Weight gains by re-trapped passerine migrants at an artificially vegetated site, Eastern Desert, Egypt

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European songbirds are known to migrate on a broad front towards their wintering quarters (Alerstam 1990). Birds wintering in oases of the Sahara or south of the desert have to cross vast areas of desert without opportunities to feed. Consequently their strategy consists in putting on fat reserves before they cross this barrier (Alerstam 1990). According to earlier desert studies, in NW Egypt, oases are very attractive for birds needing to replenish their fat reserves (Biebach *et al* 1986). In the light of this hypothesis, we present a small data sample documenting weight and fat reserves of migrants stopping at a sewage plant at Ras Shukheir and an olive plantation west of El Gouna, in the Eastern Desert, Egypt (Figure 1). All re-traps occurred at the sewage plant site.

METHODS

Between 7 September and 29 October 2006, birds were caught in mist nets at two sites in the Eastern Desert of Egypt. One site was at the sewage plant on the premises of the oil firm Gupco at Ras Shukheir (Figure 1, 28° 8.093′ N, 33° 14.824′ E). The vegetation around the waste water basins was copiously watered and consisted mainly of tamarisks, wild olives, acacias, dates, shrubs and grass. Mist nets of 5–9 m in length, with 4 pockets and a total length of 100 m were set up. On average, the mist nets were spread for three hours (Table 1). The other ringing site was 3 km west of El Gouna (27° 57.84′ N, 33° 21.56′ E) and vegetation there consisted mainly of planted olives.

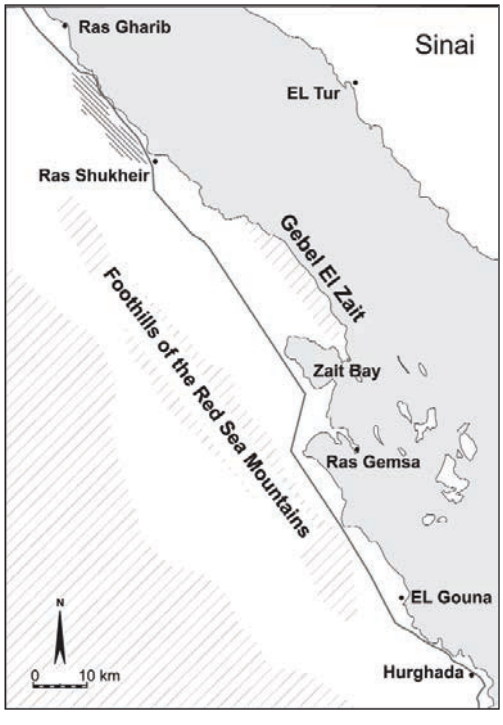

Figure 1. Location of ringing sites: at Ras Shukheir and near El Gouna, Eastern Desert, Egypt.

Table 1. Trapping dates and times in the morning when mist nets were open, at two sites in the Eastern Desert, Egypt, 2006

trapping date	mist nets open	
	sewage plant	olive farm
7 Sept	6.45–11.00	
8 Sept		6.13–9.00
12 Sept	6.10–8.55	
14 Sept		6.30–8.05
16 Sept	6.05–8.45	
18 Sept		6.15–8.45
20 Sept	6.15–8.10	
28 Sept	5.15–10.15	
3 Oct	5.30–9.10	
7 Oct	6.15–9.00	
15 Oct	5.30–10.30	
23 Oct	5.30–9.00	
26 Oct	5.30–10.00	
29 Oct	5.45–10.00	

Table 2. Number, weight and fat deposition (± SD) of all birds at first capture in mist nets at the sewage plant and olive plantation, 9 September–29 October 2006. If less than 4 birds were caught, the individual weights and fat scores are given.

		sewage plant		
		n	weight (g)	fat score
Scops Owl	*Otus scops*	1	85.9	1
Red-backed Shrike	*Lanius collurio*	5	25.38 ± 5.7	0.6 ± 1.4
Masked Shrike	*Lanius nubicus*	8	20.18 ± 0.78	1.6 ± 1.4
Sand Martin	*Riparia riparia*	3	14.8; 10.9; 12.3	5;0;2
Barn Swallow	*Hirundo rustica*	10	17.03 ± 1.27	1.8 ± 0
River Warbler	*Locustella fluviatilis*	9	13.91 ± 0.21	1.4 ± 0
Sedge Warbler	*Acrocephalus schoenobenus*	21	10.49 ± 0.14	2.1 ± 0
Reed Warbler	*Acrocephalus scirpaceus*	95	10.26 ± 0.56	1.6 ± 0.7
Olivaceous Warbler	*Hippolais pallida*	1	10.2	3
Willow Warbler	*Phylloscopus trochilus*	73	7.87 ± 2.12	2 ± 0.7
Chiffchaff	*Phylloscopus collybita*	52	7.22 ± 0.85	1.8 ± 2.1
Lesser Whitethroat	*Sylvia curruca*	33	11.57 ± 0.43	2.5 ± 0.7
Sardinian Warbler	*Sylvia melanocephala*	2	8.1; 8.3	1; 0
Bluethroat	*Luscinia svecica*	6	11.7 ± 0.57	0.8 ± 0.7
Redstart	*Phoenicurus phoenicurus*	3	18.5; 13.9; 15	4; 2; 2
Whinchat	*Saxicola rubetra*	2	12.3; 15.9	0; 1
Spotted Flycatcher	*Muscicapa striata*	3	14.7; 15.0; 13.1	2; 4; 2
Collared Flycatcher	*Ficedula albicollis*	1	9.4	0
Red-breasted Flycatcher	*Ficedula parva*	2	8.4; 8.0	1;1
Pied Wagtail	*Motacilla alba*	2	15.2; 15.5	0; 0
Total		332		
		olive plantation		
		n	weight (g)	fat score
Reed Warbler	*Acrocephalus scirpaceus*	14	9.73 ± 0.07	1.4 ± 0
Olivaceous Warbler	*Hippolais pallida*	1	10.2	3
Willow Warbler	*Phylloscopus trochilus*	6	7.87 ± 1.2	2 ± 2.1
Wood Warbler	*Phylloscopus sibilatrix*	1	10.3	3
Lesser Whitethroat	*Sylvia curruca*	45	10.86 ± 1.48	2.3 ± 1.4
Thrush Nightingale	*Luscinia luscinia*	4	24.83 ± 0.28	4 ± 0
Total		71		

At the sewage plant, we trapped birds on 11 days and in the olive plantation, 3 days. Duration between ringing days varied between 3–8 days at the sewage plant and 4–6 days at the olive plantation (Table 1). Fat deposition was estimated according to a scale from 1 to 8 (Kaiser 1993).

RESULTS

In all, 23 species were trapped, including a Scops Owl *Otus scops*. At the sewage plant, Reed Warbler *Acrocephalus scirpaceus* was the most frequently caught species, followed by Willow Warbler *Phylloscopus trochilus*. At the olive plantation, Lesser Whitethroat *Sylvia curruca* was most frequent followed by Reed Warbler (Table 2).

At the sewage plant, a total of 332 birds were trapped (64.5% Reed Warbler, Chiffchaff *Phylloscopus collybita* and Willow Warbler) and at the olive plantation, 71 (87% Lesser Whitethroat and Reed Warbler) (Table 2). All migrants, except for Thrush Nightingale

Table 3. Re-trapped individuals, other than Reed Warblers, at the sewage plant: date and weight at first and last capture.

	date		weight (g)	
	first capture	last capture	first capture	last capture
Scops Owl	23 Oct	26 Oct	85.9	111.8
Masked Shrike	7 Oct	23 Oct	19.6	20.8
Masked Shrike	12 Sept	16 Sept	20.2	20.8
Willow Warbler	23 Oct	29 Oct	7	8.6
Lesser Whitethroat	12 Sept	20 Sept	9.9	13.2

Table 4. First and last capture data of Reed Warblers re-trapped at the sewage plant.

date		time difference	first weight	last weight	weight difference
First capture	last capture	(days)	(g)	(g)	(g)
7 Sept	12 Sept	5	9.2	10.4	1.2
7 Sept	12 Sept	5	9.5	10.2	0.7
7 Sept	12 Sept	5	9.9	11.3	1.4
7 Sept	12 Sept	5	9.8	11.1	1.3
12 Sept	20 Sept	8	9.2	11.3	2.1
12 Sept	20 Sept	8	9.4	11.6	2.2
12 Sept	20 Sept	8	9.0	11.6	2.6
12 Sept	16 Sept	4	10.8	11.8	1.0
12 Sept	16 Sept	4	9.1	10.3	1.2
12 Sept	20 Sept	8	8.2	11.7	3.5
16 Sept	20 Sept	4	9.6	11.3	1.7
16 Sept	20 Sept	4	9.8	12.2	2.4

Luscinia luscinia, had, on average, little fat deposition on arrival (Table 2). Re-trapped birds gained weight during their stay (Tables 3 & 4).

Reed Warblers arrived with a mean weight of 10.26 ± 0.56 g SD and was the species most often re-trapped (13%). Re-trapped Reed Warblers arrived with a mean weight of 9.45 ± 0.6 g. At their last capture, re-trapped Reed Warblers had a mean weight of 11.23 ± 0.6 g (Table 4, Figure 2). On average, they gained 1 g in weight in 3.5 days (Table 4).

DISCUSSION

This study confirms regular passerine migration through the Eastern Desert of Egypt. Clearly, migrants can stop at artificially vegetated sites there. Species that we caught in very small numbers, or not at all, do not necessarily use a non-stop migration strategy to cross the Sahara. Similarly, of course, the relative trapping frequency of the different species need not reflect abundances of species migrating through this area. An intermittent migration strategy is now assumed in trans-Saharan passerine migrants (Biebach *et al* 2000, Schmaljohann *et al* 2007). The majority of trans-Saharan migrants travel nocturnally through the desert and rest in the shade during the day (Biebach *et al* 1986, Schmaljohann *et al* 2007). This implies that these birds have enough fat deposition to continue without refuelling. The Spotted Flycatcher *Muscicapa striata*, however, depends on regular refuelling and feeds in oases/artificially-vegetated sites while Reed Warblers are supposed to gain sufficient fat reserves shortly before the desert crossing (Schaub & Jenni 2000). Distance calculations for Reed Warblers migrating along the West African route suggested they should, on average, be able to reach the southern border of the desert without refu-

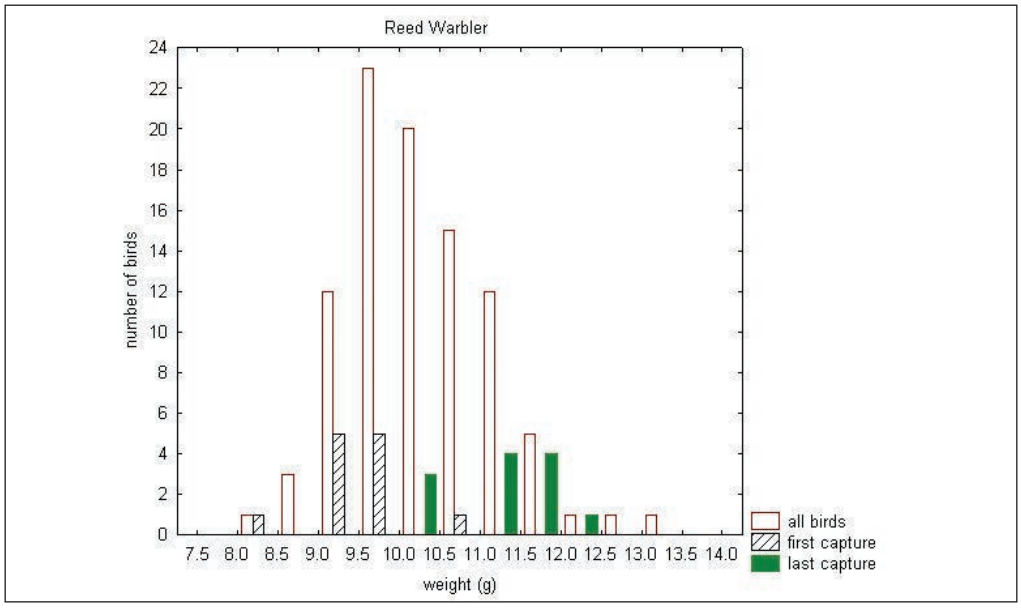

Figure 2. Weights of all Reed Warblers (open bars), of re-trapped birds at first capture (hatched) and at last capture (solid).

elling (Hilgerloh & Wiltschko 2000). Our study shows, however, that some Reed Warblers in the eastern Sahara need to refuel. In the same period, Lesser Whitethroats, the species that was the most frequent at the olive plantation, were also observed by us in large numbers in bushes at the golf course and around houses in El Gouna, east of the olive plantation. In the face of increasing desertification, man-made habitats may become of increasing importance for migrants.

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