

Distance-based Habitat Associations of Northern Bobwhite in Kansas

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INTRODUCTION

- Decline attributed to changes in land use.
 - But these changes have been on landscapes
- Research/management has been often focused on the fine scale e.g. field scale



INTRODUCTION

- Management has often used the “shotgun approach” when conducting habitat management for bobwhite.
- Focus on quality rather than quantity: usable space.



OBJECTIVES

- Determine the effects of landscape configuration on bobwhite habitat use.
- Determine bobwhite preference for habitat at landscape vs. field scales.



STUDY AREA

- 64.75 km² located in Bourbon County in Southeastern Kansas.
- Part of 4 county demonstration area for KS Wildlife and Parks Quail Initiative.
- Area dominated by fescue grasslands.
- Area showed very little change in land cover from 2003 to 2005.



STUDY AREA

- Woodland areas consisted of fencerows, hedgerows, riparian zones, and woodlots.
- Conservation Reserve Program lands consisted of big bluestem, Indian grass and switchgrass dominated areas.
- Native grasslands were intensively managed for livestock and hay production.



METHODS

Capture

- Trapping occurred October-April in 2003, 2004, and 2005 using baited funnel traps.
- Six random individual with in each covey were fitted with <5 g necklace style radio transmitters.



METHODS

Telemetry

- Radio equipped individuals were monitored ≥ 3 days/week until radio failure, long distance movement, or mortality.
- A combination of homing and vehicle triangulation was used.



METHODS

Land Cover Mapping

- National Agricultural Inventory Program digital color aerial photos were used as base maps.
- Land cover on-screen digitized in ArcView 3.3.
- Land cover classification consisted of 2 levels.
 - Broad scale habitat classification i.e. fescue grassland, Conservation Reserve Program, etc.
 - Fine scale habitat classification i.e. fescue pasture, new CRP, etc.

METHODS

- Animal Movement Extension in ArcView used to create 95% Fixed Kernel home range for covey period and reproductive period.
- 30 random points were generated within a 1 km buffer of each home range.
- Nearest Neighbor in ArcGIS 9.0 used to obtain distances to each habitat for random and quail locations.



METHODS

Euclidean Distance

- Calculated $u_i / r_j = d_j$
- Ho: $d_j = 1$
- Used MANOVA to test significance of d_j and if the mean differed from one.

METHODS

Euclidean Distance

- If observed/random ratio < 1.0
 - animal associated more with habitat
- If observed/random ratio > 1.0
 - animal is associated less with the animal than expected.
- A paired t-test was used to determine if one particular habitat was preferred over another.

RESULTS

Euclidean Distance

- Total of 41 individuals (17 female and 24 males) used during reproductive season and 35 coveys used during covey season.
- Habitat selection was found for the reproductive and covey seasons both land cover classification levels ($P < 0.0001$).



RESULTS

Broad Scale Land Cover Preferences

- During Reproductive Period
 - Fescue > Woodland > CRP > Native Prairie > Cropland
 - Showed preference for locations in close proximity to fescue over all other habitats.



RESULTS

Broad Scale Land Cover Preferences

- During Covey Period
 - Woodland > CRP > Cropland > Native Prairie > Fescue
 - Preference for locations in close proximity to woody cover ($P > 0.0001$).



RESULTS

Fine Scale Land Cover Preferences

■ During Reproductive Period

- Fescue pasture & Road > burned CRP > fencerows > woodlot > CRP > New CRP > Fescue Waterway > Native Prairie Hayland > Native Prairie Waterway > Native Prairie Pasture > Fescue Hayland > idleland
- Highest preference for locations in close proximity to fescue pastures and roads ($P > 0.001$).

RESULTS

Fine Scale Land Cover Preferences

■ During Covey Period

- Road > CRP > Woodlot > Cropland > Idleland > Fencerow > New CRP > Burned CRP > Native Prairie Pastureland > Native Prairie Waterway > Fescue Waterway > Native Prairie Hayland > Fescue Hayland > Fescue Pasture
- Showed avoidance of fescue pasture.
- Preferred location in close proximity to CRP and roads ($P > 0.001$).

DISCUSSION

- Woody cover was important primarily during covey period, but also played a role during the reproductive period.
- Woody cover has been found to act as escape cover, feeding area, and roosting cover.

DISCUSSION

- Seasonal shift from avoidance of fescue during covey period to use of it during reproductive.
- There was a shift in preference from large blocks of woody cover during covey to more linear areas during reproductive period.



DISCUSSION

- Showed a higher preference for CRP edge in the covey period than during reproductive period.
- Road edges were preferred during both periods.



MANAGEMENT IMPLICATIONS

[Sorry Fred]

Really Just Expanded Discussion

- Fescue was dominant and provided some structural “cue” which attracted bobwhites. This does not mean it was good habitat.
- CRP in this context was tall, dense, and composed only of grass so provided no “cue.” It was not usable by bobwhites.
- Woody cover was scarce and more closely related to “edges” especially roadsides. Need it everywhere and not just along roads.

MANAGEMENT IMPLICATIONS

- Species such as bobwhite need to be managed on landscapes as opposed to the current method of management at farm scale.



ACKNOWLEDGMENTS

- Dr. Shawn Hutchinson
- Dr. Samantha Wisely
- Dr. Brett Sandercock
- Research Assistants

- Funding
 - Federal Aid in Wildlife Restoration Grant
 - Kansas Department of Wildlife and Parks
 - Division of Biology, Kansas State University
 - US Geological Survey
 - Wildlife Management Institute

