Wildlife Preservation Fund Grant #09-009W

Grantee: Vicki Hedrick 13901 Oak Drive Carlinville, IL 62626 217-854-2324

Time Frame: Spring 2008-Spring 2010

Report completed by the Grantee.

Project Objectives: To determine whether canine presence in Carpenter Park is increasing; to determine if owners are obeying the new regulation with regard to leashing their dogs; to determine if dogs are remaining on trail; and to determine whether interactions are occurring between dogs and wildlife.

Completed Project Description: Forty four (44) sampling visits were conducted from April 2008 – May 2010 for the purpose of assessing canine presence in Carpenter Park. A sampling visit consisted of opportunistic observations while walking trails as well as static observations of 20 minutes duration each at sampling plots established for previous research during the years 2001 to 2003 (Hedrick, V.J., 2004). For the most recent monitoring, a sampling plot was added in the parking area and observations in the parking area were included in data analysis. All sampling visits occurred during daylight hours. The following data were collected:

- Number of humans
- Number of humans accompanied by dogs.
- Number of dogs accompanied by humans.
- Dogs leashed or unleashed for each encounter.
- Dogs observed on trail only or ventured off trail during each encounter.
- Distance of encounter from parking area.
- Evidence (dog scat or paw prints) of unobserved dog presence in the park.
- Identity of trail on which dog or dog evidence was located.
- Distance of dog evidence from parking lot.
- Dog-wildlife interaction, if any; identified at least to Class of wildlife involved.
- Extent and type of interaction.
- Outcome of interaction, if known.

All distances were measured from the encounter location to the parking lot coordinates

using a personally-owned GPS. If a dog or human was encountered at several locations 1

during the same sampling visit, only the encounter most distant from the parking lot was included in data analysis.

Introduction: In January of 2008, the site management plan for Carpenter Park Nature Preserve in Springfield, Illinois was revised by the City of Springfield and the Illinois Nature Preserves Commission. The revised plan allowed for the presence of leashed dogs to accompany their owners on trails in the park. The plan will be reviewed 3 years from the date of implementation. The former plan excluded dogs in accordance with Title 17 of the Illinois Administrative Code dated July 6, 2004, Chapter 5, Part 4015(m). Despite this exclusion and despite signage to that effect, dogs were documented in Carpenter Park during the 2001-2003 project.

Recreationists enjoy walking their dogs in nature preserves and parks. Several studies and literature reviews (C.A. Sime [1999]; M. Liddle [1997]; Miller et al [2001]), however, have documented the potential of dogs to negatively impact birds and mammals. Researchers have documented such wildlife responses to dog presence as a heightened alert state, flight from nests, interrupted feeding (more frequently and sooner than when a lone human was present), disrupted breeding displays, and disturbed roosting activities. Dogs were also documented to be the cause of both adult and fawn mortality in ungulate research.

During the 2001-2003 project at Carpenter Park, two unleashed dogs were observed to leave the trail in pursuit of a small mammal. The mammal apparently escaped; however, foraging by two migrating hermit thrushes was interrupted as the birds fled the approaching dogs. In a residential setting, a domestic dog was observed to chase, capture, shake, kill and carry away a gray squirrel (personal observations).

Since dogs do have the potential to harass, injure, and kill wildlife, it is especially important to assess their presence in a nature preserve (a reserve designed to protect native species of plants and animals), to assess whether their presence is increasing and the effect, if any, dogs have on both resident and migratory wildlife.

The following hypotheses will be addressed and evaluated in this report:

- (a) Dog numbers will increase (over observed 2001-2003 levels) in Carpenter Park
- (b) Dogs will be leashed more frequently than observed in 2001-2003.
- (c) Observations of dogs will be more numerous closer to the parking lot and will decrease with distance from the parking lot.

Materials and Methods: The following personal equipment was supplied by and carried by the applicant: binoculars, Garmin GPSmap 76CSx, Kodak Easy Share digital camera.

Prior to the first sampling session, thirteen (on trail) sampling plots (established during 2001 – 2003) were relocated using a GPS and the previously recorded plot coordinates. 3 additional (off trail) sites had also been previously established, but were not visited during the first year of the present research due to lack of securing the necessary permit in a timely fashion. Additionally, a GPS point in the parking area was established to facilitate determining distance of any dog/dog evidence/human encounter to parking area. To obtain a more complete picture of both human and dog presence at Carpenter, the parking lot was designated as a sampling plot with data being recorded in accordance with static observation sampling plot procedures. To facilitate data comparison for statistical analysis, field notes from the 2001-2003 monitoring project were reviewed and pertinent data retrieved for humans and dogs observed in the parking area. Since distance to parking lot for opportunistic trail encounters during those same years was not collected, these encounters solely provide anecdotal information.

For each sampling visit, 'static' observation sampling plots were randomly selected from the previously established sampling plots. However, due to the delay in securing the permit and then to flooding and extremely muddy conditions in lowland locations for much of the summer 2009 to spring 2010 seasons, no visits were made to the farthestmost off trail site (west of the railroad track), and fewer visits were made to all other lowland on-trail and off-trail locations than to drier sites. Opportunistic observations occurred as the observer either walked on-trail or off-trail between selected 'static' observation sites. When an encounter occurred, forward progress was halted until the dog (and/or human) passed. Encounter coordinates were recorded and distance to the parking lot was determined by GPS. Trail ID, if on-trail, was recorded.

Static observations at sampling plots consisted of the observer standing alongside the trail, or in the plot center if an off-trail plot was selected, for a period of 20 minutes. 20 minute observations were utilized during observer's thesis research and were adhered to for this project to allow comparison between new and previously recorded dog observation data.

For both opportunistic and sampling plot encounters, data as listed under Completed Project Description was recorded. To avoid counting the same dog or human more than once during any single sampling session, only the encounter farthest from the parking lot was used for statistical purposes. All sampling sessions (44 total) occurred during daylight hours, during all seasons and included weekdays and weekend days.

None of the data was normally distributed, thus non-parametric tests were used to determine significance. To test for different aspects of dog presence, Mann-Whitney Rank Sum Test was used to evaluate the following four different sets of variables:

Dogs/Hour (post)	Dogs/Hour (pre)
Dogs/Dog Owner/Hour (post)	Dogs/Dog Owner/Hour (pre)
Dog Owners/Hour (post)	Dog Owners/Hour (pre)
People/Hour (post)	People/Hour (pre)

"Post" refers to the sampling period of spring 2008 to spring 2010 (n = 44 sampling visits) after the regulation allowing dogs had been changed. "Pre" refers to the 2001-2003 sampling period (n = 42 sampling visits) prior to the changed regulation.

Since the number of hours spent sampling varied during each site visit and for each project, the above data was standardized by sampling time for each visit ("Hour").

Mann-Whitney Rank Sum Test was also used to evaluate whether dogs observed after the regulation change were leashed more frequently than dogs observed prior to the regulation change.

The relationship between both dog and human observations and distance from the parking lot was assessed using Spearman Rank Correlation. Spearman Rank Correlation was also used to determine if individuals walking dogs were inclined to walk farther than individuals without dogs.

Related graphs are included in the Appendix.

Results:

Hypothesis 1: Dog numbers will increase post-regulation (over observed 2001-2003 levels) in Carpenter Park.

To test the first hypothesis, four different sets of variables (as noted above) were evaluated.

Dogs/Hour tests whether all dog occurrences increased between the first and second sampling projects. The data includes dogs with humans and dogs without humans. It does not necessarily reflect individuals responding to the regulation change. (See Graph 1, Appendix.) The difference in the median values between the two groups is not great enough to exclude the possibility that the difference is due to random sampling variability (P = 0.806, $n_{(post)} = 44$; $n_{(pre)} = 42$). In fact, fewer dogs were documented in the most recent project than in the previous project (56 vs. 66 dogs).

The following two sets of variables test whether dog owners are more likely to bring dogs after the regulation change. For *Dogs/DogOwners/Hour*, the number is not significant (P = 0.773, $n_{(post)} = 44$; $n_{(pre)} = 42$). Graph 2 (Appendix) shows little difference between the medians and any difference could be due to chance. The test *Dog Owners/Hour* (graph 3) might be more revealing than the previous test. Although the

test showed no significant difference between the two time periods (P = 0.611, $n_{(post)}$ = 44; $n_{(pre)}$ = 42), in terms of actual numbers, there were fewer humans with dogs (93 humans) observed during the post-regulation project than during the pre-regulation project (101 humans with dogs). These results suggest that dog owners were no more likely to bring their dogs to Carpenter after the regulation change.

One question resulting from the above is whether park usage in general might have decreased. However, again in terms of actual numbers, more people were observed in the park post-regulation change (604 people observed) than pre-regulation change (504 people observed). Therefore, *People/Hour (post and pre)* was tested. This is the only test in this series that is significant (P < 0.001, $n_{(post)} = 44$; $n_{(pre)} = 42$). Graph 4 (Appendix) shows that the difference between the median values is distinct and greater than would be expected by chance. Although human usage in the park has significantly increased, apparently many people either are not aware that the park regulation regarding dog presence has changed or are just not inclined to walk their dogs in Carpenter.

Hypothesis 2: Dogs will be leashed more frequently post-regulation change than observed in 2001-2003 (pre-regulation change).

Since the only concern for this test was whether observed dogs were leashed or not, all zero values (representing observation sessions when no dogs were observed) were removed. A population of percentages was then generated based on the number of leashed dogs/visit resulting in a population percent ($n_{[pre]}$) of 21% leashed (pre-regulation) vs. ($n_{[post]}$) 23% leashed post-regulation. Since the data was not normally distributed, Mann-Whitney Rank Sum Test was used to test this hypothesis. Although the medians were different, the difference was not great enough to exclude the possibility that the difference was due to random sampling variability (P = 0.586). (See Graph 5, Appendix.) Dogs were no more likely to be leashed after the regulation change.

Hypothesis 3: Observations of dogs will be more numerous closer to the parking lot and will decrease with distance from the parking lot.

During the 2001-2003 study, it was noted that most activity (human and/or dog) occurred in the parking lot or along portions of trails close to the parking lot. Human and/or dog activity decreased with increasing distance from the parking lot. To see if this pattern still held (not if the patterns were different between the two time periods), Spearman Rank Order Correlation was used to test for significance between two pairs of post-regulation change variables: Number of Humans vs. Distance from Parking Lot (Graph 6, Appendix), and Number of Dogs vs. Distance from Parking Lot (Graph 7, Appendix).

In each case, sample size was n =215. This represents the total number of observations made during the 44 sampling periods. For both, the test is significant (P=0.000) with negative correlation coefficients indicating that one variable increased while the other decreased (decreasing humans or decreasing dogs vs. increasing distance from parking lot). However, the graph for number of dogs vs. distance from parking lot suggests that the data is heavily influenced by zero values due to either no encounters while the observer was at a sampling plot or no encounters while the observer was at a sampling plot or no encounters while the observer was. Therefore, the test was rerun with the zero encounters removed. The number of humans vs. distance from the parking lot (n = 88) still is significant (P=0.000) with a correlation coefficient of -0.666. Most human activity still occurs in or near the parking lot. However, removing the zero dog encounters (n=31), rendered the decreasing dog encounters with increasing distance from the parking lot not significant (P=0.249, correlation coefficient -0.212). The graphs were not regenerated with zeros removed.

Curiosity led to determining if humans with dogs would walk farther than humans without dogs. Spearman Rank Order Correlation was used to evaluate these variables; however, no graphs are included for this test. All zero encounters were removed prior to analysis. For humans without dogs vs. distance from the parking lot, P=0.000, n = 77, correlation coefficient = -0.577. For humans with dogs vs. distance from parking lot,

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P=0.123, n = 29, correlation coefficient = -0.292. Since this set of variables is not significant, it cannot be concluded that humans walking dogs will walk farther. The results might be influenced by the fact that there were more observations of humans without dogs than humans with dogs.

Discussion: Although numbers of humans visiting Carpenter Park increased from the pre-regulation change project (2001-2003), it did not necessarily follow that dog numbers also increased. Dog owners and their dogs were not more likely to visit Carpenter Park post-regulation change than pre-regulation change. Perhaps the reason for this was that publicity related to the change was minimal. This observer was aware of just one newspaper article (winter 2007-2008) in the State Journal Register announcing the then newly revised management plan and the policy change for dogs. For the duration of this most recent monitoring, the Nature Preserve signs in Carpenter were not redone to reflect the change either. Therefore, it is possible that most visitors to the park were not aware that leashed dogs were allowed.

During each sampling visit (2008-2010), the location of dog evidence (scat or paw prints) was noted and the trail (or off-trail) location and distance to the parking lot was determined using GPS. It was thought that documenting this would be a good indicator of unobserved dog presence in the park. However, it was realized that, during days when sampling visits occurred, if the evidence was fresh, it was impossible to determine if the scat or paw print belonged to an observed dog. Some prints, as well, could have been observed on multiple sampling visits. Therefore, dog evidence was not used to evaluate dog presence in Carpenter.

Visits occurred during daylight hours and were concluded before 5 p.m. Since many owners might walk their dogs after arriving home from work, a possibly important component of park visitors was missed. Thus, dog presence might be greater than what was observed.

Dogs wandering freely in the park have the potential to disrupt wildlife. Although statistical analysis was not performed to determine significance, data about free-

roaming dogs was gathered and is reported here. A total of 56 dogs was observed in Carpenter during the 2008-2010 monitoring period. Twenty (20) dogs were encountered only in the parking lot. Several (some leashed, others not) were observed entering or exiting a trail with their owners but it could not be ascertained if these dogs were restricted to the trail. These were counted as being in the parking lot.

Thirty six (36) dogs were encountered along the trails. Of these 36 dogs, 72% (26 dogs) were observed to remain on-trail for the duration of the observation. It must be emphasized, however, that encounters with dogs lasted mere seconds and it could not be ascertained if dogs on-trail eventually wondered off-trail or if leashed dogs were freed to roam at some point. Nine (9) dogs (25%) were observed to leave the trail to wander in the woods during the observation period. One (1) dog was observed with its owner as it walked from Westwood Trail onto Blackberry Trail. However, intervening vegetation obscured whether the dog was leashed and whether the dog remained on-trail. Several seconds after entering Blackberry, four deer, one turkey and one duck were observed to hastily flee from the direction of Blackberry (consistent with where the human's and dog's position would have been) toward the river. It is possible that these were disturbed by the human and dog passing on the trail or by the dog running off the trail at that point. This sighting was the only observation of this nature during the project. No wildlife/dog interactions were observed otherwise. During the earlier project, one dog/wildlife interaction was noted and described (Hedrick, 2004).

Conclusion: Despite an increase in human visits to Carpenter Park, dog presence in Carpenter has not increased since the new management plan with its revised policy toward dogs was implemented. Both before and after the policy change, observations of dogs leaving the trail were minimal and most dogs, during the observation period, remained with their owners on trail or in the parking lot. Observations of interactions between dogs and wildlife were rare during both projects. However, if dog numbers do increase in the park, the likelihood of encounters with wildlife will increase and the presence of dogs could then become detrimental to wildlife welfare. Therefore, it is recommended that, if dogs are continued to be allowed in Carpenter Park, periodic

studies be conducted to monitor this situation and, if necessary, the newer policy should revert to the original. If the newer policy is deemed desireable, it is also recommended that signage boldly note that dogs be leashed and remain on-trail and, in particular, signs both at the park entrance and in the parking lot should be readily visible.



DOGS/HOUR AT CARPENTER PARK



Graph 1.

The graph shows the median values and the range for the 5th and 95th percentiles. There is much overlap in the data between the two time periods. The graph displays raw (not ranked) data.

Pre n =42; mean = 0.315; median = 0.195; SE = 0.0570; C.I. = 0.115 Post n=44; mean = 0.390; median = 0.268; SE = 0.0699; C.I. = 0.141 P = 0.806

DOGS/DOG OWNERS/HOUR AT CARPENTER PARK



Graph 2.

The graph shows the median values and the range for the 5th and 95th percentile. The graph reflects raw (not ranked) data.

Pre n = 42; mean = 0.134; median = 0.0619; SE = 0.0392; C.I. = 0.0792 Post n = 44; mean = 0.231; median = 0.0619; SE = 0.0593; C.I. = 0.120 P = 0.773

DOG OWNERS/HOUR AT CARPENTER PARK



Graph 3.

The graph shows the median values and the range for the 5th and 95th percentile. The graph reflects raw (not ranked) data.

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 \begin{array}{ll} \mbox{Pre} & n=42; \mbox{ mean}=0.466; \mbox{ median}=0.236; \mbox{ SE}=0.0900; \mbox{ C.I.}=0.182\\ \mbox{Post} & n=44; \mbox{ mean}=0.575; \mbox{ median}=0.250; \mbox{ SE}=0.150; \mbox{ C.I.}=0.303\\ \mbox{P}=0.611 \end{array}
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PEOPLE/HOUR AT CARPENTER PARK



Graph 4.

The median values for the two time periods in this graph are clearly distinct. This set of variables is the only set testing the first hypothesis that is significant. The graph displays raw (not ranked) data.

 $\begin{array}{ll} \mbox{Pre} & n=42; \mbox{ mean}=2.223; \mbox{ median}=1.780; \mbox{ SE}=0.336; \mbox{ C.l.}=0.679 \\ \mbox{Post} & n=44; \mbox{ mean}=4.003; \mbox{ median}=3.238; \mbox{ SE}=0.481; \mbox{ C.l.}=0.970 \\ \mbox{P}<0.001 \end{array}$

FREQUENCY OF LEASHED DOGS IN CARPENTER PARK





Graph 5.

The difference in the median values between the pre- and post- regulation periods was not great enough to exclude the possibility that the difference is due to randon sampling variability. Raw (rather than Rank) data is displayed.

Percent leashed (pre) n = 21; mean = 0.571; median = 0.667; SE = 0.0954; C.I. = 0.199 Percent leashed (post) n =23; mean = 0.504; median = 0.500; SE = 0.0936; C.I. = 0.194 P = 0.586



Graph 6.

This set of paired variables may not be influenced heavily by the number of zero observations as the dog vs. distance variables (Graph 7). With zeros included, P = 0.000, correlation coefficient = -0.613, n = 215. With zeros removed n = 88; correlation coefficient = -0.666; P = 0.000.



Graph 7.

This graph (n=215) appears to be heavily influenced by the number of 0 values. Correlation coefficient: -0.291, P = 0.000. Once the zero entries were removed, the decrease in dog observations with increasing distance from the parking lot was no longer significant (n = 31; correlation coefficient = -0.212; P = 0.249).

REFERENCES

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- Sime, C.A. 1999. Domestic dogs in wildlife habitats. Pages 8.1-8.17 in *Effects of* recreation on Rocky Mountain Wildlife: A Review for Montana. G.Joslin and H. Youmans, coordinators. Committee on Effects of Recreation on Wildlife, Montana Chapter of the Wildlife Society. 307pp.
- Sokal, R.R. and F. J. Rohlf. 1995. Biometry, the principles and practice of statistics in biological research. 3rd edition. Freeman and Company, New York

Visit Data	#	# 0000	DOG	# D w U	# U D					EEEODT
		# D0G5								
4/16/08	13	1	0	1	1	?	?	?	?	2.5
6/2/08	10	0	0	0	0	0	0	0	0	3
1/23/08	15	0	0	0	0	0	0	0	0	4.25
8/10/08	11	0	0	0	0	0	0	0	0	5
9/17/08	14	0	0	0	0	0	0	0	0	3
9/21/08	34	0	0	0	0	0	0	0	1	2
10/18/08	46	5	0	5	17	4	1	1	0	4
11/19/08	8	0	0	0	0	0	0	0	0	3.25
11/29/08	6	2	0	2	4	2	0	2	0	3
12/13/08	1	4	0	3	1	0	3	0	3	3
1/9/09	16	2	2	2	6	2	0	0	0	3.25
1/29/09	7	3	2	3	1	0	3	3	0	2
2.7/09	36	4	6	4	14	4	0	5	0	5
3/14/09	7	0	1	0	0	0	0	0	0	4.5
3/26/09	4	0	1	0	0	0	0	0	0	2.25
4/25/09	24	2	0	2	2	2	0	0	0	3
5/20/09	15	1	0	1	1	0	1	0	0	4
6/1/09	19	0	0	0	0	0	0	0	0	4.25
6/6/09	10	0	0	0	0	0	0	0	0	3.5
6/13/09	26	0	1	0	0	0	0	0	0	3.5
7/3/09	13	0	1	0	0	0	0	1	0	3.5
7/13/09	8	0	0	0	0	0	0	0	0	3.75
7/18/09	6	0	0	0	0	0	0	0	0	3.75
8/18/09	10	1	0	1	1	0	1	0	0	3.5
9/3/09	9	0	0	0	0	0	0	0	0	2.5
9/18/09	7	1	1	0	0	0	1	0	0	3.5
9/23/09	37	1	1	1	1	1	0	0	0	4
10/4/09	17	2	0	2	2	1	1	0	0	3.5
10/19/09	11	0	2	0	0	0	0	0	0	4
10/24/09	30	4	0	4	14	2	2	2	0	4
11/6/09	11	2	0	2	1	0	2	0	0	3.5
11/28/09	29	5	1	5	11	4	1	2	0	4
12/14/09	4	0	0	0	0	0	0	0	0	3.25

1/13/10	5	2	2	2	1	0	2	2	0	3
1/27/10	2	4	1	4	1	0	4	1	4	3
2/13/10	5	2	1	2	2	1	1	1	0	3
2/19/10	3	3	3	3	1	0	3	1	0	2.5
3/8/10	7	0	1	0	0	0	0	1	0	3.5
3/20/10	4	1	0	1	2	1	0	1	0	3
3/25/10	3	0	0	0	0	0	0	0	0	2
3/30/10	25	2	2	1	3	1	1	0	0	4
4/1/10	22	0	1	0	0	0	0	0	1	4.25
4/8/10	10	1	1	1	5	1	0	1	0	3
4/22/10	4	1	1	1	1	1	0	2	0	2.25
Totals	604	56	32	53	93	27	27	26	9	

#HwD = number of humans with dogs

#DwH = number of dogs with humans

Effort = total sampling time per visit

Grant Agreement #09-009W: An Assessment of Canine Presence in Carpenter Park Nature Preserve, Springfield, IL.

A total of 44 sampling visits were made to Carpenter Park, Springfield, IL beginning April 16, 2008. The final sampling visit occurred April 22, 2010.

Total round trip miles/visit from Carlinville, IL to Carpenter Park = 118 miles.

For purposes of this grant, mileage reimbursement for 40 (only) sampling visits at the amount stipulated in the grant agreement is requested. There were no additional expenditures.

Sampling visits occurred on the following dates:

4/16/08	4/25/09	11/6/09
6/2/08	5/20/09	11/28/09
7/23/08	6/1/09	12/14/09
8/10/08	6/6/09	1/13/10
9/17/08	6/13/09	1/27/10
9/21/08	7/3/09	2/13/10
10/18/08	7/13/09	2/19/10
11/19/08	7/18/09	3/8/10
11/29/08	8/18/09	3/20/10
12/13/08	9/3/09	3/25/10
1/9/09	9/18/09	3/30/10
1/29/09	9/23/09	4/1/10
2.7/09	10/4/09	4/8/10
3/14/09	10/19/09	4/22/10
3/26/09	10/24/09	









PARK VEHICLES ONLY



