ALERT CALLS OF MALE RED-WINGED BLACKBIRDS: 
DO FEMALES LISTEN?

by

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Introduction

Two approaches used for investigating the function of animal signals have proved especially productive. In one, the environmental contexts in which particular signals are generated are recorded, and correlational relationships are used to infer function (Smith, 1977). Vocalizations given by animals only when they detect potential predators are thought, for example, to serve as anti-predation signals. The other approach is to identify the intended receivers of an animal's signals. Determining, for example, that a male's call is directed at female conspecifics permits at least a preliminary assessment that the call has some function in inter-sexual communication. I used this latter approach to investigate alert calls of male red-winged blackbirds (Agelaius phoeniceus).

Breeding male redwings use a communal vocal alert system to warn about predators that incorporates several unusual features. Foremost is that communication is achieved in part by "call switching" (Beletsky et al., 1986). An individual broadcasts a series of the same brief call and transmits alerting information by switching call types after, for instance, detecting an approaching predator. Most territory owners in small breeding "colonies" give the same call type at the same time, as a common background signal. After one male changes call types during alerting behavior, other males quickly switch to the same type, resetting the alert system to a new baseline. Many call types are interchangeably used as background signals (Beletsky et al., 1986).

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Another novel feature is that male redwings give “alert” calls during most of the day throughout the breeding season. The alert system is always operating, in contrast to alarm systems of most other animals that have been studied, in which calling starts only after predators are detected (e.g., great tits, *Parus major*, Curio & Regelmann, 1985; California ground squirrels, *Spermophilus beecheyi*, Owings et al., 1986; reviewed by Klump & Shalter, 1984). Furthermore, the number of different alert calls used, between 10 and 15 in various populations (Orians & Christman, 1968; Simmers, 1975; Beletsky, unpubl. data), and the vocal barrage resulting from the high rate of calling and call switching of many males on crowded breeding marshes, suggests levels of complexity to this alerting system that are not yet fully understood.

In a preliminary study (Beletsky et al., 1986), I used contextual analysis and other methods to provide a basic description of this alert system and to suggest that males use their alert calls to warn each other about predators and other potentially dangerous environmental disturbances. By call-matching and call switching, in natural and experimental situations, males demonstrated their perception of predator-evoked call switches and, presumably, reception of alerting information. The system appears to be intra-sexually cooperative because neighboring males match call types and switch types together. The initial study did not address the question of whether females breeding on a male’s territory, and perhaps their young, also listen to and benefit from alert calls. In fact, mates and young may be the primary intended receivers of male alert calls. My objective in the present study was to test the hypothesis that males direct their alert calls to their mates. Because the two hypotheses of the function of these alert calls, that males use them to warn other males (Beletsky et al., 1986) or to warn their mates (this study) are not mutually exclusive, the results of the current study cannot discriminate between these hypotheses. They can only provide support for the mate-warning hypothesis.

Female redwings build nests in the dense vegetation of their mates’ marsh territories. They incubate unassisted by their mates and do most of the provisioning of young. Females spend much of their time foraging for themselves and their young, both on and near territory. Males in my study area spend about two-thirds of their daylight hours on their territories during most of the breeding season, calling about 80% of the time (see below). Females could benefit by attending to their mates’ steady streams of calls and receiving information about predator detection and movements because they could reduce their expenditure of time.