THE ROYAL AIR FORCE
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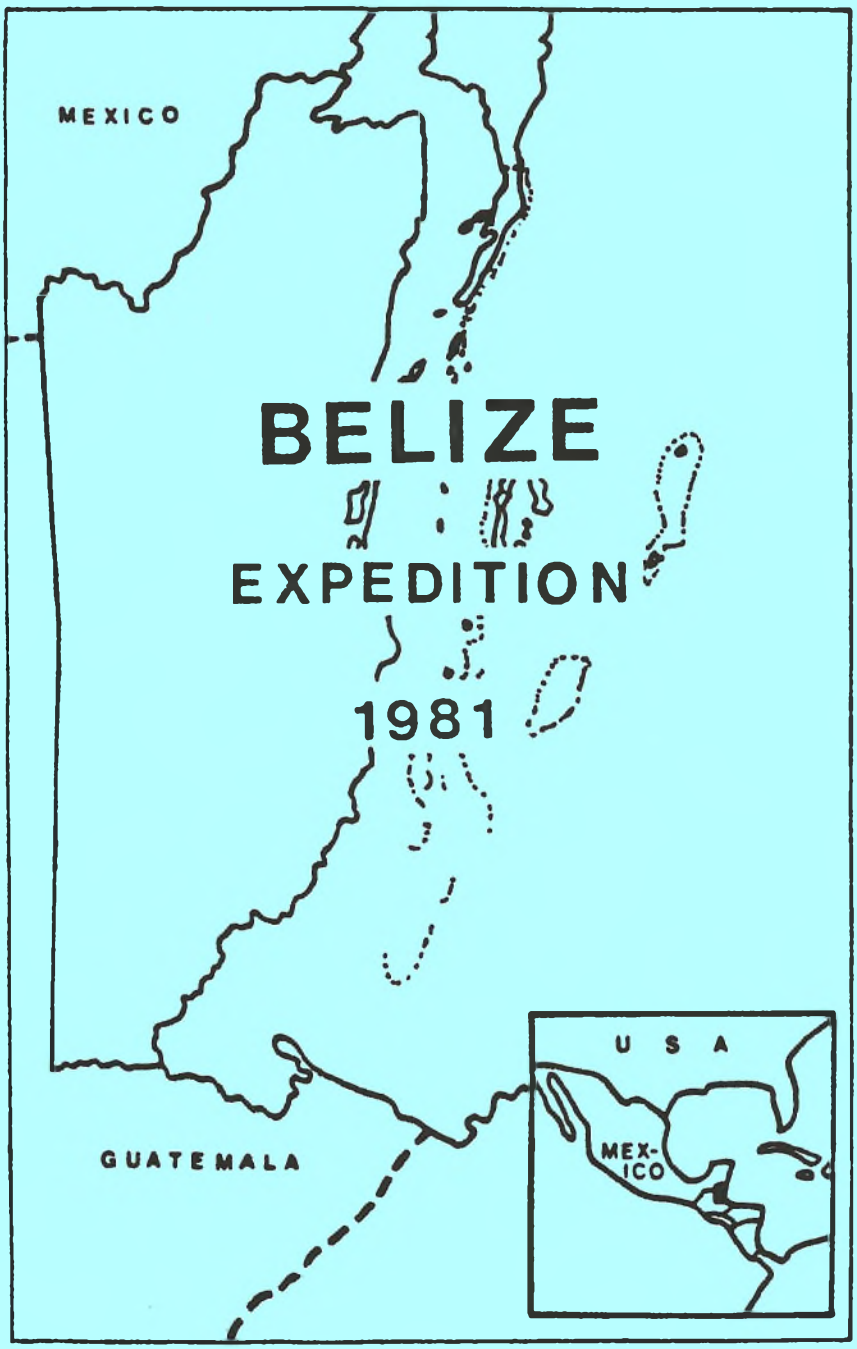

Edited by: P G Jenkins

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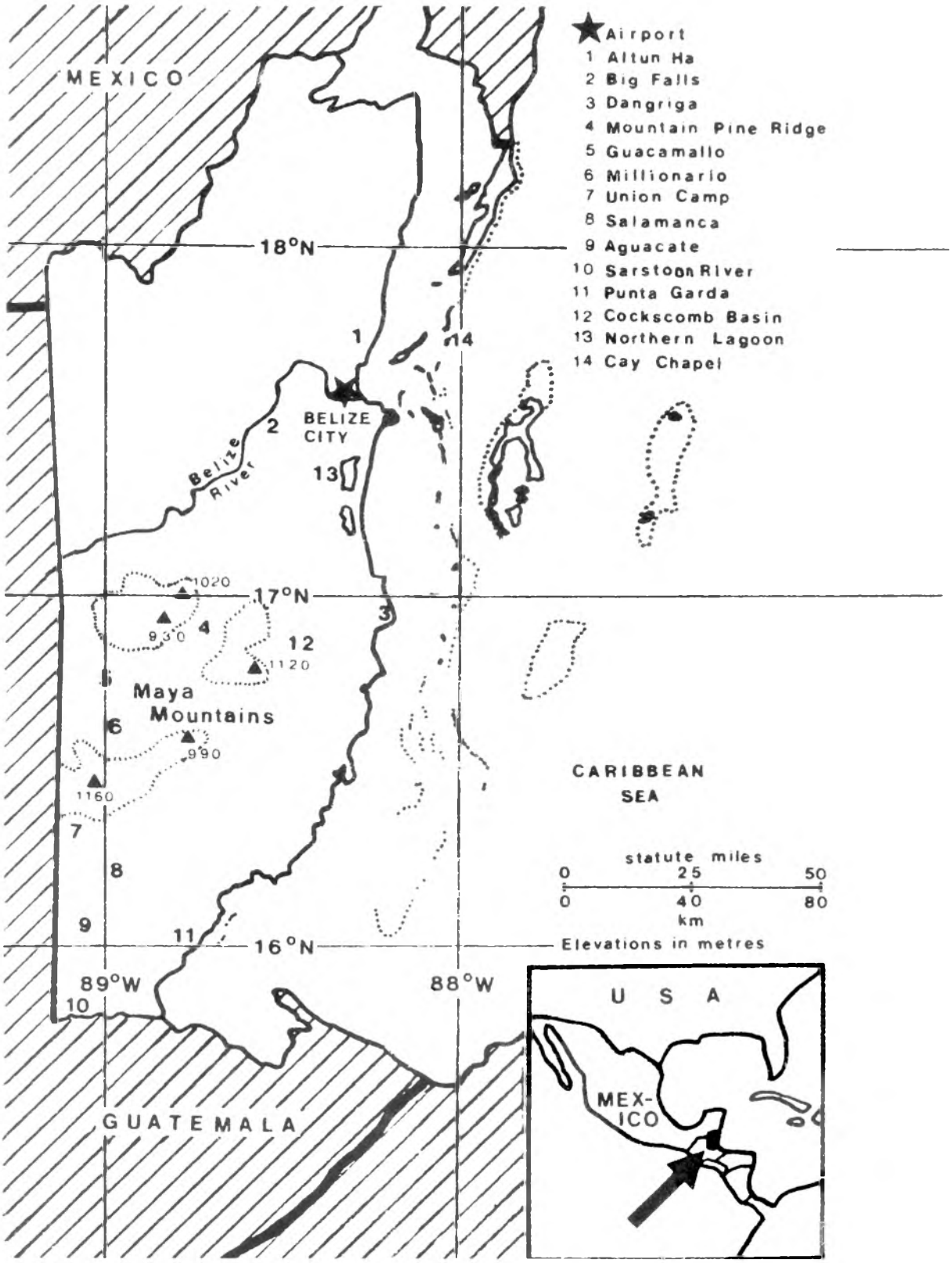
The Bridge at Guacamallo

Photo: T Hallchurch


MEXICO
18°N
17°N
16°N
89°W
88°W
BELIZE CITY
Belize River
Maya Mountains
1020
930
1120
990
1160
CARIBBEAN SEA
GUATEMALA
Airport
1 Altun Ha
2 Big Falls
3 Dangriga
4 Mountain Pine Ridge
5 Guacamallo
6 Millionario
7 Union Camp
8 Salamanca
9 Aguacate
10 Sarstoon River
11 Punta Garda
12 Cockscomb Basin
13 Northern Lagoon
14 Cay Chapel
statute miles
0 25 50
0 40 80
km
Elevations in metres
U S A
MEX-ICO

EXPEDITION OBJECTIVES, ADMINISTRATION AND PROGRAMME

OBJECTIVES

Within the main aim of the expedition detailed objectives were established and used to plan the programme. An important factor was the wide range of experience of the members of the expedition and following RAFOS policy the expedition included both those with experience and novices. It was therefore necessary for each team to spend some time becoming familiar with new species.

The objectives were as follows:

Undertake ornithological and arduous training in the form of living, working and trekking in jungle and swamp, particularly near Guacamallo Bridge and Salamanca Camp.

Obtain biometric and other data on all birds observed and netted - in particular hummingbirds, Trochilidae and woodcreepers, Dendrocolaptidae.

Net for rails, Rallidae at Big Falls Ranch.

Collect ectoparasites, flies, nests and eggs (deserted).

Collect dead specimens of birds, reptiles, small mammals and molluscs.

Visit a cay.

Visit Union Camp and the Sarstoon River and survey the Cockscomb Basin and Cockscomb Mountain Range.

Find a Scarlet Macaw and a Sun Bittern.

ADMINISTRATION

British Forces Belize provided equipment and rations, and accommodation when the expedition was not in the field. Without this enormous support the expedition would not have been possible.

Communications 244 Sig Sqn of Brize Norton provided a signalman on detachment on each team, and PRC 320 HF radios.

Movement Spare concessionary seats were available on scheduled RAF flights, and the advance party travelled to Belize on 17 Feb 81. The remainder of Team A arrived on 24 Feb 81. Team A left Belize on 18 Mar 81, having briefly handed over to Team B who arrived in Belize on the same aircraft. Team B departed Belize on 11 Apr 81, four days later than originally planned because force changeovers delayed the scheduled aircraft.

Health The expedition was not hampered by serious medical problems although there were several minor problems which are described later in Annex D, "Living and Working in the Belize Jungle".

OUTLINE PROGRAMME

Team A

17–24 Feb	APC – Adv Party Preparations
24–27 Feb	APC, Altun Ha and Belize City area
28– 2 Mar	Big Falls Ranch
3– 4 Mar	Mountain Pine Ridge
5 Mar	APC – resupply
6–12 Mar	Salamanca and Jimmy Cut
14–16 Mar	APC, Northern Lagoon and Cay Chapel
17 Mar	Depart Belize

Team B

17–19 Mar	APC, Altun Ha and Belize City area
20–23 Mar	Big Falls Ranch
24–26 Mar	Guacamallo Bridge and Mountain Pine Ridge
27 Mar	APC – resupply
28–29 Mar	Salamanca and Jimmy Cut
30– 6 Apr	Aguacate
8–10 Apr	APC, Northern Lagoon and Cay Chapel
11 Apr	Depart Belize

A full account of each team's programme can be found at Annex B.

RECORD OF SPECIES

The list of bird species identified by the expedition is based on daily records which were taken down each evening from field notes and netting data. A full record of our observations is at Annex A. Sample notes are included at the end of Annex A to amplify the evidence on certain species. A considerable number of photographs of birds were taken and have since proved invaluable in the positive identification of species. Some records have been rejected because of a lack of sufficient evidence, and the aim has been to include only those species for which good positive identification can be established. However, for interest and completeness a small number of possibles and probables have also been included in the list, but have not been serialised or included in the total of 301 species identified.

A status of species recorded during the expedition's 7 weeks in Belize agrees in the main with Stephen M Russell's 'Distributional Study' of 1964 and the 'Field Checklist of the Birds of Belize' compiled in 1977 by Dora Weyer and W Ford Young of the Belize Audubon Society (BAS). We found both of these works to be very useful, although Russell's study needs an update to include additional species and changes in status. Many of these have been reported in the BAS monthly Bulletins, and are supported by our observations. In addition, our records from the more inaccessible areas of the south and south west and Tony Hutson's netting data reveal other changes not yet documented.

Although the list of species gives our results in detail, the more interesting records include CHUCK WILL'S WIDOW Caprimulgus carolinensis, which was recorded for the first time in Belize when it was heard early one morning at Aguacate. At Union Camp, species considered to be rare such as SLATE-COLORED SOLITAIRE Myadestes unicolor and STRIPE-TAILED HUMMINGBIRD Eupherusa eximia were seen over such a very short period that they are very unlikely to be rare in that location. Other species currently considered rare but seen in the south included ORANGE-BREASTED FALCON Falco deiroleucus (photographed), COLLARED TROGON Trogon collaris, TODY MOTMOT Hylomanes momotula and LOVELY COTINGA Cotinga amabilis. Further evidence of breeding was obtained for LEAST BITTERN Ixobrychus exilis and WHITE HAWK Leucopternis albicollis. Also, during a short visit to Dangriga a sighting of an AMERICAN OYSTERCATCHER Haematopus palliatus is believed to be only the second record for the country. Two small flocks of AMERICAN GOLDEN PLOVER Pluvialis dominica were an interesting sighting of a species that has been added to the Belize List since 1964.

With the limited time we had available we could only begin to scratch the surface and to realise that there is still much to be learnt about the Belizean avifauna. Nevertheless, we hope that our records will contribute in some way to future work.

The list of species in Annex A follows the order and names used by Dora Weyer and W Ford Young in their 'Field Checklist', (1957), and R T Peterson and E L Chalif in their 'Field Guide to Mexican Birds', (1970). Where local names are known they have been included in brackets with each species. The status abbreviations are the same as those in the Checklist: (Courtesy of Russ Mason's Natural History Tours, Kissimee, Florida).

A = Accidental R = Rare U = Uncommon
S = Spring and Summer Resident
T = Spring or Fall Transient W = Winter Resident
L = Local N1 = Positive evidence of Breeding
N2 = Believed to breed but no positive evidence
O = No specimen or reliable photograph
* = Indicates the species was netted and further details are available in the netting records.
Ph = Indicates a photograph is available

REFERENCES

1 Bent, A C.1940. Life Histories of North American Cuckoos, Goatsuckers, Hummingbirds and their Allies. Washington Smithsonian Bulletin 176.

2 Robbins, Bruun, Zim, & Singer. 1966. A Guide to Field Identification of the Birds of North America. New York. Golden Press

3 Davies, L I. 1972. A Field Guide to the Birds of Mexico and Central America. University of Texas Press.

4 Hubert, P. 1976. Birdwatching in Belize. Army Birdwatching Society Bulletin No.1/76.

5 Land, H. 1970. Birds of Guatemala. Wynnewood, Pa. Livingston Press.

6 Peterson, R T & Chalif, E L. 1973. A Field Guide to Mexican Birds. Boston. Houghton Miffin Co.

7 Peterson, R T. 1960. A Field Guide to the Birds of Texas. Boston. Houghton Miffin Co.

8 Russell, S M. 1964. A Distributional Study of the Birds of British Honduras. Lawrence Ka. Allen Press.

9 Smithe, F B & Trimm, H W. 1966. The Birds of Tikal. Garden City, New York. Natural History Press.

10 Field Checklist of the Birds of Belize, Jan 1977. Compiled by Weyer D and Young, W F, Russ Mason's Flying Carpet Tours, Inc. Kissimee, Florida.

11 Monthly Bulletins of the Belize Audubon Society. Jan 1979 to Dec 1981.

HUMMINGBIRD RESEARCH ON RAFOS BELIZE '81

Robert D Powell

AIMS

One of the aims of RAFOS Belize '81 was to find more complicated hummingbird communities than those in the United States and to obtain, if possible, quantitative data to aid in the design of future experiments. Twenty-one species of hummingbird have been recorded in Belize, of which 13 are known or strongly suspected to breed. There was thus ample basis for speculating that interesting associations might be found. Although most species could be expected to have distinct preferences from evolutionary or ecological grounds, it was hoped that we would find groups of three or more species which would exhibit shared preferences to at least some extent.

BACKGROUND

Recently a new branch of biology has emerged called theoretical ecology. It differs from other branches of biology in that it seeks to make predictions of the behaviour of ecosystems under given sets of circumstances. The vehicle for this activity is the description of ecosystem dynamics by sets of differential equations in the same way that engineers describe the dynamics of mechanical, electrical and thermal systems. This enables the use of well-known techniques of analysis to predict the response of the system to various stimuli or impulses.

The hummingbirds,Trochilidae of the New World provide an excellent medium for studies of this type. Hummingbirds maintain a very delicate energy balance from one day to the next with characteristically very high energy rates. They are usually highly visible and are easily attracted to feeders (at least in the United States) where their caloric intake can be accurately measured. Some species are highly territorial and very aggressive; others are more retiring. In short, much behavioural diversity is exhibited in a family which is readily observed and manipulated and whose feeding habits can be quantitatively determined.

For the past five years, the author has been associated with the work of Dr Stuart Pimm of the Texas Tech University, Lubbock, Texas. Working with the hummingbirds of the Chiricahua Mountains of Arizona, Pimm has been able to explain how hummingbird behaviour changes as a function of resource predictability, resource richness and extraction rates. Essentially, this work has dealt with what may be termed one-dimensional studies of two-player systems; "one-dimensional" in the sense that only one parameter is changed at a time, and "two-player" in the sense that in any one experiment there is usually significant interaction between only two species. The schematic situation is that of a large, aggressive species capable of high extraction rates holding territory against members of its own species and against a smaller species as well. This behaviour is carried on only as long as the cost of defense of the resource is repaid by the richness and predictability of the resource and/or its susceptibility to high extraction rates. In each case crossover points can be exhibited where the costs of defense become probibitive. At these points the larger species disappears from the system and the resource is taken over by the smaller species. Each case can be modelled by differential equations and the behaviour predicted by heuristically seeking the optimal strategy for each species.

METHOD

The primary method to be used was straightforward birdwatching: find areas of high hummingbird activity and then set up regular routes through these areas to be run several times a day for several days. Detailed observations from each run should eventually yield a picture of concentrations of activity which might then lead to quantitative experiments.

In the event such concentrations were indeed found. It was planned to collect specimens of plants used by hummingbirds, to take series of corrolla length measurements, to measure nectar production rates, and to measure the sugar content of the nectar. The first two of these are self-explanatory. To measure nectar production rates, a number of flowers are bagged to remove them from the hummingbirds' field of feeding. At intervals the bags are removed and the accumulated nectar is measured with a micropipette. The sugar content of the nectar is then measured with a hand-held refractometer.

In addition, attempts were made to attract hummingbirds to feeders. Finally, the activities of the netting team yielded data on bill lengths.

RESULTS

As expected, we had no difficulty finding hummingbirds in Belize. A summary of our experience appears at Appendix A. Significant findings were made at Big Falls Ranch, Altun Ha, and Aguacate Bridge. Our camp at Guacamallo Bridge (Map Reference BP828657) provided little hummingbird data. This probably indicates nothing more than that we were not in the area long enough to discover the areas of concentrated activity. The site at Jimmy Cut (Map Reference BP004029) was occupied for less than two days and no significant results were obtained.

At Big Falls Ranch (Map Reference CQ316345) a productive area was discovered in the extreme northeastern extension of the ranch along a watercourse adjacent to a large cattle pasture. The stream was chocked with water lettuce and provision trees Pachira aquatica. (All plant identifications vide Meg Craig, resident expert on Belizean flora). The banks were lined with small trees (5 -10m), principally bri-bri Inga rodriqueziana, bay cedar and bigthorn acacia. Large trees (23-30m) occurred at intervals along the banks. Some of these, e.g. swamp immortal, bore large inflorescences of showy flowers. Almost all of the big trees hosted one or more large growths of bromeliads and other epiphytes. Climbing vines in the smaller trees provided many flowers. There was very little in the way of herbaeceous flowering plants ("wildflowers") and still less in the way of wildflowers specifically adapted for hummingbirds, i.e. with long narrow corollas.

In this area we had many observations of Rufous-tailed Hummingbirds Amazilia tzacatl and Green-breasted Mangoes Anthracothorax prevostii. Knowledgeable local observers stated that White-bellied and Fork-tailed Emeralds had often been observed in the same area, but we saw none.

Three mango nests were found, all within about 115m, all high in provision trees, all with bri bri nearly. Females were observed on all the nests, but only one male was seen in the vicinity of the nests. The mangoes were often observed feeding among the bromeliads, particularly Achineae, a prominent plant with large red bracts. Almost all of our mango sightings were at considerable altitudes - 6m or more above the ground. This trend was contradicted, however, by a capture in the nets at a height of about 1.3m. Only one case of a Mango defending was observed. A male chased a male of the same species away from a flowering climber in a bay cedar tree. Green-breasted Mangoes were observed feeding in bri-bri, a tree said by local experts to be beloved of the hummingbirds. The flowers of this tree do not appear to be typical hummingbird flowers; however, the trees we observed were generous hosts to climbers with long-corolla flowers.

The Rufous-tailed Hummingbirds were already well-known to us as the most numerous and conspicuous hummingbirds in Belize. Here we observed them feeding in bri-bri trees, Bignonia sp, Solanum sp, and in a honeysuckle-like climber. Defensive behaviour was noted against other Rufous-tails and against Green-breasted Mangoes. Specimens of the major plants were taken.

Altun Ha (Map Reference CQ575638) is an ancient Mayan site featuring partially restored ruins. The site consists of two large plazas surrounded by pyramids about forty feet high. The sides of the unrestored pyramids are covered by dense stands of Hamalia patens, a shrub 1.3-1.7m high bearing red-orange flowers with long corollas. This rich growth hosted an example of the classic two-hummingbird community described in the introduction. Rufous-tailed hummingbirds were aggressively holding territory against each other and against traplining White-bellied Emeralds Amazilia candida. The area offers an ideal set-up for watching hummingbirds. The pyramids are very steep and the vertical development opens the entire field of Hamalia to view at one time. There were six territories on the one side that I worked, providing almost constant action. The usual Rufous-tail tactic was to perch on one of the little fig trees which emerged occasionally above the Hamalia. The birds normally choose a perch near the uphill boundary of their territories so as to be able to launch attach downhill. In a few cases a perch in a low overhanging branch of a big tree was used, affording an even greater altitude advantage.

White-bellied Emeralds are small, nondescript and unobtrusive. Although no systematic data were taken, casual observations indicate that the White-bellies were able to feed at 1-6 flowers before being detected and chased off by the Rufous-tails. Many fewer White-bellies were found than Rufous-tails.

Altun Ha was the only site where we were able to take quantitative nectar data. See Table 1. Specimens of Hamalia patens were taken.

TABLE 1

ALTUN HA NECTAR PRODUCTION DATA

Hamalia patens

Fifteen inflorescences bagged at 0600. Sunrise 0615. Accuracy ±.4 L.

	0600	0700	0800
Flowers Examined	4	7	7
Average Nectar Volume (L)	1.2	4.5	8.1
Standard Deviation	-	2.1	4.0
Range (L)	-	1.0-7.0	3.0-14.9
Refractometer Reading	16.5	19.6	-

24 corollas measured: Average=19.8mm, SD=1.3, Range 17.8-22.2mm

The location at Aguacate Bridge (Map Reference BN775882) offered great promise for hummingbird studies. Within 200m of our camp were excellent examples of primary and secondary jungle and lush riparian habitat. Encouraged by finding

six species of hummingbird within 36 hours of our arrival, I established a route incorporating seven spots where hummingbirds had been seen. See Figure 1 for a sketch map of the study area and the route. The plan was to spend five minutes at each of the seven stations. With transit time, this made the route almost exactly one hour long. Five minutes was chosen as the observation time because if no species is observed in that time it means that to a first approximation the mean time between visits is not less than ten minutes. Experiments with US hummingbirds led me to believe that if the mean time between visits is as long as ten minutes, then the resource is not likely to be significant. In the ensuing three days the route was run eight times. The data are displayed in Table II.

The final result to be presented is the tabulation of the hummingbird bill-lengths taken from the netting data. See Table III

Hummingbird feeders were set out at Jimmy Cut and at Aguacate Bridge. Feeders were placed in areas where hummingbirds had been observed feeding. There were no results at Jimmy Cut, hardly surprising in view of the fact that we were there for less than two days. At Aguacate Bridge two feeders were in position at Stations 1 and 3 for five days. Only one observation was made - a Rufous-tailed Hummingbird at Station 1 on Day 3.

TABLE II

AGUACATE BRIDGE ROUTE DATA

Run No, Time and Date	Station 1	2	3	4	5	6	7
1, 0611 1 Apr 81			RTH				
2, 0801 1 Apr 81				LH			RTH
3, 1500 1 Apr 81		LTH RTH		LH			RTH
4, 1704 1 Apr 81							
5, 0700 2 Apr 81				2 unk			
6, 1600 2 Apr 81							
7, 0630 3 Apr 81				LTH 2LH			
8, 1600 3 Apr 81					RTH		

Legend: LH = Little Hermit, LTH = Long-tailed Hermit, RTH = Rufous-tailed Hummingbird, unk = unknown

When a symbol appears between two columns, it indicates that the observation occurred in transit between the two station.

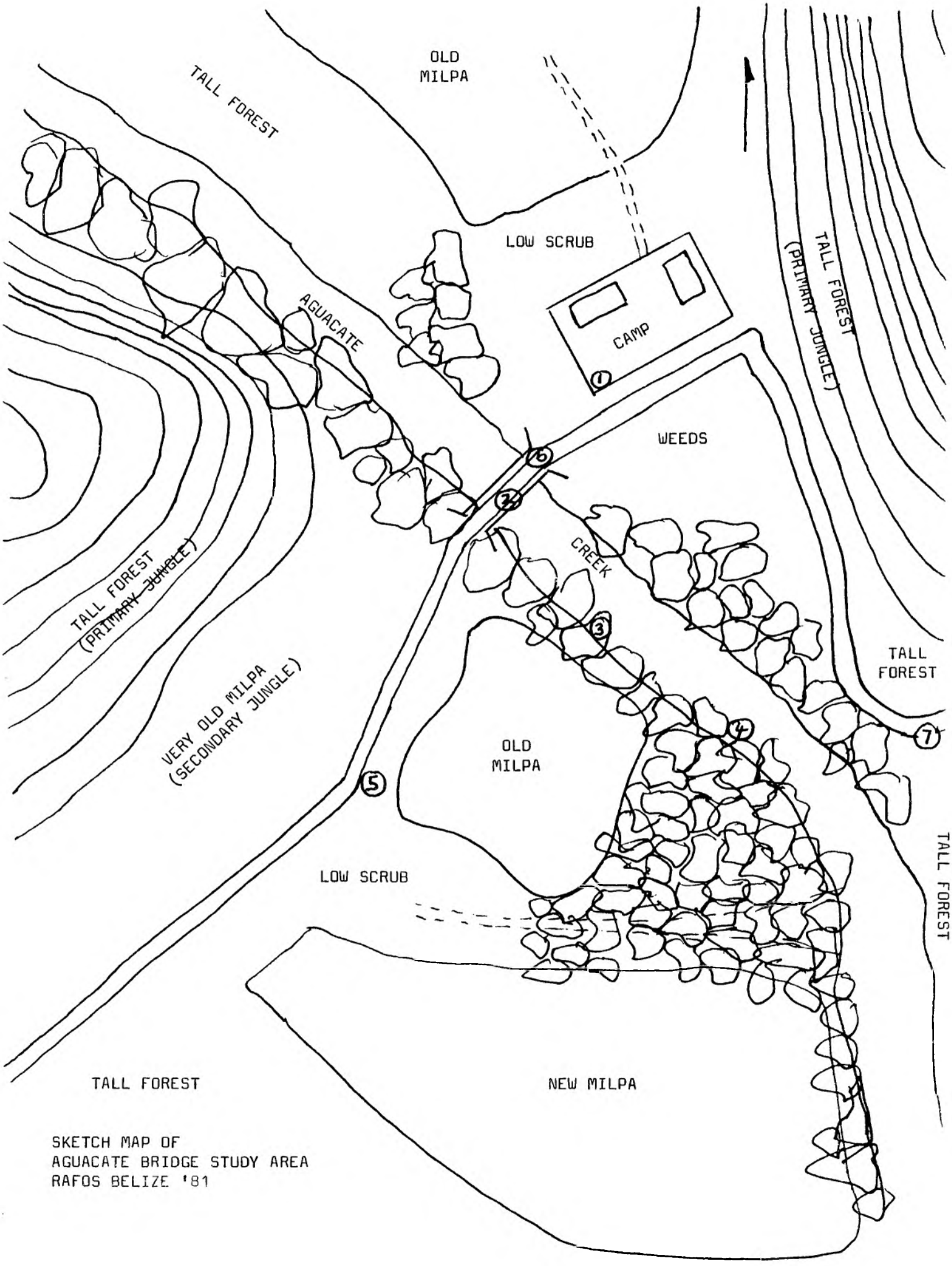

OLD
MILPA
TALL FOREST
LOW SCRUB
AGUACATE
CAMP
1
TALL FOREST
(PRIMARY JUNGLE)
WEEDS
6
2
CREEK
3
TALL FOREST
(PRIMARY JUNGLE)
VERY OLD MILPA
(SECONDARY JUNGLE)
TALL
FOREST
4
OLD
MILPA
7
5
LOW SCRUB
TALL FOREST
TALL FOREST
NEW MILPA
SKETCH MAP OF
AGUACATE BRIDGE STUDY AREA
RAFOS BELIZE '81

FIGURE 1

DISCUSSION

Any discussion of the results cannot avoid the judgement that they are extremely sketchy. This is due to two causes; first, the exploratory nature of the expedition, and, second, the extent to which our thinking about hummingbirds was preconditioned by our experience in the US. Since none of us had been to Belize before (save Jenkins' 1979 recce), we were understandably anxious to cover as many potentially rich bird areas as possible. Each time we moved to a new location, two or three days were required to find the interesting areas, leaving only a day or two for serious work. Aguacate Bridge was the exception to this rule. We were also lucky to obtain so much data at Altun Ha for so little investment of time.

TABLE III

HUMMINGBIRD BILL LENGTHS

Group I - measured to base of skull

Species	No Measured	Average (mm)	Std Dev	Range
Band-tailed Barbthroat	3	26.1	3.7	22.6-30.0
Long-tailed Hermit	6	37.9	4.4	29.6-41.5
Little Hermit	1	19.0	-	-
Violet Sabrewing	1	29.0	-	-
Rufous-tailed Hummingbird	4	21.9	3.2	19.5-26.5

Group II - measured to first feather

Species	No Measured	Average (mm)	Std Dev	Range
Long-tailed Hermit	2	38.0	1.4	37.0-39.0
Little Hermit	3	21.0	1.0	20.0-22.0
Scaly-breasted Hummingbird	1	22.0	-	-
Green-breasted Mango	1	28.0	-	-
Common Woodnymph	1	19.0	-	-
White-bellied Emerald	1	15.0	-	-
Red-billed Azurecrown	1	21.0	-	-
Cinnamon Hummingbird	1	21.0	-	-
Rufous-tailed Hummingbird	19	21.3	1.3	19.0-23.0

The effect of our US preconditioning showed up increasingly as we moved south. We had no difficulty understanding the system at Altun Ha; it was essentially a replication of the hummingbird communities of the American Southwest. At Big Falls the community we found departed from our previous experience. Here we found two large species interacting and no small species, or at least none was observed. It is possible that the small species was overlooked, or that its importance only shows up later in the season. At any rate, we were clearly dealing with a system different from any other I have previously encountered.

At Aguacate Bridge we were even more baffled. The data do not admit of any generalizations at all. The only concentration is that of Little Hermits at Station 4. All of these observations were of the peculiar "plunging" behaviour also observed in Long-tailed Hermits elsewhere. The behaviour consisted of the

bird emerging from a hidden perch in the interior of a streamside bush, hovering 3-5 body lengths above the water for about a second, plunging in, rising immediately back up to the hover position, plunging immediately back in, then returning to its perch. The purpose of this behaviour is not known. No flowers were found in the vicinity of the plunging site. No defensive behaviour was noted. It is therefore difficult to see the significance of this concentration in the structure of the community. Having dismissed the one concentration, we are left only with the conclusion that there is an astonishing lack of consistency of behaviour in the community. If there is a consistency, it lies in the salient fact that not one defensive act was observed in any species of hummingbird at any location on the route or off.

The usual explanation for nonterritoriality is that the environment is not rich enough to support the costs of defense. In such a situation, however, we would expect on the basis of our previous experience that the bigger species would be displaced. This is flatly contradicted by the fact that the most often observed and trapped species, the Rufous-tailed Hummingbird, had already been observed to be highly territorial elsewhere. Going to the other extreme, we might entertain the novel idea that the environment is so rich that it acts essentially like an inifinite resource. There is no point in defending an infinite resource to any larger extent than is necessary to assure that you get your turn at it. However, an infinite resource would surely give rise to very high population densities, certainly high enough to provide many sightings in a one-hour round. In contrast, my rounds averaged less than two hummingbird sightings per hour.

We are left with the inescapable conclusion that one or more important factors have been excluded from the experiment. In critiquing the study, two areas leap instantly to mind. First, all the stations were either roadside or streamside sites. This suggests that the interior of the forest might play an important role. This is almost certainly a factor in the organization of hermits, who seem to prefer the dark places. Some netting was carried out in the forest interior, but these results are too sketchy to be useful. The other significant suggestion is that activity in the higher elevations of the forest is an important part of the hummingbird community structure.

In fact, there can be hardly any doubt of it. At all the locations we visited in Belize we were struck by the absence of herbaeceous plants and by the magnificent inflorescences high in the big trees. Many of these trees are bountiful producers of nectar. Local sources told of varieties which continually drip nectar during the periods of peak production to the point that a man cannot stand under them without becoming quickly covered with syrup. These trees must play an important role in the hummingbird community. This conclusion is buttressed by some of our observations. At Belize River Landing, for example, I saw a Rufous-tailed Hummingbird defending against two others of the same species among the large apricot blossoms of a swamp immortal tree. On many other occasions we saw hummingbirds feeding at altitudes so high that we could not identify them.

If we incorporate the idea of vertical extent of territory, then our ground level observations represent activity only at one boundary. It is almost axiomatic that all defensive activity takes place at the periphery, but that is not necessarily true with three-dimensional territories. In any case, the boundary at the ground is probably the least important. The idea of three-dimensional territories can be extrapolated to the hypothetical case of a

totally arboreal hummingbird, one which never descends below fifty or sixty feet above ground level.

A final note of discussion is in order on hummingbird feeders. In the western US, hummingbird feeders are as common as tit feeders in the UK. A bottle is filled with a sugar solution (usually one part sugar to four parts water). A stopper with a bent glass tube through it is placed in the mouth of the bottle and the whole business upended to present a constant supply of syrup to the birds. Hummingbirds are in our experience intensely curious creatures and will attempt to feed at any bright object, including a man's tie. If there is a hummingbird in the area, it will find the feeder in a day or two. A day or so later, a dominant hummingbird will have established a territory over it, at least in the breeding season. Our lack of success with feeders in Belize was thus hard to understand, but not totally unexpected. Pimm once tried without success to attract hummingbirds to feeders in Yucatan. It may well be that the trait of curiosity which is so prominent in the US hummingbirds is an aberrant behaviour occurring only in those few members of the family who breed in the wildly unpredictable temperate zone. At Aguacate Bridge we met a Mennonite missionary who lives in San Antonio, not far away. She reported that she has attracted hummingbirds to feeders and that two conditions seem to be important. First, ants must be kept away; and, second, the proportions must be just right. Having said that, she was unable to give me any idea of what the correct proportions are.

CONCLUSIONS AND RECOMMENDATIONS

We came in search of hummingbird communities different from those in the United States and we found them. At Big Falls Ranch, we found a community containing two large hummingbird species, which is a case not covered by the current theory. At Aguacate Bridge we found a very complicated hummingbird community which the theory in its present state cannot begin to comprehend. In addition, we found at Altun Ha a hummingbird community which seems well understood by the present theory. A most interesting fact is that one species, Rufous-tailed Hummingbird, strongly contributes to each of these three very different communities.

A comprehensive research program to investigate the structure of these communities should be based on the central role of the Rufous-tailed Hummingbird. The cornerstone of such a program would be physiological studies of captive birds. Hummingbirds are relatively easy to keep for short periods (on the order of a few weeks), so that such a project would not be beyond the capabilities of experienced amateurs.

Next, the botany must be better understood, both in itself and in relation to the hummingbirds. This is probably best done by the establishment of a transect in accordance with the common practice of field ecology: a surveyed course is laid out and all the plants along it are systematically identified. Then regular bird censuses are taken along the course, noting in detail the plants used by or associated with the birds.

In the case of the tall tropical forest it is imperative that the transect include the vertical dimension, as well as the horizontal. This means scaling the trees to catalog the bromeliads and epiphytes and to make observations of the birds. Various bits of climbing, caving, and logging equipment would be necessary. Carrying out such a project at a remote jungle location would almost certainly fulfill the "adventurous and arduous" requirement for a RAFOS expedition.

Finally, it should be clear from this report that what we do not know about the structure of tropical hummingbird communities far exceeds what we do know. Therefore, ANY data at all is highly welcome in whatever form.

APPENDIX A

RAFOS BELIZE '81

SYNOPSIS OF HUMMINGBIRD EXPERIENCE

BAND-TAILED BARBTHROAT Threnetes ruckeri - Experience limited to three netting records.

LONG-TAILED HERMIT Phaethornis superciliosus - Commonly observed only in the South along streams and in the interior of dark woods. Conspicuous but not numerous. Seldom observed at heights above two metres. Eight netting records.

LITTLE HERMIT Phaethornis longuemareus - Uncommon; most records from Aguacate Bridge. Prefers streamsides and thickets. Not conspicuous, remains close to ground. Four netting records.

SCALY-BREASTED HUMMINGBIRD Phaeocroa cuvierii - One netted. The Union Camp team reported them common and holding territory.

VIOLET SABREWING Campylopterus hemileucurus - One netted.

WHITE-NECKED JACOBIN Florisuga mellivora - Rare; a few sight records in the Aguacate area and no netting records.

GREEN-BREASTED MANGO Anthrocothorax prevostii - Locally common. Observed most readily at Big Falls Ranch where three nests were found. Conspicuous. Most often found at considerable height feeding on bromeliads. One netting record.

COMMON WOODNYMPH Thalurania furcata - One netted.

WHITE-BELLIED EMERALD Amazilia candida - Undoubtedly much more common than our records indicate. Small and inconspicuous, probably consistently overlooked until late in the expedition. Most easily found as the object of the ire of a Rufous-tailed Hummingbird. One netted.

RED-BILLED AZURECROWN Amazilia cyanocephalus - One netted.

CINNAMON HUMMINGBIRD Amazilia rutila - Locally common (e.g. Airport Camp). Very conspicuous; addicted to showy flowers of ornamental plants. Never observed more than a hundred yards from habitations. One netted.

RUFOUS-TAILED HUMMINGBIRD Amazilia tzacatl - Commonest hummingbird; widespread and numerous. Observed at every study location on every day. Pugnacious, often observed vigorously defending. Feeds on a wide variety of plants at heights ranging from ground level to high in the tall trees. Twenty-three netted.

NETTING RECORDS

RAFOS '81

Mike Rogers

The expedition found that obtaining a US banding permit and bands would be administratively complex and considered that over the time available banding would be of little scientific value. It was however thought worthwhile to net birds for identification and measurement. Indeed some of the species caught in mist nets could not have been identified by any other method.

The data summarised in the lists has as far as possible been correlated with information in the references, in particular with Land (1970), who provides wing measurements. In some cases wing formulae were recorded, and these have been compared against the references, where available. However, a detailed guide to species in the hand was not available, so that sex and age could not be recorded reliably. The absence of such a reference has made it difficult to ensure that all of the recorded netting data is consistent; we would therefore welcome any feedback on the following data.

BRITISH MUSEUM '79

The second section of netting data was obtained by A M Hutson and C H C Lyal of the British Museum while studying ectoparasites in Belize from April to June 1979. Birds were trapped in the Toledo district at Rideau, Hot Springs, Rio Grande, Aguacate, Union Camp and Jimmy Cut (Salamanca), plus a few at Mountain Pine Ridge.

Key to Location Codes:

A - Airport Camp
B - Big Falls Ranch
C - Altun Ha
D - Salamanca/Jimmy Cut
E - Guacamallo Bridge
F - Mountain Pine Ridge
G - Aguacate
H - Union Camp
J - Hot Springs
K - Rio Grande
L - Rideau

SUMMARY OF BIRDS NETTED BY RAFOS 17 FEB -- 12 APR 81

ORDER NO	SPECIES	NO	LOC'ON CGHT	WINGS mm MAX	WINGS mm MIN	WINGS mm MEAN	BILL mm MAX	BILL mm MIN	BILL mm MEAN	TARSUS mm MAX	TARSUS mm MIN	TARSUS mm MEAN	WEIGHT g MAX	WEIGHT g MIN	WEIGHT g MEAN
208	MOURNING DOVE	1	A	142.00	142.00	142.00	00,00	00,00	0,00	00,00	00,00	0,00	027,00	027,00	27,00
212	RUDDY GROUND-DOVE	9	AB	91,00	81,00	87,00	14,40	11,30	12,77	16,80	14,60	15,81	51,60	35,00	50,63
235	GROOVE-BILLED ANI	3	CA	140,00	133,00	137,00	30,00	28,00	29,00	42,00	33,90	37,95	075,50	066,00	71,50
255	PAURAQUE	6	D	175,00	162,00	169,33	13,90	09,40	11,67	28,80	22,00	25,70	073,00	063,00	67,50
266	BAND-TAILED BARBTHROAT	3	D	067,00	055,00	62,33	30,00	22,60	26,06	04,50	04,70	4,46	006,00	004,50	5,25
267	LONG-TAILED HERMIT	10	DG	067,00	051,00	61,16	42,00	29,60	38,33	05,40	04,60	4,75	007,00	003,50	5,57
268	LITTLE HERMIT	4	DG	041,00	029,00	36,25	22,00	19,00	20,50	03,80	03,80	3,80	002,80	002,10	2,36
269	SCALY-BREASTED HUMMINGBIRD	1	G	068,00	068,00	68,00	22,00	22,00	22,00	00,00	00,00	0,00	007,20	007,20	7,20
271	VIOLET SABREWING	1	D	067,00	067,00	67,00	29,00	29,00	29,00	55,00	55,00	55,00	000,00	000,00	0,00
274	GREEN-BREASTED MANGO	2	CB	072,00	066,00	69,00	28,60	25,50	27,05	04,30	04,30	4,30	007,50	006,20	6,85
278	COMMON WOODNYMPH	1	G	057,00	057,00	57,00	19,00	19,00	19,00	00,00	00,00	0,00	000,00	000,00	0,00
279	WHITE-BELLIED EMERALD	1	G	054,00	054,00	54,00	15,00	15,00	15,00	00,00	00,00	0,00	004,00	004,00	4,00
280	RED-BILLED AZURECROWN	1	E	058,00	058,00	58,00	21,00	21,00	21,00	00,00	00,00	0,00	005,20	005,20	5,20
281	CINNAMON HUMMINGBIRD	5	A	060,00	054,00	56,40	21,00	16,50	18,12	00,00	00,00	0,00	005,00	004,60	4,90
283	RUFOUS-TAILED HUMMINGBIRD	27	BFDCAEG	061,00	050,00	56,44	26,50	19,50	21,43	09,00	04,40	1,30	005,20	003,00	4,62
295	GREEN KINGFISHER	6	EG	089,00	082,00	86,50	51,00	43,00	46,16	14,00	11,00	12,50	049,00	033,50	40,80
302	BLACK-CHINNED JACAMAR	1	D	084,00	084,00	84,00	53,50	53,50	53,50	13,00	13,00	13,00	000,00	000,00	0,00
314	ACORN WOODPECKER	1	A	144,00	144,00	144,00	26,70	26,70	26,70	23,60	23,60	23,60	086,00	086,00	86,00
318	YELLOW-BELLIED SAPSUCKER	1	A	125,00	125,00	125,00	24,00	24,00	24,00	18,00	18,00	18,00	049,00	049,00	49,00
324	RUDDY WOODCREEPER	1	D	097,00	097,00	97,00	22,80	22,80	22,80	25,00	25,00	25,00	030,50	030,50	30,50
325	OLIVACEOUS WOODCREEPER	1	G	076,00	076,00	76,00	12,00	12,00	12,00	18,00	18,00	18,00	012,30	012,30	12,30
326	WEDGE-BILLED WOODCREEPER	1	D	074,00	074,00	74,00	12,90	12,90	12,90	17,30	17,30	17,30	015,00	015,00	15,00
329	IVORY-BILLED WOODCREEPER	2	D	110,00	110,00	110,00	37,00	34,60	35,80	24,00	22,30	23,15	043,00	042,00	42,50
333	BUFF-THROATED FOLIAGE CLEANER	2	H	095,00	089,00	92,00	23,00	22,00	22,50	26,00	24,00	25,00	046,20	038,40	42,30
334	PLAIN XENOPS	2	D	061,00	061,00	61,00	11,50	11,50	11,50	13,30	13,30	13,30	010,50	010,50	10,50
338	BARRED ANTSHRIKE	2	D	076,00	072,00	74,00	28,00	18,00	23,00	27,00	25,00	26,00	025,50	025,50	25,50
343	DUSKY ANTBIRD	2	G	066,00	065,00	65,50	15,00	15,00	15,00	26,00	23,00	24,50	028,20	017,80	23,00
348	WHITE-COLLARED MANAKIN	7	DCG	059,00	054,00	56,71	19,00	09,50	12,05	35,00	20,00	23,78	023,00	015,00	18,73
349	THRUSHLIKE MANAKIN	1	D	085,00	085,00	85,00	14,40	14,40	14,40	21,60	21,60	21,60	031,00	031,00	31,00
352	BRIGHT-RUMPED ATTILA	1	D	090,00	090,00	90,00	15,80	15,80	15,80	16,30	16,30	16,30	039,50	039,50	39,50
365	VERMILION FLYCATCHER	1	A	071,00	071,00	71,00	11,20	11,20	11,20	17,20	17,20	17,20	014,50	014,50	14,50
374	BOAT-BILLED FLYCATCHER	1	B	100,00	100,00	100,00	20,50	20,50	20,50	00,00	00,00	0,00	052,00	052,00	52,00
375	SOCIAL FLYCATCHER	11	ACB	098,00	084,00	90,72	14,00	12,40	13,22	28,30	18,40	21,50	033,20	025,30	29,46
376	GREAT KISKADEE	3	A	125,00	115,00	119,00	29,90	29,90	29,90	25,40	25,40	25,40	072,00	066,00	68,33
378	BROWN-CRESTED FLYCATCHER	1	A	107,00	107,00	107,00	23,00	23,00	23,00	25,00	25,00	25,00	027,60	027,60	27,60
380	DUSKY-CAPPED FLYCATCHER	2	AD	082,00	076,00	79,00	18,00	11,00	14,50	20,00	21,00	20,50	024,00	019,20	21,60
382	TROPICAL PEWEE	1	G	073,00	073,00	73,00	13,00	13,00	13,00	14,00	14,00	14,00	011,50	011,50	11,50
386	YELLOW-BELLIED FLYCATCHER	3	D	068,00	058,00	64,33	12,70	10,50	11,50	17,80	11,40	14,73	009,00	008,50	9,00
390	EMPIDONAX FLYCATCHERS	6	AED	064,00	059,00	62,66	11,00	5,00	8,00	19,00	15,00	17,00	010,60	008,70	9,58
393	SULPHER-RUMPED FLYCATCHER	12	DG	069,00	057,00	65,33	12,60	08,50	10,01	19,00	09,30	14,55	013,00	008,30	11,10
394	NORTHERN ROYAL-FLYCATCHER	1	C	081,50	081,50	81,50	27,40	27,40	27,40	19,50	19,50	19,50	019,00	019,00	19,00
395	WHITE-THROATED SPADEBILL	6	DG	063,00	050,00	57,50	10,00	09,00	9,82	17,00	11,80	13,70	011,00	008,00	9,90
396	YELLOW-OLIVE FLYCATCHER	1	D	068,00	068,00	68,00	06,00	06,00	6,00	21,00	21,00	21,00	013,80	013,80	13,80
398	COMMON TODY-FLYCATCHER	7	A	044,00	040,00	42,42	14,00	13,00	13,50	21,00	18,00	19,50	007,60	006,50	6,32
399	SLATE-HEADED TODY-FLYCATCHER	1	G	045,00	045,00	45,00	13,00	13,00	13,00	18,00	18,00	18,00	007,10	007,10	7,10
400	NORTHERN BENTBILL	1	H	062,00	062,00	62,00	09,00	09,00	9,00	16,00	16,00	16,00	000,00	000,00	0,00
401	YELLOW-BELLIED ELAENIA	5	AB	086,00	076,00	80,80	10,50	10,50	10,50	22,00	22,00	22,00	024,70	019,70	22,74

ORDER NO	SPECIES	NO LOC ON CGHT	WINGS mm MAX	WINGS mm MIN	WINGS mm MEAN	BILL mm MAX	BILL mm MIN	BILL mm MEAN	TARSUS mm MAX	TARSUS mm MIN	TARSUS mm MEAN	WEIGHT g MAX	WEIGHT g MIN	WEIGHT g MEAN
404	NORTHERN BEARDLESS TYRANNULET	2 A	52,00	50,00	51,00	0,00	0,00	0,00	0,00	0,00	0,00	8,30	7,70	8,00
406	YELLOW-BELLIED TYRANNULET	4 D	46,00	44,00	45,00	8,20	7,00	7,40	18,00	13,00	15,05	7,00	5,00	6,12
407	SEPIA-CAPPED FLYCATCHER	1 G	66,00	66,00	66,00	12,00	12,00	12,00	16,00	16,00	16,00	12,00	12,00	12,00
408	OCHRE-BELLIED FLYCATCHER	1 G	69,00	69,00	69,00	11,00	11,00	11,00	16,00	16,00	16,00	12,10	12,10	12,10
411	MANGROVE SWALLOW	2 A	103,70	94,00	98,85	7,00	7,00	7,00	8,00	8,00	8,00	15,20	10,60	12,90
414	ROUGH-WINGED SWALLOW	2 B	109,00	102,00	105,50	7,50	5,90	6,70	11,60	8,50	10,05	15,00	14,50	14,75
427	SPOT-BREASTED WREN	3 DG	57,00	55,00	56,00	18,00	15,00	16,00	23,00	21,00	22,00	13,20	12,80	12,93
428	SOUTHERN HOUSE WREN	1 E	51,00	51,00	51,00	14,00	14,00	14,00	18,00	18,00	18,00	10,90	10,90	10,90
429	WHITE-BREASTED WOOD-WREN	7 DG	59,00	53,00	56,60	16,00	14,10	15,28	25,80	24,00	24,95	17,50	13,50	15,15
430	WHITE-BELLIED WREN	1 F	51,00	51,00	51,00	12,10	12,10	12,10	19,70	19,70	19,70	8,50	8,50	8,50
434	GRAY CATBIRD	8 FDA	92,00	88,00	89,86	17,60	12,40	15,50	30,00	18,70	26,52	42,10	30,00	37,81
435	TROPICAL MOCKINGBIRD	1 B	95,00	95,00	95,00	18,20	18,20	18,20	27,80	27,80	27,80	38,00	38,00	38,00
438	CLAY COLOURED ROBIN	6 ADE	134,00	120,00	124,83	24,00	20,70	22,00	34,00	30,10	32,43	87,00	66,00	76,33
440	WOOD THRUSH	4 DG	110,00	103,00	107,75	18,00	17,00	17,60	31,50	29,00	30,50	55,00	46,50	49,83
448	LONG-BILLED GNATWREN	1 D	51,00	51,00	51,00	23,30	23,30	23,30	21,00	21,00	21,00	8,00	8,00	8,00
456	WHITE-EYED VIREO	1 E	60,00	60,00	60,00	10,00	10,00	10,00	0,00	0,00	0,00	10,90	10,90	10,90
457	MANGROVE VIREO	3 A	56,00	55,00	55,50	12,00	12,00	12,00	23,00	23,00	23,00	10,50	9,70	10,00
462	YELLOW-GREEN VIREO	4 EA	83,00	80,00	81,25	13,00	13,00	13,00	14,00	14,00	14,00	19,50	15,10	17,12
466	TAWNY-CROWNED GREENLET	3 DG	55,00	55,00	55,00	12,00	12,00	12,00	18,90	18,90	18,90	0,00	0,00	0,00
467	LESSER GREENLET	1 D	38,00	38,00	38,00	12,20	12,20	12,20	15,00	15,00	15,00	7,50	7,50	7,50
472	BANANAQUIT	1 D	50,00	50,00	50,00	13,20	13,20	13,20	15,10	15,10	15,10	9,00	9,00	9,00
474	BLACK-AND-WHITE WARBLER	3 ABC	69,00	66,00	67,66	12,50	11,30	11,76	19,60	16,50	18,53	9,50	9,00	9,25
484	NORTHERN PARULA	1 C	54,00	54,00	54,00	10,40	10,40	10,40	17,80	17,80	17,80	7,50	7,50	7,50
485	YELLOW WARBLER	8 BAD	67,00	61,00	63,25	10,00	9,90	9,95	22,00	18,00	19,86	10,00	8,40	8,94
487	MAGNOLIA WARBLER	16 BECADG	62,00	56,00	58,87	11,10	9,00	10,22	21,00	18,00	19,11	10,20	6,80	7,91
490	YELLOW-RUMPED WARBLER	5 AB	70,00	57,00	64,75	10,90	9,00	9,95	19,60	16,70	18,15	10,00	7,00	8,97
496	CHESTNUT-SIDED WARBLER	1 D	63,00	63,00	63,00	12,00	12,00	12,00	18,00	18,00	18,00	9,40	9,40	9,40
500	OVENBIRD	22 FDCAGH	78,00	68,00	75,63	13,50	10,00	12,21	23,20	14,50	21,03	23,20	16,50	18,55
502	NORTHERN WATERTHRUSH	9 DCEGA	81,00	74,00	76,88	16,00	12,00	13,50	23,20	21,00	22,34	20,90	14,60	16,35
503	KENTUCKY WARBLER	7 DG	70,00	60,00	65,28	20,00	10,00	12,50	23,00	21,00	21,95	14,70	4,60	11,85
506	COMMON YELLOWTHROAT	40 BAEDG	61,00	52,00	56,78	21,30	10,50	13,30	30,00	19,60	22,43	11,40	8,40	9,61
507	GRAY-CROWNED YELLOWTHROAT	5 A	57,00	53,00	54,50	10,00	10,00	10,00	21,00	21,00	21,00	9,70	7,30	8,80
508	YELLOW-BREASTED CHAT	11 FABD	82,00	72,00	76,60	13,60	13,00	13,30	27,30	27,00	27,15	24,60	23,30	25,74
510	HOODED WARBLER	6 DH	69,00	66,00	67,33	20,00	9,00	12,00	51,00	20,00	25,46	11,40	9,50	10,30
511	WILSON'S WARBLER	7 DGA	62,00	52,50	55,92	9,50	4,00	7,82	20,40	17,70	18,92	9,50	6,00	7,15
513	AMERICAN REDSTART	5 ABE	62,00	59,00	60,20	8,00	8,00	8,00	19,00	19,00	19,00	7,80	6,70	7,38
519	YELLOW-BILLED CACIQUE	5 DG	110,00	97,00	103,50	30,10	29,50	29,80	33,50	30,80	32,15	59,50	30,00	44,75
522	GREAT-TAILED GRACKLE	2 A	160,00	153,00	156,50	33,00	33,00	33,00	43,00	43,00	43,00	124,00	06,00	124,50
524	ORCHARD ORIOLE	25 A	83,00	74,00	79,64	17,00	15,00	15,73	26,00	22,00	23,33	26,60	11,60	20,41
526	HOODED ORIOLE	1 A	90,00	90,00	90,00	20,00	20,00	20,00	25,00	25,00	25,00	25,00	25,00	25,00
531	RED-WINGED BLACKBIRD	7 B	95,00	87,00	91,00	0,00	0,00	0,00	0,00	0,00	0,00	34,60	30,00	31,90
542	BLUE-GRAY TANAGER	5 A	93,00	85,00	89,80	11,50	11,50	11,50	18,90	18,90	18,90	32,40	28,30	30,70
543	YELLOW-WINGED TANAGER	2 C	99,00	97,00	98,00	13,30	12,10	12,70	23,20	22,40	22,80	40,50	40,50	40,50
544	SCARLET-RUMPED TANAGER	6 DG	79,00	72,00	77,33	14,60	14,00	14,23	25,00	20,00	22,11	38,40	27,00	31,98
545	CRIMSON-COLLARED TANAGER	2 DG	92,00	89,00	90,50	17,00	16,00	16,50	24,00	21,00	22,50	41,50	40,90	41,20
552	RED-CROWNED ANT-TANAGER	8 DG	100,00	88,00	92,33	18,00	16,00	16,87	25,90	23,00	24,81	46,00	30,00	35,14
559	BUFF-THROATED SALTATOR	6 D	116,00	97,00	102,33	21,00	18,30	19,60	27,00	23,00	25,86	54,50	42,00	44,83

ORDER NO	SPECIES	NO	LOC'ON CGHT	WINGS mm MAX	WINGS mm MIN	WINGS mm MEAN	BILL mm MAX	BILL mm MIN	BILL mm MEAN	TARSUS mm MAX	TARSUS mm MIN	TARSUS mm MEAN	WEIGHT g MAX	WEIGHT g MIN	WEIGHT g MEAN
560	GRAYISH SALTATOR	2	A	104,00	104,00	104,00	20,00	20,00	20,00	27,00	27,00	27,00	060,00	055,00	57,50
561	BLACK-FACED GROSBEAK	1	G	098,00	098,00	98,00	18,00	18,00	18,00	22,00	22,00	22,00	038,80	038,80	38,80
563	ROSE-BREASTED GROSBEAK	3	A	102,00	100,00	101,00	16,00	16,00	16,00	22,00	22,00	22,00	041,20	038,30	39,66
564	BLUE GROSBEAK	1	D	085,00	085,00	85,00	00,00	00,00	0,00	00,00	00,00	0,00	026,10	026,10	26,10
566	BLUE-BLACK GROSBEAK	7	DG	085,00	073,00	80,42	21,00	09,00	18,58	25,00	16,00	22,48	033,10	029,00	31,64
567	INDIGO BUNTING	43	BFDA	072,00	062,00	66,82	11,50	10,00	10,75	26,50	12,80	16,94	018,60	010,50	14,57
568	PAINTED BUNTING	3	D	075,00	074,00	74,66	10,00	10,00	10,00	20,00	20,00	20,00	016,60	014,60	15,80
570	WHITE-COLLARED SEEDEATER	47	ABDG	058,00	045,00	49,42	9,30	7,70	8,57	21,00	14,00	16,18	012,90	005,50	8,58
571	VARIABLE SEEDEATER	4	DG	058,00	055,00	56,25	09,00	07,00	8,33	17,70	14,00	15,56	014,00	009,50	11,25
572	THICK-BILLED SEED-FINCH	2	EG	060,00	055,00	57,50	09,00	09,00	9,00	20,00	20,00	20,00	013,10	012,10	12,60
573	BLUE-BLACK GRASSQUIT	12	BDA	050,00	043,00	47,45	10,00	07,80	9,54	19,10	15,50	16,87	010,00	007,50	9,07
575	ORANGE-BILLED SPARROW	5	DG	083,00	070,00	78,00	17,00	14,00	15,85	31,00	28,00	29,40	040,00	031,90	36,26
577	GREEN-BACKED SPARROW	5	FDCEG	069,00	66,00	67,20	15,30	11,20	13,47	28,00	24,50	26,26	27,00	25,50	26,00

SUMMARY OF BIRDS NETTED BY A M HUTSON AND C H C LYAL FROM APR - JUN 79

Scientific names are included only for those species not recorded by RAFOS and already appearing with their scientific names elsewhere in the report.

Species	No Caught	Loc'on	Wing mm Max	Wing mm Min	Wing mm Mean	Weight g Max	Weight g Min	Weight g Mean
Short-billed Pigeon	1	D	135	135	135	-	-	-
Ruddy Quail-Dove	1	H	148	148	148	142	142	142
Vermiculated Screech-Owl *Otus quatemalae*	2	DJ	133	133	133	110	110	110
Pauraque	1	J	-	-	-	-	-	-
Band-tailed Barbthroat	5	DG	60.0	54.5	57.4	5.6	5.4	5.5
Long-tailed Hermit	28	DGHJ	69.0	59.0	63.4	7.1	5.2	6.0
Little Hermit	1	G	36.0	36.0	36.0	2.3	2.3	2.3
Scaly-breasted Hummingbird	2	GH	73.0	68.0	70.5	8.7	7.5	8.3
Wedge-tailed Sabrewing *Campylopterus curvipennis*	7	DH	70.5	62.0	67.4	6.7	4.3	5.9
Violet Sabrewing	11	DH	86.0	66.0	77.0	13.2	6.8	9.9
White-necked Jacobin	1	G	67.5	67.5	67.5	7.2	7.2	7.2
Common Woodnymph	2	D	56.0	53.5	54.8	4.5	4.1	4.3
White-bellied Emerald	3	DH	54.5	49.0	52.2	4.0	3.6	3.8
Red-billed Azurecrown	2	F	-	-	-	-	-	-
Rufous-tailed Hummingbird	2	DH	57.5	57.0	57.3	5.0	4.8	4.9
Stripe-tailed Hummingbird	6	H	61.0	57.0	59.0	4.4	3.9	4.2
Purple-crowned Fairy *Heliothrix barroti*	2	D	70.0	68.0	69.0	5.8	5.2	5.5
Grey Kingfisher	3	G	85.0	85.0	85.0	35.0	35.0	35.0
Pygmy Kingfisher	3	DG	63.0	60.0	61.7	18.6	17.0	17.8
Tody Motmot	1	G	75.0	75.0	75.0	31.0	31.0	31.0
Smoky-brown Woodpecker	1	H	89.0	89.0	89.0	34.4	34.4	34.4
Tawny-winged Woodcreeper *Dendrocincla anabatina*	1	D	94.0	94.0	94.0	32.3	32.3	32.3
Ruddy Woodcreeper	5	DGH	104	96.0	98.8	43.0	35.0	39.1
Olivaceous Woodcreeper	2	H	77.0	70.0	73.5	13.5	12.9	13.2
Wedge-billed Woodcreeper	4	DGJ	79.0	75.0	77.2	16.2	15.2	15.9
Streak-headed Woodcreeper	1	D	98.0	98.0	98.0	31.1	31.1	31.1
Spotted Woodcreeper *Xiphorhynchus erythropygius*	1	H	112.0	112.0	112.0	40.0	40.0	40.0
Buff-throated Foliage-gleaner	2	D	85.0	85.0	85.0	37.7	37.7	37.7
Plain Xenops	3	DHK	65.5	60.0	62.8	11.1	10.4	10.8

Species	No Caught	Loc'on	Wing mm Max	Wing mm Min	Wing mm Mean	Weight g Max	Weight g Min	Weight g Mean
Scaly-throated Leafscraper *Sclerurus guatemalensis*	1	G	92.0	92.0	92.0	23.0	23.0	23.0
Plain Antureo *Dysithamnus mentalis*	1	H	60.2	60.2	60.2	13.9	13.9	13.9
Dusky Antbird	3	D	67.0	61.0	63.3	17.8	15.6	16.8
Red-capped Manakin	7	DGH	62.0	59.0	60.5	15.8	12.5	14.4
White-collared Manakin	10	DJK	60.0	56.5	58.1	20.8	15.2	17.8
Thrushlike Manakin	1	H	91.0	91.0	91.0	32.8	32.8	32.8
Bright-rumped Attila	1	G	91.0	91.0	91.0	39.5	39.5	39.5
Black Phoebe	1	G	85.0	85.0	85.0	17.7	17.7	17.7
Tropical Kingbird	1	L	-	-	-	-	-	-
Yellow-bellied Flycatcher	1	H	68.5	68.5	68.5	13.7	13.7	13.7
Sulphur-rumped Flycatcher	7	DGJ	71.0	63.0	67.6	14.0	10.9	12.3
White-throated Spadebill	1	H	60.0	60.0	60.0	11.0	11.0	11.0
Yellow-olive Flycatcher	1	G	-	-	-	9.9	9.9	9.9
Northern Bentbill	1	H	44.5	44.5	44.5	6.8	6.8	6.8
Yellow-bellied Elaenia	2	L	80.0	80.0	80.0	25.5	25.5	25.5
Ochre-bellied Flycatcher	8	GHK	69.0	61.0	65.6	14.3	11.3	13.2
White-breasted Wood-wren	8	DGH	59.0	54.5	56.8	17.4	14.0	15.7
Gray Catbird	1	K	91.0	91.0	91.0	35.5	35.5	35.5
Swainson's Thrush *Catharus ustulatus*	3	HK	99.0	96.0	97.5	29.2	24.6	26.8
Long-billed Gnatwren	2	HJ	54.5	51.0	52.3	10.3	10.1	10.2
Yellow-green Vireo	2	L	83.0	74.0	78.5	17.5	15.7	16.6
Tawny-crowned Greenlet	4	D	68.0	58.0	62.0	11.9	11.0	11.45
Ovenbird	1	J	79.0	79.0	79.0	26.6	26.6	26.6
Louisiana Waterthrush	1	G	77.0	77.0	77.0	18.6	18.6	18.6
Golden-crowned Warbler	1	H	61.0	61.0	61.0	9.7	9.7	9.7
Yellow-throated Euphonia	3	H	62.0	58.0	60.2	15.3	11.8	13.3
Red-throated Ant-tanager	4	D	108	96.0	102.4	42.3	39.7	41.1
Blue-black Grosbeak	7	DGHK	84.5	70.0	79.3	36.0	29.3	32.7
White-collared Seedeater	2	L	48.0	48.0	48.0	8.2	8.2	8.2
Variable Seedeater	2	DG	57.0	53.0	55.0	12.0	10.4	11.2
Thick-billed Seed-Finch	1	G	59.0	58.0	58.0	10.9	10.9	10.9
Blue-black Grassquit	6	DL	59.0	31.0	46.2	11.0	9.5	9.9
Orange-billed Sparrow	12	DGJ	89.0	70.5	82.6	46.0	35.0	36.99
Green-backed Sparrow	1	H	64.0	64.0	64.0	24.0	24.0	24.0

EMPIDONAX FLYCATCHERS - WHITE-THROATED OR LEAST FLYCATCHER?

Empidonax Flycatchers are a genus of tyrant flycatchers , Tyrannidae, that are particularly hard to identify. In the field many species can only be reliably distinguished by their voice, and even in the hand we found it was still difficult without detailed biometric data. Team A did not record any Empidonax sp, but Team B reported netting two YELLOW-BELLIED FLYCATCHERS, E. flaviventris and six WHITE-THROATED FLYCATCHERS, E. albigularis. The following data was recorded on the latter:

	Location	Date	Wing mm	Weight g	Other Notes
1	APC	19 Mar	59.0	8.7	Emarg 4,5 & 6 slightly WP=4=5=longest
2	Guacamallo Bridge	25 Mar	64.0	10.5	Emarg 4 & 5 WP=4=5, 2 6
3	Jimmy Cut	29 Mar	64.0	9.4	
4	Jimmy Cut	30 Mar	64.0	9.5	
5	Jimmy Cut	30 Mar	63.0	8.8	
6	Jimmy Cut	07 Apr	63.0	10.6	

At each site birds were trapped in fairly open habitat consisting of low - medium bush and trees.

There are six Empidonax sp. appearing on the 1977 Checklist. Some relevant diagnostic data from Peterson & Chalif, (1973), Robbins et al (1966) and Land, (1970) are as follows:

YELLOW-BELLIED FLYCATCHER E. flaviventris W
Yellow throat and flanks (wg 62-70, 10 $\geqslant$ 5)

ACADIAN FLYCATCHER E. virescens W
(Wg 67-81, no emarg on 6)

ALDER FLYCATCHER E. alnorum WO
(Wg 64-78, 10 $\geqslant$ 5, no emarg on 6)

WILLOW FLYCATCHER E. traillii WO
As for E. alnorum

WHITE-THROATED FLYCATCHER E. albigularis UN2
Small, dull brown with considerable contrast between white throat and dusky chest. Buff wingbars. (Wg 55-63, 10 $\leqslant$ 5, 6 slightly emarg).

LEAST FLYCATCHER E. minimus W
Olive brown, but grey above and underparts whitish with washed-out olive below. Less contrast between throat and side of breast than E. traillii. (Wg 59-67, 10 5, 6 emarg).

Considering the six records, plumage coloration rules out E. flaviventris, and the wing sizes are too small for ACADIAN, ALDER & WILLOW. Record one at APC has a wing that is within the referenced limits for WHITE-THROATED, but the wing of the other five are at the maximum end of the limits. They are however in the middle of the range for LEAST. Photographs taken of records one and four are not a great help; however there is evidence of buff wingbars in record one and of extensive white on the underside of record four.

Based on the above it is thought likely that the majority of records were in fact E. minimus, but that the first record at APC was possibly E. albigularis.

SPECIMEN DATA LIST

Royal Scottish Museum
Register Number 1981.63

BIRDS

	Name	Data	RAFOS Ref
	Caprimulgidae - Nightjars		
1	Pauraque, Nyctidromus albicollis, m, 21 Mar 81, Big Falls Ranch		B6
	Picidae - Woodpeckers		
2	Yellow-bellied Sapsucker, Sphyrapicus varius varius, m, 19 Mar 81	APC Football Pitch, Belize	B5
	Tyrannidae - Tyrant Flycatchers		
3	Ruddy-tailed Flycatcher, Terenotriccus erythrurus, , 9 Mar 81	Jimmy Cut	B3
	Icteridae - American orioles etc		
4	Chestnut-headed Oropendola, Psarocolius wagleri, 26 Mar 81	Jimmy Cut (Nest)	N1
	Thraupidae - Tanagers		
5	Red-throated Ant-tanager Habia fuscicauda, , 9 Mar 81	Jimmy Cut	B2
	Emberizidae - Finches and Buntings		
6	White-collared Seed-eater, Sporophila torqueola, f, 28 Feb 81	Big Falls Ranch	B1
7	White-collared Seedeater, Sporophila torqueola, m, 19 Mar 81	Transmitter Site, APC Belize	B4
8	White-collared Seedeater, Sporophila torqueola, m, 2 Apr 81	Aguacate, Belize	B8
9	Indigo Bunting, Passerina cyanea, m, 22 Mar 81, Big Falls Ranch		B7

BATS — British Museum

Name	Data	RAFOS Ref
1 *Carollia perspicillata*	29 Mar 81, Jimmy Cut	BA1 & BA6
2 *Sturnira lilium*	29 Mar 81, Jimmy Cut	BA2 - BA5 & BA9

Resources were not available to determine the small number of insects and reptiles collected.

SUMMARY OF RESULTS

Some of the detailed objectives of the expedition could not be tackled because of lack of time. Needless to say a Sun Bittern was not seen, and although Guacamallo means Macaw, the threatened Scarlet Macaw was not seen at Guacamallo Bridge or elsewhere. Lack of time and helicopters prevented a visit to the Sarstoon river, but a brief stay was made at Union Camp. A limited recce was made of the Cockscomb Basin and a new forestry road followed to within about 6 miles of Victoria Peak. Netting to discover more about the status of rails was attempted at Big Falls Ranch, but much more time and special equipment would be needed to develop and use a successful catching method. Seven species of bird and two species of bat were collected for the Royal Scottish and British Museums; although some insects were also collected, the value of such general collecting is limited. A visit was made to the Northern Lagoon and Cay Chapel to see something of the coastal and off-shore avifauna.

Fiftysix hummingbirds of 11 different species were netted and the work done by R D Powell has revealed the exciting potential of hummingbird communities in Belize. We were not so successful in netting woodcreepers, but our data complemented that of A H Hutson whose 1979 data published in this report includes a new species for Belize - a Spotted Woodcreeper Xypharhynchus orythropygius netted at Union Camp.

Three hundred and one species were positively identified, and 600 birds were netted. At Aguacate, Chuck-Will's-Widow Caprimulous carolinensis was recorded for the first time in Belize, and an American Oystercatcher Haematopus palliatus was recorded at Dangriga for only the second time in the country. Our visit also coincided with the first positive identification of a White Pelican Pelecaus erythrorhynchos since 1901.

Other observations, especially in the south, should expand knowledge of the avifauna of that area, and could be used to aid future distributional studies. Records included several observations of birds for which few previous records exist.

Thus the expedition achieved many of its detailed objectives and gathered a great deal of useful data. After three weeks in the field each expedition member had become familiar with the identification, habitat etc. of many Neotropical species, and had learnt something of the problems and hazards of living and working in the Central American jungle.

CONCLUSIONS AND RECOMMENDATIONS

The expedition satisfied its main aim of arduous training and ornithological observation. It showed that there is still much to be learnt about the rich avifauna of Belize. In particular, the remote Maya Mountains, the areas to the south of Guacamallo Bridge and that around Union Camp would benefit considerably from further visits. Work should also be done to expand upon the start made with hummingbird communities. An expedition with the specific aim of establishing the status of the threatened Scarlet Macaw would be very useful, as would an attempt to ascend and survey Victoria Peak and the Cockscomb Ridge.

DETAILED RECORD OF SPECIES IDENTIFIED

Tinamous — Tinamidae

1 LITTLE TINAMOU (Bawley) — *Crypturellus soui* — N1

Two birds were seen close to the camp at Guacamallo Bridge on 26 Mar, and on 31 Mar two birds were seen crossing a dry stream bed and a path in the jungle between Blue Creek and Santa Cruz.

Grebes, Shearwaters and Petrels, Tropicbirds — Podicipedidae, Procellariidae, Phaethontidae

2 LEAST GREBE (Diving Dabbler or Dopper) — *Podiceps dominicus* — N1

Four birds were seen on a small pond by both teams in an area south of Georgeville beside the road to Augustine and Guacamallo Bridge.

3 PIED-BILLED GREBE — *Podilymbus podiceps* — W

A Pied-billed Grebe was seen at a small pool beside the San Antonio-Georgeville road on 3 and 4 Mar, and also at Willows Bank on 16 Mar.

Pelicans and Boobies — Pelecanidae Sulidae

4 WHITE PELICAN — *Pelecanus erythrorhynchos* — AO

A single bird was seen at the fuel storage depot south of Belize City on 7 and 9 Apr. The bird was first positively identified by Mr W Ford Young of the Belize Audubon Society (BAS) and is a second record for Belize, the only previous record being in 1901 and regarded by Russell as unreliable. (Ph)

5 BROWN PELICAN — *Pelecanus occidentalis* — N1

Small numbers were seen off the coast and along the shoreline on each day with a maximum of 30 on 15 Mar. A nesting site was seen on the southern end of Hicks Cay on 9 Apr, consisting of about 15 nests and 30-40 adult birds. (Ph)

Cormorants, Anhingas, Frigatebirds — Phalacrocoracidae, Anhingidae, Fregatidae

6 NEOTROPIC CORMORANT (Sheg) — *Phalacrocorax olivaceus* — N1

Small numbers were seen off the coast and at least 50 birds were seen by each team on its visit to Cay Chapel. Birds exhibited a great variety of plumage from immature to adult. Also up to 25 birds were seen in similar locations to Anhinga adjacent to the Belize river at the Big Falls Ranch. (Ph)

7 ANHINGA (Snake bird) Anhinga anhinga N1

Up to 30 birds were seen by each team while travelling by boat to the Northern Lagoon. Similar numbers were also seen roosting near the Belize river at the Big Falls Ranch. Single birds were seen in flight from Airport Camp and Guacamallo Bridge. (These records add weight to the opinion that this is now a more commonly observed bird than reported by Russell).

8 MAGNIFICENT FRIGATEBIRD (Man-o-War, Scissortail) Fregata magnificens N1

One was seen with nesting material at Dangriga on 5 Mar, and although daily numbers at the coast were not large, over 50 were observed from Belize City Harbour on 20 Mar. No males were seen with an inflated red throat patch. There was a great variety of plumage, mostly females and immatures. (Ph)

Herons and Egrets Ardeidae

9 GREAT BLUE HERON (Full Pot, Toby Full Pot) Ardea herodias N1 O

Small numbers (usually about two and a maximum of six) were seen on most days in the appropriate wet habitat. There were records from cays, coastal wetlands, Mafredi Lagoon in the south, and at Big Falls Ranch on the Belize river. There were no sightings of the white race A.h. occidentalis.

10 GREAT EGRET (Gaulin) Egretta alba N1

More than 20 were seen at the coast and nearby. Inland the species was seen daily at most wet low locations in small numbers (less than five). Records for this species decreased markedly as distance from the coast increased. (Ph)

11 SNOWY EGRET (Gaulin) Egretta thula N1

Seen in numbers of up to 20 at any one time - almost entirely on the coast or coastal lagoons. (Ph)

12 LITTLE BLUE HERON Florida caerulea N1

Probably the most numerous and widespread heron after the Cattle Egret. Very large numbers (100-200) were seen at Big Falls Ranch, and these included a high proportion of white immature birds. (Ph)

13 TRICOLORED HERON Hydranassa tricolor N1

Some 20-30 birds were seen at the pool by the fuel storage station outside Belize City. There were single birds at other locations inland as far as Big Falls Ranch. (Ph)

14 CATTLE EGRET (Gaulin) Bubulcus ibis N1

This bird now seems to be much more widely established and numerous than indicated by Russell. Birds were seen on every day of the expedition in open fields as well as on the coast and cays. (Ph)

15 GREEN HERON (Poor Joe) Butorides virescens N1

Observed on 25 days and up to 100 at Big Falls Ranch. This small heron was found in denser habitat than other herons and close to very small streams and jungle ponds. A pair was suspected of nesting in the DOE area at Airport Camp.

16 BLACK-CROWNED NIGHT-HERON Nycticorax nycticorax W

(The same species as the Night Heron of the Palearctic). An adult was seen at Big Falls Ranch on 20 Mar and two birds at the Northern Lagoon on 8 Apr. The species is probably not as rare as indicated by Russell.

17 YELLOW-CROWNED NIGHT-HERON (Carpenter) Nyctanassa violacea N1

Seen in small numbers of up to 11 at any one time. Five birds, including immatures, were seen roosting at Big Falls Ranch and birds were also seen at the Mafredi and Northern Lagoons.

18 BARE-THROATED TIGER-HERON (Barking Gaulin) Tigrisoma mexicanum N2

There are only three expedition records and these are from Big Falls Ranch between 20 Mar and 6 Apr. This is a well camouflaged species that is easy to miss despite its large size.

19 LEAST BITTERN Ixobrychus exilis N2

Very good close views of a single adult were recorded on three occasions at the DOE pool at the Airport Camp. Two birds were also flushed from reeds at Big Falls Ranch on 21 Mar. (Further investigation should reveal positive evidence of breeding).

CHESTNUT-BELLIED HERON (Blue Jacket) Agamia agami U N2

A single bird was seen beside the Western Highway by Team B on 21 Mar. RDP observed the rufous belly, sinuous neck and long heavy bill. His recorded notes of the observation indicate a high chance that it was indeed Agamia agami, but no good views or photos are available, so this is recorded only as a probable.

Boat-billed Herons, Storks, Ibises and Spoonbills, Flamingos — Cochleariidae, Ciconiidae, Threskiornithidae, Phoenicopteridae

20 BOAT-BILLED HERON (Cooper) Cochlearius cochlearius N1

There were only two sightings of this shy nocturnal species. Team A saw 25 birds at the Northern Lagoon on 14 Mar, including adults and immatures. On their visit on 9 Apr Team B saw approximately 15 birds, all were immature and located on the protected Bird Cay in the Northern Lagoon.

21 WOOD STORK (John Crow Culu) Mycteria americana N1

Up to 25 birds were seen in a roost at the Big Falls Ranch, and two birds at the Northern Lagoon. (Ph)

22 JABIRU (Turk, Filly-mingo) *Jabiru mycteria* N1

The only sightings were by TL from an Army Air Corps Gazelle helicopter on 13 Mar. Two birds were seen together at a nest about 32km NNW of Airport Camp. One remained standing on the nest while the other circled at up to 12000 ft. The helicopter did not approach close to the nest so it was not possible to observe young or eggs. At a further nest site about 5km north of the Western Highway and about 40km from Belize City, a single bird was seen in a nest. (Pn)

23 WHITE IBIS *Endocimus albus* N1

Twenty were seen at Big Falls Ranch on 21-22 Mar. Between 80 and 100 were seen at the fuel storage depot outside Belize City by Team A on 14 Mar and by Team B on 7-10 Apr - about 75% of the birds were immature. (Ph)

24 DARK IBIS *Plegadis falcinellus/chichi* RN2 O

A single bird was seen at the Big Falls Ranch on 22 Mar.

25 ROSEATE SPOONBILL *Ajaia ajaja* N1

The pool at the fuel storage depot just outside Belize City was the only place where these birds were seen (three on 7 and 10 Apr). All three were pink and one was clearly an adult in full breeding plumage. (Ph)

Ducks and Geese Anatidae

26 BLACK-BELLIED TREE-DUCK (Whistling Duck) *Dendrocygna autumnalis* N1

At least 20 of these ducks were heard 'whistling' at Big Falls Ranch on the night of 22 Mar.

27 AMERICAN WIGEON *Anas americana* TR

Very small numbers (two and three) were seen at Big Falls Ranch on 27 Feb and 20 Mar.

28 BLUE-WINGED TEAL *Anas discors* W

Large numbers at Big Falls Ranch. Team A reported at least 2000 on 28 Feb and Team B observed about 1000 on 22 Mar. Smaller numbers, more consistent with Russell, were found elsewhere on many small lakes.

29 NORTHERN SHOVELER *Anas clypeata* W

One male at Big Falls Ranch on 28 Feb was the only record.

30 MUSCOVY *Cairina moschata* N1

Up to 20 birds were seen, usually at dusk, at the Big Falls Ranch.

Vultures and Osprey — Cathartidae, Pandionidae

31 TURKEY VULTURE (John Crow, Dr John Crow) — Cathartes aura — N1

The most widespread of the vultures and seen every day of the expedition, although generally in small numbers. Up to 30 were seen together at the Big Falls Ranch.

32 LESSER YELLOW-HEADED VULTURE — Cathartes burrovianus — UN2

Although this species is very similar in appearance to C.aura, positive identification from head colour and wing was obtained on at least two birds at Big Falls Ranch. This tends to support Russell, who thought that the difficulty of separating the species resulted in its under-recording.

33 BLACK VULTURE (John Crow) — Coragyps atratus — N1

Not seen as frequently as C.aura, but although less widespread this species appeared to be more gregarious with numbers of up to 40 at Big Falls Ranch.

34 KING VULTURE (King John Crow) — Sarcoramphus papa — N1

This bird was recorded on nine days and at most locations, usually at a considerable height.

35 OSPREY (Billy Hawk) — Pandion haliaetus — N1

'Billy Hawks' were seen in small numbers at all coastal locations.

Kites, Hawks and Eagles — Accipitridae

36 SWALLOW-TAILED KITE (Scissor-tailed hawk) — Elanoides forficatus — N1S

Seen in small numbers on five days at jungle locations such as Guacamallo Bridge, Jimmy Cut and Aguacate.

37 WHITE-TAILED KITE — Elanus leucurus — N1

Seen in all locations and on most days, with up to eight records on a single day (11 Mar at Jimmy Cut).

38 SNAIL KITE — Rostrhamus sociabilis — N1

Up to four birds mostly females and immatures were seen daily at Airport Camp. Also along coastal roads, at lagoons and Big Falls Ranch. For a large bird of prey this species seems to be surprisingly unperturbed by humans and very close views were possible. Many empty and broken shells beneath posts were evidence of the suitability of the bird's name.

39 PLUMBEOUS KITE — Ictinia plumbea — N1S

This species was often seen over jungle areas. On one day 14 were seen.

40 WHITE HAWK — Leucopternis albicollis — N2

Seen in small numbers over most inland jungle areas including Guacamallo Bridge, Jimmy Cut and Aguacate. Also seen over the Hummingbird Highway and from a helicopter over the Southern Highway. At Aguacate there was a pair in nearby tall trees giving further evidence of breeding.

41 COMMON BLACK HAWK — Buteogallus anthracinus — N1

There were a few records from low lying areas. An immature bird was photographed and seen at close range at Big Falls Ranch. Although it had long yellow legs the number of tail bands (six) was taken to be diagnostic. (Smithe & Trimm 1966, p.50) (Ph)

42 GREAT BLACK HAWK — Buteogallus urubitinga — N1

Birds were seen at inland jungle areas in the south (Aguacate and Jimmy Cut) where tall trees remained. On 10 Mar Team A observed a pair mating in a remnant of primary jungle just north of their campsite at Jimmy Cut.

43 BLACK-COLLARED HAWK (Fishing Hawk) — Busarellus nigricollis — N1

One bird was seen from a helicopter when travelling North from Aguacate to Union Camp on 1 Mar.

44 GRAY HAWK — Buteo nitidus — N1

Seen in small numbers (confirming Russell's observations).

45 ROADSIDE HAWK — Buteo magnirostris — N1

The most common hawk. Seen on eighteen days, and up to six seen on a single day.

46 BLACK HAWK-EAGLE — Spizaetus tyrannus — N2

An adult and an immature were seen at quite close range just south of Blue Creek village on 5 Apr.

Falcons and Caracaras — Falconidae

47 LAUGHING FALCON (Guaco) — Herpetotheres cachinnans — N1

A bird, apparently nesting, was seen by both teams at Big Falls Ranch. Also a bird was seen at Team A's campsite near Jimmy Cut. (Ph)

48 COLLARED FOREST-FALCON — Micrastur semitorquatus — UN2

There was only one confirmed sighting by Team A on 11 Mar near Jimmy Cut.

49 AMERICAN KESTREL — Falco sparverius

Single birds were observed at a number of inland areas on five days. A maximum of three birds was seen on a single day.

50 BAT FALCON (Lion Hawk) Falco rufigularis N1

One bird was seen in the vicinity of Airport Camp and a pair was observed together at Team A's campsite near Jimmy Cut. (This is about the same latitude as the Ycacos Lagoon referred to by Russell as the most southerly record).

51 ORANGE-BREASTED FALCON Falco deiroleucus RN20

Team 8 had excellent close views of this bird on 4 Apr at the Maya site of Lubaantun, just outside San Pedro. The bird was perched less than 100m from the main temple and was feeding on an Aztec Parakeet Aratinga astec. (Ph)

52 PEREGRINE FALCON Falco peregrinus W

Single birds were seen at Airport Camp, Big Falls Ranch and Cay Chapel on four days. A bird seen at Cay Chapel on 3 Apr was an immature and appeared to be very exhausted.

Chachalacas, Guans and Curassows Cracidae

53 PLAIN CHACHALACA (Cockrico) Ortalis vetula N1

These wary 'game' birds were recorded in most jungle areas, including Airport Camp. Although easily overlooked, their short-lived but loud early morning call always betrayed their presence.

CRESTED GUAN (QUAM) AND GREAT CURASSOW Penelope purpurascens and Crax rubra

Fleeting glimpses of large dark birds disappearing into the jungle, and loud unidentified calls at Union Camp were possibly the above species. Local inhabitants at Aguacate indicated that both were to be found in the surrounding jungle. They also alleged that Black Penelopina (Black Chachalaca) Penelopina nigra occurred in the jungle. Land (1970) shows this as a fairly common bird occurring from 900m to 2900m in sub tropical highlands of central Guatemala. (The local people were possibly misidentifying the Crested Guan and Great Curassow, but further investigation would be interesting).

Quails, Turkeys Phasianidae, Meleagrididae

54 OCELLATED TURKEY Agriocharis ocellata N1

One was seen on 24 Mar on the logging track between Guacamallo Bridge and Millionario.

Limpkin Aramidae

55 LIMPKIN (Clucking Hen) Aramus guarauna N1

At least two birds were seen at Airport Camp, and up to five were seen together in pools alongside the Northern Highway.

Rails, Gallinules and Coots — Rallidae

56 GRAY-NECKED WOOD RAIL (Top-na-chick) — Aramides cajanea — N1

These large rails were reasonably easy to see in many wet wooded or jungle areas including Airport Camp and Big Falls Ranch, where 15 were seen on one day.

57 SORA — Porzana Carolina — W

The only record was of one heard in a reed bed in the southeastern part of Big Falls Ranch.

58 RUDDY CRAKE — Laterallus ruber — N1

Excellent views were obtained of up to three birds at a small pool surrounded by reeds at Airport Camp. Other birds were heard calling at Big Falls Ranch, and near Blue Creek in the south.

59 COMMON GALLINULE — Gallinula chloropus — N2

Seen on small ponds in a number of different locations, including Airport Camp, the fuel storage depot at Belize City, Mafredi Lagoon and a farm pond between Georgeville and San Antonio, where five birds were seen together. (The occurrence of these birds and the possibility of their breeding seems greater than indicated by Russell.)

60 PURPLE GALLINULE — Porphyrula martinica — N2

The only records were from the small pool at Airport Camp where the species was observed on most days, two birds being seen on some days.

61 AMERICAN COOT — Fulica americana — W

The only records were from the fuel storage depot pool outside Belize City, where four birds were seen.

Finfoots, Jacanas — Heliornithidae, Jacanidae

62 SUNGREBE — Heliornis fulica — N1

There were three records of this species on the Belize river at the Big Falls Ranch. All members of Team B saw these birds with the exception of the Recorder, who is now obliged to record their observations!

63 NORTHERN JACANA (Georgie Bull) — Jacana spinosa — N1

Seen at all wet low lying areas including the Big Falls Ranch in numbers of up to 40 on a single day. (Ph)

Oystercatchers — Haematopodidae

64 AMERICAN OYSTERCATCHER — Haematopus palliatus

One bird was seen at the Dangriga ship terminal by Team A on 5 Mar. Satisfactory notes were taken to confirm this as the second sighting for Belize. (The species was first seen by Ms M Craig et al on 9 Feb 79 at Birds Island, Northern Lagoon - BAS Bulletin Vol.11 No.7 Sep 79).

Plovers — Charadriidae

65 BLACK-BELLIED PLOVER (Grey plover - UK) — Pluvialis squatarola — T

Up to six were seen on sandy shores at Dangriga and Cay Chapel. (Ph)

66 AMERICAN GOLDEN PLOVER — Pluvialis dominica — TR

Thirteen birds were seen in a pool alongside the Northern Highway north of Airport Camp on 19 Mar, and 6 were seen at Big Falls Ranch on 21 Mar. Observers were familiar with the differences between Grey and Golden Plover and were fully satisfied that they were not observing the former.

67 SEMIPALMATED PLOVER — Charadrius semipalmatus — W

Seen in small numbers of up to ten on every visit to a suitable sandy shore or cay.

68 KILLDEER — Charadrius vociferus — W

Less than five birds were seen on each of the seven days on which this bird was recorded. Records were from a variety of open inland areas.

69 WILSON'S PLOVER — Charadrius wilsonia — N1

Single birds in winter plumage were recorded on the shore at Punta Gorda and Dangriga.

Sandpipers, Snipes etc — Scolopacidae

70 GREATER YELLOWLEGS — Tringa melanoleuca — W

Team A recorded one bird at Big Falls Ranch and Team B recorded four birds at the same place.

71 LESSER YELLOWLEGS — Tringa flavipes — W

Up to 50 were seen by Team A at Big Falls Ranch on 27 & 28 Feb. Team B saw six birds there on 22 Mar and a single bird at the Belize fuel storage terminal on 7 Apr.

72 SOLITARY SANDPIPER — Tringa solitaria — W

Up to 12 were seen on 15 days at Big Falls Ranch, and others at Airport Camp and most low lying inland water. (Ph)

73 WILLETT — Catoptrophorus semipalmatus — W

Seen in small numbers at all observation points and at Cay Chapel. Eight were seen together by Team A at Dangriga on 5 Mar. (Ph)

74 SPOTTED SANDPIPER (Shaky Batty) — Actitis macularia — W

The most frequently seen sandpiper; this species was observed on 30 days at a wide variety of places, both inland and coastal, including Airport Camp, Dangriga, Mafredi Lagoon, Cay Chapel, Big Falls Ranch, Guacamallo Bridge and Blue Creek.

75 RUDDY TURNSTONE — Arenaria interpres — W

Sightings at Dangriga on 5 & 6 Mar and 6 Apr (maximum nine birds), and at Cay Chapel when it was visited on 16 Mar and 9 Apr, a maximum of 20 birds were seen.

76 PECTORAL SANDPIPER — Calidris melanotus — T

A flock of about 100 birds seen at Big Falls Ranch on 21 Mar was the only sighting.

77 SANDERLING — Calidris alba — W

Records of up to eight birds from Cay Chapel on the days that each team visited. Both teams also saw large numbers at Dangriga, and Team A estimates that 115 birds were present on 5 Mar.

78 WHIMBREL — Numenius phaeopus — TU

The only record was of two birds at Dangriga on 5 Mar.

LONG BILLED DOWITCHER — Limnodromus scolopaceus — TR

Two birds seen at Cay Chapel on 16 Mar are the only record. However, field notes could not satisfactorily separate L.scolopaceus from L.griseus in winter plumage, and this is therefore not included as a positive record.

79 COMMON SNIPE — Gallinago gallinago — W

There was only one expedition record at Big Falls Ranch on 28 Feb.

Stilts and Avocets, Jaegers and Skuas — Recurvirostridae, Stercorariidae

80 BLACK-NECKED STILT — Himantopus mexicanus — N1

Birds were seen in only two places. Up to 40 birds were seen at Big Falls Ranch by Team A on 27-28 Feb between eight and 14 were seen by Team B on 20-22 Mar. Approximately 20 birds were seen at the Belize fuel storage depot on 7-10 Apr. (Ph)

Gulls and Terns — Laridae

81 RING-BILLED GULL — Larus delawarensis — RO

The only records were of a single bird at Belize City harbour on 20 Mar and on 6-10 Apr. (The current status is now probably not 'Rare - No specimen/photo').

82 HERRING GULL — Larus argentatus — Wu

Small numbers of up to five immature birds were seen at Belize City harbour on 20 Mar and 6-10 Apr.

83 LAUGHING GULL (Laughing Bird) — Larus atricilla — N1

Present in numbers of at least 100 at Belize City and recorded also in much smaller quantities at Dangriga and Punta Gorda. By 7 Apr some birds were in summer plumage.

84 LEAST TERN — Sterna albifrons — N1

The only record was of a single bird at Belize City harbour on 5 Mar.

85 ROYAL TERN — Sterna maxima — W

Seen in numbers of up to 35 on all visits to the coast (Belize City, Dangriga, and Punta Gorda). (The current status would appear to be 'common', rather than 'moderately common' as indicated by Russell.) (Ph)

86 SANDWICH TERN — Sterna sandvicensis — N1

Approximately 30 were counted at Belize City on 5 Mar. Birds were also seen in smaller numbers on every trip to the coast. (The current status would appear to be 'common' rather than 'uncommon' as indicated by Russell.)

Skimmers — Rynchopidae

87 BLACK SKIMMER — Rynchops nigra — WU

Both teams recorded two birds at a sandbank off Dangriga on their visits on 5-6 Mar and 6 Apr. One of the birds was approximately 5cm larger than the other and both were in adult plumage.

Pigeons and Doves — Columbidae

88 RED-BILLED PIGEON — Columba flavirostris — N2

A sighting of three birds daily at Guacamallo Bridge from 23-26 Mar is the only expedition record of this species.

89 PALE-VENTED PIGEON — Columba cayennensis — N1

This large pigeon was seen on nine days in small numbers. Most records were from the Airport Camp area.

90 SCALED PIGEON (Mountain Pigeon) — Columba speciosa — N1

Seen only at Guacamallo Bridge where ten birds were recorded on 25 Mar.

91 SHORT-BILLED PIGEON (Tres pe-sos son) — Columba nigrirostris — N1

Once the call of this bird had been identified ("here comes the train!") it was heard in large numbers, especially in the south around Team B's camp at Aguacate. Previous to this, small numbers were seen at Airport Camp and Altun Ha.

92* MOURNING DOVE — Zenaida macroura — TU

The only record was of two birds netted in a pasture at Big Falls Ranch on 21-22 Mar.

93 COMMON GROUND-DOVE *Columbina passerina* N1

The only records of this bird were from Team A at Jimmy Cut where five were seen on 8 Mar and two on 9 Mar.

94 PLAIN-BREASTED GROUND DOVE (Turtle Dove) *Columbina minuta* N1

Small numbers were seen throughout the country.

95* RUDDY GROUND-DOVE *Columbina talpacoti* N1

The most common and widespread of the ground doves. Seen on almost every day and in all areas. (Ph)

96 BLUE GROUND-DOVE *Claravis pretiosa* N1

There were records from only two places: Big Falls Ranch, where only one or two birds were seen, and Blue Creek where up to 20 were seen at one time. (Ph)

97 WHITE-TIPPED DOVE *Leptotila verreauxi* N1

The only good sightings were of single birds at Big Falls Ranch on 22 Mar, and at Aguacate on 5 Apr.

98 GREY-CHESTED DOVE *Leptotila cassinii* N1

The only good identification was of single birds at Aguacate on 31 Mar and 1 Apr.

99 RUDDY QUAIL-DOVE *Geotrygon montana* N1

The only positive record was from Union Camp on 2-3 Apr. However it is likely that the species was being heard elsewhere.

Macaws, Parakeets and Parrots Psittacidae

100 AZTEC PARAKEET (Keetie) *Aratinga astec* N1

Seen on 25 days at all locations. The maximum for a single day was 50 at Guacamallo Bridge.

101 BROWN-HOODED PARROT *Pionopsitta haematotis* N1

A single bird was seen at Guacamallo Bridge on 25 Mar, and a maximum of five were seen together at Aguacate 1-4 Apr.

102 WHITE-CROWNED PARROT *Pionus senilis* N1

This species was seen in numbers of up to 25 at all jungle locations.

103 YELLOW-LORED PARROT *Amazona xantholora* N1

The only records were from the Belize river at the Big Falls Ranch. Birds were seen on three days and up to 20 were seen on each day.

104 WHITE-FRONTED PARROT — Amazona albifrons — N1

Small numbers of this species were seen at Big Falls Ranch and in the Salamanca area.

105 RED-LORED PARROT — Amazona autumnalis — N1

Six were seen at the Altun Ha ruins on 26 Feb and 27 Mar.

106 MEALY PARROT (Watch-out Parrot) — Amazona farinosa — N1

The species were recorded on only 3 days. A flock of 15 was seen on 2-3 Apr at Union Camp and one bird was seen at Jimmy Cut on 30 Mar.

Cuckoos and Anis — Cuculidae

107 SQUIRREL CUCKOO (Pe-guam) — Piaya cayana — N1

This species was seen regularly at all jungle locations, but only one or two records on each day of individual birds.

108 *GROOVE-BILLED ANI (Cow Boy) — Crotophaga sulcirostris — N1

Very common and seen on every day in almost all areas as they moved about noisily in small flocks. (Ph)

Barn and True Owls — Tytonidae, Strigidae

109 FERRUGINOUS PYGMY-OWL — Glaucidium brasilianum — N1

This was the only owl heard. Several birds were present in the pine woods north of Guacamallo Bridge and one was recorded at Aguacate.

Potoos, Nightjars — Nuctibiidae

110 *PAURAQUE (Hoo-yoo) — Nyctidromus albicollis — N1

The species was heard and seen in large numbers at almost all locations. (Ph)

111 CHUCK-WILL'S-WIDOW — Caprimulgus carolinensis

Heard at Aguacate Bridge at 0520h on 6 Apr by RDP and PGJ. Not previously recorded in Belize, it is a species that migrates to the USA. The winter range is not clearly defined but it includes Guatemala and the Caribbean so that the possibility of a Belize record appears high. (See detailed notes at end of section).

Swifts — Apodidae

112 WHITE-COLLARED SWIFT — Striptoprocne zonaris — N1

Seen in small numbers south of the Hummingbird Highway.

113 VAUX'S SWIFT — Chaetura vauxi — N2

Seen along the Hummingbird Highway on 27 Mar, and at Union Camp on 3 Apr.

Hummingbirds — Trochilidae

114* BAND-TAILED BARBTHROAT — Threnetes ruckeri — U

Three birds were netted at Jimmy Cut on 10 Mar. This was the only record.

115 *LONG-TAILED HERMIT — Phaethornis superciliosus — N1

The species was only seen in the south at Jimmy Cut and Aguacate, and in tall forest. There were up to ten records in a single day. (Ph)

116 *LITTLE HERMIT — Phaethornis longuemareus — N1

The distribution and habitat of this species was generally similar to that of the preceding species (see Russell p.86), but there was one record at Guacamallo Bridge, and overall fewer were seen and netted than superciliosus. (Ph)

117 *SCALY-BREASTED HUMMINGBIRD — Phaeochroa cuvierii — U

The only record was of a male netted at Aguacate on 31 Mar.

118 *VIOLET SABREWING — Campylopterus hemileucurus — N2

One female was netted in the Jimmy Cut area on 10 Mar, and one female was seen on 5 Apr. A male and female were also seen at Union Camp.

119 WHITE-NECKED JACOBIN — Florisuga mellivora — N1

A male and female were seen at Union Camp, and single males were seen at Aguacate.

120 *GREEN-BREASTED MANGO — Anthracothorax prevostii — N1

A bird netted at Altun Ha and a bird seen at Airport Camp confirm Russell's view that this is mainly a species of coastal lowland. However records of nesting birds at Big Falls Ranch should perhaps modify Russell's conclusion that the bird is rare inland. (Ph)

121 FORK-TAILED EMERALD — Chlorostilbon canivetii — N1

One male was seen at Altun Ha on 26 Feb.

122 *COMMON WOODNYMPH — Thalurania furcata — R

A male netted at Aguacate on 31 Mar was the only expedition record. (Ph)

123 *WHITE-BELLIED EMERALD — Amazilia candida — N1

There were regular sightings of up to six birds each day at Aguacate and Guacamallo Bridge. Also four birds were seen at Altun Ha on 27 Mar. (Ph)

124 *RED-BILLED AZURECROWN — Amazilia cyanocephala — N1

One bird netted at Guacamallo Bridge supports Russell's view that the bird enters other habitats in the vicinity of the pine ridge. (Ph)

125 *CINNAMON HUMMINGBIRD — Amazilia rutila — N1

The most common hummingbird at Airport Camp and in coastal urban locations. (This seems to modify Russell's conclusion that the bird is rare on the mainland.)

126 *RUFOUS-TAILED HUMMINGBIRD — Amazilia tzacatl — N1

This was the most frequently seen of all the hummingbirds. The records came mainly from open lowland sites such as Altun Ha and Big Falls Ranch. However, smaller numbers were also seen in areas of taller jungle such as Guacamallo Bridge, Aguacate and Salamanca.

127 STRIPE-TAILED HUMMINGBIRD — Eupherusa eximia — R

The only records were from Union Camp where five were seen in a very small area and appeared to be the most common hummingbird species. This adds further evidence to Russell's conclusion that the species is a breeding resident at higher altitudes. It is also probably not rare at such locations.

Trogons — Trogonidae

128 SLATY-TAILED TROGON — Trogon massena — N1

The species was seen on nine days in tall forest at Guacamallo Bridge, Jimmy Cut and Aguacate. Single birds were normally seen, but a female and two males were seen together at Jimmy Cut.

129 CITREOLINE TROGON (Ramatutu) — Trogon citreolus — N1

Single birds were seen and heard around Aguacate and Altun Ha.

130 COLLARED TROGON — Trogon collaris — RN1

There was only one record; a bird was seen behind Aguacate camp on 5 Apr. (See notes of RDP at end of section).

131 VIOLACEOUS TROGON — Trogon violaceus — N1

Seen and heard in numbers of up to four on any one day - predominantly at jungle locations, but also recorded at Big Falls Ranch.

Kingfishers — Alcedinidae

132 RINGED KINGFISHER — Ceryle torquata — N1

Seen daily overflying Airport Camp in numbers of up to six on a single day. Also around the ruins at Altun Ha, and in the south at the Mafredi Lagoon.

133 BELTED KINGFISHER — Ceryle alcyon — W

Seen in numbers of up to 20 on most days at coastal and lowland areas, and in particular on wires along the Western Highway. Not seen at jungle locations such as Guacamallo Bridge, Jimmy Cut and Aguacate.

134 AMAZON KINGFISHER — Chloroceryle amazona — N1

There were sightings of up to three birds (including females) on six days, but only at Guacamallo Bridge and Aguacate.

135 *GREEN KINGFISHER — Chloroceryle americana — N1

This species was seen regularly at almost all inland water sites, ranging from Union Camp (small stream) to Guacamallo Bridge and Big Falls Ranch (large river), and the canals leading into the Northern Lagoon. (Ph)

136 PYGMY KINGFISHER — Chloroceryle aenea — N1

A male and a female seen each day at the stream close to Aguacate camp constitute the only reliable sightings.

Motmots, Jacamars — Momotidae, Galbulidae

137 TODY MOTMOT — Hylomanes momotula — RN1

On 5 Apr there was a sighting of one bird along the river upstream from Aguacate Camp.

138 BLUE-CROWNED MOTMOT (Good Cook) — Momotus momota — N1

Heard at jungle locations such as Aguacate and Guacamallo Bridge, but normally only for a short time in the early mornings. A good sighting was obtained at Guacamallo Bridge on 26 Mar.

139 *BLACK-CHINNED JACAMAR — Galbula ruficauda — N1

This species was seen on six days in small numbers in jungle areas. (Maximum of four records on one day). At least two sightings by Team B were by a small dried-up stream. (See Russell p.95 - this seems to be a preferred habitat.)

Puffbirds — Bucconidae

140 WHITE-NECKED PUFFBIRD — Notharchus macrorhynchos — N1

A sighting of ten birds by Team A in the area of Salamanca Camp on 10 Mar is the only expedition record. (PGJ saw two birds in the same location on his recce in Feb 80.)

Toucans — Ramphastidae

141 KEEL-BILLED TOUCAN (Bill Bird) — Ramphastos sulfuratus — N1

There were several records - mostly of small noisy flocks of up to eight at Guacamallo Bridge and Jimmy Cut.

142 EMERALD TOUCANET — Aulacorhynchus prasinus — N1

The only records were from Aguacate where birds were seen each day, and up to five were seen on 1 Apr. A pair was nesting about 15m high in a dead tree behind the camp at the edge of a small clearing.

143 COLLARED ARACARI (Phyllis) — Pteroglossus torquatus — N1

Seen and heard regularly in numbers of up to 5 at all jungle locations. At Team A's camp site near Jimmy Cut, a pair was seen excavating a hole in a dead tree.

Woodpeckers — Picidae

144 GOLDEN-OLIVE WOODPECKER — Piculus rubiginosus — N1

Single birds were seen on four days in jungle areas at Aguacate and Guacamallo Bridge.

145 CHESTNUT-COLORED WOODPECKER — Celeus castaneus — UN1

Seen in tall forest close to Aguacate camp on 31 Mar (two birds) and 4 Apr (three birds). One flew into a net behind the camp of 5 Apr but escaped before it could be extracted.

146 LINEATED WOODPECKER — Dryocopus lineatus — N1

Seen at Guacamallo Bridge and Altun Ha (single birds) and at Jimmy Cut and Aguacate where up to seven were recorded on a single day. On 11 Mar a pair was seen mating in the vicinity of Salamanca camp.

147 *ACORN WOODPECKER — Melanerpes formicivorus — N1

Seen frequently on each day's observations at the Airport Camp and at Big Falls Ranch. However, there was only one record from the southern area at Jimmy Cut - presumably because of the absence of pines.

148 BLACK-CHEEKED WOODPECKER — Centurus pucherani — N1

One record only - from Union Camp on 2 Apr.

149 GOLDEN-FRONTED WOODPECKER (Carpenter) — Centurus aurifrons — N1

Only seen at the northern observation points, and generally in the semi-open areas of Airport Camp, Altun Ha and Big Falls Ranch. (Daily records of one or two birds).

150 *YELLOW-BELLIED SAPSUCKER — Sphyrapicus varius — W

One was netted at Airport Camp on 19 Mar, and one was seen at Guacamallo Bridge on 24 Mar.

151 SMOKY-BROWN WOODPECKER — Veniliornis fumigatus — N1

Only seen in the depths of the tall forest in the south. Two and three birds were seen on 31 Mar and 1 Apr respectively in the area of Aguacate.

152 PALE-BILLED WOODPECKER (Father Red-cap) *Phloeocaestes guatemalensis* N1

Apart from a single sighting at Guacamallo Bridge, all records were from the south, where up to seven birds were seen on one day near Jimmy Cut, and where the bird was recorded on each day at Aguacate.

Woodcreepers — Dendrocolaptidae

153 *RUDDY WOODCREEPER *Dendrocincla homochroa* N1

Single birds were seen on four days under tall forest on high ground in southern areas such as Blue Creek and Aguacate.

154 *OLIVACEOUS WOODCREEPER *Sittasomus griseicapillus* N1

There were only two records. One bird was netted in the Aguacate area in tall forest on 1 Apr and one was seen at Jimmy Cut - Salamanca on 10 Mar.

155 *WEDGE-BILLED WOODCREEPER *Glyphorhynchus spirurus* N1

The only records were from tall forest near the Jimmy Cut camp (two birds on two successive days). One bird was netted there on 10 Mar.

156 BARRED WOODCREEPER *Dendrocolaptes certhia* N1

There was only one record of a bird being seen at the edge of a clearing in tall secondary forest on 1 Mar.

157 *IVORY-BILLED WOODCREEPER *Xiphorhynchus flavigaster* N1

This species was heard almost every day in jungle areas, and was seen at the Aguacate and Jimmy Cut camp sites. It was netted at Jimmy Cut on 10 Mar.

158 STREAK-HEADED WOODCREEPER *Lepidocolaptes souleyetti* N1

Single birds were seen on only three days in the tall forests around Aguacate and Jimmy Cut.

Ovenbirds and allies — Furnariidae

159 RUFOUS-BREASTED SPINETAIL *Synallaxis erythrothorax* N1

The bird was only seen once, but after the call had been identified small numbers were heard at Big Falls Ranch, Jimmy Cut and Aguacate.

160 *BUFF-THROATED FOLIAGE-GLEANER *Automolus ochrolaemus* UN2

Two birds netted at Union Camp were the only records of this secretive ground-level forest species.

161 *PLAIN XENOPS *Xenops minutus* N1

Two birds were netted at Jimmy Cut on 9 and 10 Mar.

Antbirds — Formicariidae

162 *BARRED ANTSHRIKE — Thamnophilus doliatus — N1

Seen (or more usually heard) in all forest areas, (except near the coast) on each day. Daily records often exceeded 20 birds. (Ph)

163 DOT-WINGED ANTWREN — Microrhopias quixensis — N1

There was one record from Guacamallo Bridge, and up to five birds were recorded on one day at Jimmy Cut and Aguacate. Daily sightings usually comprised male and females together.

164 *DUSKY ANTBIRD — Cercomacra tyrannina — N1

In addition to two birds netted at Aguacate on 31 Mar and 1 Apr, small numbers of these birds were seen regularly in the dense thickets around the camp and the milpa fields on the forest edge.

Manakins — Pipridae

165 RED-CAPPED MANAKIN — Pipra mentalis — N1

Groups of up to eight birds (approx 50% males, 50% females) were seen in dense thickets in the vicinity of the road and camp at Aguacate. The many whistling and clapping noises were similar to, but clearly different, from those of the more obvious Manacus candei.

166 *WHITE-COLLARED MANAKIN — Manacus candei — N1

Seen in quite large numbers (20-30) each day in the thickets around the camps at Aguacate and Jimmy Cut. Seven were netted (including one female) in the north, at Altun Ha on 15 Mar. Detailed observation of the birds' noisy display behaviour was made by TL and PM on 11 Mar. (Ph)

167 *THRUSHLIKE MANAKIN — Schiffornis turdinus — N1

The only positive record was of one bird netted in a tall forest area close to the Jimmy Cut on 9 Mar.

Cotingas — Cotingidae

168 LOVELY CONTINGA — Cotinga amabilis — R

There were two sightings (on 1 and 5 Apr) of single males perched at the top of tall trees on the north of the track to Aguacate village. The species is possibly not rare in that area, just previously overlooked. (underlooked as well!)

169 *BRIGHT-RUMPED ATTILA — Attila spadiceus — N1

The only 2 records were both from the south. One bird was netted at Jimmy Cut on 7 Mar.

170 RUFOUS MOURNER — Rhytipterna holerythra — N1

The only record was of three birds near Jimmy Cut on 10 Mar.

171 RUFOUS PIHA — Lipaugus unirufus — N1

There were three records of single birds at Jimmy Cut and Aguacate on 10 and 26 Mar and 1 Apr. As with the previous species, distance and height often restricted identification.

172 CINNAMON BECARD — Pachyramphus cinnamomeus — N1

This was more frequently seen than the above two species, with records of single birds on six days. One record from Altun Ha.

173 ROSE-THROATED BECARD — Platypsaris aglaiae — N1

Two birds were seen at Altun Ha, and there was also one sighting at Guacamallo Bridge. On 4 Apr a male and female were seen together near Aguacate.

174 MASKED TITYRA (White Woodpecker) — Tityra semifasciata — N1

Seen in numbers of up to 20 on 13 days, and at most observations sites except Big Falls Ranch.

Tyrant flycatchers — Tyrannidae

175 BLACK PHOEBE — Sayornis nigricans — N1

Four birds were seen at Guacamallo Bridge, including two immatures. There was also a sighting of three birds further upstream at the San Luis rapids. Two were also seen regularly on the creek at Aguacate.

176 *VERMILION FLYCATCHER (Robin Red-breast) — Pyrocephalus rubinus — N1

Most of the records were from the Airport Camp and similar lowland habitat where this bird was recorded every day in numbers of up to 50. Breeding was observed at Airport Camp.

177 FORK-TAILED FLYCATCHER — Muscivora tyrannus (Tyrannus savana) — N1

This species was seen in numbers of 100 on some days. All records were from Airport Camp and open grassy countryside, usually en-route to jungle sites. On mornings in Feb large numbers (ten to 100) flew north over Airport Camp. (Ph)

178 EASTERN KINGBIRD — Tyrannus tyrannus — T

There were no records until 4 Apr, when 20 birds were seen at Punta Gorda. Similar numbers were then seen daily at Airport Camp from 6-8 Apr, with numbers reducing by 8/9 Apr.

179 TROPICAL KINGBIRD — Tyrannus melancholicus — N1

This species was seen on every day in all locations, with the greatest numbers (50) reported from Airport Camp. (Ph)

180 PIRATIC FLYCATCHER — Legatus leucophaius — N1S

The species was first recorded on 28 Mar in a tall forest clearing north of the Jimmy Cut Camp. There were three more records from a similar habitat near Aguacate on 4 and 5 Apr.

181 SULPHUR-BELLIED FLYCATCHER — Myiodynastes luteiventris — N1S

The first record was on 25 Mar at Guacamallo Bridge. (The earliest record for Belize is 20 Mar). It was then seen in numbers of ten to 20 on all days at Aguacate where nest building activities were observed.

182 *BOAT-BILLED FLYCATCHER — Megarhynchus pitangua — N1

The first positive record was a bird netted at Big Falls Ranch on 21 Mar. Two were then seen at Guacamallo Bridge on 25 Mar and three were seen each day at Aguacate. (Ph)

183 *SOCIAL FLYCATCHER (Katy-y-baby-di-cry) — Myiozetetes similis — N1

Eleven birds were netted at Airport Camp, Altun Ha and Big Falls Ranch. The species was seen on all days and was the most common flycatcher, especially in the vicinity of the Airport Camp.

184 *GREAT KISKADEE — Pitangus sulphuratus — N1

The Kiskadee was recorded every day, although in somewhat smaller numbers than M.similis. (Ph)

185 *BROWN-CRESTED FLYCATCHER — Myiarchus tyrannulus — N1

One was netted at Airport Camp on 19 Mar and small numbers (one to three) were seen on seven other days. This species was possibly under-recorded because of the difficulty of identification. Open second growth seemed the preferred habitat.

186 *DUSKY-CAPPED FLYCATCHER — Myiarchus tuberculifer — N1

Recorded in small numbers of one to two birds on most days and in most locations except Guacamallo Bridge. (Ph)

187 *TROPICAL PEEWEE — Contopus cinereus — N1

Single birds were recorded at Guacamallo Bridge and Aguacate on seven days. The bird's call was used to identify it on at least one occasion.

188 *YELLOW-BELLIED FLYCATCHER — Empidonax flaviventris — W

Two birds netted north of the Jimmy Cut camp on 8 and 10 Mar were the only positive records.

*LEAST (WHITE-THROATED) FLYCATCHER — Empidonax minimus albigularis — W/UN2

Netting records of six birds at Airport Camp, Guacamallo Bridge and Jimmy Cut. (See notes at the end of the netting section for further comment on this record.) (Ph)

189 *SULPHUR-RUMPED FLYCATCHER — Myiobius sulphureipygius — N1

This species was seen only in the south at Salamanca and Aguacate. Four were seen on a single day close to the river at Aguacate. (Ph)

190 *NORTHERN ROYAL-FLYCATCHER — Onychorhynchus mexicanus — N1

One record of a bird netted at Altun Ha on 15 Mar.

191 *WHITE-THROATED SPADEBILL — Platyrinchus mystaceus — N1

Most records were from netting at Jimmy Cut and Aguacate on five days.

192 *YELLOW-OLIVE FLYCATCHER — Tolmomyias sulphurescens — N1

A bird netted at Jimmy Cut on 29 Mar was the only record. (Ph)

193 *COMMON TODY-FLYCATCHER — Todirostrum cinereum — N1

All six netting records were from Airport Camp. The only other place the species was seen in any numbers was in the low milpa area near Jimmy Cut. (Ph)

194 *SLATE-HEADED TODY FLYCATCHER — Todirostrum sylvia — UN1

The only record was of a bird netted in low scrub adjacent to milpa and tall forest at Aguacate on 5 Apr.

195 *NORTHERN BENTBILL — Oncostama cinereigulare — N1

The only records were one netted at Union Camp on 3 Apr and one seen near Aguacate on 5 Apr.

196 *YELLOW-BELLIED ELAENIA — Elaenia flavogaster — N1

The only records were from Airport Camp and Big Falls Ranch, where five birds were netted. (Ph)

197 *NORTHERN BEARDLESS TYRANNULET — Camptostama imberbe — N1

Two birds netted at Airport Camp on 10 and 11 Apr were the only records.

198 *YELLOW-BELLIED TYRANNULET — Ornithion semiflavum — UN2

Recorded on four days only. Four birds were netted on 8, 9 and 30 Mar at Jimmy Cut, and one was seen at Aguacate on 4 Apr. (Ph)

199 *SEPIA-CAPPED FLYCATCHER — Leptopogon amaurocephalus — N1

Recorded on three days only. Two sightings at Jimmy Cut, and one bird netted at Aguacate on 5 Apr.

200 *OCHRE-BELLIED FLYCATCHER — Pipromorpha oleaginea — N1

One netted at Aguacate on 1 Apr was the only record.

Swallows — Hirundinidae

201 TREE SWALLOW (Christmas bird) — Tachycineta (Iridoprocne) bicolor — W

Team A reported these as common at Airport Camp on 27 and 28 Feb, but there were no further records until about 50 were seen at Big Falls Ranch on 21 Mar - the last day recorded.

202 *MANGROVE SWALLOW — Tachycineta (Iridoprocne) albilinea — N1

Seen in large numbers (ten to 100) at Airport Camp and other coastal locations on each day observations were made there. A record of about ten birds over Belize river at Big Falls Ranch on 22 & 23 Mar were the only inland sightings. (Ph)

203 *ROUGH-WINGED SWALLOW — Stelgidopteryx ruficollis — WN1

At Big Falls Ranch two birds were netted on 28 Feb and up to 25 birds were seen together on each day spent there. A few birds were seen at Airport Camp, and approximately 100 were seen at the 'Dump' in Toledo district on 4 Apr. At weights of 15.0g and 14.5g the two birds caught were considerably heavier than those in Russell (12.4-13.9g.) The species was also observed at San Luis in Mtn Pine Ridge on 26 Mar.

204 GRAY-BREASTED MARTIN — Progne chalybea — N1

This species was common at the Airport Camp (ten to 100) and at other coastal areas such as Punta Gorda and Dangriga. Six birds were seen near Aguacate village on 31 Mar. (Ph)

205 BARN SWALLOW — Hirundo rustica — W

The first record was on 21 Mar at Big Falls Ranch. Twelve were then seen on 27 Mar, and a small number in the area of 'Dump' and Mafredi Lagoon on 1 and 4 Apr. Finally, about 70 were seen each day at Airport Camp by 10 Apr.

Jays — Corvidae

206 BROWN JAY (Piam-Piam) — Psilorhinus morio — N1

This noisy bird was seen and heard on each day of the expedition in numbers of ten to 100.

207 GREEN JAY (Cling-Cling) — Cyanocorax yncas — N1

The only records were of two to six birds from the rivers at Guacamallo Bridge, Blue Creek and Aguacate.

208 YUCATAN JAY (Blue Piam-Piam) — Cissilopha yucatanica — N1

This species was seen only once, when five birds were observed together on the Northern Highway about 32km out of Belize City. (PGJ saw this species at the same place during his recce in Feb 80).

Wrens — Troglodytidae

209 BAND-BACKED WREN — Campylorhynchus zonatus — N1

The only record was on the 26 Mar of a bird seen at medium height on a mahogany tree close to Guacamallo Bridge - Millionario track about 1km south of the bridge.

210 *SPOT-BREASTED WREN (Katy-yu-baby-di-cry) — Thryothorus maculipectus — N1

The species seen and heard in large numbers (Order 2) on all days at forest locations. Also a sighting was made at a wooded/scrub area within the Airport Camp. (Ph)

211 *SOUTHERN HOUSE WREN — Troglodytes musculus — N1

One or two were seen each day at Airport Camp and Aguacate village. Apprently out of its normal habitat, one was netted at Guacamallo Bridge on 24 Mar.

212 *WHITE-BREASTED WOOD-WREN — Henicorhina leucosticta — N1

The eight birds netted at Jimmy Cut and Aguacate form the majority of records of this species. (Ph)

213 *WHITE-BELLIED WREN — Uropsila leucogastra — N1

The only records were of a bird netted in a forest cut in the Mtn Pine Ridge, and one netted in a small area of tall forest at Jimmy Cut. (The latter record expands on the range of the species given in Russell.)

Thrashers and Mockingbirds — Mimidae

BLACK CATBIRD — Melanoptila glabrirostris — W

One bird was probably seen at Airport Camp sewage farm. However, in the absence of a photograph and a verified positive sighting this must remain a possible record only.

214 *GRAY CATBIRD — Dumetella carolinensis — N1

This species was seen and heard almost daily in numbers from one to 15, and at almost all locations. The greatest numbers were at Airport Camp, Altun Ha and the more open coastal areas. The sewage farm at Airport Camp was very popular, and six of the seven netting records were from there! (Ph)

215 *TROPICAL MOCKINGBIRD (Nightingale) — Mimus gilvus — N1

The species was seen in large numbers (ten to 100) on most days. There were fewer records from forest sites. (Ph)

Thrushes, Solitaires and Bluebirds — Turdidae

216 *CLAY-COLORED ROBIN (Cusco) — Turdus grayi — N1

Small numbers were recorded frequently at all locations. Netting records from Airport Camp, Jimmy Cut and Aguacate. (Ph)

217 SLATE-COLORED SOLITAIRE — Myadestes unicolor — RLN2

The only record was of a bird near the Union Camp clearing. It was perched on an exposed tree top and singing heartily. (The species may not be rare at such sites.)

218 *WOOD THRUSH — Hylocichla mustelina — W

There were netting records of two birds at both Jimmy Cut on 7 and 8 Mar and Aguacate on 31 Mar and 5 Apr. The only other records of sightings were from Airport Camp on 25-27 Feb, 2, 19, 20 Mar. (Ph)

Gnatcatchers and Gnat Wrens — Sylviidae

219 BLUE-GRAY GNATCATCHER — Polioptila caerulea — N1

The only record was of a single bird at Big Falls Ranch on 21 and 22 Mar, where it was seen in a small tree beside a grazing field.

220 TROPICAL GNATCATCHER — Polioptila plumbea — N1

The only record was of two males seen in a small tree in the edge of secondary growth on the Blue Creek to Aguacate track.

221 *LONG-BILLED GNATWREN — Ramphocaenus rufiventris — N1

Once identified by its sound, the bird was heard at all forest locations, and one was netted at Jimmy Cut on 7 Mar.

Vireos — Vironidae

222 *WHITE-EYED VIREO — Vireo griseus — W

One netting record from Guacamallo Bridge, but the species was seen or heard in small numbers on most days. (Ph)

223 *MANGROVE VIREO — Vireo pallens — N1

Three birds netted at Airport Camp on 18 and 19 Mar were the only records.

224 RED-EYED VIREO — Vireo olivaceus — W

The only record was of one bird at Altun Ha on 27 Mar. (This seems to agree closely with Russell as the usual arrival time for north bound migrants.)

225 *YELLOW-GREEN VIREO — Vireo flavoviridis — SN1

Four birds were netted at Guacamallo Bridge on 25 Apr and Airport Camp on 10/11 Apr. From 31 Mar - 6 Apr in the Salamanca/Aguacate area, the bird was seen or heard in numbers of ten to 100 on each day.

226 *TAWNY-CROWNED GREENLET — Hylophilus ochraceiceps — N1

There were three netting records from Jimmy Cut and Aguacate, and one was seen at Union Camp.

227 *LESSER GREENLET — Hylophilus decurtatus — N1

One netted in tall forest at Jimmy Cut on 19 Mar, and one seen at Aguacate on 4 Apr were the only positive identifications, but many small birds seen high in trees were probably H.decurtatus or H.ochraceiceps.

Honeycreepers — Coerebidae

228 RED-LEGGED HONEYCREEPER — Cyanerpes cyaneus — N1

Small numbers (up to four) seen on three days at the top of tall trees near Jimmy Cut and Aguacate. (A telescope proved a useful aid in identifying these small birds.)

229 SHINING HONEYCREEPER — Cyanperpes lucidus

Up to ten birds were continually active above the Union Camp site. (The altitude of Union Camp is 640m (2040 ft), so this evidence slightly modifies Russell, who suggests on p.149 that this species is not common below 660m (2200 ft).)

230 GREEN HONEYCREEPER — Chlorophanes spiza — N1

The only record was a sighting of a bird in dense medium height growth at Union Camp.

231 *BANANAQUIT — Coereba flaveola — N1

There were sightings of up to six birds in the dense scrub beside the Aguacate road, and one was netted at Jimmy Cut on 10 Mar. (Russell p.246 refers to two doubtful specimen records only for this species.)

Wood-warblers — Parulidae

232 *BLACK-AND-WHITE WARBLER — Mniotilta varia — W

These were seen on most days and at most locations in numbers of up to six per day.

233 WORM-EATING WARBLER — Helmitheros vermivorus — W

Only one record of a bird that was seen on the ground below tall forest at the edge of a cliff close to Aguacate Creek on 4 Apr.

234 BLUE-WINGED WARBLER — Vermivora pinus — W

One record only - from Jimmy Cut on 30 Mar.

235 TENNESSEE WARBLER — Vermivora peregrina — W

One record only - from Airport Camp on 8 Apr.

236 NASHVILLE WARBLER — Vermivora ruficapilla — RO

Recorded on four days; two were seen at Big Falls Ranch on 22 Mar, one at Airport Camp on 27 Mar, and one at Aguacate on 3/4 Apr. Identification was made by RDP and indicates that this warbler may be more common than suggested.

237 *NORTHERN PARULA — Parula americana — W

Only record was of one netted at Altun Ha on 15 Apr.

238 *YELLOW WARBLER — Dendroica petechia — W

There were eight netting records from the more open areas at Airport Camp, Big Falls Ranch and Jimmy Cut. The species was also seen each day at those locations. It was not seen at the forest locations of Guacamallo Bridge and Aguacate. The first record was on 11 Mar and it was still being seen on 10 Apr. (Ph)

239 *MAGNOLIA WARBLER — Dendroica magnolia — W

Fifteen birds were netted in all locations. Daily sightings were generally of two birds, with up to eight per day at Big Falls Ranch.

240 *YELLOW-RUMPED WARBLER — Dendroica coronata — W

This was recorded from 18 Mar to 4 Apr. Early records were from Airport Camp and Big Falls Ranch, and then no further reports until two were seen in the south on 4 Apr. (Ph)

241 BLACK-THROATED GREEN WARBLER — Dendroica virens — W

Seen on five days only. A male was seen on 10 Mar in the Salamanca area. The last record was on 31 Mar.

242 BLACKBURNIAN WARBLER — Dendroica fusca — T

One record on 4 Mar from Mtn Pine Ridge. Two were seen on 24 Mar at Guacamallo Bridge and one at the Airport Camp on 28 Mar.

243 YELLOW-THROATED WARBLER — Dendroica dominica — W

Records from 13-27 Mar - Airport Camp and Altun Ha only.

244 *CHESTNUT-SIDED WARBLER — Dendroica pensylvanica — W

One was netted at Jimmy Cut on 30 Mar. Two further records from the area on 5 and 6 Apr.

245 *OVENBIRD — Seiurus aurocapillus — W

There were 21 netting records from all locations except Big Falls Ranch, and most records resulted from netting between 4 Mar - 10 Apr. (Ph)

246 LOUISIANA WATERTHRUSH — Seiurus motacilla — W

The only records were of single birds seen on the river at Aguacate on 2 and 3 Apr.

247 *NORTHERN WATERTHRUSH — Seiurus noveboracensis — W

Nine birds were netted at all locations. There were from two to six records each day, from 26 Feb to 10 Apr. (This should perhaps be a common rather than a moderately common species as suggested by Russell on p.157.)

248 *KENTUCKY WARBLER — Oporornis formosus — W

Eight nettings from Jimmy Cut on 8 Mar to the Airport Camp on 5 Apr form the majority of the records. (Ph)

249 *COMMON YELLOWTHROAT — Geothlypis trichas — W

The most recorded warbler - on each day and in most locations in numbers of between ten to 100. There were 38 netting records - mainly from the more open habitats of Airport Camp and Big Falls Ranch.

250 *GRAY-CROWNED YELLOWTHROAT — Geothlypis (Chamaethlypis) poliocephala — N1

The six netting records form the majority of the sightings at Airport Camp and Big Falls Ranch. (Ph)

251 *YELLOW-BREASTED CHAT — Icteria virens — WU

There were 11 netting records - mainly from the more open habitats, and the species was recorded on ten days. (Ph)

252 *HOODED WARBLER — Wilsonia citrina — W

Netted and recorded at most locations, including a very tame female at the Airport Camp Officers' Mess! (Ph)

253 *WILSON'S WARBLER — Wilsonia pusilla — W

There were seven netting records from 7 Mar to 10 Apr. (Sightings from a variety of places, including Union Camp, suggest that this warbler is more common than indicated by Russell p.159.) (Ph)

254 *AMERICAN REDSTART — Setophaga ruticilla — W

The species was seen daily in numbers of one to ten in most open places.

255 GOLDEN-CROWNED WARBLER — Basileuterus culicivorus — N1

There were two records only - both from tall forest in the south: Aguacate on 31 Mar and Union Camp on 3 Apr.

256 RUFOUS-CAPPED WARBLER — Basileuterus rufifrons — N1

This species was recorded only at Guacamallo Bridge on 24 and 25 Mar. (one and four birds resp.). The birds were seen in bushes beside a track that bordered rain forest and was directly across the river from an extensive area of pine.

257 CHESTNUT-HEADED OROPENDOLA *Zarhynchus wagleri* UN1

Recorded only in the south in the Jimmy Cut, Salamanca and Aguacate areas. A site with 11 nests on the Salamanca to Jimmy Cut track was recorded by Team A on 9-12 Mar. Team B found this site deserted on 28 Mar. However an active site with nine nests was recorded close to the Aguacate Camp and was observed daily from 31 Mar - 3 Apr. The smaller females appeared to be the nest builders, while their mates defended aggressively. Neither nest site was close to water and was in tall-to-medium forest. From the ease with which we saw this species it probably rates as moderately common. (Ph)

258 MONTEZUMA OROPENDOLA (Yellowtail) *Gymnostinops montezuma* N1

There were records of small numbers of these birds seen or heard during time spent at Guacamallo Bridge, Jimmy Cut and Aguacate. A small nesting colony of about 15 birds was located on the northern bank of the river at Guacamallo about 800m upstream of the bridge. A large nest site with 40-50 birds was seen at Esso Landing, near Punta Gorda.

259 *YELLOW-BILLED CACIQUE (Bamboo Cracker) *Amblycercus holosericeus* N1

There were five netting records from Jimmy Cut and Aguacate, and 5-10 were seen daily in places where there was plenty of dense humid bush. Indeed observation of this species was often found to be best from 'inside' the vegetation. There were also some records from Big Falls Ranch. (Ph)

260 BRONZED COWBIRD *Molothrus (Tangavius) aeneus* N2

This species was seen at farms on the Hummingbird Highway at the "Cave" Branch and on the track to Blue Creek, where between ten to 20 birds were present. (The status and distribution of this species has perhaps changed since Russell p.162)

261 *GREAT-TAILED GRACKLE (Blackbird) *Cassidix mexicanus* N1

Large numbers (ten to 100) were seen on most days, but fewer were seen inland.

262 MELODIUS BLACKBIRD *Dives dives* N1

This species was recorded each day at all locations except tall forest areas. The largest numbers were at Big Falls Ranch.

263 *ORCHARD ORIOLE *Icterus spurius* W

There were 25 netting records, 24 of which were from Airport Camp from 18-20 Mar when the greatest numbers were seen. The species was first seen on 11 Mar, and although numbers of ten to 100 were seen at appropriate habitats in the south up to 4 Apr, by 10 Apr very few were being recorded at Airport Camp. (Ph)

264 BLACK-COWLED ORIOLE *Icterus prosthemelas* N1

The only records were from Altun Ha on 26 Feb (one female and one male) and 19 Mar (two females). (The species did not seem as common as suggested by Russell.)

265 *HOODED ORIOLE (Banana bird) Icterus cucullatus N1

Records were from 25 Feb - 10 Apr at Airport Camp and other coastal locations.

266 YELLOW-TAILED ORIOLE Icterus mesomelas N1

The only positive sightings were in the dense cover beside the Belize river at Big Falls Ranch where up to five were seen daily on the northern bank.

267 YELLOW-BACKED ORIOLE Icterus chrysater N1

Six birds seen at Guacamallo Bridge on 25 Mar and one at Jimmy Cut on 30 Mar are the only records.

268 NORTHERN ORIOLE Icterus galbula W

First recorded on 9 Mar at Salamanca and at Airport Camp a female and male were seen on 15 Mar. There were regular daily sightings at Aguacate up to 6 Apr.

269 *RED-WINGED BLACKBIRD (Soldier Bird Nancy Swasey) Agelaius phoeniceus N1

The 'Soldier Bird' was seen primarily at Airport Camp and Big Falls Ranch where vast numbers (1000-10,000) were seen. Seven birds were netted at Big Falls Ranch on 21 Mar.

270 EASTERN MEADOWLARK Sturnella magna N1

This species was recorded on nine days, with a maximum of seven on a single day. Generally it was seen in fields and open areas when en-route. Also on the airfield at Airport Camp, at Big Falls Ranch and at the 'Dump' north of Punta Gorda.

Tanagers Thraupidae

271 SCRUB EUPHONIA Euphonia affinis N1

Recorded on only five days from Guacamallo Bridge and Aguacate.

272 YELLOW-THROATED EUPHONIA Euphonia hirundinacea N1

Recorded on five days from Guacamallo Bridge and Aguacate.

273 MASKED TANAGER Tangara larvata N1

Seen regularly at tall forest sites. Most often recorded at Aguacate where eight birds were observed on 2 Apr. (Telescopes proved useful to watch these birds high in trees.)

274 *BLUE-GRAY TANAGER (Bluebird) Thraupis episcopus N1

The 'Bluebird' was seen daily at most locations, and in particular at Airport Camp where about ten were seen regularly.

275 *YELLOW-WINGED TANAGER — Thraupis abbas — N1

Recorded at clearings near all forest sites, including Altun Ha. Sightings were made on 12 days, and a maximum of 30 were seen at Aguacate on 4 Apr. The ten seen at Union Camp were at 640m (2040 ft) (cf Russell p.169 which suggests the species only occurs below 480m (1200 ft)).

276 *SCARLET-RUMPED TANAGER — Ramphocelus passerinii — N1

This was only recorded in the south, in particular at Aguacate with daily records of five to ten birds. (Ph)

277 *CRIMSON-COLLARED TANAGER — Phlogothraupis sanguinolenta — N1

Very similar localities to R. passerinii, although the numbers recorded were slightly less. (Ph)

278 SCARLET TANAGER — Piranga olivacea — WR

There were only two records. Two were seen on 8 Mar at Jimmy Cut and one at Aguacate on 3 Apr. (Other evidence, such as sightings by the Audubon Society suggests that this species might now be more common than indicated in Russell).

279 *RED-CROWNED ANT-TANAGER — Habia rubica — N1

There were records of three to four birds daily from the edge of extensive tall forest at Aguacate, with fewer numbers at Jimmy Cut. (Ph)

280 RED-THROATED ANT-TANAGER — Habia fuscicauda — N1

Most records were from Aguacate where daily counts were of about ten birds in the bush beside the camp and track.

Grosbeaks and Finches — Fringillidae

281 BLACK-HEADED SALTATOR — Saltator atriceps — N1

Large numbers (ten to 100) were seen on each visit to Altun Ha, and also at Guacamallo Bridge. There were fewer records in the south, with up to seven seen daily at Aguacate.

282 *BUFF-THROATED SALTATOR — Saltator maximus — N1

The species was only recorded in the south, in particular at Aguacate close to extensive tall forest, where up to ten were seen on a single day. (Russell p.175 should perhaps be 'common in south'.) (Ph)

283 *GRAYISH SALTATOR — Saltator coerulescens — N1

There were five records, four from Airport Camp, and one from Jimmy Cut. One bird was netted at Airport Camp. (Ph)

284 *BLACK-FACED GROSBEAK — Caryothraustes poliogaster — N1

The only sightings were of 20-30 birds seen daily at Aguacate and Union Camp. At Aguacate small noisy groups moved at medium level in dense shrub and bush along the track, only occasionally appearing in the open.

285 RED CARDINAL — Cardinalis cardinalis — N1

Recorded daily at Airport Camp and Altun Ha, where six birds of both sexes were seen. Not observed at any other location.

286 *ROSE-BREASTED GROSBEAK — Pheucticus ludovicianus — WU

Three birds were netted at Airport Camp on 18, 19 and 20 Mar. Two females were first seen on 25 Feb at Airport Camp. Other records of single birds from Big Falls Ranch and Jimmy Cut. (The species is perhaps now more common than Russell p.177 indicated?)

287 *BLUE GROSBEAK — Guiraca caerulea — T

Four birds were seen in a weedy field near Blue Creek from 6 Mar to 4 Apr, and one was netted at Jimmy Cut on 20 Mar.

288 *BLUE-BLACK GROSBEAK — Cyanocompsa cyanoides — N1

Single birds were seen at Big Falls Ranch. All other records were from Jimmy Cut and Aguacate in the low dense bush which was close to milpa. Most records of this agressive but secretive bird were from netting rather than field sightings. (Ph)

289 *INDIGO BUNTING — Passerina cyanea — W

Forty three birds were netted form 28 Feb to 29 Mar, primarily at Big Falls Ranch where 100-1000 were present in the reeds. There were also daily records from all sites. (Ph)

290 *PAINTED BUNTING — Passerina ciris — T

The only records were of three birds netted at Jimmy Cut on 29 and 30 Mar (two female and one male), and one seen at Aguacate on 1 Apr. (Ph)

291 *WHITE-COLLARED SEEDEATER (Ricey) — Sporophila torqueola — N1

This species was abundant to common and recorded at all locations - in particular the flatter, grassy areas of Airport Camp and Big Falls Ranch. (Ph)

292 *VARIABLE SEEDEATER — Sporophila aurita — N1

Recorded in small numbers from Jimmy Cut, Guacamallo Bridge and Aguacate.

293 *THICK-BILLED SEED-FINCH — Oryzoborus funereus — N1

A bird netted at Guacamallo Bridge on 25 Apr was the only positive record. (We found distinguishing it from S. aurita in the field was difficult, especially as both species are somewhat shy.) (Ph)

294 *BLUE-BLACK GRASSQUIT — Volatinia jacarina — N1

Large numbers were recorded at most open grassy places, in particular at Big Falls Ranch where 100-1000 were seen daily.

295 *ORANGE-BILLED SPARROW — Arremon aurantiirostris — N1

There were netting records from all locations in the south, including Union Camp. (We found a good way to observe this species was to get under the low bushes beside a track or path.) (Ph)

296 *GREEN-BACKED SPARROW — Arremonops chloronotus — N1

Most records were of birds netted on five days at all forest locations, including Altun Ha. (Ph)

297 SAVANNAH SPARROW — Passerculus sandwichensis — TR

The only record was of four birds in grass beside the shore at Dangriga on 6 Apr. (This seems to be the same place that Russell reported seeing the species (p.182) on 28 Mar 1956! Perhaps the status should be local rather than rare?)

298 GRASSHOPPER SPARROW — Ammodramus savannarum — N1

The only record was of approximately 50 birds seen in the fields at Big Falls Ranch.

299 RUSTY SPARROW — Aimophila rufescens — N1

This species was seen in the long grass below the Guacamallo Bridge camp and facing the pine ridge. It was observed each day in numbers from three to ten.

300 CHIPPING SPARROW — Spizella passerina — N1

The only records were of six birds seen daily below some pines at Airport Camp, near the QM's store! (Ph)

301 BLACK-HEADED SISKIN — Spinus notatus — UN2

Four birds were seen near the Thousand Foot Falls in the Mtn Pine Ridge. (Status should perhaps be local rather than uncommon?)

The list of species in Annex A follows the order and names used by Dora Weyer and W Ford Young in their 'Field Checklist', (1957), and R T Peterson and E L Chalif in their 'Field Guide to Mexican Birds', (1970) Where local names are known they have been included in brackets with each species. The status abbreviations are the same as those in the Checklist: (Courtesy of Russ Mason's Natural History Tours, Kissimee, Florida).

A = Accidental
R = Rare
U = Uncommon
S = Spring and Summer Resident
T = Spring or Fall Transient
W = Winter Resident
L = Local
N1 = Positive evidence of Breeding
N2 = Believed to breed but no positive evidence
O = No specimen or reliable photograph
* = Indicates the species was netted and further details are available in the netting records.
Ph = Indicates a photograph is available

COURTING/DISPLAY DANCE Tom Leech

WHITE-COLLARED MANAKIN *Manacus candei*

On 11 Mar 81 Tom Leech and Fred McAughtrie made the following notes of their observations that day on a track near Salamanca Camp.

> "When first confronted with the sound, F McA and I believed that the source of the loud and intense noise was a large bird. After listening for 3-4 min we estimated there were four birds present in an area of about 250 sq metres. We listened for a further 15 min; my own impression of the sound was of an elongated buzzing followed by a two note whistle, the second being lower. This was followed by four or five sharp 'snaps' (I can only liken it to someone cracking nuts!) F McA's impression was as follows: the first noise resembled a large bough creaking, the disyllabic call as described above and, finally, a large piece of wood snapping.
>
> When we caught sight of the bird we were most surprised at the small size, and were rewarded with a fine view of a male and female White-collared Manakin.
>
> Initially I thought that the male was flying to and from a nest; he would dart out of a thicket and up to a branch three to four metres off the ground, disappear from view only to return to the edge of the suspect nest site and then dive groundwards into it. The snapping sound followed the bird's disappearance into the thicket.
>
> We then thought we were probably witnessing a courtship dance and decided to move closer. The bird(s) seemed to take no notice of our presence and continued the display sequence much as before. We were then within two to three metres of them. The male (or males) were hopping furiously from side to side, covering about half a metre in the process and rising about the same distance in the air. This 'hopping' was repeated four to five times before the birds began a circuit of the branches. The 'hopping' was being done so quickly that we decided that at least two males were taking turns to display to the female perched above the display area. The snapping sound previously described was caused by wing clapping at the end of each hop from side to side.
>
> Were the four birds we heard all in competition for the same female, or were there two or three separate displays being conducted at the same time in different areas? There seem to be many interesting questions to be answered."

On 2 Apr 81 Peter Jenkins made the following notes:

> "In an area of medium height bush near Aguacate I observed three males displaying within 25 metres of one female. The males made at least four distinct sounds: clapping, scolding, churring and a buzzing noise as they flew. As part of the display the males erected feathers under the chin.
>
> Similar, but distinctly different sounds were also being made by RED-CAPPED MANAKIN *Pipra mentalis* occupying similar habitat in the area.