

Distribution of Woodchucks (*Marmota monax*) in Illinois

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ABSTRACT

The woodchuck is important ecologically and because of its interactions with humans. We speculated that its abundance declined from historic levels and determined its current range to compare to past studies. Personal observations, sightings by hunters, and permits issued for removal indicated a statewide distribution as in the past. Range is a coarse indicator of abundance, so we recommend a systematic monitoring program and a study of demographics along an urban-rural gradient to determine relative values and risks of contemporary habitats.

INTRODUCTION

Woodchucks (*Marmota monax*) occur at low elevations from eastern Alaska to Labrador, south through the eastern United States to northern Georgia and Louisiana, and west to eastern Nebraska, Kansas, and North Dakota (Kwiecinski 1998, Armitage 2003). They are important ecologically as prey (Grizzell 1955, Meier 1985, Warner and Ver Steeg 1995) and because they modify their environment through burrowing, herbivory, and defecation (Merriam and Merriam 1965, Swihart 1991a, Swihart and Picone 1991, English and Bowers 1994). Abandoned dens provide shelter for many vertebrates, including opossum (*Didelphis virginiana*), river otter (*Lontra canadensis*), raccoon (*Procyon lotor*), eastern cottontail (*Sylvilagus floridanus*), and meadow vole (*Microtus pennsylvanicus*) (Hamilton 1934, Grizzell 1955, Schmeltz and Whitaker 1977, Hossler et al. 1994, Swihart 1995, Gorman et al. 2006).

The woodchucks's status is also a concern because of its interactions with people. It is pursued by hunters and trappers for meat and pelts (Hamilton 1934, Anderson et al. 1996, Anderson and David 1997) and causes damage to crops (Hamilton 1934, Swihart 1991b), cultural resources (Bruleigh and Vandruff 1998), human residences, and other structures (Miller et al. 2001, Bluett et al. 2003). This species also serves as a model for medical research on human diseases such as hepatitis (Wright et al. 1987, Dandri et al. 1996, Zhou et al. 2003).

The woodchuck is characterized as a forest-edge species (Kwiecinski 1998, Armitage 2003). We speculated that its abundance declined from historic levels as documented for

other edge species such as northern bobwhite (*Colinus virginianus*; Roseberry and Sudkamp 1998, Dimmick et al. 2002) and eastern cottontail (Roseberry 1998). We determined the woodchuck's current distribution in Illinois to compare to past studies (e.g., Mohr 1943, Hoffmeister 1989); a range contraction of 20-50% was considered indicative of a change in status (e.g., Ceballos and Ehrlich 2002, Laliberte and Ripple 2004).

METHODS

We used three sources to document distribution: personal observations, Nuisance Animal Removal Permits issued by the Illinois Department of Natural Resources (IDNR), and sightings reported by archery deer hunters who participated in a survey administered by IDNR. Nuisance Animal Removal Permits were issued to landowners and tenants to authorize removal of wildlife after an investigation by IDNR confirmed the existence of damage and a lack of effective alternatives. We examined all permits issued during 2003 through 2006 ($n = 2,771$) to determine county-level locations of properties with damage caused by woodchucks ($n = 420$). We eliminated some of these ($n = 90$) because we were less confident about correct identification of the offending animal when a permit allowed removal of multiple species (including woodchucks) than those issued only for woodchucks ($n = 330$).

The Archer Survey offers an economical and statistically robust means of monitoring the relative abundance of several species of terrestrial mammals (Hamilton et al. 1989, Winchcombe and Ostfeld 2001). IDNR first administered this survey in 1991 (Ver Steeg and Warner 1997). Data were collected by archery deer hunters who volunteered to keep standardized daily logs of their efforts (number of hours afield) and wildlife observations from 1 October through 14 November. We examined 5,120 surveys returned during 2003 through 2006 to determine county-level locations of woodchucks. We also recorded authors' incidental observations of woodchucks from April through October 2006.

RESULTS

The Archer Survey provided 168 observations of woodchucks in 62 counties. Nuisance Animal Removal Permits were issued for properties in 52 counties. We observed 28 woodchucks at 26 locations in 16 counties. Altogether, we documented occurrences in 80 counties; 39 had observations from two or more sources (Fig. 1).

DISCUSSION

Woodchucks were distributed statewide in 2003-2006. Their range was the same as historical reports by Kennicott (1855), Mohr (1943), who observed woodchucks in 81 of Illinois' 102 counties during 1931-1942, and Hoffmeister (1982), who examined 44 specimens from 23 counties. Our findings suggest the woodchuck's status is secure. However, we acknowledge that range is a coarse metric (Goehring et al. 2007) best suited for detecting major changes in abundance, especially when supported by other data (e.g., Martin et al. 2003, Gompper and Hackett 2005).

Monitoring programs allow managers to evaluate and adjust strategies for wildlife conservation (Lancia et al. 2005). Unfortunately, methods to monitor the abundance of

woodchucks at large spatial scales are lacking. We have doubts about reliability of the Archer Survey as an index of relative abundance because the sampling period (1 Oct - 14 Nov) coincides with onset of hibernation (Bronson 1962, Ferron 1996). Thus, annual variations in climatic conditions might affect sightings and mask population effects. We suggest that a road-kill index might be useful for detecting trends in relative abundance, as it has for white-tailed deer (*Odocoileus virginianus*; McCaffery 1973), raccoons (Gehrt 2002, Gehrt et al. 2002), Virginia opossums, and striped skunks (*Mephitis mephitis*; Gehrt et al. 2006).

We detected woodchucks in residential, industrial, agricultural, and natural areas. Woodchucks prefer fencerows and woodlands for their hibernacula (Hamilton 1934, Twichell 1939, Grizzell 1955, Meier 1985). Densities are greatest where such areas adjoin crop fields, pastures, orchards, and other sources of abundant and palatable foods (de Vos and Gillespie 1960, Henderson and Gilbert 1978, Swihart 1992). Interspersion of these habitats has declined in Midwestern landscapes (e.g., Illinois Department of Energy and Natural Resources 1994, Warner 1994, Ribic et al. 1998), as have mammals that are dependent on them such as eastern cottontail (Roseberry 1998) and gray squirrel (*Sciurus carolinensis*; Rosenblatt et al. 1999, Swihart et al. 2007). The same might be true for woodchucks. On the other hand, woodchucks have adapted to residential and other human-modified habitats (Anthony 1962, Woodward 1990, Kwiecinski 1998), which are increasingly available. Studying populations along an urban-rural gradient would be useful for management and monitoring programs because demographic characteristics might differ among land uses as was the case for other habitat generalists like raccoon (Prange et al. 2003) and red fox (*Vulpes vulpes*; Gosselink 2002).

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Figure 1. Distribution of woodchucks (*Marmota monax*) in Illinois, 2003-2006.

