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RELEASE CALLS OF MIST-NETTED BIRDS

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Abstract.—Release calls may be given by mist-netted birds upon release from the hand. The calls are short, repeated notes with a wide frequency range. Species that flock, during migration or on the wintering grounds, call significantly more than non-flocking species. Resident and migrant species show no difference in the incidence of calling. The calls may be given in order that the calling individual can relocate its flock. Experiments reported in this paper support these conclusions.

LLAMADAS DE LIBERACIÓN DE AVES CAPTURADAS CON REDES

Resumen.—Las aves pueden vocalizar (llamadas de liberación) cuando son liberadas, luego de haber sido atrapadas con redes. Esta vocalización es corta y consiste de notas que se repiten, aunque las mismas muestran una amplia gama en sus frecuencias. Las especies que se asocian en grupos durante la migración o en sus áreas en donde pasan el invierno, vocalizan más que las aves que no se agrupan. No se encontró diferencias en la incidencia de llamadas de liberación entre especies residentes o migratorias. Los experimentos que se llevaron a cabo tienden a indicar, que este tipo de llamada puede ayudarle al ave liberada a relocalizar su grupo, o atraer hacia ésta miembros del mismo.

During many years of bird banding, I have observed that some birds vocalize upon release from the hand whereas others are silent. The calls that I have labeled release calls, are short, repeated notes usually given as the bird flies away from the bander, although some species call only upon reaching the surrounding vegetation. Release calls are given at all times of the year, by those species that I have handled in more than one season such as the American Robin (*Turdus migratorius*). I assume that release calls are also given at all times of the year by those species that do not breed in my banding areas, such as the Tennessee Warbler (*Vermivora peregrina*). Since the production of such a call would require a minimal amount of energy, I believe that birds that give release calls produce them at all times regardless of their physiological status. Because the biological significance of release calls has not been discussed previously, I report comparative data on their distribution among species and speculate on their function.

Release calls are not synonymous with distress calls of a bird in the hand, for which there is an abundant literature (Hogstedt 1983, Inglis et al. 1982, Norris and Stamm 1965, Perrone and Paulson 1979, Rohwer et al. 1976). These two calls are distinguished by context; possible differences in call characteristics have not been examined.

I propose that release calls are given by an individual to send information about its location to facilitate regrouping with either its mate or

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offspring, or a mixed or single species flock. The banding process causes captured birds to lose contact with other individuals with which they may have social relationships. From this working hypothesis, two predictions can be made and tested. (1) Release calls should be given more frequently by resident individuals than non-resident individuals (the latter including migrants and winter visitants), as residents probably would have either a mate or kin in the area. The advantages for regrouping with a mate or kinship flock would be to protect them from predators, as well as supplying them with food (during the breeding season). (2) Release calls should be given more frequently by individuals of species that normally travel in flocks than by individuals of species that travel alone. A group of birds is considered to be a flock if it shows positive social behavior (Moriarty 1976, Thompson 1964). Social behavior is varied and ranges from shared call notes to morphological characters such as color patterns (Hinde 1973). Birds that are members of a flock benefit by reduced predation (Caraco et al. 1980, Goldman 1980, Pulliam et al. 1982) and by increased feeding rates (Caraco 1979a,b; Elgar 1986).

METHODS

Birds were mist-netted 20 Sep.–23 Nov. 1981 and 11 Sep.–7 Nov. 1982 at the Peffer Park Nature Preserve on the Miami University campus, Oxford, Butler County, Ohio, and 20 Sep.–25 Oct. 1986 in Perry County, Pennsylvania. Additional fall data on select species were collected by S. A. Rohwer in Kansas, New York, and Washington and by the author in Wisconsin. All individuals captured by the author were removed from the nets, placed in socks, and taken to the handling area 25–95 m from the site of capture. The birds netted by Rohwer, however, were released at the net. All birds were banded using a standardized procedure to eliminate any effect variation in handling might have on calling. The incidence of release calls was recorded as the bird flew away or as soon as it landed in the nearest vegetation which was always within 15 s. In 1982, release calls of a variety of species were recorded on a Uher 4000 IC recorder and sonograms were prepared using a Kay Elemetric Model 7029A sonograph.

Data were obtained for 644 individuals of 37 species (Table 1). Only those species represented by three or more individuals were included in the following analyses. A species was designated as flocking based on published accounts or personal observations. Not all species listed as flocking join flocks during migration, some flock only when they reach their wintering grounds in Central or South America. Residency status for Ohio caught birds was assigned by consulting Trautman and Trautman (1968). The residency status of those birds netted by Rohwer was determined by him, but in no case was the residency status different from Ohio caught birds of the same species. There was no difference in the residency status of birds of the same species caught in Pennsylvania or Wisconsin. Those species whose resident or migrant status could not be

determined were not used in comparisons between resident and non-resident species.

RESULTS AND DISCUSSION

Migrant and wintering species called as frequently as resident birds upon release (Fisher's exact text, $P > 0.15$), whereas flocking species called significantly more frequently than non-flocking species (Fisher's exact test, $P = 0.017$). Sonograms of some representative release calls are presented in Figure 1. The release calls are characterized by short, repeated notes with a wide frequency range (1–16 KHz). The release calls are similar to the mobbing calls discussed by Marler (1957) in that they show convergence for being easily located. Among the release calls presented in Figure 1, that of the American Robin is distinct to the human ear while the others are similar and can be best described as "chips." The distinct release call of the American Robin is of interest, since the robin forms large, single species flocks in the fall and winter. Other species that form single species flocks also have distinct release calls. The release call of the Black-capped Chickadee (*Parus atricapillus*) and the Carolina Chickadee (*P. carolinensis*) is the "chick-a-dee" call which is very different sonographically from the calls presented in Figure 1 (Ficken et al. 1978, Nowicki 1983). The release calls of the American Goldfinch (*Carduelis tristis*) and the Rosy Finch (*Leucosticte tephrocotis*) also differ from the release call presented in Figure 1 (Mundinger 1970, Shreeve 1980). This suggests that those species that form strong single species flocks have very distinct release calls whereas species that join loose flocks or mixed species flocks seem to have more convergent calls.

These results are consistent with the hypothesis that the calls given by banded birds upon release are used to locate or attract other members of the flock with which they are associated. This argument is strengthened by examination of the release call of the American Goldfinch, which uses the "perchickoree" flight call as its release call. Mundinger (1970) has shown that the flight call is used by mated pairs as an individual recognition signal. Each male has a repertoire of one to three flight calls at least one of which is not shared with any other male. When an individually specific male flight call is played back to females sitting on the nest, only the mate of the male, whose call was used, responded to the playback. Mundinger suggested that flight calls may also be used to maintain flock cohesion in the non-breeding season.

Further evidence that release calls function in flock cohesion is seen if one releases three or four individuals of a flocking species, such as the White-throated Sparrow (*Zonotrichia albicollis*), the House Finch (*Carpodacus mexicanus*), or the Pine Siskin (*Carduelis spinus*) at the same time. Although the birds may fly in different directions, they give release calls prior to forming a flock (Knopf 1983; J. A. Smallwood, pers. comm.; pers. obs.).

Some flocking species rarely or never gave release calls (American Tree

TABLE 1. Species mist-netted and tested for incidence of release calls.

Species	*n*	Number calling	Percent calling	Flocking[a] status	Resident[b] status
Downy Woodpecker *Picoides pubescens*	3	0	0	F (1)	PR
Least Flycatcher *Empidonax minimus*	4	0	0	NF (2)	M
Blue Jay *Cyanocitta cristata*	3	1	33	F (3)	U
Black-capped Chickadee *Parus atricapillus*	18	12	67	F (4)	PR
Carolina Chickadee *Parus carolinensis*	23	14	61	F (5)	PR
Tufted Titmouse *Parus bicolor*	26	0	0	F (6)	PR
White-breasted Nuthatch *Sitta carolinensis*	3	3	100	F (7)	PR
Brown Creeper *Certhia americana*	6	1	17	F (8)	M
Golden-crowned Kinglet *Regulus satrapa*	26	11	42	F (9)	M
Ruby-crowned Kinglet *Regulus calendula*	12	7	58	F (9)	M
Gray-cheeked Thrush *Catharus minimus*	6	0	0	NF (8)	M
Swainson's Thrush *Catharus ustulatus*	6	1	17	NF (8)	M
Hermit Thrush *Catharus guttatus*	11	5	45	NF (8)	M
American Robin *Turdus migratorius*	49	48	98	F (9)	U
Gray Catbird *Dumetella carolinensis*	28	16	57	NF (10)	M
Cedar Waxwing *Bombycilla cedrorum*	7	4	57	F (11)	U
Tennessee Warbler *Vermivora peregrina*	6	5	83	F (8, 12)	M
Magnolia Warbler *Dendroica magnolia*	8	2	25	F (8)	M
Yellow-rumped Warbler *Dendroica coronata*	34	34	100	F (12)	M
Bay-breasted Warbler *Dendroica castanea*	4	4	100	F (13)	M
Ovenbird *Seiurus aurocapillus*	10	3	30	NF (8)	M
Common Yellowthroat *Geothlypis trichas*	7	7	100	NF (8)	M
Northern Cardinal *Cardinalis cardinalis*	60	38	63	F (14)	PR
Rose-breasted Grosbeak *Pheucticus ludovicianus*	3	3	100	F (14)	M
Indigo Bunting *Passerina cyanea*	5	1	20	F (14)	M
American Tree Sparrow *Spizella arborea*	20	0	0	F (14)	M
Chipping Sparrow *Spizella passerina*	3	2	67	F (14)	M
Field Sparrow *Spizella pusilla*	13	8	62	F (14)	M
Fox Sparrow *Passerella iliaca*	8	6	75	F (14)	M

TABLE 1. Continued.

Species	*n*	Number calling	Percent calling	Flocking[a] status	Resident[b] status
Song Sparrow *Melospiza melodia*	24	0	0	NF (8)	U
White-throated Sparrow *Zonotrichia albicollis*	50	31	62	F (14)	M
Dark-eyed Junco *Junco hyemalis*	20	17	85	F (14)	M
Brown-headed Cowbird *Molothrus ater*	3	2	67	F (15)	U
Purple Finch *Carpodacus purpureus*	3	0	0	F (14)	M
House Finch *Carpodacus mexicanus*	37	34	92	F (14)	PR
Pine Siskin *Carduelis pinus*	5	1	20	F (14)	M
American Goldfinsh *Carduelis tristis*	90	76	84	F (14)	PR
Totals: 37 species	644				

[a] Flocking status: F—Flocking; NF—Non-flocking; A species is labeled as flocking if it occurs in either single or mixed species flocks. Sources for flocking status: 1—Bent 1939; 2—Bent 1942; 3—Bent 1946; 4—Ficken et al. 1981; 5—Smith 1972; 6—Condee 1970; 7—Ingold 1977; 8—Personal observation; 9—Bent 1949; 10—Bent 1948; 11—Bent 1950; 12—Bent 1953; 13—Griscom and Sprunt 1957; 14—Bent 1968; 15—Bent 1958.

[b] Resident status: PR—Permanent resident; M—Migrant; U—Unknown; Status designations for Ohio netted birds from Trautman and Trautman 1968.

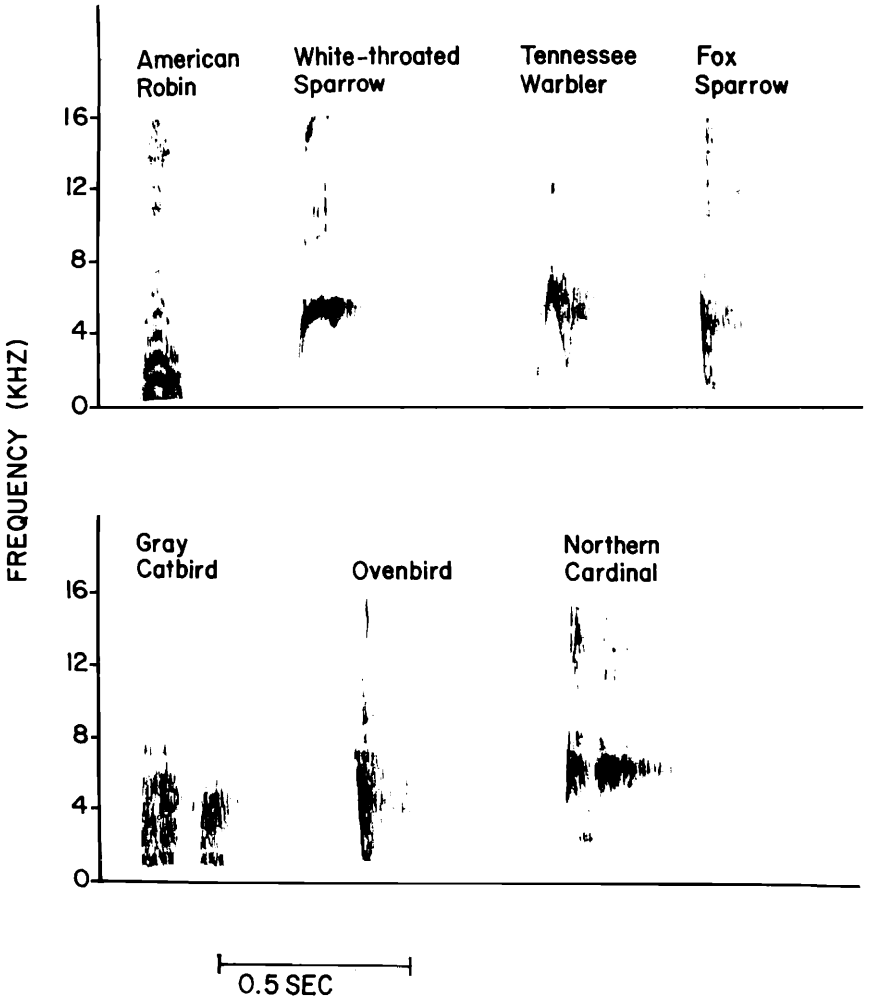

FIGURE 1. Sonograms of release calls from select species of birds.

Sparrow, *Spizella arborea*; Purple Finch, *Carpodacus purpureus*; Table 1). The American Tree Sparrow maintains only loose flocks (Baumgartner 1938; S. A. Rohwer, pers. comm.) and therefore may not require a mechanism for maintaining flock cohesion.

The data best support the prediction that birds in flocks, during at least part of their life-cycle, are more apt to give release calls than those species that never flock. This idea could be tested in a variety of ways. A simple playback experiment could determine if members of a flock respond to release calls by moving towards the caller. It would be more

difficult, however, to determine if the release call causes members of the flock to call in response, thereby leading the released bird back to the flock. One method would be to monitor behavior of an individual of a flocking species to a playback of a release call from the same species.

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