Population Dynamics and Dispersal of Bobcats in Iowa

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Goals and Objectives:

- 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.

Progress:
We marked an additional 38 live-captured bobcats in 2008, of which 20 were radio-collared and 18 were ear-tagged only. Since 2003, we have marked a total of 158 individuals and radio-collared 118 of these. We continued to track weekly the approximately 50 radio-collared bobcats that remained in the study, and also began intensive sequential tracking of 23 bobcats, collecting data on a total of 74 six-hour sessions. Data on habitat selection and home ranges (Objective 1) were published in the Journal of Wildlife Management in the Tucker et al. 2008 article entitled: "Space use and habitat selection by bobcats in the fragmented landscape of south-central Iowa." We are continuing work to estimate dispersal distances. We have recorded dispersal of 20 juvenile bobcats (5 females, 15 males) over the duration of this study so far. Displacement (straight-line) dispersal distances ranged from 16-50 km (10-31 mi) for females and 24-194 km (15-121 mi) for males.

To gather data on observations of bobcats throughout the state, we continued to distribute bobcat sighting cards to fur harvesters and the general public, as well as collect carcasses of road-killed and incidentally trapped bobcats (Objective 2). We again conducted a bowhunter survey, sampling a total of 8,991 bowhunters across the state. Responses were analyzed to describe the distribution and abundance of bobcats and 11 other carnivore species across Iowa.

We collected and processed an additional 216 bobcat carcasses this year and refined estimates of sources of mortality (Objective 3). We also examined reproductive tracts of females to estimate pregnancy rates and litter sizes, adding 48 females of known age to our sample. We constructed the age structure and estimated survivorship displayed in a standard life table. We converted the life-table data into a pre-birth projection matrix to estimate the annual finite rate of increase of the population.

We collected an additional 38 DNA samples from live-captured and 216 samples from carcasses of Iowa bobcats this year, bringing our total number of Iowa genetic samples to approximately 870 (Objective 4). We genotyped 195 samples at 23 or more microsatellite markers and performed preliminary analyses of spatial genetic autocorrelation and kinship. We also collected 1,058 tissue samples from Minnesota, Wisconsin, Illinois, Missouri, Kansas, Nebraska, South Dakota, and North Dakota. We extracted DNA from 551 of the regional samples, genotyped 201 of these samples at 19 microsatellite markers, and performed preliminary analyses of population structure.

Future Plans:
We will continue to track collared bobcats throughout 2009. Further analyses on bobcat dispersal will be conducted as sample size for dispersal routes increase. We will also continue to monitor bobcats using the bow survey, and with more years of data, we will be able to examine population trends in this species across the state. We will complete microsatellite genotyping of the Iowa and regional samples, and begin to try several sex-linked markers, which will help to highlight potential differences in male vs. female patterns of dispersal.