

**2020 WHITE-TAILED DEER SPOTLIGHT
SURVEY REPORT FOR THE CITY OF
LAKEWAY, TX**



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INTRODUCTION

Lakeway, TX is located just west of Westlake, TX and south of man-made Lake Travis. Lakeway, TX is approximately 7,271 acres (GIS city limit boundary of Lakeway, TX) and is home to roughly 14,000 residents with a rapidly expanding population and infrastructure system. The city is also home to an abundance of native wildlife species including White-tailed deer, Rio Grande turkey, sporadic quail populations and many others. Due to the new development and an expanding urban population across central Texas over the past 20 years, wildlife populations including White-tailed deer (*Odocoileus virginianus*) have adapted to survive in metropolitan settings.

The city of Lakeway, TX and the Wildlife Advisory Board seek to understand the White-tailed deer population dynamics and specifically estimate White-tailed deer density within Lakeway. To do so, Lakeway, TX contracted Kolbe Ranches and Wildlife, LLC to conduct a White-tailed deer spotlight survey to estimate deer density within city limits.

White-tailed deer spotlight surveys are generally conducted after daylight hours utilizing a 3+ person team, a vehicle for transportation, spotlights, GPS and recording sheets. The surveyors drive a predetermined route that attempts to represent the area of interest holistically. The route is decided upon to be relatively accessible by vehicle but also tries to survey the entirety of the area and encompass all areas of interest. Notable areas to be utilized during the survey route will be open lots, golf course openings, and scattered opened fields around the area where White-tailed deer are likely to browse during nocturnal hours. Surveys were conducted on November 12th, November 19th and November 25th of 2020. An updated visibility estimation was conducted on November 9th, 2020.

As with all survey methodology, there are positives and negatives. One drawback to the survey being that in late November to early December, White-tailed deer are in the rutting season, meaning that males begin to seek females to breed. This tends to expand the home-range of a White-tailed deer and thus spreads the population out further than normal. Expanded home-ranges means an increase in short-term immigration and emigration. This implies that deer normally found in the Lakeway area could potentially emigrate away from Lakeway in search of mates or opportunistic feeding opportunities. Conversely, deer that are not normally located within the Lakeway area could be present during the time of survey as they immigrate in search of a mate or for feeding purposes.

The rutting period and changes in immigration and emigration implies changes to foraging patterns as well. Throughout the early months of October, deer are generally still grouped in male and female cohorts and can be quite predictable to feed during the nocturnal hours. However, during December and the rutting period, feeding strategies can drastically alter as males decrease nutrition consumption to focus more on mating. Females tend to still be consuming nutrition at a normal rate and possibly increasing as they prepare for gestation, but are displaced from normal feeding times and locations by rutting males. The change in foraging locations and timing can make accurately estimating deer density more difficult.

However, with the present drawbacks are positive points. Lakeway is roughly 4-5 square miles in size. Most of the area is highly developed leaving very particular areas available for White-tailed deer to forage. Moreover, a total of 3 surveys each one week apart, will be conducted to acquire the highest count possible. Conducting at least 3 surveys helps account for the stochastic factors within the survey that cannot be manipulated such as immigration, emigration, temperature, wind, precipitation and others.

Beginning and continuing routine White-tailed deer density estimates is the first step to becoming more informed on the population trend of White-tailed deer in Lakeway. Using the long-term trend data to track changes in the White-tailed deer density, the city of Lakeway can become more connected to deer density changes.

SURVEY TIMELINE AND DETAILS

- November 9, 2020..... Conducted visibility estimation for updated visible acreage
- November 12, 2020..... Conducted first spotlight survey in Lakeway, TX (Approx. 8:45pm – 11:45pm)
- November 19, 2020..... Conducted second spotlight survey in Lakeway, TX (Approx. 8:50pm – 12:30am)
- November 25, 2020..... Conducted third spotlight survey in Lakeway, TX (Approx. 8:45pm – 12:00am)
- November 26-Dec. 3, 2020..... Constructed GIS maps and data metrics for consultation and presentations
- December 4, 2020 Submit Report by

All actions and liabilities by surveyors are the sole responsibility of Kolbe Ranches and Wildlife, LLC. Furthermore, all communication will be through the city officials of the Lakeway, TX Wildlife Advisory Committee and Kolbe Ranches and Wildlife Consulting (Nicholas Kolbe). At no time should Lakeway, TX city officials and those representing Lakeway, TX in any capacity contact anyone other than Nicholas Kolbe regarding details of this contract, questions pertaining to work being conducted or any other dealings in this matter.

Kolbe Ranches and Wildlife, LLC (Nicholas Kolbe) retains the right to discuss details pertaining to this contract and the results in which are produced to ONLY those individuals listed herein this contract unless otherwise instructed and given the permission to do so by the Lakeway, TX Wildlife Advisory Board.

BASELINE SURVEY DATA

Visible Acres for Survey Route	Length of Route (Miles)	Size of Lakeway, TX (Acres)
713/night**	27.3	7,271

** New visibility estimation data derived in 2020

RESULTS

Trip: 1 of 3	Date:	12-Nov	Start time:	8:45 PM	CDT	
	Official					
	Sunset	5:34 PM	End Time:	11:45 PM	CDT	
	Moon Phase	n/a				
	light (5-8mph)	Start Cloud				
Start Wind Speed (MPH):	8mph	Cover:	0			
Start Wind Direction:	S	Start Temp. (F):	55			
End Wind Speed (MPH):	n/a	End Cloud Cover:	Clear			
End Wind Direction:	n/a	End Temperature:	54			
Trip	Male	Female	Juvenile	Unknown	Total	Density (acres:deer)
1 of 3	21	77	19	0	117	6.18

Trip: 2 of 3	Date:	19-Nov	Start time:	8:50 PM	CDT	
	Official					
	Sunset	5:30 PM	End Time:	12:30 AM	CDT	
	Moon Phase	n/a				
	Calm (0-5mph)	Start Cloud				
Start Wind Speed (MPH):	5mph	Cover:	0%			
Start Wind Direction:	S	Start Temp. (F):	58			
End Wind Speed (MPH):	n/a	End Cloud Cover:	Clear			
End Wind Direction:	n/a	End Temperature:	58			
Trip	Male	Female	Juvenile	Unknown	Total	Density (acres:deer)
2 of 3	22	103	23	0	148	4.89

RESULTS CONTINUED

Trip: 3 of 3	Date:	25-Nov	Start time:	8:45 PM	CDT	
	Official					
	Sunset	5:30 PM	End Time:	12:00 PM	CDT	
	Moon Phase	n/a				
	Calm (5-8mph)	Start Cloud				
Start Wind Speed (MPH):		Cover:	0			
Start Wind Direction:	S	Start Temp. (F):	65			
End Wind Speed (MPH):	n/a	End Cloud Cover:	Clear			
End Wind Direction:	n/a	End Temperature:	49			
Trip	Male	Female	Juvenile	Unknown	Total	Density (acres:deer)
3 of 3	25	84	31	3	143	5.06

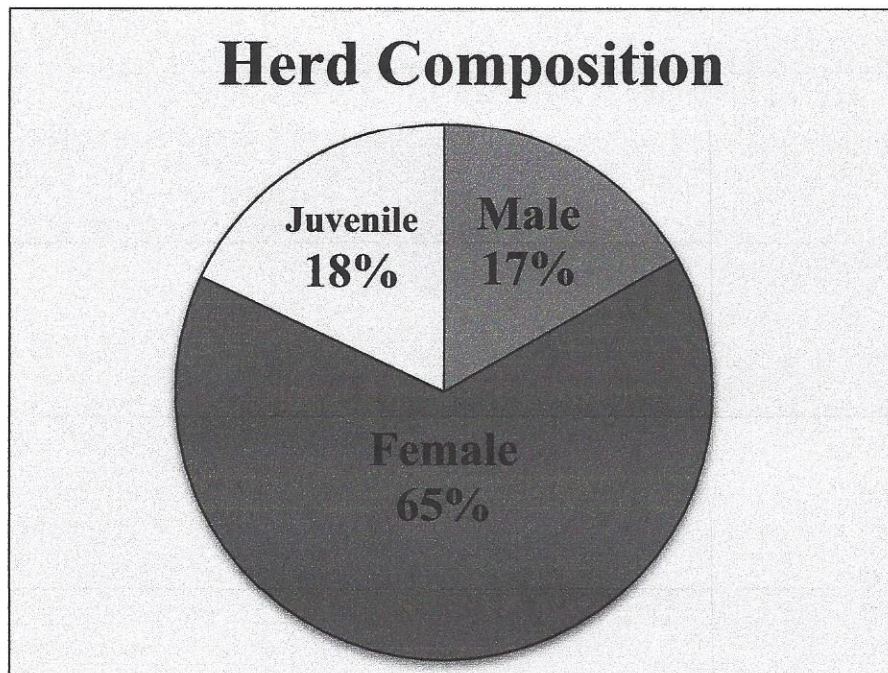
SURVEY DATA SUMMARY

Night	Male	Female	Juvenile	Unidentified	Total Deer Seen	Density (Deer Seen/Vis.)
1	21	77	19	0	117	6.18
2	22	103	23	0	148	4.89
3	25	84	31	3	143	5.06
TOTAL	68	264	73	3	408	Average (5.38)

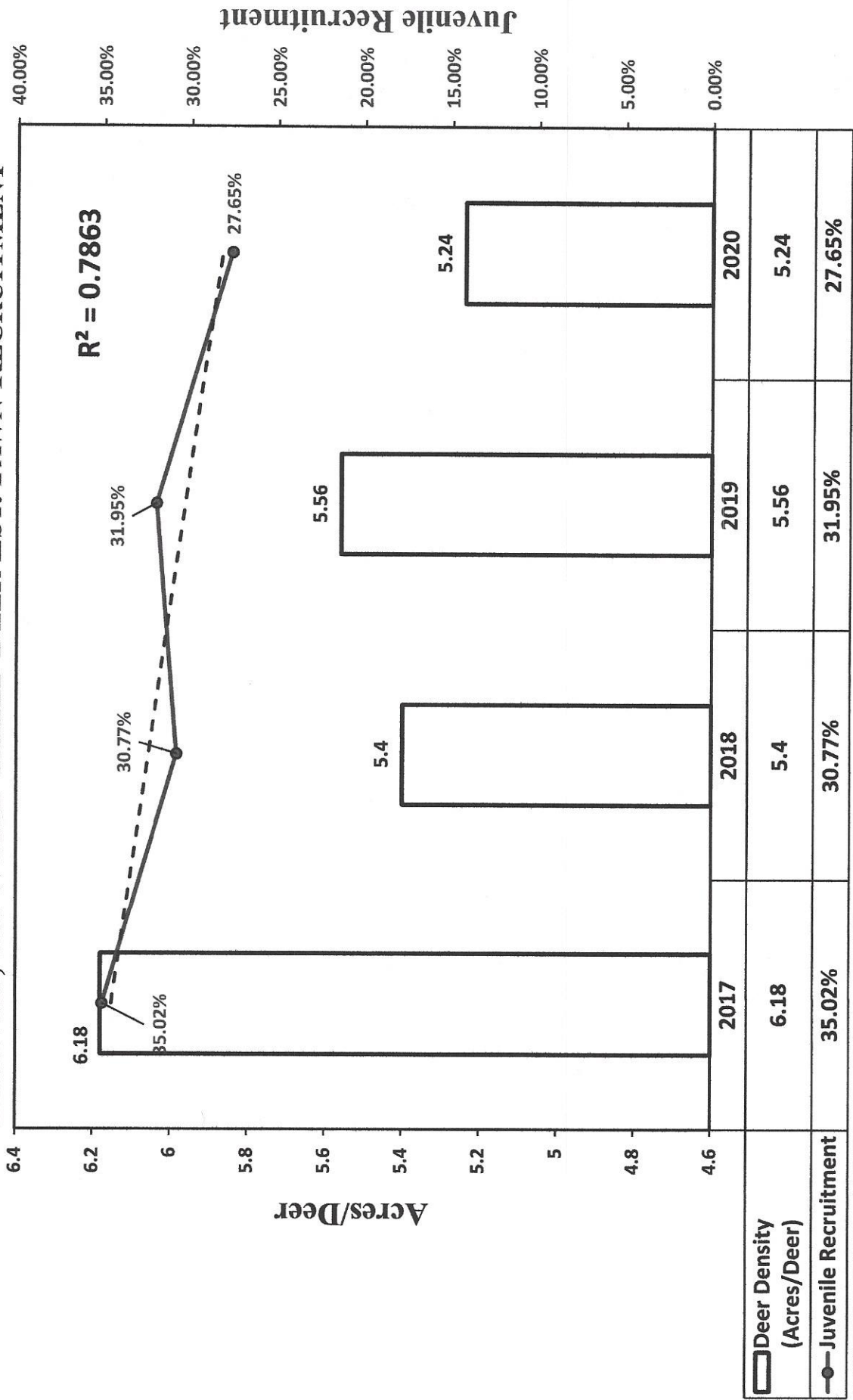
METRIC DESCRIPTION

METRIC

Total Area Surveyed (Acres) (All three nights of visible acres added together (713 * 3 = 2139))	2139
Total Deer Sighted (Total males, females & juveniles)	408
Acres / Deer (Total acres viewed ÷ total deer seen)	5.24
Female / Male (Total females ÷ total males)	3.88
Juvenile / Female (Recruitment) (Total juveniles seen ÷ total females seen) = 0.2765	27.65%

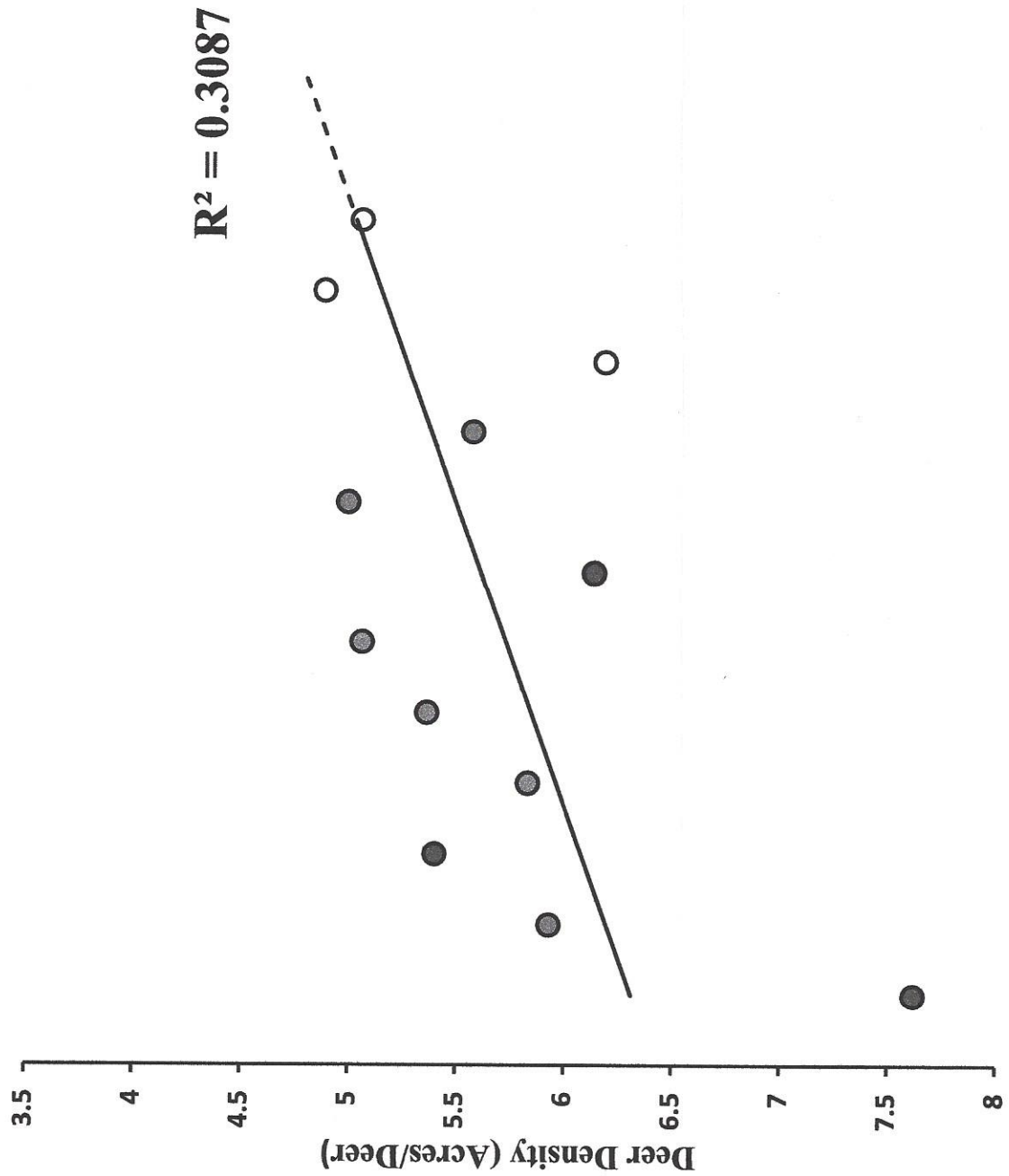


LAKEWAY, TX WHITE-TAILED DEER EST. FAWN RECRUITMENT

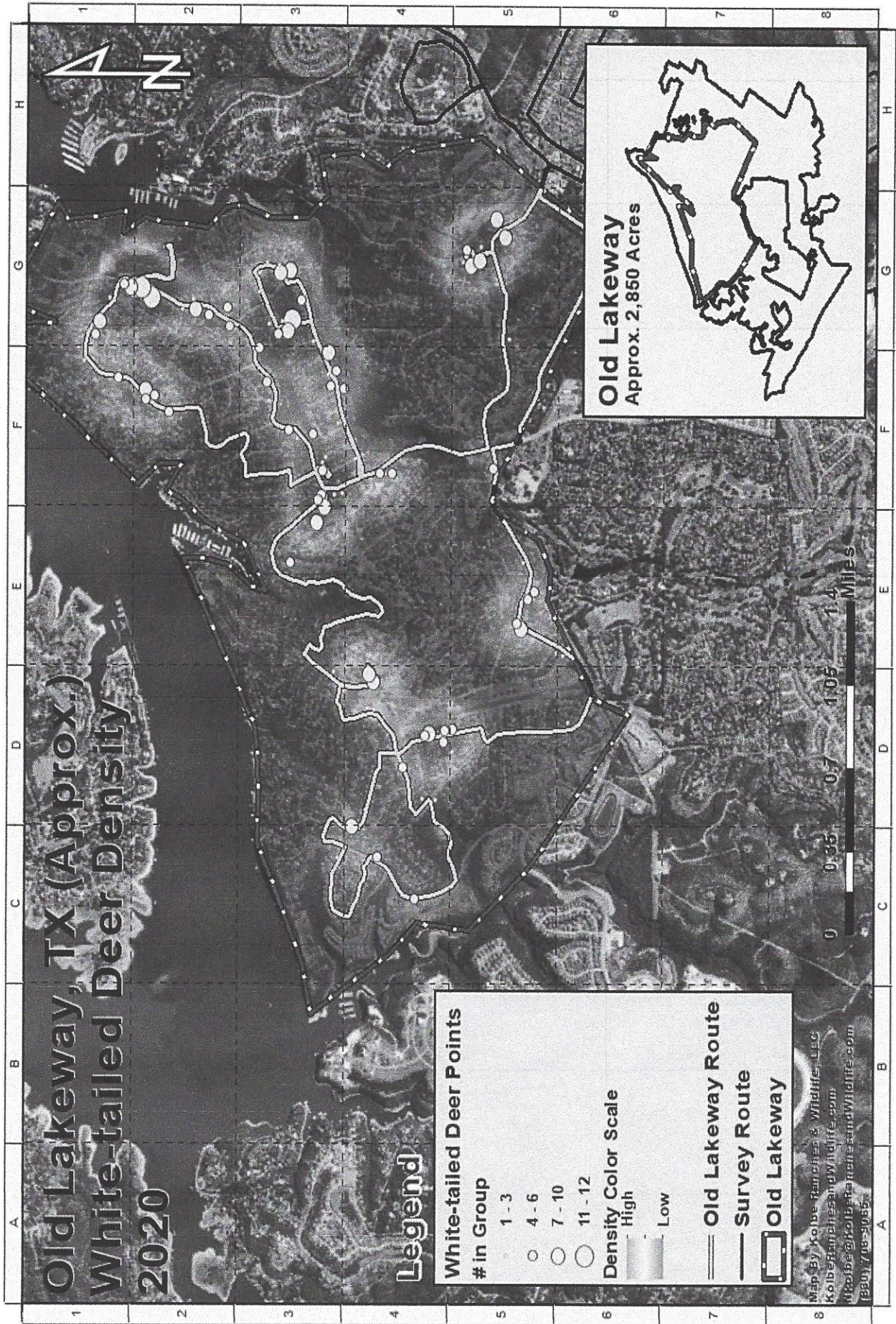


Deer Density (Acres/Deer)	6.18	5.56	5.24
Juvenile Recruitment	35.02%	31.95%	27.65%

2017-20 RUNNING SPOTLIGHT SURVEY DENSITY ESTIMATES



Year	Deer Density
2017	7.62
2017	5.93
2017	5.4
2018	5.83
2018	5.36
2018	5.06
2019	5.98
2019	4.82
2019	5.44
2020	6.18
2020	4.88
2020	5.05



**Old Lakeway, TX (Approx.)
 White-tailed Deer Density
 2020**

Legend

- White-tailed Deer Points**
- # in Group
 - 1 - 3
 - 4 - 6
 - 7 - 10
 - 11 - 12
- Density Color Scale**
 - High
 - Low
- Old Lakeway Route**
- Survey Route**
- Old Lakeway**

Map By Kolbe Ranches & Wildlife, LLC
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Lakeway, TX White-tailed Deer Survey Summary

Below are the white-tailed deer spotlight survey metric data collected over the past four consecutive years within the city limits of Lakeway, TX.

White-tailed Deer Metric Data

	Deer Density (Acres:Deer)	% Fawn Recruitment (Fawn:Does)	Sex Ratio (Doe:Buck)	Total Deer Sighted	Miles Driven
Year					
2017	6.18	35%	3.74 : 1	351	27.3
2018	5.4	31%	4.41 : 1	402	27.3
2019	5.56	32%	3.6:1	393	27.3
2020	5.38	28%	3.88:1	408	27.3

** Lit. Sited - White-tailed Deer Management in the Texas Hill County. W. E. Armstrong & E. L. Young. Texas Parks and Wildlife **

Concluding Remarks

When compared to literature figures, a healthy and managable white-tailed deer density located on natural range conditions is between 10-15 Acres:Deer in the Eastern portion of the Edwards Plateau. Past and current population density estimate are roughly double of what is considered healthy and manageable for this part of Texas. However, a urban deer population lends itself to a much different set of density dependent and independent factors than that of a natural range condition setting.

With where the white-tailed deer population currently is, there is much more risk of the deer population decreasing in density (more acres/deer) than increasing (less acres/deer). Populations of most biological species cannot grow indefinitely. The same is true when we look at the white-tailed deer data over the past 4 years of surveying within Lakeway, TX. The population has increased from the first survey of a deer/6.18 acres to today with a deer/5.38 acres. These data show very little increase in density over a 4 year survey period which, in turn when coupled with other data metrics such as fawn recruitment and doe:buck ratios, indicated a population at or close to a max (K-carrying capacity) threshold. The risk of the population increasing density past where it currently sits is minimal. I am not saying it is not possible, but I am saying the population of white-tailed deer has a greater risk of decreasing in density rather than increasing due to where it currently sits.

A white-tailed deer population at this level on natural range conditions or a "ranch" setting would warrant removal of animals. However, Lakeway, TX is not a "ranch" setting. Many other factors need to be considered when managing a urban deer herd such as cultural factors (public view, city goals and development), inability to limit emigration/immigration, artificial supplemental feeding, lack of many natural predators, minimal hunting/recreational harvest pressure, and others.