

## **HABITAT PREFERENCE, DIET, AND SCAT DEGRADATION ON A MANAGED NORTHERN BOBWHITE PLANTATION IN SOUTHWEST GEORGIA**

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**ABSTRACT:** Bobcat habitat quality is often defined by the ability of habitats to support prey. I looked at the habitat preference of bobcats within a managed quail plantation in a longleaf pine/wiregrass ecosystem during 2001-2002. Through compositional analysis, I found that bobcats tend to prefer agriculture fields/food plots and mature pine within their home range, and hardwoods and mature pine throughout the site.

Bobcats are opportunistic predators. Southeastern studies show that bobcats prey most heavily on small mammals such as rabbits and cotton rats. Diet can vary seasonally, however, depending on the availability of prey. Food habits of bobcats in a longleaf pine/wiregrass ecosystem are unknown. In this study, I looked at the food habits of bobcats from summer of 2001 through spring 2002. I found that rodents were the most common prey item throughout the year.

Carnivore food habits are primarily studied through the collection and sorting of scat. Many studies have even looked at the digestibility of prey in carnivores. No studies have looked at the persistence of prey items in scat or the persistence of the scat in the environment. I fed 3 different diets to captive bobcats and collected the scat. I then put the scat in the environment, during the spring, and compared starting weight to ending weight over 6 weeks. I found that scat containing deer degraded faster than scat containing mice/rats or rabbit, and that the length of time that the scat spent in the environment influenced degradation of the scat.

### **INTRODUCTION**

Because quail managers consider bobcats (*Lynx rufus*) to be major predators of Northern bobwhite (*Colinus virginianus*), hereafter quail, it is important to understand the effects of quail management on bobcat ecology. Creation of agriculture fields and food plots, supplemental feeding, and prescribed burning are prominent quail management practices that also affect bobcat ecology (Landers and Mueller 1986, Boutin 1990, Cummings and Vessey 1994).

Bobcat habitat quality is often defined by the ability of habitats to support prey (Fendley and Buie 1982, Boyle and Fendley 1987). Many quail management practices are beneficial to bobcat prey, and may make habitats more attractive to bobcats. Prey, such as cotton rats (*Sigmodon hispidus*) and other small rodents, are most dense in areas with dense herbaceous ground cover (Golley et al. 1965). Quail management practices such as prescribed burning can increase the abundance of herbaceous ground cover (Landers and Mueller 1986). Small mammals are known to be attracted to field edges (Cummings and Vessey 1994). Supplemental feeding increases breeding, decreases home range size, and increases density of potential prey, which may benefit bobcats (Boutin 1990).

Bobcats are opportunistic predators (Latham 1991). In the southeast, bobcats prey most heavily on small mammals (e.g. rabbits (*Sylvilagus* spp.), cotton rats) (Beasom and Moore 1977, Miller and Speake 1978). Only one other study has been done on land that was managed for quail and they found that bobcats most commonly preyed on rodents, the second most common prey item was bird, but quail remains were rare (0.9% occurrence) (Miller and Speake 1978).

### **STUDY SITE AND METHODS**

The study took place on Ichauway, the outdoor laboratory facility of the Joseph W. Jones Ecological Research Center, located in Baker County, Georgia. This 11,700-ha facility was found in the Southern Coastal Plain. Longleaf pine (*Pinus palustris*) woodlands dominated the landscape. Slash pine (*P. elliottii*)

flatwoods, natural loblolly pine (*P. taeda*) stands, mixed pine hardwoods, creek swamps, and agricultural fields were distributed throughout the area. Old field grasses (e.g., *Andropogon* spp.) and wiregrass dominated the understory (Goebel et al. 1997). However, more than 1,000 vascular plant species were documented on the property (Drew et al. 1998).

To keep areas productive for quail, fields at Ichauway were disked to increase food and cover. Disking removed thicker vegetation and allowed establishment of plants such as ragweed (*Ambrosia artemisiifolia*) and partridge pea (*Chamaecrista fasciculata*) (Landers and Mueller 1986). Widely scattered agriculture and wildlife food plots consisting of grain sorghum (*Sorghum vulgare*), Egyptian wheat (*Sorghum* spp.), brown top millet (*Brachiaria ramosa*), cowpea (*Vigna* spp.), corn (*Zea mays*), and winter wheat (*Triticum aestivum*) made up about one-fifth of the property. To supplement quail food, grain consisting of corn, milo (*Sorghum vulgare*), soybean (*Glycine max*) and sunflower (*Helianthus* sp.) seed was spread in areas heavily managed for quail from November–May in 2-week intervals. Supplemental food was spread in thickets and along field edges and in food plots. Prescribed burning occurred throughout the site. Ichauway employed dormant and growing season burns in a 2-year rotation on approximately 4,000-6,000 ha annually.

We studied habitat selection of bobcats and the effect of supplemental feeding and prescribed burning on bobcat habitat selection on land managed for quail during 2001-2002. Bobcats ( $n = 27$ ) were captured beginning in January 2001 using foothold traps. Following sedation, they were fitted with a radio-transmitter collar and released. Bobcats were then located by triangulation of radio signals from known reference locations. These locations were used in a compositional analysis to determine habitat selection.

We studied bobcat diet on quail-managed land in a longleaf pine/wiregrass (*Aristida beyrichiana*) ecosystem during 2001-2002. We searched 30 1 km sections of road each month for scat as well as collecting any scat we came across opportunistically. We placed the scat in a paper bag which was labeled with the date and location and then was frozen. Prior to analysis we dried the scat and sorted the remains in the scat to species when possible.

## RESULTS

Within their home range, we found that bobcats preferred agriculture fields and food plots during fall ( $P = 0.0588$ ), winter ( $P = 0.0008$ ), and spring ( $P = 0.0027$ ). In the summer ( $P = 0.0003$ ) they preferred hardwood areas. Since rodents and other bobcat prey are also attracted to field edges, bobcats could be attracted to this prey source. In the summer, bobcats may be less interested in hunting and more likely to look for cool, shady areas. Bobcats did not select for habitat for their home range throughout the site except during the spring ( $P = 0.0016$ ) and summer ( $P = 0.0085$ ) when they preferred mixed pine/hardwood areas.

We determined if bobcats were attracted to supplemental food by comparing bobcat locations to random locations and found that bobcats were found closer to supplemental food than expected ( $P < 0.0001$ ). We determined if bobcats were attracted to areas that were burned by comparing the locations found in areas 30 days before a burn versus 30 days after the burn. We found that there was no significant difference in the number of locations found in the areas before or after the burn.

We found that bobcats most commonly preyed upon rodents, with cotton rats being the most common rodent consumed. Birds were the second most common prey item. This is not surprising because quail management practices such as creation of fields, prescribed burning, and supplemental feeding all benefit birds (e.g. quail) as well as other bobcat prey (e.g. cotton rats).

## DISCUSSION

We believe that bobcats may benefit from many quail management practices. Although we did not evaluate quail populations in our study area, we suggest that bobcats may be more beneficial than detrimental to quail populations. For example, we found that bobcat consumption of known quail nest

predators (i.e. opossums (*Didelphis virginiana*), armadillos (*Dasypus novemcinctus*), raccoons (*Procyon lotor*), and snakes) was greater than their consumption of quail. Moreover, quail management practices, such as creation of field edges, prescribed burning, and supplemental feeding, benefit many rodent species (e.g. cotton rats), that both compete with quail for food and destroy quail nests. Finally, increases in rodent populations may attract many other predators that are more detrimental to quail (e.g. snakes, birds of prey).

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