

Distribution of Ruffed Grouse Southeast of the Range of Quaking Aspen

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Abstract: We delineated the distribution of ruffed grouse (*Bonasa umbellus*) southeast of the range of quaking aspen (*Populus tremuloides*), and estimated the total range-area and forested range-area within this expanse. All or portions of 11 states comprised a total range-area of 285,184.3 km², 25.7% of the total land-area of those states. The percentage of each state occupied by ruffed grouse varied from 99.4% in West Virginia to 2.5% in each of South Carolina and Alabama. Approximately 67% of the species' range was forested.

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In the Southern Appalachians, ruffed grouse traditionally have received little specific management emphasis from state or federal wildlife agencies. However, a long-term regional decline in bobwhite (*Colinus virginianus*) populations and limited access of bobwhite habitat to hunters have increased the consideration given to ruffed grouse in those southeastern states inhabited by the bird. Food habits and nutritional research (Stafford and Dimmick 1979, Seehorn et al. 1981, Servello and Kirkpatrick 1987), restoration emphases in some states (e.g. Kalla and Dimmick 1987), and the participation by several state agencies in a coalition of southern ruffed grouse workers are evidence of this mounting interest.

Ruffed grouse harvest and habitat management strategies present constraints and opportunities unique to the Southern Appalachian region, and are different from those recognized for landscapes where aspen comprises a major component of the forest. For example, birds in the Southern Appalachian region feed largely on green, herbaceous vegetation during winter rather than on aspen buds, and a relatively light or an absence of snow cover enables them to feed at ground level throughout the year. Hunting pressure typically is greatest in late winter rather than autumn, as

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dense leafy cover and warm weather persist much later in the southern latitudes than in the aspen range.

Various published range boundaries are similar for ruffed grouse within the aspen range, but differ markedly among authors in defining the bird's southern range (Bump et al. 1947, Gullion and Svoboda 1972, Johnsgard 1975). In this report we delineate the occupied range of ruffed grouse in the Appalachian Mountains and associated physiographic regions southeast of the range of quaking aspen. Although bigtooth aspen (*P. grandidentata*) occurs farther south than quaking aspen, it is not a major forest component in this part of its range, and is unlikely to influence ruffed grouse welfare. Our objectives were to: (1) define the boundaries of the southeastern range of ruffed grouse, including county, state, and physiographic regions; (2) estimate the total land area occupied by ruffed grouse in the region; and (3) quantify the amount of forested land (probable habitat) within this portion of the species' range.

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Methods

Methods used by state agency personnel to ascertain statewide ruffed grouse distributions included hunter surveys, personal communications with other state wildlife agency personnel, and records of drumming censuses. Boundaries of major physiographic regions were based upon information provided by Fenneman (1938). Range information provided by Little (1971) was used to delineate the southern boundary of quaking aspen.

Total range-area and amount of forested range-area within the southern ruffed grouse range were assessed on a per county basis for each state. Data regarding total land area and the amount of forested land area for each county were obtained from U.S. Forest Service statistical reports (DeBald and McCay 1969, Considine and Powell 1980, Bechtold 1985, Brown 1986, Tansey 1987, Frieswyk and DiGiovanni 1988, Thompson 1989, Alerich 1990, DiGiovanni 1990, McWilliams et al. 1990, Vissage and Duncan 1990). Subjective evaluations were used to estimate the percent of total range-area for peripheral counties not entirely within the grouse range. Forested range-area estimates for counties not entirely within the range were derived by utilizing Forest Service statistical information and the percent of total range-area.

Results

All or portions of 11 states comprise the contiguous range of ruffed grouse south of the range of quaking aspen (Fig. 1); disjunct populations also occur in Indiana and Missouri but were not included in our study. Their distribution extends from the southern portions of Ohio and Pennsylvania to northern and northeastern Alabama, Georgia, and South Carolina, westward to central Tennessee and central Kentucky, and eastward to northwestern Maryland, central Virginia, and western North Carolina. Virtually all of the state of West Virginia is included within this expanse.

The total range of ruffed grouse south of the range of quaking aspen comprises 285,184.3 km², 25.7% of the total land-area within the 11 occupied states (Table 1). Approximately 190,908.7 km² (66.9%) of the total range-area is forested. All of 230 counties and portions of 90 counties are within the species' southern range.

All the states within the geographic area surveyed contained one or more of the following physiographic regions: Appalachian Plateau (48% of the occupied range), Ridge and Valley (20%), Blue Ridge (20%), and Piedmont (9%). Ruffed grouse were distributed throughout the Blue Ridge Province, and were in all but the southern extremes of the Appalachian Plateau and Ridge and Valley provinces. Excluding Virginia, ruffed grouse which occupied the Piedmont Province did so in close proximity to the Blue Ridge Province. Virginia was the only state reporting ruffed grouse occurring on the Coastal Plain Province; these were introduced into areas that were not historical range. Other more localized (or minor) physiographic regions containing ruffed grouse included the Eastern Highland Rim region in Tennessee,

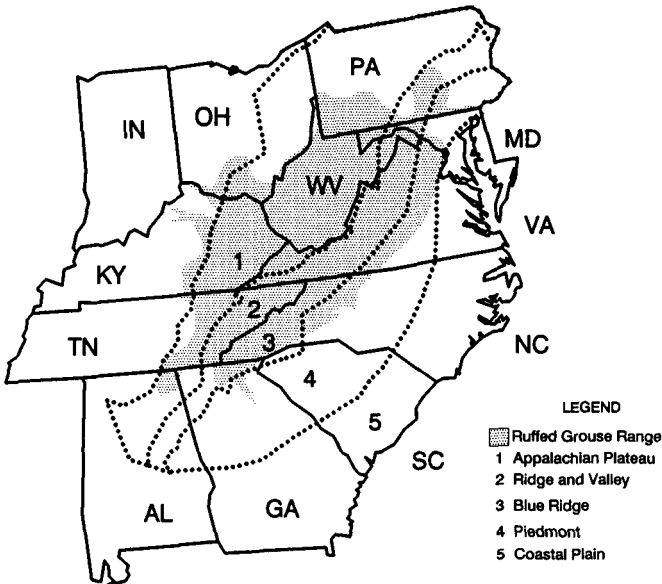


Figure 1. Contemporary southern range of ruffed grouse, with respect to physiographic, state, and country boundaries.

Table 1. Total range-area and forested range-area within the distribution of ruffed grouse south of the range of quaking aspen.

State	Total range-area (km ²) (% of state occupied)	Forested range-area (km ²) (% occupied range forested)
W. Virginia	62,098.5 (99.4)	48,418.8 (78.0)
Virginia	67,029.7 (65.2)	41,477.3 (61.9)
Kentucky	42,074.2 (41.0)	28,764.7 (68.4)
Tennessee	39,832.8 (37.4)	25,679.1 (64.5)
N. Carolina	23,113.8 (18.3)	17,397.0 (75.3)
Pennsylvania	22,312.0 (19.2)	10,979.4 (49.2)
Georgia	9,388.1 (6.2)	7,338.6 (79.0)
Ohio	9,938.9 (9.4)	5,262.8 (53.5)
Maryland	4,189.4 (16.4)	2,404.8 (57.4)
Alabama	3,254.0 (2.5)	1,908.9 (58.7)
S. Carolina	1,952.9 (2.5)	1,277.3 (65.4)
Total	285,184.3 (25.7)	190,908.7 (66.9)

the Bluegrass and Pennyroyal regions in Kentucky, and the Till Plain region in Ohio. These regions lie immediately west of the Appalachian Plateau.

Discussion

Ruffed grouse in the southeastern United States occupy 5 major and 4 minor physiographic provinces. Topography and climate vary widely among these provinces, yet they are largely hilly to mountainous and mostly free of persistent deep winter snows. Oak-hickory (*Quercus spp.* - *Carya spp.*) and other oak-associated forest types dominate the region. Broad-leaved evergreen shrubs, e.g., mountain laurel (*Kalmia latifolia*), are common and significant habitat components. Consequently, ruffed grouse tend to share certain ecological and biological traits within the region, but demonstrate markedly different traits from ruffed grouse in more northerly areas. For example, the winter diet of southern ruffed grouse is typically comprised of leafy green vegetation gleaned from the snow-free forest floor (Stafford and Dimmick 1979, Seehorn et al. 1981, Servello and Kirkpatrick 1987), while northern birds feed predominantly on buds and twigs of woody plants that remain available above snow. There is comparatively little information regarding population densities of southern ruffed grouse. Cade and Sousa (1985) synthesized information that indicated male ruffed grouse densities may reach as low as 10 per 500 ha in the southern portion of their range. Epperson (1988) estimated springtime densities of 2 to 5 males per 500 ha on the Cumberland Plateau in Tennessee in an unmanaged forest; managed forests yielded populations nearly twice this figure (Dimmick 1991, unpubl. data). Boyd (1990) and Pelren (1991) reported that springtime densities (including both sexes) in the Blue Ridge Province ranged from 2 to 27 birds per 500 ha. These densities are much lower than reported for birds living in northerly forests (Gullion 1984). These and other dissimilarities strongly indicate that management

principles and practices applicable for northern ruffed grouse may need to be modified for populations residing in the range that we have delineated.

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