

The Neotropical plovers of Estero El Yali in central Chile

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Five species of Neotropical plovers using the delta of the river El Yali in central Chile were censused in 1989, 1990 and 1991. The species observed were the Southern Lapwing *Vanellus chilensis*, Two-banded Plover *Charadrius falklandicus*, Rufous-chested Dotterel *C. modestus*, Collared Plover *C. collaris* and Snowy Plover *C. alexandrinus*. The Southern Lapwing is a year-round resident, and, between early May and late September, the other four species collectively attained numbers of 206, 545 and 753 birds.

Se realizaron censos en 1989, 1990 y 1991 de cinco especies de chorlito neotropicales que emplean el delta del río El Yali, en la zona central de Chile. Las especies observadas fueron el tero *Vanellus chilensis*, el chorlito de doble collar *Charadrius falklandicus*, el chorlo de pelo colorado *C. modestus*, el chorlito de collar *C. collaris* y el chorlitejo patinegro *C. alexandrinus*. El tero reside en esas regiones durante todo el año; entre comienzos de mayo y fines de septiembre, se observaron 206, 545 y 753 ejemplares de las otras cuatro especies.

Cinq espèces de pluviers néotropicaux se trouvant dans la région du delta de la rivière El Yali, dans le centre du Chili, ont été dénombrées en 1989, 1990 et 1991. Les espèces observées étaient le Vanneau téro *Vanellus chilensis*, le Pluvier des Falkland *Charadrius falklandicus*, le Pluvier d'Urville *C. modestus*, le Pluvier d'Azara *C. collaris* et le Gravelot à collier interrompu *C. alexandrinus*. Le Vanneau téro y séjourne toute l'année; entre le début mai et la fin septembre, on a dénombré au total pour les quatre autres espèces 206, 545 et 753 individus respectivement, pour ces trois années.

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Introduction

The delta of the river El Yali (33°47'S, 71°23'W) is a wetland with as high a diversity of avian species as is found anywhere along the central Chilean coastline. A maximum of 96 species has been recorded (Vilina & López-Calleja 1992). Scott & Carbonell (1986) indicated that this area contains a waterfowl community fully representative of this part of Chile. More importantly, the area has also been described as an important gathering site for both Nearctic and Neotropical shorebirds. Twelve species of resident and migrant shorebirds have been recorded here (Philippi 1940, 1951; Reed & Larrain 1943; Johnson & Ewer 1969; Chang *et al.* 1989; Vilina & Drouilly 1990).

In this paper, we assess the importance of this wetland as a wintering area for Neotropical plovers by (1) documenting the species present and their relative numbers and (2) describing the habitat preferences of both resident and southern migrants over three consecutive winter seasons.

Study area

The river El Yali is near Villa Alhué (34°02'S, 71°06'W) in the province of Melipilla. The river stretches approximately 60 km to its outlet, where it can attain depths of 4 m. Seven lagoons are formed from underground streams and rainfall; one of them, the coastal lagoon, is simply part of the river bank. All the lagoons have muddy banks, and only the Matanza and El Rey lagoons have tall aquatic vegetation (Juncaceae and Cyperaceae). El Convento is a human-made salt-marsh for occasional mining of salt. The coastline is primarily sandy beach.

Materials and methods

In the winters of 1989, 1990 and 1991, we conducted monthly censuses from May to August inclusive. Each census followed linear transects, and all birds observed within a 200-m-wide sampling zone were recorded. We used 8 × 30 field glasses and conducted the surveys between 07:30 and 10:30. A spring census was undertaken in late September, and similar observations were carried out

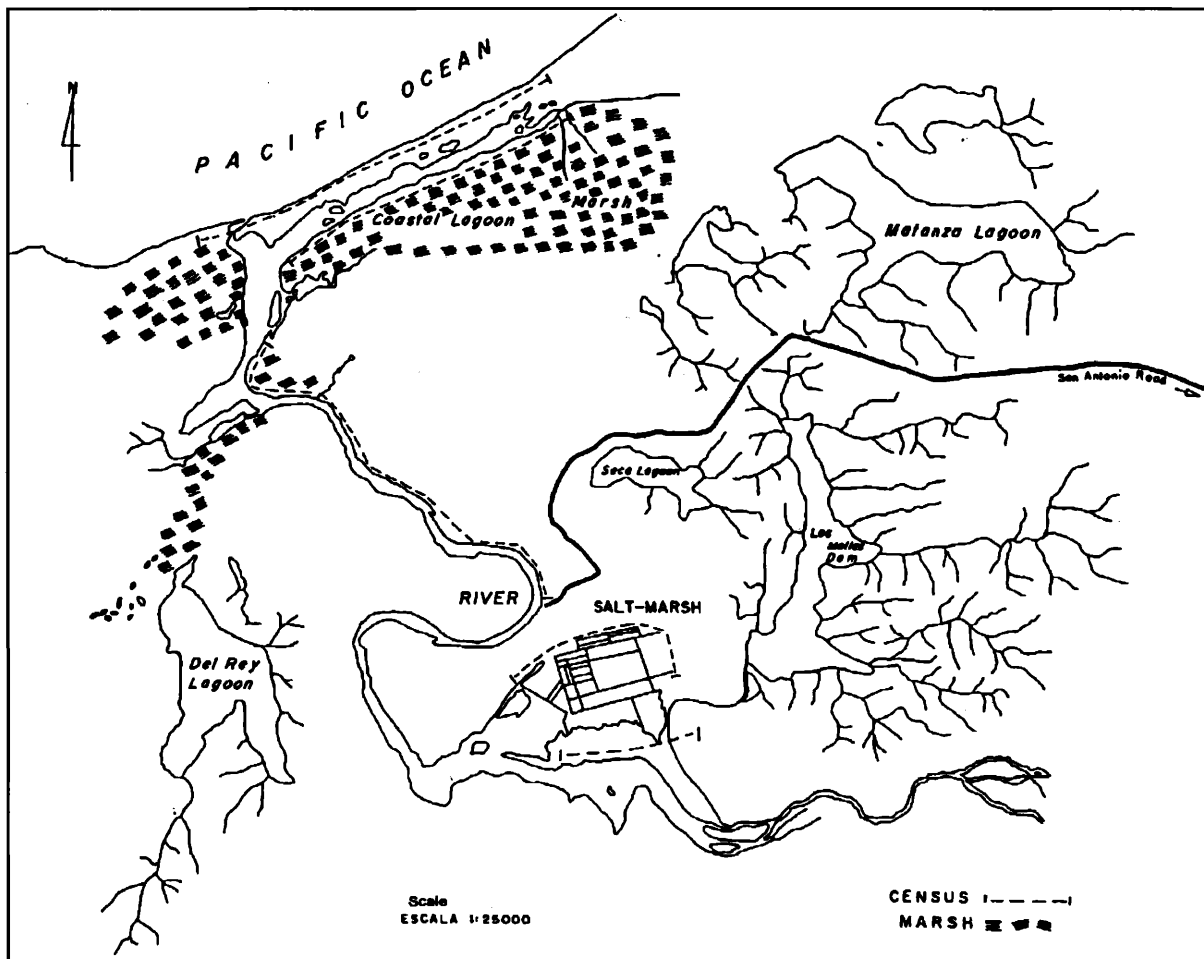


Figure 1. The El Yali wetland in central Chile.

periodically during the summer. All transects were done in representative wetland habitats: the El Convento salt-marsh, the El Yali river shoreline, the coastal lagoon and sandy beach (Figure 1). At each site, we determined species diversity and counted the Neotropical plovers present. We omitted from our analysis the Southern Lapwing *Vanellus chilensis*, because its presence cannot be directly associated with wetland habitats. Precipitation records from the meteorological station of San Antonio (33°34'S, 71°37'W) were correlated with species diversity and abundance.

Results

Our surveys revealed the occurrence of five species of Neotropical plovers in our study area: the Southern Lapwing, Two-banded Plover *Charadrius falklandicus*, Rufous-chested Dotterel *Charadrius (Zonibyx) modestus*, Collared Plover *Charadrius collaris* and Snowy Plover *Charadrius alexandrinus*. *Vanellus chilensis* and *C. falklandicus* were resident, *C. modestus* was seasonal and *C. collaris* and *C. alexandrinus* were seen only occasionally.

Over three field seasons, the migrants from Tierra del Fuego (Hayman, Marchant & Prater 1986), Rufous-chested Dotterel and Two-banded Plover, were the most abundant species, with 722 and 688 individuals seen over the three survey years (see Tables 1, 2 & 3). The largest numbers of *C. falklandicus* (97) and *C. modestus* (147) occurred during the month of July in 1991. Although the same species were recorded each winter, the total numbers of birds in the winters of 1989 (Table 1) and 1991 (Table 3) were about three times higher than in 1990 (Table 2). In each of the three years, the numbers declined as summer approached and the summer migration ensued.

The highest species richness values and the larger individual concentrations of birds were observed on the coastal lagoon (Figures 2, 3 & 4), mainly on those sections where the mudflats were most extensive. Most species, except the Snowy Plover, also occupied the stream banks, although in lesser numbers. The beach itself was not particularly attractive to shorebirds, probably owing to the fact that erosion had impoverished the substrate (Vargas 1990). In 1990, the salt-marsh was the poorest site in terms of bird densities (Figure 3),

Table 1. Numbers and percentages of four species of Neotropical plovers seen on the census transects in 1989.

	May	June	July	August	September	Total
<i>C. alexandrinus</i>	1 5.6%	7 38.9%	7 38.9%	3 16.7%	0 0.0%	18
<i>C. falklandicus</i>	52 16.9%	71 23.1%	72 23.5%	85 27.7%	27 8.8%	307
<i>C. collaris</i>	3 11.1%	8 29.6%	8 29.6%	1 3.7%	7 25.9%	27
<i>C. modestus</i>	26 13.5%	73 37.8%	92 47.7%	2 1.0%	0 0.0%	193
Total	82	159	179	91	34	545

Table 2. Numbers and percentages of four species of Neotropical plovers seen on the census transects in 1990.

	May	June	July	August	September	Total
<i>C. alexandrinus</i>	2 28.6%	5 71.4%	0 0.0%	0 0.0%	0 0.0%	7
<i>C. falklandicus</i>	23 25.0%	31 33.7%	9 9.8%	26 28.3%	3 3.3%	92
<i>C. collaris</i>	3 21.4%	5 35.7%	2 14.3%	0 0.0%	4 28.6%	14
<i>C. modestus</i>	14 15.1%	21 22.6%	19 20.4%	38 40.9%	1 1.1%	93
Total	42	62	30	64	8	206

Table 3. Numbers and percentages of four species of Neotropical plovers seen on the census transects in 1991.

	May	June	July	August	September	Total
<i>C. alexandrinus</i>	2 25.0%	1 12.5%	1 12.5%	4 50.0%	0 0.0%	8
<i>C. falklandicus</i>	54 18.7%	64 22.1%	97 33.6%	58 20.1%	16 5.5%	289
<i>C. collaris</i>	3 15.0%	2 10.0%	7 35.0%	4 20.0%	4 20.0%	20
<i>C. modestus</i>	87 20.0%	139 31.9%	147 33.7%	63 14.4%	0 0.0%	436
Total	146	206	252	129	20	753

because during these months it was unusually dry. Nevertheless, during flooding in 1989 and 1991, this salt-marsh provided a suitable site for these birds before their departure on the southward migration, as well as for Nearctic shorebirds arriving from the north (see Figures 2, 3 & 4).

The remarkable decrease in bird numbers observed during the 1990 winter season may have been due to the drought in northern and central Chile. In the

study area, from May to September 1989, 230.5 mm of rain were recorded; in the same period in 1990, only 154.0 mm were recorded. As a consequence, in 1990, the muddy flats in the salt-marsh became dry, leaving the birds without alternative feeding and resting sites during late winter and early spring. In 1991, when large numbers of plovers were observed using the wetland, the largest amount of rainfall, 442.5 mm, was recorded between May and September (Table 4).

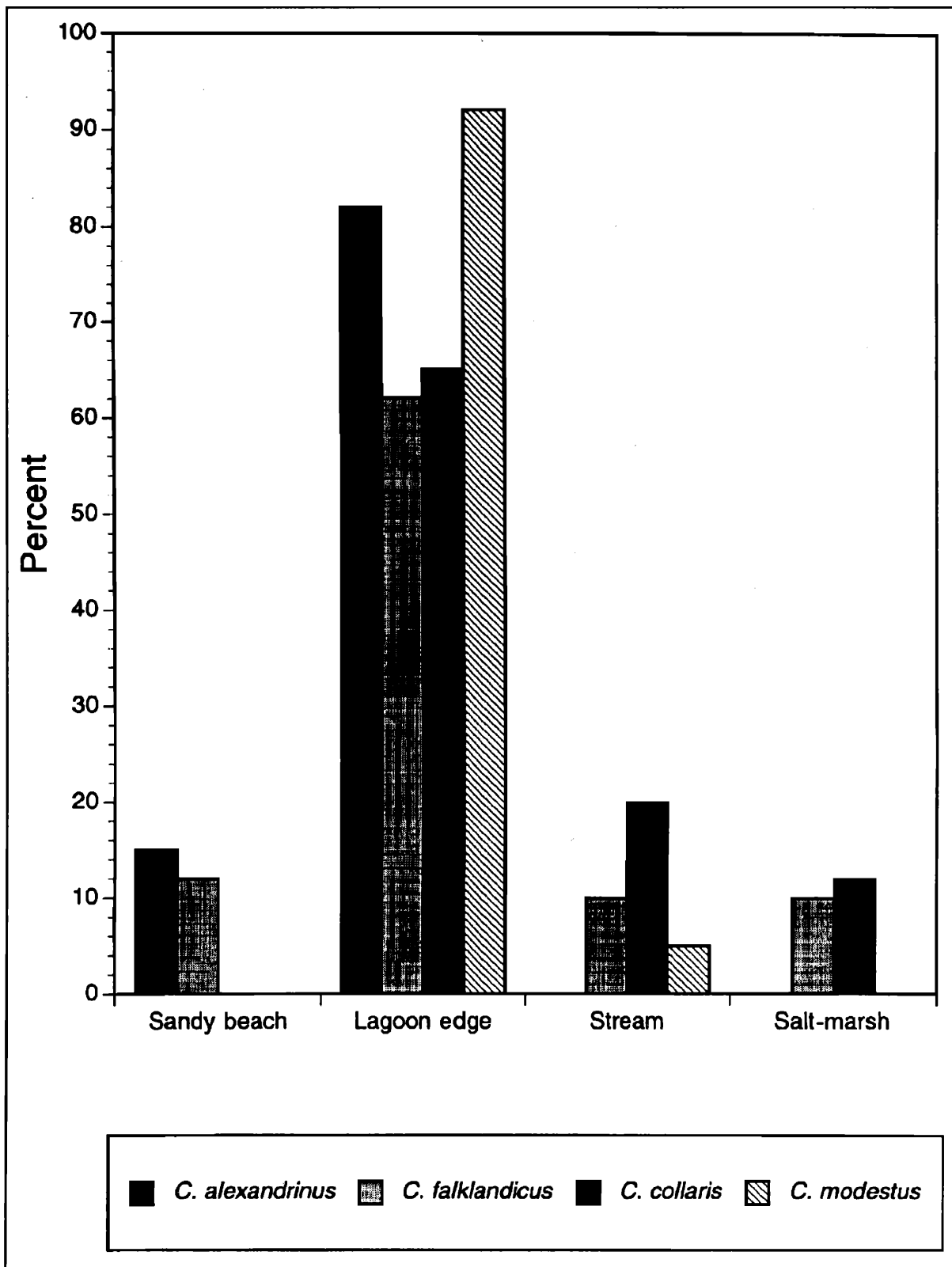


Figure 2. The habitat preferences of Neotropical plovers along the El Yali river in central Chile in 1989.

Species accounts

Rufous-chested Dotterel

This was the most abundant species. Its southward migration began in August in 1989 and September

in 1990. These dates agree with the dates when they arrived in Tierra del Fuego (Philippi *et al.* 1954). The moult to breeding plumage occurred prior to the southward migration. Dotterels were absent from the study area from late spring and

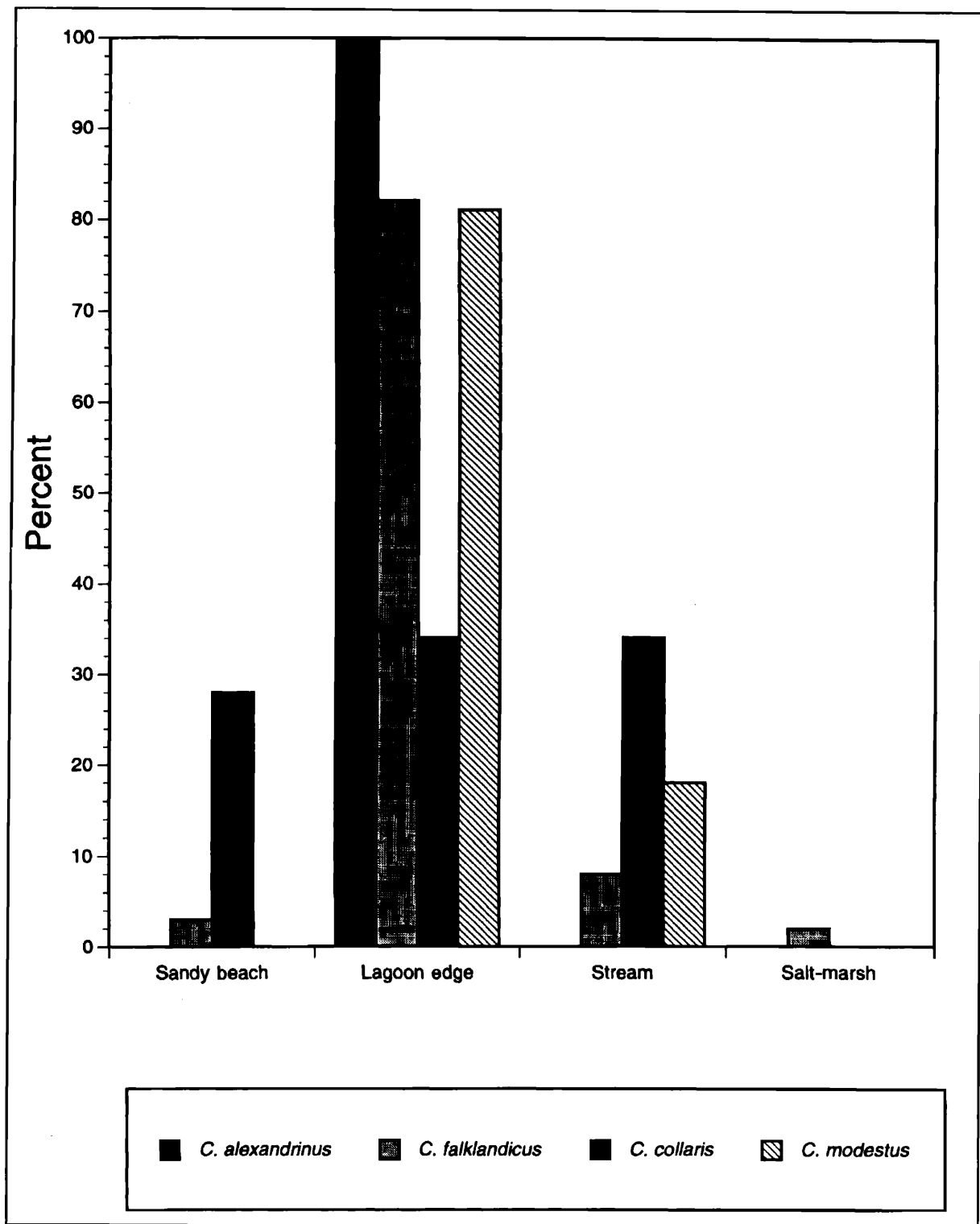


Figure 3. The habitat preferences of Neotropical plovers along the El Yali river in central Chile in 1990.

throughout the austral summer. The preferred habitat was the coastal lagoon, but dotterels were also present, in lesser numbers, along stream banks and occasionally in the salt-marsh. We never detected this species on the sandy beaches.

Two-banded Plover

This species remained all year round in the study area, even though its numbers decreased in spring and summer. In winter, it was possible to detect some birds in breeding plumage; by spring, all were in this condition. This species probably nests in this wetland (Philippi *et al.* 1954). They occupied all four habitats, with marked preference for the

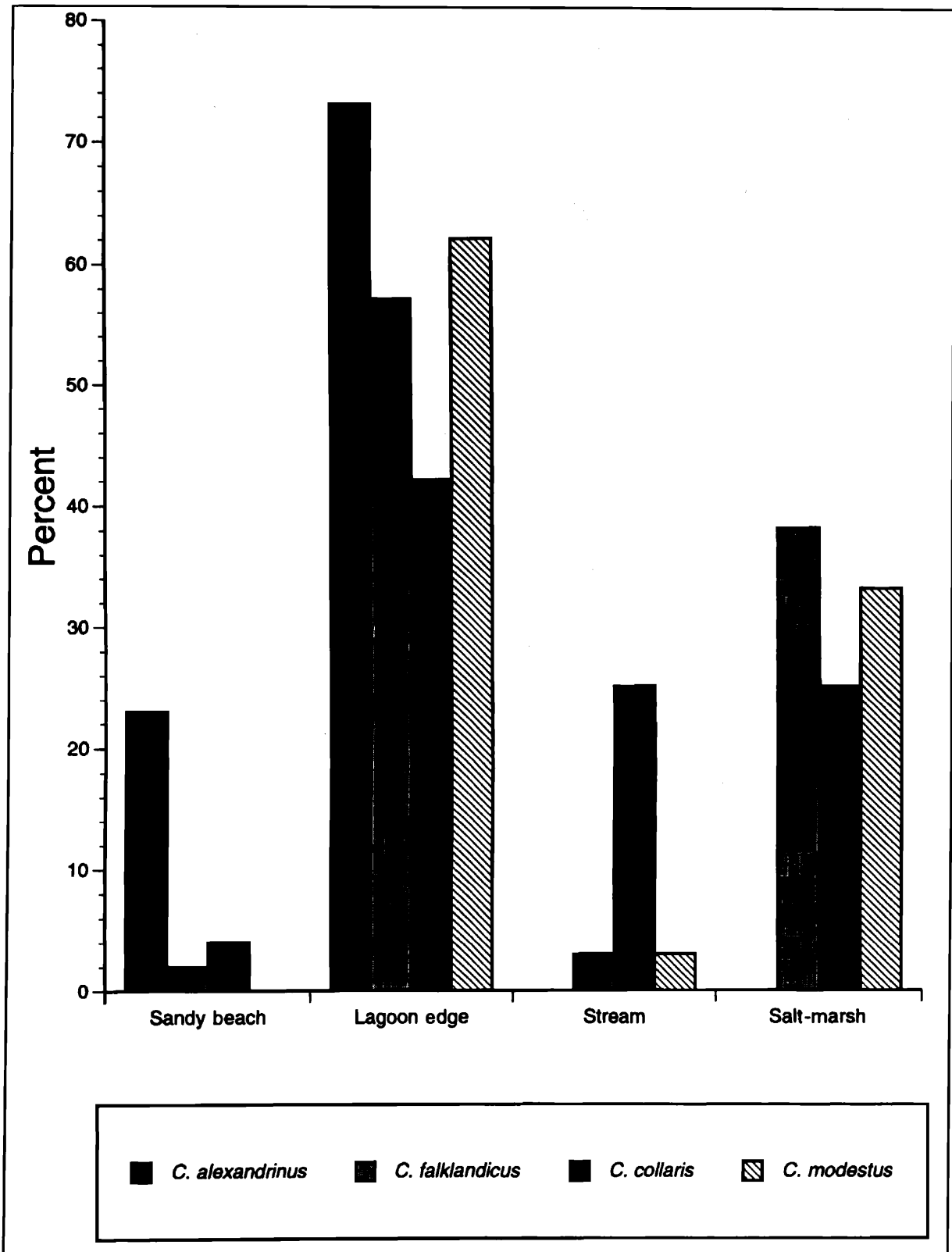


Figure 4. The habitat preferences of Neotropical plovers along the El Yali river in central Chile in 1991.

coastal lagoon, which they shared with the Rufous-chested Dotterel.

Collared Plover

These plovers were usually seen singly or in small flocks at all sites, but always in low numbers. They preferred to feed in small ponds on the northern

Table 4. Cumulative rainfall (mm) in the study area and total numbers of Neotropical plovers in the census transects.

	May	June	July	August	September
1989					
accumulated mm	6.5	28.0	157.5	230.5	230.5
no. of plovers	82	159	179	91	34
1990					
accumulated mm	40.0	44.0	109.5	134.0	154.0
no. of plovers	42	62	30	64	8
1991					
accumulated mm	122.0	311.5	386.5	400.5	442.5
no. of plovers	146	206	252	129	20

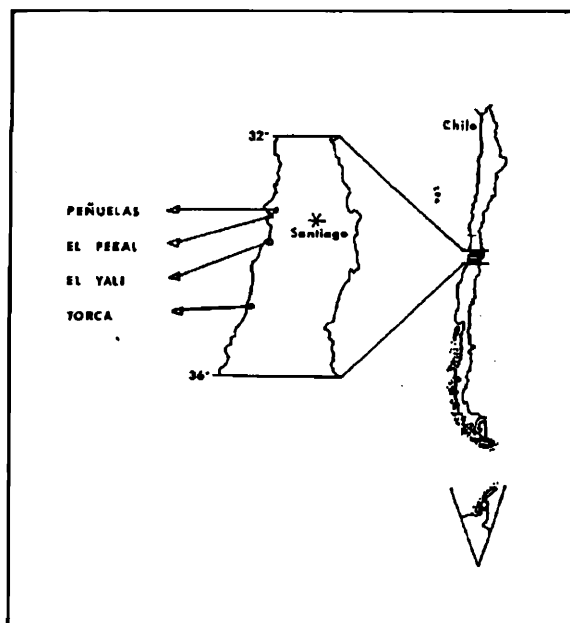


Figure 5. The protected coastal wetlands of central Chile.

shore of the coastal lagoon and also along the stream.

Snowy Plover

Small numbers of this species were occasionally observed in the wetter months. They disappeared in spring. Snowy Plovers preferred the coastal lagoon, and occasionally they were detected on the beach.

Southern Lapwing

Present all year round, this species used all available habitats. In June and July, flocks of more than 1,000 individuals gathered close to the coastal lagoon and the stream.

Discussion

Many coastal wetlands of central Chile are recognized as important gathering and breeding

sites for waterfowl, and some are protected as national wildlife reserves, as is the case for Laguna Torca (34°10'S, 71°38'W), Lago Peñuelas (33°10'S, 71°38'W) and Laguna El Peral (33°30'S, 71°35'W) (Figure 5). The wetland formed by the river El Yali, which will probably also become a wildlife reserve, presents similar conditions (Vilina & López-Calleja 1989, 1992).

As these surveys revealed, the El Yali wetland is an important wintering area for Neotropical plovers. In this wetland, we find five of the six species of Neotropical plovers ascribed to the lowlands of central Chile (Araya & Millie 1986; Hayman, Marchant & Prater 1986). Only the Tawny-throated Dotterel *Oreopholus ruficollis* is absent.

The numbers of these birds in winter, principally the Rufous-chested Dotterel and the Two-banded Plover, seem to depend on the yearly rainfall. During rainy years, the wetland holds a significant number of these birds. In contrast, in dry years, they gather farther south or migrate via the Atlantic coastal route. The option to migrate through the coast of the Atlantic Ocean or Pacific Ocean, depending on climatic conditions, seems to occur in not only Neotropical plovers but also other birds, such as Black-necked Swan *Cygnus melancoryphus* and Coscoroba Swan *Coscoroba coscoroba* (Schlatter *et al.* 1991). This hypothesis should be explored with a banding programme.

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