

WHITE-TAILED DEER SPOTLIGHT SURVEY IN LAKEWAY, TEXAS

LAKeway, TEXAS

PREPARED BY NICHOLAS R. KOLBE

KOLBE RANCHES AND WILDLIFE CONSULTING

CONTACT: NICK@TURNKEYRANCH.COM

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LAKEWAY, TEXAS

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CITIZEN ADVOCATES FOR ANIMALS (CAFA)

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WHITE-TAILED DEER SPOTLIGHT SURVEY

M.S. IN WILDLIFE ECOLOGY

Spotlight surveys were conducted on December 5th, 12th, and 19th, 2017

EXECUTIVE SUMMARY

Property Description:

Lakeway, Texas is located west of Austin, Texas in Travis County and is home to approximately 14,000 permanent residence. The official city limits encompasses approximately 7,270 acres. The city sits within the Edwards Plateau ecoregion. Historically this type of environment would consist of open grassland with early successional brush mixed throughout. Today the majority of the area has been developed with homes, businesses and roadways replacing native habitat. Roughly 38% of the native habitat remains with the majority being brush mottes with species such as White brush, Live oak, Texas kidneywood, Cedar *sp.*, Yaupon, Cenizo, Persimmon and others.

Mission:

Citizen Advocates For Animals (CAFA) seeks to better understand the current population density and future population density trends in the urban White-tailed deer (*Odocoileus virginianus*) population within Lakeway, Texas. To do so, a spotlight survey was prescribed to survey the city and estimate deer density.

Purpose:

With the expansion of urban sprawl throughout Texas cities, interaction between humans and wildlife has become much more frequent. In response to the increased interaction within city limits, Lakeway has implemented Trap, Transport and Process (TTP) procedures to remove White-tailed deer from the city annually to decrease the, what is perceived as, overpopulation of deer. However, currently there is little long-term data available that supports regular TTP efforts of White-tailed deer in Lakeway. With the use of long-term survey methods such as annual spotlight surveys, the city can begin to track changes in the White-tailed deer population more closely. In turn, the city will be able to better prescribe control measures, or lack thereof, annually that is warranted by long-term survey data.

Target Indigenous Species

White-tailed deer (*Odocoileus virginianus*)

LAKEWAY, TEXAS

CITIZEN ADVOCATE FOR ANIMALS (CAFA)

SPOTLIGHT SURVEY

PREPARED BY: NICHOLAS KOLBE

Site Visit Conducted on November 27, 2017

Property Summary

The city of Lakeway, Texas is located within Travis County and is approximately 7,270 acres in size. In reference to Austin, Texas, Lakeway is approximately 22 miles northwest of the downtown Austin metro area (30.3680° N, 97.9917° W). To the north of Lakeway is the Colorado River and manmade Lake Travis. Two major interstates border Lakeway. To the east is farm to market road 620. To the south is highway 71. Both roads are heavily traversed and increasingly important as city expansion continues. The Hills sits in the southern part of Lakeway and is not part of the city (Map 1).

Lakeway is located within the Edwards Plateau ecoregion. Historically this ecoregion was predominately open grasslands with brush species interspersed. Native grasses that occur are species such as Silver bluestem, Canada wildye, Big muhly, Little bluestem, Indian grass and others. Brush species that are native to this ecoregion are American beauty-berry, Elbowbush, Lantana, Spicebush, Sumac, Sage and others. (Armstrong). Native terrestrial species that occur within this ecoregion are White-tailed deer, Grey and Red fox, Coyotes, Skunk *sp.*, Nine-banded armadillo and many others. All of these species listed can still be found within Lakeway. However through urban development, invasive/exotic species introduction, climate change and cultural shifts such as urban expansion, many species have greatly decrease in abundance and thus shifted the ecosystem dynamics in the past 100 years.

For this particular project, the species of interest was the White-tailed deer (*Odocoileus virginianus*). In short, the White-tailed deer is a browsing species meaning that the majority, >50-60%, of the White-tail's diet is comprised of browse species like the ones listed above (Cathey et al.). If located in optimal range conditions, deer would prefer to consume a majority of forb species like Bundleflower, Knotweed Leafflower, Indian mallow, Arrowleaf sida and others. However because of drought condition, competition with other browsing/grazing animals and seasonality changes, forb species are not consistently available on the range. Therefore deer have adapted to consume a much higher percentage of browse to make up their diet as these herbaceous species tend to persist on the range throughout the year. It is also important to note that very little of a deer's diet is made up of grass. Approximately <5-8% of their diet is from grass consumption and this generally occurs when grass shoots are very young and tender (Cathey et al.).

White-tailed deer are general in nature meaning the species can utilize many different habitat types to fulfil life processes. For this project, a delineated habitat map was constructed to depict areas within Lakeway that were "suitable" for White-tailed deer and areas that were "unsuitable". Suitable space was defined as areas that encompasses basic rural habitat that White-tailed deer can use for carrying out life processes. In detail, habitat types that reflect this criteria are

- Native bottomland/riparian
- Timberlands

- Pasture/grasslands
- Native brush mottes

Unsuitable habitat were spaces that represented development such as roads, houses, front/backyards, and businesses that White-tailed deer cannot and should not utilize for life processes.

Understanding where these areas were located allowed for a survey route to be determined which holistically represented the entire Lakeway area. From the map, approximately 2,739 acres (38%) of Lakeway encompasses suitable habitat for White-tailed deer. The majority of Lakeway, 4,507 acres (62%), encompasses unsuitable habitat for White-tailed deer (Map 2).

Goals

CAFA seeks to better understand the White-tailed deer density within Lakeway, Texas and begin accumulating long-term trend data. By conducting surveys, CAFA, city regulators, trapping agencies and residents of Lakeway can begin making more educated decision when deciding to remove deer from the Lakeway area.

SURVEY

Spotlight Survey Results

Population Survey to Determine White-tailed deer Density (Fall 2017): In order to understand the dynamics of a White-tailed deer population, one must first grasp where the population is in terms of density (acres/deer). The Edwards Plateau ecoregion has historically and is currently characterized as a high population density area for White-tailed deer. Through research in the ecoregion and long-term survey and harvest data, adequate deer density should be approximately one deer per 12-15 acres (12-15 acres/deer) (¹Armstrong, Armstong and Young 2000).

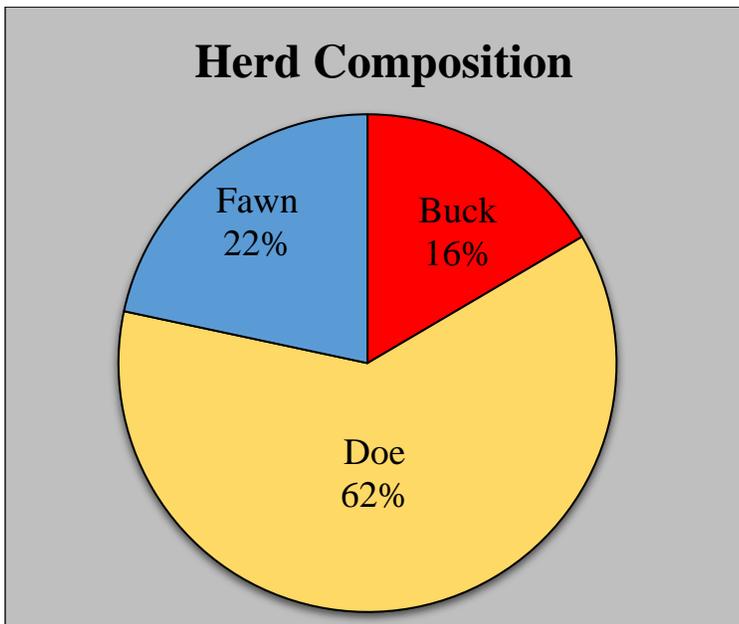
To estimate population density of White-tailed deer in Lakeway, vehicle spotlight surveys were conducted in line with Texas Parks and Wildlife spotlight survey protocol (Jester and Dillard). Visibility estimation was conducted on December 1, 2017 between 8pm-10pm. Surveys were done on December 5th, 12th, and 19th of 2017 (Map 3).

Trip: 1 of 3		Date:	5-Dec	Start time:	8:00 PM	CDT
		Official Sunset	5:30 PM	End Time:	12:33 AM	CDT
		Moon Phase	n/a			
Start Wind Speed (MPH):	light (10mph)	Start Cloud Cover:	0.6			
Start Wind Direction:	NW	Start Temp. (F):	45			
End Wind Speed (MPH):	n/a	End Cloud Cover:	0.6			
End Wind Direction:	n/a	End Temperature:	43			
Trip	Buck	Doe	Fawn	Unknown	Total	Density (acres:deer)
1 of 3	13	57	25	0	95	7.62

Trip: 2 of 3		Date:	12-Dec	Start time:	8:30 PM	CDT
		Official Sunset	5:31 PM	End Time:	12:45 AM	CDT
		Moon Phase	n/a			
Start Wind Speed (MPH):	Calm (3-8mph)	Start Cloud Cover:	0%			
Start Wind Direction:	NW	Start Temp. (F):	53			
End Wind Speed (MPH):	n/a	End Cloud Cover:	Clear			
End Wind Direction:	n/a	End Temperature:	46			
Trip	Buck	Doe	Fawn	Unknown	Total	Density (acres:deer)
2 of 3	30	63	29	0	122	5.93

Trip: 3 of 3		Date:	19-Dec	Start time:	8:30 PM	CDT
		Official Sunset	5:34 PM	End Time:	12:30 AM	CDT
		Moon Phase	n/a			
Start Wind Speed (MPH):	Calm (5-8mph)	Start Cloud Cover:	0.8			
Start Wind Direction:	NW	Start Temp. (F):	68			
End Wind Speed (MPH):	n/a	End Cloud Cover:	Clear			
End Wind Direction:	n/a	End Temperature:	64			
Trip	Buck	Doe	Fawn	Unknown	Total	Density (acres:deer)
3 of 3	15	97	22	0	134	5.40

White-tailed deer spotlight survey data in Lakeway, TX.



Herd composition of White-tailed deer in Lakeway, TX.

Doe seen foraging on roadside in north Lakeway, TX.

Over the three nights of surveying, a total of 351 deer were seen on a total of 2,170.59 acres surveyed (723.5 acres surveyed per night × 3 nights = **2,170.59 total acres surveyed**). Lastly, fawn recruitment is estimated at 35% (total fawns seen ÷ total does seen = 35%).

DEER DENSITY DATA

Total Area Surveyed (Acres)	2,170.59
Total Deer Sighted	351.00
Acres in Lakeway, TX	7,271
Fawn Recruitment (Total # of fawns) ÷ (Total # of does)	0.35
Estimated # of Deer in Lakeway	379



Data breakdown of deer in Lakeway, TX

Deer in front yard of homeowner in Lakeway, TX

Discussion

Many different research projects have been conducted to examine urban deer populations, their effect on habitat and cultural influences on population regulation (Schenck 2013, Clark 2012, Cathey et al., Greacy 2006). For this particular project, we sought to provide insight into the current population density within the city of Lakeway, Texas. Of the deer seen, roughly 90% of them were sighted in the front yard of homes, on roadways, or crossing golf courses within the city. The remaining 10% were seen in the sporadically dotted suitable habitat that still remains within Lakeway. It is important to note that the southern portion of Lakeway with the most suitable habitat (Map 2 and 3) was not included within the survey route because of the lack of access and necessity considering that the deer within the metro area of Lakeway was the population of concern.

The total number of fawns seen in relation to the total number of does seen (fawn recruitment) is an important indice to consider when tracking long-term density trends. This metric details how many fawns from the past fawning season made it to be recruited into the population. This value also provides insight into where the population is relative to carrying capacity (the number of animals the environment can support without causing detriment to the habitat). A high fawn recruitment is generally associated with a low population density as more fawns survive following parturition, make it to adulthood and are recruited into the population. High fawn recruitment implies that the population is below the carrying capacity level as more deer survive to be placed into the ecosystem. The inverse is true with a low fawn recruitment number. Lower fawn recruitment ratios express higher population levels as a fewer number of fawns make it to adulthood. Low fawn recruitment implies that the population is at or is reaching the carrying capacity threshold as fewer number of deer survive to make it to adulthood. For this survey, there was a 35% fawn recruitment observed. This also can be expressed by saying there were 0.35 fawns associated with every female seen during the survey. On its own and without multiple past years of fawn recruitment data, this indice can be quite crude and not provide that much insight into population trends. However this ratio will be crucial in coming years as surveys continue and population density fluctuates.

Urban wildlife can be much more difficult to understand as they are, at times, not regulated by the same limiting factors as deer found in rural settings. For example, deer found within rural settings are

constrained to food/water availability within their range while animals in urban environments are at times provided supplemental feed/water by residents within the community or supplemental food/water stations. This in turn would allow those animals, which would have normally been removed from the population due to food/water constraints, to thrive and reproduce which artificially increases population density within that area. A similar situation can occur with the lack of natural predators. With most large predators like coyotes and mountain lions extirpated from the Lakeway area, predation as a limiting factor to keep population levels in check as it would in a more rural setting, is removed.

However with an urban environment comes other limiting factors which, at times, are not so apparent outside of city limits. The number of deer that tend to be removed from the population by car accidents is a much larger problem in city limits than those in rural settings. Disease with urban populations can become problematic as well with a large number of animals congregated in a generally small area. Genetic inbreeding can also become a problem, however unlikely, as animals tend to not emigrate away from an area as they normally would.

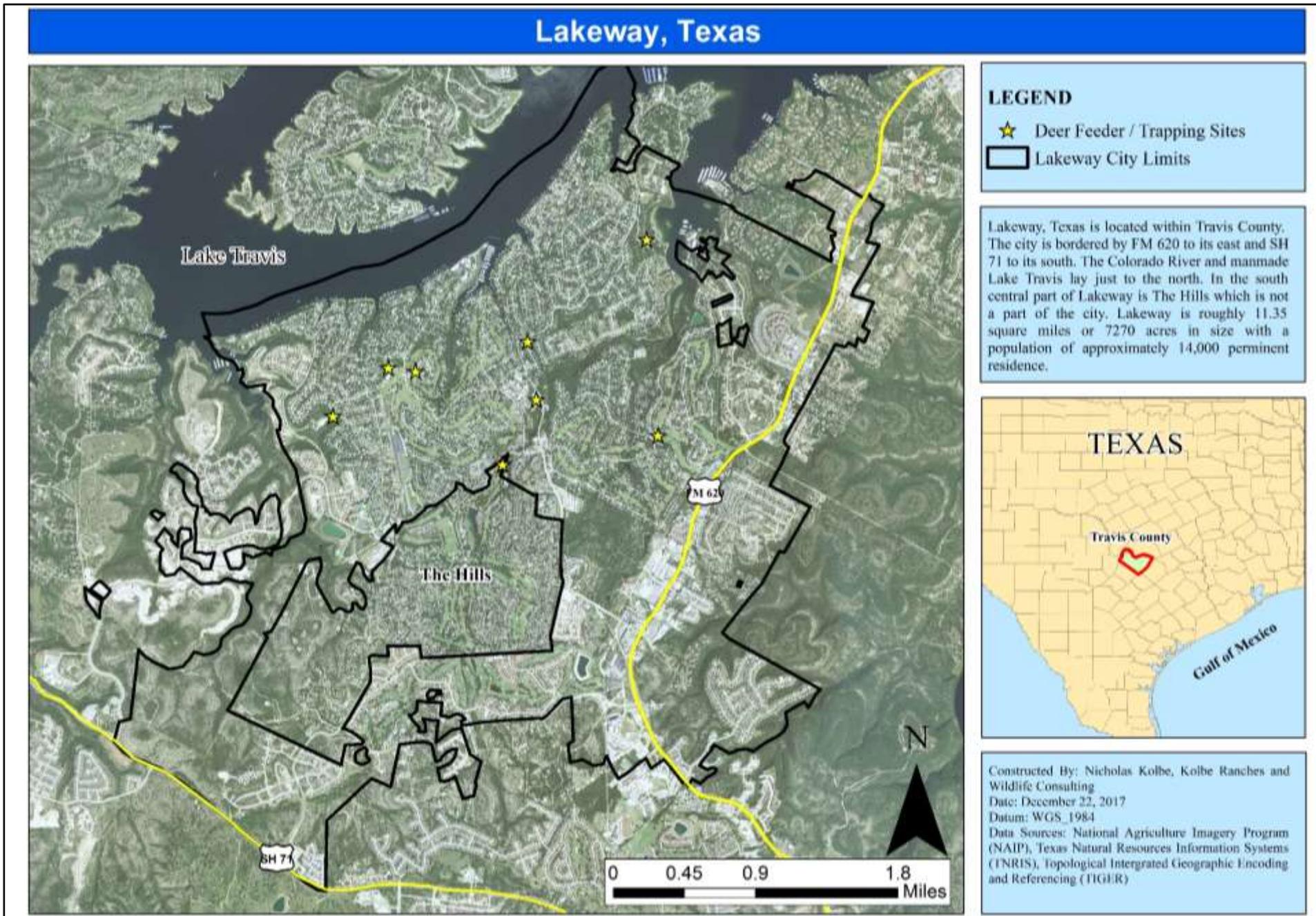
Given the differences in regulating factors, it is safe to say that deer density recommendations in rural habitats of the Edwards Plateau do not and should not mirror what should be seen in urban settings. Further surveys and comparing long-term data such as fawn recruitment ratios and population density trends will aid in providing the prescribed density for Lakeway. The more years of survey data that are available, the better the city will be able to track trends in the deer population thus enabling city regulators to make the most informed decisions when regulating the White-tailed deer population.

WORK CITED

- ¹Armstrong, W. E. Year N/A. How to Manage Deer Habitat: Edwards Plateau. Wildlife Management Handbook. II-D: 37-39.
- ²Armstrong, W. E. Year N/A. Key Food Plants for Deer in the Edwards Plateau Region. Wildlife Management Handbook. II-B: 19-20.
- Armstrong, W. E. and E. L. Young. 2000. White-tailed deer Management in the Texas Hill Country. Texas Parks and Wildlife. 1: 1-53.
- Cathey, J. C., S. L. Locke, C. E. Adams, S. Ramirez, J. Alderson, and K. Schwausch, Year N/A. Managing Overabundant White-tailed deer. Texas A&M AgriLife Extension and Texas Parks and Wildlife Department. 1-15.
- Clark, L. L. 2012. Urban White-tailed deer Management Plan For the Town of Harpers Ferry, West Virginia. Master Naturalist, Potomac Valley Chapter. 1-15.
- Creacy, G. 2006. Deer Management Within Suburban Areas. Texas Parks and Wildlife. 1-12.
- Jester, S., J. Dillard. Year N/A. Conducting White-tailed deer Spotlight Surveys in the Cross-Timbers and Prairies Region of North & Central Texas. Texas Parks and Wildlife. 1-2.
- Schenck, K. 2013. White-tailed deer Management in Northwest Austin: People and Wildlife in a Suburban Landscape. Honors Senior Thesis. 1-19.

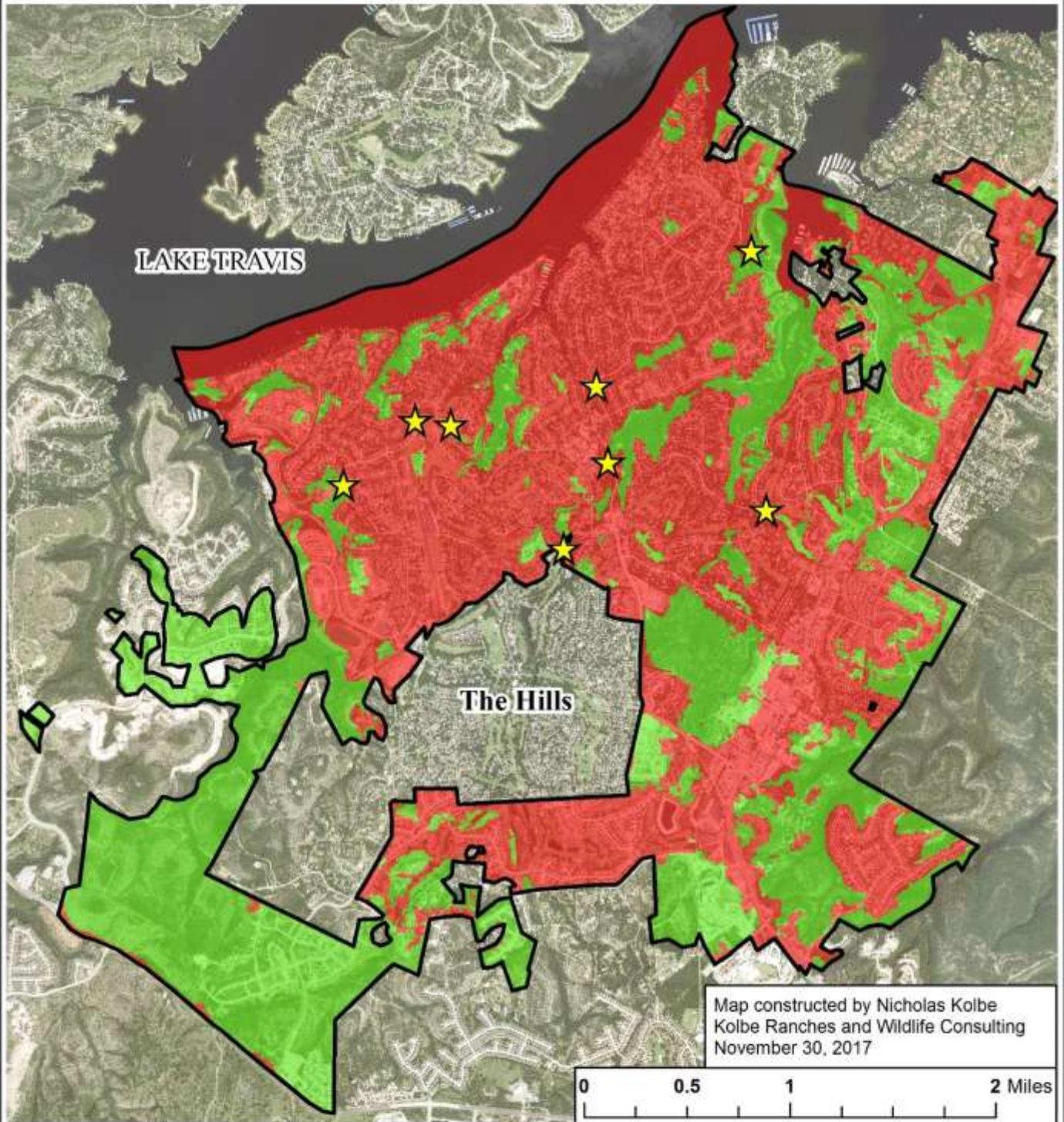
MAPS

1.

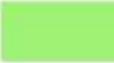


2.

LAKEWAY, TX WHITE-TAILED DEER HABITAT CLASSIFICATION



LEGEND

- | | |
|---|--|
|  Feeder Locations |  Unsuitable Habitat |
|  Lakeway City Limits |  Suitable Habitat |

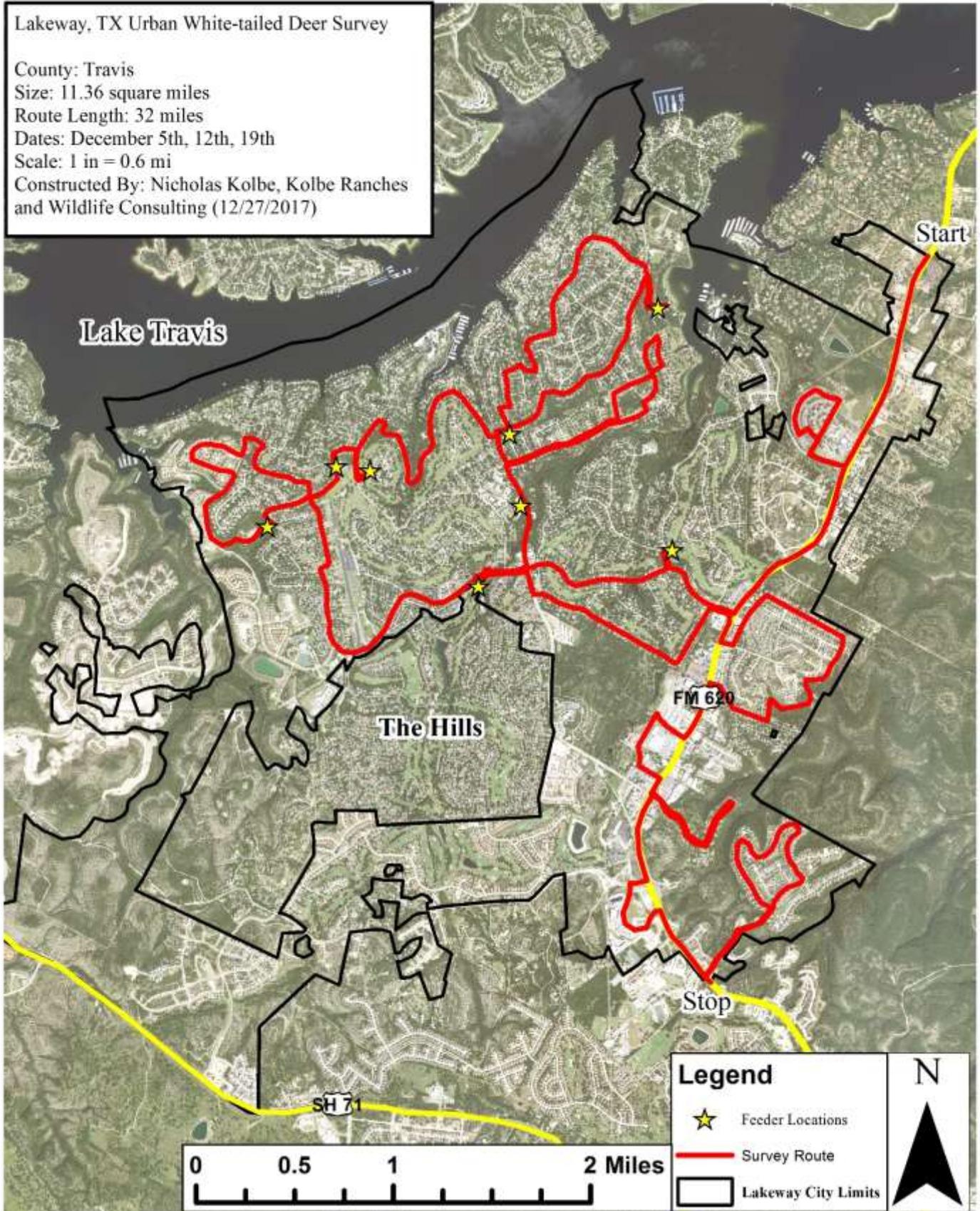


3.

LAKEWAY, TX URBAN WHITE-TAILED DEER SURVEY

Lakeway, TX Urban White-tailed Deer Survey

County: Travis
Size: 11.36 square miles
Route Length: 32 miles
Dates: December 5th, 12th, 19th
Scale: 1 in = 0.6 mi
Constructed By: Nicholas Kolbe, Kolbe Ranches
and Wildlife Consulting (12/27/2017)



PHOTOS

