J. Field Ornithol., 53(2):125–132

WINTER RESIDENT REPEATS AND RETURNS OF AUSTRAL AND BOREAL MIGRANT BIRDS BANDED IN VENEZUELA

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Individual migrant birds tend to annually occupy the same tropical winter quarters, and may even stop year after year at the same localities between their wintering and breeding grounds (Loftin et al. 1966, Loftin 1977, Smith and Stiles 1979, Ely et al. 1977). Records of such behavior involve 49 species. Furthermore, individuals of species like the American Redstart (*Setophaga ruticilla*) seem to lead solitary lives within fairly restricted areas of their wintering habitats (Schwartz 1964). Some birds have been recaptured at the same net location where they had been caught in the previous year (Snow and Snow 1960, Faaborg and Winters 1979). For example, most resident and many transient Northern Waterthrushes (*Seiurus noveboracensis*) defend a "winter territory" in Venezuela; individuals that completed the second fall migration returned to the territory they had occupied the previous year (Schwartz 1964).

There seems to be a lack of information about site attachment of austral migrant species on the area they occupy during the austral winter. This paper contains a report on both boreal and austral migrant species.

STUDY AREAS AND METHODS

North American species of shorebirds and warblers and austral species of flycatchers were mist-netted and banded near Cumaná (10°25′42″N, 64°11′36″W) and Chiguana (10°30′N, 63°40′W, 5 km west of Cariaco at the head of the Gulf of Cariaco), state of Sucre, northeastern Venezuela. In Cumaná, netting operations took place in homogeneous stands of deciduous forest from 17 May 1965 to 10 May 1967 and on 19 and 20 November 1968, during 2-day netting periods every 2 or 3 weeks. Eight nets were used from May to September 1965, 10 from October 1965 to March 1966, and 12 thereafter.

Near Chiguana, nets were operated in habitats associated with a lagoon complex (described in McNeil 1970). Netting took place from 27 May 1965 to 19 January 1967 during 1- or 2-day netting periods approximately every 2 or 3 weeks. Nets 1 to 5 were placed in deciduous woodlands on the north side of the lagoon complex (nets 1 and 5 were at the edge of that forest and at the edge of the lagoon). Nets 6 to 12 were located end-to-end in homogeneous mangrove forest and perpendicular to the south side of the lagoon; net 6 was at the forest edge near 3 other nets (L in Table 1) erected end-to-end across the narrowest section of the lagoon. This part of the lagoon formed a corridor used by birds flying between east and west sections of the lagoon complex.

Nets were always erected in the same locations. Distance between re-

captures was recorded as distance between nets of capture and subsequent recapture. All migrants caught and released were marked with U.S. Fish and Wildlife Service bands provided by the Canadian Wildlife Service. However, not all birds captured were banded and released. Some North American shorebirds captured from July 1966 to January 1967 (Chiguana) and Small-billed Elaenias (*Elaenia parvirostris*) taken from May to October 1966 (Chiguana and/or Cumaná) were kept for other studies (see McNeil and Carrera de Itriago 1968, McNeil 1970).

RESULTS AND DISCUSSION

For the purposes of this paper, the "winter" covers the period between the fall arrival of migrants on the wintering ground and their spring departure.

Boreal migrants: shorebirds.—Nine species of shorebirds were captured and marked at the Chiguana station. Marked individuals of 2 species, the Spotted Sandpiper (*Actitis macularia*) and the Willet (*Catoptrophorus semipalmatus*), were retaken in the same general area where they had previously been caught (Table 1). Compared with other groups of birds, "considerably less is known about site fidelity in wintering shorebirds" (Smith and Stiles 1979). Nevertheless, some territoriality, varying in extent among species, individuals, and habitats, has been demonstrated in non-breeding shorebirds, including the Spotted Sandpiper and the Willet (Myers and Myers 1979, Myers et al. 1979).

My captures and repeats of Spotted Sandpipers were in the same or adjoining nets in the lagoon or at the edge of the woods where they had been caught before. This pattern demonstrates an attachment to the same lagoon complex for up to 4 months. It does not imply that each bird was strongly defending a territory. Optimum foraging positions shift with the rate of the water line movement at a given site (Myers and Myers 1979). In a broad intertidal habitat such as the mangrove stands of Chiguana, Spotted Sandpipers showed less territory defense than others living in a tide-free environment such as the shoreline of the San Luis Lagoon in Cumaná (McNeil 1970) where individuals led solitary lives and stayed in the same area.

In 1966, 2 Spotted Sandpipers (3.5% of the birds marked during the previous winter) were retaken in the same lagoon as the previous winter (Table 1) confirming the report by Smith and Stiles (1979) that this species tends to return to the same general wintering area in a later migratory season. Some Spotted Sandpipers summer in their winter quarters (McNeil 1970). Close examination of the recaptured birds did not reveal reason (injuries and/or endoparasites, abnormal plumage or molt, abnormal fat reserves; see McNeil 1970) to suspect they had diverged from the normal migratory habits.

After 14 January 1966, only one Willet and 2 Spotted Sandpipers were captured and none was recaptured. In 1967, netting ended on 19 January. After mid-January 1966, Chiguana Lagoon gradually dried up until the end of March. Most Spotted Sandpipers moved deeper in

the mangrove stands or elsewhere. The number of Spotted Sandpipers decreased in Chiguana, but increased in more suitable habitats such as the San Luis Lagoon near Cumaná (McNeil 1970). Willets followed a similar pattern, increasing in number from August to the end of November and decreasing drastically after the middle of December until the end of February. Some Willets overwintered in the same lagoon as shown by 4 repeats (Table 1), but others moved into more adequate environments: one bird marked on 13 October 1966 was killed in El Peñón Lagoon, 55 km east near Cumaná, on 20 February 1967. Near Palo Alto, California, Kelly and Cogswell (1979) found that many Willets stayed in the same area for 8 to 9 months each year; they presumed that some left for more southern areas. Their findings contradict Recher's (1966) conclusion that a shorebird presence is temporary in any one area of the wintering ground.

Boreal migrants: warblers.—Five species of North American warblers were captured and marked at the Chiguana site. Marked individuals of 3 species, the Prothonotary Warbler (*Protonotaria citrea*), the Northern Waterthrush, and the American Redstart, were retaken in the same or adjoining nets, generally within 75 m of the original capture point during the same winter (Table 1). Individual Northern Waterthrushes and American Redstarts (respectively 2.5 and 11.1% of the birds marked during the previous winter) were retaken near their original banding location of the previous winter.

Since long-term site fidelity on the wintering ground and return to the same site from one year to the next are considered evidence of territoriality by Rappole and Warner (1980), even if the birds were not observed defending an area, it is apparent that the recaptured Northern Waterthrushes and American Redstarts were territory defenders. Evidence of territoriality and site attachment on the wintering ground has been reported for both species (Schwartz 1964, Loftin 1977, Faaborg and Winters 1979, Rappole and Warner 1980). The only previous report of the recapture of a Prothonotary Warbler on wintering grounds (one retaken from the previous year) is that of Faaborg and Winters (1979).

Austral migrants.—Nine species or subspecies of migratory Passeriformes come to Venezuela from the austral regions of South America (Phelps and Phelps 1963). Three species were captured and marked near Chiguana and/or Cumaná. Marked individuals of 2 species were retaken: the Slaty Elaenia (*Elaenia strepera*) and the Small-billed Elaenia (Table 2). The Slaty Elaenia breeds in northern Bolivia and northwestern Argentina and winters to eastern Pasco in Peru, eastern Colombia, and eastern Venezuela; the Small-billed Elaenia breeds in Bolivia, Paraguay, Uruguay, and southern Brazil south to central Argentina, and migrates north to Guyana, Surinam, Venezuela, and eastern Colombia (Meyer de Schauensee 1971). Both species were captured in deciduous woods and were abundant at the Cumaná study area in 1966.

Four Small-billed Elaenias (9.3% of the birds marked during the pre-

TABLE 1. Repeats, returns, and recoveries of boreal migrant birds mist-netted and banded at Chiguana, Venezuela.

Species	No. banded in 1965–1966	No.[1] taken in 1966–1967	Recaptures					
			Date banded	Age/sex[2] when banded	Net position	Date retaken	Net position	Distance from where first taken
Spotted Sandpipers	56	18	23 Sep. 65	U/U	L	04 Dec. 65	L	Same net
			11 Aug. 65	U/U	6	26 Aug. 65	6	Same net
						09 Sep. 65	7	<50 m
			27 Aug. 65	A/U	6	09 Sep. 65	6	Same net
			10 Sep. 65	U/U	6	23 Sep. 65	1	<150 m
			23 Sep. 65	U/U	6	15 Oct. 65	7	<50 m
			24 Sep. 65	U/U	7	09 Nov. 65	5	<200 m
			09 Sep. 65	A/U	8	09 Nov. 65	1	<200 m
			10 Sep. 65	A/U	6	14 Jan. 66	6	Same net
						03 Nov. 66	6	Same net
			15 Oct. 65	U/U	7	13 Oct. 66	Killed	<500 m
Willet	23	50	13 Oct. 66	U/U	L	20 Feb. 67	Killed	55 km
			30 Nov. 66	U/U	L	18 Jan. 67	L	Same net
			30 Nov. 66	U/U	L	18 Jan. 67	L	Same net
			13 Oct. 66	U/U	L	19 Jan. 67	L	Same net
			29 Nov. 66	U/U	L	19 Jan. 67	L	Same net

TABLE 1. Continued.

Species	No. banded in 1965–1966	No.[1] taken in 1966–1967	Recaptures					
			Date banded	Age/sex[2] when banded	Net position	Date retaken	Net position	Distance from where first taken
Prothonotary Warbler	18	6	04 Dec. 65	A/M	10	14 Jan. 66	8	<75 m
			08 Nov. 65	A/M	8	14 Jan. 66	6	<75 m
			29 Jan. 66	A/U	6	04 Mar. 66	10	<200 m
			13 Oct. 66	A/U	12	30 Nov. 66	6	<150 m
			04 Nov. 66	A/M	6	19 Jan. 67	7	<50 m
Northern Waterthrush	40	12	09 Nov. 65	A/U	1	04 Dec. 65	10	<350 m
			08 Nov. 65	A/U	8	04 Dec. 65	9	<50 m
			09 Nov. 65	A/U	2	14 Dec. 65	2	Same net
			08 Nov. 65	A/U	9	04 Dec. 65	7	<75 m
			04 Dec. 65	A/U	10	29 Jan. 66	10	Same net
			14 Jan. 66	A/U	7	17 Feb. 66	7	Same net
			29 Nov. 66	A/U	10	19 Jan. 67	10	Same net
			10 Sep. 65	A/U	8	29 Nov. 66	6	<75 m
American Redstart	9	4	23 Sep. 65	A/M	9	28 Jan. 66	10	<50 m
			23 Sep. 65	A/F	9	04 Mar. 66	9	Same net
			09 Nov. 65	A/F	9	04 Mar. 66	9	Same net
			04 Mar. 66	A/F	7	12 Oct. 66	6	<50 m

[1] Excluding repeats (recaptures during the same wintering season). The netting season ended on 19 Jan. 1967.
[2] U—unknown; A—adult; M—male; F—female.

TABLE 2. Repeats and returns of austral migrant birds mist-netted and banded at Cumaná, Venezuela.

Species	No. banded in 1965	No.[1] taken in 1966	No.[1,2] taken in 1967	Recaptures					
				Date banded	Age/sex[3] when banded	Net position	Date retaken	Net position	Distance from where first taken
Slaty Elaenia	0	58	0	07 Sep. 66	I/U	5	19 Sep. 66	8	<100 m
Small-billed Elaenia	43	267	14	02 Jun. 65	A/U	3	14 Jun. 66	9	<150 m
				25 Aug. 65	A/U	3	26 Jun. 66	8	<150 m
				17 Jun. 65	A/U	4	20 Jul. 66	4	Same net
				07 Sep. 65	A/U	4	21 Sep. 66	12	<200 m
				19 Sep. 66	A/U	8	08 May 67	8	Same net
				29 Jun. 66	A/U	8	22 Aug. 66	1	<200 m
				05 Aug. 66	A/U	12	07 Sep. 66	11	<50 m
				06 Aug. 66	A/U	12	09 Sep. 66	11	<50 m

[1] Excluding repeats (recaptures during the same austral wintering season).
[2] The netting ended on 10 May 1967.
[3] U—unknown; A—adult; I—immature.

vious austral winter) were taken in 1966 near their banding location of the previous year (Table 2). Only one bird was recaptured during the single netting period of 1967, when birds of that species had just started to appear in the study area. These data constitute the first known report of the fidelity of South American austral passerine migrants to their wintering grounds.

For similar netting efforts, the number of Small-billed Elaenias taken in 1966 at Cumaná was much higher than in 1965 (267 vs 43; Table 2). In addition, 58 Slaty Elaenias were taken in 1966, but none in 1965. Elaenias are insect eaters (flycatching/foliage gleaning birds) and the insect biomass or abundance is presumably tied to rainfall, reaching its highest level in the middle of the rainy season (see Waide et al. 1980). At Cumaná, from April to December 1965, the amount of rain was 220 mm compared with 775 mm recorded for the same period in 1966 (data from División de Hydrometerología, Ministerio de Obras Publicas, Venezuela). Therefore, food shortage and higher competition from local breeders in 1965 may have caused the move by austral migrants to more favorable areas as suggested by Willis (1966; cf. Waide 1980).

SUMMARY

Repeats and recaptures of austral (2 species of *Elaenia* flycatchers) and boreal (2 species of shorebirds and 3 species of warblers) migrant birds banded in northeastern Venezuela are discussed in terms of fidelity to wintering sites during the same winter and from one winter to the next. Austral migrants also seem to move to more favorable areas in food shortage years.

ACKNOWLEDGMENTS

I thank Mr. José Ramón Rodriguez Silva of the University of Oriente in Venezuela who aided me in various ways. I also thank Mr. Normand David and Dr. Lucie Maillette of the University of Montreal for reading the manuscript. I am also indebted to the Shell Foundation of Venezuela which provided a vehicle for field work. Financial support was given by the University of Oriente, the University of Montreal, and the Natural Sciences and Engineering Research Council Canada.

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