

# Population Dynamics and Dispersal of Bobcats in Iowa

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**Goals and Objectives:**

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- Determine local habitat selection by bobcats, including home range characteristics and dispersal patterns in relation to forest, grassland, and agricultural land and the configuration of these habitats
  - Evaluate population monitoring techniques that can be reliably and efficiently used to survey bobcats both at the local scale and also across Iowa
  - Determine demographic rates of bobcats in Iowa, including recruitment and survival
  - Evaluate genetic similarity of the Iowa population in relation to potential dispersal linkages with populations in other states.
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## Progress:

During the last year of the project and our focus was on final publication of results. We continued to refine estimates of survival, dispersal, and population trends.

## Conclusions and Recommendations:

Analyses at both the scale of the home range (Tucker et al. 2008, Journal of Wildlife Management) and at the landscape scale (Reding et al. 2013 Landscape Ecology) consistently support the conclusion that forest cover is highly selected by bobcats but also that the interspersion of forests with perennial grasslands is important to both resident and dispersing bobcats. Despite observing the influence of habitat heterogeneity on movement behavior through Iowa's landscape, we did not detect an effect of landscape configuration on fine-scale genetic structure (Reding et al. 2013). But at the regional scale of the Midwest, the expanse of the row crop agriculture is a significant limitation to residence and dispersal of bobcats (Objective 1)

The bowhunter observation survey (BOS) has proven to be a reliable and efficient way to survey bobcats and other carnivores across the state (Linde et al. 2012, Journal of Wildlife Management). Models of relative BOS abundance at the county-level and HUC 12 watershed scale led to the same conclusion that bobcats are present and abundant where perennial grassland habitat is interspersed with patches of forests. Hard edge between forest and cropland was negatively related to abundance and brushy edge associated with cottontail abundance was positively related. (Objective 2)

Based on nearly 1200 carcasses of bobcats litter size averaged 3.2 kittens and pregnancy rate peaked at 83% of 3-year-old females. Age structure based on tooth sectioning indicates that only about 10% of the population is greater than 4 years old. Estimates of survival derived from radio telemetry are somewhat greater and surprisingly suggest that annual survival of 1 and 2 aged bobcats (77%) exceeds that of 3-5 aged animals (60%). We estimated that the bobcat population in Iowa is growing 1.09 per year (CI 0.99 - 1.19). (Objective 3)

Analyses indicate that the recent regional expansion of bobcats into Iowa has come from the states immediately to the south and west. But analysis of both nuclear and mitochondrial DNA collected across the nation revealed a major phylogeographic break between bobcats in the eastern versus western United States with a transition zone occurring along the Great Plains. These two basic lineages apparently were separated during the time of Pleistocene glaciation. The greater number of subpopulations on the landscape that was delineated by the nuclear markers within some regions of the continent is the result of variation that has arisen more recently. This landscape genetic variation is largely the result of anthropogenic changes in habitat and population levels in the last 200 years, e.g. conversion of the Corn Belt, and has been superimposed on the longer term evolutionary patterns (Reding et al. 2012, Molecular Ecology). (Objective 4)

Collectively the data suggest that not only have bobcat populations successfully re-colonized Iowa but that populations are sufficient to maintain a limited harvest season.