

THE EFFECTS OF FOREST MANAGEMENT ON RUFFED GROUSE HOME  
RANGE SIZE AND HABITAT SELECTION IN RHODE ISLAND, VIRGINIA,  
AND WEST VIRGINIA, USA

BY

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## ABSTRACT

Ruffed grouse (*Bonasa umbellus*) are the most widely distributed non-migratory bird in North America. Grouse prefer early successional forest habitats, especially forests where aspen (*Populus tremuloides*) is common. Eastern ruffed grouse populations have experienced declines over the past 50 years concomitant with forest maturation. Even-aged silviculture produces early successional habitat that is preferred by grouse, however, selective harvesting methods are still commonly prescribed in Eastern forests. The implications of selective harvest forest management on ruffed grouse have not been adequately documented.

Grouse home range size and habitat selection were assessed in Rhode Island, Virginia, and West Virginia using five years of radio telemetry data on 575 grouse (29,558 locations) from the Appalachian Cooperative Grouse Research Project (ACGRP). For the Appalachian sites, mean home range size of grouse differed significantly by site, but did not differ predictably by proportion of 5-15 year old stands distributed on each site. In the Appalachians, female grouse had larger home ranges than males. Juvenile grouse had larger home ranges in the fall-winter than in the spring-summer, while adult home ranges did not significantly differ by season. In Rhode Island, home range size did not significantly differ by age or gender ( $\bar{x} = 103 \pm 24.91$  ha, 95% isopleth kernel).

Compositional analysis was used to determine if grouse selected stands based on their age and management type. Habitat selection was assessed at two spatial scales: home range and study area scale. On the three Appalachian sites, grouse avoided recently harvested stands (< 4 years in age), softwood stands (all ages), and

stands managed with diameter-limit cutting. Grouse selected 5-15 year old stands harvested by clearcutting. Grouse in Rhode Island selected early successional forest, mixed deciduous-conifer stands, and deciduous forest, and grouse avoided evergreen forests and developed areas. Forest roads were strongly selected by grouse on all sites. Habitat selection was different at the two spatial scales, with grouse not as selective at the home range scale on all study areas. The age and gender of grouse, as well as the season (fall-winter or spring-summer) had a significant effect on habitat selection by grouse in the Appalachians. The age and gender of grouse did not significantly affect home range size of grouse in Rhode Island.

Without the introduction of forest disturbance into forested ecosystems in eastern United States, it is likely that grouse populations will continue to decline with the maturation of existing early successional forests and further habitat fragmentation. I suggest that forest managers use even-aged forest management to provide early successional habitats for grouse. Diameter-limit cuts have little value for producing habitat used by grouse; therefore its application is discouraged for managing eastern hardwood forests for grouse.