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GIFFORD POINT/FONTENELLE FOREST URBAN DEER SURVIVAL AND CASE STUDY

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Abstract: From 1995-1996, we radio collared and/or ear tagged 98 white-tailed deer (*Odocoileus virginianus*) in an urban area of Bellevue, Nebraska. We determined the density to be 44 deer/km^2 and observed the movements of 52 collared does. The managed hunt and harvest results are discussed.

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Key Words: urban deer, survival, managed hunt, telemetry, white-tailed deer, *Odocoileus virginianus*

The white-tailed deer (*Odocoileus virginianus*) is economically the most important wildlife species in the Midwest. The mosaic of agricultural land and interspersed riparian woodlands of the Missouri River valley provide excellent habitat for white-tailed deer. The Gifford Point/Fontenelle Forest complex (GPFF) has one of the highest deer densities (>20/km^2) of any area west of the Missouri River (proper) and north of Texas (Information Outfitters 1992). These deer provide tremendous benefits for hunters and deer watchers, but high deer densities cause problems for local managers and landowners, because of damage to crops and ornamental plants, vehicle collisions, and detrimental impacts on plant communities and hardwood regeneration (Craven and Hygnstrom 1993). The goal of deer management in the Midwest is to maintain local populations near social carrying capacity, thereby providing sufficient hunter recreation, minimal damage problems, and ensuring the biological integrity of deer herds and habitats (Gladfelter 1984, Menzel 1984).

Observers have reported that the density of deer in GPFF (especially FF) have exceeded biological carrying capacity and are causing detrimental impacts to local plant communities (Diamond 1992, Porter 1992). Management of the deer herd in GPFF is confounded by restrictions on hunting in the FF and Gifford Farm portions of the area (Diamond 1992, Nebraska Game and Parks Commission 1993). Research is currently underway to document the density of deer in the area and the degree, distribution, and potential ramifications of resultant deer damage. Knowledge about the seasonal movements and habitat selection of deer in GPFF will enable managing agencies and organizations to make sound decisions regarding deer management strategies, land use, and resource protection.

STUDY SITE

The GPFF is a relatively large riparian woodland complex in the Missouri River valley system that is immediately adjacent to the cities of Omaha and Bellevue, Nebraska (Figure 1). The area consists of steep upland

hardwoods (260 ha) and flat bottom land hardwoods (940 ha) (Nebraska Game and Parks Commission 1993). A 160 ha farm and educational facility is located in the middle of the floodplain and large naturally-vegetated corridors extend into the urban area. Gifford Point is open to public recreation and has one of the highest archery success rates in the nation (43%, 28 deer/km^2 hunted). Muzzleloader hunts have been conducted on the area occasionally with harvests ranging from 8 to 82 deer. Gifford Farm has made claims of $15,000 damage to their crop field from deer damage. After the failure of a 5-wire high-tensile electric fence at keeping deer out of the field, an 2 m high-tensile woven wire fence was erected in 1996.

Fontenelle Forest is a privately-owned nature center used primarily for outdoor education and until recently has had a hands-off, let nature take its course policy toward management. As the city of Bellevue grew, during the 1980s, housing moved into the surrounding property and formed large corridors that allow for easy movement of deer into the urban area where they cause damage to gardens, ornamental landscapes, and vehicle collisions.

Fontenelle Forest first began to notice a deer damage problem in the late 1980s. With the printing of Diamond's article “Must We Shoot Deer to Save Nature?” (1992) and press releases by FF, public outcries for and against managing deer were strong. After talks with the Nebraska Game and Parks Commission (NGPC) and research into urban deer problems, the Bellevue Deer Task Force was developed in 1993. It includes representatives of all stakeholders and interest groups associated with GPFF. It provides a forum for all to express their points of view, evaluate research results, review land-use practices, and discuss management options.

DENSITY

Density estimates were obtained by helicopter counts because of their preferred aerial capabilities (Beasom et al. 1981, Thompson and Baker 1981) and accuracy (Stoll et al. 1991). The design and methods used were similar to Stoll et al. (1991) except for a federal restriction on altitude of a minimum of 90 m above the residential area. Aerial surveys were conducted March 8, 1995 and January 29, 1997 shortly after a 15-20 cm snowfall. We observed 495 deer (44 deer/km^2, 286 upland and 209 floodplain) in 1995 and 316 deer (28 deer/km^2, 153 upland and 163 floodplain) in 1997. The 1997 survey was taken after the first managed hunt. We feel that the accuracy of the survey is high due to the complete snow coverage, low obstruction of vegetation, and the stationary behavior of the deer during the survey.

SURVIVAL AND MOVEMENT

Deer in GPFF were captured with drop-door traps, remote chemical immobilization, and rocket nets in the winter of 1995 and 1996. All captured deer were tagged with a visible cattle ear tag and does were equipped with radio collars to enable monitoring of movements, habitat use, and survival. Individual deer were located 3-4 times per week throughout the 24-hour diel cycle. Forty-six males and 52 females were tagged. Analysis of home range data is currently underway (Ekstein and Hygnstrom, in progress).

Witham and Jones (1992) were able to determine the fate of most (94/103, 91%) ear tagged males due to the extensive fieldwork and related activities at Ned Brown Preserve in Chicago, Illinois. We were unable to determine the fate of most (28/46, 61%) of our ear tagged males (Table 1) in GPFF even-though extensive use and activities in the area were similar.

Table 1. Sources of mortality for ear tagged male white-tailed deer in GPFF.

	train	archery	EHD	survived	dispersed	survival	total
1995 males	3	2	3	2*	**	13	23
1996 males	2	4	0	1	1***	15	23
							46

*harvested in 1996
**unknown
***resulted in vehicle collision

The predominant source of mortality at Ned Brown Preserve (Witham and Jones 1992) was vehicle collisions (78%). Cornicelli (1992) approximated a 13-16% loss of the population annually to vehicle collisions at Carbondale, Illinois. In GPFF, the largest source of mortality for females (Table 2) in 1995 and 1996 was archery harvest (5/29, 17% and 5/40, 13% respectively). Vehicle collisions only occurred for deer that had dispersed from the study area. Analysis of the annual deer vehicle collision reports indicate a 325% increase in deer vehicle collisions from 1984-1995 in the city of Bellevue. The high increase in collisions is a result of deer becoming acclimated to the urban area in the last 5 years. Accidents are a small source of mortality for the population and will undoubtably remain low due to a 40 kph speed limit throughout the study area.

MANAGED HUNT

To address the deer overpopulation, the Bellevue Deer Task Force recommended a managed hunt for 1996. The board at FF approved the recommendation and set the rules and regulations for the 9-day managed hunt. The forest was opened for 50 bowhunters and 50 muzzleloader hunters. All applicants had to pass a proficiency test, take or have taken the hunter or bowhunter education course, harvest antlerless only, and have no prior game violations. The proficiency test involved shooting 4 out of 5 arrows at 18 m into a 25 cm circle and 4 out of 5 balls at 45 m into a 25 cm circle for muzzleloaders.

Roughly 200 applications were given out to interested individuals. Only 66 individuals completed the application. Several people became ineligible due to conflicts in applying for other permits or did not participate during the 9 days. Forty-seven hunters participated in the managed hunt, 13 muzzleloaders and 34 archers. Twenty-eight deer were harvested, 23 does and 5 button bucks. Muzzleloader success was 77%, archery success was 53%.

During the first day, approximately 20 people protested the managed hunt. An area was roped off in the parking lot for individuals to protest, however, they soon moved to the sidewalk where they were more visible. Protestors stayed for the media and then dispersed (3 hours). Little to no activity occurred for the rest of the 8 days.

CONCLUSION

After reviewing the operation and results of the managed hunt, the FF board has approved a managed hunt for 1997. To increase participation, the NGPC is offering 100 bonus permits. After the completion of the 1997 managed hunt, the results of the harvest, bonus permits, and home range analysis will be reviewed to determine if the GPFF deer population can be managed at 19 deer/km^2.

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Table 2. Sources of mortality for radio collared female white-tailed deer in GPPF.

	train	archery	EHD	sur-vived	dis-persed	un-known death	old age	poach ed	preda-tor	collar failed	total
1995 females	2	5	2	17	3	0	0	0	0	0	29
1996 females	1	5	0	19	7*	1	1	1	1	1	40
											52**

* resulted in 2 vehicle collisions, 2 harvests, 2 survive, and 1 fate unknown

** total number collared

Figure 1. Gifford Point/Fontenelle Forest study area showing property lines.