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RESEARCH PROGRAMME NO. 24

MIGRATORY ANIMAL PATHOLOGICAL SURVEY

sponsored by

U.S. ARMY RESEARCH AND DEVELOPMENT GROUP ( FAR EAST )

UNDER GRANT NO. DA-CRD-AFE-592-514-67-G75

conducted by

APPLIED SCIENTIFIC RESEARCH CORPORATION OF THAILAND

in collaboration with

TUNGSHAI UNIVERSITY, REPUBLIC OF CHINA

BOMBAY NATURAL HISTORY SOCIETY, INDIA

LEMBAGA BIOLOGI NASIONAL ( NATIONAL BIOLOGICAL INSTITUTE, INDONESIA )

YAMASHINA INSTITUTE FOR ORNITHOLOGY, JAPAN

KYUNG HEE UNIVERSITY, REPUBLIC OF KOREA

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UNIVERSITY RESEARCH CENTER, MINDANAO STATE UNIVERSITY, PHILIPPINES

PHILIPPINES NATIONAL MUSEUM, PHILIPPINES

## ANNUAL PROGRESS REPORT 1968

by

H. ELLIOTT McCLURE

MAPS GROUP

ENVIRONMENTAL AND ECOLOGICAL RESEARCH INSTITUTE

ASRCT, BANGKOK 1969

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by

H. ELLIOTT McCLURE, Ph. D.

APPLIED SCIENTIFIC RESEARCH CORPORATION

OF THAILAND

BANG KHEN, BANGKOK, THAILAND

1969

U. S. ARMY RESEARCH AND DEVELOPMENT GROUP

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## PARTICIPATING INSTITUTIONS

1. Kyung Hee University  
Seoul, Korea

Responsible Investigator: Dr. Won Pyong-Oh  
Grant No. DA-CRD-AFE-592-544-68-G131  
DA Project No. 3A061101A91C 00 080 FE

2. Yamashina Institute for Ornithology  
49 Nampeidai-machi, Shibuya-ku, Tokyo, Japan

Responsible Investigator: Dr. Yoshimaro Yamashina  
Grant No. DA-CRD-AFE-592-544-68-G133  
DA Project No. 3A061101A91C 00 083 FE

3. Tunghai University  
Taichung, Taiwan, Republic of China

Responsible Investigator: Prof. Johnson T. F. Chen  
Grant No. DA-CRD-AFE-592-544-68-G130  
DA Project No. 3A061101A91C 00 089 FE

4. National Museum  
Manila, Republic of the Philippines

Responsible Investigator: Mr. Godo Fredo L. Alcasid  
Grant No. DA-CRD-AFE-592-544-68-G134  
DA Project No. 3A061101A91C 00 084 FE

5. University Research Center, Mindanao State University  
Marawi City, Mindanao, Republic of the Philippines

Responsible Investigator: Dr. Dioscoro S. Rabor  
Grant No. DA-CRD-AFE-592-544-68-G132  
DA Project No. 3A061101A91C 00 081 FE

6. The Applied Scientific Research Corporation of Thailand (ASRCT)  
196 Phahonyothin Road, Bangkok, Thailand

Responsible Investigator: Dr. Prasert Lohavanijaya  
Grant No. DA-CRD-AFE-592-544-68-G135  
DA Project No. 3A061101A91C 00 086 FE



7. Bombay Natural History Society  
Bombay 1, B. R. India

Responsible Investigator: Dr. Salim Ali  
Grant No. DA-CRD-AFE-592-544-68-G137  
DA Project No. 3AO61101A91C 00 105 FE

8. Lembaga Biologi Nasional (National Biological Institute)  
Kebun Raya, Bogor, Indonesia

Responsible Investigator: Dr. Soekarja Somadikarta  
Grant No. DA-CRD-AFE-592-544-68-G136  
DA Project No. 3AO61101A91C 00 095 FE

9. University of Malaya  
Kuala Lumpur, Malaysia

Responsible Investigator: Lord Medway  
Grant No. DA-CRD-AFE-592-544-67-G80  
DA Project No. 3AO61101A91C 00 082 FE

10. Sabah Museum  
Jesselton, Sabah

Responsible Investigator: Mr. Henry Tsen  
Grant No. DA-CRD-AFE-592-544-68-G92  
DA Project No. 3AO61101A91C 00 089 FE

11. Sarawak Museum  
Kuching, Sarawak

Responsible Investigator: Mr. Tom Harrison  
Grant No. DA-CRD-AFE-592-544-68-G88  
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## ABSTRACT

Part I: Summarizes or gives excerpts from the reports submitted by the responsible investigators of thirteen research teams in Eastern and South-eastern Asia. These involve discussions of bird migration and distribution in each area with special reference to House Swallows, Brown Shrikes and Ardeids and to migration across mountain ranges.

Part II: Lists the numbers of birds banded in 1968. This was 150,000 birds of 798 species bringing the total for the five years of this work to 820,000 birds of 1,060 species.

Part III: Summarizes the recovery information for 180 species based upon 1,762 recovery records.

Part IV: Discusses the ectoparasites identified to date from 739 species of birds listing 259 species.

Part V: Discusses blood parasitism by Haematozoa, Microfilaria, and Trypanosoma among more than 700 species of birds which have been examined.

# MIGRATORY ANIMAL PATHOLOGICAL SURVEY

## ANNUAL PROGRESS REPORT

1968

### TABLE OF CONTENTS

#### PART I

SUMMARY OF ACTIVITIES OF COOPERATING GROUPS	Page
Introduction	1
Headquarters Report	1
Korea	7
Ardeid Study	7
House Swallow Investigation	10
Weights of House Swallows and Chestnut Buntings	12
Chick food analysis	13
Threatened and vanishing bird survey in Korea	16
Publications and publicity	16
Japan	18
Taiwan	21
Summary of cooperative encephalitis studies	23
Review of the recovery of Taiwan banded birds	24
Summary	37
Hong Kong	38
Northern Philippines	39
Southern Philippines	52
Thailand	53
Survey of the bird sales at Bangkok "Sunday Market"	57
Recommendations for the management of this resource	64
Observations of birds purchased at the market, ringed and released	65
Homing among the purchased birds	66
Effect of releases on the bird population at ASRCT	66
House Swallow banding	69
Open-billed Storks	73
Studies in Northern Thailand	73
Studies at Bang Phra	73
Malaya	78
General	79
Intensive studies of selected species	81
Area studies	81
Fraser's Hill, Pahang	82
Brown Shrike studies	88

	Page
Sabah	92
Sarawak	93
Singapore	94
Indonesia	96
India	99
Areas under study	100
Methods used	104
Sex ratio of some species	105
Arrival and departure of some migrants at Bharatpur	105
Recoveries	106
Other groups: Okinawa, Vietnam, Nepal, Guam	109

## PART II

### LIST OF SPECIES BANDED IN 1968

Discussion	110
List of banded species	117

## PART III

### RECOVERIES OF BANDED BIRDS

Introduction	167
Philippine banding	168
Distribution of recoveries	168
Annotated list of recoveries	168

## PART IV

### ECTOPARASITE SURVEY

Ectoparasite survey	275
Hippoboscidae	289
A summary of Hemiptera and Diptera (Pupipara) collected by the MAPS in 1963-68, by Dr. T. C. Maa	289
Mallophaga	299
Ticks	299
Chiggers	300
Chiggers on birds at Fraser's Hill	302
Other Acarina	302
Bat ectoparasites	304

PART V

BLOOD INFECTIONS AMONG EAST ASIAN BIRDS	Page
Blood infections among East Asian birds	305
Infection rate among owls	309
Infection rates among the thrushes	311
PUBLICATIONS	338

## LIST OF TABLES

	Page
1. Estimates of number of Ardeidae in known breeding colonies in Korea in 1968	9
2. Returns of House Swallows banded at nesting sites 1967 and their return to same sites in 1968, Kyongiido, Korea.	10
3. Returns of the House Swallows to nesting and roosting sites in Kyongiido, Korea.	10
4. Weights of House Swallow and Chestnut Bunting netted in Korea.	12
5. Age and movements of House Swallows banded in Kyongiido, Korea.	13
6. Birds banded and recovered in Korea.	14
7. Summary of the collar method examinations of nestlings in Korea.	15
8. Foreign recoveries of Ardeids banded in Taiwan.	26
9. Distribution of recoveries of Cattle Egrets banded in Taiwan.	26
10. Distribution of recoveries of House Swallows banded in Taiwan.	28
11. House Swallow local recoveries the winter seasons following banding from birds banded in Southern Taiwan at Liuying.	31
12. House Swallow local recoveries the winter seasons following banding in Central Taiwan at Taiping.	31
13. House Swallow, distribution of 77 recoveries with respect to region banded, recovered and span of time and distance.	33
14. House Swallow, five inter-regional recoveries (out of 77.6%) within the same over-wintering period.	33
15. House Swallow, 59 recoveries (out 77.6%) indicating the tendency of the same individuals to remain together throughout the winter season.	33
16. The sale of birds at the Bangkok, "Sunday Market", listed by families.	58
17. Species making up more than 1% of sales at Bangkok Market.	63
18. The average number of species recorded and the average number of birds tallied each week at the Bangkok, "Sunday Market".	63

	Page
19. Records of birds bought at Sunday Market, Bangkok, and released at Bangkhen in the outskirts north of Bangkok.	67
20. The status of the birds in the vicinity of the ASRCT and the species that were released there.	70
21. The distribution of "Returns" among House Swallows captured at Bangkok.	72
22. The number of birds banded in Northern Thailand at (M) Doi Pui, 1, 300 to 1, 500 meters and at (V) Ban Khi Lek, 350 meters.	74
23. Species netted in both highlands and lowlands of Northern Thailand, arranged to indicate those species caught more often in the valleys (first 11 species) or in the hills (last 4 species).	75
24. Changes in weights of Great Reed Warblers recaptured within seven days of first capture.	81
25. Birds attracted to lights at night on the top of Fraser's Hill 4, 700 ft., Pahang, and those collected at lighthouses.	84
26. Weights of birds caught at a radio tower in Central Malaya.	89
27. Sex ratios of some of the species captured at Ghana Bird Sanctuary, Bharatpur.	106
28. Period of stay of some migrants at Ghana Bird Sanctuary.	107
29. Species banded in greatest numbers.	112
30. The numerical relationships of the number of banded birds, indicating the relative abundance and ease of capture in the habitats of Eastern Asia.	112
31. Summary by families of the number of birds banded in 1968.	113
32. Birds banded in 1968. Listed by country and compared with the total for five years.	117
33. The distribution of recoveries of banded birds in Asia.	192
34. The distribution of recoveries of banded House Swallows in Eastern Asia.	193
35. Geographical distribution of avian ectoparasites.	276

	Page
36. Trombiculid mites collected from birds migrating at night over the 4,700 ft. peak of Fraser's Hill, Pahang, Malaya in the fall of 1968.	303
37. Infection rates of Haematozoa among owls of Eastern Asia.	312
38. Infection rates of Haematozoa among the thrushes of Southern Asia.	314
39. Infection rates of Haematozoa among the thrushes of Northern Asia.	315
40. Summary of infection rates by genera.	313
41. List of positive blood films from birds of Eastern Asia.	316



## LIST OF FIGURES

	Page
1. General Phya Salwidhannidhes (seated), chairman of the Board Applied Scientific Corporation of Thailand and Mr. Dusit Panitphat, Director of Royal Forestry Department welcome the delegates at the opening ceremony of the 1968 MAPS Conference in Bangkok	3
2. MAPS team leaders and delegates at opening ceremony of 1968 conference in the library of the ASRCT.	3
3. Fred Hechtel and David Wells at the discussions in Khao Yai National Park.	4
4. Team leaders listening to a report from Taiwan by Miss Huang Wan-tsih.	4
5. Distributing Dr. Boonsong Lekakul's "Bird Guide" to conferees.	5
6. Lunch at Khao Yai National Park.	5
7. Delegates trekking in Khao Yai National Park.	6
8. The conference group gathered at Khao Yai National Park.	6
9. Breeding colonies of Ardeidae in Korea 1968.	8
10. Band returns of the House Swallows indicating distances between nesting site and roosting site.	11
11. Locations where threatened or vanishing birds in Korea still occur.	17
12a. Map of Taiwan indicating the central and southern regions where banding/recovering studies of House Swallows were made.	29
12. <u>Charadrius mongolus</u> in Calatagan and Camarines	44
13. <u>Charadrius mongolus</u> in Palawan.	44
14. <u>Charadrius leschenaulti</u> in Calatagan and Camarines.	44
15. <u>Charadrius leschenaulti</u> in Palawan.	44
16. <u>Calidris ruficollis</u> in Calatagan and Camarines.	44
17. <u>Calidris ruficollis</u> in Palawan.	44
18. <u>Capella megala</u> in Calatagan and Camarines	45

	Page
19. <u>Capella megala</u> in Palawan.	45
20. <u>Tringa glareola</u> in Calatagan and Camarines.	45
21. <u>Tringa glareola</u> in Palawan.	45
22. <u>Actitis hypoleucos</u> in Calatagan and Camarines.	45
23. <u>Actitis hypoleucos</u> in Palawan.	45.
24. <u>Calidris subminuta</u> in Calatagan and Camarines.	46
25. <u>Calidris subminuta</u> in Palawan.	46
26. <u>Charadrius dubius</u> in Calatagan and Camarines.	46
27. <u>Charadrius dubius</u> in Palawan.	46
28. <u>Lanius cristatus</u> in Dalton and Sinipsips.	46
29. <u>Lanius cristatus</u> in Palawan.	46
30. <u>Coturnix chinensis</u> at Dalton Pass.	47
31. <u>Rallina eurizonoides</u> at Dalton and Sinipsips.	47
32. <u>Porzana fusca</u> at Dalton and Sinipsips.	47
33. <u>Porzana tabuensis</u> at Dalton and Sinipsips.	47
34. <u>Ixobrychus cinnamomeus</u> at Dalton and Sinipsips.	48
35. <u>Rostratula benghalensis</u> in Palawan.	48
36. <u>Charadrius alexandrinus</u> in Palawan.	48
37. <u>Charadrius peroni</u> in Calatagan and Camarines.	48
38. <u>Charadrius dominicus</u> in Palawan.	48
39. <u>Numenius phaeopus</u> in Palawan.	48
40. <u>Capella stenura</u> in Palawan.	49
41. <u>Capella gallinago</u> in Palawan.	49
42. <u>Gallinula chloropus</u> at Dalton Pass.	49

	Page
43. <u>Rallus striatus</u> at Dalton and Sinipsips.	49
44. <u>Porzana cinerea</u> at Dalton Pass.	49
45. <u>Porzana pusilla</u> at Dalton and Sinipsips.	49
46. <u>Alcedo atthis</u> in Palawan.	50
47. <u>Pitta erythrogaster</u> at Dalton Pass.	50
48. <u>Hirundo rustica</u> in Palawan.	50
49. <u>Erithacus calliope</u> at Dalton and Sinipsips.	50
50. <u>Mirafra javanica</u> at Dalton and Sinipsips.	50
51. <u>Anthus novaeseelandiae</u> in Palawan.	50
52. <u>Motacilla flava</u> in Palawan.	51
53. <u>Motacilla cinerea</u> at Dalton and Sinipsips.	51
54. <u>Acrocephalus arundinaceus</u> at Dalton and sinipsips.	51
55. <u>Acrocephalus sorgophilus</u> at Dalton and Sinipsips.	51
56. <u>Locustella certhiola</u> at Dalton and Sinipsips.	51
57. <u>Locustella lanceolata</u> at Dalton and Sinipsips.	51
58. <u>Pseudochelidon sirintarae</u> Kitti, photos of the first living bird seen at the MAPS headquarters. Note the size of the bird related to the the hand, and also its large red feet.	55
59. Princesses Sirindhorn and Chulaporn watching Mr. Kitti removing a bird from a mist net.	56
60. Cages of <u>Emberiza aureola</u> at the Sunday Market.	61
61. Birds for sale at Sunday Market; starlings, parakeets, Garganey teal, Night-herons, Purple gallinula, Bulbul, Munia, etc.	62
62. The Tientsin band, found on a House Swallow already bearing our band No. 013-22977.	77
63. Numbers of dead birds picked up each day at west coast lighthouses during the migration seasons of 1966 and 1967.	86

	Page
64. Numbers of migrant birds taken by night at the Telecoms Tower Fraser's Hill, at six different trapping periods in 1967.	87
65. Black-winged Kite, <u>Elanus caeruleus</u> , trapped in the Bal-chatri trap at Batu Berendam, Malacca, Malaya.	91
66. Singapore banders at one of the net lines on Singapore Island.	95
67. Egrets, herons and cormorants returning to Pulau Dua, West Java, to roost.	98
68. Mirshikar tribesmen with their bird netting equipment used at Bharatpur.	102
69. Painted Stork, Intermediate Egret, White Ibis, and cormorants nesting together at Ghana Sanctuary Bharatpur.	102
70. Spanish Sparrows, <u>Passer hispaniolensis</u> , roosting in deciduous shrubs near Bharatpur, India.	95
71. Mountains and road on way to Thimpu, Bhutan.	108
72. Physiography of the central plain of Luzon.	169
73. Physiography of the Cagayan Valley region of Luzon.	170
74. A. <u>Dicrurus paradiseus</u> , B. <u>Dicrurus baliassius</u> , C. <u>Oriolus chinensis</u> , D. <u>Sarcops calvus</u> .	194
75. Recovery of Layson Albatross, <u>Diomedea immutabilis</u> , banded at Sand Island, Midway.	206
76. Recovery of Black-footed Albatross, <u>Diomedea nigripes</u> , from Sand Island, Midway.	207
77. Recoveries of <u>Puffinus carneipes</u> , Pale-footed Shearwater, banded at Lord Howe Island or Victoria, Australia.	208
78. Recoveries of <u>Puffinus leucomelas</u> , Streaked Shearwater from Japan.	209
79. Recovery of <u>Phalacrocorax niger</u> (1), Pygmy Cormorant and <u>P. sulcirostris</u> (2) Little Black Cormorant, banded at Pulau Dua, Java.	210
80. Four recoveries of <u>Fregata ariel</u> , Lesser Frigate Bird and 1 <u>Sula dactylatra</u> , Blue-faced Booby from Howland Island.	211
81. <u>Ardea cinerea</u> , Grey Heron, recovery of Russian and Korean banded birds.	212

	Page
82. <u>Ardea purpurea</u> , Purple Heron, recoveries of birds banded at Lake Khanka, USSR.	213
83. The distribution of Ardeids banded in Korea, Japan and Taiwan and recovered in Luzon.	214
84. The distribution of Ardeids banded in Korea, Japan and Taiwan and recovered in the Philippine Islands.	215
85. The distribution of Cinnamon Bitterns, <u>Ixobrychus cinnamomeus</u> , from Dalton Pass.	216
86. The distribution of Chinese Little Bittern, <u>Ixobrychus sinensis</u> from Dalton Pass.	217
87. Open-billed Stork, <u>Anastomus oscitans</u> , banded at Wat Phai Lom, Phatumthani, Thailand.	218
88. Pintail, <u>Anas acuta</u> , banded at Bharatpur, India, and Saitama, Japan.	219
89. Shoveler, <u>Anas clypeata</u> , banded at Bharatpur, India, and Saitama, Japan.	220
90. Common Teal, <u>Anas crecca</u> , banded at Bharatpur, India, and Saitama, Japan.	221
91. European Widgeon, <u>Anas penelope</u> , banded at Bharatpur, India, and Saitama, Japan.	222
92. Mallard, <u>Anas platyrhynchos</u> , recoveries of Japanese birds compared with earlier records from the Bombay Natural History Society.	223
93. Garganey Teal, <u>Anas querquedula</u> , comparing the recent recoveries of Bharatpur banded birds with earlier records of the Bombay Natural History Society.	224
94. <u>Aythya ferina</u> , European Pochard, banded at Bharatpur, India, and Khadyn Lake, USSR.	225
95. Tufted Duck, <u>Aythya fuligula</u> , birds banded at Bharatpur, India, and Saitama, Japan.	226
96. Recoveries of, <u>Aythya nyroca</u> , White-eyed Pochard banded at Bharatpur, India.	227
97. Recoveries of <u>Netta rufina</u> , Red-crested Pochard (1 and 2) and <u>Nettapus coromandelianus</u> , Cotton Teal, (unnumbered).	228
98. Recoveries of <u>Sarkidiornis melanotus</u> , Comb Duck, banded at Bharatpur, India.	229

	Page
99. Recovery of <u>Coturnix chinensis</u> , Blue-breasted Quail, banded at Dalton Pass.	230
100. Recovery of <u>Amaurornis olivaceus</u> , Bushhen, banded at Dalton Pass.	231
101. Recovery of <u>Gallicrex cinerea</u> , Water Cock, banded at Dalton Pass.	232
102. Recoveries of <u>Gallinula chloropus</u> , Moorhen, in the Philippines.	233
103. Recovery of <u>Porzana cinerea</u> , White-browed Rail, banded at Dalton Pass.	234
104. Recovery of <u>Porzana fusca</u> , Ruddy Crake, banded at Dalton Pass.	235
105. Recovery of <u>Rallina eurizonoides</u> , Philippine Banded Crake, banded at Dalton Pass.	236
106. Recovery of <u>Rallus striatus</u> , Slaty-breasted Rail, banded at Dalton Pass.	237
107. Recoveries of <u>Fulica atra</u> , Coot, banded at Bharatpur, India and Lake Khanka, East Siberia.	238
108. Recovery of a <u>Charadrius dominicus</u> , Golden Plover, in Hokkaido apparently flying the wrong way from the Pribilof Islands.	239
109. Recoveries of <u>Arenaria interpres</u> , Ruddy Turnstone, banded in Japan and Alaska.	240
110. Recoveries of <u>Capella megala</u> , Swinhoes Snipe, from Philippine banded birds.	241
111. Recovery of <u>Numenius phaeopus</u> , Whimbrel, banded at Calatagan, Batangas, Philippines.	242
112. Recovery of <u>Philomachus pugnax</u> , Ruff and Reeve, banded at Bharatpur, India.	243
113. Recovery of <u>Tringa glareola</u> , Wood Sandpiper from the Philippines and from Bharatpur.	244
114. Recoveries of <u>Larus crassirostris</u> , Black-tailed Gull, within eight months after leaving nest.	245
115. Recovery of <u>Sterna fuscata</u> , Sooty Tern, banded on Pacific Islands.	246
116. Horn-billed Puffin, <u>Cerorhinca monocerata</u> , banded at Teuri Island, Hokkaido.	247

	Page
117. Recoveries of Emerald Doves, <u>Chalcophaps indica</u> , banded in the Philippines.	248
118. Recovery of Zebra Doves, <u>Geopelia striata</u> , banded at Siaton, Negros Oriental, Philippines.	249
119. Recovery of Black-chinned Fruit Dove, <u>Ptilinopus leclancheri</u> , banded at Dalton Pass.	250
120. Recovery of Spotted-necked Dove, <u>Streptopelia chinensis</u> , banded at Siaton, Negros Oriental, Philippines.	251
121. Recovery of Red-turtle Dove, <u>Streptopelia tranquebarica</u> , banded at Dalton Pass.	252
122. Recovery of Lesser Thick-billed Green Pigeon, <u>Treron curvirostris</u> in Mindoro.	253
123. Recovery of a Pompador Green Pigeon, <u>Treron pompadora</u> , banded at Dalton Pass.	254
124. Recovery of a Pink-necked Green Pigeon, <u>Treron vernans</u> , banded at Siaton.	255
125. Recovery of Plaintive Cuckoo, <u>Cacomantis merulinus</u> , (1) and Fantailed Cuckoo. <u>C. variolosus</u> , (2) banded at Dalton Pass.	256
126. Recoveries of <u>Ninox scutulata</u> , Brown Hawk-owl.	257
127. Ruddy Kingfisher, <u>Halcyon coromanda</u> , banded at Dalton Pass.	258
128. Recovery of a Broad-billed Roller, <u>Eurystomus orientalis</u> , banded at Dalton Pass.	259
129. Recovery of <u>Hirundo daurica</u> , Red-rumped Swallow.	260
130. Recovery of <u>Criniger pallidus</u> , Swinhoe's White-throated Bulbul in Thailand.	261
131. Recovery of <u>Hypisipetes amaurotis</u> , Brown-eared Bulbul, in Southern Japan.	262
132. Recovery of <u>Turdus chrysolus</u> , Brown Thrush banded in Taiwan.	263
133. Recovery of <u>Dendronanthus indicus</u> , Forest Wagtail, banded in Southern India.	264

	Page
134. Recoveries of <u>Motacilla alba</u> , Pied Wagtail, comparing those from Japan, Korea and India marked birds.	265
135. Recoveries of <u>Motacilla flava</u> , Yellow Wagtail, banded in Taiwan, Thailand and India.	266
136. Movements of <u>Lanius bucephalus</u> , Bull-headed Shrike in Japan.	267
137. Recoveries of <u>Lanius cristatus</u> , Brown Shrike, in the Philippines from Korea and Taiwan.	268
138. Recovery of <u>Aplonis panayensis</u> , Philippine Glossy Starling, banded at Calatagan, Batangas.	269
139. Recoveries of <u>Emberiza rutila</u> , Chestnut Bunting, banded in Thailand and Korea.	270
140. Recovery of a Common Reed Bunting, <u>Emberiza schoeniclus</u> , in Western Japan.	271
141. Recoveries of <u>Emberiza spodocephala</u> , Black-faced Bunting from Korea.	272
142. Recovery of <u>Lonchura leucogastra</u> , White-bellied Munia, banded at Dalton Pass.	273
143. Recoveries of <u>Passer hispaniolensis</u> , Spanish Sparrow, banded at Bharatpur, India.	274
144. Examples of haematozoa found in avian blood; Lankasterella, Leucocytozoon, Haemoproteus, Haemogregarine.	310



## FOREWORD

This is the fourth annual report related to the work of the Migratory Animal Pathological Survey. It is designed to summarize some of the work of the cooperating scientists and to show the diversity of their interests. From the length of the reports and the number of topics it is obvious that comprehensive summaries of all of the work could not be given in one volume even if we had a staff large enough to do so. It is hoped that the responsible investigators and team leaders will publish their own findings. The total files at MAPS headquarters in Bangkok are open to review by any visiting scientists and copies of original field data are available to anyone requesting them for use in their specific projects.

# MIGRATORY ANIMAL PATHOLOGICAL SURVEY

## ANNUAL PROGRESS REPORT

1968

### PART I

#### SUMMARY OF ACTIVITIES OF COOPERATING GROUPS

##### INTRODUCTION

The Migratory Animals Pathology Survey experienced another very successful year in 1968. Through continued accumulated experience field teams improved the quality of their studies, their techniques, and their results.

A thirty-five percent reduction in financial support of the survey resulted in equal reductions in support of field activities. Every responsible investigator had to reevaluate his work and alter his efforts in order to remain within the boundaries of his budget. This curtailment resulted in some loss of field effort, but many leaders through judicious reallocation of funds managed to keep field teams as active as before.

Ringling in Hong Kong was practically discontinued because of disturbances there, but a hawk rehabilitation center was set up for the purchase and release of hawks brought to market. Continued pressure of antagonistic local people required the relocation of field stations in Mindanao. The Singapore Royal Air Force Ornithological Society mounted a two week banding expedition into eastern Malaya. The Bombay Natural History Museum placed a banding and collecting team in Bhutan for two months. Ringing activities were discontinued in Sarawak and Sabah, but the Bogor Museum began studies in Kalimantan (Borneo) and a volunteer did some ringling in Northern Sumatra at Medan.

All of the cooperating taxonomists and specialists interested in the ectoparasites that have been collected continued to give the project assistance. Additional assistance in the identification of chiggers was provided by Miss Panita Lakshana of the SEATO Medical Research Laboratory, Bangkok.

##### HEADQUARTERS REPORT

There were several changes at the headquarters in Bangkok. The opening of a new laboratory building permitted an expansion of the MAPS

office to occupy four rooms, greatly reducing over-crowding and increasing the office efficiency. Miss Puntipa Puangpong, the entomologist, received a UNESCO grant for study of museum techniques at Edinburgh, Scotland and worked there from March into August. The work load of blood films increased and Miss Pranee Heng, a student of Chulalongkorn University, was employed part time to assist Miss Pilai Poonswat and Miss Somtrakul Paurkpun. In order to improve the quality of the identifications of avian haematozoa and to speed up the screening of slides Miss Somtrakul, the microscopist, was sent to The Memorial University of Newfoundland, St. John's, Newfoundland, to receive additional training from Dr. Marshall Laird. She continued these studies from September 1968 to March 1969.

An accumulation of records on nearly a million birds required that Miss Somchit (Mrs. Pon) Niyomthai, biologist, receive assistance and Miss Porntip Leclavit, graduate in biology of Chalalongkorn University, was employed as her understudy and assistant. Mr. Yongyot Chunyarux continued to sort and ship ectoparasites and to run the entomology section in the absence of Miss Puntipa. Miss Chalernporn Cheosakul and Miss Wasana Kaosrikaserm were added to the clerical staff.

The Annual MAPS Conference was held in Thailand during the week of August 18-24. It was sponsored by the ASRCT and the Royal Forestry Department. The conference was opened by a one day study at the ASRCT and headquarters. Then the team leaders and delegates, (all of the investigating groups except Sarawak, and Sabah was represented) went to Khao Yai National Park (140 miles NE of Bangkok) where they participated in field observations and discussions for three days. The delegates were guests of the Forestry Department and had an opportunity to see much of the wildlife of this excellent park. Figs. 1 through 8

Dr. Boonsong Lekakul's handbook "Bird Guide of Thailand" came off press during the conference and autographed copies of this useful guide were given to all delegates.



**Fig. 1. General Phya Salwidhannidhes, (seated) Chairman of the Board ASRCT and Mr. Dusit Panitphat, Director of Royal Forestry Department, welcome the delegates at the opening ceremony of the 1968 MAPS Conference at Bangkok.**



**Fig. 2. MAPS team leaders and delegates at opening ceremony of 1968 Conference, in the library of the ASRCT.**

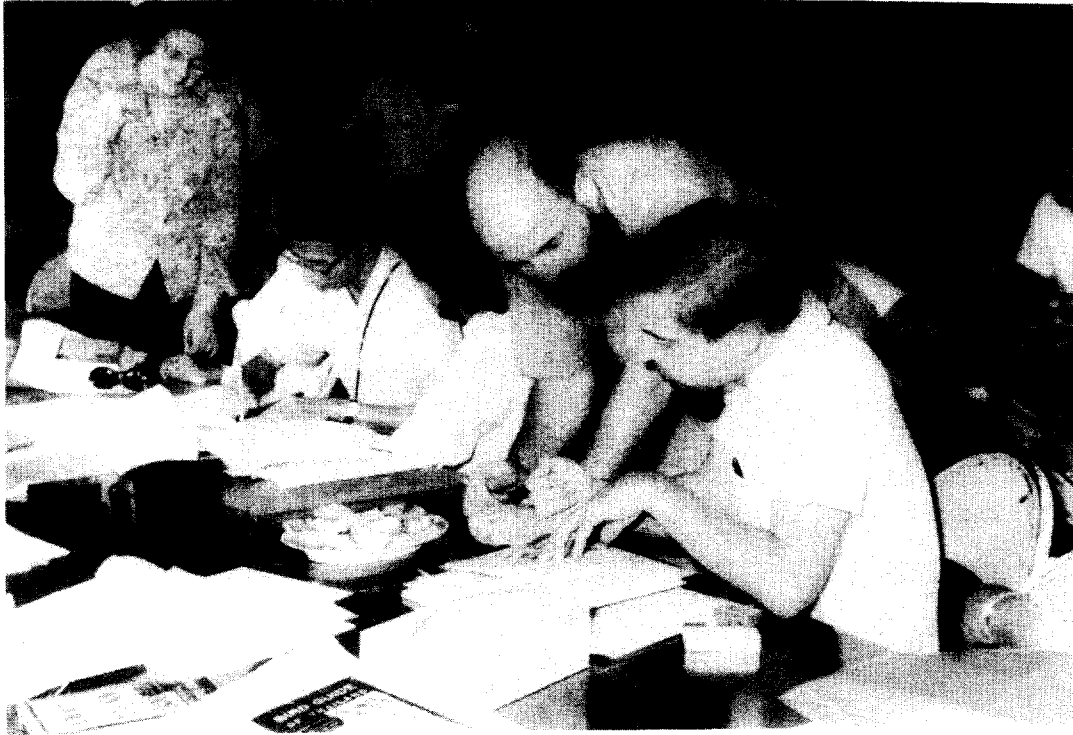


Fig. 3. Fred Hechtel and David Wells confer at the discussions in Khao Yai National Park.

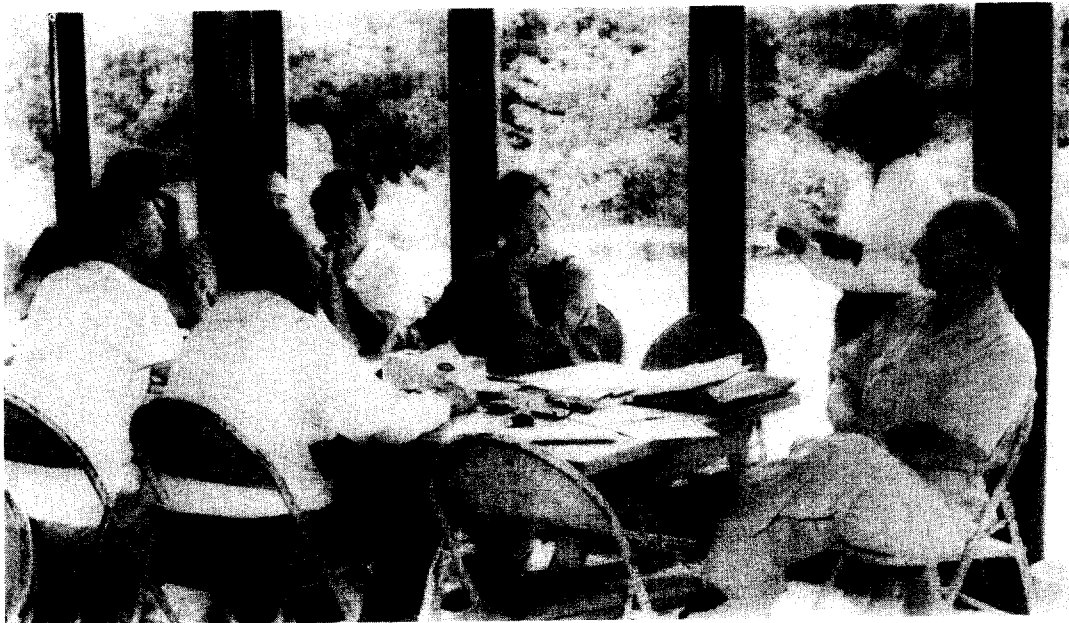


Fig. 4. Team leaders listening to a report from Taiwan by Miss Huang Wan-tsih.



Fig. 5. Distributing Dr. Boonsong Lekakul's "Bird Guide" to conferees.



Fig. 6. Lunch at Khao Yai National Park.



Fig. 7. Delegates trekking in Khao Yai National Park.



Fig. 8. The Conference Group gathered at Khao Yai National Park.

## KOREA

**Institution:** Kyung Hee University, Seoul.

**Responsible Investigator:** Won, Pyong-Oh, D. Ag.

**Team Members:** Woo Han-chung, Chun Mi-Za, Lee Hi-Chung, Kang Duk-Su.

**Volunteer Workers:** Koo Tae-Hae, Lee Chung-Jae, Ham Kyu-Whang, Kim Chung-Woo, Shin Yoon-Jin and many students.

**Location of Banding Stations:** 1. Yangku, Kangwon-do, 220M, 38.02N, 127.58E; 2. Chunkok, Kyunggi-do, 220M, 37.52N, 127.00E; 3. Pochun Kyungii-do 200M, 37.49N, 127.49E; 4. Kwangnung, Kyungii-do, 200M, 37.45N, 127.45E; 5. Chinchup, Kyungii-do, 200M, 37.45N, 127.15E; 6. Yangju, Kyungii-do, 100M, 37.41N, 127.10E; 7. Taenung, Seoul, 200M, 37.38N, 127.05E; 8. Seoul, 200M, 37.38N, 127.04E, 9. Sosa, Kyungii-do, 100M, 37.28N, 126.47E; 10. Youngchun, Kyung-sang-bukdo, 120M, 36.04N, 129.21E; 11. Maepo, Choongchung-bukdo, 150M, 36.28N, 127.28E; 12. Kochang, Chulla-bukdo, 150M, 35.26N, 126.45E; 13. Muan, Chulla-namdo, 100M, 35.10N, 126.31E; 14. Haenam, Chulla-namdo, 100M, 34.32N, 126.40E; 15. Kuze Is., Kyung-sang-namdo, 140M, 34.46N, 128.38E; 16. Kumwha, Kangwon-do, 100M, 38.42N, 127.37E;

<b>Birds Banded:</b>	1964	-	70 species	18,763 individuals
	1965	-	86 species	57,205 individuals
	1966	-	80 species	49,303 individuals
	1967	-	86 species	48,617 individuals
	1968	-	62 species	8,123 individuals
	Total	-	125 species	182,011 individuals

Following is a summary of a report prepared by Dr. Won Pyong-Oh: Unlike previous years, in 1968 our main effort was limited to certain specific projects. In particular we made spot checks on certain species at selected stations throughout the year. Field work was limited, and more emphasis was laid on laboratory work including statistical analysis, the study of reference material and the preparation of written reports. By the end of the December we had collated all the data obtained during 1968.

**Ardeid Study:** A survey of the colonial breeding sites of Ardeidae and banding of the nestlings were made through this nationwide survey, we have checked 14 breeding colonies, and, as a result counted 6340 birds of 5 species



and banded 1580 birds. Table 1 and Fig. 9.



Fig. 9. Breeding Colonies of Ardeidae in Korea, 1968.

Table 1: Estimates of number of Ardeidae in known breeding colonies in Korea in 1968. Figure in parenthesis indicates number of young banded at each colony from 1964-1968.

District	Kyunggi-do	Kangwon-do		Choongchungbuk-do		Choong Chungnam-do		Kyungsangbuk-do		Kyungsangnam-do		Chullanam-do		Total	
Place	Kwangnung	Yuju	Youngwol	Chinchun	Maepo	Youngdong	Kongju	Kimchun	Koryong	Samchunpo	Tongyong	Kore	Muan	Haenam	
<u>Ardea</u> <u>cinerea</u>	20 (3)	100 (6)	50	30		60 (14)	20 (12)	60 (11)	60 (16)	100 (109)	50 (25)	100	200 (38)	40 (8)	890 (242)
<u>Egretta</u> <u>alba</u>	80 (10)	500 (156)	400	40	800	140 (86)	400 (36)	600 (120)	350 (147)	500 (309)	250 (147)	200	400 (113)	500 (97)	5160 (1221)
<u>Egretta</u> <u>intermedia</u>			50	20	100 (10)										170 (10)
<u>Egretta</u> <u>garzetta</u>					2+									100 (97)	102 (97)
<u>Ardeola</u> <u>ibis</u>					6+ (4)									20 (6)	26 (10)
<b>Total</b>	100 (13)	600 (162)	500	90	908 (14)	200 (100)	420 (48)	660 (131)	410 (161)	600 (418)	300 (172)	300	600 (151)	660 (208)	6340 (1580)

House Swallow Investigation: Recovery and return data mainly obtained within Kyongii-do, are shown in Tables 2 and 3. The percentage of returns was 5.66% of 1694 adults and 0.66% of 8600 nestlings. The low percentage of returns can be attributed to the fact that it was not possible for a full check to be undertaken of the House Swallows banded in the previous year. However, even though the returns are lower than anticipated, they show the lower return of young to parental nesting sites usually noted in such studies. The data listed in Table 3 and illustrated in Fig. 10 indicate the ranges from which nestling and adults move to a common roosting place. The pear orchard roost at Taenung attracted birds from distances up to 25 km. In Fig. 10 solid lines indicate movement of young and dashed lines movements of adults.

Table 2: Returns of House Swallows banded at nesting sites 1967 and their return to same sites in 1968, Kyongii-do, Korea.

Age	Number Banded	Number of Returns	Percent of Returns
Adult	1694	96	5.66%
Nestling	8600	57	0.66%

Table 3: Returns of the House Swallows to nesting and roosting sites in Kyongii-do, Korea.

Age	Returns		Local Movements		Total
	Same nesting site	Nesting site nearby	Roosting site to nesting site	Nesting site to roosting site	
Adult	62	34	4	6	106
Juvenile	8	3	23		34
Nestling	29	28		2	59
?	4	1	4		9
Total	103	66	31	8	208



Table 4: Weights of House Swallow and Chestnut Bunting netted in Korea.

Date	Age	Range	Mean	S. D.	S. E.
<u>Hirundo rustica</u>					
23-31 Jul.	ad.	12.8-17.5	15.36 (75)	1.10	0.12
	Juv.	10.7-22.5	14.15 (148)	1.71	0.04
1-10 Oct.	ad.	15.3-22.5	18.80 (71)	1.39	0.16
	Juv.	15.5-20.4	17.80 (104)	0.98	0.09
<u>Emberiza rutila</u>					
Aug.	ad.	14.1-18.7	16.35 (50)	1.17	0.17
	Juv.	13.8-17.4	15.54 (17)	1.17	0.28
	ad.	14.1-18.7	15.77 (15)	1.30	0.34
	Juv.	13.9-15.5	14.81 (11)	0.47	0.14
Sept.	ad.	17.1-17.2	17.15 (2)	0.07	0.05
	Juv.	14.0-17.5	16.01 (6)	1.24	0.51
	ad.	15.2-17.3	16.50 (7)	0.77	0.30
	Juv.	13.3-17.5	15.80 (10)	1.36	0.37
Oct.	ad.	16.5-24.1	20.32 (20)	2.35	0.53
	Juv.	15.3-21.9	18.44 (45)	1.39	0.21
	ad.	16.3-21.8	18.94 (10)	1.79	0.57
	Juv.	15.8-20.8	18.11 (27)	1.54	0.29

Weights of House Swallows and Chestnut Buntings: Representative samples of these species were weighed at monthly intervals during migration. The swallow, both adults and juveniles showed an increase in weight between July and October, adults 14.7% and juveniles 13.4%. The bunting females were uniformly lighter than males and showed a 17.6% increase over the period of August to October while the male weights increased by 13.6%.

Movements and ages of the swallows are shown in Table 5. This is an excellent illustration of the circulation of swallows within their breeding areas but also demonstrates the tenacity of their territorialism.

Local recoveries of birds do not appear in Section 3 and those species other than H. rustica and E. rutila which have been recaptured in Korea are listed in Table 6.

Table 5: Age and Movements of House Swallows banded in Kyongii-do, Korea.

Year Banded	1968	1967	1966	1965
Year Recovered	1968	1968	1968	1968
Birds banded at nesting site and recovered at roosting site	6	2		
Birds banded at nesting site and recovered at same nesting site		22	8	1
Birds returned same nesting site		88	14	1
Birds returned to nesting site nearby		62	3	1

**Chick food analyses:** Analyses of food brought to nestlings was continued in 1968. The collar method was used to determine the food of the following seven species. Table 7: summarizes this work: Dendrocopos major hon-doensis: The preferred foods supplied during the nesting period appeared to be Noctuidae indet. 37.4% and Cimbicidae indet. 12.5%. They consumed animal matter including insect larvae 78%, insect adults 9.36%, spiders 3.12%, Mollusca 3.12% and also a small amount of vegetable matter. Parus major wladivostokensis: Pine caterpillar, Dendrolimus spectabilis 84.6% was the most important food. Animal matter included insect larvae 97.94%, Lepidoptera 96.96%, Mollusca 1.18% and spider 1.18%, Streptopelia orientalis orientalis: The preferred food supplies during the nesting period appeared to be vegetable matter; red pepper seeds 85%, soybean 11.25% and some grains. Emberiza elegans elegans: The diet included Lepidoptera, Noctuidae indet. Geometridae indet. And Pachyligia dolosa. Eurystomus orientalis abundus: Consumed insect adults only; Potosia aerata 30%, Oxycetonia jucunda 13.9%, Anomala viridana 11%, Dieranocephala adamsi 8.3%, and Platypeura kaemferi 11%, Coleoptera made up 75% of the diet. Zoothera dauma toratugumi: The diet included insect larvae 17%, insect adults 33% and earth worms 50%. Ninox scutulata scutulata: The food samples found in nest, were the Line-backed Field Mice, Apodemus agrarius, and Cicadas, Platypeura kaemferi which appear to make up the bulk of the food brought to young.

Table 6: Bird Banded and Recovered in Korea

Species	Band No.	Age	Banding Date	Locality	Recovery Date	Recovery Locality	Elapsed Time (Mos.)
<u>Emberiza rustica</u>							
	015-15636	ad.	4 Nov. 67	Pochun	15 Jan. 68	Kye-sen	2 Mos.
	015-07536	"	10 Nov. 67	Chinchup	10 Feb. 68	Tuksum (Seoul)	3 "
	013-09053	"	20 Dec. 67	Chinchup	19 Feb. 68	Inchun	2 "
	011-61094	"	10 Dec. 65	Taenung	11 Mar. 68	Chinchup	28 "
	011-61099	"	10 Dec. 65	Taenung	11 Mar. 68	Chinchup	28 "
	010-41304	"	11 Nov. 64	Kwangnung	24 Mar. 68	Chinchup	40 "
	010-49126	"	23 Mar. 68	Chinchup	27 Mar. 68	Chinchup	36 "
	015-34050	"	23 Mar. 68	Kwangnung	2 Apr. 68	Chinchup	1 "
	015-34119	"	26 Mar. 68	Kwangnung	2 Apr. 68	Chinchup	1 "
	015-34074	"	24 Mar. 68	Kwangnung	2 Apr. 68	Chinchup	1 "
<u>Motacilla alba</u>							
	020-53240	ad.	9 Jul. 66	Taenung	28 Mar. 68	Seoul	20 Mos.
	020-27987	Juv.	1 Jul. 66	Taenung	5 Apr. 68	Seoul	21 "
	013-62677	Juv.	26 Jul. 67	Taenung	12 Apr. 68	Seoul	10 "
	020-53369	Juv.	10 Jul. 66	Taenung	15 Apr. 68	Seoul	10 "
	013-60352	FG.	14 Jul. 67	Taenung	11 May. 68	Seoul	11 "
	012-85920	Sub. ad.	12 Aug. 66	Taenung	2 Jun. 68	Kwangnung	11 "
	013-58898	FG.	13 Jul. 67	Taenung	Apr. 68	Seoul	9 "
<u>Paradoxornis webbiana</u>							
	013-19948	ad.	30 Mar. 67	Pochun	10 Apr. 68	Chinchup	13 Mos.
<u>Parus major</u>							
	015-34179	ad.	29 Mar. 68	Kwangnung	30 Apr. 68	Chinchup	1 Mos.
<u>Aegithalos caudatus</u>							
	012-97802	ad.	23 Oct. 66	Chinchup	1 Apr. 68	Chinchup	19 Mos.
<u>Egretta alba</u>							
	110-23490	NL.	1 Jul. 67	Yongdong	26 Aug. 67	Okgu	1 "
	120-04628	NL.	16 Jun. 67	Samchunpo	14 Jul. 68	Kangju	11 "
<u>Emberiza rutila</u>							
	013-63174	ad.	12 Sep. 67	Pochun	27 Aug. 68	Cochun	11 "
	015-03041	ad.	17 Sep. 67	Pochun	27 Aug. 68	Cochun	11 "
<u>Emberiza cioides</u>							
	011-67487	ad.	22 Sep. 65	Pochun	24 Aug. 68	Seoul	36 Mos.
	015-05431	FG.	30 Oct. 67	Pochun	5 Mar. 68	Seoul	5 "

Table 7: Summary of the Collar Method examinations of nestlings in Korea

Species	Average Brood Size	Time Collared (min)	No. of Examinations	Total of Nestlings Collared	Date Examined
<u>Dendrocopos major hondoensis</u>	4	100-120	8	14	14-17 Jun. 68
<u>Parus major wladivostokensis</u>	10	50-60	18	78	2-7 Jun. 68
<u>Streptopelia orientalis</u>	2	100-120	5	14	11-15 Jun. 68
<u>Emberiza elegans</u>	3	50-60	2	6	29-30 May 68
<u>Eurystomus orientalis abundus</u>	4	100-120	11	35	8-13 Jun. 68
<u>Zoothera dauma toratugumi</u>	2	100-120	3	6	27 Jun. - 4 Jul. 68



Threatened and vanishing bird survey in Korea: This was a byproduct of the banding project. We have conducted a preliminary survey on this and the results we have obtained from 1961 to date is shown in Fig. 11. An accurate census is required for their preservation and management.

Publications and Publicity:

1. Seasonal distribution and ecology of migrant bird populations studied by mist-netting and banding in Korea (II) Misc. Report, Yamashina's Institute for Ornithology, Vol. 5, No. 3 (No. 29), pp. 241-258, June 1968. Tokyo, Japan (in Japanese with English summary).
2. Chick food analysis of some Korean birds (II), op. cit., pp. 259-277.
3. Seasonal distribution and ecology of migrant bird populations studied by mist-netting and banding in Korea (III). op. cit., (in press).
4. Chick food analysis of some Korean birds (II). op. cit., (in press).
5. Check-list of the birds of the Republic of Korea. Inst. Ornith., Kyung Hee Univ., Seoul, Korea. 27 pp. Aug. 1968.
6. An annotated checklist of the birds of Korea (Manuscript). 34+418 pp. (in Korean with English Resume).
7. Designation of breeding colonies of Ardeidae as natural monuments. 21 July 1968 (Hanbook Daily Newspaper).
8. Birding lecture in Summer School. 26 July 1968 (The Children's Times).
9. Japanese Black-faced Bunting and Japanese Yellow Bunting discovered. 31 Sept. 1968 (Dong - A Children's Times).
10. The occurrence of two unrecorded birds from Kuje Is. 11 Sept. 1968 (Seoul Newspaper).
11. Six species of migrant birds previously unrecorded discovered. 15 Sept. 1968 (Chosun Children's Times).
12. Wild birds decreasing due to indiscriminate use of air gun. Stop the practise by law. 18 Jan. 1969 (Seoul Newspaper).

13. Vanishing birds in Korea. 21 Jan. 1969 (Seoul Newspaper).
14. Birds, flowers (by Patty Barker). 8 Dec. 1968 (The Korea Times).
15. Endangered birds, their actual condition. 26 Jan. 1969 (Chosun Weekly News).

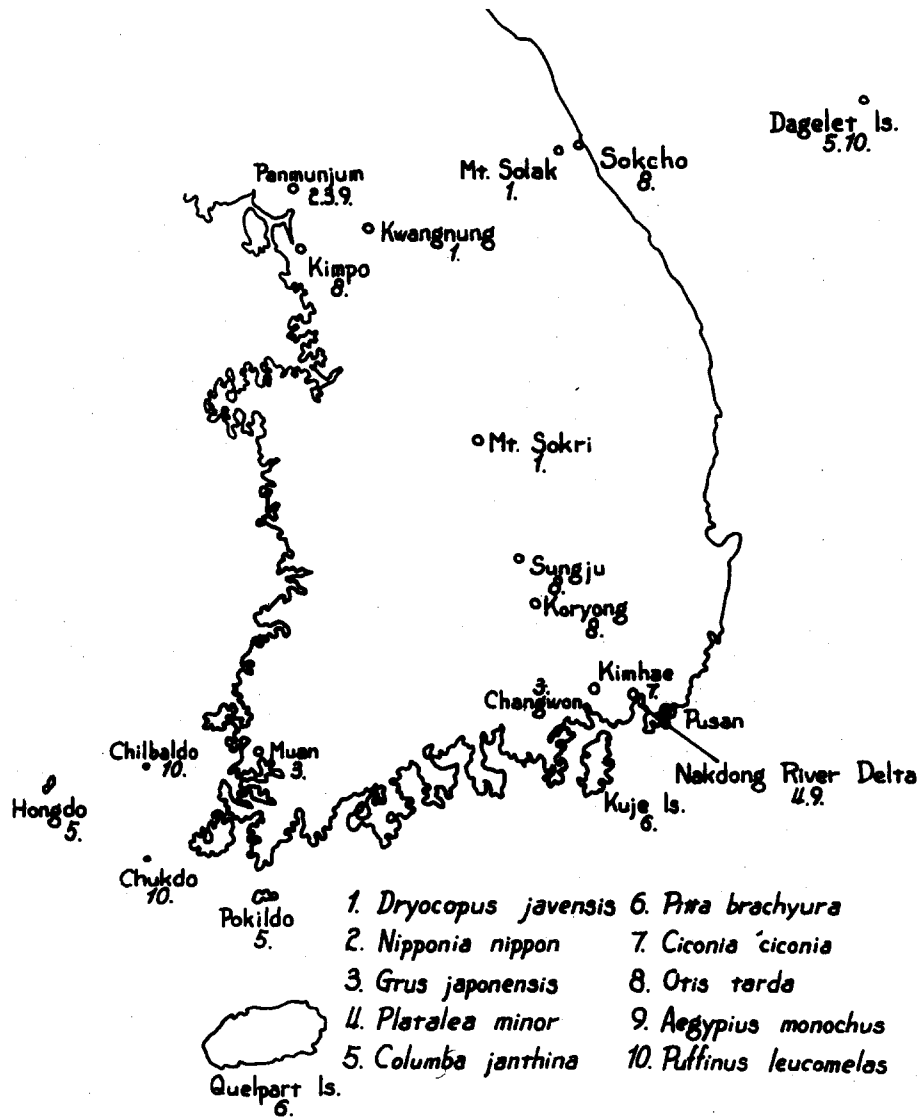


Fig. 11: Locations where threatened or vanishing birds in Korea still occur.

## JAPAN

Institution: Yamashina Institute for Ornithology, Shibuya, Tokyo, Japan

Responsible Investigator: Yoshimaro Yamashina

Team Members: Masashi Yoshii M. S., Team Leader, Yoshitake Hasuo B. S.

Team Advisor: Nagahisa Kuroda Dr. Sc., Chief of Research Section

Volunteer Banders: N. Ichida, N. Okada, K. Okada, S. Kakita, T. Kazama, K. Kashiwagi, M. Kato, T. Kawasaki, Shinhama Duck Refuge and Saitama Duck Refuge of Palace Bureau, K. Kobayashi, N. Kobayashi, K. Komatsu, T. Saito, M. Sano, N. Shiraishi, A. Chiba, M. Chiba, Bird Study Club of Tokyo University of Agriculture and Technology, T. Nakamura, H. Nakamura, K. Kasegawa, R. Homma, C. Makishima, R. Matsumoto, S. Matsuyama, T. Mano, T. Motai, Y. Yoshikawa, A. Tominaga, Each of them belongs to either the Ornithological Society of Japan or the Wild Bird Society of Japan, or to both.

Location of Banding Stations: Hokkaido: Teuri Island 44. 21N. 141. 20E.  
Honshu: Kabushima, Aomori 40. 32N. 141. 33E; Sanganjima, Iwate 39. 18N. 141. 59E; Nakamachi, Ibaraki 36. 30N. 140. 30E; Katsuta, Ibaraki 36. 23N. 140. 32E; Saitama Duck Refuge, Saitama 35. 53N. 139. 48E; Shinhama Duck Refuge, Chiba 35. 40N. 140. 00E; Nakakoma-gun, Yamashiro 35. 35N. 138. 31E; Niigata-shi, Niigata 37. 56N. 139. 07E; Kashiwazaki, Niigata 37. 23N. 138. 33E; Shiga Plateau, Nagano 36. 43N. 138. 31E; Chino-shi, Nagano 35. 59N. 138. 09E; Subashiri Experimental Station, 35. 21N. 138. 50E; Okazaki-shi, Aichi 34. 57N. 137. 09E; Kobe-shi, Hyogo 34. 41N. 135. 11E; Tsunoshima, Yamaguchi 34. 21N. 130. 51E; Kyushu: Isahaya-shi, Nagasaki 34. 25N. 129. 21E.

Besides the above mentioned stations, our banding cooperators in five other prefectures banded less than 100 birds annually in each place.

Birds Banded:	1964	75 species	6,057 individuals
	1965	93 species	6,288 individuals
	1966	118 species	21,913 individuals
	1967	81 species	19,497 individuals
	1968	129 species	17,227 individuals
	Total	152 species	70,982 individuals

Banding was continued through 1968 on a national scale with emphasis on the banding of colonial or communal roosting birds, such as Ardeids, Barn Swallow, House Martin, Horn-billed Puffin, Pied Wagtail, Black-tailed Gull and Streaked Shearwater, and the migratory birds passed through the two important banding stations Tsunoshima and Kashiwazaki. Total 17, 227 birds of 144 species were banded.

Egretta garzetta, E. intermedia, E. alba, Ardeola ibis and Nycticorax nycticorax: Banding Ardeids was carried out at Shinahama and Katsuta. Shinahama is noted for the Duck Refuge of Palace Bureau and a big heronry is in the bamboo thicket surrounding the main duck pond. We banded a total of 1, 772 chicks and young of egrets and herons, not so much as in the previous years because of the recent disastrous decay of the bamboo thicket. In this refuge, together with in Saitama Duck Refuge, ducks were banded in winter.

The second place of ardeid banding was in Katsuta near Mito City. The colony was located in the pine forest behind the Hitachi Electric Company. Hasuo and three amateur cooperators from the Wild Bird Society banded 209 chicks of Egretta garzetta (100), E. intermedia (1) and Nycticorax nycticorax (108).

Catching adult egrets and herons with mist nets was not attempted, because it would often injure birds.

Hirundo rustica: Barn Swallow banding was carried out in a wide reed bed of Fuji River, about 60 meters wide and 300 meters long, where thousands of swallows make roost. Setting 20 nets approximately at right angles to the stream, we caught the roosting swallows late in the evening and early in the morning. Total: 1, 249 Hirundo rustica, 67 Acrocephalus arundinaceus, 10 A. bistrigiceps, and other birds were banded here.

Delicon urbica: House Martins were banded at the Kamikawa Bridge, Chino City and a hot spa of Shiga Plateau. The martins were nesting beneath the bridge in the former colony, and were nesting under the eaves of a large hotel in the latter. We caught the martins by nets and with fingers took the chicks out of the nests. A total of 1, 344 adults and chicks of House Martins were banded. In these two places a lot of return and repeat data were obtained, and Hasuo is preparing to analyze these data.

Cerothrinca monocerata: Horned Puffins were colonizing on the southern side of Teurijima Island, Hokkaido. Mist-nets were applied at first but soon given up because many birds were tangled in the nets and injured. Later, six fish-nets, of thicker threads, about 22 m. m. in mesh, total 60 meters long and two meters wide, were set on the steep slope just in front of the colony. A total of 905 Horned Puffins were banded by Hasuo and his two co-operators during three nights.

Larus crassirostris: Kabushima is a very tiny island (but actually connected with the main land), less than 200 meters in the longest diameter, and is wholly covered with the Black-tailed Gulls' nests. One third of the nests had been washed away by a big tidal wave caused by a heavy earthquake, and the hatching rate of eggs seemed to have been reduced by the long rainy period prior to our research, our banding result was not sufficient, and only 1,502 nestlings of Black-tailed Gull were banded by Hasuo and his two helpers.

Puffinus leucomelas: Streaked Shearwater banding was carried out at Sanganjima, a small uninhabited island about three miles off Kamaishi City, Iwate Prefecture, where numerous shearwaters were making holes and nests under the soft ground. Being warned of a big tidal wave caused by a heavy earthquake and of approaching low pressure front, our banding team had to give up work only one day after landing and returned back to Kamaishi. During the night our three banders caught 994 shearwaters (adult) by hands and banded them.

Motacilla alba: Pied Wagtail banding was carried out at Yahagi Bridge, Okazaki City, Aichi Prefecture. More than 4,000 Pied Wagtails were roosting under the bridge. At first the combined two nets method was taken (36 m. m. mesh x 4 shelves x 2.4 m. x 12 m. x 2 nets), but later one-net-method (36 m. m x 4 shelves x 2.4 m. x 8 m.) was applied. This method took advantages for saving workers and time, and also is convenient in case of strong wind blowing.

Variations of plumage color of Pied Wagtails made it very difficult to identify the sexes, ages and even the subspecies, *M. lugens* or *M. ocularis*. Yoshii is working on the problem.

Miscellaneous migratory birds: a. At Kashiwazaki, Niigata Pref., four cooperators worked on banding and Yoshii frequently went there to encourage them. The main banding site here is a narrow reed field, about 500 meters square, facing Japan Sea. A total of 3,741 birds of 59 species were banded. As the excellent leader of Kashiwazaki Banging Team, Mr. T. Kazama was unfortunately transferred to Sado Island by his Kashiwazaki Police Headquarters, Mrs. Y. Yoshikawa was requested by Yamashina Institute to work at Kashiwazaki. She did beautiful work there, meeting our demand.

b. Tsunoshima is a very small island covered with cultivated land and scattered forests, located at the west end of Honshu. This island is deemed to be situated at the key-point in the migration routes of Japanese birds. Hasuo and his cooperator Shiraishi worked for about ten weeks and banded a total of 815 birds of 52 species. Netting result was good under such weather of slight rain in spring, and calm and fine weather in autumn.

## TAIWAN

Institution: Tunghai University, Taichung.

Responsible Investigator: Professor Johnson T. F. Chen.

Team Members: Sheldon Severinghaus, BA; Kang Kuo-wei, BS; Chao Mao Cheng, BS (January-July); Wang Ching-te, BS (January-July); Chen Cheng-an, BS (January-July); Meng Hsien-chang; Chen Ping-huang, BS (August-December); Ma Te-lo, BS(August-December); Miss Huang Wan-tsih, BS (January-July); Miss Huang Hsin-tsih, Typist.

Volunteer Workers: 44 farmers and trappers who have caught birds for the team at various local areas.

Location of Banding Stations: Heronries: Shihkuang (Hsinchu), 330, 24.49N, 121.07E; Kaoshuang (Taoyuan), 150, 24.56N, 121.11E; Wanfu (I-lan), 300, 24.41N, 121.40E; Sugar cane roosts: Wu-chang-li (Taichung), 150, 24.06N, 120.39E; Hsin-tien (Taichung), 594, 24.13N, 120.44E; Wanfeng (Taichung), 250, 24.01N, 120.42E; Tali (Taichung), 150, 24.06N, 120.41E; Chiu-she (Taichung), 400, 24.11N, 120.42E; Liunan (Taichung), 200, 24.04N, 120.40E; Wen-shan (Taichung), 150, 24.09N, 120.38E; Tan-tzu (Taichung), 350, 24.13N, 120.42E; Shuikutou (Taichung), 560, 24.11N, 120.37E; Wufeng (Taichung), 120, 24.04N, 120.41E; Taiping (Taichung) 120, 24.07N, 120.43E; Hengshan (Taichung), 530, 24.13N, 120.38E; Houli (Taichung), 900, 24.18N, 120.42E; Tachia (Taichung), 150, 24.21N, 120.36E; Nantou (Nantou), 160, 23.52N, 120.41E; Shui-shang (Chia-I), 100, 23.26N, 120.42E; Nanching (Chia-I), 100, 23.25N, 120.22E; Chingliao (Tainan), 120, 23.23N, 120.21E; Taikang (Tainan), 100, 23.17N, 120.19E; Pen-haieh (Tainan), 100, 23.22N, 120.23E; Mountain areas: Wushe (Nantou), 3765, 24.01N, 121.07E; Tsuifeng (Nantou), 7564, 24.06N, 121.11E; Yuanfeng (Nantou), 9040, 24.12N, 121.13E; Tayuan (I-lan), 4500, 24.44N, 121.38E; University: Tunghai (Taichung), 600, 24.09N, 121.34E; Shrikes: Hengchun (Pingtung), 160, 22.01N, 120.44E;

Birds Banded:	1964	42 species	802 individuals
	1965	69 species	20,983 individuals
	1966	99 species	54,192 individuals
	1967	83 species	54,130 individuals
	1968	73 species	22,247 individuals
	Total	148 species	152,354 individuals

Summary of report prepared by Sheldon Severinghaus: The year 1968 for the

Tunghai Bird Banding Project can be characterized briefly as a year of increased specificity yet continued significance of research in light of previous knowledge gained and mounting budgetary restrictions. As early as the beginning of 1967 the team began concentrating on those areas which were at the same time the most scientifically productive and the most financially efficient while still furthering the overall objectives of the MAPS project. Within those areas in 1967, the team's policy was to get as many bands flying as possible. This resulted in 54,130 birds banded (95% migratory), with an accompanying large number of collected parasites and smears, bringing the total number of birds banded since 1964 to 130,107. This work was summarized in the previous annual reports.

By contrast, 1968 saw far fewer birds banded (22,247). This was the team's intention since it was neither scientifically necessary nor financially feasible to continue banding at the inflated rates of 1967. Even though fewer birds were banded, the high degree of specificity in research was maintained. New and significant information was picked up in each of the special projects pursued.

In 1968, 94% of the birds banded were migratory. Aside from the migrants banded, one of the most surprising things to happen was the recovery of 3000-4000 bands from Yellow Wagtails (Motacilla flava), Black-faced Buntings (Emberiza spodecephala), and House Swallows (Hirundo rustica), these bands were returned to the team by local bird catchers who net the birds at night when they are roosting in sugar cane fields. The birds were all originally banded in Taiwan at least one year or one migration season prior to recovery. Presently, this mass of data is being tabulated and summarized. The results should illuminate the dynamics of the over-wintering wagtail, swallow, and bunting populations in Taiwan. The banding of these birds was greatly reduced over the previous years in accordance with the plan, yet more data were picked up on swallow moult and wagtail weights.

In cooperation with the U. S. Navy Medical Research Unit (NAMRU-2). Studies of Japanese-B encephalitis infection in pigs, mosquitoes, man, and birds were continued in 1968 with particular attention given to nestling Black-crowned Night Herons (N. nycticorax) and Little Egrets (Egretta garzetta). Nests were examined for inquilines at regular intervals throughout the breeding season, and among other parasites an undescribed species of Argas was collected. The numbers of herons and egrets banded in 1968 was reduced. Cattle Egrets (Ardeola ibis) received the least attention (323) because the most is known about them. Black-crowned Night Herons received the greatest attention (1117) since the least is known about them with Little Egrets falling in between (846).

The team made three major trips to the mountain study areas at different times of the year than those in 1966 and 1967. This was in keeping with

the plan to observe these areas at different seasons. Several species new to the mountain list were processed, including two Pygmy Owls (Glaucidium brodiei). In November, large movements of migratory Gray-headed Thrushes (Turdus obscurus) were observed, more than ever before in Taiwan. Six were processed. A summary of all the mountain work since August 1966 is presently under way and will show the seasonal and altitudinal variations among migratory and resident birds.

The survey of the annual passage of Brown Shrikes (Lanius cristatus) across the southern tip of the island was continued in 1968 at much the same intensity as in previous years. The best information on the population dynamics of this migrant comes from banding as many birds as possible during the month-long passage.

Based upon observations made in 1967 a different system of age classification was used. Tunghai University's sociology department sent a six-man survey team to join the bird team. In a period of ten days they interviewed 400 families in the Heng Chun region, both trapping and non-trapping families, in an effort to determine the economic, nutritional, and social value of the Brown Shrike in the lives of the local people. The sociological aspects of the shrike project were financed by the sociology department. Results of these studies are to be published.

Cooperation with the Southeast Asia Mosquito Project of the Smithsonian Institution was continued in 1968.

LIFE photographer Eliot Elisofon visited the east coast of Taiwan in October 1968 and took some 800 pictures of the island's indigenous Mikado (Syrmaticus mikado) and Swinhoe's (Lophura swinhoii) Pheasants. Selected photographs and a text supplied by the MAPS personnel will appear in an article in "Life". One Mikado Pheasant was banded and released.

Summary of Cooperative encephalitis studies: The following summary was prepared by Dr. Roger Detels (NAMRU-2): "Widespread epidemics of Japanese encephalitis occur annually on Taiwan causing permanent neurologic damage or death to many children. The seasonal incidence of Japanese encephalitis and the finding of JE antibodies in 50% adult Black-crowned Night Herons (BCNH) here and in Japan suggested that these birds may play an important role in the dissemination of the Japanese encephalitis virus (JEV).

An ecologic study designed to determine the chronologic relationship of infection in BCNH to infection in pigs, mosquitoes, and human (known hosts and vectors) was undertaken in a heronry in the county which has the highest annual incidence of Japanese encephalitis on Taiwan.

Preliminary results indicate that Japanese encephalitis infection occurs



in nestling BCNH during the 2nd to 5th week of life from the time that mosquitoes are found to be infected, but several weeks after the sentinel pigs become infected. This finding suggests that BCNH play a role in the dissemination of JEV on Taiwan.

Recently JEV has been found in reptiles and amphibians. Therefore, further studies are planned to determine the role of reptiles and amphibians in the chronology of JEV dissemination and the possible vectors between such disparate hosts as birds, humans, pigs, reptiles and amphibians." Recent Publications: 1. Preliminary evidence of *Culex annulus* Theob. as a vector of Japanese Encephalitis in Taiwan. Cates, M. D. Detels, R. submitted to Science. 2. Chronology of Infection in Mosquitoes, Herons, Pigs and Humans in Taiwan. Detels, R., Chen, P. L. H., Liu, H. C. C. American Mosquito Control Association Meetings, March 1968.

Review of the Recovery of Taiwan Banded Birds: The Tunghai University Bird Banding Project has now completed its fifth year of activity. Since the inception of the program in the early spring of 1964, the Tunghai team has banded 152,354 birds (the vast majority of them migratory) representing 148 species. Out of all these, 152 individuals of 10 species have been reported from foreign countries, a .1% return. At the same time, the team has recovered in Taiwan 14 individuals of 6 species originally banded by cooperators in other countries.

Ardeidae: Three species Ardeidae were represented: The Cattle Egret, the Little Egret, and the Black-crowned Night Heron. All three species breed commonly during the summer in Taiwan's heronries. Most were banded as nestlings or "runners"; very few adults were banded relative to the number of young of the year.

Though these species have been banded in roughly similar numbers, the rate of foreign recaptures is significantly disproportionate (Table 8). Cattle Egrets were much more frequently recovered (1.8%) than Little Egrets (0.2%) and Little Egrets more frequently than Black-crowned Night Herons (0.1%).

The distribution of Cattle Egret recoveries was as follows: 94, the Philippines (primarily Luzon); 2, the Caroline Islands, Pacific Ocean; 1, Sabah (North Borneo), Malaysia; 1, Japan.

All Little Egret recoveries (11) and the one Black-crowned Night Heron have come from the Philippines. More than half come from birds shot dead with shot guns, air rifles, sling shots or other weapons. One man, indeed, claims he bagged 12 herons with one shot, among which the banded bird was included. Numerous birds were caught and kept as "pets" while others were simply "found dead". A few were caught by baited hooks and one in a fish net.

It could be that species differences in behavior are responsible for the different rates of recovery. In Taiwan, Night Herons are largely crepuscular and nocturnal, especially during the non-breeding season. They are also dark-colored (not conspicuous) and do not have the habit of associating with man or his domestic animals.

In contrast to Night Herons, Cattle Egrets and Little Egrets are strictly diurnal. They are brilliant white (conspicuous) and are characteristically found with man and domestic animals. Of the two, the Little Egret is the shyer, the less gregarious, and the Cattle Egret the bolder and more fearless. These behavioral differences might well account for the different rates of recovery with the diurnal, most fearless species (Cattle Egret) having the highest rate of recovery and the nocturnal species (Night Heron) the lowest with the other (Little Egret) in between.

Migration patterns may also affect the recovery rate. From observation records, it is clear that the great majority of Cattle Egrets residing in Taiwan during the summer breeding season leave the island during the winter. Little Egret and Night Herons, on the other hand, can be seen and heard commonly all winter long. It is possible that with only a partial migration of the breeding populations of these latter two species, fewer individuals will winter in the Philippines, fewer will be captured there, and hence, the recovery rates will be lower. Four local returns from Night Herons (October-January, not listed here) support this, showing that some of them, perhaps more, remain in Taiwan all winter and some, perhaps fewer, move to the Philippines. The late-November recovery in Taiwan of one Japan-banded Night Heron also suggests that the overwintering population of herons is supplemented to some degree by Japanese birds. It remains to be determined what proportions of the Night Heron flocks include Japanese birds and what percentage of the Night Herons and Little Egret flocks move to the Philippines.

Local returns from Little Egrets (September-November, not listed here) do not show conclusively that they over-winter in Taiwan, for no recoveries have come from Taiwan after November while the greatest number have come from the Philippines in December (6). Local recoveries may indicate a late fall migration from Taiwan resulting in the cluster of December recoveries, in the Philippines. More likely, Little Egrets, like Night

Table 8: Foreign Recoveries of Ardeids Banded in Taiwan.

	No. Banded	No. Rec.	% Rec.
<u>Ardeola ibis</u>	5308	98	1.8
<u>Egretta garzetta</u>	5687	11	0.2
<u>N. nycticorax</u>	6844	1	0.01

Table 9: Distribution of Recoveries of Cattle Egrets banded in Taiwan.

MONTHS

Age	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Total	%
0-1 yr.	3	24	14	8	6	7	8	5	1				76	78
1-2 yrs.	2	4	3	4	2				1		1		17	17
2-3 yrs.	1		1	1				1			1		5	5
Totals	6	28	18	13	8	7	8	6	2		2		98	100

Hérons, undergo partial migration, with some of the birds remaining in Taiwan as winter residents and others migrating to the Philippines.

The large number of Cattle Egret recoveries (98) permits an analysis of seasonal and age distribution (Table 9). 78% of the recoveries were of birds less than one year old (banded as nestlings), 17% have been those 1-2 years old, and 5% have been 2-3 years old. Reading down in Table 9 represents this dimension of decrease. There is a second dimension, reading across to the right. As the winter season wears on beyond October, the number of recoveries drops steadily. The greatest number occur from October through December (60%), with October being the peak followed by a steady decline thereafter.

There are several possible explanations. First, as the birds get older, whether in years as in the first dimension or in months as in the second dimension, they get "wiser". Time brings experience (with hunters) and experience results in fewer captures. Biologically speaking, those birds genetically unfit to escape environmental hazards are quickly selected against. Second, the greatest number of recoveries occurring in October may indicate a period when the birds are especially concentrated, particularly in Luzon. When concentrated, they would be far easier targets for hunters than when dispersed in smaller numbers over the many islands. Third, fatigue after migration, in the early days of arrival in the Philippines, could make them physically less prepared to escape potential dangers. Fourth,

hunting pressure in the Philippines is greatest at the time of arrival of the birds because the hunters get out at that time to shoot them. Perhaps all of these factors enter in to explain the heavy clustering of recoveries in the fall of each year with diminished returns both in the winter and spring and in the succeeding years.

Two Cattle Egrets were recovered from the Philippines in July (both shot with air rifles), of the following year having originally been banded as nestlings in Taiwan. These birds were either physically unable to migrate north again or had established themselves as (breeding?) residents of the Philippines. Regarding the latter, it is a well-known fact that juvenile birds have a tendency to disperse, frequently establishing themselves in areas new from those of their parents. It seems impossible that these two birds were migrating at the time they were shot for in July their breeding season is in full swing in Taiwan.

Another individual banded as a nestling in Taiwan, was recovered 22 months later, 900 miles to the Northeast and some 60 miles off the coast of Japan. Its May recovery so far north of its birth place suggests another possible example of geographical dispersal of juveniles to new areas. (Unlisted in this report are numerous individuals that have been banded as nestlings one year and that have returned to the same heronry in following years to breed).

One Cattle Egret banded in Taiwan was recovered from the island of Palawan (Philippines) in October. Another was recovered in Sabah (North Borneo), Malaysia in December. These two recoveries suggest Palawan as a route leading from the central Philippines to Borneo.

Cattle Egrets, typically birds of lowland rice paddies and marshes in Taiwan, have been taken at 7,500 ft. and at 3,500 ft. the mountains of central Luzon. Presumably these birds were migrating, or at least making significant local movements, for mountain tops and rain forests are not their customary habitats.

Eleven recoveries of Little Egrets seem to be falling into a two-dimensional pattern of distribution similar to that of the Cattle Egrets. Ten of the eleven were birds less than one year old; the other was 1-2 years old. The peak month for recoveries, unlike Cattle Egrets, was December (6), followed by February (2) and November (1). The earliest recovery was in September. One individual was recovered at the end of June in Northern Luzon. This bird must either have been unable to migrate or have established itself as a summer resident. Future recoveries of Little Egrets will help fill out the distribution chart and provide a more reliable picture of their migration patterns.

House Swallow, *Hirundo rustica*: from 1964 through 1968, a total of 33,333 House Swallows were banded in Taiwan. Of these, 23 were recovered in foreign countries giving a 0.07% rate of return.

House Swallows are winter visitors in Taiwan and were banded monthly from September through to May.

The geographical distribution of recoveries with respect to season (Table 10) shows returns from latitudes to the north of Taiwan (Japan, Siberia) and to the south of Taiwan (the Philippines, Thailand and Malaysia). The northern recoveries were from spring and summer; the southern ones from fall and winter. Combining this distinct pattern with the continuous residence of swallows in Taiwan from early fall to late spring, it becomes clear that there are both resident and transient populations involved.

Table 10: Distribution of Recoveries of House Swallows banded in Taiwan.

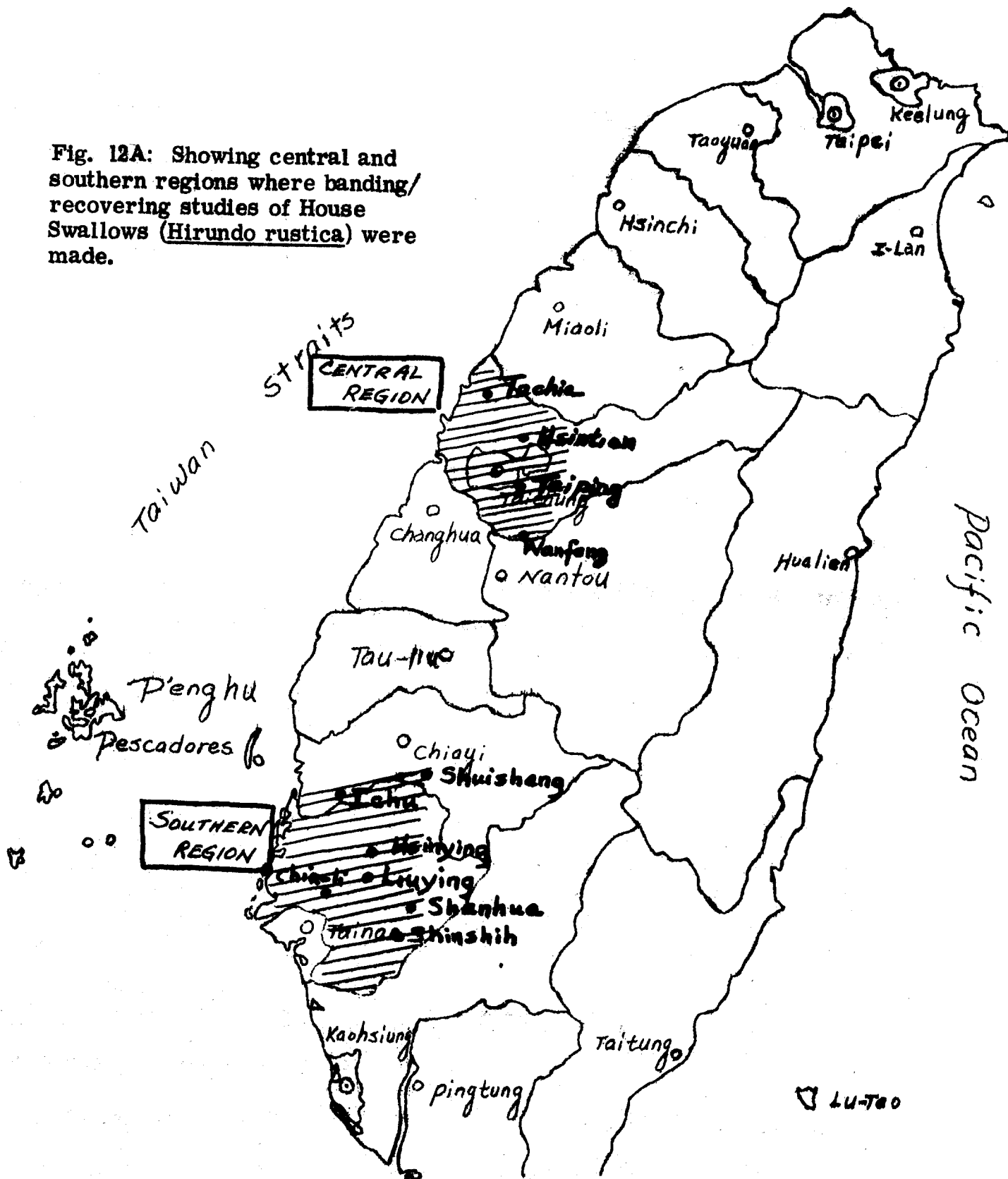
	Sep	Nov	Dec	Jan	Mar	Apr	May	Jun	Jul	Total
Japan					3	1	5	3	2	14
USSR						1				1
Philippines	1	1	2	1		1				6
Malaysia			1							1
Thailand		1								1

The six swallow recoveries from the Philippines illustrate Taiwan's transient migrants. Clearest example was an individual banded in October 1966 in Taiwan and recovered that December in the Philippines. The other examples appear less distinctly because one northward migratory season intervened between banding and recovery; the Taiwan-Philippine trip was not direct.

It would also appear that most of Japan's summer breeding population of swallows move to or through Taiwan in the fall and winter. This is suggested by the fact that, out of the 150,000-200,000 swallows banded in countries to the south of Japan (principally Taiwan, Thailand, and Malaysia). The majority of Japan's swallow recoveries have been from Taiwan-banded birds (14). Were Thailand and Malaysia the major wintering grounds for Japan's swallows, more birds banded in those countries would have been picked up in Japan by now. As it is, only a scattered few, relative to Taiwan's, have been returned from Japan whereas numerous returns have come from continental Asia (Korea, Siberia).

Though Taiwan would seem to receive most of the Japanese swallows, there is certainly "crossing over" (to and from the continent) and mixing of

Fig. 12A: Showing central and southern regions where banding/recovering studies of House Swallows (*Hirundo rustica*) were made.



populations. Three Korean birds were recovered in Taiwan (November-April). Returns from the Philippines in winter suggest passage for some Korean birds through Taiwan to more southerly latitudes. One swallow banded in Taiwan and recovered in Vladivostok, suggests a northerly extension of the Korean crossover with a migration route continuing up north along the continent.

Up to this point, Taiwan appears to act as a funnel, first receiving birds from Japan with some "cross-overs" from the continent (Korea-Siberia) and then either shunting them further south to the Philippines or serving as a wintering territory.

This may indeed be Taiwan's primary position in the swallow migration. Three recoveries, however, complicate the above picture and suggest more complex patterns may exist. Two swallows banded in Taiwan at the same locality within one day of each other in April 1966 were recovered 7 months later at widely different localities: one in the Philippines (Cebu, 900 miles to the south), the other in Malaysia (1800 miles to the southwest). A third individual banded in Taiwan in October one year, was taken in Thailand the next year in December.

The above reports of local recoveries of Taiwan-banded swallows indicate general patterns of movement within the island. During the overwintering season from September to May, it is possible to pick up recoveries from individuals banded the previous season as well as those banded within the same season. This report deals with 607 recoveries taken the seasons following banding and 77 recoveries taken within the same season as banding. The recoveries came either as bands bought back from birds which were then eaten or as bands on live, recaptured individuals which were then released. The birds are customarily caught at night as they are driven from their sugar cane roosts into nets along the edges of the cane fields.

**Movement:** For the purposes of this report, swallow movements are being considered as between two regions where most of the banding has been done: the central region in the vicinity of Taichung (24-08N/120-40E) and the southern region in the vicinity of Liuying (23-17N/120-19E), the two areas being more than 100 kilometers apart. Fig. 12A.

The 607 recoveries listed in Tables 11 and 12 indicate that individual swallows do return to Taiwan after the northern summer and suggest that Taiwan serves as regular winter quarters for specific segments of the Asian swallow population. Although the three foreign recoveries discussed in the previous report suggest some annual variation in migration patterns among individual swallows, the above 607 recoveries point to the regular, annual return of the same population segments, apparently the Japanese birds to a

Table 11 : House Swallow, Hirundo rustica, local recoveries the winter seasons following banding from birds banded in Southern Taiwan at: Liuying, Tainan County; Date Banded: 27 February 1967  
Number Banded: 4699; Number Recaptured: 568 (12%).

Place Recaptured	Date	Number	Distance (kms)	Distance
Liuying, Tainan	17 Oct. 67	5	0	-
Shanhua, "	26 Apr. 68	97	16	S
Shanhua, "	2 May 68	67	16	S
Shanhua, "	4 May 68	124	16	S
Hsinying, "	10 Mar. 68	6	27	S
Hsinying, "	23 Apr. 68	66	27	S
Hsinying, "	30 Apr. 68	45	27	S
Hsinying, "	3 May 68	70	27	S
Chiali, "	28 Apr. 68	73	19	SW
Ichu, "	24 Apr. 68	11	10	NW
Shuishang, Chia-I	28 Nov. 68	4	20	N

31

Table 12 : House Swallow, Hirundo rustica, local recoveries the winter seasons following banding from birds banded in Central Taiwan at: Taiping, Taichung County; Date Banded: 27 February 1967  
Number Banded: 400; Number Recaptured: 39 (10%).

Place Recaptured	Date	Number	Distance (kms)	Distance
Shanhua, Tainan	26 Apr. 68	9	119	S
Shanhua, "	2 May 68	2	119	S
Shanhua, "	4 May 68	7	119	S
Shinshih, "	23 Apr. 68	6	125	S
Shinshih, "	30 May 68	1	125	S
Shinshih, "	3 May 68	3	125	S
Chiali, "	28 Apr. 68	5	117	S
Ichu, "	24 Apr. 68	2	99	S
Fengshan, Kaohsiung	1 May 68	1	171	S
Hsinying, Tainan	8 Mar. 68	1	99	S
Hsinying, "	10 Mar. 68	1	99	S
Shuishang, Chia-I	28 Nov. 68	1	80	S



significant degree.

Within Taiwan and within the same over-wintering period, swallows tend to remain in the same region throughout the season. Of 77 swallows banded and recovered within the same season Table 13, 71 of them were recaptured within the same region they were banded, no farther than 39 kilometers from the banding site and as long as 6-7 months after banding.

Swallows do not necessarily return to the same region from one season to the next, however. The individuals listed in Table 12 were banded in the central region of Taiwan one season and were recovered in the southern region the next. In contrast, the birds in Table 11, which were banded on the same date as those in Table 12 but in the southern region, returned to the same region after the northern breeding season.

The five inter-regional recoveries listed in Table 14 stand as a small minority (6%) of the local recoveries being considered and could be variously explained. The first three (014-85823/85517/86887) which were banded relatively early in the winter season in central Taiwan would still have been migrating to more permanent winter quarters in the Southern region where they were recaptured four-five months later. The fifth one (014-89547) might have already reached its southern region winter quarters when it was banded in October and was then recaptured in the central region as it began moving north during the following spring migration. The fourth recovery (014-90407) suggests that the above explanations might be wrong. This individual, banded in the central region in February, more than half way through the winter season, was then recaptured in the southern region two months later. Migration doesn't appear as a reasonable explanation since, if anything, it would be migrating "in the wrong direction." More likely, this recovery represents a simple, inter-regional shift during the over-wintering period. All five of these inter-regional recoveries may indicate that a small percentage of the swallows over-wintering in Taiwan do shift from one region to another within the same season.

Of the local recoveries within the same season, one individual (013-85414), banded in November in the central region, was later recaptured twice within the same region; the first time 22 kilometers to the north in February, the second time 18 kilometers further to the northwest in March.

Population segments: Data in Tables 11, 12 and 15 suggests that specific segments of the over-wintering swallow population, perhaps large portions, remain together during the over-wintering period, that they may have similar northern origins (breeding areas), and that they possibly mass together for the fall and spring migrations.

Table 13 : House Swallow, Hirundo rustica, distribution of 77 recoveries with respect to region banded recovered and span of time and distance.

Region Banded	Region Recovered	No. Recovered	Time (mos.)	Distance (kms)
Central	Central	38	0-6	0-39
Central	Southern	4	0-6	160-174
Southern	Southern	33	0-7	4-27
Southern	Central	1	5	123

Table 14 : House Swallow, Hirundo rustica, five inter-regional recoveries (out of 77.6%) within the same over-wintering period.

Band No.	Region	Date Banded	Region	Date Recovered	Distance (kms)
014-85823	Central	14 Nov. 1967	Southern	2 May 1967	174
014-85517	"	20 Nov. 1967	"	1 May 1967	166
014-86887	"	20 Nov. 1967	"	2 May 1967	160
014-90407	"	26 Feb. 1968	"	29 Apr. 1968	166
014-89547	Southern	17 Oct. 1967	Central	17 Mar. 1967	123

Table 15: House Swallow, Hirundo rustica, 59 recoveries (out of 77.6%) indicating the tendency of the same individuals to remain together throughout the winter season.

Elapsed Time (mos.)	No. Originally Banded (date)	No. Recovered Together (date)
0-1	325 (Feb. 14)	2 (Feb. 26)
1-2	685 (Mar. 20)	2 (Mar. 21)
	424 (Mar. 10)	2 (Apr. 23)
	" "	3 (May 2)
	" "	2 (May 3)
	" "	3 (May 4)
2-3	661 (Nov. 20)	9 (Feb. 14)
3-4	" "	18 (Feb. 26)
4-5	685 (Oct. 17)	2 (Mar. 10)
6-7	" "	3 (Apr. 26)
	" "	2 (Apr. 28)
	" "	2 (Apr. 30)
	" "	2 (May 2)
	" "	2 (May 3)
	" "	5 (May 4)

Tables 11 and 12 indicate that the same groups of individuals can be found together from one season to the next, even after the intervening northward migration for the summer breeding season. 124 birds banded together on the same day in February 1967 were recaptured together on the same day in May 1968 (Table 11), after the round-trip migration. The last entry in Table 11 shows four individuals which were banded together on the same date in February 1967 and recovered together two seasons later in November 1968, after two round-trip migrations.

The weight of these data, showing the strong tendency for groups of individuals to remain together during the same over-wintering season and from one season to the next, suggests that Taiwan's over-wintering swallow population may have definite geographical origins in the north, different from the geographical origins of swallows wintering elsewhere in Asia.

Summary: Considering the foreign and local recoveries of House Swallows dealt with in this report, there appears to be a general regularity and pattern to their population movements. Taiwan's over-wintering swallows may have common geographical origins to the north. Groups of individuals tend to remain together during the winter season in Taiwan and can be found together from one season to the next, probably as a result of their common geographical origins to the north rather than as accidental aggregations in Taiwan of geographically widely separated populations to the north. Within Taiwan during the same over-wintering season, swallows do not move extensively from one region to another. An extensive, random mixing of swallows between widely separated regions of the island does not generally occur.

Beyond these emerging patterns lie numerous unanswered questions. What might distinguish the over-wintering population groups in Taiwan, if anything, is not known. Precise explanations for the short-distance movements of swallows within one region and more precise details on the apparent tendency not to randomly intermix are not presently possible. It is not known either in what way the northern geographical origins of Taiwan's over-wintering swallows might be delimited or whether different population groups in Taiwan represent different geographical sources to the north.

Brown Shrike, *Lanius cristatus*: Brown Shrikes are transient migrants through Taiwan every September, their passage taking up the entire month. Since 1965, 20,382 shrikes have been banded. Eight have been recovered abroad giving a 0.08% return. All recoveries have come from the Philippines between September and May. Three shrikes banded in the Philippines during the winter months were recaptured in Taiwan the following September after

the northward passage in spring and the summer breeding season.

The Philippines clearly serve as winter quarters for the shrikes. The summer breeding range has produced no returns because it lies mostly within Communist China for that particular race of Brown Shrike (L. c. lucionensis) which passes through Taiwan. Korea, though it also serves as breeding grounds for this race, has not yet picked up any bands. This could be attributed to a low population density of breeding shrikes or to the difficulty of catching them in large numbers. That no Korean-banded shrikes have been recovered in Taiwan is very likely due to the improbability of recovering one of the very few banded there or, more remotely, to the possibility they by-pass Taiwan entirely. A Korean bird banded in July was reported from the Philippines in November. The exact southward route, however, is still unknown. Do Korean birds cross the Yellow Sea to China, then cross the Formosan Straits to Taiwan before migrating to the Philippines? Or do they pass via the Japanese Island of Kyushu to Taiwan, then down? Or do they by-pass Taiwan completely?

Gray-faced Buzzard, Butastur indicus: The last authoritative publication on Taiwan birds (Hachisuka and Udagawa. Contribution to the Ornithology of Taiwan, 1951). listed the Gray-faced Buzzard as known only from three specimens. Recent MAPS research has shown this species, instead, to be a common fall and spring transient through Taiwan.

From the 38 individuals banded in Taiwan (1965-67), two have been recovered in the Philippines giving a 5.3% return. From the several thousand birds banded on Miyako Island in the Ryukyus, 5 have been recovered in Taiwan.

All of the birds banded in Taiwan come from the very southern tip of the island in the month of October. At this juncture of time and place, they pass in large, concentrated numbers and are hunted at night while they roost. Two returns from the Philippines indicate winter residency (December) and either early arrival or failure to migrate north (August).

The five reports in Taiwan from the Miyako-banded birds present a seasonal distribution pattern. One individual was recovered in October of the year following banding. This is the only evidence that the Gray-faced Buzzard passes Taiwan first on its southward trip from the Ryukyus, rather than moving directly to the Philippines across open water. Three other recoveries came in the spring; two from the southern tip of the island (March-April) and one from the central part of the island on the west coast (March).

These returns confirm observation records that the northward spring migration is up the west coast in March and April. The Gray-faced Buzzard, therefore, follows a different route through Taiwan in the spring than in the fall. Nothing is known of the northern origin of Taiwan's banded birds.

Family Motacillidae: Two species of this family have been recovered abroad and show themselves to be truly long-distance travelers, most of the returns coming from Siberia 2000-5500 miles to the north and northeast of Taiwan. One Tree Pipit (Anthus hodgsoni) out of 990 banded was reported from Sakhalin (USSR), a 0.1% return. Six Yellow Wagtails (Motacilla flava) out of 32,205 banded have been reported from various regions of Siberia and Alaska (USA), a 0.02% return on bands.

All the northern recoveries are summer ones (June, July, August), save one on September 20th and another on November 5th, both the latter 2000 miles north of Taiwan. The first was shot (on migration?) and the second was "found dead" (starved, frozen?). In Taiwan, motacillids, like swallows, are banded from September through to May. Unlike swallows, none has been recovered in the Philippines during the winter which suggests that Taiwan is the southern limit and winter quarters for this particular population. This appears to be especially probable for Yellow Wagtails. Such great numbers have been banded in Taiwan that, were there transients in the population, at least a few would have been picked up by now in the Philippines. Tree Pipits, with far fewer numbers banded, could still have escaped recovery from the Philippines, though even that seems doubtful after five years.

The northward migration route for Tree Pipits and Yellow Wagtails probably crosses the Formosa Straits and proceeds northward up the continent. This is implied by the fact that none has been recovered from Korea or Japan, and both these countries work extensively with motacillids.

The Alaskan recovery of a breeding Yellow Wagtail originally banded in Taiwan points up the interesting fact that even though Asian populations of birds mingle with North American populations where they converge in Alaska, these populations return to their respective sources, the Asian birds to Asia, the North American birds to North America after the breeding season.

Black-faced Bunting, Emberiza spodocephala: The Black-faced Bunting is interesting because of what has not been learned. Out of 15,423 individuals banded in Taiwan, not one has been recovered anywhere to the north or south. It is listed as an abundant passage migrant in Korea, yet the Korean team, which works intensively with emberizids, has not picked up one Taiwan-

banded bird. Taiwan, with its sustained and intensive banding of emberizids, has recovered only one Korean-banded bird. The clear implication is that Taiwan's over-wintering buntings by-pass Korea on their north-south migration, probably moving up and down the continent like Wagtails. Further, it seems likely that the abundant passage migrants through Korea do not come to Taiwan, except perhaps an occasional few.

There has been no exchange of buntings either way between Taiwan and Japan, again implying no major migratory connections for emberizids between the two countries.

Brown Thrush, Turdus chrysolaus: One Brown Thrush from a total of 25 banded in Taiwan was recovered in Japan, an unusually high and fortuitous 4% return. This species is a winter resident in Taiwan. The recapture, banded originally in April, as taken on the island of Kyushu at the end of November. The late recovery may possibly be from an individual over-wintering in southern Japan, for it is long past the usual September arrival date of Brown Thrushes in Taiwan. Yamashina's Birds in Japan (1961) lists this species as a winter visitor of Kyushu.

Dunlin, Calidris alpina: The 0.8% return on banded Dunlins comes from one individual out of 121 ringed in Taiwan. It was shot in Sakhalin (USSR) in May, 3000 miles northeast of its banding locality. Dunlins, like most shorebirds, are winter residents in Taiwan. This Dunlin was banded in mid-December

#### SUMMARY

Taiwan is located in a "keystone" position with respect to Asian migrants in that it deals with three different kinds. The eleven species listed and discussed here represent summer residents, winter residents, and transients. With its latitude intermediate between tropical and temperate Asia, Taiwan is bound by migratory routes to both areas, receiving birds from and sending them to these areas. Data is accumulating which will enable the possible correlation of external parasitism and blood infections of these migratory birds to pathways and to seasonal and geographical distribution.

There are three other migrant species for which foreign recoveries are becoming a reasonable expectation: Rubythroat (Erithacus calliope) 560 banded, Pied Wagtail (Motacilla alba) 747 banded, and Yellow Bunting, (Emberiza sulphurata) 887 banded. Beyond these, there are 37 species of migrants which, though they stand less chance of foreign recovery because of the few banded, have just the same been processed for parasitism and blood infection during their Taiwan residency. In brief, therefore, Taiwan's various migrants should be of significant comparative importance in any analysis of pathological data, for Taiwan stands as the gate between the temperate zone and the tropics and plays host to all varieties of migrants.

## HONG KONG

Institution: University of Malaya, Kuala Lumpur, Malaysia.

Responsible Investigator: Lord Medway, Ph. D.

Team Members: F. O. P. Hechtel, Team Leader.

Location of Banding Stations: None for 1968

Birds Banded:	1965	23 species	174 individuals
	1966	82 species	1, 972 individuals
	1967	57 species	882 individuals
	1968	1 species	1 individual
	Total	96 species	3, 029 individuals

Although this project was kept active it was impossible for Mr. Hechtel to get any ringing done. Toward the end of a year he established a "Hawk Rehabilitation Center" where he could hold hawks impounded from dealers which have them for illegal sale. This was in cooperation with the Game and Forestry Department and with the Humane Society. At certain times of the year, mainly during migration, hawks appear for sale at the market. It is hoped that many of these can be brought back to health, ringed and released. These may add to the limited information available on hawk migration in eastern Asia.

## NORTHERN PHILIPPINES

Institution: Philippine National Museum, Manila.

Responsible Investigator: Godofredo L. Alcasid, B.S.

Team Members: Pedro C. Gonzales, Field Supervisor, Dalton Pass;  
T. Oane, Field Supervisor, Palawan. Manuel Celestino, Jaime  
Cabrera and field personnel as needed.

Location of Banding Stations: Luzon: Calatagan, Batangas, 13. 48N, 120. 37E;  
Paracale, Camarines Norte, 14. 17N, 122. 45E; Dalton Pass, Nueva  
Vizcaya, 16. 08N, 120. 55E; Sinipsips, Benguet, 16. 40N, 120. 47E;  
Palawan: Aborlan, 9. 30N, 118. 27E; Iwahig, 9. 40N, 118. 27E.

Birds Banded: Luzon:	1963	12 species	371 individuals
	1964	130 species	4, 293 individuals
	1965	150 species	10, 621 individuals
	1966	164 species	16, 443 individuals
	1967	157 species	11, 020 individuals
	1968	114 species	4, 415 individuals
	Total	240 species	47, 163 individuals
Palawan:	1964	60 species	483 individuals
	1965	115 species	3, 335 individuals
	1966	98 species	2, 444 individuals
	1967	97 species	4, 417 individuals
	1968	95 species	3, 884 individuals
	Total	152 species	14, 563 individuals

The following report was prepared by Mr. Alcasid: The National Museum team continued with the ringing of birds this year giving more emphasis on the migratory species and on somewhat lessened number of individuals in conformity with the directive no longer emphasizing mass banding work but more or less banding on a selective basis. This change of emphasis was partly brought about by a drastic reduction of funds, observations that some species which were mass banded did not show very encouraging numbers of recaptures, indicating that the birds might be passing through areas we have no communication with, and by a desire to work on immediate problems.

So therefore, this year's banding record was somewhat reduced not only because of the reasons given above but also compounded by several



external factors, namely: the year 1968 had been a very dry year. This affected to a great extent the catches at Dalton where the method of catching birds depended largely on the presence of high humidity, fog. A big drop was also noted in Calatagan, Batangas due to extreme dryness. The mud flats where the shore birds used to stay became dusty. These drops were somewhat compensated by an increased take in Camarines Norte and the volunteer work of Dr. Frederick Ludwig of the Cavite Naval Base.

In late 1967 Dr. Ludwig visited the National Museum and learned of our bird banding work. He being a bird bander since childhood in his hometown, volunteered to do some banding work at his backyard in Cavite during his spare time. His efforts accounted for 122 birds. We have been trying to interest some local people to pursue bird banding work on a voluntary basis during their spare time. It seems that we are not yet ready for that. It either comes to asking how much we are willing to pay or that they eat all edible species. Even in the reporting of recaptured birds we end up with considerations for a reward or asking us for them to be employed.

Mr. Oane missed to visit Palawan in July and August largely due to the delay in the processing of the grant funds on our side. Then last November he was visited by two strong typhoons in rapid succession in a week's time, causing him to lose many nets. Palawan is not in the heavy typhoon belt and no strong typhoon has hit this area in the past 30 years. The first typhoon that came took him unawares. Just after he had fixed and installed whatever nets were salvaged, another one came again in stronger fury.

At Iwahig in Palawan, Mr. Oane was able to locate a roosting place of Hirundo rustica on the bamboo slats of a fish coral set in shallow water just off shore. By going there at night, using a small banca, he was able to pick by hand the swallows from their roosts. This way he was able to band and release more than 500 in three nights, after which the swallows moved away. Fig. 48.

Oane and I were in Palawan in November during the migration of the Yellow Wagtail, Motacilla flava. More than 70% of the birds were juveniles with just a light wash of yellow on the abdomen. They spent most of the daytime in newly harrowed or newly planted wet paddy fields feeding, pairing or chasing each other about. Most of the time they avoided the nets set on the levees but occasionally they were caught as they chased each other. On any one day more than five hundred were counted. Late in the afternoon, between five and six, the birds would start moving south flying high well above the bamboo and coconut trees. Their flight, although quite simultaneous, do not constitute a tight mass as in the case of shore birds and terns, but presented that of a loose flock spread over a wide area with individuals weaving and flying in the characteristic dipping and rising wave. The

next day another set of birds would occupy the field. Fig. 52

Gonzales observed the Grey Wagtail, Motacilla cinerea in Camarines Norte to be exhibiting a different pattern. They were plentiful in the rice fields during the month of November staying most of the time in the newly plowed and newly planted fields. They also fed and playfully chased each other. They seemed to be more clever in avoiding the nets. In the evening they would roost in nearby reeds and there was no mass movement in any definite direction. Could it be that Camarines Norte is the end of the line for Motacilla cinerea? It is pertinent to mention here that the Grey Wagtail seemed to be confined to Luzon while the Yellow Wagtail and Pied Wagtail were in Palawan. Fig. 53

Information about migrants: Calidris subminuta, in Calatagan and Camarines Norte this bird begins to come in August but the peak of migration appears to be sometime in November and December, then gradually reducing by January. However, in Palawan the heavier concentration is narrowed down to September. There is no evidence that the Luzon birds proceed to Palawan and vice-versa. Until further observations and positive evidences are on hand it can only be postulated that the Luzon and Palawan birds may belong to different groups or that they come from different routes. Figs. 24-25.

Calidris ruficollis, those for Luzon and Palawan show practically identical patterns, that is migration starting by mid-August, a high peak in September and gradual reduction through January or February. Figs. 16-17.

Charadrius dubius in Palawan starts earlier with the peak occurring in September--October then gradually thinning out from November and ending in March. On the other hand, in Luzon, there is a peak which builds up to October and November and similarly dwindles until March. This behavior is also true for C. leschenaulti and C. mongolus. Figs. 12, 13, 14, 15, 26, 27.

Charadrius alexandrinus is not caught in Luzon while C. peroni is not reported from Palawan. The two exhibit similar patterns of migration, starting in October, a peak in November and then gradually decreasing to March. Fig. 36.

Actitis hypoleucos follows almost identical patterns of migration in both Luzon and Palawan. Figs. 22, 23.

Tringa glareola in Luzon is more erratic with peaks in September and December, whereas in Palawan the capture is more equally distributed with slightly lower counts in November. Foreign recaptures for this species indicate that both the Luzon and Palawan birds breed in the same area in Siberia. Figs. 20, 21.

Capella megala in Luzon is abundant from August to December and practically absent in other months. In Palawan, however, where there are fewer megala, concentrations are heavy from September to December with another peak in February. Fig. 18, 19.

C. gallinago is fewer in Luzon but is encountered in greater numbers in Palawan where the concentration of catches occurs from October through February.

In the case of Capella it may be pertinent to note the observation that in Luzon this bird is heavily hunted which could account for a big drop in the population by January the following year. In Palawan there are fewer hunters most of whom are using a .22 rifle considered not to be effective for snipes on the wing.

Among the warblers, Acrocephalus arundinaceus and Locustella certhiola follow a similar pattern arriving by the middle of August with a peak in September and gradually diminishing in numbers in October through December. Apparently they return northward in May using the same route they came by. Fig. 54, 56.

A. sorghophilus follows practically the same pattern of the two above named warblers with the exception that the drop in numbers is not so sharp in November and December but instead spreads out till February. Fig. 55

Locustella lanceolata apparently comes in a big wave in October but some of them trail behind and are still being caught as late as March the following year. Fig. 57.

It is noticeable among the warblers that none have been caught in April. Does this mean that they are not in the area? One factor which may effect our records may lie in our method of catching the birds. The success of lights at Dalton Pass depends upon the presence of fog. April is the driest month at Dalton and no fogs are formed at night so that no birds were caught. May marks the start of the rainy season and this also is about the time when the birds return on their northward migration. This is attested by a low peak in May. Another observation for the warblers, especially L. lanceolata is that they weaken so easily on handling and many die as a result of the ringing activity. This could account for a big drop in the number of birds ringed for May.

Lanius cristatus is also taken in great numbers at Dalton, starting from late August to a steep peak in September and as suddenly as they came, also suddenly drop out in October. They return, although in much smaller numbers in late April and May. This bird spreads out through central and

southern Luzon after passing through Dalton Pass in their southern migration. They are noisy and occupy territories near habitations so that they are always hunted by children in much the same manner that Chinese catch them in Taiwan. In line with the Taiwan team's study on this bird an observation is hereby reported of a bird ringed in Calatagan, Batangas in October 18, 1966 as a juvenile, 040-55001, was recaptured in the same place on November 7, 1968 or after two years, yet still retaining some barring on the sides. Fig. 28, 29.

Local Species: Among the local species of birds being taken at Dalton, the following need some remarks.

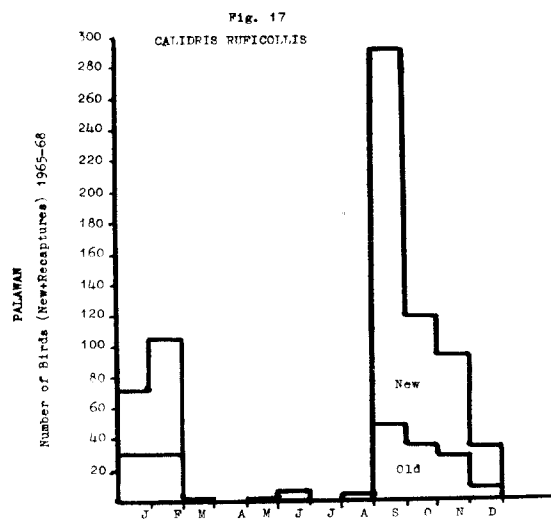
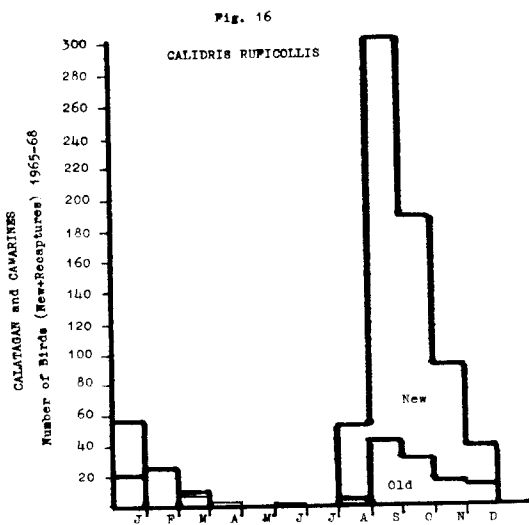
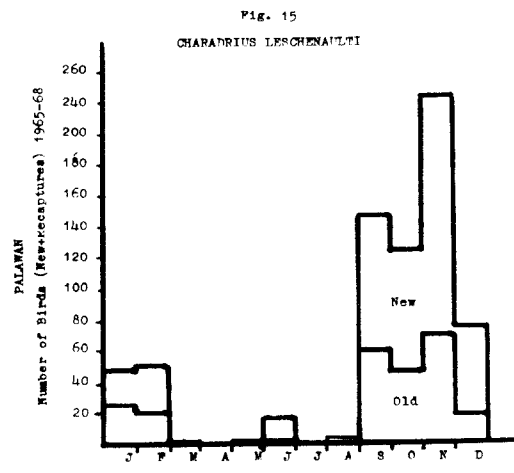
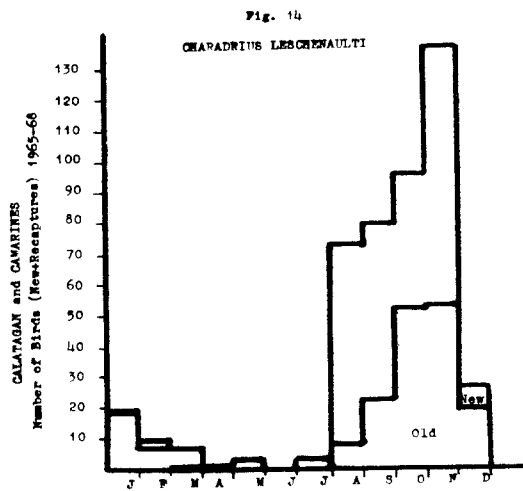
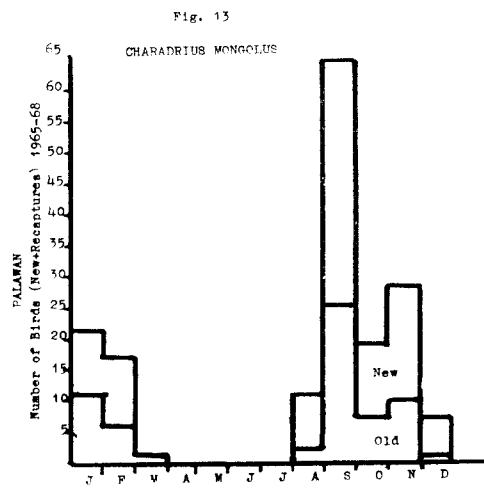
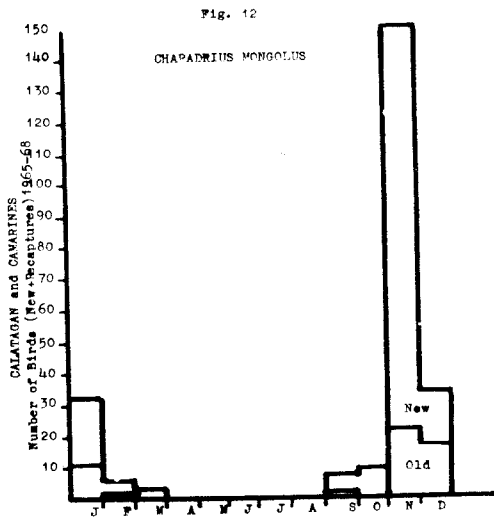
1. Pitta erythrogastrer shows two peaks in its occurrence; a northward movement, mostly adults or full grown in May-June and a southward movement in October-December, consisting mostly of juveniles. The true age of a breeding Pitta is not yet known, however age composition would indicate that breeding occurs in the Cagayan Valley sometime between June and July. Fig. 47

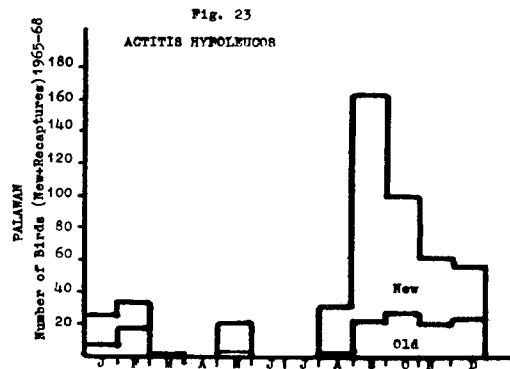
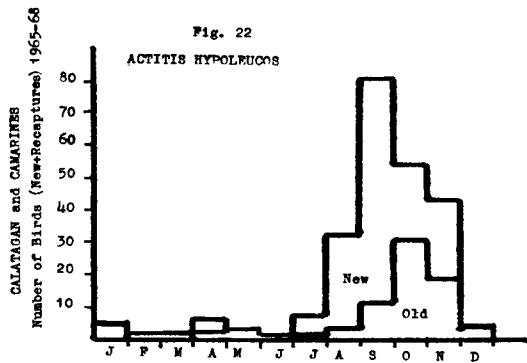
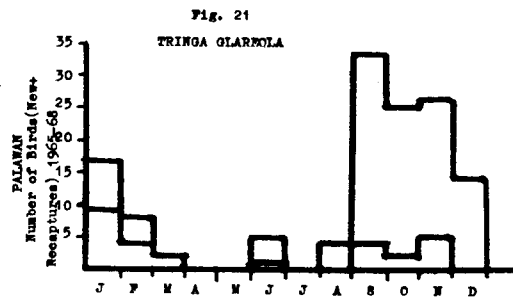
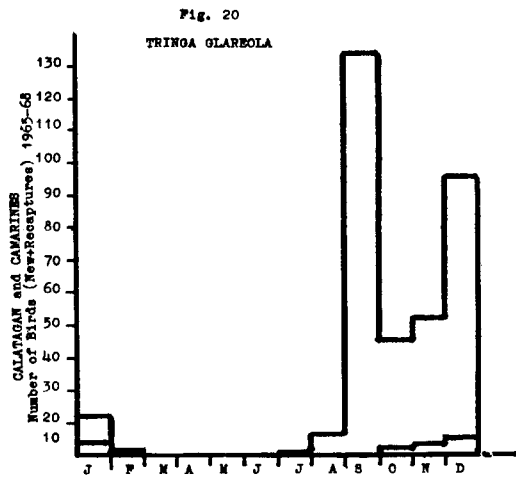
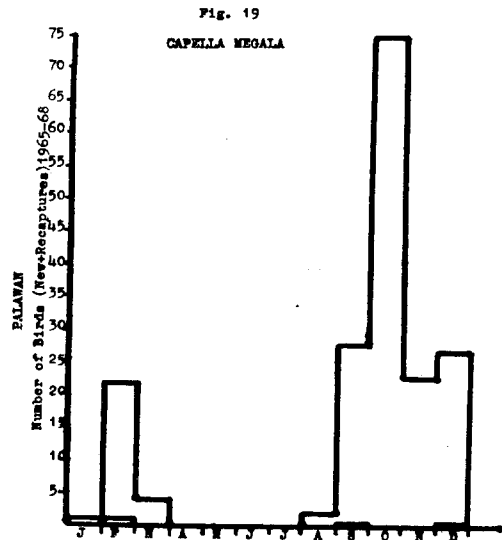
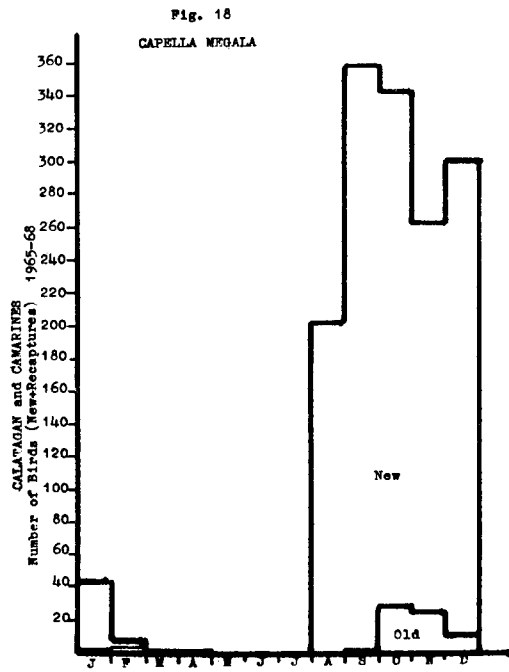
2. Coturnix chinensis. This birds moves northward during December through February and March with a high peak in January and another movement, southward, is recorded during August to October. Fig. 30.

3. Five species of rails, Rallina eurizonoides, Rallus striatus, Porzana cinerea, P. fusca, P. pusilla and P. tabuensis exhibited almost identical migration patterns passing through Dalton on their southward movement from October to January and a smaller movement northward in May and June. Fig. 31, 32, 33.

These are local species which we never suspected of any migratory tendencies and yet were observed in Dalton to be doing a lot of crossings. The extent of the migration is not yet determined nevertheless it points to a deeper study.

Figures 12 through 29 compare the numbers of similar species captured at Palawan and in Luzon and illustrate differences in time of abundance. Figures 30 through 57 illustrate the numbers of birds of other species that have been ringed in Luzon and Palawan.





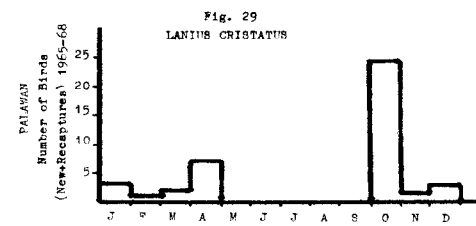
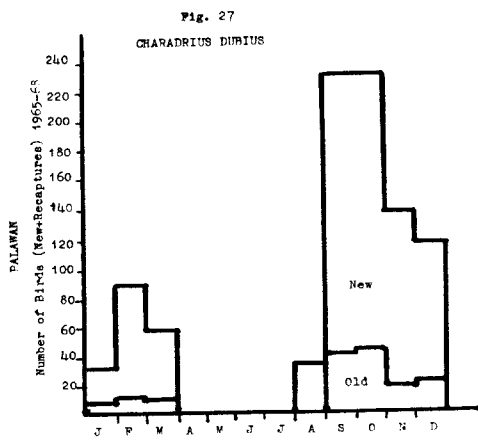
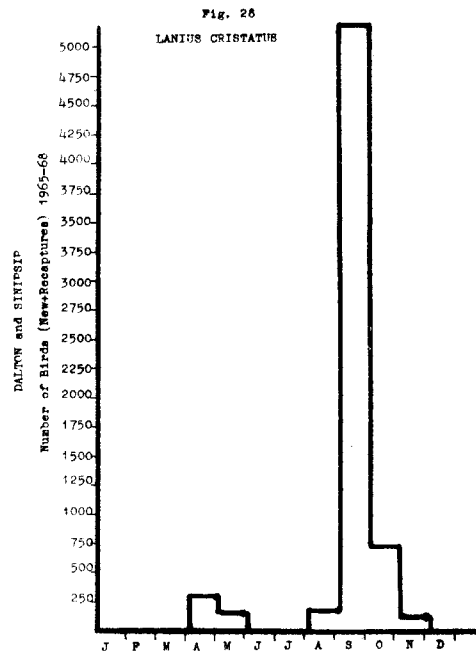
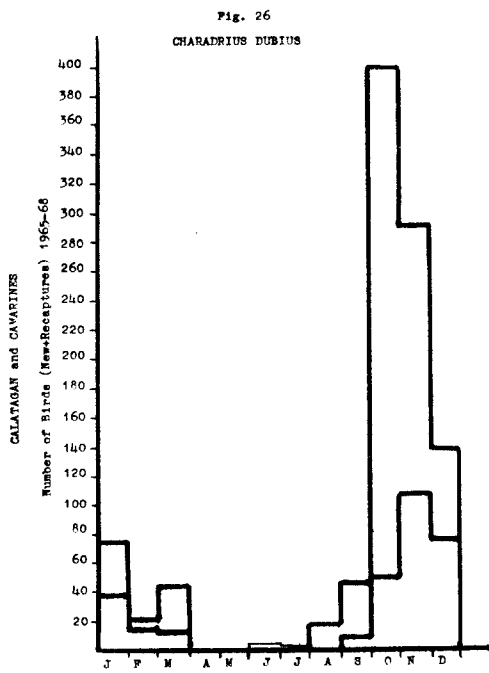
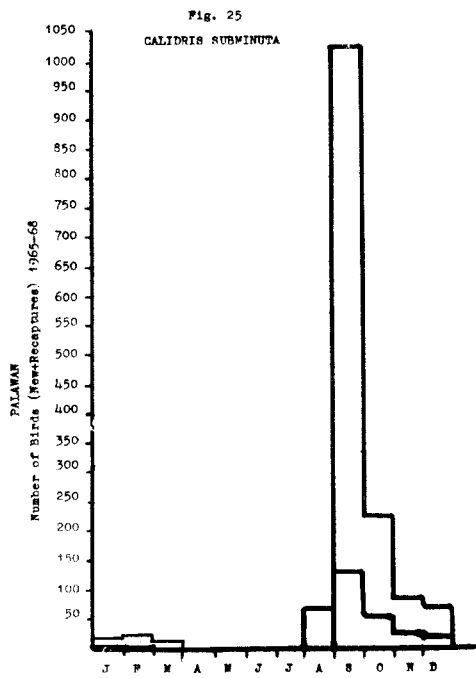
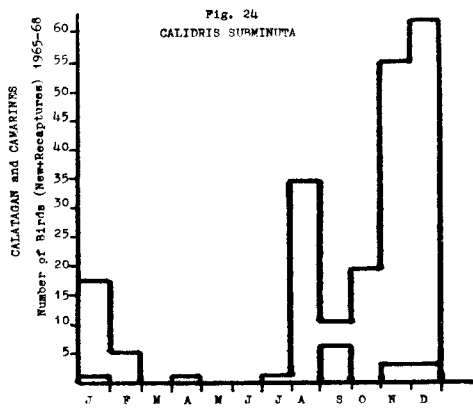


Fig. 30  
COTURNIX CHINENSIS

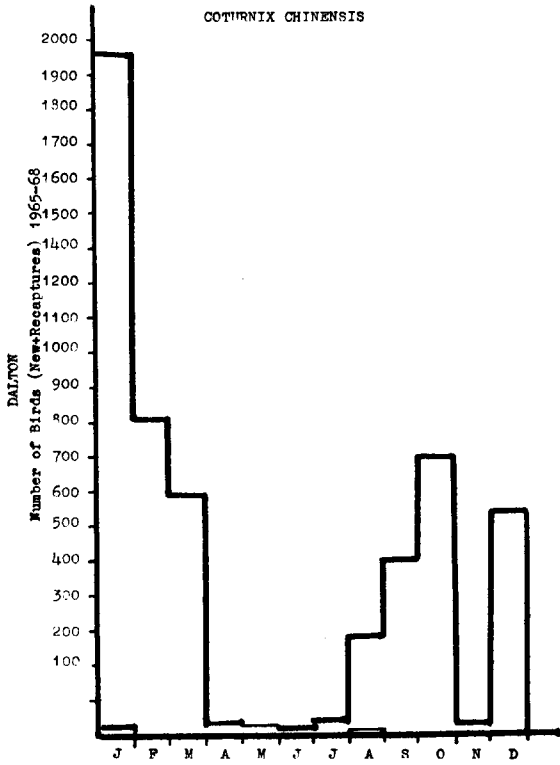


Fig. 31  
RALLINA VIRIZONOIDES

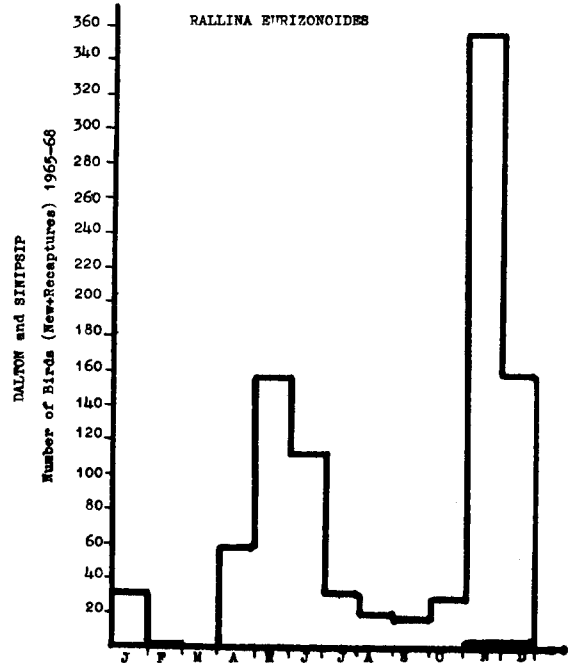


Fig. 32  
PORZANA FUSCA

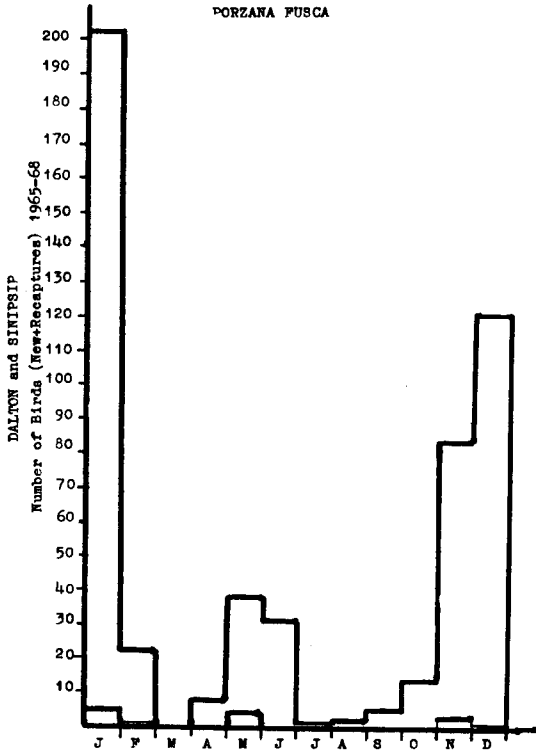
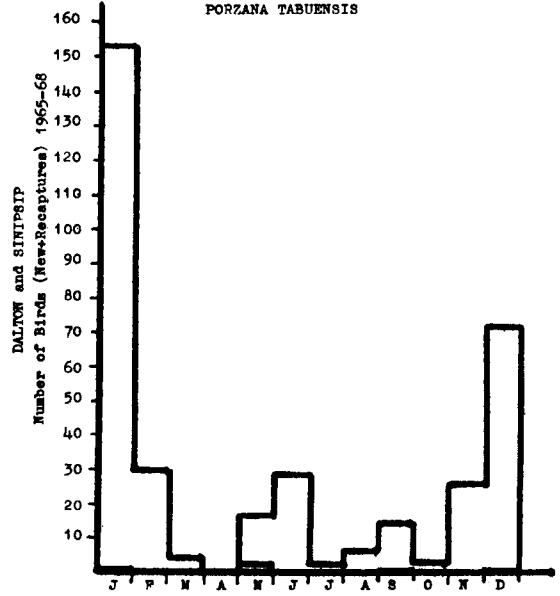
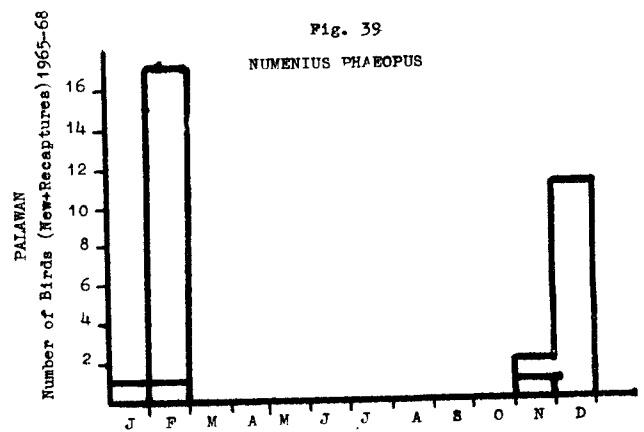
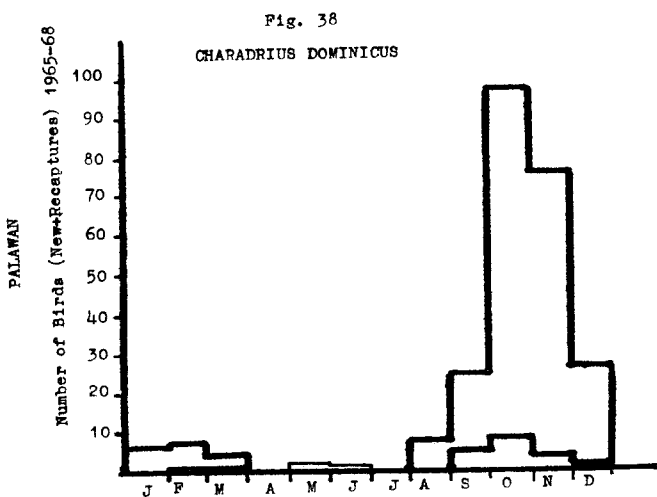
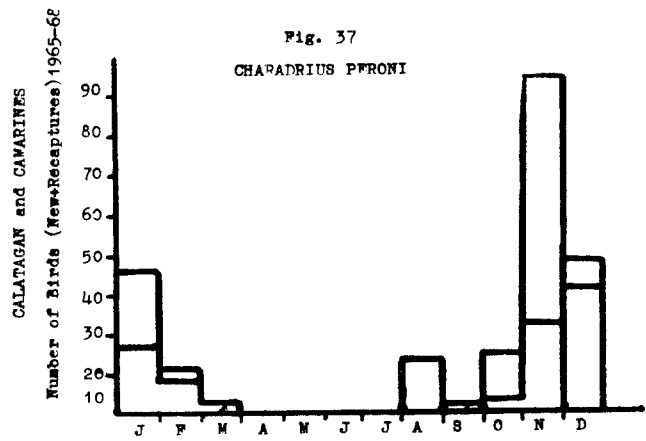
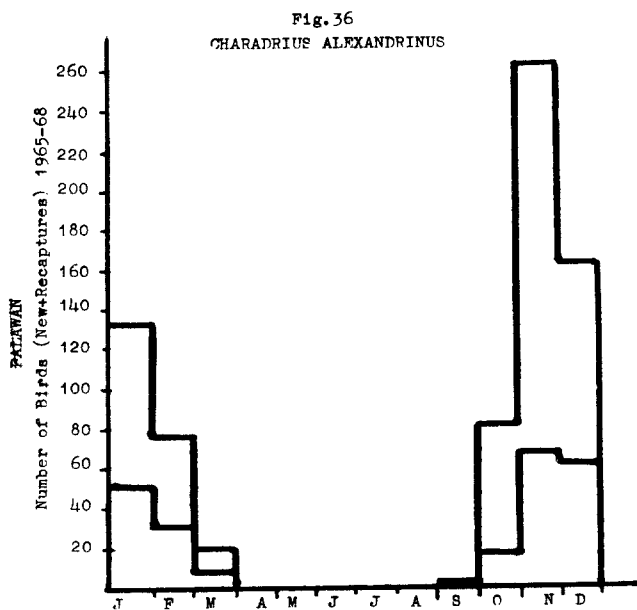
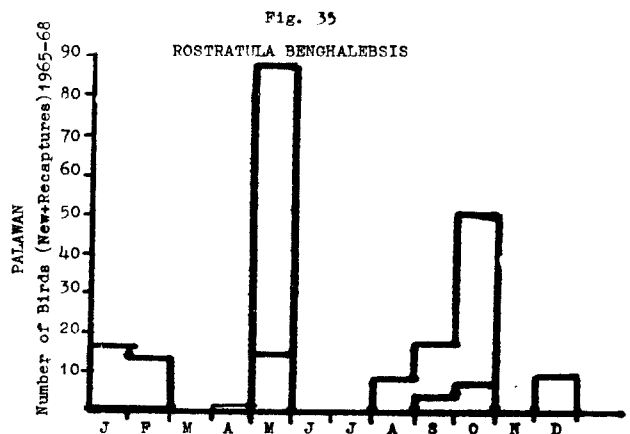
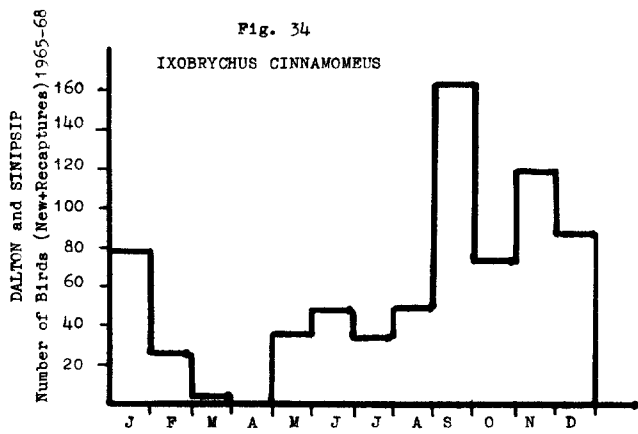


Fig. 33  
PORZANA TABUENSIS







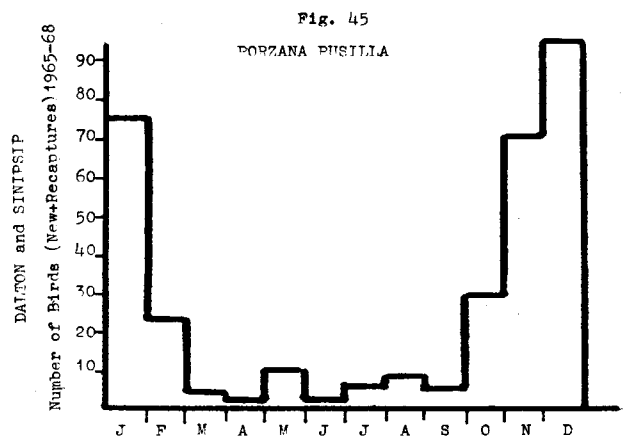
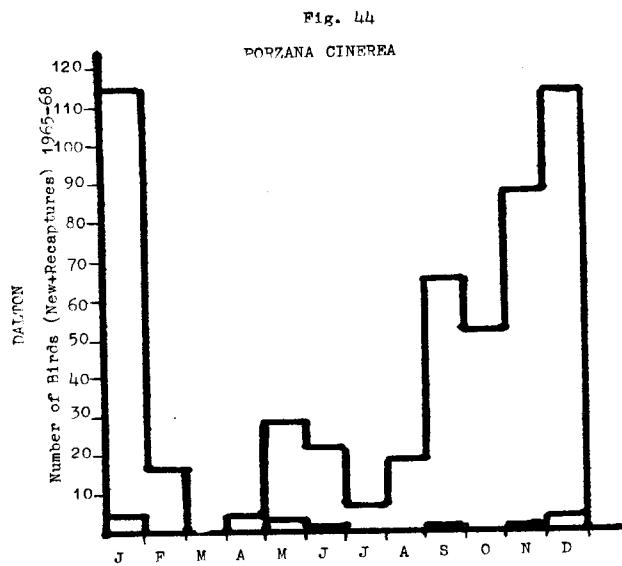
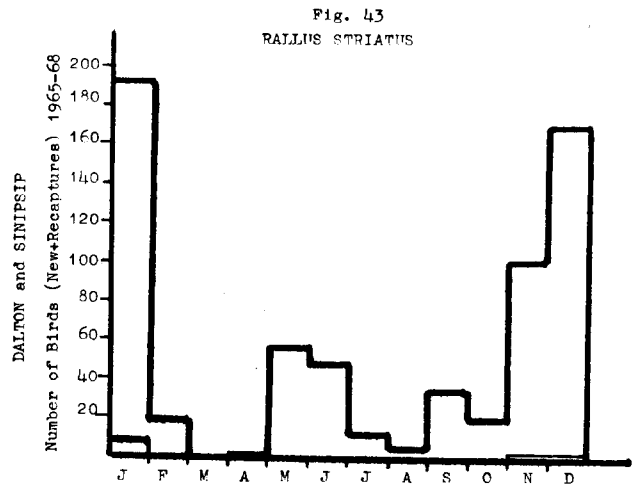
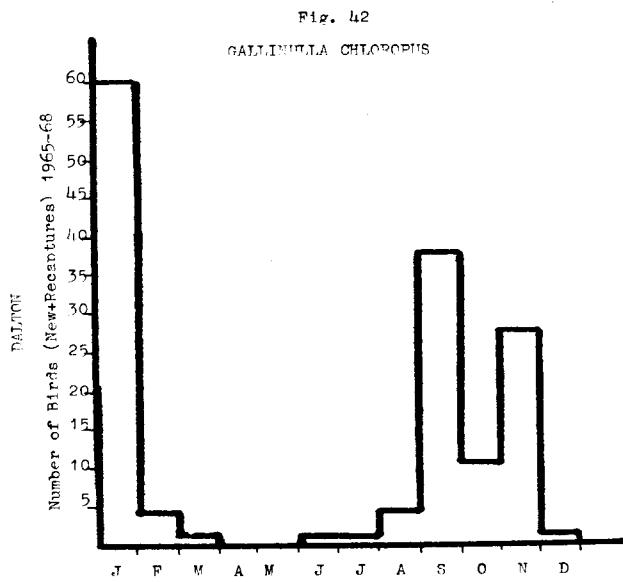
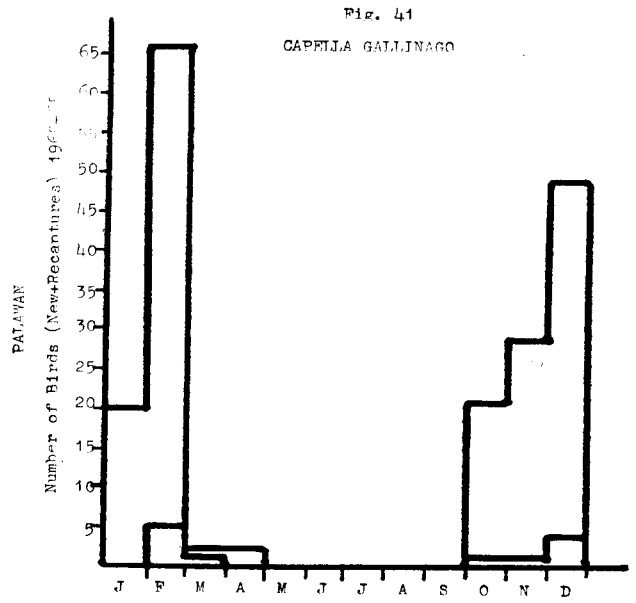
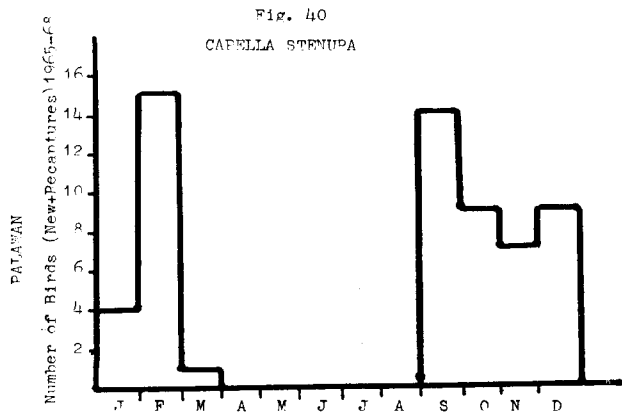


Fig. 46  
ALCEDO ATTHIS L.

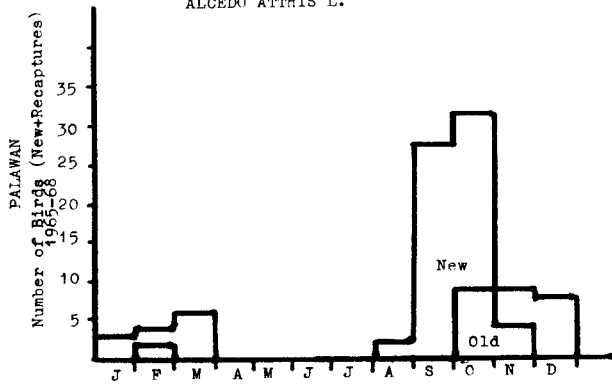


Fig. 47

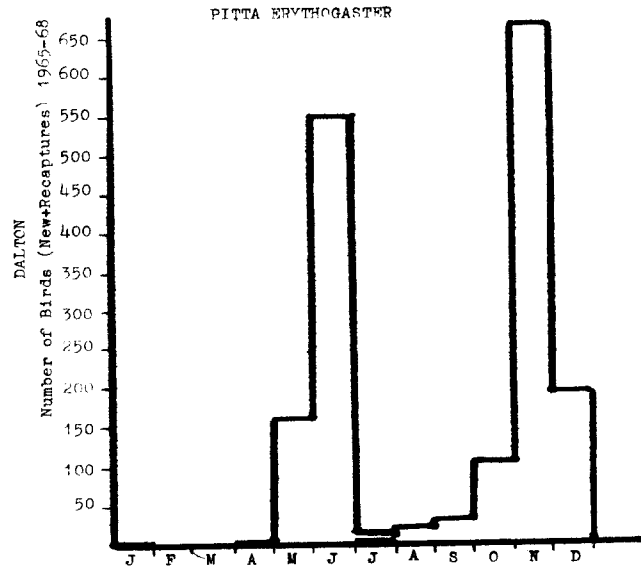


Fig. 48  
HIRUNDO RUSTICA

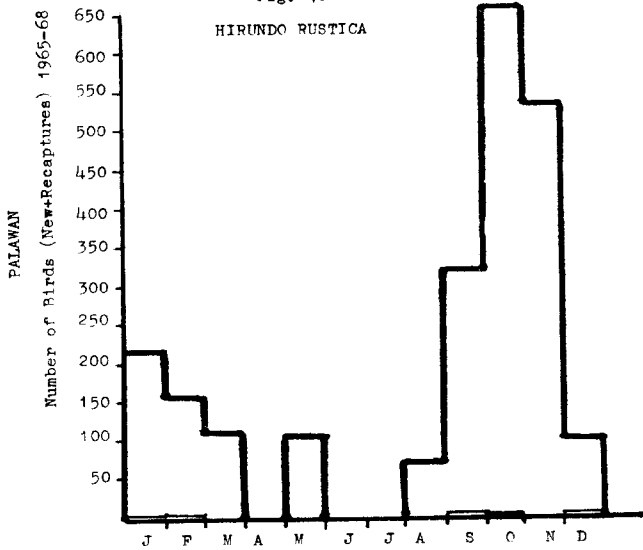


Fig. 49

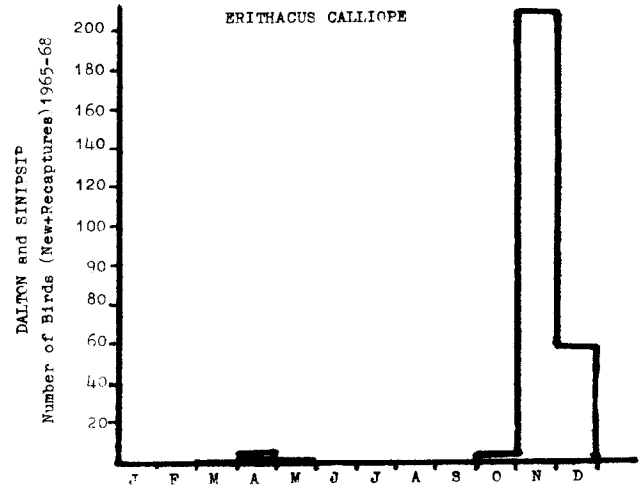


Fig. 50  
MIPAPRA JAVANICA

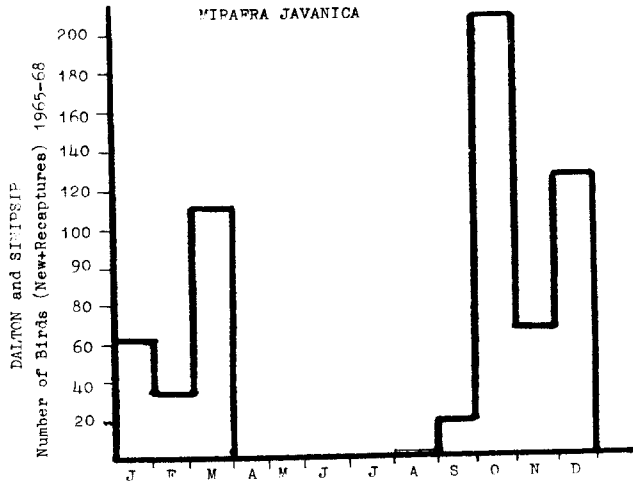
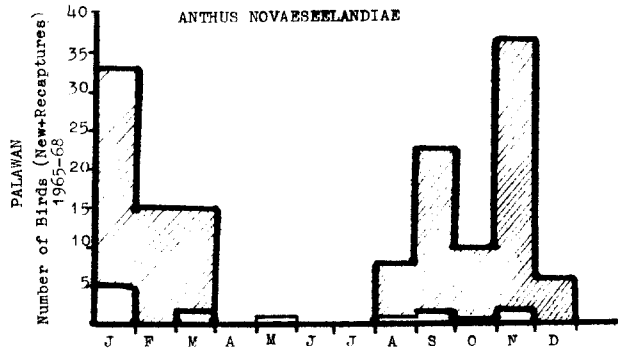
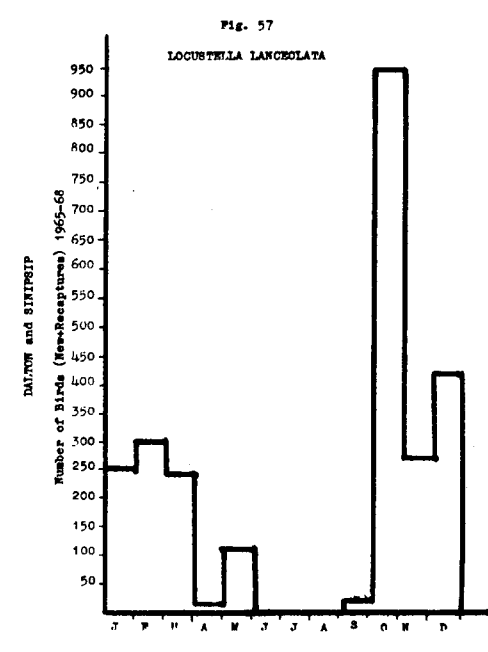
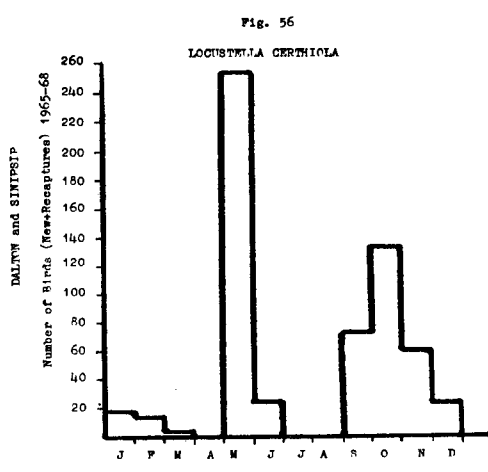
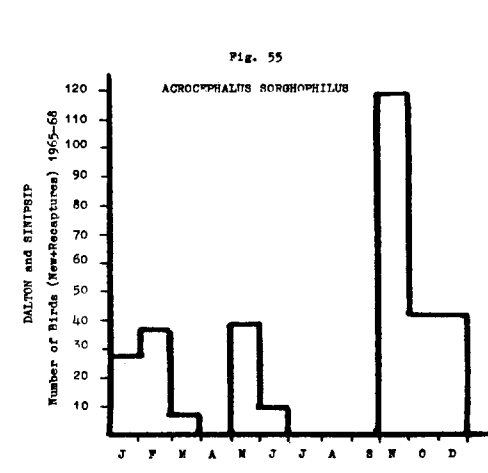
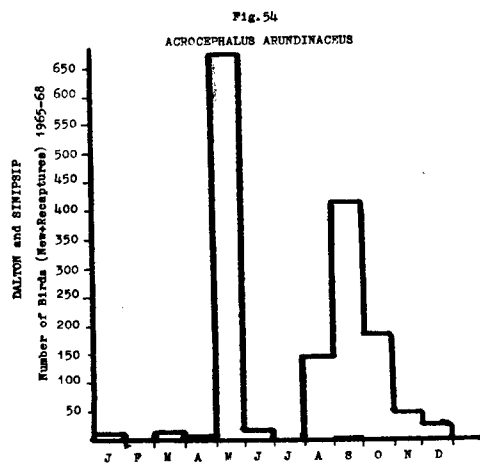
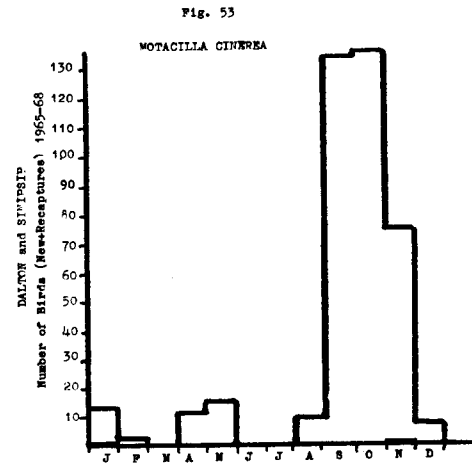
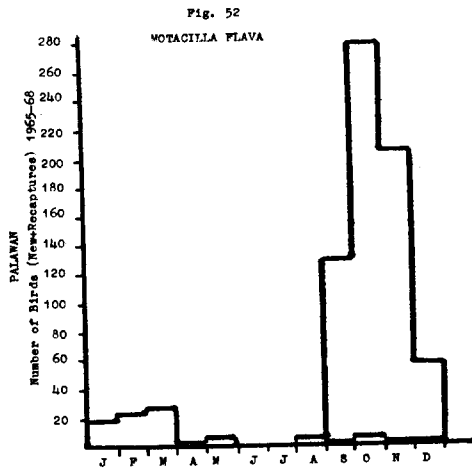


Fig. 51





## SOUTHERN PHILIPPINES

**Institution:** Mindanao State University, Marawi City, Mindanao.

**Responsible Investigator:** Dioscoro S. Rabor, Ph. D.

**Team Members:** Julio R. Leuterio, and new field men whose names have not been reported.

**Location of Banding Stations:** Mindanao Island, Misamis Oriental Province, Tuburan, Tu-od, Manticao Municipality, 8. 23N; 124. 21E, Tu-od, Manticao Municipality (Includes Pagangon), 8. 25N; 124. 18E, Balintad, Tu-od, Manticao Municipality, 8. 25N; 124. 20E, Camp Dunque, Tu-od, Manticao Municipality (Includes Malibato, Opol Municipality), 8. 22N; 124. 25E, Mahayahay (Part Manticao and part Lanao del Norte), 8. 21N; 124. 16E, Maasin, Tu-od, Manticao Municipality, 8. 26N; 124. 19E, Tagbalogo, Naawan Municipality, 8. 34N; 124. 25E, Lanao del Norte Province: Tambo, Munai, 8. 05N; 124. 03E, Lanao del Sur Province: Bacolod Chico, Marawi City, 8. 0N; 124. 15E, Camiguin (South) Island: Camiguin Province: Casangsangan, Catarman, 9. 10N; 124. 40E, Guidag-om, Catarman, 9. 10N; 124. 41E.

Birds Banded:	1966	25 species	2, 830 individuals
	1967	68 species	3, 491 individuals
	1968	59 species	13, 416 individuals
	Total	75 species	19, 737 individuals

No further work was done in Negros this year. The work in Mindanao was constantly interrupted by armed or pugnacious natives and the ringing camp sites had to be moved. The team finally found an area in Misamis Oriental province where local people were not antagonistic to their presence.

The previous field supervisor Warlito Sanguila returned to Silliman University for advanced training and his place was taken by Julio Leuterio. Other team members changed rapidly with changes in banding locations.

Dr. Rabor has not submitted an Annual Report so we do not know what the team has accomplished.

## THAILAND

Institution: Applied Scientific Research Corporation of Thailand, Bangkok, Bangkok.

Responsible Investigator: Prasert Lohavanijaya Ph. D.

Team Members: Kitti Thonglongya B. S., team leader; Preecha Lucha, Nivesh Nadee.

Volunteer Banders: Joe T. Marshall Ph. D., Roger T. Nelson MD, J. M. Anholm DD, Somthop Chaiyaphun MS, H. Elliott McClure Ph. D.

Location of Banding Stations: Satun, Muang, Wang Prachan, 6. 45N, 100. 10E; Phatthalung, Muang, Khuan Kut, 7. 30N, 100. 10E; Ranong, Muang, Ban Bang Non, 10. 00N, 98. 40E; Nakhon Ratchasima (Khorat), Pak Thong Chai, Sakaerat, 14. 30N, 101. 56E; Chiangmai, Muang, Doi Pui, 18. 49N, 98. 54E; Chiangmai, Chiang Dao, Pang Puai, 19. 40N, 98. 54E; Chiangmai, Mae Rim, Ban Khi Lek, 19. 00N, 99. 00E; Chiangmai, Fang, Tham Tap Tao, 19. 50N, 99. 00E; Nakhon Sawan, Muang, Bung Boraphet, 15. 43N, 100. 14E; Petchabun: Thung Salaeng Luang National Park, 16. 56N, 100. 41E; 600-700M. Pitsanuloke: Muang, 16. 56N, 100. 14E; 250M. Khao Yai National Park, 15. 00E, 101. 30N; 400M. Bangkok, 13. 45N, 100. 33E; 10M. Wat Phai Lom, Phathumtani, 13. 55N, 100. 25E.

Birds Banded:	1963	22 species	593 individuals
	1964	303 species	6, 844 individuals
	1965	340 species	30, 270 individuals
	1966	229 species	59, 455 individuals
	1967	282 species	18, 680 individuals
	1968	227 species	30, 654 individuals
	Total	465 species	146, 496 individuals

The Thai team made eight extended field trips in 1968 to northern, central and north-eastern Thailand.

Many rare or uncommon birds were taken during these trips and these are listed below:

Pseudochelidon sirintarae Kitti: Found only from Bung Boraphet, Nakhon Sawan Province.

Alcippe rufogularis major: Formerly known only from Nan and Loei, now collected at Thung Salaeng Luang Nt. Park, Pitsanuloke.

Seicercus castaneiceps sinensis: Now record from Thailand, found on the summit of Doi Pui.

Phylloscopus cantator: Only one bird known from Thailand from Tak, two were collected from Doi Pui. Occurred with Phylloscopus ricketti.

Muscicapa narcissina elisae: One female was recorded for the first time in the Peninsular region from our collection at Phathalung.

Muscicapa leucomelanura: Recorded for the first time from Doi Pui.

Motacilla citreola: Formerly known from Chiangmai & Chiangrai, Dr. Boonsong has another specimen from Nan. Collected more from Bung Boraphet, known for the first time in the central region of Thailand.

Passer rutilans intensior: First record for Thailand, found at Ban Mae Kah; Mae Taeng and Ban Khi Lek, Mae Rim, Chiangmai.

Carpodacus eos: Known for the first time in Thailand and known for the first time outside the breeding ground. Found at Ban Mae Kah, Mae Taeng, Chiangmai.

Erythrura prassina: Known formerly at the south of the peninsular Thailand. Now obtained from Doi Pui and Pang Puai, Chiangdao, Chiangmai.

Emberiza fucata: Deignan listed only in Chiangrai and Nan. One adult male in the plain of Ban Khi Lek, Mae Rim, Chiangmai.

Emberiza spodecephala: Two specimens at Ban Khi Lek, Mae Rim, Chiangmai, known for the first time for Thailand and Chiangmai.

Emberiza melanocephala: Known for the first record, believed to be collected from the south, bought from Sunday Market.

Coturnix coromandelica: Mr. Somthop found common on the SW Thailand, near Kanchanaburi.

Cochoa purpurea: Deignan said that he considered this was the rarest bird in Thailand. One taken at 1,200 meters on Doi Pui, Chiangmai.

Emberiza pusilla: Found at Ban Khi Lek near Chiangmai.

Paradoxornis davidiana thompsoni: One collected in bamboo jungle near the Khék River in north central Thailand.

Carpococcyx renauldi: This bird was first collected from Thailand by E. C. Herbert at Pak Chong in 1915. This present specimen from Thung Sa-laeng Luang National Park is the second record.

The most spectacular discovery of the year was the capturing of a new species of swallow at Nakorn Sawan in February. This species Fig. 58 is related to the African River Martin Pseudochelidon eurystomina Hartlaub and Kitti described it naming, it in honor of Her Royal Highness Princess Sirindhorn Thepratanasuda, the third daughter of King Bhumibol Adulyadei of Thailand, Fig. 59, Pseudochelidon sirintarae. Mr. Kitti says of this bird "The type locality is a swallow, marshy, reed-filled lake of 25,000 hectares. The reeds, Saccharum spp., Arundo spp., and Sorghum spp., mature in the period October to April, and thousands of swallows come to the lake each evening to roost on them. Professional bird-catchers work the lake with boats, going slowly into or close to the reeds at dusk or after dark. They throw fish-nets over the reeds, thus trapping the birds underneath. The new birds were captured in this way during a programme of swallow banding.



**Fig. 58: Pseudochelidon sirintarae Kitti, photos of the first living bird seen at the MAPS headquarters. Note the size of the bird related to the hand, and also its large red foot.**





**Fig. 59: Princesses Sirindhorn and Chulaporn watching Mr. Kitti removing a bird from a mist-net.**

They were found amongst migratory flocks of *Hirundo rustica*, *Hirundo daurica*, and *Riparia riparia* as well as other species of migratory birds (*Motacilla flava*, *Motacilla alba*, *Acrocephalus bistrigiceps*, and *Phragmatocola aedon*). More than 10,000 birds (including about 6,000 swallows) were banded during the last week of January and the first two weeks of February when the nine type specimens were taken. No other specimens of the new bird were seen during further banding operations in the first two weeks of March. The type specimens were the only ones found in banding more than 17,000 birds in this area.

Despite its apparent rarity, *P. sirintarae* seems to be a regular visitor to this marsh since the local catchers have a name for it, "Nok Ta Phong" (swollen-eyed bird), from its conspicuous eye-rings. Nothing is known of its habits. Flight patterns or actions in the air or among the reeds were not observed. In holding cages used during banding, it was noticed that the birds did not perch, but stood quietly in the corner of the cage in strong contrast to other swallows which move rapidly from perch to perch calling repeatedly. The stomach of one bird contained parts of a large beetle."

In December another trip was made to Nakorn Sawan and one more of these birds was collected, this time among nearly 6,000 swallows of three species. This bird was brought to Bangkok for observation. It uttered only a raucous chirp when handled. It did not perch, but sat on the floor of its cage like a martin. As this bird was not released, still nothing is known of its flight patterns or action on the wing.

#### Survey of the Bird Sales at the Bangkok "Sunday Market"

Dr. McClure and Mr. Somthop collaborated in a study of the sale of birds at the Bangkok weekly market known as the "Sunday Market" (preliminary report in the MAPS Annual Report 1967) and a summary of the two years observation is given below: Observations of sale of birds at the weekly "Sunday Market" in Bangkok were continued through 1968. A total of 622,318 birds representing 369 species was tallied during the two year study. These data are summarized by family in Table 16. A detailed report will be published later. Figs. 60 and 61.

Exotic species shipped in from the world markets (London, Hong Kong, Singapore, etc.) made up only 17.1% of the total sales and included 73 species. The bulk of these were parrots and African ploceids. Native species made up 82.8% of the sales. These included more than 1/2 million birds of 51 families. Those families making up more than 1% of the sales were Phasiacidae 1.3, Columbidae 7.5, Psittacidae 4.7, Pycnonotidae 2.5, Motacillidae 2.8, Sturnidae 2.9, Fringillidae 14.0, and Ploceidae 41.4. Although there were 369 species represented in the shops only 19 of them made up sales of

TABLE 16. THE SALE OF BIRDS AT THE BANGKOK "SUNDAY MARKET" LISTED BY FAMILIES.

Family	Total Species	No. Native Species	Total Native Species	% Total Sales	No. Exotic Species	Total Exotics	% Exotics	
Podicipidae	1	1	9	-	0	0	-	
Ardeidae	11	11	202	-	0	0	-	
Anatidae	6	5	649	.1	1	16	2.4	
Accipitridae	17	17	1128	.1	0	0	-	
Falconidae	4	4	363	-	0	0	-	
Phasianidae	17	14	8457	1.3	3	76	.8	
Turnicidae	3	3	1313	.2	0	0	-	
Rallidae	7	7	1369	.2	0	0	-	
Jacaniidae	2	2	46	-	0	0	-	
Rostratulidae	1	1	19	-	0	0	-	
Charadriidae	4	4	19	-	0	0	-	
Scolopacidae	3	3	27	-	0	0	-	
Glareolidae	1	1	2	-	0	0	-	
Laridae	1	1	261	-	0	0	-	
Columbidae	18	15	47045	7.5	3	7650	13.9	
Psittacidae	31	7	29379	4.7	24	44687	60.0	
Cuculidae	8	8	1105	.1	0	0	-	
Tytonidae	2	2	50	-	0	0	-	
Strigidae	9	9	325	-	0	0	-	
Caprimulgidae	2	2	12	-	0	0	-	
Trogonidae	4	4	23	-	0	0	-	
Alcedinidae	9	9	285	-	0	0	-	
Meropidae	4	4	38	-	0	0	-	
Coraciidae	2	2	406	-	0	0	-	
Upupidae	1	1	873	.1	0	0	-	
Bucerotidae	8	8	359	-	0	0	-	
Capitonidae	10	10	2694	.4	0	0	-	
Picidae	14	14	277	-	0	0	-	
Eurylaimidae	3	3	239	-	0	0	-	
Pittidae	5	5	214	-	0	0	-	
Alaudidae	3	1	61	-	2	39	39.0	
Hirundinidae	2	2	33	-	0	0	-	
Campephagidae	2	2	3	-	0	0	-	
Dicruridae	5	5	274	-	0	0	-	
Oriolidae	3	3	793	.1	0	0	-	
Corvidae	7	7	1691	.2	0	0	-	
Timaliidae	15	13	4072	.6	2	212	4.9	
Pycnonotidae	19	18	15660	2.5	1	47	.2	
Aegithinidae	6	6	4396	.7	0	0	-	
Turdidae	7	7	5262	.8	0	0	-	
Sylviidae	3	3	62	-	0	0	-	
Muscicapidae	7	6	16	-	1	2	1.1	
Motacillidae	5	5	17627	2.8	0	0	-	
Bombycillidae	1	0	0	-	1	46	100.0	
Artamidae	1	1	1	-	0	0	-	
Laniidae	2	2	18	-	0	0	-	
Sturnidae	12	11	18497	2.9	1	10	-	
Nectariniidae	7	7	442	-	0	0	-	
Dicaeidae	4	4	3267	.5	0	0	-	
Zosteropidae	1	1	856	.1	0	0	-	
Fringillidae	17	4	87430	14.0	13	12393	12.4	
Ploceidae	32	11	257919	41.4	21	41572	13.8	
52 Families	Total	369	296	515568	82.8	72	106750	17.1

TABLE 16A- AVERAGE NUMBER OF BIRDS FOR SALE PER WEEK.

Family	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Ave	Estimated Total for year
Podicipidae				1.0							.1	.2	.1	5
Ardeidae	.6	5.2	4.2	1.1	1.5	3.7	3.0	2.2	2.9	.4	3.1	1.6	2.5	128
Anatidae	2.0	13.5	50.2	21.7	5.0	2.8	.4	.2	.9	.6	.7	.7	8.1	421
Accipitridae	4.0	23.5	62.0	37.1	20.0	12.7	3.3	2.7	2.9	1.6	.8	2.1	13.7	712
Falconidae	3.0		.7	1.5	15.0	10.7	12.0	3.1	6.1	.9	1.5	.9	4.4	229
Phasianidae	46.6	23.0	132.0	160.0	146.5	67.8	68.4	62.0	38.0	120.0	157.6	157.1	104.0	5408
Turnicidae	5.6		46.2	37.3	42.5	27.8	4.0	.6	.9	16.0	3.9	10.1	16.0	832
Rallidae	5.2	36.5	18.2	5.6	8.0	21.7	9.0	2.7	5.3	29.0	44.0	9.7	16.7	868
Jacaniidae			.6						.1	2.3	1.7	.9	.5	26
Rostratulidae			2.1									.2	.2	10
Charadriidae			1.4	.3			.1			.7			.2	10
Scolopacidae			.1							3.6		.1	.3	15
Glareolidae					.1		.1						.02	1
Laridae	4.4									1.7	18.8	5.0	3.2	166
Columbidae	697.8	781.5	840.4	711.3	540.0	564.7	616.4	685.3	640.0	522.6	672.8	733.6	667.0	34684
Psittacidae	709.2	830.2	1039.5	1008.5	710.7	794.0	856.3	952.5	977.0	941.8	910.4	957.1	903.2	46966
Cuculidae	9.0	23.2	28.1	17.0	22.0	19.0	20.7	7.0	6.7	5.3	6.6	5.5	13.5	702
Tytonidae	1.2	1.5	1.9	1.3		.3		.5		.3	.5	.2	.6	31
Strigidae	.4	2.2	4.7	10.0	13.7	10.1	4.7	2.0	.4	.4	1.2	1.1	4.0	208
Caprimulgidae		.2	.1	1.3			.1				.1		.14	7
Trogonidae		.5	1.6	1.1	.1								.28	15
Alcedinidae	1.8	.2	1.3	3.1	8.3	14.3	1.7	1.5	.3	2.4	6.1	.6	3.5	182
Meropidae	1.4		.2	1.7	.5		.3	1.5	.3				.46	24
Coraciidae	2.4	.2	1.7	8.3	19.1	16.1	4.6	.7	1.6	1.7	4.2	1.7	4.9	254
Upupidae	.8	20.5	20.9	9.5	13.3	28.0	37.0	1.2	.4	3.7	1.1	1.0	10.6	551
Bucerotidae	.2	2.2	2.7	8.5	12.0	16.1	6.3	3.5	1.3	3.0	1.0	.7	4.4	229
Capitonidae	32.4	23.7	27.1	32.3	64.0	60.0	36.4	38.2	31.6	25.4	18.9	17.0	32.8	1705
Picidae	2.2	.2	.2	1.3	4.0	5.1	3.7	5.2	4.1	2.0	4.8	5.0	3.4	77
Eurylaimidae	2.6	1.0	5.5	4.3	3.0	1.5	1.8	1.7	5.0	6.3	1.5	1.6	2.9	151
Pittidae		.5	1.2	2.5	5.0	1.8	10.4	5.0	3.1	.3	.4	.7	2.6	135
Alaudidae			.1	.8	.7	1.8	7.3	2.1		.4	.3	.6	1.2	62
Hirundinidae		.5		.7	.2							3.2	.4	21
Campephagidae			.3							.1			.04	2
Dicruridae	2.0	5.0	2.1	1.0	2.1	3.0	6.7	6.2	4.0	3.1	2.7	2.1	3.3	172
Oriolidae	13.2	13.0	14.5	4.1	9.1	8.7	2.0	1.0	1.4	.9	22.4	20.7	9.7	504
Corvidae	20.6	36.0	47.0	25.0	15.7	16.3	26.4	24.4	17.0	10.7	6.9	11.0	20.6	1071
Timaliidae	43.8	62.5	48.2	20.7	18.0	40.5	73.4	99.0	37.6	58.0	56.9	51.5	52.2	2714
Pycnonotidae	251.0	93.2	119.1	101.5	90.5	263.7	210.4	271.7	207.6	257.0	178.9	212.7	191.5	9958
Aegithinidae	59.2	42.0	48.1	29.3	12.1	41.0	36.7	92.2	100.5	78.4	32.7	59.6	53.6	2787
Turdidae	40.4	45.5	54.2	46.0	70.5	71.0	62.0	62.2	70.0	97.1	60.4	77.0	64.2	3338
Sylviidae	.6	.5	1.5	1.3	.3				.3	3.4	.4	.6	.76	39
Muscicapidae				.5	.3	.3	.1	.1		.3	.7		.22	11
Motacillidae		290.5	499.3	377.3		2.3			300.0	561.4	332.6	107.0	352.5*	18330*
Bombycillidae	3.0	1.2	1.0	1.0								1.5	.56	29
Artamidae								.1					.01	5
Laniidae	.2					.5	1.1	.1	.1	.4		.1	.22	11
Sturnidae	250.0	130.0	103.5	141.3	147.3	186.3	213.1	260.7	252.4	194.4	309.0	415.5	225.7	11736
Nectariniidae		1.2	3.1	.5	2.5	7.1	9.4	19.6	13.3	4.4	.2		5.4	281
Dicaeidae	13.2	10.0	45.0	52.3	50.0	58.3	56.0	40.0	30.0	40.0	48.0	20.0	39.8	2070
Zosteropidae	2.0	8.0	2.5	6.0	4.0	9.1	6.5	14.1	26.0	15.0	15.0	11.0	10.4	541
Fringillidae	2523.2	3037.0	1046.0	421.3	116.5	156.3	180.7	189.3	181.5	266.3	3039.1	3276.2	1217.3*	63300*
Ploceidae	2403.2	1780.2	2422.0	4931.8	5202.5	5268.5	4307.0	4727.2	4706.3	3071.8	2633.4	2489.1	3652.3	189920
52 Families	7310	7331	6763	8251	7409	7796	6537	7560	7363	6358	8656	8684	7589	394628
Total observations	5	4	8	6	6	6	7	8	7	7	10	8	82	
Total species	162	175	233	227	195	196	201	207	200	205	212	211		

\* Based upon those months when the migrants were present.

one percent or greater. Of these, four were exotics (marked by an asterisk) and 15 were native. Table 17.

By actual tally and estimate 622, 318 birds were recorded on 82 Saturdays, since the market was open 50 weeks of each year this represented an estimated annual sale of over 395, 000 birds. No effort is made here to correct these figures because of birds missed through sales or purchases on Saturday or Sunday. This tally is treated as accurate for the sake of discussion.

The purchase of birds for release for "merit" or to be kept as pets would be considered as a luxury item in the average budget. Sales of birds could be considered as a barometer of the public income. The national income in Thailand is increasing and this was reflected in the sale of birds. Table 18 lists the weekly average number of bird species and total birds for sale by months for 1967 and 1968. Because of popular demand more and more species appeared in the market to a peak of 160 species per week during April 1968. Sales were consistently higher in 1968 than in 1967 with 31% more species available each week and an increase of 40% in sales. This meant that the annual weekly average sales went up from 106 species and 6206 individuals to 139 species and 8704 individuals. There was no overlap between the years, for the greatest numbers of species and individuals for sale in 1967 were less than the lowest number in 1968.

In addition to the sale of living birds for pets and for release there was a large unrecorded sale for food. The species most heavily utilized for food included the Ploceus, Lonchura, Emberiza aureola, Rallus, Gallicrex, and several species of snipes and shorebirds. Judging by the bundles of carcasses for sale the traffic in these species was equally as great or greater than that for living birds of the same species.

Observations of similar Emberiza (podocephala, cioides, etc.) in the breeding grounds in Hokkaido and Honshu suggested that a population density of a pair of Emberiza aureola per acre or hectare in their breeding grounds in Eastern Siberia, Manchuria, Hokkaido, and Sakhalin would be considered average or above average. To illustrate the drain on this species in one market alone we have the following figures for one year:

Sale of living birds	87, 000
Mortality in handling at least 20%	17, 400
Sale of birds for food, probably greater than living birds	+ <u>90, 000</u>
Total	194, 400



Fig. 60: Cages of Emberiza aureola at the Sunday Market.

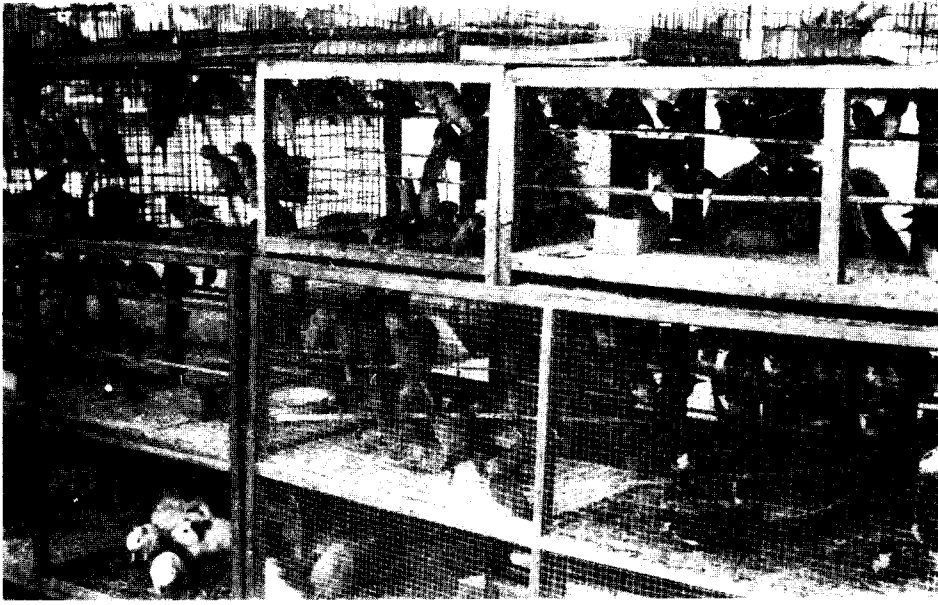


Fig. 61: Birds of sale at Sunday Market; starlings, parakeets, ploceids, Garganey Teal, night herons, purple, gallinule, bulbuls, munia, etc.

Table 17: Species making up more than 1% of sales at Bangkok Market

Species	Percentage
<u>Geopelia striata</u> , Zebra Dove	4.1
* <u>Streptopelia decaocta</u> , Ring-necked Dove	1.1
<u>Streptopelia chinensis</u> , Spotted-necked Dove	2.4
* <u>Melopsittacus undulatus</u> , Budgerigar	6.6
<u>Psittacula alexandri</u> , Mustache Parakeet	1.4
<u>Psittacula roseata</u> , Blossom-headed Parakeet	1.2
<u>Pycnonotus jocosus</u> , Red-whiskered Bulbul	1.5
<u>Motacilla flava</u> , Yellow Wagtail	2.6
<u>Emberiza aureola</u> , Yellow-breasted Bunting	14.0
* <u>Serinus canaria</u> , Canary	1.7
<u>Erythrura prasina</u> , Pin-tailed Parrot-finch	4.7
<u>Estrilda amandava</u> , Strawberry Finch	3.4
<u>Lonchura maja</u> , White-headed Munia	1.8
<u>Lonchura malacca</u> , Chestnut Munia	3.3
<u>Lonchura punctulata</u> , Spotted Munia	14.2
<u>Lonchura striata</u> , Sharp-tailed Munia	1.0
<u>Ploceus manyar</u> , Manyar Weaver	1.5
<u>Ploceus philippinus</u> , Baya Weaver	10.5
* <u>Taeniopygia castanotis</u> , Zebra Finch	1.4
19 species	78.4
350 species	21.6

Table 18: The average number of species recorded and the average number of birds tallied each week at the Bangkok, "Sunday Market"

Months	1967		1968	
	Species	Birds	Species	Birds
Jan.	99	6044	119	7627
Feb.	105	6417	119	8245
Mar.	109	6050	151	7478
Apr.	112	6766	160	9748
May	105	5927	146	10376
Jun.	100	6219	147	8584
Jul.	107	5488	142	7324
Aug.	101	7070	142	7855
Sept.	103	6493	138	8525
Oct.	104	5233	138	7201
Nov.	115	6726	135	12168
Dec.	110	6041	135	9316
Average	106	6206	139	8704



This suggests that the sale at Bangkok is capable of eliminating the entire population of 97, 000 acres, or more than 150 square miles of breeding territory each year. The total drain on this species as it moves south through China and while in its South-east Asian wintering grounds must be appalling. The continued use of more sophisticated trapping techniques (mist nets, etc.) may bring this and other emberizids into the realm of endangered species.

Hardy species such as Emberiza, Ploceus and Lonchura may be able to stand the handling, starvation and crowding of capture and, when released by the Buddhist buyer, may be able to survive. By purchasing fresh caught birds and releasing them at a marsh where there was food and water we were able to keep the immediate mortality of released birds at 1%. What percent died following release could not be determined. If 50% of those released survived to return north then we could adjust the above figures to indicate an overall population loss for 77, 000 acres or 120 square miles.

Other species, especially the motacillids are not rugged and mortality following our releases where we were careful with them was around 10%. It is doubtful if those released by layman survived. Motacilla flava breeds in northern Siberia and we have seen no estimates of their population density. Allowing a density equally as high as the Emberiza places the estimated loss to this environment of flava for 8, 500 acres or 13 square miles each year.

Recommendations for the management of this resource: In spite of the heavy drain on their numbers the emberizids and ploceids are capable of rebuilding their populations quickly. The emberizids breed in the temperate zone, have more than one brood and raise three to five young at each brood. While most tropical species have only one or two young in each brood, the tropical ploceids raise larger families of three to five.

Management of the harvestable surplus of birds in Thailand must consider the following factors: 1. The sale of native birds provides an appreciable percentage of the income of a small segment of the Thai merchants. 2. There is a popular demand by devout Buddhists for birds to release for merit. 3. This traffic in birds must be limited to those species which have a harvestable surplus or which are capable of rapidly replacing their losses. 4. There are epicures who demand birds other than domestic fowl as gastronomic delicacies. 5. That endangered or highly specialized species should not be permitted in this traffic. 6. That humane methods of capture, transport and housing should be enforced. 7. Hunting regulations should receive further study before species to be harvested and bag-limits are to be established.

Based upon two years of observation at the markets the following management plan is recommended: 1. Limit the sale of living birds for release to the Ploceidae, Fringillidae and Sturnidae. 2. Establish a survey to be done by the game wardens assigned to this work to determine the location and abundance of the flocks from which the birds are harvested. 3. Based upon the information and recommendations supplied by these wardens limit the numbers to be sold by each licensed retailer. 4. Limit the use of wild birds for food to the ploceids that damage rice (Ploceus, Passer, Lonchura). 5. Limit the sale of birds for pets to imported exotics and to a few hardy native species. These could include Gracula religiosa, Psittacula spp., Oriolus chinensis, Geopelia striata, Streptopelia chinensis. 6. Encourage the dealers to establish aviaries for breeding popular species so as to reduce the number of wild caught individuals. 7. Encourage dealers and aviculturists to establish an avicultural society. 8. Although the sale of many families is not great, to prevent exploitation of specialized species the dealers should not be permitted to buy or sell Pittidae, Capitonidae, Eurylaimidae, Picidae, Dicruridae, Bucerotidae, Coraciidae, Upipidae, Alcedinidae, Hirundinidae, Ardeidae, Accipitridae, Falconidae, Strigidae, Tytonidae, Muscicapidae, Meropidae, Motacillidae or the rare genera of Phasianidae (Argus, Polyplectron, Arborophila, etc.). The sale of Columbidae should be limited to the seed eating genera which are hardier in captivity than the fruit eating species (i. e. Streptopelia, Geopelia, Chalcophaps).

The above recommendations take in consideration the cost of survey and enforcement (which would not be great), the protection of rare or specialized species, and they still permit a wide selection for pets and release.

Observations of birds purchased at the market, ringed and released: The availability of large numbers of birds at the market offered an opportunity to acquire data on the survival and dispersal of several species from a site of release unrelated to their original points of capture. There appeared to be no systematic collecting of species except by those commercial trappers who exploited roosts. Birds were brought to the wholesalers by individuals who caught a few when they could. (Children who robbed a nest, adults who snared an occasional birds, etc.) Since the animal dealers were friendly and derived benefit from our extensive purchases we anticipated that we would receive rings or banded birds as they were brought in. Unfortunately this was not the case. Even though a purchase price for rings was increased to 15¢ per ring (3 bahts, double the price of the birds) very few were reported. It appeared to be "just too much trouble" to save or record the ring and nearly every dealer who reported a ring or delivered a banded bird also mentioned that he had seen several more in his cages or that the banded birds had died and been discarded. For this reason it is doubtful if more than 10% of the recaptured birds were reported to us. Not a single recovery was reported from the thousands of emberizids and ploceids which were prepared for food.

In this case the butchers must have been suspicious of the rings and discarded them all.

From the data at hand two interesting studies resulted: 1. Notes on the persistence of homing in several species; 2. The population pressure in the immediate environment surrounding ASRCT.

Homing among the purchased birds: To have known the exact points of capture and recapture of released birds would have been desirable, but information from shop keepers indicated that their suppliers worked restricted areas. Also the fact that a given bird was again for sale at the market indicated that it had returned to its original territory. Table 19 lists the recaptured birds and the information available about them.

One Baya Weaver was bought three times: 030-64979, 17 June 1967, 25 May 1968, and 21 September 1968. Birds banded at Bang Phra, 100 km SE of Bangkok were caught there by commercial trappers and sold at the market. None of these are known to have been recaptured back at Bang Phra. Some of the weavers returned to their roosts as much as 120 km away.

Lack of recoveries from Yellow-breasted Buntings was remarkable; none from their breeding territory, probably in northern China and only one recaptured a year later in the vicinity of Bangkok. Many may have been recaptured for sale or food in Bangkok but were not reported. If the return from their breeding grounds had been as great as the return of the weavers to their roosts we should have found at least 27 banded birds among the thousands for sale at the market. Recapturing only one would suggest a harvest of this species too great to be supported for long.

Records from the migrant Yellow Wagtail supported the information from House Swallows (see page 69) that some migrants move through Thailand from roost to roost before going on south. One released in March 1967 was recaptured a year later on its way north at the marshes of Nakorn Sawan 230 km N. of Bangkok. A second bird, banded at Nakorn Sawan in March 1968 was recaptured near Bangkok in October 1968 on its return trip south.

Effect of releases on the bird population at ASRCT: The environment in the immediate vicinity of the ASRCT included rice fields, a permanent grass and reed filled marsh with an open pond, bamboo thickets about adjacent farmyards, and isolated clumps of trees or brush. Observations in the area indicated that there were 27 species that used the habitats regularly, many of which were resident and nested there. These 27 species included about 149 birds. During the two years 1142 individuals of 20 species of residents were released. The habitats were apparently occupied at saturation levels for none of the breeding populations showed an increase. Two migrant or semipermanent populations, the Black Drongo and Burmese Roller, were increased by the releases and banded birds were seen in the vicinity. All other released residents apparently dispersed. Some, as the rails, might have remained in the marsh but were not seen.

Table 19: Records of birds bought at Sunday Market, Bangkok and released at Bangkhen in the outskirts north of Bangkok. (ASRCT = Applied Scientific Research Corporation of Thailand). Recovery date is the date the bird was again found in the market.

Band No.	Date + Place Banded	Date Recovered	Remarks
<u>Baya Weaver, Ploceus philippinus</u>			
020-39843	12 April 66 Bang Phra	1 June 68	Recaptured at Bang Phra 100 km SE and brought to Bangkok.
020-39880	22 April 66 " "	"	"
020-39916	19 May 66 " "	"	"
020-51674	3 May 67 " "	"	"
020-51683	8 May 67 " "	"	"
030-70512	17 June 67 ASRCT	"	"
030-64713	13 May 67 "	27 May 67	Point of recapture unknown
030-64821	27 May 68 "	2 Nov. 68	"
030-64604	6 May 67 "	15 Aug. 67	"
030-84132	6 July 68 "	23 Nov. 68	"
030-64715	13 May 67 "	2 Sept. 67	"
030-64609	6 May 67 "	3 Aug. 68	Recaptured 70 km W.
030-64979	17 June 67 "	24 May 68	Recaptured 20 km W.
030-64979	17 June 67 "	21 Sept. 68	Recaptured again and brought to market
030-70934	25 May 68 "	12 Aug. 68	Recaptured 80 km N. W.
030-36221	21 Sept. 68 "	15 Mar. 68	Point of recapture unknown
* 843 had been recaptured at Bang Phra by bird banders on 24 August 66, 12 May 67 and 5 January 67. 880 had been recaptured at Bang Phra by bird banders on 23 May 66.			
<u>Manyar Weaver, Ploceus manyar</u>			
020-81759	26 Aug. 67 ASRCT	17 Aug. 68	Point of recapture unknown
020-38249	11 Mar. 67 "	3 Jun. 67	"
<u>Spotted Munia, Lonchura punctulata</u>			
-73170	?	Nov. 68	Report from catcher incomplete
015-73354	21 Sept. 68 ASRCT	23 Nov. 68	Point of recapture unknown
015-66687	2 Mar. 68 "	20 Jul. 68	"
<u>Sharp-tailed Munia, Lonchura striata</u>			
013-72921	19 Aug. 67 ASRCT	16 Sept. 67	Point of recapture unknown
015-73380	21 Sept. 68 "	15 Mar. 68	Nakorn Sawan, 230 km N.

Table 19, page 2

Band No.	Date + Place Banded	Date Recovered	Remarks
<u>Yellow-breasted Bunting, <i>Emberiza aureola</i></u>			
015-66066	20 Jan. 68 ASRCT	10 Nov. 68	Point of recapture unknown
014-35312	18 Nov. 67 "	19 Nov. 67	Found dead 1 km N.
<u>Yellow Wagtail, <i>Motacilla flava</i></u>			
010-89484	14 Nov. 66 ASRCT	26 Oct. 68	Point of recapture unknown
013-69237	4 Mar. 67 "	15 Mar. 68	Recaptured and released at Nakorn Sawan, 280 km N.
014-56023	15 Mar. 68 "	26 Oct. 68	Recaptured near Bangkok 230 km S. Released at ASRCT
016-21782	7 Dec. 68 "	16 Feb. 69	Bangkok, 8 km S.
<u>Pied Starling, <i>Sturnus contra</i></u>			
050-27978	21 Dec. 68 ASRCT	24 Dec. 68	Found dead 2 km N.
<u>Golden-crowned Myna, <i>Ampeliceps coronatus</i></u>			
050-27940	10 Aug. 68 ASRCT	17 Aug. 68	Found dead 1 km S.
<u>Yellow-vented Bulbul, <i>Pycnonotus goiavier</i></u>			
030-38295	15 Jul. 66 ASRCT	6 Jul. 68	Recaptured at Sattahob 57 km S. Released at ASRCT
<u>House Swallow, <i>Hirundo rustica</i></u>			
012-16510	7 Jan. 66 Bangkok	Dec. 68	Killed in Bangkok
012-29452	14 Jun. 66 "	"	"
012-30322	17 Jan. 66 "	21 Dec. 68	Recaptured in Bangkok
012-55074	28 Dec. 66 "	21 Dec. 68	Recaptured in Bangkok and released at ASRCT
016-22639	16 Dec. 68 "	"	Found dead at ASRCT
<u>Lesser Thick-billed Green Pigeon, <i>Treron curvirostra</i></u>			
080-07116	25 Aug. 68 Bangkok	9 Sept. 68	Shot near Ayuthya 40 km N.
<u>Giant Nightjar, <i>Eurostopodus macrotis</i></u>			
070-19801	17 Feb. 68 ASRCT	20 Feb. 68	Found dead 1 km N.
<u>Indian Hanging Lorikeet, <i>Loriculus vernalis</i></u>			
040-67252	3 Aug. 68 ASRCT	31 Aug. 68	Found dead 1 km N.
<u>Black-winged Kite, <i>Elanus caerulus</i></u>			
090-13925	9 Mar. 68 ASRCT	16 Mar. 68	Shot 25 km N.

The presence of an extensive marsh with abundant food in the surrounding rice fields and local trees for nesting suggested that the area could support a population of Ploceus and Lonchura. A release of 3,300 ploceids failed to establish them, therefore some element of the environment was refractory to them.

The release of 9,065 birds of 68 species not regularly found in the area failed to establish them and all apparently immediately dispersed. Several were reported at a distance from the ASRCT indicating that they were attempting to return to their points of origin or to a more favorable habitat. Table 20 lists the releases and their apparent results.

It is commonly recognized among ecologists that most environments are filled to saturation by the species of animals that they can support. Fluctuations in these populations fall within the capabilities of the environment to support them. The layman labors under the illusion that habitats once depleted may be refilled by releases of either local or exotic species. This little experiment involving a release of 10,000 birds of nearly one hundred species at one point illustrates the difficulty of getting a group of habitats to accept more individuals. Only if the habitat is improved or altered favourably for a given species can a population change be expected and then mainly through the natural spread from surrounding occupied habitats.

House Swallow Banding: Recapture rates of swallows netted in downtown Bangkok during the winter of 1967-68 suggested that the birds were not remaining in Bangkok all winter, but were moving on following a brief stay. If the population had remained the number of recently ringed birds should have increased. The percentage of the birds recaptured during the same season did show a rise, but it was probably related only to the increased numbers of birds banded. If the birds were not remaining then the numbers of birds ringed in previous seasons should fluctuate. The data for both seasons (Oct. 66-Mar. 67 and Oct. 67-Mar. 68) indicate a build up of all birds followed by a reduction as they moved on. No birds of the Oct. 68-Mar. 69 season were captured until March and then the number of previously marked birds was very low. This may have been related to the lateness of the study and might indicate that the older birds left early in the spring.

Forty-five swallows were recaptured more than once. The survival indicated by these birds was as follows: Number to survive 12 months, 45, 15 months 41, 18 months 41, 21 months, 41, 24 months 32, 27 months 12, 30 months 12, 33 months 12, 36 months 3. Table 21.

A bird ringed 012-27618 in 13 Jan. 1966 at Bangkok was recaptured there on 29 Mar. 67. In addition to the Hong Kong ring it had on its other foot a band of thin metal with the writing Noi, Khorat. There was no date. The

Table 20: The status of the birds in the vicinity of the Applied Scientific Research Corporation of Thailand and the species that were released there.

Species	Number Present or Tallied	Number Released	Residence Status at ASRCT	Results of Releases
Pond Heron, <u>Ardeola ralloides</u>	0	1	Resident in nearby rice fields	Did not remain
Cinnamon Bittern, <u>Ixobrychus cinnamomeus</u>	0	3	Not seen in area	Did not remain
Chinese Little Bittern, <u>Ixobrychus sinensis</u>	0	1	Not seen in area	Did not remain
Shikra Goshawk, <u>Accipiter badius</u>	1	2	Occasional in winter	Did not remain
Asiatic Sparrow Hawk, <u>Accipiter virgatus</u>	1	3	Occasional in winter	Did not remain
Black-winged Kite, <u>Elanus caeruleus</u>	1	20	Resident in vicinity	Quickly left, one recovered 15 miles N
Black-eared Kite, <u>Milvus lineatus</u>	1	0	Winter resident in area	None released
White-rumped Falcon, <u>Polybrierax insignis</u>	0	3	Not seen in area	Did not remain
Painted Quail, <u>Coturnix chinensis</u>	0	32	Not recorded, but should be present	None seen after being released
Migratory Quail, <u>Coturnix coturnix</u>	0	15	Not recorded, but should be present	None seen after being released
Barred Button Quail, <u>Turnix suscitator</u>	0	34	Not recorded, but should be present	None seen after being released
Yellow-legged Button Quail, <u>Turnix tanki</u>	0	4	Not recorded	None seen after being released
White-breasted Waterhen, <u>Amaurornis phoenicurus</u>	0	52	Not seen on the marsh	None seen after being released
Watercock, <u>Gallicrex cinerea</u>	0	14	Not seen on the marsh	None seen after being released
Moorhen, <u>Gallinula chloropus</u>	0	8	Not seen on the marsh	Did not remain
Ruddy Crane, <u>Porzana fusca</u>	0	4	Not seen, but should be in marsh	Not seen after being released
Baillon's Crane, <u>Porzana pusilla</u>	0	9	Not seen, but should be in marsh	Not seen after being released
Slaty-breasted Rail, <u>Rallus striatus</u>	0	3	Not seen, but should be in marsh	Not seen after being released
Pheasant-tailed Jacana, <u>Hydrophasianus chirurgus</u>	0	8	Does not occur in this marsh	Remained for only a day
Bronze-winged Jacana, <u>Metopidius indicus</u>	0	2	Does not occur in this marsh	Remained for only a day
Painted Snipe, <u>Rostratula benghalensis</u>	0	2	May occur in the marsh	Not seen after release
Grey-headed Lapwing, <u>Vanellus cinereus</u>	0	1	Does not occur in this marsh	Did not remain
Red-wattled Lapwing, <u>Vanellus indicus</u>	0	2	Does not occur in this marsh	Did not remain
Common Sandpiper, <u>Actitis hypoleucos</u>	1	0	Winter resident at pools	Did not remain
Red turtle Dove, <u>Streptopelia tranquebarica</u>	2	25	Seen in vicinity	None remained in area
Lesser Thick-billed Green Pigeon, <u>Treron curvirostra</u>	0	10	Does not occur here, a forest species	None remained, one recovered 25 mi. N
Indian Hanging Lorikeet, <u>Loriculus vernalis</u>	0	20	Does not occur here, a forest species	None remained, recovered 1 mi. N
Lesser Coucal, <u>Centropus toulou</u>	0	1	Probably in the area, none seen	Probably did not remain
Spotted Owlet, <u>Athene brama</u>	0	3	Live in nearby groves	Not seen
Collared Scops Owl, <u>Otus bakkamoena</u>	0	5	Live in nearby groves	Not seen
Giant Nightjar, <u>Eurostopodus macrotis</u>	0	1	Does not occur in this habitat	Was found dead a mile away
Burmese Roller, <u>Coracias benghalensis</u>	4	3	Present Feb. to May	Remained in vicinity until group left
Hoopoe, <u>Upupa epops</u>	0	3	Not present	Did not remain
House Swallow, <u>Hirundo rustica</u>	25	7	Resident Sept. until Apr.	May have remained, but not seen
Sand Martin, <u>Riparia riparia</u>	0	1	Not seen in area	Did not remain
Lesser Greybird, <u>Coracina fimbriata</u>	0	1	Not from this habitat	Did not remain

Table 20, page 2

Species	Number Present or Talled	Number Released	Residence Status at ASRCT	Results of Releases
Black Drongo, <u>Dicrurus adsimilis</u>	5	10	Resident from Sept. until Apr.	At least 3 remained in area
Large Racquet-tailed Drongo, <u>Dicrurus paradiseus</u>	0	5	Does not occur in this habitat	Did not remain
Black-throated Laughing thrush, <u>Garrulax chinensis</u>	0	1	Occurs in forest habitats	Did not remain
White-crested Laughing thrush, <u>Garrulax leucolophus</u>	0	22	Occurs in forest habitats	Did not remain
Abbott's Jungle Babbler, <u>Trichastoma abbotti</u>	0	1	Occurs in nearby farmyards	Did not remain
Swinhoe's White-throated Bulbul, <u>Criniger pallidus</u>	0	2	Does not occur in this habitat	Did not remain
Black-headed Bulbul, <u>Pycnonotus atriceps</u>	0	14	Occurs in secondary forest	Did not remain
Blanford's Bulbul, <u>Pycnonotus blanfordi</u>	6	1	Permanent residents	May have remained
Red-eyed Brown Bulbul, <u>Pycnonotus brunneus</u>	0	5	Occurs in secondary forest	Did not remain
Grey-bellied Bulbul, <u>Pycnonotus cyaniventris</u>	0	3	Occurs in forest habitats	Did not remain
Puff-backed Brown Bulbul, <u>Pycnonotus eutilotus</u>	0	3	Occurs in secondary forest	Did not remain
Stripe-throated Bulbul, <u>Pycnonotus finlaysoni</u>	0	10	Occurs in secondary forest	Did not remain
Yellow-vented Bulbul, <u>Pycnonotus goiavier</u>	0	42	Not seen in area, brushland species	Did not remain, recovered 34 mi. S
Red-whiskered Bulbul, <u>Pycnonotus jocosus</u>	0	139	Not seen in area, brushland species	Did not remain
Black-crested Yellow Bulbul, <u>Pycnonotus melanicterus</u>	0	28	Secondary forest species	Did not remain
Large Olive Bulbul, <u>Pycnonotus plumosus</u>	0	1	Farm and Brushland species, not here	Did not remain
White-eyed Brown Bulbul, <u>Pycnonotus simplex</u>	0	2	Secondary forest Species	Did not remain
Gold-fronted Leafbird, <u>Chloropsis aurifrons</u>	0	12	Secondary forest species	Did not remain
Fairy Bluebird, <u>Irena puella</u>	0	2	Forest species	Did not remain
Magpie Robin, <u>Copsychus saularis</u>	2	0	Farm and city species	Did not remain
Ruby throat, <u>Erithacus calliope</u>	0	1	Not seen	Did not remain
Blue Rock thrush, <u>Monticola solitarius</u>	1	0	Resident Oct. to Apr.	None Released
Grey-headed thrush, <u>Turdus obscurus</u>	0	25	Not seen in area	Did not remain
Great Reed Warbler, <u>Acrocephalus arundinaceus</u>	10	14	Resident Oct. to Apr.	May have remained
Streaked Fantail Warbler, <u>Cisticola juncidis</u>	3	1	Permanent resident	May have remained
Black-necked Tailorbird, <u>Orthotomus atrogularis</u>	4	0	Permanent resident	None Released
Brown Wren-warbler, <u>Prinia subflava</u>	6	2	Permanent resident	May have remained
Pied Fantail Flycatcher, <u>Rhipidura javanica</u>	1	1	Resident of nearby thickets	May have remained
Tree Pipit, <u>Anthus hodgsoni</u>	0	1	Not seen in area	Did not remain
Richards Pipit, <u>Anthus novaeseelandiae</u>	2	10	Permanent resident	Did not remain
Forest Wagtail, <u>Dendronanthus indicus</u>	0	195	None seen	Did not remain
Pied wagtail, <u>Motacilla alba</u>	2	6	Present Oct. until Apr.	Did not remain
Yellow Wagtail, <u>Motacilla flava</u>	0	1755	Not present	Did not remain, recovered 150 mi. N
Black-headed Shrike, <u>Lanius nasutus</u>	1	5	Permanent resident in nearby fields	Did not remain
Brown Shrike, <u>Lanius cristatus</u>	2	0	Present Sept. until Apr.	None Released
Gold-crested Myna, <u>Ampeliceps coronatus</u>	0	6	Not in this habitat	None remained, recovered 1/2 mi. S
Philippine Glossy Starling, <u>Aplonis panavensis</u>	0	7	Not in this habitat	None remained
Jerdon's Starling, <u>Sturnus burmannicus</u>	0	37	Not seen here	Did not remain, recovered 1 mi. N
Pied Starling, <u>Sturnus contra</u>	2	81	Resident in nearby fields	Remained a week and then left
Crested Myna, <u>Sturnus cristatellus</u>	2	12	Resident in nearby fields	Remained a week and then left
Ashy-headed Starling, <u>Sturnus malabaricus</u>	0	41	None seen here	Did not remain



Table 20, page 3

Species	Number Present or Tallied	Number Released	Residence Status at ASRCT	Results of Releases
Black-collared Myna, <u>Sturnus nigricollis</u>	2	6	Breed on the ASRCT grounds	Did not remain
Chinese Starling, <u>Sturnus sinensis</u>	0	117	None seen here	Did not remain
Common Myna, <u>Sturnus tristis</u>	8	0	Breed on the ASRCT grounds	None Released
Brown-throated Sunbird, <u>Anthreptes malacensis</u>	0	11	Not seen here	Did not remain
Yellow-breasted Sunbird, <u>Nectarinia jugularis</u>	0	13	Not seen here	Did not remain
Van Hasselt's Sunbird, <u>Nectarinia sperata</u>	0	5	Resident of secondary forest	Did not remain
Scarlet-backed Flowerpecker, <u>Dicaeum cruentatum</u>	0	35	Town and farm resident, not seen here	Did not remain
White-eye, <u>Zosterops palpebrosa</u>	0	4	Forest inhabitant	Did not remain
Yellow-breasted Bunting, <u>Emberiza aureola</u>	0	3845	Not seen here	Remained few days, but soon left
Pin-tailed Parrot-Finch, <u>Erythrura prasina</u>	0	55	Not present in this habitat but could be	Did not remain
Strawberry Finch, <u>Estrilda amandava</u>	0	50	Not present in this habitat but could be	Did not remain
White-headed Munia, <u>Lonchura maja</u>	0	10	Not present in this habitat but could be	Did not remain
Spotted Munia, <u>Lonchura punctulata</u>	4	922	Occasionally seen on lawns	Did not remain
Sharp-tailed Munia, <u>Lonchura striata</u>	0	252	Not seen in this habitat	Did not remain
Pegu House Sparrow, <u>Passer flaveolus</u>	0	79	Not seen in this habitat	Did not remain
House Sparrow, <u>Passer montanus</u>	50	11	Permanent resident, breeding in building	Ringed birds were not seen
Manyar Weaver, <u>Ploceus manyar</u>	0	399	Not seen, but could be supported here	Did not remain
Baya Weaver, <u>Ploceus philippinus</u>	0	1587	Not seen, but could be supported here	Did not remain, recovered up to 70 miles away
Total Species	27	88		
Total Birds	149	10207		

72

Table 21: The Distribution of "Returns" among House Swallows captured at Bangkok

Month	Total Captured	This Season	Recaptured Birds Banded During			
			1 Season Ago	2 Seasons Ago	3 Seasons Ago	4 Seasons Ago
Dec. 66	490					
Jan. 67	2169		11.2%	4.4%		
Mar. 67	2072		17.0	7.6		
Oct. 66-Mar. 67	4731	.6%	6.6	3.3		
		.2	10.7	4.9		
Nov. 67	4146	.4				
Dec. 67	1460	1.2	1.6	9.5	3.9%	
Feb. 68	2581	1.4	1.4	10.0	5.0	
Oct. 67-Mar. 68	8187	2.4	1.3	7.5	3.0	
Mar. 69	2718	1.2	1.5	9.0	3.8	
			.9	.6	1.2	.4%

band had only recently been put on the bird for the foot was injured by it and still not healed. Apparently this bird had been captured and released by someone named Noi who lived at Khorat (Nakorn Ratchasima, 14. 20N, 101. 56 E) about 300 km north-east of Bangkok.

Open-billed Storks: In 1967 specimens of the soft tick, Argas (P) robertsi Hoogstraal, Kaiser and Kohls 1968, from the Open-billed Stork colony at Wat Phai Lom were found to be infected with Nyamanini virus which is a virus known from Africa. In November 1968 when the storks returned to Wat Phai Lom to nest a study was initiated to follow the population of ticks as it developed in the colony and to learn if the ectoparasites infested other birds at the peak of the population. Samples of living ticks were submitted to the Virus Department of the SEATO Medical Research Laboratory for analysis. To date every pool of ticks has been infectious, killing mice after an eight to nine day incubation. Further studies are in progress.

Studies in Northern Thailand: During the past three years eight trips have been made to Northern Thailand to operate in the vicinity of Chiangmai. One series of collections was made on Mt. Doi Poi at elevations of 1, 300 to 1, 500 meters in broad-leaved evergreen to deciduous forests. The other series of collections was made near Ban Khi Lek at 350 meters in man-disturbed habitats of cultivation, secondary growth, and brushland. Tables 22 and 23 illustrate the faunistic differences in these two areas. Although more species were present on the mountain they were more difficult to net. The average take was 68 birds per day with 120 species recorded in the mountains and 138 birds per day of 80 species in the valley. Fifteen species were taken both on the mountains and in the valley. Eleven of these were more abundant in the valley habitats; 43 times as many were ringed as on the mountain. This was a ratio of . 7 birds per day in the mountains and 50. 7 per day in the valley. Four species were more abundant on the mountain, but only slightly so, 1. 6 times as many ringed. On a daily basis the takes were the same . 3 per day in both areas.

During 1966 and 1967 Dr. Joe Marshall made a study of the vertebrate fauna of the Red Cross House Farm, Bang Phra, Cholburi. Following is an excerpt from his report which is to be published by the Siam Society.

Studies at Bang Phra: The Red Cross Farm, operated by the Pasteur Institute to produce horse antivenin, is 75 km SE of Bangkok at 50 m altitude, 13° 12' N by 100° 57' E in Sriracha District, Cholburi Province. It lies on a plain used for agriculture between wooded hills fronting a reservoir to the east and mangroves and village along the gulf coast 1. 5 km to the west. Most of the 16 hectares of the farm is in close-cropped pasture with scattered large rain trees and mangoes, the 130 horses use the pasture in the morning and the rest of the time are kept in large stables.

Table 22: The number of Birds banded in Northern Thailand at (M) Doi Pui, 1300 to 1500 meters and at (V) Ban Khi Lek, 350 meters. This illustrates the relative abundance and ease of captive at different months in these areas.

			J	F	M	A	M	J	J	A	S	O	N	D	Total	Birds Per Day
Number of Days		M	29				9				8	13			59	
		V	15	2			6					13			36	
17 Non-Passerine Families; Species	30	M	60				73				13	51			198	3.3
		V	59	5			26					113			202	5.6
14 Passerine Families; Species	19	M	98				66				11	25			200	3.4
		V	17	2			6					57			82	2.3
Alaudidae	0	M													0	0
	1	V	4				23					195			222	6.1
Pycnonotidae	8	M	237				129				110	47			523	8.8
	4	V	293	36			77					207			613	17.0
Timaliidae	24	M	872				323				249	257			1701	28.8
	3	V	86	16			44					101			247	6.8
Paradoxornithidae	1	M	49				42				1	25			117	1.9
	0	V													0	0
Turdidae	10	M	39				29				1	11			80	1.3
	6	V	52	29			16					112			209	5.8
Sylviidae	11	M	425				12				20	46			503	8.5
	14	V	277	61			79					326			743	20.6
Muscicapidae	11	M	309								42	121			530	8.9
	5	V	47	5								52			104	2.9
Motacillidae	1	M	17									1			18	.3
	4	V	4	3								119			126	3.5
Laniidae	0	M													0	0
	3	V	82	11								75			168	4.7
Ploceidae	3	M	2				2				4	1			9	.1
	6	V	1293	41			32					879			2245	62.3
Fringillidae	2	M	129												129	2.2
	1	V	7									3			10	.3
Total	120	M	2238				735				451	586			4010	67.9
	80	V	2222	209			302					2248			4981	138.4

Table 23: Species netted in both highlands and lowlands of Northern Thailand, arranged to indicate those species caught more often in the valleys (first 11 species) or in the hills (last 4 species)

		Jan.	Feb.	May	Oct.	Total
Centropus sinensis	M	1				1
	V	2				2
Cacomantis sonnerati	M	1				1
	V	1			1	2
Pycnonotus aurigaster	M	4		1		5
	V	3	2	3	28	46
Erithacus calliope	M	2				2
	V	22	15		31	68
Copsychus malabaricus	M			3	2	3
	V	6	2			10
Phragmaticola aedon	M			1		1
	V	35	9	12	37	93
Orthotomus sutorius	M	2				2
	V	23	6	12	29	70
Terpsiphone paradisi	M			1		1
	V				3	3
Anthus hodgsoni	M	17			1	18
	V	3	3		85	91
Lonchura striata	M	1		2	4	7
	V	10	2	1	29	42
Lonchura punctulata	M	1				1
	V	800	35	23	541	1399
11 Species Total	M	29		8	5	42
	V	905	74	51	796	1826
Otus bakkamoena	M	2			5	7
	V	2			4	6
Pellorneum ruficeps	M	6		1	2	9
	V	1	1			2
Erithacus cyane	M				1	1
	V	1				1
Hypothymis azurea	M	1			2	3
	V				3	3
4 Species Total	M	9		1	10	20
	V	4	1		7	12

The aim of the vertebrate effort was to provide the laboratory with large numbers of blood samples, taken serially as recaptures permitted, from accurately identified individuals of the abundant small vertebrates at the serum farm. Problems of identification necessitated preparing some museum specimens and embarking upon a taxonomic review of all the rats and mice of Thailand. Data and age, reproduction and home range accumulated through handling and recording the animals but a scientific population study was precluded by heavy use of the farm. Capture stations could not be set up in a regular pattern and had to be confined to thickets, banana patches and streamsides unfrequented by horses.

The various wild animals caught by hand, noosed, netted and live-trapped, were bled from the heart except that birds were bled from the right jugular vein and mice from the retro-orbitai sinus after injecting 0.3 ml of saline into the body cavity of the mice. A few of the smallest birds died but most survived bleeding. The donor animal was identified, toe-clipped or supplied with an aluminum numbered band or ear tag, weighed, measured, sex determined, inspected to determine the reproductive condition and these data, along with date and specific location of capture were recorded on a punch card before the animal was released. The duration of the study was from February 1966 through 1963.

Of the common species of birds and mammals, a population many times in excess of what could be directly observed in the field was uncovered by netting and live trapping. Although most individuals were not captured again, the many that were recaptured over periods up to two years indicate a remarkably sedentary behaviour, an attraction to a home range or territory. In a given species there would be multiple recaptures of a few land-owning adults on areas up to 150 m across. A greater number, presumably mostly immatures, showed restriction also but to a wider area of about 400 m diameter. Some of them eventually settled down to a small area as they filled the ranks of the territorial hierarchy. Thus there is a large floating component and a smaller stationary component in each species population.

Of the 102 species of birds captured at or near the Serum Farm, 31 are migrants which breed in northeast Asia and spend their winter in Thailand. Most occupy fixed areas during their stay, as do the year round residents. Eight additional migrants merely pass through the horse farm in spring or fall between breeding stations to the north and wintering grounds farther south. The influx of passage and wintering migratory birds had swollen the bird population by a third or half in October. This is also the time, at the end of the rainy season, when the resident population is at its height from recent nesting.

A peak breeding season could not be discerned in records of 194 female

fruit bats that were pregnant, lactating, or carrying a baby. Most of the pregnancies were in February and June. For rodents generally, pregnancies were scattered from July to March but concentrated in the cold months from November to February. Within these months the proportion of immature individuals increases to exceed the number of adults.

Breeding and molting season of birds is the same as in the north temperate zone except that it is spread over a longer time, involving more variation and less synchrony among individuals. Display and singing begin in January; nesting (judged from the incubation patch in adults and appearance of juveniles in the population) extends from February through July. After that the population is at least doubled by immatures. Exceptional birds are rice-feeding weavers and doves whose utilization of human agriculture is doubtless correlated with a long breeding season from December through August. Lizards and particularly the geckos, which have vocalizations of apparent use in advertising territories, seem to have the same reproductive season as the birds.

Weaver-birds (Ploceidae: Passer, Ploceus, Lonchura) were permanently resident at the horse farm but could be netted little if at all from October through January. The explanation seems to be in daily sorties to ripening grain in rice paddies at that season. The closest paddies are 2 and 4 km away. Passer flaveolus, at least, would return to the horse farm in flocks to roost in bamboos.

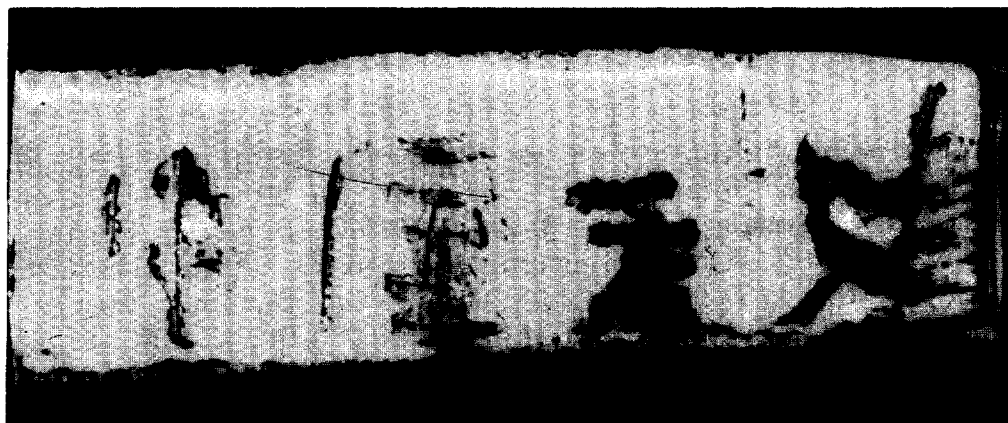


Fig. 62: The Tientsin band, found on a Barn Swallow already bearing our band, no. 013. 22977. Greatly enlarged.

## MALAYA

Institution: U. S. Army Medical Research Unit and the Zoology Department of the University of Malaya, Kuala Lumpur.

Responsible Investigator: Lord Medway, Ph. D.

Team Members: Husain bin Othman and Dawam bin Hazah.

Volunteer Banders: Bird-banding continued to attract amateur enthusiasts who were supplied with free rings and in return submitted their records on the forms provided by MAPS. Those active in Malaysia in 1968 were Messrs. B. D. Bond, L. H. Lee, J. B. Mitchell, K. W. Scriven and C. S. Tan; the Science Society of the Bukit Bintang Boys' School, Petaling Jaya, worked at Sungei Way. Many members of the R. A. F. Ornithological Society and the Army Bird-Watching Society, both based in Singapore but often working also in the States of Malaya, gave valuable support during the year. In Perak, the State Game Department under Inche M. K. Mohamed Khan completely took over the annual banding of nestling night-herons at Kuala Gula. Several staff members and students of the University of Malaya School of Biological Sciences (including J. K. Charles, P. H. Soo and D. R. Wells) are engaged in research using bird bands, although not receiving any outside grants. Their records were also submitted to MAPS, and mention of their work is included in the report below without further distinction. The contribution of these volunteer banders to the Malaysian/Singapore totals for 1968 was considerable, and their work accounts for much of the wide geographical spread of banding in the two countries.

Location of Banding Stations: Ampang, Selangor, 250 ft., 3.07N. 101.46E; Bagan S. Puloh, Selangor, 0 ft., 3.03N. 101.22E; Balik Pulau (Pg. Kemunting), Penang, 15 ft., 5.21N. 100.17E; Bentong, Pahang, 300ft., 3.30N. 101.54E; Changi, Singapore, 20-40 ft., 1.22N. 104.00E; Fraser's Hill, Pahang, 4750 ft., 3.40N. 101.45E; Gn. Benom, Pahang, 1700 ft., 3.38N. 102.8E; Gombak, 13th mile, Sel. 600 ft., 3.18N. 101.43E; Gombak, 16th mile (Field studies centre), Sel. 800ft., 3.20N. 101.45E; Gombak, 21st mile, Sel. 1700 ft., 3.21 N. 101.47E; Gombak, Genting Simpah (up), 4000 ft., 3.23N. 101.46E; Gombak, Genting Simpah (down) 2800 ft., 3.22N. 101.47E; Kledang Besar, Malacca, 2.13N. 102.13E; Kaki Bukit, Perlis, 6.38N. 100.12E; Karak, Pahang, 3.25N. 102.03E; Kluang Jungle Reserve, Johore, 2.05N. 103.27E; Kisap F. R., Langkawi, 500 ft., 6.22N. 99.53E; Kuala Gula, Perak, 0ft., 4.52N. 100.32E; Kuala Krai, Kelantan, 150 ft., 5.30N. 102.10E; Kuala Lumpur, Sel. 3.8N. 101.43E; Kedah Peak, Kedah, 3200 ft., 5.48N. 100.27E; Pantai Jungle Reserve.

Johore, 1. 55N. 103. 55E; Pasoh, F. R., Negri Sembilan, 300 ft., 2. 58N. 102. 18E; Pulau Tekukor, Jeram, 0 ft., 3. 09N. 101. 16E; Rantau Panjang, 10 ft., 3. 02N. 101. 25E; Raub, Pahang, 250 ft., 3. 48N. 101. 52E; S. Renggam F. R., Johore, 1. 59N. 103. 47E; Sungei Way, Sel. 200 ft., 3. 12N. 101. 40E; Subang, Sel. 200 ft., 3. 10N. 101. 35E; Singapore, (Seletar), 20 ft., 1. 23N. 103. 52E; Sungei Buloh, Sel. 200 ft., 3. 16N. 101. 19E; Tanah Ratah, Pahang, 4000 ft., 4. 28N. 101. 49E.

Birds Banded:	1963	22 species	76 individuals
	1964	211 species	6, 415 individuals
	1965	225 species	26, 130 individuals
	1966	199 species	27, 820 individuals
	1967	244 species	34, 023 individuals
	1968	321 species	25, 902 individuals
	Total	400 species	120, 366 individuals

Following is a summary of reports prepared by Lord Medway:

**General:** Important new work was initiated in only one area, at Pasoh Forest Reserve, Negri Sembilan (Dr. D. R. Wells). This forest reserve has been selected as the site of the joint U. K. /Malaysia I. B. P. (International Biological Program) research programme, and it is hoped that regular bird ringing will yield data relevant to studies on the productivity of the lowland tropical evergreen rainforest. At other localities, the main aim has been to round off projects instituted in earlier years rather than begin new ventures.

During the year we finally completed the transition from MAPS rings (P. O. B. Hong Kong) to our own rings, which bear the return address "P. O. Box 750 Kuala Lumpur"; larger sizes also carry the two Chinese characters meaning "Inform", and the Malay language equivalent, "Beri Tahu".

**Intensive studies of selected species:** Night herons, *Nycticorax nycticorax*: Since 1964 nestlings have been ringed each year at the only known breeding colony of this species in Malaya, at Tanjong Selinsing, near the town of Kuala Gula, Perak. Recoveries (notified in this and previous annual reports) have shown a pattern of dispersion throughout the northern half of West Malaysia, extending in small numbers as far as the southern provinces of Thailand.

In 1968, ringing was carried out entirely by personnel of the Perak State Game Department, who are locally responsible for the enforcement of the laws based on the Wild Animals and Birds Protection ordinance.



House Swallow, *Hirundo rustica*: The most distant recoveries reported were those of the migratory Barn Swallow. Results to date have shown that the breeding range of the population wintering in our area extends over a wide stretch of northeastern Asia, east of longitude 108°E. and north of latitude 37° 50'N. The control in Tientsin represents our first record from China, and makes a story as dramatic as any in bird ringing.

The Barn Swallow concerned (ring number 013. 22977) was first ringed by the University of Malaya team in Karak, Pahang, on 31st Jan., 1967, with a ring bearing the return address, P. O. Box 3443, Hong Kong. This swallow was subsequently retrapped by the same ringers at the same place, on 16th Feb., 1968, having performed the double migratory journey to and from its northern breeding grounds. On retrapping, it was found to be carrying a second ring, most ingeniously formed from a narrow strip cut from the edge of a thin metal sheet (? aluminium) originally painted white on one side. On the painted side, our unknown cooperator had scratched with great delicacy the four characters: 中國天津, i. e. China, Tienstin. He had then rolled his strip round the swallow's leg, with the writing outside. Fig. 62

Chinese experts have pointed out that the character "country", i. e. 國, is written as the abbreviated form in use in mainland China, not ㇇ as common in Taiwan, nor the unabbreviated, 國, almost invariably used by Malaysian Chinese. Even without this calligraphic evidence, we see no reason to suspect a hoax. If these words ever come to the attention of our fellow bird-ringer in Tientsin, we offer warmest thanks and congratulations for his contribution. Because the ring had Hong Kong on it the owner of the home-made ring undoubtedly expected the bird to return there. However, it made a much longer trip, to Malaya instead.

The magpie robin, *Copsychus saularis*: During the year Mr. J. K. Charles finished his study of territoriality and related behaviour in this resident turdid, and submitted his thesis as required for the degree of M. Sc. at the University of Malaya. His work was carried out principally at Rantau Panjang, Selangor, one of the original sites of banding studies in West Malaysia (see below). In the course of his research Mr. Charles used rings provided by the University Bird Ringing Project, and also abstracted information from our past records.

Richard's pipit, *Anthus novaseelandiae*: A second M. Sc. candidate, Mr. Soo Pak Heng, commenced work during the year on the biology of the local subspecies of Richard's pipit, *A. n. malayanus*, which is a common resident of open turf and grassland in West Malaysia. Mr. Soo is also making use of our rings. In return he is providing full documentation of all birds banded in the course of his study, which is being carried out largely on the new Sungei Way Golf Course, Selangor.

Zebra Dove, *Geopelia striata*: The distant recovery of a Zebra Dove unexpectedly suggests that this species may perform extensive local movements. With this dove, as with other birds popular as cage pets, it is necessary to interpret recoveries cautiously. The locality of the recovery in the present instance, on the summit of Gunong Brinchang, invites comparison with the many pigeons and doves taken at Fraser's Hill, although no Zebra Doves were included among them.

Great Reed Warbler, *Acrocephalus arundinaceus*: Many hundreds of Great Reed Warblers have been captured repeatedly in a study of weight and plumage changes before migration in the spring. These data have now been put on computer tapes and analysis of the results of the work are under way. During the analysis it became apparent that certain groups of birds were losing weight. A scrutiny of these data resulted in information concerning the effect of capture upon a bird. Non-bird banders have always said that catching a bird to ring it was traumatic to the bird, which the banders denied. The data shown in Table 24 tends to support the non-bander's opinion. There appears to be a loss in weight for a day or two after the bird has been ringed; a loss which is regained later. This may be the result of the bird remaining in hiding following its capture and not getting a normal feeding for at least a day. Field observations indicate that a bird does not like to be caught in a net and will avoid it having once been caught. This is not so of the bird trapped in a food-baited trap. Apparently the offering of food offsets the fear of being caught.

Table 24: Changes in weight of Great Reed Warblers recaptured within seven days of first capture.

Interval of Days to the next Capture	Number of Birds	Mean Change in Weight in Grams
0	7	-0.13 (+ 0.37)
1	40	-0.55 (+ 0.19)
2	34	-1.00 (+0.24)
3	29	-0.50 (+0.32)
4-5	19	-0.53 (+0.35)
6-7	21	-0.55 (+0.37)

Area Studies: Rantau Panjang, Selangor. Intermittent netting and banding continued to be carried out by H. O. Husain in this area of mixed coconut plantation, scrub and mangrove fringe, where the studies have been carried on since 1960, under the supervision initially of Dr. H. E. McClure (cf. McClure, 1968) and subsequently of Lord Medway. No other banding locality in Malaysia has been worked consistently for so long a time. Analysis of longevity and retrap data is therefore likely to be productive. Seven common resident species, one migrant and one partial migrant have been selected for

intensive treatment. Records have been carded and sorted in preparation for computation.

The Gombak Valley, Selangor. In the upper reaches of the Gombak river, within 15-20 miles of Kuala Lumpur, accessible forest reserve extends on each side of the main trans-peninsular highway and a new feeder road from 600 ft. to 5700 ft. The complete range of native forest vegetation from lowland dipterocarp rainforest to upper montane oak-laurel or ericaeous formations is therefore available for study.

During the year monthly netting continued at the University of Malaya Field Studies Centre, 16th mile, Ulu Gombak, until July. This completed the sixth continuous year of work in the area. In May - July, faunal sampling by netting was also carried out at various elevations in the valley from the lowlands to 4000 ft. Comparison of the species trapped at different elevations will be used in current studies on altitudinal zonation in Malaysia.

Sungei Way, Selangor. This area of reed beds has been worked regularly since February 1964, until April 1968, when systematic netting was terminated. The following common species present have been selected for analysis of moult, weight changes and movement, based on our records: (1) Palaeartic migrants, Acrocephalus orientalis, A. bistrigiceps, Locustella certhiola, Lanius cristatus; (2) Local residents, Pycnonotus goiavier, Prinia flaviventris. One report has been published (Nisbet, 1967), a second submitted and others are in preparation.

Ampang, Selangor. A second area of reed beds, netted regularly by K. W. Scriven and colleagues, which has yielded interesting comparative data for our analyses of the bird species mentioned above.

Pasoh Forest Reserve, N. S. Work in this area of lowland forest began early in 1968, and it is intended that the study should be continued for a full year at least. As noted above Pasoh Forest Reserve is planned to become the site of the Malaysian I. B. P. contribution. The main programme will be concerned with the primary productivity of lowland tropical rainforest, but peripheral studies of secondary or tertiary productivity (i. e. including the birds) will be tied in to give a broader picture of the total productivity of the forest.

Fraser's Hill, Pahang. The major portion of our field effort in 1968 was concentrated on the netting and banding of night-flying migrants taken at the telecommunications station on the top of Pine Tree Hill, Fraser's Hill. Work in previous years had indicated that large numbers of migrants could be trapped here under suitable weather conditions (Nisbet, 1968). In order to discover the effect of weather on trapping, and to establish the duration of

migration and approximate numbers of individuals passing, we decided to man the station continuously, every night of the migratory season. Nets were accordingly first set in early September, and kept in use until 23rd December. During each night, hourly observations of temperature, wind, cloud cover, mist and rain, and moonlight, were recorded, and analysis will show to what extent these factors accounted for variations in catch.

As a result of this work, the annual total Palaearctic migrants ringed in Malaya in 1968 greatly exceeds the numbers ringed in previous years. As many birds as possible were screened for ectoparasites each night, and the impressive results of this intensive study have been submitted separately. (see Section 4).

Totals are given in Table 25 together with numbers picked up dead at three west coast lighthouses at Kuala Selangor and Pulau Angsa, Sel., and at Pulau Undan, Mal. Once again, we are grateful to the Superintendent, Jabatan Talikom, Fraser's Hill, for permission to work at the Pine Tree Hill station, and to the lighthouse keepers of the Marine Department for their continued cooperation.

As noted in previous years, there is broad overlap between the collection from the lighthouses and that from inland. The greater diversity of species taken at Fraser's Hill may be due in part to the more intensive effort applied. At the lighthouses dead birds are gathered each morning, whereas at Fraser's Hill not only are watchers alert throughout the night, but also mist nets are set to catch alive and uninjured birds that might otherwise pass by undetected.

On the other hand, we are only able to work at Fraser's Hill intermittently, whereas the lighthouses are operative every night throughout the migration season. Although a proportion of larger birds (including pigeons) may go into the cooking pot rather than our preserving jars, the total daily collection at all lighthouses can be plotted to show the variations in catch during the season, as for 1966 and 1967 in Fig. 63. It should be noted that in 1966 collections were made only at Kuala Selangor and Pulau Angsa lights. The catch in 1967 has been increased by additional collecting at Pulau Undan, but the pattern of variation in frequency of bird casualties is still seen to be very similar in both years, with a distinct peak in mid-October.

At Fraser's Hill, irregular sampling in 1967 gave the same pattern for small Palaearctic passerine migrants, with a light catch on 23rd Sept., somewhat increased on 30th Sept., greatest in mid-October, tailing off in early November to almost nil in the first week of December (Fig. 64). Although none were caught, it should be noted that thrushes were heard passing overhead by night in early December.

Table 25: Birds attracted to lights at night on the top of Fraser's Hill, 4700 ft., Pahang and those collected at lighthouses. Those species marked with \* have also been night caught at Dalton Pass, Luzon, Philippines.

Species	Fraser's Hill		Lighthouses 1967
	1967	1968	
* <i>Coturnix chinensis</i> , Blue-breasted Quail		1	
<i>Gorsachius melanolophus</i> , Tiger Bittern	1	3	
<i>Dupetor flavicollis</i> , Black Bittern		6	
* <i>Ixobrychus cinnamomeus</i> , Cinnamon Bittern		2	
* <i>Ixobrychus sinensis</i> , Chinese Little Bittern	1	2	
* <i>Rallina fasciata</i> , Malay Banded Crake	13	39	2
* <i>Rallina eurizonoides</i> , Philippine Banded Crake		1	
<i>Porzana paykulli</i> , Chinese Banded Crake	1	2	
* <i>Gallicrex cinerea</i> , Watercock		6	1
<i>Treron curvirostra</i> , Lesser Thick-billed Green Pigeon	56	76	
<i>Treron olax</i> , Little Green Pigeon	1		
<i>Ptilinopus jambu</i> , Jambu Fruit Pigeon	420	582	4
* <i>Chalcophaps indica</i> , Emerald Dove	59	158	
<i>Ducula badia</i> , Mountain Imperial Pigeon		1	
<i>Clamator coromandus</i> , Red-winged Crested Cuckoo	3	9	
<i>Cuculus micropterus</i> , Indian Cuckoo	4	5	
* <i>Cuculus fugax</i> , Hawk Cuckoo		1	
<i>Cacomantis sonnerati</i> , Banded Bay Cuckoo		2	
<i>Chrysococcyx xanthorhynchus</i> , Violet Cuckoo	3	13	
* <i>Chrysococcyx malayanus</i> , Malay Cuckoo		2	
* <i>Surniculus lugubris</i> , Drongo Cuckoo	7	12	
<i>Otus scops</i> , Scops Owl	5	4	
<i>Otus spilocephalus</i> , Mountain Scops Owl		1	
<i>Glaucidium brodiei</i> , Pygmy Owlet		1	
* <i>Ninox scutulata</i> , Brown Hawk-owl		1	
<i>Caprimulgus indicus</i> , Migratory Nightjar	1		
<i>Caprimulgus macrurus</i> , Long-tailed Nightjar		1	
<i>Collocalia brevirostris</i> , Himalayan Swiftlet	1		
<i>Chaetura cochinchinensis</i> , White-throated Spinetailed Swift	2		
* <i>Chaetura gigantea</i> , Malaysian Spine-tailed Swift		1	
<i>Collocalia gigas</i> , Giant Swiftlet		1	
<i>Apus affinis</i> , House Swift		3	
<i>Apus pacificus</i> , Migrant Swift	6	1	
<i>Ceyx erithacus</i> , Black-backed Kingfisher	27	57	5
* <i>Halcyon coromanda</i> , Ruddy Kingfisher	1	4	
<i>Halcyon pileata</i> , Black-capped Kingfisher	2	14	
<i>Eurystomus orientalis</i> , Broad-billed Roller		4	
<i>Pitta moluccensis</i> , Blue-winged Pitta	59	98	
* <i>Pitta sordida</i> , Hooded Pitta	200	275	
<i>Calyptomena viridis</i> , Green Broadbill		4	
<i>Dicrurus annectans</i> , Crow-billed Drongo	45	34	
<i>Dicrurus remifer</i> , Lesser Racquet-tailed Drongo		1	
<i>Hirundo rustica</i> , House Swallow		16	

Table 25, page 2

Species	Fraser's Hill		Lighthouses	
	1967	1968	1967	
<i>Delichon dasypus</i> , House Martin		5		
<i>Motacilla flava</i> , Yellow Wagtail			3	
<i>Dendronanthus indicus</i> , Forest Wagtail		1		
<i>Pycnonotus melanoleucos</i> , Black and White Bulbul		1		
<i>Heterophasia picaoides</i> , Long-tailed Sibia		8		
* <i>Erithacus calliope</i> , Rubythroat		1		
<i>Erithacus cyane</i> , Siberian Blue Robin	102	73	13	
<i>Brachypteryx leucophrys</i> , Lesser Shortwing		1		
<i>Zoothera sibirica</i> , Siberian Ground Thrush	4	1		
<i>Zoothera citrina</i> , Orange-headed Thrush		5		
* <i>Turdus obscurus</i> , Grey-headed Thrush		1		
* <i>Locustella certhiola</i> , Pallas's Grasshopper Warbler	9	11	6	
* <i>Locustella lanceolata</i> , Streaked Grasshopper Warbler	26	17	55	
* <i>Acrocephalus arundinaceus</i> , Great Reed Warbler	1			
* <i>Phylloscopus borealis</i> , Arctic Leaf Warbler	32	45	9	
<i>Phylloscopus coronatus</i> , Crowned Leaf Warbler	93	86	2	
<i>Muscicapa rufilata</i> , Ferruginous Flycatcher	10	10		
<i>Muscicapa latirostris</i> , Brown Flycatcher	36		3	
* <i>Muscicapa sibirica</i> , Siberian Flycatcher		10		
<i>Muscicapa rubeculoides</i> , Blue-throated Flycatcher	9	21		
<i>Muscicapa mugimaki</i> , Mugimaki Flycatcher		3		
<i>Muscicapa zanthopygius</i> , Tricolored Flycatcher	73	69	24	
<i>Rhinomyias brunneata</i> , Migratory Jungle Flycatcher	94	169		
<i>Terpsiphone paradisi</i> , Paradise Flycatcher	6	9	4	
<i>Sturnus sturninus</i> , Daurian Starling		3		
* <i>Lanius cristatus</i> , Brown Shrike	2	17	1	
<i>Lanius tigrinus</i> , Thick-billed Shrike	6	4	9	
<i>Sitta azurea</i> , Blue Nuthatch		1		
<i>Zosterops everetti</i> , Everetti White-eye		1		
72 species	Total	1421	2017	141

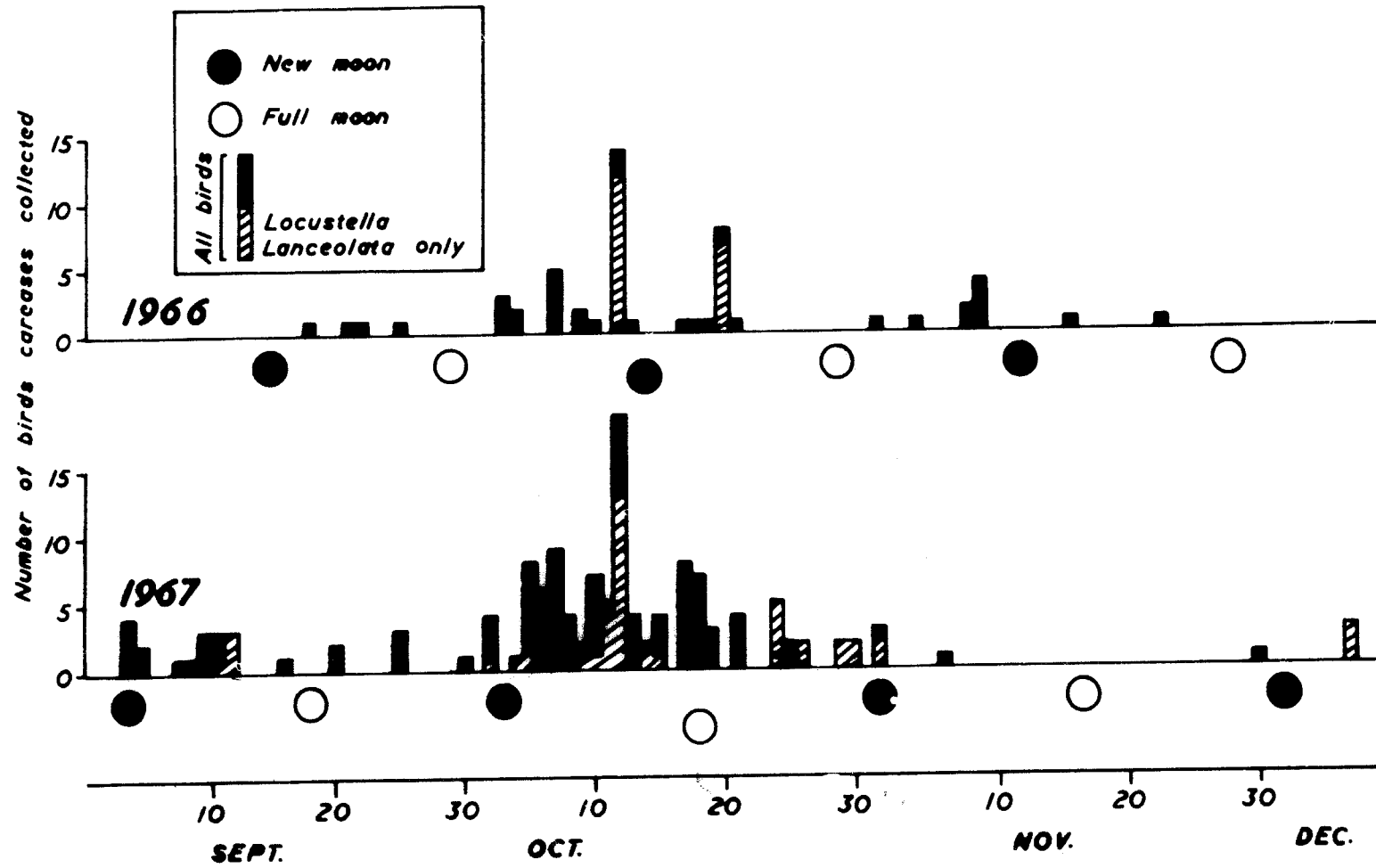


Fig. 63: Numbers of dead birds picked up each day at west coast lighthouses during the migration seasons of 1966 and 1967.

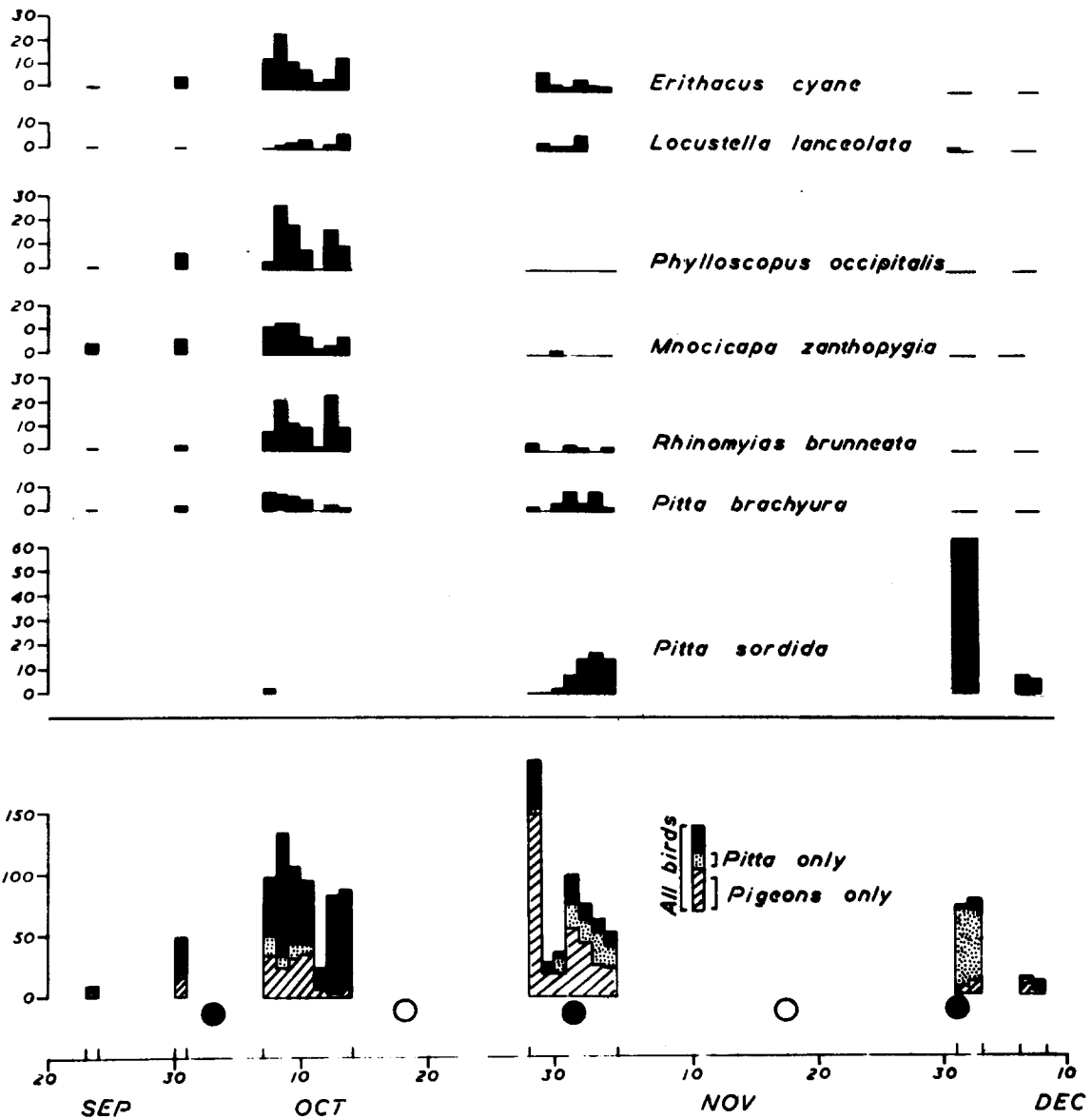


Fig. 64: Numbers of migrant birds taken by night at the telecoms tower, Fraser's Hill, at six different trapping periods in 1967. Black circles indicate new moon; open circles indicate full moon.



Two groups of birds, the pittas and the pigeons, showed differing patterns of movement. The Blue-winged Pitta, which is widespread in the Oriental region, nesting as far north as southern Korea, was trapped in numbers through October into early November. The major movement of the Hooded Pitta, which ranges less far northwards, began in November and reached its peak in early December. Resident species of pigeons presumably performing local movements were trapped on all dates, although in greatest numbers at the time of the new moon at the end of October/early November.

Many residents of Fraser's Hill have informed us that large influxes of birds at night can only be expected at the new moon and in cloudy weather. Our experience in 1967 has supported this claim to some extent, particularly as far as pigeons were concerned. But comparison of catches at Fraser's Hill with collections at the lighthouses suggests more strongly that, as far as migrant small passerines from the Palaearctic region are concerned, each year there is a major passage from September to December, at maximum intensity within the first two weeks of October, on a broad front covering at least the central highlands and western coastal strip.

Thirteen species that overwinter in Malaya were intercepted as they arrived at Fraser's Hill and their average weight was 8% less upon arrival than the average winter weight after they had settled into their winter territories. This suggests that migrants arriving in Malaya have burned up all of their energy reserves to a point below normal weight. While in Malaya they rebuild to normal weight and then gain again in the weeks previous to spring migration. Table 26 lists these weights as determined at the tower on Fraser's Hill and at other localities in Malaya.

Brown Shrike Studies: Wintering Brown shrikes frequent open lowland country, a habitat that is largely man-made in Malaya. Individuals are sedentary during the winter season, each occupying a restricted area and exhibiting territorial behaviour.

The earliest observation each year in different part of South-east Asia indicate that the southward migratory journey is relatively rapid. In Malaya, migrants arrive from the first week of September to the third week of October. At a lowland netting station, during 1964-68 a major part of the total catch was taken in the months of September and October. Only a small proportion of these early shrikes wintered in the netting area. No distant recoveries were reported, and the subsequent movements of birds that were not retrapped are unknown.

Table 26: Weights of birds caught at a radio tower in central Malaya

SPECIES	TOWER BIRDS	WINTERING BIRDS
Black-capped Kingfisher, <i>Halcyon pileata</i>	80.6 (2)	84.0+2.0 (25)
Blue-winged Pitta, <i>Pitta brachyura cyanoptera</i>	74.1+2.3 (13)	85.2 <sup>1</sup> (4)
Siberian Flycatcher, <i>Muscicapa sibirica</i>	10.4 <sup>-</sup> (1)	11.8 (3)
Brown Flycatcher, <i>Muscicapa latirostris</i>	9.78+0.24 (13)	11.0 (3)
Blue-throated Flycatcher, <i>Muscicapa rubeculoides</i>	14.5 <sup>-</sup> (3)	no data
Tricoloured Flycatcher, <i>Muscicapa zanthopygia</i>	11.20+0.32 (9)	11.39+0.25 (9)
Pallas's Grasshopper Warbler, <i>Locustella certhiola</i>	13.3 <sup>-</sup> (4)	14.42+0.13 (136)
Streaked Grasshopper Warbler, <i>Locustella lanceolata</i>	10.51+0.30 (5)	10.62+0.63 (6)
Arctic Leaf Warbler, <i>Phylloscopus borealis</i>	7.9 <sup>-</sup> (4)	8.51+0.21 (13)
Crowned Leaf Warbler, <i>Phylloscopus occipitalis</i>	7.5 (2)	8.88+0.38 (6)
Siberian Blue Robin, <i>Luscinia cyane</i>	13.65+0.24 (19)	14.76+0.16 (52)
Siberian Thrush, <i>Zoothera sibirica</i>	55.5 <sup>-</sup> (2)	76.72+0.6 (6)
Thick-billed Shrike, <i>Lanius tigrinus</i>	24.4 (2)	25.3 (4)

Notes: The figures listed are the mean weights, + the standard error if five or more weights were available, with the sample size in parentheses. The second column summarizes the data for birds caught at a radio tower during migration in October 1965 and 1966. The third column summarizes the data for birds caught elsewhere in central Malaya from 1963-1967 during the winter season September-April.

<sup>1</sup>Birds of the larger resident race P. b. megarrhyncha have been excluded.

<sup>2</sup>McClure (1964, "Bird Banding" 35:141-183) gave 75.5 g as the mean weight of 76 birds.

Shrikes netted in September-October comprised 29% adults, 54% full grown (i. e., immatures plus poorly characterised adults), and 17% juveniles. The mean wing length was significantly longer among adults than among both subadult classes, which did not differ significantly. During the winter, all ages showed a progressive decline in wing length until the flight feathers were renewed in a premigratory moult falling in February-early April. Moult recorded in four Brown Shrikes taken in October-November is interpreted as a post-breeding moult, temporarily arrested during autumn migration. In April, after the spring moult, adults constituted 70% of the total trapped and immatures 30%.

The mean weight of September birds was lower than any other month except November. The low weight in November is partly correlated with the shorter mean wing length of the sample; it may also reflect the seasonally unfavourable weather of this month. The mean weight in February was high, although all birds were moulting; the weather in this month is typically hot and dry. Highest weights were recorded in April, indicating the premigratory deposition of fat. Weights of birds trapped more than once at different intervals showed a small initial weight loss (2 g), followed by a recovery within four days and no long-term adverse effects. A comparison of September weights in Taiwan and Malaya provides a tentative basis for the calculation of fat reserves utilised on the migratory flight.

The proportion of returns after one year was 11%, and after two years 1% only. Most returning birds were present in the netting area during the latter part of the winter of initial ringing; it is suggested tentatively that imprinting of the wintering grounds may occur during this period.

Ecologically in Malaya the Brown Shrike occupies a new habitat only gradually being filled by the resident Rufous-backed shrike. There is no evidence of interaction between the two species.

Bee-eater, *Merops* spp: Adult and nestling bee-eaters were again ringed at two breeding colonies, Padang Kemunting on Penang Island and Sungei Buloh Research Station in Selangor. Three species, *Merops leschenaultii*, *M. viridis* and *M. (superciliosus) philippinus*, nest at Padang Kemunting at slightly different seasons, but only *M. viridis* breeds as far south as Selangor State. The colony at Sungei Buloh is of limited size; comparison of re-trap data for 1967 and 1968 should give some idea of the numbers present, the longevity of individuals and productivity of the colony. All ringing and recapture details have been carded in preparation for calculation.



Fig. 65: Black-winged Kite Elanus caeruleus trapped in the Bal-chatray trap at Batu Berendam, Malacca.

## SABAH

Institution: Sabah Museum, Kota Kinabalu.

Responsible Investigator: Henry Tsen.

Team Members: Henry Tsen and local people hired as needed.

Location of Banding Stations: Papar, 5. 45N, 115. 55E and vicinity of Kota Kinabalu, 6. 00N, 116. 05E.

Birds Banded:	1964	55 species	444 individuals
	1965	7 species	22 individuals
	1966	0 species	0 individuals
	1967	34 species	54 individuals
	1968	43 species	1301 individuals
	Total	90 species	1821 individuals

The 1967-68 grant to this organization expired in July bringing the work to a close. Although Sabah is in a very important position geographically to receive numerous migrants from the north through the Luzon-Palawan route, the museum was in the process of moving and expansion and the work could not be continued. It is hoped that at a future date interest in ringing can be renewed in this part of Malaysia.

Movements and longevities of birds on Mt. Kinabalu which is an isolated mountain massif would be of great interest.

## SARAWAK

Institution: Sarawak Museum, Kuching.

Responsible Investigator: Tom Harrisson.

Team Members: Ambrose anak Achang.

Location of Banding Station: Kuching area, 2.00N, 110.30E.

Birds Banded:	1964	106 species	1, 235 individuals
	1965	139 species	1, 690 individuals
	1966	1 species	48 individuals
	1967	79 species	1, 245 individuals
	1968	69 species	1, 617 individuals
	Total	150 species	5, 835 individuals

The 1967-68 grant for this group expired in July and at that time the study was brought to a close. No analysis of the data collected here has as yet been made. Since work continued in the Semengo Forest for five years there are survival records on local species for this period. Only a few recoveries of local birds have been received and no long distance movements other than those of Swallows.

## SINGAPORE

In July 1967 a group of Air Force officers and enlisted men who were interested in birds organized the Singapore Branch of the Royal Air Force Ornithological Society. Their objectives were to sponsor an interest in birds among the people of Singapore, to study the birds of Singapore for their own pleasure, and to meet regularly for discussions. Several members had previously done bird ringing in England and were interested in assisting with the MAPS program. Since Singapore is faunistically similar to Malaya the work was in cooperation with the Malayan team. Peak membership of the Society was 36 in the early part of 1968. Because the British forces are being withdrawn from Singapore many members have been re-assigned to other posts.

This active group of banders has been under the leadership of Flight Lieutenant John Gregory and during 1968 they marked several thousand birds. These are combined in Table 32 with the list from Malaya since many of the birds were ringed in Johore and other points within Malaya as well as in Singapore.

Lt. Gregory reports that most of the members have been RAF men and their wives although occasionally they were joined on field trips by men from the army. Two civilian women, one from New Zealand, also joined the group. One Chinese man has become interested and may join. "A number of Asians have shown interest and have joined us for a few hours during a morning, but everyone so far has not had the stamina for a full day. All have been afraid to hold the birds and it is practically impossible to get them to work more than a hundred yards from the main road." There were three sub-branches at the main airfields of Tengah, Seletar and Changi and during peak interest eleven volunteer banders were active. Fig. 66 shows one of the net lines in Singapore

In September the group mounted an expedition into Malaya. Eight men with two Landrovers and trailers left Singapore on September 27. They traveled up the east coast of Malaya as far as Kuala Kri in Kelantan, returning by the same route to Singapore on 18th October. During the expedition they set up banding stations in Pahang, Trengganu and Kelantan. A total of 708 birds of 81 species were ringed and 179 species were observed by the group.

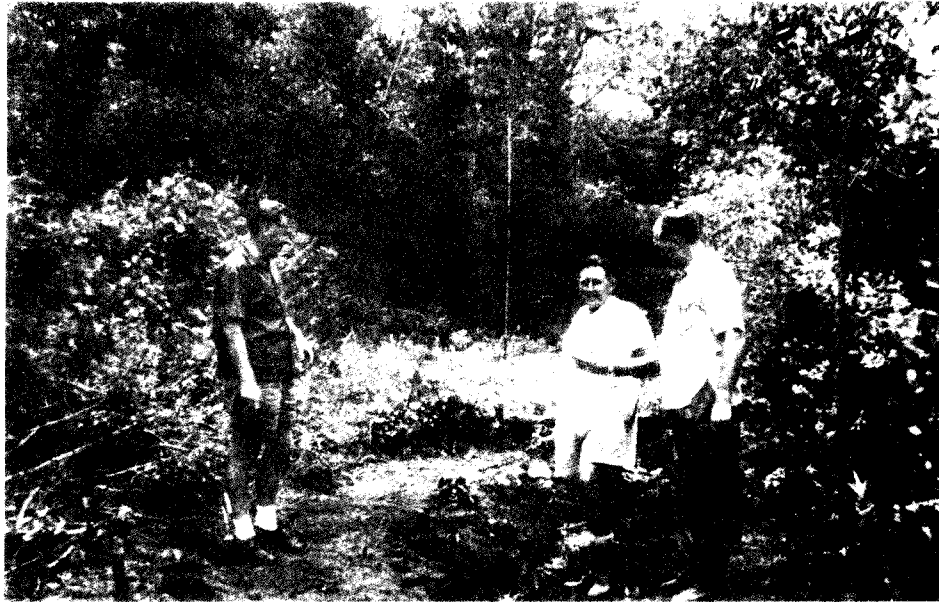


Fig. 66: Singapore banders at one of the net lines on Singapore Island. Flt/Lt. Gregory at left.



Fig. 70: Spanish Sparrows, *Passer hispaniolensis*, roosting in deciduous shrubs near Bharatpur, India.



## INDONESIA

Institution: Lembaga Biologi Nasional (National Biological Institute)  
Muzium Bogoriense, Bogor, W. Java.

Responsible Investigator: Dr. Soekarja Somadikarta

Team Members: Soetikno, M. Djajasasmita and two field technicians.

Location of Banding Stations: Kebun Raya (Botanical Garden), Bogor, West Java 06.36S, 106.48E, 250.0M; Pasar Ikan (Fish Market, near the harbor), Djakarta, West Java 06.07S, 106.48E, 1.0M; Tjiburial (Water catchment area), near Bogor, West Java 06.36S, 106.47E, 300.0M; Pulau Dua (Mangrove forest), small island (20 acres), Java Sea off West Java 06.01S, 106.12E, 0.5M; Rawa Kalong (Cave on the sea coast), Pelabuhan Ratu, West Java 07.00S, 106.33E, 1.5M; Bandjarmasin (Harbor area), South Kalimantan 03.20S, 114.35E, 5.0M; Tjibodas (Nature Reserve Area), West Java 06.44S, 107.00E, 1400.0M.

Birds Banded:	1967	18 species	68 individuals
	1968	62 species	8664 individuals
	Total	62 species	8732 individuals

The Indonesian Migratory Animal Pathological Survey team started to operate in November 1967, soon after the 1967 MAPS Annual Conference held in Baguio City, Philippines. The team included five persons inexperienced in bird ringing, but they soon mastered the techniques. During the year 21 species new to the MAPS banding records were ringed including five migrants: Phalacrocorax sulcirostris, Ibis cinereus, Plegadis falcinellus, Threskiornis melanocephala, Halcyon sancta. The team is very fortunate to have access to the resources at the Zoological Museum of the National Biological Institute, which houses more than 26,000 bird skins collected from the Indonesian Archipelago. The National Biological Institute also furnished a 1958 Landrover for the team's use. During the first two months, the activities of the team were concentrated on training personnel. This training included the putting up and taking down of mist nets, demonstrations of the techniques of handling living birds, etc. A card file was set up recording the date and collection place of migrant bird species available in the Zoological Museum. This card file has been important for the team in planning its operations.

The Indonesian team was very active in 1968. The greatest effort was made at Pulau Dua a small island of 20 acres 1/2 mile off the north coast of West Java. It has low vegetation, trees and shrubs up to 25 ft. height is partially inundated by high tides, and has no fresh water. A small house

built as a field station by Hoogerwerf before the revolution is still standing as is useable although in disrepair. The team spent three months, March through May here banding the nestlings of the 16 species of colonial birds (mainly Ardeidae) using this sanctuary. Fig. 67. These birds made up 88.3% of their year's take.

Soon after the young left there were recoveries of the Little Black Cormorant (Phalacrocorax sulcirostris) from the coast of south western Sumatra where they were being hunted for food. This is the first evidence of migratory movements from Java. But few House Swallows reach here and there have been no recoveries yet. The Australian Sacred Kingfisher which looks so much like the White-collared Kingfisher, Halcyon sancta and chloris, was ringed near central Java. This bird had probably come from Queensland.

In 1968 the team banded 8,664 birds from seven stations, prepared 837 blood smears and collected 430 vials of parasites. The most interesting banding place we have found so far, is Pulau Dua, a bird sanctuary. It is a breeding place for cormorants (2 species), herons (4 species), egrets (4 species), stork (1 species), and ibises (2 species). 88.3% or 7,600 of the total birds (8664) we banded in 1968 were nestlings and fledglings from Pulau Dua. Less than 0.5% of the total nestlings we banded, were found dead on the island within one to 59 days after the date of banding. These included 12 Egretta alba, 3 E. garzetta, 12 E. intermedia, 4 Nycticorax nycticorax, and 1 Ibis cinerus.

In 1968, five recoveries were reported so far, analysis from the other stations cannot be made, since insufficient data is available. Two Phalacrocorax pygmaeus from West Java, two P. sulcirostris from Java and South Sumatra, one Ardeola ibis from West Java, and one N. nycticorax from West Java. These are our first definite records of bird movements in Indonesia

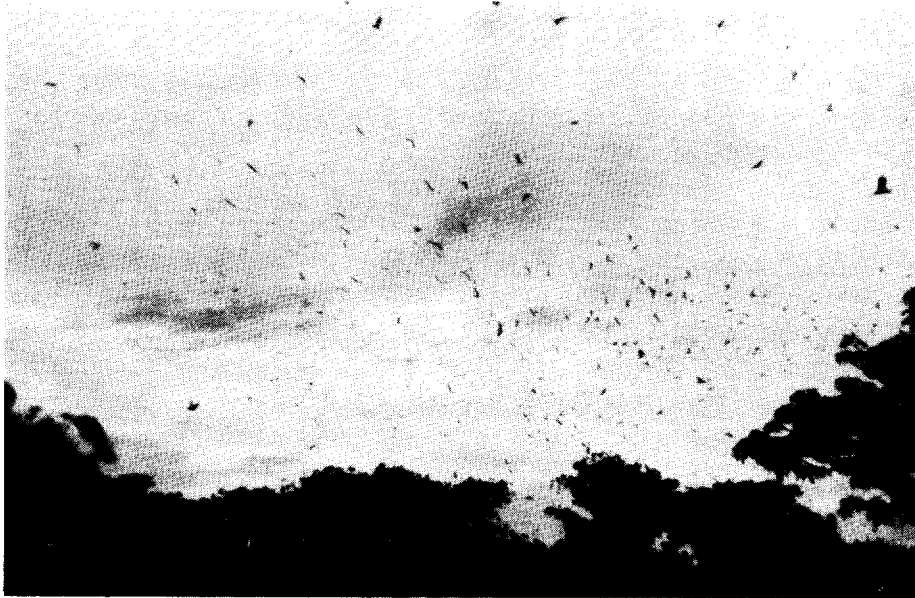


Fig. 67: Egrets, Herons and Cormorants returning to Pulau Dua, West Java, to roost.



## INDIA

Institution: Bombay Natural History Society.

Responsible Investigator: Dr. Salim Ali, D. Sc., F. N. I.

Team Members: Jamshed D. Panday, Robert P. Grubh, P. B. Shekar, Rex J. Bimento, and assistants as and when available.

Volunteer Workers: Mr. & Mrs. R. McL. Cameron (Ceylon Bird Club, Deltota, Ceylon), Mr. Lavkumar (Teacher, Rajkumar College, Rajkot, Gujarat), Miss Shama Futehally (32 A, Juhu Lane Andheri, Bombay), Mr. Rauf Ali (46 Pali Hill, Pandra, Bombay 50).

Location of Banding Stations: Bharatpur (27.13N; 77.32E) Rajasthan.  
Mahabalehwar (17.56N; 73.40E) Satara District, Maharashtra.  
Krishnagiri National Park (19.31N; 72.59E) Bombay 91, Maharashtra.  
Dualatabad (19.57N; 75.13E) Aurangabad District, Maharashtra.  
Bhutan (c. 26.41 & 28.7N; 88.54 & 90.00E).

Birds Banded: September 1967 through 1968 - 284 species 24245 individuals.

The following report was prepared by Mr. Robt. Grubh and Dr. Salim Ali:

The Bombay Natural History Society has been conducting bird migration studies since 1959 in different parts of India, first in collaboration with the WHO, and now under joint sponsorship of the Smithsonian Institution, Washington, and Migratory Animal Pathological Survey (MAPS), Bangkok.

The following are the major aims of the Bird Banding Project:

1. To plot accurately the migratory routes of the hundreds of migratory species coming into India during winter. To calculate their period of stay in the winter quarters, study the alterations in the plumage, their relationship with the resident birds, the food and feeding habits in the wintering areas.
2. Resident birds have been banded by the Society to know more about them and their distribution. Their measurements, plumage variations and informations such as sex ratio and weights are being incorporated in works on the birds of India.
3. To investigate the possibilities of birds being carriers of certain

virus diseases. For this, blood samples are taken from birds and sent to experts at laboratories where they can be tested.

4. To collect various ectoparasites found on birds, identify them and study their importance in the pathological point of view. Scientists from the United States are helping us with this research, through the MAPS.

5. By conducting bird banding in different parts of India, thus studying the abundance of species and numbers, the Society aims at persuading the governments to make sanctuaries wherever necessary, and protect certain species that may be threatened with extinction.

#### Areas Under Study

BHARATPUR is a semidesert zone situated 33 miles from Agra, and about 100 miles from Delhi, connected by railway. The vegetation consists chiefly of characteristic semidesert scrub jungle, shrubs and trees, interspersed with cultivation. Ghana Bird Sanctuary is located inside Bharatpur in an natural depression of about 7000 acres covered with vegetation chiefly of Acacia arabica, Prosopis spicigera, Capparis horrida, Salvadora persica, S. oleoides, Zizyphus jujuba, and Stephegyne parviflora. The several rivers which bring water to this sanctuary also bring enormous supply of fish which forms a major factor for the great concentrations of nesting birds such as Painted Stork, Openbilled Stork, Spoonbill, Egrets, Cormorants, Darters, etc. Fig.69. In winter the lake teams with migratory ducks, geese and other birds. The jungle of the sanctuary affords refuge for numerous species of birds, both resident and migratory. A detailed description of this place is given in the journal of the Bombay Natural History Society 59;120.

The project at Ghana Bird Sanctuary commenced on the 21st September, 1967, and ended on 10th March, 1968. This is the longest camp we ever had for bird banding in any one place. As Bharatpur was then flooded in many parts Mr. H. B. Shekar went there earlier to see the condition and make the necessary arrangements for the party. The weather was normal and favourable during the first three months but for the flood waters which prevented us from catching terrestrial species for a while. Towards the end of December and the major portion of January, there were frequent showers and wind which greatly affected the work. Once again the weather improved and continued to be fine till we closed the camp. The winter was cold and the ground temperature went almost down to 0° C. in January. Within this period we caught and ringed 21107 birds of 159 species. 465 birds of 113 species were examined for ectoparasites; blood smear was collected from 796 birds of 130 species

MAHABALESHWAR, the principal hill station of Maharashtra is a tropical evergreen forest and has a general elevation of 1370 m above sea-level, rising at points to c 1450 m. Quoting from the Imperial Gazetteer of India (vol. XVI:426), "The average annual mean temperature of Mahabaleshwar Hill is 67° F. In November, December and January the coldest months, the temperature averages 63° F. rising to a mean of 67° F. in February, when the cold season ends. The hottest time of the year is from about the middle of March to the middle of April, when during the day, the temperature rises to a little over 90° F. Towards the end of April invigorating sea-breezes set in from the west, which gather strength as the season advances. Occasional showers occur in May, and the monsoon usually sets in early in June, attaining its maximum force in July when 12 inches or even more of rainfall are occasionally registered in a single day. The annual rainfall averages 292 inches." The heavy rainfall has resulted in dense forest all over except where there is soilless rocky surface, the jungle is made up mainly of medium sized trees with dense leaves, and thick undergrowth. The commonest trees are: Jambul (Syzigium cumini), Anjan (Memecylon edule), Pisa (Actinodaphne hookeri), Gela bush (Randia brandisi), Rameta (Lassiosiphon ericephalus), Bhama (Glochidia hohenackeri), Ghanera (Mappia foetida), Pygeum gardneri, and Salix tetrasperma. The undergrowth consists mostly of Callicarpa laneta, Strobilanthes callosus and S. wightianus.

The second camp was at Mahabaleshwar, about 100 miles south-east by air from Bombay, from 25 March to 24 April. Here a total of 851 birds of 41 species were ringed. Of these, 211 birds of 39 species were bled for smear, and 168 birds of 38 species deparasited. The weather was favourable all along except the last two days when heavy showers marred the catches in the evening.

Several species of birds breed in Mahabaleshwar i. e. Black Bulbul, (Hypsipetes madagascariensis ganeesa), and Black-capped Blackbird (Turdus merula nigropileus). Game birds like Grey Junglefowl (Gallus sonneratii) and Red Spurfowl (Galloperdix spadicea) are common. During winter it accommodates a wide range of winter visitors. Among large mammals, the Common Langur (Presbytis entellus) and the Bonnet Macaque (Macaca radiata) were commonly seen during the day. Barking deer (Muntiacus muntjak) was occasionally observed. Panther is at times noted by the local people, while the tiger has apparently not been seen during the last several years.

KRISHNAGIRI NATIONAL PARK is situated in the northern suburbs of Bombay city in Salsette Island. It is partly at sea-level, but the area also includes several hills, some rising to heights of about 300 m. A maximum mean temperature of 29°C. in January. The mean annual precipitation is a little above 1750 mm (70 inches) most of which falls during the south-east



**Fig. 68: Mirshikar tribesmen with their bird netting equipment used at Bharatpur.**



**Fig. 69: Painted Stork, Intermediate Egret, White Ibis and Cormorants nesting together at Ghana Sanctuary Bharatpur.**

monsoon, commencing normally about mid-June and ending in the latter half of September. Borivli, a railway station on the Western Railway is within a kilometre of the Park. Krishnagiri National Park is formed mostly of mixed evergreen and deciduous forests interspersed with cultivation. The trees include Flame of the Forest (Butea monosperma), Indian Laburnum (Cassia fistula), Cassia sp., Gul Mohur (Delonix regia), Indian Coral Tree (Erythrina indica), and Silk cotton Tree (Salmalia malabarica), Bomboo, Karvanda (Carrissa sp.,) Lantana, Strobilanthes, and various other kinds of bushes and grasses from the undergrowth.

The third camp (15 May to 10 June) was held here and although the weather was hot, it was not unbearable. Fifty species and 436 individuals were ringed. Of these, 167 were bled and 177 deparasited.

Besides the resident birds, several species of migrants, mostly terrestrial, also visit the area. Among game birds Jungle Bush Quail (Perdica asiatica), Grey Junglefowl (Gallus sonneratii), and Indian Peafowl (Pavo cristatus) occur. Large mammals are rare. A few spotted deer (Axis axis) and a panther have been reportedly seen. The government has plans to introduce more deer and other mammals into the park.

DUALATABAD has an old historically famous hill-fort carved in rock. The present Dualatabad (170 miles north-east of Bombay) is a decrepit village surrounded by cultivation. However, among the ruins of the old fort, there is a dense growth of secondary scrub jungle consisting mostly of Lantana camara with a sprinkling of sandal wood and other plants. The Lantana berries attract a wide range of passerine birds into this area.

The fourth bird banding station was Dualatabad and here the banding was done in the middle of the monsoon (8 July to 6 August). However, the scanty rainfall in the area enabled an "air conditioned" weather by the intermittent sprinkling of mild rains, and in no way inhabited the catches. 52 species and 1167 individuals were ringed; 50 species and 167 individuals were bled; 48 species and 234 birds were deparasited.

BHUTAN, adjacent to Sikkim, is a hill-country where the lofty peaks and ranges of the Himalayas extend along the whole of the northern boundary, with a succession of separate transverse hill ranges running to the south with deep valleys in between. Fig.71. The hills around Gedu are covered chiefly with semitemperate moist evergreen forest, while at Chimakothi the temperate zone begins with Pinus longifolis and other coniferous trees higher up. Samchi is in the foothills touching the Indian border. For further information on Bhutan see Imperial Gazetteer of India vol. 8:154.

The fifth and last bird banding camp was conducted in the foothills and



the interior of western Bhutan, situated in the eastern Himalayas. The work was started on 30 September, and ended on 27 November. There was torrential rain, non-stop, for six days from the 3rd of October. Due to this rain there were 42 lands slides on the road to Thimpu, the capital of Bhutan. This was the road connecting us with various places within Bhutan which we had planned to visit. Besides land slides there were several floods. As a result we could not visit all the scheduled places within our limited time, and, out of the areas visited, only three viz, Samchi 1000 ft; Gedu (6000 ft.) and Chimakothi (7300 ft.) proved to be good for netting. As the society had combined birds banding with birds survey in this trip we did collecting and banding side by side; wherever netting was not practicable, only collecting was done. However, blood smears were taken from most of the species shot. The number of birds ringed in Bhutan was 684, and species 83. The number of birds deparasited were 213, and species 104. Blood samples were obtained from 114 species, and 348 individuals.

### Methods Used

Professional bird trappers known as Mirshikars and Sahanis living in Bihar were employed to catch waders and ducks at Bharatpur. The Sahanis used their single tier nets to catch ducks by fixing them over water and chasing the birds into the nets at night. The Mirshikars used their throwing nets (JBNHS 61:380) and caught mostly waders. Fig.68. They needed shallow waters while the Sahanis preferred deeper water. In addition to waders and ducks, we used our mist nets and caught terrestrial birds, mostly passerine, within the sanctuary. Besides, we netted Spanish Sparrow and migratory House Sparrow (ssp. parkini or bactrianus) from roosts situated some 11 miles from the sanctuary (JBNHS 59:924). Fig.70. These sparrows were caught at the roost in two ways: 1. Fixing the nets in scrubland in the evening before the birds started coming to the roost. 2. Working after dark and holding the net on one side of a bush then driving the roosting birds from the opposite side into the net.

At Mahabaleshwar and Krishnagiri National Park, only mist nets were used as in the remaining places, and the species caught were mostly non-water birds. As it was summer, and the water scarce, those nets fixed near water holes produced the maximum number of birds. At Dualatabad, on the other hand, we could fix the nets anywhere among the Latana thickestets and still catch enough birds during the day. Though it was often drizzling, the catches were always satisfactory. In Bhutan, the number of birds ringed per day was not high, but the variety of species obtained was remarkable.

Blood smear and ectoparasites: Every possible effort was made to collect blood smears from all the species caught. At Bhutan we could bleed and de-

paratize the widest range of species because we did collecting as well as banding: Several species we caught or shot for skinning were also bled and deparasitized, chloroform was used for removing the parasites in this case.

At Bharatpur and Mahaleshwar, more than half the birds examined did not have parasites. The birds netted at Krishnagiri National Park and Dualatabad showed a higher percentage of infestation. But most of the birds deparasitized in Bhutan did have ectoparasites.

### Discussion

Sex ratio of some species: The sex ratio of thirteen species, on the basis of the birds we caught and ringed is shown in Table 27. It becomes evident from the Table that in Aythya nyroca, Erithacus svecicus, Copsychus saularis, and Saxicoloides fulvicata, the percentages of the males were considerably higher than those of the females. On the contrary, in Philimachus pugnax the females predominated in number remarkably (72%). As no effort was made to catch any particular sex, the proportion of the different sexes for these species in this area during the period of study should not differ very much from that given in the Table.

Arrival and departure of some migrants at Bharatpur: The Siberian Crane (Grus leucogeranus), a rare winter visitor to India, was first noted to have arrived in the sanctuary on 31 December. We counted over 70 of them during the day while they were feeding in the shallow grassy part of the lake. Some individuals were apparently young, having patches of brown on their white plumage. Later on we saw more than 90 individuals. Their call was in single syllables at high pitch in two different notes. Almost every morning they flew into the sanctuary in two or three batches, and went out late in the evening. At times most of them disappeared and were not to be seen for several days. However, they were with us till the end of February.

Greylag geese were seen at Bharatpur towards the end of October and were ringed till 11 February. There were very few during February. All the ducks of the genus Anas ringed here were present in more or less equal abundance throughout the field session although there was an increased flow of the Blue-winged Teal into the sanctuary during February. Among the Pochards, the Common Pochard and the Red-crested Pochard appeared late and were first caught in the nets on 15 November and 7 December respectively. Common Pochard was seen in good numbers till the end of our stay while Red-crested Pochard decreased in number considerably and was not caught after 20 February. Among the passerines, the Black-throated Thrush arrived very late and was caught from 15 February onwards. We got them in the nets till 28 February.

Among the migrants banded, the maximum period an individual bird was known to have stayed with us is shown in Table 28 based on the recaptures of the birds ringed during the session at Bharatpur. Many might have stayed longer. However, as they did not come into the nets, we have no proof.

**Recoveries:** Out of the 21107 birds banded in Bharatpur some 137 birds have already been reported (till 21st December 1968) from various parts of North India, West Pakistan and the U. S. S. R. (these are listed in Section 3 of this report). There is every possibility that the birds banded by us do pass through China. An interesting case was that of a Reeve, ringed during 1968 in Bharatpur. This bird was recaptured by us in the same area and was released with a new ring. She finally ended her journey in Uttar Pradesh on 6 February, 1968 when she was shot. During the camp at Bharatpur we recaptured four birds (Streptopelia senegalensis, Otus bakkamoena, Tephrodornis pondicerianus and Sturnus contra) we had banded in Bharatpur six years and three months earlier. They were released unhurt.

Table 27: Sex Ratios of some of the species captured at Ghana Bird Sanctuary, Bharatpur

Species	Total Ringed	Percentage of		
		Male	Female	Unsexed
<u>Anas crecca</u>	1632	49	46	5
<u>Anas strepera</u>	335	52	41	7
<u>Netta rufina</u>	73	50	50	-
<u>Aythya ferina</u>	489	51	47	2
<u>Aythya nyroca</u>	174	61	30	9
<u>Philomachus pugnax</u>	2348	26	72	2
<u>Erithacus svecicus</u>	239	79	13	8
<u>Copsychus saularis</u>	48	60	35	5
<u>Phoenicurus ochruros</u>	76	39	53	8
<u>Saxicoloides fulicata</u>	34	59	29	12
<u>Passer domesticus</u>	2523	54	41	5
<u>Passer hispaniolensis</u>	3230	46	53	1
<u>Nectarinia asiatica</u>	78	56	38	6

Table 28: Period of stay of some migrants at Ghana Bird Sanctuary

Ring Number	Species	Date of Ringing	Recaptured in the same place on	Time
F-2691	<u>Anas strepera</u>	30 Nov. 1967	19 Feb. 1968	31 days
F-3283	<u>Anas clypeata</u>	21 Dec. 1967	28 Jan. 1968	39 "
F-2638	<u>Aythya ferina</u>	26 Nov. 1967	1 Mar. 1968	97 "
F-3411	<u>Aythya fuligula</u>	23 Dec. 1967	23 Jan. 1968	32 "
AB-16723	<u>Tringa ochropus</u>	22 Jan. 1968	5 Mar. 1968	43 "
AB-13698	<u>Tringa glareola</u>	3 Oct. 1967	19 Feb. 1968	139 "
AB-16632	<u>Capella minima</u>	19 Jan. 1968	21 Feb. 1968	34 "
AB-10980	<u>Upupa epops</u>	24 Sep. 1967	14 Jan. 1968	113 "
AB-16407	<u>Jynx torquilla</u>	1 Jan. 1968	18 Jan. 1968	17 "
A-77131	<u>Sylvia curruca</u>	29 Dec. 1967	19 Feb. 1968	53 "
A-76928	<u>Erithacus svecicus</u>	18 Dec. 1967	21 Jan. 1968	35 "
A-72708	<u>Phoenicurus ochruros</u>	17 Oct. 1967	21 Jan. 1968	96 "
AB-16345	<u>Zoothera citrina citrina</u>	29 Dec. 1967	21 Jan. 1968	24 "

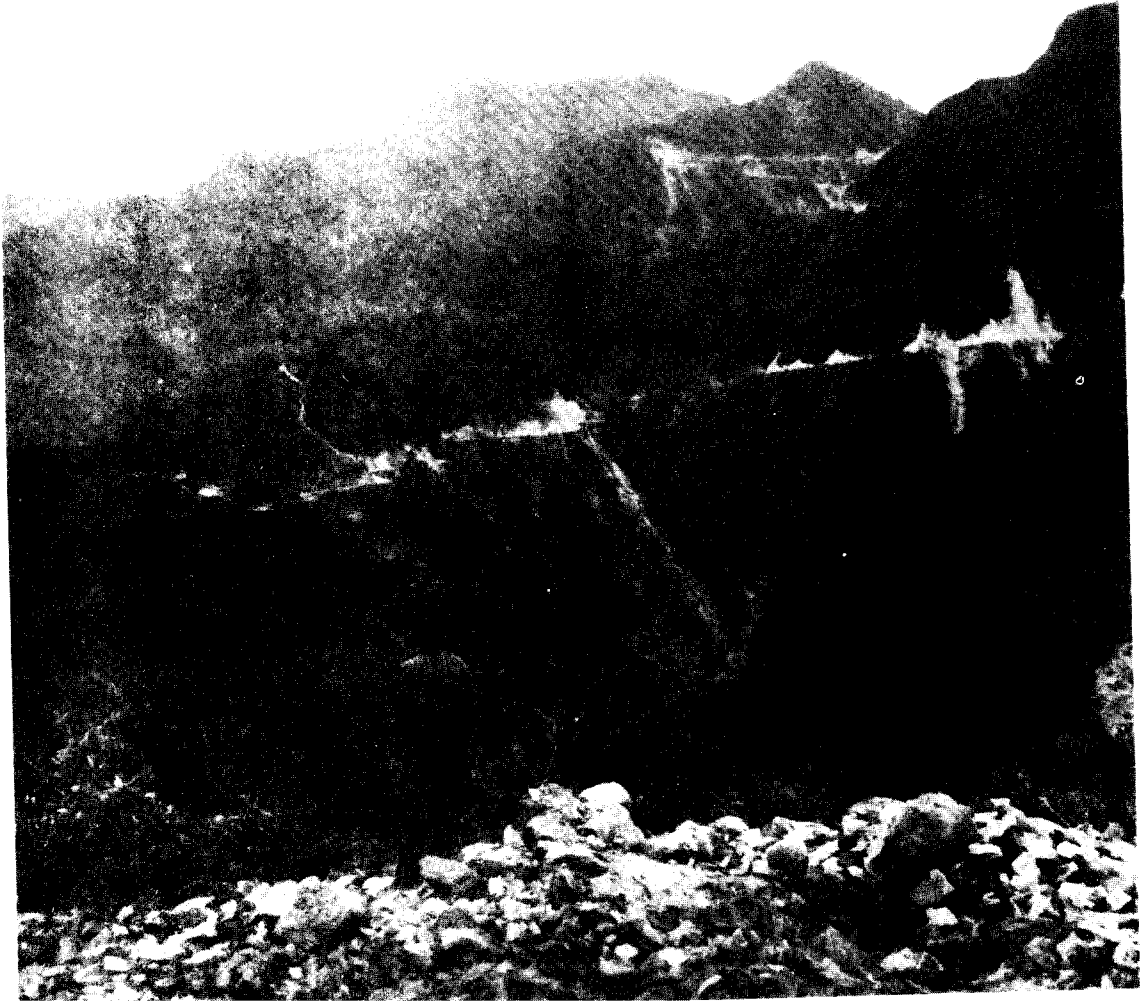


Fig. 71: Mountains and road on way to Thimpu, Bhutan.

## OTHER GROUPS

Okinawa: No further reports of banding have been received from Dr. Sado Ikehara who has been making a special study of the Gray-faced Buzzard, Butastur indicus. Recoveries from earlier ringing continue to come in as these birds are shot in the Philippines, but no records to date from the breeding ranges.

Vietnam: Continued unsettled conditions and violence in Saigon has prevented the students working with Dr. Bui-Thi-Lang, University of Saigon from doing any more ringing.

Nepal: No further ringing has been done in Nepal and no recoveries from previously banded birds have been received.

Guam: We have no records of any banding being done in Guam and no reports of recoveries from there. Since recoveries of egrets and sea birds have been received from other oceanic islands it was anticipated that some would be reported from here.

# MIGRATORY ANIMAL PATHOLOGICAL SURVEY

## ANNUAL PROGRESS REPORT

1968

### PART II

#### LIST OF SPECIES BANDED IN 1968

#### DISCUSSION

With active ringing going on in Indonesia (Java) and India, habitats and avifauna were tapped in 1968 that had not previously been explored. This resulted in a considerable increase in the number of species ringed. Ninety-seven species new to the study were marked bringing the total for the five year period to 1,060 species. Even though 262 species that had been ringed before were not taken this year the total for 1968 was 798 species and 149,384 individuals. Each year some records fail to arrive at headquarters early enough to be included in the report so there will be some adjustment to these figures. Compared by year the round figures were as follows:

Year	Number of Species	Total Birds
1964	609	50,000
1965	697	174,000
1966	581	240,000
1967	637	213,000
1968	798	150,000
Total	1060	827,000

1966 was the year of the "Big Push" when all teams concentrated on getting large numbers of colonial or flocking species. The number of species declined that year, but the total was the greatest for the five year period. Reduction of funds available for field work in 1968 brought the total down to 70% of what it had been in 1967 but the work in new areas and an effort to get unmarked species brought the species total up by 26% over the previous four year average. Not only was there an increase of species banded but also in the number of families represented, 69, lacking only five families of reaching the total for the five years.

In spite of the reduction in field work seven species were ringed in numbers greater than 4000. These were the familiar Black-crowned Night Heron 4651, House Swallow 32669, Yellow-vented Bulbul 4703, Yellow Wagtail 8502, Brown Shrike 8716, Black-faced Bunting 4035 and Chestnut Bunting 6225.

These seven species also continue to appear among the 18 most abundantly ringed each year, Table 29. From the list in Table 29 it is evident that no team or area has a monopoly of species which can be caught in large numbers. These 18 species are represented in at least one area and most from several. All of them are associated with man and his disturbed environments. All of them are weed species which increase with cultivation and the break up of uniform stands of forest. These 18 species make up only 1.6% of the species that have been ringed, but 70% of the total.

The numerical distribution of the banded species indicated their relative abundance and ease of capture in the habitats which have been extensively used by the various teams of banders. As the data have accumulated year after year this becomes more evident. Birds that are rare, hard to get, or which inhabit inaccessible habitats (tree top, mountain peaks, etc.) are taken only occasionally. The longer a banding operation continues the fewer species are ringed only once. Table 30 illustrates this, for the number of species taken only once has dropped from 12.9% to 8.8% from 1965 to 1968. The same is true of these species taken only a few times. Those species which are common and can be taken often make up a quarter of those present in the habitats. Species that are abundant and easily trapped to numbers approaching 10,000 make up about 5% of the populations. The colonial or flocking species which can be taken by the thousands make up about 1% of the population.

Table 31 lists the ringing results by family and country for 1968. Table 32 lists all species banded and the number for each country, giving the total for 1968 and the grand total for 1964 through 1968.



Table 29: Species banded in greatest numbers

Species	No. Banded	Percent of Total	Remarks
Cattle Egret	7529	.9	Nestlings at colonys
Little Egret	15054	1.8	Nestlings at colonys
Black-crowned Night Heron	17812	2.1	Nestlings at colonys
Blue-breasted Quail	5914	.7	Migrants in Luzon
Black-tailed Gull	5986	.7	Nestlings in Honshu
House Martin	7498	.9	Adults at colonies
House Swallow	241702	29.2	At roosts
Yellow-vented Bulbul	16484	1.9	In South-east Asia
Pied Wagtail	25470	3.0	At roosts
Yellow Wagtail	37230	4.5	At roosts
Brown Shrike	28861	3.4	Migration through Taiwan
Rustic Bunting	63074	7.6	Over-wintering in Korea
Chesnut Bunting	64628	5.6	Migration through Korea
Black-faced Bunting	19789	2.3	Migration in Korea and roosts in Taiwan
Chestnut Munia	13175	1.5	Roosts in S. E. Asia
Spotted Munia	6462	.7	Roosts in S. E. Asia
Tree Sparrow	12571	1.5	In citys of E. Asia
Baya Weaver	4957	.5	Roosts in S. E. Asia

112

Table 30: The numerical relationships of the number of banded birds, indicating the relative abundance and ease of capture in the habitats of Eastern Asia

Number of Birds Banded	Percent of species in this category based upon accumulated totals			
	1965	1966	1967	1968
1	12.9	11.7	9.7	8.8
2-10	31.1	29.8	27.0	25.5
11-100	38.7	33.4	32.8	31.5
101-1000	14.6	19.8	23.8	26.1
1001-10000	2.2	4.7	5.4	6.8
10001-over	.4	.6	1.1	1.1

TABLE 31. SUMMARY BY FAMILIES OF THE NUMBER OF BIRDS BANDED IN 1968. S=SPECIES, T= TOTAL BANDED

Family		Korea	Japan	Taiwan	Hong Kong	Luzon	Palawan	Negros	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
Procellariidae	S		1														1	2
	T		994														994	4817
Hydrobatidae	S		1														1	3
	T	1															1	100
Phalacrocoracidae	S													2	3		5	5
	T												1312	98			1410	1442
Anhingidae	S														1		1	1
	T														2		2	5
Ardeidae	S	6	6	4		7	2		1	7	1		3	8	3		17	18
	T	134	1884	2107		190	15		1	1816	2		7	5925	16		12097	48298
Threskiornithidae	S													2			2	2
	T													341			341	341
Ciconiidae	S												1	1	1		3	3
	T												152	22	4		178	579
Anatidae	S		8			2									16		18	22
	T		146			21									2180		2347	6574
Accipitridae	S		2	1	1		2			2			3		3		9	17
	T		4	1	1		2			5			30		5		48	2682
Pandionidae	S																	1
	T																	1
Falconidae	S						1	1					2		1		5	6
	T						1	4					4		2		11	33
Phasianidae	S		1	2		1	1			7			2		4		13	21
	T		1	3		46	1			20			46		31		148	6048
Turnicidae	S					2	1			1			2	1	1		3	4
	T					6	2			8			58	1	17		92	403
Rallidae	S	1	3			14	2			10		1	6		4		20	20
	T	4	5			379	5			72		1	97		316		879	4723
Jacaniidae	S												2		1		2	2
	T												10		20		30	43
Rostratulidae	S					1	1						1		1		1	1
	T					85	30						2		27		144	805
Charadriidae	S		2			5	5			2		3	3		6		10	13
	T		17			132	608			27		14	4		51		853	5002
Scolopacidae	S		8	1		7	15			5		3	3		14		24	35
	T		134	1		437	502			96		32	9		1313		2524	15843
Recurvirostridae	S														1		1	1
	T														45		45	127
Phalaropodidae	S																	1
	T																	56
Burhinidae	S														1		1	1

Table 31, page 2

Family		Korea	Japan	Taiwan	Hong Kong	Luzon	Palawan	Negros	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
	T														4		4	4
Glareolidae	S						2										2	3
	T						12										12	57
Laridae	S		1				1			1							3	11
	T		1506				1			25							1532	6201
Alcidae	S		2														2	3
	T		906														906	1048
Columbidae	S	1	1	1		4	5	2	3	10	1	2	4	1	9	1	20	30
	T	4	4	2		97	338	7	238	879	4	48	80	1	183	1	1886	7887
Psittacidae	S							1		2			3		1		6	11
	T							3		5			33		36		77	202
Cuculidae	S	1	1	2		6	3		1	13		4	4		3		19	24
	T	1	1	6		63	5		3	78		8	17		8		190	1229
Tytoidea	S			1			1			1							2	2
	T			1			4			1							6	26
Strigidae	S		6	3		2	2			7	1	1	5	1	4		12	18
	T		20	7		2	6			22	2	1	35	1	16		112	667
Podargidae	S									1							1	3
	T									1							1	16
Caprimulgidae	S		1			2	1			1	1	1	2		1		5	6
	T		2			4	42			9	2	40	6		1		106	517
Apodidae	S					4	2	1	1	5	1	1			1		8	13
	T					68	104	1	1	453	1				15		643	5483
Hemiprocnidae	S																	1
	T																	2
Trogonidae	S									3			1				4	8
	T									14			2				16	101
Alcedinidae	S	1	1	1		5	5		2	12			5	2	2		13	20
	T	5	3	11		108	31		36	313	63	67	28	3	17		685	4298
Meropidae	S					1			1	5	1	1	3		1		7	7
	T					4			13	1035	2	177	13		8		1252	3459
Coraciidae	S	1								1			1		1		2	2
	T	5								4			1		4		14	36
Upupidae	S												1		1		1	1
	T												6		22		28	52
Bucerotidae	S												4		1		5	7
	T												4		2		6	16
Capitonidae	S			1		1			1	6			4		5		15	16
	T			1		1			19	14			5		89		129	516
Indicatoridae	S									1							1	1
	T									4							4	12
Picidae	S	1	4	1		1				13		6	1	7		7	27	36
	T	9	7	5		6				113	25	1	33		43		242	846
Eurylaimidae	S									4	3						4	7

Table 31, page 3

Family		Korea	Japan	Taiwan	Hong Kong	Luzon	Palawan	Negros	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
	T									59	10						69	278
Pittidae	S	1				2	2			4	1				1		5	10
	T	1				73	2			379	1				6		462	2587
Alaudidae	S	1	2			2							1		3		6	7
	T	7	3			52							34		31		127	1465
Hirundinidae	S	3	4	3		2	3			4	2	1	3	1	2		8	8
	T	2627	3766	5021		11	822			12259	864	97	14835	14	9		40325	262991
Campephagidae	S		1			2	1	1	1	6	1	1	7		4	1	14	23
	T		4			5	1	4	5	48	3	19	12		70	1	172	1337
Dicruridae	S						2		1	5	1		5		1	2	8	9
	T						22		45	55	7		51	5	10	3	198	1048
Oriolidae	S									3			1	1	2		4	6
	T									10			3	3	3		19	606
Corvidae	S		3				1			3					3		9	18
	T		8				2			7					15		32	316
Paridae	S	5	3	3		1			1	1				1	1	2	8	12
	T	589	123	11		1			11	7				3	2	58	805	4464
Certhiidae	S								1								1	4
	T								5								5	34
Sittidae	S		1	1			1			1			1		1	2	5	5
	T		1	1			4			1			2		11	19	39	151
Timaliidae	S			9		1	2		3	39	11	2	21	2	13	15	81	107
	T			101		1	9		225	1152	145	58	519	12	600	255	3077	12052
Paradoxornithidae	S	1		2									1				3	4
	T	346		17									7				370	3158
Pycnonotidae	S		1	3		1	3		4	21	11	4	17	3	7	2	42	50
	T		41	24		7	518		2850	2468	156	373	862	25	1613	2	8949	34374
Aegithinidae	S						2			8		1	3	1	2	1	11	12
	T						5			43	1	28	20	7	20	3	127	541
Cinclidae	S																	1
	T																	6
Troglodytidae	S			1													1	1
	T			3													3	45
Turdidae	S	5	16	7		4	2		5	11	2	1	14	3	13	7	45	63
	T	47	343	219		54	3		13	254	5	21	252	20	687	22	1927	9603
Sylviidae	S	4	10	7		11	4	1	9	18	4	2	25	2	11	11	64	81
	T	16	839	61		402	20	1	144	788	94	67	558	10	605	56	3661	20324
Muscicapidae	S	2	7	2		6	3		3	29	3	2	16	1	9	10	47	64
	T	6	142	5		18	19		77	655	13	44	231	2	305	68	1585	7174
Pachycephalidae	S								1	2	1						3	4
	T								3	55	6						64	217
Prunellidae	S	1	2														3	3
	T	65	8														73	163
Motacillidae	S	1	6	4		3	5		1	3			6		6	2	10	12
	T	358	952	4404		55	341		27	145			4844		183	52	11361	68025
Bombycillidae	S																	1

Table 31, page 4

Family		Korea	Japan	Taiwan	Hong Kong	Luzon	Palawan	Negros	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
	T																	40
Artamidae	S						1		1			1					1	2
	T						13		1			1					15	188
Laniidae	S	2	3	1		2	1		2	3	1	1	3		2	1	7	9
	T	4	108	6786		1787	1		17	59	2	7	110		69	1	8951	30430
Sturnidae	S	2	2	1		3	1	1	2	4			9		7		18	21
	T	15	91	2		5	72	2	137	210			324		518		1376	4368
Nectariniidae	S					3	5	2	5	16	7	3	8	3	5	3	23	30
	T					6	249	22	211	1146	93	27	96	48	314	4	2216	7168
Dicaeidae	S					2	1	1	6	9	2	1	2	1	2	1	21	22
	T					3	1	1	938	215	42	1	18	8	8	1	1238	2359
Zosteropidae	S		1	1		1			1	2			2	1	1	1	4	7
	T		30	23		8			264	14			13	7	21	5	385	2851
Fringillidae	S	21	17	7									1		3	1	29	33
	T	3866	3021	3415									3779		33	40	14154	159851
Ploceidae	S	1	2	3		4	2	1	2	9	2	2	9	4	9		21	23
	T	14	1928	9		284	65	9	8132	859	74	169	3402	186	2476		17607	55553
Families		21	34	27	1	33	38	10	25	46	24	23	45	23	51	17	69	74
Species		62	130	73	1	114	95	12	59	321	69	43	227	44	206	62	798	1060
Birds		8123	17043	22247	1	4415	3884	54	13416	25902	1617	1301	30654	7981	21170	591	149384	826809

TABLE 32. BIRDS BANDED IN 1968. LISTED BY COUNTRY AND COMPARED WITH THE TOTAL FOR FIVE YEARS

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
PROCELLARIIDAE															
<i>Pterodroma leucoptera</i> , Gould's Petrel															2
<i>Puffinus leucomelas</i> , Streaked Shearwater		994												994	48 15
HYDROBATIDAE															
<i>Oceanodroma castro</i> , Madeiran Storm Petrel															23
<i>Oceanodroma leucorhoa</i> , Leach's Storm Petrel		1												1	76
<i>Oceanodroma monorhis</i> , Swinhoe's Storm Petrel															1
PHALACROCORACIDAE															
<i>Phalacrocorax carbo</i> , Common Cormorant												2		2	2
<i>Phalacrocorax fuscicollis</i> , Indian Shag												6		6	6
<i>Phalacrocorax pygmeus</i> , Pygmy Cormorant												815	90	905	927
<i>Phalacrocorax sulcirostris</i> , Little Black Cormorant												497		497	4 97
ANHINGIDAE															
<i>Anhinga rufa</i> , Darter												2		2	5
ARDEIDAE															
<i>Ardea cinerea</i> , Gray Heron		6									129			135	4 48
<i>Ardea purpurea</i> , Purple Heron						1					245			246	2 49
<i>Ardeola grayii</i> , Pond Heron												9		9	9
<i>Ardeola ibis</i> , Cattle Egret		6	26	361	13						1767	6		2179	7 529
<i>Ardeola ralloides</i> , Chinese Pond Heron										2	1151			1153	11 66
<i>Botaurus stellaris</i> , Great Bittern														1	17 1
<i>Butorides striatus</i> , Little Green Heron														1	17 1
								40						41	20 9

Table 32, page 2

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Dupetor flavicollis</u> , Black Bittern							7							7	11
<u>Egretta alba</u> , Large Egret	55	102									535			692	2346
<u>Egretta garzetta</u> , Little Egret	56	1174	875	9							147			2261	15054
<u>Egretta intermedia</u> , Intermediate Egret	10	227									273	1		511	1964
<u>Gorsachius goisagi</u> , Japanese Night Heron															15
<u>Gorsachius melanolophus</u> , Tiger Bittern							5							5	8
<u>Ixobrychus cinnamomeus</u> , Cinnamon Bittern	1			122	13		4	2		4				146	964
<u>Ixobrychus eurhythmus</u> , Von Schrenck's Bittern							2							2	29
<u>Ixobrychus sinensis</u> , Chinese Little Bittern		3	1	36	2		7			1				50	300
<u>Nycticorax nycticorax</u> , Black-crowned Night Heron	352	870					1751				1678			4651	17812
<b>THRESKIORNITHIDAE</b>															
<u>Plegadis falcinellus</u> , Glossy Ibis											156			156	156
<u>Threskiornis melanocephala</u> , White Ibis											185			185	185
<b>CINCONIIDAE</b>															
<u>Anastomus oscitans</u> , Open-billed Stork										152				152	553
<u>Ibis cinercus</u> , Milky Stork											22			22	22
<u>Xenorhynchus asiaticus</u> , Black-necked Stork												4		4	4
<b>ANATIDAE</b>															
<u>Aix galericulata</u> , Mandarin Duck															15
<u>Anas acuta</u> , Pintail		17										383		400	1295
<u>Anas clypeata</u> , Shoveller		22										278		300	560

Table 32, page 3

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Anas crecca</u> , Teal		20										335		355	1 949
<u>Anas falcata</u> , Falcated Teal		3												3	5
<u>Anas formosa</u> , Spectacled Teal															3
<u>Anas luzonica</u> , Philippine Mallard															1
<u>Anas penelope</u> , European Widgeon		81										33		114	283
<u>Anas platyrhynchos</u> , Mallard															76
<u>Anas poecilorhyncha</u> , Spot-billed Duck				19								29		48	1 18
<u>Anas querquedula</u> , Garganey				2								116		118	5 81
<u>Anas strepera</u> , Gadwall		1										183		184	357
<u>Anser anser</u> , Gray-leg Goose												5		5	40
<u>Anser indicus</u> , Bar-headed Goose												4		4	4
<u>Aythya ferina</u> , Common Pochard												428		428	508
<u>Aythya fuligula</u> , Tufted Duck		1										77		78	151
<u>Aythya marila</u> , Scaup Duck		1												1	1
<u>Aythya nyroca</u> , White-eyed Pochard												145		145	182
<u>Netta rufina</u> , Red-crested Pochard												42		42	78
<u>Nettapus coromandelianus</u> , Cotton Teal												36		36	102
<u>Sarkidiornis melanotos</u> , Comb Duck												82		82	261
<u>Tadorna ferruginea</u> , Ruddy Sheldrake												4		4	4
<hr/>															
ACCIPITRIDAE															
<u>Accipiter badius</u> , Shikra Goshawk										6		2		8	17
<u>Accipiter nisus</u> , Sparrow Hawk												2		2	7



Table 32, page 4

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Accipiter soloensis</u> , Chinese Goshawk														73
<u>Accipiter trivirgatus</u> , Crested Goshawk					1		1						2	17
<u>Accipiter virgatus</u> , Asiatic Sparrow Hawk			1				4		4				9	95
<u>Aquila heliaca</u> , Imperial Eagle														1
<u>Butastur indicus</u> , Gray-faced Buzzard					1								1	2429
<u>Buteo buteo</u> , Common Buzzard														3
<u>Circus aeruginosus</u> , Marsh Harrier														2
<u>Circus cyaneus</u> , Hen Harrier														1
<u>Circus melanoleucus</u> , Pied Harrier														4
<u>Elanus caeruleus</u> , Black-winged Kite									20		1		21	25
<u>Hieraetus kienerii</u> , Rufous-bellied Dwarf Eagle														1
<u>Milvus lineatus</u> , Black-eared Kite			1										1	2
<u>Spilornis cheela</u> , Serpent Eagle														1
<u>Spizaetus nipalensis</u> , Hodgson's Hawk Eagle			3										3	3
<hr/>														
PANDIONIDAE														
<u>Pandion haliaetus</u> , Osprey														1
<hr/>														
FALCONIDAE														
<u>Falco peregrinus</u> , Peregrine Falcon											2		2	3
<u>Falco severus</u> , Oriental Hobby														1
<u>Falco tinnunculus</u> , Kestrel					1								1	8
<u>Microhierax caerulescens</u> , Red-breasted Falconet									1				1	11
<u>Microhierax erythrogenys</u> , Philippine Falconet														3

Table 32, page 5

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Polihierax insignis</u> , White-rumped Falcon										3				3	3
PHASIANIDAE															
<u>Arborophila brunneopectus</u> , Bare-throated Tree Partridge							1							1	1
<u>Arborophila crudigularis</u> , Formosan Hill Partridge			2											2	2
<u>Arborophila gingica</u> , Rickett's Hill Partridge															1
<u>Arborophila rufogularis</u> , Rufous throated Hill Partridge															2
<u>Argusianus argus</u> , Argus Pheasant							1							1	1
<u>Bambusicola thoracica</u> , Bamboo Partridge															12
<u>Coturnix chinensis</u> , Blue-breasted Button Quail				46	1		5			32				84	5 914
<u>Coturnix coturnix</u> , Migratory Quail		1								14				15	20
<u>Francolinus pintadeanus</u> , Francolin															7
<u>Francolinus pondicerianus</u> , Gray Partridge												16		16	20
<u>Galloperdix spadicea</u> , Red Spurfowl												1		1	1
<u>Gallus gallus</u> , Red Jungle Fowl															5
<u>Lophura erythrophthalma</u> , Crestles Fireback Pheasant							4							4	4
<u>Perdicula argoondah</u> , Rock Bush Quail												13		13	13
<u>Perdicula asiatica</u> , Jungle Bush Quail												1		1	1
<u>Phasianus colchicus</u> , Ring-necked Pheasant															32
<u>Polyplectron inopinatum</u> , Rothschild's Peacock-Pheasant							4							4	5
<u>Polyplectron malacense</u> , Malay Peacock-Pheasant															1
<u>Rollulus roulroul</u> , Crested Wood Partridge							3							3	3
<u>Syrmaticus mikado</u> , Mikado Pheasant			1											1	1

Table 32 page 6

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
TURNICIDAE															
<i>Turnix ocellata</i> , Ocellated Button Quail				1			8							9	15
<i>Turnix suscitator</i> , Barred Button Quail				5	2					54	1	17		79	226
<i>Turnix sylvatica</i> , Little Button Quail															136
<i>Turnix tanki</i> Yellow-legged Button Quail										4				4	26
RALLIDAE															
<i>Amaurornis olivaceus</i> , Bushhen				1										1	3
<i>Amaurornis phoenicurus</i> , White-breasted Waterhen				1			13		1	53		2		70	122
<i>Fulica atra</i> , Coot												302		302	644
<i>Gallicrex cinerea</i> , Watercock				3			8			15				26	79
<i>Gallinula chloropus</i> , Moorhen			1	80						9				90	158
<i>Poliolimnas cinereus</i> , Grey-bellied Crane							1							1	1
<i>Porphyrio porphyrio</i> , Purple Gallinula							2					10		12	14
<i>Porzana cinerea</i> , White-browed Crane				47	2									49	610
<i>Porzana fusca</i> , Ruddy Crane		4	2	24			1			6				37	579
<i>Porzana porzana</i> , Spotted Crane												2		2	3
<i>Porzana paykulli</i> , Chinese Banded Crane							2							2	6
<i>Porzana pusilla</i> , Baillon's Crane				36						9				45	253
<i>Porzana tabuensis</i> , Sooty Crane				12										12	352
<i>Rallina eurizonoides</i> , Philippine Banded Crane				94			1							95	922
<i>Rallina fasciata</i> , Malay Banded Crane				1			39							40	67
<i>Rallina mirificus</i> , Luzon Rail				12										12	171
<i>Rallus aquaticus</i> , Eastern Water Rail			2											2	2
<i>Rallus philippensis</i> , Philippine Rail				3										3	17

Table 32, page 7

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Rallus striatus</u> , Slaty-breasted Rail				45	3		4			5				57	692
<u>Rallus torquatus</u> , Barred Rail				20										20	28
<b>JACANIDAE</b>															
<u>Hydrophasianus chirurgus</u> , Pheasant-tailed Jacana										8		20		28	36
<u>Metopidius indicus</u> , Bronze-winged Jacana										2				2	7
<b>ROSTRATULIDAE</b>															
<u>Rostratula benghalensis</u> , Painted Snipe				85	30					2		27		144	805
<b>CHARADRIIDAE</b>															
<u>Charadrius alexandrinus</u> , Kentish Plover					152				4			9		165	587
<u>Charadrius dominicus</u> , Pacific Golden Plover		16		84	83							4		187	641
<u>Charadrius dubius</u> , Little Ringed Plover		1		28	260					1		10		300	1922
<u>Charadrius leschenaulti</u> , Large Sand Plover				13	97		1							111	1068
<u>Charadrius mongolus</u> , Mongolian Plover				3	16		26		9					54	467
<u>Charadrius peroni</u> , Malay Sand Plover				4					1					5	245
<u>Charadrius placidus</u> , Long-billed Ringed Plover															6
<u>Charadrius squatarolus</u> , Grey Plover															11
<u>Vanellus cinereus</u> , Grey-headed Lapwing										1				1	1
<u>Vanellus indicus</u> , Red-wattled Lapwing										2		15		17	20
<u>Vanellus leucurus</u> , White-tailed Lapwing													13	13	33
<u>Vanellus vanellus</u> , Lapwing															1
<b>SCOLOPACIDAE</b>															
<u>Actitis hypoleucos</u> , Common Sandpiper		1		7	64		72			7		1		152	1457
<u>Arenaria interpres</u> , Turnstone		69												69	504

Table 32, page 8

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<i>Calidris acuminatus</i> , Sharp-tailed Sandpiper					3									3	8
<i>Calidris alpina</i> , Dunlin												2		2	122
<i>Calidris ferrugines</i> , Curlew Sandpiper															27
<i>Calidris malanota</i> , Pectoral Sandpiper															16
<i>Calidris ruficollis</i> , Rufous-necked Stint		1		26	79				10			111		227	2186
<i>Calidris subminuta</i> , Long-toed Stint				3	98		1		15					117	1646
<i>Calidris temminckii</i> , Temminck's Stint					2							33		35	185
<i>Calidris tenuirostris</i> , Great Knot															3
<i>Capella gallinago</i> , Common Snipe		1		15	48							217		281	940
<i>Capella hardwickii</i> , Latham's Snipe															64
<i>Capella megala</i> , Swinhoe's Snipe			1	378	35									414	1835
<i>Capella minima</i> , Jack Snipe												57		57	110
<i>Capella solitaria</i> , Solitary Snipe															1
<i>Capella stenura</i> , Pintail Snipe					12		5		7					24	157
<i>Heteroscelus brevipes</i> , Grey-rumped Tattler															8
<i>Heteroscelus incanus</i> , Wanderina Tattler		43		2										45	464
<i>Limicola falcinellus</i> , Broad-billed Sandpiper							4							4	9
<i>Limosa lapponica</i> , Bar-tailed Godwit															11
<i>Limosa limosa</i> , Black-tailed Godwit												4		4	5
<i>Numenius arquatus</i> , Common Curlew															4
<i>Numenius minutus</i> , Pygmy Curlew															1
<i>Numenius phaeopus</i> , Common Whimbrel		17			16					1				34	238
<i>Philomachus pugnax</i> , Ruff												127		127	2348

Table 32 page 9

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Scolopax rusticola</u> Eurasian Woodcock		1												1	12
<u>Tringa erythropus</u> , Dusky Red Shank										1		32		33	48
<u>Tringa glareola</u> , Wood Sandpiper		1		6	128							538		673	2683
<u>Tringa guttifer</u> , Nordmana's Greenshank															1
<u>Tringa nebularia</u> , Greenshank					1							8		9	106
<u>Tringa ochropus</u> , Green Sandpiper					3							124		127	153
<u>Tringa stagnatilis</u> , Marsh Sandpiper					1							45		46	58
<u>Tringa totanus</u> , Redshank					8		14					14		36	383
<u>Xenus cinereus</u> , Terek Sandpiper					4									4	44
<b>RECURVIROSTRIDAE</b>															
<u>Himantopus himantopus</u> , Black-winged Stilt												45		45	127
<b>PHALAROPODIDAE</b>															
<u>Phalaropus lobatus</u> , Red-necked phalarope															56
<b>BURHINIDAE</b>															
<u>Burhinus oediceramus</u> , European Stone Curlew												4		4	4
<b>GLAREOLIDAE</b>															
<u>Glareola lactea</u> , Small Pratincole															2
<u>Glareola maldivarum</u> , Collared Pratincole					12									12	55
<b>LARIDAE</b>															
<u>Chlidonias hybridus</u> , Whiskered Tern															2
<u>Gelochelidon nilotica</u> , Gull-billed Tern															1
<u>Larus argentatus</u> , Herring Gull															1
<u>Larus brunneiceps</u> , Brown-headed Gull															1

Table 32 page 10

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Larus crassirostris</u> , Black-tailed Gull		1506												1506	5986
<u>Sterna albifrons</u> , Little Tern															1
<u>Sterna anaetheta</u> , Bridled Tern															68
<u>Sterna bengalensis</u> , Lesser Crested-Tern															5
<u>Sterna fuscata</u> , Sooty Tern															1
<u>Sterna hirundo</u> , Common Tern					1									1	25
<u>Sterna sumatrana</u> , Black-naped Tern								25						25	110
ALCIDAE															
<u>Cerorhinca monocerata</u> , Hornbilled Puffin		900												900	1041
<u>Synthliboramphus antiquus</u> , Ancient Murrelet		6												6	6
<u>Synthliboramphus wumizusume</u> , Japanese Murrelet															1
COLUMBIDAE															
<u>Chalcophaps indica</u> , Emerald Dove				13	309	39	171	4		10		11		558	2118
<u>Columba elphinstonii</u> , Nilgiri Wood Pigeon												4		4	4
<u>Columba janthina</u> , Japanese Wood Pigeon															1
<u>Columba livia</u> , Rock Dove							6					1		7	11
<u>Columba pulchricollis</u> , Ashy Wood Pigeon															2
<u>Columba vitiensis</u> , Metallic Wood Pigeon															1
<u>Ducula badia</u> , Mountain Imperial Pigeon							4							4	4
<u>Ducula carola</u> , Spotted Imperial Pigeon															12
<u>Geopelia striata</u> , Zebra Dove				79			31				1			111	1501

Table 32, page 11

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Macropygia phasianella</u> , Red Cuckoo-Dove						1								1	219
<u>Macropygia ruficeps</u> , Little Cuckoo-Dove							1							1	3
<u>Macropygia unchall</u> , Barred Cuckoo-Dove							1							3	8
<u>Phapitreron amethystina</u> , Amethyst Brown Fruit Dove															11
<u>Phapitreron leucotis</u> , White-eared Brown Fruit Dove						198								198	617
<u>Ptilinopus jambu</u> , Pink-headed Fruit Dove						582								582	1070
<u>Ptilinopus leclancheri</u> , Black-chinned Fruit Dove															41
<u>Ptilinopus melanocephalus</u> , Black-naped Fruit Dove															1
<u>Ptilinopus occipitalis</u> , Yellow-breasted Fruit Dove															92
<u>Streptopelia bitorquata</u> , Javanese Turtle Dove				1	1									2	983
<u>Streptopelia chinensis</u> , Spotted-necked Dove			2		2		3		39	2		3		51	249
<u>Streptopelia decaocto</u> , Ring Dove												35		35	47
<u>Streptopelia orientalis</u> , Eastern Turtle Dove		4	4									5		13	52
<u>Streptopelia senegalensis</u> , Little Brown Dove												120		120	129
<u>Streptopelia tranquebarica</u> , Red Turtle Dove				4						27		2		33	87
<u>Treron curvirostra</u> , Lesser Thick-billed Green Pigeon					1		76			41				118	208
<u>Treron olax</u> , Little Green Pigeon								2						2	23



Table 32, page 12

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Treron phoenicoptera</u> , Yellow-footed Green Pigeon															3
<u>Treron pompadora</u> , Pompadour Green Pigeon												2		2	27
<u>Treron sphenura</u> , Wedge-tailed Green Pigeon															5
<u>Treron vernans</u> , Pink-necked Green Pigeon					25				9					34	351
PSITTACIDAE															
<u>Bolbopsittacus lunulatus</u> , Guaiabero															40
<u>Loriculus galgulus</u> , Blue-crowned Hanging Parrot															1
<u>Loriculus philippinsis</u> , Philippine Hanging Parrot															5
<u>Loriculus vernalis</u> , Javanese Hanging Lorikeet										20				20	20
<u>Prioniturus discursus</u> , Blue-headed Racquet-tailed Parrot															23
<u>Psittacula cyanocephala</u> , Indian Blossum-headed Parakeet										12				12	14
<u>Psittacula krameri</u> , Rose-ringed Parakeet												36		36	56
<u>Psittacula longicauda</u> , Long-tailed Parakeet								1						1	10
<u>Psittacula roseata</u> , Blossum-head Parakeet										1				1	1
<u>Psittinus cyanurus</u> , Blue-rumped Parrot								4						4	4
<u>Tanygathus lucionensis</u> , Blue-naped Parrot															21
CUCULIDAE															
<u>Cacomantis merulinus</u> , Plaintive Cuckoo					1	3	6		2	9				21	391
<u>Cacomantis sonnerati</u> , Banded Bay Cuckoo					1		3		3	3				10	34
<u>Cacomantis variolosus</u> , Fantail Cuckoo				32			3							35	210
<u>Centropus sinensis</u> , Common Coucal									1	3		2		6	12

Table 32, page 13

Species	Korea	Japan	Taiwan	Lu-chiu	Pulawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<i>Centropus toulou</i> , Lesser Coucal			5	2			12			2				21	94
<i>Centropus viridis</i> , Philippine Cuckoo															27
<i>Clamator coromandus</i> , Red-winged crested Cuckoo							10		2					12	26
<i>Clamator jacobinus</i> , Pied Crested Cuckoo												2		2	4
<i>Chrysococcyx maculatus</i> , Emerald Cuckoo															3
<i>Chrysococcyx malayanus</i> , Malay Cuckoo							5							5	25
<i>Chrysococcyx xanthorhynchus</i> , Violet Cuckoo							13							13	22
<i>Cuculus canorus</i> , Common Cuckoo	1													1	70
<i>Cuculus fugax</i> , Hawk Cuckoo					10		1							11	34
<i>Cuculus micropternus</i> , Indian Cuckoo							5							5	13
<i>Cuculus poliocephalus</i> , Little Cuckoo															4
<i>Cuculus saturatus</i> , Blyth's Cuckoo		1	1											2	44
<i>Cuculus sparveriioides</i> , Large Hawk Cuckoo					9									9	61
<i>Cuculus vagans</i> , Lesser Hawk Cuckoo							3							3	8
<i>Eudynamis scolopacea</i> , Koel					4							4		8	43
<i>Phoenicophacus curvirostris</i> , Chestnut-breasted Malcoha															5
<i>Phoenicophaeus diardi</i> , Lesser Green-billed Malcoha															1
<i>Phoenicophaeus superciliosus</i> , Rough-crested Malcoha							2							2	7
<i>Phoenicophaeus tristis</i> , Large Green-billed Malcoha							1							1	6
<i>Surniculus lugubris</i> , Drongo Cuckoo				6	3		14							23	85
TYTONIDAE															
<i>Phodilus badius</i> , Bay Owl							1							1	11

Table 32, page 14

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<i>Fyto capensis</i> , Grass Owl			1		4									5	15
STRIGIDAE															
<i>Asio flammeus</i> , Short-eared Owl		1												1	3
<i>Asio otus</i> , Long-eared Owl		4												4	6
<i>Athene brama</i> , Spotted Owlet										6		8		14	21
<i>Bubo bubo</i> , Eagle Owl															1
<i>Bubo coromandus</i> , Dusky Eagle Owl												4		4	4
<i>Glaucidium brodiei</i> , Pygmy Owlet			2				1		1	5		1		10	46
<i>Glaucidium cuculoides</i> , Barred Owlet												5		5	29
<i>Ketupa ketupu</i> , Fish Owl															4
<i>Ninox philippensis</i> , Philippine Boobook Owl															98
<i>Ninox scutulata</i> , Brown Hawk Owl		5		1	3		1							10	79
<i>Otus bakkamoena</i> , Collared Scops Owl		3	3		1		8			15	1	3		34	199
<i>Otus brookei</i> , Rajah Scops Owl															1
<i>Otus rufescens</i> , Reddish Scops Owl							3	2						5	15
<i>Otus sagittatus</i> , White-fronted Scops Owl							2							2	5
<i>Otus scops</i> , Scops Owl		2	2	1			6			4				15	91
<i>Otus spilocephalus</i> , Mountain Scops Owl							1							1	48
<i>Strix aluco</i> , Tawny Owl															1
<i>Strix uralensis</i> , Ural Owl		5												5	9
PODARGIDAE															
<i>Batrachostomus javensis</i> , Javan Frog Mouth															3
<i>Batrachostomus septimus</i> , Philippine Frog Mouth															10

Table 32, page 15

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Batrachostomus stellatus</u> , Gould's Frog Mouth							1							1	3
CAPRIMULGIDAE															
<u>Caprimulgus affinis</u> , Savanna Nightjar															43
<u>Caprimulgus asiaticus</u> , Common Indian Nightjar												1		1	1
<u>Caprimulgus concretus</u> , Bonaparte's Nightjar								2						2	6
<u>Caprimulgus indicus</u> , Migratory Nightjar		2												2	24
<u>Caprimulgus macrurus</u> , Long-tailed Nightjar				2	42		9		40	5				98	427
<u>Eurostopodus macrotis</u> , Great-eared Nightjar				2						1				3	16
APODIDAE															
<u>Apus affinis</u> , House Swift							3	1						4	1094
<u>Apus pacificus</u> , White-rumped Swift							1							1	13
<u>Chaetura cochinchinensis</u> , White-Throated Spinetail Swift															1
<u>Chaetura gigantea</u> , Malaysian Spinetail Swift				1			1							2	29
<u>Chaetura leucopygialis</u> , White-rumped Spinetail Swift															1
<u>Chaetura picina</u> , Philippine Spinetail Swift															2
<u>Collocalia brevirostris</u> , Himalayan Swiftlet															1
<u>Collocalia esculenta</u> , White-bellied Swiftlet					61		447				15			523	3901
<u>Collocalia gigas</u> , Giant Swiftlet							1							1	1
<u>Collocalia inexpectata</u> , Edible-nest Swiftlet															8
<u>Collocalia troglodytes</u> , Pygmy Swiftlet				30		1								31	102
<u>Collocalia vestita</u> , Brown-rumped Swiftlet				2										2	12
<u>Collocalia whitehead</u> , Whitehead's Swiftlet				35	43									78	312
<u>Cypsiurus parvus</u> , Palm Swift															6

Table 32, page 16

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<b>HEMIPROCINIDAE</b>															
<u>Hemiprocne comata</u> , White-whiskered Tree Swift															2
<b>TROGONIDAE</b>															
<u>Harpactes ardens</u> , Philippine Trogon															8
<u>Harpactes diardii</u> , Diard's Trogon									2					2	12
<u>Harpactes duvauceli</u> , Red-rumped Trogon									7					7	22
<u>Harpactes erythrocephalus</u> , Red-headed Trogon											2			2	41
<u>Harpactes kasumba</u> , Red-naped Trogon															4
<u>Harpactes oreskios</u> , Orange-breasted Trogon															4
<u>Harpactes orrhophaeus</u> , Cinnamon-rumped Trogon									5					5	5
<u>Harpactes whiteheadi</u> , White-head's Trogon															5
<b>ALCEDINIDAE</b>															
<u>Alcedo atthis</u> , Common Kingfisher	5	3	11	10	3		27		1	12		8		80	1011
<u>Alcedo euryzona</u> , Blue-banded Kingfisher									10					10	14
<u>Alcedo meninting</u> , Deep Blue Kingfisher					8		4	9	1	1				23	91
<u>Ceryle lugubris</u> , Pied Kingfisher															1
<u>Ceyx argentatus</u> , Silvery Kingfisher															1
<u>Ceyx cyanopectus</u> , Dwarf River Kingfisher															4
<u>Ceyx erithacus</u> , Black-backed Kingfisher							67	21						88	298
<u>Ceyx melanurus</u> , Philippine Forest Kingfisher															2
<u>Ceyx rufidorsus</u> , Red-backed Kingfisher					6		24							30	92
<u>Halcyon chloris</u> , White-collared Kingfisher				56	10	34	91	22	64		2			279	1832
<u>Halcyon concreta</u> , Chestnut collared Kingfisher							21	11						32	59

Table 32, page 18

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<b>BUCEROTIDAE</b>															
<u>Anthracoeros convexus</u> , Northern Pied Hornbill															4
<u>Buceros bicornis</u> , Great Hornbill										1				1	1
<u>Penelopides panini</u> , Tarictic Hornbill															3
<u>Ptilolaemus tickelli</u> , Tickell's Hornbill										1				1	1
<u>Rhyticeros plicatus</u> , Blyth's Hornbill										1				1	1
<u>Rhyticeros undulatus</u> , Wreathed Hornbill										1				1	2
<u>Tockus birostris</u> , Common Grey Hornbill													2	2	4
<b>CAPITONIDAE</b>															
<u>Calorhamphus fuliginosus</u> , Brown Barbet							5							5	8
<u>Megalaima asiatica</u> , Blue-throated Barbet							1							1	34
<u>Megalaima australis</u> , Little Barbet										1				1	5
<u>Megalaima chrysopogon</u> , Gold-Whiskered Barbet							1							1	1
<u>Megalaima faiostricta</u> , Green-eared Barbet										1				1	8
<u>Megalaima franklini</u> , Golden-throated Barbet												1		1	82
<u>Megalaima haemacephala</u> , Coppersmith Barbet					1		19					13		33	244
<u>Megalaima henrici</u> , Yellow-crowned Barbet							1							1	2
<u>Megalaima incognita</u> , Hume's Blue-throated Barbet															12
<u>Megalaima mystacophanes</u> , Gaudy Barbet							3							3	9
<u>Megalaima oorti</u> , Muller's Barbet				1										1	6
<u>Megalaima virens</u> , Great Barbet												2		2	11
<u>Megalaima viridis</u> , Small Green Barbet												72		72	72
<u>Megalaima zeylanica</u> , Lineated Barbet										1		1		2	9
<u>Psilopogon pyrolophus</u> , Fire-tufted Barbet							3							3	11

Table 32 page 19

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
INDICATORIDAE															
<i>Indicator archipelagicus</i> , Malay Honeyguide							4							4	12
PICIDAE															
<i>Blythipicus pyrrhotis</i> , Bay Woodpecker															13
<i>Blythipicus rubiginosus</i> , Maroon Woodpecker							2	4						6	44
<i>Chrysocolaptes lucidus</i> , Golden-backed Four-toed Woodpecker							2			1				3	24
<i>Dendrocopos atratus</i> , Striped-breasted Pied Woodpecker															10
<i>Dendrocopos canicapillus</i> , Oriental Pygmy Pied Woodpecker															5
<i>Dendrocopos darjellensis</i> , Darjeeling Pied Woodpecker														2	2
<i>Dendrocopos kizuki</i> , Japanese Pygmy Woodpecker		1												1	7
<i>Dendrocopos leucotos</i> , White-backed Woodpecker															3
<i>Dendrocopos macei</i> , Fulvous-breasted Red Woodpecker															4
<i>Dendrocopos maculatus</i> , Philippine Pygmy Woodpecker															4
<i>Dendrocopos mahrattensis</i> , Yellow-fronted Pied Woodpecker														2	9
<i>Dendrocopos major</i> , Great Spotted Woodpecker		9	1											2	10
<i>Dendrocopos moluccensis</i> , Malaysian Pygmy Pied Woodpecker							12							12	22
<i>Dinopium benghalense</i> , Lesser Golden-backed Woodpecker															20
<i>Dinopium javanense</i> , Golden-backed Three-toed Woodpecker					6		7					20		20	29
<i>Dinopium rafflesii</i> , Olive-backed Three-toed Woodpecker							1	2						3	6
<i>Dryocopus javensis</i> , White-bellied Black Woodpecker															5
<i>Gecinulus grantia</i> , Pale-headed Woodpecker							1							1	11
<i>Hemicircus canente</i> , Heart-spotted Woodpecker										1				1	3
<i>Jynx torquilla</i> , Wryneck		4								23		12		39	114

Table 32, page 20

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<i>Meiglyptes tristis</i> , Fulvous-rumped Woodpecker							3	7						10	15
<i>Meiglyptes tukki</i> , Buff-necked Woodpecker							32		1					33	76
<i>Micropternus brachyurus</i> , Rufous Woodpecker							7	2		1		4		14	70
<i>Mulleripicus funebris</i> , Sooty Woodpecker															1
<i>Picumnus innominatus</i> , Speckled Piculet										1				1	34
<i>Picus awokera</i> , Japanese Green Woodpecker		1												1	3
<i>Picus canus</i> , Black-naped Green Woodpecker				5										5	16
<i>Picus chlorolophus</i> , Lesser Yellow-naped Woodpecker												2		2	7
<i>Picus erythropygius</i> , Red-rumped Green Woodpecker															6
<i>Picus flavinucha</i> , Large Yellow-naped Woodpecker										2		1		3	7
<i>Picus mentalis</i> , Checker-throated Woodpecker								1						1	2
<i>Picus miniaceus</i> , Banded Red Woodpecker														1	10
<i>Picus puniceus</i> , Crimson-winged Woodpecker							1							1	4
<i>Picus vittatus</i> , Bamboo Green Woodpecker							17							17	104
<i>Sasia abnormis</i> , Rufous Piculet							27	9						36	99
<i>Sasia ochracea</i> , White-browed Rufous Piculet										4				4	40
<b>EURYLAIMIDAE</b>															
<i>Calyptomena viridis</i> , Green Broadbill							44	6						50	121
<i>Cymbirhynchus macrorhynchos</i> , Black-and-Red Broadbill							12	1						13	39
<i>Eurylaimus javanicus</i> , Banded Broadbill							2	3						5	23
<i>Eurylaimus ochromalus</i> , Black-and-Yellow Broadbill							1							1	5
<i>Eurylaimus steerii</i> , Wattled Broadbill															9



Table 32, page 21

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Psarisomus dalhousiae</u> , Long-tailed Broadbill															16
<u>Serilophus lunatus</u> , Silver-breasted Broadbill															65
PITTIDAE															
<u>Pitta caerulea</u> , Giant Pitta															1
<u>Pitta cyanea</u> , Lesser Blue Pitta															10
<u>Pitta erythrogaster</u> , Red-breasted Pitta					62	1								63	1722
<u>Pitta granatina</u> , Garnet Pitta								4						4	10
<u>Pitta guajana</u> , Banded Pitta								2						2	9
<u>Pitta kochi</u> , Koch's Pitta															2
<u>Pitta moluccensis</u> , Blue-winged Pitta		1						101	1			6		109	205
<u>Pitta oatesi</u> , Fulvous Pitta															5
<u>Pitta phayrei</u> , Phayr Pitta															1
<u>Pitta sordida</u> , Hooded Pitta					11	1		272						284	622
ALAUDIDAE															
<u>Alauda arvensis</u> , Skylark		7	1		1									9	587
<u>Alauda gulgula</u> , Lesser Skylark													2	30	37
<u>Ammomanes phoenicurus</u> , Rufous-tailed Finch-lark												28			1
<u>Galerida cristata</u> , Crested Lark														2	24
<u>Mirafra assamica</u> , Rufous-winged Bush Lark														34	173
<u>Mirafra erythroptera</u> , Red-winged Bush Lark													1	1	1
<u>Mirafra javanica</u> , Bush Lark														51	642
HIRUNDINIDAE															
<u>Delichon urbica</u> , House Martin		1344						5						1349	7498

Table 32, page 22

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Hirundo concolor</u> , Dusky Crag Martin												1		1	1
<u>Hirundo daurica</u> , Red-rumped Swallow	5	13								3385		8		3411	3948
<u>Hirundo rustica</u> , House Swallow	2621	2408	4315	10	777		12092	135	97	10200	14			32669	241702
<u>Hirundo striolata</u> , Striated Swallow			124											124	361
<u>Hirundo tahitica</u> , Pacific Swallow				1	42		161	729						933	4928
<u>Riparia paludicola</u> , Brown-throated Sand Martin			582											582	2961
<u>Riparia riparia</u> , Sand Martin	1	1			3		1			1250				1256	1561
CAMPEPHAGIDAE															
<u>Coracina fimbriata</u> , Lesser Graybird										1				1	5
<u>Coracina larvata</u> , Black-faced Graybird															1
<u>Coracina melanoptera</u> , Black-headed Graybird												2		2	2
<u>Coracina melaschista</u> , Dark Gray Cuckoo-shrike										3			1	4	12
<u>Coracina novaehollandiae</u> , Black-faced Cuckoo-shrike															5
<u>Coracina ostenta</u> , White-winged Cuckoo-shrike															7
<u>Coracina polioptera</u> , Lesser Cuckoo-shrike										1				1	6
<u>Coracina striata</u> , Barred Graybird															21
<u>Hemipus hirundinaceus</u> , Black-winged Flycatcher-shrike							1							1	5
<u>Hemipus picatus</u> , Bar-winged Flycatcher-shrike							4			4				8	130
<u>Lalage melanoleuca</u> , Black-and-White Triller															4
<u>Lalage nigra</u> , Pied Triller				4	1	5	33	3	19					65	897
<u>Pericrocotus brevirostris</u> , Scarlet-billed Minivet															6
<u>Pericrocotus cinnamomeus</u> , Small Minivet												13		13	20

Table 32, page 23

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Pericrocotus divaricatus</u> , Ashy Minivet		4												4	4
<u>Pericrocotus ethologus</u> , Long-tailed Minivet															22
<u>Pericrocotus flammeus</u> , Scarlet Minivet							5			1		9		15	45
<u>Pericrocotus igneus</u> , Fiery Minivet							4							4	4
<u>Pericrocotus roseus</u> , Rosy Minivet				1										1	16
<u>Pericrocotus solaris</u> , Mountain Minivet							1			1				2	21
<u>Tephrodornis gularis</u> , Hook-billed Gray Bird															1
<u>Tephrodornis pondiceriana</u> , Common Wood Shrike												46		46	58
<u>Tephrodornis virgatus</u> , Brown-tailed Wood Shrike										1				1	41
DICRURIDAE															
<u>Dicrurus adsimilis</u> , Black Drongo										24		3		27	97
<u>Dicrurus aeneus</u> , Bronzed Drongo							3			2				5	61
<u>Dicrurus annectans</u> , Crow-billed Drongo							37							37	108
<u>Dicrurus balicassius</u> , Balicassiao															135
<u>Dicrurus caerulescens</u> , White-bellied Drongo												7		7	7
<u>Dicrurus hottentottus</u> , Hair-crested Drongo					6	45				3				54	148
<u>Dicrurus leucophaeus</u> , Ashy Drongo					16		1			12	5		3	37	158
<u>Dicrurus paradiseus</u> , Greater Racket-tailed Drongo							7	7		10				24	140
<u>Dicrurus remifer</u> , Lesser Racket-tailed Drongo							7							7	194
ORIOOLIDAE															
<u>Oriolus chinensis</u> , Black-naped Oriole							8				3			11	581
<u>Oriolus cruentus</u> , Black-and-Crimson							1							1	1

Table 32, page 24

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Oriolus oriolus</u> , Golden Oriole												2		2	2
<u>Oriolus tenuirostris</u> , Slender-billed Oriole															2
<u>Oriolus traillii</u> , Maroon Oriole															10
<u>Oriolus xanthonotus</u> , Malaysian Black-headed Oriole							1			3		1		5	10
CORVIDAE															
<u>Cissa chinensis</u> , Green Magpie															3
<u>Cissa erythrorhyncha</u> , Red-billed Blue Magpie															4
<u>Cissa thalassina</u> , Short-tailed Green Magpie															4
<u>Corvus corone</u> , Carrion Crow		1												1	11
<u>Corvus enca</u> , Slender-billed Crow					2									2	2
<u>Corvus macrorhynchos</u> , Large-billed Crow												2		2	3
<u>Corvus splendens</u> , House Crow							2					6		8	8
<u>Crypsirina formosae</u> , Grey Treepie															1
<u>Crypsirina occipitalis</u> , Malaysian Treepie															10
<u>Crypsirina temia</u> , Racquet-tailed Treepie															22
<u>Crypsirina vagabunda</u> , Rufous Treepie															3
<u>Cyanopica cyana</u> , Blue Magpie		2												2	48
<u>Dendrocitta vagabunda</u> , Indian Treepie												7		7	8
<u>Garrulus glandarius</u> , Jay		5												5	101
<u>Nucifraga caryocatactes</u> , Nutcracker															1
<u>Pica pica</u> , Magpie															71
<u>Platylophus galericulatus</u> , Crested Malay Jay							2							2	9
<u>Platylophus leucopterus</u> , Black-crested Magpie							3							3	7

Table 32, page 25

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total: 1964-1968
<b>PARIDAE</b>															
<u>Aegithaliscus concinnus</u> , Red-headed Tit			4										11	15	73
<u>Aegithaliscus caudatus</u> , Long-tailed Tit	15	2												17	448
<u>Parus amabilis</u> , Palawan Tit															1
<u>Parus ater</u> , Coal Tit	122	6	1											129	312
<u>Parus atricapillus</u> , Willow Tit															27
<u>Parus elegans</u> , Elegant Titmouse				1		1								12	111
<u>Parus major</u> , Great Tit	391	115					7				3	2		518	2910
<u>Parus monticolus</u> , Green-backed Tit			6										47	53	112
<u>Parus palustris</u> , Marsh Tit	50													50	192
<u>Parus varius</u> , Varied Tit	11													11	210
<u>Parus xanthogenys</u> , Yellow-cheeked Tit															67
<u>Sylviparus modestus</u> , Yellow-browed Tit															1
<b>CERTHIIDAE</b>															
<u>Certhia discolor</u> , Brown-throated Treecreeper															19
<u>Certhia familiaris</u> , European Treecreeper															2
<u>Rhabdornis inornatus</u> , Plain-headed Creeper															3
<u>Rhabdornis mystacalis</u> , Striped-headed Creeper						5								5	10
<b>SITIDAE</b>															
<u>Sitta azurea</u> , Blue Nuthatch							1							1	4
<u>Sitta castanea</u> , Chestnut-bellied Nuthatch												11	4	15	15
<u>Sitta europaea</u> , European Nuthatch		1	1											2	41
<u>Sitta frontalis</u> , Velvet-fronted Nuthatch					4					2				6	76

Table 32, page 26

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Sitta himalayensis</u> , White-tailed Nuthatch													15	15	15
TIMALIIDAE															
<u>Actinodura egertoni</u> , Egerton's Barwing													2	2	2
<u>Actinodura morrisoniana</u> , Formosan Barwing			7											7	16
<u>Actinodura ramsayi</u> , Spectacled Barwing															120
<u>Alcippe brunnea</u> , Gould's Nun Babbler															17
<u>Alcippe brunneicauda</u> , Brown-tailed Nun Babbler							37							37	101
<u>Alcippe castaniceps</u> , Chestnut-headed Nun Babbler													100	100	461
<u>Alcippe cinereiceps</u> , Brown-headed Nun Babbler			7											7	59
<u>Alcippe morrisonia</u> , Gray-faced Nun Babbler			13							31				44	1393
<u>Alcippe nipalensis</u> , Mountain Nun Babbler							87							87	592
<u>Alcippe poiocephala</u> , Common Nun Babbler							21			3		134		158	388
<u>Alcippe vinipectus</u> , White-browed Nun Babbler												2		2	2
<u>Chrysomma sinense</u> , Yellow-eyed Babbler										44		69		113	186
<u>Dumetia hyperythra</u> , Rufous-bellied Babbler												40		40	40
<u>Eupetes macrocercus</u> , Rail Babbler								1						1	2
<u>Gampsorhynchus rufulus</u> , White-headed Babbler															4
<u>Garrulax albogularis</u> , White-throated Laughing Thrush													3	3	4
<u>Garrulax canorus</u> , Hwamei			6											6	23
<u>Garrulax chinensis</u> , Black-throated Laughing Thrush										5				5	28
<u>Garrulax erythrocephalus</u> , Red-headed Laughing Thrush							13							13	165
<u>Garrulax leucolophus</u> , White-created Laughing Thrush										26				26	??
<u>Garrulax lineatus</u> , Streaked Laughing Thrush													8	8	8

Table 32, page 27

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Garrulax lugubris</u> , Black Laughing Thrush															1
<u>Garrulax milnei</u> , Red-tailed Laughing Thrush															1
<u>Garrulax mitratus</u> , Chestnut-capped Laughing Thrush							14							14	53
<u>Garrulax moniligerus</u> , Necklaced Laughing Thrush										5				5	20
<u>Garrulax morrisonianus</u> , Formosan Laughing Thrush			7											7	31
<u>Garrulax palliatus</u> , Gray-and-Brown Laughing Thrush															4
<u>Garrulax pectoralis</u> , Greater Necklaced Laughing Thrush										1				1	2
<u>Garrulax perepicillatus</u> , Spectacled Laughing Thrush															18
<u>Garrulax poecilorhynchus</u> , Rufous Laughing Thrush															3
<u>Garrulax strepitans</u> , Tickell's Laughing Thrush															22
<u>Heterophasia annectens</u> , Chestnut-backed Sibia															52
<u>Heterophasia auricularis</u> , White-eared Sibia			1											1	20
<u>Heterophasia capistrata</u> , Black-headed Sibia												22		22	22
<u>Heterophasia melanoleuca</u> , Tickell's Sibia															376
<u>Heterophasia picaoides</u> , Long-tailed Sibia							16			1				17	64
<u>Kenopia striata</u> , Striped Wren-babbler							10							10	14
<u>Leiothrix argenteauris</u> , Silver-eared Mesia							72							72	381
<u>Leiothrix lutea</u> , Red-billed Leiothrix															9
<u>Liocichla ripponi</u> , Crimson-headed Liocichla															22
<u>Liocichla steerei</u> , Steere's Liocichla			38											38	151
<u>Macronus flavicollis</u> , Gray-faced Tit Babbler						8								8	66
<u>Macronus gularis</u> , Striped Tit Babbler							32	25	48	82			2	189	864
<u>Macronus ptilosus</u> , Fluffy-backed Tit Babbler							46	16						62	120

Table 32, page 28

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Macronus stricklandi</u> , Brown Tit Babbler						201								201	349
<u>Malacopteron affine</u> , Plain Babbler							17							17	62
<u>Malacopteron albogulare</u> , White-throated Babbler							2	1						3	9
<u>Malacopteron cinereum</u> , Lesser Red-headed Babbler						39	4				4			47	163
<u>Malacopteron magnirostre</u> , Brown-headed Babbler						49								49	206
<u>Malacopteron magnum</u> , Greater Red-headed Babbler						41	3							44	76
<u>Minia cyanouroptera</u> , Blue-winged Siva						11				1			17	29	142
<u>Minia ignotincta</u> , Red-tailed Siva												5		5	5
<u>Minia strigula</u> , Chestnut-tailed Siva													38	38	137
<u>Myzornis pyrrhoura</u> , Fire-tailed Myzornis													1	1	1
<u>Napothera brevicaudatus</u> , Streaked Wren-Babbler							8							8	152
<u>Napothera crassa</u> , Mountain Wren-Babbler															5
<u>Napothera epilepidotus</u> , Small Wren-Babbler							1							1	29
<u>Napothera macrodactylus</u> , Large-footed Wren-Babbler							8							8	11
<u>Pellorneum albigaster</u> , Plain Brown Babbler															26
<u>Pellorneum capistratum</u> , Black-capped Babbler						49	12							61	132
<u>Pellorneum ruficeps</u> , Striped Babbler						2				14		110	2	128	357
<u>Pnoepyga albiventer</u> , Formosan Scaly-breasted Wren													7	7	7
<u>Pnoepyga pusilla</u> , Pygmy Wren-Babbler													1	1	4
<u>Pomatorhinus erythrogenys</u> , Rusty-cheeked Scimitar Babbler															54
<u>Pomatorhinus hypoleucos</u> , Large Scimitar Babbler															4
<u>Pomatorhinus ochraceiceps</u> , Ochraceous-headed Scimitar Babbler															4



Table 32, page 29

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<i>Pomatorhinus ruficollis</i> , Rufous-necked Scimitar Babbler			3										4	7	9
<i>Pomatorhinus schisticeps</i> , Chestnut-naped Scimitar Babbler										4		55		59	292
<i>Pteruthius aenobarbus</i> , Chestnut-fronted Shrike-Babbler										1				1	5
<i>Pteruthius flaviscapis</i> , Greater Shrike-Babbler							1			1				2	25
<i>Pteruthius melanotis</i> , Black-eared Shrike-Babbler							1							1	2
<i>Ptilocichla falcata</i> , Falcated Ground Babbler															3
<i>Rhopophilus pekinensis</i> , Chinese Babbler															9
<i>Stachyris capitalis</i> , Rufous-crowned Tree Babbler						10								10	14
<i>Stachyris chrysaea</i> , Golden Tree Babbler							16			5				21	107
<i>Stachyris erythroptera</i> , Red-winged Tree Babbler							68	41						109	281
<i>Stachyris leucotis</i> , White-eared Tree Babbler							16							16	25
<i>Stachyris maculata</i> , Red-rumped Tree Babbler							45							45	88
<i>Stachyris nigriceps</i> , Gray-throated Tree Babbler							56			19				75	587
<i>Stachyris nigricollis</i> , Black-necked Tree Babbler							34	7						41	76
<i>Stachyris nigrocapitata</i> , Black-crowned Tree Babbler															6
<i>Stachyris plateni</i> , Pygmy Tree Babbler						14								14	21
<i>Stachyris poliocephala</i> , Gray-headed Tree Babbler							71	1						72	222
<i>Stachyris ruficeps</i> , Red-headed Tree Babbler													36	57	210
<i>Stachyris rufifrons</i> , Hume's Tree Babbler										1				1	9
<i>Stachyris speciosa</i> , Rough-templed Tree Babbler															41
<i>Stachyris striolata</i> , Spotted Tree Babbler															1
<i>Stachyris whiteheadi</i> , Whitehead's Tree Babbler						1								1	27
<i>Timalia pileata</i> , Red-capped Babbler										39				39	114

Table 32, page 30

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<i>Trichastoma abbotti</i> , Abbott's Jungle Babbler							37			12				49	205
<i>Trichastoma bicolor</i> , Ferruginous Jungle Babbler							33	1						34	64
<i>Trichastoma cinereiceps</i> , Ashy-headed Ground Babbler					1									1	14
<i>Trichastoma malaccense</i> , Short-tailed Babbler							136	34						170	415
<i>Trichastoma pyrrhogenys</i> , Temminck's Jungle Babbler															1
<i>Trichastoma rostratum</i> , Blyth's Jungle Babbler							40		10					50	106
<i>Trichastoma sepiarium</i> , Horsfield's Jungle Babbler							11					8		19	26
<i>Trichastoma tickelli</i> , Tickell's Jungle Babbler							1			6				7	74
<i>Turdoides earlei</i> , Striated Babbler															1
<i>Turdoides caudatus</i> , Common Babbler												28		28	89
<i>Turdoides malcolmi</i> , Large Grey Babbler												5		5	15
<i>Turdoides striatus</i> , Jungle Babbler												152		152	234
<i>Yuhina bakeri</i> , Baker's Yuhina													2	2	2
<i>Yuhina brunneiceps</i> , Formosan Yuhina			49											49	25
<i>Yuhina castaniceps</i> , Chestnut-headed Siva										1				1	190
<i>Yuhina flavicollis</i> , Yellow-naped Yuhina													39	39	173
<i>Yuhina nigrimentum</i> , Black-chinned Yuhina													3	3	3
<i>Yuhina zantholeuca</i> , White-bellied Yuhina							8			17			1	26	151
PARADOXORNITHIDAE															
<i>Paradoxornis gularis</i> , Gray-headed Parrotbill										7				7	158
<i>Paradoxornis guttaticolis</i> , Rufous-headed Parrotbill															19
<i>Paradoxornis nipalensis</i> , Orange Parrotbill														7	222
<i>Paradoxornis webbiana</i> , Webb's Parrotbill	346		10											356	2759

Table 34, page 32

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<i>Pycnonotus blanfordi</i> , Blanford's Bulbul										288				288	1448
<i>Pycnonotus brunneus</i> , Red-eyed Brown Bulbul							34	5						39	138
<i>Pycnonotus cafer</i> , Red-vented Bulbul											13	568	1	582	598
<i>Pycnonotus cyaniventris</i> , Gray-bellied Bulbul							9			3				12	36
<i>Pycnonotus erythroptalmos</i> , Lesser Brown Bulbul							65	6		1				72	178
<i>Pycnonotus eutilotus</i> , Crested Brown Bulbul							11	12		1				24	40
<i>Pycnonotus finlaysoni</i> , Stripe-throated Bulbul							13							13	394
<i>Pycnonotus flavescens</i> , Pale-faced Bulbul										1				1	502
<i>Pycnonotus goiavier</i> , Yellow-vented Bulbul				7		2383	1811	73	337	73	19			4703	16484
<i>Pycnonotus jocosus</i> , Red-whiskered Bulbul										321		679		1000	1467
<i>Pycnonotus leucogenys</i> , White-browed Bulbul												88		88	137
<i>Pycnonotus luteolus</i> , White-browed Bulbul												18		18	18
<i>Pycnonotus melanicterus</i> , Black-crested Yellow Bulbul							5			72		1		78	653
<i>Pycnonotus melanoleucos</i> , Black-and-white Bulbul							3	1						4	17
<i>Pycnonotus nieuwenhuisi</i> , Malayan Wattled Bulbul															97
<i>Pycnonotus plumosus</i> , Large Olive Bulbul					232		154	27	32	2				446	1392
<i>Pycnonotus simplex</i> , White-eyed Brown Bulbul							81	1		1				84	118
<i>Pycnonotus sinensis</i> , Chinese Bulbul			2											2	2831
<i>Pycnonotus squamatus</i> , Scaly-breasted Bulbul								1						1	4
<i>Pycnonotus striatus</i> , Striated Green Bulbul															28
<i>Pycnonotus taiwanus</i> , Styan's Bulbul			19											19	26
<i>Pycnonotus urostictus</i> , Yellow-Wattled Bulbul						181								181	284

Table 32, page 33

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Pycnonotus xanthorrhous</u> , Anderson's Bulbul															182
<u>Pycnonotus zeylanicus</u> , Yellow-crowned Bulbul								1	2					3	14
<u>Setornis criniger</u> , Hook-billed Bulbul															6
<u>Spizixos canifrons</u> , Finch-billed Bulbul															168
<u>Spizixos semitorques</u> , Collared Finch-billed Bulbul			3											3	10
AEGITHINIDAE															
<u>Aegithina lafresnayei</u> , Great Iora							2							2	15
<u>Aegithina nigrolutea</u> , Marshall's Iora												10		10	11
<u>Aegithina tiphia</u> , Common Iora					4		20	1	28	6	7	10	3	79	265
<u>Aegithina viridissima</u> , Green Iora							9							9	16
<u>Chloropsis aurifrons</u> , Golden-fronted Leafbird										12				12	48
<u>Chloropsis cochinchinensis</u> , Yellow-headed Green Leafbird														1	30
<u>Chloropsis cyanopogon</u> , Lesser Green Leafbird							3							3	10
<u>Chloropsis hardwickii</u> , Hardwickes Leafbird							1							1	20
<u>Chloropsis palawanensis</u> , Palawan Leafbird					1									1	29
<u>Chloropsis sonnerati</u> , Greater Green Leafbird							2							2	7
<u>Irena cyanogaster</u> , Philippine Fairy Bluebird															1
<u>Irena puella</u> , Fairy Bluebird							5			2				7	89
CINCLIDAE															
<u>Cinclus pallasii</u> , Pallas Dipper															6
TROGLODYTIDAE															
<u>Troglodytes troglodytes</u> , House Wren			3											3	45

Table 32, page 34

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
TURDIDAE															
<u>Brachypteryx leucophrys</u> , Lesser Shortwing							5							5	101
<u>Brachypteryx montana</u> , Blue Shortwing						8								8	86
<u>Cochoa viridis</u> , Green Cochoa															1
<u>Copsychus luzoniensis</u> , White-eyebrowed Shama															11
<u>Copsychus malabaricus</u> , Common Shama							26			33		1	4	64	405
<u>Copsychus niger</u> , Palawan Black Shama					2									2	40
<u>Copsychus pyropygus</u> , Oranged-tailed Shama							1	1						2	9
<u>Copsychus saularis</u> , Magpie Robin						1	69	4	21	58	7	79		239	2118
<u>Enicurus immaculatus</u> , Black-backed Forktail															5
<u>Enicurus leschenaulti</u> , White-crowned Forktail							15							15	15
<u>Enicurus maculatus</u> , Spotted Forktail													2	2	2
<u>Enicurus ruficapillus</u> , Chestnut-naped Forktail							20							20	73
<u>Enicurus schistaceus</u> , Slaty-backed Forktail										1			1	2	23
<u>Enicurus scouleri</u> , Little Forktail															1
<u>Erithacus akahige</u> , Japanese Robin		1												1	20
<u>Erithacus brunnea</u> , Indian Blue Robin												79		79	79
<u>Erithacus calliope</u> , Rubythroat	6	13	92	43			1			32		4		191	1166
<u>Erithacus chrysaeus</u> , Golden Bush Robin													2	2	2
<u>Erithacus cyane</u> , Siberian Blue Robin		69					110			44				223	830
<u>Erithacus pectoralis</u> , Himalayan Rubythroat															5
<u>Erithacus sibilans</u> , Red-tailed Robin		6												6	44
<u>Erithacus svecicus</u> , Bluethroat												181		181	275

Table 32, page 35

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Monticola cinclorhynchus</u> , Blue-headed Rock Thrush												60		60	60
<u>Monticola gularis</u> , White-throated Rock Thrush										1				1	8
<u>Monticola rufiventris</u> , Chestnut-bellied Rock Thrush															2
<u>Monticola solitaria</u> , Blue Rock Thrush		4	75	4	1	1				1				86	325
<u>Myiomela leucura</u> , White-tailed Blue Robin			4							8			4	16	257
<u>Myophonus coeruleus</u> , Blue Whistling Thrush										1			2	3	77
<u>Myophonus glaucinus</u> , Sunda Whistling Thrush															3
<u>Myophonus horsfieldii</u> , Formosan Whistling Thrush													2	2	2
<u>Myophonus robinsoni</u> , Malayan Whistling Thrush															2
<u>Phoenicurus aureus</u> , Daurian Redstart	7	44												51	419
<u>Phoenicurus frontalis</u> , Blue-fronted Redstart															2
<u>Phoenicurus ochrurus</u> , Black Redstart												68		68	87
<u>Rhyacornis fuliginosus</u> , Plumbeous Redstart															1
<u>Saxicola caprata</u> , Pied Stonechat				2		2				29		9		32	221
<u>Saxicola ferrea</u> , Grey Bushchat										1			7	8	117
<u>Saxicola jerdoni</u> , Jerdon's Bushchat															2
<u>Saxicola torquata</u> , Stonechat	23	4								12				39	606
<u>Saxicoloides fulicata</u> , Indian Robin												40		40	40
<u>Tarsiger cyanurus</u> , Red-flanked Bluetail		21	3											24	250
<u>Tarsiger indicus</u> , White-browed Bush Robin			23											23	46
<u>Tarsiger johnstoniae</u> , Johnston's Bush Robin			16											16	93
<u>Turdus cardis</u> , Grey Thrush		18												18	247
<u>Turdus celaenops</u> , Seven Islands Thrush															19
<u>Turdus chrysolais</u> , Brown Thrush			43											43	568

Table 32, page 36

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Turdus dauma</u> , Golden Mountain Thrush															13
<u>Turdus dissimilis</u> , Black-breasted Thrush															1
<u>Turdus hortulorum</u> , Grey-backed Thrush		1												1	227
<u>Turdus merula</u> , Black bird												106		106	107
<u>Turdus naumanni</u> , Dusky Thrush		24												24	249
<u>Turdus obscurus</u> , Grey-headed Thrush		9	6			1	1			29				46	221
<u>Turdus pallidus</u> , Pale Thrush	7	77												84	300
<u>Turdus poliocephalus</u> , Island Thrush															10
<u>Turdus ruficollis</u> , Red-throated Thrush												24		24	24
<u>Zoothera andromedae</u> , Sunda Ground Thrush															1
<u>Zoothera cinerea</u> , Ashy Ground Thrush					5									5	135
<u>Zoothera citrina</u> , Orange-headed Thrush							5				11	104		120	170
<u>Zoothera dauma</u> , White's Ground Thrush	4	4								2				10	75
<u>Zoothera dixonii</u> , Long-tailed Ground Thrush															1
<u>Zoothera everetti</u> , Everett's Ground Thrush															4
<u>Zoothera interpres</u> , Chestnut-headed Ground Thrush											2			2	3
<u>Zoothera marginata</u> , Lesser Long-billed Ground Thrush															32
<u>Zoothera sibirica</u> , Siberian Ground Thrush		5					1							6	223
SYLVIIDAE															
<u>Abroscopus superciliaris</u> , Yellow-bellied Flycatcher Warbler															10
<u>Acrocephalus agricola</u> , Paddy-field Warbler															1
<u>Acrocephalus arundinaceus</u> , Great Reed Warbler		188	17	80	3	25	159	3	40	21				536	4421

Table 32, page 37

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Acrocephalus bistrigiceps</u> , Von Schenck's Reed Warbler		95					11			27				133	1059
<u>Acrocephalus concinens</u> , Brown Paddy-field warbler										1				1	7
<u>Acrocephalus dumetorum</u> , Blyth's Reed Warbler												37		37	57
<u>Acrocephalus sorghophilus</u> , Speckled Reed Warbler				11										11	313
<u>Acrocephalus stentoreus</u> , Southern Great Reed Warbler										3				3	8
<u>Bradypterus caudatus</u> , Long-tailed Ground Warbler															2
<u>Bradypterus luteoventris</u> , Brown Bush Warbler		1												1	1
<u>Cettia acanthizoides</u> , Yellow-bellied Bush Warbler			30											30	140
<u>Cettia brunnifrons</u> , Rufous-capped Bush Warbler													1	1	1
<u>Cettia canturians</u> , Singing Bush Warbler															5
<u>Cettia diphone</u> , Bush Warbler		67	2											69	1108
<u>Cettia fontipes</u> , Mountain Bush Warbler			9											9	25
<u>Cettia pallidipes</u> , Pale-footed Bush Warbler															6
<u>Cettia squameiceps</u> , Short-tailed Bush Warbler		3	22											25	149
<u>Cettia whiteheadi</u> , Whitehead's Bush Warbler															7
<u>Cisticola exilis</u> , Rufous-headed Fantail Warbler				4		12								16	81
<u>Cisticola juncidis</u> , Streaked Faintail Warbler		77				58	14			1				149	433
<u>Gerygone fusca</u> , Flyeater				5			2							7	32
<u>Hippolais caligata</u> , Booted Warbler												1		1	6
<u>Locustella certhiola</u> , Pallas Grasshopper Warbler				3	1	3	46	1						54	771
<u>Locustella fasciolata</u> , Gray's Grasshopper Warbler				2										2	106
<u>Locustella lanceolata</u> , Streaked Grasshopper Warbler				202			17			1				220	2611
<u>Locustella ochetensis</u> , Middendorff's Grasshopper Warbler		49		66										115	513
<u>Megalurus palustris</u> , Striated Canegrass Warbler				3										3	111



Table 32, page 38

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<i>Megalurus timoriensis</i> , Rufous-capped Canegrass Warbler						4								4	37
<i>Orthotomus atrogularis</i> , Black-necked Tailorbird				25		25	61			14				125	452
<i>Orthotomus cinereiceps</i> , White-eared Tailorbird						2								2	4
<i>Orthotomus cucullatus</i> , Mountain Tailorbird							10							10	59
<i>Orthotomus nigriceps</i> , Black-headed Tailorbird															12
<i>Orthotomus ruficeps</i> , Red-headed Tailorbird							71		27		4			102	188
<i>Orthotomus sericeus</i> , Red-tailed Tailorbird					8		110					35		153	287
<i>Orthotomus sutorius</i> , Long-tailed Tailorbird							37			20		63	4	124	418
<i>Phragamaticola aedon</i> , Thick-billed Warbler										70				70	182
<i>Phylloscopus affinis</i> , Tickell's Willow Warbler												4	3	7	8
<i>Phylloscopus armandii</i> , Buff-browed Willow Warbler															1
<i>Phylloscopus borealis</i> , Arctic Willow Warbler		1	62		8	7	62	80		6				226	1701
<i>Phylloscopus cebuensis</i> , Yellow-faced Willow Warbler															19
<i>Phylloscopus collybita</i> , Chiffchaff												211		211	259
<i>Phylloscopus coronatus</i> , Crowned Willow Warbler							90							90	182
<i>Phylloscopus davisoni</i> , White-tailed Willow Warbler										1				1	93
<i>Phylloscopus fuscatus</i> , Dusky Willow Warbler										126				126	316
<i>Phylloscopus inornatus</i> , Yellow-browed Willow Warbler		1								19			6	26	165
<i>Phylloscopus maculipennis</i> , Grey-faced Willow Warbler															2
<i>Phylloscopus occipitalis</i> , Greater Crowned Willow Warbler	11	159												170	623
<i>Phylloscopus olivaceus</i> , Philippine Willow Warbler				1		8								9	506
<i>Phylloscopus proregulus</i> , Pallas Willow Warbler															36
<i>Phylloscopus pulcher</i> , Orange-barred Willow Warbler													1	1	36

Table 32, page 39

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Phylloscopus reguloides</u> , Blyth's Crowned Willow Warbler										12			1	13	66
<u>Phylloscopus schwarzi</u> , Radde's Willow Warbler										3				3	15
<u>Phylloscopus subaffinis</u> , Grant's Willow Warbler										1				1	2
<u>Phylloscopus tenellipes</u> , Pale-legged Willow Warbler		111								4				115	319
<u>Phylloscopus trivirgatus</u> , Green Willow Warbler							4							4	13
<u>Phylloscopus trochiloides</u> , Dull Green Willow Warbler													3	3	12
<u>Prinia atrogularis</u> , White-breasted Wren-Warbler										1				1	17
<u>Prinia familiaris</u> , Bar-winged Wren Warbler											6			6	8
<u>Prinia flaviventris</u> , Yellow-bellied Wren Warbler			1				81	10		16				108	651
<u>Prinia hodgsoni</u> , Franklin's Wren Warbler										130			13	143	233
<u>Prinia polychroa</u> , Brown Hill Warbler										2				2	5
<u>Prinia rufescens</u> , Rufescent Wren Warbler							5			26				31	124
<u>Prinia socialis</u> , Ashy Long-tailed Warbler													23	23	26
<u>Prinia subflava</u> , Brown Wren Warbler										14			19	33	268
<u>Prinia sylvatica</u> , Woodland Wren Warbler															2
<u>Regulus ignicapillus</u> , Firecrest			1											1	11
<u>Regulus regulus</u> , Goldcrest		7												7	382
<u>Seicercus albogularis</u> , White-throated Flycatcher-warbler			1											1	6
<u>Seicercus burkii</u> , Yellow-eyed Flycatcher-warbler										36			21	57	266
<u>Seicercus castaniceps</u> , Chestnut-headed Flycatcher-warbler													3	3	16
<u>Seicercus montis</u> , Yellow-breasted Flycatcher-warbler							5							5	27
<u>Seicercus superciliaris</u> , Yellow-bellied Flycatcher-warbler							3							3	19

Table 32, page 41

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Muscicapa leucomelanura</u> , Slaty Blue Flycatcher															4
<u>Muscicapa macgrigoriae</u> , Small Niltava															30
<u>Muscicapa monileger</u> , White Gorgetted Flycatcher										4				4	99
<u>Muscicapa mugimaki</u> , Mugimaki Flycatcher		12					3							15	65
<u>Muscicapa narcissina</u> , Narcissus Flycatcher		51												51	452
<u>Muscicapa pallipes</u> , White-bellied Blue Flycatcher													24	24	24
<u>Muscicapa panayensis</u> , Panay Flycatcher				1										1	19
<u>Muscicapa parva</u> , Red-breasted Flycatcher										61		1	1	63	170
<u>Muscicapa platanae</u> , Palawan Flycatcher															2
<u>Muscicapa poliogenys</u> , Brook's Flycatcher															1
<u>Muscicapa rubeculoides</u> , Blue-throated Flycatcher							26			3			1	30	50
<u>Muscicapa rufigastra</u> , Mangrove Blue Flycatcher				1		23	26		7					57	393
<u>Muscicapa rufilata</u> , Ferruginous Flycatcher														11	81
<u>Muscicapa sibirica</u> , Siberian Flycatcher		5		4			10						15	34	57
<u>Muscicapa solitaria</u> , White-throated Flycatcher							2							2	54
<u>Muscicapa strophliata</u> , Orange-gorgeted Flycatcher													5	5	27
<u>Muscicapa sundara</u> , Blue-and-Orange Flycatcher										14			30	44	290
<u>Muscicapa thalassina</u> , Verditer Flycatcher							1							1	93
<u>Muscicapa tickelliae</u> , Tickell's Blue Flycatcher							3			22		41		66	120
<u>Muscicapa turcosa</u> , Malaysian Blue Flycatcher															1
<u>Muscicapa unicolor</u> , Pale Blue Flycatcher							1							1	6
<u>Muscicapa venusta</u> , Bornean Blue Flycatcher															4

Table 32, page 42

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<i>Muscicapa vivida</i> , Rufous-bellied Blue Flycatcher															2
<i>Muscicapa westermanni</i> , Little Pied Flycatcher							1			1				2	28
<i>Muscicapa zanthopygia</i> , Tricolor Flycatcher		5					82							87	202
<i>Philentoma pyrrhoptera</i> , Chestnut-winged Flycatcher							44	3		1				48	140
<i>Philentoma velata</i> , Maroon-breasted Flycatcher							2							2	10
<i>Rhinomyias brunneata</i> , Migratory Jungle Flycatcher							194							194	296
<i>Rhinomyias gularis</i> , White-browed Jungle Flycatcher															68
<i>Rhinomyias olivacea</i> , Olive-backed Jungle Flycatcher															54
<i>Rhinomyias ruficauda</i> , Rufous-tailed Jungle Flycatcher															5
<i>Rhinomyias umbratilis</i> , White-throated Jungle Flycatcher							11	6						17	71
<i>Rhipidura albicollis</i> , White-throated Fantail Flycatcher							10			12			1	23	299
<i>Rhipidura albogularis</i> , White-spotted Fantail Flycatcher												5		5	5
<i>Rhipidura aureola</i> , White-browed Fantail Flycatcher												1		1	2
<i>Rhipidura cyaniceps</i> , Blue-headed Fantail Flycatcher				3										3	101
<i>Rhipidura hypoxantha</i> , Yellow-bellied Fantail Flycatcher															12
<i>Rhipidura javanica</i> , Pied Fantail Flycatcher				6	3	1	87	4	37	12	2			152	1202
<i>Rhipidura nigrocinnamomea</i> , Black-and-Cinnamon Fantail Flycatcher															3
<i>Rhipidura perlata</i> , Spotted Fantail Flycatcher							3							3	9
<i>Rhipidura superciliaris</i> , Blue Fantail Flycatcher															9
<i>Terpsiphone atrocaudata</i> , Japanese paradise Flycatcher		1	1				2							4	28
<i>Terpsiphone cinnamomea</i> , Rufous paradise Flycatcher															2
<i>Terpsiphone cyanescens</i> , Blue Paradise Flycatcher						12								12	70
<i>Terpsiphone paradisi</i> , Paradise Flycatcher							34			1				35	144

Table 32, page 43

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<b>PACHYCEPHALIDAE</b>															
<u>Pachycephala cinerea</u> , Mangrove whistler							54	6						60	129
<u>Pachycephala hypoxantha</u> , Bornean Mountain Whistler							1							1	10
<u>Pachycephala philippensis</u> , Yellow-bellied Whistler						3								3	38
<u>Pachycephala plateni</u> , White-bellied Whistler															40
<b>PRUNELLIDAE</b>															
<u>Prunella collaris</u> , Alpine Accentor			6											6	6
<u>Prunella montanella</u> , Mountain Accentor		65												65	153
<u>Prunella rubida</u> , Japanese Accentor			2											2	4
<b>MOTACILLIDAE</b>															
<u>Anthus gustavi</u> , Petchora Pipit			1		1									2	24
<u>Anthus hodgsoni</u> , Indian Tree Pipit		13	242	19	9					83		40	51	457	2278
<u>Anthus novaeseelandiae</u> , Richard's Pipit					57		137			14				208	846
<u>Anthus spinoletta</u> , Water Pipit															37
<u>Anthus trivialis</u> , European Tree Pipit													12	12	12
<u>Dendronanthus indicus</u> , Forest Wagtail			4				7			130				141	568
<u>Motacilla alba</u> , Pied Wagtail	358	914	16		6					219		71		1584	25470
<u>Motacilla caspica</u> , Gray Wagtail		84	321	31		27	1			8		9	1	482	1543
<u>Motacilla citreola</u> , Yellow-headed Wagtail														37	42
<u>Motacilla flava</u> , Yellow-wagtail			3825	5	268					4390		14		8502	37230
<u>Motacilla grandis</u> , Japanese Wagtail	1	12												13	23
<u>Motacilla maderaspatensis</u> , Large Pied Wagtail															1

Table 32, page 44

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<b>BOMBYCILLIDAE</b>															
<u>Bombycilla garrula</u> , Waxwing															40
<b>ARTAMIDAE</b>															
<u>Artamus fuscus</u> , Ashy Wood Swallow															2
<u>Arthamus leucorhynchus</u> , White-breasted Wood Swallow					13	1			1					15	186
<b>LANIIDAE</b>															
<u>Lanius bucephalus</u> , Bull-headed Shrike	1	102												103	1104
<u>Lanius collurioides</u> , Chestnut-backed Shrike										5				5	16
<u>Lanius cristatus</u> , Brown Shrike		4	6786	1783	1	6	29	2	7	97			1	8716	28861
<u>Lanius nasutus</u> , Black-headed Shrike						11				8				19	76
<u>Lanius schach</u> , Schach Shrike				4			1					18		23	157
<u>Lanius tephronotus</u> , Tibetan Shrike															6
<u>Lanius tigrinus</u> , Thick-billed Shrike	3	2					29							34	105
<u>Lanius validirostris</u> , Strong-billed Shrike															53
<u>Lanius vittatus</u> , Bay-backed Shrike												51		51	52
<b>STURNIDAE</b>															
<u>Ampeliceps coronatus</u> , Gold-crested Myna										6				6	6
<u>Aplonis panayensis</u> , Philippine Glossy Starling				2	72	27	56							157	1619
<u>Gracula religiosa</u> , Hill Myna															2
<u>Sarcops calvus</u> , Coletto				1		110								111	534
<u>Sturnus burmannicus</u> , Jerdon's Starling										37				37	41
<u>Sturnus cineraceus</u> , Grey Starling	6	57												63	339
<u>Sturnus contra</u> , Pied Starling										123		70		193	369

Table 32, page 45

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Sturnus cristatellus</u> , Crested Myna										12				12	35
<u>Sturnus ginginianus</u> , Bank Myna												193		193	198
<u>Sturnus javanicus</u> , Orange-billed Jungle Myna										50				50	109
<u>Sturnus mahrattensis</u> , Jungle Myna															1
<u>Sturnus malabaricus</u> , Ashy-headed Starling										48		2		50	59
<u>Sturnus nigricollis</u> , Black-collared Starling										37				37	69
<u>Sturnus pagodarum</u> , Black-headed Myna												216		216	255
<u>Sturnus philippensis</u> , Violet-backed Starling		34	2	2						7				45	191
<u>Sturnus roseus</u> , Rose-colored Starling												6		6	6
<u>Sturnus sericeus</u> , Silky Starling															1
<u>Sturnus sinensis</u> , Chinese Starling							114							114	125
<u>Sturnus sturninus</u> , Daurian Starling		9												12	217
<u>Sturnus tristis</u> , Common Myna							37			4		26		67	165
<u>Sturnus vulgaris</u> , European Starling												5		5	25
NECTARINIIDAE															
<u>Aethopyga boltoni</u> , Apo Sunbird															3
<u>Aethopyga christinae</u> , Fork-tailed Sunbird															1
<u>Aethopyga gouldiae</u> , Gould's Sunbird															315
<u>Aethopyga mystacalis</u> , Scarlet Sunbird							2							2	4
<u>Aethopyga nipalensis</u> , Green-tailed Sunbird													1	1	31
<u>Aethopyga pulcherrima</u> , Mountain Sunbird				1										1	3
<u>Aethopyga saturata</u> , Black-breasted Sunbird							25			5				30	104
<u>Aethopyga helleyi</u> , Lovely Sunbird															28
<u>Aethopyga siparaja</u> , Yellow-backed Sunbird							3	7				2	2	14	126
<u>Anthreptes malacensis</u> , Brown-throated Sunbird				1	6	8	216	16	11	11	6			275	1058
<u>Anthreptes rhodolaema</u> , Rufous-throated Sunbird															6

Table 32, page 46

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<i>Anthreptes simplex</i> , Plain-colored Sunbird							21	3						24	46
<i>Anthreptes singalensis</i> , Ruby-cheeked Sunbird							8			4				12	52
<i>Arachnothera affinis</i> , Gray-breasted Spiderhunter							31	2						33	182
<i>Arachnothera chrysogenys</i> , Lesser Yellow-eared Spiderhunter							1							1	6
<i>Arachnothera clarae</i> , Naked-faced Spiderhunter						3								3	4
<i>Arachnothera crassirostris</i> , Thick-billed Spiderhunter															2
<i>Arachnothera flavigaster</i> , Greater Yellow-eared Spiderhunter							1							1	3
<i>Arachnothera longirostris</i> , Little Spiderhunter					210	149	702	50		51	36			1198	3509
<i>Arachnothera magna</i> , Streaked Spiderhunter							5			3			1	9	57
<i>Arachnothera robusta</i> , Long-billed Spiderhunter							1							1	10
<i>Hypogramma hypogrammica</i> , Purple-naped Sunbird							56	9	1					66	210
<i>Nectarinia asiatica</i> , Purple Sunbird										3		254		257	258
<i>Nectarinia chalcostetha</i> , Macklot's Sunbird					15		34							49	112
<i>Nectarinia jugularis</i> , Yellow-breasted Sunbird					15	50	39	6	15	14	6			145	899
<i>Nectarinia lotenia</i> , Loten's Sunbird												2		2	2
<i>Nectarinia minima</i> , Small Sunbird												15		15	15
<i>Nectarinia sperata</i> , Van Hasselt's Sunbird				4	3	1	1			5				14	59
<i>Nectarinia zeylonica</i> , Purple-rumped Sunbird												41		41	41
DICAEDIDAE															
<i>Dicaeum agile</i> , Thick-billed Flowerpecker												4		4	30
<i>Dicaeum anthonyi</i> , Yellow-crowned Flowerpecker							3							3	3
<i>Dicaeum australe</i> , Philippine Flowerpecker						228								228	570



Table 32, page 47

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Dicaeum bicolor</u> , Bicolored Flowerpecker						36								36	75
<u>Dicaeum celebicum</u> , Black-sided Flowerpecker							1							1	1
<u>Dicaeum chrysorrheum</u> , Yellow-vented Flowerpecker							3							3	17
<u>Dicaeum concolor</u> , Plain Flowerpecker										1				1	5
<u>Dicaeum cruentatum</u> , Scarlet-backed Flowerpecker							6		1	17			1	25	119
<u>Dicaeum erythrorhynchos</u> , Tickell's Flowerpecker												4		4	4
<u>Dicaeum hypoleucum</u> , White-bellied Flowerpecker						31								31	48
<u>Dicaeum ignipectus</u> , Fire-breasted Flowerpecker															11
<u>Dicaeum pygmaeum</u> , Pygmy Flowerpecker				2		3								5	34
<u>Dicaeum sanguinolentum</u> , Javan Fire-breasted Flowerpecker							6							6	19
<u>Dicaeum trigonostigma</u> , Orange-breasted Flowerpecker				1		634	28							663	884
<u>Dicaeum trochileum</u> , Scarlet-headed Flowerpecker												8		8	8
<u>Prionochilus johanna</u> , Palawan Yellow-rumped Flowerpecker					1									1	52
<u>Prionochilus maculatus</u> , Yellow-throated Flowerpecker							153	32						185	391
<u>Prionochilus olivaceus</u> , Olive-backed Flowerpecker						6								6	36
<u>Prionochilus percussus</u> , Crimson-breasted Flowerpecker							14							14	27
<u>Prionochilus thoracicus</u> , Scarlet-breasted Flowerpecker							1							1	5
<u>Prionochilus xanthopygius</u> , Yellow-rumped Flowerpecker								10						10	19
ZOSTEROPIDAE															
<u>Chlorocharis emiliae</u> , Mountain Blackeye															142
<u>Zosterops erythropleura</u> , Chestnut-flanked White-eye															382
<u>Zosterops everetti</u> , Everett's White-eye						264	10							274	301

Table 32, page 48

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Zosterops japonica</u> , Chinese White-eye		30	23							8				61	546
<u>Zosterops montana</u> , Mountain White-eye															34
<u>Zosterops nigrorum</u> , Yellow-white-eye				8										8	449
<u>Zosterops palpebrosa</u> , Oriental White-eye							4			5	7	21	5	42	1004
FRINGILLIDAE															
<u>Carduelis flammea</u> , Common Redpoll															217
<u>Carduelis sinica</u> , Oriental Greenfinch	4	651												655	3 800
<u>Carduelis spinus</u> , Siskin	563	276												839	3008
<u>Carpodacus erythrinus</u> , Common Rose Finch		1										18	40	59	544
<u>Carpodacus roseus</u> , Pallas Rose Finch	151													151	216
<u>Carpodacus vinaceus</u> , Vinaceous Rose Finch				9										9	94
<u>Coccothraustes coccothraustes</u> , Hawfinch	1	5												6	3 52
<u>Emberiza aureola</u> , Yellow-breasted Bunting	25		3							3779				3807	6299
<u>Emberiza chrysophrys</u> , Yellow-browed Bunting	3													3	19
<u>Emberiza cioides</u> , Meadow Bunting	163	167												330	3793
<u>Emberiza elegans</u> , Yellow-throated Bunting	368	4												372	3129
<u>Emberiza fucata</u> , Gray-hooded Bunting	20	85	1											106	981
<u>Emberiza leucocephalus</u> , Pine Bunting															9
<u>Emberiza pusilla</u> , Little Bunting	1													1	68
<u>Emberiza rustica</u> , Rustic Bunting	1440	239												1679	630 74
<u>Emberiza rutila</u> , Chestnut Bunting	880													880	46628
<u>Emberiza schoeniclus</u> , Common Reed Bunting	10	849												859	3194

Table 32, page 49

Species	Korea	Japan	Taiwan	Luzon	Palwan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Emberiza spodocephala</u> , Black-faced Bunting	8	646	3371											4035	19789
<u>Emberiza stewarti</u> , White-capped Bunting												2		2	3
<u>Emberiza sulphurata</u> , Japanese Yellow Bunting		16	26											42	1049
<u>Emberiza tristrami</u> , Tristram's Bunting	16													16	1976
<u>Emberiza variabilis</u> , Grey Bunting		1												1	40
<u>Emberiza yessoensis</u> , Japanese Reed Bunting	30	8												38	330
<u>Eophona migratoria</u> , Migratory chinese Grosbeak	18													18	148
<u>Eophona personata</u> , Japanese Grosbeak															1
<u>Fringilla montifringilla</u> , Brambling	121	48												169	384
<u>Haematospiza sipahi</u> , Scarlet Finch															5
<u>Loxia curvirostra</u> , Red Crossbill	10	1												11	42
<u>Melophus lathami</u> , Crested Bunting												13		13	16
<u>Pyrrhula erythaca</u> , Beavan's Bullfinch			4											4	44
<u>Pyrrhula nipalensis</u> , Brown Bullfinch			1											1	6
<u>Pyrrhula pyrrhula</u> , Bullfinch	31	2												33	90
<u>Uragus sibiricus</u> , Long-tailed Rose Finch	3	22												25	315
PLOCEIDAE															
<u>Erythrura hyperythra</u> , Bamboo Parrot-finch															7
<u>Erythrura prasina</u> , Pin-tailed Parrot Finch							84			55				139	221
<u>Estrilda amandava</u> , Red Avadavat		4								30		2		36	74
<u>Lonchura fuscans</u> , Dusky Munia								62	66					128	213
<u>Lonchura leucogastra</u> , White-bellied Munia				163	26	2045	53							2287	4650

Table 32, page 50

Species	Korea	Japan	Taiwan	Luzon	Palawan	Mindanao	Malaya	Sarawak	Sabah	Thailand	Java	India	Bhutan	Total 1968	Grand Total 1964-1968
<u>Lonchura leucogastroides</u> , Javanese Munia											37			37	37
<u>Lonchura maja</u> , White-throated Munia,							42							42	567
<u>Lonchura malabarica</u> , White-throated Munia												43		43	46
<u>Lonchura malacca</u> , Chestnut Munia			3	39	39	6087	10	12	113					6303	14125
<u>Lonchura punctulata</u> , Spotted Munia			5	80			55			1340	59	7		1546	6462
<u>Lonchura striata</u> , Sharp-tailed Munia			1				25			162		6	2	196	2057
<u>Padda oryzivora</u> , Java Sparrow				2			2				49			53	118
<u>Passer domesticus</u> , European House Sparrow												1044		1044	2538
<u>Passer flaveolus</u> , Pegu Sparrow										112				112	735
<u>Passer hispaniolensis</u> , Spanish Sparrow												945		945	3252
<u>Passer montanus</u> , Tree Sparrow	14	1924					588			63	41			2630	12571
<u>Passer rutilans</u> , Russet Sparrow										11				11	65
<u>Petronia xanthocollis</u> , Yellow-throated Sparrow												112		112	221
<u>Ploceus benghalensis</u> , Black-throated Weaver Bird												2		2	16
<u>Ploceus hypoxanthus</u> , Golden Weaver															6
<u>Ploceus manyar</u> , Manyar Weaver										222				222	538
<u>Ploceus philippinus</u> , Baya Weaver							206			1407		313		1926	4957

Hong Kong: Aegypius monachus 1.

Negros Oriental: Microhierax erythrogenys 4, Chalcophaps indica 1, Phapitreron leucotis 6, Loriculus philippensis 3,  
Collocalia esculenta 1, Lalage nigra 4, Cisticola exilis 1, Aplonis panayensis 2, Nectarinia jugularis 15,  
Nectarinia sperata 7, Dicaeum pygmaeum 1, Lonchura malacca 9.

# MIGRATORY ANIMAL PATHOLOGICAL SURVEY

## ANNUAL PROGRESS REPORT 1968

### PART III

#### RECOVERIES OF BANDED BIRDS

##### INTRODUCTION

A steady stream of letters from people reporting the recovery of ringed birds brought the total up to 1762 recoveries from 182 species. In this study if a bird is recaptured by the same bander at intervals less than a year or a breeding season it is termed a "Repeat". If a migrant species is recaptured by the same bander after a season of winter or summer residency, usually after a year, it is termed a "Return". A "Recovery" is the recapturing, collection, or finding of a banded bird by anyone, not the original bander, at any distance or time from the location or date of banding. By this interpretation, if another bander happens to be at the location of a banding operation, at a later date, his recapturing of a local bird constitutes a recovery. Many local recoveries listed here fall in this category.

From the data now accumulating is appearing a picture of the great movements and migration routes of birds across the tremendous land mass of Asia. With the addition of another year of recovery records equivalent to our annual increase in information this picture will become much clearer for a number of species. I never cease to be amazed by the success of this international enterprize. In spite of what would appear to have been insurmountable obstacles of political and sociological antipathy or antagonism the goal of learning something of the distinations of Asian migrants is being achieved. China has been unable to enforce biological isolation as well as political isolation and we now begin to see the vast channels of migrants crossing her borders from north and south. From such a massive part of the heart of Asia, had there been cooperation, we would probably have received at least another thousand recoveries pointing out more closely the movements into and through China and the breeding ranges within it. As it is we have enough data to extrapolate much of this. Outside of China our records are demonstrating the flyways of many great groups of migrants.

The accompanying maps illustrate some of our spectacular recoveries: A Taiwan Yellow Wagtail from Point Barow Alaska; Ruffs from India, Wood Sandpiper from Philippines, and Japanese Turnstones in breeding grounds along the shores of the East Siberian Sea; Turnstones that made the circuit from Japan to Pribilof Islands in Alaska, to Tonga and Ninigo Islands in the

south and southwest Pacific. These and the less spectacular movements of local birds that fly but a few miles in a lifetime are facets of the picture that is developing.

## PHILIPPINE BANDING

Physiographic and sociological factors in the recovery of foreign and Philippine banded birds have been discussed in previous reports. Recoveries from 1968 further substantiate these inferences. The maps of the several species from which significant recoveries have been obtained illustrate the importance of land forms and density of human populations as affecting the numbers of recoveries. Figs. 72 and 73 illustrate the physiography of the areas to the south and north-east of Dalton Pass. The reader can compare these figures with the maps of recoveries and draw his own conclusions.

## DISTRIBUTION OF RECOVERIES

During the period of activity of the MAPS program bird ringing schemes which have played a part in demonstrating the movements of Asian birds have been, or are being, carried out in the following areas: 1. Eastern Siberia, using Moscow rings and banding at Lake Khanka and other points in eastern and central Siberia. 2. Japan, using their own Norinsho rings written in Japanese as well as MAPS rings. 3. U. S. Fish and Wildlife Service, a big program of Pacific Ocean migration studies with ringing at the Pribilof Islands, Midway, Sand, Howland, and numerous other islands. 4. North Korea, using bands labeled Pyongyang. 5. Australia, using their own bands and ringing at Lord Howe Island as well as on Papua and New Guinea and the mainland. 6. India, using Bombay Natural History Society rings and working at Bharatpur as well as several other areas in India. We have not picked up European ringed birds in Eastern Asia, although many Russian and Western-Siberian birds have appeared in India. Because the MAPS program is well known in Eastern Asia many rings from other schemes have been reported to us. These are summarized in the following annotated list of recoveries.

The distribution of recoveries in eastern Asia is very interesting and is shown in Table 33. As mentioned earlier (1966, 1967 Annual Reports) the political, economic, and literacy levels of each area greatly effect the rate of reporting of recovered rings and the figures in Table 33 are not indicative of the numbers of ringed birds that are flying in each country.

## ANNOTATED LIST OF RECOVERIES

Following is a list, by species, of the recovery records, and the factors related to them or their significance are discussed. Maps which show data

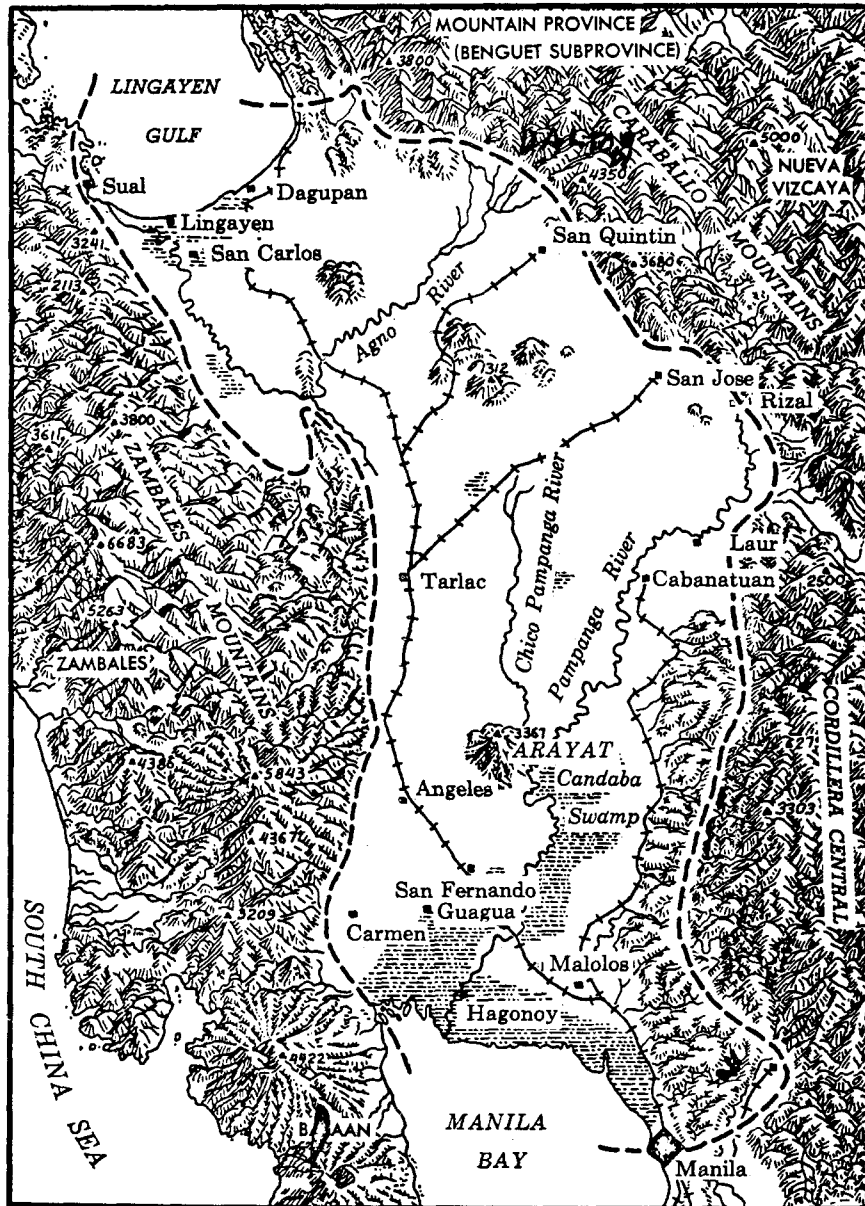


Fig. 72: Physiography of the Central Plain of Luzon. (From "The Philippine Island World")

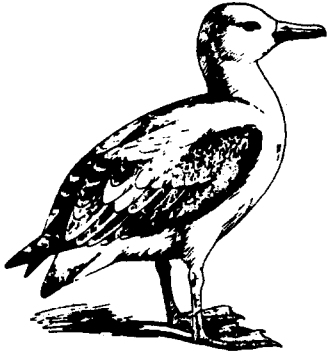


Fig. 73: Physiography of the Cagayan Valley region of Luzon. (From "The Philippine Island World")



not given in previous reports are also included to illustrate significant movements.

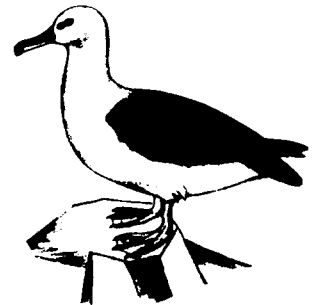
#### DIOMEDEIDAE (0 Banded, 18 Recoveries)



Diomedea albatrus, Short-tailed Albatross: One recovery of a nestling banded on Torishima, in the Isu Chain of Japan, and found dead at Hachijo-jima 200 miles north 39 months later.

Diomedea exulans, Wandering Albatross: One recovery reported to us by a Japanese ship's officer, a bird banded as a nestling on Bird Island, South Georgia, in Antarctica and recovered 3,000 miles NE in the Indian Ocean 47 months later.

Diomedea immutabilis, Laysan Albatross: Eleven recoveries from birds banded as nestlings at Sand Island Midway, by Japanese fisherman from the waters of the Northwest Pacific bordering Japan. Fig. 75. Since this species is not hunted the bulk of the recoveries were from accidental death, therefore the number of birds reported over one year of age is greater than that of the hunted species. Seven, 63%, of the birds were more than one year old and one was eleven.



Diomedea nigripes, Black-footed Albatross: Five recoveries all of birds banded in Midway Islands by members of Fish and Wildlife Service and reported by Japanese fisherman along the coasts of Hokkaido. These have been old birds ranging in age from 50 to 115 months since ringed as nestlings. Fig. 76.

#### PROCELLARIDAE (4817 Banded, 14 Recoveries)



Puffinus carneipes, Pale-footed Shearwater: Eleven recoveries from Korea and Japan of birds banded as nestlings at Lord Howe Island or Victoria, Australia. Six of them reported from the seas around Korea were caught by fisherman and averaged 28 months since banding. One reported from North Korea was 33 months old. Four from the waters around Japan were reported 55, 41, 5 and 8 months since being banded. All were taken in the Sea of Japan. Fig. 77.

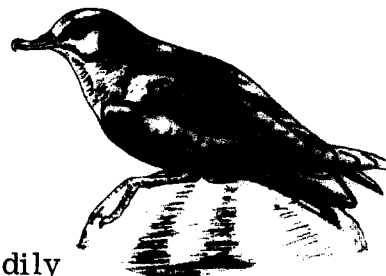
Puffinus leucomelas, Streaked Shearwater: Two recoveries of Japanese birds, one six months later in Japanese waters 200 miles south of its point of release and the second, a bird released from the zoo in Tokyo and taken in the Philippines two months later.



Fig. 78

Puffinus tenuirostris, Slender-billed Shearwater:

One recovery of a juvenile banded at Port Fairy, Victoria Australia, and reported 33 days later off the coast of Shikoku, Japan. Since the bird was captured and released this record remains in doubt. The bird would have had to have flown steadily north about 200 miles a day to make it.



HYDROBATIDAE (100 Banded, 1 Recovery)

Macronectes giganteus, Giant Petrel: One recovery. Although this was not a MAPS ring the record passed through our hands. The bird had been banded at Signy Island, South Orkney, Antarctica in March 1966 and was picked up by a Japanese fishing vessel in the Indian Ocean in November 1967, at a distance of about 3,000 miles NE of its point of release.

PHALACROCORACIDAE (1442 Banded, 5 Recoveries)

Phalacrocorax niger, Pygmy Cormorant: Two recoveries of birds ringed as nestlings at Pulau Dua, a small island off the north coast of W. Java; one five months later and 30 miles E. along the coast, the other two miles W. also on the coast, seven months later. Fig. 79

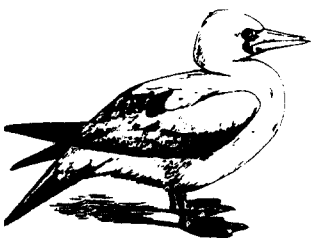


Phalacrocorax sulcirostris, Little Black Cormorant: Three recoveries of nestlings ringed at Pulau Dua, W. Java; two caught by fisherman in the swamps of Southern Sumatra 200 miles NW and four months after fledging, one shot 250 miles east along the N. coast of Java five months later. Fig. 79

ANHINGIDAE (5 Banded, 0 Recoveries)

SULIDAE (0 Banded, 1 Recovery)

Sula dactylatra, Blue-faced Booby: One recovery of an adult banded by the U. S. Fish and Wildlife Service banders on Howland Island in October 1964 and recovered in the Japan Sea 39 months later. It landed on board a ship and was taken to the Ueno Zoo in Tokyo. Fig. 80



FREGATIDAE (0 Banded, 4 Recoveries)

Fregata ariel, Lesser Frigate Bird: Four recoveries of birds banded as juveniles at Howland Island in Mid-Pacific by Fish and Wildlife Service personnel. All were found off the coasts of Islands of the West Pacific when less than a year old; New Guinea, eight months, Negros Oriental four months, Okinawa eight months, Chiba, Japan eight months. Fig. 80



ARDEIDAE (48298 Banded, 381 Recoveries)

Ardea cinerea, Grey Heron: Seven recoveries. Six Korean banded as nestlings, five found locally within fifty miles of the breeding colonies, one was from Luzon. A heron found dead in Thailand had been ringed at Lake Khanka, East Siberia by Russian banders 29 months before. Fig. 81 shows these recoveries and earlier records of Russian birds recovered in Southern India and Thailand.

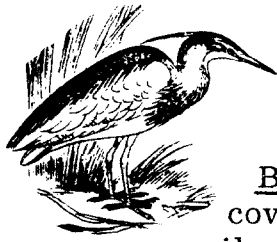


Ardea purpurea, Purple Heron: Six recoveries of birds banded at Lake Khanka North of Vladivostok, two in eastern Malaya, three in North Central Thailand and one in Korea. Fig. 82.



Ardeola ibis, Cattle Egret: 118 recoveries, six of these have been of Japanese birds and 92 of Taiwanese birds all recovered in the Philippines. In addition Taiwan birds have been recovered: two on Palau Island in the Caroline Group, one in Sabah (Borneo), One in Kyushu (Japan), and eight within Taiwan. Three Japan banded birds were recovered, one in Kyushu and two near the colony in Chiba (Honshu). Of those birds captured crossing Dalton Pass in Luzon one was reported from Taiwan and one from Mindoro. Two birds banded in W. Java were reported from Western Java. The distribution of recoveries in the Philippines is shown in Figs. 83-84. The age distribution of recovered birds has been: less than six months old 56%, 7 to 12 months 26%, 13 to 18 months, 10%, 19 to 24 months, 3% and over 24 months 5%. Less than 8% of the human population of Luzon lives in Cagayan Province which is the most North-eastern landfall for the migrating egrets. They may arrive tired, the young are inexperienced with hunters, and the take here has made up 25% of that of the whole archipelago; and 84% of these birds have been less than a year old.





Ardeola ralloides, Chinese Pond Heron: One recovery of a Thailand bird banded South-east of Bangkok and shot within three miles of its point of release seven months later.

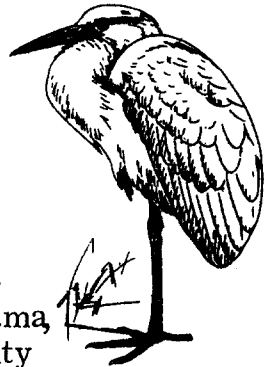
Butorides striatus, Little Green Heron: One recovery in Negros Oriental Philippines about 15 miles from its point of release and 19 months later.



Dupetor flavicollis, Black Bittern: One recovery of a bird banded near Kuala Lumpur and shot 1,500 miles N. 11 months later in Manipur State, India.



Egretta alba, Large Egret: 18 recoveries. Four of these were of Japanese birds recovered within 30 miles of the colony at Tokyo. Seven were of birds from Korean colonies taken in Korea. One was a Dalton Pass banded migrant found dead 60 miles North-west a few days

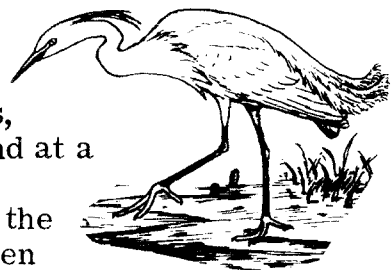


later. Migrants moving long distances included two Korean birds taken in Northern Luzon and five birds from Tokyo taken in the Philippines. All of the migrants were taken when less than a year old. Figs. 83-84.

Egretta garzetta, Little Egret: 77 recoveries. 53 of these have been from Japan of birds ringed as juveniles at Shinhama, the colony at Tokyo. 28 were found in the immediate vicinity of the colony, up to 15 miles. Beyond 25 miles the birds were dispersing from the colony and the dispersal pattern was as follows:

<u>Average Distance</u>	<u>Direction</u>	<u>Number</u>
35 miles	N	2
35 "	NE	2
35 "	E	4
40 "	SE	2
35 "	S	2
145 "	SW	7
50 "	W	2
50 "	NW	4

Although the dispersal appeared to be in all directions, 36% of the birds were found W and SW of the colony and at a much greater distance from the colony as they moved South-westward along the archipelago. All but two of the recoveries were of birds less than six months old. Ten egrets ringed at colonies in Taiwan were recovered in Taiwan and



these were less than six months old.

Foreign recoveries included three Japanese birds, from Mindanao, Rizal and Camarines Norte in the Philippines. Eleven Taiwan birds were also reported from the Philippines and were widely scattered, but four of them were from Cagayan in Luzon. They appeared to be following the same patterns as the Cattle Egret. Figs. 83 and 84.

Egretta intermedia, Intermediate Egret: 35 recoveries, all of nestlings or juveniles banded at Shinhama or nearby colonies in Japan. Four of these were taken in Japan, two less than six months old and two adults which had bred at least one year. A fifth bird was found on the deck of a ship 500 miles at sea south of Tokyo, but the officer finding the bird did not know when it had come abroad. The migration pattern appears to be different from the other egrets. One has been reported from the Ryu Kyus and none from Taiwan. In the Philippines the 29 recoveries have been widely dispersed, but have been scattered mainly along the north and east side of the archipelago. Nineteen, 68%, of them were from eastern provinces and eleven, 39% from the provinces of Camarines, Albay and Sorsogon which jut eastward from the main islands. This suggests that the intermediate Egrets may migrate further at sea, or along the coast and concentrate at these provinces. 82% of the recoveries were of birds that had not yet bred, less than one year. Fig. 83-84.



Gorsachius goisagi, Japanese Bittern: One recovery of a birds banded in Palawan and captured and released in southern Honshu eight months later on its journey north.

Ixobrychus cinnamomeus, Cinnamon Bittern: 13 recoveries have all been of birds banded at Dalton Pass. Except for one bird taken on Tablas Island 270 miles southeast, all recoveries fell within an average of 40 miles from Dalton. The dispersal appeared to be in all directions from the Pass. Fig. 85



Ixobrychus sinensis, Chinese Little Bittern: Nine recoveries, one of which was a Palawan bird shot within five miles of its point of release and the remainder were recoveries of Dalton Pass birds. Two of the eight were taken at distances greater than a hundred miles from Dalton while the remainder fell within the average 40 mile range noted for the previous species. Sinensis may be more migratory or wide ranging than cinnamomeus.  
Fig. 86.



Nycticorax nycticorax, Black-crowned Night Heron 94 recoveries. The bulk of those ringed in Japan were nestlings at Shinhama. From these have been 33 recoveries within Japan and three outside (1 Taiwan, 2 Philippines). The distribution in Japan was as follows:



Direction	Number	Average Miles
N	2	15
NE	17	30
E	2	35
SE	2	25
S	1	0
SW	4	185
W	2	50
NW	3	22

There was a distinct tendency for the young birds to disperse NE into the region around the mouth of the Tone River and into Ibaraki Prefecture; 53% of the recoveries were from that area. Those taken SW and W of the colony were probably migrants since they were at a greater distance. All but six of the recoveries, 81%, were birds less than six months old.

Taiwan birds were banded at several colonies and there were six recoveries scattered over the island, five of which were taken when less than six months old. They were picked up at an average distance of 50 miles from their colonies. One bird was reported from Mindanao. One juvenile was recovered 20 miles SW of the Pulau Dua colony in West Java.

All of the herons ringed in Malaya have been at the Kuala Gula colony in NW Malaya. Recoveries of dispersed birds from this colony have been within Malaya. Rings that may have been taken in Southern Thailand have not been reported. The distribution was as follows:

Direction	Number	Average Distance Miles
N	35	30
NE	4	35
E	1	150
SE	8	50
S	1	30
SW	Straits of Malacca	
W	"	"
NW	"	"

The bulk of the recoveries (70%) was from N. of the colony which is a heavily cultivated area. One bird was reported across the peninsular from the east coast. Those that moved south-east went greater distances. All were juvenile except three.

The migration patterns of this circumpolar species appear to be made up of local and long distance migration from northern colonies (temperate and sub-tropical zones) and only local dispersal from tropical colonies. Figs. 83 and 84.

THRESKIORNITHIDAE (341 Banded, 0 Recoveries)

CICONIIDAE (579 Banded, 6 Recoveries)

Anastomus oscitans, Open-billed Stork: Six recoveries of nestlings banded at the colony at Wat Phai Lom, Phatumthani, Thailand, two from East Pakistan, one from Cambodia, three from Thailand up to 150 miles away. All except the bird shot in Cambodia (30 months) were less than six months old. Fig. 87.



ANATIDAE (6574 Banded, 288 Recoveries)

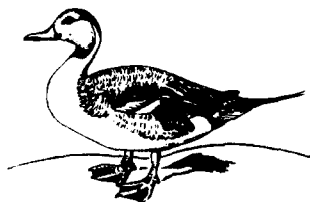


Fig. 88.

Anas acuta, Pintail: 34 recoveries; 26 from Bharatpur, India, banded birds recovered in USSR; seven from Japan banded birds, three recovered within Japan and four from USSR. The most remarkable recovery was made in Shizuoka, Honshu, Japan of a Pintail banded at Tule Lake, California, 76 months previously.

Anas clypeata, Shoveller: 25 recoveries; 20 from Bharatpur banded birds, 19 recovered in USSR and one in Kashmir; five from Japan birds, two recovered in Japan and three in USSR. Fig. 89

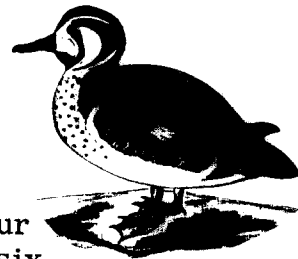


Anas crecca, Common Teal: 133 recoveries; 70 from Japan birds, eleven from USSR and the remainder local recoveries; 63 from Bharatpur birds, eight from India, two from W. Pakistan and 53 from USSR. The distribution of these recoveries, Fig. 90, strongly suggests that there are two flyways being used by this species; central and western Siberia and Eastern Russian congregating and moving south into Northern India, and Eastern and Central Siberia at least as far as Lake Bikal moving east and south

into Japan. No birds have been banded in Northern Thailand to determine their origins.

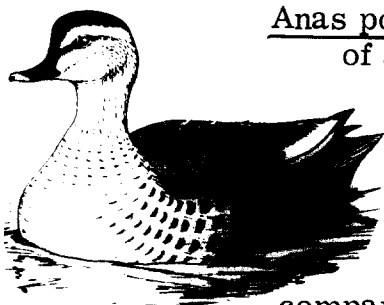
Anas falcata, Falcated Teal: Two recoveries within fifty miles of point of release in Japan.

Anas formosa, Spectacled Teal: One recovery of a Japan banded bird (Saitama) from Yakutian, Siberia, 2,000 miles NE.



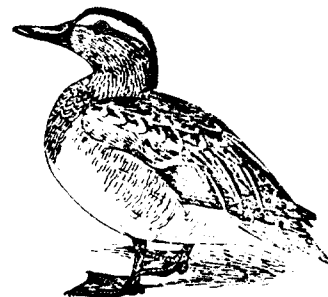
Anas penelope, European Wigeon: 12 recoveries; three from USSR of Bharatpur banded birds; nine from Japan birds, six local recoveries and three from Eastern Siberia. Fig. 91.

Anas platyrhynchos, Mallard: 32 recoveries including 27 local recoveries from birds banded in Japan. Four birds were taken in Eastern Siberia and one banded at Lake Khanka in Eastern Siberia was taken in Kyushu. Fig. 92 shows these records compared with earlier records from the Bombay Natural History Society showing an exchange of birds between Eastern Russia and W. Pakistan and India.



Anas poecilorhyncha, Spot-billed Duck: A single recovery of a Philippine bird banded in Southern Luzon and shot four months later 30 miles SW of the point of release.

Anas querquedula, Garganey Teal: Seven recoveries of Bharatpur banded birds from Western Siberia. Fig. 93 compares these recoveries with those from earlier records of the Bombay Natural History Society. (earlier recoveries are numbered).

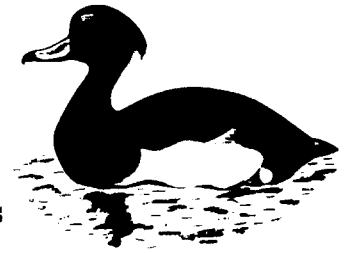


Anas strepera, Gadwall: One recovery of a drake banded at Bharatpur, India and recovered 286 miles NW ten months later.

Aythya ferina, European Pochard: 19 recoveries; 16 from Bharatpur banded birds recovered in Eastern Russia and Western Siberia and one from India; and one Russian banded bird, west of Lake Bikal, recovered in Kyushu, Japan. Fig. 94



Aythya fuligula, Tufted Duck: Twelve recoveries; ten from Bharatpur banded birds recovered in Western Siberia, and one recovered in India; and one Japan bird recovered in Sakhalin, Fig. 95



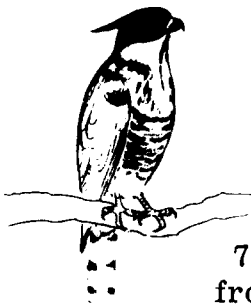
Aythya nyroca, White-eyed Pochard: Three recoveries of birds banded at Bharatpur; one recovered 1,200 miles north in western Siberia two months after banding, and two in India. Fig. 96.

Nettapus coromandelianus, Cotton Teal: Two recoveries of birds banded at Bharatpur and recovered in India. Fig. 97.

Netta rufina, Red-crested Pochard: One recovery of a bird banded at Bharatpur and collected 595 miles SE by museum collectors. Fig. 97 indicates previous recovery records from this species.

Sarkidiornis melanotus, Comb Duck: Three recoveries of birds banded at Bharatpur and shot; one a month later and 130 miles NE, and the other two ten months later 595 and 475 miles SE. Fig. 98

#### ACCIPITRIDAE (2682 Banded, 77 Recoveries)



Accipiter trivirgatus, Crested Goshawk: One recovery in Palawan in the immediate vicinity where it had been ringed 40 months before.

Butastur indicus, Gray-faced Buzzard: 75 recoveries, one from Ryu Kyus, five from Taiwan, 69 from Philippines, none from the breeding range north of Okinawa. Hunting pressure and possibly the population density of hawks continues to be greatest in Luzon; Batanes 3, Luzon 49, Leyte 4, Panay 5, Romblan 1, Cebu 2, Negros 2, Mindanao 3 recoveries.



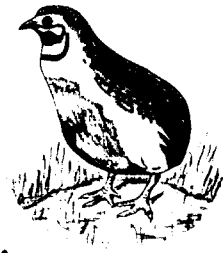
Elanus caeruleus, Black-winged Kite: One recovery in Thailand, 15 miles N. of its point of release at Bangkok, within one month.

PANDIONIDAE (1 Banded, 0 Recoveries)

FALCONIDAE (33 Banded 0 Recoveries)

PHASIANIDAE (6048 Banded, 18 Recoveries)

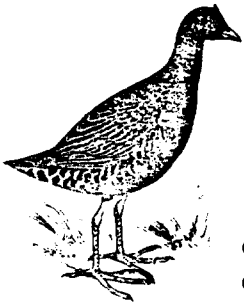
Coturnix chinensis, Blue-breasted Quail: 18 recoveries of birds banded at Dalton Pass, Luzon. All of these were reported within less than five months following ringing. Two-thirds of the birds were taken north of the Pass and of these 12 birds eight had been ringed in January. This would suggest that the main northward movement of Quail occurs at this time. The fact that they were not recovered at a great distance from the Pass probably indicates cultivation or land use favorable to them rather than an inability to fly further. Fig. 99.



TURNICIDAE (403 Banded, 0 Recoveries)

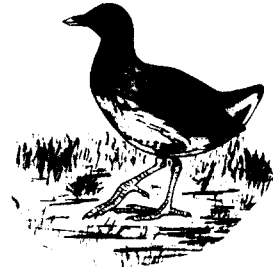
RALLIDAE (4723 Banded, 70 Recoveries)

Amaurornis olivaceus, Bushhen: One recovery of a bird banded at Dalton Pass and taken 375 miles SE 30 months later. Fig. 100.

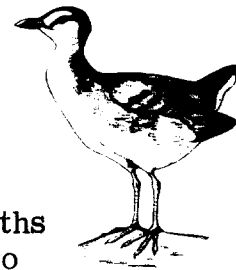


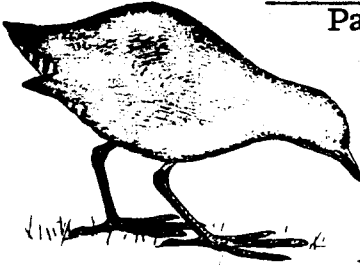
Gallicrex cinerea, Watercock: One recovery of a Dalton Pass banded bird taken 35 miles south 20 months later. This is a widely hunted species throughout Asia and more recovery records should have been received. Fig. 101.

Gallinula chloropus, Moorhen: Seven recoveries, five from Dalton Pass within a year of release, one from Camarines Norte, Fig. 102, and one ringed at Kuala Lumpur and recovered 15 months later about six miles away.



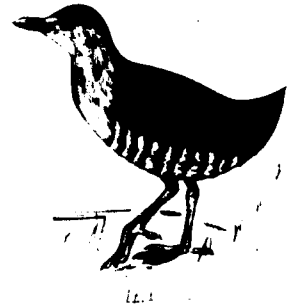
Porzana cinerea, White-browed Rail: 21 recoveries of birds ringed at Dalton Pass and recovered in Luzon. Fig. 103. The radiation of recoveries from Dalton Pass makes one wonder what attraction this Pass has for migrants. However, these data may simply be an artifact of the method. If collecting stations were distributed across the Caraballo range it might be discovered that the migrants were passing on a broad front and that there was no focus at Dalton. The time distribution of these recoveries suggests that the bulk of the birds were young for 14 (66%) were reported within six months of release while five were reported a year later and two, two years later.



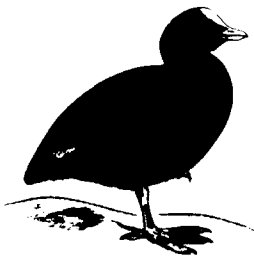


Porzana fusca, Ruddy Crake: Six recoveries, all of Dalton Pass birds. Fig. 104. Three of these birds were reported soon after release. The birds are captured at night and released in the early morning. One was reported 35 miles NE of Dalton Pass on the same day that it was released. One was reported 12 miles N. 14 days later and the one flying NW to La Union Province was more than 50 miles away when reported 13 days later. Two birds were reported a year after release.

Rallina eurizonoides, Philippine Banded Crake: 7 recoveries of Dalton Pass birds. Fig. 105. Six of these birds were not reported until more than a year after ringing, suggesting that they were older birds when first caught or that their migration routes were different from those of the other rails.



Rallus striatus, Slaty-breasted Rail: 27 recoveries of Dalton Pass birds. Although this species has been widely ringed in South-eastern Asia in small numbers it has only been reported from Luzon where the recoveries have made up 4% of the number ringed. Fourteen (50%) were reported within six months of release so may have been young birds. Several of these showed rapid flight, one reported 170 miles S. in less than a month, another 120 miles SW in 13 days. Eight have been reported a year or more after release. The distribution of recoveries is somewhat similar to those of P. cinerea, but with a greater proportion to the North of Dalton Pass and at a greater distance from the Pass. Fig. 106.



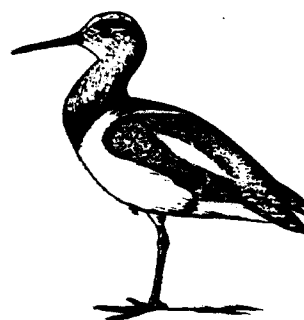
Fulica atra, Coot: Twenty-one recoveries. A Russian banded bird was reported from Kyushu, Japan. Thirteen birds banded at Bharatpur and recovered in USSR and seven recovered in India. Fig. 107.

JACANIDAE (43 Banded, 0 Recoveries)

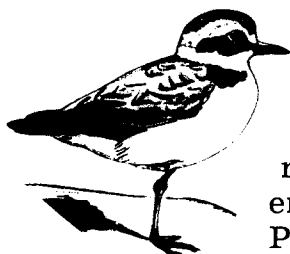
ROSTRATULIDAE (805 Banded, 10 Recoveries)

Rostratula benghalensis, Painted Snipe: Ten recoveries, four from birds ringed at Calatagan, Batangas in Southwest Luzon and four from those banded in Camarines Norte in South-east Luzon. All eight were taken within a few miles of where originally banded and one to three years after ringing. A doubtful record indicates that a bird from Camarines Norte went

130 miles W in thirteen days during December. A single recovery of a Japanese bird caught near by its banding place a year later, and one in Malaya found within two months near its point of release.



CHARADRIIDAE (5002 Banded, 12 Recoveries)

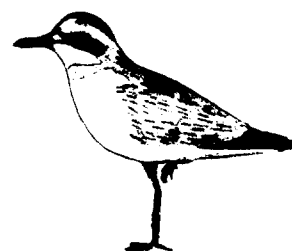


Charadrius alexandrinus, Kentish Plover: Three recoveries. Two were birds banded in Palawan and recovered within a mile or two of their point of release three months and 25 months later, respectively. The third was a Russian banded bird which was ringed in the Primorski territory of Eastern Siberia in September 1966 and shot two months later in Negros Oriental, Philippines.

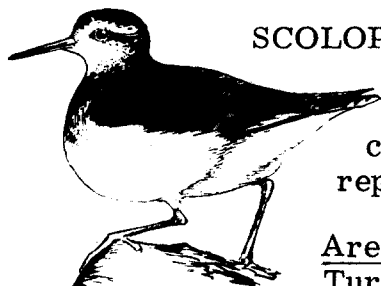


Charadrius dominicus, Golden Plover: Five recoveries, three were birds ringed in Calatagan Batangas, Luzon and recovered there 24, 25 and 27 months later. One was ringed in Camarines Sur, Luzon, and recovered there four months later. The fifth was a bird banded in the Pribilof Islands by members of the U.S. Fish and Wildlife Service and recaptured two months later (Sept. to Oct.) in Hokkaido, Japan. This is a significant recovery since it indicates a reversed flight from the usual pattern shown by Pribilof birds. They usually move south to the Pacific Islands and then north up the east coast of Asia. This bird was back in Hokkaido 58 days after having been ringed in the Pribilofs, flying SW when it should have been going NE. Fig. 108.

Charadrius leschenaulti, Large Sand Plover: Four recoveries, one Palawan banded bird recovered a mile away two months later, two Calatagan, Batangas birds recovered in some area seven and one months later, one Sabah banded bird found and released two months later in same area.



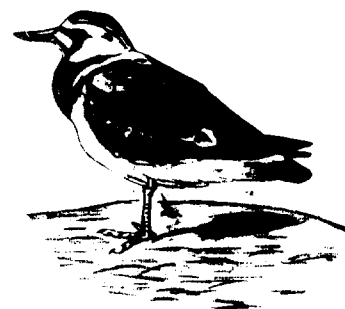
SCOLOPACIDAE (15843 Banded, 109 Recoveries)



Actitis hypoleucos, Common Sandpiper: One recovery of a bird ringed in Bulacan Province, Luzon and reported from the same locale a month later.

Arenaria interpres, Ruddy Turnstone: 52 recoveries. Turnstones banded along the shores of Tokyo Bay went north-east to breeding territories in

eastern Siberia and Alaska. The U.S. Fish and Wildlife Service has a banding station on the Pribilof Islands in Alaska and the banders there recaptured 34 of the 404 birds ringed at Chiba, 7.6%. Twelve of the American banded birds were recaptured in Chiba by Japanese banders. We do not know what percentage of the Pribiloff birds these made up. In addition the Russians reported four Japanese marked birds from their breeding territories far to the north, one on the East Siberian Sea near Pevek (70°N). In Fig. 109 are shown American ringed birds recovered from Pacific Islands and Japanese birds found on Tonga and Ninigo Islands. It is not possible in this chart to draw the route by which the birds return from the South Pacific to Chiba since we have no recoveries from the Philippines or Taiwan. The lack of recoveries from the Philippines strongly suggests that they by-pass these islands. These remarkable birds arrive in the Pribilofs in August, three months or less after having been captured in Japan. Fourteen of the recoveries there were within five months, seven of them returned in August the following year, eight two years later, one three years later, and one four years later, having made the complete circuit at least four times. At Chiba the twelve American marked birds arrived in May, ten the spring following capture in the Pribilofs and two the spring of the second year. We do not have the records of the birds recaptured in Chiba on following years. The bird taken in Pevek in North Siberia had made the trip from Chiba in less than a month (2500 miles). One taken in upper Kamchatka was also reported less than a month after banding in Chiba. The other two birds were taken two and three years later. The Tonga bird was found dead so we do not know when it had arrived, but the date was 16 months following its capture at Chiba. The recovery of a Japanese banded bird found dead in the Ninigo Island Group in the Bismarks eight months after it had been ringed in Japan is very important. This bird may have been back in the stream soon to move north for it was found in January. In Fig. 101 both the Tonga and Ninigo recoveries are shown as from the Pribilofs for lines to Japan would be misleading.



Calidris alpina, Eastern Dunlin: One recovery of bird ringed in Taiwan and recovered in Sakhalin in the following banding season, five months later, 3,000 miles NE.

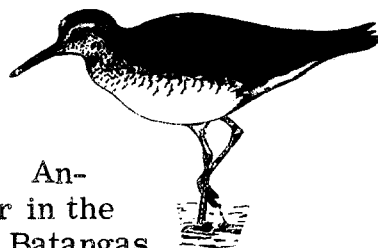


Capella gallinago, Common Snipe: Three recoveries. A Japanese bird reported in the same area two months after banding, a Philippine bird ringed at Calatagan, Batangas, and reported from Chiba, Japan thirteen months later, and a Philippine bird ringed in Camarines Norte and reported from there a few days later.

Capella megala, Swinhoe's Snipe: Eighteen recoveries. Thirteen of these were birds ringed in Camarines Norte, Luzon and recovered there, eleven within three months, one one year and another two years later. One of the Camarines Norte birds was reported 85 miles SE 40 days later. A Camarines Sur bird was collected near its point of release three months later, a Calatagan, Batangas bird was reported 55 miles NE in two months, and a Palawan bird had moved 350 miles NE into Camarines Sur when recaptured 23 months later. Two long distance recoveries place the breeding grounds of these snipe in central Siberia, Fig. 110, both birds being reported from Siberia the breeding season following ringing in the Philippines.

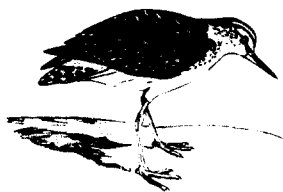
Capella stenura, Pintail Snipe: One recovery of a bird ringed near Malacca, Malaya, and shot there two months later.

Heteroscelus incanus, Wandering Tattler: Three recoveries. One banded at Chiba, Japan, found dying thirteen months later at Moreton Bay, Queensland, Australia more than 5,000 miles south. Another Japanese bird from Chiba shot 24 months later in the same local. A Philippine bird banded at Calatagan, Batangas, Luzon and shot there three weeks later.



Numenius phaeopus, Whimbrel: Nine recoveries. Eight of these were of birds banded in Negros Oriental, Philippines and shot near the point of release, three the same season that they were banded, four the following winter, and one the second winter, one long distance recovery was reported for a bird ringed at Calatagan, Batangas, Luzon and taken in Eastern Siberia, Fig. 111, near the East Siberian Sea 33 months later, in its third breeding season since banding.

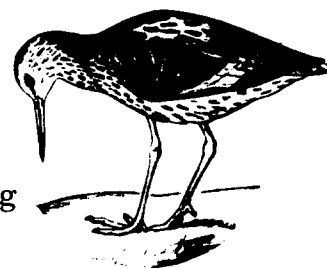
Philomachus pugnax, Ruff and Reeve: Twelve recoveries of this species were reported by Salim Ali and the long distance recoveries are shown in Fig. 112. These were banded at Ghana Sanctuary in Bharatpur. It is significant that this species which is rarely seen in the banding areas of Eastern Asia intermingles in the breeding areas of North-eastern Siberia with species banded in Japan, Taiwan and the Philippines.



Tringa glareola, Wood Sandpiper: Four recoveries, two of Philippine birds taken in Siberia, a Calatagan bird shot in Sakhalin, and a Palawan bird shot near Pavek on the East Siberian Sea, four and eight months respectively following release in the Philippines. Also two birds banded at Bharatpur and recovered in Southern India and W. Pakistan

fourteen and six months respectively. Fig. 113.

Tringa totanus, Red shank: Five recoveries. One Singapore bird shot nearby less than a month after ringing. One Korean bird shot two months after ringing and in the same area. Both of these birds were overwintering.



RECURVIROSTRIDAE (127 Banded, 0 Recoveries)

PHALAROPODIDAE (56 Banded, 0 Recoveries)

BURHINIDAE (4 Banded, 0 Recoveries)

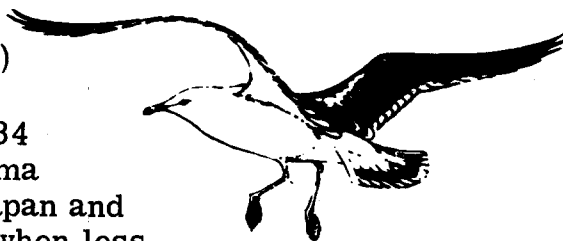
GLAREOLIDAE (57 Banded, 0 Recoveries)

STERCORARIIDAE (0 Banded, 1 Recovered)

Catharacta skua, Great Skua: One recovery. Although this bird was banded by a New Zealand ringer at Cape Hallett, Antarctica, it was reported to us by the fisherman who caught it off the coast of Hokkaido 27 months later. Such six and seven thousand mile flights are remarkable even when we know the great aerial capabilities of these birds.

LARIDAE (6201 Banded, 38 Recoveries)

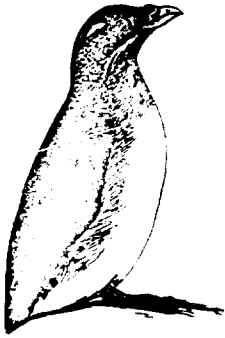
Larus crassirostris, Black-tailed Gull: 34 recoveries of nestlings ringed at Kabushima off the coast of Northern Honshu, 29 in Japan and five in USSR. All but two were reported when less than a year old, and Fig. 114 illustrates the dispersion from the colony up to eight months after fledging. More than twice as many birds moved north as were reported from the south.



Sterna fuscata, Sooty Tern: Four birds banded by U.S. Fish and Wildlife Service personnel on Sand, Wake and Lisianski Islands were recorded on the coasts of Japan, six, four, four and three months after being ringed as nestlings. Fig. 115.

ALCIDAE (1048 Banded, 4 Recoveries)

Cerorhinca monocerata, Horn-billed Puffin: Four recoveries from birds banded at Teuri Island, Hokkaido, two at sea 30 miles south and two at sea



75 miles north-west. Fig. 116

COLUMBIDAE (7887 Banded, 44 Recoveries)



Chalcophaps indica, Emerald Dove: Six recoveries. This species is believed to be highly transitory. Two of birds banded in the mountains of Laguna, Philippines were taken on the same mountain

later. Two Dalton Pass birds five and twenty months were recovered, one 80 miles south twelve months later and one 65 miles NE sixteen months later. One banded at Calatagan, Batangas was taken five miles N. 31 months later. The record of the sixth bird is in doubt but it appears to be one banded in Mindoro and recovered in Nueva Viscaya 230 miles N. eleven months later. Fig. 117

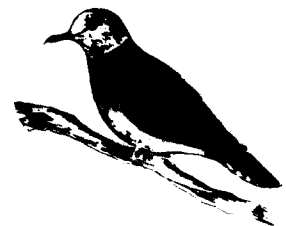
Geopelia striata, Zebra Dove: Ten recoveries. Four of Negros Oriental birds ringed at Siaton moved distances up to 95 miles, one crossing over to the island of Cebu. Their dispersal appeared to be mainly to the North-east. One Calatagan bird was shot there 21 months later. Three other Calatagan birds moved distances up to 40 miles. Two Malayan birds were recovered, one found dead 20 miles east of its point of release 73 months later, and another ringed in Singapore and captured at Mt. Brinchang in Cameron Highlands, Malaya, 350 miles N. 23 months later. All of these suggest a much greater movement of this species than had been known before. Fig. 118.



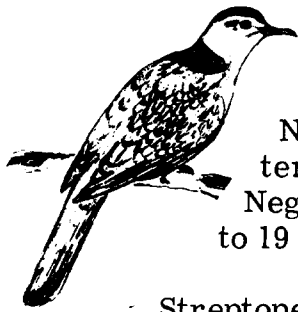
Phapitreron leucotis, White-ear Brown Fruit Dove: One recovery, a bird ringed on Siquijor Island, Philippines and recovered about five miles away 23 months later.

Ptilinopus leclancheri, Black-chinned Fruit Dove: One recovery of a Dalton Pass bird taken 150 miles south 11 months after being banded. Fig. 119. This is one of the species of fruit pigeons considered to be non-migratory.

Streptopelia bitorquata, Javanese Turtle Dove: Nine recoveries, all of birds banded at Siaton, Negros Oriental and taken within five miles of the point of release. Survival appears to be dependent upon the hunting pressure in the area. Birds were shot from 2 to 39 months following banding.







Streptopelia chinensis, Spotted-necked Dove: Eight recoveries, three of these of Singapore birds which were taken less than five miles from their points of release within three months. Five were of birds banded at Siaton, Negros Oriental, which appeared to have a distribution pattern similar to that of the Zebra Dove. Four were taken in Negros and one had flown to Cebu. They were recovered up to 19 months following ringing. Fig. 120.

Streptopelia senegalensis, Little Brown Dove: One recovery of a bird banded at Bharatpur, India, and recovered there 75 months later.

Streptopelia tranquebarica, Red Turtle Dove: One recovery of a Dalton Pass bird taken 30 miles S nine months later. Fig. 121.

Treron curvirostra, Lesser Thick-billed Green Pigeon: Four recoveries, one a bird bought and released at Bangkok and taken 25 miles N., another a Palawan bird shot near its point of release 10 months later. Two birds ringed in Mindoro, Philippines illustrate the amount of movement this species apparently does. They went 45 and 20 miles respectively from their point of release. Fig. 122.

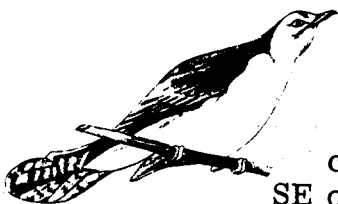


Treron pompadora, Pompadour Green Pigeon: One recovery of a Dalton Pass bird taken 80 miles SW eight months later. Fig. 123.

Treron vernans, Pink-necked Green Pigeon: Two recoveries, one of a Sabah ringed bird recovered nine months later in the same area, and one banded at Siaton, Negros Oriental, and shot 80 miles N. five months later. Fig. 124.

#### PSITTACIDAE (202 Banded, 1 Recovery)

Loriculus vernalis, Indian Hanging Lorikeet: One recovery of a bird bought at the Bangkok market and found dead a few days later a mile from the point of release.



#### CUCULIDAE (1229 Banded, 2 Recoveries)

Cacomantis merulinus, Plaintive Cuckoo: One bird recovered, banded at Dalton Pass and picked up 25 miles SE one month later. It was apparently on a fall southward movement. Fig. 125.

Cacomantis variolosus, Fantail Cuckoo: One recovery of a Dalton Pass bird

taken 100 miles south 16 months later Fig. 125.

TYTONIDAE (26 Banded, 0 Recovery)

STRIGIDAE (667 Banded, 5 Recoveries)

Ninox scutulata, Brown Hawk Owl: Two recoveries. One ringed in Nigata Prefecture in Japan in September just before migration and reported two months later in Nueva Ecija, Luzon. The other ringed at Dalton Pass in September and reported on its next trip south, fourteen months later in Nueva Ecija 55 miles S. of Dalton. Fig. 126.



Otus bakkamoena, Collared Scops Owl: Two recoveries. One bird banded near Penampang, Sabah, was found near Kota Minabalu a few days later and kept for a pet. It had traveled only a short distance. The second had been ringed at Bharatpur, India and was recaptured there 75 months later.

Otus scops, Scops Owl: One recovery of a bird banded in January in Negri Sembilan, Malaya and found dead in December, 11 months, near Kuala Lumpur, about 15 miles NE. This owl had probably returned to its breeding territory in the north and was back in Malaya for another winter.



PODARGIDAE (16 Banded, 0 Recovery)

CAPRIMULGIDAE (517 Banded, 3 Recoveries)

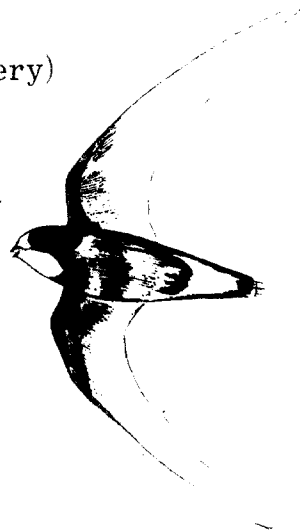
Caprimulgus macrurus, Long-tailed Nightjar: Two birds ringed in Palawan and recovered within six months in the same area, 1 and 25 miles from their points of release.



Eurostopodus macrotis, Great-eared Nightjar: One bought at the Bangkok market and released, found dead three days later less than a mile away.

APODIDAE (5483 Banded, 1 Recovery)

Chaetura gigantea, Malaysian spine-tailed Swift: One banded at Dalton Pass was caught twelve miles north a month later. This was in February and March when a northward movement would be anticipated.

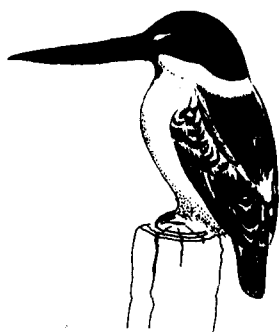


HEMIPROCNIIDAE (2 Banded, 0 Recovery)

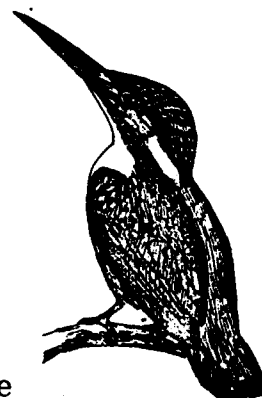
TROGONIDAE (101 Banded, 0 Recovery)

ALCEDINIDAE (4298 Banded, 12 Recoveries)

Alcedo atthis, Common Kingfisher: One recovery from near Seoul, Korea, to central Luzon within three months.



Halcyon chloris, White-collared Kingfisher: Seven recoveries all from the Philippines. Four from Luzon, one, ten, fifteen and a doubtful 45 miles from point of release. One on Siquijor Island at point of release, one from Negros Oriental at point of release, and one on Palawan 20 miles from point of release.



Halcyon coromanda, Ruddy Kingfisher: Two recoveries of Dalton Pass birds taken 22 and 150 miles south within Luzon. Fig. 127.



Halcyon smyrnensis, White-breasted Kingfisher: Two recoveries, one each from Malaya and Luzon, both within a mile of the point of release.



MEROPIDAE (3459 Banded, 5 Recoveries)

Merops philippinus, Blue-tailed Bee-eater: Three recoveries of Philippine birds, one taken near the point of release in Luzon less than a month later, and two which were ringed at Siaton in Negros Oriental and collected seven months later near Cotabato, Mindanao 160 miles SE.



Merops viridis, Blue-throated Bee-eater: Two recoveries of Malayan birds, both within two months and 20 miles of release.

CORACIIDAE (36 Banded, 2 Recoveries)

Eurystomus orientalis, Broadbilled Roller: Two recoveries, one of a bird banded on Siquijor Island, Negros Oriental, and recovered there 20 months later. The other a Dalton Pass bird shot 70 miles N. on its way N. seven months later. Fig. 128.

UPUPIDAE (52 Banded, 1 Recovery)

Upupa epops, Hoopoe: One recovery of a Korean bird banded at Chin Chup Myun, Kyunggido and recovered ten days later 15 miles E.



BUCEROTIDAE (16 Banded, 0 Recovery)

CAPITONIDAE (516 Banded, 0 Recovery)

INDICATORIDAE (12 Banded, 0 Recovery)

PICIDAE (846 Banded, 2 Recoveries)

Picus puniceus, Crimson-winged Woodpecker: One recovery of a bird banded at Rantau Panjang, Selangor, Malaya and shot there seven months later by a collector.

Picus vittatus, Bamboo Green Woodpecker: One recovery of a bird banded at Rantau Panjang, Selangor, Malaya and shot two miles away 26 months later.

EURYLAIMIDAE (278 Banded, 1 Recovery)

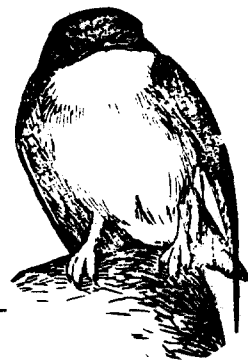
Cymbirhynchus macrorhynchus, Black-and-Red Broodbill: One recovery of a bird banded near Kuching, Sarawak and found dead in the same locality six months later.

PITTIDAE (2587 Banded, 0 Recovery)

ALAUDIDAE (1465 Banded, 0 Recovery)

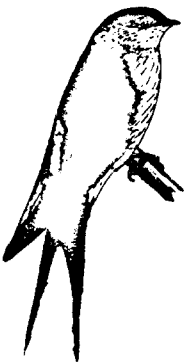
HIRUNDINIDAE (262, 991 Banded, 301 Recoveries)

Delichon urbica, House Martin: Two recoveries of Japanese birds ringed in Nagano Prefecture, one found dead 25 miles SW two weeks after ringing, and the other re-captured and released by the Japanese banders 10 miles NE two years later.



Hirundo daurica, Red-rumped Swallow: One recovery of a bird banded at Nakorn Sawan in central Thailand and recovered near Vientiane, Laos the following month. Fig. 129

Hirundo rustica, House Swallow: 277 recoveries. The complete



mixing of swallow populations that appears to go on in Eastern Asia is shown in Table 34. A map illustrating this would be a confusion of crossed lines. Data in the headquarters files are not complete so the figures given in Table 34 will change as more material is accumulated. Approximately 5% of the birds that have been ringed have been recaptured again at the same places (see discussions by the various team leader). The overall recovery rate has been .15% (.11% for Korean birds, .09% for Japanese, .11% for Taiwanese, .06% for Malayan and .15% for Thai marked birds.) The large number of birds from Thailand and Malaya reported from Siberia, North Korea and Korea simply points up the fact that China produces the bulk of the Swallows that overwinter in South East Asia. The exchange of birds between Japan, Taiwan and the Philippines suggest that this is a different population from that of the mainland. Borneo and Javanese flocks have not yet yielded enough information to suggest their areas of origin. It would be interesting to know if the swallows of India originate from west central Asia demonstrating the same flyways suggested by the ducks. The lack of recoveries of swallows from Western Siberia would intimate this.



Hirundo tahitica, Pacific Swallow: 19 recoveries, twelve of these have been birds ringed at Bentong or Raub in Pahang, Malaya and recovered within a few miles. Six have been birds banded at Bentong and moved to Raub, or the reverse, which are about 20 miles apart. Seven birds were ringed at Kuching, Sarawak and recovered within fourteen miles of there. This species roosts with the flocks of H. rustica and is easily confused with them in poor light or at night. When the House Swallow have returned north tahitica still gathers in small flocks. Recoveries indicate that they move as much as 35 miles from these flocks to breeding territories.

#### CAMPEPHAGIDAE (1337 Banded, 1 Recovery)

Tephrodornis pondicerianus, Common Wood Shrike: One recovery of a bird banded at Bharatpur, India and recaptured there 75 months later.

#### DICRURIDAE (1048 Banded, 3 Recoveries)

Dicrurus balicasius, Balicassiao: One recovery of a bird banded on Mt. Makiling in Luzon and shot there 41 months later.

Dicrurus paradiseus, Large Racquet-tailed Drongo: One recovery of a bird banded in Northern Thailand at 1,300 ft. altitude. It was shot on the same mountain, but 300 ft. lower ten months later.

TABLE 33. THE DISTRIBUTION OF RECOVERIES OF BANDED BIRDS IN ASIA

Country Where Recovered	Country Where Banded																	Total		
	Eastern Siberia	Pribilof Alaska	N. Korea	S. Korea	Japan	Okinawa	Taiwan	Philippines	Thailand	Malaya	Sabah	Sarawak	Singapore	Java	India	Pacific Islands	Australia		Antarctica	California
Siberia				2	43		9	3	32	3										246
Pribilof Alaska					34															34
Alaska				6			1													1
North Korea				129					52	11							1			70
South Korea	1								9	1							6			146
Japan	3	13			265		17	2		1						22				329
Okinawa					1	1										1			1	3
Taiwan				4	1	5	46	4												60
Philippines	1			10	48	69	119	245								1				493
China										1										1
Laos									2	1										3
South Vietnam				1				1												2
Cambodia									1											1
Thailand	4			8			1		95	5										113
Burma															1					1
Malaya	2		1	2	1		1		6	125	1		1							140
Sabah				1			1				5									7
Sarawak												29								29
Singapore													14							14
Sumatra														2						2
Java														6						6
East Pakistan									2											2
India										1					40					41
West Pakistan															3					3
New Guinea																1				1
Australia					1															1
Ninigo Islands					1															1
Tonga Islands					1															1
Caroline Islands							2													2
Indian Ocean																		2		2
Total	11	13	1	163	396	75	197	255	199	149	6	29	15	8	198	25	12	2	1	1755

Table 34: The distribution of recoveries of banded House Swallows in Eastern Asia

	Korea	Japan	Taiwan	Luzon	Palawan	Thailand	Malaya	Sabah	Sarawak	N. Korea	Totals	
Number Banded	29044	5246	33714	89	2057	92379	76443	156	417		239, 545	
Number Returned	245	9	292	2	21	7439	3340	0	10		11, 358	
Number Recovered	32	5	40	0	1	143	53	1	1	1	277	
Country where recovered												
	Siberia	-	-	2	-	-	32	3	-	-	-	37
	North Korea	4	-	-	-	-	52	11	-	-	-	67
	Korea	9	-	-	-	-	8	1	-	-	-	18
	Japan	-	3	15	-	-	-	1	-	-	-	17
	China	-	-	-	-	-	-	1	-	-	-	1
	Taiwan	3	-	16	-	-	-	-	-	-	-	19
	Luzon	3	-	5	-	-	-	-	-	-	-	8
	Palawan	1	1	1	-	-	-	-	-	-	-	3
	Laos	-	-	-	-	-	1	1	-	-	-	2
	Vietnam	1	-	-	-	1	-	-	-	-	-	2
	Thailand	7	-	1	-	-	44	5	-	-	-	57
	Malaya	2	1	1	-	-	6	30	1	-	1	42
	Sarawak	-	-	-	-	-	-	-	-	1	-	1
	Sabah	1	-	-	-	-	-	-	-	-	-	1
	Negros	1	-	1	-	-	-	-	-	-	-	2

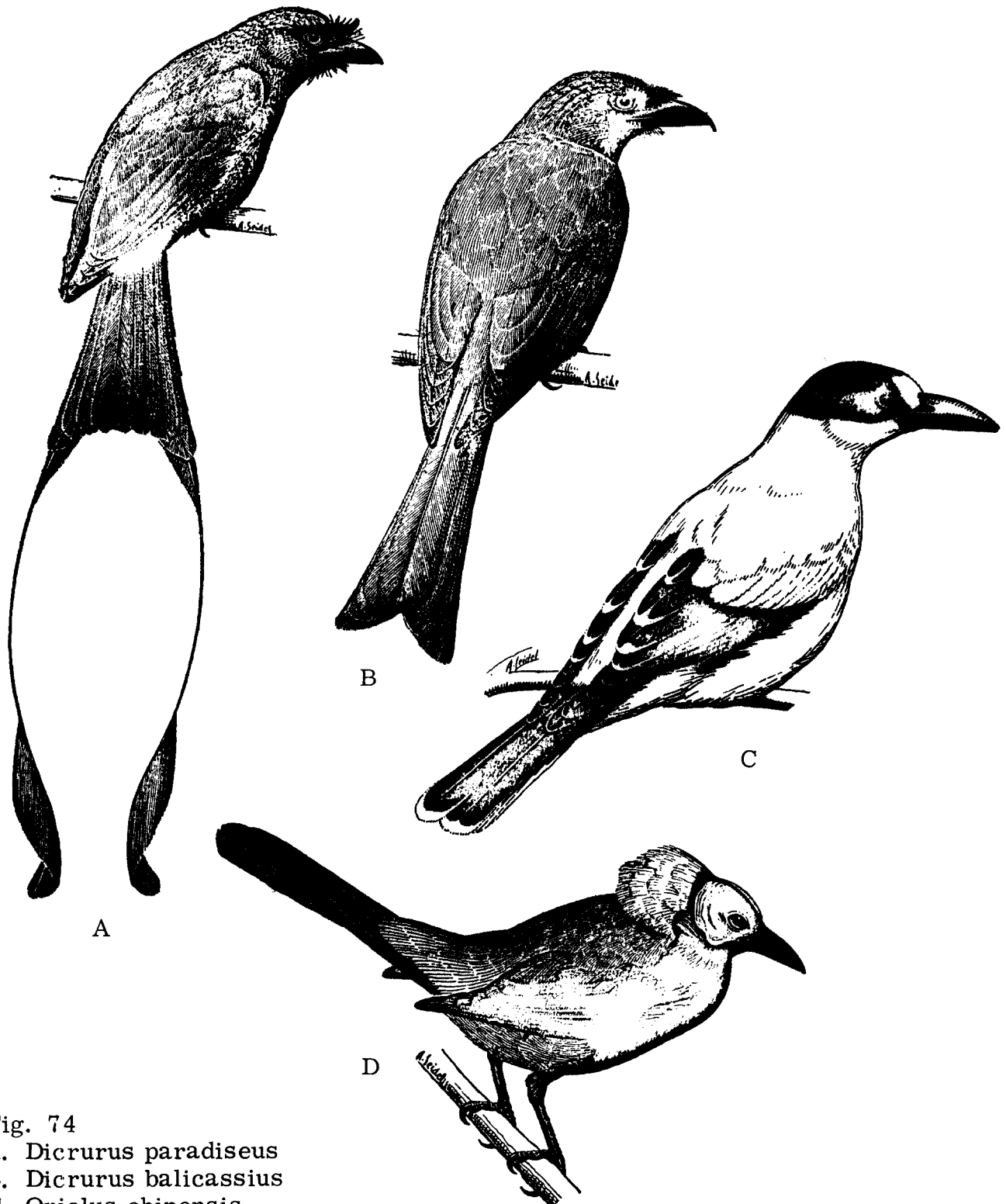


Fig. 74

- A. *Dicrurus paradiseus*
- B. *Dicrurus balicassius*
- C. *Oriolus chinensis*
- D. *Sarcops calvus*



Dicrurus remifer, Lesser Racquet-tailed Drongo: One recovery of a bird banded in Northern Thailand at 5,200 ft. altitude. It was captured and released thirteen months later 600 ft. lower on the same mountain.

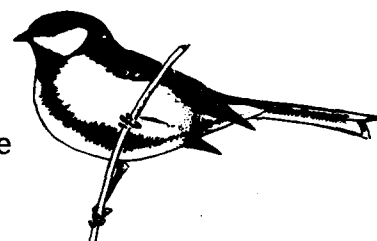
ORIOLIDAE (606 Banded, 3 Recoveries)

Oriolus chinensis, Black-naped Oriole: Three recoveries of Philippine birds, one shot on Siquijor Island, Negros Oriental, near where it was ringed three months before, another shot near Siaton, Negros Oriental, five months later and within a few miles of its point of release, and the third ringed in Camarines Norte, Luzon, and shot two miles away seven months later.

CORVIDAE (316 Banded, 0 Recovery)

PARIDAE (4464 Banded, 1 Recovery)

Parus major, Great Tit: A Korean bird recaptured by the bird banders about four miles away a month later.



CERTHIIDAE (34 Banded, 0 Recovery)

SITTIDAE (151 Banded, 0 Recovery)

TIMALIIDAE (12052 Banded, 16 Recoveries)

Alcippe morrisonia, Grey-eyed Nun Babbler; One recovery of a bird banded on Mt. Doi Pui in Northern Thailand and recaptured there by another bander a year later.

Alcippe nipalensis, Mountain Nun Babbler: Four recoveries of Malayan birds; two from Fraser's Hill recaptured there twelve and sixteen months later, and one on Mt. Brinchang at 5,500 ft. and collected there 89 months after ringing.

Garrulax erythrocephalus, Red-headed Laughing Thrush: One recovery of a Malayan bird ringed at 5,500 ft. on Mt. Brinchang and recovered there by another bander 50 months later.

Leiothrix argenteauris, Silver-eared Mesia: Three recoveries of Malayan birds, all ringed on Mt. Brinchang, Pahang above 5,000 ft. and recovered there by other banders 50, 63 and 66 months after ringing.

Macronus gularis, Striped Tit Babbler: One recovery of a bird banded at Khao Yai National Park, Thailand and recovered there 28 months later by another bander.

Pomatorhinus schisticeps, Yellow-billed Scimitar Babbler: One recovery of an adult banded on Mt. Doi Pui Northern Thailand and recaptured there by another bander a year later.

Stachyris erythroptera, Red-winged Tree Babbler: One recovery of a bird ringed in Singapore and struck by a car near its point of release five months later.

Stachyris maculata, Red-rumped Tree Babbler: A Malayan bird ringed at Subang, Selangor (by the International Airport) and recaptured there by another bander 43 months later.



Stachyris nigriceps, Gray-throated Tree Babbler: Two recoveries of Malayan birds, one at Fraser's Hill recaptured there four months later, and one at Cameron Highlands recaptured a month later, both by other banders.

Trichastoma abbotti, Abbotts Jungle Babbler: One recovery of a bird banded at Sakaerat, Pak Thong Chai, Thailand and recaptured there a year later by another bander.

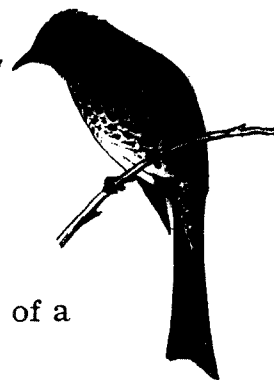
#### PARADOXORNITHIDAE (3158 Banded, 9 Recoveries)

Paradoxornis webbiana, Webb's Parrotbill: Nine recoveries of Korean birds retrapped as distances up to five miles from point of release by Korean banders. Six were taken in the following breeding season up to a year later.

#### PYCNONOTIDAE (34374 Banded 39 Recoveries)

Criniger pallidus, Swinhoe's White-throated Bulbul: Three recoveries of Thai birds, two on Doi Pui, Chiangmai, recaptured and released by other bird banders eleven and thirteen months later. The third recovery was of a bird banded near Saraburi and recovered near Kanajanaburi 90 miles SW nearly three years later. Such a long movement is unusual for tropical bulbuls. Fig. 130

Hypsipetes amurotis, Brown-eared Bulbul: One recovery of a Japanese bird ringed in Yamaguchi Prefecture and recovered in Fukuoka Prefecture 75 miles SW, between November and January. This would be a normal migration of this species to its wintering grounds and it was taken while passing through Yamaguchi. Fig. 131



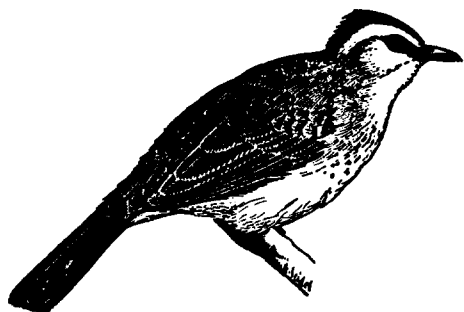
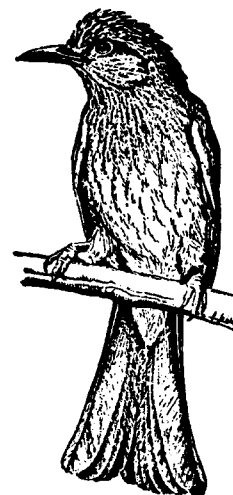
Hypsipetes criniger, Hairy-backed Bulbul: One recovery of a

bird ringed at mile 16 Ulu Gombak, near Kuala Lumpur, Malaya and netted and released the following day in another valley of the same watershed more than two miles away.

Hypsipetes philippinus (gularis), Philippine Bulbul: One recovery of the Philippine bird ringed in Luzon and shot near the point of release 18 months later.

Hypsipetes propinquus, Olive Bulbul: One recovery of a Thai bird banded at Khao Yai National Park and recaptured nearby by another bander 25 months later.

Pycnonotus aurigaster, White-eared Bulbul: One recovery of a Thai bird, banded at Mt. Doi Pui above 4,500 ft. and recaptured by another bander in the same area thirteen months later.



Pycnonotus goiavier, Yellow-vented Bulbul: Twenty-one recoveries of this species which appears to have erratic movements. One banded at Sungei Way, Selangor, Malaya shot twenty-two months later a mile or so away in Kuala Lumpur; one banded at 3 1/2 mile Ampang Road, Kuala Lumpur and recaptured fourteen months later at Sungei Way more than ten miles away; four Singapore birds reported within a mile or so of point of release 7, 7, 19 and 24 months later; one banded in Penang, Malaya and recovered nearby point of release 15 months later; seven banded in Kuching, Sarawak and recovered up to five miles from points of release, six within a year of banding and one 27 months later; three banded at Sangley Point, Luzon and recovered two

miles away one and three months later; three Thai birds, two at Bang Phra, Chulburi Province and taken a mile from the point of release three and ten months later; and one Bang Phra bird found for sale in the Bangkok Market 27 months later.

Pycnonotus melanicterus, Black-crested Yellow Bulbul: One recovery of a Thai bird banded at Sakaerat, Pak Thong Chai and recaptured there by another bander eight months later.

Pycnonotus plumosus, Large Olive Bulbul: Eight recoveries of birds banded at Kuching and reported within a mile of the points of release more than two

years later.

Pycnonotus sinensis, Chinese Bulbul: One recovery of a bird banded at Tunghai University, Taiwan and shot less than a mile away three days later.

AEGITHINIDAE (541 Banded, 0 Recovery)

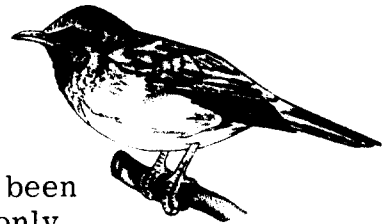
CINCLIDAE (6 Banded, 0 Recovery)

TROGLODYTIDAE (45 Banded, 0 Recovery)

TURDIDAE (9603 Banded, 2 Recoveries)

Copsychus luzoniensis, White-eyebrowed Thrush: One Philippine bird banded in Laguna Province, Luzon and recovered near its point of release a year later.

Turdus chrysolaus, Brown Thrush: One recovery of a male banded in Taiwan in April and recovered in Kyushu, Japan the following November. This bird had probably been to its breeding territory in the mountains of Honshu and was on its way back to Taiwan. This has been a very important food and cage species in the past, but only 568 have been banded to date and our migration information is consequently limited to this one bird. Fig. 132.



SYLVIIDAE (20324 Banded, 3 Recoveries)

Cettia diphone, Bush Warbler: One recovery of a Korean bird banded at Chin Chup Myun, Kyunggido, and recaptured and released by the banding team five miles away a year later.



Seicercus burkii, Yellow-eyed Flycatcher-Warbler: One recovery of an adult banded at Khao Yai National Park, Thailand and recaptured there by another bander a year later.

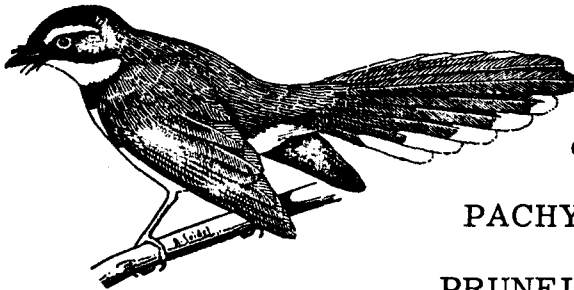
Seicercus montis, Yellow-breasted Flycatcher-Warbler: One recovery of an adult banded at Cameron Highlands, Malaya and recaptured there a month later by another bander.

MUSCICAPIDAE (7174 Banded, 4 Recoveries)

Muscicapa banyumas, Hill Blue Flycatcher: Two recoveries of birds banded at Khao Yai National Park in Thailand and retrapped there by another bander

eleven and thirteen months later.

Muscicapa narcissina, Narcissus Flycatcher: One recovery of a Japanese bird found dead ten months later near its breeding territory on Mount Fuji.

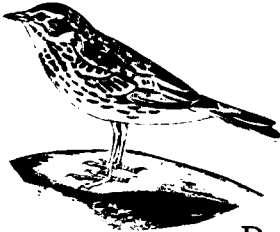


Rhipidura javanica, Pied Fantail Flycatcher: One recovery of a bird banded in Kuching, Sarawak and caught nearby 27 months later.

PACHYCEPHALIDAE (217 Banded, 0 Recovery)

PRUNELLIDAE (163 Banded, 0 Recovery)

MOTACILLIDAE (68025 Banded, 55 Recoveries)

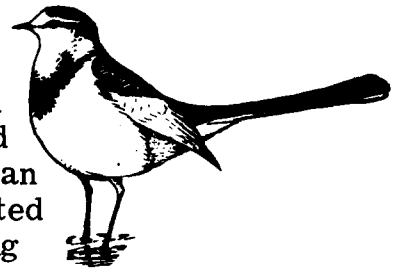


Anthus hodgsoni, Tree Pipit: One recovery of a bird wintering in Taiwan and reported from Sakhalin I, 600 miles NE five months later at its breeding territory.

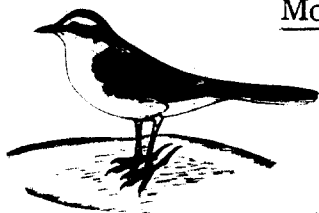
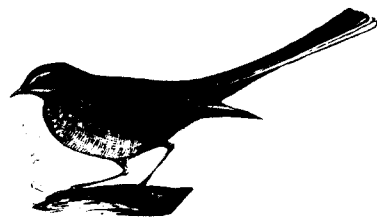
Dendronanthus indica, Forest Wagtail: One recovery of a bird banded by the Bombay Natural History Society in February in Southern India and recovered two months later in the Chin Hills of Burma. Although thousands of other motacillids have been banded only 568 of this species have been ringed. This bird is an important recovery since the time and place suggest a migration route up the Brahmaputra and Irrawadi River valleys into Central China. Fig. 133.



Motacilla alba, Pied Wagtail: 41 recoveries of Korean and Japanese birds. This species breeds in Korea and 29 recoveries were reported locally (most by the Korean banders capturing the birds at banding stations separated by several miles) 19 were reported the season following ringing when they had returned to the same roosts and five returned two years later. One was recovered 100 miles NW in North Korea two months after ringing. Banding in Japan has been done mainly at a winter roost in Aichi Prefecture near Nagoya. Three recoveries of these birds have been up to 18 months later, in the second breeding season in Hokkaido, and seven have been from Sakhalin breeding territories, three the following season and four the second season. Fig. 134 compares these recoveries with earlier ones from India.



Motacilla cinerea, Grey Wagtail: One recovery of a Japanese bird found dead a month later in the area where released.



Motacilla flava, Yellow Wagtail: Twelve recoveries. This species has given us some of our most spectacular recoveries. Six Taiwan winter residents have been taken in Eastern Siberia and Alaska. The longest flight was that of a bird taken nesting at the mouth of the Mackenzie River in Northern Alaska two months later. Two others were found more than 2,000 miles north in Siberia two and three months after ringing. Only one has been reported the second season after ringing. This species appears in Thailand as a transient at roosts in November and March. Two others were taken locally. Birds released at Bangkok have been recaptured, one at Nakorn Sawan 140 miles N. ten days later, and three locally. Fig. 135 compares recent recovery data with that reported earlier from India. These data suggest, as does that from the ducks, that there are different major flyways across Asia.

BOMBYCILLIDAE (40 Banded, 0 Recovery)

ARTAMIDAE (188 Banded, 2 Recoveries)

Artamus leucorhynchus, White-breasted Wood Swallow: Two recoveries of birds ringed in Palawan and recovered five and twenty-five miles respectively from their points of release.

LANIDAE (30430 Banded, 17 Recoveries)

Lanius bucephalus, Bull-headed Shrike: Three recoveries of Japanese birds. One was taken a mile from its point of release four months later, one was twenty miles NE fifteen months later, and the third moved 565 miles SW in 51 days. Fig. 136.



Lanius cristatus, Brown Shrike: Fourteen recoveries, four ringed in the Philippines, one in Korea, and the remainder in Taiwan. The Korean bird was taken in the mountains of Luzon four months later. One Taiwan bird was reported locally. Shrike trapping in Taiwan is carried on mainly at the southern tip (see Taiwan reports 1967-68). One bird was caught in Luzon about 400 miles south eight days after release; three others were known to have moved to the Philippines up to 600 miles in less

than a month. Two were reported from Luzon the season following ringing having made the return trip. One bird banded in Negros Oriental was taken in Taiwan nine months later on its way back to the Philippines. Two picked up at Dalton Pass were taken in Taiwan, both on their way back to the Philippines the following fall, and one bird from Dalton Pass was collected a month later 145 miles further south in Luzon. Fig. 137.

#### STURNIDAE (4368 Banded, 19 Recoveries)

Ampeliceps coronatus, Gold-crested Myna: One recovery of a bird bought at the Bangkok Market, released, and found unable to fly a few days later near the point of release.

Aplonis panayensis, Philippine Glossy Starling: Eight recoveries, five were ringed at Calatagan, Batangas four of which were recovered near there 10 and 16 months later. The fifth bird, a juvenile, was reported from southern Leyte about 360 miles SE three months after ringing. Two birds banded in Palawan were reported near their points of release 20 and 35 months later. A Sabah bird ringed at Kota Kinabalu was found there fifteen months later. Fig. 138.

Sarcops calvus, Coletto: Six recoveries. Four were ringed in Negros Occidental and recovered nearby one, four and twenty months later. A bird at Calatagan was shot there 13 months later. The longest movement was made by one in Cotabato, Mindanao which was found injured 25 miles north of its point of release eight days later.

Sturnus cineraceus, Gray Starling: One recovery of a bird banded at Seoul, Korea and recaptured by the banding team 25 miles NE and 25 months later.



Sturnus contra, Pied Myna: Two recoveries, one a bird bought at the Bangkok Market and released at Bangkok. It was recaptured near Bangkok a few days later. The second had been banded at Bharatpur, India and was recaptured there 77 months later.

Sturnus tristis, Common Myna: One recovery of a Thai bird banded at Bang Phra, Cholburi Province, and caught nine miles north-east six months later.

#### NECTARINIDAE (7168 Banded, 4 Recoveries)

Aethopyga gouldiae, Gould's Sunbird: One recovery of a bird ringed at 6,800 ft. altitude on Mt. Doi Pui and recaptured a month later at 4,300 ft. and several miles away.

Arachnothera longirostris, Little Spider Hunter: Three recoveries of Malayan birds, two in Cameron Highlands recovered by other banders in same locality one month and 50 months after release. A recovery of a local bird banded near Kuala Lumpur and found dead a month later.

DICAEIDAE (2359 Banded, 0 Recovery)

ZOSTEROPIDAE (2851 Banded, 2 Recoveries)

Zosterops palpebrosa, Oriental White-eye: Two recoveries of Japanese birds found dead near their points of release one and ten months later.

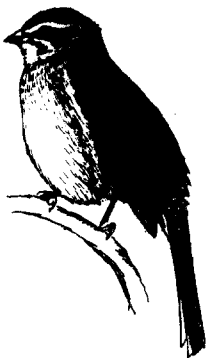
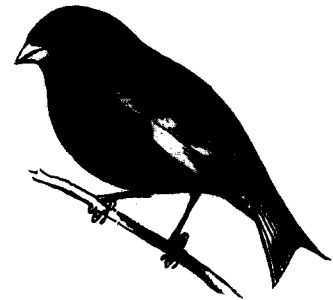
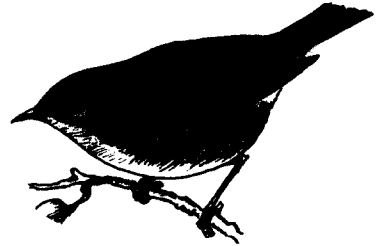
FRINGILLIDAE (159, 851 Banded 75 Recoveries)

Carduelis sinica, Oriental Green Finch: Two recoveries one in Korea and one in Japan, both within a mile of the point of release. The Japanese bird was taken three months later, and the Korean one 15 months.

Coccothraustes coccothraustes, Hawfinch: One recovery of a Korean bird taken in Siberia 2, 800 miles north and west seven months later in its breeding territory.

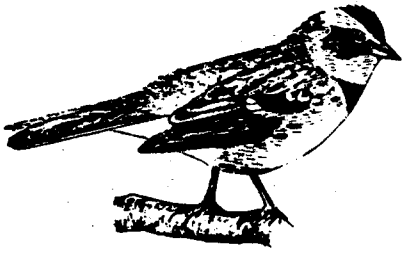
Emberiza aureola, Yellow-breasted Bunting: Two recoveries. A bird bought and released at Bangkok was found in the market again ten months later following a breeding season. The second bird was found dead near point of release a few days later.

Emberiza cioides, Meadow Bunting: Six recoveries of Korean birds, all within fifteen miles of point of release, four after one month, one at five months, and one at fifteen months.



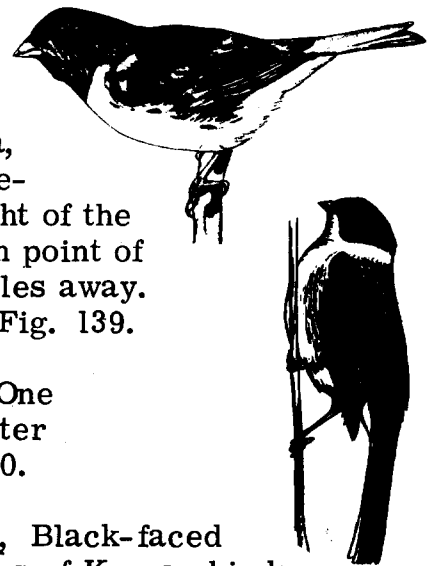


Emberiza elegans, Yellow-throated Bunting: Three recoveries, Korean birds, all taken within five miles of point of release, one, 24 and 25 months later.

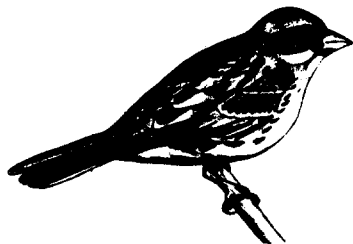


Emberiza rustica, Rustic Bunting: 36 recoveries of Korean birds. Twenty of these were recaptured by the Korean banders within ten miles of point of release and released again, thirteen were reported in the same area by hunters, and three were caught by the banders fifteen miles from the point of release. 24 of the birds were recaptured within the same winter season, nine the following season, 2 two years later, and one 4 years later.

Emberiza rutila, Chestnut Bunting: Seventeen recoveries, sixteen Korean birds and one from Thailand. Three recoveries were at a distance, one 70 miles SE in Korea, one from North Korea, and a migrant ringed in Northern Thailand and recaptured by the Korean banders near Seoul. Eight of the Korean recoveries were less than ten miles from point of release and six were recaptured about fifteen miles away. Five in the same season and nine a year later. Fig. 139.



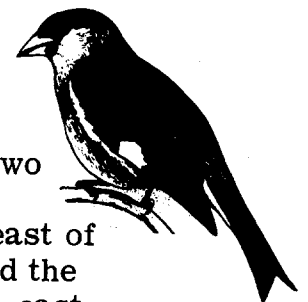
Emberiza schoeniclus, Common Reed Bunting: One recovery of a Japanese bird found dead a year later and 110 miles NE of its point of release. Fig. 140.



Emberiza spodecephala, Black-faced Bunting: Two recoveries of Korean birds, one in Taiwan seventeen months after banding and one in Eastern Siberia 48 months after banding, 1, 100 and 650 miles respectively from Seoul. Fig. 141.

Emberiza tristrami, Tristrams Bunting: One recovered by Korean banders of a bird they had ringed twenty miles away and a week previously.

Eophona migratoria, Migratory Chinese Grosbeak: Two recoveries of birds banded in Kyunggi Province, Korea and taken within fifteen miles of their point of release.



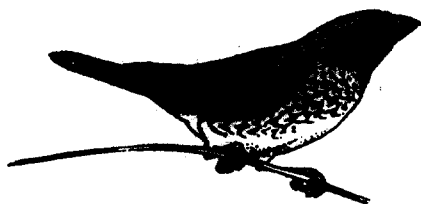
Uragus sibiricus, Long-tailed Rose Finch: Two recoveries of Japanese birds, one eighteen months later found dead seven miles northeast of its point of release in Iwate Prefecture and the other two months later and 25 miles south-east from the same point of release.

PLOCEIDAE (55, 553 Banded, 49 Recoveries)

Lonchura fuscans, Dusky Munia: Two recoveries of Sarawak banded birds, one found at point of release four months afterward, and the second recovered thirteen miles SE of point of release fourteen months later.

Lonchura leucogastra, White-bellied Munia: One recovery of a bird banded at Dalton Pass and found killed by a typhoon in Palawan 27 months later. Fig. 142.

Lonchura malacca, Chestnut Munia: Five recoveries; a bird ringed in Camarines Norte in Luzon and reported from Legaspi City, Albay 100 miles SW eight months later; a bird banded in Oriental Mindoro and reported five miles away 31 months later; the third ringed in Sandakan, Sabah, and found dead two months later in the same town, and two birds ringed in Kuching, Sarawak, one recovered a year later seven miles SE and the other in the banding area six months later.



Lonchura punctulata, Spotted Munia: Two recoveries of birds bought at the Sunday Market in Bangkok and recaptured for sale again two months later.

later.

Lonchura striata, Sharp-tailed Munia: One recovery of a bird bought from the Bangkok Sunday Market and released. It was recaptured for sale again one month

Padda oryzivora, Java Sparrow: One recovery of a bird banded at Malacca, Malaya, and reported nine months later from the same area.

Passer hispaniolensis, Spanish Sparrow: Two recoveries of birds banded at Bharatpur, India and taken in Southern Russia 1,100 miles north less than six months later. Fig. 143.

Passer montanus, Tree Sparrow: 22 recoveries. One ringed at Taichung, Taiwan and taken fifteen miles NW eighteen months later; one ringed in Negros Oriental, Philippines and shot in Negros Oriental 80 miles N 24 months later; one ringed at Chin Chup Myun, Korea and shot in the same area seven months later. In Malaya two at Malacca were recovered within a year near their points of release, and a birds at Kuala Lumpur was found dead nearby 19 months later. Five Singapore birds were recovered nearby within a year of release. Twelve Japanese birds were recovered within a year, all close by except one that moved from Niigata Prefecture to Shizuoka a distance of 200 miles south.



Ploceus philippinus, Baya Weaver: Twelve recoveries. Although thousands of these birds have been ringed and they are commonly used for food in South-east Asia the only recoveries have been of those bought at the Bangkok Market, released, and found at the market again. These have included five birds banded by Dr. Marshall at Bang Phra, Cholburi, about 60 miles SE of Bangkok, trapped there, and brought to Bangkok for sale. Three of these had been ringed two years previously and two one year. In addition one bird was taken with these five and it had been released at Bangkhen, Bangkok, twelve months before. The remaining birds were recaptured at their roosts dispersed over the plain of the Chao Phya River and brought to the market up to eighteen months later.

Ploceus manyar, Striated Weaver: One recovery of a bird bought at the Bangkok Market, released at Bangkhen, and reappearing in the market twelve months later.

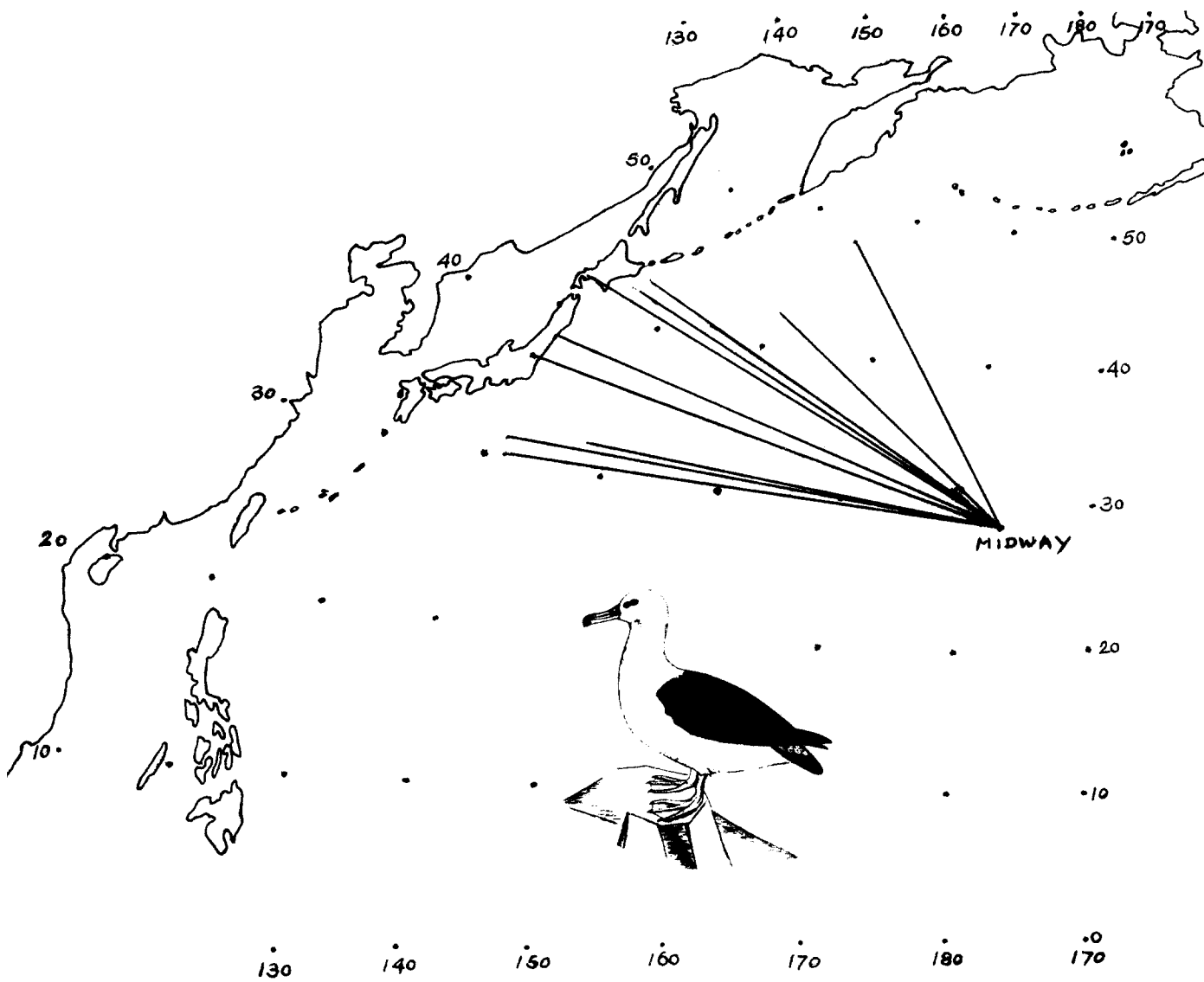


Fig. 75: Recovery of Laysan Albatross, Diomedea immutabilis, banded at Sand Island, Midway.

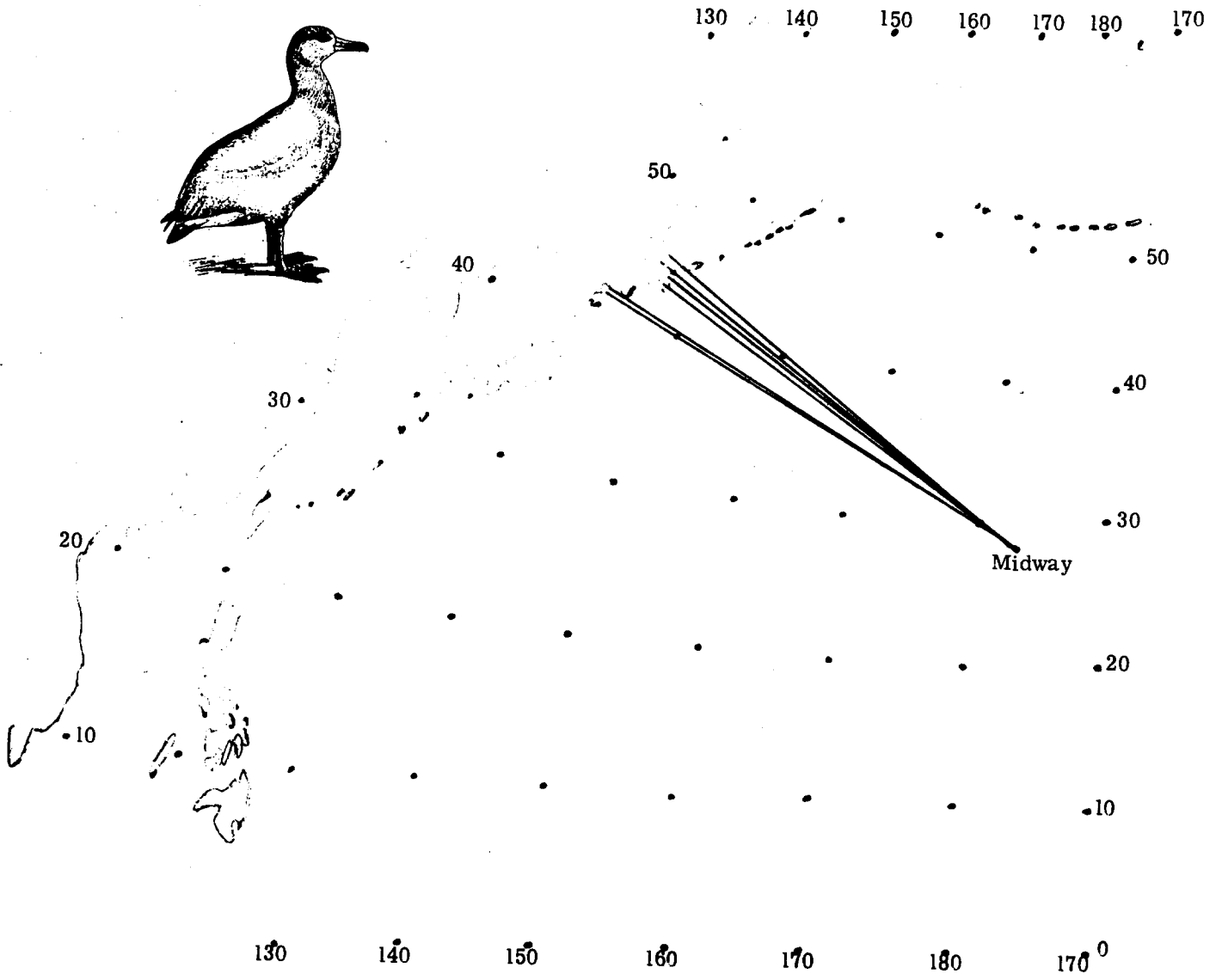
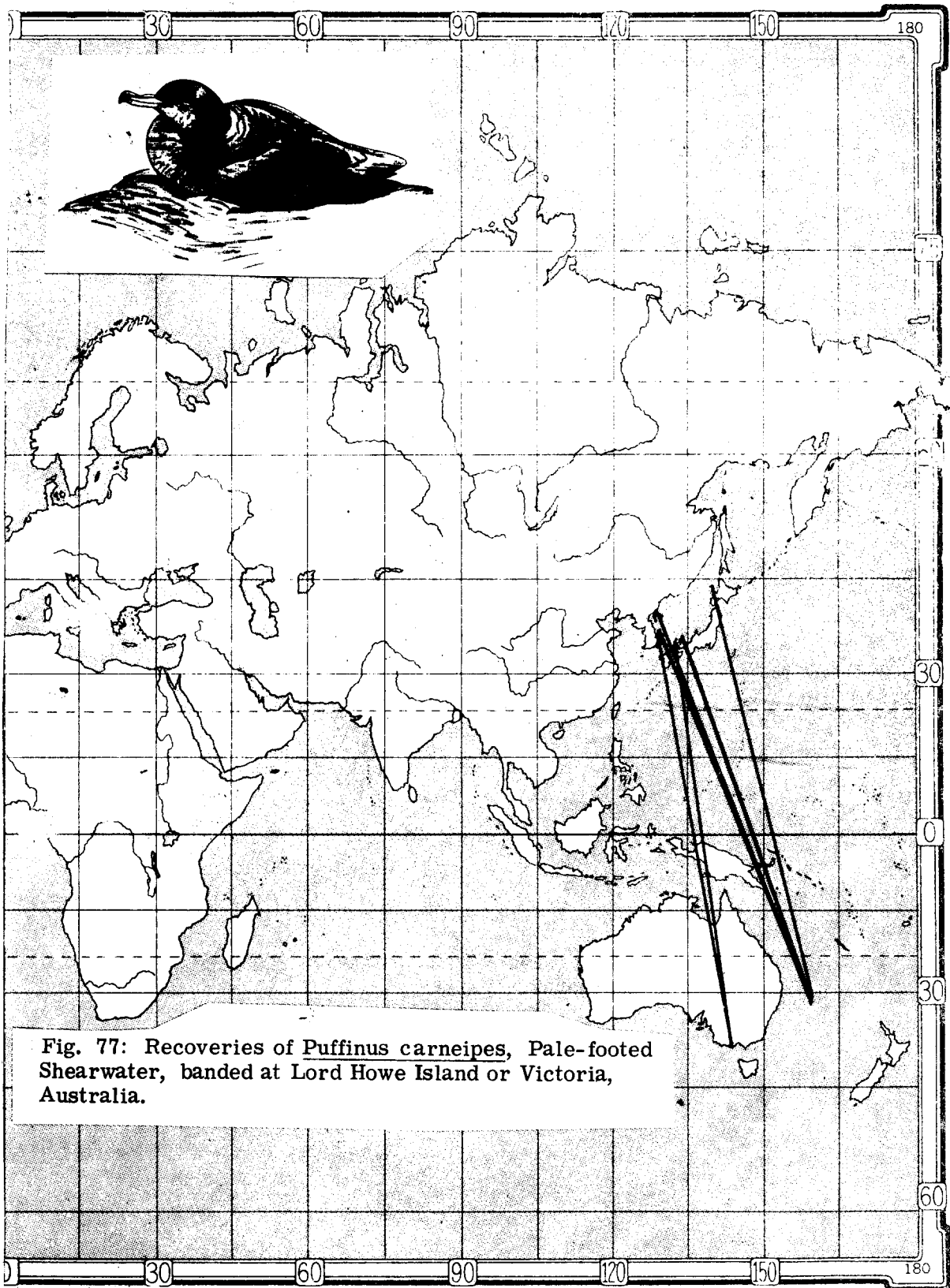


Fig. 76: Recoveries of Black-footed Albatross, Diomedea nigripes from Sand Island, Midway.



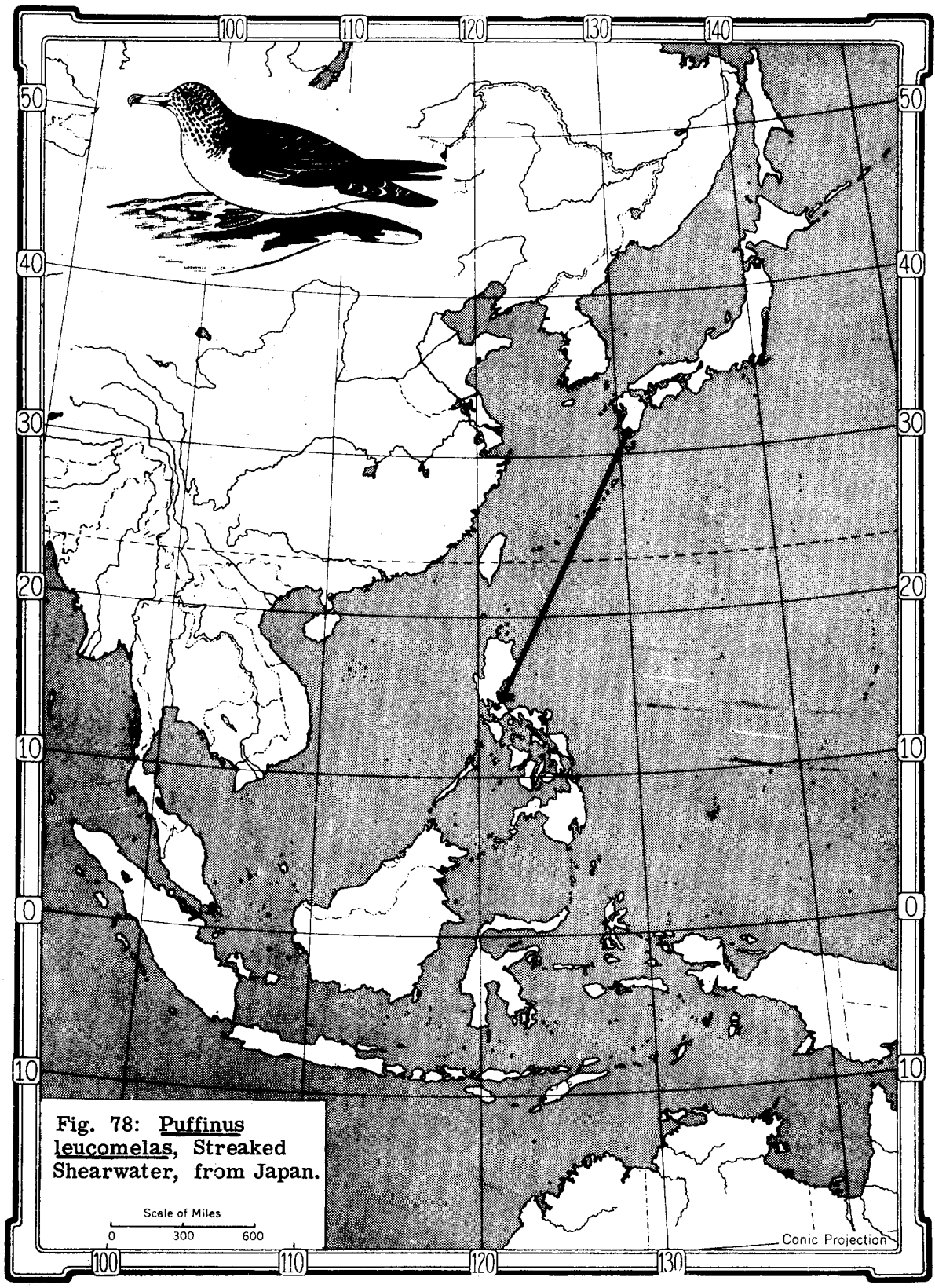


Fig. 78: *Puffinus leucomelas*, Streaked Shearwater, from Japan.

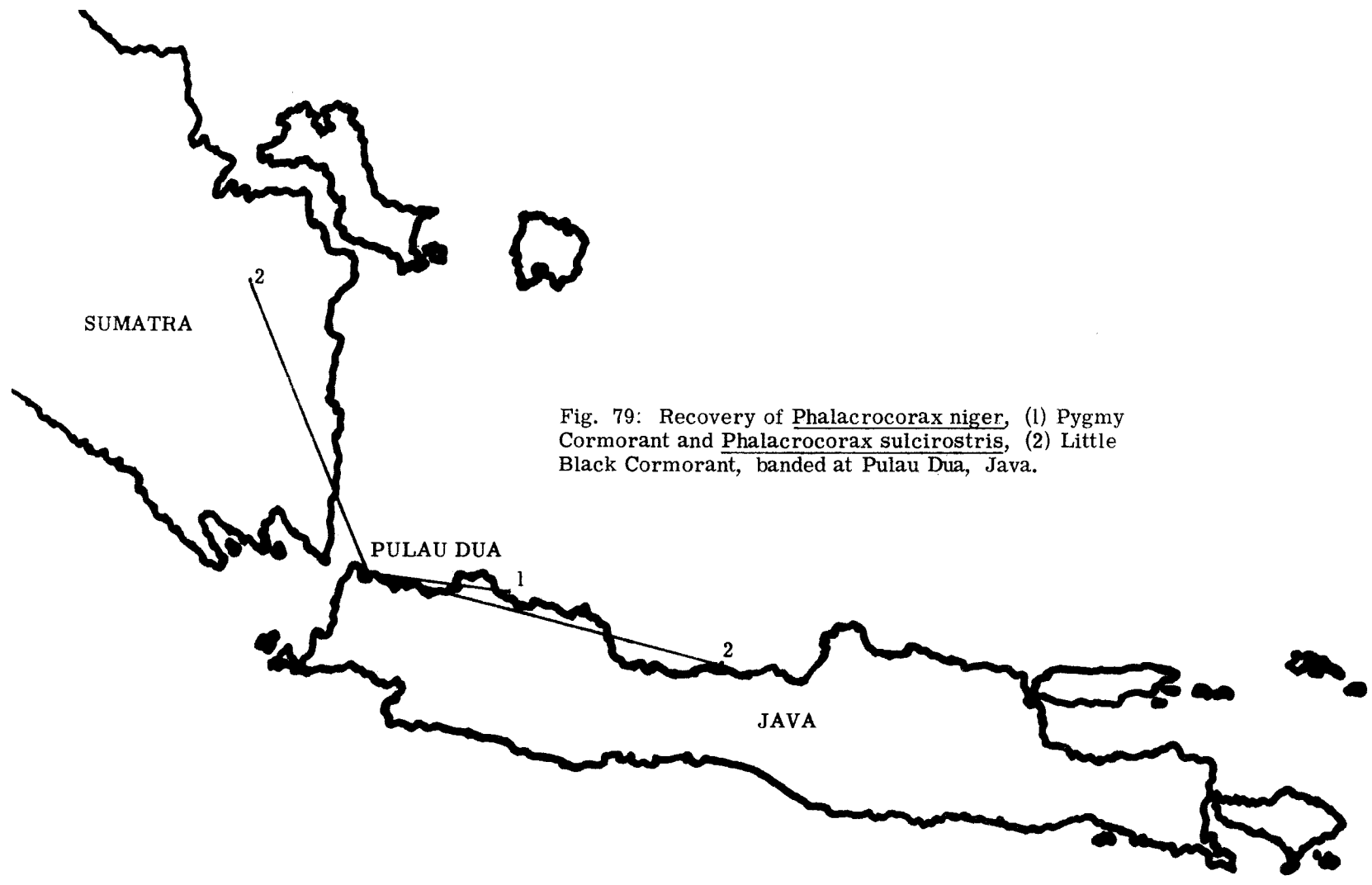


Fig. 79: Recovery of Phalacrocorax niger, (1) Pygmy Cormorant and Phalacrocorax sulcirostris, (2) Little Black Cormorant, banded at Pulau Dua, Java.



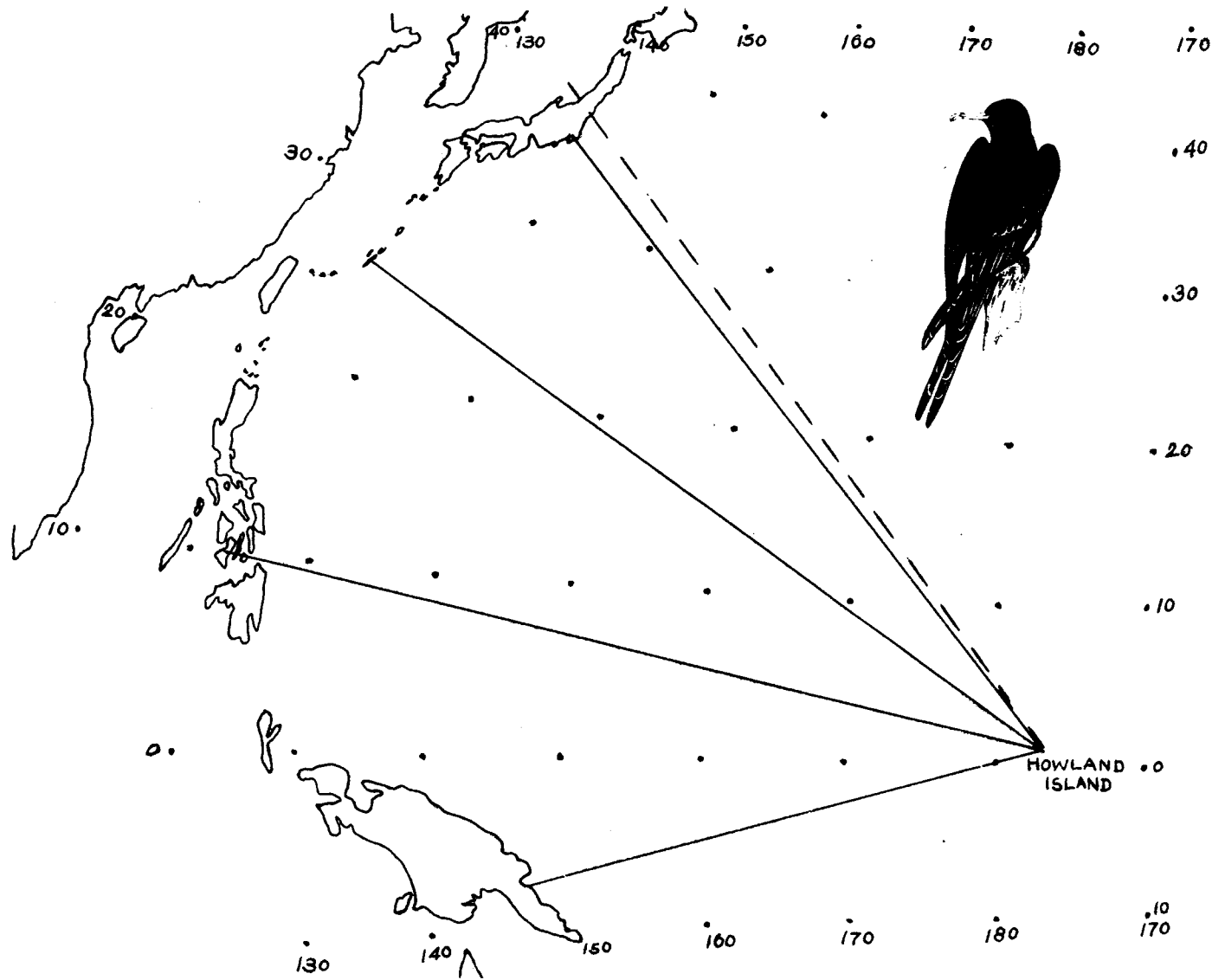


Fig. 80: Four recoveries of *Fregata ariel*, Lesser Frigate Bird, and one *Sula dactylatra*, Blue-faced Booby from Howland Island.

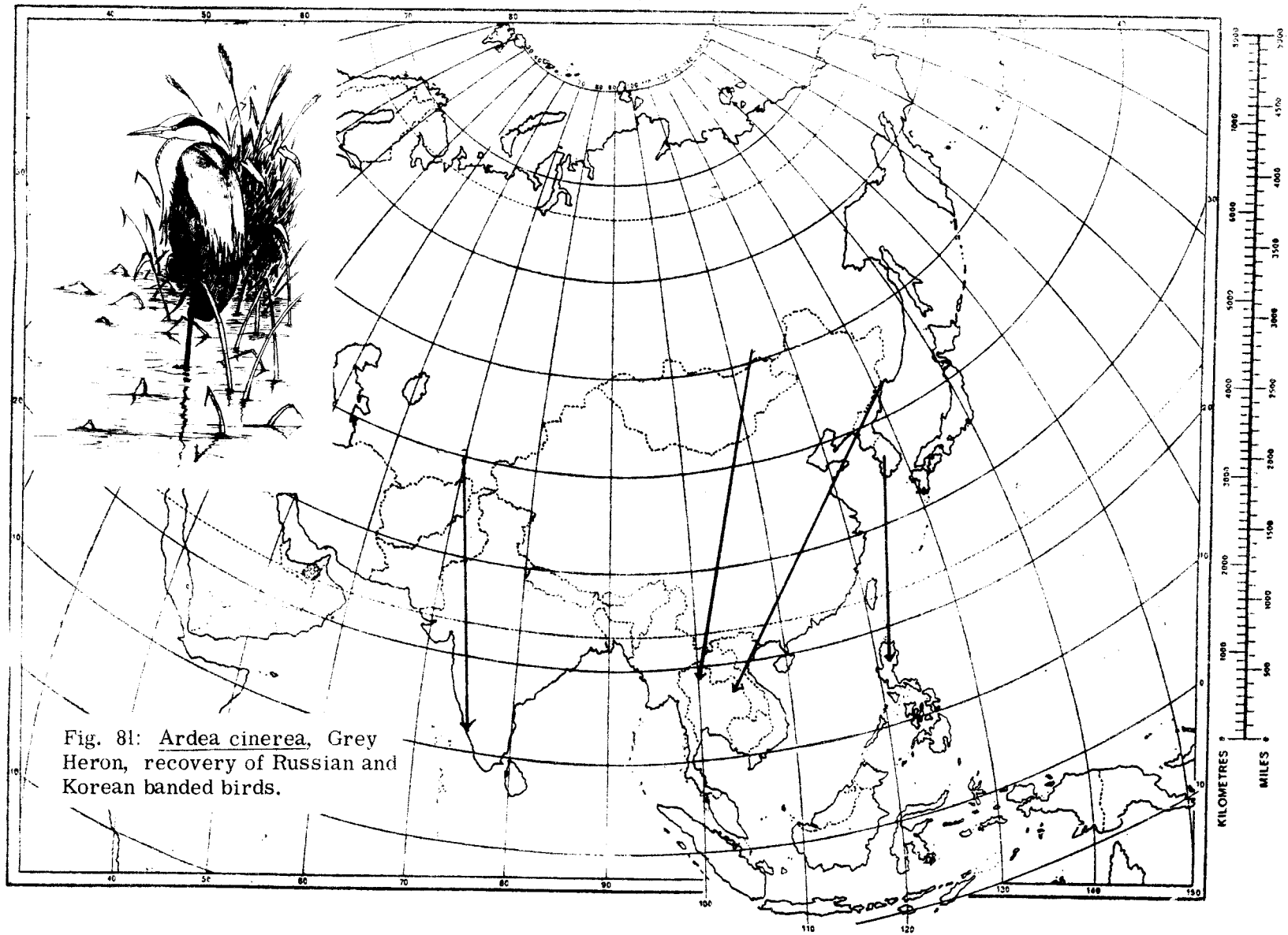
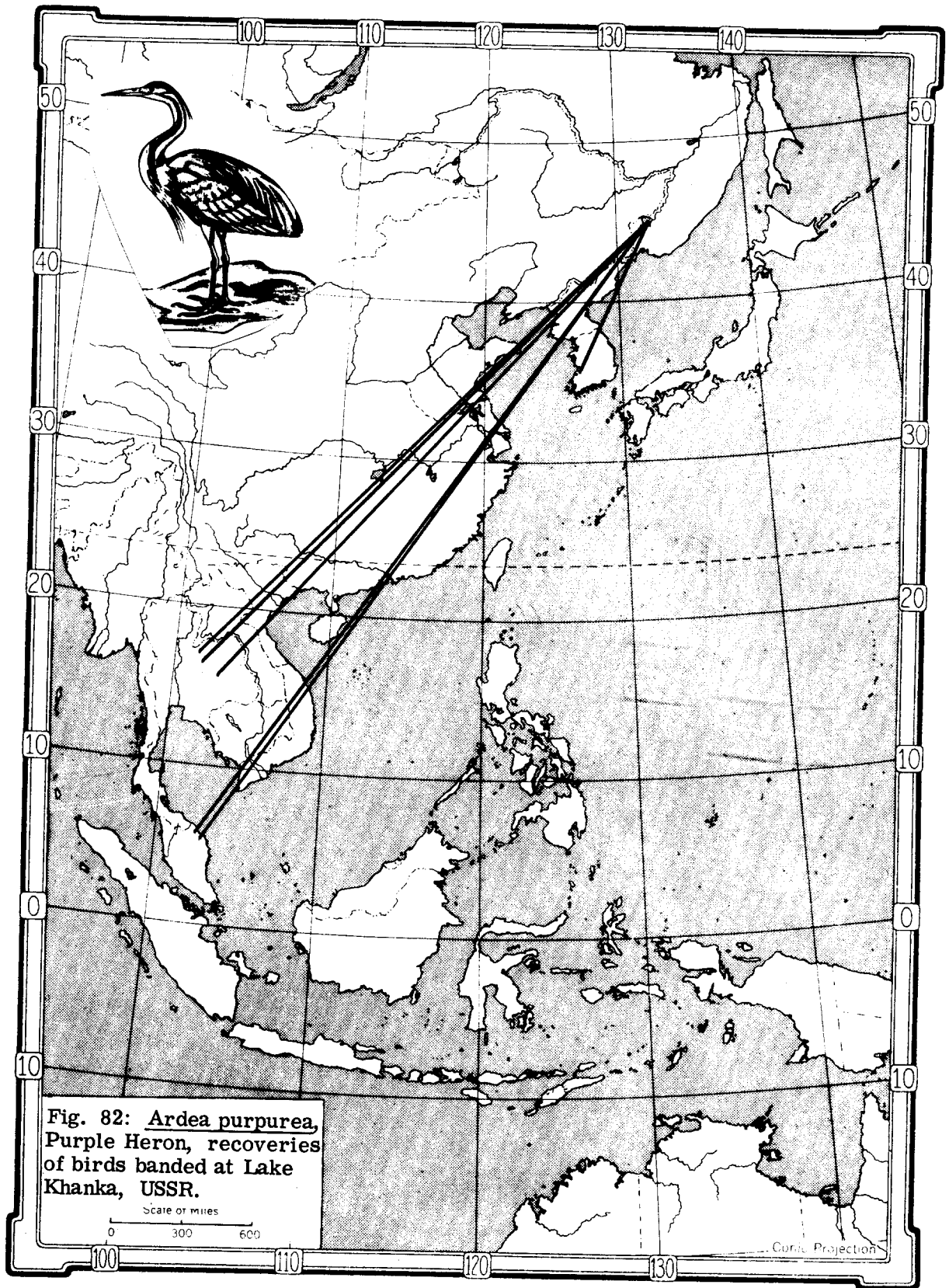


Fig. 81: *Ardea cinerea*, Grey Heron, recovery of Russian and Korean banded birds.



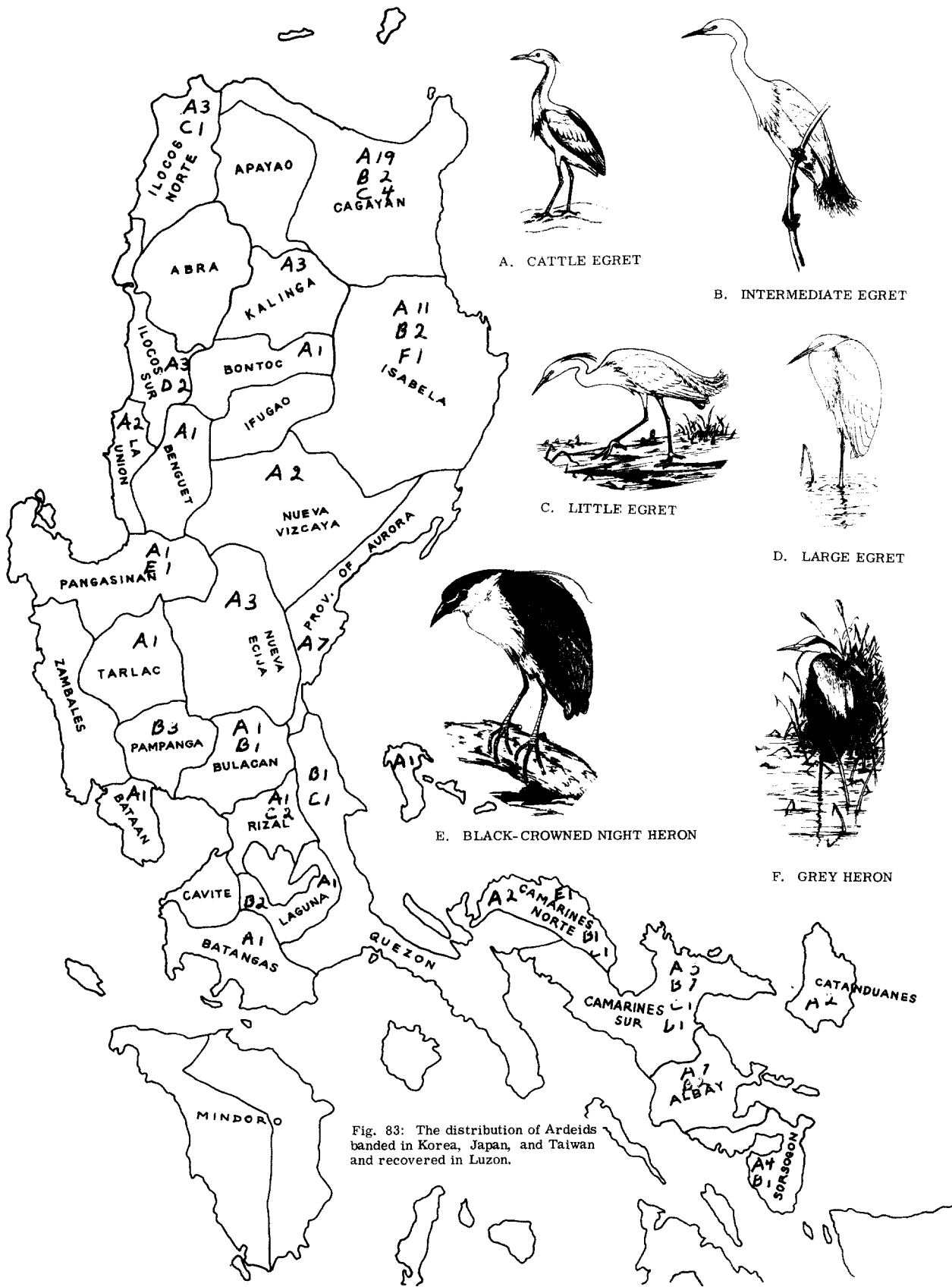


Fig. 83: The distribution of Ardeids banded in Korea, Japan, and Taiwan and recovered in Luzon.

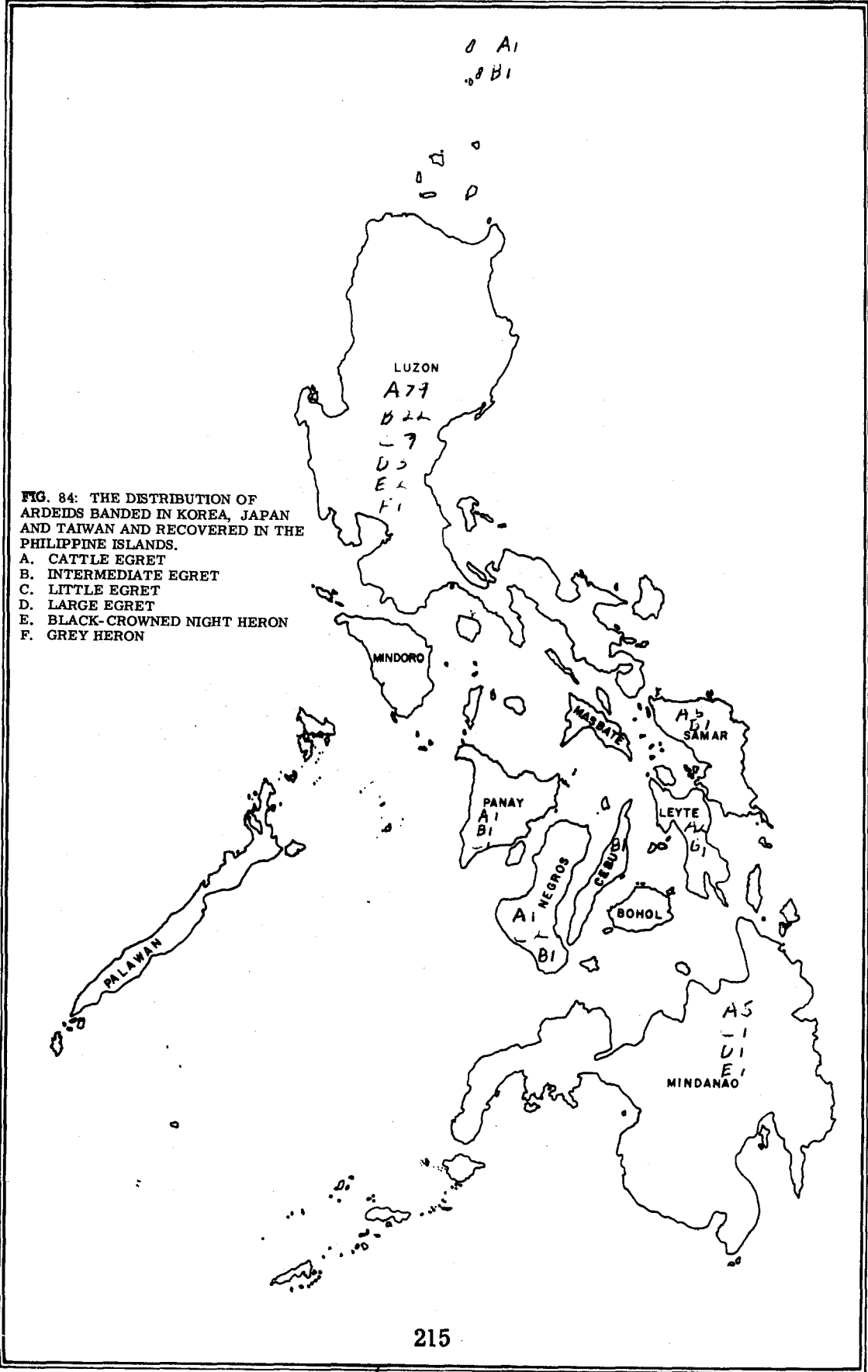


FIG. 84: THE DISTRIBUTION OF ARDEIDS BANDED IN KOREA, JAPAN AND TAIWAN AND RECOVERED IN THE PHILIPPINE ISLANDS.  
 A. CATTLE EGRET  
 B. INTERMEDIATE EGRET  
 C. LITTLE EGRET  
 D. LARGE EGRET  
 E. BLACK-CROWNED NIGHT HERON  
 F. GREY HERON

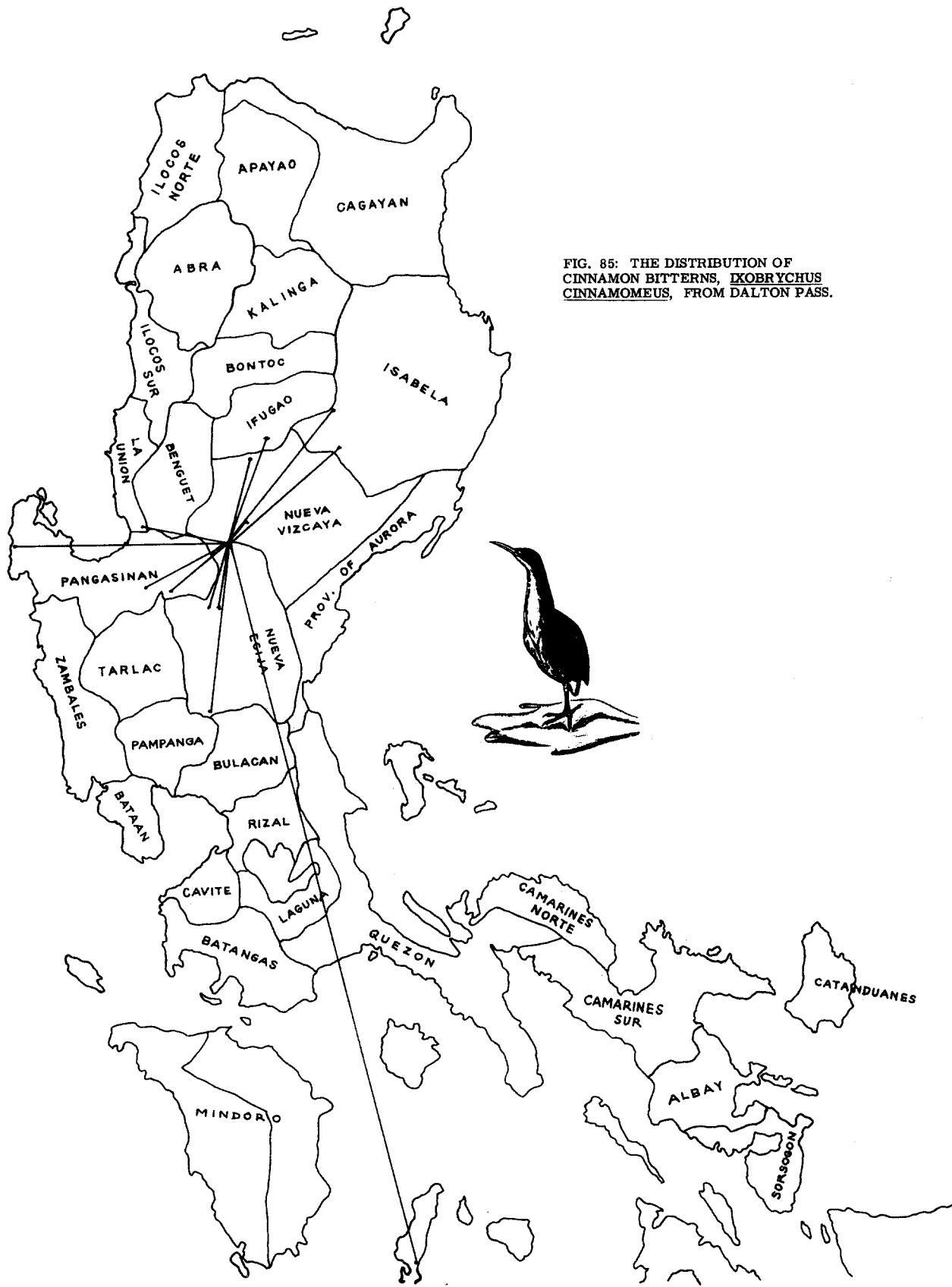


FIG. 85: THE DISTRIBUTION OF CINNAMON BITTERN, IXOBRYCHUS CINNAMOMEUS, FROM DALTON PASS.

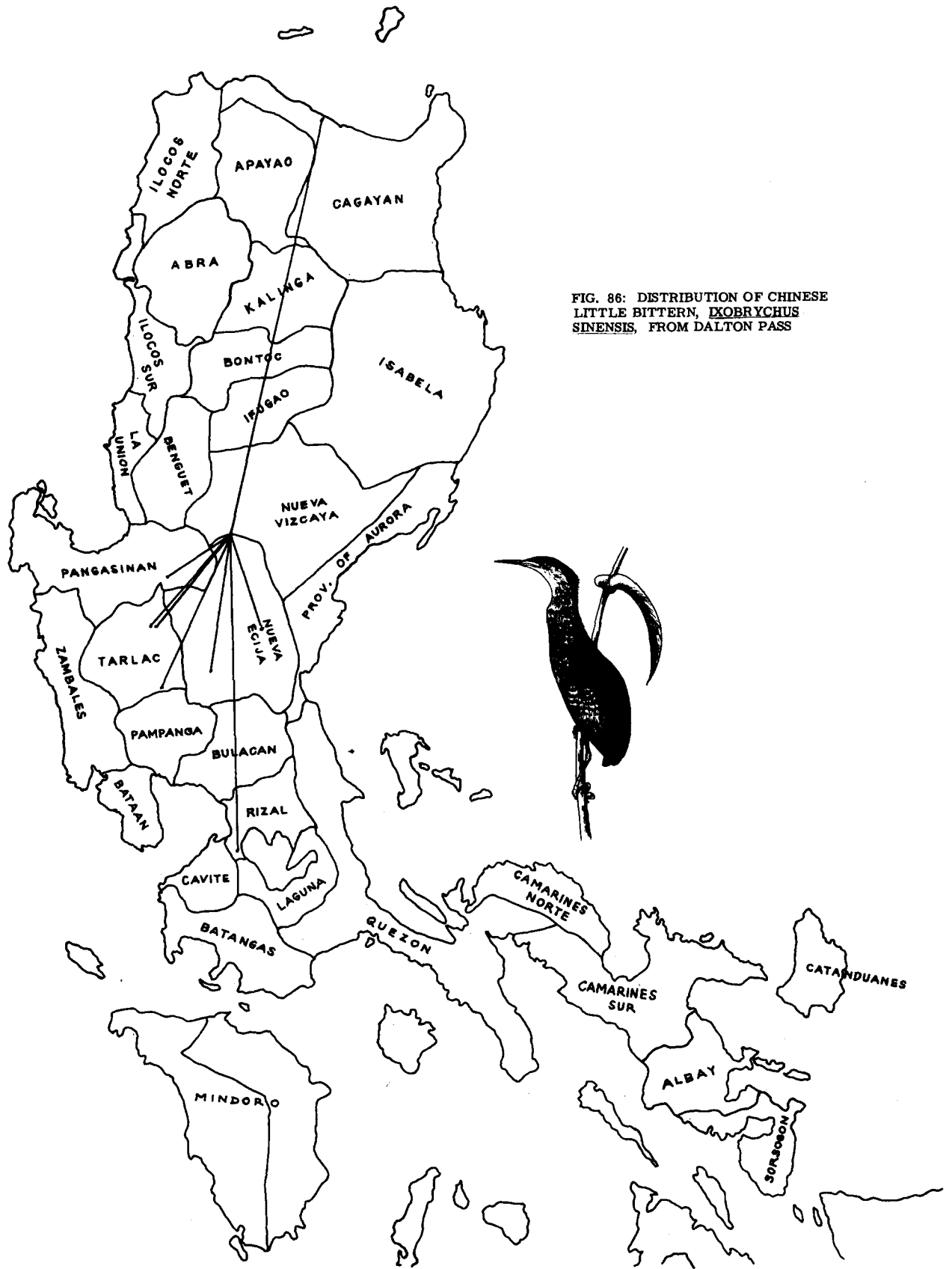


FIG. 86: DISTRIBUTION OF CHINESE LITTLE BITTERN, IXOBRYCHUS SINENSIS, FROM DALTON PASS

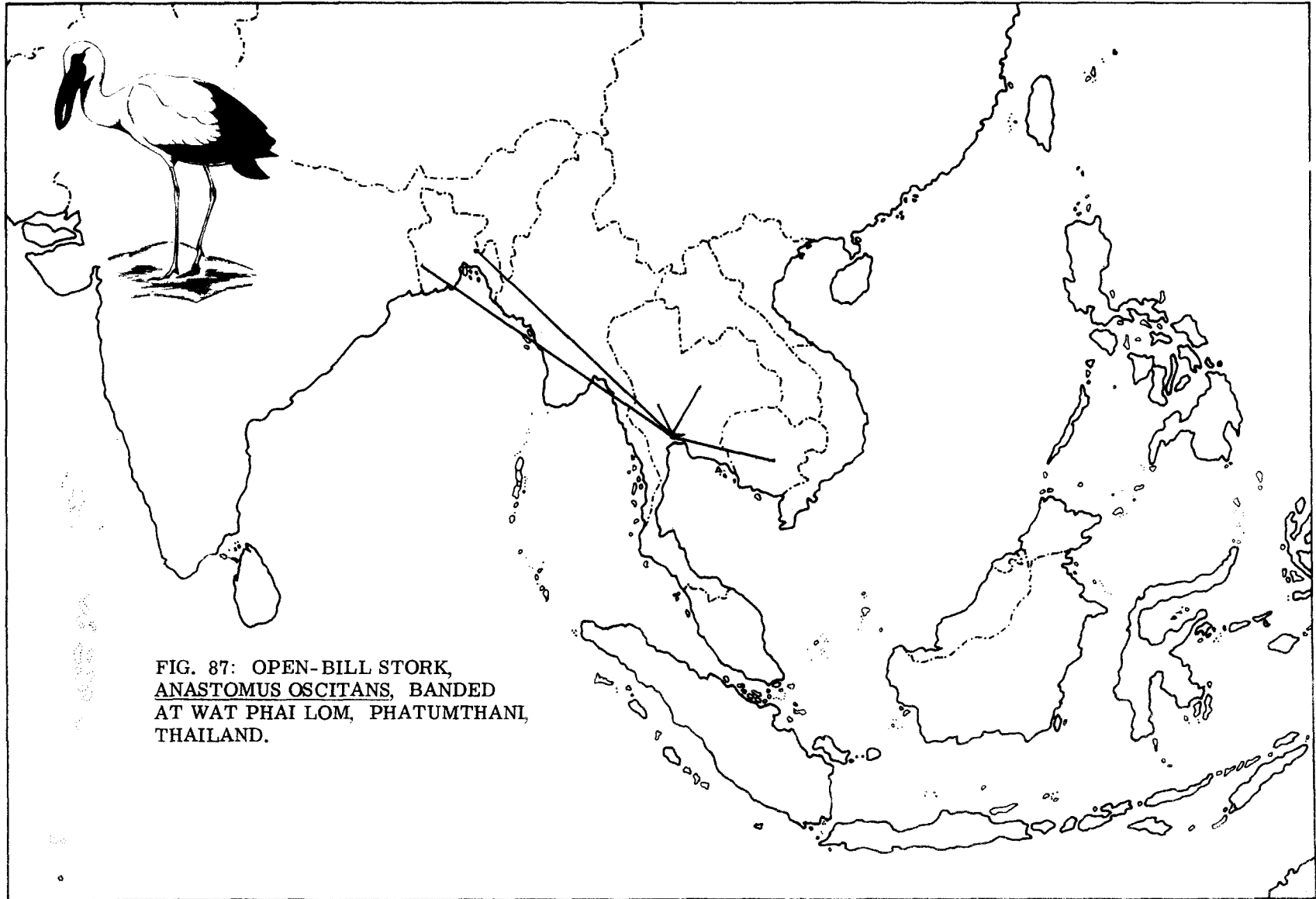


FIG. 87: OPEN-BILL STORK,  
ANASTOMUS OSCITANS, BANDED  
AT WAT PHAI LOM, PHATUMTHANI,  
THAILAND.



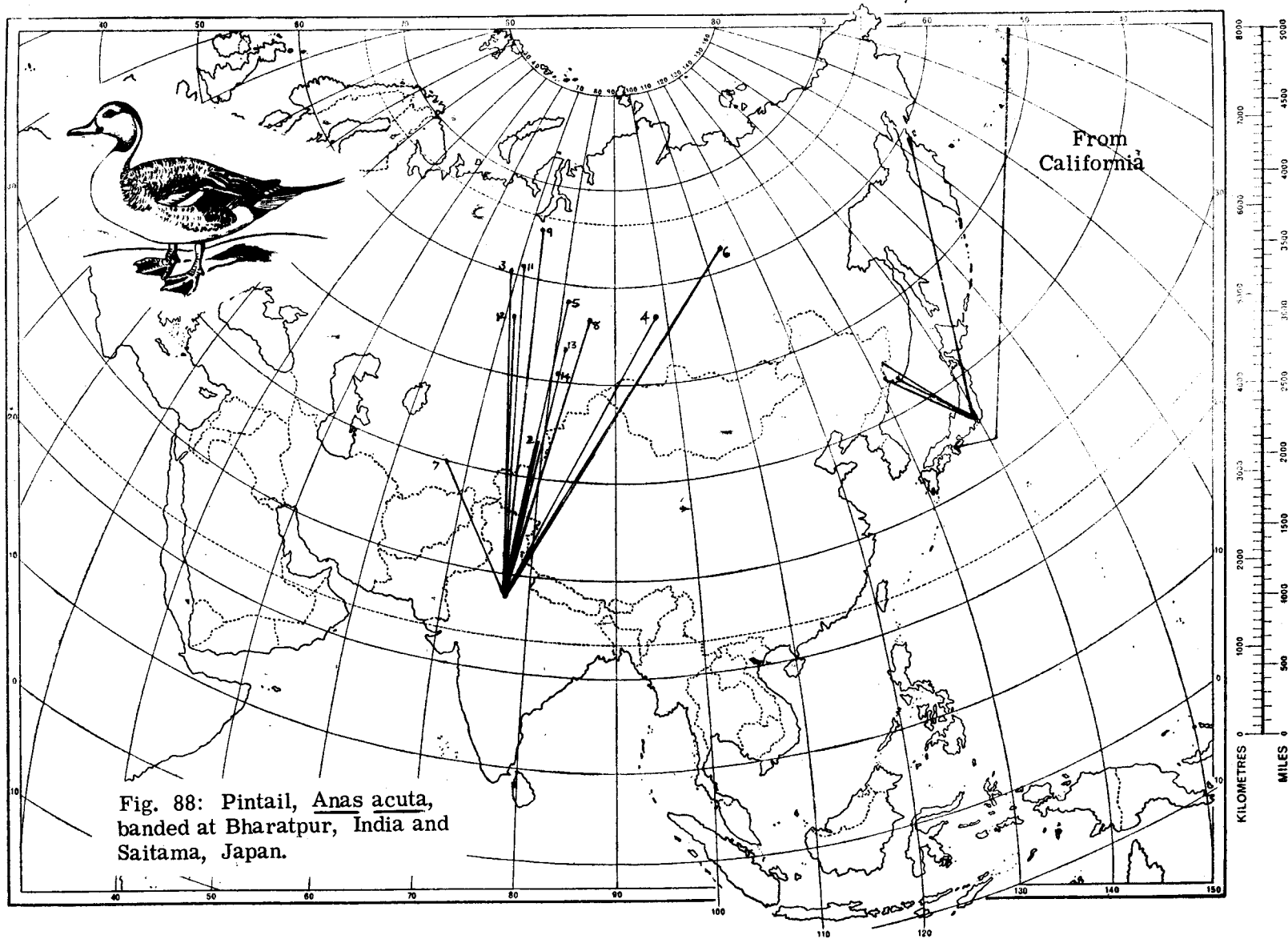


Fig. 88: Pintail, *Anas acuta*, banded at Bharatpur, India and Saitama, Japan.

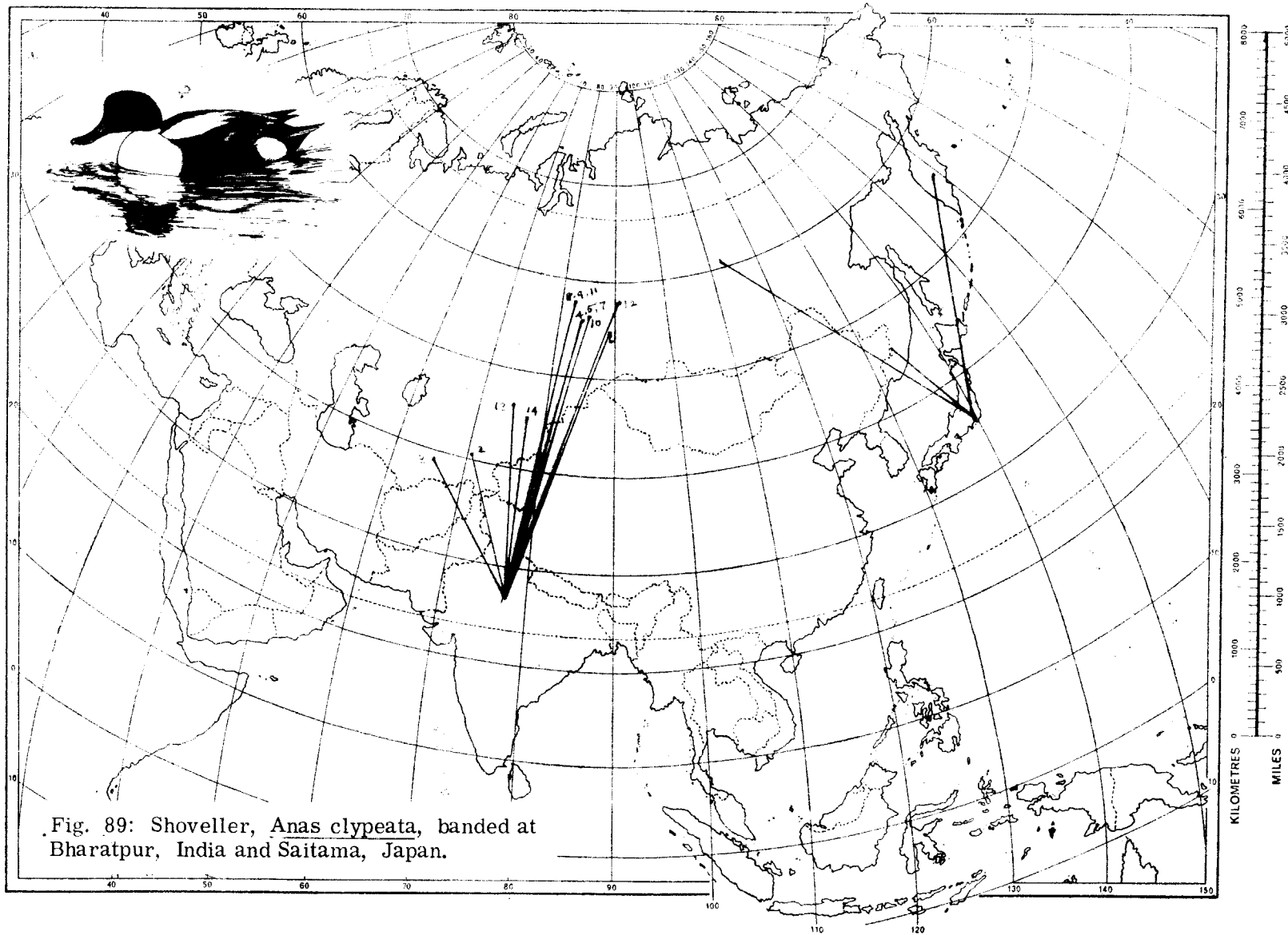
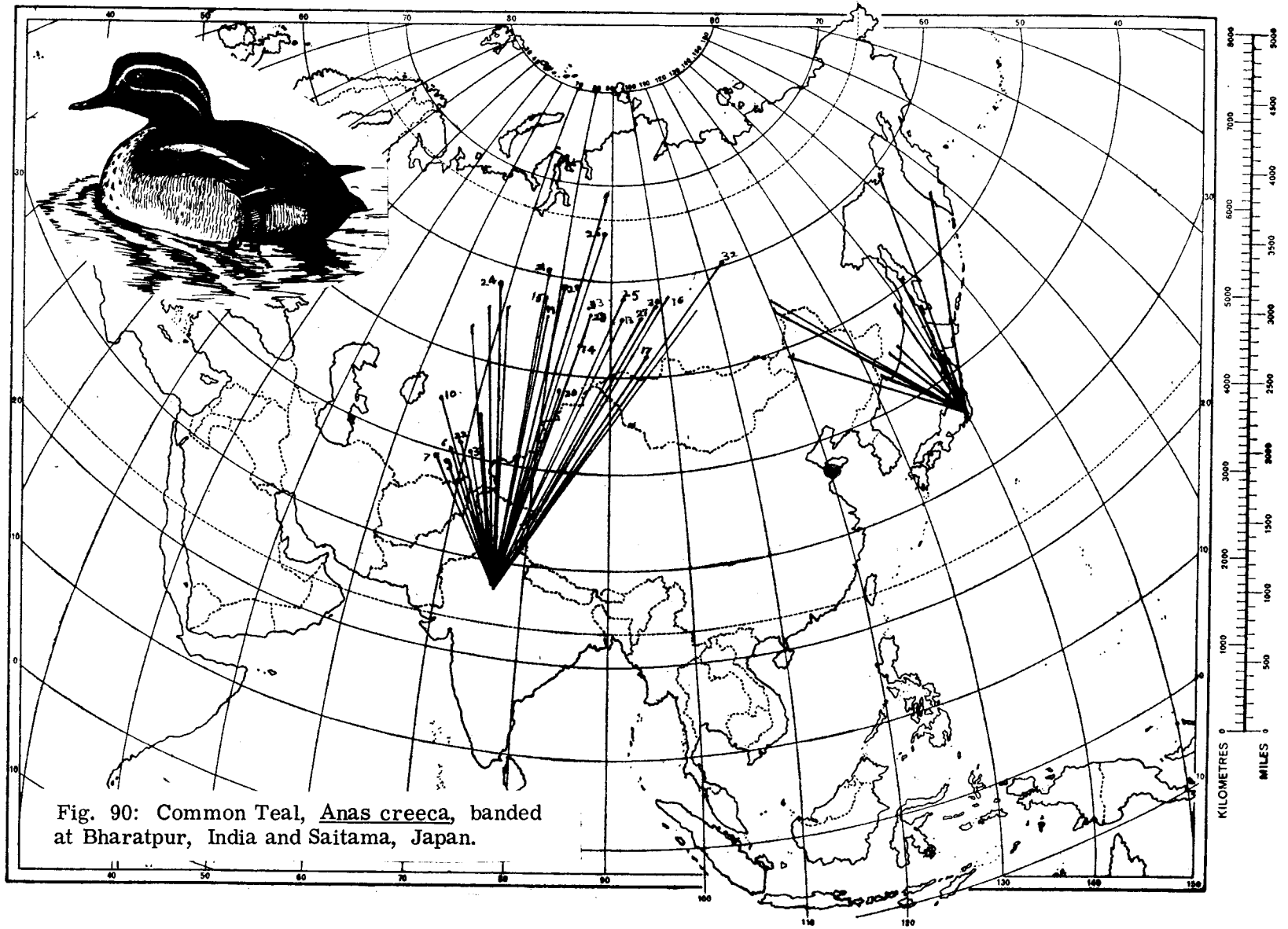


Fig. 89: Shoveller, *Anas clypeata*, banded at Bharatpur, India and Saitama, Japan.



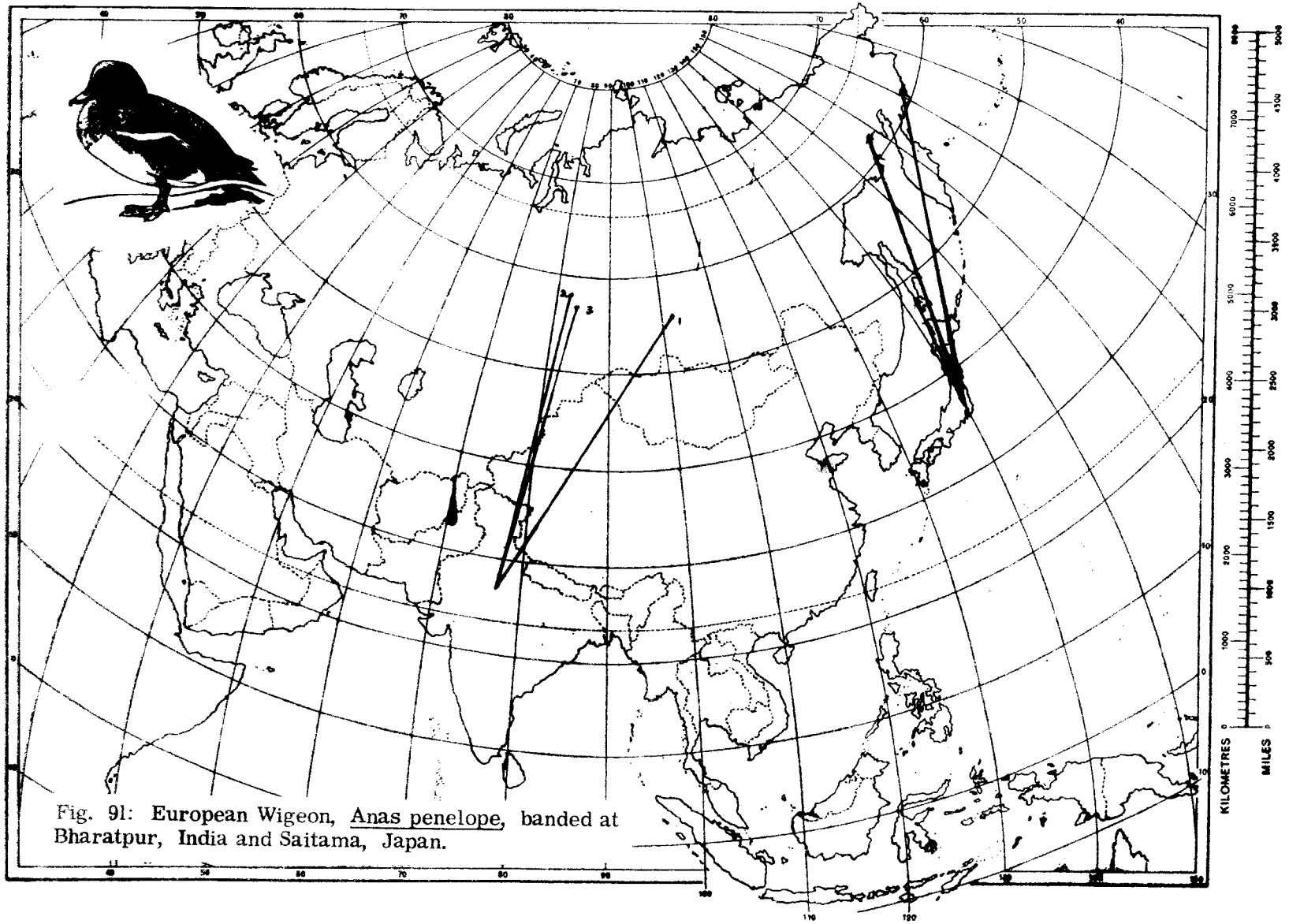


Fig. 91: European Wigeon, *Anas penelope*, banded at Bharatpur, India and Saitama, Japan.

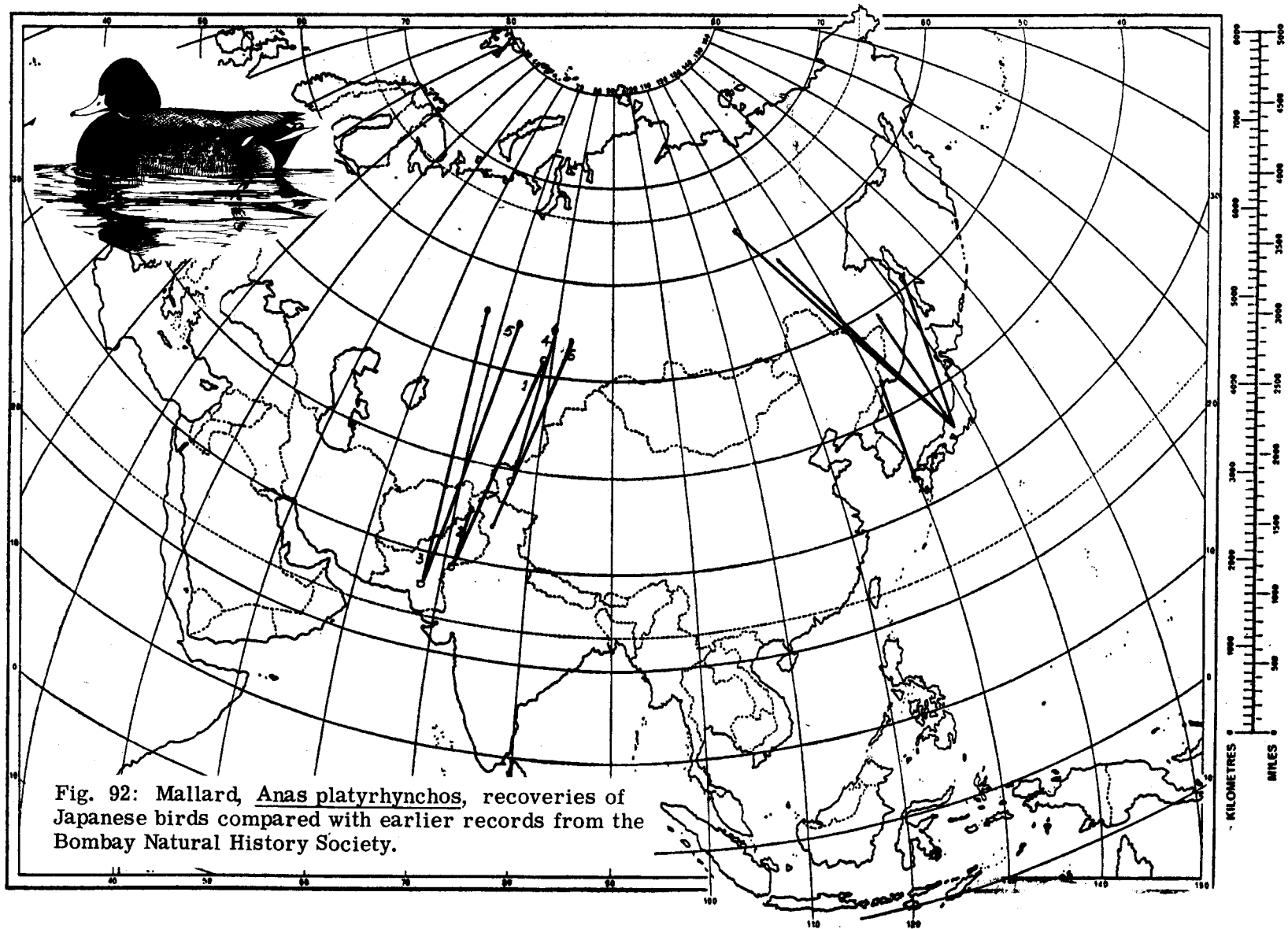


Fig. 92: Mallard, *Anas platyrhynchos*, recoveries of Japanese birds compared with earlier records from the Bombay Natural History Society.

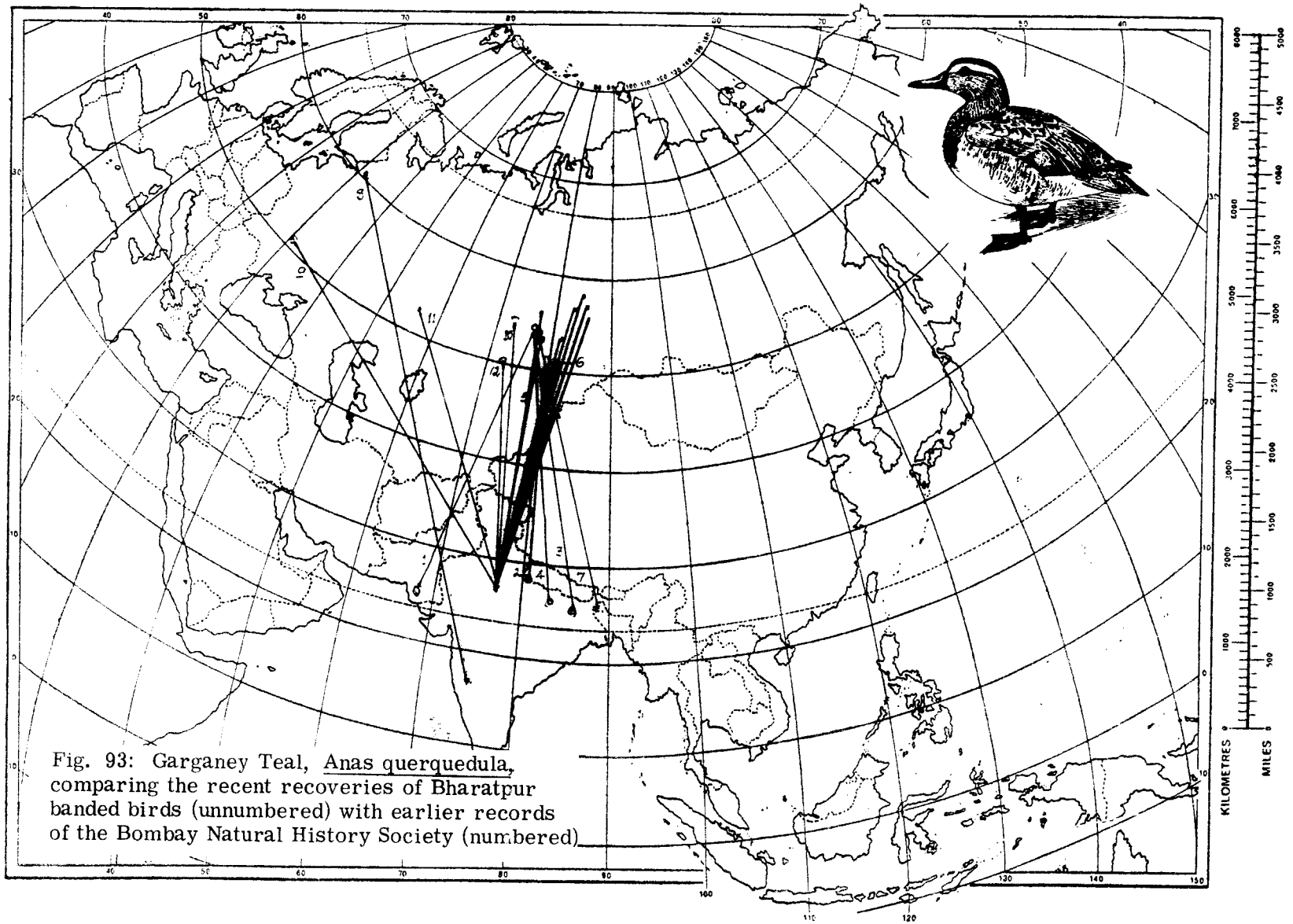


Fig. 93: Garganey Teal, *Anas querquedula*, comparing the recent recoveries of Bharatpur banded birds (unnumbered) with earlier records of the Bombay Natural History Society (numbered)

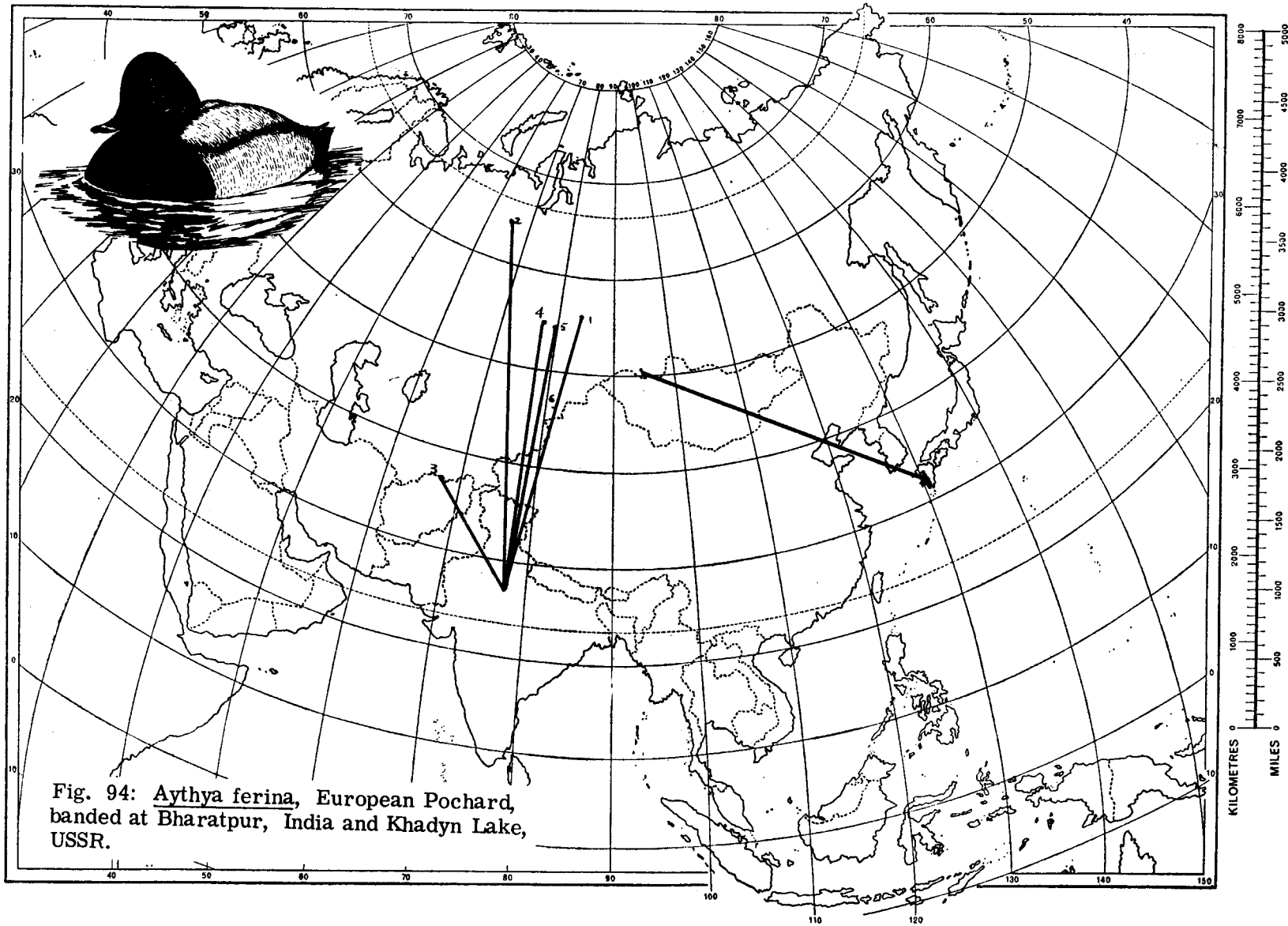


Fig. 94: *Aythya ferina*, European Pochard, banded at Bharatpur, India and Khadyn Lake, USSR.

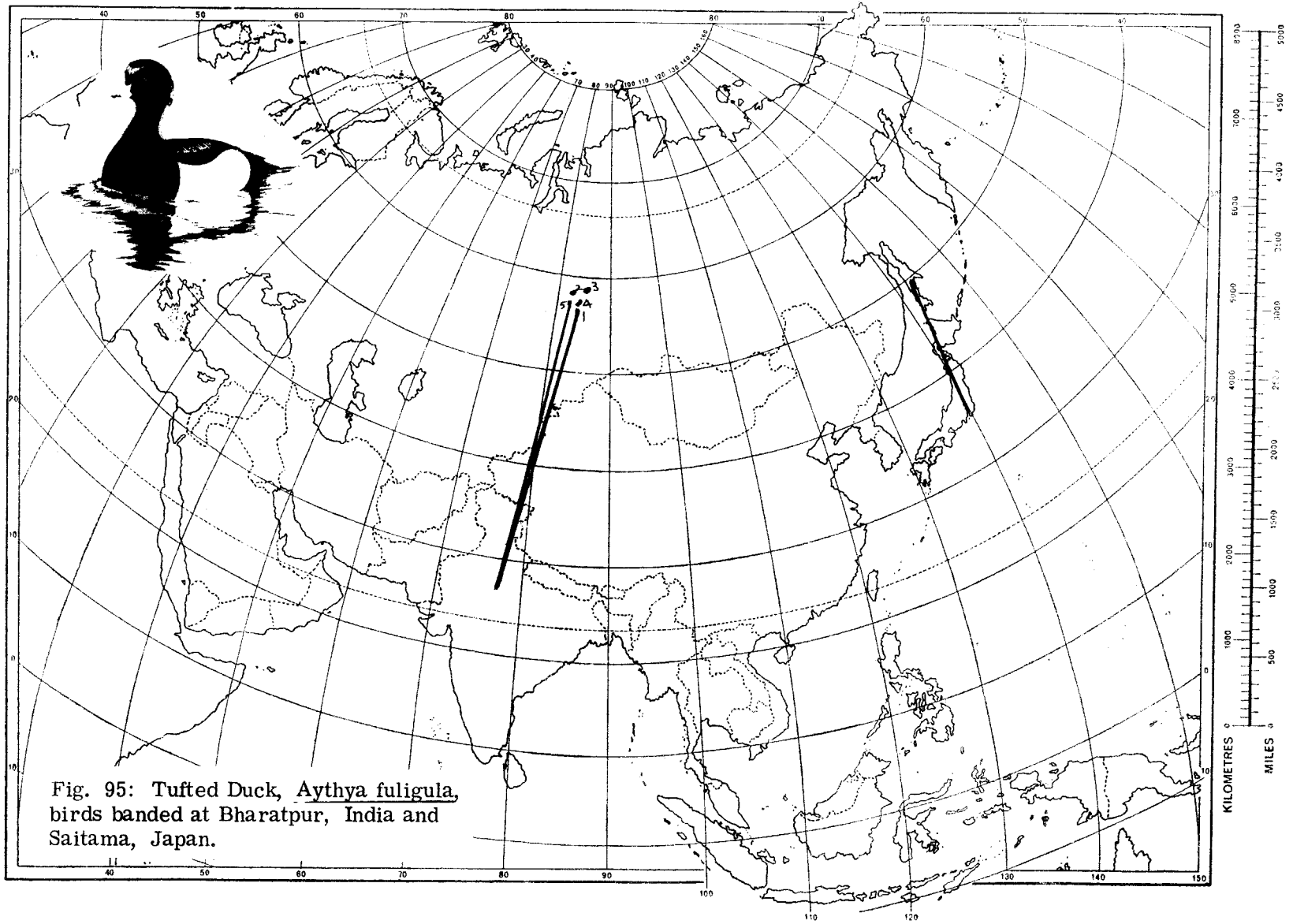
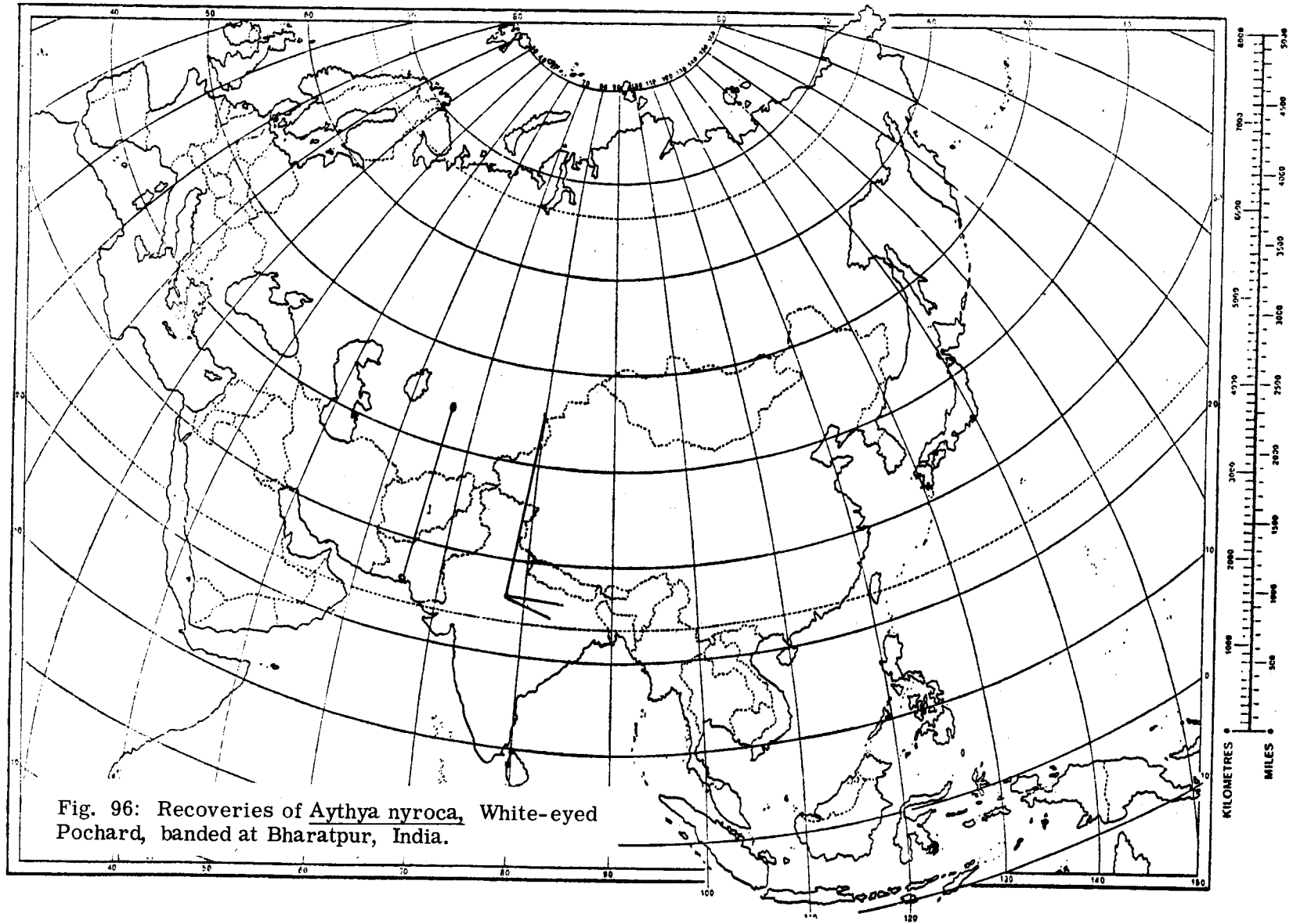


Fig. 95: Tufted Duck, *Aythya fuligula*, birds banded at Bharatpur, India and Saitama, Japan.





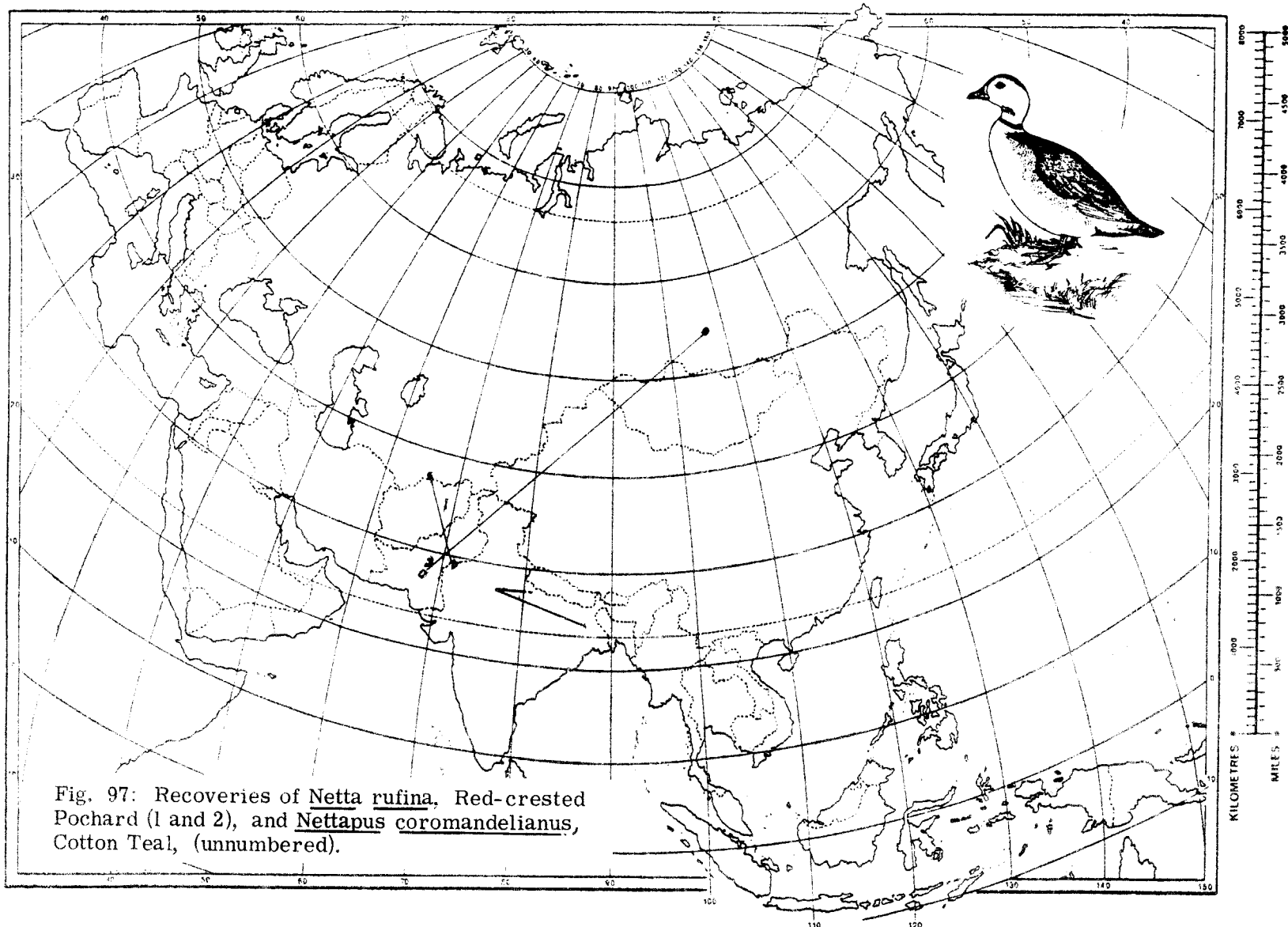


Fig. 97: Recoveries of *Netta rufina*, Red-crested Pochard (1 and 2), and *Nettapus coromandelianus*, Cotton Teal, (unnumbered).

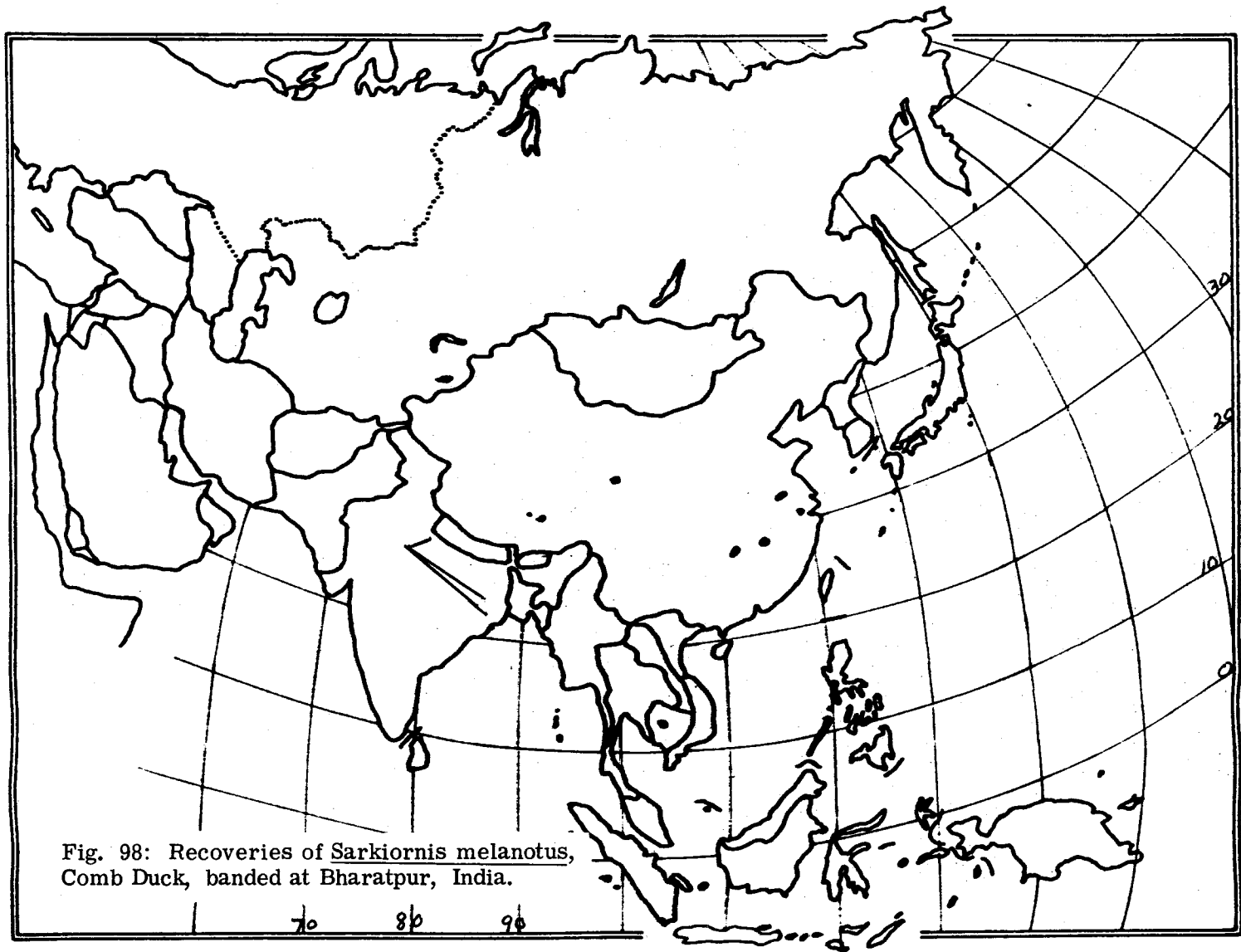


Fig. 98: Recoveries of *Sarkiornis melanotos*,  
Comb Duck, banded at Bharatpur, India.

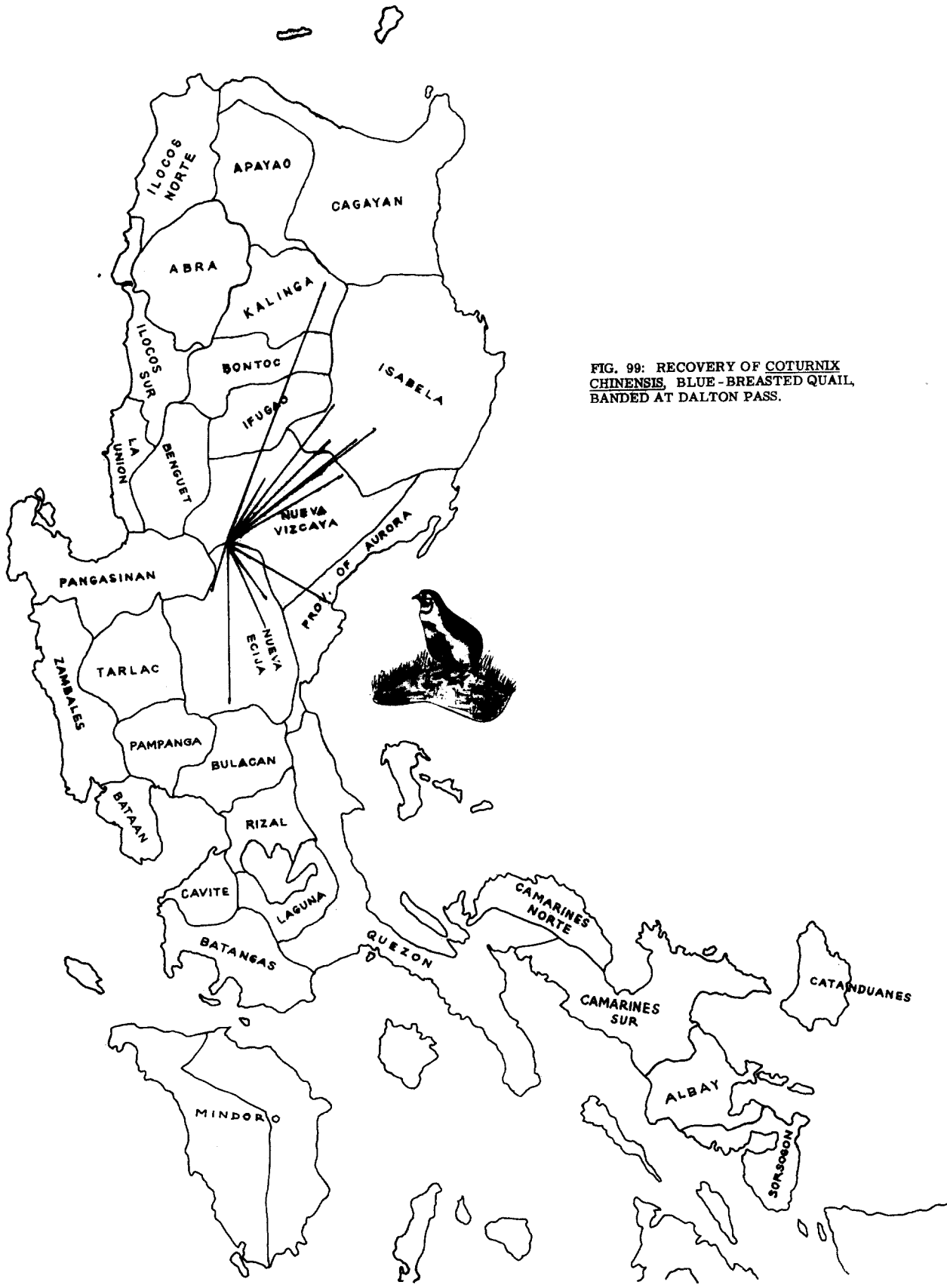


FIG. 99: RECOVERY OF *COTURNIX CHINENSIS*, BLUE-BREASTED QUAIL, BANDED AT DALTON PASS.

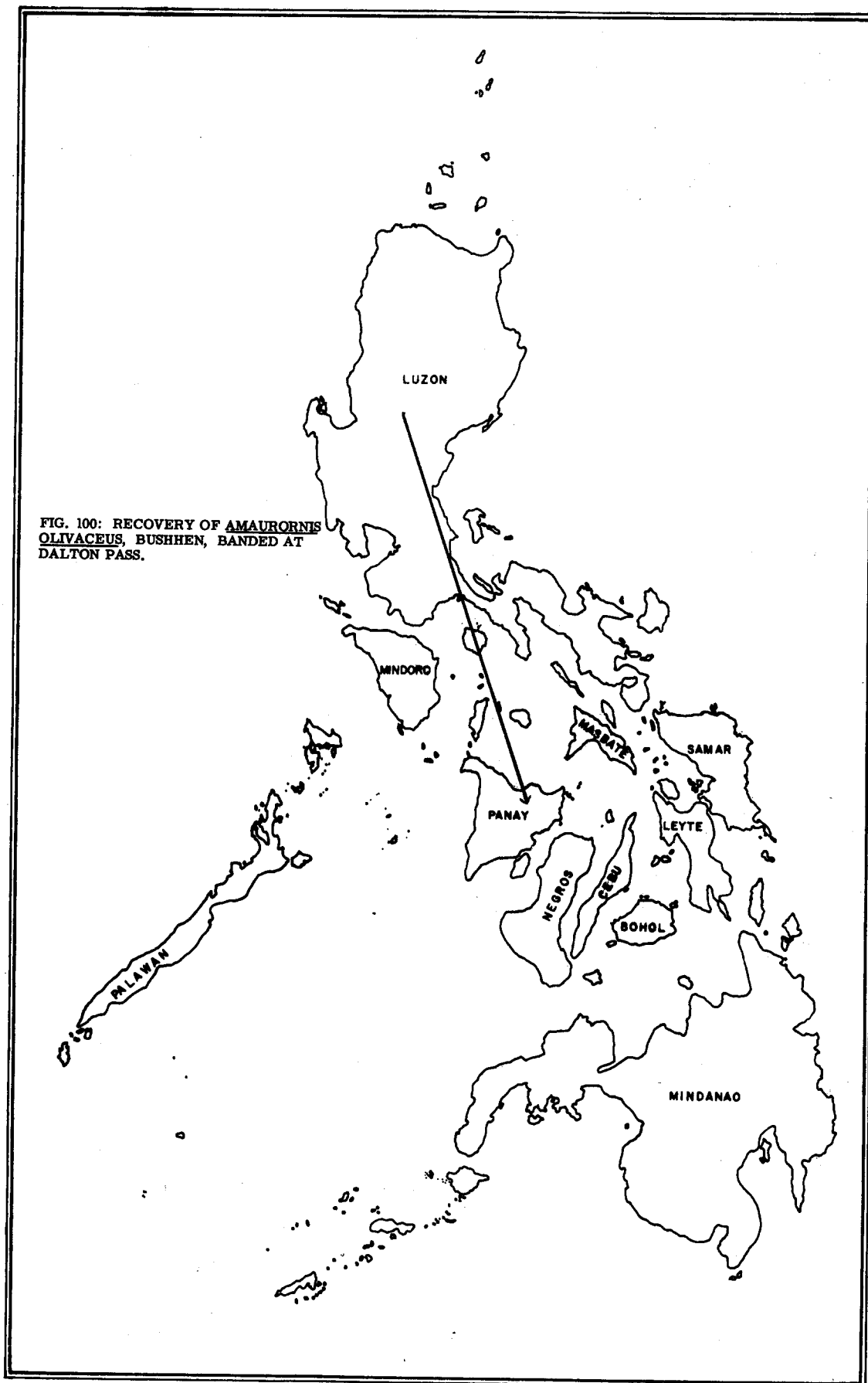


FIG. 100: RECOVERY OF AMAUORNIS OLIVACEUS, BUSHHEN, BANDED AT DALTON PASS.

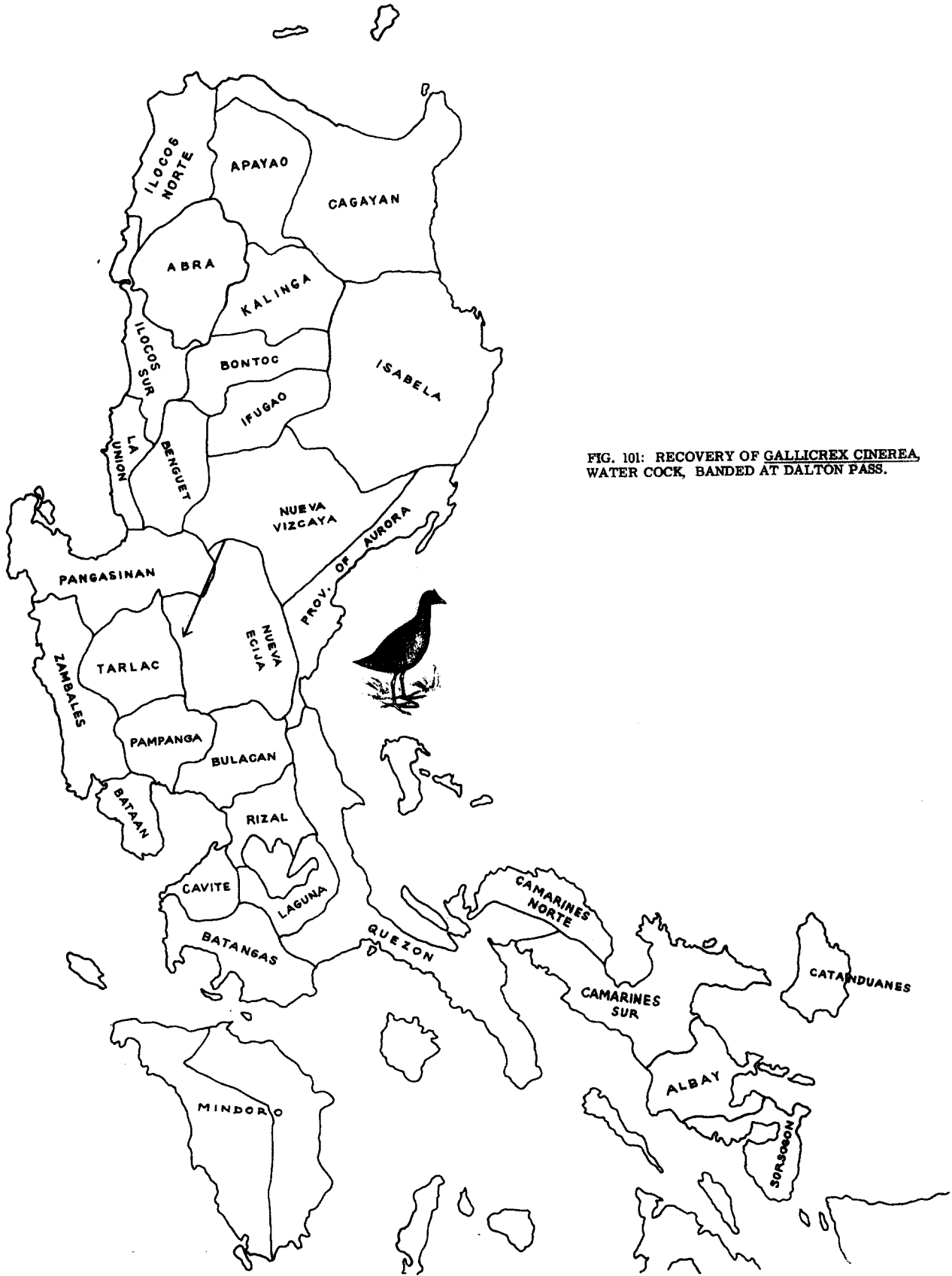
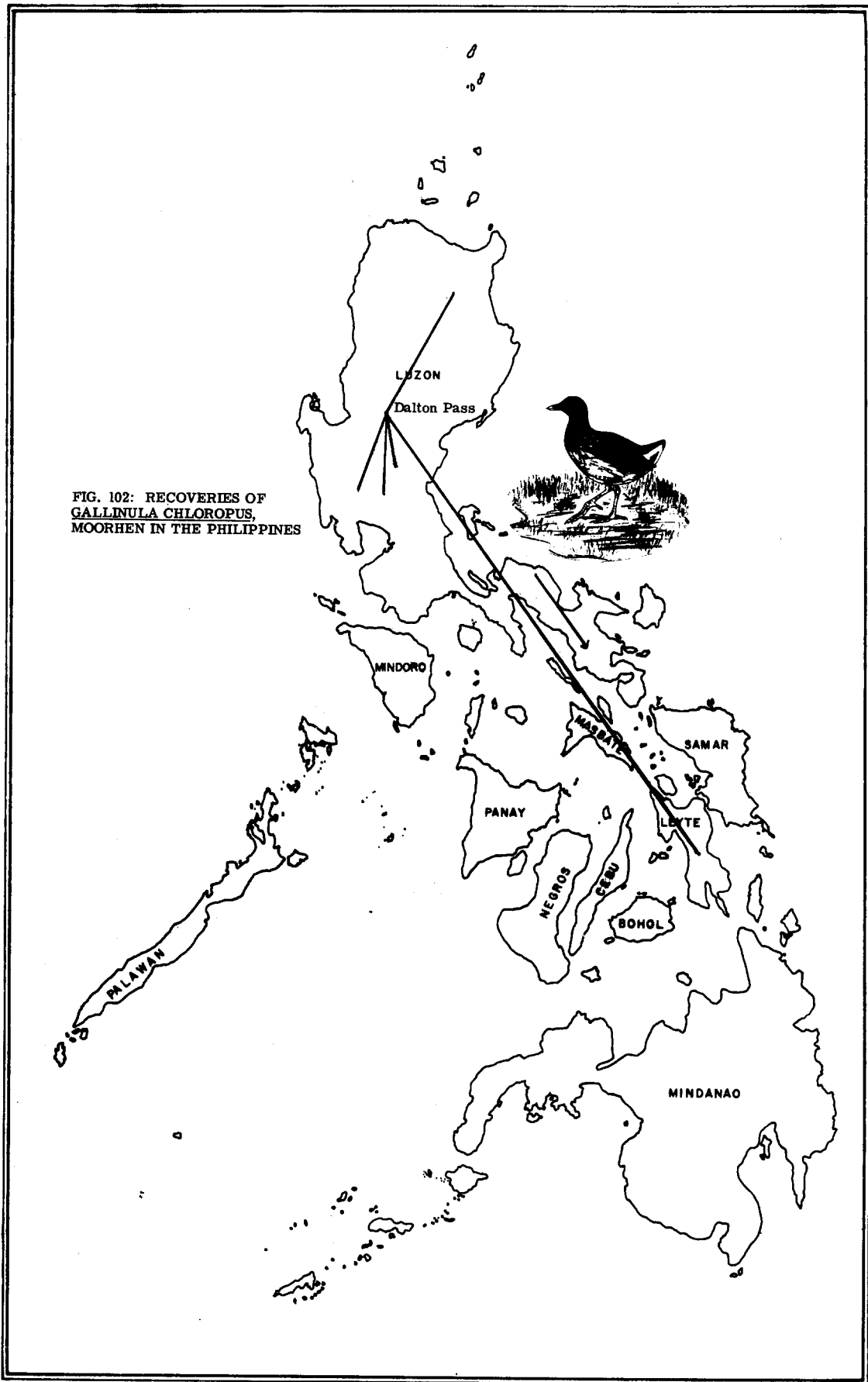


FIG. 101: RECOVERY OF GALLICREX CINEREA WATER COCK, BANDED AT DALTON PASS.



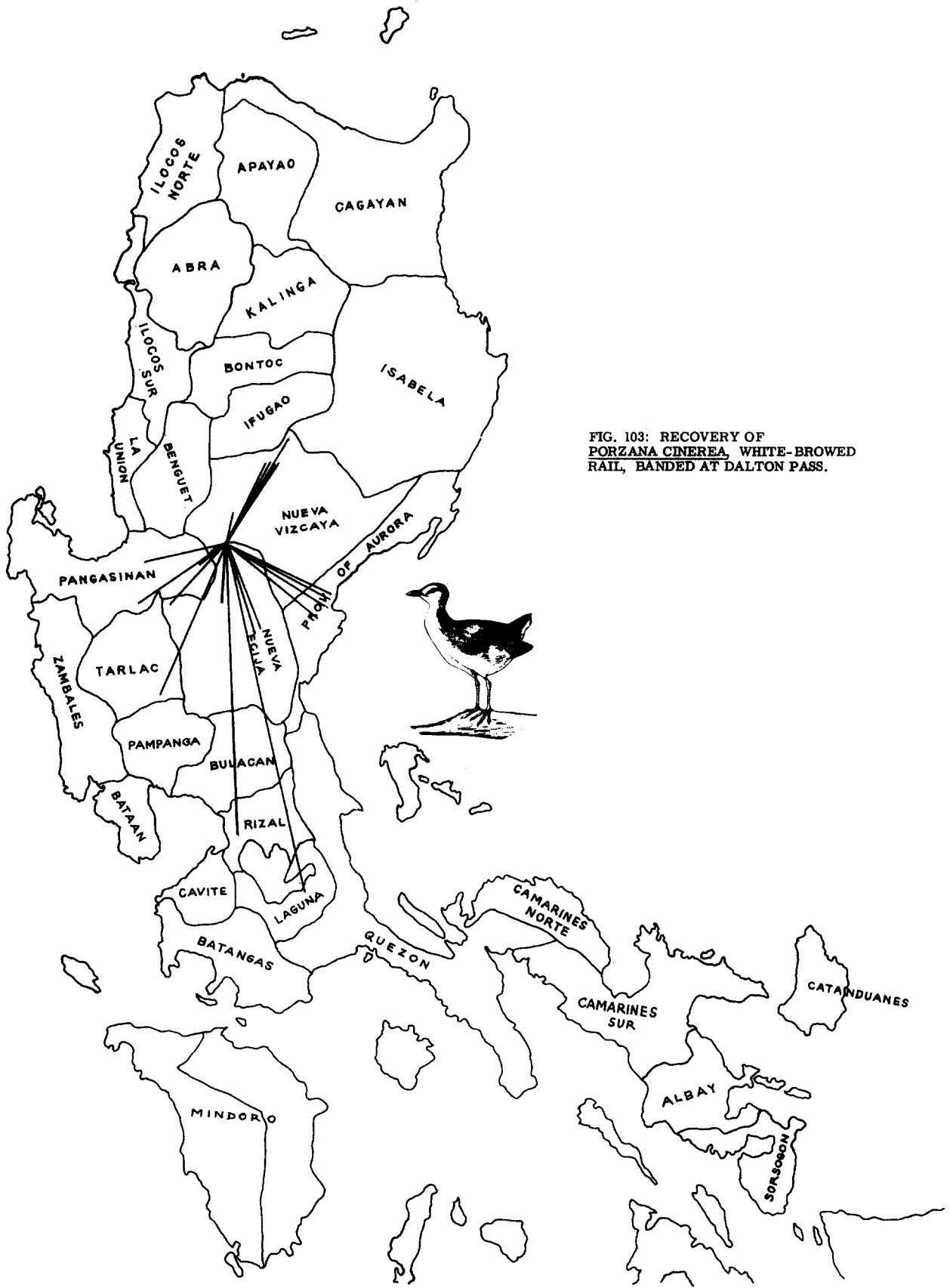


FIG. 103: RECOVERY OF PORZANA CINEREA, WHITE-BROWED RAIL, BANDED AT DALTON PASS.





FIG. 104: RECOVERY OF PORZANA FUSCA, RUDDY CRAKE, BANDED AT DALTON PASS.

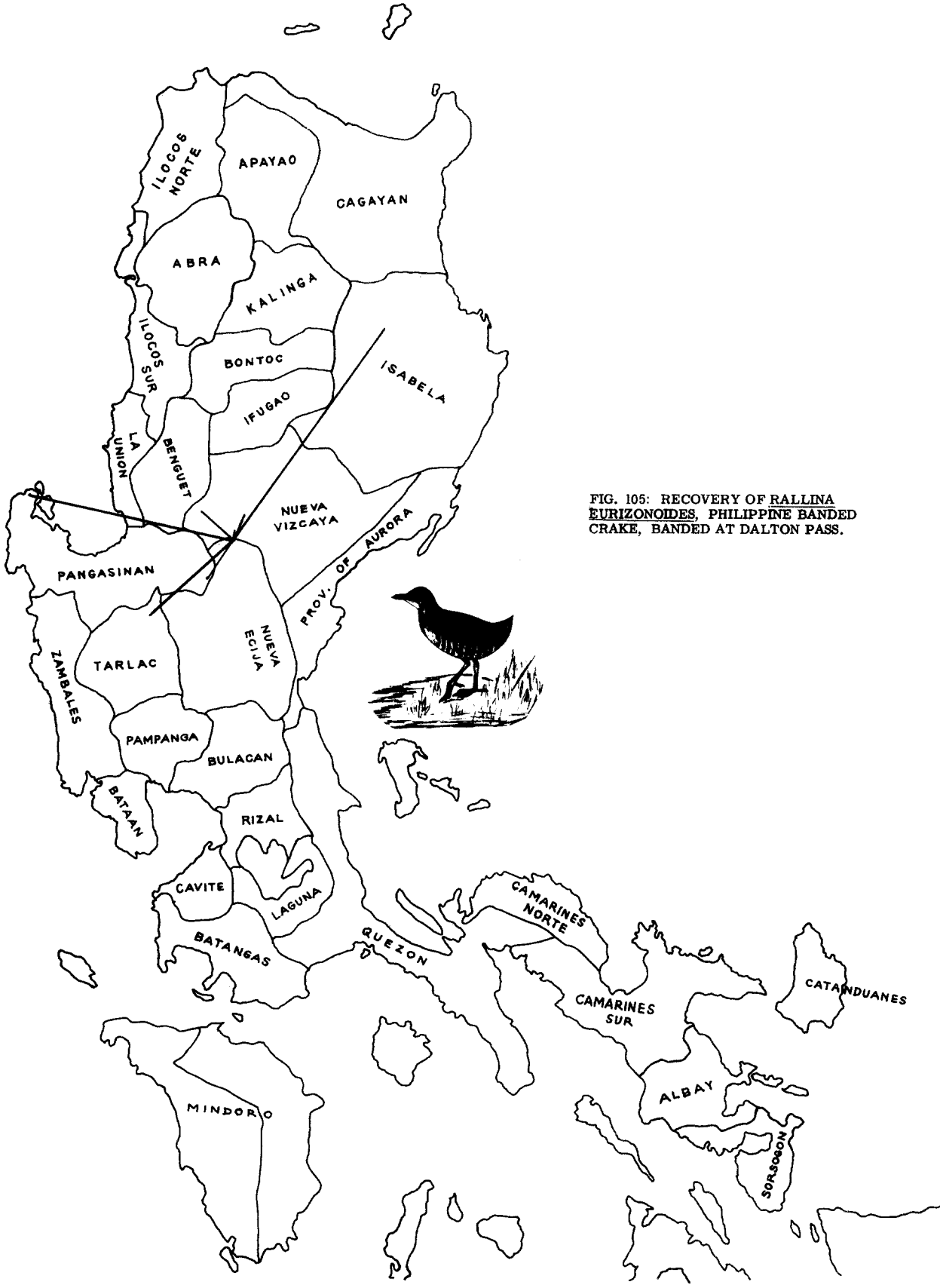


FIG. 105: RECOVERY OF RALLINA EURIZONODES, PHILIPPINE BANDED CRAKE, BANDED AT DALTON PASS.

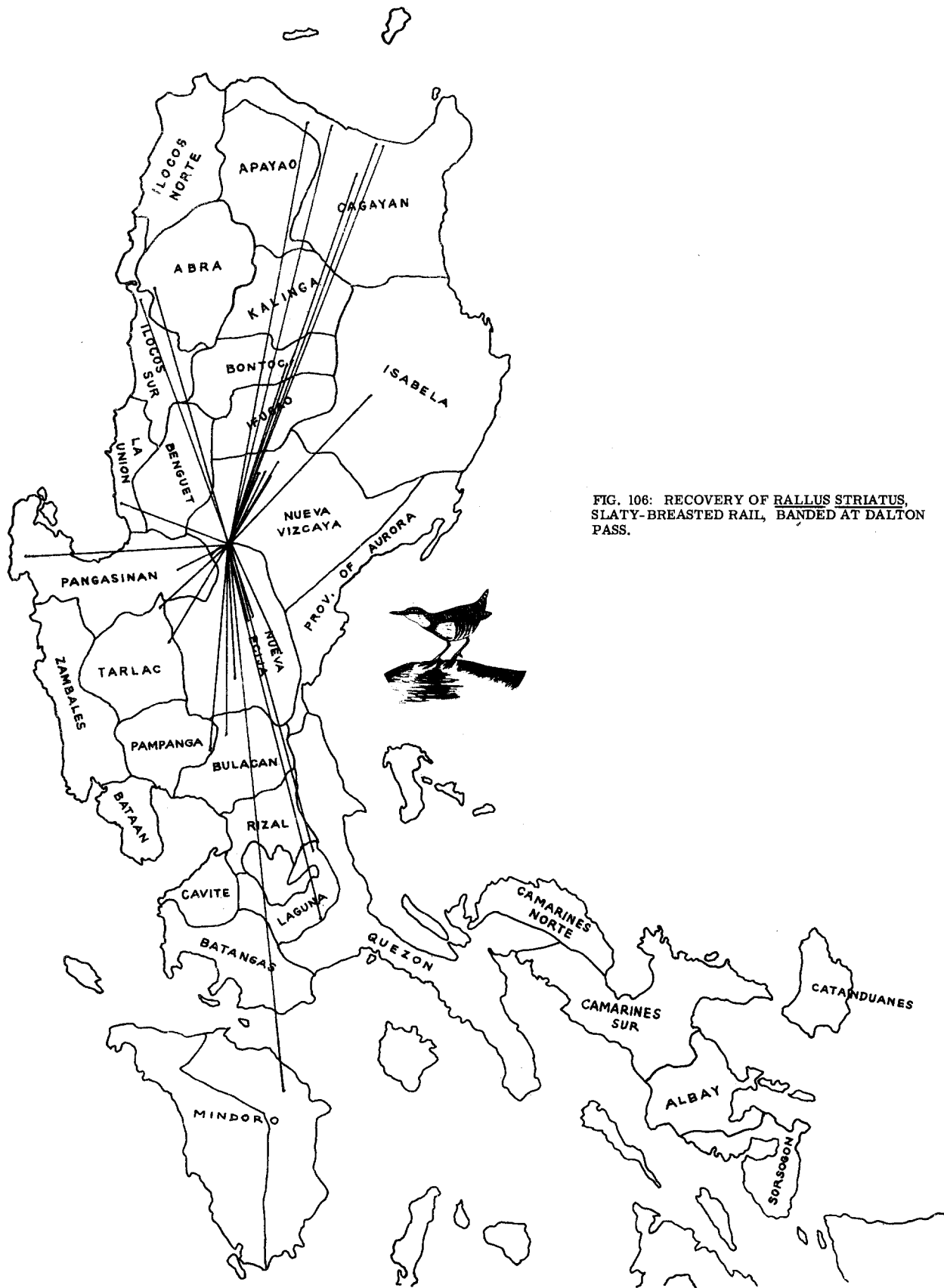


FIG. 106: RECOVERY OF RALLUS STRIATUS, SLATY-BREASTED RAIL, BANDED AT DALTON PASS.

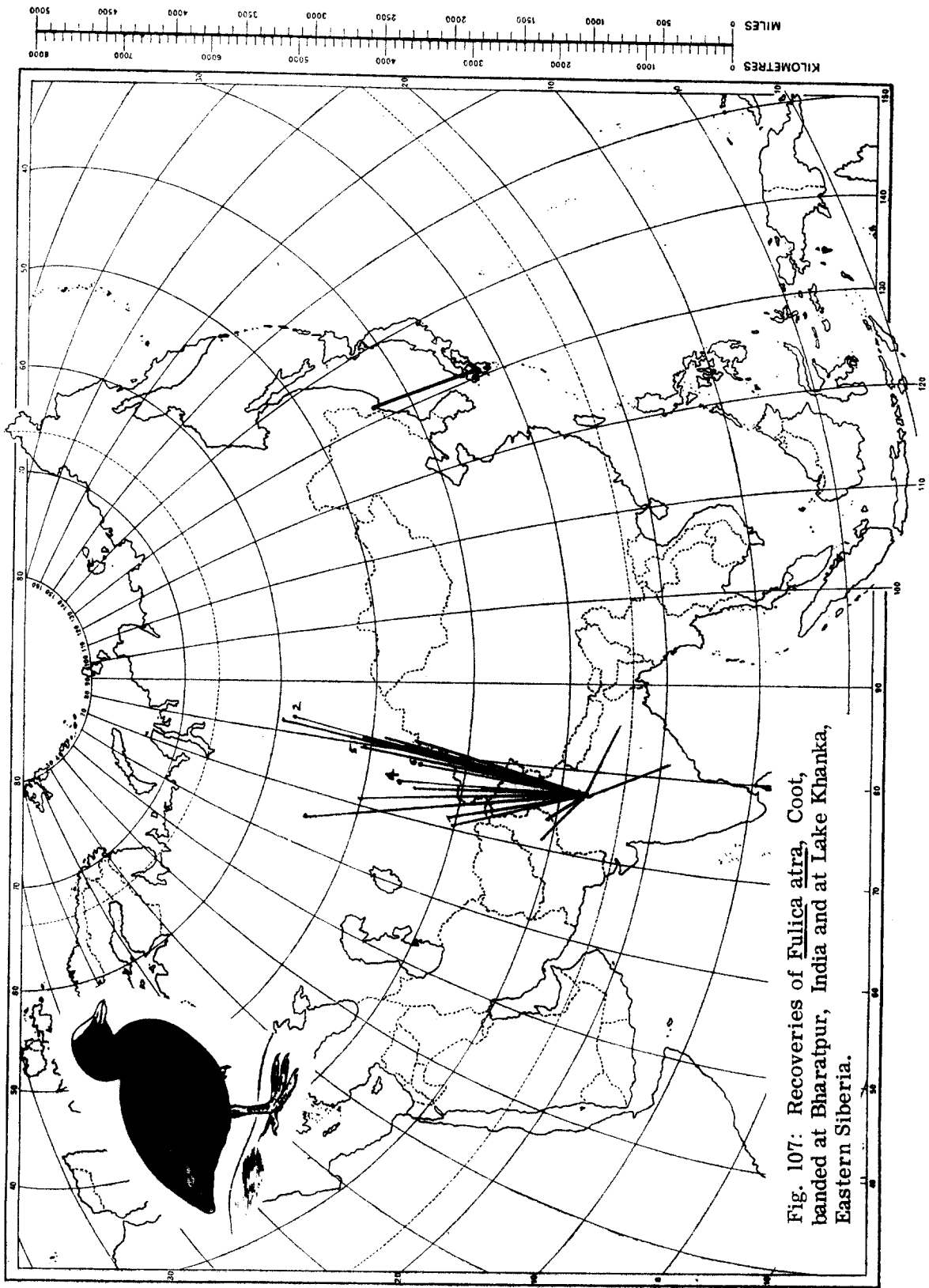


Fig. 107: Recoveries of *Fulica atra*, Coot, banded at Bharatpur, India and at Lake Khanka, Eastern Siberia.

PRIBILOF  
ISLANDS

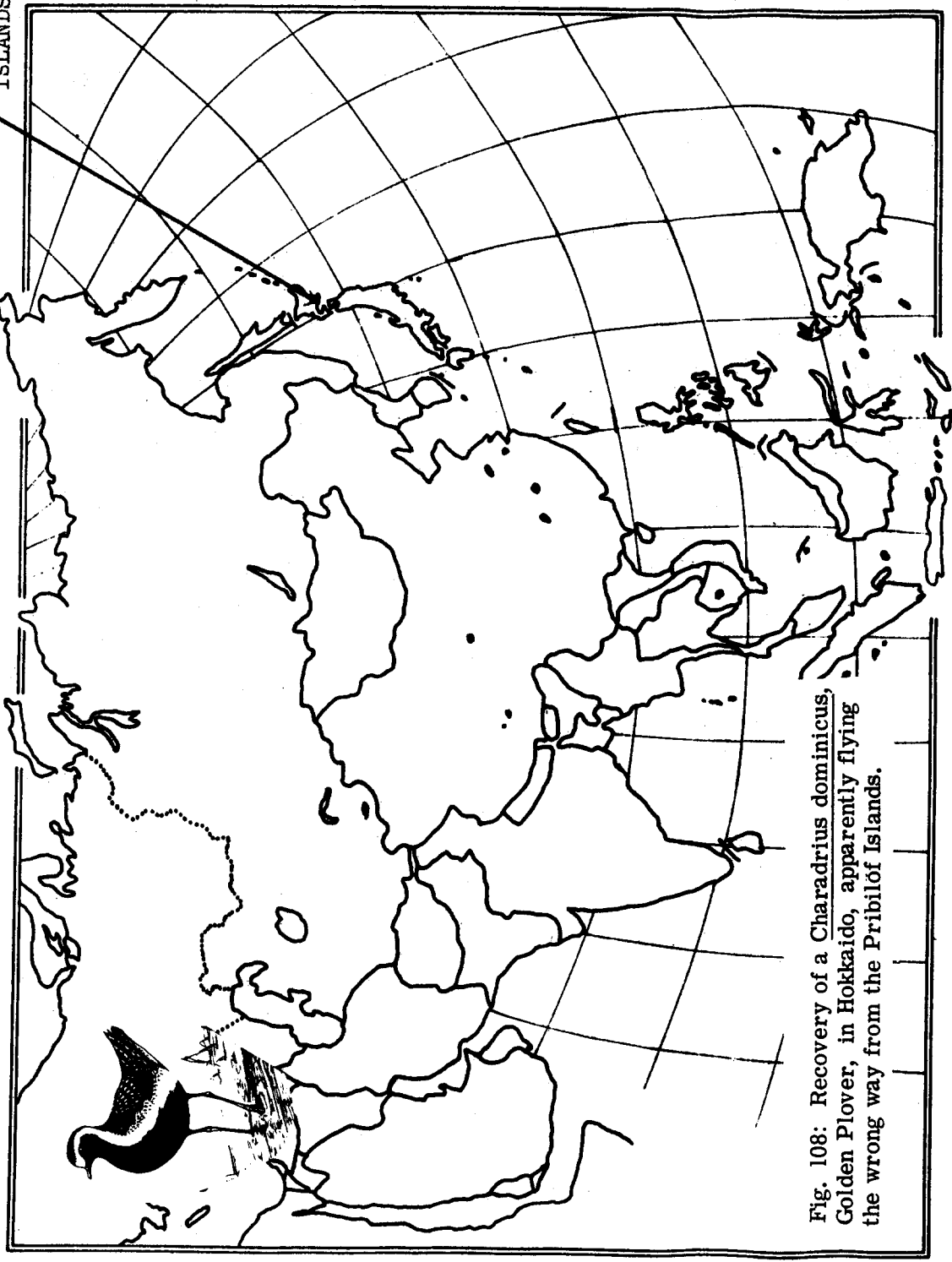


Fig. 108: Recovery of a *Charadrius dominicus*, Golden Plover, in Hokkaido, apparently flying the wrong way from the Pribilof Islands.

PACAF, TAB, JAPAN

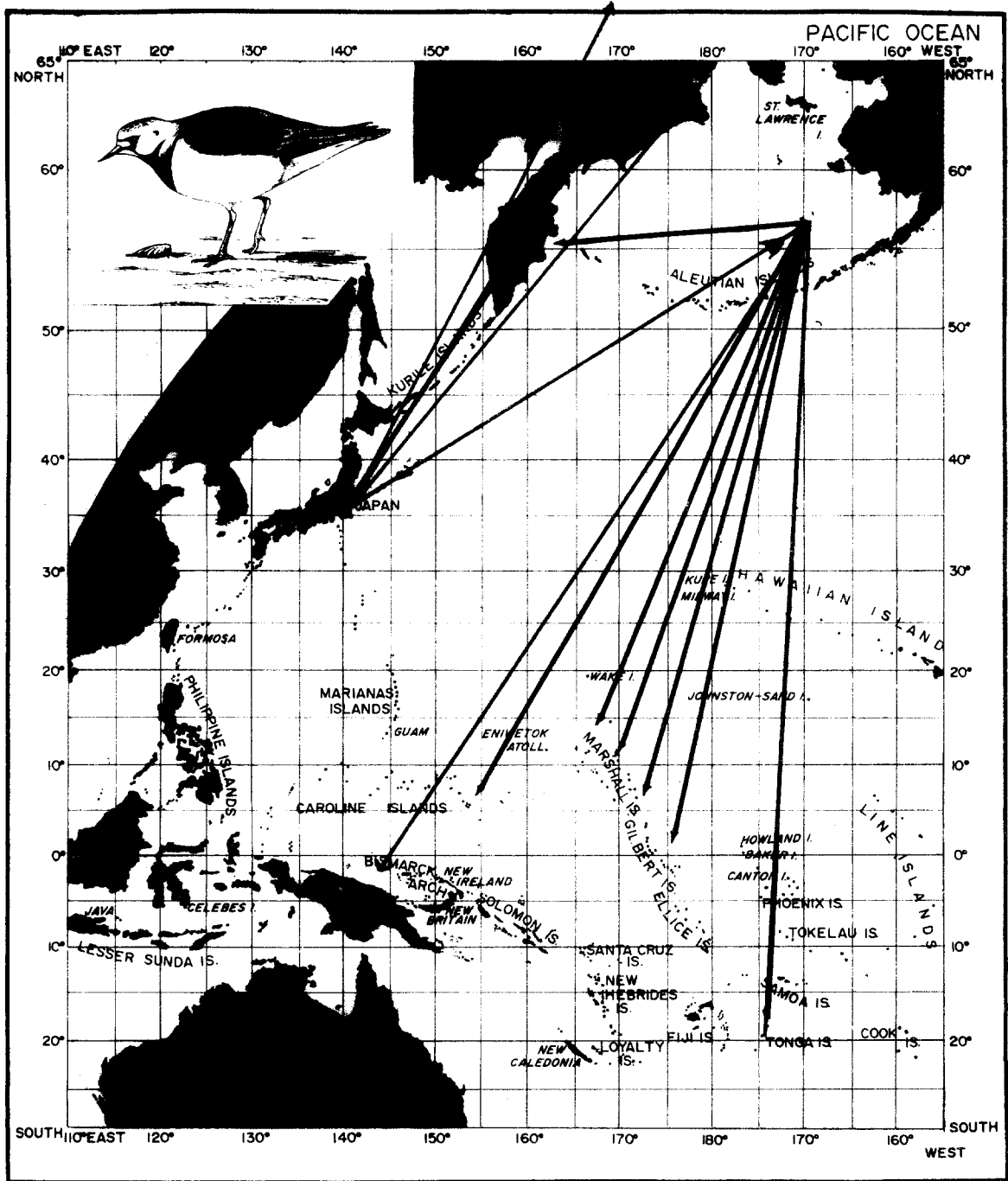


Fig. 109: Recoveries of *Arenaria interpres*, Ruddy Turnstone, banded in Japan and Alaska.

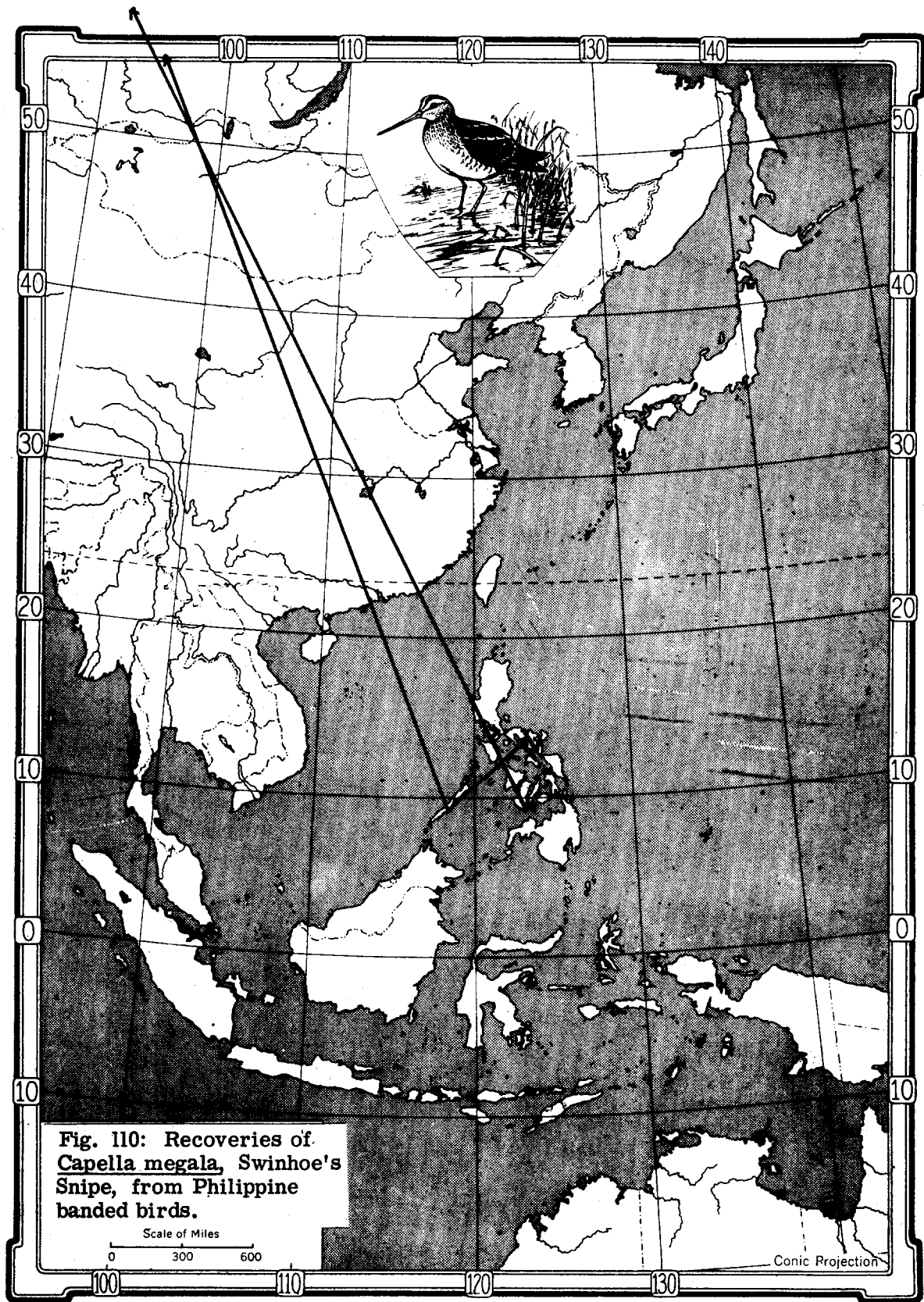


Fig. 110: Recoveries of *Capella megala*, Swinhoe's Snipe, from Philippine banded birds.

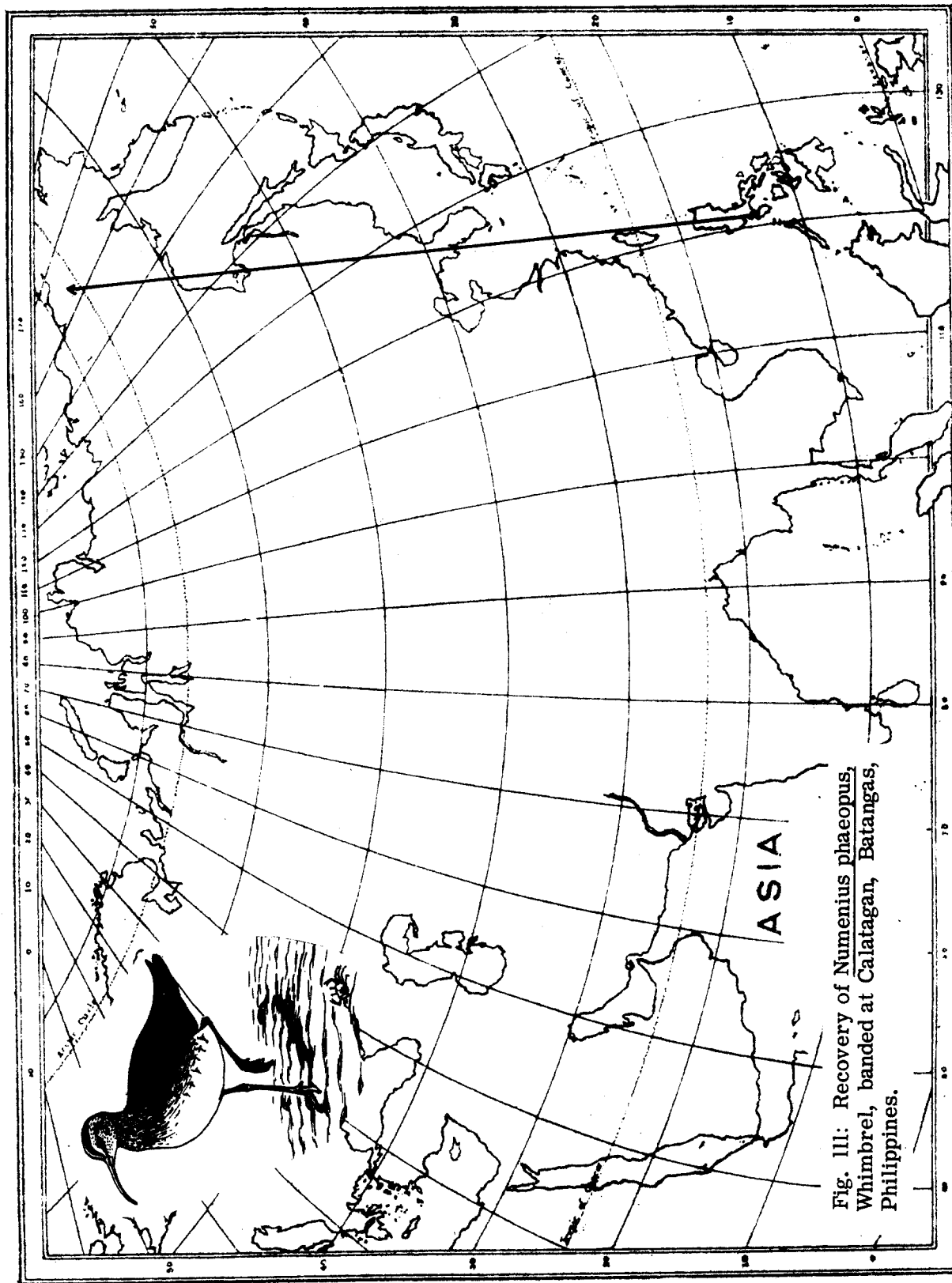


Fig. 111. Recovery of *Numenius phaeopus*, Whimbrel, banded at Calatagan, Batangas, Philippines.



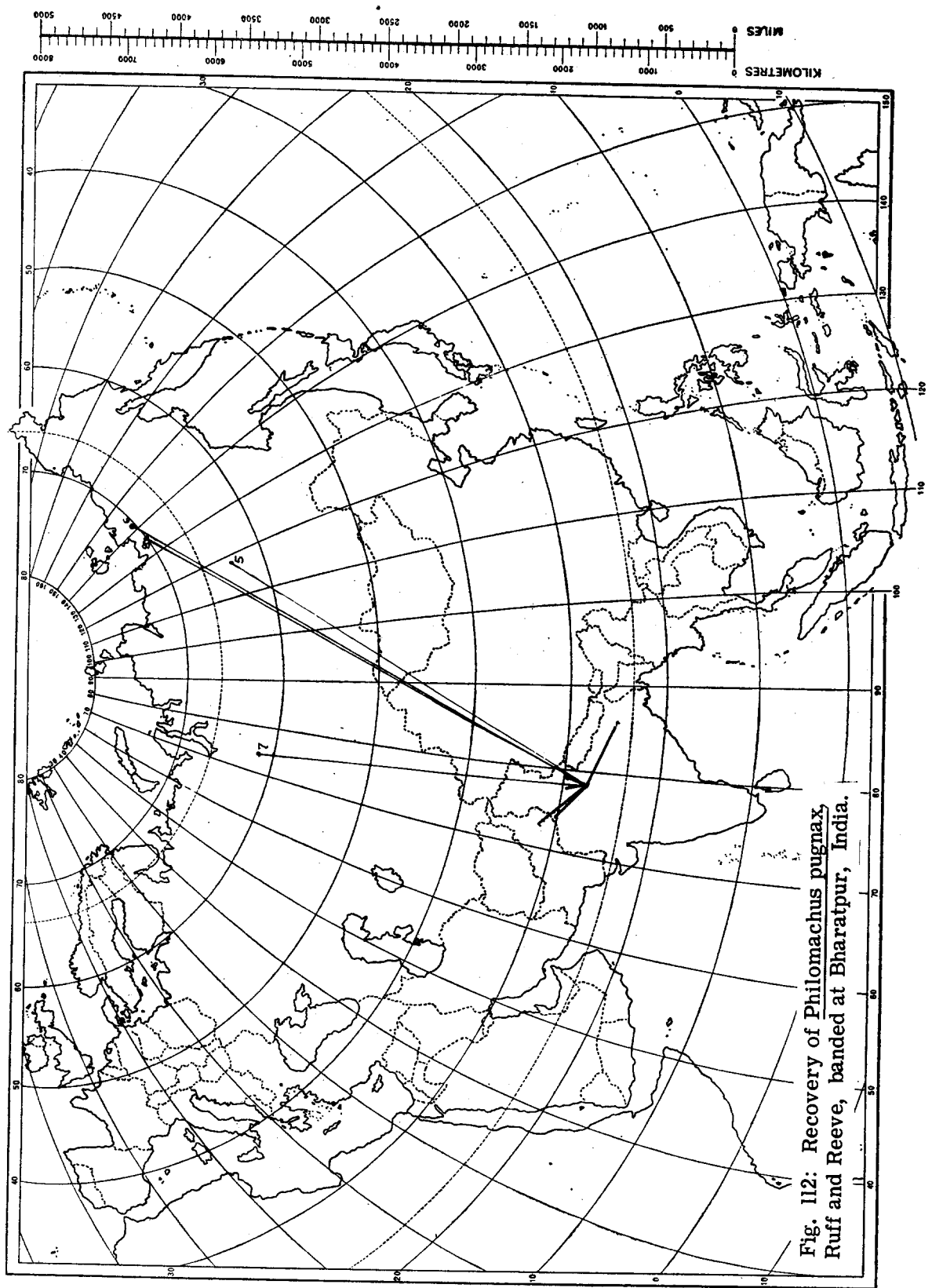


Fig. 112: Recovery of *Philomachus pugnax*, Ruff and Reeve, banded at Bharatpur, India.

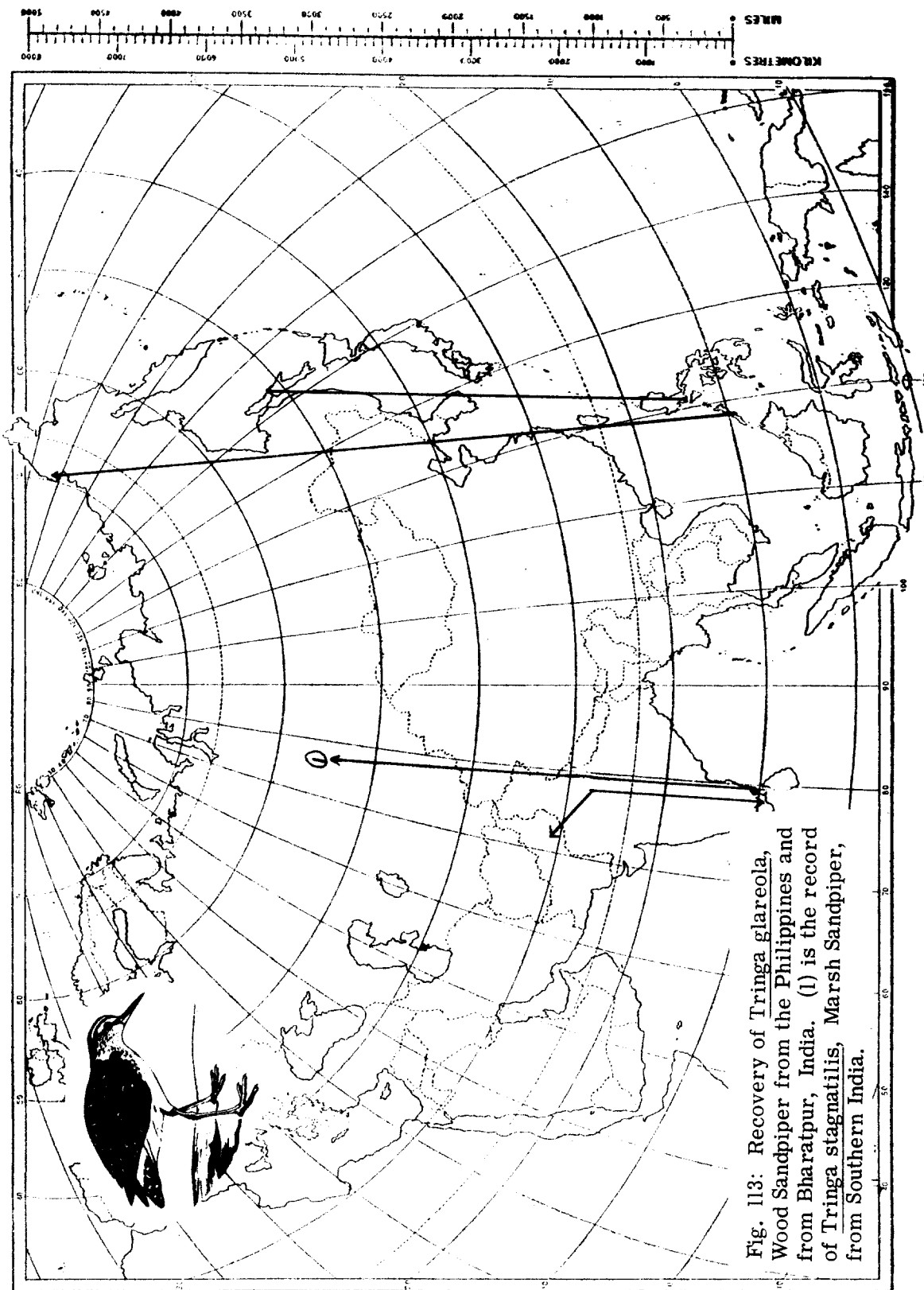


Fig. 113: Recovery of *Tringa glareola*, Wood Sandpiper from the Philippines and from Bharatpur, India. (1) is the record of *Tringa stagnatilis*, Marsh Sandpiper, from Southern India.

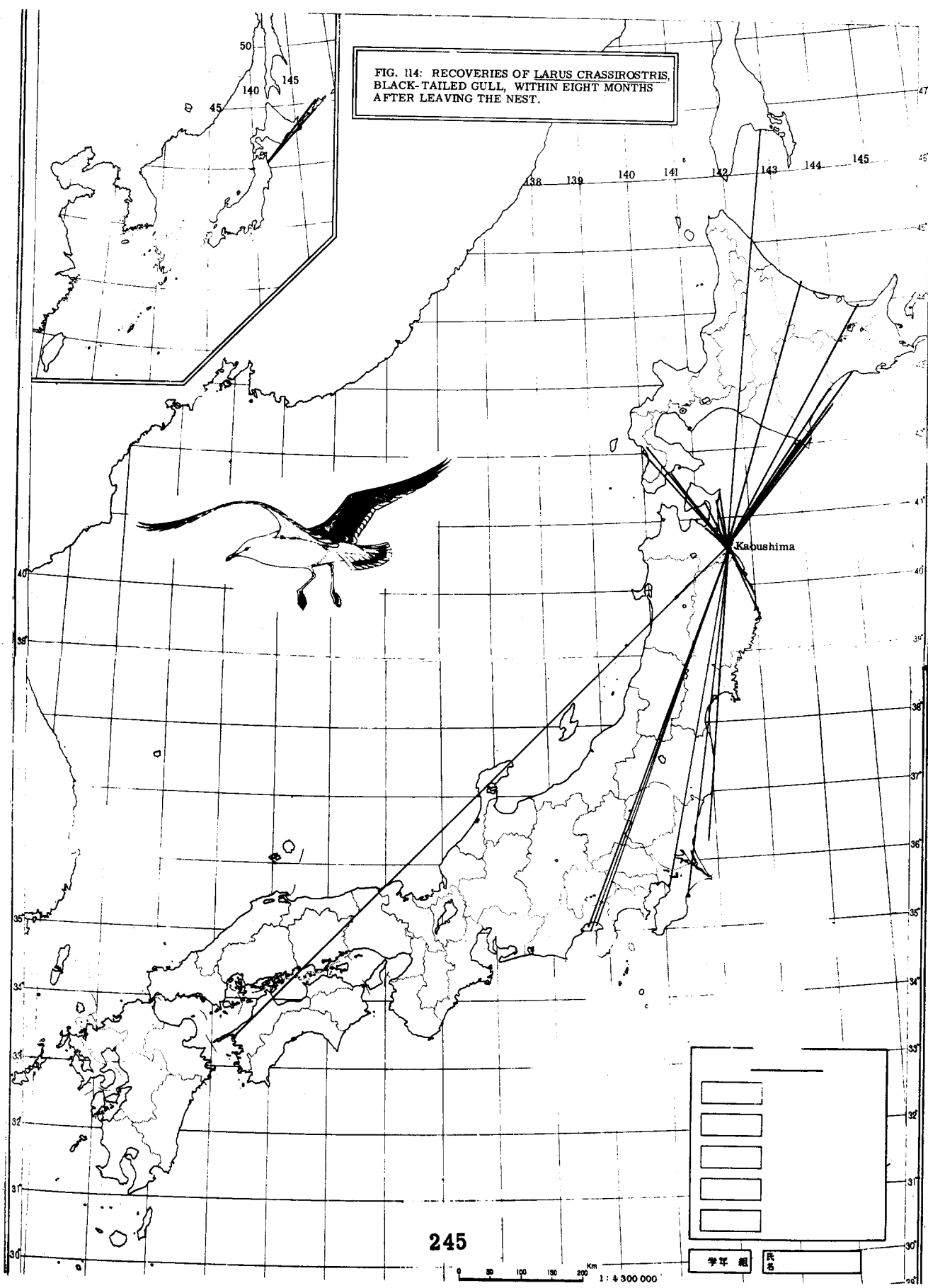


FIG. 114: RECOVERIES OF *LARUS CRASSIROSTRIS*, BLACK-TAILED GULL, WITHIN EIGHT MONTHS AFTER LEAVING THE NEST.

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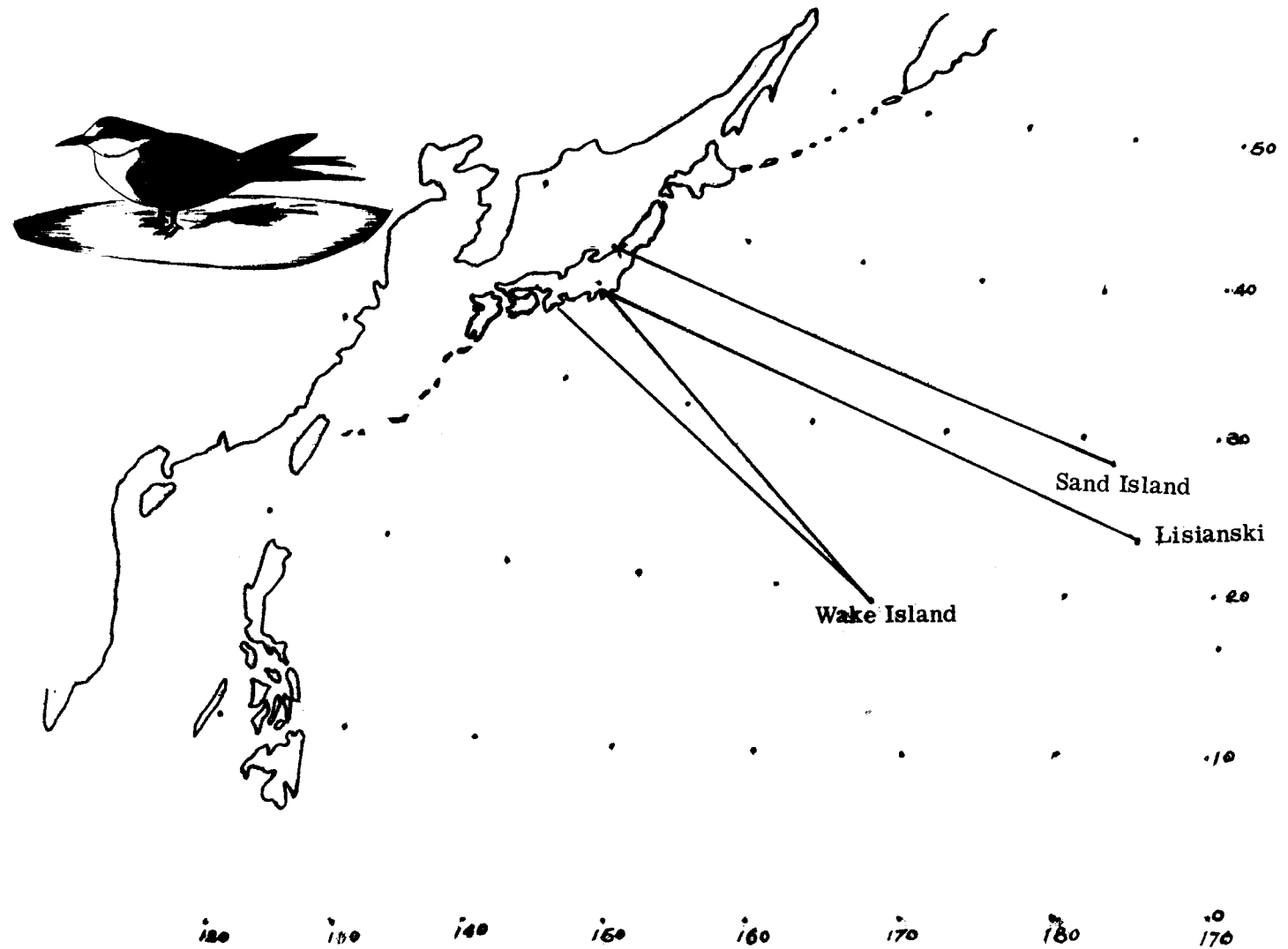


Fig. 115: Recovery of *Sterna fuscata*, Sooty Tern, banded on Pacific Islands.

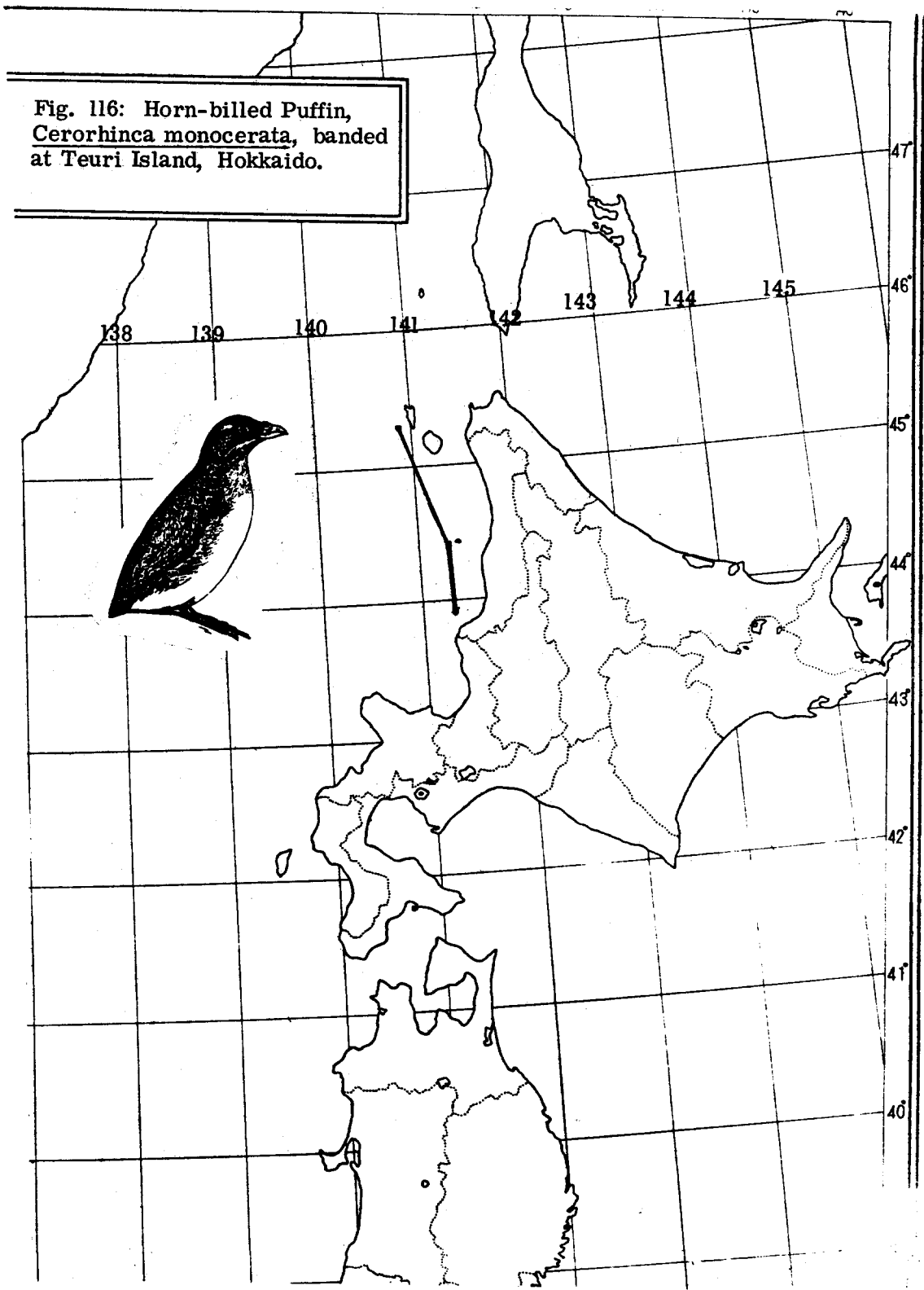


Fig. 116: Horn-billed Puffin,  
*Cerorhinca monocerata*, banded  
at Teuri Island, Hokkaido.

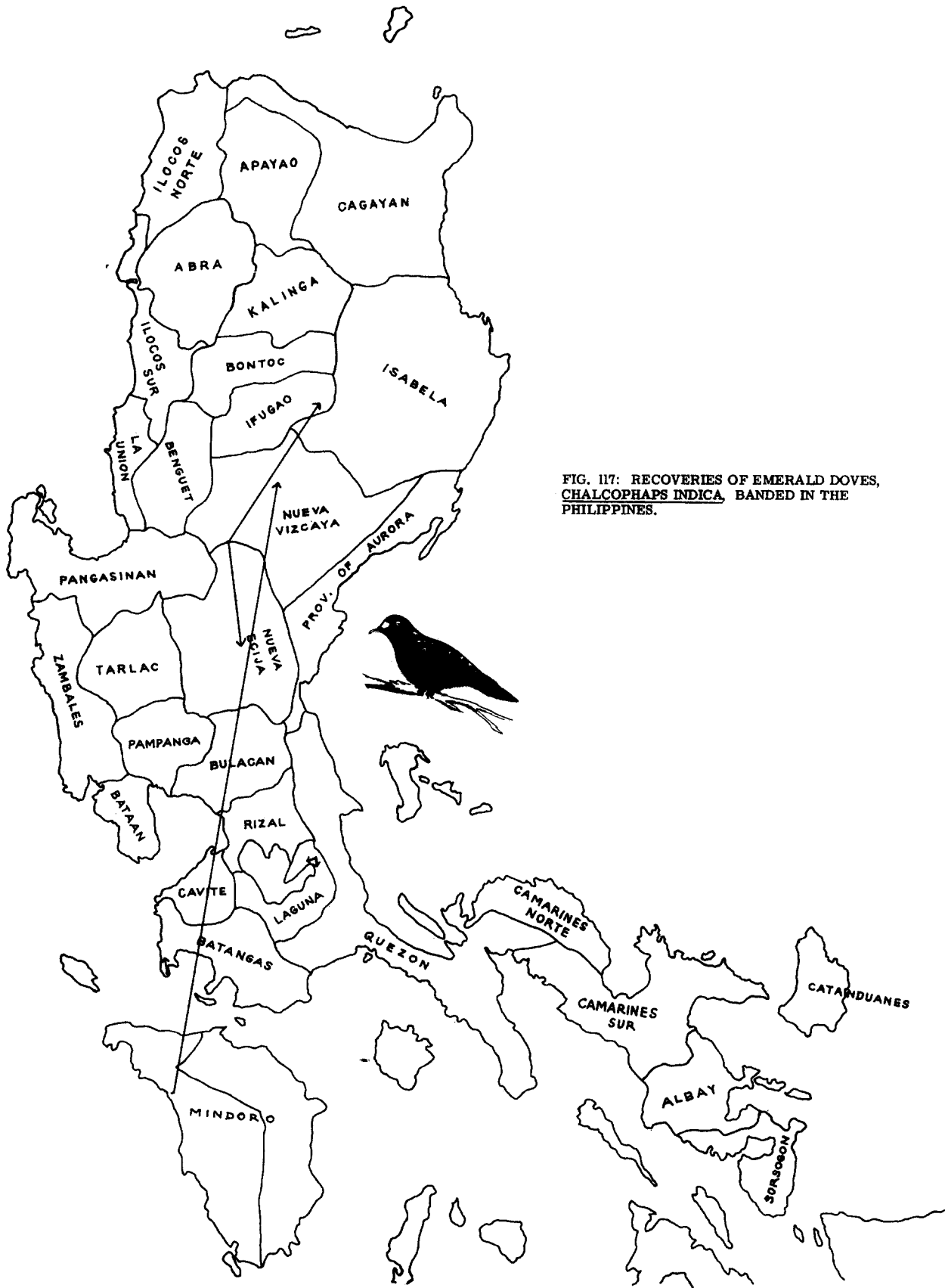
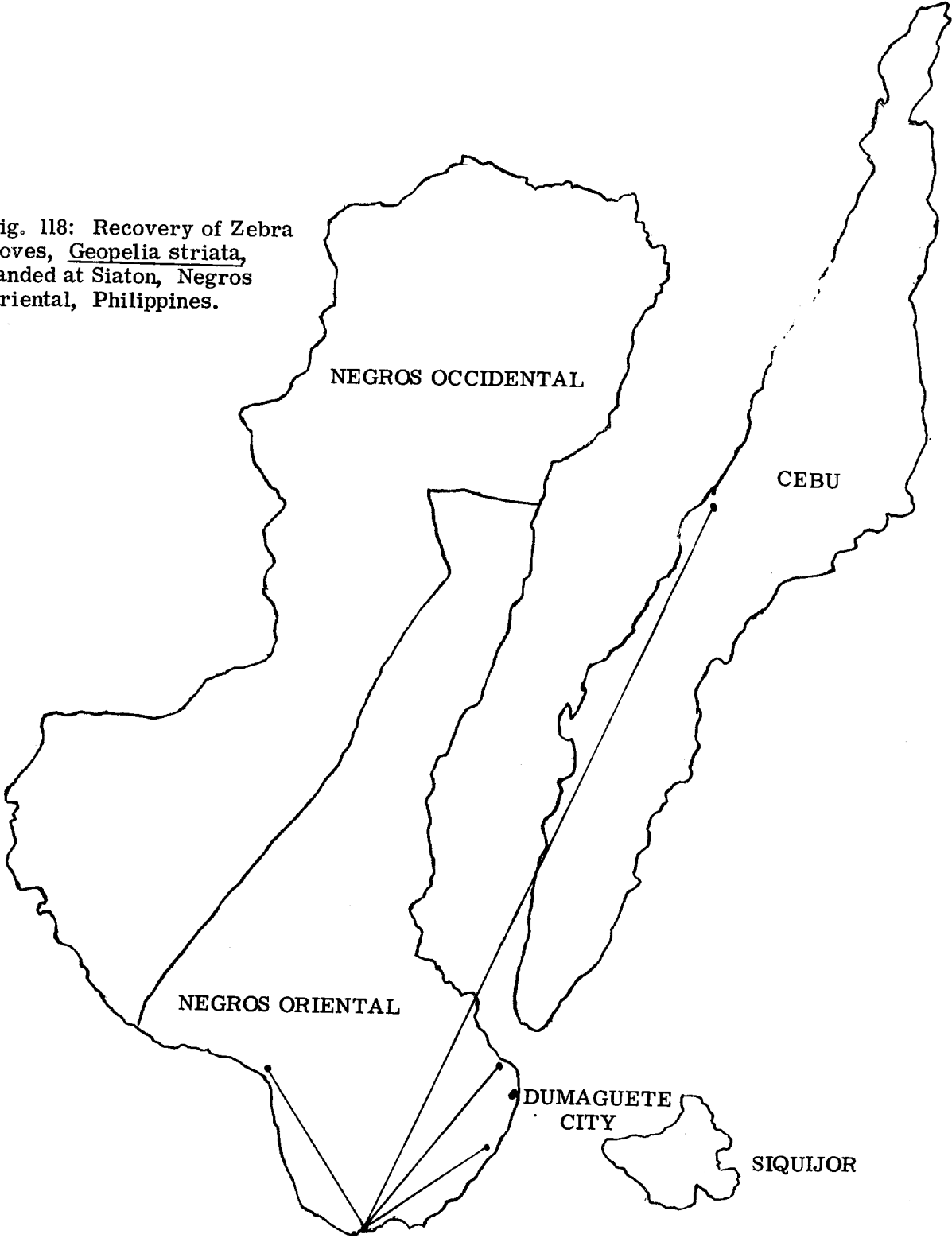


FIG. 117: RECOVERIES OF EMERALD DOVES, *CHALCOPHAPS INDICA*, BANDED IN THE PHILIPPINES.

Fig. 118: Recovery of Zebra Doves, Geopelia striata, banded at Siaton, Negros Oriental, Philippines.



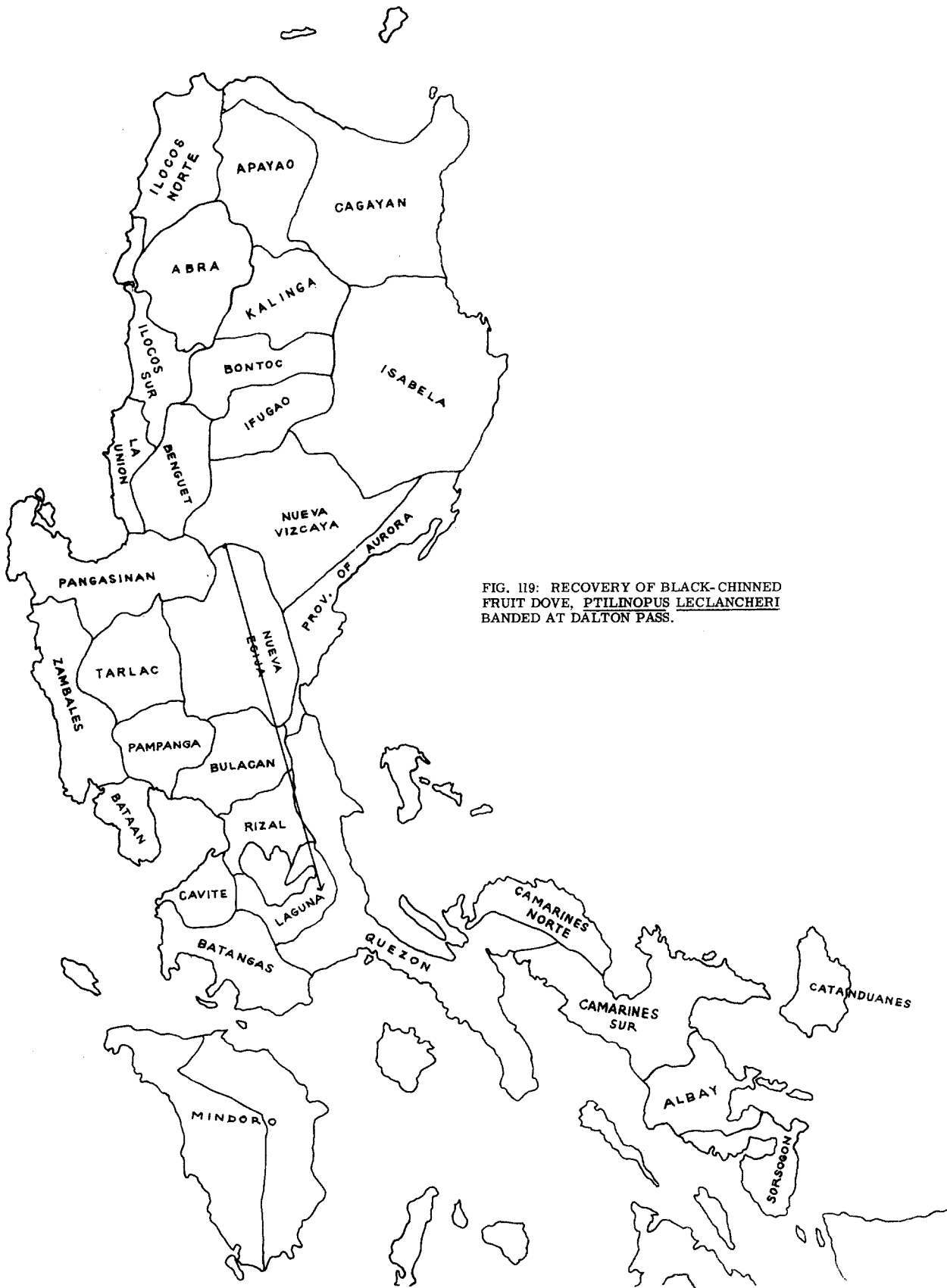


FIG. 119: RECOVERY OF BLACK-CHINNED FRUIT DOVE, Ptilinopus leclancheri banded at DALTON PASS.



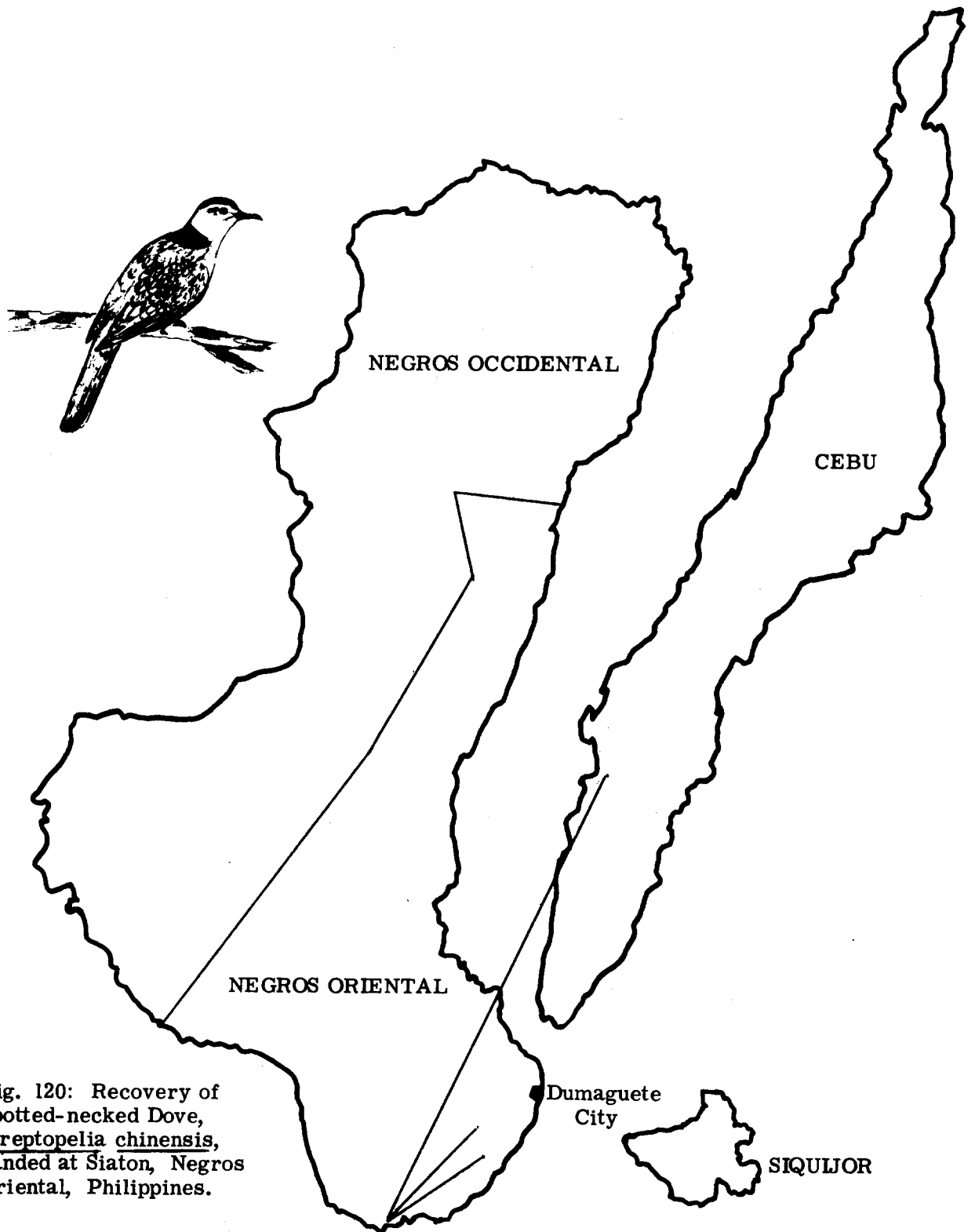


Fig. 120: Recovery of Spotted-necked Dove, *Streptopelia chinensis*, banded at Siaton, Negros Oriental, Philippines.

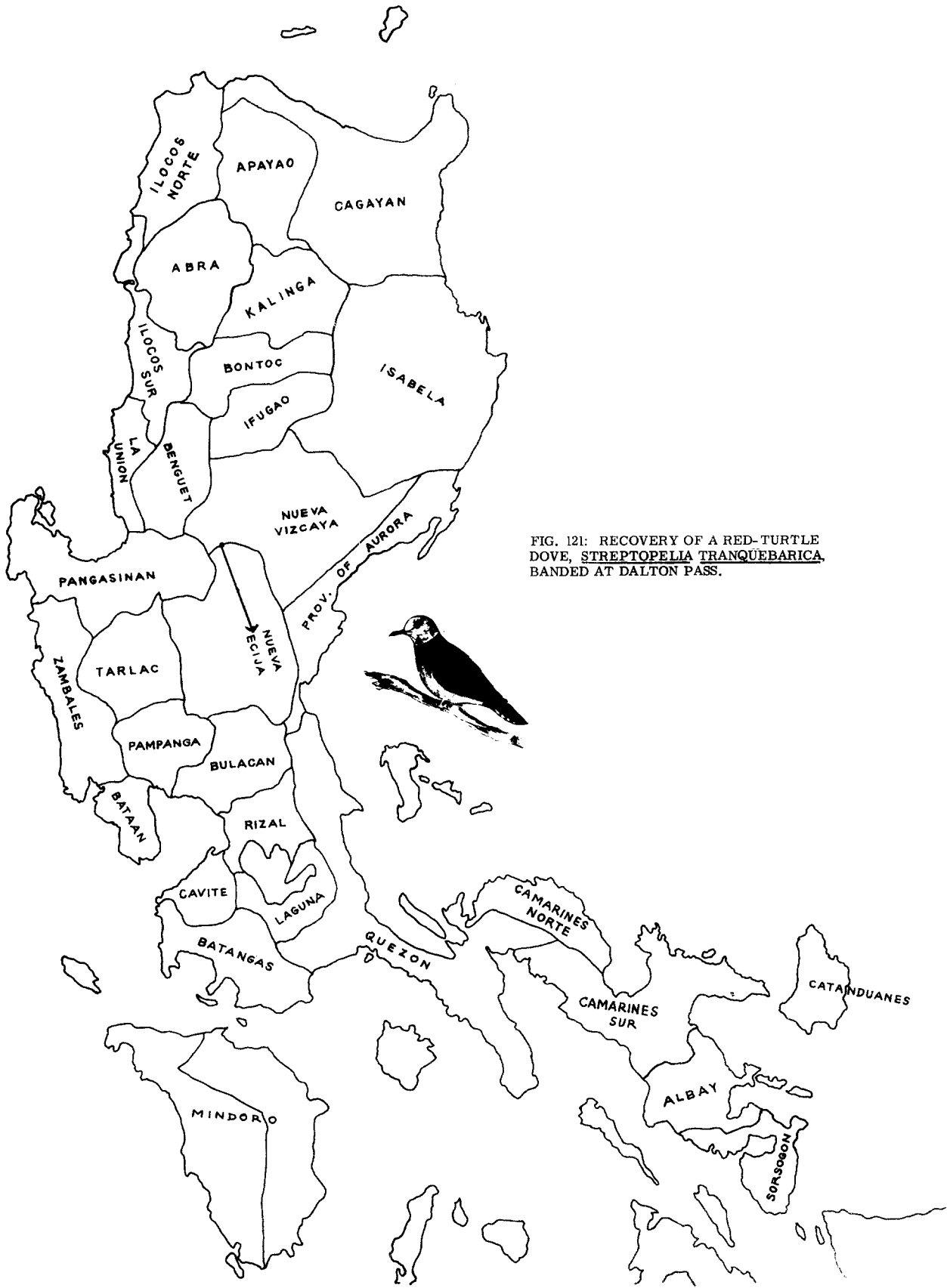


FIG. 121: RECOVERY OF A RED-TURTLE DOVE, STREPTOPELIA TRANQUEBARICA, BANDED AT DALTON PASS.



Fig. 122: Recovery of Lesser Thick-billed Green Pigeons, Treron curvirostra, in Mindoro.

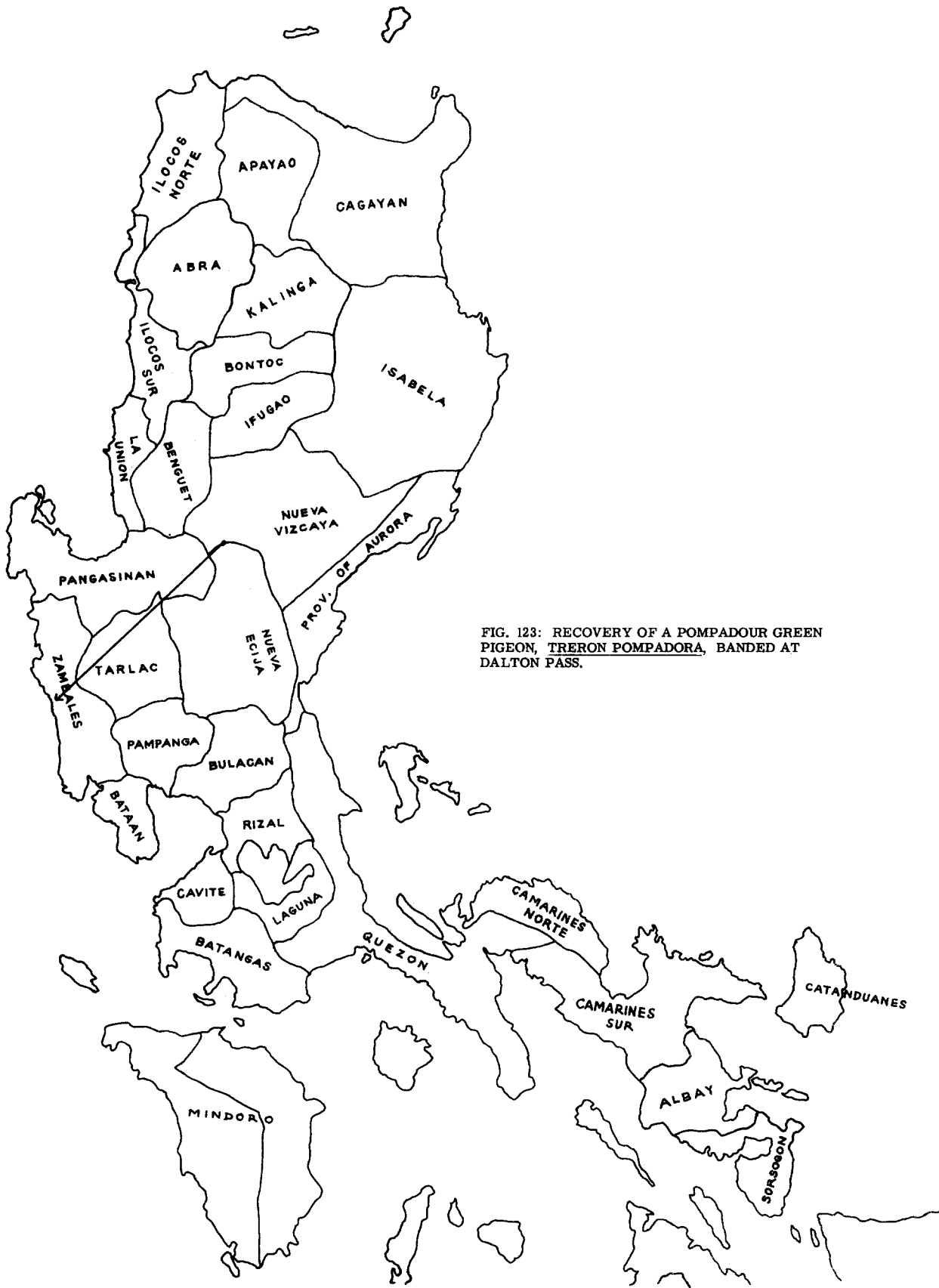
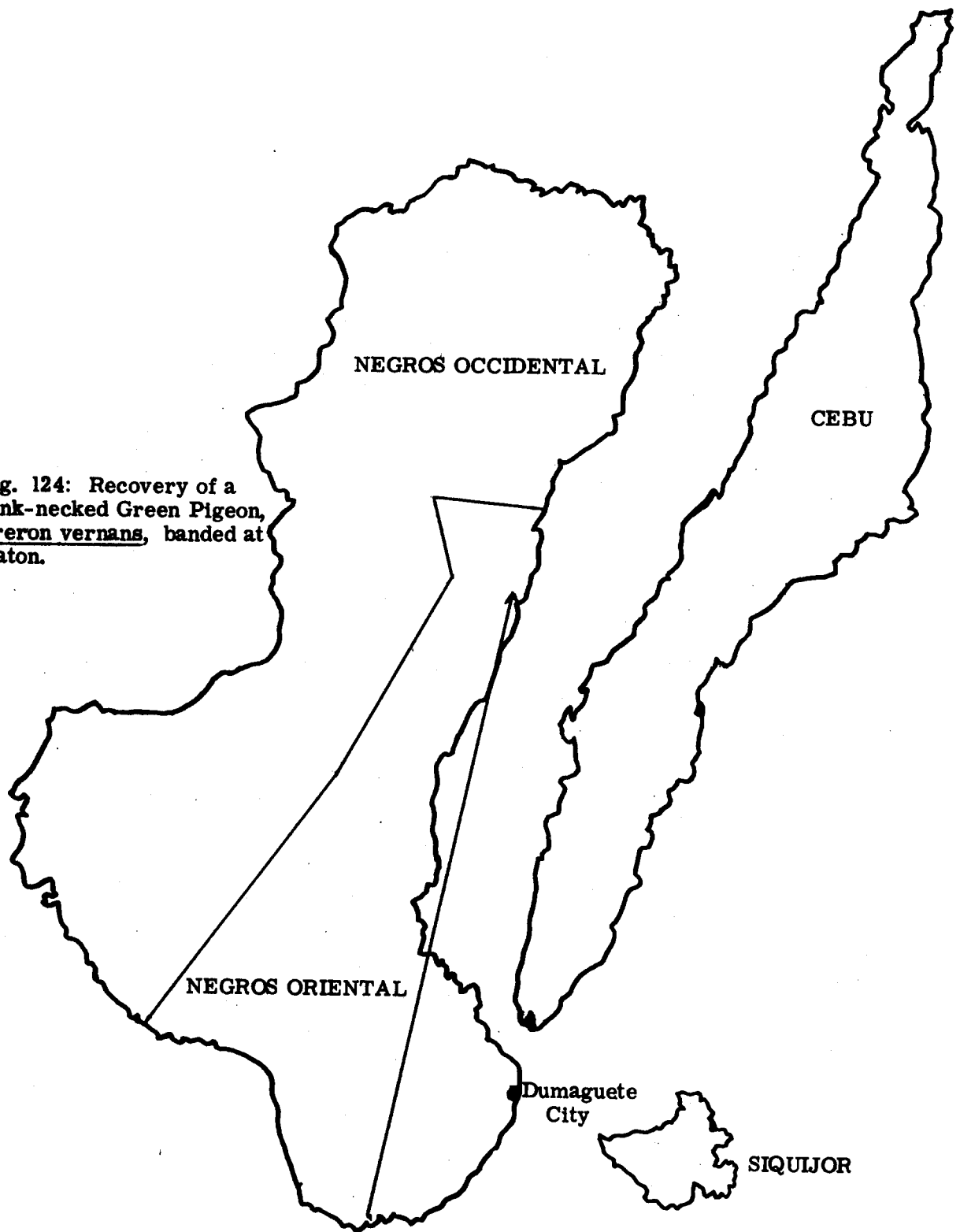


FIG. 123: RECOVERY OF A POMPADOUR GREEN PIGEON, TRERON POMPADORA, BANDED AT DALTON PASS.

Fig. 124: Recovery of a Pink-necked Green Pigeon, Treron vernans, banded at Siaton.



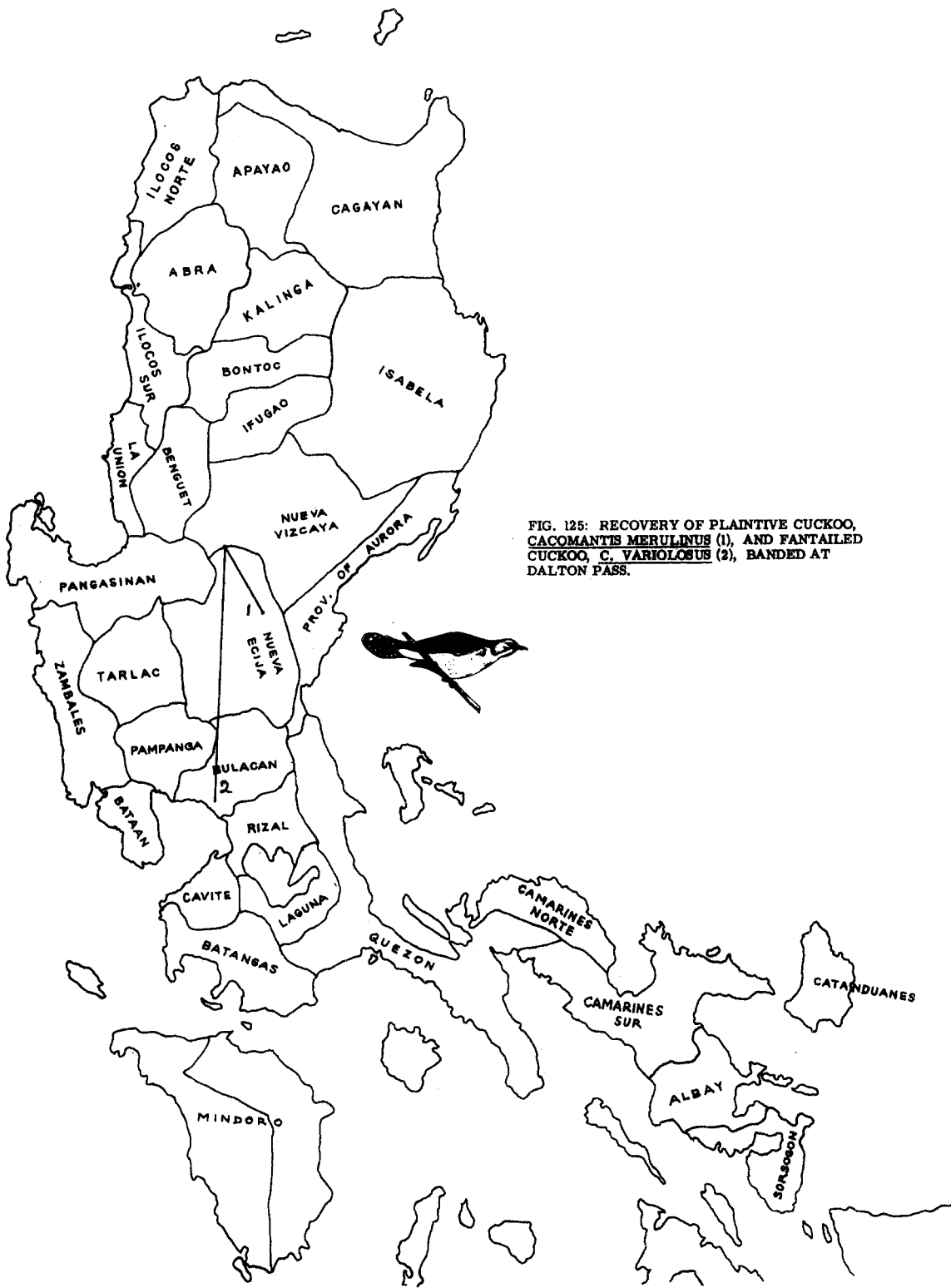
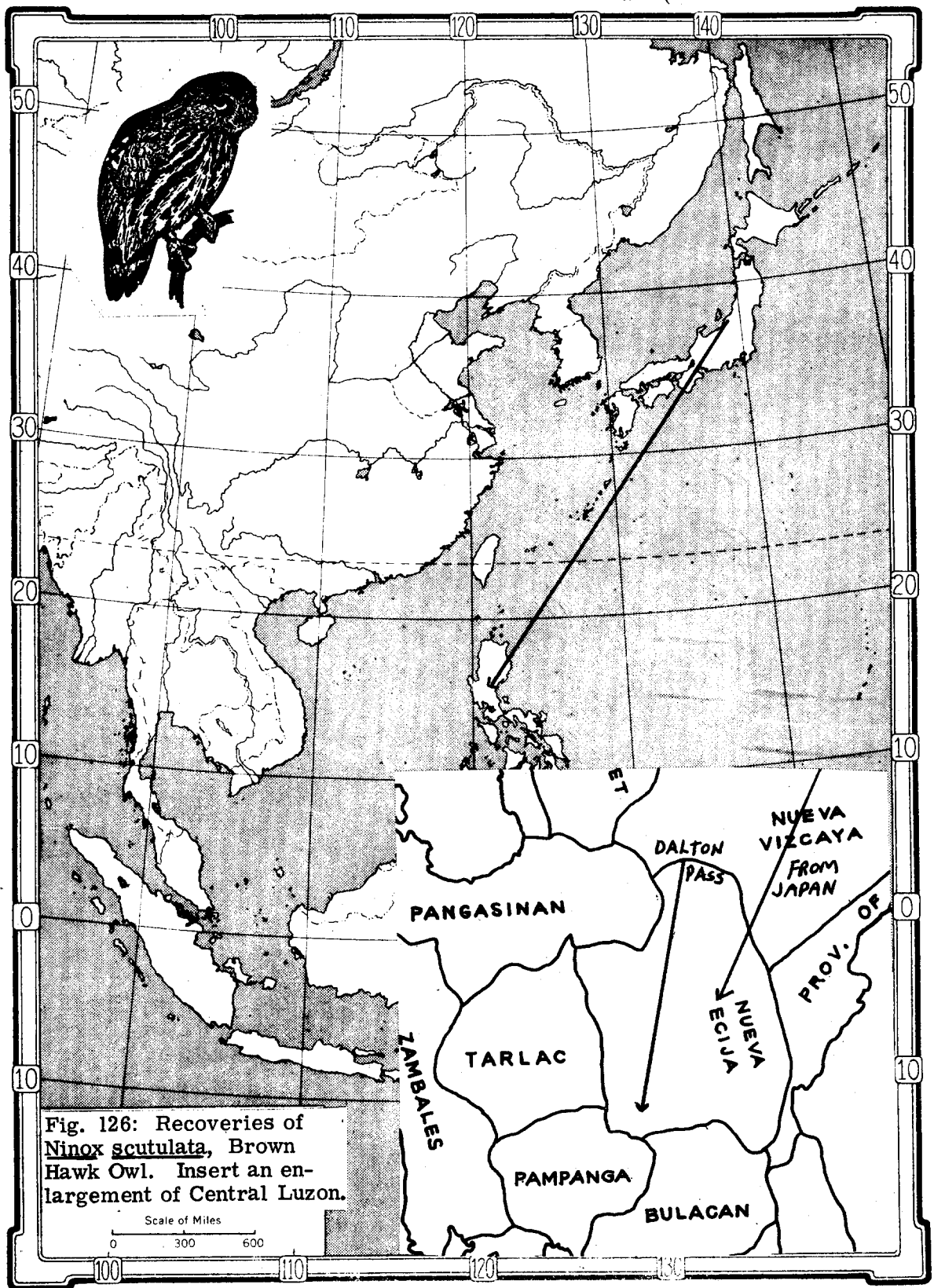


FIG. 125: RECOVERY OF PLAINITIVE CUCKOO, *CACOMANTIS MERULINUS* (1), AND FANTAILED CUCKOO, *C. VARIOLOSUS* (2), BANDED AT DALTON PASS.



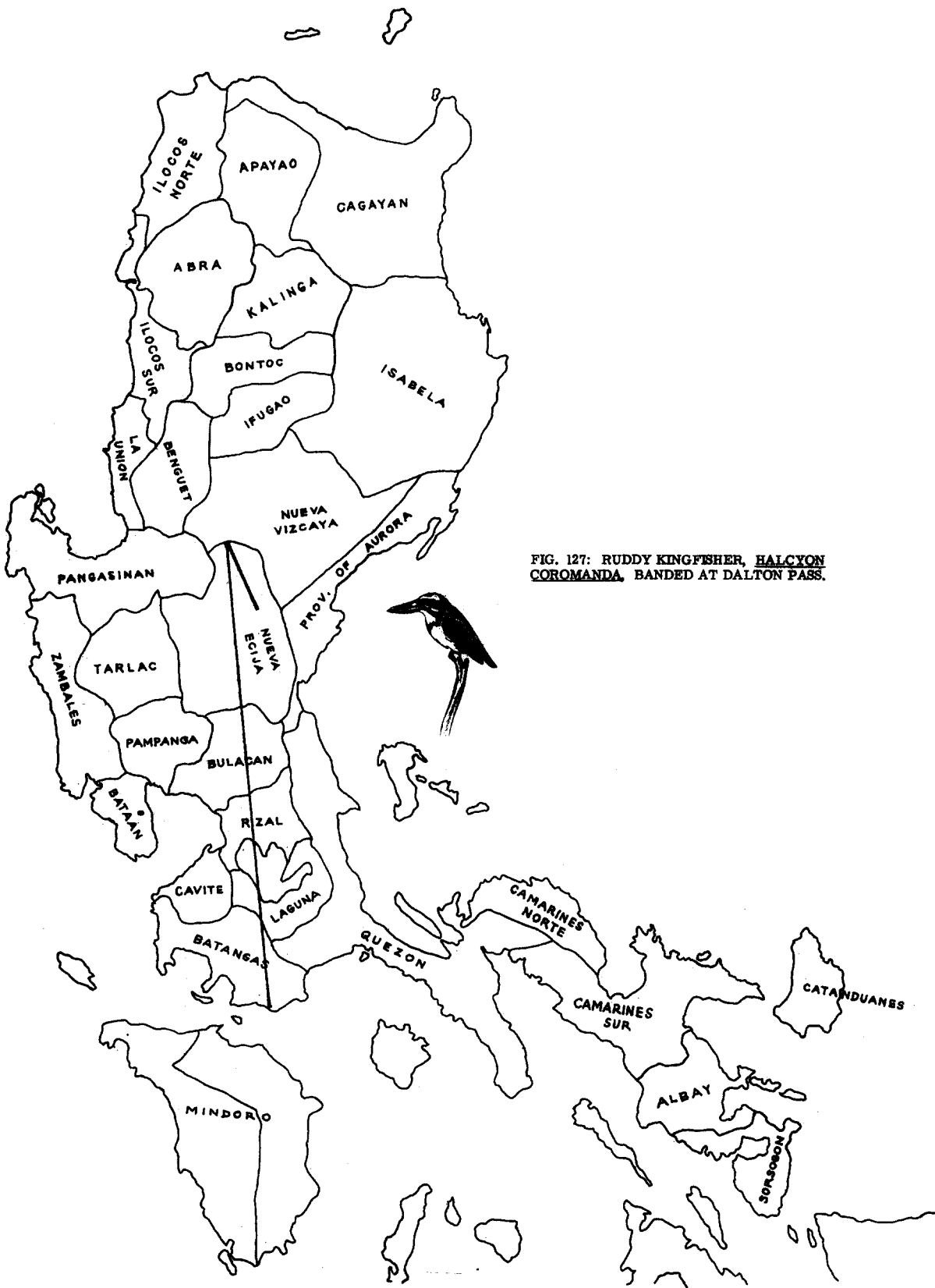


FIG. 127: RUDDY KINGFISHER, HALCYON  
COROMANDA, BANDED AT DALTON PASS.



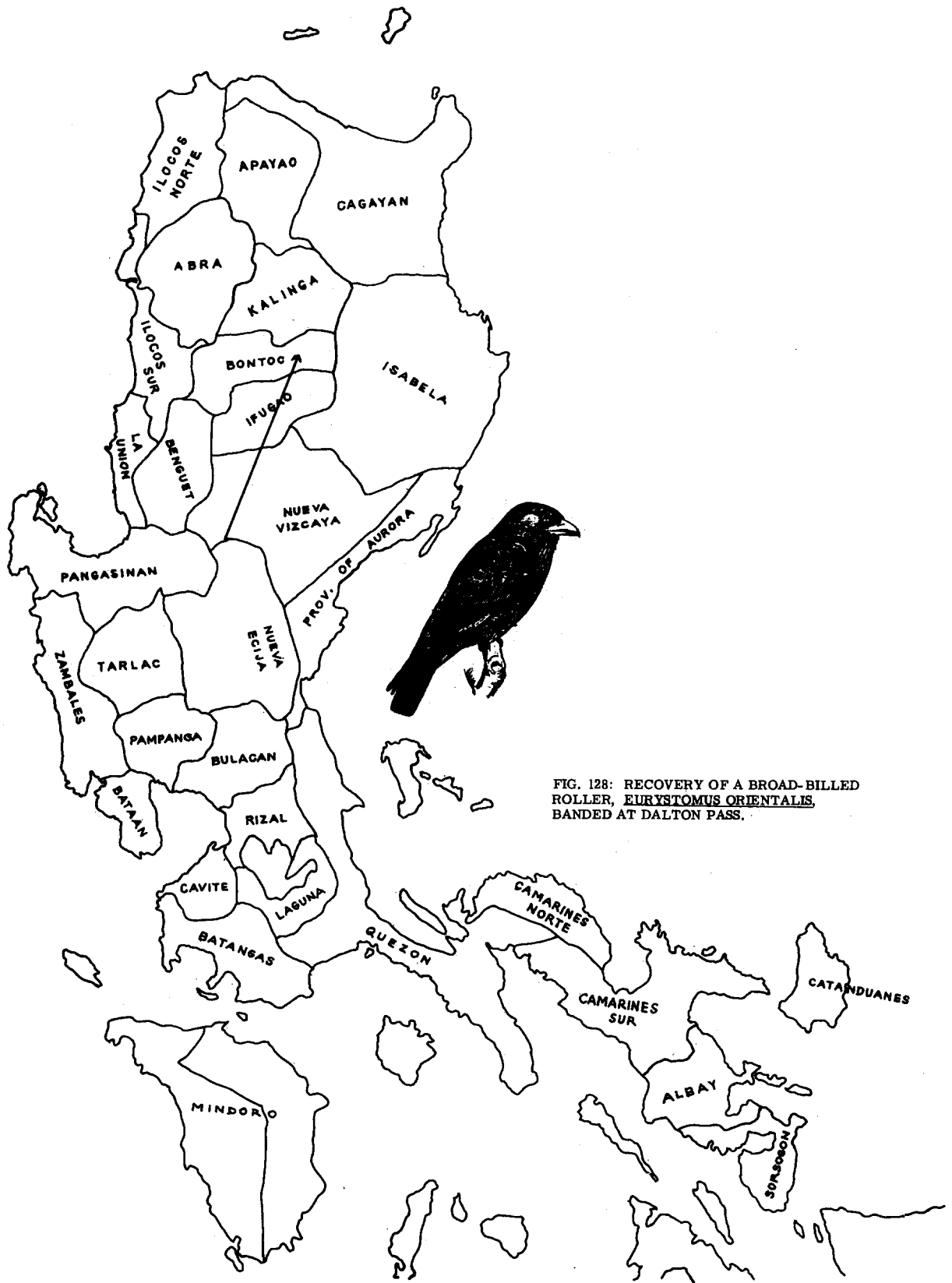


FIG. 128: RECOVERY OF A BROAD-BILLED ROLLER, *EURYSTOMUS ORIENTALIS*, BANDED AT DALTON PASS.

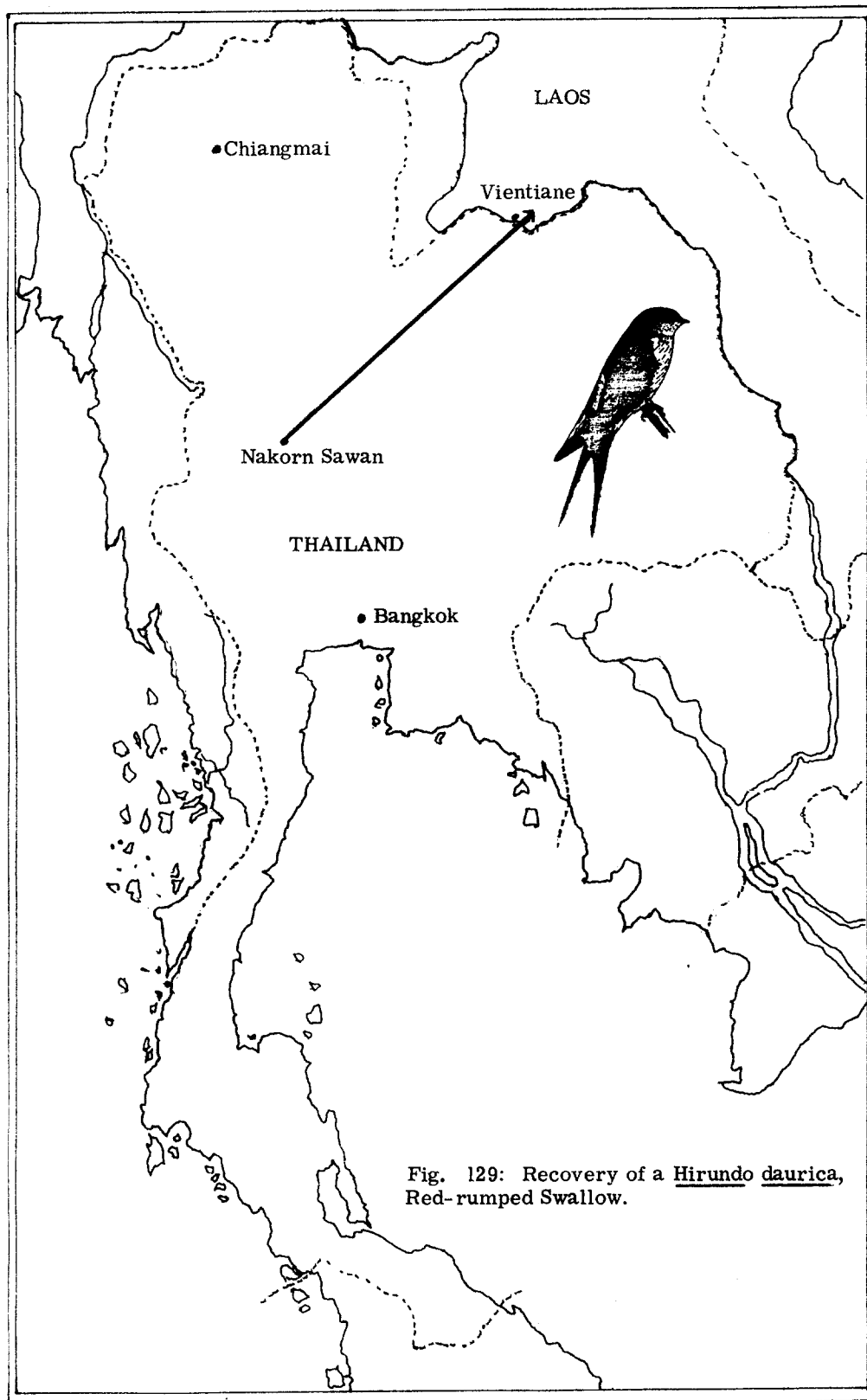
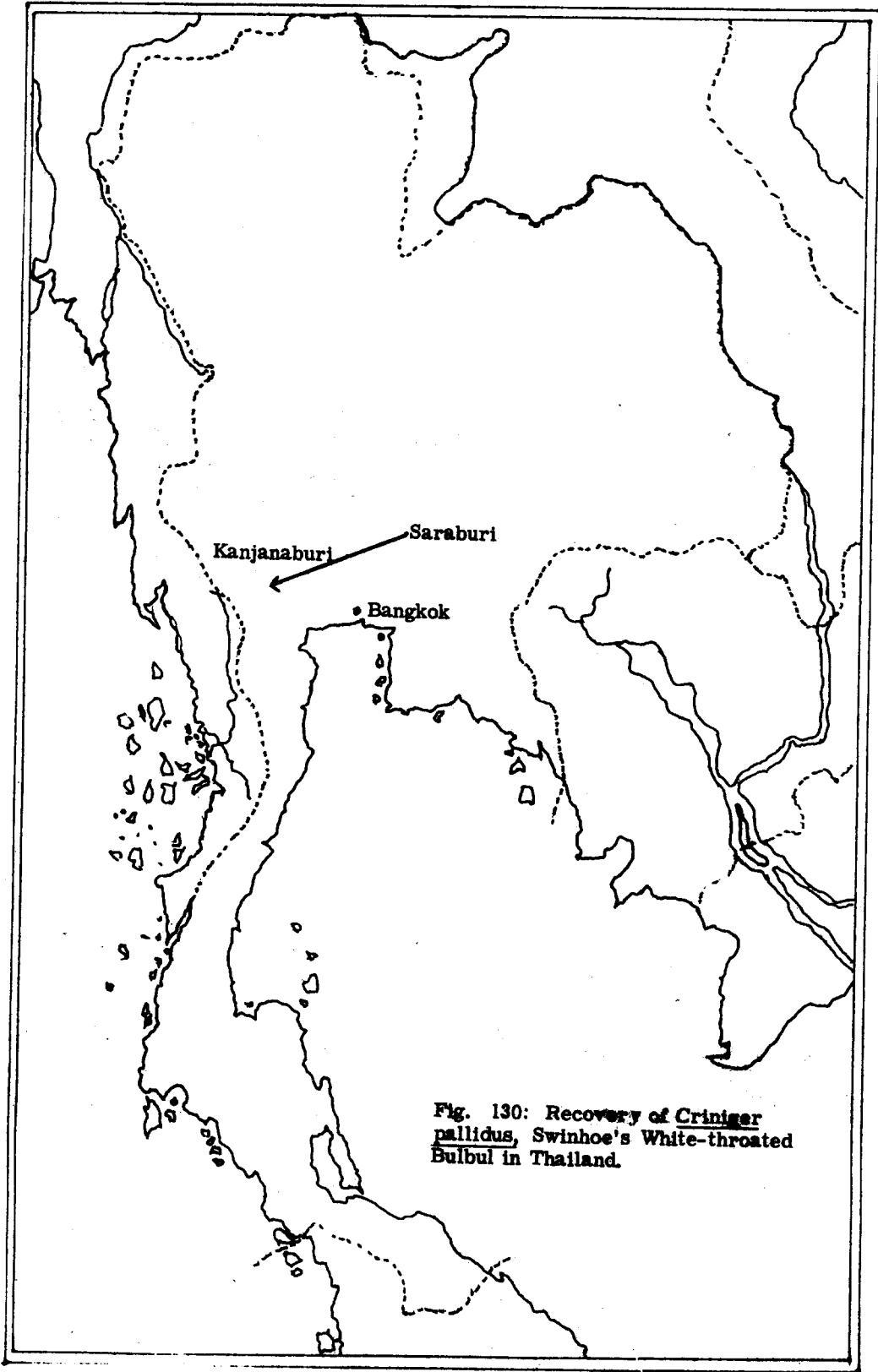


Fig. 129: Recovery of a *Hirundo daurica*, Red-rumped Swallow.



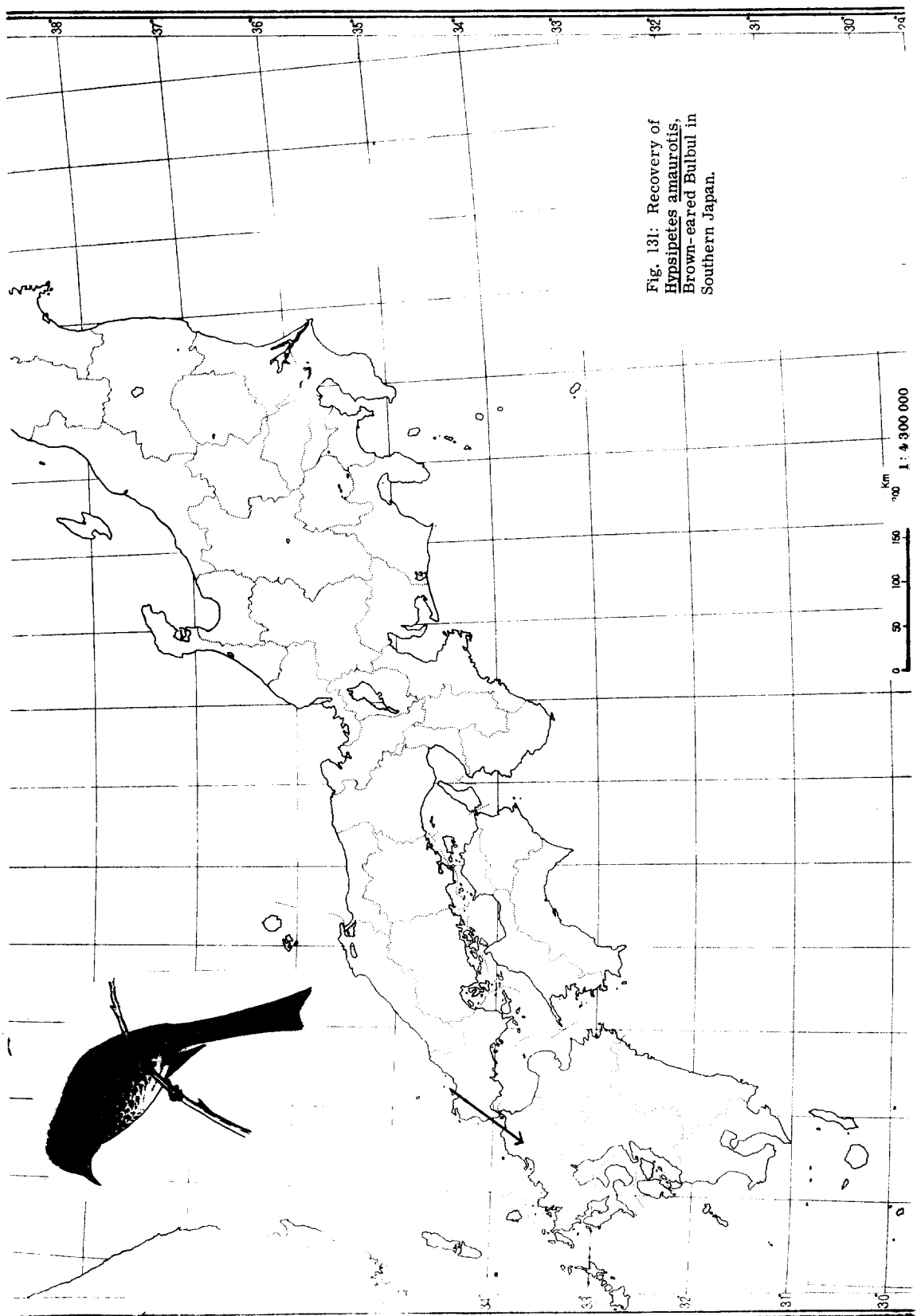
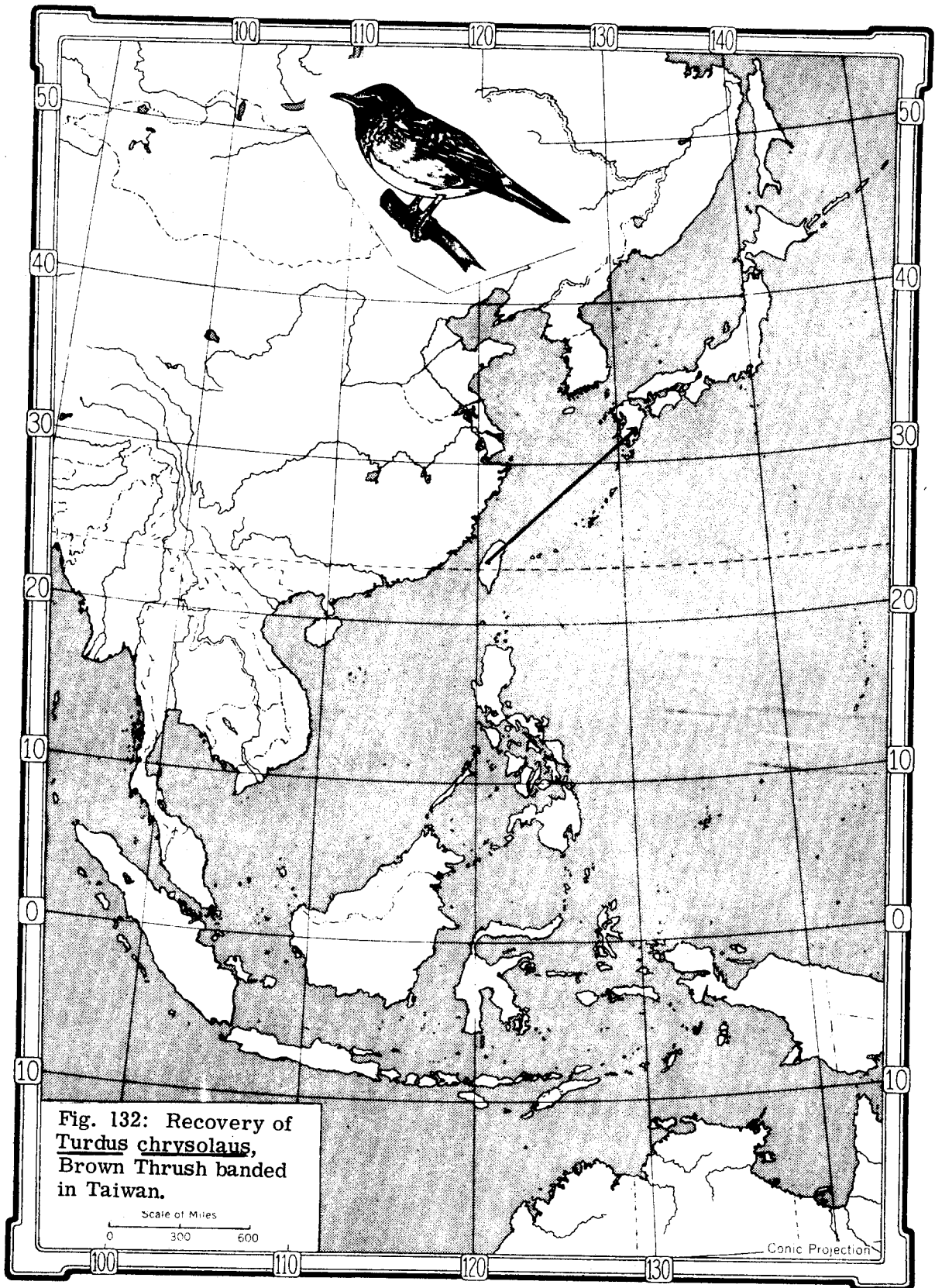


Fig. 131: Recovery of *Hypsipetes amaurolis*, Brown-eared Bulbul in Southern Japan.



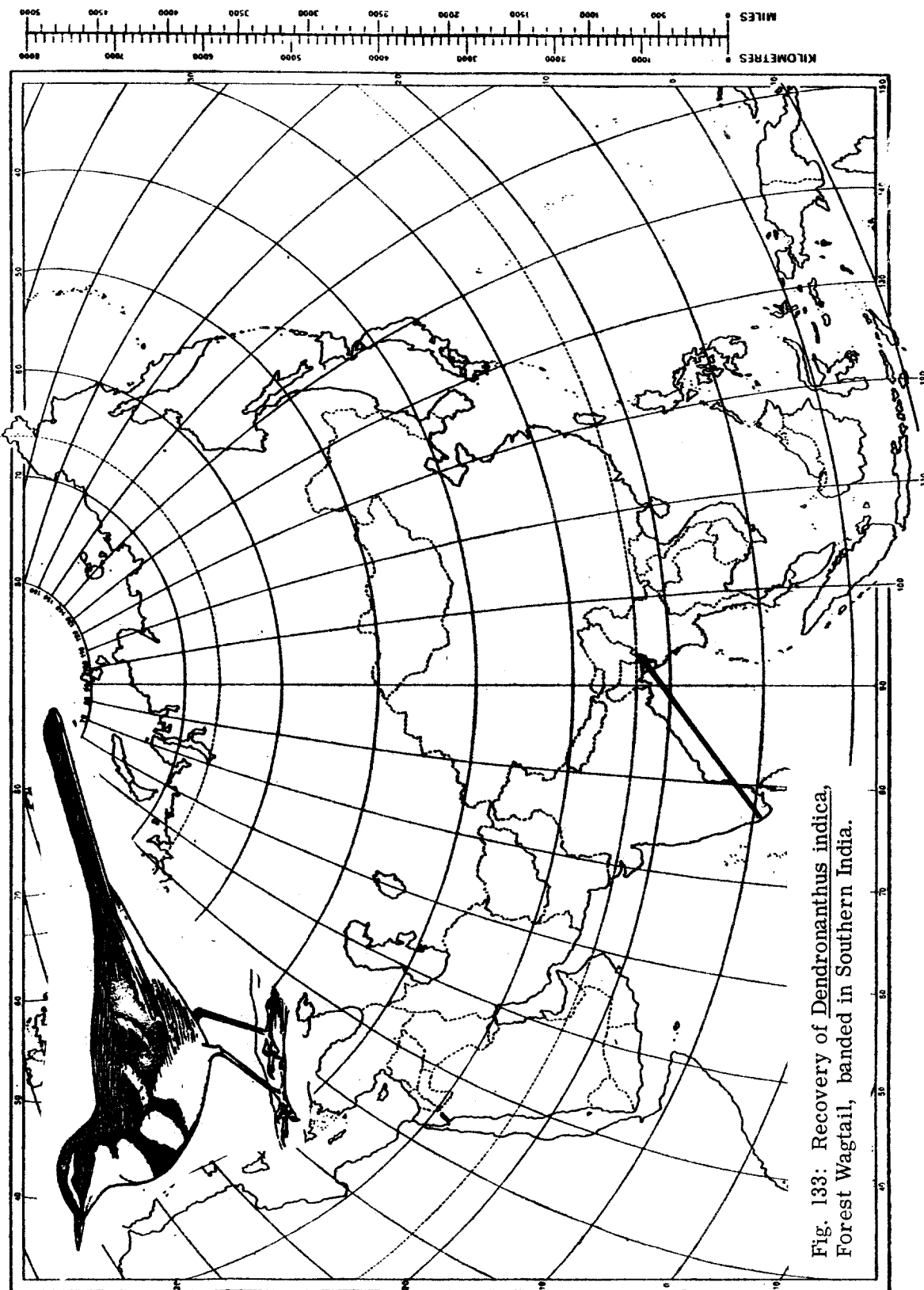


Fig. 133: Recovery of *Dendronanthus indica*, Forest Wagtail, banded in Southern India.

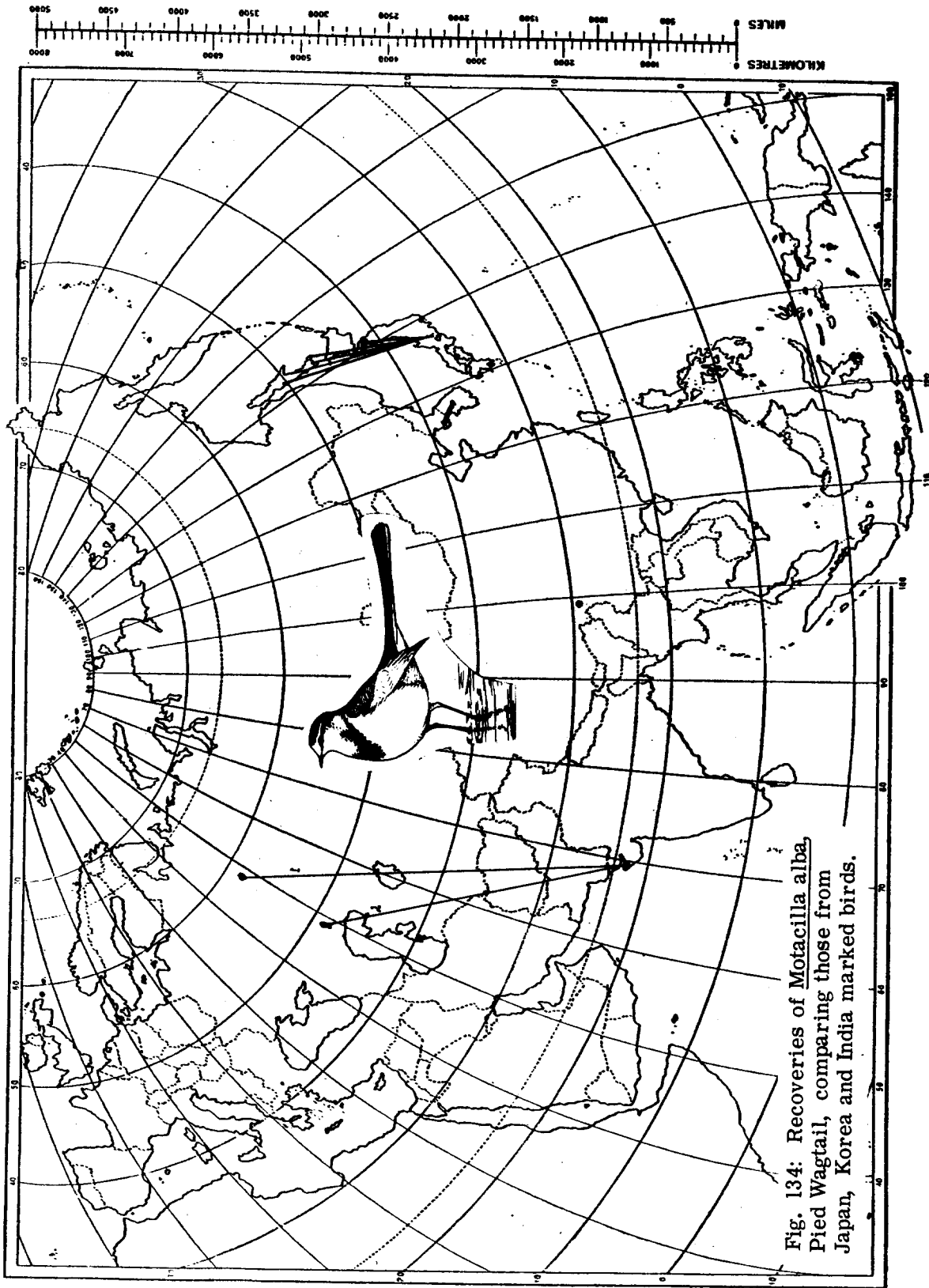


Fig. 134: Recoveries of *Motacilla alba*, Pied Wagtail, comparing those from Japan, Korea and India marked birds.

Point Barrow Alaska

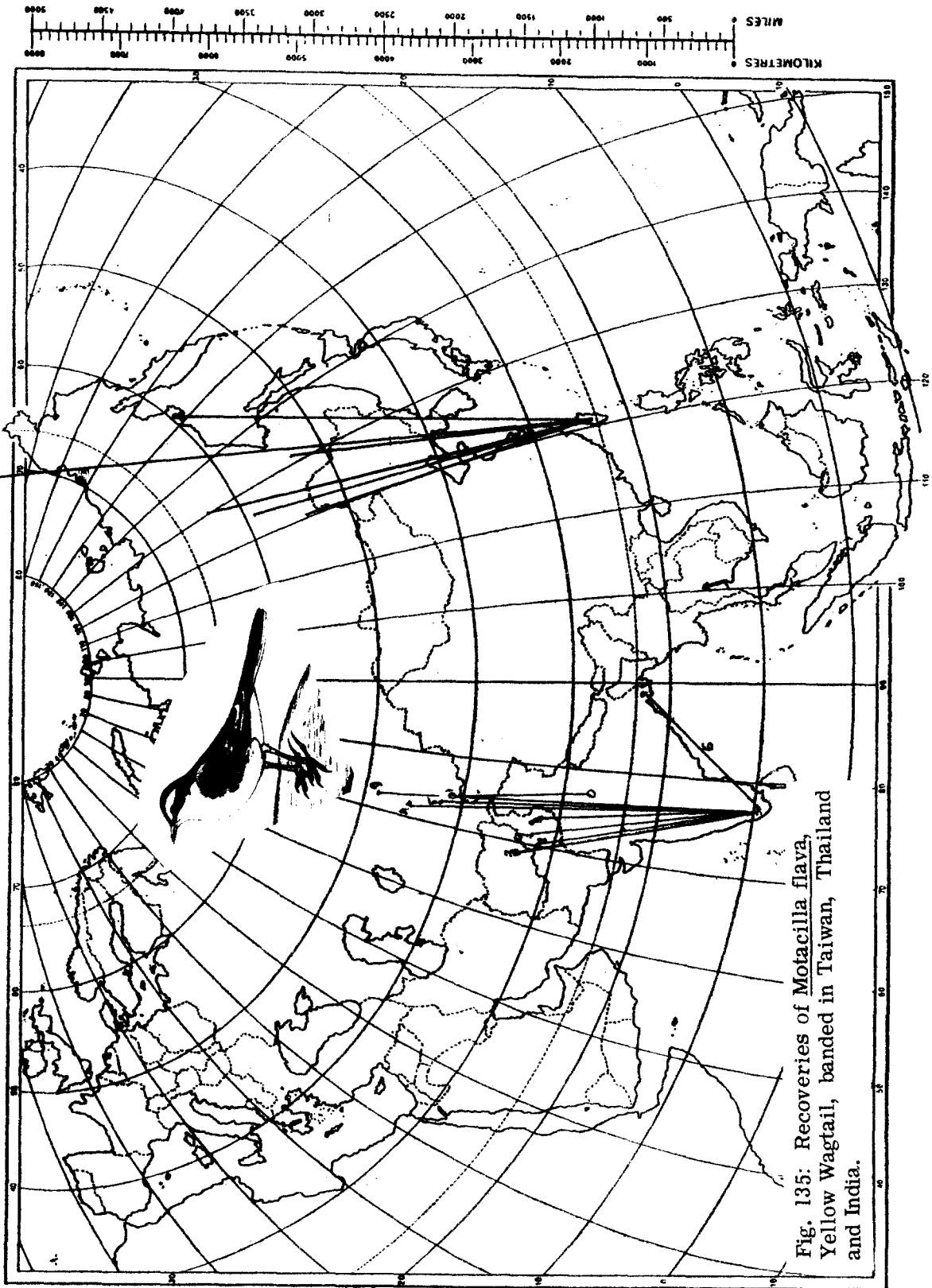


Fig. 135: Recoveries of *Motacilla flava*, Yellow Wagtail, banded in Taiwan, Thailand and India.



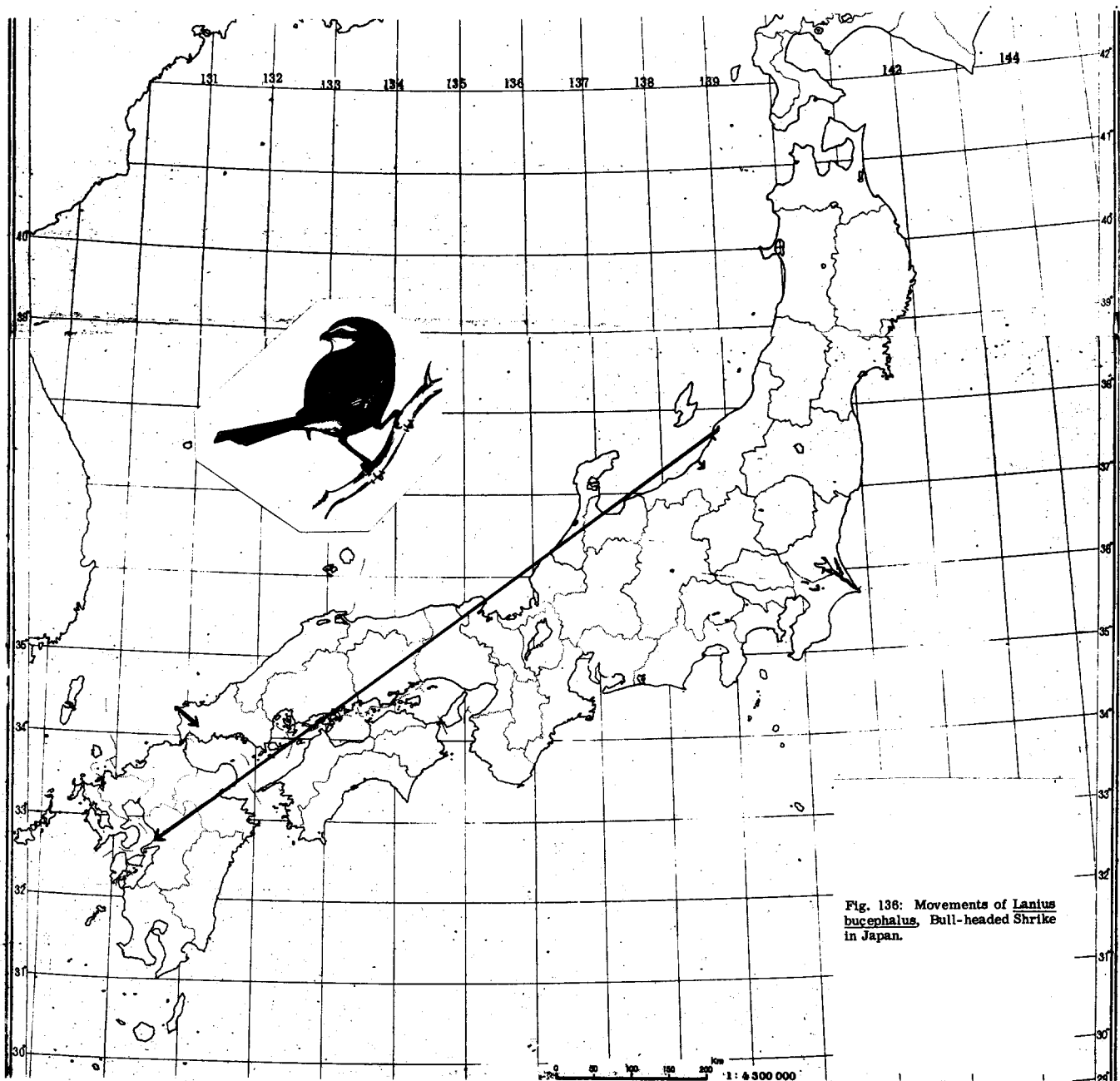


Fig. 136: Movements of Lanius bucephalus, Bull-headed Shrike in Japan.

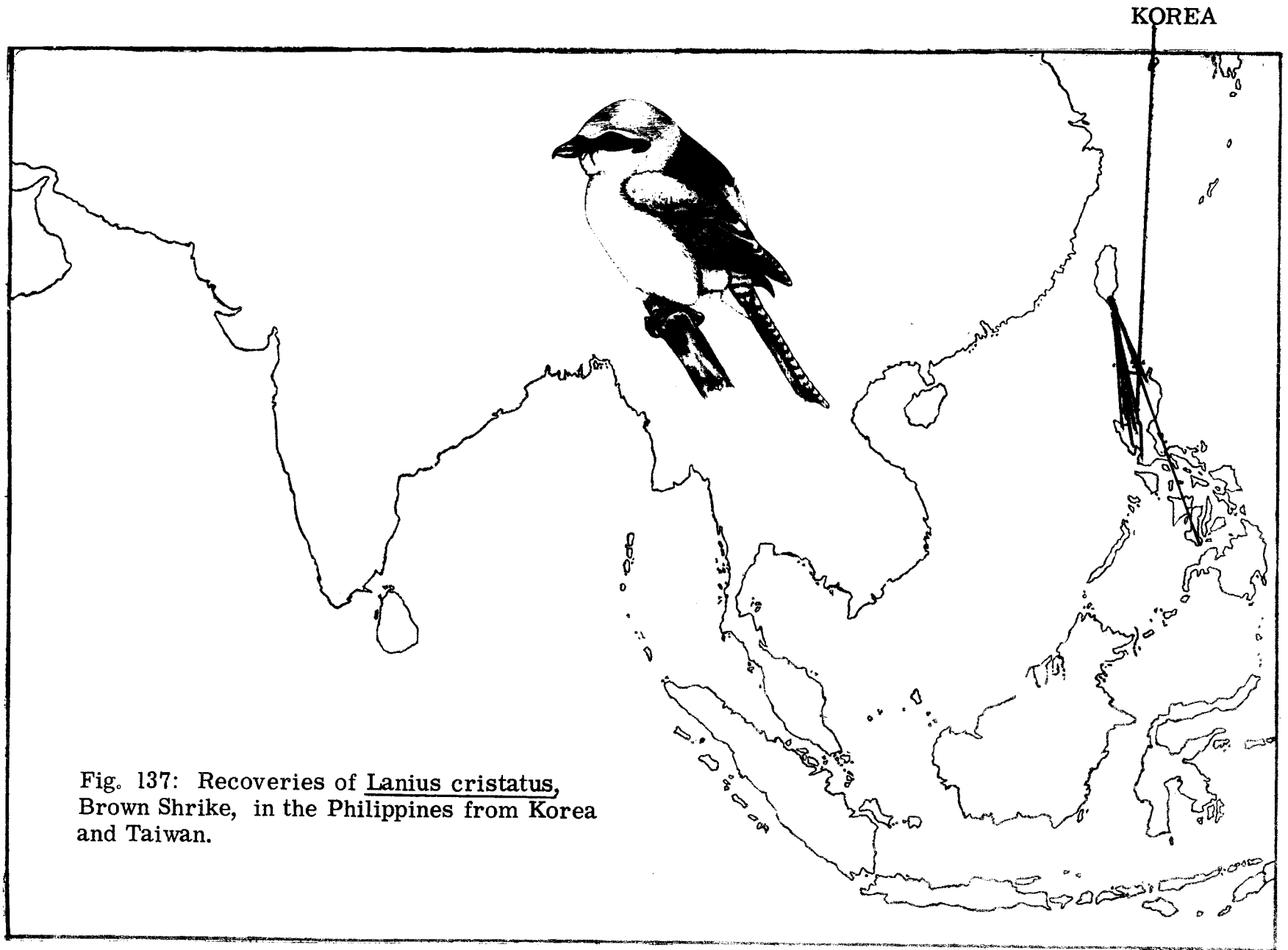
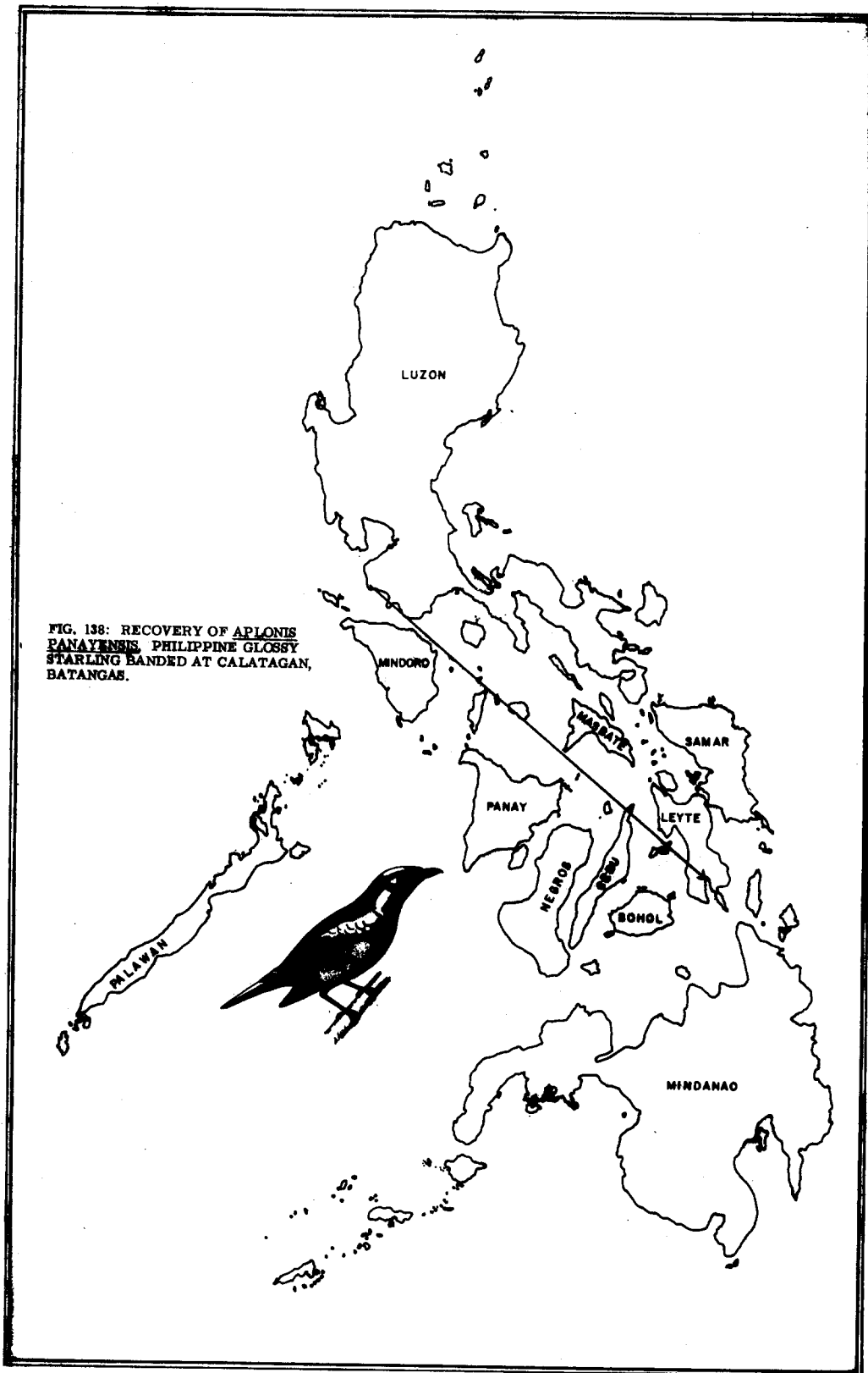


Fig. 137: Recoveries of Lanius cristatus,  
Brown Shrike, in the Philippines from Korea  
and Taiwan.



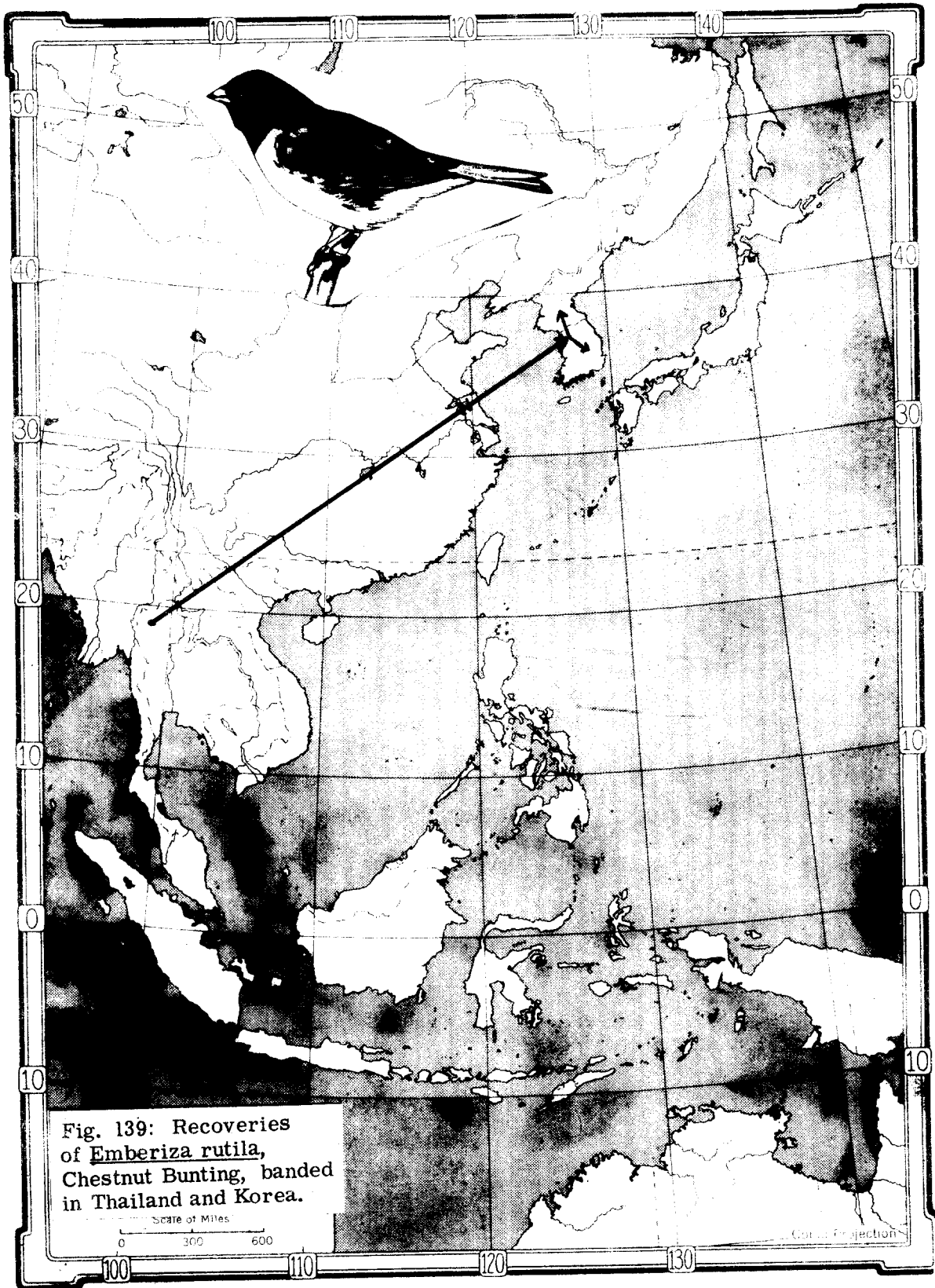
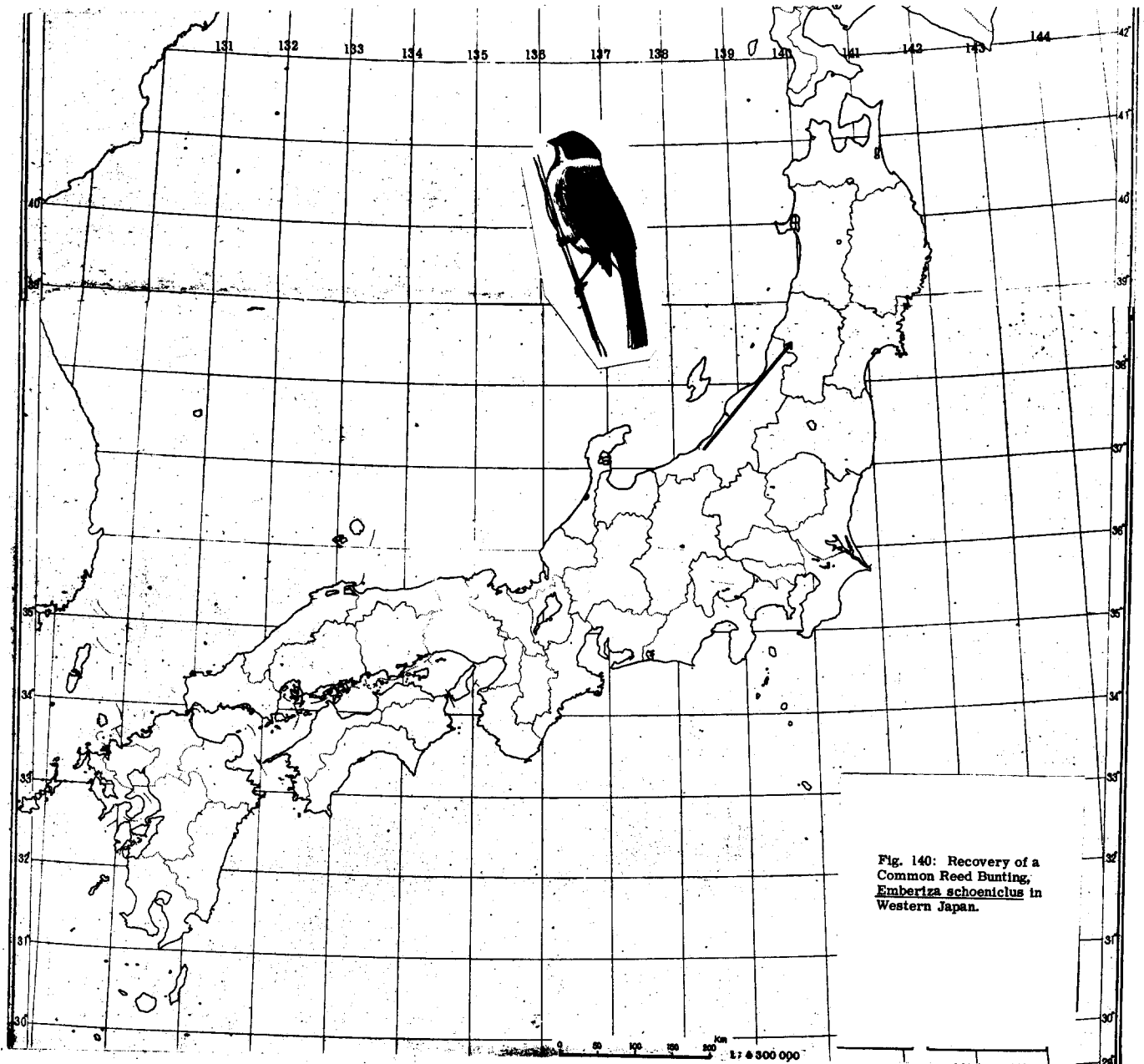


Fig. 139: Recoveries of *Emberiza rutila*, Chestnut Bunting, banded in Thailand and Korea.



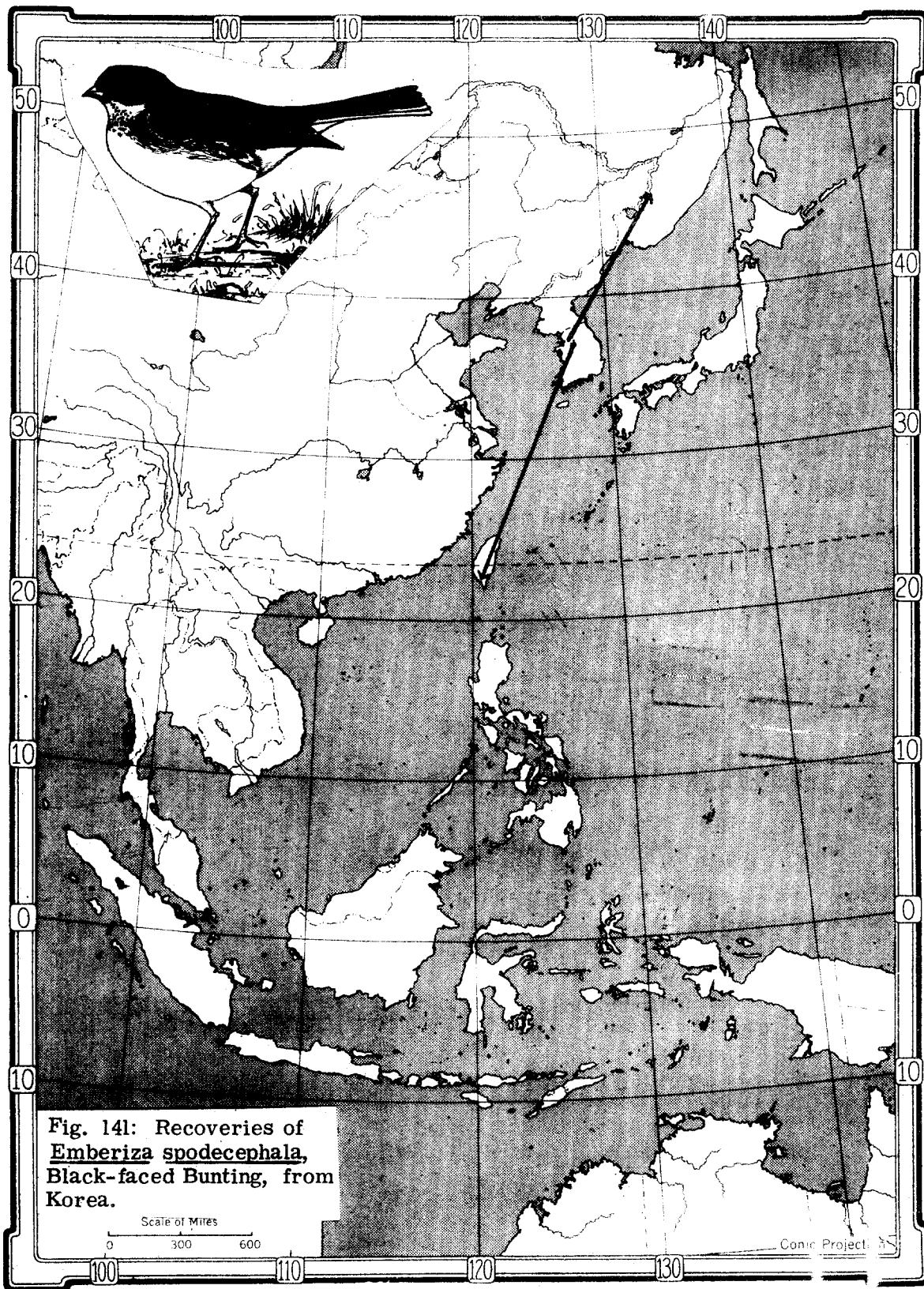


Fig. 141: Recoveries of *Emberiza spodecephala*, Black-faced Bunting, from Korea.

Scale of Miles  
0 300 600

Conic Project.

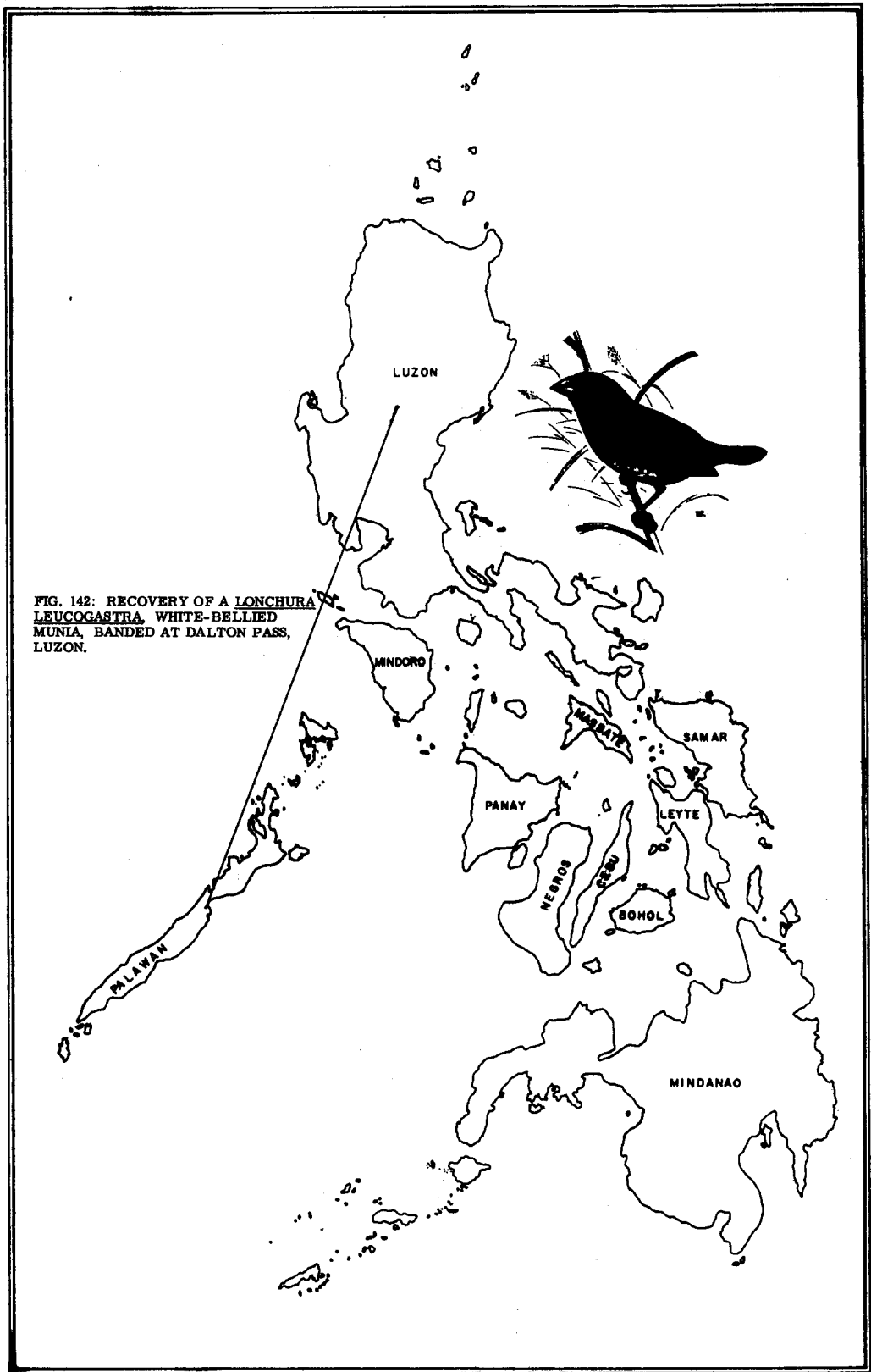


FIG. 142: RECOVERY OF A LONCHURA  
LEUCOGASTRA, WHITE-BELLIED  
MUNIA, BANDED AT DALTON PASS,  
LUZON.

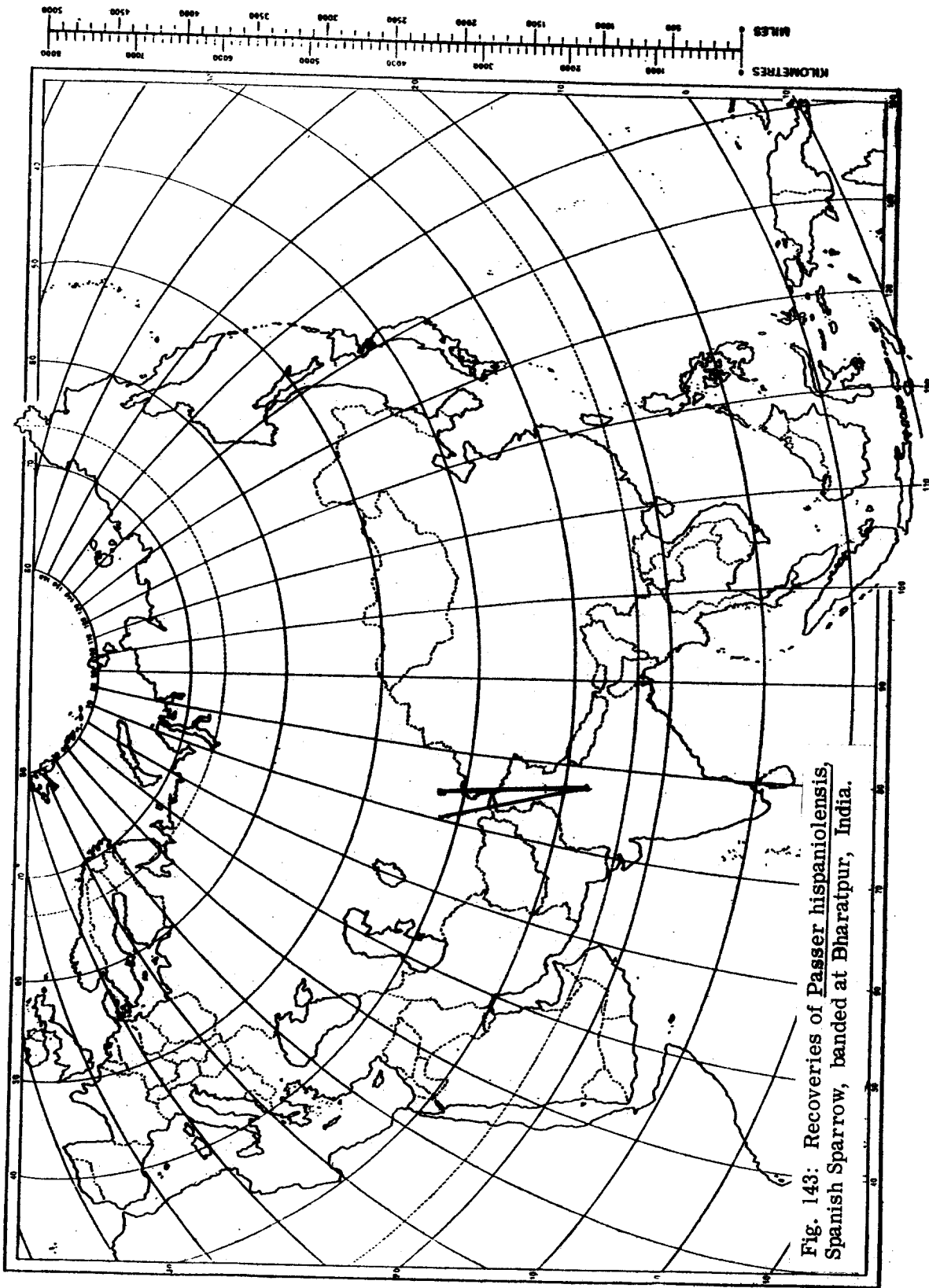


Fig. 143: Recoveries of Passer hispaniolensis, Spanish Sparrow, banded at Bharatpur, India.



# MIGRATORY ANIMAL PATHOLOGICAL SURVEY

## ANNUAL PROGRESS REPORT

1968

### PART IV

#### ECTOPARASITE SURVEY

Ectoparasite studies continued in 1968 at a reduced rate from two factors; reduction of field activities, and more selectivity of hosts. Most field teams felt that they had adequate series of specimens from most common avian hosts and collected only from selected species or selected habitats. General collections from all species were continued in India and Indonesia. The Bombay Natural History Society team under Dr. Salim Ali collected extensively in Bhutan, but identifications of these parasites will not be available until next year.

Our cooperating scientists, bogged down by the mass of material we have sent to them and plagued by reduced funds have had to slow up on their taxonomic work. Identifications to species have been slowly accumulating until we have 259 species of parasites from 739 species of birds. This does not include 40 species of feather mites. The complexity of the feather mite communities on the birds had necessitated revisions of all groups. To date two monographs resulting from the MAPS collections have appeared, summarizing the genera Proctophyllodes, Allanalges, Calcealges, Hemicalcealges, Bicentralges, Uniscutalges, Arthrogynalges, Pseudalges, Neocalcealges. (See list of publications page 338). Discussion of this group will appear in later reports.

Ectoparasite collections from bats have been somewhat haphazard because of the difficulty of identifying hosts accurately. Often ectoparasites were just labeled from "Bat".

The total data on hand, excepting feather mites, are listed in Table 35. In this table are given only those hosts from which positive identifications have been made. Generic lists or those species of hosts from which collections were made but identifications have not been received are not included. An X is marked in each column for each country in which the parasite has been collected. Until final analyses of all collections have been received the absence of an X in a column will not mean the absence of the parasite.

Table 35: Geographical Distribution of Avian Ectoparasites. MA., Mallophaga, H., Hippoboscidae, CH., Chigger  
T., Tick, M., Mites, N., Nycterobiidae, FM., Feather Mites

	Korea	Japan	Taiwan	Hong Kong	Philippines	Thailand	Malaya	Indonesia	India
<b>PROCELLARIIDAE</b>									
<b>PUFFINUS LEUCOMELAS</b>									
MA: Halipeurus angusticeps		X							
Procellariphaga longithoracica		X							
P. paulula		X			X				
Saemundssonina orientalis		X							
Trabeculus hexaken					X				
<b>PHALACROCORACIDAE</b>									
<b>PHALACROCORAX CARBO</b>									
MA: Pectinopygus gyricornis						X			
<b>PHALACROCORAX PYGMEUS</b>									
H: Icosta macclurei								X	
<b>PHALACROCORAX SULCIROSTRIS</b>									
H: Icosta ardeae								X	
I. macclurei								X	
<b>ARDEIDAE</b>									
<b>ARDEA CINEREA</b>									
H: Icosta macclurei								X	
<b>ARDEOLA IBIS</b>									
MA: Ciconiphilus decimfasciatus			X						
H: Icosta ardeae			X						
<b>EGRETTA GARZETTA</b>									
MA: Ardeicola expallidus						X			
Ciconiphilus decimfasciatus			X						
<b>GORSACHIUS MELANOLOPHUS</b>									
H: Ornithoetona plicata					X				
<b>IKOBRYCHUS CINNAMOMEUS</b>									
CH: Blankaartia acuscutellaris						X		X	
IKOBRYCHUS SINENSIS								X	
CH: Blankaartia acuscutallaris								X	
<b>NYCTICORAX NYCTICORAX</b>									
MA: Ciconiphilus decimfasciatus			X						
<b>CICONIIDAE</b>									
<b>ANASTOMUS OSCITANS</b>									
MA: Ciconiphilus quadripustulatus						X			
Neophilopterus completus						X			
H: Icosta macclurei						X			
M: Ornithonyssus bursa						X			
T: Argas robertsi						X			
<b>ANATIDAE</b>									
<b>DENDROCYGNA JAVANICA</b>									
MA: Acidoproctus emersoni						X			
Trinoton emersoni						X			
<b>ACCIPITRIDAE</b>									
<b>ACCIPITER BADIUS</b>									
MA: Degeeriella nisus						X			
H: Ornithoetona plicata						X			
<b>ACCIPITER GENTILIS</b>									
H: Icosta chalcolampra						X			
<b>ACCIPITER NISUS</b>									
H: Icosta chalcolampra						X			
<b>ACCIPITER TRIVIRGATUS</b>									
H: Icosta chalcolampra						X			
<b>ACCIPITER VIRGATUS</b>									
H: Icosta chalcolampra						X			
<b>AQUILA NIPALENSIS</b>									
MA: Degeeriella fulva						X			
H: Icosta longipalpis						X			
<b>AVICEDA JERDONI</b>									
H: Ornithoetona plicata					X				
<b>BUTASTUR INDICUS</b>									
MA: Degeeriella beaufacies			X						
Laemobothrion indicus						X		X	
<b>BUTEO BUTEO</b>									
MA: Craspedorhynchus platystomus		X							
Degeeriella fulva		X							
<b>CIRCUS MELANOLEUCOS</b>									
H: Ornithoica curvata						X			
<b>HALIASTER INDUS</b>									
MA: Colpocephalum turbinatum						X			
Craspedorhynchus pachypus						X			
Degeeriella regalis						X			
<b>ICTINAETUS MALAYENSIS</b>									
MA: Laemobothrion maximum						X			

	Korea	Japan	Taiwan	Hong Kong	Philippines	Thailand	Malaya	Indonesia	India
H: <i>Icosta longipalpis</i>						X			
MILVUS MIGRANS									
MA: <i>Craspedorrhynchus spathulatus</i>								X	
Degeeriella regalis								X	
FALCONIDAE									
MICROHIERAX ERYTHROGENUS									
MA: <i>Falcolius samarensis</i>					X				
H: <i>Icosta nigrita</i>					X				
PHASIANIDAE									
ARBOROPHILA CAMBODIANA									
MA: <i>Amyrsidea elbeli</i>						X			
<i>Oxylpeurus formosanus</i>						X			
<i>O. unicolor</i>						X			
H: <i>Ornithoctona plicata</i>						X			
ARBOROPHILA RUFOGULARIS									
MA: <i>Goniodes indicus</i>						X			
<i>G. processus</i>						X			
<i>Oxylpeurus unicolor</i>						X			
BAMBUSICOLA FYTCHII									
CH: <i>Leptotrombidium scutellare</i>						X			
COTURNIX CHINENSIS									
MA: <i>Cuclotogaster cinereus</i>					X				
<i>Goniodes astrocephalus</i>					X				
<i>Menacanthus abdominalis</i>					X				
COTURNIX CHINENSIS									
CH: <i>Leptotrombidium akamushi</i>					X				
<i>L. deliense</i>					X				
<i>L. keukenschrijveri</i>					X				
GALLUS GALLUS									
MA: <i>Menopon gallinae</i>						X			
<i>Oxylpeurus dentatus</i>						X			
LOPHURA LEUCOMELANA									
MA: <i>Amyrsidea uniseriata</i>						X			
<i>Goniodes near</i>						X			
<i>Lipeurus introductus</i>						X			
TURNICIDAE									
TURNIX SUSCITATOR									
MA: <i>Turnicola angustissimus</i>			X		X				
TURNIX SYLVATICA									
MA: <i>Turnicola nigrolincatus</i>			X						
TURNIX TANKI									
CH: <i>Leptotrombidium deliense</i>						X			
<i>L. scanloni</i>						X			
<i>L. scutellare</i>						X			
RALLIDAE									
AMAURORNIS PHAENICURUS									
MA: <i>Rallicola ortygometrae</i>								X	
GALLICREX CINEREA									
MA: <i>Rallicola ferrisi</i>					X				
GALLINULA CHLOROPUS									
MA: <i>Laemobothrion chloropodis</i>					X				
<i>Pseudomenopon pilosum</i>					X				
<i>Rallicola minuta</i>					X				
PORZANA FUSCA									
CH: <i>Leptotrombidium deliense</i>								X	
PORZANA TAGUENSIS									
MA: <i>Rallicola tabuensis</i>					X				
RALLINA EURIZONOIDES									
H: <i>Icosta holoptera</i>					X				
RALLUS STRIATUS									
MA: <i>Rallicola ortygometrae</i>					X			X	
CH: <i>Blankaartia acuscutellaris</i>								X	
<i>Leptotrombidium deliense</i>								X	
ROSTRATULIDAE									
ROSTRATULA BENGHALENSIS									
MA: <i>Actornithophilus erinaceus</i>					X				
<i>Pseudomenopon rostratulae</i>					X				
<i>Quadriceps quadrisetaceus</i>					X				
H: <i>Icosta omnisetosa</i>					X				
CHARADRIIDAE									
CHARADRIUS ALEXANDRINUS									
MA: <i>Actornithophilus ochraceus</i>			X						
<i>Quadriceps assimilis</i>			X						
CHARADRIUS DOMINICUS									
MA: <i>Actornithophilus ochraceus</i>					X				
<i>Quadriceps charadrii</i>					X		X		
<i>Saemundssonina conica</i>					X			X	

	Korea	Japan	Taiwan	Hong Kong	Philippines	Thailand	Malaya	Indonesia	India
CHARADRIUS DUBIUS									
MA: Actornithophilus ochraceus					X				
Quadriceps bispus					X				
FM: Breyshosceles charadrii					X	X			
CHARADRIUS LESCHENAULTI									
MA: Actornithophilus ochraceus					X				
Austromenopon aesiaalitidis					X				
Quadriceps assimilis					X				
Q. ptyadis					X				
Saemundssonina chenamycha					X	X			
CHARADRIUS MONGOLUS									
MA: Actornithophilus ochraceus					X				
Austromenopon aesiaalitidis					X				
MA: Quadriceps assimilis					X				
Q. pallasii					X				
Saemundssonina chenamycha					X	X			
CHARADRIUS PERONI									
MA: Actornithophilus ochraceus					X				
Quadriceps assimilis					X				
VANELLUS INDICUS									
MA: Actornithophilus hoplopteri						X			
Quadriceps dasi						X			
SCOLOPACIDAE									
ACTITIS HYPOLEUCOS									
MA: Actornithophilus flumineus	X								
Quadriceps ravus	X								
Saemundssonina tringae					X				
ARENARIA INTERPRES									
MA: Actornithophilus bicolor		X			X				
Quadriceps strepsilaris		X			X				
CALIDRIS ALPINA									
MA: Austromenopon alpinum				X					
Carduiceps meinerzhageni				X					
CALIDRIS CANUTUS									
MA: Actornithophilus unbrinus						X			
Carduiceps zonarius						X			
Luniceps holophaeus						X			
CALIDRIS FERRUGINEA									
MA: Carduiceps zonarius						X			
CALIDRIUS RUFICOLLIS									
MA: Actornithophilus umbrinus					X				
Carduiceps zonarius					X				
CALIDRIS SUBMINUTA									
MA: Actornithophilus ochraceus					X				
A. umbrinus						X			
MA: Carduiceps zonarius					X	X			
CALIDRIS TEMMINCKI									
MA: Actornithophilus umbrinus						X			
HETEROSCELUS INCANUS									
MA: Quadriceps conformis					X				
LIMICOLA FALCINELLUS									
MA: Carduiceps zonarius						X			
Luniceps falcinellus						X			
NUMENIUS MINUTUS									
MA: Austromenopon crocatum					X				
Luniceps numenii					X				
NUMENIUS PHAEOPUS									
MA: Austromenopon phaeopodis	X				X				
Luniceps numenii					X	X			
L. phaeopi					X				
Saemundssonina scolopacis					X				
SCOLOPAX RUSTICOLA									
MA: Cummingsiella aurea						X			
TRINGA GLAREOLA									
MA: Quadriceps obscurus					X				
TRINGA NEBULARIA									
MA: Actornithophilus paludosus					X				
Quadriceps ravus					X				
TRINGA OCHROPUS									
MA: Quadriceps ochropi						X			
TRINGA STAGNATILIS									
MA: Carduiceps zonarius						X			
Quadriceps obscurus					X	X			
TRINGA TOTANUS									
MA: Quadriceps conformis					X	X			
XENUS CINEREUS									
MA: Carduiceps fulvo					X	X			
RECURVIROSTRIDAE									
HIMANTOPUS HIMANTOPUS									
MA: Quadriceps hemichorus						X			
Q. semifissus						X			

GLAREOLIDAE					
GLAREOLA PRATINCOLA					
MA:	Quadriceps ellipticus	X			X
	Turnicola angustissimus	X			
LARIDAE					
ANOUS STOLIDUS					
MA:	Actornithophilus incisus				X
	Quadriceps separatus				X
CHLIDONIAS LEUCOPTERUS					
MA:	Quadriceps pagasti				X
GELOCHELIDON NILOTICA					
MA:	Saemundssonina gelochelidoni				X
HYDROPROGNE CASPIA					
MA:	Quadriceps griseus				X
LARUS BRÜNNEICEPHALUS					
MA:	Saemundssonina lari				X
LARUS RIDIBUNDUS					
MA:	Saemundssonina lari				X
STERNA ANAETHETUS					
MA:	Quadriceps legatus				X
	Saemundssonina meridiana				X
STERNA AURANTIA					
MA:	Saemundssonina hopkinsi				X
STERNA BERGII					
MA:	Actornithophilus piceus				X
STERNA DOUGALLII					
MA:	Saemundssonina sterna				X
STERNA HIRUNDO					
MA:	Actornithophilus piceus				X
	Saemundssonina sterna				X
STERNA SUMATRANA					
MA:	Actornithophilus piceus				X
COLUMBIDAE					
CHALCOPHAPS INDICA					
MA:	Columbicola quimaraesi		X		
H:	Icosta chalcolampra				X
	Ornithomya fuscipennis				X
GEOPELIA STRIATA					
MA:	Columbicola mjobergi		X		
MACROPYGIA PHASIANELLA					
H:	Ornithoictona plicata		X		
CH:	Tortitrombicula asa		X		
PHAPITRERON LEUCOTIS					
H:	Ornithoictora plicata		X		
STREPTOPELIA BITORQUATA					
MA:	Coloceras streptopeliae		X		
H:	Pseudolynchia canariensis		X		
STREPTOPELIA ORIENTALIS					
MA:	Columbicola turturis		X		
	TRERON SPHENURUS	X			
H:	Icosta chalcolampra				X
PSITTACIDAE					
LORICULUS VERNALIS					
M:	Mesonyssus psittaculae				X
CUCULIDAE					
CACOMANTIS MERULINUS					
MA:	Cuculiphilus snodgrassi		X		
H:	Icosta elbeli				X
CACOMANTIS SONNERATI					
MA:	Cuculiphilus snodgrassi		X		
CARPOCOCCYX RENAULDI					
MA:	Rhynonirmus kingi		X		
CENTROPUS SINENSIS					
T:	Haemaphysalis papuana				X
CENTROPUS TOULOU					
H:	Icosta sensilis		X		
	Ornithoica bistativa				X
CH:	Blankaartia acuscutellaris				X
T:	Haemaphysalis centropi				X
	H. doenitzii				X
CENTROPUS VIRIDIS					
H:	Icosta sensilis		X		
	Ornithoica exilis		X		
CUCULUS CANORUS					
MA:	Cuculiphilus fasciatus				X
CUCULUS SPARVERIOIDES					
MA:	Cuculiphilus upsak				X
H:	Ornithomya fuscipennis				X

TYTONIDAE					
PHODILUS BADIUS					
MA:	Strigiphilus marshalli				X
H:	Ornithoica unicolor				X
	Ornithomya avicularis				X
STRIGIDAE					
ASIO OTUS					
MA:	Kurodaia platyclypeatum	X			
GLAUCIDIUM BRODIEI					
MA:	Kurodaia deighani				X
	Strigiphilus siamensis				X
H:	Ornithoica exilis				X
	O. unicolor				X
	Ornithomya avicularia				X
	O. fuscipennis				X
GLAUCIDIUM CUCULOIDES					
MA:	Strigiphilus macrogenitalis				X
NINOX PHILIPPENSIS					
MA:	Strigiphilus heterogenitalis		X		
NINOX SCUTULATA					
MA:	Strigiphilus heterogenitalis		X		
H:	Ornithoica exilis	X			
OTUS BAKKAMOENA					
MA:	Kurodaia platyclypeatum				X
	Strigiphilus heterogenitalis				X
	S. tuleskovi				X
H:	Ornithoica unicolor				X
	Ornithomya avicularia				X
	O. fuscipennis				X
OTUS SCOPS					
MA:	Kurodaia platyclypeatum	X			
	Strigiphilus heterogenitalis				X
	S. tuleskovi				X
H:	Ornithoica unicolor				X
	Ornithomya avicularia	X			
OTUS SPILOCEPHALUS					
MA:	Kurodaia platyclypeatum				X
	Strigiphilus heterogenitalis				X
H:	Ornithoica unicolor		X		X
	Ornithomya avicularia				X
	O. fuscipennis				X
CH:	Leptotrombidium scutellare				X
PODARGIDAE					
BATRACHOSTOMUS HODGSONI					
H:	Ornithoica unicolor				X
	Ornithomya fuscipennis				X
CAPRIMULGIDAE					
CAPRIMULGUS MACRURUS					
MA:	Multicola deighani				X
H:	Pseudolynchia garzettae		X		X
EUROSTOPODUS MACROTES					
CH:	Leptotrombidium scutellare				X
	Toritrombicula hasegawai				X
APODIDAE					
APUS AFFINIS					
MA:	Dennyus minor	X			
APUS PACIFICUS					
MA:	Dennyus clayae				X
CHAETURA COCHINCHINENSIS					
CH:	Trombicula macclurei				X
CHAETURA GIGANTEA					
MA:	Dennyus giganteus		X		
M:	Liponyssoides intermedius		X		
COLLOCALIA ESCULENTA					
MA:	Dennyus orientalis		X		X
	Eureum salangane				X
COLLOCALIA TROGLODYTES					
M:	Liponyssoides intermedius		X		
TROGONIDAE					
HARPACTES ERYTHROCEPHALUS					
H:	Ornithomya avicularia				X
ALCEDINIDAE					
ALCEDO ATTHIS					
MA:	Alcedoffula alcedinis	X			
CH:	Mackiena migratoria	X			
M:	Ornithonyssus sylvitarum	X			
ALCEDO MININTING					
H:	Ornithoica bistativa				X

	Korea	Japan	Taiwan	Hong Kong	Philippines	Thailand	Malaya	Indonesia	India
HALCYON CHLORIS									
MA: Alcedoecus latigenitalis					X			X	
HALCYON LINDSAYI									
H: Ornithoica exilis					X				
HALCYON PILEATA									
MA: Alcedoecus constrictus				X				X	
HALCYON SMYRNENSIS									
MA: Alcedoecus annulatus				X		X		X	
LACEDO PULCHELLA									
MA: Alcedoecus incisus						X			
MEROPIDAE									
MEROPS LESCHENAULTI									
MA: Meropoecus smithi						X			
Ornithophila metallica								X	
MEROPS ORIENTALIS									
MA: Meropoecus capri						X			
MEROPS VIRIDIS									
H: Ornithoica bistativa								X	
Ornithophila metallica								X	
CORACIIDAE									
EURYSTOMUS ORIENTALIS									
MA: Capraiella subcuspidata					X				
H: Ornithoica exilis					X				
BUCEROTIDAE									
ANTHRACOCEROS ALBIROSTRIS									
H: Ornithoica curvata						X			
BUCEROS BICORNIS									
MA: Buceronirmus cephalotes						X			
Bucerophagus forcipatus						X			
M: Ornithonyssus sylviarum						X			
CAPITONIDAE									
MEGALAIMA FAIOSTRICTA									
M: Androlaelaps dissimilis						X			
MEGALAIMA FRANKLINII									
H: Icosta trita						X			
Ornithoica bistativa						X			
Ornithophila metallica						X			
CH: Leptotrombidium scutellare						X			
M: Androlaelaps dissimilis						X			
Pellonyssus biscutatus						X			
MEGALAIMA MYSTACOPHANES									
T: Amblyomma geoemydae						X			
MEGALAIMA VIRENS									
H: Icosta trita						X			
MEGALAIMA ZEYLANICA									
M: Androlaelaps dissimilis						X			
A. haydocki						X			
PICIDAE									
BLYTHIPICUS PYRRHOTIS									
CH: Leptotrombidium deliense						X			
L. scutellare						X			
M: Androlaelaps dissimilis						X		X	
A. haydocki						X			
Ornithonyssus bursa								X	
DENDROCOPOS KIZUKI									
M: Androlaelaps dissimilis		X							
DENDROCOPOS MAJOR									
MA: Bruelia straminea		X							
DRYOCOPUS JAVENSIS									
H: Ornithoictona plicata					X				
PICUS CANUS									
MA: Colpocephalum tirkham		X							
Picicola condidus						X			
M: Pellonyssus trachyphoni						X			
PICUS CHLOROLOPHUS									
M: Ornithonyssus sylviarum									X
PICUS VITTATUS									
H: Ornithoica curvata						X			
Pellonyssus trachyphoni						X		X	
EURYLAIMIDAE									
PSARISOMUS DALHOUSIAE									
H: Ornithoica bistativa						X			
PITTIDAE									
PITTA CYANEA									
H: Icosta fenestella						X			
Ornithoica unicolor						X			

	Korea	Japan	Taiwan	Hong Kong	Philippines	Thailand	Malaya	Indonesia	India
CH: Neoschoengastia sotitus						X			
Toritrombicula hasegawai						X			
PITTA ERYTHROGASTER									
MA: Kelerimenopon thompsoni					X				
H: Ornithoica exilis					X				
N: Eucamsipoda inermis					X				
CH: Neoschoengastia rectangulare					X				
Odontacarus audyi					X				
PITTA MOLUCCENSIS									
CH: Eutrombicula wichmanni								X	
Leptotrombidium deliense								X	
L. rapmundi								X	
Siseca rara								X	
Walchiella oudemansi								X	
PITTA OATESI									
MA: Philopterus claviformis						X			
PITTA SORDIDA									
MA: Kelerimenopon thompsoni					X				
Philopterus claviformis						X			
CH: Leptotrombidium deliense							X		
Toritrombicula asa					X				
PITTA SOROR									
H: Ornithoica bistativa						X			
O. unicolor						X			
CH: Toritrombicula hasegawai						X			
ALAUDIDAE									
ALAUDA ARVENSIS									
MA: Menacanthus alaudae			X						
Penenirmus hibari			X						
MIRAFRA ASSAMICA									
T: Haemaphysalis doenitzi						X			
MIRAFRA JAVANICA									
T: Haemaphysalis doenitzi					X				
HIRUNDINIDAE									
DELICHON URBICA									
MA: Bruelia gracilis		X							
Philopterus excisus		X				X			
H: Craterina hirundinis		X							
Flea: Callopsylla waterstoni		X							
T. Argas japonicus		X							
HIRUNDO DAURICA									
H: Ornithomya biloba						X			
O. comosa						X			
HIRUNDO RUSTICA									
MA: Bruelia domestica						X			
Myrsidea rustica	X					X	X		
Philopterus excisus		X							
H: Ornithomya comosa		X				X	X		
Ornithophila metallica						X	X		
M: Dermanyssus hirundinis		X							
Ornithonyssus bursa						X			
O. sylviarum		X							
HIRUNDO TAHITICA									
H: Ornithoetona plicata								X	
Ornithomya biloba								X	
O. comosa								X	
PSEUDOCHELDON SIRINTARAE									
MA: Philopterus excisus						X			
RIPARIA RIPARIA									
H: Ornithomya comosa						X			
M: Ornithonyssus bursa						X			
T: Haemaphysalis doenitzi						X			
CAMPEPHAGIDAE									
PERICROCOTUS ETHOLOGUS									
H: Icosta fenestella						X			
TEPHRODORNIS VIRGATUS									
CH: Leptotrombidium scutellare						X			
DICRURIDAE									
DICRURUS BALICASIUS									
MA: Myrsidea sindianus					X				
H: Ornithoica exilis					X				
O. rabori					X				
DICRURUS HOTTENTOTUS									
MA: Myrsidea sidianus						X	X		
H: Icosta fenestella								X	
Ornithophila metallica						X			
DICRURUS LEUCOPHAES									
H: Icosta fenestella						X			
M: Pellonyssus reedi					X				



	Korea	Japan	Taiwan	Hong Kong	Philippines	Thailand	Malaya	Indonesia	India
<b>DICRURUS PARADISEUS</b>									
MA: <i>Myrsidea sindianus</i>									X
H: <i>Ornithoica bistativa</i>									X
<i>O. exilis</i>									X
<i>Ornithophila metallica</i>									X
<b>DICRURUS REMIFER</b>									
H: <i>Costa fenestella</i>									X
<i>Ornithophila metallica</i>									X
<b>ORIOLIDAE</b>									
<b>ORIOLUS CHINENSIS</b>									
H: <i>Ornithoica bistativa</i>								X	
<b>ORIOLUS TRAILLI</b>									
H: <i>Ornithophila metallica</i>							X		
<b>CORVIDAE</b>									
<b>CESSA THALASSINA</b>									
H: <i>Ornithoica bistativa</i>									X
<i>O. unicolor</i>									X
<b>CORVUS ENCA</b>									
MA: <i>Colpocephalum fregili</i>					X				
<i>Myrsidea grandiceps</i>					X				
<b>CORVUS MACRORHYNCHOS</b>									
MA: <i>Bruelia sallemi</i>									X
<i>Colpocephalum fregili</i>									X
<i>Myrsidea trithorax</i>									X
<i>Philopterus extraneus</i>									X
<b>CYNOPTICA CYANA</b>									
MA: <i>Menacanthus tibialis</i>									X
<i>Myrsidea cyanopycae</i>									X
<b>GARRULUS GLANDARIUS</b>									
MA: <i>Bruelia glandarii</i>									X
<b>PLATYLOPHUS GALERICULATUS</b>									
CH: <i>Leptotrombidium deliense</i>									X
<b>PARIDAE</b>									
<b>PARUS ATER</b>									
MA: <i>Menacanthus sinuatus</i>									X
CH: <i>Leptotrombidium subintermedia</i>				X					
M: <i>Dermanyssus hirundinis</i>									X
<b>PARUS MAJOR</b>									
MA: <i>Menacanthus sinuatus</i>									X
<b>PARUS MONTICOLUS</b>									
H: <i>Ornithophila metallica</i>									X
CH: <i>Leptotrombidium subintermedia</i>									X
<b>PARUS PALUSTRIS</b>									
M: <i>Ornithonyssus sylviarum</i>									X
<b>PARUS VARIUS</b>									
M: <i>Ornithonyssus sylviarum</i>									X
<b>SYLVIPARUS MODESTUS</b>									
CH: <i>Leptotrombidium deliense</i>									X
<i>L. scutellare</i>									X
<b>TIMALIDAE</b>									
<b>ACTINODURA RAMSAYI</b>									
H: <i>Ornithophila metallica</i>									X
CH: <i>Leptotrombidium scutellare</i>									X
<b>ALCIPPE CASTANEICEPS</b>									
CH: <i>Leptotrombidium bodensis</i>									X
<i>L. deliense</i>									X
<b>ALCIPPE MORRISONIA</b>									
CH: <i>Leptotrombidium scutellare</i>									X
M: <i>Ornithonyssus sylviarum</i>									X
<b>ALCIPPE NIPALENSIS</b>									
M: <i>Ornithonyssus bursa</i>									X
<b>ALCIPPE POIOCEPHALA</b>									
H: <i>Ornithoica bistativa</i>									X
<b>GARRULAX CHINENSIS</b>									
CH: <i>Leptotrombidium deliense</i>									X
<i>L. scutellare</i>									X
<b>GARRULAX ERYTHROCEPHALUS</b>									
H: <i>Ornithoica bistativa</i>									X
<i>Ornithomya fuscipennis</i>									X
CH: <i>Eutrombicula wichmanni</i>									X
<i>Leptotrombidium deliense</i>									X
<i>L. scutellare</i>									X
<b>GARRULAX LEUCOLOPHUS</b>									
CH: <i>Leptotrombidium scutellare</i>									X
<b>GARRULAX MILNEI</b>									
CH: <i>Leptotrombidium scutellare</i>									X
<b>GARRULAX MONLLIGERUS</b>									
CH: <i>Leptotrombidium deliense</i>									X
<b>GARRULAX STREPTANS</b>									
H: <i>Ornithoica bistativa</i>									X

	Korea	Japan	Taiwan	Hong Kong	Philippines	Thailand	Malaya	Indonesia	India
HETEROPHASIA ANNECTENS									
H: Ornithophila metallica									X
HETEROPHASIA MELANOLEUCA									
CH: Leptotrombidium scutellare									X
MACRONUS GULARIS									
M: Ornithonyssus sylviarum									X
NAPOTHERA BREVICAUDATA									
H: Ornithoica bistativa									X
Ornithophila metallica									X
CH: Leptotrombidium deliense									X
L. scanloni									X
PELLORNEUM ALBIVENTRE									
CH: Leptotrombidium scutellare									X
PELLORNEUM CAPISTRATUM									
CH: Leptotrombidium deliense					X		X		
PELLORNEUM RUFICEPS									
H: Ornithoica bistativa									X
Ornithophila metallica									X
CH: Leptotrombidium arvina					X				
L. deliense					X				
L. scutellare					X				
M: Ornithonyssus sylviarum									X
POMATORHINUS ERYTHROGENYS									
CH: Leptotrombidium deliense					X				
L. scutellare					X				
POMATORHINUS HYPOLEUCOS									
CH: Toritrombicula hasegawai					X				
POMATORHINUS OCHARACEICEPS									
CH: Odontacarus audyi					X				
POMATORHINUS SCHISTICEPS									
H: Ornithoica bistativa					X				X
CH: Hemicula lanius					X				
Leptotrombidium scanloni					X				
L. scutellare					X				
M: Ornithonyssus sylviarum									X
STACHYRIS ERYTHROPTERA									
CH: Leptotrombidium deliense					X				
STACHYRIS LEUCOTIS									
CH: Leptotrombidium bodensis								X	
L. deliense								X	
L. keukenshrijveri								X	
M: Echinonyssus nasutus								X	
STACHYRIS MACULATA									
FM: Bicaltrages caudatus								X	
CH: Leptotrombidium deliense								X	
STACHYRIS NEGRICEPS									
CH: Leptotrombidium deliense					X				
L. nakatae					X				
L. scutellare					X				
FM: Bicaltrages caudatus					X				
STACHYRIS POLIOCEPHALA									
CH: Leptotrombidium deliense					X		X		
Odontacarus audyi							X		
M: Ornithonyssus bursa					X				
TIMALIA PILEATA									
CH: Leptotrombidium scutellare					X				
TRICHASTOMA ABBOTTI									
CH: Leptotrombidium arenicola								X	
L. deliense								X	
TRICHASTOMA MALACCENSIS									
CH: Leptotrombidium deliense					X		X		
TRICHASTOMA TICELLI									
CH: Hemicula simena					X				
Leptotrombidium deliense					X				
L. scutellare					X				
TURDOIDES CAUDATUS									
CH: Schoengastia dartevillei									X
TURDOIDES STRIATUS									
M: Ornithonyssus sylviarum									X
T: Haemaphysalis kutchensis									X
YUHINA BRUNNEICEPS									
M: Ornithonyssus bursa				X					
YUHINA FLAVICOLLIS									
CH: Leptotrombidium scutellare					X				
PARADOXORNITHIDAE									
PARADOXORNIS GUTTATICOLLIS									
CH: Leptotrombidium scutellare					X				
Neoschoengastia longipes					X				
PYCNOTIDAE									
CRINIGER OCHRACEUS									
CH: Leptotrombidium deliense					X				

	Korea	Japan	Taiwan	Hong Kong	Philippines	Thailand	Malaya	Indonesia	India
CRINIGER PALLIDUS									
CH: Leptotrombidium scutellare									X
HYPSPETES AMAUROTIS									
H: Ornithomya avicularia		X							
HYPSPETES CRINIGER									
MA: Myrsidea pycnonoti									X
HYPSPETES FLAVALA									
H: Ornithophila metallica									X
CH: Leptotrombidium scutellare									X
HYPSPETES MCCLELLANDII									
CH: Leptotrombidium scutellare									X
HYPSPETES PHILIPPINUS									
MA: Myrsidea pycnonoti					X				
HYPSPETES SQUILORENSIS									
MA: Myrsidea pycnonoti					X				
PYCNONOTUS AURIGASTER									
CH: Leptotrombidium scutellare									X
PYCNONOTUS BLANFORDI									
MA: Myrsidea pycnonoti									X
PYCNONOTUS BRUNNEUS									
CH: Leptotrombidium deliense									X
PYCNONOTUS FINLAYSONI									
MA: Myrsidea pycnonoti									X
PYCNONOTUS FLAVESCENS									
MA: Myrsidea pycnonoti									X
CH: Leptotrombidium scutellare									X
PYCNONOTUS GOIAVIER									
MA: Myrsidea pycnonoti					X				X
H: Icosta sensilis					X				X
Ornithophila metallica					X				X
PYCNONOTUS JOCOSUS					X				X
MA: Myrsidea pycnonoti									X
H: Ornithophila metallica									X
CH: Leptotrombidium scutellare									X
PYCNONOTUS MELANICTERUS									
H: Icosta sensilis									X
I tarsata									X
Ornithoctona plicata									X
M: Pellonyssus trachyphoni									X
PYCNONOTUS SINENSIS									
MA: Myrsidea pycnonoti			X		X				
H: Icosta sensilis					X				
PYCNONOTUS XANTHORRHOS									
CH: Leptotrombidium scutellare									X
PYCNONOTUS ZEYLANICUS									
MA: Myrsidea pycnonoti									X
SPIZIXOS CANIFRONS									
CH: Leptotrombidium scutellare									X
AEGITHINIDAE									
IRENA PUELLA									
H: Icosta fenestella									X
CINCLIDAE									
CINCLUS PALLASII									
MA: Myrsidea franciscocoli			X						
TURDIDAE									
BRACHYPTERYX LEUCOPHRYS									
CH: Neoschoengastia solitus									X
BRACHYPTERYX MONTANA									
H: Icosta sensilis					X				
COCHOA PURPUREA									
CH: Leptotrombidium scutellare									X
COPSYCHUS MALABARICUS									
H: Ornithoica bistativa									X
Ornithophila metallica									X
CH: Leptotrombidium deliense									X
Siseca rara									X
COPSYCHUS SAULARIS									X
H: Ornithoica bistativa									X
Ornithophila metallica									X
ERITHACUS BRUNNEUS									
M: Ornithonyssus sylviarum									X
ERITHACUS CALLIOPE									
MA: Menacanthus nogoma					X				
H: Ornithomya fuscipennis									X
Ornithophila metallica					X				
CH: Neoschoengastia longipes									X
Leptotrombidium deliense									X
L. elisbergi									X

	Korea	Japan	Taiwan	Hong Kong	Philippines	Thailand	Malaya	Indonesia	India
L. scutellare						X			
ERITHACUS CYANE						X			
H: Ornithoica bistativa						X			
CH: Eutrombicula wichmanni						X			
Leptotrombidium deliense						X			
Neoschoengastia longipes						X			
N. solitus						X			
Odontacarus audyi						X	X		
M: Ornithonyssus sylviarum	X								
HODGSONIUS PHOENICUROIDES						X			
H: Ornithoica bistativa						X			
CH: Leptotrombidium scutellare						X			
MONTICOLA SOLITARIUS						X			
CH: Leptotrombidium scutellare						X			
MYIOMELE LEUCURA						X			
H: Ornithophila metallica						X			
CH: Neoschoengastia solitus						X			
Leptotrombidium deliense						X			
L. scutellare						X			
MYOPHONUS CAERULEUS						X			
MA: Myrsidea sultanpurensis				X					
H: Ornithomya avicularia						X			
CH: Leptotrombidium deliense						X			
SAXICOLA FERREA						X			
H: Icosta fenestella						X			
CH: Leptotrombidium scutellare						X			
TARSIGER CHRYSAUSE						X			
CH: Leptotrombidium scutellare						X			
TARSIGER CYANURUS						X			
CH: Leptotrombidium scutellare						X			
TURDUS CARDIS						X			
H: Ornithophila momoyamai	X								
T: Haemaphysalis wellingtoni				X					
TURDUS CHRYSOLAUS						X			
MA: Myrsidea thoracica						X			
TURDUS HORTULORUM						X			
H: Ornithoica tridens				X					
Ornithophila metallica				X					
T: Haemaphysalis wellingtoni				X					
TURDUS MERULA									X
M: Ornithonyssus sylviarum									X
TURDUS NAUMANNI									X
MA: Ricinus elongatus	X								
M: Ornithonyssus sylviarum	X								
T: Ixodes turdus		X							
TURDUS OBSCURUS						X			
MA: Myrsidea thoracica		X				X			
H: Ornithomya avicularia						X			
CH: Leptotrombidium scutellare						X			
TURDUS PALLIDUS						X			
MA: Myrsidea thoracica		X	X						
M: Ornithonyssus sylviarum				X					
ZOOTHERA CITRINA									
H: Icosta fenestella									X
CH: Neoschoengastia solitus									X
M: Ornithonyssus sylviarum									X
ZOOTHERA DAUMA									X
MA: Bruelia daumae		X							X
Myrsidea ishizawai		X							X
CH: Helenicula sjmena									X
Leptotrombidium scutellare									X
T: Haemaphysalis doenitzi									X
ZOOTHERA SIBIRICA									X
MA: Myrsidea thoracica		X							X
H: Ornithoica momiyamai		X							X
Ornithomya avicularia		X							X
SYLVIIDAE									
ACROCEPHALUS ARUNDINACEUS									
H: Ornithomya avicularia									X
ACROCEPHALUS STENTOREUS									X
H: Ornithophila metallica									X
CETTIA CANTARIENS									X
M: Ornithonyssus sylviarum									X
CETTIA PALLIDIPIES									X
CH: Leptotrombidium scutellare									X
LOCUSTELLA LANCEOLATA									X
CH: Blankaartia acuscutellaris						X			X
Leptotrombidium keukenschrijveri						X			X
T: Ixodes granulatus									X
PHRAGMATICOLA AEDON									X
M: Ornithonyssus sylviarum									X

	Korea	Japan	Taiwan	Hong Kong	Philippines	Thailand	Malaya	Indonesia	India
PHYLLOSCOPUS BOREALIS									
H: Ornithonyssus bursa				X					
PHYLLOSCOPUS FUSCATUS									
H: Ornithophila metallica						X			
PRINIA ATROGULARIS									
CH: Leptotrombidium scutellare						X			
PRINIA HODGSONI									
M: Ornithonyssus bursa						X			
PRINIA RUFESCENS									
CH: Leptotrombidium scanloni						X			
L. scutellare						X			
SEICERCUS BURKII									
CH: Leptotrombidium scutellare						X			
MUSCICAPIDAE									
HYPOTHYMIS AZUREA									
MA: Myrsidea chiapensis				X					
MUSCICAPA BANYUMAS									
H: Ornithoica bistativa						X			
Ornithophila metallica						X			
CH: Helenicula simena						X			
Leptotrombidium deliense						X			
L. scutellare						X			
Neoschoengastia solitus						X			
Toritrombicula hasegawai						X			
M: Ornithonyssus sylviarum						X			
MUSCICAPA GRANDIS									
H: Ornithophila metallica						X			
CH: Leptotrombidium scutellare						X			
MUSCICAPA HAINANA									
H: Ornithoica bistativa						X			
Ornithophila metallica						X			
CH: Neoschoengastia solitus						X			
MUSCICAPA LATIROSTRIS									
M: Ornithonyssus sylviarum		X							
MUSCICAPA MONILEGER									
H: Ornithophila metallica						X			
CH: Leptotrombidium scutellare						X			
M: Ornithonyssus sylviarum						X			
MUSCICAPA NARCISSINA									
M: Dermanyssus hirundinis		X							
Ornithonyssus sylviarum		X							
MUSCICAPA PALLIPES									
M: Ornithonyssus sylviarum								X	
MUSCICAPA SUNDARA									
CH: Leptotrombidium scutellare						X			
MUSCICAPA TICKELLIAE									
H: Ornithoica bistativa						X			
CH: Siseca rara						X			
RHIPIDURA ALBICOLLIS									
Diptera: Culicoides malayae						X			
RHIPIDURA CYANICEPS									
MA: Ricinus mugimaki					X				
SAXICOLOIDES FULICATA									
T: Haemaphysalis kutchensis								X	
PACHYCEPHALIDAE									
PACHYCEPHALA PHILIPPINSIS									
H: Ornithophila metallica					X				
MOTACILLIDAE									
ANTHUS HODGSONI									
CH: Leptotrombidium deliense						X			
L. scanloni						X			
L. scutellare						X			
T: Haemaphysalis kutchensis								X	
MOTACILLA ALBA									
MA: Myrsidea dukhunensis		X							
M. rustica		X							
H: Ornithophila metallica		X							
MOTACILLA FLAVA									
MA: Bruelia kratochvili		X							
LANIIDAE									
LANIUS BUCEPHALUS									
MA: Philopterus coarctatus				X					
LANIUS COLLURIOIDES									
H: Icosta sensilis						X			
LANIUS CRISTATUS									
H: Icosta holoptera					X				
M: Ornithonyssus sylviarum								X	
Pellonyssus reedi					X				



## HIPPOBOSCIDAE

Forty families of birds are known to be infested by these louse flies. The role of these flies in the transmission of arbor viruses has not been clarified, but they are proven vectors of Haemoproteus. In California Lynchia fusca (Macquart) has been shown to transmit this infection to the Great Horned Owl, Bubo virginianus. Louse flies common to the Great Horned Owl and to owls of Asia have been Ornithomya fuscipennis, O. avicularis, Ornithoica unicolor and O. exilis but the relationships of these parasites to Haemoproteus are unknown. Seventy percent of the owls examined in Asia have been infected with Haemoproteus or Leucocytozoon.

A summary of Hemiptera and Diptera (Pupipara) collected by the MAPS in 1963-68 by Dr. T. C. Maa: The following is a concised list of the Hemiptera and Diptera (Pupipara) received from the Migratory Animal Pathological Survey up to the end of 1968. The collection proved to be exceedingly interesting and contained 50 species, 17 of which are new to science.

To indicate relative abundance of the various species on different hosts, the number of records (i. e., number of lots, not of specimens) is given after each country under each host. The hosts under each species are arranged alphabetically, and to save space, only their scientific names (omitting subspecific and authors' names) are given. Doubtful and apparently unreliable host records resulting from straggling, mislabeling, misidentification and contamination are each prefixed by an asterisk mark (\*).

### Family POLYCTENIDAE (Hemiptera)

Eoctenes spasmae (Waterhouse)

"Bat": Thailand, 2 records

Widespread in the Orient. Specific on Megaderma spasma (Megadermatidae).

### Family HIPPOBOSCIDAE (Diptera)

Ornithoica (Ornithoica) bistativa Maa

Alcedo meninting: Thailand, 1 record

Alcippe poiocephala: Thailand, 2

Arachnothera longirostra: Thailand, 2

Centropus bengalensis: Malaya, 1

Ceyx erithacus: Malaya, 1

Cissa thalassina: Thailand, 1

Copsychus malabaricus: Thailand, 3

C. saularis: Thailand, 1

Dicrurus paradiseus: Thailand, 1

Erithacus cyane: Thailand, 1

Garrulax erythrocephalus: Thailand, 1

G. mitratus: Malaya, 1

G. strepitans: Thailand, 3

Hodgsonius phoenicuroides: Thailand, 1  
Lanius schach: India, 1  
Megalaima franklini: Thailand, 1  
Merops viridis: Thailand, 1  
Muscicapa banyumas: Thailand, 3  
M. hainana: Thailand, 1  
M. tickellii: Thailand, 1  
Napothera brevicaudata: Thailand, 1  
Oriolus chinensis: Java, 1  
Pellorneum ruficeps: India, 1  
Pitta cyanea: Thailand, 1  
P. soror: Thailand, 1  
Pomatorhinus schisticeps: India, 1; Thailand, 2  
Psarisomus dalhousiae: Thailand, 1  
Zosterops erythropleura: Thailand, 2

India to Indonesia. Known from 35 genera, 15 families, 5 orders of birds; preferring Pycnonotidae and Timaliidae and Turdidae.

Ornithoica (Ornithoica) exilis (Walker)  
Centropus viridis: Philippines, 2 records  
Dicrurus ballicassius: Philippines, 1  
D. paradiseus: Thailand, 1  
Eurystomus orientalis: Philippines, 1  
Glaucidium brodiei: Thailand, 1  
Ninox scutulata: Philippines, 1  
Pitta erythrogaster: Philippines, 1

Very widespread in the Orient. Known from 96 genera, 34 families, 14 orders of birds; preferring Accipitridae, Psittacidae, Cuculidae, Strigidae, Coraciidae, Alcedinidae, Picidae, Sturnidae, Dicruridae and Corvidae.

Ornithoica (Ornithoica) momiyamai Kishida  
Turdus cardis: Japan, 1 record  
Zoothera sibiricus: Japan, 1

Japan. Known from 5 genera, 3 families of passerine birds; probably preferring Turdidae.

Ornithoica (Ornithoica) rabori Maa  
Dicrurus ballicassius: Philippines, 1 record  
Pycnonotus goiavier: Philippines, 1

Philippines. Known from 8 genera, 5 families, 2 orders of birds; preferring Pycnonotidae, Oriolidae and Dicruridae.



Ornithoica (Ornithoica) tridens Maa  
Turdus hortulorum: Hong Kong, 1 record

Taiwan, Kwangtung. Known from 17 genera, 9 families, 3 orders of birds; preferring Turdidae and Dicruridae.

Ornithoica (Ornithoica) unicolor Speiser  
\*Batrachostomus hodgsoni: Thailand, 1 record  
\*Cissa thalassina: Thailand, 1  
Glaucidium brodiei: Thailand, 1  
Otus bakkamoena: Malaya, 1; Thailand, 17  
O. scops: Thailand, 2  
O. spilocephalus: Malaya, 1; Thailand, 12  
Phodilus badius: Thailand, 2  
\*Pitta cyanea: Thailand, 1

West Pakistan to Borneo. Specific on Strigidae.

Ornithoica (Lobolepis) curvata Maa  
Anthracoceros albirostris: Thailand, 1 record  
Centropus sinensis: Malaya, 1; Thailand, 1  
\*Circus melanoleucos: Thailand, 1  
\*Garrulax leucophaeus: Thailand, 1  
\*Phargmaticola aedon: Thailand, 1  
Picus vittatus: Thailand, 4

Ceylon to Borneo. Known from 20 genera, 11 families, 6 orders of birds; preferring Cuculidae, Bucerotidae and Picidae.

Ornithophila metallica (Schiner)  
Acrocephalus stentoreus: Thailand, 1 record  
Actinodura ramsayi: Thailand, 1  
Copsychus malabaricus: Thailand, 2  
C. saularis: Malaya, 1; Thailand, 1  
Dicrurus hottentottus: Thailand, 1  
D. paradiseus: Thailand, 1  
D. remifer: Thailand, 3  
Emberiza cioides: Japan, 1  
Garrulax strepitans: Thailand, 1  
Heterophasia annectens: Thailand, 1  
Hirundo rustica: Malaya, 1  
Hypsipetes flavala: Thailand, 2  
Lonchura punctulata: Java, 1  
Luscinia calliope: Hong Kong, 1  
Merops leschenaulti: Malaya, 2

M. orientalis: Thailand, 1  
M. viridis: Malaya, 7  
Megalaima franklini: Thailand, 1  
Motacilla alba: Korea, 3  
Muscicapa banyumas: Thailand, 2  
M. grandis: Thailand, 1  
M. hainana: Thailand, 1  
M. monileger: Thailand, 1  
Myiomela leucura: Thailand, 1  
Oriolus traillii: Thailand, 1  
Pachycephala philippensis: Philippines, 1  
Parus monticolus: Taiwan, 1  
Pellorneum ruficeps: Thailand, 3  
Phylloscopus fuscatus: Thailand, 1  
Ploceus philippinus: Thailand, 1  
Pycnonotus goiavier: Malaya, 4; Philippines, 1; Thailand, 3  
P. jocosus: Thailand, 1  
Strunus tristis: Thailand, 1  
Turdus hortulorum: Hong Kong, 1

Very widespread in the entire Old World. Known from 134 genera, 42 families, 13 orders of birds; preferring Coraciidae, Alcedinidae, Pycnonotidae, Muscicapidae, Sturnidae, Dicruridae and Corvidae, Turdidae.

Ornithomya avicularia aobatonis Matsumura  
Acrocephalus arundinaceus: Korea, 1 record  
Emberiza rutila: Korea, 1  
E. spodocephala: Korea, 1; Japan, 1  
E. tristrami: Korea, 1  
Hypsipetes amaurotis: Japan, 1  
Otus scops: Japan, 2  
Turdus sibiricus: Japan, 2

Japan, Korea. Known from 13 genera, 8 families, 5 orders of birds; preferring Accipitridae, Muscicapidae and Corvidae.

Ornithomya chloropus extensa Maa  
Emberiza rutila: Korea, 1 record  
Erythrura vinacea: Taiwan, 1  
Fringilla montifringilla: Japan, 1

Korea, Japan, Taiwan. Known from Motacillidae and Muscicapidae.

Ornithomya fuscipennis Bigot  
Batrachostomus hodgsoni: Thailand, 1 record  
Cuculus sparverioides: Thailand, 1

Chalcophaps indica: Thailand, 2  
Emberiza rutila: Hong Kong, 1  
Garrulax erythrocephalus: Thailand, 1  
Glaucidium brodiei: Thailand, 2  
Harpactes erythrocephalus: Thailand, 1  
Myiophoneus caeruleus: Thailand, 1  
Otus bakkamoena: Thailand, 3  
O. spilocephalus: Thailand, 7  
Phodilus badius: Thailand, 1  
Saxicola ferrea: Thailand, 1  
Turdus obscurus: Thailand, 1  
Zoothera dauma: Taiwan, 1

Burma to Australia. Known from 42 genera, 19 families, 11 orders of birds; preferring Accipitridae, Columbidae, Strigidae, Podargidae, Trogonidae, Alcedinidae and Turdidae.

Ornithomya biloba Dufour

Hirundo daurica: Thailand, 2 records  
H. tahitica: Malaya, 1

Widespread in the Palaearctic, sporadically in the Orient. Specific on Hirundo (Hirundinidae).

Ornithomya comosa Austen

Hirundo daurica: Thailand, 1 record  
H. rustica: Korea, 1; Malaya, 11; Thailand, 15  
H. tahitica: Malaya, 1  
Riparia paludicola: Nepal, 1  
R. riparia: Thailand.

Nepal, India to Malaya. Specific on Hirundo, occasionally on Riparia (Hirundinidae).

Crataerina hirundinis (Linnaeus)

Delichon urbica: Japan, 13 records

Widespread in the Palaearctic. Specific on Delichon (Hirundinidae).

Ornithoctona plicata (von Olfers)

Accipiter badius: Thailand, 2 records  
A. virgatus: Thailand, 1  
Arborophila cambodiana: Thailand, 1  
Aviceda jerdoni: Philippines, 1  
Dryocopus javensis: Philippines  
Gorsachius melanolophus: Philippines, 1

Macropygia phasianella: Philippines, 2  
Phapitreron leucotis: Philippines, 1

Very widespread in the Old World tropics, from Madagascar to the Samoa and Tonga Is. Known from 52 genera, 20 families, 12 orders of birds; preferring Accipitridae, Columbidae and Psittacidae.

Icosta (Ornithopus) lonchurae Maa  
Acrocephalus arundinaceus: Malaya 1 record  
Lonchura atricapilla: Malaya, 1  
L. ferruginosa: Philippines, 1  
L. leucogaster: Philippines, 1  
L. punctulata: Singapore, 1; Taiwan, 1; Thailand, 7  
L. striata: Taiwan, 13  
Ploceus philippinus: Thailand, 1  
\*Rhipidura javanica: Philippines, 1

Thailand to Taiwan and the Philippines. Specific on Lonchura (Ploceidae).

Icosta (Ornithopus) sensilis sensilis Maa  
Brachypteryx montans: Philippines, 1 record  
Centropus toulou: Philippines, 4; Thailand, 2  
C. viridis: Philippines, 2  
Copsychus saularis: Thailand, 2  
\*Hirundo tahitica: Malaya, 1  
Lanius collurioides: Thailand, 1  
L. cristatus: Malaya, 1  
Pycnonotus goiavier: Malaya, 2; Singapore, 1; Thailand, 1  
P. melanicterus: Thailand, 1  
P. sinensis: Hong Kong, 1

East Pakistan to the Philippines. Known from 10 genera, 7 families, 2 orders of birds; preferring Cuculidae, Pycnonotidae, Muscicapidae and Laniidae.

Icosta (Icosta) chalcopampra (Speiser)  
Accipiter badius: Thailand, 1 record  
A. nisus: Thailand, 1  
A. trivirgatus: Thailand, 2  
A. virgatus: Thailand, 2  
Chalcophaps indica: Thailand, 1  
Cuculus saturatus: Thailand, 1  
Pitta cyanea: Thailand, 1  
Treron sphenurus: Thailand, 1

Burma to Australia and the Solomon Is. Known from 31 genera, 15

families, 8 orders of birds; preferring Accipitridae, Columbidae, Psittacidae, Sturnidae and Corvidae.

Icosta (Icosta) elbeli Maa

Cacomantis merulinus: Thailand, 1 record

Centropus sinensis: Thailand, 1

Assam to the Philippines. Specific on Cuculidae.

Icosta (Icosta) fenestella Maa

Dicrurus hottentottus: Thailand, 1

D. leucophaeus: Thailand, 5

D. paradiseus: Thailand, 2

D. remifer: Thailand, 2

Glaucidium brodiei: Thailand, 1

Irena puella: Thailand, 1

Monticola gularis: Thailand, 1

Muscicapa grandis: Thailand, 1

Pericrocotus ethologus: Thailand, 1

Pitta cyanea: Thailand, 2

Zoothera citrina: Thailand, 1

Burma to Taiwan and the Philippines. Known from 16 genera, 12 families, 6 orders of birds; preferring Muscicapidae, Dicruridae and Corvidae.

Icosta (Icosta) longipalpis (Macquart)

Aquila nipalensis: Thailand, 2 records

Ictinaetus malayensis: Thailand, 1

East Pakistan to the Philippines. Known from 7 genera, 2 families, 2 orders of birds; specific on Accipitridae, particularly Spilornis.

Icosta (Icosta) tarsata Maa

Myiophoneus caeruleus: Thailand, 1 record

\*Pycnonotus melanicterus: Thailand, 1

Thailand, probably specific on Myiophoneus (Turdidae).

Icosta (Icosta) trita (Speiser)

Megalaima franklini: Thailand, 1

M. virens: Thailand, 2

\*Muscicapa banyumas: Thailand, 1

Burma to Taiwan. Specific on Megalaima (Capitonidae).

Icosta (Ardmoeca) ardeae ardeae (Macquart)

Bubulcus ibis: Taiwan, 2 records

Ixobrychus cinnamomeus: Thailand, 1

Very widespread in the Old World. Specific on Ardeidae.

Icosta (Ardmoeca) holoptera omnisetosa Maa

\*Lanius cristatus: Philippines, 1 record

Porzana paykullii: Malaya, 1

Rallina eurizonoides: Philippines, 1

Rostratula benghalensis: Philippines, 1

Found sporadically in the Orient, very seldom collected. Specific on Rallidae.

Icosta (Ardmoeca) macclurei Maa

Anastomus oscitans: Thailand, 11 records

Phalacrocorax pygmaeus: Java 2

P. sulcirostris: Java, 6

Thailand, Java. Specific on Phalacrocoracidae and Ciconiidae.

Phthona nigrita (Speiser)

Microhierax erythrogenys: Philippines, 1 record

\*Charadrius leschenaulti: Philippines, 1

Philippines, specific on Microhierax erythrogenys (Falconidae).

Pseudolynchis canariensis (Macquart)

Streptopelia bitorquata: Philippines, 2 records

A cosmopolitan parasite of domestic pigeon; on wild Accipitridae and Columbidae in the Old World.

Pseudolynchia garzettae (Rondani)

Caprimulgus affinis: Thailand, 1 record

C. macrurus: Philippines, 1; Thailand, 2

Widespread in the Old World. Known from 14 genera, 7 families, 7 orders of birds; preferring Strigidae and Caprimulgidae.

Family STREBLIDAE (Diptera)

Brachytarsina parvior Maa

Eonycteris robusta: Philippines, 4 records

"Bat": Thailand, 3

Widespread in the Orient. Specific on Eonycteris (Pteropodidae).

Raymondia pagodarum Speiser  
\*Rhinolophus acuminatus: Thailand  
"Bat": Thailand, 1

Widespread in the O-

Raymondia pseudopagodarum Jobling  
\*Eonycteris robusta: Philippines, 1 record  
\*Lanius tigrinus: Thailand, 1  
Rhinolophus coelophyllus: Thailand, 2  
Rhinolophus sp.: Thailand, 1  
"Bat": Thailand, 15

Widespread in the Orient. On Rhinolophus (Rhinolophidae).

Family NYCTERIBIIDAE (Diptera)

Eucampsipoda inermis Theodor  
\*Eonycteris robusta: Philippines, 26 records  
\*Rousettus leschenaulti: Thailand, 1  
\*Scotophilus heathii: Thailand  
"Bat": Thailand, 9

Widespread in the Orient. On Rousettus amplexicaudatus (Pteropodidae).

Eucampsipoda latisternum Schuurmans Stekhoven  
\*Cynopterus brachyotis: Thailand, 1 record  
Rousettus amplexicaudatus: Thailand, 10  
R. leschenaulti: Thailand, 7

India, Ceylon to Indonesia. On Rousettus, particularly R. leschenaulti (Pteropodidae).

Eucampsipoda philippinensis Ferris  
\*Ptenochirus jagori: Philippines, 1 record  
Philippines. On Eonycteris robusta (Pteropodidae).

Eucampsipoda sundaica Theodor  
\*Eonycteris robusta: Philippines, 6 records  
E. spelaea: Thailand, 15  
"Bat": Thailand, 6

Thailand to Indonesia and the Philippines. On Eonycteris spelaea and E. major (Pteropodidae).

Leptocyclopodia ferrarii (Rondani)

Cynopterus brachyotis: Philippines, 4 records; Singapore, 2; Thailand, 33  
C. luzoniensis: Philippines, 1  
C. sphinx: Thailand, 2  
\*Eonycteris spelaea: Thailand, 1  
Megaerops ecaudatus: Thailand, 1  
"Bat": Thailand, 6

Widespread in the Orient. On Cynopterus (Pteropodidae).

Leptocyclopodia simulans (Theodor)  
\*Cynopterus brachyotis: Philippines, 1 record  
\*Eonycteris robusta: Philippines, 2  
Ptenochirus jagori: 8

Philippines. On Ptenochirus jagori (Pteropodidae).

Leptocyclopodia thaii Maa  
Sphaerias blanfordi: Thailand, 1 record

Thailand. On Sphaerias blanfordi (Pteropodidae).

Cyclopodis horsfieldi de Meijere  
Pteropus hypomelanus: Thailand, 1 record  
P. vampyrus: Philippines, 3; Thailand, 2

Burma to Celebes. On Pteropus particularly P. vampyrus (Pteropodidae).

Basilina benkingi Maa  
"Bat" (#M 106): Thailand, 1 record

Thailand. Host uncertain.

Basilina chlamydophora (Speiser)  
Scotophilus temminckii: Thailand, 5 records

Widespread in the Orient. On Scotophilus temminckii (Vespertilionidae).

Phthiridium caudatum (Theodor)  
"Bat" (#M159-160): Thailand, 2 records

Burma, Thailand. On Rhinolophus (Rhinolophidae).

Phthiridium fraternum (Theodor)  
Rhinolophus sp.: Thailand, 1 record  
"Bat": Thailand, 3



Malaya, Thailand. On Rhinolophus (Rhinolophidae).

Phthiridium kittii Maa

Rhinolophus lepidus: Thailand, 1 record

Thailand. On Rhinolophus (Rhinolophidae).

Records and descriptions of the above-listed material are incorporated in the following reports by me (descriptions of 2 Brachytarsina and 1 Phthiridium species are yet to be published):

1. The genus Ornithoica Rondani. Pacif. Ins. Monogr. 10: 10-124, 139-140 1966
2. On the genus Pseudolynchia Bequaert. Pacif. Ins. Monogr. 10: 125-138, 140. 1966
3. A synopsis of Diptera Pupipara of Japan. Pacif. Ins. 9: 727-760. 1967
4. Partial revision of the Cyclopodiinae. Pacif. Ins. 8:648-685. 1966
5. Additions to the Cyclopodiinae. Part I. Pacif. Ins. 10: 1-23
6. New Basilina species from Thailand, Mexico and Brazil. Pacif. Ins. 10: 25-32. 1968
7. Synopses of the genera Ornithophila and Ornithoctona with remarks on their habitat diversification. Pacif. Ins. Monogr. 20: 3-25
8. A revision of Icosta Speiser (= Lynchia auctt.) with erection of a new genus Phtona. Pacif. Ins. Monogr. 20: 27-204
9. Further notes on Lipopteniae. Pacif. Ins. Monogr. 20: 205-236
10. Notes on the Hippoboscidae, II. Pacif. Ins. Monogr. 19: 237-260
11. A revised checklist and concise host index of Hippoboscidae. Pacif. Ins. Monogr. 20: 261-299

## MALLOPHAGA

There have been identifications of 163 species of bird lice from Asian birds. Many of these parasites are known to scarify the tissue and ingest blood. Most of them feed upon exudates and feather scales. Their role in the mechanical transmission of arbor viruses or rickettsiae has not been clarified. Of all of the avian parasites they are among the most host specific. This would limit their epizootic relationships to disease except within the closed circuit of one species or genus.

## TICKS

In recent years a number of viruses and rickettsias have been recovered from ticks, many that have avian hosts at some stage of their life cycle. Ten species of ticks have been identified among the MAPS collections and some of these are known or suspected virus or rickettsia vectors.

Kyasanur Forest virus, recognized in 1957 as an important infectious agent of a man in India, is transmitted by Haemaphysalis papuana. This disease could be a potential health hazard in South-east Asia where ground inhabiting birds could move the ticks long distances. This tick has been identified from Centropus sinense, the common Coucal, a ground cuckoo of Thailand. It and other similar coucals of the same genus are wide spread as scrub inhabiting birds of SE Asia.

Some species of Amblyomma are vectors of rickettsial disease: A. americanum a vector for tick paralysis, spotted fever, and tularemia in America; three species of Amblyomma in Africa are incriminated as vectors of Boutonneuse Fever a tick typhus caused by Rickettsia conori. These Amblyommas have been found in Egypt, France, Bulgaria, Israel and Azerbaijan and their larvae or nymphs have been collected from northward migrating birds. Among the MAPS collections has been found A. geoemydae infecting the widespread Gaudy Barbet, Megalaima mystacophanes, which is a forest species.

Studies are underway concerning the life cycle and vectorability of the soft tick Argas robertsi described in 1968 from domestic chickens in Queensland. This species develops immense populations in an Open-billed Stork colony near Bangkok and is heavily infected with some virus agent that is lethal to mice. The juvenile storks are heavily parasitized by the tick larvae and could transport them long distances. Adult and nymphal ticks are intermitten feeders and remain attached to the bird only a few hours.

Seven other ticks identified in the MAPS collections were Ixodes turdus, I. granulatus, Haemaphysalis kutchensis, H. wellingtoni, H. centropi, H. doinitze and Argas japonicus. (See Table 35 for hosts).

## CHIGGERS

In spite of the effectiveness of antibiotic drugs Scrub Typhus (tsutsugamushi) continues to be an important public health hazard over much of Asia especially to western foreigners. It is now believed to be endemic north and west of the Indus River to southern and eastern Siberia, through semi-desert, montane desert, alpine terrain, lowland habitats including deciduous, tropical deciduous, to tropical rain forests into the Philippines and the Indonesian archipelago. Throughout this vast geographical and habitat range it appears to be associated with a number of vector trombiculid mites and a host of avian and mammalian hosts.

Leptotrombidium deliense is a widespread vector and can survive from Japan to Malaysia in nearly every habitat which is in forest or has recently been deforested. Among the MAPS collections this chiggers has been found on ten families, Phasianidae, Turnicidae, Picidae, Pittidae, Paridae,

Timaliidae, Pycnonotidae, Turdidae, Muscicapidae and Fringillidae. Most of its avian hosts are those that inhabit the soil surface or low shrubery.

Leptotrombidium arenicola is a co-species which replaces deliense on sandy beaches. It was found on Abbotts Jungle Babbler, a brushland species (Trichastoma abbotti) in Malaya.

Leptotrombidium akamushi is also widespread. It was identified in Japan as the vector of tsutsugamushi but later was shown to be involved as a vector and resident of grasslands and scrub as far south as Malaysia. It parasitizes a long list of ground loving avian hosts.

Leptotrombidium scutellare is an important vector in Japan where it is found on insular areas, transmitting a fall and winter infection of Scrub Typhus. It was identified from 16 families of birds in Thailand: Phasianidae, Turnicidae, Strigidae, Caprimulgidae, Capitonidae, Picidae, Campephagidae, Paridae, Timaliidae, Paradoxornithidae, Pycnonotidae, Turdidae, Sylviidae, Muscicapidae, Motacillidae, and Fringillidae. It was most common on terrestrial species.

Leptotrombidium subintermedia and certain other chiggers have been found in ecological islands in all of the montane habitats under study in West Pakistan by Robt. Traub and his associates, despite intervening mountains, rivers or semi-deserts. It was abundant and may have been a tsutsugamushi reservoir. This species was collected from the Coal Tit, Parus ater, in Taiwan.

Other species of Leptotrombidium are widespread in distribution and have been picked up in MAPS collections. These have included bodensis which infests a number of families in Malaya and was taken from Timaliidae in Thailand; rapmundi from Pittidae and Turdidae; scanloni from Turnicidae, Timaliidae and Motacillidae; keukenschrijveri from Rallidae, Pittidae, Timaliidae, and Sylviidae; elisbergi from Turdidae; nakatae from Timaliidae; arvina from Pittidae, Timaliidae, Turdidae and Nectariniidae.

The genera Mackiena and Neoschoengastia are trombiculid mites which are usually specific to birds, although some have been found on mammals. These infestations have been thought to be accidental. Among the species of these groups in the MAPS collections have been Neoschoengastia longipes from Paradorornithidae and Turdidae; rectangulare from Pittidae; solitus from Coraciidae, Pittidae, Turdidae, and Muscicapidae. Mackiena migratoria has been reported from Alcedinidae.

Eutrombicula wichmanni is found on a wide range of hosts from reptiles to rats and was originally thought to be specific to rodents in Japan. Subsequently they have been found on so many groups that rodent infestations may

be only incidental. In MAPS collections they have been found on Pittidae, Ardeidae, Timaliidae, and Muscicapidae.

Other chigger groups appearing in MAPS collections have been: Toritrombicula hasegawai from Caprimulgidae, Pittidae, Timaliidae and Muscicapidae; T. asa from Columbidae and Pittidae; T. densipiliata from Ardeidae, Columbidae, Rallidae, Pittidae, Turdidae, and Muscicapidae; T. uphami from Pittidae, Turdidae and Muscicapidae. Walchiella oudemansi from Pittidae. Siseca rara from Pittidae, Rallidae, Turdidae and Muscicapidae. Blankaartia acuscutellaris from Ardeidae, Rallidae, Cuculidae and Sylviidae. Helenicula simeria from Timaliidae, Turdidae and Muscicapidae; H. lanius from Timaliidae. Ondontacarus audyi from Columbidae, Rallidae, Pittidae, Timaliidae, Turdidae and Muscicapidae. Schoengastia dartavellei from Timaliidae, S. vieta from Ardeidae and Pittidae. Trombicula macclurei from Apodidae.

Chiggers on birds at Fraser's Hill, Malaya: From September to December 1968 entomologists from the U. S. Army Medical Research Unit of Kuala Lumpur accompanied the MAPS team to Fraser's Hill where birds attracted to lights at a radio relay station on 4,700 ft. peak were being netted and they examined these birds for the presence of chiggers. The total number of birds examined was 1238, 377 (30.4%) of which were infested with chiggers. These included the twelve species listed in Table 36 and a possible new species. Fourteen species of birds including 554 (44.7%) of the birds harbored these parasites. In a previous study (McClure, in press) at Mt. Brinchang, a few miles further north in the same mountain range, Leptotrombidium scutellaris was the species found on migrant Grey-headed Thrushes, Turdus obscurus. In the present study Toritrombicula densipiliata made up 63.3% of the collections and L. scutellaris was not reported.

Ectoparasites have been collected from many of the same species of birds moving across the mountains of Luzon at Dalton Pass, but the collections have not been quite as intensive as those made at Fraser's Hill. However Pitta sordida migrates in numbers across both mountain ranges. Only Toritrombicula asa was collected at Dalton Pass. This raises the fascinating possibility that the ectoparasites a migrant carried with it into the tropics or subtropics may indicate its origin or route of travel from the north. The continental route of flight for the Hooded Pitta arriving in Malaya was a source of many more species of chiggers parasites than the route taken by the same bird entering or moving through Luzon.

Other Acarina: In addition to the above parasites birds are hosts to several other families and genera of mites. Many of these are nest inhabiting parasites that bite the bird and soon drop off, others many remain for a longer period.

Thirteen species of these mites have been identified in the MAPS col-

TABLE 36. TROMBICULID MITES COLLECTED FROM BIRDS MIGRATING AT NIGHT OVER THE 4700 FT, PEAK OF FRASER'S HILL, PAHANG, MALAYA IN THE FALL OF 1968. FIGURES IN PARENTHESIS INDICATE THE AVERAGE NUMBER OF CHIGGERS PER BIRD.

	Status	Number Examined	Leptotrombidium	Leptotrombidium	Leptotrombidium	Leptotrombidium	Toritrombicula	Toritrombicula	Odontacarus	Siseca	Eutrombicula	Neoschoengastia	Schoengastia	Blakartia	Totals	Ave. Number of chiggers per bird
			(L.) delense	(L.) arvina	(L.) keukenschri- jveri	(L.) bodense	densipiliata	uphami	audyi	rara	wichmanni	solitus	vieta	acuscutellaris		
Black Bittern	Migrant	6					2				10(1.7)		10(1.7)		22	3.7
<i>Dupetor flavicollis</i>	Migrant	2												4(2.0)	4	2.0
Chinese Little Bittern																
<i>Ixobrychus sinensis</i>	Itinerant	91	6			7	3		1						17	.2
Emerald Dove																
<i>Chalcophaps indica</i>	Resident	1	2												2	2.0
Barred Cuckoo-Dove																
<i>Macropygia unchall</i>	Resident	35	48(1.4)		1	59(1.7)	2		2	2					114	3.2
Malay Banded Crane																
<i>Rallina fasciata</i>	Migrant	4										2			2	.5
Broad-billed Roller																
<i>Eurystomus orientalis</i>	Migrant	223	152	6	71	118	1712(7.7)	43	97	30		13	1		2243	10.0
Hooded Pitta																
<i>Pitta sordida</i>	Migrant	92	307(3.3)	18	3	93	136(1.5)	5	1	45	173(1.9)	8	22		811	8.8
Blue-Winged Pitta (Moluccan)																
<i>Pitta moluccensis</i>	Itinerant	3		1			12(4.0)		7(2.3)						20	6.6
Orange-headed Thrush																
<i>Zoothera citrina</i>	Migrant	32	13			1	47(1.5)	3	11						75	2.3
Siberian Blue Robin																
<i>Erithacus cyane</i>	Migrant	27	1				409(15.1)	10	30						450	16.6
Migratory Jungle Flycatcher																
<i>Rhinomyias brunneata</i>	Migrant	9	1				6				1				8	.9
Ferruginous Flycatcher																
<i>Muscicapa rufilata</i>	Migrant?	16	1				168(10.5)	4							173	10.8
Blue-throated Flycatcher																
<i>Muscicapa rubeculoides</i>	Migrant	13					14(1.0)	6	1						21	1.6
Tricolored Flycatcher																
<i>Muscicapa zanthopygia</i>																
Total		554	531(.9)	25(.04)	75(.1)	278(.5)	2511(4.5)	71(.1)	150(.3)	77(.1)	184(.3)	23(.04)	33(.05)	4(.007)	3962	7.1
% of infestations			13.4	6.	1.8	7.0	63.3	1.7	3.7	1.9	4.6	.5	.8	.1		

lections. These have been: Androlaelaps crispis from Fringillidae, A. haydocki from Capitonidae and Picidae, A. dissimilis from Capitonidae and Picidae. Echinonyssus nasutus from Timaliidae. Dermanysus hirundinis from Hirundinidae, Paradae, Muscicapidae and Fringillidae. Pellonyssus reedi from Dicruridae, Laniidae and Fringillidae; P. biscutatus from Capitonidae. Liponissoides intermedia from Apodidae. Mesonyssus psittaculae from Psittacidae. Ornithonyssus bursa from Ciconiidae, Picidae, Hirundinidae, Timaliidae, Laniidae, Sturnidae, and Fringillidae; O. sylviarum from Alcedinidae, Bucerotidae, Picidae, Hirundinidae, Paridae, Timaliidae, Turdidae, Sylviidae, Muscicapidae, Laniidae and Fringillidae. Although these mites have wide geographical distribution and host selection, they have not been incriminated as effective vectors of virus or rickettsial disease.

Bat Ectoparasites: Although bats occupy the air above most terrestrial habitats in Asia, they are difficult to identify in the hand and impossible to distinguish in the air. When nets remain open all night numerous bats are captured but most have been released by the banders, collected for museums, or banded and released. The collection of ectoparasites has been done extensively only in Malaya, Thailand and the Philippines. Dr. Maa lists the identifications of parasites in the MAPS collections in his discussion of the Pupipara.

# MIGRATORY ANIMAL PATHOLOGICAL SURVEY

## ANNUAL PROGRESS REPORT

1968

### PART V

#### BLOOD INFECTIONS AMONG EAST ASIAN BIRDS

Dr. Marshall Laird and his associates are establishing an international reference center for the identification of haematozoa on a world wide basis. This center at the Memorial University of Newfoundland, St. John's, will eventually have extensive reference collections for comparative studies and identification of blood parasites from all over the world. At present it is in a state of organization and staffing. Miss Somtrakul Paurkpon spent the period August 1968 to March 1969 at this laboratory learning techniques and identification characters of haematozoa and screening positive slides already sent there from the MAPS collections. She returned to Bangkok with these data which have been incorporated in the records. Because of the general interest of students of haematozoa and collectors in the field these data are listed in Table 41. No attempt has been made to summarize this as yet, because much more will be added from the 20, 000 slides still under study. To date more than 21, 000 slides from about 700 species of avian hosts have been examined. Many of these host samples have been small and no positives recorded. However, 47% of the species have had infections of haematozoa, trypanosomes or microfilaria and 16% of all blood films have been positive.

Table 41 lists the data from only those species that have had infections. The negative information is listed here by species with the number of slides examined.

<i>Phalacrocorax carbo</i>	2	<i>P. pygmeus</i>	20
<i>Fregata andrewsi</i>	3	<i>F. ariel</i>	2
<i>Ardea cinerea</i>	6	<i>A. purpurea</i>	2
<i>Ardeola ralloides</i>	11	<i>A. ibis</i>	48
<i>Egretta alba</i>	15	<i>E. garzetta</i>	57
<i>E. intermedia</i>	2	<i>Ixobrychus eurhythmus</i>	3
<i>Gorsachius melanolophus</i>	1	<i>Nycticorax caledonicus</i>	3
<i>Anastomus oscitans</i>	120	<i>Nettapus coromandelianus</i>	1
<i>Accipiter badius</i>	10	<i>A. gentilis</i>	1
<i>A. gularis</i>	1	<i>A. nisus</i>	2
<i>Buteo buteo</i>	1	<i>Circus aeruginosus</i>	1
<i>C. cyaneus</i>	1	<i>C. melanoleucos</i>	3
<i>Haliastur indus</i>	2	<i>Heiraetus kienerii</i>	1

<i>Spizaetus cirrhatus</i>	1	<i>Microheirax caerulescens</i>	2
<i>Arborophila brunneopectus</i>	1	<i>A. rufugularis</i>	1
<i>Gallus gallus</i>	17	<i>Melanoperdix nigra</i>	2
<i>Turnix ocellata</i>	1	<i>T. tanki</i>	10
<i>Gallicrex cinerea</i>	6	<i>Gallinula chloropus</i>	10
<i>Porzana fusca</i>	28	<i>P. tabuensis</i>	18
<i>Rallus mirificus</i>	2	<i>R. philippensis</i>	9
<i>R. striatus</i>	36	<i>Rostratula benghalensis</i>	18
<i>Charadrius alexandrinus</i>	16	<i>C. dominica</i>	66
<i>C. mongolus</i>	26	<i>C. peroni</i>	12
<i>C. placidus</i>	2	<i>C. squatarolus</i>	2
<i>Arenaria interpres</i>	5	<i>Calidris alpina</i>	8
<i>C. canutus</i>	1	<i>C. ferruginae</i>	1
<i>C. subminuta</i>	52	<i>C. ruficollis</i>	12
<i>C. temminkii</i>	5	<i>C. tenuirostris</i>	1
<i>Capella gallinago</i>	14	<i>C. hardwickii</i>	2
<i>C. solitaria</i>	1	<i>Himantopus himantopus</i>	1
<i>Glareola pratincola</i>	1	<i>Anous stolidus</i>	1
<i>Chlidonias hybridus</i>	1	<i>C. leucopterus</i>	6
<i>Larus argentatus</i>	1	<i>Sterna anethetus</i>	1
<i>S. bergii</i>	4	<i>S. daugalli</i>	4
<i>S. fuscata</i>	1	<i>S. hirundo</i>	4
<i>S. sumatrana</i>	7	<i>Caloenas nicobarica</i>	2
<i>Geopelia striata</i>	87	<i>Phapitreron amethystina</i>	4
<i>Sphenurus sphenurus</i>	1	<i>Streptopelia bitorquata</i>	100
<i>S. tranquebarica</i>	3	<i>Treron sphenura</i>	1
<i>Psittacula longicauda</i>	2	<i>Tanygnathus lucionensis</i>	6
<i>Cacomantis sonneratii</i>	10	<i>Centropus sinensis</i>	5
<i>Chrysococcyx maculatus</i>	5	<i>Clamator coromandus</i>	11
<i>Cuculus fugax</i>	2	<i>C. micropterus</i>	1
<i>C. saturatus</i>	4	<i>Phoenicophaeus curvirostris</i>	2
<i>P. diardi</i>	3	<i>P. tristis</i>	1
<i>Surniculus lugubris</i>	10	<i>Tyto alba</i>	2
<i>T. capensis</i>	1	<i>Batrachostomus hodsoni</i>	1
<i>B. javensis</i>	1	<i>B. septimus</i>	2
<i>B. stellatus</i>	10	<i>Caprimulgus affinis</i>	1
<i>C. indicus</i>	2	<i>C. macrourus</i>	49
<i>Apus affinis</i>	13	<i>A. pacificus</i>	10
<i>Chaetura gigantea</i>	3	<i>C. picina</i>	1
<i>Collocalia maxima</i>	7	<i>C. troglodytes</i>	12
<i>C. vestita</i>	2	<i>C. whiteheadi</i>	17
<i>Harpactes diardii</i>	10	<i>H. erythrocephalus</i>	15
<i>H. kasumba</i>	4	<i>H. oreskios</i>	1
<i>H. orrhophaeus</i>	1	<i>Alcedo euryzona</i>	6
<i>A. meninting</i>	20	<i>Ceyx cyanopectus</i>	4
<i>C. melanurus</i>	1	<i>Merops leschenaulti</i>	16



<i>M. philippinus</i>	5	<i>M. superciliosus</i>	2
<i>Nyctiornis athertoni</i>	1	<i>N. amictus</i>	1
<i>Anorrhinus galleritus</i>	1	<i>Berenicornis comatus</i>	1
<i>Penelopides panini</i>	1	<i>Megalaima australis</i>	2
<i>M. haemacephala</i>	80	<i>M. mystacophanes</i>	2
<i>Indicator archipelagicus</i>	1	<i>Blythpicus pyrrhotis</i>	10
<i>B. rubiginosus</i>	6	<i>Chrysocolaptes lucidus</i>	7
<i>C. validus</i>	1	<i>Dendrocopos atratus</i>	3
<i>D. canicapillus</i>	1	<i>D. kizuki</i>	1
<i>D. leucotis</i>	1	<i>D. macei</i>	2
<i>D. moluccensis</i>	2	<i>Dinopium javanense</i>	52
<i>D. rafflesi</i>	2	<i>Dryocopus javensis</i>	1
<i>Hemicircus canente</i>	2	<i>Jynx torquilla</i>	5
<i>Meiglyptes tristis</i>	3	<i>M. tukki</i>	31
<i>Micropternus brachyurus</i>	37	<i>Mulleripicus funebris</i>	1
<i>Picumnus innominatus</i>	2	<i>Picus canus</i>	1
<i>P. flavinuchus</i>	5	<i>P. miniaceus</i>	10
<i>P. puniceus</i>	1	<i>Sasia abnormis</i>	9
<i>S. ochracea</i>	18	<i>Calyptomena viridis</i>	23
<i>Cymbirhynchus macrohynchus</i>	20	<i>Pitta cyanea</i>	9
<i>P. moluccensis</i>	4	<i>P. phayrei</i>	1
<i>Alauda arvensis</i>	6	<i>Galerida cristata</i>	1
<i>Miragra assamica</i>	15	<i>M. javanica</i>	22
<i>Delichon dasypus</i>	3	<i>Hirundo daurica</i>	2
<i>H. striolata</i>	1	<i>H. tahitica</i>	21
<i>Coracina melaschista</i>	9	<i>C. polioptera</i>	2
<i>C. striata</i>	6	<i>Hemipus hirundinaceus</i>	2
<i>Lalage melanoleuca</i>	1	<i>Pericocrotus ethologus</i>	5
<i>P. flammeus</i>	3	<i>P. solaris</i>	4
<i>Dicrurus aeneus</i>	7	<i>Cissa chinensis</i>	1
<i>Corvus macrorhynchus</i>	12	<i>Crypsirina formosa</i>	1
<i>C. temia</i>	20	<i>C. vagabunda</i>	2
<i>Cyanopica cyanus</i>	3	<i>Platylophus galericulatus</i>	11
<i>Platysmurus leucopterus</i>	1	<i>Aegithalicus concinnus</i>	1
<i>Parus atricapillus</i>	2	<i>P. elegans</i>	12
<i>P. palustris</i>	4	<i>Sylviparus modestus</i>	1
<i>Certhia discolor</i>	1	<i>Sitta frontalis</i>	5
<i>Actinodura morrisoniana</i>	5	<i>Alcippe brunnea</i>	3
<i>A. cinereiceps</i>	3	<i>Chrysomma sinense</i>	13
<i>Gamsorhynchus rufulus</i>	1	<i>Garrulax albogularis</i>	1
<i>G. canorus</i>	3	<i>G. chinensis</i>	2
<i>G. milnei</i>	1	<i>G. monilegerus</i>	7
<i>G. morrisonia</i>	3	<i>G. poecilorhynchus</i>	3
<i>Kenopia striata</i>	2	<i>Liocichla ripponi</i>	23
<i>L. steerei</i>	9	<i>Malacopteron albogulare</i>	8
<i>M. cinereum</i>	56	<i>M. magnirostre</i>	10

<i>Napothera atrigularis</i>	1	<i>N. brevicaudata</i>	129
<i>N. crispifrons</i>	1	<i>N. epilepidota</i>	7
<i>N. macrodactylus</i>	1	<i>Pellorneum albiventre</i>	15
<i>P. tickelli</i>	2	<i>Pomatorhinus erythrogenys</i>	34
<i>P. ochraceiceps</i>	2	<i>P. ruficollis</i>	1
<i>Pnoepyga pusilla</i>	1	<i>Pteruthius flaviscapis</i>	4
<i>Ptilocichla basilanica</i>	1	<i>P. falcata</i>	1
<i>Rhopophilus pekinensis</i>	2	<i>Stachyris nigriceps</i>	125
<i>S. nigricollis</i>	18	<i>S. ruficeps</i>	27
<i>S. rifufrons</i>	2	<i>Trichastoma tickelli</i>	16
<i>Paradoxornis guttaticollis</i>	15	<i>Criniger finschi</i>	3
<i>Hypsipetes malaccensis</i>	1	<i>Pycnonotus cyaniventris</i>	4
<i>P. eutilotus</i>	19	<i>P. melanoleucos</i>	1
<i>P. sinensis</i>	19	<i>P. taiwanus</i>	1
<i>P. urostictus</i>	15	<i>P. xanthorrhous</i>	40
<i>Spizixos canifrons</i>	64	<i>S. semitorques</i>	2
<i>Abroscopus superciliaris</i>	6	<i>Acrocephalus bistrigiceps</i>	8
<i>A. concinens</i>	4	<i>A. stentorius</i>	2
<i>Cettia acanthizoides</i>	10	<i>C. canturians</i>	1
<i>C. diphone</i>	23	<i>C. fortipes</i>	3
<i>C. montanus</i>	4	<i>C. pallidipes</i>	1
<i>C. squameiceps</i>	20	<i>Cisticola juncidis</i>	23
<i>Gerygone fusca</i>	1	<i>G. sulphurea</i>	4
<i>Locustella ochotensis</i>	9	<i>Orthotomus cinereiceps</i>	3
<i>O. cucullatus</i>	3	<i>O. sepium</i>	49
<i>Phylloscopus armandii</i>	1	<i>P. coronatus</i>	4
<i>P. davisoni</i>	41	<i>P. fuscatus</i>	22
<i>P. maculipennis</i>	1	<i>P. olivaceus</i>	10
<i>P. proregulus</i>	15	<i>P. pulcher</i>	22
<i>P. reguloides</i>	14	<i>P. schwarze</i>	6
<i>P. subaffinis</i>	2	<i>P. tenellipes</i>	24
<i>P. trochiloides</i>	3	<i>Prinia atrogularis</i>	5
<i>P. subflava</i>	32	<i>Regulus regulus</i>	2
<i>Seicercus albogularis</i>	1	<i>S. burkii</i>	72
<i>S. castaniceps</i>	2	<i>S. montis</i>	6
<i>S. superciliaris</i>	3	<i>Tersiphone atrocaudata</i>	1
<i>Tesia castaneocoronata</i>	1	<i>T. olivea</i>	1
<i>Culicicapa ceylonensis</i>	25	<i>C. helianthea</i>	1
<i>Muscicapa concreta</i>	1	<i>M. dumetoria</i>	3
<i>M. leucomelanura</i>	3	<i>M. macgrigoriae</i>	5
<i>M. moniliger</i>	27	<i>M. sibirica</i>	1
<i>M. solitaris</i>	1	<i>M. strophinata</i>	17
<i>M. tichelliae</i>	14	<i>M. turcosa</i>	1
<i>M. vivida</i>	1	<i>M. westermanni</i>	9
<i>M. zanthopygia</i>	7	<i>Philentoma pyrrhoptera</i>	32
<i>P. relata</i>	4	<i>Rhinomyias olivaceae</i>	8

<i>R. ruficauda</i>	2	<i>Rhipidura cyaniceps</i>	15
<i>R. nigrocinnamonia</i>	1	<i>R. perlata</i>	4
<i>Prunella montanella</i>	5	<i>Artamus fuscus</i>	2
<i>Anthus gustavi</i>	3	<i>A. novaeseelandiae</i>	33
<i>Sturnus cristatellus</i>	6	<i>S. burmannicus</i>	2
<i>S. sericeus</i>	1	<i>Aethopyga mystacalis</i>	1
<i>A. nipalensis</i>	1	<i>A. shelleyi</i>	1
<i>A. siparaja</i>	5	<i>Arachnothera philippinensis</i>	15
<i>Zosterops exilis</i>	1	<i>Anaimos olivaceus</i>	2
<i>Dicaeum agile</i>	7	<i>D. bicolor</i>	1
<i>D. chrysorrheum</i>	2	<i>D. hypoleucum</i>	1
<i>D. ignipectus</i>	3	<i>D. pygmaeum</i>	2
<i>Prionochilus percusses</i>	17	<i>Carduelis sinica</i>	3
<i>Carpodacus erythrinus</i>	164	<i>C. roseus</i>	11
<i>Emberiza leucocephalos</i>	4	<i>E. pusilla</i>	4
<i>E. sulphurata</i>	3	<i>Fringilla montifringilla</i>	6
<i>Haematosipiza sipahi</i>	1	<i>Melophus lathamii</i>	1
<i>Pyrrhula erythaca</i>	6	<i>P. nipalensis</i>	2
<i>P. pyrrhula</i>	3	<i>Uragus sibiricus</i>	6
<i>Erythrura hyperythra</i>	2	<i>E. prasina</i>	1
<i>Padra oryzivora</i>	4	<i>Passer rutilans</i>	9
<i>Ploceus manyar</i>	18		

#### INFECTION RATE AMONG THE OWLS

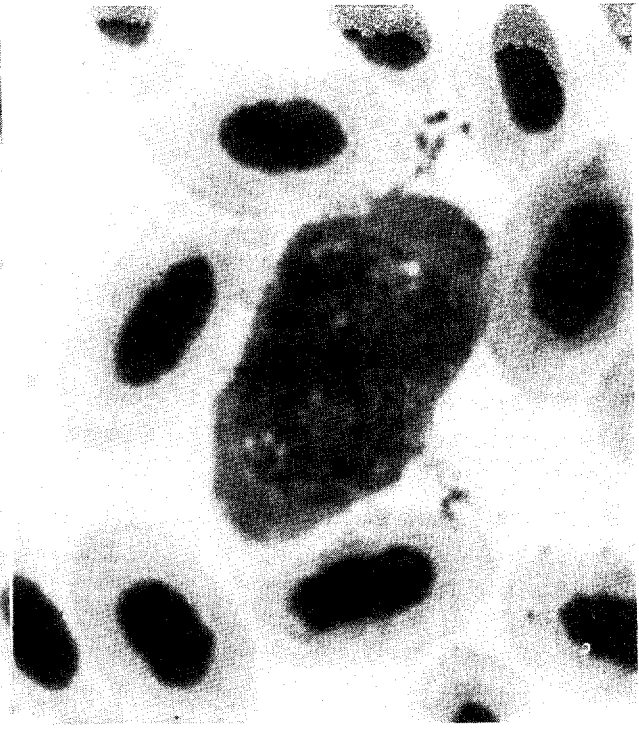
The owls (Strigidae) are closely related, with similar habits, filling much the same niches and usually living in a forested situation. They have soft feathers and nest or hide in tree hollows or crevices. This type of environment exposes them to parasites that live in the nest or roost. They are fairly heavily infested with Mallophaga and feather mites and are usually hosts to Hippoboscid flies (See Part IV of this report). Some species of these flies are known vectors of Haemoproteus infections.

Blood films have been taken from 14 species over a wide area. Most of these have been from tropical and sub-tropical environments where owls are abundant and much more easily caught than in the temperate habitats. More than three hundred blood films from 13 species have been examined from Luzon, Negros, Thailand and Malaysia while only 31 smears from five species have been from Korea, Japan and Taiwan. The rate of infection has been significantly different, 80% of the southern birds positive and 42% of the northern ones.

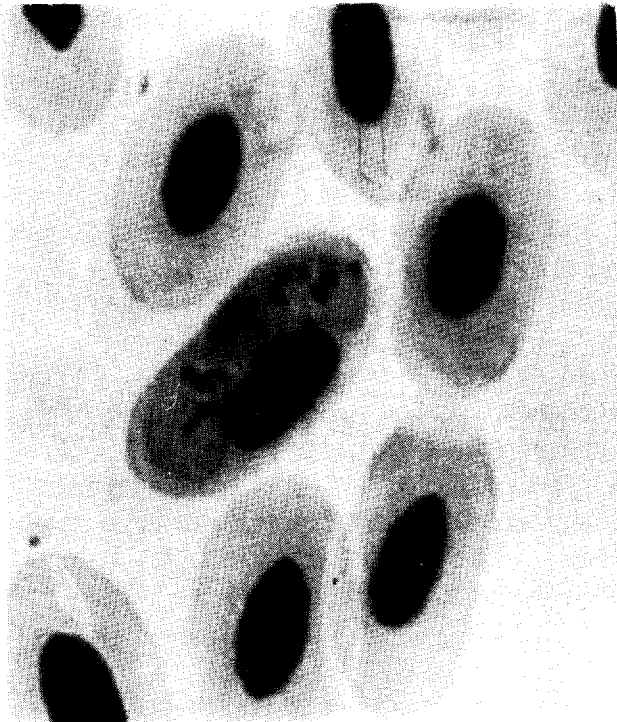
Studies are at present being made of birds trapped repeatedly to determine how long the infections persist. Previous studies in Malaya suggested that persistence of Haemoproteus infections may depend upon the individual



LANKASTERELLA



LEUCOCYTOZOON



HAEMOPROTEUS



HAEMOGREGARINE

Fig. 144: Examples of Haematozoa found in avian blood.

host as well as upon reinfections. For example, among four Otus bakkamoena; one bird retained its infection for one month but was negative when recaptured nine months later, the second bird retained its infection for a month, but was negative two weeks following that, the third bird remained positive for a month and was negative six months later, while the fourth bird was negative three months after its first capture, but was again positive seven months after that.

The migratory Ninox scutulata was 77% infected in its southern wintering areas and 75% infected in its Japanese breeding grounds suggesting that it retained its infection or was reinfected both in the north and south. Otus scops showed the same relationships.

Table 37 compares the data for the different geographical areas.

### INFECTION RATES AMONG THE THRUSHES

The large thrush family (Turdidae) includes several genera with closely related species having similar habits and often using similar habitats. The family includes many migratory species as well as temperate zone and tropical zone limited forms. Tropical species tend to be sedentary and the temperate zone ones are migrant even though they remain north of the tropics. Species in the family are usually easily netted and make up a large percentage of the catch.

At the southern banding stations 43 species were sampled and 1725 blood films have been examined. Eighteen species were not represented by positive blood-films, but the overall percentage of infection was 31. North of the tropics there were 270 collections from 20 species, but 11 species were negative. The total percent infection was 10. Among the 25 positive species in the tropics the infection rate was 35% while among the 9 northern species the infection rate was 16%. The infection rate in the north appears to be less than half that in the tropics. Tables 38 and 39 list these data by species.

Table 40 reduces these two tables to genera. The four tropical genera including 13 species: Brachypteryx small, brush loving, usually montane, only 1.1% infected; Rhyacornis small, riverside birds only one negative specimen; Copsychus forest and farm species, thrush size, 45.2% infected; Enicurus, delicate thrush or wagtail sized birds usually found on streams in the forests, 15.6% infected. The remaining nine genera including 39 species were found both in northern and southern habitats. All of these except Tarsiger and Phoenicurus (negatives) were more heavily infected in the south than in the north. Only one genus, Zoothera, reversed this, and it was 57% positive in the north compared with 38% positive in the south.

Table 37: Infection rates of Haematozoa among owls of Eastern Asia. Figures in parentheses indicate number of blood films examined.

TROPICAL ENVIRONMENTS							
Species	Number of Blood Films	% Positive	Luzon	Negros	Thailand	Malaysia	Others
<i>Athena brama</i>	12	33			20 (6)		India 50(6)
<i>Bubo coromandus</i>	2	100					India 100(2)
<i>Glaucidium brodiei</i>	8	88			100 (5)	66 (3)	
<i>Glaucidium cuculoides</i>	12	92			92 (12)		
<i>Ketupa ketupu</i>	4	0					
<i>Ninox philippinus</i>	48	96	75 (4)	98 (44)			
<i>Ninox scutulata</i>	30	77	86 (22)	60 (5)	0 (2)		Sarawak 100 (1)
<i>Otus bakkamoena</i>	111	87	75 (4)	100 (5)	69 (39)	92 (59)	
<i>Otus sagittatus</i>	1	0			0 (1)		
<i>Otus rufescens</i>	3	66				66 (3)	
<i>Otus scops</i>	65	75			65 (23)	81 (42)	
<i>Otus spilocephalus</i>	13	46			36 (11)	100 (2)	
<i>Strix leptogrammica</i>	1	0			0 (1)		
Total	310	80	83 (30)	94 (54)	63 (100)	86 (109)	
NORTHERN ENVIRONMENTS							
			Korea	Japan	Taiwan		
<i>Glaucidium brodiei</i>	2	0			0 (2)		
<i>Ninox scutulata</i>	5	80		75 (4)	100 (1)		
<i>Otus asio</i>	3	0		0 (3)			
<i>Otus scops</i>	16	50	0 (2)	75 (4)	50 (10)		
<i>Otus spilocephalus</i>	5	20			20 (5)		
Total	31	42	0 (2)	55 (11)	39 (18)		

Those species that were represented in collections both in the north and the south were as follows: *Erithacus calliope*, 0% positive in the north, 1% in the south; *Erithacus cyane*, 10% north, 19% south; *Myophonus caeruleus*, 0% N, 5% S.; *Muscivivia leucura*, 0% N, 1% S.; *Saxicola torquata*, 0% both N and S.; *Turdus chrysolais*, 16% N, 44% S.; *Zoothera dauma*, 20% N, 35% S.; *Zoothera sibirica*, 85% N, 55% S.

The greater rate of infection in the south is probably due to a greater abundance of more effective vectors active over a longer period of time. Equally effective vectors in the north would have a shorter period in which to attack the birds. Of course, population densities of both hosts and vectors in both areas could be determining factor in the infection rates.

Table 40: Summary of infection rates by genera.

	NORTH				SOUTH			
	Species	Slides	Positive	%	Species	Slides	Positive	%
<i>Brachypteryx</i>					2	90	1	1.1
<i>Copsychus</i>					5	495	224	45.2
<i>Enicurus</i>					5	64	10	15.6
<i>Erithacus</i>	4	16	5	7.5	6	287	40	13.9
<i>Monticola</i>	4	10	0	0	4	33	9	27.2
<i>Myophonus</i>	1	1	0	0	3	25	2	8.0
<i>Muscivivia</i>	1	2	0	0	1	141	1	.7
<i>Phoenicurus</i>	1	24	0	0	1	2	0	0
<i>Rhyacornis</i>					1	1	0	0
<i>Saxicola</i>	1	14	0	0	4	70	1	1.4
<i>Tarsiger</i>	3	33	0	0	1	50	0	0
<i>Turdus</i>	6	106	13	12.2	4	274	167	60.9
<i>Zoothera</i>	2	14	8	57.1	6	193	74	38.3
Total	21	270	26	9.6	43	1725	529	30.6

Table 38: Infection rates of Haematozoa among the Thrushes of Southern Asia. Figures in parentheses indicate number of blood films examined.

Species	Number of Blood Films	% Positive	Luzon	Palawan	Negros	Thailand	Malaysia	India
<i>Brachypteryx leucophrys</i>	76	0				0 (63)	0 (13)	
<i>Brachypteryx montana</i>	14	8	20 (5)		0 (1)	0 (8)		
<i>Copsychus luzoniensis</i>	8	0	0 (8)					
<i>Copsychus malabaricus</i>	159	51		100 (2)		35 (83)	58 (53)	
<i>Copsychus niger</i>	21	57		57 (21)				
<i>Copsychus pyrropygus</i>	7	14					14 (7)	
<i>Copsychus saularis</i>	300	43	12 (8)		85 (87)	29 (191)	0 (2)	0 (12)
<i>Enicurus immaculatus</i>	1	0						0 (1)
<i>Enicurus leschenaulti</i>	10	40				44 (9)	0 (1)	
<i>Enicurus maculatus</i>	1	0						0 (1)
<i>Enicurus ruficapillus</i>	32	16				8 (13)	21 (19)	
<i>Enicurus schistaceus</i>	20	5				0 (8)	8 (12)	
<i>Erithacus brunneus</i>	4	0						0 (4)
<i>Erithacus calliope</i>	74	1	0 (23)			2 (48)		0 (3)
<i>Erithacus chryseus</i>	1	0						0 (1)
<i>Erithacus cyane</i>	201	19				12 (152)	42 (50)	
<i>Erithacus ruficeps</i>	1	0					0 (1)	
<i>Erithacus svecicus</i>	6	0				0 (5)		0 (1)
<i>Monticola cinclorhynchos</i>	10	80						80 (10)
<i>Monticola gularis</i>	4	0				0 (4)		
<i>Monticola rufiventris</i>	1	0				0 (1)		
<i>Monticola solitaria</i>	18	5	11 (9)		0 (2)	0 (7)		
<i>Myophonus coeruleus</i>	20	5				6 (16)	0 (2)	0 (2)
<i>Myophonus horsfieldi</i>	1	0						0 (1)
<i>Myophonus robinsoni</i>	4	25					25 (4)	
<i>Musciviviva leucura</i>	141	1				0 (131)	10 (10)	
<i>Phoenicurus frontalis</i>	2	0				0 (2)		
<i>Rhyacornis fuliginosus</i>	1	0				0 (1)		
<i>Saxicola caprata</i>	16	6	0 (2)		9 (11)	0 (3)		
<i>Saxicola ferrea</i>	46	0				0 (45)		0 (1)
<i>Saxicola jerdoni</i>	2	0				0 (2)		
<i>Saxicola torquata</i>	6	0				0 (6)		
<i>Tarsiger cyanurus</i>	50	0				0 (50)		
<i>Turdus chrysolaus</i>	16	44	44 (16)					
<i>Turdus merula</i>	10	30						30 (10)
<i>Turdus obscurus</i>	238	64	50 (4)	0 (1)	33 (3)	36 (36)	71 (194)	
<i>Turdus ruficollis</i>	10	40						40 (10)
<i>Zoothera cinerea</i>	30	33	33 (30)					
<i>Zoothera citrina</i>	49	18				10 (30)	0 (3)	37 (16)
<i>Zoothera dauma</i>	20	35	55 (11)			11 (9)		
<i>Zoothera interpres</i>	1	0					0 (1)	
<i>Zoothera marginata</i>	8	12				12 (8)		
<i>Zoothera sibirica</i>	85	55				0 (2)	57 (83)	
43 Species Total	1725	31	24 (116)	58 (24)	73 (104)	14 (933)	55 (455)	18 (73)



Table 39: Infection rates of Haematozoa among the Thrushes of Northern Asia. Figures in parentheses indicate the number of blood films examined.

Species	Number of Blood Films	% Positive	Korea	Japan	Taiwan	Hong Kong
<i>Erithacus akahige</i>	4	25		25 (4)		
<i>Erithacus calliope</i>	20	0	0 (1)	0 (3)	0 (9)	0 (7)
<i>Erithacus cyane</i>	40	10	0 (8)	12 (32)		
<i>Monticola saxatilis</i>	2	0			0 (2)	
<i>Monticola solitaria</i>	8	0		0 (6)	0 (2)	
<i>Myophonus caeruleus</i>	1	0				0 (1)
<i>Muscisylvia leucura</i>	2	0			0 (2)	
<i>Phoenicurus aureoreus</i>	24	0	0 (8)	0 (11)	0 (2)	0 (3)
<i>Saxicola torquata</i>	14	0	8 (12)	0 (1)	0 (1)	
<i>Tarsiger cyanurus</i>	16	0		0 (2)	0 (3)	0 (11)
<i>Tarsiger indicus</i>	1	0			0 (1)	
<i>Tarsiger johnstoniae</i>	18	0			0 (18)	
<i>Turdus cardis</i>	13	31		33 (9)		25 (4)
<i>Turdus celaenops</i>	4	0		0 (4)		
<i>Turdus chrysolaus</i>	19	16		18 (11)	11 (9)	
<i>Turdus hortulorum</i>	19	21	0 (1)	0 (1)		24 (17)
<i>Turdus naumanni</i>	27	4	0 (11)	8 (16)		
<i>Turdus pallidus</i>	24	4	0 (3)	10 (10)	0 (8)	0 (3)
<i>Zoothera dauma</i>	4	75	100 (1)	50 (2)	100 (1)	
<i>Zoothera sibirica</i>	10	50		50 (10)		
<b>20 Species Totals</b>	<b>270</b>	<b>10</b>	<b>4 (45)</b>	<b>15 (122)</b>	<b>3 (58)</b>	<b>11 (46)</b>

Table 41: List of Positive Blood Films from Birds of Eastern Asia. Plasm. = Plasmodium; Haem. = Haemoproteus; Leuco. = Leucocytozoon; Microf. = Microfilaria; Trypa. = Trypanosoma; Plasm + Haemo, Etc. = Multiple Infections, Atox. = Atoxoplasma; Lank. = Lankesterella; Nutt. = Nuttalia.

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<b>PROCELLARIIDAE</b>										
<i>Calonectris leucomelas</i>	19	2		neg. 17 pos. 2						
<b>ARDEIDAE</b>										
<i>Butorides striatus</i>	26	1	neg. 2			neg. 17	neg. 1	neg. 1	neg. 2	neg. 2 microf. 1
<i>Dupeter flavicollis</i>	1	1				pos. 1				
<i>Ixobrychus cinnamomeus</i>	94	14				neg. 66 pos. 12	neg. 4 pos. 1		neg. 2	neg. 8 plasm. 1 neg. 6 pos. 1
<i>Ixobrychus sinensis</i>	37	8		pos. 1		neg. 23 haem. 1 leuco. + P. rouxi pos. 4				
<i>Gorsachius goisagi</i>	8	3				neg. 5 microf. 1 pos. 2				
<i>Nycticorax nycticorax</i>	8	1		neg. 6	neg. 1 pos. 1					
<b>ANATIDAE</b>										
<i>Anas crecca</i>	2	1			neg. 1 pos. 1					
<b>ACCIPITRIDAE</b>										
<i>Accipiter soloensis</i>	12	1	pos. 1		neg. 2			neg. 9		
<i>Accipiter trivirgatus</i>	5	3				haem. 1	neg. 1 pos. 1 haem. 1			
<i>Accipiter virgatus</i>	54	19			neg. 5		neg. 1	neg. 6 pos. 8	neg. 15 leuco. 1 pos. 1 haem. 1	neg. 8 leuco. 8 haem. 1
<i>Butastur indicus</i>	39	4			neg. 33 pos. 2		neg. 2			
<i>Elanus caeruleus</i>	12	1						pos. 1	neg. 11	
<b>FALCONIDAE</b>										
<i>Falco peregrinus</i>	1	1								leuco. 1
<b>PHASIANIDAE</b>										
<i>Argusianus argus</i>	3	3								plasm. sp. + haem. haem. + microf. 1 plasm. sp. haem. +microf.

Table 41, page 2

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Coturnix chinensis</i>	29	18			neg. 1	neg. 8 haem. 9 pos. 3	neg. 1 haem. 5 plasm. sp. 1	neg. 1		
<i>Lophura erythrophthalma</i>	8	1								neg. 7 P. sp. 1
<i>Rollulus roulroul</i>	3	1								neg. 2 haem. 1
<b>TURNICIDAE</b>										
<i>Turnix suscitator</i>	39	9			neg. 1	neg. 3 pos. 1	<i>P. vaughani</i> 1	neg. 8 pos. 2	neg. 8	neg. 10 <i>P. vaughani</i> 4 <i>P. vaughani</i> + tryp. 1
<b>RALLIDAE</b>										
<i>Amaurornis phoenicurus</i>	52	18				neg. 1			neg. 2	neg. 31 plasm. sp. 17 microf. 1
<i>Porzana cinereus</i>	24	1				neg. 19 pos. 1	neg. 3	neg. 1		
<i>Porzana pusilla</i>	21	1				neg. 20 pos. 1				
<i>Rallina eurizonoides</i>	11	4				neg. 7 microf. 2 haem. + microf. 1 pos. 1				
<i>Rallina fasciata</i>	3	1				neg. 1 pos. 1				neg. 1
<b>CHARADRIDAE</b>										
<i>Charadrius dubius</i>	69	14			neg. 3	neg. 47 pos. 14	neg. 2		neg. 3	
<i>Charadrius leschenaulti</i>	65	3				neg. 52 pos. 3	neg. 1		neg. 9	
<b>SCOLOPACIDAE</b>										
<i>Actitis hypoleucos</i>	107	6	neg. 5			neg. 71 pos. 6	neg. 6	neg. 6	neg. 8	neg. 5
<i>Capella megala</i>	51	1				neg. 45 haem. 1	neg. 4	neg. 1		
<i>Capella stenura</i>	11	1				neg. 4	neg. 3 haem. 1		neg. 3	
<i>Heterocellus incanus</i>	19	1		neg. 4 pos. 1		neg. 9	neg. 5			
<i>Numenius phaeopus</i>	20	2		neg. 1		neg. 9 haem. 1		neg. 8 haem. 1		
<i>Scolopax rusticola</i>	3	1		neg. 1					neg. 1 pos. 1	

Table 41, page 3

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Tringa glareola</i>	14	1				neg. 4	neg. 4 plasm. sp.		neg. 5	
<i>Tringa ochropus</i>	1	1				haem. 1				
<i>Tringa stagnatilis</i>	3	1				pos. 1			neg. 2	
<i>Tringa totanus</i>	23	1				neg. 3 haem. 1	neg. 3	neg. 15	neg. 1	
<i>Xenus cinereus</i>	7	1		neg. 1		neg. 1 pos. 2	neg. 1	neg. 2		
<b>COLUMBIDAE</b>										
<i>Chalcophaps indica</i>	341	25				neg. 61	neg. 25 haem. 2 pos. 2	neg. 106 haem. 1 pos. 4 microf. + trypa. 1	neg. 55 pos. 10	neg. 69 haem. 5
<i>Ducula bicolor</i>	1	1								
<i>Macropygia phasianella</i>	18	10				neg. 1	neg. 5 haem. 1 pos. 3	neg. 2 haem. 1 pos. 5		haem. 1
<i>Macropygia ruficeps</i>	3	1								leuco. 1
<i>Macropygia unchall</i>	2	2								haem. 1
<i>Phapitreron leucotis</i>	46	9				neg. 13 haem. 4 P. polare 1		neg. 24 pos. 4		haem. +microf. 1
<i>Ptilinopus leclancheri</i>	15	6				neg. 4 haem. 2 pos. 1		neg. 5 pos. 2 haem. 1		
<i>Ptilinopus occipitalis</i>	9	4				neg. 5 haem. 2 pos. 2				
<i>Streptopelia chinensis</i>	40	6			neg. 4		neg. 19 haem. 1  leuco. 1 haem. + leuco. + P. relictum 1 pos. 2	neg. 7 P. vaughani + P. relictum + P. polare 1	neg. 2	neg. 2
<i>Streptopelia orientalis</i>	9	1	neg. 8 haem. 1							
<i>Treron curvirostra</i>	29	6				neg. 14 pos. 1	neg. 8 pos. 2 haem. 1			neg. 1 haem. 2
<i>Treron pompadora</i>	3	1						neg. 2 pos. 1		
<i>Treron vernans</i>	56	10					neg. 8	neg. 26 haem. 1 pos. 9		neg. 12

Table 41, page 4

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Macropygia unchall</i>	2	2								haem. 1
<i>Phapitreron leucotis</i>	46	9				neg. 13 haem. 4 P. polare 1		neg. 24 pos. 4		haem. + microf. 1
<i>Ptilinopus leclancheri</i>	15	6				neg. 4 haem. 2 pos. 1		neg. 5 pos. 2 haem. 1		
<i>Ptilinopus occipitalis</i>	9	4				neg. 5 haem. 2 pos. 2				
<i>Streptopelia chinensis</i>	40	6			neg. 4		neg. 19 haem. 1 leuco. 1 haem. + leuco. P. relictum pos. 2	neg. 7 P. vaughani+ P. relictum	neg. 2	neg. 2
<i>Streptopelia orientalis</i>	9	1	neg. 8 haem. 1							
<i>Treron curvirostra</i>	29	6				neg. 14 pos. 1	neg. 8 pos. 2 haem. 1			neg. 1 haem. 2
<i>Treron pompadora</i>	3	1						neg. 2 pos. 1		
<i>Treron vernans</i>	56	10					neg. 8	neg. 26 haem. 1 pos. 9		neg. 12
<b>PSITTACIDAE</b>										
<i>Bolbopsittacus lunulatus</i>	15	12				neg. 3 haem. 12				
<i>Prioniturus discurus</i>	9	3					neg. 6 haem. 2	pos. 1		
<b>CUCULIDAE</b>										
<i>Cacomantis merulinus</i>	59	2				neg. 22	neg. 7	neg. 1	neg. 20	neg. 7 haem. 1 pos. 1
<i>Cacomantis variolosus</i>	17	2				neg. 13 haem. 1 microf. 1		neg. 2		
<i>Centropus toulou</i>	9	4							neg. 1 haem. 2 pos. 2	neg. 4
<i>Centropus viridis</i>	7	1				neg. 3 pos. 1	neg. 3			
<i>Cuculus canorus</i>	8	1				neg. 7 haem. 1				

Table 41, page 5

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Cuculus sparveroides</i>	11	1				neg. 5 microf. 1		neg. 1	neg. 4	
<i>Cuculus vagans</i>	1	1								
<i>Eudynamis scolopacea</i>	14	1				neg. 9 haem. 1	neg. 1		neg. 3	pos. 1
<i>Phaenicophaeus javanicus</i>	1	1								plasm. 1
<i>Phaenicophaeus superciliosus</i>	2	1				neg. 1 pos. 1				
TYTONIDAE										
<i>Phodilus badius</i>	14	13							pos. 4	neg. 1 haem. 7 plasm. 1 pos. 1
<i>Tyto capensis</i>	3	1				neg. 1	neg. 1 haem. 1			
CAPRIMULGIDAE										
<i>Eurostopus macrotis</i>	6	4				neg. 2 haem. 2 pos. 2				
<i>Eurostopodus temminckii</i>	58	2				neg. 2	neg. 1	neg. 1		neg. 1 haem. 2
APODIDAE										
<i>Collocalia esculenta</i>	58	2				neg. 2	neg. 1	neg. 1		neg. 52 haemogregarine 2
TROGONIDAE										
<i>Harpactes ordens</i>	3	1				neg. 2 haem. 1				
<i>Harpactes duvauceli</i>	14	1								neg. 13 haem. 1
ALCEDINIDAE										
<i>Alcedo atthis</i>	104	4	neg. 45 haem. 1	neg. 1	neg. 4	neg. 23 haem. 1 pos. 2		neg. 1	neg. 25	neg. 1
<i>Ceyx erithacus</i>	44	7							neg. 5	neg. 32 haem. 7
<i>Ceyx rufidorsus</i>	32	1					neg. 8		neg. 3	neg. 20 haem. 1
<i>Halcyon hambroni</i>	1	1				haem. 1				
<i>Halcyon chloris</i>	221	83				neg. 92 haem. 16 haem. + plasm. 1 pos. 4	neg. 4 haem. 8 haem. + microf. 2 pos. 3	neg. 13 haem. 5 pos. 5	neg. 5 haem. 1	neg. 24 haem. 38

Table 41, page 6

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Halcyon concreta</i>	20	17							neg. 1	neg. 8 haem. 15 pos. 2
<i>Halcyon coromanda</i>	48	9		neg. 1		neg. 14 leuco. 1	neg. 3	neg. 2		neg. 19 haem. 6 leuco. 2
<i>Halcyon lindsayi</i>	14	10				neg. 2 pos. 8		neg. 2 leuco. 1 pos. 1		
<i>Halcyon pileata</i>	65	16	neg. 1						neg. 20 haem. 1 pos. 1	neg. 28 haem. 14
<i>Halcyon smyrnensis</i>	94	6				neg. 14		neg. 11 haem. 1 pos. 1	neg. 41	neg. 22 haem. 4
<i>Lacedo pulchella</i>	5	2							neg. 2	neg. 1 haem. 1 pos. 1
<i>Pelargopsis capensis</i>	18	1					neg. 4		neg. 8	neg. 5 haem. 1
<b>MEROPIDAE</b>										
<i>Merops orientalis</i>	35	1							neg. 34 pos. 1	
<i>Merops viridis</i>	30	2				neg. 8		neg. 7	neg. 10	neg. 3 haem. 2
<b>CORACIIDAE</b>										
<i>Coracias benghalensis</i>	1	1							pos. 1	
<i>Eurystomus orientalis</i>	3	2				neg. 1	haem. 1			haem. 1
<b>UPUPIDAE</b>										
<i>Upupa epops</i>	14	1	neg. 1						neg. 12 haem. 1	
<b>BUCEROTIDAE</b>										
<i>Anthracoceros malayanus</i>	2	1								neg. 1 leuco. 1
<b>CAPITONIDAE</b>										
<i>Megalaima asiatica</i>	5	2							neg. 3 pos. 2	
<i>Megalaima faiostricta</i>	1	1							neg. 9	neg. 44
<i>Megalaima franklini</i>	62	9							pos. 2	haem. 2 leuco. 4 microf. 1





Table 41, page 8

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
Hemipus picatus	18	4							neg. 14 pos. 4	leuco. 1 microf. 1
Lalage nigra	77	2				neg. 21 pos. 1 neg. 1	neg. 1	neg. 36 pos. 1		neg. 17
Pericrocotus roseus	3	1								neg. 1 P. relictum 1
Tephrodornis virgatus	7	2							neg. 5 pos. 2	
DICRURIDAE										
Dicrurus adsimilis	28	3			neg. 1				neg. 24 haem. 3	
Dicrurus annectans	25	7								neg. 18 leuco. 1 haem. 4 microf. 1 leuco. +microf 1
Dicrurus balicassius	47	8				neg. 17 haem. 3		neg. 22 pos. 5		
Dicrurus hottentottus	62	17				neg. 6 haem. 8 plasm. 1	neg. 7 pos. 1 haem. 1 atox. 1 neg. 13 pos. 2 haem. 1		neg. 32 pos. 3 haem. 2	
Dicrurus leucophaeus	49	6							neg. 30 pos. 1 haem. 1 haem. + microf. 1 neg. 14	neg. 20 leuco. 1 neg. 17 haem. 2 leuco. 1
Dicrurus paradiseus	38	1								
Dicrurus remifer	149	3							neg. 129	
ORIOLIDAE										
Oriolus chinensis	108	67	pos. 2			neg. 7 haem. 1 microf. 1	neg. 3 pos. 1	neg. 27 pos. 56 microf. 3 haem. 1	neg. 2 pos. 2	neg. 2
Oriolus traillii	6	1							neg. 5 pos. 1 pos. 1	
Oriolus xanthonotus	1	1								
CORVIDAE										
Corvus corone	1	1		leuco. 1						
Crypsirina occipitalis	3	3							haem. 3	
Garrulus glandarius	3	2		neg. 1					pos. 1	

Table 41, page 9

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<b>PARIDAE</b>										
<i>Aegithalos caudatus</i>	14	5	neg. 8 pos. 5	neg. 1						
<i>Parus ater</i>	9	1	neg. 8 pos. 1							
<i>Parus major</i>	23	4	neg. 13 pos. 1	neg. 6	pos. 3					
<i>Parus varius</i>	4	1	neg. 2 pos. 1	neg. 1						
<i>Parus xanthogenys</i>	17	1							neg. 16 pos. 1	
<b>SITTIDAE</b>										
<i>Sitta europaea</i>	11	3	neg. 1						neg. 7 pos. 3	
<b>TIMALIIDAE</b>										
<i>Actinodura ramsayi</i>	63	3							neg. 60 pos. 2 haem. 1	
<i>Alcippe brunneicauda</i>	26	8							neg. 18 haem. 4 microf. 1 haem. + microf. 3	
<i>Alcippe castaniceps</i>	125	4							neg. 85 haem. 1	neg. 36 leuco. 3
<i>Alcippe morrisonia</i>	207	47							neg. 158 pos. 16 haem. 33	
<i>Alcippe nipalensis</i>	151	27			Neg. 31 P. vaughani 1				neg. 2	neg. 91 pos. 5 leuco. 20 haem. + leuco. 1
<i>Alcippe poiocephala</i>	79	19							neg. 47 pos. 1 haem. 3 microf. 2 haem. + microf. 2	neg. 11 haem. 11
<i>Cutia nipalensis</i>	2	1								neg. 1 microf. 1
<i>Garrulax erythrocephalus</i>	118	48							neg. 54 pos. 4	neg. 16 leuco. 34 haem. 2 microf. 1 leuco. +microf. 2 leuco. +haem. 1

Table 41, page 10

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Garrulax leucolophus</i>	12	1							neg. 11 pos. 1	haem. +microf. 1
<i>Garrulax mitratus</i>	24	10								neg. 14 pos. 2 haem. 2 leuco. 3 haem. +Leuco. 2 haem. +microf. 1
<i>Garrulax strepitans</i>	6	1							neg. 5 pos. 1	
<i>Heterophasia amectens</i>	13	2							neg. 11 pos. 1 haem. 1	
<i>Heterophasia auricularis</i>	6	2			neg. 4 leuco. 2					
<i>Heterophasia melanoleuca</i>	113	12							neg. 101 pos. 7 haem. 2 leuco. 2 haem. + P. rouxi. 1 neg. 3	neg. 44 pos. 3 leuco. 10 haem. 1 trypa. 1
<i>Heterophasia picaoides</i>	62	15								neg. 20 leuco. 10 microf. 1 leuco. +microf. 2
<i>Leiothrix argenteauris</i>	64	29							neg. 15 pos. 5 haem. 11	neg. 7
<i>Macronus flavicollis</i>	10	5					neg. 5 pos. 1 microf. 2 plasm. + microf. 1 haem. + microf. 1			
<i>Macronus gularis</i>	280	15							neg. 258 pos. 15	neg. 7
<i>Macronus ptilosus</i>	32	13								neg. 19 microf. 11 trypa. 1 lank. 1
<i>Macronus striaticeps</i>	22	14				neg. 8 pos. 1 haem. 11 leuco. + microf. 2				

Table 41, page 11

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
Malacopteron affine	22	2								neg. 20 microf. 2 neg. 17
Malacopteron magnum	23	3				neg. 3 pos. 2 haem. 1				
Minla cyanouroptera	47	4							neg. 38 pos. 2 leuco. 1 neg. 26	
Minla strigula	130	76								neg. 28 pos. 5 microf. 12 leuco. 41 trypa. 1 haem. 1 leuco. + microf. 11 leuco. +microf. + trypa. 2 leuco. +trypa. 3 neg. 2 microf. 4 neg. 3
Pellorneum capistratum	8	4							neg. 2	
Pellorneum ruficeps	80	4							neg. 73 pos. 3 microf. 1 neg. 4	
Pomatorhinus hypoleucos	7	3								plasm. 1 microf. 1 leuco. 1 microf. 1
Pomatorhinus montanus	10	2			neg. 8 P. vaughani 1					
Pomatorhinus schisticeps	98	4							neg. 94 pos. 1 leuco. 1 haem. 2 haem. 2 neg. 1	
Pteruthius erythropterus	3	3								
Pteruthius melanotis	8	4								
Stachyris capitalis	1	1								
Stachyris chrysaea	31	1								plasm. 1 neg. 3 leuco. 4
Stachyris erythroptera	24	1				haem. 1				
Stachyris leucotis	3	2							neg. 17 leuco. 1	
Stachyris maculata	44	3							neg. 17 neg. 17 trapa. 1 neg. 1 microf. 1 leuco. 1 neg. 41 trypa. 1 microf. 1 leuco. 1	

Table 41, page 12

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Stachyris poliocephala</i>	46	21							neg. 13	neg. 12 pos. 2 microf. 13 leuco. 1 P. vaughani 1 microf. +haem. 2 P. vaughani + tank. +microf. 1 P. vaughani+ microf. 1
<i>Stachyris speciosa</i>	6	1						neg. 6 pos. 1		
<i>Stachyris whiteheadi</i>	4	1				neg. 3 haem. 1				
<i>Timalia pileata</i>	39	2							neg. 3 haem. 2	
<i>Trichastoma abbotti</i>	37	5							neg. 17	neg. 15 microf. 5
<i>Trichastoma bicolor</i>	24	12							neg. 1	neg. 11 microf. 12
<i>Trichastoma cinereiceps</i>	3	1					neg. 2 pos. 1			
<i>Trichastoma malaccense</i>	35	12							neg. 3	neg. 20 microf. 12 neg. 98 microf. 17 plasm. 4 P. rouxi 5 atox. 1 plasm. +lank. 1 microf. +lank. 1 plasm. +atox. 1
<i>Trichastoma rostratum</i>	128	30								
<i>Yuhina brunneiceps</i>	4	1			neg. 3 pos. 1					
<i>Yuhina castaniceps</i>	11	1								
<i>Yuhina flavicollis</i>	41	1							neg. 10 pos. 1 neg. 40 haem. 1	
<i>Yuhina zantholeuca</i>	33	14			neg. 2				neg. 17 pos. 13 leuco. 1	
PARADOXORNITHIDAE										
<i>Paradoxornis gularis</i>	10	2							neg. 8 pos. 1 haem. 1	

Table 41, page 13

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
PYCNONOTIDAE										
<i>Criniger bres</i> ( <i>tephrogenys</i> )	99	33					neg. 6 pos. 19 haem. 5		neg. 9 haem. 1	neg. 51 haem. 5 leuco. 2 microf. 1
<i>Criniger ochraceus</i>	140	19							neg. 121 pos. 15 haem. 4	
<i>Criniger pallidus</i>	44	15							neg. 29 pos. 7 haem. 3 haem. + leuco. 1 haem. + leuco. + leuco. + nut. 1 haem. + Babesia 1 neg. 12	
<i>Criniger phaeocephalus</i>	94	2								neg. 80 microf. 1 trypa. 1
<i>Hypsipetes amaurotis</i>	10	5	neg. 1 pos. 4	neg. 4 pos. 1					neg. 4	haem. 1 leuco. 1
<i>Hypsipetes charlottae</i>	6	2							neg. 10 pos. 1	neg. 58 haem. 4
<i>Hypsipetes criniger</i>	73	5							neg. 22 pos. 3	neg. 3 haem. 2
<i>Hypsipetes flava</i>	31	6							haem. 1 neg. 10 pos. 2	
<i>Hypsipetes madagascariensis</i>	12	2							neg. 57 pos. 33	neg. 112 leuco. 10
<i>Hypsipetes mccllellandii</i>	232	65							haem. 15 leuco. 2	haem. 1 leuco. +microf. 1 leuco. +haem. 1
<i>Hypsipetes gularis</i> ( <i>philippinus</i> )	169	86				neg. 54 pos. 10 microf. 2		neg. 28 pos. 73 haem. 1	neg. 1	
<i>Hypsipetes propinqua</i>	25	12					neg. 2 pos. 1		neg. 11 pos. 5 haem. 5	
<i>Hypsipetes thompsoni</i>	18	1							haem. + leuco. 1 neg. 17 pos. 1	
<i>Pycnonotus atriceps</i>	102	11					neg. 47		neg. 33	neg. 9

Table 41, page 14

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Pycnonotus aurigaster</i>	114	12					pos. 5		pos. 1 haem. 3 neg. 102 pos. 11 leuco. 1 neg. 333 pos. 44 haem. 317	microf. 1 leuco. 1
<i>Pycnonotus blanfordi</i>	698	365							* plasm. + haem. 1 haem. +P. relictum ? haem. +P. vaughani haem. + trypa. 1 neg. 5	
<i>Pycnonotus brunneus</i>	49	8								neg. 36 haem. 4 microf. 1 P. vaughani 1 haem. +trypa. 1 leuco. +microf. 1
<i>Pycnonotus cafer</i>	2	2							P. rouxi. + haem. 1 haem. 1 neg. 7 leuco. 1	
<i>Pycnonotus erythroptalmos</i>	26	9								neg. 10 pos. 1 leuco. 5 leuco. +microf. 1 haem. 1 neg. 1
<i>Pycnonotus finlaysoni</i>	141	31							neg. 109 pos. 19 leuco. 6 haem. 3 microf. 2 microf. + leuco. 1 neg. 163 pos. 3 leuco. 1	
<i>Pycnonotus flavescens</i>	167	4								
<i>Pycnonotus goiaver</i>	1805	257				neg. 143 pos. 16 haem. 11 P. rouxi. 1		neg. 44 pos. 90 haem. 2 P. vaughani 1		neg. 951 leuco. 26 atox. 1 P. circum- flexum + leuco. 1 microf. 85 leuco. +microf. 13 leuco+trypa. 1

Table 41, page 15

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Pycnonotus jocosus</i>	124	17							neg. 107 pos. 12 haem. 5	
<i>Pycnonotus melanicterus</i> (dispar)	161	109							neg. 52 pos. 52 haem. 25 haem. + leuco. 23 P. vaughani+ leuco. + haem. 1 haem. + leuco. + trypa. 1 leuco. +P. vaughani + P. polare 1 leuco. + P. rouxi. 1 haem. + nut. 1 P. rouxi. 1 leuco. 2 haem. + leuco. + microf. 1	
<i>Pycnonotus plumosus</i>	492	54						neg. 15 pos. 22 haem. 1 leuco. 1 P. polare 1 P. relictum 1	neg. 11	neg. 412 pos. 1 microf. 26 leuco. 1
<i>Pycnonotus simplex</i>	82	11								neg. 71 haem. 8 microf. 2 leuco. 1
<i>Pycnonotus striatus</i>	10	1							neg. 9 haem. 1	
<i>Pycnonotus xeylanicus</i>	9	2								neg. 7 microf. 2
SYLVIIDAE										
<i>Acrocephalus arundinaceus</i>	140	23	neg. 3	neg. 16 haem. 3 plasm. 1	neg. 4 pos. 3 haem. 2	neg. 22			neg. 17 pos. 1	neg. 55 pos. 8 haem. 5



Table 41, page 16

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Acrocephalus sorghophilus</i>	21	1				neg. 20 pos. 1				
<i>Cisticola exilis</i>	5	1				neg. 4 haem. 1				
<i>Locustella certhiola</i>	28	1				neg. 14 pos. 1				neg. 13
<i>Locustella fasciolata</i>	30	6	neg. 1		neg. 1	neg. 22 pos. 4 haem. 2				
<i>Locustella lanceolata</i>	57	3				neg. 53 pos. 1			neg. 1	
<i>Megalurus palustris</i>	12	1				microf. 2				
<i>Megalurus palustris</i>	12	1				neg. 9		neg. 2 microf. 1		
<i>Megalurus timoriensis</i>	6	2				neg. 2 haem. 2		neg. 2		
<i>Orthotomus atrogularis</i>	56	3				neg. 3		neg. 13	neg. 32 pos. 2	neg. 5 haem. +leuco. 1
<i>Orthotomus nigriceps</i>	2	2				haem. 1 microf. 1				
<i>Orthotomus sericeus</i>	52	3					neg. 1 haem. 1		neg. 8 pos. 2	neg. 40 trypa. 1
<i>Orthotomus sutorius</i>	90	2					pos. 1		neg. 56 pos. 1	neg. 32
<i>Phragmaticola aedon</i>	71	26							neg. 45 pos. 20 haem. 6	
<i>Phylloscopus borealis</i>	64	4		neg. 3 haem. 1	neg. 14 pos. 1	neg. 18 haem. 1		neg. 9	neg. 10 pos. 1	neg. 6
<i>Phylloscopus inornatus</i>	47	2							neg. 45 pos. 1 haem. 1	
<i>Phylloscopus occipitalis</i>	17	1	neg. 4	neg. 12 pos. 1						
<i>Phylloscopus trivirgatus</i>	3	1							neg. 2 leuco. 1	
<i>Prinia flaviventris</i>	58	1			neg. 24				neg. 8 pos. 1	neg. 25
<i>Prinia hodgsoni</i>	23	7							neg. 16 pos. 7	
<i>Prinia rufescens</i>	26	3							neg. 23 pos. 3	
MUSCICAPIDAE										
<i>Hypothymis azurea</i>	78	2			neg. 8	neg. 6	neg. 1 pos. 1	neg. 3	neg. 44 pos. 1	neg. 14

Table 41, page 18

Host Family and Species	No. Slide Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Rhipidura albicollis</i>	80	1							neg. 56	neg. 23
<i>Rhipidura javanica</i>	344					neg. 22	neg. 1	neg. 33	neg. 122 haem. 3	leuco. 1 neg. 158 haem. 2 lank. 3
<i>Rhipidura superciliaris</i>	5	3				neg. 2 haem. 3 haem. 1				
<i>Terpsiphone cinnamomea</i>	1	1								
<i>Terpsiphone cyanescens</i>	7	2					neg. 5 haem. 1 haem. + nut. 1			
<i>Terpsiphone paradisi</i>	46	7							haem. 1 neg. 15	neg. 24 pos. 1 haem. 5
<b>PACHYCEPHALIDAE</b>										
<i>Pachycephala cinerea</i>	56	1								neg. 55 lank. 1
<i>Pachycephala philippensis</i>	10	8				neg. 2 haem. 6 pos. 2				
<i>Pachycephala plateni</i>	4	2						neg. 2 pos. 2		
<b>ARTAMIDAE</b>										
<i>Artamus leucorhynchus</i>	14	2				neg. 18	neg. 2	neg. 2 pos. 2		
<b>MOTACILLIDAE</b>										
<i>Anthus hodgsoni</i>	86	3	neg. 1	neg. 13 haem. 1 pos. 1	neg. 7	neg. 6			neg. 51 pos. 1	neg. 5
<i>Dendronanthus indicus</i>	24	3	neg. 6						neg. 14 pos. 1	neg. 1 haem. 2
<i>Motacilla alba</i>	56	12	neg. 37 haem. 7 pos. 2	neg. 1	neg. 1		neg. 1		neg. 4 haem. 2 pos. 1	
<i>Motacilla cinerea</i>	40	6	neg. 6 haem. 1		neg. 2	neg. 15 pos. 3			neg. 7 haem. 1 pos. 1	neg. 2
<i>Motacilla flava</i>	27	5	neg. 1		neg. 1		neg. 1 haem. 2	neg. 4 haem. 1 pos. 1	neg. 15 haem. 1	
<b>LANIIDAE</b>										
<i>Lanius bucephalus</i>	22	3	neg. 11 haem. 2	neg. 4 pos. 1	neg. 4					
<i>Lanius collurioides</i>	3	1							neg. 2 P. sp. 1	

Table 4I, page 19

Host Family and Species	No. Slides Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Lanius cristatus</i>	259	82	neg. 9 haem. 1 pos. 1	neg. 2	neg. 1 haem. 1 haem. + P. relictum 3 haem. + P. relictum 2 haem. + plasm. 1 P. polare 1	neg. 36 haem. 5 pos. 11	neg. 11 haem. 1 P. relictum 3	neg. 22 haem. 2 pos. 14	neg. 77 haem. 14 pos. 3	neg. 19 haem. 9 P. polare 1
<i>Lanius nasutus</i>	16	3							neg. 13 haem. 3	
<i>Lanius schach</i>	7	6					pos. 1	pos. 4		neg. 1 pos. 1
<i>Lanius tephronotus</i>	2	1							neg. 1 haem. 1	
<i>Lanius trigrinus</i>	6	4		haem. 3 neg. 1						haem. 1 neg. 1
STURNIDAE										
<i>Aplonis panayensis</i>	71	13				neg. 29 pos. 4 haem. 3	neg. 25 haem. 3 pos. 3 haem. 1	neg. 4		
<i>Gracula religiosa</i>	3	2								neg. 1 haem. 1
<i>Sarcops calvus</i>	63	44				neg. 3 pos. 1 haem. 1		neg. 16 pos. 33 haem. 8		
<i>Sturnus contra</i>	84	3							neg. 81 haem. 3	
<i>Sturnus javanica</i>	83	2							neg. 81 haem. 2	
<i>Sturnus nigricollis</i>	36	17							neg. 19 haem. 14 haem. + P. rouxi 1 haem. + P. vaughani 1 haem. + microf. 1	
<i>Sturnus sinensis</i>	12	2							neg. 10 haem. 2	
<i>Sturnus sturninus</i>	2	1								neg. 1 microf. 1
<i>Sturnus tristis</i>	37	2							neg. 33 haem. 2	

Table 41, page 21

Host Family and Species	No. Slides Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
DICAEDAE										
<i>Anaimos johannae</i>	3	1					neg. 2 haem. 1			
<i>Dicaeum australe</i>	19	1				neg. 4 haem. 1		neg. 14		
<i>Dicaeum cruentatum</i>	31	1							neg. 21	neg. 9 plasm. 1
<i>Dicaeum trigonostigma</i>	13	2				neg. 4 haem. 1 pos. 1		neg. 3		neg. 4
<i>Prionochilus maculatus</i>	30	1							neg. 7	neg. 22 pos. 1
<i>Prionochilus thoracicus</i>	1	1							pos. 1	
FRINGILLIDAE										
<i>Coccothraustes coccothraustes</i>	2	1	neg. 1	haem. 1						
<i>Chloris sinica</i>	85	1	neg. 70 pos. 1	neg. 14						
<i>Eophona migratoria</i>	11	1	neg. 10 haem. 1							
<i>Emberiza aureola</i>	32	1	neg. 9 pos. 1						neg. 22	
<i>Emberiza cioides</i>	41	2	neg. 24 pos. 1	neg. 15 pos. 1						
<i>Emberiza elegans</i>	74	4	neg. 41 pos. 3	neg. 29 leuco. 1						
<i>Emberiza fucata</i>	57	1	neg. 55 P. relictum 1	neg. 1						
<i>Emberiza rustica</i>	49	1	neg. 49 pos. 1	neg. 2						
<i>Emberiza rutila</i>	168	36	neg. 25 haem. 4		neg. 1				neg. 106 haem. 17 leuco. 3 haem. + leuco. 1 pos. 11	
<i>Emberiza spodocephala</i>	44	4	neg. 2 haem. 1	neg. 19	neg. 5	neg. 14 pcs. 3				
<i>Emberiza variabilis</i>	5	1		haem. 1 neg. 4						
<i>Emberiza yessoensis</i>	12	2		neg. 10 pos. 2						
PLOCEIDAE										
<i>Lonchura ferruginosa</i>	14	2				neg. 6	neg. 3 haem. 2	neg. 3		

Table 41, page 22

Host Family and Species	No. Slides Examined	No. Positive	Korea	Japan	Taiwan	Luzon	Palawan	Negros & Mindanao	Thailand	Malaya
<i>Lonchura leucogastra</i>	58	5				neg. 47 haem. 1 trypa. 2	neg. 1 haem. 1 pos. 1	neg. 5		
<i>Lonchura maja</i>	28	2								neg. 26 leuco. 1 trypa. 1 P. relictum 1
<i>Lonchura atricapilla</i>	16	1								
<i>Lonchura malacca</i>	71	2				neg. 64 P. relictum 1		neg. 5 plasm. 1		
<i>Lonchura punctulata</i>	138	41			neg. 22	neg. 6			neg. 54 haem. 34 haem. + P. relictum 1 P. polare. 1 pos. 5 neg. 17 pos. 7 haem. 7 neg. 149 haem. 73 plasm. 1 pos. 15 neg. 115	neg. 15
<i>Lonchura striata</i>	55	14			neg. 24					
<i>Passer flaveolus</i>	238	89								
<i>Passer montanus</i>	220	2	neg. 7 haem. 1 pos. 1	neg. 14	neg. 4					
<i>Ploceus philippinus</i>	265	116							neg. 143 haem. 76 haem. + P. rouxi 1 haem. + P. relictum 1 tryp. 1 P. relictum 1 pos. 35	neg. 6 P. vaughani 1

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13. ABSTRACT <p>The fourth Annual Report of the MAPS program is divided into five parts. Part 1, summarizes reports prepared by leaders of the research teams, discussing the significant results of their work; Part 2, lists the numbers of birds banded in 1968, 150, 000 birds of 798 species totalling 820, 000 birds of 1, 060 species for a five year period; Part 3, a summary of the recovery records, 1, 762 recoveries of 180 species; Part 4, a discussion of the ectoparasites collected from birds, 259 species of ectoparasites from 739 species of birds; Part 5, a discussion of the blood parasites of Asian birds listing infections in species and reviewing the infection rates in owls and thrushes.</p>		

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