Bacalar Chico Bird Report Ambergris Caye, Belize

Sponsored by: The International Tropical Conservation Foundation.

Administered by: Chief Fisheries Administrator Fisheries Department Government of Belize

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Bacalar Chico Bird Survey Bacalar Chico

Location : See map I and map II
Country: Belize
Grid reference for Bacalar Chico: Approximately Lat. 18 deg. N, Lon. 88 deg. W.
Land Form : Part of peninsula (See map I and map II)
The proposed Reserve: The boundaries are yet to be decided upon, but if taken to include everything north to Mexico from a line drawn west from Robles point to the west coast, then it will include an area of approximately 60 square kilometers.

Life Zone:

The environmental life zone based on Holdridge's classification (1967) revised by Hartshorn et al. (1984) for this area is the <u>Sub Tropical</u> <u>Moist Forest Zone</u>. This zone in Ambergris Caye experiences a seasonal "dry" season (most trees are dry deciduous and some shallow lagoons dry out); The average annual precipitation is around 1500 mm.

Geology:

The bedrock is limestone often fossiliferous reef, forming a fairly flat platform, either below sea level (giving lagoons), to sea level (giving seasonal lagoons), to just above sea level supporting very little (where bare rock) to thin soil. Rocky point has the highest rock outcrop rising to around 4 meters. Sinks occur in the limestone.

Topography:

Partly described in Geology, basically very flat and low. The highest land being along the eastern shore, where storms have deposited sand and coral rubble. The reef becomes a fringing reef between Robles and Rocky Points, and here coral rubble forms a wide ridge some 50 meters across and rises about 5 meters above sea level.

Habitat Types:

The 1:50000 VTM grid NAD 27 sheet gives the following habitats. If the location of the proposed reserve is as under location 1, then these habitats give :

TYPE	<u>SQ. KM.</u>	%
Scrub Forest Lagoons/ Shallows Mud/ Sand Mangrove and Swamp Mangrove Coconut Plantation	19.5 15.0 3.5 10.0 11.0 1.0	32.5 25.0 6.0 16.5 18.5 1.5
	60 sq. km.	100 %

Relevance to the bird survey

In relation to the bird survey these habitats are too restrictive and not in fact strictly true to fact. Obvious examples are the mud/sand areas which are often etched limestone rock, and in the rainy season become shallows. Where does mangrove and swamp become mangrove ? And is the limited coconut plantation adjoining coastal scrub forest going to give different bird species ? The lagoons and shallows in the case of a few bird species influence them more depending on if they were freshwater or saltwater.

Ornithologically it is better to look at the habitats as wet or dry, with specific remarks about certain species preferences. In this way we come up with a survey of water birds, eg. Egrets, Ibis: approached in one way and a survey of forest birds approached in another way.

Objectives of the bird survey

- 1. To record species diversity.
- 2. To record species distribution.
- 3. To obtain some idea of habitat value to birds, especially from central scrub forest to coastal scrub forest.
- 4. To make observations of this relatively undisturbed part of Ambergris Caye, and compare with the "developed" part as regards to birds.
- 5. To outline the importance of this area.

Limitations of the bird survey

The short time period in November resulting in :

- a: Some migrant species having already passed through, and other species yet to arrive.
- b: No idea of the main nesting populations, especially for the wetland bird rookeries (only Double Breasted Cormorant nesting).



c: Little idea of how many of the migrant Egrets and Ibis remain in the area.

Method

- 1. To cover as much of the area as possible noting species and numbers seen with time records to obtain an idea of species frequency per habitat (especially any central scrub forest).
- 2. To find the main Egret/ Heron/ Ibis roost to obtain an idea of numbers in the area.

Augmenting records

To obtain a fuller idea of species in this area, the species list has an "R" for species I have recorded with Birders over the last six years, mainly around Captain Morgan's Retreat, and at the Bird Cayes to the southwest. Other species listed as "L" are likely species which need confirming.

Field time (See map III and map IV)

Eleven days were spent in the area with a canoe for the wetlands. Three days were devoted to scrub forest. Dates were from the 9 th. of October to the 20 th. of October, 1994 on Ambergris Caye.

Birds of Belize and Bacalar Chico

Belize in Central America contains birds both from the Neo-Tropical Region and from the Sub-Tropical to the Temperate North American Zone, as well as Pan Tropical, mainly sea bird families.

The Yucatan Peninsula has several Endemic species of which the Black Catbird, Red-Vented Woodpecker, Yucatan Jay, and Yucatan Vireo reach their Southern limits with a viable population.

The Bacalar Chico area is very important for these Endemics.

Wintering North American birds concentrate in the small land mass of Central America (some pass through) and a healthy habitat where they make landfall in an exhausted state and then winter is very important.

Bacalar Chico with it's extensive wetlands is very important for both resident and migrant wetland birds.

The Caribbean Region has several Endemics found at Bacalar Chico, notably White-Crowned Pigeons, Smooth-Billed Ani (Caribbean race), and the Caribbean Elaenia.

APPENDIX: A

The Laguna De Cantena Rookery/ Roost, and Roosts/ Rookeries in general.

Position :

Belize 1:50000 VTM grid NAD 27 118045

Area:

A mangrove Caye 25 m in diameter with two central black mangrove trees around 15 m tall, fringed with red mangrove 80 m from the fringing mangrove shore of the lagoon.

Nesting Birds :

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Double Crested Cormorants (Phalacrocorax auritus) were building or incubating on about ten nests.

Four Reddish Egrets (Egretta Rufescens) appeared to be disputing nest sites.

Roost from 4:40 pm to 5:50 pm on Sunday 30 th. October, 1994.

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SPECIES	<u>COMMON NAME</u>	<u># IN ROOST</u>
SPECIES Pelicanus occdentalis Phalacrocorax auritus Fregata magnificens Casmerodius albus Egretta thula Egretta caerulea Egretta tricolor	COMMON NAME Brown Pelican Double Crested Cormoran Magnificent Frigate Bird Great Egret Snowy Egret Little Blue Heron Tricolored Heron	13 t 114 1 39 246 164 349
Egretta rufescens	Reddish Egret	41
Eudocimus albus	Boat-Billed Heron White Ibis	6 <u>431</u> *
	Το	tal 1404
	* Only 16 1st. year plumage	e.

N.B. At 5:17 pm. a Peregrine Falcon (Falco peregrinus) flew over. N.B. For Cattle Egrets (Bubulcus ibis) roosted in the above roost on 26th. October, 1994. Importance:

Birds flew in from all directions, but primarily from the west, and more the north west, indicating they came in from all the shallow lagoon feeding areas around Laguna De Cantena.

It is a very large roost.

Other Rookeries/ Roosts:

1. The Bacalar Chico area just north of the tidal channel entrance to Laguna De Cantena, Greg Smith disturbed a few birds. We had seen Great Egrets and Cattle Egrets in the vicinity.

2. Other Roosts/ Rookeries out of the area of Bacalar Chico are :

NAME	MAP REF.
Caye Rosario	952 892
Caye Pajeros	969 955
North Bird Caye	969 978
Caye in Laguna De Mato	010 862

If possible future management is needed for these sites. Others may occur. The Laguna De Mato on the 15th. November, 1994, had only 171 Egrets/ Herons/ Ibis, with 1 Roseate Spoon bill (to far to count Cormorants), as compared to the studied one of 1290 birds (excluding Cormorants). Roosts are usually empty by 15 minutes after sunrise on a clear day.

Yearly cycle- varies according to dry/rainy season intensities. SPP. Nesting months

Great Blue Heron	December
Great Egret	February, March, April
Snowy Egret	April
Tricolored Heron	May, June
Reddish Egret	November, December,
	January, and occasionally
	March
White Ibis	April, May
Boat Billed Heron	November, December,
	and occasionally March
Roseate Spoon Bill	March through April, and
	rarely December
Double Crested Cormorants	Highly variable, usually
	October to July and
	August
Brown Pelican	January, February

Predators :

Man :

By far the most important cause of nesting failure. The once common practice of barbecuing fat nestling birds (especially Spoonbills and Wood Storks is fast dying out) probably because of cheap oven ready chickens, education and taking tourists to see birds.

Raccoons :

Most colonies are on islands and so Raccoons play no part. Boa Constrictors :

Probably the most serious predator, they swim to Cayes and get very large at rookeries. The most probable reason for Spoonbills / Ibis/ Egrets/ Cormorants to sometimes forsake a Caye used the previous year. I have taken tourists to see late fledged Cormorant chicks only to find a nest occupied by a large 2.5 m Boa Constrictor. Future management may have to control Boas on nesting Cayes.

Black/ Turkey Vultures :

These birds hang around rookeries and must find food, probably after human disturbance has left eggs/ young unprotected by parents.

Magnificent Frigate Birds :

Present at colonies although not nesting in the area. Increasing in numbers because of waste fish from shrimp boats. They probably mainly only affect Booby bird nesting success to date.

Great Tailed Grackles :

Occasionally at nest sites probably account for a few eggs,

"development" is likely to increase damage to nearby rookeries.

Spiny Tailed Iguanas :

Only on sand Cayes? On nesting Cayes such as Caye Rosario. Eat eggs and very young nestlings.

APPENDIX B

Effects of people on birds on Ambergris Caye and more specifically Bacalar Chico.

Bacalar Chico-North of Roles Point

Population :

Only about five houses are occupied and a similar number have become derelict, all being along the Eastern shore. The coconut plantations are in a bad shape and the industry is clearly not paying. Isolation, boat transport costs and insects do not at present attract people.

Feral Dogs :

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A pack of dogs seem to roam the shoreline and coastal coconul/ shrub forest area, they certainly pose a threat to nesting/ nestling/ \cdot fledgling birds as well as to "tame", rather exhausted migrants (usually warblers).

Future pressures :

A McDermott "development" ! Stretching for a kilometer along the northern eastern shoreline with cleared "roads" stretching into the black mangrove from the coastal scrub forest is a very serious threat. A pier has been put into an inlet of the Laguna De Cantena.

This, if it goes ahead will fragment the coastal forest, the most important habitat for non wetland birds, allow undesirable bird species (see below) to enter the system, and will loose certain species especially the Lineated Woodpecker (Dryocopus Lineatus), and will increase predatory (cats and dogs). Power boating on the Laguna De Cantena will disrupt the wetland bird nesting sites and roosts, for which this area is outstanding.

Undesirable Bird Species :

The Great Tailed Grackle (Quiscalus mexicanus) is a man commensal species which is a serious nest destroyer, eating eggs and nestlings of other species. On this study only one was seen at the McDermott camp. And yet only 20 km. south at Journey's End and Captain Morgan's Retreat, they are common.

Another man commensal is rather more serious, it is the Bronzed Cowbird (Molothrus aeneus) again liking the broken habitat with lawns, clearings and rubbish dumps (it is very common on San Pedro Town dump). This species lays it's eggs in other species' nests, which end up feeding a fat Cowbird (evicts the eggs/ young) instead of their own young. This species parasitisis many species including the Black Catbird (Melanoptila glabrirostris). A similar species, Molothrus ater has had serious effects on songbirds in the U.S.A. following habitat fragmentation. The above species show that a few "development !" areas within a reserve have a much larger effect than the "developers" would like us to believe.

Coastal Forest and Development:

This coastal forest as mentioned before in th report is exceptionally important to the scrub forest birds being more heavily populated than the central scrub forest and with an important fruiting Pouleria sp. absent in the central scrub forest. In times of severe stress (drought/ hurricane) this forest is certainly a repopulation area for the others. The absence of forest bird families Furnariidae and Dendrocolaptidae and Formicariidae mirrors the Caye scrub forest harshness.

It is on this narrow strip of coastal forest with "high" ground due to deposition of sand and coral by wave action, especially in hurricanes over thousands of years with "ocean" frontage (beach frontage) that "developers" find their dream lots. Backed by low mangrove lands to the west (often put in as lower priced lots) with a healthy natural mosquito population (bird food), that if developed whenever a west wind or a windless day occurs, the areas will be chemically fogged against mosquitos, disrupting food chains as well as contaminating rainwater collected from roofs.

In short, an ornithological and environmental disaster. It is essential that somewhere in Belize this type of habitat should be saved, and I can see none placed better than this Bacalar Chico area.

Hunting :

A few cartridge cases were found and central Calabash marsh areas had been burned. Collared Peccary and white tailed deer were seen, these isolated populations must be vulnerable to hunting. There is also a risk of hunters shooting large birds or even firing near a roost/ rookery just to see the birds take off. Hunting/ guns should be banned.

Drugs :

There is no doubt that drug drops, mainly cocaine take place in this area. It needs future police back-up to make future "park/ reserve" wardens work less dangerous.

APPENDIX C :

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Bird species of special note.

Wetland species :

All need a large, varied wetlands area for feeding (both in the rainy and dry seasons) and isolated, undisturbed usually mangrove islands for roosting and nesting.

Bacalar Chico is especially important for the less common :-

Reddish Egret (Egretta rufescens) of which approximately 25 % of Belize birds are of the uncommon white phase.

Boat Billed Heron (Cochlearius Cochlearius) a peculiar "duck billed" Night Heron relative limited to the Neotropics with a patchy distribution. It was found in four locations in Bacalar Chico indicating a small well spread out population.

White Ibis (Eudocimus albus) The four hundred plus at the main roost must be a significant proportion of White Ibis in Belize. This species is both a winter visitor and resident, the lack of young birds points to either a disastrous breeding season or a different post breeding dispersal.

Roseate Spoonbill (Ajaia ajaja) Only three birds were seen with none at the roost. Their specialized filter feeding methods result in feeding concentrations not seen during the study. They nest in three Cayes 17 km. southwest of Bacalar Chico in the dry season (April), occasionally earlier.

Wood Stork (Mycteria americana) This species is highly vulnerable to nest colony disturbance. Present numbers in Belize are a fraction of thirty years ago.

Singing Quail (Dactylortyx thoracius) Very few records for Belize.

Rufous-Necked Wood Rail (Aramides axillaris) Not observed, but is present on the Cayes.

Wilson's Plover (Charadrius wilsonia) Nests on beaches, bare ground. This species is getting noticeably less common with human disturbance. Bacalar Chico has excellent habitat for this species.

Caribbean Dove (Leptotila jamaicensis) Bacalar Chico's scrub forests are a stronghold for this species.

Mangrove Cuckoo (Coccyzus minor) Not observed but must be present, another Caribbean species.

Smooth-Billed Ani (Crotophala ani) In Belize very rare and restricted to the Cayes.

Great Horned Owl (Bubo virginianus) This widespread species elsewhere in Belize seems to be restricted to the coastal area of Ambergris Caye.

- Tawny-Collared Nightjar (Caprimulgus salvini) Very localized and rarely reported resident.
- Red-Vented Woodpecker (Melanerpes pygmaeus) Not reported but known from 12 km. south. A Yucatan species.
- Yucatan Jay (Cyanocorax yucatanicus) Widespread in the area where no Brown Jays were observed. This area is their southernmdst stronghold. A Yucatan species.
- Black Catbird (Dumetella carolinensis) A Yucatan coastal scrub/ mangrove species restricted to the Yucatan. Observations showed a widespread "thin" population.
- Yucatan Vireo (Vireosylva magister) A Yucatan species, thinly distributed on Bacalar Chico at it's southern limits.

APPENDIX D BIRD LIST

This gives in columns from left to right :

Column 1: Family Species Column 2: Common English name Column 3 : Status Where: R= resident W= winter visitor D= dry season visitor T = transientColumn 4 : Occurrence Where : O= observed during study H= heard during study R= recorded on Ambergris Caye and should occur in similar habitat in Bacalar Chico L= liable to occur in Bacalar Chico Column 5: Habitat W= wetlands Column 6 : Habitat F= forest Column 7: Remarks

Summary

- 114 species observed during study.
 - 3 species heard but not seen during study.
 - 46 species recorded on Caye and with different time of year and more study time should be present.
 - 16 species liable to occur.

FAMILY SPECIES	COMMON NAME	STAT.	O,H R,L	WF	REMARKS
Podicipedae Podilymbus podiceps Tachybaptis dominicu	Pied billed Grebe s Least Grebe	R W R	L L	x x	
Pelecanidae Pelicanus occidentalis	Brown Pelican	RW	0	х	
<i>Phalacrocoracidae</i> Phalacrocorax auritus	Double crested Cormorant	R	0	x	Freshwater
Anhingidae Anhinga anhinga	Anhinga	R	0	x	
Fregatidae Fregata magnificens	Magnificent Frigatebird			x	
Hreidae Ixobrychus exilis Tigrisoma mexicanus	Least Bittern Bare Throated Tiger Heron	R R	0 0	X X	Freshwater
Ardea herodias Casmolodidius albus Egretta thula Egretta caerulea Egretta tricolor Egretta rufescens Bubulcus ibis Butorides striatus	Great Blue Heron Great Egret Snowy Egret Little Blue Heron Tricolored Heron Reddish Egret Cattle Egret Green Backed Heron	R R R R R R R R R R R R R R R R R R R	000000000	× × × × × × × × × × × × × × × × × × ×	Open area s
Cochlearius cochlearin	Night Heron Us Boat Billed Heron	R	0	x	
Threskiornithidae Eudocimus albus Ajaia ajaja	White Ibis Roseate Spoonbill	R W R	0 0	X X	
Ciconidae Mycteria americana	Wood Stork	R	0	x	
Anatidae Anas dicors Anas americana Aythya affinis L	Blue Winged Teal American Widgeon esser Scaup	W W W	O R L	X X X	
Cathartidae Coragyps atratus Catharses aura Catharses burrovianus	Black Vulture Turkey Vulture s Lesser Yellow- Headed Vulture 12	R W R W R	O O R	X X X	

FAMILY SPECIES	COMMON NAME	STAT.	L, 0 H,R	W	F	REMARKS
Accipitridae Pandion haliaetus Chondrohierax uncii	Osprey n <i>atus</i> Hook-billed Kite	R W R	0 0	х	x	
Elanus caeruleus	Black-Shouldered Kite	R	0			Open Areas
Geranospiza caerule Buteogallus anthrac	escens Crane Hawk inus Common black Hawk	R R	0 0	х	X X	Op <mark>en</mark> Areas
Buteo magnirostris	Roadside Hawk	R	0		х	
Falconidae Falco culumbarius Falco peregrinus	Merlin Peregrine	W W	00	X X	х	
Cracidae Ortalis vetula	Plain Chachalaca	R	0		х	
Phasianidae Dactylortyx thoracius	Singing Quail	R	н		х	
Rallidae Rallus longirostris Aramides axillaris	Clapper Rail Rufous-necked Wood Rail	R R	O L	X X		
Porzana carolina Gallinula chloropus Fulica americana	Sora Common Moorhen American Coot	W R W	L O L	X X X		Freshwater
Aramidae Aramusgu ar auma	Limpkin	R	0	х		
Charadriidae Pluvialis squatarola Pluvialis dominica Charadnus wilsonia Charadrius semipaln	Black Bellied Plover Lesser Golden Plover Wilson's Plover hatus Semipalmated	W W R W	0 L 0 0	X X X X		
Charadrius vociferus	Killdeer	W	R	Х		
Recurvirostridae Himantopus mexicar	nus Black-Necked Stilt	W	0	х		
Scolopacidae Tringa melanoleuca Tringa flavipes Tringa solitaria Catoptrophorus semi Actilis macularia Boatramia logicauda	Greater Yellowlegs Lesser Yellowlegs Solitary Sandpiper <i>ipalmatus</i> Willet Spotted Sandpiper Upland Sandpiper		O R R R O R	X X X X X X X X		

FAMILY SPECIES	COMM	ION NAME	STAT.	O,H R,L	W	F	REMARKS
Numenius phae Numenius amer Arenaria interpre Calidris alba Calidris pusilla Calidris mauri Calidris minutilla Limnodromus gi	opus Wi icanus Lo es Rudd San Semi Pali Wester Least riseus Sh	nimbrel ng-Billed Curlew y Turnstone iderling mated Sandpiper n Sandpiper sandpiper ort Billed owitcher		R L O O T O O O	××× ××× ×××	0	X
Gallinago gallina	<i>ago</i> Com	imon Snipe	W	0	Х		Freshwater
Laridae Stercorarius para Larus atricilla Sterna nilotica Sterna caspia Sterna maxima Sterna sandvice Sterna antillarum	asiticus Pa Laug Gull Bil Caspia Royal 1 nsis Sand n Lea	arasitic Jaeger hing Gull lled Tern n Tern fern Jwich Tern st Tern	T WR D? R WR WR R	L R R O O R R	× × × × × × ×		
Columbidae Columba leucoc	ephala	White Crowned	WR	R	х	х	Mangroves
Zenaida asiatica Columbina pass Leptolila jamaice	White erina Co ensis Caril	Pigeon Winged Dove Immon Ground Ibbean Dove	R R R	0 L 0	х	x x	Mangroves Open Areas
Psittacidae Aratinga nana	Olive Thro	bated Parakeet	R	0		x	
Cuculidae Coccyzus amerio	canus Yell	ow-Billed	Т	R		х	
Coccyzus minor Piaya cayana Crotophaga ani Crotophaga sulci	Mangi Squiri Smootl irostrils Gr	rove Cuckoo rel Cuckoo h-Billed Ani oove-Billed Ani	R R R R	R H O O		X X X X	Mangroves
Strigidae Bulbo virginianus Ciccaba virgata	Great H Mottled	lorned Owl I Owl	R R	О Н		x x	
Caprimulgidae Chordeiles acutij Chordeiles minol Nyctidromus albio Caprimulgus salv	oennis Les r Comn collis Com vini Taw	sser Nighthawk non Nighthawk Imon Pauraque ny-Collared Nightjar	R RW R R	R R O O	х	× × × ×	Open Areas

FAMILY SPECIES	COMMON NAME	STAT.	L,O H,R	WF	REMARKS
Apodidae Chaetura pelagica Chaetura vauxi	Chimney Swilt Vauxs Swift	T R	0 0	x x x x	
Trochilidae Chlorostilbon canive Amazilia Iutila Cin Archilochus colubris	tti Fork-Tailed Emeral namon Hummingbird Ruby-Throated Hummingbird	d R R T	O O R	X X X	
Trogonidae Trogan melanoceph	alus Black-Headed Trogan	R	0	х	
Alcedinidae Ceryle alcyon Chloroceryle america	Belled Kinglisher ana Green Kinglisher	W R	O L	X X	
Picidae Melanenpes pygmae	eus Red-Vented	R	R	хх	Mangroves
Melanerpes aurifrons	s Golden-Fronted	R	0	х	
Sphyrapicus varius	Woodpecker Yellow-Bellied	Ŵ	0	х	
Dryocopus lineatus L	Sapsucker inealed Woodpecker	R	0	х	
Tyrannıdae / Elaemiı Elaenia martinica C Elaenia flavogaster Todirostrum cinereur	nae aribbean Elaenia Yellow-Bellied Elaenia n Common Tody- Flycatcher	R R R	L 0 0	x x x	
Fluvicolinae Empidonax Empidonax minimus	Least Flycatcher	W W	0 0	X X	
Tyrannidae Myiarchus yucataner	isis Yucatan	R	R	х	
Myiarchus tuberculife	er Dusky-Capped	R	0	х	
Myiarchus tyrannulus	Brown Crested	R	0	х	
Pilangus sulphuratus Myiozetates similis Tyrannus melancholi Tyrannus couchii Tyrannus tyrannus	Great Kiskadee Social Flycatcher cus Tropical Kingbird Couch's Kingbird Eastern Kingbird	R R R T	0 0 0 R	X X X X X X	Freshwater

FAMILY SPECIES	COM	IMON NAME	STAT.	L,O H,R	W	F	REMARKS
Hirundinidae Progne subis Progne chalybea Tachycineta bicolot Tachycineta albiline Stelgidopteryx serri	Purple Gray-E r Tree ea Mar pennis Ro	e Martin Breasted Martin Swallow ngrove Swallow North uchwing Swallow	T D T T R T T	R R R C O O	x x x x x x x x x x	x x x x x	Esp.Mangroves
Riparia riparia Hirundo pyrihonota Hirundo rustica	Ba Cli Ba	ank Swallow iff Swallow arn Swallow	T T T W	R R O	X X X	X X X	
Corvidae Cyanocorax yucata	nicus	Yucatan Jay	R	0		х	
Sylviinae Polioptila caerulea	Blue-(Gray Gnatcatcher	R	0		х	
Turdidae Catharus fuscescer Catharus minimus Catharus ustulatus Hylocichla mustelin.	ns Gray-(Swai a	Veery Cheeked Thrush inson's Thrush Wood Thrush	W W W T W	R R R R		X X X X	Also Black Mangrove
Mimidae Dumetella cardoline Melanoptila glabriro	ensis ostris	Gray Catbird Black Catbird	W R	0 0	x	x x	Scrub Forest
Mimus gilvus	Tropie	cal Mockingbird	R	0	х		Open Areas
Vireonidae Vireo griseus Vireo pallens Vireo flavifrons Vireo olivaceus Vireosylva magister Cyclathis gujanensi	White- Mangre Yellow Red-Ey 7 Yuca 5 Ruío Pep	Eyed Vireo ove Vireo -Throated Vireo yed Vireo atan Vireo us-Browned pershrike	W R W R R R	000000		X X X X X X	Mangrove
Parulinae Vermivora pinus Vermivora peregrina Parula americana Dendroica petechia	Blue-W a Ten Northe Yello	Vinged Warbler nessee Warbler rn Parula ww / Mangrove Warbler	W W W W R	R 0 0 0			
Dendroica magnolia Dendroica tigrina Dendroica caerules	a Mag Cape cens	molia Warbler May Warbler Black-Throated Blue Warbler	W W W	O R C			

FAMILY SPECIES	COMMON NAME	STAT.	L,O H,R	W	F	REMARKS
Dendroica coronat	a Yellow-Rumped Warbler	W	R			Open Areas
Dendroica virens	Black-Throated Green Warbler	W	0			
Dendroica fusca	Blackburnian Warbler	ΨT	R			
Dendroica dominic	a Yellow-Throated Warbler	W	0			
Dendroica discolor	Prairie Warbler	W	R			
Dendroica palmaru	m Palm Warbler	W	0			Open Areas
Dendroica striata E	Black-Poll Warbler	Т	С			
Mniotilta varia Bla	ack & White Warbler	W	0			
Setophaga ruticilla	American Redstart	W	0			
Protonotaria eitrea	Prothonolary Warbler	WΤ	R			
Helmitheros vermiv	orus Worm-Eating Warbler	W	R	Х	Х	Forest, Black Mangrove
Limnothlyps swains	<i>onii</i> Swainson's Warbler	· W	0		Х	U
Seiurus aurocapillu	s Oven bird	W	0	Х	Х	Forest, Black Mangrove
Seiurus noveborac	ensis Northern Waterthrush	W	О	Х		Black, Forest Mangrove
Seiurus motacilia L	ouisiana Waterthrush	WΤ	R	Х		5
Oporornis formosu	s Kentucky Warbler	W	R		Х	
Oporomis philadelp	hia Mourning Warbler	wт	R		X	
Geothylpis trichas	Common Yellowthroat	W	0	Х	Х	Open Areas
Geothylpis poliocer	ohala Gray-Crowned Yellowthroat	R	С		Х	Open Areas
Wilsonia citrina	Hooded Warbler	Ŵ	0		Х	
Icteria virens Yello	w-Breasted Chat	W	R		Х	
Coerebinae						
Coereba flaveola	Banana Quit	R	L		Х	
Thraupinae						
Piranga rubra	Summer Tanager	W	0		Х	
Piranga olivacea	Scarlet Tanager	W	0		Х	
Cardinalinae						
Saltator atriceps E	llack-Headed Saltator	R	L		Х	
Pheucticus Iudovici	arius Rose-Breasted Grosbeak	W	0		Х	
Guiraca caerulea	Blue Grosbeak	WΤ	0	Х	Х	Open Areas
Passerina cyane <mark>a</mark>	Indigo Bunting	W	0	Х	Х	Open Areas
Emberizinae						
Sporophila torqueo	la White-Collared Seedeater	R	L	Х		Open Areas
Melospiza lincolnii	Lincoln's Sparrow	W	0		Х	

FAMILY SPECIES	COMMON NAME	STAT.	L,O H,R	W	F	REMARKS
lcterinae						
Dives dives	Melodius Blackbird	R	L		Х	
Quiscalus mexical	nus Great-Tailed Grackl	e R	0	Х		Only one bird
						seen
lcterus spurius	Oachard Oriole	W	R		Х	
Icterus cucullatus	Hooded Oriole	R	0		Х	
Icterus chrysater	Yellow-Backed Oriole	R	0		Х	
lcterus galbula	Northern Oriole	W	R			
Amblycercus holo.	sericeus Yellow-Billed	R	0		Х	Red Mangrove
	Cacique					& Scrub Forest

APPENDIX E :

MAPS

Map I: Localion of Bacalar Chico, Ambergris Caye

Map II : Bacalar Chico 1:50000

Map III : Overflight route 1:50000

Map IV: Ground survey routes 1:50000

MAP. I .

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LOCATION OF BACALAR CHICO, AMBERGRIS CAY









APPENDIX F:

Habilat Richness For Birds

A : Forests

The scrub forests differ; from the coastal one with deep root penetration in sandy soils, coastal rubble, and probably less drought effects with the fruiting Pouteria sp. being very common; from the central scrub forest on shallow soil on hard limestone lacking the Pouteria sp.

As the coastal scrub forest disappears under "development" (see appendix B) a comparison was done in frequency or sightings in both forests.

Forest Type	Birds Seen	Time(mins.)	Minutes per bird
Coastal Forest	348	489	1.4
Central Forest	108	451	4.1

It indicates that the coastal scrub forest is almost 3x as congenial to birds than the central forest.

B: Lagoons

reasons:

These are incredibly rich, partly because of the following

- 1./ The main Laguna De Cantena has a daily tidal flow through the channel to the north.
- 2./ Fringing mangrove with their leaf decay etc.
- 3./ Salinity variations from almost freshwater behind Robles Point to highly saline dry season "salt pans".
- 4./ Depth variations from a few inches to1.5 meter. A few sinks occur and some deep pools surrounded by mangrove could well be very large sinks.
- 5./ On the ground it is obvious that the number of pools is the result of a Mayan salt industry. The shallows are sub divided by old walls now usually mangrove covered, giving a patch work of varied feeding areas. Some banks seem to keep freshwater "fresh".

Summary :

This large number of pools gives an excellent chance of daily feeding success.