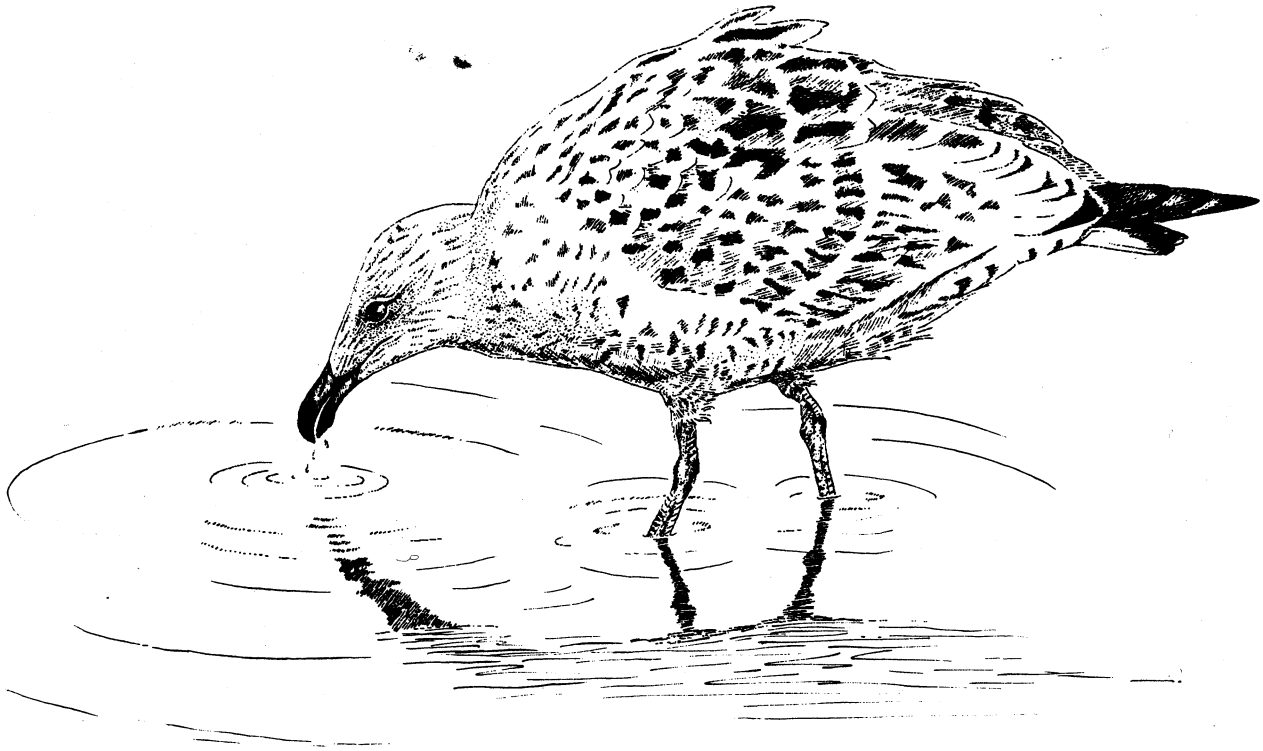
An Aerial Survey of Birds in Wetlands on the Pacific Coasts of the Mexican States of Michoacan, Colima, Jalisco, Nayarit and Sinaloa



Service canadien de la faune
Conservation et protection
Environnement Canada
Région de l'Atlantique

Canadian Wildlife Service
Conservation and Protection
Environment Canada
Atlantic Region

An Aerial Survey of Birds in Wetlands on the Pacific Coasts of the Mexican States of Michoacan, Colima, Jalisco, Nayarit and Sinaloa

Anthony R. Lock,
Canadian Wildlife Service,
Atlantic Region,
Bedford Institute of Oceanography
November, 1990

TABLE OF CONTENTS

PREFACE

Through its Latin American Programme the Canadian Wildlife Service provides funds for its scientists to work in collaboration with Latin-American counterparts on projects of importance both to Canada and to the host country. In 1979 and 1980 funds were provided to A. R. Lock enabling him to work with Prof. Monica Herzig and her students on a wetland inventory project on the Pacific coast of southern Mexico. This project included studies of the flora and fauna of saline coastal lagoons in the state of Oaxaca, but its main purpose was a detailed low-level aerial survey of coastal wetlands in Chiapas, Oaxaca and Guerrero states. The work carried out in 1989 has been summarised in a data report which was submitted in March 1990 and in a major report on the floral and faunal inventories of Manialtepec Lagoon.

The 1990 survey was carried out by A.R. Lock with the assistance of Gilberto Binnequist who was working under the supervision of Prof. Herzig. This report is a preliminary presentation of the results of the survey. A compilation the planned three years of aerial survey work on the Pacific coast of Mexico will be prepared on completion of the third year of surveys.

INTRODUCTION

The birds of the southern Pacific coast of Mexico are not well described. For various regions of this coast there are annotated distributional lists, but these are, in the main, non-quantitative.

The United States Fish and Wildlife Service make periodic aerial surveys of the most important wetlands in Mexico but these surveys do not examine the smaller wetlands. Furthermore, these surveys have traditionally concentrated on waterfowl, although pelicans and some waders have been included in more recent surveys by that agency. The numbers of waterfowl reported on these surveys have decreased radically in the last decade. The U.S. F.&W.S. surveys were, however only of major wetlands and the status of birds on the multitude of small lagoons and estuaries was unknown. The L.A.P. funded aerial survey was a response to the need to describe accurately the distribution of waterbirds on the coast outside the major wetlands and to the need to quantify the abundance of waterbirds other than waterfowl.

METHODS

A low level aerial survey of the coast was carried out using a Cessna 172 aircraft based at Mazatlan in Sinaloa State. The survey was carried out at height of 150 to 250 feet(45 and 75m) at a speed of 100 knots (180km/h). The aircraft speed was reduced to about 70 knots (125km/h) when photographs were taken or concentrations of birds were counted. The height used for counts and photography varied between 150 and 700 feet (45 and 200m).

For the purposes of tabulating the results of this census, the coastline was divided up into census blocks. The criteria for delimiting these blocks were simple. The borders of each are readily identifiable coastal features which are named on the topographic maps. Within each block, habitat is more or less uniform. The larger and more important lagoons and their associated wetlands may make up an entire census block, whereas a stretch of shoreline with many similar small lagoons and intervening farmland may comprise another block. The blocks extended inland to the extent of the coastal plain. These census blocks are listed in Table 1 and their locations are shown in Fig.1.

All species of gulls, terns, waders, shorebirds and waterfowl were counted, as were frigate birds, cormorants and pelicans. The need to enumerate so many species required some sacrifice of detail. Anhingas (Anhinga anhinga) could not always be distinguished form Olivaceous Cormorants (Phalacrocorax olivaceus)and so the cormorant totals include the less abundant anhingas. Similarly, numbers of Common and Snowy Egrets (Casmerodius albus and Leucophoyx thula) are pooled in the tabular summary of results. Immature Little Blue Herons (Florida caerulea) and White Ibises (Eudocimus albus) occurred in smaller numbers and because they were not consistently distinguished from egrets, they are included in the egret totals. The smaller herons: adult Little Blue, Green

(Butorides virescens), and Louisiana Herons (Hydranassa tricolor) were usually individually identifiable, but they occurred in small enough numbers that separate tabulation was not practical so these were grouped with dark ibises (Plegadis chihi and P. falcinellus) and Black-crowned Night Herons (Nycticorax nycticorax) as "small herons".

Shorebirds which were readily identifiable, such as American Avocets (Recurvirostra americana) and Black-necked Stilts (Himantopus mexicanus) were counted separately, other species were divided into three size-categories. Large Shorebirds included Whimbrels (Numenius phaeopus), Long-billed Curlews (Numenius americanus) and Willets (Catoptrophorus semipalmatus), Medium Shorebirds were those whose size approximated dowitchers (Limnodromus sp), and the Small Shorebirds were shorebirds smaller than dowitchers, those birds generally referred to as "peeps".

In the time available it was not possible to distinguish consistently the various gull species and age-classes encountered. Laughing Gulls (Larus articilla) were the most common gulls on the coast. The most common terns were Caspian Terns (Sterna caspia)but in an aerial survey Royal Terns (Thalasseus maximus)are not easily separated from Caspians. These species were grouped as Large Terns. The less abundant smaller terns were primarily Forsters Terns (Sterna forsteri), though the less common Elegant Terns (Thalasseus elegans) were also included in this category.

Waterfowl were more easily dealt with. Teal and whistling ducks were the most abundant waterfowl. Blue and Green-winged Teal (Anas discorsand A. carolinensis) were enumerated in a single category, however Blue-winged Teal were noted to be more abundant than Green-winged Teal at most sites. The two species of whistling ducks (Dendrocygna autumnalis and D. bicolor) were easily distinguished and their numbers were tabulated separately. Other ducks, such as Lesser Scaup (Athya affinis), American Widgeon (Anas americana), Gadwall (Anas strepera) and Shoveller (Anas clypeata), were recorded separately. American Coot (Fulica americana) were recorded separately, but this category included smaller numbers of Moor Hens (Gallinula chloropus) and Purple Gallinules (Porphyrula martinica). The category "Other Ducks" contains counts of birds which were not easily identified at first sight. Where numbers were small it was sometimes not thought worthwhile making a further pass over an area to check their identities. Also in this category are small numbers of species which were not sufficiently common to justify separate tabulation.

In order that surveys might be carried out in the coolest part of the day we began as soon after sunrise as possible and attempted to finish before noon. The course of the aerial survey covered all habitat along the coast within which water birds were likely to be found. This involved the examination of the entire coastline and the coastal plain; all estuaries, river mouths, and all wetlands and lagoons and ponds were included. Topographic maps of 1/250,000 scale issued by the Instituto Nacional de Estidistica Geographia e Informatica were used for navigation, and the names of geographic features and locations are taken from these maps.

All birds in the previously listed categories were counted. Where flocks were small accurate counts of individuals were made, but in larger flocks counts were made by fives and tens; in the largest flocks by hundreds. Guesses of numbers were not made; only careful estimates were recorded. Data were recorded using a Sony portable cassette recorder, and the survey track and colony locations were marked on 1/250,000 scale topographic maps.

Where colonies were encountered the numbers and species of birds in them were carefully estimated. If the numbers were too large for accurate counting the colony was photographed. Colony photographs were taken with a Pentax 6X7 camera using Kodak TMax 120 black and white film, and with a Pentax 35mm camera using Kodachrome 64 positive colour film.

RESULTS AND DISCUSSION

1. Extent and Limitations of the Survey

The aerial survey required 36.5 hours of air time between Feb. 3 and 10, 1990 at a cost of $4015 US. The counts obtained, summarised by census block, are presented in Table 2. These totals include counts of birds on colonies. Visual estimates of birds on colonies are summarised in Table 3. The results of the aerial survey were summarized by totals for the 22 census blocks in which counts were performed. Blocks 32 and 33 at the southern end of the survey area were not flown. The coastline in these blocks does not contain any significant water bodies or wetlands and it is likely that their water bird populations are small.

The accuracy of estimates of numbers of birds made in the course of an aerial survey is dependent on the colouration of the birds, their habitat, time of day, flock size and the skills of the observer. Estimates are likely to be most accurate for birds such as the large wading birds which are quite conspicuous and which do not usually occur in large flocks. Where birds are encountered singly or in very small flocks they are easily and accurately counted. Where birds are encountered in large flocks estimates of numbers must be made and these are, for the larger flocks, likely to be conservative.

2. Cormorants,Frigate Birds and Pelicans

Because it was not always possible to distinguish Anhingas from Olivaceous Cormorants they were not tabulated separately. However it was apparent that Anhingas constituted less than 5% of the total at most sites. Undoubtedly many birds in the water were not counted but at any one time the majority of cormorants are out of the water. They roost at exposed sites and, usually, in small numbers. Therefore it is reasonable to expect that they were counted accurately, and that the number recorded for each census area is a consistent, though conservative, estimate of the number actually present.

Frigate Birds (Fregata magnificens) were also easily identified and counts are thought to have been accurate and consistent. Brown Pelicans (Pelecanus occidentalis) occur in large numbers on the ocean which was not sampled adequately, so the numbers recorded are less than those present by a great margin. White Pelicans (Pelecanus erythrorhynchus), however are confined to fresh water. They are large and highly visible so there is every reason to expect that their numbers are accurately assessed by an aerial survey. The only difficulty in their assessment is the fact that they often occur in large flocks and estimates of large flocks are less likely to be accurate than estimates of small flocks. These birds were rare in smaller lakes and estuaries and the great majority (90%) were in the two large wetlands.

3. Waders

White birds such as immature Little Blue Herons, Snowy and Great Egrets are highly visible and, while these species could usually be distinguished with careful observation, the circumstances of the census were such that it was not usually practical to take the time to make the distinction. Because these white birds usually occur individually or in small flocks, they were counted accurately. White ibises were not common except at a very few sites and because it was not certain that all of this species were properly identified they were not tabulated separately in Tables 2 and 4. The majority of this species were identified in Blocks 48 to 51 and it is estimated that no more than 500-700 were seen in the course of this survey. Great Blue Herons were highly visible and accurately counted. They were widely dispersed in wetlands of all types but tending to associate with cormorants.

4. Shorebirds

Shorebirds constituted 43% of the birds counted. Of those categorised as 'Large' shorebirds, Whimbrels were the majority, with Long-billed Curlews less common. Marbled Godwits (Limosa fedoa) were only occasionally identified. Willets, which were easily identifiable only when they took wing, occurred regularly in all parts of the survey area but in small numbers. Medium shorebirds were primarily Short-billed Dowitchers (Limnodromus griseus) , Greater and Lesser Yellowlegs (Totanus melanoleucus and T. flavipes) were probably included in this category most often, though these species are difficult to categorise and sometimes they were probably counted as Large shorebirds.

Large shorebirds occurred in relatively small flocks or individually and were, hence, accurately counted. Small shorebirds, those generally categorised as 'peeps' were most difficult to assess. They occurred in flocks which were often very large and took wing in a shifting mass that was often very difficult to estimate accurately.

Furthermore, at most sites, shorebirds were encountered in mixed flocks and estimations were complicated by the need to count several different species and size categories in a single flock. Numbers of small shorebirds are probably on the low side but undoubtedly well reflect their relative abundances.

5. Waterfowl

Thirty seven percent of the birds counted were waterfowl, 40% if coots are included. The majority (67%) were in the two major wetland areas censused, but ducks were usual in even the smallest water body or wetland. Most species were quite widely distributed but unusual numbers of some were observed in a few areas.

Exceptional numbers of scaup (46% of the total) were found in lakes in the southern portion of Block 40. This survey block was examined in the late morning, at a time when scaup usually seek cover in the shade of mangroves. This suggests that many more scaup were actually present in these lakes. Unusual concentrations of coot and whistling ducks (36% of total) were also found in these lakes.

6. Other Species

Gulls and terns are not concentrated in major wetlands, rather they are most abundant in estuaries and at the out-flows of small lagoons and streams all along the coast. The majority of gulls encountered appeared to be Laughing Gulls (Larus atricilla), though Ring-billed (L. delawarensis)and California gulls (L. californicus) were became more common in the more northerly areas. Frigate Birds were most abundant in mangroves in the major wetlands but they were present in small numbers in most survey blocks. Ospreys (Pandion halieatus) were seen regularly but they could not always be reliably and rapidly distinguished from immature Frigate Birds sitting in treetops. These birds have white heads and in a rapid survey they may be easily confused with Ospreys. For this reason Ospreys, though often positively identified, were not recorded as a separate category. The majority of the immature Frigate Birds were encountered in mangroves in the major wetlands included in blocks 47 to 52.

7. Comparison of Large and Small Wetlands

In Scott and Carbonell's (1986) catalogue of neo-tropical wetlands two major wetlands are identified in the area of the 1990 aerial census: Laguna Caimanero (Census blocks 53 and 54) and Marismas Nationales (Census Blocks 47 to 52). These wetlands have been subjected to periodic mid-winter aerial censuses by the U. S. Fish and Wildlife Service for more than 30 years. Waterfowl are the chief target of these censuses but in recent years numbers of shorebirds, waders, pelicans and cormorants have been recorded on some surveys.

A major purpose of the Canadian Wildlife Service surveys has been to determine the relative importance to waterbirds of the small wetlands and estuaries which are not surveyed by the U.S. Fish and Wildlife Service. Table 4 summarises the survey data for these major wetlands and for less important lakes, ponds, wetlands and estuaries in other survey blocks. It is apparent that 76% of all birds observed occurred within the boundaries of the two major wetlands identified by Scott and Carbonell. Some species such as Brown Pelicans, whistling ducks and Black-legged Stilts were most abundant in the smaller wetlands while others, such as shorebirds and White Pelicans (89% and 90% of which were encountered in large wetlands) were relatively rare in smaller wetlands. The species most dependant on the large wetlands on this coast were the large waders. The Great Blue Herons, Roseate Spoonbills and Wood Storks are particularly dependant on the larger wetlands; only 2-4% of these species were found in small wetlands.

Flocks of birds in the large wetlands were larger than comparable flocks in the many smaller ponds and estuaries. The likelihood of under-estimating of numbers is greater, therefore, in large wetlands and the proportion of the total waterbird population in smaller wetlands is likely to be less than the 25% estimated on this survey.

Overall ducks made up 37% of the birds counted and shorebirds 41%. In small wetlands ducks constituted 54% of all birds counted while shore-birds made up only 18%. The situation is quite different in the major wetlands. Here shorebirds made up 48% of the counted birds while ducks constituted only 31%.

8. Colonies

In the course of the survey several aggregations of birds in treetops were encountered. It was often difficult to decide whether these aggregations were breeding colonies or merely roosts. At several sites numbers of cormorants were noted in treetops suggesting colony formation, however only those sites at which nests or partial nests were seen were counted as colonies. Occasionally large numbers of Great Blue Herons were noted in tree tops also. At two sites in Block 48 a total of 106 Great Blue Herons were seen at high density in treetops, with no cormorants present. No nests were seen and it is not suggested that these Herons were in fact breeding at these sites, merely that their aggregation suggested a readiness for breeding.

Colonies of Wood Storks and Roseate Spoonbills are more easily acertained. These species aggregate in treetops in daytime only at breeding sites and at each site noted in Table 3 nests were visible. At the colony of Frigate Birds noted in Block 49 no nests were actually seen. However, no comparable aggregation of this species of this size and density was seen during this survey and a nascent colony was strongly suspected.

REFERENCES

Scott, D.A. and M. Carbonell 1986. A Directory of Neotropical Wetlands. I.U.C.N.,Cambridge and I.W.R.B., Slimbridge. 684 pp.

Table 1. Census blocks used during the aerial survey of the coasts of Michoacan, Colima, Jalisco, Nayarit and Sinaloa states, Feb 4- Feb. 12, 1990

CENSUS BLOCK DESCRIPTION	NAME	No.
Punta Cayacal to Playa Titzupan	Playa Azul	32
Playa Titzupan to Punta La Playa Corrida	Playa Titzupan	33
Punta La Playa Corrida to el Paraiso	Tecoman	34
el Paraiso to Punta Santiago	Manzanillo	35
Punta Santiago to Punta Graham	Santiago	36
Punta Graham to Punta Farallon	Barra de Navidad	37
Punta Farallon to Punta Rivas	Isla San Andres	38
Punta Rivas to Punta Chalacatepec	Chalacatepec	39
Punta Chalacatepec to Punta Las Penitas	Roca Negra	40
Punta Las Penitas to Cabo Corrientes	Tehualmixtl	41
Cabo Corrientes to Boca Tomatlan	Tuito	42
Boca Tomatlan to Punta Villela	Puerto Vallarta	43
Punta Villela to Punta Raza	Punta Monterrey	44
Punta Raza to Punta el Custodia	Isla la Pena	45
Punta el Custodio to Boca Borrego	Ensenada los Cocos	46
Boca el Borrego to Playa los Corchos	San Blas	47
Playa Los corchos to Santa Cruz	Tuxpan	48
Santa Cruz to Playa Navillero	Agua Brava	49
Playa Navillero to Los Angeles	Estero Agua Grande	50
Los Angeles to Las Cabras	Los Cannales	51
Los Cabras to Majahual	Laguna Grande	52
Majahual to Los Pozos	Laguna el Caimanero	53
Los Pozos to El Walamo	Laguna el Huizache	54
El Walamo to Mazatlan	Mazatlan	55

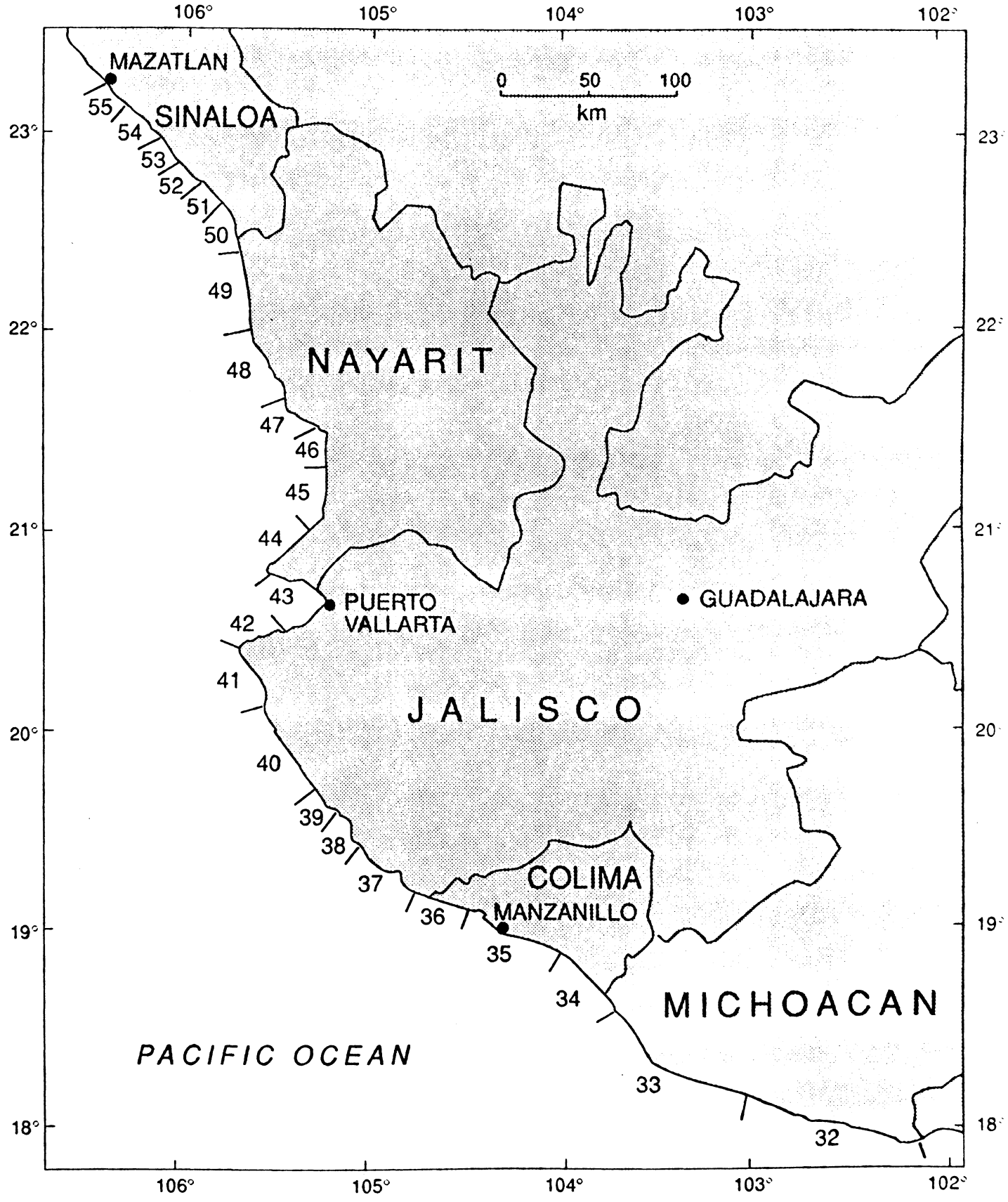


Figure 1. Aerial census blocks on the Pacific coast of Mexico.

Table 2. Total numbers of birds counted in each census block.
The locations of the census blocks are shown in Figure 1.

SPECIES	CENSUS BLOCKS											
	34	35	36	37	38	39	40	41	42	43	44	45
Cormorants and Anhingas	1,014	2,293	225	136	13	503	385	275	0	0	70	319
Brown Pelicans	160	73	0	74	45	20	76	0	6	28	38	795
White Pelicans	300	160	12	30	12	210	683	42	0	0	0	23
Frigate Birds	1	0	16	0	0	14	0	0	4	0	0	112
Great and Snowy Egrets	526	184	244	320	7	152	574	45	0	28	27	192
Cattle Egrets	0	0	0	0	0	0	0	0	0	0	0	0
Great Blue Herons	2	25	11	2	0	7	23	4	0	0	0	6
Small Herons	10	12	2	6	0	5	12	5	0	0	5	22
Roseate Spoonbills	0	1	0	0	0	0	9	1	0	4	0	6
Wood Storks	0	1	0	0	0	0	0	0	0	0	0	11
Avocets	100	150	20	10	2	0	340	10	0	50	0	30
Black-legged Stilts	920	6,156	90	60	7,302	275	1,270	35	0	45	0	30
Shorebirds-large	100	150	20	10	17	0	320	10	0	50	0	30
Shorebirds-medium	190	468	20	0	0	0	270	55	0	500	0	1,095
Shorebirds-small	0	1,080	0	0	82	0	150	100	0	600	0	250
Gulls	1,095	4,002	0	1,104	0	67	570	975	0	6,959	0	470
Black Skimmers	55	20	0	0	0	0	0	0	0	0	0	0
LargeTerns	40	145	0	3	0	0	80	5	0	3	0	85
Smaller terns	30	3	0	0	0	0	115	0	0	0	0	4
Coot	185	0	0	0	0	370	4,353	0	0	0	0	400
Teal	35	1,095	0	0	0	0	11,821	20	0	220	0	50
Shoveller	0	1,100	0	0	0	0	1,095	205	0	0	0	280
Pintail	0	50	0	0	0	0	9,167	25	0	0	0	0
Gadwall	0	0	0	0	0	0	0	20	0	0	0	190
Widgeon	0	450	0	0	0	0	750	0	0	0	0	0
Lesser Scaup	240	45	55	0	0	545	15,024	0	0	0	0	0
Fulvous Whistling Ducks	0	0	12	75	0	0	605	0	0	0	0	0
Blk-bellied Whistling Ducks	0	0	354	530	0	530	17,510	300	0	0	1,450	3,452
Other Ducks	10	0	0	25	6	10	100	65	0	0	0	20
Totals	5,013	17,663	1,081	2,385	7,486	2,708	65,302	2,197	10	8,487	1,590	7,872

Table 2. continued

SPECIES	CENSUS BLOCKS 46	47	48	49	50	51	52	53	54	55	TOTALS
Cormorants and Anhingas	0	4,835	430	4,378	1,286	510	926	676	197	87	18,558
Brown Pelicans	150	736	25	231	254	564	417	289	0	56	4,037
White Pelicans	0	440	405	5,148	588	751	288	5,795	39	39	14,965
Frigate Birds	95	351	0	529	175	86	608	36	113	12	2,152
Great and Snowy Egrets	12	682	602	7,934	1,011	752	334	152	197	133	14,108
Cattle Egrets	0	0	0	45	0	0	0	0	0	0	45
Great Blue Herons	0	70	220	552	215	213	188	779	143	23	2,483
Small Herons	0	23	454	212	62	184	0	10	6	41	1,071
Roseate Spoonbills	0	7	67	281	37	66	21	25	10	0	535
Wood Storks	0	20	9	390	61	136	0	0	0	0	628
Avocets	0	465	355	17,124	1,156	14,729	17,830	6,025	6,517	0	64,913
Black-legged Stilts	0	962	639	6,341	2,459	9,862	2,611	1,285	980	28	41,350
Shorebirds-large	0	777	605	3,330	1,416	4,319	2,337	0	13	0	13,504
Shorebirds-medium	0	3,896	2,425	6,598	2,570	4,140	2,180	1,269	3,054	450	29,180
Shorebirds-small	0	17,122	2,335	8,775	132	9,705	2,480	23,920	8,805	8	75,544
Gulls	340	911	2,140	1,455	495	173	4,458	1,672	281	725	27,892
Black Skimmers	0	120	0	990	0	0	160	390	0	19	1,754
Caspian and Royal Terns	84	118	36	740	196	356	107	737	30	12	2,777
Smaller terns	0	45	0	279	67	320	0	20	10	30	923
Coot	0	573	3,064	2,878	0	430	4,779	0	560	25	17,617
Teal	0	8,206	3,860	6,337	2,576	5,032	2,082	310	7,616	0	49,260
Shoveller	0	100	700	21,466	35	2,850	753	320	1,230	0	30,134
Pintail	0	0	0	1,262	105	1,005	1,005	29	260	0	12,908
Gadwall	0	165	150	1,330	0	1,115	2,045	122	1,100	0	6,237
Widgeon	0	1,054	435	170	0	275	87	30	52	0	3,303
Lesser Scaup	0	65	0	4,104	0	5,480	3,130	70	3,680	0	32,438
Fulvous Whistling Ducks	45	0	0	43	469	47	0	10	28	26	1,360
Blk-bellied Whist. Ducks	150	335	2,494	19,138	222	2,926	0	75	0	0	49,466
Other Ducks	0	35	90	162	144	55	77	115	42	25	981
Totals	876	42,113	21,540	122,222	15,731	66,081	48,903	44,161	34,963	1,739	520,123

Table 3. Numbers of Olivaceous Cormorants, Egrets, Wood Storks,Roseate Spoonbills and Frigate Birds on colony sites.

Block No.	Lat.	Long.	Location	Numbers of Breeding Birds				
				Oliv. Corm.	Snowy Egrets	Wood Storks	Ros. Spbill.	Frigate Birds
53	22:53	106:04	2 islands in Laguna el Caimanero	265				
51	22:38	105:46	2 km S. of Palmito del Verde		270	60		
50	22:27	105:29	Both sides of river, 2km w. of Buenavista			64	90	
49	22:08	105:15	2.5 km W. of Rosa Morada			300		
49	22:03	10:.24	2 km N. of Pimientillo	45				
49	22:09	105:31	North side of Agua Brava					390
37	19.:44	104.:44	Pond near San Patricio	32				
34	18:49	108 :46	S. end of Lago Amela	220				

Table 4. Comparison of bird populations of large and small wetlands

SPECIES	Marismas Nationales	Laguna Caimanero	Total Large Wetlands No.	%	Total Small Wetlands No.	%	% in Large Wetlands	TOTALS
Cormorants	12,365	873	13,238	3.3	5,320	4.3	71.33	18,558
Brown Pelicans	2,227	289	2,516	0.6	1,521	1.2	62.32	4,037
White Pelicans	7,620	5,834	13,454	3.4	1,511	1.2	89.90	14,965
Frigate Birds	1,749	149	1,898	0.5	254	0.2	88.20	2,152
Great and Snowy Egrets	11,315	349	11,664	2.9	2,444	2.0	82.68	14,108
Cattle Egrets	45	0	45	0.0	0	0.0	100.00	45
Great Blue Herons	1,458	922	2,380	0.6	103	0.1	95.85	2,483
Small Herons	935	16	951	0.2	120	0.1	88.80	1,071
Roseate Spoonbills	479	35	514	0.1	21	0.0	96.07	535
Wood Storks	616	0	616	0.2	12	0.0	98.09	628
Avocets	51,659	12,542	64,201	16.2	712	0.6	98.90	64,913
Black-legged Stilts	22,874	2,265	25,139	6.4	16,211	13.0	60.80	41,350
Shorebirds-large	12,784	13	12,797	3.2	707	0.6	94.76	13,504
Shorebirds-medium	21,809	4,323	26,132	6.6	3,048	2.4	89.55	29,180
Shorebirds-small	40,549	32,725	73,274	18.5	2,270	1.8	97.00	75,544
Gulls	9,632	1,953	11,585	2.9	16,307	13.1	41.54	27,892
Black Skimmers	1,270	390	1,660	0.4	94	0.1	94.64	1,754
Large Terns	1,553	767	2,320	0.6	457	0.4	83.54	2,777
Smaller terns	711	30	741	0.2	182	0.1	80.28	923
Coot	11,724	560	12,284	3.1	5,333	4.3	69.73	17,617
Teal	28,093	7,926	36,019	9.1	13,241	10.6	73.12	49,260
Shoveller	25,904	1,550	27,454	6.9	2,680	2.2	91.11	30,134
Pintail	3,377	289	3,666	0.9	9,242	7.4	28.40	12,908
Gadwall	4,805	1,222	6,027	1.5	210	0.2	96.63	6,237
Widgeon	2,021	82	2,103	0.5	1,200	1.0	63.67	3,303
Lesser Scaup	12,779	3,750	16,529	4.2	15,909	12.8	50.96	32,438
Fulvous Whistling Ducks	559	38	597	0.2	763	0.6	43.90	1,360
Black-bellied Whistling Ducks	25,115	75	25,190	6.4	24,276	19.5	50.92	49,466
Other Ducks	563	157	720	0.2	261	0.2	73.39	981
TOTALS	316,590	79,124	395,714	100.0	124,409	100.0	76.08	520,123