

NEW INFORMATION ON COSTA RICAN WATERBIRDS

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The land birds of Costa Rica are the best-known of Central America, thanks to the efforts of Slud (1964) and several later authors. However, over the years the waterbirds have been relatively neglected. Save for the accounts of selected species by Orians and Paulson (1969), little recent information is available on the rich freshwater avifauna of northwestern Costa Rica. The only careful account of seabirds in Costa Rican waters is based on only a few days' observations (Jehl 1974). Recently the Pacific Ocean Biological Survey Program (POBSP) gathered a wealth of data on seabird distribution in the eastern Pacific, but virtually all of their information is for pelagic, as opposed to coastal, waters (King 1974).

Over the past three years we have studied the distribution and abundance of seabirds, shorebirds and other waterbirds on the Pacific slope of Costa Rica. These studies have included three main phases: offshore voyages in small boats for seabirds; censusing waterbirds on certain freshwater marshes; and an intensive shorebird banding program. The results of the first study will be treated in some detail, as we have no immediate possibilities of continuing it; the other two programs are ongoing and we present here only those data that add significantly to knowledge of a species' status in Costa Rica.

LOCALITIES AND METHODS

Localities from which the most data have been obtained are described here (numbers correspond with those of fig. 1). Other localities are mentioned beyond under the appropriate species accounts.

Playas del Coco (3a): a small beach resort and fishing port on the Bahía del Coco (3b). From 1972 through 1975 we made boat trips from here out into the Golfo de Papagayo. Prior to April 1974 all trips were mainly within area A (fig. 1B), which extends out N to El Virador (3c), a precipitous 20-m tall rocky stack, and SW to about Punta Matapalo (3d). After this date we usually worked the more extensive area B, south to:

Islas Santa Catalina (4): two small, steep, uninhabited islands at the southern edge of the Golfo de Papagayo (fig. 1). Above the fringing cliffs, the islands are densely covered by bunchgrass (*Uniola pittieri*), with scattered tall cardón cacti (*Cereus aragonii*) (fig. 2).

Tamarindo and vicinity (5): visited mainly during

fall migration period, major habitats are: rugged rocky promontories, Punta del Carbón (5a), Punta Ventanas (5b), and Punta San Francisco (5f); broad sandy beaches, Playa Grande (5c) and Playa Tamarindo (5a); and the estuary of the Río Tamarindo (5d).

Ostional (6): a small seaside village on the Nicoya Peninsula; the adjacent coastline consists of sand beaches and rough rock pavements exposed at high tide.

Palo Verde (7): extensive freshwater marshes and lagoon in the basin of the Río Tempisque. The water level fluctuates widely according to the highly seasonal rainfall. One or both of us have spent a week or more censusing waterbirds here between late January and March, every year since 1974.

Salina Bonilla (8): a group of salt ponds situated 0.3 km inland from the Golfo de Nicoya, and connected to it via channels through the intervening mangrove swamp. Since October 1974 we have been banding shorebirds here.

Laguna Chacarita (9): a small (ca. 2 ha.) brackish lagoon ca. 3 km E of Puntarenas, intermittently connected with the estuary that separates the sandspit upon which the town is located from an extensive mangrove swamp.

Whenever possible, we collected specimens to document new or unusual occurrences. Sight records are reported when identification seems certain—and in most such cases, one or both of us has had extensive previous experience with the species in question. For specimens we give here data on gonads, fat and plumage, as these summarize most information on the annual cycle. Weights, exact gonad measurements, skull ossification, stomach contents and colors of soft parts are available on request. Specimens are deposited either in the Universidad de Costa Rica (in which case the University collection numbers are given) or the Western Foundation of Vertebrate Biology (when the collector's number is given). Inquiries regarding U. C. R. specimens should be addressed to Stiles; regarding WFVZ specimens, to L. F. Kiff, Curator, 1100 Glendon Ave., Los Angeles, California, 90024.

We also include here observations by others when these add significantly to the information on certain species. We thank L. Kiff, C. Leahy, K. Leber, P. Opler, R. Ridgely, J. Sánchez, A. F. Skutch, and J. A. Tosi for generously contributing their data. For plant identifications we thank J. Gómez L. and M. Montiel. In the accounts that follow, the numbers in parentheses following locality names correspond with those of figure 1.

SPECIES ACCOUNTS

Puffinus griseus. Sooty Shearwater. Recorded in numbers in May (Puntarenas, Playas del Coco, table 1), July (Playas del Coco by Kiff) and September (Golfo de Nicoya); apparently an irregularly com-

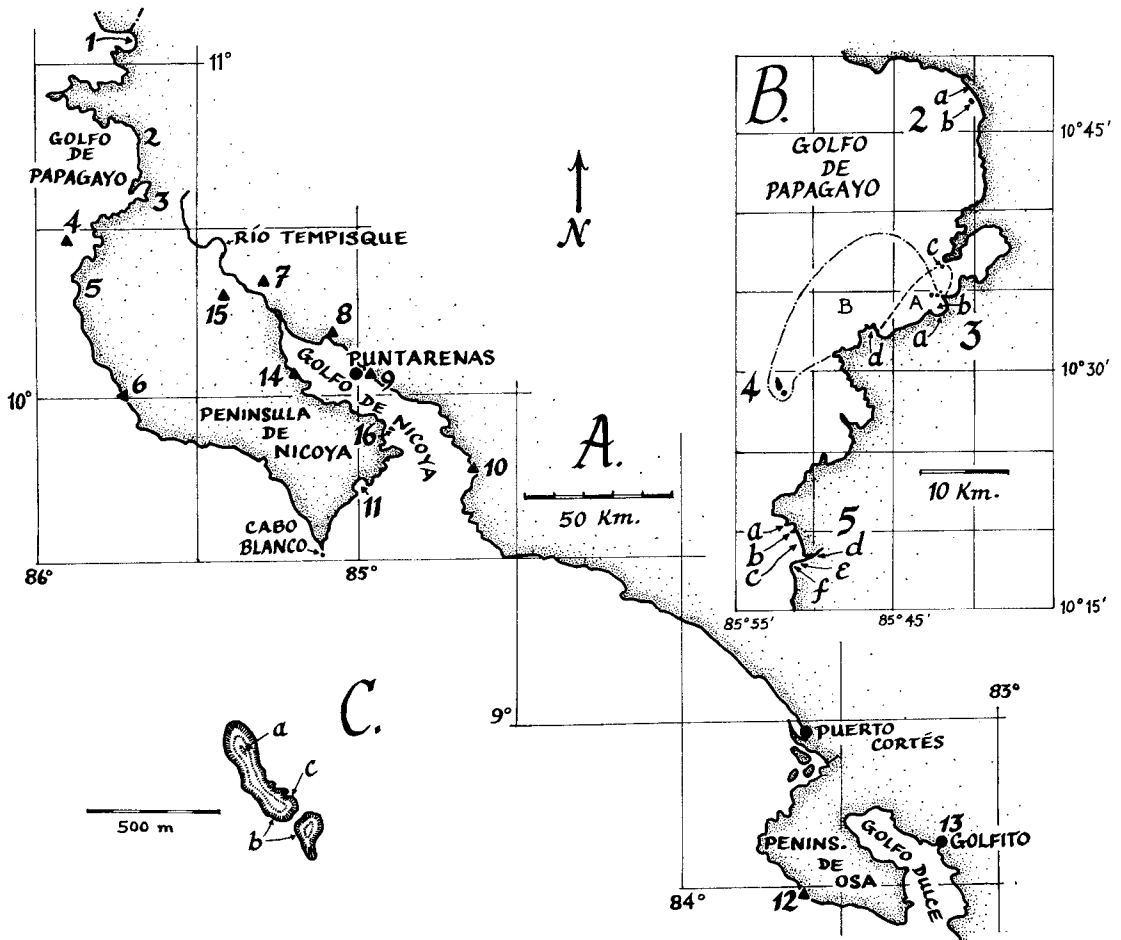


FIGURE 1. Map showing localities on the Pacific slope of Costa Rica mentioned in the text. A. Pacific coast and adjacent lowlands; B. Details of area most intensively worked for seabirds; C. Detail of Isla Santa Catalina. Localities are: 1. Bahía Salinas; 2a. Playa Naranjo de Santa Rosa; 2b. Peña Bruja; 3a. Playas del Coco; 3b. Bahía El Coco; 3c. El Virador; 3d. Punta Matapalo; A = area worked for seabirds prior to 29 Apr. 1974; B = area worked on most trips after this date; 4. Islas Santa Catalina (for explanation of letters see text); 5a. Punta del Carbón; 5b. Punta Ventanas; 5c. Playa Grande; 5d. Estero de Tamarindo; 5e. Playa Tamarindo; 5f. Punta San Francisco; 6. Ostional; 7. Palo Verde; 8. Salina Bonilla; 9. Laguna Chacarita; 10. Boca de Tárcoles; 11. Bahía Ballena; 12. Río Claro; 13. Golfito; 14. Playa Naranjo de Puntarenas; 15. Laguna Mata Redonda; 16. Isla Guayabos.

mon seasonal visitant. One previous sighting in 1925 (Slud 1964). Specimen (first for Costa Rica): FGS 644, adult ♀, ovary very slightly enlarged, light fat, fresh plumage; 23 Sept. 1972, 2 km S Bahía Ballena (11). In addition, two fresh-plumaged birds were picked up dead on the beach at Puntarenas 18 May 1975, and were preserved as skeletons (FGS 928,929).

Procellaria parkinsoni. Parkinson's Black Petrel. We saw a bird at close range ca. 6 km NW Playas del Coco, 21 Apr. 1975. The heavy, horn-colored, dark-tipped bill, dark wing-linings, and different flight prevented confusion with the preceding species or any other shearwater. Previously seen and collected in Costa Rican waters by Jehl (1974). Most of the known or suspected sightings of this species near the Central American coast (summarized by Jehl 1974) have also been during March or April; the species may visit these waters regularly during these months.

Oceanodroma melania. Black Storm-Petrel. 14 sightings during migration periods (late Aug.–Nov., Apr.–early June), from Playas del Coco, Golfo de Nicoya, and Punta San Francisco (5f). Much more numerous in fall than in spring (table 1). Previously recorded only by Jehl (1974). Specimen (first for Costa Rica): FGS 702, immature ♀, ovary not enlarged, light fat, heavy molt, 2 Sept. 1973, 5 km NW Playas del Coco.

Oceanodroma leucorhoa. Leach's Storm-Petrel. At least 3 individuals sighted ca. 15 km WNW Playas del Coco, 25 May 1975. Their distinctive nighthawk-like flight and rump color (white with a dark center streak to mostly dark with grey sides) separated them from Wilson's Storm-Petrels seen on the same date (table 1). First Costa Rican record; seen by Jehl (1974) only as far south as Guatemala.

Oceanodroma tethys. Galapagos Storm-Petrel. Four seen, one collected ca. 10 km NW Playas del Coco, 21 Oct. 1974. Specimen: FGS 866, ♂, testes not

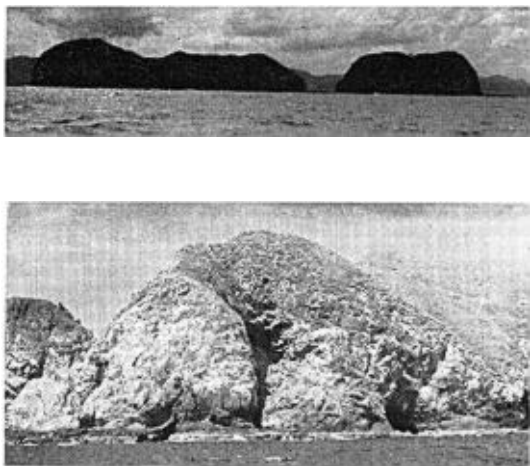


FIGURE 2. Islas Santa Catalina, showing topography and vegetation. A. View of islands from approx. 1 km WSW. B. The promontory upon which Bridled Terns nested in the bunchgrass (*Uniola pittieri*) above the cliffs; note also the cardón cacti (*Cereus aragonii*) in the background.

enlarged, no fat, fresh plumage. The short wing (121 mm) indicates that the specimen is of the Peruvian race, *O. t. kelsalli*, which is apparently more wide-ranging than the larger Galápagos race (Crossin 1974). No previous Costa Rican report.

Oceanites oceanicus. Wilson's Storm-Petrel. Records for the Pacific coast include Jehl's (1974) in April and ours for May, June and July, all off Playas del Coco (table 1). A regular, often common seasonal visitant.

Halocryptena microsoma. Least Storm-Petrel. Our several sightings of this species (table 1) as well as that of Jehl (1974) are all for the spring migration period (Apr.–June); none seen in fall. Specimen (first for Costa Rica): UCR 1258, ♀, ovary not enlarged, moderate fat, molting; 3 June 1974, 15 km WNW Playas del Coco.

Pelecanus occidentalis. Brown Pelican. The only presently known breeding colony of this species in Costa Rica is on Isla Guayabos, at the mouth of the Golfo de Nicoya (16). It contained 100–150 pairs in Jan.–Feb. 1972, when it was visited several times by J. A. Tosi and K. Leber. Many eggs and some chicks were present in early January, while most nests held well-grown young by late February. The vegetation on this island is mainly scrubby second-growth woodland; the nests were bulky structures of sticks placed in small trees, as is usual for *P. o. carolinensis*, the presumed breeding race (F. Gress pers. comm., Wetmore 1965). Unless other, much larger breeding colonies remain to be discovered, this small breeding population cannot begin to account for the year-round abundance of the species on the Pacific coast of Costa Rica. We have recorded our largest numbers of pelicans Feb.–May and Sept.–Oct. (table 1), including 1000+ 5 km E Puntarenas on 6 Oct. 1973. This suggests that the bulk of the population in Costa Rican waters breeds elsewhere, perhaps in the much larger colonies in the Golfo de Panamá (cf. Wetmore 1965).

Fregata magnificens. Magnificent Frigatebird. The report of Milton for Cabo Blanco in October quoted as evidence of breeding by Slud (1964) made no

specific mention of nests, eggs or young; almost certainly, it referred to a roosting aggregation, especially because breeding dates for the Pacific coastal islands of Honduras and Panamá are Jan.–May (Palmer 1965). Stiles detected no sign of breeding at Cabo Blanco on 23 Sept. 1972. A ballooning male was seen on Islas Santa Catalina on 30 Sept. 1974 (at a in fig. 1c) but no sign of nesting was ever seen there. Numbers seen in the Playas del Coco area (table 1) show a tendency to peak Apr.–June and Sept.–Oct., again suggesting that many birds are transients.

Sula leucogaster. Brown Booby. Although this species was stated to breed on "islets off the coast a little farther north" (than Puerto Cortés) by Carricker (1910), no specific published data on breeding sites or breeding seasons on the Pacific coast of Costa Rica are known to us. We observed the conspicuous white downy young being fed or attended by one or both parents on Islas Santa Catalina (b in fig. 1c) on 21 Oct. and 18 Nov. 1974. We estimate the breeding population on these islands to be about 40–50 pairs at most. The breeding population and our two specimens (UCR 1244, adult ♀, ovary not enlarged, light fat, finishing molt; and UCR 1325, adult ♂, testes enlarged, moderate fat; 29 Apr. and 20 Aug. 1974, respectively, both 8–10 km W Playas del Coco) are typical of the race *etesiacca*.

Dichromanassa rufescens. Reddish Egret. The only Costa Rican record is an immature ♂ we collected at Laguna Chacarita (9) on 8 Nov. 1973; FGS 716, testes not enlarged, fairly heavy fat, in postjuvénal molt. The bird was fishing in shallow water in the active manner typical of the species.

Plegadis falcinellus. Glossy Ibis. Regular in winter at Palo Verde (7), where at least 15 have been seen during Jan.–Mar. each year since 1974, although Stiles saw none in Mar. 1971. Probably increasing in Costa Rica, perhaps reflecting an expansion of the breeding range in E North America (Palmer 1962). Specimen (first for Costa Rica) UCR 1500, adult ♀, ovary not enlarged, light fat, light molt, 5 Feb. 1976, Palo Verde. Three previous sightings for Costa Rica (Slud 1964, Orians and Paulson 1969).

Anas cyanoptera. Cinnamon Teal. Stiles saw a full-plumaged drake at Palo Verde 22 Jan. 1974, and two more on 27 Jan. 1974 in a large flock of Blue-winged Teal (*A. discors*). None were found there in Jan.–Feb. 1975 or 1976 despite intensive searches. No previous Costa Rican report.

Dendrocygna bicolor. Fulvous Tree Duck. 20, 35 and ca. 50 were seen at Palo Verde in Jan.–Feb. 1974, 1975 and 1976. The species is apparently increasing in Costa Rica, but there is as yet no evidence of breeding; only adults have been seen, whereas in *D. autumnalis* and *viduata* we have seen many juvenile-plumaged birds in Jan.–Feb. and Mar., respectively. Specimen: UCR 1499, adult ♂, testes slightly enlarged, moderate fat, fresh plumage; 5 Feb. 1976, Palo Verde. Not previously reported for Costa Rica.

Charadrius alexandrinus. Snowy Plover. At least 3 seen at Playa Grande (5c) 28–29 Sept. and 20 Oct. 1974. Specimens: two ♀♀, ovaries not enlarged, fresh plumage; UCR 1372 had heavy fat; FGS 880, light fat. Both are typical of the western race *nivosus*. The first specimens for Costa Rica since one taken a century ago by Zeledón that is now lost (Slud 1964).

Limosa fedoa. Marbled Godwit. One previous report for this species in fall migration (Slud 1964).

TABLE 1. Numbers of different seabird species recorded in voyages off Playas del Coco and on Islas Santa Catalina (numbers in parentheses), 1972-1975. A— or B— before dates is area (from Fig. 1B).

Species	Dates															
	A—3 Feb. 74	B—10 Mar. 75	B—21 Apr. 75	A—28 Apr. 72	B—29 Apr. 74	B—25 May 75	B—3 June 74	B—30 June 74	A—28 July 73	B—20 Aug. 74	A—3 Sept. 73	B—30 Sept. 74	B—21 Oct. 74	A—23 Oct. 72	B—18 Nov. 74	A—18 Dec. 75
<i>Oceanodroma melania</i>	-	-	15	-	10	8	2	-	-	2	35	52	23	2	-	-
<i>O. leucorhoa</i>	-	-	-	-	-	3+	-	-	-	-	-	-	-	-	-	-
<i>O. tethys</i>	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-
<i>Oceanites oceanicus</i>	-	-	-	-	-	1	35	-	7	-	-	-	-	-	-	-
<i>Halocptena microsoma</i>	-	-	-	-	4	2	18	-	-	-	-	-	-	-	-	-
<i>Puffinus griseus</i>	-	-	-	-	1P	55	1	-	-	-	-	-	-	-	-	-
<i>Pelecanus occidentalis</i>	150	175	30	25	100	55	20	45	75	20	50	290	150	35	35	45
		(3)	(2)			(0)	(5)	(8)		(10)		(30)	(0)		(0)	
<i>Fregata magnificens</i>	15	30	55	50	60	85	20	50	30	50	20	105	90	15	13	12
		(15)	(25)			(135)	(120)	(35)		(80)		(75)	(75)		(12)	
<i>Sula leucogaster</i>	10	10	15	30	45	80	125	15	25	60	1	30	115	45	7	1
		(35)	(300)			(150)	(350)	(400)		(250)		(30)	(75)		(50)	
<i>Lobipes lobatus</i>	-	-	2	-	-	-	-	-	-	25	20	175	24	11	4	-
<i>Larus atricilla</i>	5	15	-	-	2	-	1	-	-	-	-	2	7	-	3	2
<i>L. pipixcan</i>	10	4	-	-	50	72	10	-	-	-	-	-	-	-	4	-
<i>Xema sabini</i>	-	1	-	8	15	2	-	-	-	1	-	-	5	-	2	-
<i>Sterna hirundo</i>	-	-	-	2	1	-	-	-	-	-	2	3	2	-	2	-
<i>S. anaethetus</i>	-	-	2	-	30	7	11	14	8	10	7	2	-	-	-	-
			(0)			(20)	(25)	(40)		(50+)		(0)				
<i>Chlidonias niger</i>	-	-	140	35	150	155	35	11	-	7	15	25	130	23	1200	15
<i>Thalasseus elegans</i>	-	-	1	-	-	-	-	-	-	-	-	2	1	-	-	-
<i>T. sandvicensis</i>	-	-	-	-	-	8	-	-	-	-	2	-	-	-	-	-
<i>Anous stolidus</i>	-	-	40	-	10	245	17	6	3	65	36	4	-	-	-	-
			(0)			(15)	(40)	(20)		(25)		(0)				

On 5 Dec. 1971 Stiles saw 5 on mudflats in the harbor of Golfito (13); on 18 Dec. 1975 Smith saw one at Playa Naranjo de Puntarenas (14). These are the first winter records for Costa Rica.

Limosa haemastica. Hudsonian Godwit. On 25 May 1975, two birds circled several times low over Laguna Chacarita (9), almost landing but finally flying off to the N. We had excellent views of the long upturned bills, conspicuous white wing-stripe, black tail and white rump. One bird was in breeding plumage, almost solid chestnut below; the other was grey below with a few chestnut flecks. Palmer (1969:242) suggested a transpacific migration for the population breeding in Alaska. Our record, with those of Dickerman (1975) for the west coast of Guatemala, give some circumstantial support to this hypothesis. First Costa Rican report.

Heteroscelus incanus. Wandering Tattler. Three birds seen on Punta San Francisco (5f) and three more (probably different individuals) on Punta del Carbón (5a) on 7 Oct. 1973; a winter-plumaged bird seen on Islas Santa Catalina on 30 June 1974; one seen on Punta Ventanas (5b) on 21 Oct. 1974; also C. Leahy and others saw one at close range on Punta Matapalo (3d) on 14 Jan. 1976. Specimens: two ♂♂ with testes not enlarged, heavy fat, and molting; FGS 711, 7 Oct. 1973, Punta del Carbón; and UCR 1359, 21 Oct. 1974, Punta Ventanas. These are the first reports for mainland Costa Rica, previous records for "Costa Rica" referring to Isla del Coco, over 200 miles offshore. The species is probably regular in small numbers in fall migration, with occasional wintering or summering individuals.

Aphriza virgata. Surf-bird. Two previous fall sightings by Slud (1964). Stiles saw three at Río Claro (12) on 7-8 Oct. 1972; we saw a flock of 29 at Punta Ventanas on 7 Oct. 1973; the first report outside of fall migration is a bird we banded at Salina Bonilla, 9 Feb. 1976. Specimens (first for Costa Rica); UCR 1157, FGS 712, two adult ♂♂, moderate to heavy fat, molting, 7 Oct. 1973, Punta Ventanas.

Calidris canutus. Red Knot. We have seen flocks of up to 50 of this species at Salina Bonilla both in fall and spring (late Aug.-Sept., early Feb.-Apr.), including 18 banded 23 Feb. 1976 and 12 banded 23 Mar. 1976. No previous spring records for southern Central America.

Micropalama himantopus. Stilt Sandpiper. We have seen this species at Salina Bonilla in every month between August and May, with peak numbers Aug.-Oct., and Mar.-Apr. This included the first Costa Rican winter record; previously reported in both migrations by Orians and Paulson (1969). Specimens (first for Costa Rica): UCR 1413, adult ♀, ovary slightly enlarged, moderate fat, heavy molt, 18 Apr. 1975; and UCR 1507, immature ♀, light fat, fresh plumage, 9 Feb. 1976; both from Salina Bonilla.

Calidris alpina. Dunlin. On 26-27 Dec. 1975 at Salina Bonilla we saw 7 birds, banded two, and collected one; two were seen on 8 Feb. 1976. Specimen: UCR 1475, ♀, ovary not enlarged, light fat, fresh plumage. No previous Costa Rican report, although Wetmore (1965) mentioned two probable winter sightings in Panamá.

Recurvirostra americana. American Avocet. A single individual was seen by A. Skutch and K. Leber on 8 Mar. 1973 at Laguna Mata Redonda

(15); this is the only report for Costa Rica and the southernmost for the species.

Himantopus mexicanus. Black-necked Stilt. We obtained the first breeding record of this species in southern Central America on 6 July 1975, when we found and collected a nest with four fresh eggs (FGS 941/4) at Salina Bonilla. The salina has a resident population of ca. 20 pairs, but up to 120 birds may be present in winter.

Steganopus tricolor. Wilson's Phalarope. We have recorded small numbers of this species at Salina Bonilla in both fall (mid-Oct.) and spring (mid-May); two individuals also spent the summer of 1975 there. All birds seen in spring were in breeding plumage. Specimens: UCR 1361, ♂, testes not enlarged, light fat, light molt, 21 Oct. 1974; UCR 1414, ♀, ovary slightly enlarged and UCR 1415, ♂, testes moderately enlarged, both with heavy fat and fresh plumage, on 18 May 1975. No previous Costa Rican report.

Lobipes lobatus. Northern Phalarope. Abundant fall migrant (Aug.-Nov.) and rare spring migrant (Apr.) off the Pacific coast (table 1). Specimens: FGS 643, adult ♀, ovary not enlarged, moderate fat, fresh plumage, 23 Sept. 1972 at Bahía Ballena (11); UCR 1352, adult ♀, ovary not enlarged, heavy fat, fresh plumage; and UCR 1353, unsexed immature, heavy fat, light molt, both 30 Sept. 1974, ca. 8 km W Playas del Coco. Prior to a sighting by Jehl (1974), the only Costa Rican record was a specimen taken near San José in Jan. 1895 by Underwood (Carriker 1910, Slud 1964), a most unusual occurrence probably representing a crippled or lost bird.

Rhynchops nigra. Black Skimmer. We saw a winter-plumaged bird of the northern subspecies *nigra* (tail mostly white) at close range at Puntarenas on 8 Nov. 1973. K. Leber saw another skimmer on the Río Tempisque near Palo Verde on 21 Nov. 1973. Although no previous published records exist for Costa Rica, the Museo Nacional de Costa Rica has a specimen (MNCR 5045) of *R. n. nigra* taken by A. Alfaro on 3 July 1890 at Bahía Salinas (1).

Stercorarius longicaudus. Long-tailed Jaeger. On 29 Apr. 1974 we collected immature-plumaged ♀ (UCR 1243, ovary not enlarged, moderate fat, molting) ca. 15 km W Playas del Coco. The bird was flying steadily northwards, not harrying the numerous fishing terns and boobies in the same area. The stomach contents (1 conehead grasshopper and 3 wasps in good condition, plus well-digested fish remains) suggest that part of its migration route to the south of Costa Rica lay overland, or that the bird came in to shore and fed. One previous sighting for Costa Rica by Jehl (1974).

Larus argentatus. Herring Gull. We saw at least two birds in first-year plumage in Puntarenas harbor on 3 Nov. 1973, along with Ring-billed (*Larus delawarensis*), Laughing (*L. atricilla*) and Franklin's (*L. pipixcan*) gulls. The present species was distinguished by its larger size, darker coloration, slower wingbeats, and heavy bill. The second Costa Rican record.

L. delawarensis. Ring-billed Gull. We saw two or three immature-plumaged birds on the occasion mentioned above; they were distinguishable from the other species by their intermediate size, pale coloration, dark-tipped bill, and narrow black tailband. In addition, we have seen two immature-plumaged birds at very close range at Barra del Colorado, on the Caribbean coast of Costa Rica (10°46'N, 83°

35°W) on 15 Dec. 1974; and a bird just attaining adult plumage at Laguna Chacarita, 16 May 1975. We know of no other Costa Rican reports, though the species may be regular and increasing here in winter, as it is in Panamá (E. Eisenmann, pers. comm.).

Xema sabini. Sabine's Gull. A common spring (March–early June) and less common fall (late Aug.–early Nov.) migrant; may rest on beaches in either season. Specimens: FGS 602, adult ♂, testes slightly enlarged, heavy fat, light molt, and L. F. Kiff 1309, adult ♀, ovary not enlarged, light fat, both 28 Apr. 1972 off Playas del Coco; UCR 1090, unsexed bird taken by J. Sánchez ca. 10 km WSW Puntarenas 4 June 1972; and UCR 1187, adult ♂, testes not enlarged, heavy fat and molting, at Ostional (6), 29 April 1973. Previously seen in Costa Rican waters only by Jehl (1974).

Gelochelidon nilotica. Gull-billed Tern. We saw 6 birds in full breeding plumage 29–30 Mar. 1975, one in breeding plumage 10 Apr. 1976, and one in winter plumage 19 Apr. 1975, all at Salina Bonilla; the only Costa Rican spring records.

Sterna hirundo. Common Tern. Locally common, widespread migrant in both spring (Mar.–May) and fall (Aug.–Nov.); uncommon winter resident on both coasts. Specimens: UCR 1184, adult ♀ in fresh breeding plumage, ovary moderately enlarged; heavy fat; and UCR 1185, immature-plumaged ♀, ovary not enlarged, heavy fat, heavy molt; both from Ostional (6), 29 Apr. 1973. J. Ibarra also took a specimen for the Museo Nacional de Costa Rica at Estero Tamarindo (5d) on 21 Oct. 1974. Considered to be very rare in Costa Rica by Slud (1964).

Sterna albifrons. Least Tern. To the previous sighting by Slud (1964) in September 1954 may be added the following: two seen by L. Kiff and A. Williams 24 Nov. 1970, and two seen by us 16–17 Dec. 1975, at Playas del Coco; two seen by R. and J. Ridgely at Playa Naranjo de Santa Rosa (2a) on 12 Dec. 1975; and one seen by Stiles 1 km W Puntarenas on 24 Apr. 1976. The species appears to be a sporadic visitor and possibly a rare winter resident in some years, at least on the Pacific coast.

Sterna anaethetus. Bridled Tern. Locally common off the north Pacific coast from April through August (table 1) where we obtained strong evidence for breeding on Islas Santa Catalina (4). On 3 and 30 June 1974, adults were observed disappearing into, and appearing from, the bunchgrass atop a promontory on the E side of the larger island (c in fig. 1c, fig. 2b). On 20 Aug. 1974, we saw at least 20 juvenal terns in the vicinity, being fed by adults while perched on ledges or in the air. Two adult ♀♀ collected ca. 1 km NE of the islands 29 Apr. 1974 had very enlarged ovaries, moderate fat, and fresh plumage (UCR 1242 and FGS 761); we also collected a juvenal ♀ UCR 1329, ovary minute, moderate fat, fresh plumage, near the aforementioned promontory on 20 Aug. 1974. We estimate the breeding population of Islas Santa Catalina at about 25 pairs. We also saw a copulation on El Virador (3c) on 28 July 1973; a few pairs may breed there and on Peña Bruja, a huge rock ca. 0.5 km off Playa Naranjo de Santa Rosa (2b); we have seen many of these terns flying about the rock on 11 May 1974, 17 May 1975 and 25 April 1976. Our specimens represent the dark-backed Pacific race *nelsoni*. Previously known in Costa Rica from a single sighting by Slud (1964) of the Caribbean race *recognita*.

Thalasseus elegans. Elegant Tern. A single previous sighting from Costa Rica by Orians and Paulson (1969). Recorded in every month between September and May by us, Kiff and Opler at various localities on the Pacific coast. We also saw a flock of 200 on 15 Dec. 1974 at Barra del Colorado, on the Atlantic coast. Elegant Terns appear to associate frequently with other terns in migration: on 29–30 Apr. 1973, at Ostional (6), Stiles recorded ca. 5 Elegant Terns in a mixed flock of terns and Sabine's Gulls fishing for shoaling anchovies. Other terns included 35–75 Black (*Chlidonias niger*), 20–50 Common, 10–20 Sandwich (*Thalasseus sandvicensis*), and 2–5 Royal (*T. maximus*). On 24 May 1974 Stiles observed a mixed flock of terns resting on the beach at Boca del Tárcoles (10); included were about 5 Elegant, 30 Common, 75 Royal and 40 Sandwich terns, as well as 8 Laughing Gulls. Specimens: (first for Costa Rica): UCR 1183, adult ♂, testes moderately enlarged, heavy fat, fresh breeding plumage; and FGS 666, adult ♂, testes slightly enlarged, heavy fat, moderate molt; both 29 Apr. 1973 from Ostional.

Thalasseus sandvicensis. Sandwich Tern. We have 18 records of this species from late November through June at various points along the Pacific coast; regularly seen at Laguna Chacarita (9) and Puntarenas; often found with other species during spring migration period (see above). Specimens (29 Apr. 1973, Ostional): UCR 1182, adult ♀, ovary not enlarged, moderate fat and molt; FGS 665, immature female, ovary not enlarged, heavy fat and molt. No previous Costa Rican report.

Anous stolidus. Brown Noddy. We and Kiff have 16 sightings of this species in every month from April through October, with peak numbers in late May and late August (table 1). We have never seen any sign of breeding: the bulk of the population appears to migrate through Costa Rican waters, probably to and from breeding grounds further north, with a few nonbreeding individuals staying through the summer. Specimens: SMS 002, adult ♀, ovary moderately enlarged, light fat, molting, 2 Sept. 1973, 3 km NW Playas del Coco; UCR 1328, adult ♂, testes slightly enlarged, and FGS 835, adult ♀, ovary moderately enlarged and postbreeding, both with light fat and molting, ca. 10 km W Playas del Coco, 20 Aug. 1974. A single previous sighting in Costa Rican waters by Jehl (1974).

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