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Roost Site Tenacity in Gambel's White-crowned Sparrows

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INTRODUCTION

Adult White-crowned Sparrows (*Zonotrichia leucophrys*) exhibit stronger attachment to winter home range than immatures (Mewaldt 1976; Ralph and Mewaldt 1975, 1976). This difference is attributed to greater adult experience or familiarity with a winter area. Attachment to a winter area is assumed to be related to habitat quality. However, the extent to which attachment is influenced by specific habitat features is unknown.

Cover-seeking behavior is common in most animal aggregations (Hamilton 1971). Cover is a critical habitat feature for wintering flocks of White-crowned Sparrows. During the day, birds seldom forage more than 4 m from cover (Pulliam and Mills 1977). At night, they are known to roost communally in select cover (personal observation).

Communal roosts may have anti-predation features, function as information centers, and offer sanctuary from inclement weather (Lack 1968; Ward and Zahavi 1973). Recent studies have explored communal roosting behavior in flocking Sturnidae and Emberizidae (see Morrison and Caccamise 1990 and references therein). Age-related centripetal dominance hierarchies have been documented in communal roosts of European Starlings (*Sturnus vulgaris*) (Summers et al. 1987) and Red-winged Blackbirds (*Agelaius phoeniceus*) (Weatherhead and Hoysak 1984). Communal roosts remain unstudied in White-crowned Sparrows.

Attachment to a winter area may be influenced, in part, by roost site quality and/or by intraspecific behavioral interactions that may occur at roosts. This study reports differences in winter roost site tenacity for displaced immature and adult Gambel's White-crowned Sparrows (*Z. l. gambelii*). Site tenacity is compared with that found for feeding areas (Ralph and Mewaldt 1976).

METHODS

Gambel's White-crowned Sparrows were mist netted (at dusk) once each week at two winter roosts, 3.7 km apart, near Bakersfield, California (lat-long 352-1190). Roost

sites consisted of patches of mature quail brush (*Atriplex lentiformis*), surrounded by fallow fields of annual grasses (*Bromus* sp.).

Birds captured at roost site A were displaced 3.7 km east and released at another White-crowned Sparrow roost (site B). Displacements were made between 01 December 1989 and 23 February 1990. Only those birds recaptured six or more days after displacement (ending 29 March 1990) were designated as recaptures (refer to Ralph and Mewaldt 1976). Age was determined by crown color.

RESULTS AND DISCUSSION

A total of 119 birds were displaced in this study (Table 1). Of 72 adults, 19.4% were recaptured at the home roost (site A). Of 47 immatures, none was recaptured at the home roost. Recapture frequencies for adults and immatures at the home roost were dissimilar (2 x 2 contingency table $\chi^2 = 8.55$, $p < 0.001$).

Table 1. Number and percent of Gambel's White-crowned Sparrows displaced 3.7 km and recaptured at home roost site and new roost site.

	Birds Displaced From Home Roost Site	Birds Recaptured At Home Roost Site		Birds Recaptured At New Roost Site	
	N	N	%	N	%
Immature	47	0	0.0	13	27.7
Adult	72	14	19.4	13	18.1
Total	119	14	11.8	26	21.8

In a study of winter area attachment in *Zonotrichia* spp., Ralph and Mewaldt (1976) found that substantial numbers of displaced adults and immatures returned to their home feeding station (Table 2). Difference in numbers returning were not statistically significant (2 x 2 contingency table, $\chi^2=1.80$, $p>0.15$).

Table 2. Number and percent of *Zonotrichia* spp. displaced 1-20 km and recaptured at home feeding area or new feeding area. (Data from Ralph and Mewaldt 1976).

	Birds Displaced From Home Feeding Area	Birds Recaptured At Home Feeding Area	Birds Recaptured At New Feeding Area		
	N	N	%	N	%
Immature	67	11	16.4	13	19.4
Adult	51	15	29.4	8	15.7
Total	118	26	22.0	21	17.8

Comparison of birds recaptured at home roosts (this study, Table 1) with those recaptured at feeding stations (Ralph and Mewaldt 1976, Table 2) reveals differences in recapture frequencies (corrected $\chi^2=6.19$, $0.01 < p < 0.02$). These differences are attributable, in part, to the paucity of displaced immatures returning to a home roost.

If retrap frequencies are a measure of site tenacity, then it is noteworthy that (1) adults exhibit greater tenacity for home roost site than immatures, and that (2) both age classes exhibit greater tenacity to a feeding area than to a home roost site. Observations suggest that wintering White-crowned Sparrows are more faithful to a diurnal activity center (e.g., feeding location) than to a roost site. Findings corroborate observations reported for European Starlings (Morrison and Caccamise 1985).

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