

**SUMMARY REPORT
(Revised)**

Deer Distance Sampling Population Estimate

Kirkwood, Missouri

by

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23 January 2018

Introduction/Methods

The City of Kirkwood is 9.2 mile² and encompasses the area directly north and east of the I-270 and I-44 junction. Geyer Road runs north/south and nearly bisects the community. We often delineate areas within a community to better describe deer density variability if it exists.

We used a population estimation method called Distance Sampling. This approach is based on the premise that you can determine the width of a transect traveled by creating a detection probability from the field observations (i.e., number of deer and distance from the transect). In simple terms, the software program projects the area sampled and then integrates the number of deer observed in that area to determine density.

First, we delineated a non-overlapping spotlighting route on a city road map (Figure 1). We used Detective Rashad Akinyemi, Kirkwood Police officer, as part of the survey team. Spotlighting surveys were conducted from ~22:00-06:00 h on 8 January 2018 and between ~22:00-04:00 h on 9-10 January 2018. The transect was ~29.9 miles long, comprised of 8.5 miles east of Geyer Road, 21.4 miles west of Geyer Road, and surveyed once on 8 January 2018. On 9-10 January 2018, the section of the route east of Geyer Road was eliminated from the transect as no deer were detected along this portion of the route.

While driving 10 mph spotters searched their respective side of the road with 400,000 candlepower spotlights. Upon sighting deer, the number in each social group, age and sex of the individuals, and the perpendicular distance to the group was recorded. These data were then entered into a software program (Distance-Version 6.0) that estimates the deer density.

Results/Discussion

The survey team counted from 62–72 deer (21-31 groups of deer) on the 3 transect replicates (See Figure 1 for the full survey route). Temperature, wind, and cloud cover were similar on all three sampling nights. Deer were observed from 1 (on the road) to 150 yards from the road, with most observations occurring less than 60 yards. The mean sighting distance was 51.1 yards. The average cluster size was 2.56. The complete observations sheets are attached as Appendix A.

Deer were only observed on ~21.4 miles of the 29.9 mile transect. The segment of the transect with deer observations occurred west of Geyer Road (Figure 2). West of Geyer Road deer appeared to be distributed along the wooded habitat/developed interface with numerous observations occurring on Marshall Road, Ballas Road, Boaz Avenue, and the S Geyer/Windsor/Orcha Road complex of roads. The sampling data from 9 January 2018 is presented in Figure 3 to visually depict the relative distribution observed.

No deer were observed east of Geyer Road even though it comprised nearly 28% of the transect route (8.5 miles of transect) and ~48% of the land area (~4.48 mile²). Based on these observations the deer densities east of Geyer Road can be assumed to be <10 deer/mi². Residents in this area may experience some conflicts with deer, but the area would typically be considered to have low deer densities.

The estimated density for the west portion of the municipality (where deer were observed; ~4.72 mile²) is ~32 deer/mile² (95% Confidence interval: 20 – 51 deer/mile²). Therefore, we estimate that there were ~151 deer (32deer/mile² X 4.72 mile² = 151.04 deer) inhabiting this area with a range of 94-240 at the 95% confidence interval. Please be advised that these estimates are pre-fawning with an expected increase in May and June.

The demographics of the population were ~40.8% yearling and adult females, ~43.8% fawns, and 14.4% yearling and adult males based on observations during the survey. The data indicates a recruitment rate of ~1.1 fawn per adult doe, slightly lower than we typically see in the western suburbs of Saint Louis, Missouri.

Field observations suggest that recreational feeding of deer is causing concentrations in certain areas within the municipality. This will likely cause increased deer damage to landscape plantings and a furtherance of human deer conflicts proximate to the feeding locations.

Integration of deer into more developed parts of the municipality is a direct result of traditional deer habitat loss and increasing deer densities. Deer utilize the forage that is available (i.e., landscape plantings) when traditional browse is not available, and seek cover in sparser, less desirable, wooded corridors as densities increase. Conflicts between humans and deer increase as they embed themselves into these more highly developed areas.

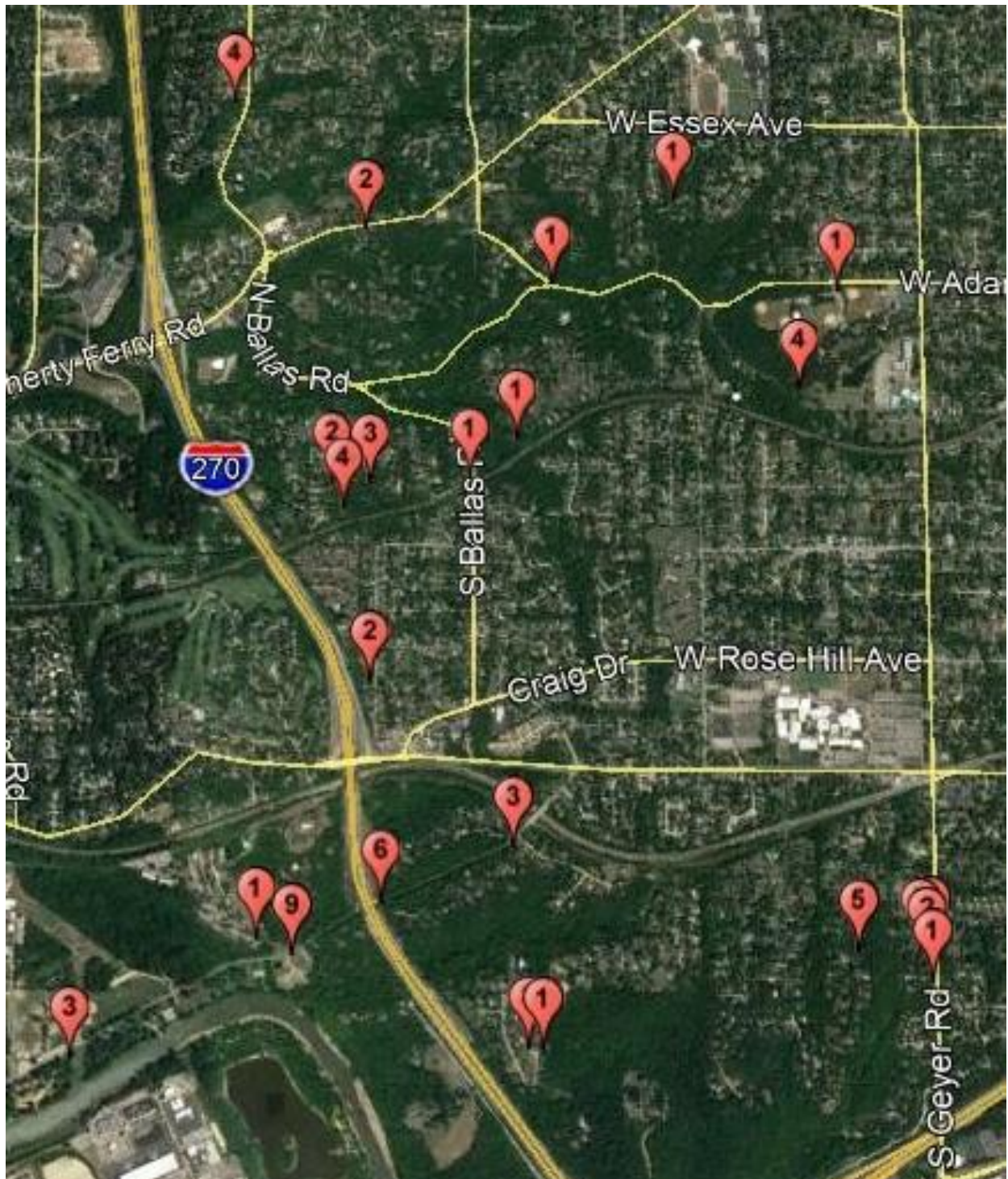
Figure 1. Kirkwood, MO Delineated Distance Sampling Route 8, 9, & 10 January 2018.



Figure 2. Kirkwood, MO Area of Deer Observations, Distance Sampling 8, 9 & 10 January 2018.



Figure 3. Kirkwood, MO deer observations 9 January 2018



Appendix A. Distance Sampling Observation 8-10 January 2018

Date	Number of Deer in Group	Perpendicular Distance (yd)	AF/AM/Fawn	Location
1/8/2018	1	35	AM	10 Windsor Ln
1/8/2018	4	45	3 AF, 1 Fawn	24 OrchaRoad Ln
1/8/2018	2	53	1 AF, 1 Fawn	1410 Royal Springs Dr
1/8/2018	2	11	2 AM	1417 Wilton Ln
1/8/2018	1	82	1 Unknown	Big Bend Road/ Marjean Ct
1/8/2018	6	30	3 AF, 3 Fawn	Marshall Road/North Signal Hills Dr
1/8/2018	3	32	3 Unknown	Marshall Road/ Charmwood Dr
1/8/2018	2	65	1 AF, 1 unknown	Marshall Road/South Signal Hill Dr
1/8/2018	3	68	1 AM, 2 unknown	Marshall Road/Timberbrook Dr
1/8/2018	2	134	1 AF, 1 Fawn	Marshall Road/Timberbrook Dr
1/8/2018	4	35	2 AF, 2 Fawn	Marshall Road/ Tree Court Industrial Blvd
1/8/2018	1	68	Unknown	Marshall Road/ Tree Court Industrial Blvd
1/8/2018	3	68	3 AM	Marshall Road/ Tree Court Industrial Blvd
1/8/2018	5	114	2 Fawns, 1 AF, 2 Unknown	71 E Glenwood Ln
1/8/2018	2	70	2 Unknown	835 Edna Ave
1/8/2018	7	30	2 AF, 4 Fawn, 1 unknown	W Adams Ave/S Ballas Road
1/8/2018	1	57	1 unknown	1651 W Adams Ave
1/8/2018	2	19	2 AF	2017 Rayner Road
1/8/2018	1	14	1 AF	Pinecrest Manor Ln/N Ballas Road
1/8/2018	4	58	2 AF, 2 Fawn	Creekbriar Ln/Lynkirk Ln
1/8/2018	1	68	1 AF	1115 Dougerty Ferry Road
1/8/2018	3	58	1 AF, 2 Fawn	1220 W Essex Ave
1/8/2018	3	27	2 AF, 1 Fawn	35 Couch Ave
1/8/2018	2	32	2 AM	1029 Lark Ave
1/8/2018	1	70	1 unknown	185 Horeshoe Dr
1/8/2018	5	60	3 Fawn, 2 AF	225 Horseshoe Dr
1/9/2018	5	2	2 AF, 3 Fawn	28 OrchaRoad Ln
1/9/2018	5	65	2 AF, 3 Fawn	Boxwood Ln/South Geyer Road
1/9/2018	1	1	1 AM	Boxwood Ln/South Geyer Road
1/9/2018	2	40	1 AF, 1 Fawn	1315 S Geyer Road
1/9/2018	1	38	1 Fawn	South Geyer Road/Ivanhoe Woods
1/9/2018	3	85	2 AF, 1 Fawn	End of Neffwold Road

1/9/2018	1	60	1 AF	End of Neffwold Road
1/9/2018	2	10	1 AF, 1 Fawn	1471 Wilton Ln
1/9/2018	1	62	1 AM	1490 Wilton Ln
1/9/2018	1	68	1 unknown	1490 Wilton Ln
1/9/2018	2	25	2 Fawn	1490 Wilton Ln
1/9/2018	3	33	1 AF, 2 Fawn	South Signal Hills Dr/Marshall Road
1/9/2018	6	35	1 AF, 5 unknown	Marshall Road/I-270
1/9/2018	2	20	2 unknown	Marshall Road/Timberbrook Dr
1/9/2018	5	43	1 AM, 4 unknown	Marshall Road/Timberbrook Dr
1/9/2018	2	100	2 unknown	Marshall Road/Timberbrook Dr
1/9/2018	3	150	3 unknown	Marshall Road/River Dr
1/9/2018	1	50	1 unknown	Timberbrook Dr/Oaktimber Ct
1/9/2018	2	60	1 AF, 1 unknown	835 Edna Ave
1/9/2018	3	25	1 AF, 2 Fawn	1851 Boaz Ave
1/9/2018	4	39	3 fawns, 1 AF	1912 Boaz Ave
1/9/2018	2	12	1 fawn, 1 AF	1919 Boaz Ave
1/9/2018	1	40	1 AM	Bach Ave/South Ballas Road
1/9/2018	1	31	1 AF	West Adams Ave/Lindemann Road
1/9/2018	2	22	2 AM	Dougherty Ferry Road/Rieth Terrace
1/9/2018	4	90	1 fawn, 3 unknown	595 N Ballas Road
1/9/2018	1	42	1 AM	405 Gabriel Dr
1/9/2018	1	44	1 AF	Amphitheatre Dr/W Adams Ave
1/9/2018	2	34	1 AF, 1 Fawn	Amphitheatre Dr/W Monroe Ave
1/9/2018	2	62	2 unknown	Amphitheatre Dr/W Monroe Ave
1/9/2018	1	52	1 Fawn	1506 Lark Ave
1/10/2018	2	14	1 AF, 1 Fawn	11 Windsor Ln
1/10/2018	1	105	1 Fawn	15 Windsor Ln
1/10/2018	4	78	4 unknowns	458 Oakshire Ln
1/10/2018	6	70	6 unknowns	end of Neffwold Road
1/10/2018	6	26	3 AF, 3 Fawns	end of Neffwold Road
1/10/2018	3	91	3 unknowns	1490 Wilton Ln
1/10/2018	3	52	3 unknowns	Marshall Road/Timberbrook Dr
1/10/2018	1	32	1 AM	Marshall Road/Timberbrook Dr
1/10/2018	4	140	4 unknowns	Marshall Road/Timberbrook Dr
1/10/2018	1	130	1 unknown	Timberbrook Dr/South Glenwood Ln
1/10/2018	2	70	2 unknown	Timberbrook Dr/South Glenwood Ln
1/10/2018	2	22	2 AF	1817 Boaz Ave
1/10/2018	2	15	1 AF, 1 Fawn	1903 Boaz Ave
1/10/2018	1	43	1 unknown	Westview Ave/Bach Ave
1/10/2018	3	65	3 unknown	Bach Ave/South Ballas Road

1/10/2018	3	28	3 unknown	West Adams Ave/South Ballas ad
1/10/2018	5	85	2 fawns, 3 unknown	Lindemann Road/View Woods Dr
1/10/2018	4	46	1 AF, 2 fawns, 1 unknown	617 N Ballas Road
1/10/2018	1	20	1 AM	W Adams Ave/Amphitheatre Dr
1/10/2018	3	55	2 AM, 1 unknown	Rifle Range Dr West/ W Monroe Ave
1/10/2018	5	59	2 AF, 3 fawns	Rifle Range Dr West/ W Adams Ave