

This article was downloaded by: [MNHN Muséum National D'Histoire Naturelle]

On: 28 April 2014, At: 02:55

Publisher: Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Ringing & Migration

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/tram20>

Vertical and horizontal distribution of five wetland passerine birds during the postbreeding migration period in a reed-bed of the Camargue, France

Bruno Pambour^{a b}

^a Réserve Nationale de Camargue , la Capelière, Arles, 13200, France

^b National Wildlife Research Center , P.O. Box 1086, Taif, Saudia Arabia

Published online: 11 Apr 2011.

To cite this article: Bruno Pambour (1990) Vertical and horizontal distribution of five wetland passerine birds during the postbreeding migration period in a reed-bed of the Camargue, France, Ringing & Migration, 11:1, 52-56, DOI: [10.1080/03078698.1990.9673961](https://doi.org/10.1080/03078698.1990.9673961)

To link to this article: <http://dx.doi.org/10.1080/03078698.1990.9673961>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our

platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Ringling & Migration 11: 52-56, June 1990

Vertical and horizontal distribution of five wetland passerine birds during the postbreeding migration period in a reed-bed of the Camargue, France.

Bruno Pambour

Pambour, B. 1990. Vertical and horizontal distribution of five wetland passerine birds during the postbreeding migration period in a reed-bed of the Camargue, France. *Ring. & Migr.* 11: 52-56.

The vertical and horizontal distribution of five wetland passerines in a reed-bed in the Camargue was studied during the postbreeding migration period. There was more evidence of vertical segregation between the species than horizontal separation. Comparisons are made with other studies in Europe and, for three species, the vertical distribution was similar in the breeding and postbreeding migration; for Reed Warbler, Moustached Warbler and Great Reed Warbler it seems that the vertical selection is almost identical in these two periods.

B. Pambour, Réserve Nationale de Camargue, la Capelière, 13200 Arles, France. New address: National Wildlife Research Center, P.O. Box 1086, Taïf, Saudia Arabia.

Received 19 April 1989; revised and accepted 1 August 1989.

INTRODUCTION

Differences in habitat selection are one of the important mechanisms in the ecological segregation of bird species (Lack 1971, Cody 1974, 1985). Whereas such segregation has been widely studied in the breeding and wintering seasons (see Bairlein 1983) few studies have been undertaken during the migration (Bairlein 1981, Baccetti 1985).

The vertical and horizontal distributions of passerine birds are an important component of segregation in some habitats and can be studied by Berthold & Schlenker's method (1975). During the long-term monitoring of wetland passerine populations in Camargue, undertaken by the Réserve Nationale de Camargue, a trapping programme was carried out in a reed-bed, and this paper describes the vertical and horizontal patterns for five species during migration: Reed Warbler *Acrocephalus scirpaceus*, Moustached Warbler *A. melanopogon*, Sedge Warbler *A. schoenobaenus*, Great Reed Warbler *A. arundinaceus* and Bluethroat *Luscinia svecica*. Of these, Bluethroat and Reed Warbler are the only two species exclusively

migrant; the three others breed in the Camargue.

STUDY AREA AND METHODS

The study area is situated in the heart of the Réserve Nationale de Camargue, at the north-east of the Vaccarès lagoon (43° 32'N 4° 39'E) where a large reed-bed of 32 ha stretches 1100 m along the shore. *Scirpeto-Phragmitetum litoralis* and *Phragmitetum* with *Solanum* and *Calystegia* are the dominant plant associations.

The line of mist-nets (see Fig. 1), was on a raised path 20-30 cm above the water level in a homogenous area of *Phragmitetum*, always fed by fresh water. The height of vegetation was usually not higher than 2-2.5 m. Seven mist-nets 12 m in length, with four 50 cm high shelves (20-25 cm between the ground and the first shelf), were set each day for four hours after sunrise, from the 25 July to the 15 October, 1988. The capture position of each bird was noted (mist-net and shelf): the vertical distribution of the birds was described by calculating the percentage of all captures in each shelf. The horizontal distribution was calculated as the percentage in each mist-net, the first being closest to the lagoon.

RESULTS

During the study period 843 Reed Warblers, 120 Moustached Warblers, 156 Sedge Warblers, 75 Great Reed Warblers

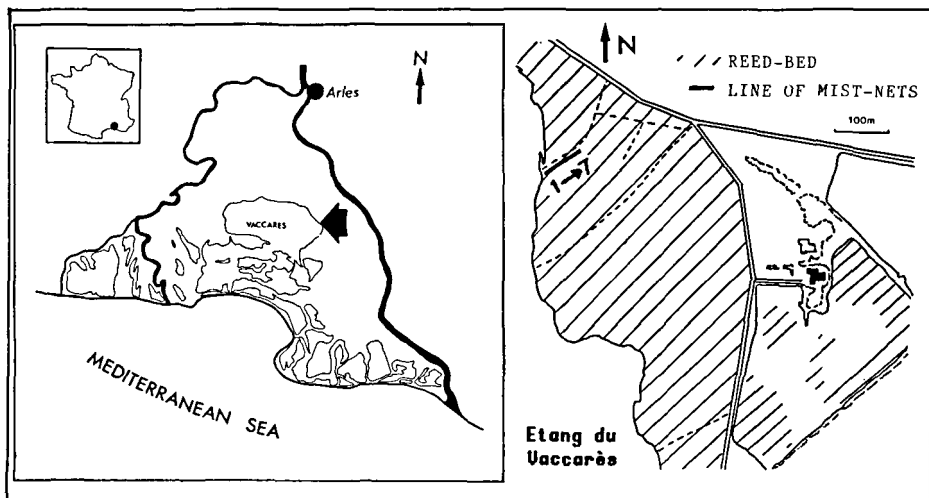


FIGURE 1. Situation of the study area (arrowed) in the Camargue, France

and 55 Bluethroats were trapped. Figures 2 and 3 show vertical and horizontal distributions of the five species, as percentages of birds trapped in each shelf or mist-net. Tables 1 and 2 show interspecific comparisons (χ^2 test).

Generally, there was more evidence of vertical segregation between the species than horizontal separation (Tables 1 and 2). Mostly, these vertical differences reflected the tendency of Moustached Warbler to occur slightly lower than the other species (shelf C and D), while Bluethroat occurred higher (shelf B). As a result, statistical comparison between these and other species revealed significant differences (Table 2). In horizontal space, individuals of most species occurred near the lake shore, and this was particularly pronounced for Bluethroat. Reed Warblers occurred significantly further away from the shore than the Sedge Warblers (Fig. 3, Table 2).

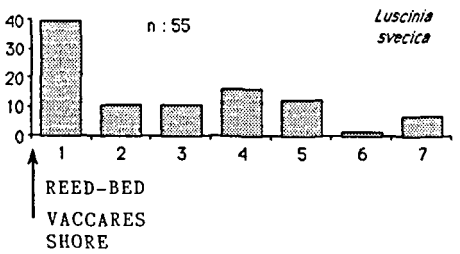
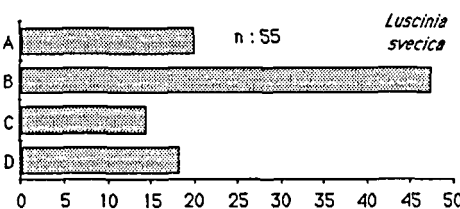
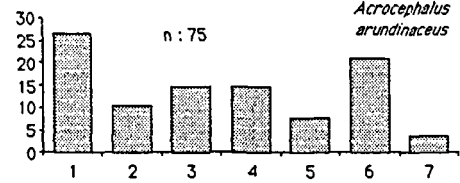
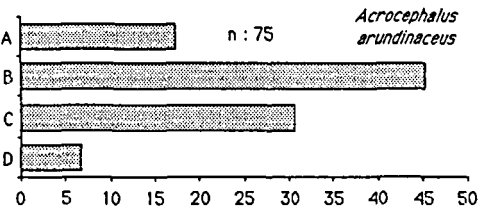
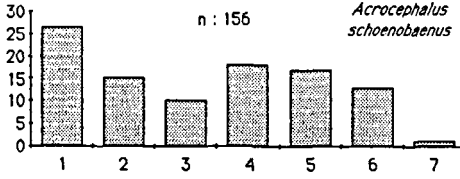
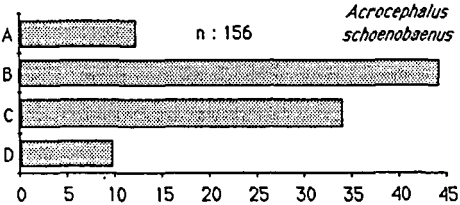
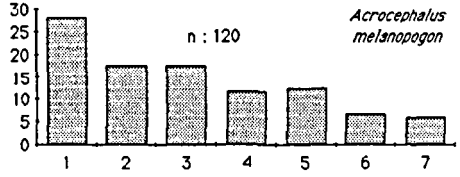
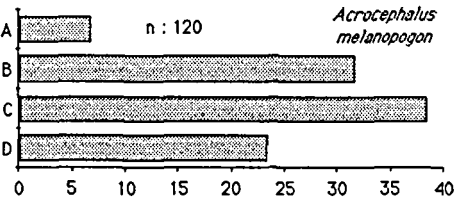
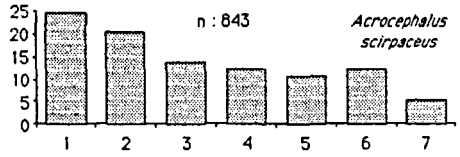
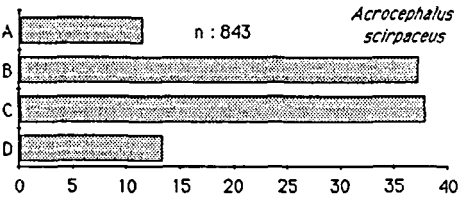
DISCUSSION

Vertical distribution

Reed Warbler, Sedge Warbler and Great Reed Warbler have a very similar vertical distribution; the majority of captures were

made in the two central shelves, with a maximum in the B shelf for the last species. Moustached Warbler showed a distribution significantly different from the four other species with a concentration of captures close to the ground: there were two or three times as many in the shelf D, as the other species. This reflects the feeding ecology of this species, which catches the majority of its prey from the water (Leisler 1970, Bibby 1982). Bluethroat also had a significantly different distribution from the *Acrocephalus* species. The distribution of Moustached Warblers in the reed-bed of the Camargue is closely similar to that observed elsewhere on its migration route (Austria, Bairlein 1981; Italy, Baccetti 1985). In the cases of Reed Warbler, Sedge Warbler and Great Reed Warbler, the distributions in Camargue are similar to the three ringing stations of the "MRI Programme" (Berthold & Schlenker 1975). For Bluethroat, two of the three German stations have a similar pattern (Bairlein 1981).

During the breeding season in central Europe the vertical distributions of Reed Warbler, Moustached Warbler and Great Reed Warbler are the same in both cases as



↑ REED-BED
VACCARES
SHORE

FIGURE 2. Percentages of birds trapped in shelves in A to D (bottom shelf represented by lowest bar) for *Acrocephalus scirpaceus*, *A. melanopogon*, *A. schoenobaenus*, *A. arundinaceus*, *Luscinia svecica*, during the postbreeding migration, 1988.

FIGURE 3. Percentages of birds trapped in mist-nets 1 to 7 for *Acrocephalus scirpaceus*, *A. melanopogon*, *A. schoenobaenus*, *A. arundinaceus*, *Luscinia svecica*, during the postbreeding migration 1988.

in the Camargue (Leisler 1981). *Acrocephalus* warblers cover vertical distances by climbing; species living in higher vegetation are those showing the best climbing ability. This ecomorphological character is highly correlated with the structure of breeding habitat and has a great importance for habitat differentiation in this genus (Leisler & Winkler 1985). It seems that the vertical selection is almost identical in the breeding and postbreeding seasons.

Horizontal distribution

In all five species, the horizontal distribution was similar. An edge effect was evident, and the rate of captures was highest at the edge of the reed-bed. The edge between the reed-bed and the Vaccarès lagoon concentrates migrants, probably because it offers a greater diversity and abundance of prey than the reed-bed itself, and also

because it forms a physical border leading the birds south. The distribution of Bluethroat was different from two *Acrocephalus* warblers. Bluethroats were most strongly concentrated on the edge of the reed-bed, possibly because this species spends a greater part of its foraging time in open areas near reed-beds (pers. obs).

ACKNOWLEDGEMENTS

I wish to thank E. Coulet for permission to work in the National Reserve of Camargue. This study received the support of the Centre de Recherches sur la Biologie des Populations d'Oiseaux and I thank particularly C. Vansteenwegen. I am grateful to Prof. J. Blondel and Dr. Franz Bairlein for contributing criticisms and reading the manuscript, and to Dr. P. Duncan and G. Maille for the review of the English manuscript. Many thanks are also due to the people who helped me in the field.

TABLE 1. χ^2 comparisons among vertical distribution of five species (SCI : *Acrocephalus scirpaceus*, MEL : *A. melanopogon*; SCH : *A. schoenobaenus*; ARU : *A. arundinaceus*; SVE : *Luscinia svecica*) — Camargue, postbreeding period, 1988.

Symbols * and ** indicate $0.05 > P > 0.01$ and $P < 0.01$. Degrees of freedom are 3.

	SCI	MEL	SCH	ARU	SVE
SCI		*	NS	NS	**
MEL			**	**	**
SCH				NS	**
ARU					NS

TABLE 2. χ^2 comparisons among horizontal distribution of five species (SCI : *Acrocephalus scirpaceus*; MEL : *A. melanopogon*; SCH : *A. schoenobaenus*; ARU : *A. arundinaceus*; SVE : *Luscinia svecica*) — Camargue, postbreeding period, 1988.

Symbols * and ** indicate $0.05 > P > 0.01$ and $P < 0.01$. Degrees of freedom are 6.

	SCI	MEL	SCH	ARU	SVE
SCI		NS	*	NS	*
MEL			NS	NS	NS
SCH				NS	NS
ARU					*

REFERENCES

- BACCETTI, N. 1985. The vertical distribution of three passerine birds in a marshland of Central Italy. *Ring. & Migr.* 6: 93-96.
- BAIRLEIN, F. 1981. Ökosystemanalyse der Rastplätze von Zugvögeln. *Ökologie der Vögel* 3: 7-137.
- BAIRLEIN, F. 1983. Habitat selection and associations of species in European passerine birds during southward, postbreeding migrations. *Ornis Scand.* 14: 239-245.
- BERTHOLD, P. and SCHLENKER, R. 1975. Das "Mettnau-Reit-Ilmitz-Programm" — ein langfristiges Vogelfangprogramm der Vogelwarte Radolfzell mit vielfältiger Fragestellung. *Vogelwarte* 28: 97-123.
- BIBBY, C. J. 1982. Studies of west Palearctic birds. 184. Moustached Warbler. *Brit. Birds* 75: 346-359.
- CODY, M. L. 1974. *Competition and the structure of bird communities*. Monographs on Population Biology 7. Princeton University Press.
- CODY, M. L. (ed.). 1985. *Habitat selection in birds*. Academic Press, Orlando.
- LACK, D. 1971. *Ecological isolation in birds*. Blackwell.
- LEISLER, B. 1970. Vergleichende Untersuchungen zur ökologischen und systematischen Stellung des Mariskensängers (*Acrocephalus (Luscinola) melanopogon*, Sylviidae), ausgeführt am Neusiedler See. Diss. Phil. Fak., Univ. Wien.
- LEISLER, B. 1981. Die ökologische Einnischung der mitteleuropäischen Rohrsänger (*Acrocephalus*, Sylviinae). Habitattrennung. *Vogelwarte* 31: 45-74.
- LEISLER, B. and WINKLER, H. 1985. Ecomorphology. *Curr. Ornith.* 2: 155-186.