SAND, OVER DARK BROWN SAND TO LOAMY SAND, AT LESS THAN 24 INCHES FROM SURFACE. MAINLY POORLY TO VERY POORLY DRAINED.	SWALES BETWEEN, AND ON, SOME LOW STRANDLINES	
	IGAN	Pn(org)	PENIAN	ORGANIC PHASE. AS ABOVE BUT UP TO 6 INCHES OF PEAT TOPSOIL.	SWALES BETWEEN OLD STRANDLINES AND ON MARGINS OF PEAT SWAMPS
An		ANOU	RAW, DARK BROWN PEAT, 6-36 INCHES THICK OVERLYING DARK BROWN SAND		

243 Location of leaf sample and sample number

MAP IIc
VEGETATION



KEY TO
VEGETATION
MAP

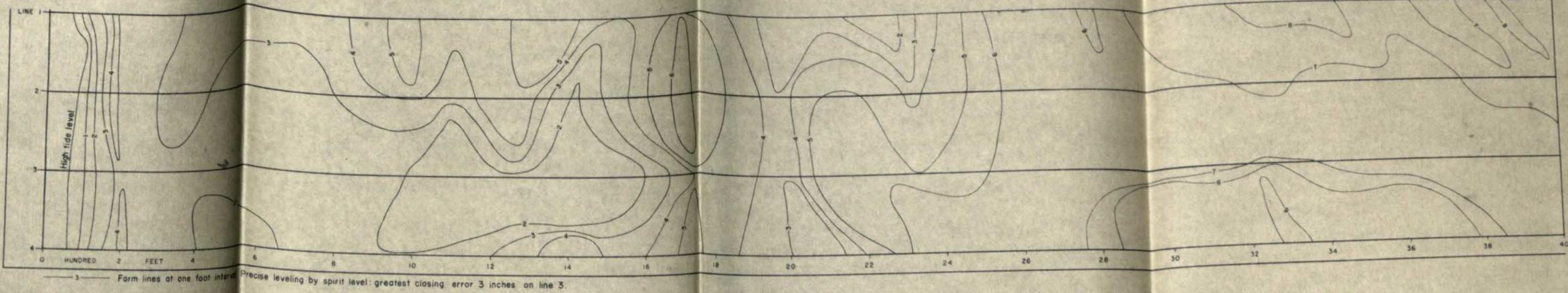
BROAD VEGETATION TYPE	MAPPING UNIT	MOST SPECIFIC SPECIES	SOIL SERIES
PRIMARY FOREST	(PF)	<i>Colophyllum retusum</i> , <i>C. serotifolium</i> , <i>Canthium umbelligerum</i> , <i>Dryobalanops rappa</i> , <i>Gonua curtisii</i> , <i>Gymnostoma nobile</i> , <i>Parishia sericea</i> , <i>Pseudosindora palustris</i> , <i>Tristania grandifolia</i>	TATAU, PENIAN
	(YSLF)	<i>Camposperma cariceae</i> , <i>Dryobalanops rappa</i> , <i>Gonua curtisii</i>	IGAN, ANDU
SECONDARY FOREST	(YSLF)	<i>Colophyllum inophyllum</i> , <i>Casuarina equisetifolia</i> , <i>Glacianan littorale</i> , <i>Guioa blythii</i> , <i>Pandanus sp.</i> , <i>Crius asiaticum</i>	PENIAN, OYA
	(YSF)	Abundant tussock sedges and a few woody plants	PENIAN
	(OSF)	<i>Colophyllum flagrans</i> , <i>Elaeocarpus obtusifolius</i> , <i>Eugenia cerina</i> , <i>Gymnostoma nobile</i> , <i>Timanus pedunculatus</i>	

LIST OF LEAF SAMPLES

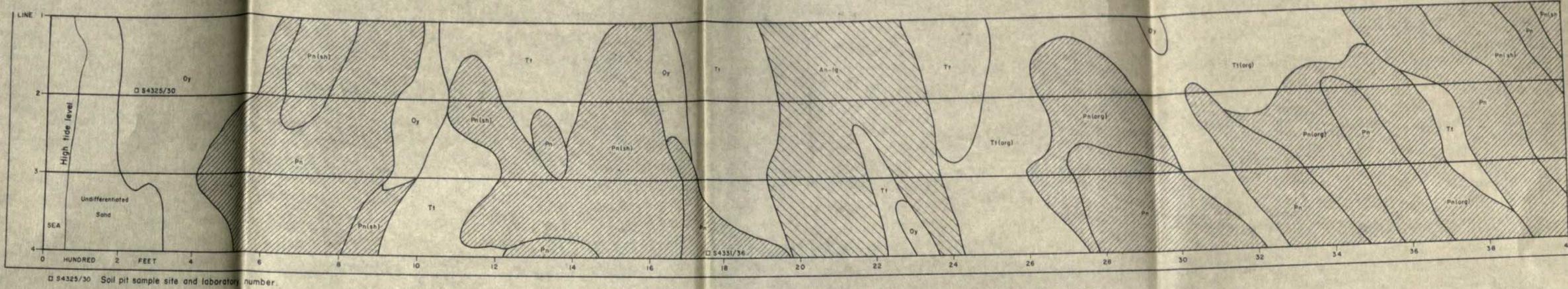
(IDENTIFIED BY DR. P.S. ASHTON, FOREST DEPARTMENT, SARAWAK.)

243 <i>Guioa blythii</i> (Bl.) Radlk	269 <i>Gonua curtisii</i> (K. et G.) H.J.L.	288 <i>Parosperma uraphyllum</i> Miq
244 <i>Casuarina equisetifolia</i> L.	270 <i>Dryobalanops rappa</i> Becc	290 <i>Dryobalanops rappa</i> Becc
246 <i>Glacianan littorale</i> Bl.	271 <i>Neolobos neriophyllum</i> Becc	291 <i>Colophyllum retusum</i> Walp.
249 <i>Santiria rubiginosa</i> Bl.	272 <i>Dryobalanops rappa</i> Becc	292 <i>Colophyllum flagrans</i> Ridl.
250 <i>Garcinia blumei</i> Pierre	273 <i>Dryobalanops rappa</i> Becc	293 <i>Eugenia cerina</i> Hand.
251 <i>Tristania grandifolia</i> Ridl.	274 <i>Melanorrhoea beccarii</i> Engl.	294 <i>Timanus pedunculatus</i> (Wall.) Ridl.
252 <i>Canthium umbelligerum</i> Ridl.	275 <i>Gonua curtisii</i> (K. et G.) H.J.L.	295 <i>Ouvatea hookeri</i> (Pionch) van Tiegh.
253 <i>Gonua curtisii</i> (K. et G.) H.J.L.	276 <i>Vitex pubescens</i> Vahl	296 <i>Neantia gracilis</i> Karst.
254 <i>Gonua curtisii</i> (K. et G.) H.J.L.	277 <i>Parishia sericea</i> Walp.	297 <i>Elaeocarpus obtusifolius</i> Merr.
255 <i>Spartina laevigata</i> Bl. forma <i>laevigata</i>	278 <i>Eugenia cf. monantha</i> Merr.	298 <i>Parishia sericea</i> Walp.
256 <i>Dryobalanops rappa</i> Becc	279 <i>Myristica lawsona</i> King	299 <i>Pseudosindora palustris</i> Sym.
257 <i>Melanorrhoea beccarii</i> Engl.	280 <i>Palaquium sidii</i> K. et G.	300 <i>Gonua curtisii</i> (K. et G.) H.J.L.
258 <i>Canthium umbelligerum</i> Ridl.	281 <i>Tristania grandifolia</i> Ridl.	301 <i>Colophyllum serotifolium</i> Hand et W.S.
259 <i>Gonua curtisii</i> (K. et G.) H.J.L.	282 <i>Gonua curtisii</i> (K. et G.) H.J.L.	302 <i>Santiria laevigata</i> Bl.
261 <i>Colophyllum inophyllum</i> Linn.	283 <i>Santiria rubiginosa</i> Bl.	
263 <i>Eugenia cerina</i> Hand.	284 <i>Camposperma cariceae</i> (Jack) Hallier f. et v. Steenis	
264 <i>Colophyllum inophyllum</i> Linn.	285 <i>Bacopa beccarii</i> Pax	
267 <i>Gonua curtisii</i> (K. et G.) H.J.L.	286 <i>Dryobalanops rappa</i> Becc	
268 <i>Eugenia cf. monantha</i> Merr.	287 <i>Dryobalanops rappa</i> Becc	

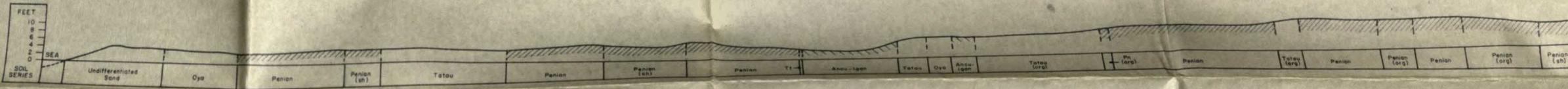
MAP IIa
TOPOGRAPHY



MAP IIb
SOILS



Line 4
Cross Section



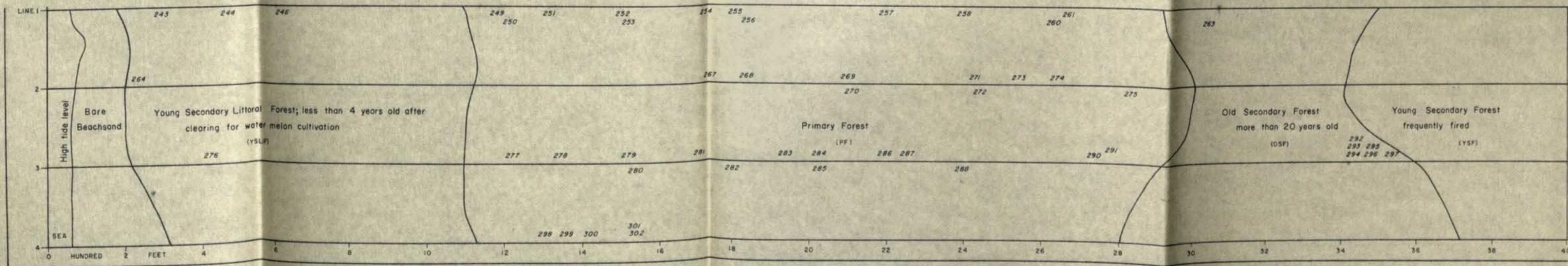
KEY TO
SOIL MAP

SOIL FAMILY	SOIL SERIES	MAIN CHARACTERISTICS	TOPOGRAPHY	PARENT MATERIAL	
KABONG	Oy	OYA	THIN DARK TOPSOIL OVER LOOSE LIGHT GREY SAND, IN PLACES MOTTLE STRONG BROWN CLOSE TO WATER TABLE. MAINLY MODERATELY TO IMPERFECTLY DRAINED.	MOST RECENT STRANDLINES AND HIGHER PARTS OF OLD STRANDLINES	YOUNG QUATERNARY QUARTZ SAND
TATAU	Tt	TATAU	THIN TO THICK PEATY TOPSOIL OVER LIGHT GREY SAND. WATER TABLE PERMANENTLY CLOSE TO SURFACE.	SWALES BETWEEN, AND ON, SOME LOW STRANDLINES	ORGANIC DEBRIS AND YOUNG QUATERNARY QUARTZ SAND
	Tt(larg)	TATAU	ORGANIC PHASE. AS ABOVE, BUT UP TO 6 INCHES OF PEAT TOPSOIL.	SWALES BETWEEN OLD STRAND LINES AND ON MARGINS OF PEAT SWAMPS	
IGAN	Ig	IGAN	RAW, DARK BROWN PEAT, 6-36 INCHES THICK OVERLYING LIGHT COLOURED SAND.		

SOIL FAMILY	SOIL SERIES	MAIN CHARACTERISTICS	TOPOGRAPHY	PARENT MATERIAL	
BUSO	Pn	PENIAN	THIN DARK TOPSOIL OVER LOOSE LIGHT GREY SAND, OVER OLIVE BROWN TO DARK BROWN SAND TO LOAMY SAND AT DEPTHS GREATER THAN 24 INCHES. WATER TABLE MAINLY MORE THAN 24 INCHES FROM SURFACE.	HIGHER PARTS OF OLD STRANDLINES	YOUNG QUATERNARY QUARTZ SAND
	Pn(sh)	PENIAN	SHALLOW PHASE. THIN TO THICK PEATY TOPSOIL OVER LIGHT GREY SAND, OVER DARK BROWN SAND TO LOAMY SAND, AT LESS THAN 24 INCHES FROM SURFACE. MAINLY POORLY TO VERY POORLY DRAINED.	SWALES BETWEEN, AND ON, SOME LOW STRANDLINES	ORGANIC DEBRIS AND YOUNG QUATERNARY QUARTZ SAND
	Pn(larg)	PENIAN	ORGANIC PHASE. AS ABOVE BUT UP TO 6 INCHES OF PEAT TOPSOIL	SWALES BETWEEN OLD STRANDLINES AND ON MARGINS OF PEAT SWAMPS	
IGAN	An	ANOU	RAW, DARK BROWN PEAT, 6-36 INCHES THICK OVERLYING DARK BROWN SAND		

243 Location of leaf sample and sample number

MAP IIc
VEGETATION



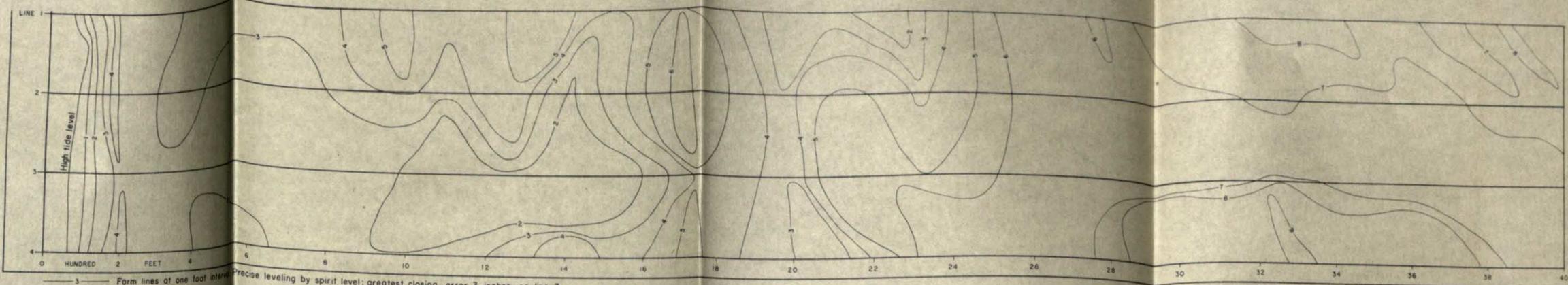
KEY TO
VEGETATION
MAP

BROAD VEGETATION TYPE	MAPPING UNIT	MOST SPECIFIC SPECIES	SOIL SERIES
PRIMARY FOREST	(PF)	<i>Calophyllum retusum</i> , <i>C. urbilifolium</i> , <i>Casuarina umbelligerum</i> , <i>Dryobalanops rappa</i> , <i>Gonua curtisii</i> , <i>Gymnostoma nobile</i> , <i>Parishia sericea</i> , <i>Pseudosida palustris</i> , <i>Tristania grandifolia</i> .	TATAU, PENIAN
	(YSLF)	<i>Compnosperma coriaceae</i> , <i>Dryobalanops rappa</i> , <i>Gonua curtisii</i> .	IGAN, ANOU
SECONDARY FOREST	(YSLF)	<i>Calophyllum inaphyllum</i> , <i>Staurina equisetifolia</i> , <i>Glaciodion littorale</i> , <i>Gonua bluge</i> , <i>Pandanus sp.</i> , <i>Crimum asiaticum</i> .	PENIAN, OYA
	(YSF)	Abundant tussock vegetation and a few woody plants.	PENIAN
	(OSF)	<i>Calophyllum flagrans</i> , <i>Emasurus obtusifolius</i> , <i>Eugenia cerina</i> , <i>Gymnostoma nobile</i> , <i>Timonius peduncularis</i> .	

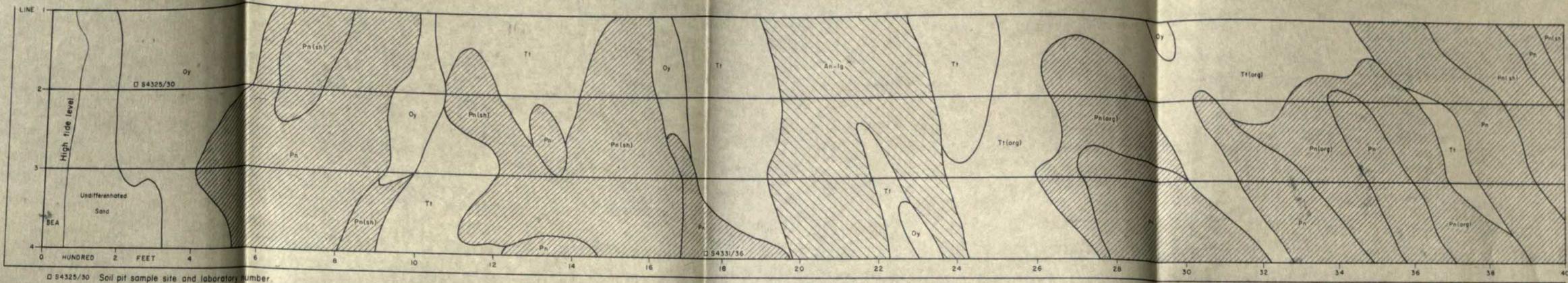
LIST OF LEAF SAMPLES

(IDENTIFIED BY DR. P. S. ASHTON, FOREST DEPARTMENT, SARAWAK.)

243 <i>Gonua plurivertia</i> (Bl.) Radlk.	269 <i>Gonua curtisii</i> (K. et G.) H.J.L.	288 <i>Parastemon uraphyllum</i> Mig
244 <i>Casuarina equisetifolia</i> L.	270 <i>Dryobalanops rappa</i> Becc.	290 <i>Dryobalanops rappa</i> Becc.
246 <i>Glaciodion littorale</i> Bl.	271 <i>Nephelium macrophyllum</i> Radlk.	291 <i>Calophyllum retusum</i> Walp.
248 <i>Santiria rubiginosa</i> Bl.	272 <i>Dryobalanops rappa</i> Becc.	292 <i>Calophyllum flagrans</i> Ridg.
250 <i>Garcinia blumei</i> Pierre	273 <i>Dryobalanops rappa</i> Becc.	293 <i>Eugenia cerina</i> Hensl.
251 <i>Tristania grandifolia</i> Ridg.	274 <i>Melanorrhoea beccarii</i> Engl.	294 <i>Timonius peduncularis</i> (Wall.) Ridg.
252 <i>Canthium umbelligerum</i> Ridg.	275 <i>Gonua curtisii</i> (K. et G.) H.J.L.	295 <i>Ouratea hookeri</i> (Planch) von Tiegh.
253 <i>Gonua curtisii</i> (K. et G.) H.J.L.	276 <i>Vitex pubescens</i> Vahl	296 <i>Nepenthes gracilis</i> Kerth.
254 <i>Gonua curtisii</i> (K. et G.) H.J.L.	277 <i>Parishia sericea</i> Radl.	297 <i>Elaeocarpus obtusifolius</i> Merr.
255 <i>Santiria laevigata</i> Bl. <i>forma laevigata</i>	278 <i>Eugenia cf. mangatha</i> Merr.	298 <i>Parishia sericea</i> Radl.
256 <i>Dryobalanops rappa</i> Becc.	279 <i>Myristica lowiana</i> King	299 <i>Pseudosida palustris</i> Sym.
257 <i>Melanorrhoea beccarii</i> Engl.	280 <i>Palaeoum ridgii</i> K. et G.	300 <i>Gonua curtisii</i> (K. et G.) H.J.L.
258 <i>Canthium umbelligerum</i> Ridg.	281 <i>Tristania grandifolia</i> Ridg.	301 <i>Calophyllum scribbitifolium</i> Hensl. et W.S.
260 <i>Gonua curtisii</i> (K. et G.) H.J.L.	282 <i>Gonua curtisii</i> (K. et G.) H.J.L.	302 <i>Santiria laevigata</i> Bl.
261 <i>Calophyllum inaphyllum</i> Linn.	283 <i>Santiria rubiginosa</i> Bl.	
263 <i>Eugenia cerina</i> Hensl.	284 <i>Compnosperma coriaceae</i> (Jack) Haller f. et v. Steenis	
264 <i>Calophyllum inaphyllum</i> Linn.	285 <i>Baccharis beccarii</i> Radl.	
267 <i>Gonua curtisii</i> (K. et G.) H.J.L.	286 <i>Dryobalanops rappa</i> Becc.	
268 <i>Eugenia cf. mangatha</i> Merr.	287 <i>Dryobalanops rappa</i> Becc.	

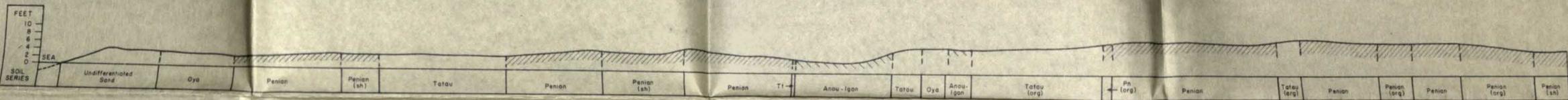


MAP IIa
TOPOGRAPHY



MAP IIb
SOILS

Line 4
Cross Section

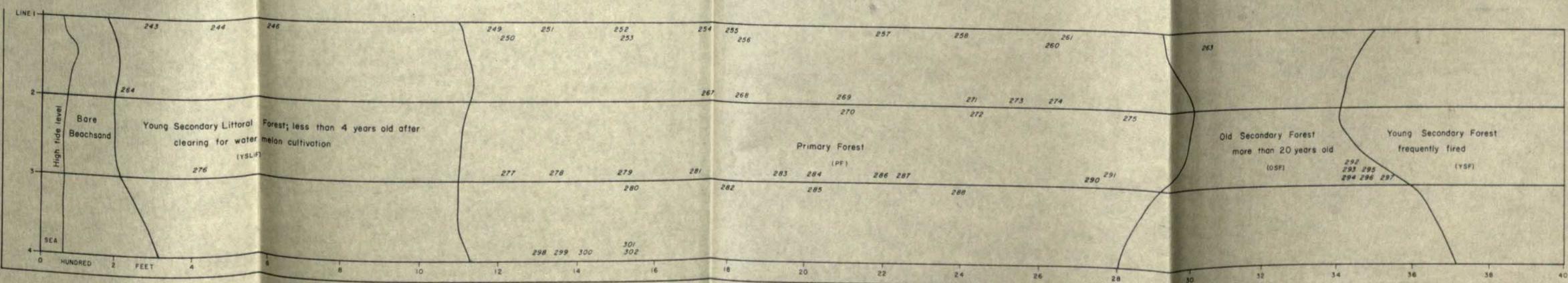


KEY TO
SOIL MAP

SOIL FAMILY	SOIL SERIES	MAIN CHARACTERISTICS	TOPOGRAPHY	PARENT MATERIAL	
KABONG	Oy	OYA	THIN DARK TOPSOIL OVER LOOSE LIGHT GREY SAND; IN PLACES MOTTLE STRONG BROWN CLOSE TO WATER TABLE. MAINLY MODERATELY TO IMPERFECTLY DRAINED.	MOST RECENT STRANDLINES AND HIGHER PARTS OF OLD STRANDLINES	YOUNG QUATERNARY QUARTZ SAND
	Tl	TATAU	THIN TO THICK PEATY TOPSOIL OVER LIGHT GREY SAND. WATER TABLE PERMANENTLY CLOSE TO SURFACE.	SWALES BETWEEN, AND ON, SOME LOW STRANDLINES	
TATAU	Tl(org)	TATAU	ORGANIC PHASE. AS ABOVE, BUT UP TO 6 INCHES OF PEAT TOPSOIL.	SWALES BETWEEN OLD STRAND LINES AND ON MARGINS OF PEAT SWAMPS	ORGANIC DEBRIS AND YOUNG QUATERNARY QUARTZ SAND
	Igan	IGAN	RAW, DARK BROWN PEAT, 6-36 INCHES THICK OVERLYING LIGHT COLOURED SAND.		

SOIL FAMILY	SOIL SERIES	MAIN CHARACTERISTICS	TOPOGRAPHY	PARENT MATERIAL
BUSD	Penian	THIN DARK TOPSOIL OVER LOOSE LIGHT GREY SAND, OVER OLIVE BROWN TO DARK BROWN SAND TO LOAMY SAND AT DEPTHS GREATER THAN 24 INCHES. WATER TABLE MAINLY MORE THAN 24 INCHES FROM SURFACE.	HIGHER PARTS OF OLD STRANDLINES	YOUNG QUATERNARY QUARTZ SAND
	Penian (sh)	SHALLOW PHASE. THIN TO THICK PEATY TOPSOIL OVER LIGHT GREY SAND, OVER DARK BROWN SAND TO LOAMY SAND, AT LESS THAN 24 INCHES FROM SURFACE. MAINLY POORLY TO VERY POORLY DRAINED.	SWALES BETWEEN, AND ON, SOME LOW STRANDLINES	
	Penian (org)	ORGANIC PHASE. AS ABOVE BUT UP TO 6 INCHES OF PEAT TOPSOIL	SWALES BETWEEN OLD STRANDLINES AND ON MARGINS OF PEAT SWAMPS	
IGAN	Anou	ANOU	RAW, DARK BROWN PEAT, 6-36 INCHES THICK OVERLYING DARK BROWN SAND	ORGANIC DEBRIS AND YOUNG QUATERNARY QUARTZ SAND

243 Location of leaf sample and sample number



MAP IIc
VEGETATION

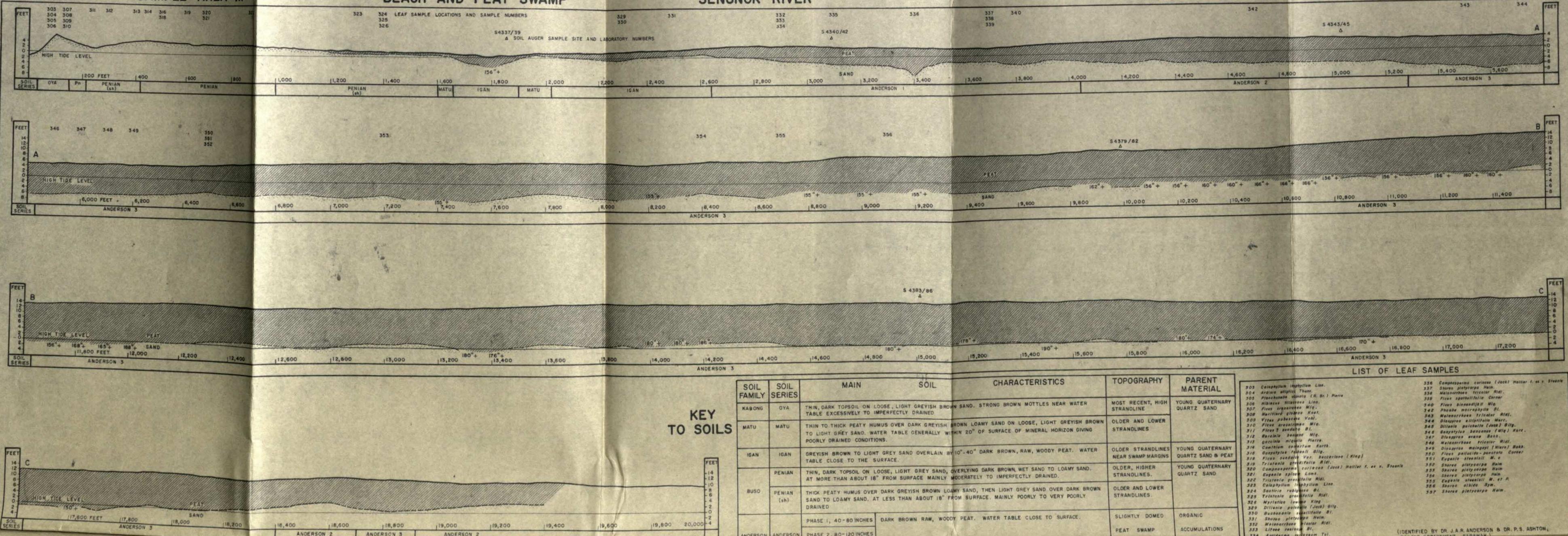
KEY TO
VEGETATION
MAP

BROAD VEGETATION TYPE	MAPPING UNIT	MOST SPECIFIC SPECIES	SOIL SERIES
PRIMARY FOREST	(PF)	<i>Calophyllum retusum</i> , <i>C. horsfieldii</i> , <i>Conchocarpum umbelligerum</i> , <i>Dryobalanops rappa</i> , <i>Gonua curtisii</i> , <i>Gymnostoma nobilis</i> , <i>Parishia sericea</i> , <i>Pseudobalanops galustris</i> , <i>Tristania grandifolia</i>	TATAU, PENIAN
	(YSLF)	<i>Camposperma coriacea</i> , <i>Dryobalanops rappa</i> , <i>Gonua curtisii</i> , <i>Gymnostoma nobilis</i> , <i>Palaquium nidii</i>	IGAN, ANOU
SECONDARY FOREST	(YSF)	<i>Calophyllum inophyllum</i> , <i>Cassipouira equisetifolia</i> , <i>Glochidion littorale</i> , <i>Guisia bijuga</i> , <i>Parabuteo sp.</i> , <i>Crinum asiaticum</i>	PENIAN, OYA
	(OSF)	Abundant tussock sedge and a few woody plants	PENIAN
	(OSF)	<i>Calophyllum flagrans</i> , <i>Elaeocarpus obtusifolius</i> , <i>Eugenia carina</i> , <i>Gymnostoma nobilis</i> , <i>Tanaisius pedunculatus</i>	PENIAN

LIST OF LEAF SAMPLES

(IDENTIFIED BY DR. P. S. ASHTON, FOREST DEPARTMENT, SARAWAK.)

243 <i>Guisia glauca</i> (Bl.) Radlk.	269 <i>Gonua curtisii</i> (K. et G.) H. J. L.	288 <i>Parastemon uraphyllum</i> Mig.
244 <i>Cesvarina equisetifolia</i> L.	270 <i>Dryobalanops rappa</i> Becc.	290 <i>Dryobalanops rappa</i> Becc.
246 <i>Glochidion littorale</i> Bl.	271 <i>Nephelium macrophyllum</i> Radlk.	291 <i>Calophyllum retusum</i> Walp.
245 <i>Santiria rubiginosa</i> Bl.	272 <i>Dryobalanops rappa</i> Becc.	292 <i>Calophyllum flagrans</i> Rid.
250 <i>Garcinia blumei</i> Pierre	273 <i>Dryobalanops rappa</i> Becc.	293 <i>Eugenia carina</i> Vahl.
251 <i>Tristania grandifolia</i> Rid.	274 <i>Melanorrhoea beccarii</i> Engl.	294 <i>Timonius pedunculatus</i> (Walp.) Rid.
252 <i>Conchocarpum umbelligerum</i> Rid.	275 <i>Gonua curtisii</i> (K. et G.) H. J. L.	295 <i>Ouratea hoaxii</i> (Pianch.) van Tiegh.
253 <i>Gonua curtisii</i> (K. et G.) H. J. L.	276 <i>Vitex pubescens</i> Vahl.	296 <i>Nepenthes gracilis</i> Karst.
254 <i>Gonua curtisii</i> (K. et G.) H. J. L.	277 <i>Parishia sericea</i> Rid.	297 <i>Elaeocarpus pedunculatus</i> Merr.
255 <i>Santiria laevigata</i> Bl. forma laevigata	278 <i>Eugenia cf. mananthe</i> Merr.	298 <i>Parishia sericea</i> Rid.
256 <i>Dryobalanops rappa</i> Becc.	279 <i>Myristica javana</i> King.	299 <i>Pseudobalanops galustris</i> Sym.
257 <i>Melanorrhoea beccarii</i> Engl.	280 <i>Palaquium nidii</i> K. et G.	300 <i>Gonua curtisii</i> (K. et G.) H. J. L.
258 <i>Conchocarpum umbelligerum</i> Rid.	281 <i>Tristania grandifolia</i> Rid.	301 <i>Calophyllum scribnerianum</i> Merr. et W. S.
260 <i>Gonua curtisii</i> (K. et G.) H. J. L.	282 <i>Gonua curtisii</i> (K. et G.) H. J. L.	302 <i>Santiria laevigata</i> Bl.
261 <i>Calophyllum inophyllum</i> Linn.	283 <i>Santiria rubiginosa</i> Bl.	
263 <i>Eugenia carina</i> Vahl.	284 <i>Camposperma coriacea</i> (Jack) Halberf. et Steenis	
264 <i>Calophyllum inophyllum</i> Linn.	285 <i>Baccouria beccarii</i> Pax	
267 <i>Gonua curtisii</i> (K. et G.) H. J. L.	286 <i>Dryobalanops rappa</i> Becc.	
268 <i>Eugenia cf. mananthe</i> Merr.	287 <i>Dryobalanops rappa</i> Becc.	



LEAF SAMPLE LOCATIONS AND SAMPLE NUMBERS
 SOIL AUGER SAMPLE SITE AND LABORATORY NUMBERS

KEY TO SOILS

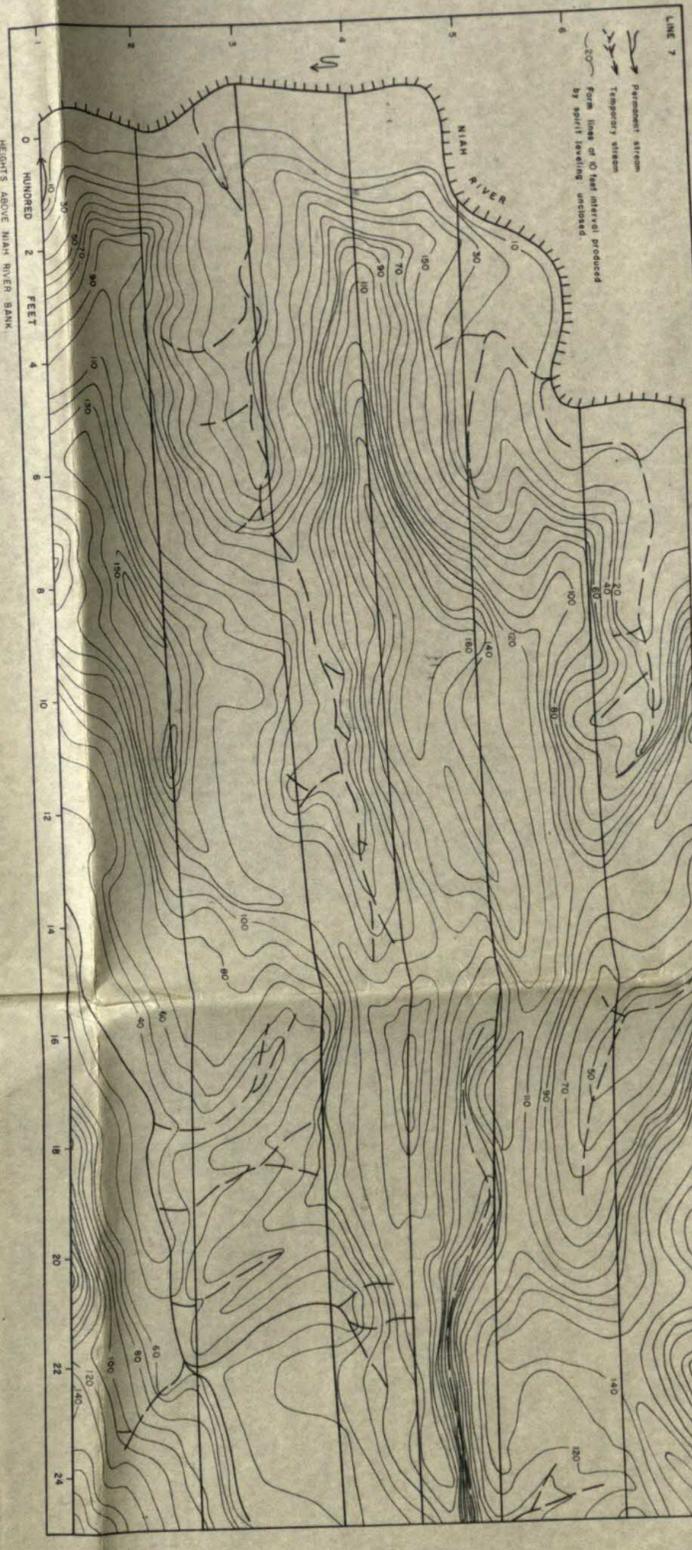
SOIL FAMILY	SOIL SERIES	MAIN SOIL	CHARACTERISTICS	TOPOGRAPHY	PARENT MATERIAL
KABONG	OYA		THIN, DARK TOPSOIL ON LOOSE, LIGHT GREYISH BROWN SAND. STRONG BROWN MOTTLES NEAR WATER TABLE EXCESSIVELY TO IMPERFECTLY DRAINED.	MOST RECENT, HIGH STRANDLINE	YOUNG QUATERNARY QUARTZ SAND
MATU	MATU		THIN TO THICK PEATY HUMUS OVER DARK GREYISH BROWN LOAMY SAND ON LOOSE, LIGHT GREYISH BROWN TO LIGHT GREY SAND. WATER TABLE GENERALLY WITHIN 20" OF SURFACE OF MINERAL HORIZON GIVING POORLY DRAINED CONDITIONS.	OLDER AND LOWER STRANDLINES	
IGAN	IGAN		GREYISH BROWN TO LIGHT GREY SAND OVERLAIN BY 10"-40" DARK BROWN, RAW, WOODY PEAT. WATER TABLE CLOSE TO THE SURFACE.	OLDER STRANDLINES NEAR SWAMP MARGINS	YOUNG QUATERNARY QUARTZ SAND & PEAT
PENIAN	PENIAN (sh)		THIN, DARK TOPSOIL ON LOOSE, LIGHT GREY SAND, OVERLYING DARK BROWN WET SAND TO LOAMY SAND. AT MORE THAN ABOUT 18" FROM SURFACE MAINLY MODERATELY TO IMPERFECTLY DRAINED.	OLDER, HIGHER STRANDLINES.	YOUNG QUATERNARY QUARTZ SAND
			THICK PEATY HUMUS OVER DARK GREYISH BROWN LOAMY SAND, THEN LIGHT GREY SAND OVER DARK BROWN SAND TO LOAMY SAND. AT LESS THAN ABOUT 18" FROM SURFACE. MAINLY POORLY TO VERY POORLY DRAINED.	OLDER AND LOWER STRANDLINES.	
ANDERSON	ANDERSON		PHASE 1, 40-80 INCHES	DARK BROWN RAW, WOODY PEAT. WATER TABLE CLOSE TO SURFACE.	SLIGHTLY DOMED
			PHASE 2, 80-120 INCHES		PEAT SWAMP
			PHASE 3, >120 INCHES		

LIST OF LEAF SAMPLES

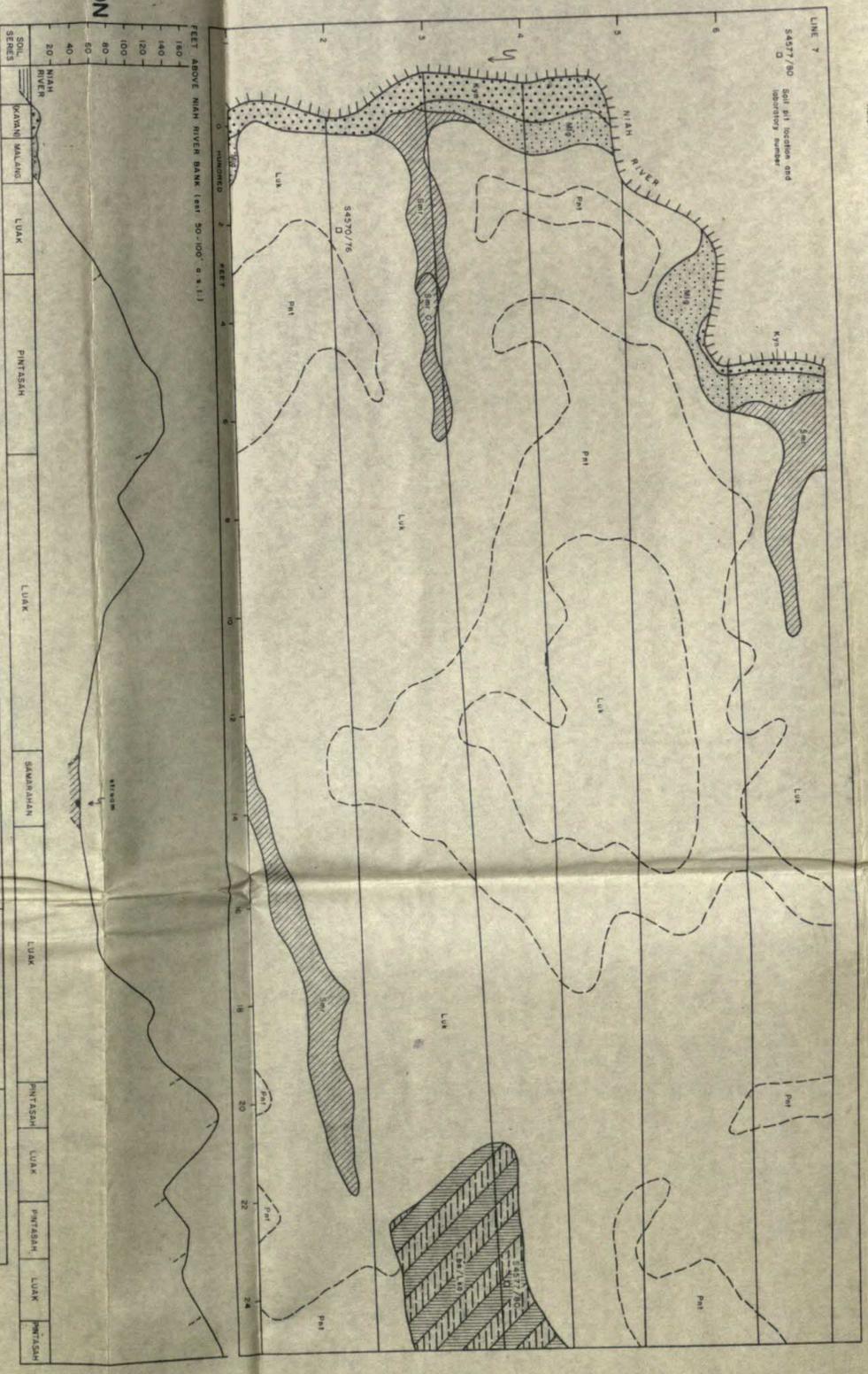
303 <i>Calophyllum inophyllum</i> Linn.	336 <i>Camphorosma curvicaule</i> (Jack) Hallier f. ex v. Steudt.
304 <i>Ardisia elliptica</i> Thunb.	337 <i>Shorea platycarpa</i> Heim.
305 <i>Pisonia hillebrandii</i> (R. Br.) Merr.	338 <i>Melastomaceae tricolor</i> Ridg.
306 <i>Hibiscus tiliaceus</i> Linn.	339 <i>Ficus spathulifolia</i> Corner
307 <i>Ficus crassipes</i> Mig.	340 <i>Ficus binnendijkii</i> Miq.
308 <i>Nauclea obovata</i> Merr.	341 <i>Ficus crassipes</i> Mig.
309 <i>Vitex pubescens</i> Vahl.	342 <i>Phorbe macrophylla</i> Bl.
310 <i>Ficus crassipes</i> Mig.	343 <i>Melastomaceae tricolor</i> Ridg.
311 <i>Ficus T. sundana</i> Bl.	344 <i>Diospyros malinayi</i> (Wern.) Merr.
312 <i>Burkea boniana</i> Mig.	345 <i>Dillenia pulchella</i> (Jack) Blig.
313 <i>Carolinia nigrifolia</i> Merr.	346 <i>Geostylis bancana</i> (Miq.) Kunt.
314 <i>Combretum sp. Kunt.</i>	347 <i>Diospyros ovata</i> Merr.
315 <i>Geophila pubescens</i> Blig.	348 <i>Melastomaceae tricolor</i> Ridg.
316 <i>Ficus sundana</i> Ver. beccariana (King)	349 <i>Diospyros malinayi</i> (Wern.) Merr.
317 <i>Tristania grandifolia</i> Ridg.	350 <i>Ficus pallidula - punctata</i> Corner
318 <i>Camphorosma curvicaule</i> (Jack) Hallier f. ex v. Steudt.	351 <i>Eugenia steudtii</i> M. & G.
319 <i>Eugenia sp. Linn.</i>	352 <i>Shorea platycarpa</i> Heim.
320 <i>Calophyllum inophyllum</i> Linn.	353 <i>Shorea platycarpa</i> Heim.
321 <i>Scaevola rubra</i> Bl.	354 <i>Eugenia steudtii</i> M. & G.
322 <i>Tristania grandifolia</i> Ridg.	355 <i>Shorea ulbida</i> Sym.
323 <i>Calophyllum inophyllum</i> Linn.	356 <i>Shorea platycarpa</i> Heim.
324 <i>Scaevola rubra</i> Bl.	
325 <i>Tristania grandifolia</i> Ridg.	
326 <i>Myrtaceae lowiana</i> King	
327 <i>Dillenia pulchella</i> (Jack) Blig.	
328 <i>Buchanania spathulifolia</i> Bl.	
329 <i>Shorea platycarpa</i> Heim.	
330 <i>Melastomaceae tricolor</i> Ridg.	
331 <i>Litsea suluensis</i> Bl.	
332 <i>Antidroma octocnemis</i> Tol.	
333 <i>Blumeodendron</i> Merr. 1913 v. v. Merr.	

(IDENTIFIED BY DR. J.A.R. ANDERSON & DR. P.S. ASHTON, FOREST DEPARTMENT, SARAWAK)

MAP 14a
TOPOGRAPHY



MAP 14b
SOILS

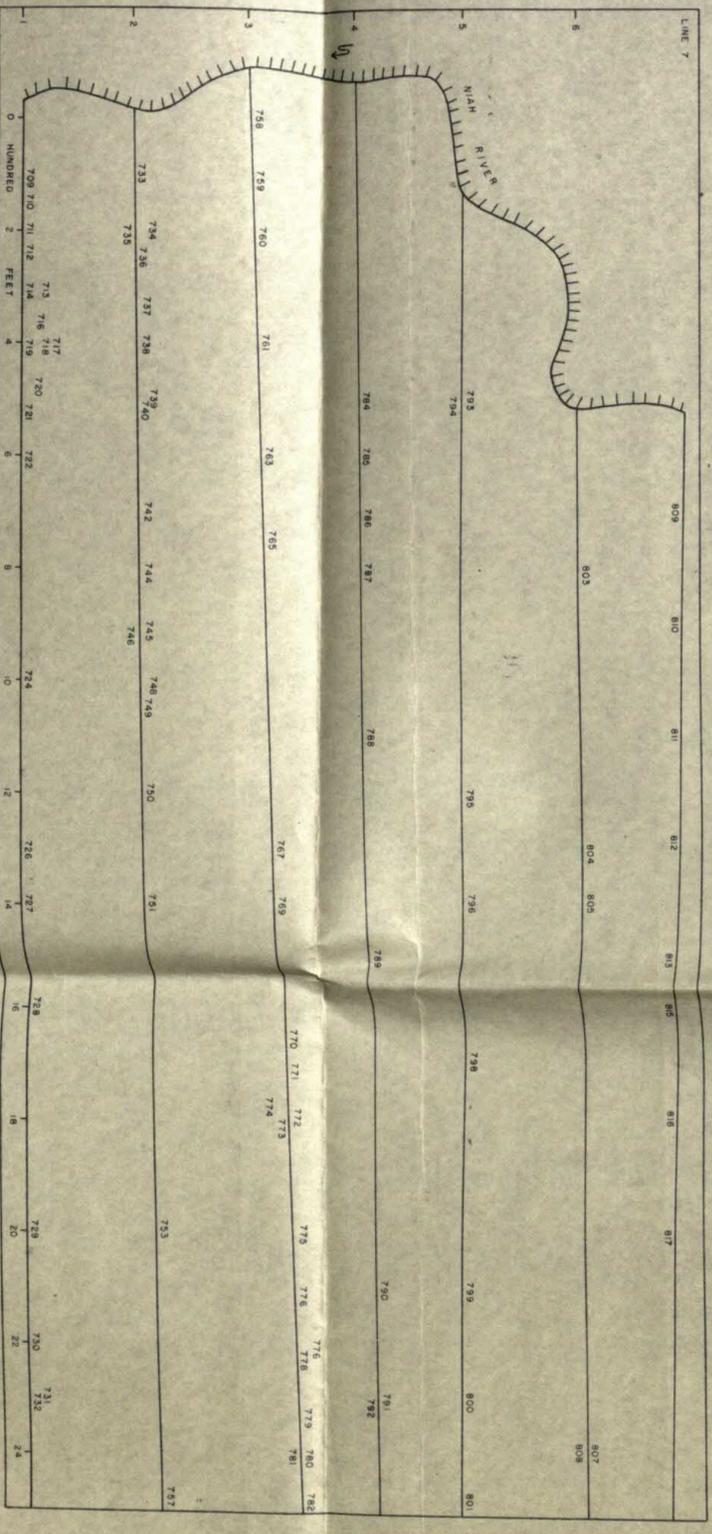


LINE 1
CROSS SECTION

SOIL FAMILY	SOIL SERIES	MAIN CHARACTERISTICS	TOPOGRAPHY	PARENT MATERIAL
LUAK	LUAK	This is a heavy, hard, red O horizon overlying a thin, dark yellowish brown loam A1 horizon. The soil is very sticky and has a high plasticity. It is moderately well drained.	Steep to gentle, predominantly steep to moderately steep ridges.	Highly ferruginous shales.
PINTASAH	PINTASAH	At Luak Series but is somewhat different from the Luak Series and may be called Luak Series. It is moderately well drained.	Steep to gentle, predominantly steep to moderately steep ridges.	Highly ferruginous shales.
LABANG	LABANG	Intermediate, mostly shallow. Main O horizon of a thin, dark yellowish brown loam A1 horizon. The soil is very sticky and has a high plasticity. It is moderately well drained.	Steep to gently, predominantly steep to moderately steep ridges.	Highly ferruginous shales.
UNCLASSIFIED	UNCLASSIFIED	This silt and loam overlying a thin, dark yellowish brown loam A1 horizon. This is thick, brownish yellow sandy loam A2 horizon overlying stony clay loam. Well drained.	Gentle slopes of ridges.	Highly ferruginous shales.
MALANG	MALANG	No O horizon and a thin to thick sandy loam A1 horizon. Bands of heavy sand and heavy clay beneath. In places clay loam. Well drained.	Gentle slopes of ridges.	Highly ferruginous shales.
SAMARAHAN	SAMARAHAN	Intermediate, silt and loam overlying a thin, dark yellowish brown loam A1 horizon. This is thick, brownish yellow sandy loam A2 horizon overlying stony clay loam. Well drained.	Gentle slopes of ridges.	Highly ferruginous shales.
SIAIT	SAMARAHAN ORANGE PHASE	At Samarahan Series but with pretty clay masses in upper subsoil.	Flat valley bottoms.	Recent volcanic cones mainly.

KEY TO
SOIL MAP

MAP 14c
VEGETATION

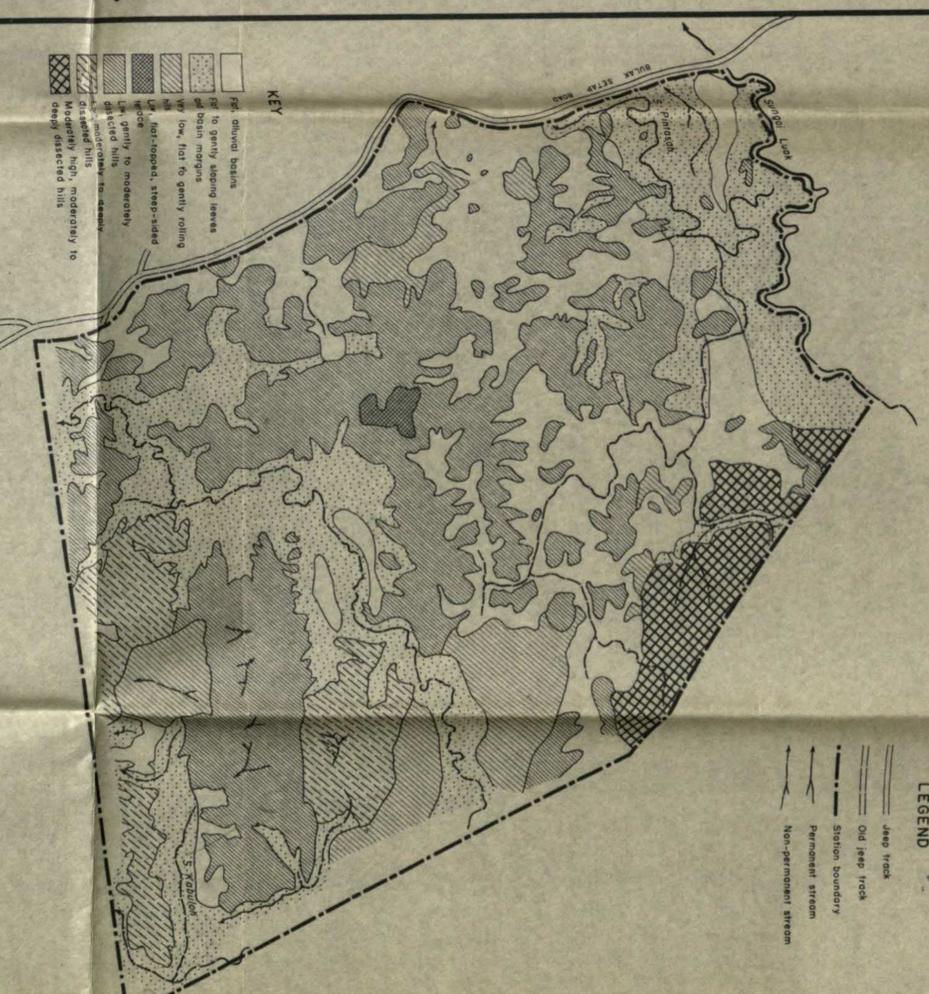
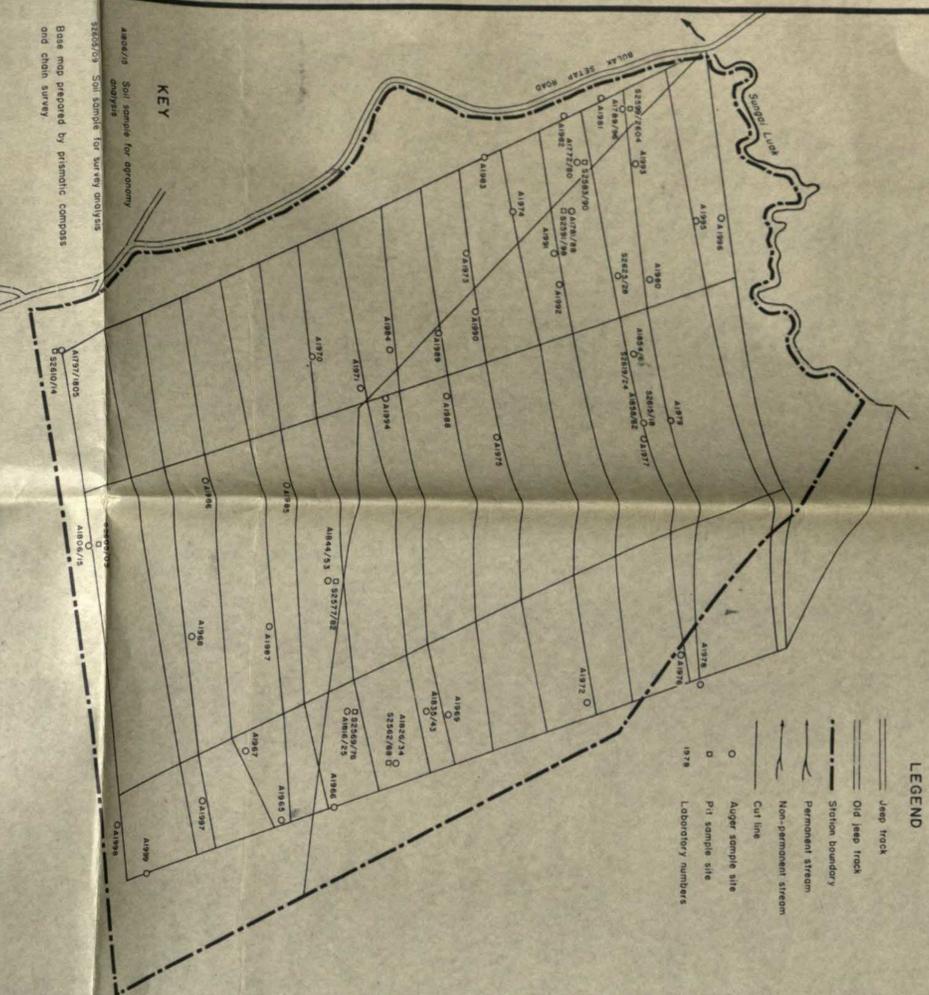


KEY TO
VEGETATION
MAP

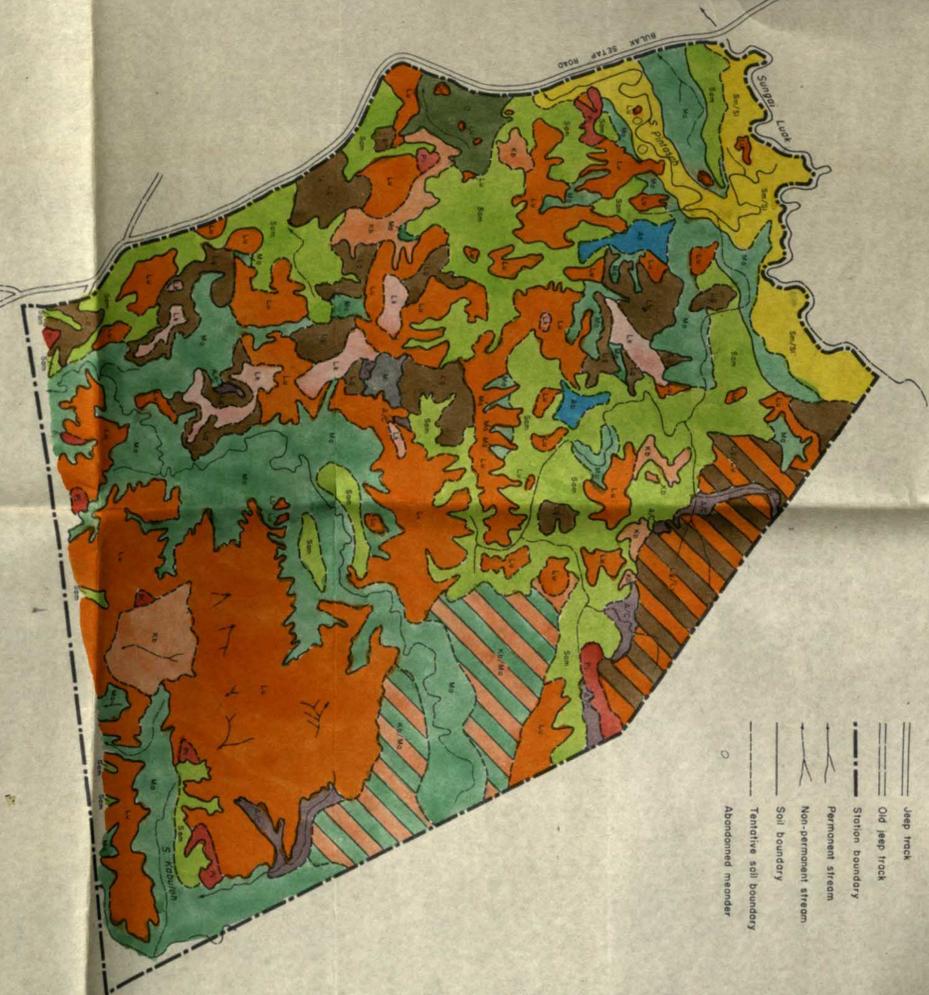
LIST OF LEAF SAMPLES

(IDENTIFIED BY DR. P. S. ASHTON, FOREST DEPARTMENT, SARAWAK.)

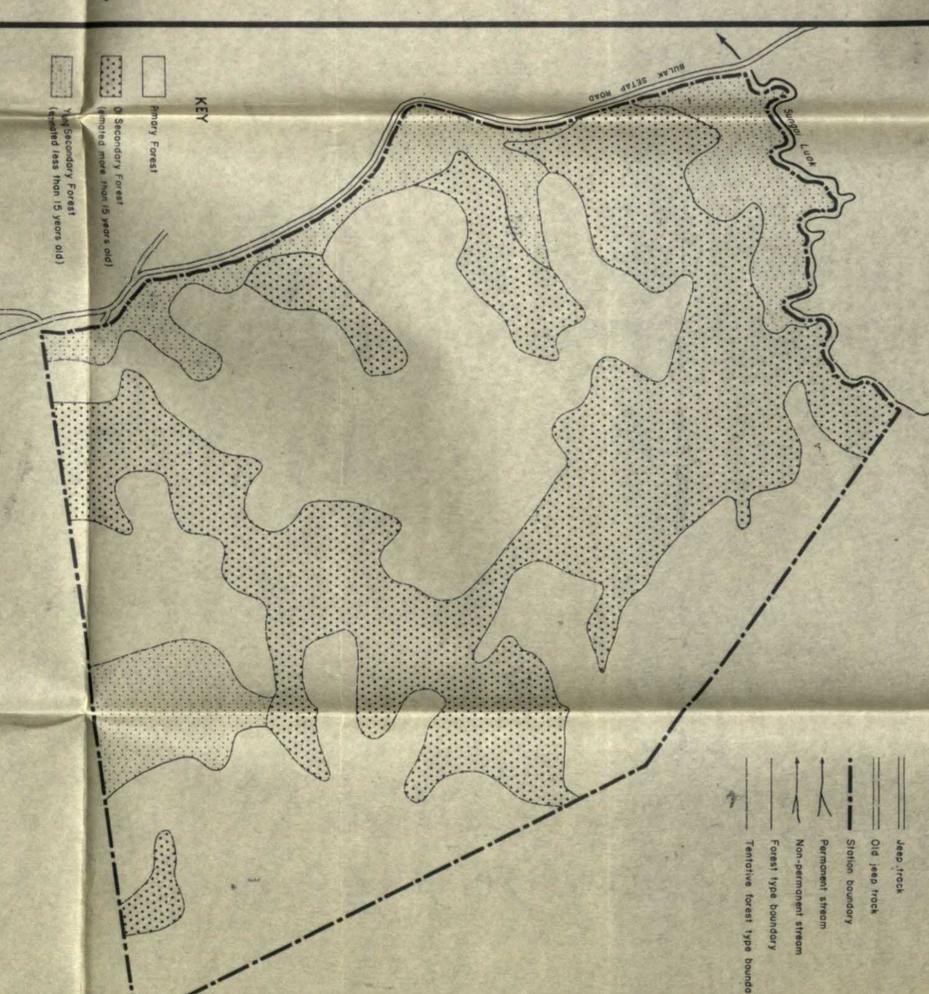
709	<i>Artocarpus</i> sp.	724	<i>Ficus</i> sp.
710	<i>Dioscorea</i> sp.	725	<i>Ficus</i> sp.
711	<i>Eugenia</i> sp.	726	<i>Ficus</i> sp.
712	<i>Podocarpus</i> sp.	727	<i>Ficus</i> sp.
713	<i>Podocarpus</i> sp.	728	<i>Ficus</i> sp.
714	<i>Podocarpus</i> sp.	729	<i>Ficus</i> sp.
715	<i>Podocarpus</i> sp.	730	<i>Ficus</i> sp.
716	<i>Podocarpus</i> sp.	731	<i>Ficus</i> sp.
717	<i>Podocarpus</i> sp.	732	<i>Ficus</i> sp.
718	<i>Podocarpus</i> sp.	733	<i>Ficus</i> sp.
719	<i>Podocarpus</i> sp.	734	<i>Ficus</i> sp.
720	<i>Podocarpus</i> sp.	735	<i>Ficus</i> sp.
721	<i>Podocarpus</i> sp.	736	<i>Ficus</i> sp.
722	<i>Podocarpus</i> sp.	737	<i>Ficus</i> sp.
723	<i>Podocarpus</i> sp.	738	<i>Ficus</i> sp.
724	<i>Podocarpus</i> sp.	739	<i>Ficus</i> sp.
725	<i>Podocarpus</i> sp.	740	<i>Ficus</i> sp.
726	<i>Podocarpus</i> sp.	741	<i>Ficus</i> sp.
727	<i>Podocarpus</i> sp.	742	<i>Ficus</i> sp.
728	<i>Podocarpus</i> sp.	743	<i>Ficus</i> sp.
729	<i>Podocarpus</i> sp.	744	<i>Ficus</i> sp.
730	<i>Podocarpus</i> sp.	745	<i>Ficus</i> sp.
731	<i>Podocarpus</i> sp.	746	<i>Ficus</i> sp.
732	<i>Podocarpus</i> sp.	747	<i>Ficus</i> sp.
733	<i>Podocarpus</i> sp.	748	<i>Ficus</i> sp.
734	<i>Podocarpus</i> sp.	749	<i>Ficus</i> sp.
735	<i>Podocarpus</i> sp.	750	<i>Ficus</i> sp.
736	<i>Podocarpus</i> sp.	751	<i>Ficus</i> sp.
737	<i>Podocarpus</i> sp.	752	<i>Ficus</i> sp.
738	<i>Podocarpus</i> sp.	753	<i>Ficus</i> sp.
739	<i>Podocarpus</i> sp.	754	<i>Ficus</i> sp.
740	<i>Podocarpus</i> sp.	755	<i>Ficus</i> sp.
741	<i>Podocarpus</i> sp.	756	<i>Ficus</i> sp.
742	<i>Podocarpus</i> sp.	757	<i>Ficus</i> sp.
743	<i>Podocarpus</i> sp.	758	<i>Ficus</i> sp.
744	<i>Podocarpus</i> sp.	759	<i>Ficus</i> sp.
745	<i>Podocarpus</i> sp.	760	<i>Ficus</i> sp.
746	<i>Podocarpus</i> sp.	761	<i>Ficus</i> sp.
747	<i>Podocarpus</i> sp.	762	<i>Ficus</i> sp.
748	<i>Podocarpus</i> sp.	763	<i>Ficus</i> sp.
749	<i>Podocarpus</i> sp.	764	<i>Ficus</i> sp.
750	<i>Podocarpus</i> sp.	765	<i>Ficus</i> sp.
751	<i>Podocarpus</i> sp.	766	<i>Ficus</i> sp.
752	<i>Podocarpus</i> sp.	767	<i>Ficus</i> sp.
753	<i>Podocarpus</i> sp.	768	<i>Ficus</i> sp.
754	<i>Podocarpus</i> sp.	769	<i>Ficus</i> sp.
755	<i>Podocarpus</i> sp.	770	<i>Ficus</i> sp.
756	<i>Podocarpus</i> sp.	771	<i>Ficus</i> sp.
757	<i>Podocarpus</i> sp.	772	<i>Ficus</i> sp.
758	<i>Podocarpus</i> sp.	773	<i>Ficus</i> sp.
759	<i>Podocarpus</i> sp.	774	<i>Ficus</i> sp.
760	<i>Podocarpus</i> sp.	775	<i>Ficus</i> sp.
761	<i>Podocarpus</i> sp.	776	<i>Ficus</i> sp.
762	<i>Podocarpus</i> sp.	777	<i>Ficus</i> sp.
763	<i>Podocarpus</i> sp.	778	<i>Ficus</i> sp.
764	<i>Podocarpus</i> sp.	779	<i>Ficus</i> sp.
765	<i>Podocarpus</i> sp.	780	<i>Ficus</i> sp.
766	<i>Podocarpus</i> sp.	781	<i>Ficus</i> sp.
767	<i>Podocarpus</i> sp.	782	<i>Ficus</i> sp.
768	<i>Podocarpus</i> sp.	783	<i>Ficus</i> sp.
769	<i>Podocarpus</i> sp.	784	<i>Ficus</i> sp.
770	<i>Podocarpus</i> sp.	785	<i>Ficus</i> sp.
771	<i>Podocarpus</i> sp.	786	<i>Ficus</i> sp.
772	<i>Podocarpus</i> sp.	787	<i>Ficus</i> sp.
773	<i>Podocarpus</i> sp.	788	<i>Ficus</i> sp.
774	<i>Podocarpus</i> sp.	789	<i>Ficus</i> sp.
775	<i>Podocarpus</i> sp.	790	<i>Ficus</i> sp.
776	<i>Podocarpus</i> sp.	791	<i>Ficus</i> sp.
777	<i>Podocarpus</i> sp.	792	<i>Ficus</i> sp.
778	<i>Podocarpus</i> sp.	793	<i>Ficus</i> sp.
779	<i>Podocarpus</i> sp.	794	<i>Ficus</i> sp.
780	<i>Podocarpus</i> sp.	795	<i>Ficus</i> sp.
781	<i>Podocarpus</i> sp.	796	<i>Ficus</i> sp.
782	<i>Podocarpus</i> sp.	797	<i>Ficus</i> sp.
783	<i>Podocarpus</i> sp.	798	<i>Ficus</i> sp.
784	<i>Podocarpus</i> sp.	799	<i>Ficus</i> sp.
785	<i>Podocarpus</i> sp.	800	<i>Ficus</i> sp.
786	<i>Podocarpus</i> sp.	801	<i>Ficus</i> sp.
787	<i>Podocarpus</i> sp.	802	<i>Ficus</i> sp.
788	<i>Podocarpus</i> sp.	803	<i>Ficus</i> sp.
789	<i>Podocarpus</i> sp.	804	<i>Ficus</i> sp.
790	<i>Podocarpus</i> sp.	805	<i>Ficus</i> sp.
791	<i>Podocarpus</i> sp.	806	<i>Ficus</i> sp.
792	<i>Podocarpus</i> sp.	807	<i>Ficus</i> sp.
793	<i>Podocarpus</i> sp.	808	<i>Ficus</i> sp.
794	<i>Podocarpus</i> sp.	809	<i>Ficus</i> sp.
795	<i>Podocarpus</i> sp.	810	<i>Ficus</i> sp.
796	<i>Podocarpus</i> sp.	811	<i>Ficus</i> sp.
797	<i>Podocarpus</i> sp.	812	<i>Ficus</i> sp.
798	<i>Podocarpus</i> sp.	813	<i>Ficus</i> sp.
799	<i>Podocarpus</i> sp.	814	<i>Ficus</i> sp.
800	<i>Podocarpus</i> sp.	815	<i>Ficus</i> sp.



MAP 15c SOILS

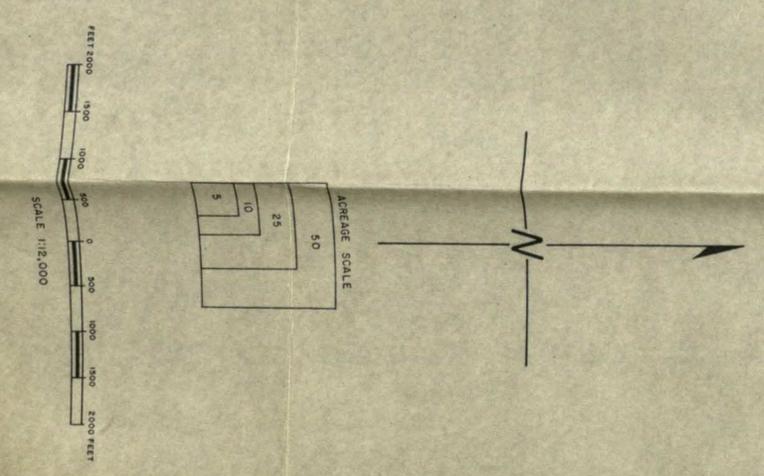


MAP 15d VEGETATION

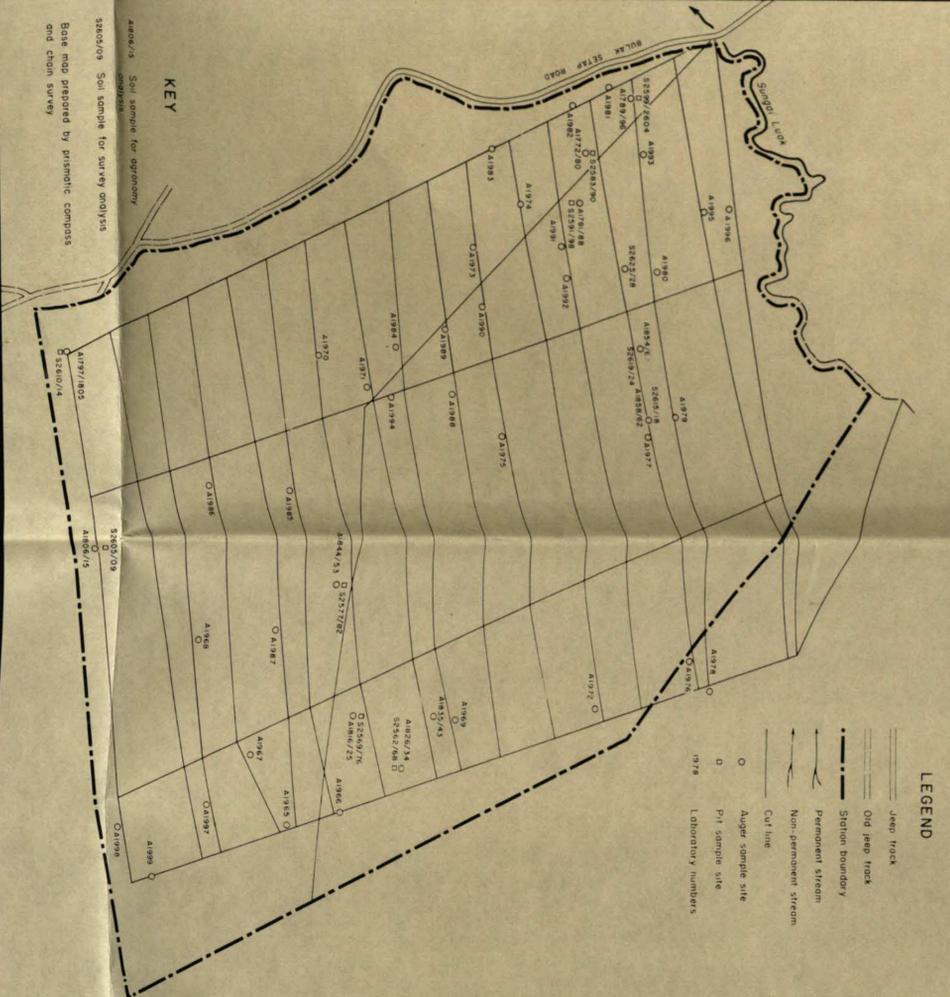


KEY TO SOILS

SOIL FAMILY	SOIL SERIES	MAIN CHARACTERISTICS	TOPOGRAPHY	PARENT MATERIAL	REMARKS
NYALAU	LIKAU	Thin to thick humic O horizon overlying dark yellowish brown sandy loam A1 horizon. Sporadic to moderately deep brownish yellow fine sandy loam A2 on timber colored fine sandy clay loam B2. Well to moderately well drained.	Low hills and ridges, less gentle to moderate slopes, 10°-30°	Shubli Fergonite fine sandstone and subglacial shale	Associated in places with former terraces subject to erosion. Minor reduction of existing Series.
BEKENU	LABANG	Sporadic thin O horizon, overlying thin dark yellowish brown loam A1 horizon. Thin yellowish brown fine sandy clay loam A2 horizon over yellowish brown clay loam to clay B2 horizon. Moderately well drained.	Flat to gently sloping	Shubli Fergonite fine sandstone and shale	Susceptible to topsoil erosion. Includes small areas of Lukau and Lukau Series.
MERIT	LUAK	Sporadic thin O horizon on thin dark yellowish brown A1 horizon. Moderately deep yellowish brown clay loam A2 horizon over yellowish brown clay B2 horizon. Moderately well drained.	Gently rolling land with slopes less than 15°	Shubli Fergonite fine sandstone and shale	Commonly stony, within 36 inches of surface. Includes many small areas of Lukau and Lukau Series.
	PINTASAH	As Lukau Series but with reddish yellow to yellowish red B2 horizon. Moderately well drained.	Flat topped terraces	Plasticine sand	Subject to erosion on terrace fronts. Merges with Kabulon Series.
KABULOH	KABULOH	Rare thin O horizon on the yellowish to dark yellowish brown clay loam A1 horizon. Moderately deep light yellowish brown clay B horizon mottled light grey in lower part and abruptly overlying C horizon. Moderately well drained.	Flat to gently sloping	Recent clay gullies	Merges with Abon and Malong Series. Very poorly drained patches in places. Merges with Samarahan Series. Deeper peaty material in small patches. Of minor importance.
MIRI	MIRI	Thick dark reddish brown O horizon on dark greyish brown loamy sand A1 horizon. Moderately deep to deep light grey sand A2 over dark brown loamy sand B2 horizon. Well drained.	Flat to gently sloping	Recent clay gullies	Includes small pockets of Samarahan and Lukau Series.
MALANG	MALANG	Moderately thick dark yellowish brown loam A1 horizon over deep yellowish brown clay loam to clay B horizon mottled light grey and reddish brown mottled C horizon. Moderately well drained.	Flat to gently sloping	Recent clay gullies	
BUAT	SAMARAHAN	Thin dark yellowish to dark greyish brown clay loam A1 horizon overlying light grey clay C1 horizon. Moderately well drained.	Flat to gently sloping	Recent clay gullies	
MUKAH	ABON	10-40 inches mucky peat overlying gleyed clay. Very poorly drained.	Flat to gently sloping	Recent clay gullies	
Undifferentiated	Aluvium/Celuvium	Pale colored silts and sandy clay loam. Poorly drained, to imperfectly drained.	Narrow valleys and floodplains close to intermittent streams.	Recent clay gullies	
	Organic Soil	Loose, whitish muck and peat deeper than 40 inches.	Flat, small swamps	Recent clay gullies	
Associations of Series	LABANG/LUAK	Refer to individual series	Low to moderately high hills, amplitude up to 80 feet; slopes 20°-35°	Recent clay gullies	
	KABULOH/MALANG		Low, gently rolling land	Recent clay gullies	
SEMI-LUAK	SEMI-LUAK	Sporadic O horizon and dark yellowish brown A1 horizon. Deep brownish yellow loamy sand A2 over sandy clay loam B horizon. Moderately well drained.	Flat to gently sloping	Recent clay gullies	
PLAN	SALTUT	Thin peaty loam, in places overlying thin yellowish brown to brown sandy loam, mottled pale yellow reddish brown and light grey. Poorly drained.	Low, gently rolling land	Recent clay gullies	



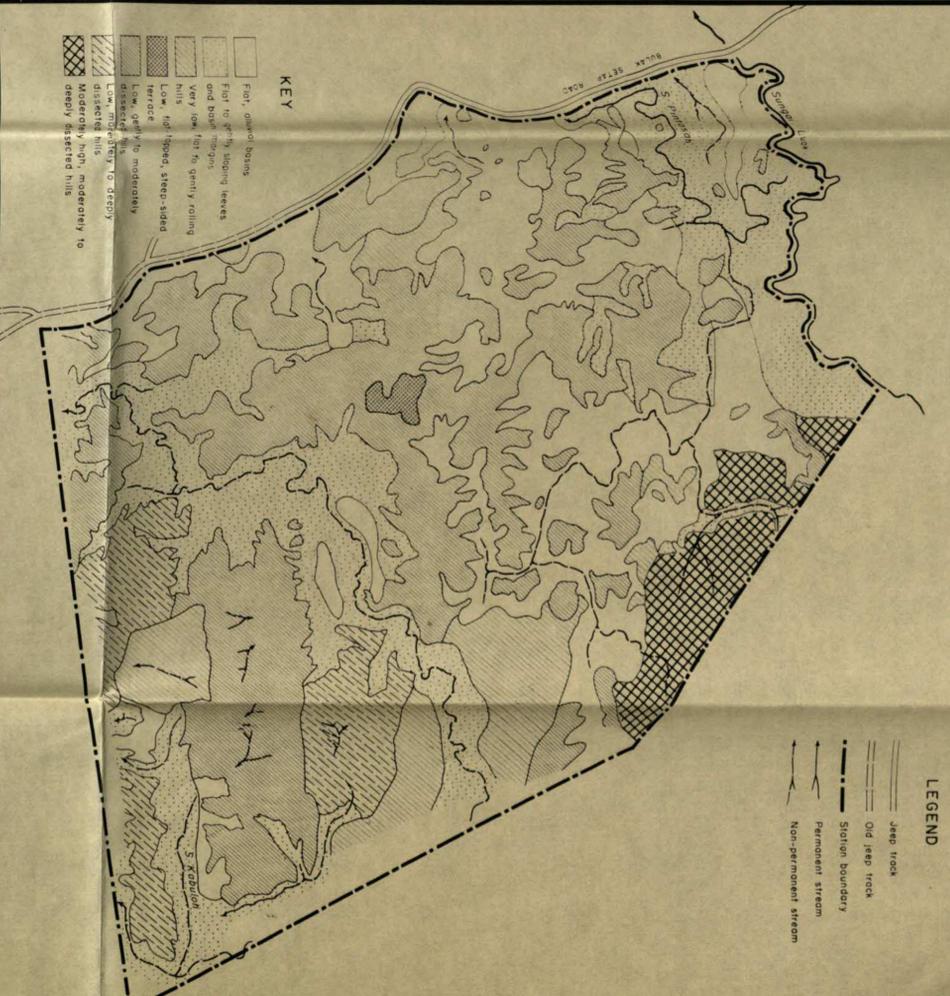
MAP 15c CUT LINES AND SAMPLE SITES



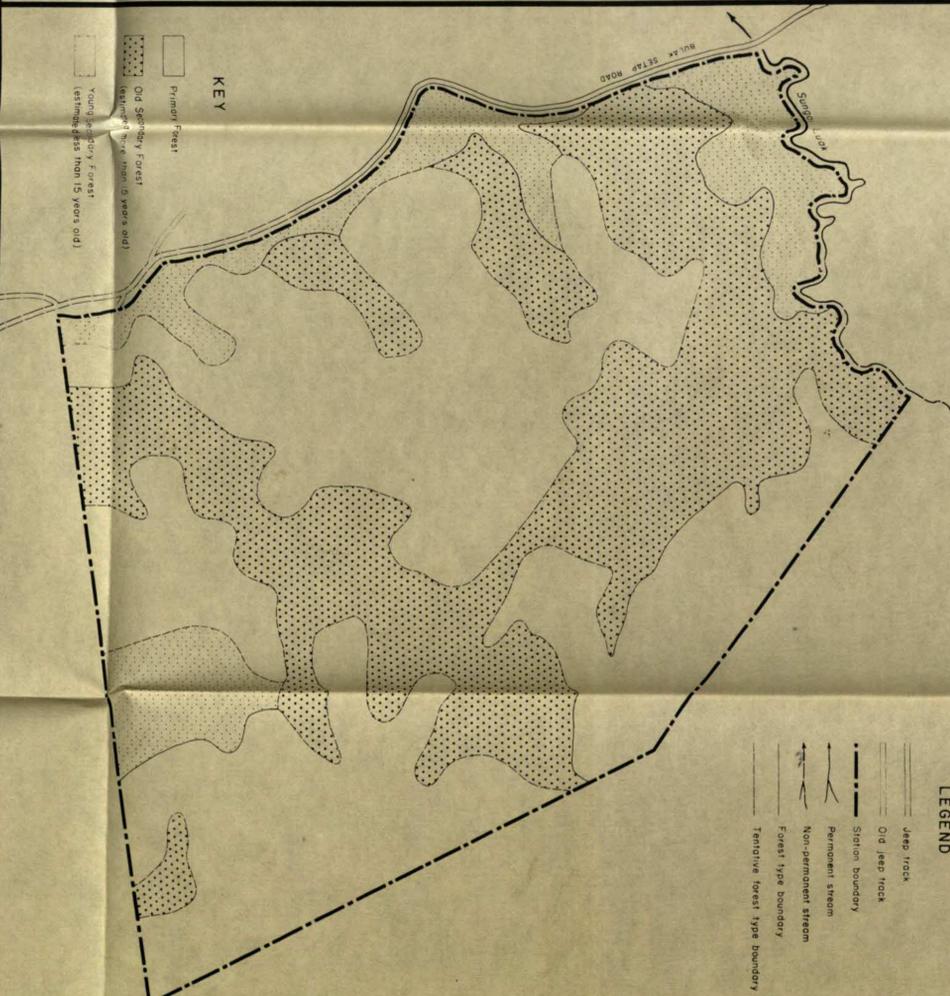
MAP 15c SOILS



MAP 15b LANDFORMS

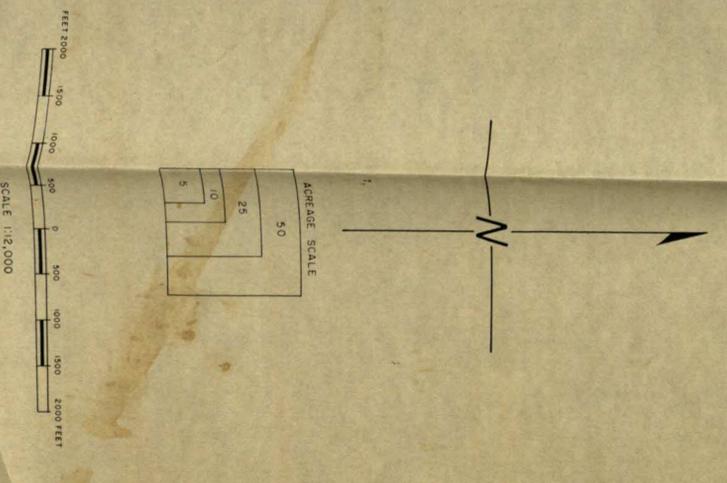


MAP 15d VEGETATION



KEY TO SOILS

SOIL FAMILY	SOIL SERIES	MAIN CHARACTERISTICS	TOPOGRAPHY	PARENT MATERIAL	REMARKS
NYALAU	LUKAU	Thin to thick, hard, B horizon overlying dark yellowish to jet grayish brown sandy loam A1 horizon. Moderately to moderately deep brownish light gray loam A2 on sandy siltstone fine sandy clay loam B2. Well to moderately well drained.	Low hills and ridges, less than 40 feet amplitude, slopes 10°-30°	Shale Formation, fine sandstone and siltstone	Associated in places with former terraces. Subject to erosion. Minor inclusion of Lalong Series.
BEKENU	LABANG	Sporadic thin O horizon overlying thin dark yellowish brown loam A1 horizon. Thin yellowish brown to sandy clay loam A2 horizon over yellowish brown clay loam to clay B2 horizon. Moderately well drained.	Gently rolling land with slopes less than 15°	Shale Formation, fine sandstone and shale	Susceptible to topsoil erosion. Includes small areas of Lukau and Lalong Series.
MERIT	LUAK	Sporadic thin O horizon on thin dark yellowish brown A1 horizon. Moderately deep yellowish brown clay loam A2 horizon over yellowish brown horizon. Moderately well drained.	Flat to gently sloping olive boscs	Shale Formation, fine sandstone and shale	Commonly stony with 36 inches of surface. Mapped areas schematic of Pantash Series.
KABULOH	KABULOH	As Lukau Series but with reddish yellow to yellowish red B2 horizon. Moderately well drained.	Flat rolling land with gentle slopes less than 15°	Shale Formation, fine sandstone and shale	Commonly stony with 36 inches of surface. Mapped areas schematic of Pantash Series.
MIRI	MIRI	Thick dark reddish brown O horizon on dark grayish brown loamy sand A1 horizon. Moderately well drained.	Flat topped terrace	Shale Formation, fine sandstone and shale	Subject to erosion on terrace flanks.
MALANG	MALANG	Moderately thick dark grayish brown loam A1 horizon over deep yellowish brown clay loam to clay B horizon merging to strongly light grey and reddish brown nodules C3 horizon. Moderately well drained.	Flat to gently sloping olive boscs	Recent clayey siltstone	Merges with Kabuluh Series.
BUJAT	SAMARAHAN	Thin dark yellowish to dark grayish brown clay loam A1 horizon overlying light grey clay C3 horizon. Lightly yellowish to reddish brown. Poorly drained.	Flat alluvial basins and small swamps	Recent clayey siltstone	Merges with Abon and Molong Series. Very poorly drained patches in places.
MUKAH	ABON	0-40 inches mucky clay overlying grayed clay. Very poorly drained.	Flat alluvial basins and small swamps	Shale Formation, sandstone and shale	Deeper clay material in small patches.
Undifferentiated	Alluvium/Colluvium	Red colored sands, fine sandy clay loam. Poorly drained, to imperfectly drained.	Narrow valleys and floodplain or small swamps	Recent alluvial deposits	Of minor importance.
Organic	Organic Soil	Loose, waterlogged top and peat deeper than 40 inches.	Low to moderately high hills, amplitude up to 80 feet, slopes 20°-35°	Organic decomposing and recent alluvium	Can probably be converted to Abon Series by drainage.
Associations of Series	KABULOH/MALANG	Refer to individual maps.	Low, gently rolling land	Shale Formation, sandstone and shale	Includes small pocket of Samarahan and Lukau Series.
SEMI-AU	SEMI-AU	Sporadic O horizon over yellowish brown A1 horizon. Deep brownish yellow loamy sand A2 over light gray to light brown B horizon. Moderately well drained.	Flat to gently sloping benches and margins of alluvial basins	Recent clayey siltstone and shale	About equal proportions of both units.
PLAN	SALTUT	Thin peaty topsoil in places overlying thin yellowish brown then light yellowish brown sandy loam. Mucky pale yellow reddish brown and light grey. Poorly drained.	Low, gently rolling land	Recent clayey siltstone and shale	Includes small pocket of Samarahan and Lukau Series.



POPULATION DISTRIBUTION BY RACES IN THE BEKENU-NIAH-SUAI AREA

Scale 1:250,000

Miles 10 5 0 10

Statute Miles

Generalized distribution from Lands and Survey Department Misc. Plan T4013, corrected to December 1963. • represents 50 persons approximately

SOURCES OF POPULATION DATA

1. Village and longhouse register by Medical Department, Sarawak.
2. 1960 Census of Population (Jones, 1960)
3. Sarawak population projection-1965.
4. 1:250,000 Map Series 14
5. 1:50,000 Map Series 7735

