2016 Remote Camera Deer Survey Report

Prepared for:
Lower Colorado River Authority (LCRA)



Plateau
Land & Wildlife
Management

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Executive Summary

During September and October 2016, four LCRA properties were surveyed using remote camera census techniques to determine estimated deer population sizes. Results for each property are as follows.

- Wheless Preserve estimated density is 13.89 acres per deer (36 animals), as determined from a 500-acre sample plot delineated within the 2,300-acre property. Extrapolation of these results across the entire Preserve results in an estimated 166 animals (same density).
- McGregor Preserve deer density is estimated to be 14.92 acres per deer (24 animals).
- Muleshoe Bend Recreation Area estimated density is 5.37 acres per deer (98 animals).
- Turkey Bend Recreation Area contains an estimated 88 animals, resulting in a density of 5.68 acres per deer, as determined from a 500-acre sample plot within the 1,029-acre property. Extrapolating these numbers to the entire acreage results in an estimated 173 animals.

Infrared, motion-triggered cameras provide a constant sampling technique over a specified period of time to capture deer that may be missed during traditional spotlight surveys. The results are essentially a complete count of deer in an area, with emphasis on bucks. However, inherent weaknesses in the methodology necessitates the use of conducting daytime incidental surveys to obtain accurate sex and fawn ratios. Without this data, these ratios must be based on known regional numbers or realistic assumed ratios, which can result in skewed estimates.

Introduction

This report presents results of a series of deer surveys conducted on four Lower Colorado River Authority (LCRA) properties in Burnet and Travis counties – the Wheless Preserve (Appendix A), McGregor Preserve (Appendix B), Muleshoe Bend Recreation Area (Appendix C), and Turkey Bend Recreation Area (Appendix D). Each of these surveys were conducted by Staff Biologist James A. Hall, with review assistance from Shane Kiefer (Director of Ecological Services), both Certified Wildlife Biologists® of Plateau Land and Wildlife Management. Protocol for these surveys was based on the technique developed by Harry A. Jacobson, et al (1997), as well as TPWD protocols (Oetgen et al. 2008).

Methodology

Digital infrared cameras were distributed throughout each property at varying densities (Table 1), for a 4-5 day pre-bait period, followed by a 10-12 day survey period.

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Table 1. Camera density on LCRA properties.

Property	Acreage	Camera Density
Wheless Preserve	500 acre plot (2,300acres)	1 camera per 125 acres (4)
McGregor Preserve	358 acres	1 camera per 119 acres (3)
Muleshoe Bend	526 acres	1 camera per 131 acres (4)
Turkey Bend	500 acre plot (1,029 acres)	1 camera per 125 acres (4)

For the Wheless Preserve and Turkey Bend surveys, 4 digital infrared cameras were placed within +/- 500 acre Survey Plots. These plot sizes were selected as a sample of each property for efficiency. The McGregor Preserve and Muleshoe Bend tracts are small enough to incorporate the entire acreage, and sample plots were not required. At the end of each survey, all pictures were analyzed with the purpose of identifying unique occurrences of bucks using antler characteristics and other identifying marks. Identification of individual does is not practical and was not attempted. The ratio of photographed bucks and does was used to estimate the doe population. The combined doe and buck populations were summed to estimate the total deer population and divided into the total acreage of each property to estimate density. Collection of daytime incidental observations was attempted during three separate visits to improve demographic data.

Wheless Preserve Results

A total of 1,333 pictures were taken during the Wheless survey, resulting in only 229 deer photographed (15.5% of pictures). A large percentage of the pictures include blanks (wind-blown vegetation), incidental wildlife species, and humans captured during installation, re-baiting, and retrieval of the cameras. Incidental wildlife species include coyote, striped skunk, gray fox, eastern cottontail, coyote, and jackrabbit.

500-acre Plot - Analysis Results:

Survey Stations - 4	**Total Acres - 500**	
Total Bucks Photographed	**Identifiable Bucks**	**Buck Population**
179	8	9*
Total Does Photographed	**Doe:Buck Ratio**	**Doe Population**
50	0.28**	18
Total Fawns Photographed	**Total Spikes Photographed**	**Fawn Population**
0	0	9***
Total Estimated Population		36
Estimated Density (Ac/Deer)		13.89

*including spikes

**Sex ratios below 1:1 are atypical in wild deer populations – an assumed ratio of 2.0 does:buck was used in calculations

***Based on assumed ratio of 0.5 fawns:doe

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Population is expressed as density in a ratio describing the number of acres-per-deer. This census revealed the density of white-tailed deer within the plot to be approximately 13.89 ac/deer, at 36 total individuals. A simple extrapolation of the plot density across the rest of Wheless Preserve (2,300 total acres) results in approximately 166 deer (at 13.89 acre/deer). Recommended herd density on well-managed, seasonally hunted Hill Country lands in good condition should be approximately 10-15 acres-per-deer. This estimated density is consistent with browse conditions observed at several locations on site. Oak recruitment along some of the drainages and in other locations is considerable, with seedling Texas red oaks and shin oak shrubberies (Figure 1) common. Redbud, escarpment blackcherry, elm, elbowbush, and kidneywood can also be found growing within the plot area (Figure 2).



Figure 1.



Figure 2.

Incidental daytime observations are typically crucial in determining estimated sex ratios. Obtaining accurate sex ratios and fawn crops is an inherent weakness in camera survey methodology, and these numbers have a significant impact on the estimated density. Collecting incidental observations was attempted on three separate occasions with no deer observed. Though lacking this information reduces the accuracy of the density estimate, it is consistent with the lack of deer numbers expected to be found on the Wheless Preserve. The estimated sex ratio of 0.28 is obviously low and not realistic in a free ranging herd. For calculations, an assumed ratio of 2.00 does-per-buck was used in order to adequately estimate densities.

Fawns rarely show up during camera surveys, making estimates of fawn production difficult, and this survey was no exception, with zero observations. Similarly, no fawns were observed during collection of incidental observations. An assumed ratio of 0.5 fawns/doe was used to calculate harvest recommendations to avoid under-harvesting, which is of greater concern in the overall area than overharvesting.

Eight (8) individual branch-antlered bucks were identified during the survey, along with at least 1 spike. The age structure is fairly well distributed though slightly skewed towards the mid-aged class. Appendix E exhibits each individual buck observed during the camera survey. The buck in Photo 1 appears to be the oldest and largest individual observed during the survey. Photos 2 and

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3 exhibit the nearly mature bucks, while the rest are immature. The young buck in Photo 8 appears to have an antler bent downwards towards his jaw, either from an injury or genetic defect. Otherwise, the animals observed during this survey (including the doe) appear to have good body condition and health. An overlap of buck observations was noted a few times during the survey, with numerous individual bucks observed at multiple stations across the plot area.

Buck Age Structure*	
Age Class	# Bucks
1.5-2.5	3
3.5-4.5	4
5.5+	1

*Not including spikes

The white-tailed deer population is estimated to be at acceptable levels. Since the primary goal of deer harvest on LCRA properties is population control rather than improvement of genetics for recreational opportunities, **the harvest recommendation for the 2016-2017 season is a maintenance harvest of 10-15 deer with emphasis on doe**. Maintaining current densities will result in significant benefits to other wildlife through reduced pressure on woody plants. Feral hogs were not observed on camera during the survey, and are not currently known to be of management concern, but should be harvested at any given occasion. A three-night spotlight survey conducted in 2015 resulted in only 3 total deer observations, partially as a result of extremely poor visibility (74 visible acres) along the survey route, despite its nearly 7 mile length.

McGregor Preserve Results

A total of 649 pictures were taken during the McGregor survey, resulting in 500 deer photographed total, making up 66% of pictures. Incidental wildlife species observed was limited to a few sightings of coyote, Wild Turkey, eastern cottontail, and raccoon.

Analysis Results:

Survey Stations - 3	**Total Acres - 358**	
Total Bucks Photographed	**Identifiable Bucks**	**Buck Population**
219	6	6
Total Does Photographed	**Doe:Buck Ratio**	**Doe Population**
281	1.28*	12
Total Fawns Photographed	**Total Spikes Photographed**	**Fawn Population**
0	0	6**
Total Estimated Population		24
Estimated Density (Ac/Deer)		14.92

*Assumed ratio of 2.00 does:buck was used in calculations
**Based on assumed ratio of 0.5 fawns:doe

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This census revealed the density of white-tailed deer to be approximately 14.92 ac/deer, at 24 total individuals. Browse conditions observed on site vary. Along the northern stream, greenbriar, grapevine, elbowbush, and elm can be observed frequently, with moderate to low browse pressure exhibited. Redbuds and Texas red oak seedling are found occasionally along the central drainage. Near the camera station in the southern uplands, shin oak and kidneywood exhibit moderate to heavy pressure (Figures 3 and 4). Conditions found on site are consistent with a relatively small enclosed population. The property is high fenced and located on a peninsula within Lake Travis, thus immigration and emigration is highly reduced if not entirely restricted.



Figure 3.



Figure 4.

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The estimated sex ratio of 1.28 would be considered low in a free ranging herd, but is possible in an enclosed population. Similar to the Wheless Preserve, no incidental observations were recorded, despite efforts to do so during three separate visits to the property. For calculations, assumed ratios of 2.00 does-per-buck and 0.5 fawns/doe were used to avoid underestimation.

Six (6) individual branch-antlered bucks were identified during the survey. The age structure is slightly skewed towards the mid-aged to older class. Appendix F displays each individually identified buck. The older bucks can be seen in Photos 1-3. These individuals appear to be mature (5.5+), and the buck in photo 1 may even be older. Most of the deer observed during this survey (including the doe) appear to have good body condition and health. An overlap of buck observations was noted a couple times during the survey, with some individual bucks observed at multiple stations across the property.

Buck Age Structure*	
Age Class	# Bucks
1.5-2.5	1
3.5-4.5	2
5.5+	3

*Not including spikes

The white-tailed deer population on the McGregor Preserve is estimated to be at acceptable levels. **A maintenance harvest of 3-5 deer is recommended**, ideally with emphasis on doe.

Incidental observations should be collected and maintained each year between August and October to aid in determination of sex and fawn ratios, and may require at least weekly visits to the property to gather this information. Neighboring landowners and homeowners that live within the vicinity of the McGregor Preserve have prearranged approval to gain access to the property for hiking and nature-watching. This beneficial public-outreach program developed by the LCRA could benefit habitat management as well by incentivizing visitors to record deer observations during this pre-season period. Improved accuracy of survey estimations is vital for proper management, especially in an enclosed population.

Photos 7-10 (Appendix F) display some of the incidental wildlife species detected during the survey (including Wild Turkey, coyote, and raccoon), most of which were observed at the northernmost camera station along the creek bottom. Photo 10 contains a young coyote that appears to be inflicted with mange.

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Muleshoe Bend Recreation Area Results

A total of 2264 pictures were taken during the Muleshoe Bend survey, resulting in 2,270 deer photographed total, making up 83% of pictures. A few coyote, raccoons, and ring-tailed cat were observed infrequently.

Analysis Results:

Survey Stations - 3	**Total Acres - 358**	
Total Bucks Photographed	**Identifiable Bucks**	**Buck Population**
1159	20	22*
Total Does Photographed	**Doe:Buck Ratio**	**Doe Population**
976	0.75**	51
Total Fawns Photographed	**Total Spikes Photographed**	**Fawn Population**
0	135	25***
Total Estimated Population		98
Estimated Density (Ac/Deer)		5.37

*Including individually identified spikes
**2.3 does-per-buck determined from incidental observations
***Based on assumed ratio of 0.5 fawns:doe

The Muleshoe survey revealed a density of approximately 5.37 ac/deer, at 98 total individuals. This high density is expected, considering browse lines noted on trees (Figure 5) and limited availability of palatable shrubs and hardwood recruitment.



Figure 5.

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Incidental observations recorded during multiple visits to the property, resulted in a sex ratio of 2.3 does-per-buck, which is favorable. No fawns were observed throughout the camera survey, nor during daytime surveys. Thus, a 0.5 fawn/doe ratio was used.

Twenty individual bucks were identified during the survey, along with at least two spikes. The age structure is slightly skewed towards the mid-aged to younger class. Appendix G displays each individually identified buck. An overlap of buck observations was noted a couple times during the survey, with some individual bucks observed at multiple stations across the property.

Buck Age Structure*	
Age Class	# Bucks
1.5-2.5	7
3.5-4.5	9
5.5+	4

*Not including spikes

The white-tailed deer population on Muleshoe Bend is high. **The harvest recommendation for the 2016-2017 hunting season at Muleshoe Bend is 4 bucks and 25 doe**, reducing the estimated 2017 pre-season density to near 10 acres:deer and reducing the sex ratio closer to 1.5 does-per-buck. This is nearly half the estimated number of doe, which is aggressive. Simply maintaining the density and at its current level with estimated fawn productivity would require a harvest of 10-15 doe. Finding a middle ground between minimum and aggressive harvests to reach more realistic results is acceptable. However, the population is likely above carrying capacity and the property's habitat health would greatly benefit from an immediate relief from heavy browsing pressure.

Incidental observations should be collected and maintained each year between August and October to aid in determination sex and fawn ratios. Park hosts may be encouraged to do so in order to improve accuracy, which will subsequently result in informed management decisions. Photos 21-23 (Appendix G) display some of the other wildlife species detected during the survey. A ring-tailed cat (Photo 23) was the highlight, observed on two separate occasions.

Turkey Bend Recreation Area Results

A total of 2,294 pictures were taken within the 500-acre Survey Plot on Turkey Bend. A total of in 2,114 deer were photographed. Other than raccoons, non-deer wildlife was lacking.

500-acre Plot Analysis Results:

Survey Stations - 4	**Total Acres - 500**	
Total Bucks Photographed	**Identifiable Bucks**	**Buck Population**
1024	18	21*
Total Does Photographed	**Doe:Buck Ratio**	**Doe Population**
1012	0.92**	42

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Total Fawns Photographed	Total Spikes Photographed	Fawn Population
0	78	21***
Total Estimated Population		84
Estimated Density (Ac/Deer)		5.95

*Including individually identified spikes
**Around 2.0 does-per-buck was determined from incidental observations
***Based on assumed ratio of 0.5 fawns:doe

The Turkey Bend survey revealed a density of approximately 5.95 ac/deer, at 84 total individuals. An extrapolation of the plot density across the rest of Turkey Bend results in approximately 173 deer (same density). Incidental observations were recorded during multiple visits to the property and resulted in only in a few dozen observations. Regardless, based on these numbers the sex ratio is estimated at 2.0 does-per-buck. As with the other surveys, a 0.5 fawn/doe ratio was necessitated due to a lack of fawn detections.

Eighteen individual bucks were identified during the survey, with at least three spikes. There appears to be a prevalence of mid-aged and mature bucks, many of which have very large native antler characteristics (Appendix H, Photos 1-6). Photo 5 exhibits a very old individual that may be 6.5+ years old. Several bucks were observed at multiple stations on the property, indicating a good sample coverage of the property.

Buck Age Structure*	
Age Class	# Bucks
1.5-2.5	4
3.5-4.5	10
5.5+	4

*Not including spikes

The white-tailed deer population on Turkey Bend, much like Mulehsoe Bend, is high and would requires a reduction. To maintain the density at its current level (while reducing the sex ratio), a harvest of 14-16 doe would be recommended. However, this will not aid in long-term goals of population reduction and habitat management, thus a more aggressive harvest is recommended. **The harvest recommendation for the 2016-2017 hunting season at Muleshoe Bend is 8 bucks and 33 doe**, resulting in a 2017 pre-season density to near 8 acres:deer and reducing the sex ratio closer to 1.5 does-per-buck. Reducing the population closer to 10 acres:deer would be ideal, and would require a harvest of 50-60 animals. This is comparable to recommendations made on the Shaffer Bend and Gloster Bend Recreation Areas (based on spotlight survey results), which are similarly suspected of having exacerbated numbers.

Conclusions

Many of these harvest goals are lofty, and not easily achieved. Short-term goals can be approached on a yearly basis using trends from ongoing, annual remote camera surveys, to ensure proper understanding of deer numbers on each property. Incorporating incidental

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observation data will need to be emphasized and increased, which will be a crucial variable to understanding what is occurring at each site. Due to high brush and tree densities found at each location, as well as general lack of accessibility (McGregor Preserve), spotlight deer surveys would not be an ideal alternative to camera surveys, but could be considered in conjunction with cameras, as a means to obtain additional sex ratio and fawn crop data.

While white-tailed deer are an important part of our ecosystem, they can be a detriment to habitat for all wildlife if not controlled, especially in an enclosed high-fenced population. One of the benefits of reducing deer numbers is that, when deer management reduces overall numbers and makes more natural food available for each animal, individual deer become healthier and less likely to suffer from malnutrition and disease. Habitats with excessive deer often have fewer and less diverse populations of forbs, important food sources for a variety of wildlife including songbirds. Properties actively managing deer populations are more likely to see a wider variety of birds and other wildlife. Also, because deer rely heavily on woody plant stems and leaves (browse), a loss of hardwood seedlings such as Texas oak, shin oak, and cedar elm is typically seen on properties with excessive deer numbers. Chronic, long-term consumption of seedlings by deer will result in a loss of lower and mid-level woody plants as no young plants are available to replace older or dying trees. This leads to an overall decrease in the diversity of plants which, in turn, decreases the diversity of wildlife able to utilize the habitat.

Harvest records should be collected for all animals taken, including sex, age, weight, and antler measurements. With adequate efforts to cull excess animals, average body weights and antler dimensions will increase both overall and within each age class. Increasing age structure of bucks by allowing young bucks to mature can increase buck quality relatively quickly (over next several years).

Plateau is happy to offer deer management services. Plateau maintains a partnership with Orion Research and Management Services, which holds a State-issued Special Use-Scientific Collection Permit. Biological data are taken from all harvested deer as part of ongoing research with several Texas Universities. We utilize an experienced team of professional wildlife biologists and military trained sharpshooters to run a safe, effective, and efficient harvest program. Our services are quick and discreet, and we will work closely with landowners and/or managers to accommodate their needs. Harvested deer will be removed from the property and edible portions will be donated to charitable organizations for human consumption.

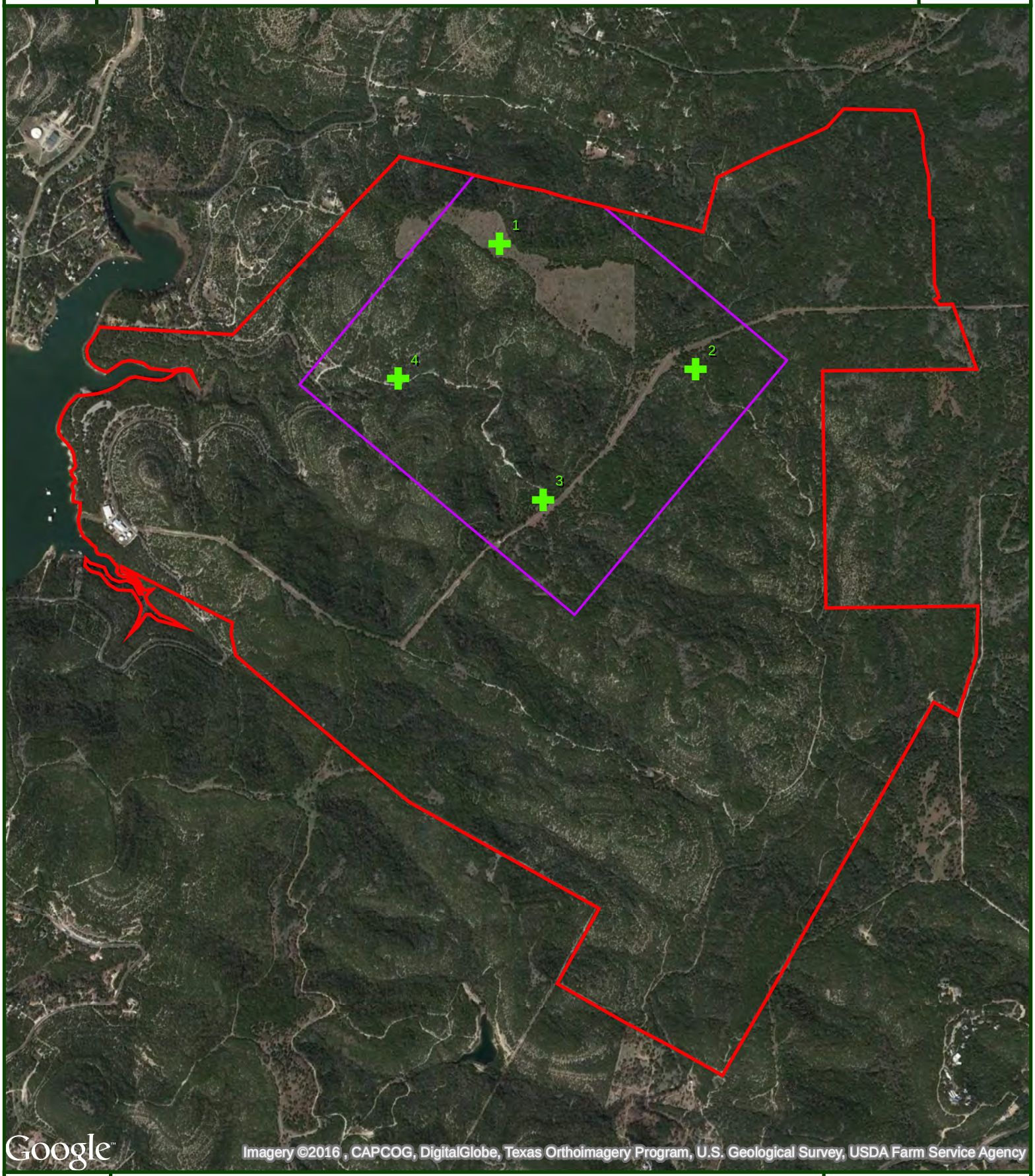
Literature Cited

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Wheless Preserve
2016 Remote Camera Survey - Appendix A



Plateau Land & Wildlife Management

Property Boundary

Survey Plot

Camera Station

Feet
0 425 850 1,700

N

McGregor Preserve
2016 Remote Camera Survey - Appendix B



Plateau Land & Wildlife Management

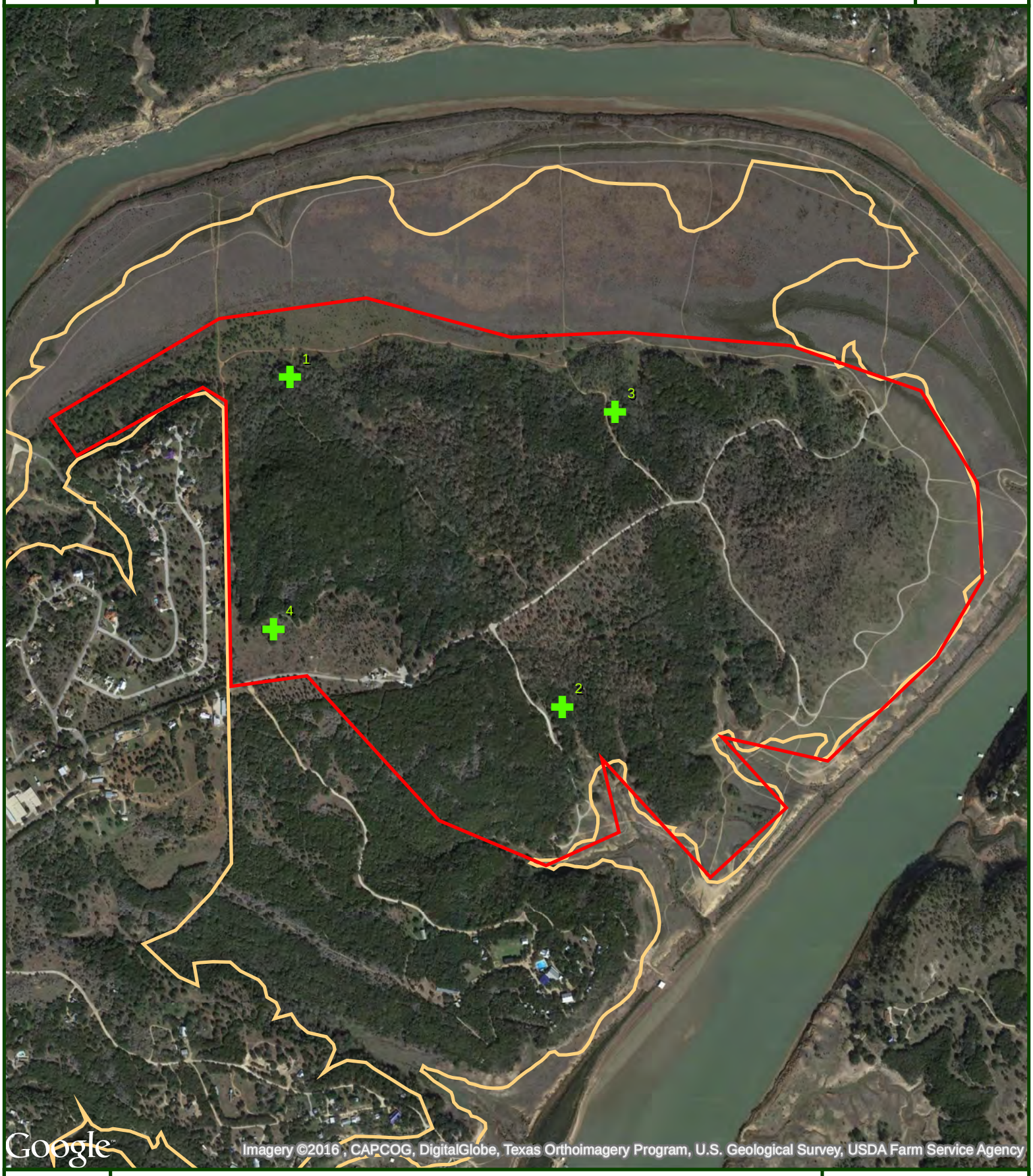
Property Boundary

Camera Station

Feet
0 225 450 900

N

Muleshoe Bend Recreational Area
2016 Remote Camera Survey - Appendix C



Plateau Land & Wildlife Management

LCRA Portion

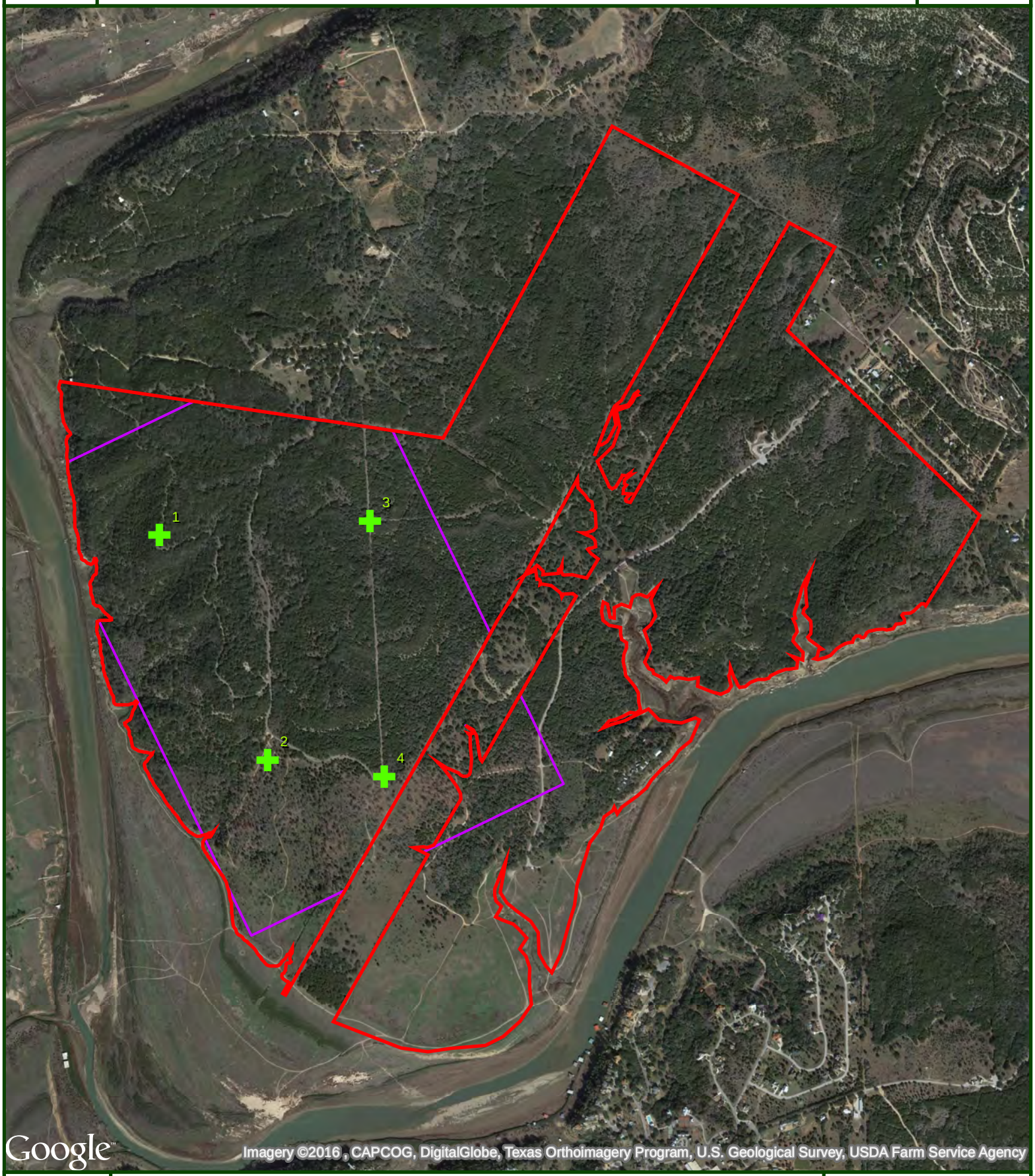
Muleshoe Bend Property Boundary

Camera Station

Feet
0 250 500 1,000

N

Turkey Bend Recreational Area
2016 Remote Camera Survey - Appendix D



Plateau Land & Wildlife Management

Property Boundary

Survey Plot

Camera Station

Feet
0 325 650 1,300

N