

THE PAN AMERICAN SHOREBIRD PROGRAM : A PROGRESS REPORT

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INTRODUCTION

Since 1982 several ringing projects in the New World have been loosely co-ordinated under the aegis of the Pan American Shorebird Program (PASP). Each of these projects has its own independent research and conservation goals, but they all share a common theme, that of gathering data on the migration pathways and timing of shorebirds moving between North and South America. Because of the shared objectives, the PASP was formed to co-ordinate ringing schemes (Myers et al. 1983a, b) and search efforts for marked birds (Myers 1983). PASP also participates directly in banding, to date largely in Peru and Chile.

The co-ordinated projects also share a larger conservation goal, building on information collated by Senner and Howe (1984) about the location of important shorebird stopovers within North America. This goal is to identify and link key sites for a network of 'sister-parks' or management areas oriented toward shorebird conservation (Morrison 1984). Movements by marked individuals will link explicitly the sites and thus highlight the responsibility for shorebird conservation and management shared by countries throughout the hemisphere.

This note reports on activities undertaken by PASP since its founding and summarizes interim results from several of the component projects.

The strategy underlying PASP's fieldwork in Latin America, in essence, has been to franchise banding activities by providing the initial impetus and wherewithal for individual projects in different countries, including information, training, and equipment. Rather than carry out the banding through a series of isolated expeditions by foreigners (i.e. North Americans), from the outset PASP has involved local ornithologists and students in each of the countries where fieldwork is undertaken. Initial work in a given area thus usually takes the form of banding workshops. The resultant continuing Latin American banding efforts are then co-ordinated with the re-sighting network in North America.

We have taken this approach to encourage long-term local interest in wader conservation issues, to help regional scientists undertake shorebird conservation and research projects, and to get as many birds banded in as many areas as possible. Towards this goal, PASP has also participated in workshops, held each spring for the last two years, for Latin American scientists on the biology of Neotropical migrant birds run by the United States Fish and Wildlife Service (USFWS) and sponsored by World Wildlife Fund - US and ICBP - Pan American. In addition, materials in Spanish have been prepared on various aspects of banding (Myers and Sallaberry 1983, 1984, Myers et al. 1983b, 1984b). Because of the lack of instructional material on shorebird biology and conservation in Spanish, these materials have proven particularly useful in enlisting new collaborators.

In North America, PASP has worked to publicize the program in order to increase public participation in searches for marked birds. These efforts have taken several forms: posters distributed to several hundred locations where marked birds might be observed, public lectures, articles for the popular press and in birding magazines, interviews, and voluminous correspondence.

THE CO-ORDINATED MARKING SCHEME

The marking scheme used by all participating projects is based upon leg-flags. Marked birds carry one or two colored leg-flags uniquely identifying the country in which they were marked. For example, all Peruvian-marked birds carry yellow flags whilst those from the US carry green flags. In addition, many birds carry one or more colored rings that identify the banding site and date within a country or, alternatively a unique combination of colored rings permitting individual identification. Many birds have also had their feathers stained with a dye such as picric acid. The code itself is presented in English and Spanish, respectively, by Myers et al. (1983a,b). Instructions for making the flags from Darvic ring blanks and for placing them are available in Spanish (Myers and Sallaberry 1983).

Posters were distributed to over 300 locations within the US, both directly and through a network of regional co-ordinators for PASP. A Spanish poster was distributed by collaborators in South America. Two bilingual editions of a PASP newsletter were also sent out.

Observers searching for marked birds are instructed to ignore all else until the leg-flag color is safely determined, and then to concentrate upon the colored rings.

BANDING EFFORTS

Banding by PASP and collaborators has concentrated to date in 5 geographic areas: the Pacific coast of South America (especially Peru and Chile), Venezuela, Brazil, eastern North America (Assateague, Virginia; Cape May, New Jersey; eastern Massachusetts), and NE Oregon and SW Washington. Most birds banded have come from 4 species: Red Knot *Calidris canutus*, Sanderling *C. alba*, Semi-palmated Sandpiper *C. pusilla* and White-rumped Sandpiper *C. fuscicollis*. Others, for example Piping Plover *Charadrius melodus*, have been banded heavily in particular areas (in this instance by S. Haig in Manitoba).

BANDING ON THE SOUTH AMERICAN PACIFIC COAST

Banding commenced after southbound migration in 1982, with the first effort made in Mejia, Peru (Table 1, Figure 1). A heavy emphasis has been placed on Sanderling because this species is the most numerous shorebird in this coastal sector, because the region boasts the highest known Sanderling abundance in the western hemisphere, and because nothing was known about

Table 1. Banding totals in Peru and Chile from 1982 to 1984.

	A ¹ Peru 83/84	B Peru 04-84 ²	B Peru 02-84	B Peru 03-83	C Peru 03-83	C Peru 12-83	D Chile 12-83	D Chile 12-83	E Chile 12-83	F Chile 83/84	G Chile 12-83	TOTAL 1982- 1984
<i>Haematopus palliatus</i>	0	0	0	0	0	0	13	0	0	0	0	2
<i>Pluvialis squatarola</i>	0	0	2	0	0	0	0	0	0	0	0	1
<i>Pluvialis dominica</i>	0	0	1	0	0	0	0	0	0	0	0	1
<i>Charadrius alexandrinus</i>	0	4	2	11	11	0	0	0	0	0	0	28
<i>Charadrius semipalmatus</i>	0	14	3	33	0	0	0	0	0	0	0	50
<i>Tringa melanoleuca</i>	0	0	0	0	0	0	0	0	1	0	0	1
<i>Arenaria interpres</i>	0	5	6	9	0	0	0	0	0	0	0	20
<i>Aphriza virgata</i>	0	0	0	0	0	0	7	1	0	0	0	8
<i>Calidris canutus</i>	0	0	0	1	0	0	0	1	0	0	0	2
<i>Calidris alba</i>	348	381	146	349	332	173	120	324	251	156	28	2608
<i>Calidris pusilla</i>	0	16	27	36	0	0	0	0	0	0	0	79
<i>Calidris mauri</i>	0	41	24	5	0	0	0	0	0	0	0	70
<i>Limnodromus griseus</i>	0	11	0	1	0	0	0	0	0	0	0	12

¹ A = Villa, B = Paracas, C = Mejia, D = Hornitos/Mejillones, E = Coquimbo, F = Longotoma/Papudo, G = Valdivia.
² Month-year



Figure 1. Map of the western hemisphere, showing the location of banding activities in South America (see Tables 1 and 4). Locations are Peru: A Villa, B Paracas, C Mejia. Chile: D Mejillones and Antofagasta, E Coquimbo, F Longotoma/Papudo, G Valdivia. Colombia: H Buenaventura. Brazil: I Lagoa do Peixe. Argentina: J south-eastern Buenos Aires Province. Paraguay: K eastern Chaco. Venezuela: L Calabozo, M north-eastern lagoons.

Sanderlings' migration patterns between South and North America (Morrison 1984, Myers et al. 1984a).

Most Sanderlings were individually marked with unique combinations of colored rings, including

all birds captured at sites A, C, E, F, and G (Figure 1, Table 1). Other Sanderlings (from sites B and D) were marked to site and year. The latter were not marked individually because it was judged unlikely that we would work those sites sufficiently to warrant the additional effort.

Summary of Sanderling sightings

Visual records in North America of Sanderlings marked in Peru and Chile now stem from the 3 major US coastlines as well as from the central and mid-western interior (Figure 2).

The first (1983) spring's return was disappointing. Only one definite sighting was reported, a Peruvian Sanderling on the Delaware Bay (G. Castro). The 1983 southbound migration brought 7 reports distributed between mid-August and mid-November (B. Nikula, W.S. James, L. Labrie, W. Peterson, L. Harper/B. Steele, G. Michaud). All but one of these was on the US eastern seaboard. The exception was a Chilean-marked Sanderling observed in Michigan on 13 November (S. Minard).

The low returns during the 1983 spring and fall migrations led us to alter our approach in two ways during the subsequent migration season. First, we intensified our efforts to bring the project to the North American birding public's eyes. Second, several areas covered poorly during the previous year were targeted for intensive searching in 1984, especially coastal Texas and SW Washington in spring, and the US north-central Atlantic seaboard in autumn.

In the second spring (1984) 22 marked Sanderlings were seen and reported. Several were reported more than once and by independent observers, although always in the same location. Sightings began with an isolated report of 2 Chilean birds in SE Texas in February (S. Haig). We do not know if these birds overwintered in that region. None were found again until April, when 2 of us (Myers and Maron) searched Texas beaches between Brownsville and Port Arthur in early and mid-April, finding 4: 3 from Peru and one from Chile. Subsequently 4 more were reported (J. Wilds, T. Amos, N. Arnold, D. Blockstein). The last was recorded on 12 May at Aransas Pass near Corpus Christi.

The first Pacific coast sighting was recorded on 7 May at Grayland Beach, Washington. In all, 7 were seen in the complex of beach/estuary habitat from the Columbia River mouth, Oregon, north to Gray's Harbor, Washington (C.T. Schick, T. Johnson, J. Gilligan, H. Nehls). One Peruvian-marked bird was re-captured from a

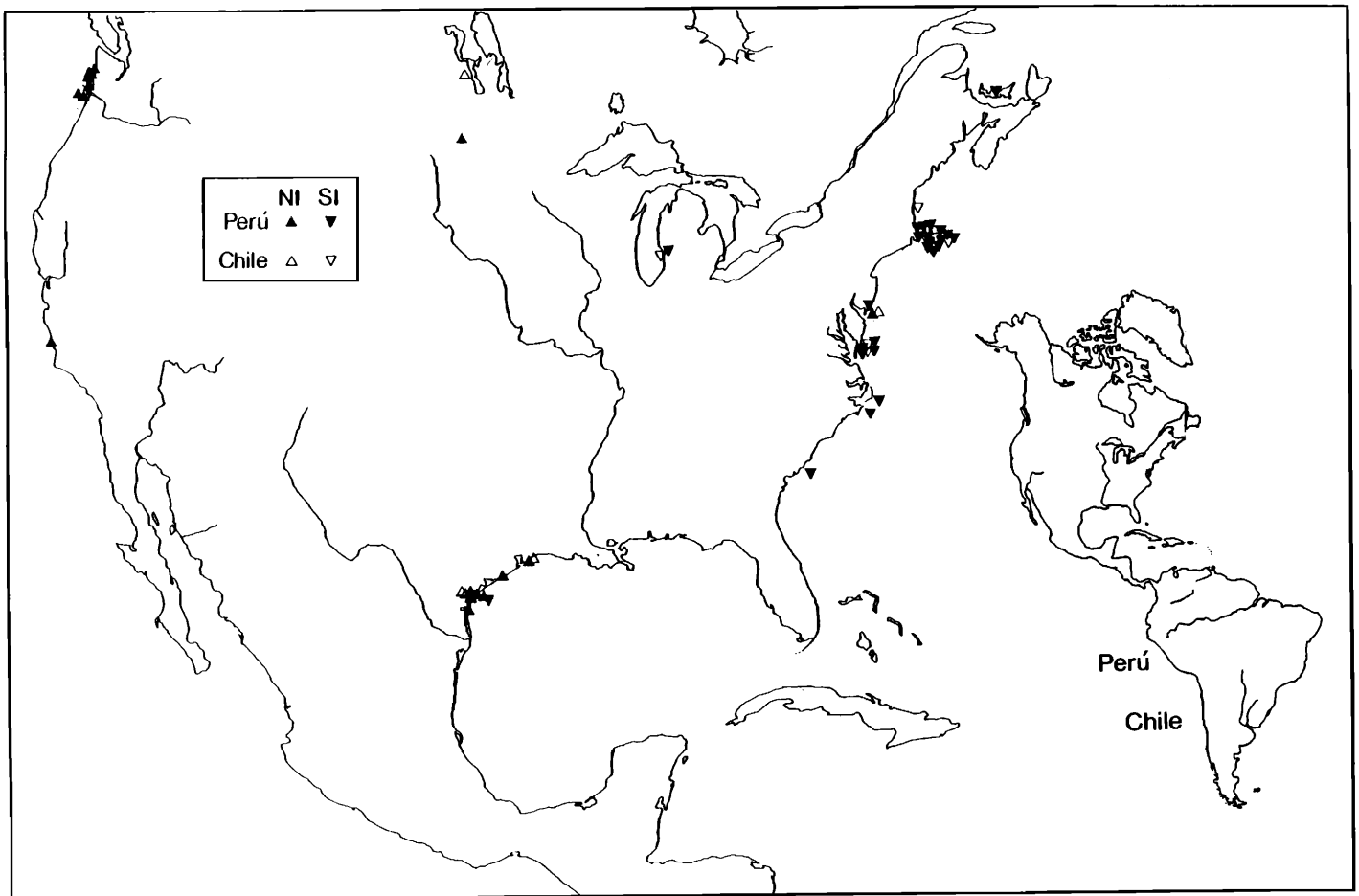


Figure 2. Distribution of sightings in North America during the 1983 and 1984 north and southbound migrations of Sanderlings marked in Peru (filled triangles) and Chile (open triangles). Upward triangles are northbound sightings, downward triangles are southbound sightings.

large night roost (20 000+) Sanderlings at the Columbia River mouth. Only one other South American-marked bird was seen on the US west coast, a Sanderling from Peru near Morro Bay, California on 15 May (M. Kunde). The last seen on the Pacific coast was in Washington on 5 June.

Only one was observed on the Atlantic coast, photographed by J.R. Woodward on Reed's Beach in Delaware Bay on 16 May. More than 50 000 Sanderlings were examined in search of marked birds in this staging area.

Two inland migrants were reported: one in North Dakota on Sibley Lake (late May, J. Eldredge), the other in Manitoba on Lake Manitoba (early June, S. Haig).

Southbound 1984 reports began in late July with a series of sightings on Monomoy Island, Massachusetts, by Blair Nikula. By early September, at least 15 different individuals were confirmed in SE Massachusetts. More individuals may have been involved because several of those reported were from cohorts not individually color-marked. Most of the South American Sanderlings on Monomoy Island were observed in early August, and only one remained by 7 September.

To the south, another center of South America birds was located on Assateague Island, Virginia. The first was reported on 3 August (C. Wilds), and 5 additional birds were found

on 9 and 10 August (J.L. Maron). At the same time, a Peruvian-marked individual was located on Cape Hatteras, North Carolina (D. Rapaski).

To date (1 October 1984) we have received only a single southbound interior report, from SW Michigan (J. Ponshair).

One bird was seen during both north and southbound migration: an individual found by Tony Amos on Mustang Island, Texas. This bird defended a small beach territory on 12 May, and it again defended the same spot on 4 September after an absence of 4 months. Amos' intensive shorebird censuses in that area preclude the possibility that the bird overwintered locally. Amos reported, however, that both northbound and southbound the bird was in basic plumage.

Thus most northbound sightings come from the Pacific and Gulf coasts, especially Oregon, Washington and Texas. Most of the Texas sightings occurred in mid to late April, where roughly 1 in 3000 Sanderlings examined were marked. Sightings on the Pacific coast occurred in mid to late May, with approximately 1 in 8500 Sanderlings marked. This ratio contrasts markedly with data from the main US east coast Sanderling staging area, the Delaware Bay, where fewer than 1 out of 50 000 Sanderlings were marked. In fact, only 2 marked individuals were located there during the 1983 and 1984 northbound migrations combined, despite intensive effort.

Sightings during southbound migration shift eastward and occurred largely between late July and early September. Two concentrations were noted: SE Massachusetts, especially Monomoy Island, and the Assateague/Chincoteague coast of Virginia. In both these areas approximately 1 in 1000 Sanderlings surveyed was marked. This is the highest ratio observed to date and it contrasts sharply with the spring east coast ratio (<1:50 000).

The immediate implications of these findings are threefold:

1. Sanderlings wintering along the west coast of South America travel to the breeding grounds along 3 distinct routes: i) along the Pacific coast, ii) through the Gulf coast of Texas and northward via the interior, and iii) along the US Atlantic coast. Few birds, however, take the last route.
2. Many Sanderlings wintering in Peru and Chile follow a clockwise, circular, route, returning along the US east coast.
3. Most Sanderlings passing through the Delaware Bay staging area in spring, estimated to be in excess of 60 000 individuals (Dunne et al. 1982), do not winter on the Pacific coast of South America. A likely wintering spot is in SE Brazil (see Myers et al. 1984a).

Warning: unusual conditions

The small sample of returns is not the only factor inhibiting sweeping conclusions at this stage of the study. The 1982/83 winter marked the worst El Niño Current conditions ever recorded along the coasts of Ecuador and Peru (Barber and Chavez 1983, Thayer and Barber 1984). By early 1983 biological communities throughout the region were reeling from abnormally high water temperatures nearshore. Quantitative data are not available, but there is no reason to suspect that intertidal invertebrates were immune. R.A. Hughes (pers. comm.), for example, described massive die-offs of the sandy-beach clam *Mesodesma*. It would seem likely that poor resource conditions might inhibit northward migration. Moreover, anomalous conditions prevailed far into the northern hemisphere. Thus the entire Pacific coast migration pattern may have been aberrant.

Other species from Peru and Chile

Few sightings attributable to birds from Peru and Chile have come in to date for species other than Sanderling. This is not surprising given i) the small samples of other species, ii) the greater difficulty of thorough searches for marked individuals of other species, and iii) confusion in band combination interpretation due to a reservoir of birds banded prior to establishing the flagging convention. Efforts to band other species in Peru and Chile are intensifying, and will be aided greatly by anticipated work in Colombia (Table 4).

To date, one Black-bellied Plover *Pluvialis squatarola* from Paracas, Peru, has appeared in Florida (J. Baker), and a Semi-palmated Sandpiper from Paracas was found on Monomoy Island, Massachusetts (B. Nikula).

BANDING IN VENEZUELA

B.T. Thomas and M.A. Howe banded a total of 604 individuals of 8 species at Rancho Masaguaral, 40 km S of Calabozo, Guarico, Venezuela, during March, April and May 1984 (Table 2). This banding site is in the interior savanna of

Table 2. Banding totals in Venezuela, spring 1984.

Species	Total banded	Total flagged
<i>Himantopus mexicanus</i>	7	0
<i>Tringa flavipes</i>	3	0
<i>Tringa solitaria</i>	87	32
<i>Actitis macularia</i>	5	4
<i>Calidris pusilla</i>	16	4
<i>Calidris minutilla</i>	187	31
<i>Calidris fuscicollis</i>	297	291
<i>Calidris melanotos</i>	2	2

Table 3. Birds banded at Lagoa do Peixe, Brazil, 27 April - 4 May 1984, during the Manomet Bird Observatory/CEMAVE Workshop.

Species	Total banded
<i>Vanellus chilensis</i>	1
<i>Pluvialis squatarola</i>	5
<i>Charadrius collaris</i>	1
<i>Charadrius semipalmatus</i>	1
<i>Charadrius falklandicus</i>	21
<i>Zonibyx modestus</i>	6
<i>Arenaria interpres</i>	2
<i>Limosa haemastica</i>	1
<i>Calidris canutus</i>	305
<i>Calidris fuscicollis</i>	41
<i>Calidris pusilla</i>	11
<i>Calidris alba</i>	8

Venezuela (site L in Figure 1). The first birds banded received only USFWS metal bands, while subsequently most were flagged and dyed with picric acid. Only 3 sightings in North America have been reported of birds in this cohort: 2 White-rumped Sandpipers northbound in Cheyenne Bottoms (E. Martinez) and one northbound in central Texas (T. Maxwell), all in late May. Thomas (1984) reported on other results from banding at this site.

BANDING IN BRAZIL

Manomet Bird Observatory held a workshop in SE Brazil during late April 1984. Ten participants attended, coming from Brazil, Argentina, Uruguay and Canada. The workshop covered various aspects of shorebird biology and conservation, and included training in capture and banding (Table 3).

The first sightings in North America of birds from this cohort were 2 marked Red Knots seen in mid-May on Reed's Beach, Delaware Bay, approximately 8500 km to the north (L. Leddy). At 60 km·h⁻¹, flight time alone must have been almost 6 days, and well beyond the maximum estimated flight ranges for shorebirds of this size (Davidson 1984), yet the sightings were made only 15 days after banding and 13 days after the first observed departure from this staging site in Brazil. Subsequently, 40 sightings of Brazilian-marked Red Knots were reported in Delaware Bay. These sightings probably stemmed from about 10 individual birds. Precisely how many is uncertain because the birds were not individually color-marked and the total therefore included multiple re-sightings of the same individuals. One Red Knot from Brazil was also observed in Chincoteague, Virginia, in mid-May (M.A. Howe).

Southbound migration has yielded 10 sightings of Red Knots from the Brazilian cohort, all in

Table 4. The 1984/85 Pan American Banding Network.

Country	Region	Collaborators
South America		
Argentina	SE Buenos Aires Province	J. Chani
Brazil	Lagoa do Peixe	S. Lara de Resende
Chile	Antofogasta	M. Sallaberry, M. Cikotovic
	Coquimbo	E. Tabilo
Colombia	Buenaventura	L. Naranjo and R. Franke
Paraguay	E Chaco	N. Lopez
Peru	Paracas	E. Ortiz (APECO) and P. Myers
	Villa	G. Castro and P. Myers
Venezuela	N coast	F. Mercier
North America		
Canada	Manitoba	S. Haig
	New Brunswick	L. White
United States	Massachusetts	Harrington <i>et al.</i> (Manomet)
	New Jersey	Harrington <i>et al.</i> , Myers <i>et al.</i>
	Virginia	M. Howe
	Texas	L. Gordon, T. Maxwell, S. Haig, Myers <i>et al.</i>
	Kansas	E. Martinez
	Washington	Myers <i>et al.</i>
	Oregon	Myers <i>et al.</i>
	California	Myers <i>et al.</i>

eastern Massachusetts during July and August. Two were recaptured by Manomet.

These observations add to the growing body of data gathered by Harrington and co-workers on the migration pathways of Red Knots along the Atlantic coast of North and South America (Harrington 1983, Morrison 1984). Observations made during the workshop in Brazil also substantiate previous indications (Morrison 1984, Silva 1984) that SE Brazil, and especially the Lagoa do Peixe, is a major staging ground for Red Knots and Hudsonian Godwits during northbound migration. Additional work is now planned to study this site more thoroughly (S. Lara-Resende pers. comm.).

BANDING IN NORTH AMERICA

Several banding stations within North America have begun using the PASP flagging scheme at migration stopovers (Table 4). To date these efforts have concentrated on Semi-palmated Sandpipers in coastal Virginia (M.A. Howe), Red Knots in New Jersey and Massachusetts (B.A. Harrington), and Sanderlings in New Jersey and Oregon/Washington (J.P. Myers). The objective of these efforts is to work the migration from the northern end, leading to the discovery of flagged birds from particular stopovers on wintering grounds in South America.

BANDING ANTICIPATED IN 1984/85

During the 1984/85 non-breeding season several new sites will join the PASP banding network. Together with continuing sites, this will result in 9 South American and 11 North American banding regions during the forthcoming season (Table 4). Other banders interested in collaborating are urged to contact the authors, as are any people intrigued by the prospects of finding rare bands on migrating birds.

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