

RUFFED GROUSE VOCALIZATIONS AT THE DRUMMING LOG

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The male Ruffed Grouse (*Bonasa umbellus*) utilizes an elevated stage, usually a log, to carry out a spectacular performance in which the major sounds are produced by his beating wings. This drumming and other displays have been thoroughly described by Hjorth (1970). The drumming (Fig. 1, Bottom) is of low frequency sounds and is given about every four minutes during its peak, which is 30 minutes before sunrise (Palmer, 1969). Male grouse also utilize vocalizations while on or near the drumming stage. While conducting an analysis of the drums of Ruffed Grouse, I had the opportunity to record these vocalizations, which are presented and analyzed in this paper.

METHODS

These vocalizations were taped while recording 11 grouse in the spring of 1971 and 1972, using the method described by Samuel et al. (in press). The microphone was placed within five feet of the drumming log and operated by a remote off-on switch. Sonagrams were processed through a Kay Electric Company Sona-graph, Model 6061-B, using the wide band pass filter and FL-1 circuit. Irrelevant noise in the recordings was removed from the sonagrams. As direct observations were not made and no experiments were conducted, the functional significance of these calls can only be inferred. One tape was sent to Gordon Gullion, an expert on Ruffed Grouse, for his interpretations which are presented here.

RESULTS AND DISCUSSION

Queet Call.—This call, recorded here as *queet-queet-queet*, was given by seven drumming males (Fig. 1, Top and Middle). In two instances this call immediately preceded drums, three times it preceded flight, and once it was given with an accompanying leaf rustle, indicating movement of the bird near the drumming log. Gullion (pers. comm.) confirmed that the *queet* is “given by a bird that doesn’t quite know what to do,” and “is usually followed by a bird running or flushing.” Aubin (1970) referred to a series of alarm calls (“queet, queet, queet”), immediately preceding flight. Bump *et al.* (1947:97) stated that this same call given just before a bird flushed was an expression of curiosity.

Trills.—On 10 May 1972 a *queet* was preceded and followed by trills (Fig. 2, Bottom). This was the only time a trill was recorded. This bird gave 5 trills, about 50 *queets*, 2 trills, 5 *queets*, and then flushed from the drumming log. The function of the trill is not known to me.

Psst, Hiss, and Whine Calls.—On 5 May 1972 I recorded an encounter between a resident male and a male or female intruder. Various calls were

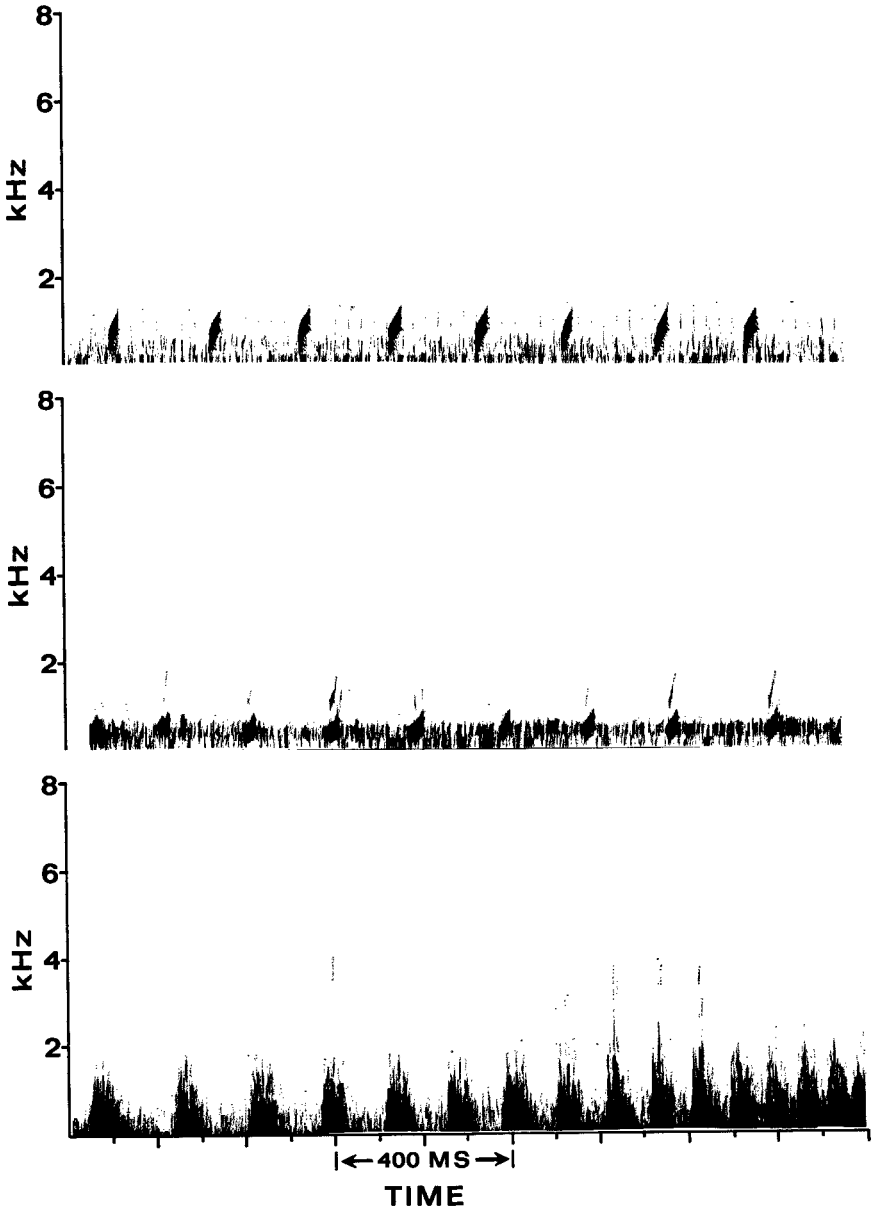


FIG. 1. Top and Middle: The *queet* call given by two different male Ruffed Grouse. Bottom: A small portion of wing beats from a single Ruffed Grouse drumming sequence.

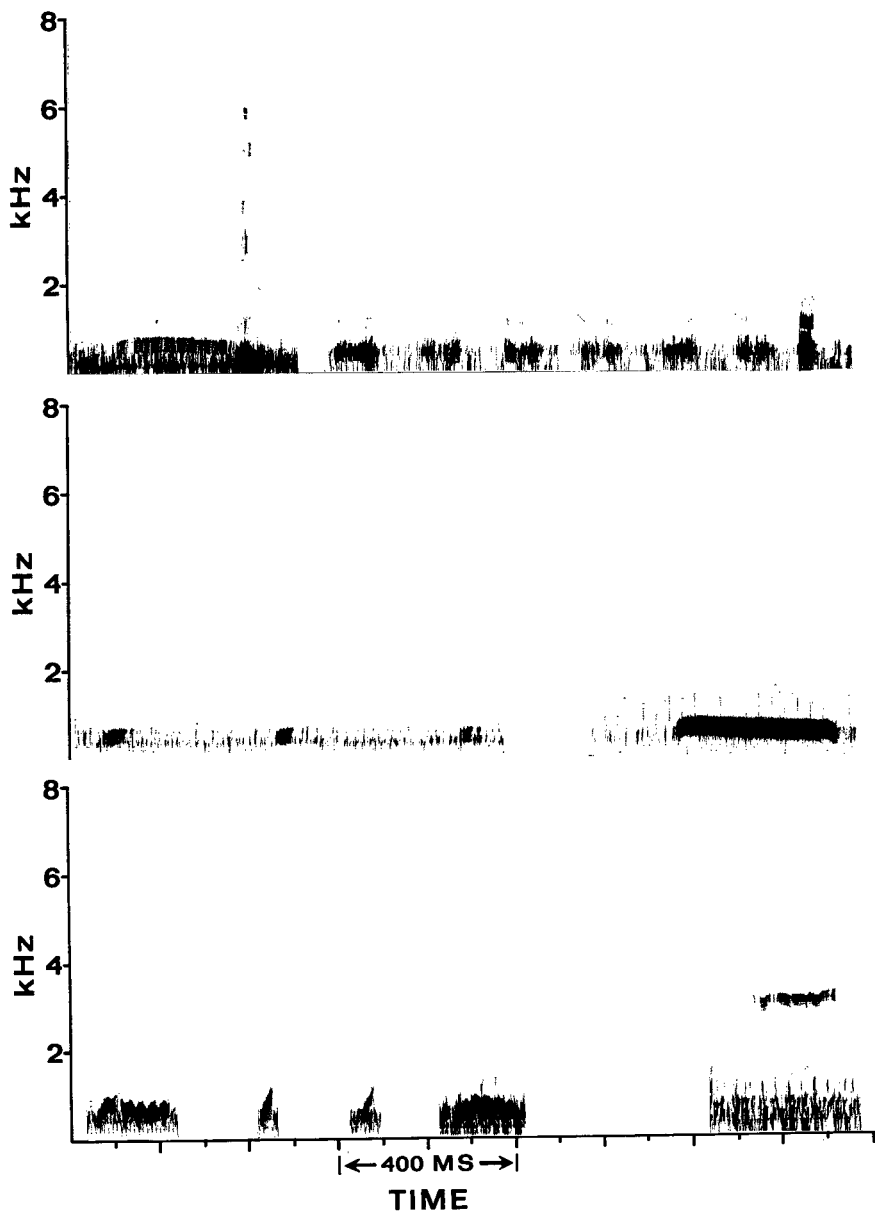


FIG. 2. Top: on left, a "long whine" immediately followed by a single wing beat; on right, a series of hiss calls ending with a pop. Middle: on left, a series of "short whine" calls; on right, a call very similar to the "long whine" call. Bottom: on left, a trill, 2 *queets*, and a trill; on right, a *psst* call.

given and all appeared to come from the resident male. The two minute sequence of events and calls were as follows: first one light *psst* call (Fig. 2, Bottom) was given by the drumming male; the bird then pecked the ground near the microphone for 30 seconds; four seconds of loud leaf rustle was followed by 15 seconds of silence, a drum was followed by a "long whine" (Fig. 2, Top) which was preceded and followed by a single wing beat, a "hiss" (Fig. 2, Top) sounding like a locomotive lasted 5 seconds terminating with a loud pop and an immediate rustle of leaves, a series of "short whines" (Fig. 2, Middle) was given for 20 seconds. This series of vocalizations continued for six minutes and ended with a bird, presumably the resident, continuing his drumming activities. An interpretation of this taped sequence emerges from the review of the literature which follows.

Aubin (1970:31-32) observed eleven grouse interactions, noting "as the resident male approached the intruder, several sharp blows of the bill were directed towards the ground. Following some displacement activity, the resident male usually drums, then rushes at the adversary in intimidation display." Hjorth (1970:235) also discussed behavior associated with an intruder entering a resident territory. He noted the ground pecking and describes the "Bowing cum Head-twisting and Panted Hissing." Rapid head twisting is accompanied by the "hiss" (Fig. 2, Top) which was likened to an accelerating locomotive. Bump *et al.* (1947) stated that this head twisting and "hiss" was followed by a short rush at the female. This could explain the loud leaf rustles heard following each "hiss." No authors refer to the *psst* call, the pop occurring at the end of the "hiss" sequence nor the "short and long whine" calls which were interspersed throughout. During the last minute of this sequence, one bird gave 40-50 *queet* calls, but no sounds of flight were noted.

One other vocalization, similar to the "long whine" (Fig. 2, Top) was recorded at another drumming log on 5 May 1972. This call (Fig. 2, Middle) was much louder than the "long whine," but since it was followed by a single wing beat this difference may have been a reflection of distance from the microphone. After a pause of 30 seconds, he called and gave another wing beat. This continued for three minutes, ending with a drum.

DISCUSSION AND CONCLUSIONS

Hjorth (1970) and Aubin (1970) both present good descriptions of Ruffed Grouse behavior around drumming stages. From my observations, various calls appear to play an integral and as yet not fully determined role in these behavior patterns. Interesting comparisons of these calls can be made with sonagrams from other species given in Hjorth (1970). For example, the "hissing" calls (op. cit.:332) of the Black Grouse (*Lyrurus*

tetrix) are very similar in appearance to the Ruffed Grouse "hiss." The Greater Prairie Chicken's (*Tympanuchus cupido*) "whoop" call (op. cit.:381) resembles the "long whine" call, as does the "cackle" (op. cit.:404) given during encounters of male Lesser Prairie Chicken (*T. pallidicinctus*). A complete sonographic analysis of all calls may contribute to our knowledge of phylogenetic relationships within the Tetraonidae.

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