

EFFECTS OF PONCHO-MOUNTED RADIOS ON BLUE GROUSE

PETER J. PEKINS¹

*Utah Cooperative Fish and Wildlife Research Unit
Utah State University
Logan, Utah 84322-5210 USA*

Abstract.—Blue Grouse (*Dendragapus obscurus*) that received transmitters during winter experienced two types of mortality directly related to poncho-mounted radios. Deaths resulted from collision with trees upon release or esophageal blockage. Collisions were eliminated by placing captured Blue Grouse in snow burrows to prevent escape flight. Esophageal blockage was avoided by a vertical slit at the base of the poncho hole to increase clearance for large food items.

EFFECTOS DE RADIOTRANSMISORES TIPO PONCHO EN *DENDRAGAPUS OBSCURUS*

Resumen.—Especímenes de *Dendragapus obscurus* a los cuales se le colocaron transmisores durante el invierno, experimentaron dos tipos de mortandad directamente relacionado a los radiotransmisores tipo poncho. Las muertes resultaron de colisiones con árboles o por bloqueos esofageales. El problema de colisiones fue eliminado al colocar las aves capturadas en cuevas en la nieve para evitar vuelos súbitos de escape. El bloqueo esofageal se evitó con una incisión vertical hecha en la base del hueco del poncho para permitir el paso de alimento de mayor tamaño.

Ponchos for radio transmitters were developed to solve behavioral and survival problems occasionally associated with harness-mounted radio transmitters (Amstrup 1980). Advantages of the poncho include reduced handling time, greater mobility of tagged birds, less irritation of the bird's skin, low weight centered on the base of the neck, better orientation of the transmitting antenna, and reduced visibility. Poncho-mounted radios have been used on most gallinaceous birds including Blue Grouse (*Dendragapus obscurus*, Cade 1985), Ruffed Grouse (*Bonasa umbellus*, Small and Rusch 1985), and Sage Grouse (*Centrocercus urophasianus*, Dunn and Braun 1986). Few problems with ponchos were encountered in these studies in which most birds received transmitters during the summer. However, two types of mortality attributed to poncho-mounted radios have been identified with Blue Grouse that received transmitters during winter in Utah. Awareness of these problems and slight modification of the poncho could help researchers avoid potential mortality of grouse receiving transmitters.

METHODS

Each of 22 adult male Blue Grouse captured in Utah during the winters of 1985-1987 with a telescopic noose pole (Zwickel and Bendell 1967) were fitted with a 25-30 g ($\leq 3\%$ body weight) poncho-mounted radio

¹ Present address: Dept. of Forest Resources, Pettee Hall, University of New Hampshire, Durham, New Hampshire 03824.

(Amstrup 1980). A radio was positioned on the lower neck after initial stretching of the central hole to allow a snug fit over the head. Eight grouse were initially released on snow-covered ground. After three deaths, grouse were placed in snow burrows excavated by hand under tree cover. A researcher sat in front of the burrow to prevent immediate flight. The researcher left 5–10 min after grouse dug away from the entrance and snow-roosted out of sight. Grouse were visually located the day after release and at least weekly thereafter.

RESULTS AND DISCUSSION

Four of 15 radio-marked adult male Blue Grouse died due to effects of the ponchos. Three died immediately after release by flying into tree trunks. The other, transmitted on 7 Jan. 1986, was found dead on 4 Mar. 1986. Death was due to partial obstruction of the esophagus and associated cachexia (Diagnostic Report, Stanley Allen, D.V.M., Utah State Univ.). The obstruction was a tip of Douglas fir (*Pseudotsuga menziesii*) twig that was too large to pass by the poncho opening (Fig. 1).

Collision mortalities were associated with an apparent temporary loss of balance due to the poncho-mounted radio. Six Blue Grouse captured during summer and winter and leg-banded only did not lose their balance upon release. Loss of balance caused by the poncho-mounted radios was shown by the awkwardness and stumbling of grouse which did not attempt flight upon release. These birds normally took shelter underneath cover and/or dug snow-roosts. Observations the following day revealed that these grouse walked from their shelter and successfully roosted in a tree. Therefore, captured grouse were placed in snow burrows to prevent immediate escape flight and provide for a post-release adjustment period. No deaths attributed to collisions occurred with the 14 subsequent releases; escape flight associated with immediate release was eliminated.

Hines and Zwickel (1985) reported that 56% of both transmitted and non-transmitted Blue Grouse escaped on foot when released in dense cover which discouraged flying; 37% still flew or attempted flight. Flight after release is less likely when grouse seek or are provided escape cover on the ground. However, Blue Grouse, as well as certain other species of grouse, typically roost, feed, and seek escape cover in trees more during winter than other seasons. Snow burrows can provide cover and prevent escape flight in Blue Grouse wintering areas where ground cover is minimal. Regardless of season, prevention of an immediate escape flight should limit deleterious short-term effects attributed to the radio collar.

Douglas fir and lodgepole pine (*Pinus contorta*) dominate the winter food habits of Blue Grouse in the Rocky Mountains (Beer 1943, Harju 1974, Marshall 1946, Stewart 1944); needles, buds, twig tips, and seeds are consumed. Although the twig tip which lodged in the esophagus at the poncho opening may have been abnormally large, twig tips are commonly eaten. The prolonged debilitation of this bird caused by the obstruction was not evident despite numerous observations of the bird. The sedentary behavior of this individual, similar to most Blue Grouse, may

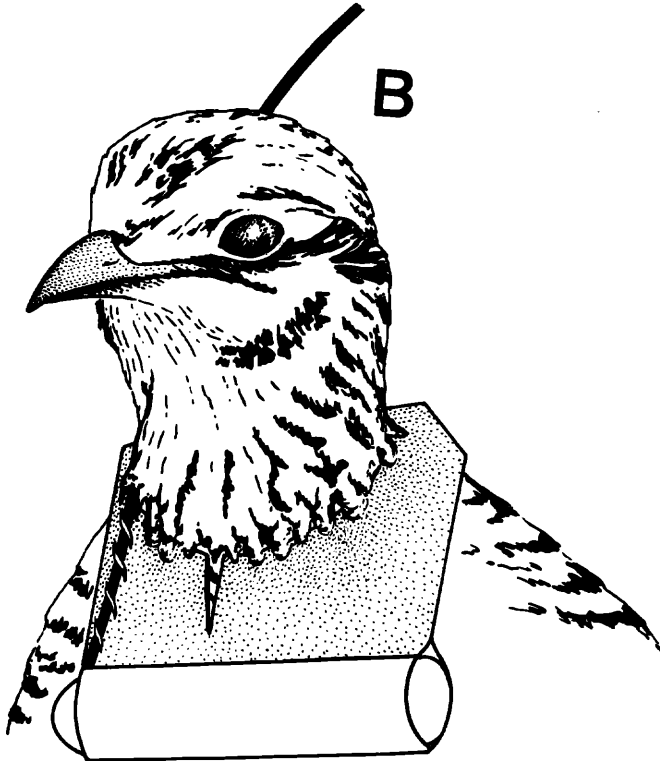
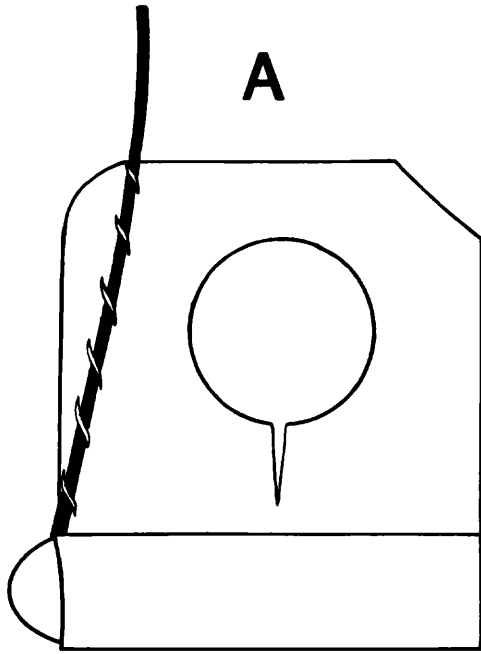


FIGURE 1. Adult male Blue Grouse with a large Douglas fir twig obstructing the esophagus anterior to the point of placement of a poncho-mounted radio. Photo by S. Allen, D.V.M.

have masked the problem. Esophageal obstruction may be seldom recognized because debilitation may predispose the bird to predation and remains of the bird may provide no evidence of its prior condition. Poncho-mounted radios should be modified on gallinaceous birds that may consume large food items such as twigs, acorns, or cones. A vertical slit cut at the base of the hole in the poncho after it has been positioned on the bird (Fig. 2) should be sufficient to facilitate food movement (e.g., 0.5

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FIGURE 2. (A) A poncho-mounted radio with the slit at the base of the hole to facilitate passage of large food items. (B) The modified poncho positioned on a grouse.



cm) without risk of poncho loss or excessive poncho movement. The size and need of the slit should be determined on an individual basis because of age and sex dimorphism. No poncho loss occurred with 12 subsequent releases.

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