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RESOURCE DEFENSE BY A MIGRATING SONG SPARROW

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Abstract.—A migratory Song Sparrow (*Melospiza melodia*) was observed aggressively defending food on two different days in March 1988. The Song Sparrow initiated 45 attacks during 54 min on individuals of five different species of Emberizidae when these birds attempted to forage on the defended feeding board. Three of the species attacked have a larger mean body mass than Song Sparrows. Exclusive right to the food was maintained for only a few minutes at a time due to the number of other birds present. Seven distinct territorial behavioral patterns were displayed by this bird. Such behavior may be important for meeting energy requirements during migration.

DEFENZA DE RECURSOS POR PARTE DE INDIVIDUO MIGRATORIO DE *MELOSPIZA MELODIA*

Sinopsis.—En marzo de 1988, un individuo migratorio de *Melospiza melodia* fue observado defender agresivamente, durante dos dias diferentes, recursos alimenticios. Durante un periodo de 54 min el ave inicio 45 ataques sobre individuos pertenecientes a cinco especies (Emberizidae) que intentaron utilizar los recursos alimenticios defendidos por el migratorio. Tres de las especies atacadas tienen un peso mayor que el agresor. La exclusividad de los recursos fue mentenida por breve tiempo dada la superioridad numérica de las otras especies presentes. El gorrión mostró siete patrones diferentes de su conducta territorial. Este comportamiento puede ser importante para poder adquirir los recursos energéticos necesarios durante la migración.

Despite the extent to which bird migration has been studied, very little is known about en route behavior of migrating birds. Food acquisition may be the most important constraint on survival of migrants (Hutto 1985). This forces them to use habitats in a manner that provides efficient intake. Consequently, studies have shown that use of space by migratory birds is positively correlated with prey density (Davis 1973, Goss-Custard 1970, Tinbergen 1981), and some migrants defend localized territories of rich food resources (Bibby and Green 1980, Rappole and Warner 1976, Sealy 1988). For example, Rappole and Warner described territorial behavior in detail for migrant Northern Waterthrushes (*Seiurus noveboracensis*), which stopped over in southern Texas, and Sealy described a similar situation in Cape May Warblers (*Dendroica tigrina*) that made stopovers at Delta Marsh, Manitoba.

During the winter, Song Sparrows (*Melospiza melodia*) often forage with mixed-species flocks of sparrows in oldfield habitats in the piedmont of Georgia (Young 1988). The winter distribution of this species extends much further south, and the southern limit of its breeding range is approximately the northern one-third of the state (Bent 1968:1522). In this paper, I describe aggressive defense of food resources by a migrating Song

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Sparrow, to my knowledge, the first description of this behavior for Song Sparrows.

METHODS AND RESULTS

During November and December 1987, I color banded wintering sparrows on a one ha. oldfield in the Whitehall Forest Research Area, Clarke County, Georgia. The oldfield, which was surrounded by deciduous woods and privet (*Ligustrum vulgare*), was dominated by broomsedge (*Andropogon virginicus*) and blackberry (*Rubus* sp.). Mist nets and baited four-cell Potter's traps were used to capture the birds, and for individual recognition each sparrow was given a U.S. Fish and Wildlife Service band plus a unique combination of plastic color bands. Subsequent banding sessions were conducted throughout the winter to keep all individuals at the oldfield marked.

I observed interactions between marked birds at a 120 cm^2 feeding board on the ground as part of a study dealing with mixed-species foraging groups (Young 1988). I sat in a canvas blind approximately three meters from the board and used 10× binoculars to identify individuals. One hundred grams of a white millet (*Panicum miliaceum*) and canary seed (*Phalaris canariensis*) mix were spread evenly on the board at the start of each observation period.

A banded Song Sparrow was last observed on the feeding board on 11 Mar. 1988. At this time it appeared that all Song Sparrows at the site were color banded, since no unbanded individuals had been seen for 24 d. On 29 Mar. an unbanded individual appeared at the feeding board and began aggressively defending the board from all other birds. Detailed notes were recorded due to the unfamiliar behavior that the bird displayed. I recorded the number and outcome of encounters the Song Sparrow initiated with all other sparrows. I scored a win for the Song Sparrow if the attacked individual was supplanted, and a loss if it was not and the Song Sparrow retreated.

The Song Sparrow came onto the board for the first time at 0653. It held its body rigidly with feathers ruffled. The bird immediately defended the board from all other individuals of all species and held exclusive rights to the board for 8 min. At this time, the number of additional birds trying to use the board had risen to such a level that the Song Sparrow could not guard all sides of the board from their intrusion, however, it still made attempts at defending the board for another 7 min.

The Song Sparrow initiated aggressive interactions with a male Northern Cardinal (*Cardinalis cardinalis*), a male and a female Rufous-sided Towhee (*Pipilo erythrophthalmus*), 11 White-throated Sparrows (*Zonotrichia albicollis,* two Swamp Sparrows (*M. georgiana*), and two Field Sparrows (*Spizella pusilla*). All of these species with the exception of the Field Sparrows and the Swamp Sparrows are typically larger than Song Sparrows in body mass (Dunning 1984). Although the Song Sparrow supplanted a male Northern Cardinal three times, it did not continually attack the Cardinal as it did other sparrows.

The bird returned at 0714 and 0723 and immediately started chasing away other birds. A total of 39 min. was spent near the board giving various territorial displays. Besides aggressive "pursuit," "fighting," and "striking," additional territorial behavior was noted in the form of "menacing behavior" and "threat posture" (Nice 1964:157). In terms of vocalizations "low threat notes" were uttered from the board, whereas "advertising song" (Nice 1964:157) was given from a perch off the board.

Much of this same behavior was repeated for 15 min on 30 Mar. by an unbanded Song Sparrow. I believe this bird was probably the same individual. On this day, however, fewer birds were using the board when the Song Sparrow arrived (0805) and it easily obtained exclusive use of the much depleted seed supply.

Over the two day period, the Song Sparrow initiated a total of 45 interactions with other sparrows (four with a Northern Cardinal, three with Rufous-sided Towhees, 29 with White-throated Sparrows, six with Swamp Sparrows, and three with Field Sparrows). Of the interactions the Song Sparrow only lost two (one each to a male and female Towhee) according to the above definitions.

DISCUSSION

Song Sparrows are early migrants for the Emberizidae family (Bent 1968:1514, Pyle et al. 1987:215). The last observation of a winter resident Song Sparrow at the field site occurred on 11 Mar. With the subsequent disappearance of this bird, I assumed that all the Song Sparrows had migrated north or otherwise left the oldfield for a breeding site. Thus, the unbanded Song Sparrow of 29 Mar. was probably a migrant. Occasionally birds at the site lost color bands, but this occurred predominantly in the larger species such as Cardinals and Towhees. Two Song Sparrows known to have returned to the site from the previous winter had their color bands intact. This evidence and the lack of an aluminum USFWS band strongly suggested that the bird in question was a true migrant at a stopover.

Nice (1964:157) listed ten methods of intimidation displayed by Song Sparrows. The migrant bird observed here displayed seven toward the other sparrows. When the Song Sparrow first arrived, it appeared in bad condition as its wings drooped and its feathers were puffed out. However, soon after it began to defend the board, I realized that this was a threat posture. The bird behaved in the manner described by Nice as "threat posture, puffing" or "threat posture, balloon."

The Song Sparrow initiated fewer encounters with Cardinals and Towhees than the other species and eventually tolerated a male Cardinal on the board. When the Cardinal was on the board, White-throated Sparrows approached the board in a manner that put the male Cardinal between them and the Song Sparrow. The Song Sparrow, however, moved around the Cardinal to chase the White-throats. The behavior of the White-throats was also similar to that described by Diamond (1981) as "Gang Theory" or "strength in numbers advantage" (Moore 1977) where

the invaders of a territory come in a group to overwhelm the owner (e.g., Robertson et al. 1976, Merritt 1980, Pietz and Pietz 1987).

Unlike the territories observed in Cape May Warblers (Sealy 1988) or Northern Waterthrushes (Rappole and Warner 1976) which lasted up to several days, the Song Sparrow only defended this particular resource for several minutes at a time. However, I believe this individual remained at the site for at least two days, and territorial behavior was observed on both days. Most of the other sparrows in the field (approximately 35) were habituated to use of the board, and as it was an abundant food source, they were often congregated there. This no doubt made the board conspicuous for migrants in the area, but also very hard to defend as a territory.

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Association of Field Ornithologists–Wilson Ornithological Society Joint Annual Meeting 31 May–3 June 1990

(Tentative schedule)

31 May Arrival; Council meetings; reception sponsored by Nuttall Club

1 June
- 0800 Welcome
- 0830 Symposium: Amateur in Ornithology
  - 0830 Opening remarks
  - 0840 From the pilgrims to the present: the contributions of amateur ornithologists—Mary Clench
  - 0915 The amateur: finding a niche in ornithology—Harold Mayfield
  - 0950 Coffee break
  - 1005 Contributions amateur banders have made and can make—Robert Yunick
  - 1040 View from the banding laboratory—John Tautin
  - 1115 Discussion
- 0800 Banding at Manomet Bird Observatory
- 1130 WOS business meeting
- 1200 Picture, Lunch
- 1330 Workshop: Towards standardization of field techniques and data management among bird banders—Christopher Rimmer
- 1330 Contributed paper sessions 1 and 2
- 1800 Dinner
- 1930 Poster paper session, reception hosted by Wheaton College and Manomet Bird Observatory

2 June
- 0800 AFO business meeting
- 0850 Banding at Manomet Bird Observatory
- 0850 Symposium: American Avian Zoogeography
  - 0850 Opening remarks
  - 0900 Origins and development of American avian zoogeography—Francois Vuillemier
  - 0935 Use of BBS, BBC, and WBPS to track zoogeographic change—Chan Robbins
  - 1010 Coffee break
  - 1025 Current problems and answers in zoogeography—Russell Greenberg
  - 1100 Global warming, deforestation and the future of avian zoogeography—Elliot Tramer
  - 1135 Discussion
- 1200 Lunch
- 1315 WOS business meeting
- 1400 Workshop: Conservation of coastal wetlands in the western hemisphere—Keith Bildstein
- 1400 Contributed paper sessions 3 and 4
- 1700 Cash Bar (?)
- 1800 Banquet Speaker: Frank Gill Title: The Quest for Pere David's Tit

3 June Field trips

Program chairs:

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