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Survey of Medium and Large Mammals in an Urban Park (Murray Park), Little Rock, Pulaski County, Arkansas

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Abstract

Because of increased environmental awareness by city planning commissions, there are more urban parks and greenbelt areas. These areas often result in increased human and wildlife contacts, thus resulting in the need for management plans regarding urban wildlife. From September 1998 to March 1999, we conducted mammal surveys of the urban greenspace Murray Park, Little Rock, Pulaski County, Arkansas. Surveys were conducted using five methods: direct observations; spot lighting; live trapping; animal sign; and scent posts. Species recorded included, opossum (*Didelphis virginiana*), nine-banded armadillo (*Dasyus novemcinctus*), fox squirrel (*Sciurus niger*), gray squirrel (*Sciurus carolinensis*), beaver (*Castor canadensis*), woodchuck (*Marmota monax*), muskrat (*Ondatra zibethicus*), eastern cottontail rabbit (*Sylvilagus floridanus*), swamp rabbit (*Sylvilagus aquaticus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), mink (*Mustela vison*), river otter (*Lontra canadensis*), bobcat (*Lynx rufus*), skunk sp., white-tailed deer (*Odocoileus virginianus*) and domestic dog (*Canis familiaris*) and cat (*Felis sylvestris*). These species represent 19 of the 23 mammals expected in surrounding natural areas. Management plans for urban wildlife need to include all mammals that potentially occur in the area.

Introduction

Today's wildlife management is rooted in the desire to protect and conserve wildlife for its innate beauty, as well as for outdoor recreation, both consumptive and non-consumptive (Gilbert, 1989; Scalet et al., 1996). Cities have become a new and important type of ecosystem, one that, if managed properly, could enable people to re-establish their contact with living things and natural beauty, perpetuate the idea of land ethic in which humans are not the conqueror but a citizen of the community, and become important reservoirs for wildlife (Gill and Bonnett, 1973).

Urban parks and refuges provide wildlife-related educational opportunities for urban youth, most of whom are deprived of such experiences. The idea that regular contact with nature has positive effects on health and mental well being and also reduces stress and anxiety is becoming a more popular philosophy (VanDruff et al., 1995). When people are aware of wildlife near their homes their recognition of more distant conservation issues, such as the retention of wilderness and wetland areas, can increase (Gill and Bonnett, 1973). Also disparity in perception of natural areas by laymen and biologists can be reduced. This is important, however, because it is laymen who control many decisions which effect natural areas (Gill and Bonnett, 1973).

Greenbelts that connect greenspaces into a habitat network are important design considerations for urban environments. Greenbelts retain and create corridors of linear wildlife habitat along creeks, ridge tops, and utility rights of way (Gill and Bonnett, 1973). Connecting areas of different

habitat types and those in various successional stages and then linking them to the rural periphery increases the diversity of wildlife in an urban area.

People-animal conflicts are a negative aspect of urban wildlife (Adams, 1994). Property damage resulting from animals nesting in homes and attics can cause structural and safety risks. The possibility of car collisions either with an animal or another object when swerving to miss an animal also increases as wildlife become prevalent in an area. Animals such as pocket gophers, deer, skunks and other mammals have been known to destroy vegetation and consume crops. Of greatest concern are the potential public health problems since over 200 animal diseases can be transmitted to humans (VanDruff et al., 1995), including rabies, tularemia, Lyme disease, and histoplasmosis. With proper management of wildlife and the education of the public these risks decrease.

Traditional methods and techniques to conduct inventory surveys of mammals in nonurban areas are well codified, but urban studies are still in their infancy. Most urban studies apply a mixture of traditional techniques (VanDruff et al., 1994) in an effort to be complete and efficient. The purposes of our study were to document the presence of medium and large mammals in an urban park setting and to determine the similarity of these animals with those expected to be found in a similar non-urban area.

Materials and Methods

Study Area.—The study area is comprised of an U.S.

Army Corps of Engineers Lock and Dam installation (Murray Lock and Dam), a 67.2 ha recreational park (Murray Park), a 153 ha golf course (Rebsamen Golf course) and the adjacent wooded bluff (Fig. 1) in greater Little Rock, Arkansas (T2N, R12W, S19). The northern boundary is the Arkansas River whereas the less rigid southern boundary is a residential area. Within the park area, an active railroad transverses southeast to northwest, and a powerline right-of-way transverses east and west on the western edge of the park.

Several different habitat types can be found in this area. The wooded area consists of mixed hardwood/pine species on a steep slope; the major tree species include oaks (*Quercus* sp.), sweetgum (*Liquidambar styraciflua*), hickory (*Carya* sp.), loblolly pine (*Pinus taeda*), and other overstory species.

Within the wooded area are several rocky outcroppings, a few of which incorporate small streams. Parts of the riverbank are composed of sandy substrate with tall grasses. Maintained grass areas can be found throughout the golf course, park, and dam complex.

Survey Methods.—Between September 1998 and March 1999, observations were conducted to sample for the presence of medium and large mammals within the study area. Medium sized mammals included those species between approximately 0.4 - 15 kg (gray squirrel - coyote). Large mammal species were those larger than 15 kg. Direct methods of survey were performed by daytime observations (over 60 days at various times), nighttime spotlighting (10 trips), and live trapping (26 trap nights) using Tomahawk live traps (model 104.5, Tomahawk Live Trap Co.,

Table 1. Annotated Checklist of Medium to Large Mammals in Murray Park, Little Rock, Pulaski County, Arkansas

Species	Documentation Method ¹	Estimated Abundance ²	
Order Didelphimorphia			
<i>Didelphis virginiana</i>	Virginia Opossum	SS, T, DO	A
Order Xenarthra			
<i>Dasybus novemcinctus</i>	Nine-banded Armadillo	DO	R
Order Rodentia			
<i>Sciurus niger</i>	Fox Squirrel	DO, SN	C
<i>Sciurus carolinensis</i>	Gray Squirrel	SS, DO, SN	A
<i>Marmota monax</i>	Woodchuck	DO	C
<i>Castor canadensis</i>	Beaver	SN	C
<i>Ondatra zibethicus</i>	Muskrat	DO	C
Order Lagomorpha			
<i>Sylvilagus aquaticus</i>	Swamp Rabbit	DO, H	R
<i>Sylvilagus floridanus</i>	Eastern Cottontail	DO, SN, H	C
Order Carnivora			
<i>Canis latrans</i>	Coyote	SS, S, DO	C
<i>Vulpes vulpes</i>	Red Fox	SS, DO	C
<i>Lynx rufus</i>	Bobcat	SS	C
<i>Procyon lotor</i>	Raccoon	SS, T, DO, S	A
<i>Mustela vison</i>	Mink	T, DO	R
<i>Lontra canadensis</i>	River Otter	SS, DO, SN	C
Skunk sp.		SS	R
<i>Canis familiaris</i>	Domestic Dog	SS, DO	C
<i>Felis sylvestris</i>	Domestic Cat	SS, DO	C
Order Artiodactyla			
<i>Odocoileus virginianus</i>	White-tailed Deer	SS, T, S, DO, SN	A

¹SS- Scent Station, T- Tracks, S-Scat, DO- Direct Observation, SN- Sign, H- Hair

²A- Abundant - Noted in 75 - 100% of observational periods

C- Common - Noted in 25-75% of observational periods

R- Rare - Noted < 25% of observational periods

Tomahawk, WI). Indirect methods of survey included the use of scent stations and animal signs.

To further document mammal presence and relative activity, eight scent stations were established in the park. The scent stations were operable for 134 station nights. Due to ground moisture, high humidity and frequent rains, scent stations were constructed by clearing a 1 m diameter area, and laying a base of plastic sheet (4 mil. poly sheeting). Powdered lime (CaCO_3) was poured to a depth of 2 centimeters. A cotton ball was soaked with an attractant composed of liquid synthetic fermented egg (Sterling Fur and Tool Co., Sterling, Ohio) and was then attached to a 30 cm. nail driven into the ground in the center of the station (Roughton, 1982). When not in use, the attractant was removed and another sheet of plastic was used to cover the station. This kept the station dry and immediately operable when needed. Powdered lime was used in lieu of sand because lime produces tracks of higher definition.

Additional animal signs used to identify presence of species included, but were not limited to, scats, deer rubs, slides, tracks left in mud, and various runways. Tumilson's (1983) hair key was used to determine the species of prey found in the scats.

Results and Discussion

Using a species checklist (Sealander and Heidt, 1990), we determined that 23 species of medium to large mammals could be present in central Arkansas. We found that 19 (82.6%) of those species were present in our study (Table 1). There was not a positive identification on two sets of skunk tracks located at two scent stations. Both the striped skunk (*Mephitis mephitis*) and the eastern spotted skunk (*Spilogale putorius*) have been recorded from the Little Rock area. Species that were not documented from our study area include the nutria (*Myocastor coypus*), black bear (*Ursus americanus*), gray fox (*Urocyon cinereoargenteus*), and possibly one species of skunk. These species have access to Murray Park (they have been documented in other Little Rock areas), and thus may be found in the park in the future.

The opossum, raccoon, and white-tailed deer were considered to be abundant because they were documented in more than 75% of the potential observational periods and by most of the survey techniques. The gray squirrel, which was mostly documented by direct observations, was also considered to be abundant. All of these species are considered abundant in central Arkansas.

The only other comprehensive mammalian survey in central Arkansas (of which we are aware) was a study of Camp Joseph T. Robinson Military Installation (10,000 ha) in North Little Rock (Penor et al., 1996). With the exception of the mink and river otter, they reported all of the mam-

mals found in this study. They did, however, report the presence of the gray fox.

The relative high percentage (86%) of medium and large mammals found in Murray Park adjacent to downtown Little Rock was expected. Corridors play a major role in linking urban Little Rock greenspace to Pulaski County non-urban areas. The Arkansas River is a natural corridor for wildlife. The railroad tracks which parallel the Arkansas River within Little Rock connect downtown Little Rock with Pinnacle Mountain State Park and non-urban areas westward of Little Rock. The river, the railroad, and current greenspace corridors within Little Rock link these areas and facilitate movement of mammals. The railroad tracks that run through the greenbelt are used in the City Planning Map (Fig. 2) as a buffer to ensure that this corridor remains undeveloped for the continued use of wildlife.

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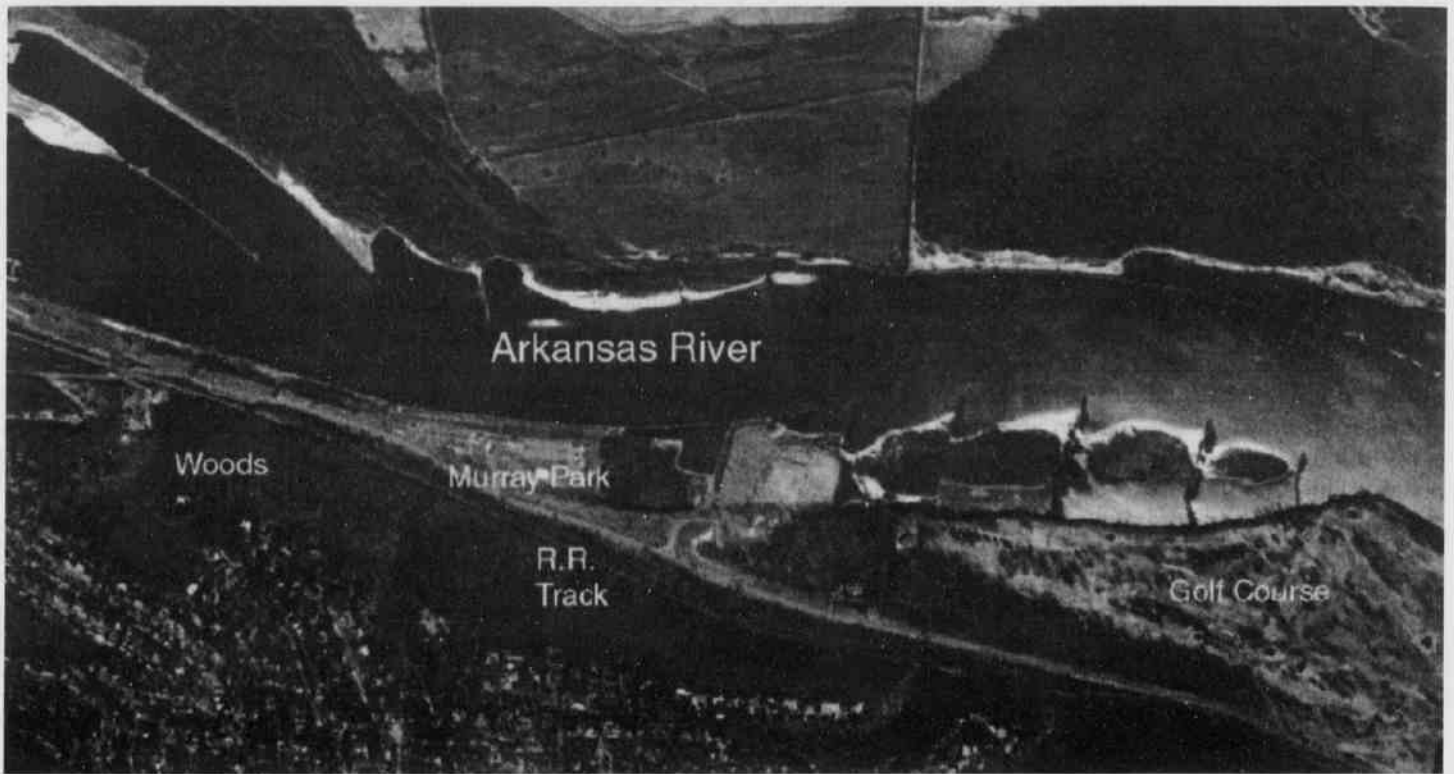


Fig. 1. Aerial photograph of the northwestern portion of Little Rock including Arkansas River, Murray Park, Murray Lock and Dam, Rebsamen Golf Course, railroad corridor, and the north facing woods that were included in this study.

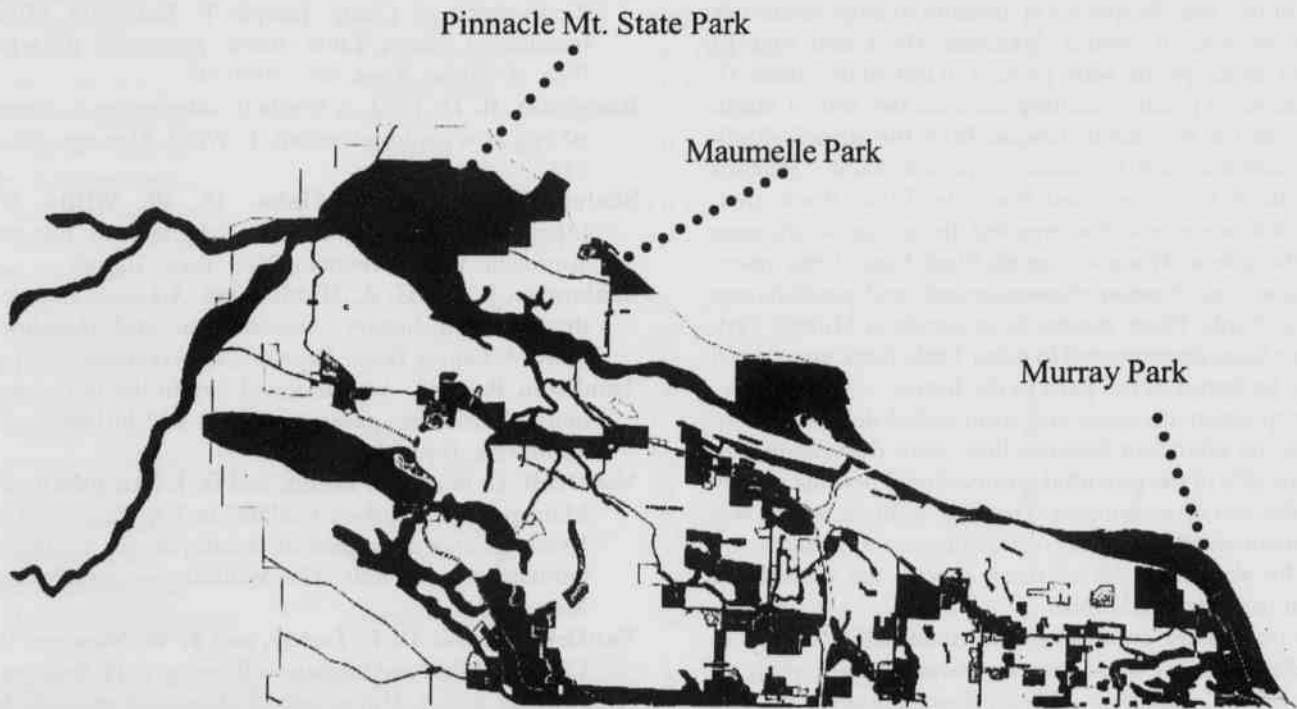


Fig. 2. GIS generated city planning map showing greenspace (black tone) for northwestern Little Rock including Murray Park, Rebsamen Golf Course, and railroad/greenspace corridor leading westward from Murray Park to Pinnacle Mountain State Park and into the rural portions of the county.