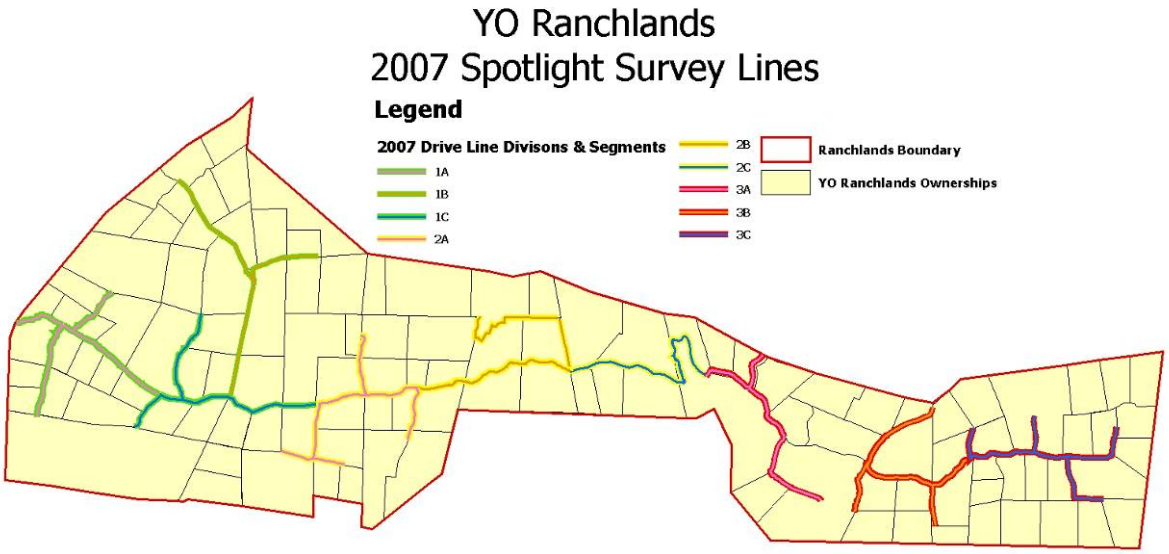
Survey Analysis & Harvest Recommendations

For: YO Ranchlands Landowner Association

August 1, 2007

By: Matt Priour and Shane Kiefer - Plateau Land & Wildlife Management



Executive Summary

Survey Goal

Determine the total number of native and exotic deer on the YO Ranchlands by sex. Due to a necessary reduction in survey effort and methodology, populations by ranchland phase cannot be reliably estimated.

Management Goal

Optimize the number and diversity of hunting opportunities for the landowners of all exotic and native game animals of average to good quality or better.

Results

Three nights of spotlight surveys were conducted in June and July. Using the most scientifically accepted method of conducting deer driving surveys and combining this information with harvest records and production estimates we were able to determine the number and kinds of deer living on the YO Ranchlands.

Deer Population by Species

	Axis	White-tailed	Sika	Fallow	Blackbuck	GRAND TOTAL
TOTAL	1442	483	475	227	206	2833

Species Composition (%)

	Axis	White-tailed	Sika	Fallow	Blackbuck	GRAND TOTAL
TOTAL	51%	17%	17%	8%	7%	100%

We established revised population goals for near term (2008) while retaining goals for the longer term (2010). Harvest recommendations were made that would allow the deer populations in the YO Ranchlands to meet the short term goal and continue to move towards the longer term goal. If progress is not made during the 2007/2008 hunting period, the 2010 goal will become increasingly difficult to meet and may need to be revised. Please note that this year's harvest recommendations are for the ranch as a whole.

YOLA Harvest Recommendations 2007/2008		Total
Axis	Buck	250
	Doe	425
White-tailed	Buck	20
	Doe	20
Sika	Buck	8
	Doe	60
Fallow	Buck	6
	Doe	12
Blackbuck	Buck	12
	Doe	4
Grand Totals	Buck	296
	Doe	521
	Total	**817**

Deer Survey Analysis & Harvest Recommendations

Survey Goal

Determine the total number of native and exotic deer on the YO Ranchlands by sex. Due to a necessary reduction in survey effort and methodology, populations by ranchland phase cannot be reliably estimated.

Survey Methods

We surveyed the YO Ranchlands this year using the same, scientifically-accepted method for conducting spotlight surveys with changes in methodology related to how we sampled the property. Surveys were conducted from mid-June to early July to allow recommendations to be provided by August 1. Two previous methods were not utilized this year. Daylight driving surveys were not conducted and feeder counts were unavailable.

Three nights of surveys, separated by 1 week, were conducted on June 21, June 28, and July 5, 2007 from 10pm-2am. During the surveys, we drove at an average speed of <10mph, and visually searched both sides of the roads for deer. We actively surveyed an average of 8 miles of road each night with a total survey length of 24 miles. When deer were seen, we measured the distance and bearing to the animal or group of animals using a laser rangefinder and a compass. We recorded the number and species, if possible, of all deer seen.

The primary change this year resulted from a desire to make the surveys more efficient by allowing a single team to conduct the survey each night, as opposed to 2 teams with volunteers required each night in previous years. Efforts were made to thoroughly distribute effort and timing of surveys while making it possible for one team to conduct the surveys. To accomplish this, we separated the Ranchlands into 3 divisions, each with 3 survey segments of roughly equal length contained within them. Each night, we randomly selected a single survey segment from each division until all 9 segments had been covered by the third night. This resulted in each division being sampling once a night, but each survey segment was only sampled once over the course of the surveys. By distributing the surveys in this manner, we hoped to reduce bias (high or low) that may have resulted from selecting a limited number of areas to be sampled repeatedly. The surveys were performed by a group of 3 people. We saw a total of 489 (1125 in 2006) deer in 111 (385) groups during the surveys, and over 89% of the deer were identified to species.

Landowner conducted feeder counts were not provided this year. This data is critical in helping to more accurately determine the buck:doe ratios for each species. For 2007, sex ratios were based on 2006 estimates, with adjustments made using harvest records if necessary. The feeder counts also reinforce the data collected during the driving surveys. We recommend resuming this practice in the future if sufficient participation is available.

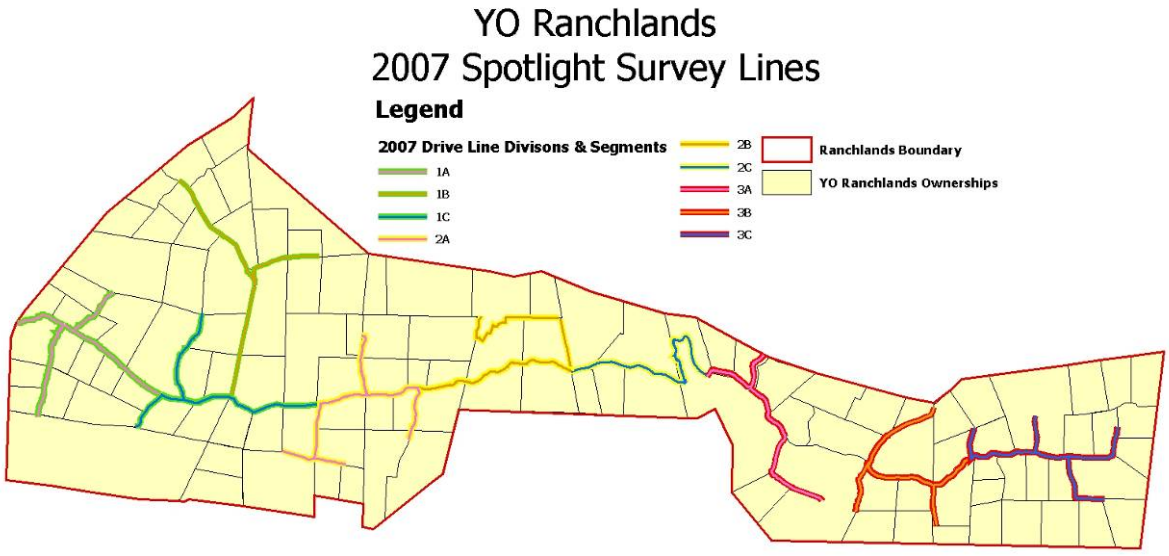
For the spotlight surveys we used a technique called Distance Sampling. In this method, a perpendicular distance from the animal to the drive line is calculated through simple trigonometry using the distance, bearing, and GPS position recorded for each animal. The data is analyzed by a computer program which performs integral calculus and statistical calculations to determine the actual area surveyed

and the density and total number of deer. The Distance Sampling method has been shown many times to be far more accurate than the traditional Strip Transect method of deer surveys. The more traditional method overestimates the number of deer by underestimating the average sightable distance. Simple arithmetic is used to calculate the number of deer. Even small errors in estimating the average sightable distance can produce large errors in calculating the total number of deer. If you would like a more detailed explanation of the Distance Sampling method, please contact us and we will send you a more thorough description of the method and the math and science supporting it.

Survey Results

While the overall deer numbers are reliable, Axis Deer were the only species numerous enough to provide reliable estimates from the spotlight surveys alone. The proportions of the total population contributed by Sika, Fallow, and White-tailed Deer and Blackbuck were estimated using a combination of the total ungulate population estimate, last year's species-specific population estimates, harvest records, and production estimates. Feral hogs and wild sheep were seen during the surveys but not often enough to give any information about the number of these species living on the YO Ranchlands.

Surveys were designed to ensure equitable sampling from each of the sections in the map below and provide a reliable overall estimate of the deer population. Phase-specific population estimates were not reliable due to insufficient sample sizes from individual phases and are not included in this report.



SURVEY RESULTS & OVERALL SPECIES COMPOSITION

All Deer

	# of Deer	Ac / Deer
TOTAL	2,833	3.5

Deer Population by Species

	Axis	White-tailed	Sika	Fallow	Blackbuck	GRAND TOTAL
TOTAL	1442	483	475	227	206	2833

Species Composition (%)

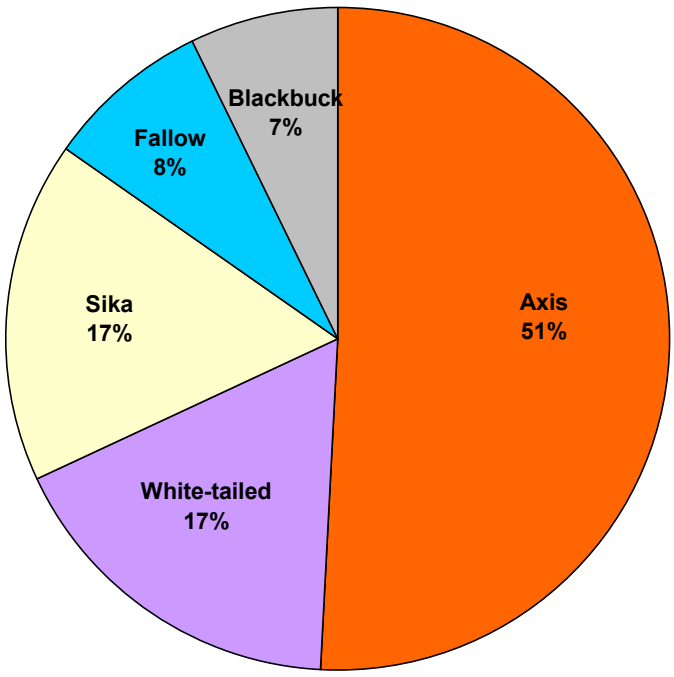
	Axis	White-tailed	Sika	Fallow	Blackbuck	GRAND TOTAL
TOTAL	51%	17%	17%	8%	7%	100%

Sex Ratios	Buck : Doe	
Species	Current	Ideal
White-tailed	1:1	1 : 1
Axis	1:2.5	1 : 2.5
Sika	1:2.8	1 : 2
Fallow	1:2.1	1 : 1
Blackbuck	1:2.8	1 : 4

Survey Length by Night

Survey Date	Line Length (miles)
6/21/2007	8.3
6/28/2007	7.4
7/5/2007	8.3
Total	24.0
Average	8.0

Overall Proportions of Deer Species



Management Goal

Optimize the number and diversity of hunting opportunities for the landowners of all exotic and native game animals of average to good quality or better.

Harvest Recommendations

Overall Deer Density

The YO Ranchlands, as a whole, remains overpopulated with deer for the current management goals. Little change in density or species composition was found. Landowners essentially harvested at the same level as animal production. It appears that production returned to near normal levels over the past year, likely fueled by abundant rainfall in the first half of 2007 enhancing fawn survival. Axis were significantly under-harvested again and recommendations for 2007-2008 remain high for this species. Axis should make up almost 80% of the total harvest for the coming year. A combination of landowner harvest and aggressive removal through trapping will be necessary to meet the recommendation. Abundant food supplies due to favorable weather conditions will allow the range to support more deer this year than in most and may result in increased fawn production. When drought returns, this could result in severe overuse of range resources.

The overall combined deer density on the YO Ranchlands is 3.5 acres / deer, virtually identical to the 2006 estimate. The actual deer density varied greatly by Phase, and was less equitable than last year, but this is just as likely due to unreliable phase-specific estimates that resulted from lower sample sizes. The maximum combined density of native & exotic deer that the Ranchlands can support without significantly depleting quail or turkey habitat is 3 acres / deer. The optimal combined deer density to provide a large number of hunting opportunities of deer and maintain moderate to good production of gamebirds is 4.5 acres / deer. The maximum combined deer density for trophy animal management is 6 acres / deer. The target density for summer of 2008 remains at 3.9 acres / deer. By 2010 the overall combined target summer density is 4 - 4.5 acres / deer. Lower overall densities and improved distribution will moderate the effects of short-term drought and other events that result in a decline in forage availability. The harvest guidelines outlined below will accomplish a slight overall reduction in deer density.

Species Composition

There remains a significant overabundance of Axis deer. They still comprise 50% of the deer on the Ranchlands as a whole. Axis are more aggressive, dominant, and productive than any other species of deer on the property. Last year's axis harvest was only 27% of the recommended level. They will out-compete Fallow, White-tailed, and Sika deer, and if harvest efforts are not increased, they will continue to rise as a proportion of deer numbers. Axis should make up almost 80% of the total harvest for the coming year. Axis deer could make up as much as 75% of the deer population within 5-7 years if efforts are not increased. A continued combination of aggressive Axis harvesting and conservative management of the remaining species should improve the overall species composition.

Populations of White-tailed deer, Fallow, Sika, and Blackbuck remained stable. The previous decline in White-tailed deer numbers and proportion appears to have abated. The 2006 White-tailed harvest was double the recommended levels, but increased fawn production likely compensated for the over-harvest. The populations

of Fallow, Blackbuck and Sika remain lower than they should be to optimize the diversity of hunting opportunities. Selective harvest of these two species combined with the removal of excess Axis should allow these populations to approach long-term targets while still providing plenty of hunting opportunities over the next few years. The resources freed up by the removal of the overly numerous Axis are more likely to be taken advantage of by Sika, Blackbuck or other Axis rather than White-tailed or Fallow deer.

Sex Ratios

The sex ratios or Buck : Doe ratios remain at or near the ideal level for nearly all species on the Ranchlands. Due to decreased observation, sex ratios were assumed to remain stable unless the harvest data warranted change. Fallow, Sika, and Blackbuck sex ratios are just slightly off from the idealized ratios. For Fallow, a slightly larger number of females to males will help the population continue to increase. Blackbuck males remain more abundant than necessary for the ideal sex ratio. Slightly more emphasis should be placed on hunting Blackbuck males during the next couple of years. To maintain sex ratios, it is important to harvest <u>at least</u> as many does as bucks of any species and often 2 – 3 times as many does as bucks.

HARVEST RECOMMENDATIONS & POPULATION GOALS

YOLA Harvest Recommendations 2007/2008		Total
Axis	Buck	250
	Doe	425
White-tailed	Buck	20
	Doe	20
Sika	Buck	8
	Doe	60
Fallow	Buck	6
	Doe	12
Blackbuck	Buck	12
	Doe	4
Grand Total	Buck	296
	Doe	521
	Total	**817**

2008 Goal

Species	% of Total
Axis	40%
White-tailed	20%
Sika	20%
Fallow	10%
Blackbuck	10%
Density	*3.9 Ac/Deer*

2010 Goal

Species	% of Total
Axis	30%
White-tailed	25%
Sika	20%
Fallow	10%
Blackbuck	15%
Density	*4.2 Ac/Deer*

Deer Survey Analysis & Harvest Recommendations
YO Ranchlands – Additional Information

Ideal 2010 Population and Theoretical Harvest

2010 Ideal	Axis		White-tailed		Sika		Fallow		Blackbuck		
Population	Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe	TOTAL
Phase 1A	51	128	74	74	40	79	30	30	18	71	595
Phase 1B	51	128	74	74	40	79	30	30	18	71	595
Phase 2 & 1C	61	153	89	89	48	95	36	36	21	86	714
Phase 3	41	102	60	60	32	63	24	24	14	57	476
Total	204	510	298	298	159	317	119	119	71	286	2381

2010 Idealized	Axis		White-tailed		Sika		Fallow		Blackbuck		
Harvest	Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe	TOTAL
Phase 1A	19	19	9	9	10	10	4	4	9	9	102
Phase 1B	19	19	9	9	10	10	4	4	9	9	102
Phase 2 & 1C	23	23	11	11	12	12	4	4	11	11	122
Phase 3	15	15	7	7	8	8	3	3	7	7	82
Total	77	77	37	37	40	40	15	15	36	36	408

Other Species of Interest

Hogs Seen During 2007 Surveys – 6

Wild Sheep Seen During 2007 Surveys - 27

2006/2007 Harvest Summary – courtesy of Bob Owen

YOLA harvest reports, Sept 01 2006 - July 01 2007

Species		Area A	B	C	D	Total
Aoudad	ram	4	4	2	1	11
	ewe	1	4	2	1	8
Axis	buck	10	10	18	4	42
	doe	23	23	58	11	115
Blackbuck	buck	4	2	7	1	14
	doe	5	4	1	0	10
Fallow	buck	7	4	5	0	16
	doe	2	2	9	4	17
Sika	buck	15	11	6	4	36
	doe	30	24	6	9	69
WT	buck	11	3	6	2	22
	doe	14	9	8	8	39
	cull	8	6	2	0	16
Grand Total		**134**	**106**	**130**	**45**	**415**

NOTE: above totals include 8 animals "found dead".

Broken Arrow harvests for Exotic Coop

October 31, 2006

	Species	Area A	B	C	Total
Axis	buck			1	1
Axis	doe		6	12	18
Fallow	doe		1	2	3
Sika	buck				0
Sika	doe		1	1	2
Total		**0**	**8**	**16**	**24**

February 8, 2007

	Species	Area A	B	C	Total
Axis	buck			1	1
Axis	doe		1	6	7
Fallow	doe				0
Sika	buck	1	1		2
Sika	doe	9	5		14
Total		**10**	**7**	**7**	**24**

Population Estimates for 2007 & 2008 and Harvest Goals for 2007-2008

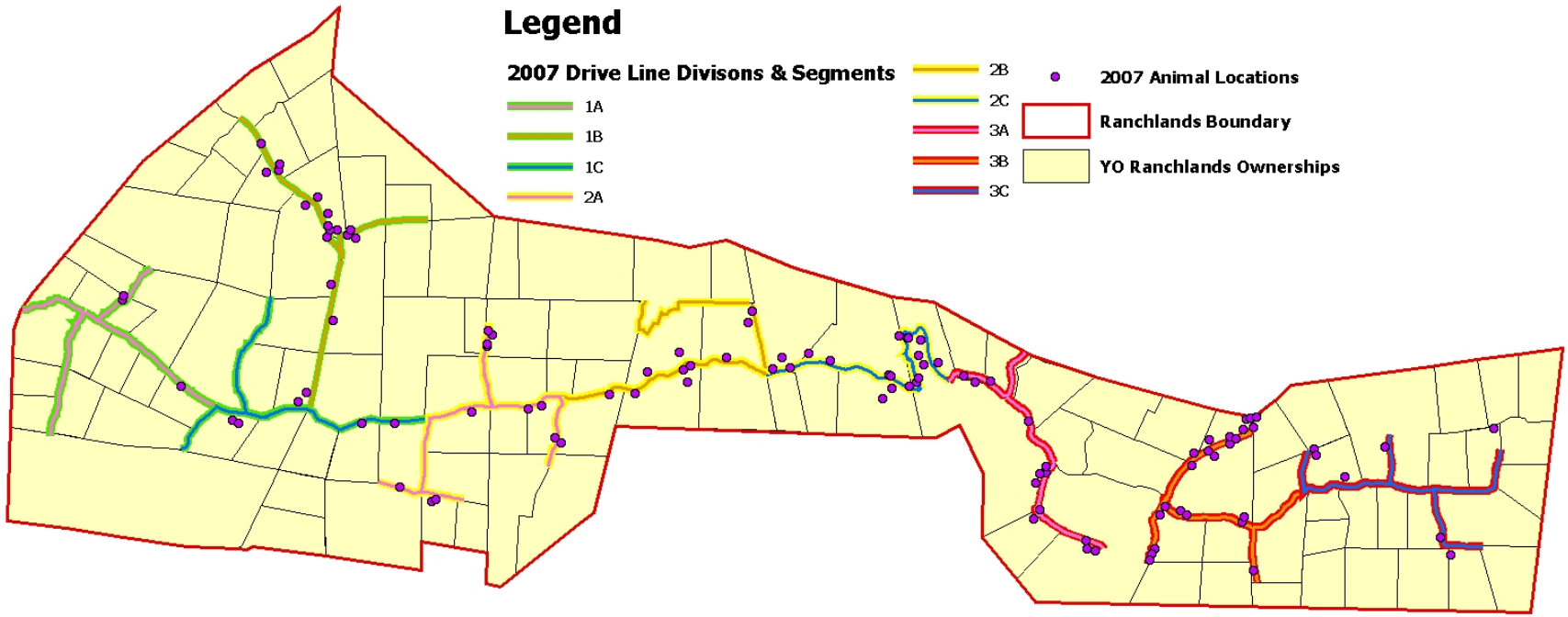
2007 Approximate Population		Axis		White-tailed		Sika		Fallow		Blackbuck		GRAND TOTAL	
		Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe
	Total	412	1030	242	242	125	350	73	154	54	152	906	1927

2007-2008 Harvest Recommendations		Axis		White-tailed		Sika		Fallow		Blackbuck		GRAND TOTAL	
		Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe
	Total	250	425	20	20	8	60	6	12	12	4	296	521

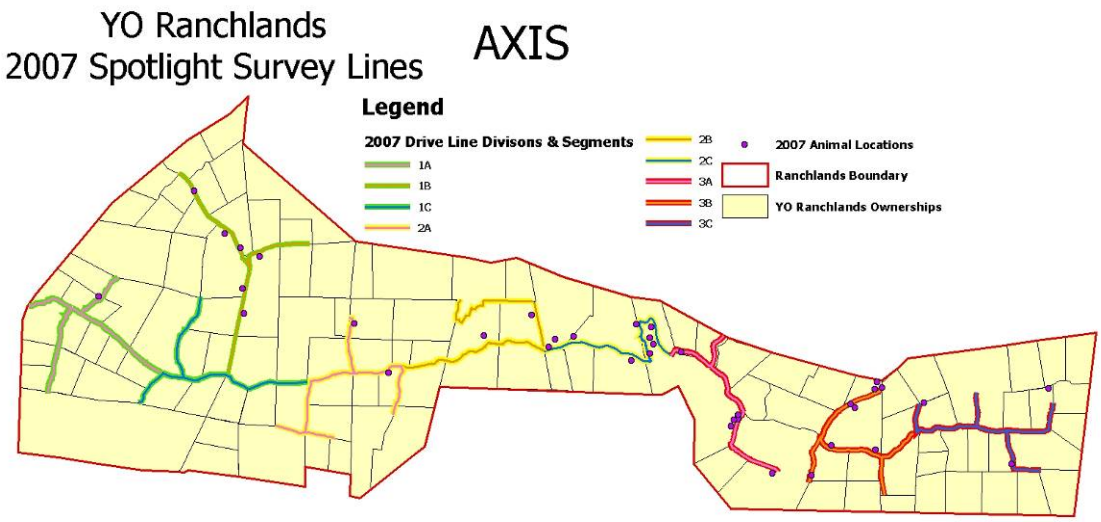
2008 Estimated Population		Axis		White-tailed		Sika		Fallow		Blackbuck		GRAND TOTAL	
		Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe	Buck	Doe
	Total	291	734	258	258	170	343	90	165	57	163	865	1662

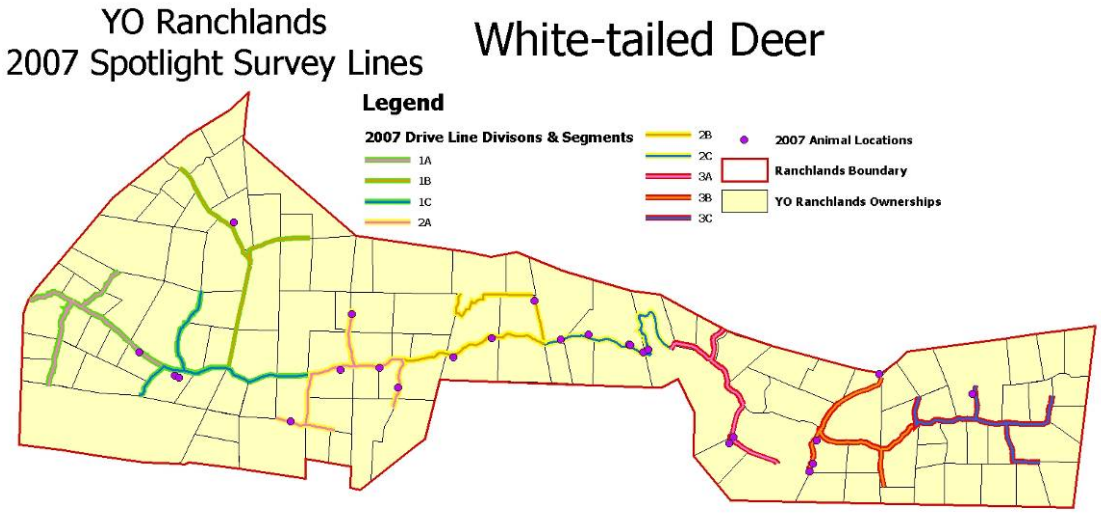
YO Ranchlands
2007 Spotlight Survey Lines

All Species



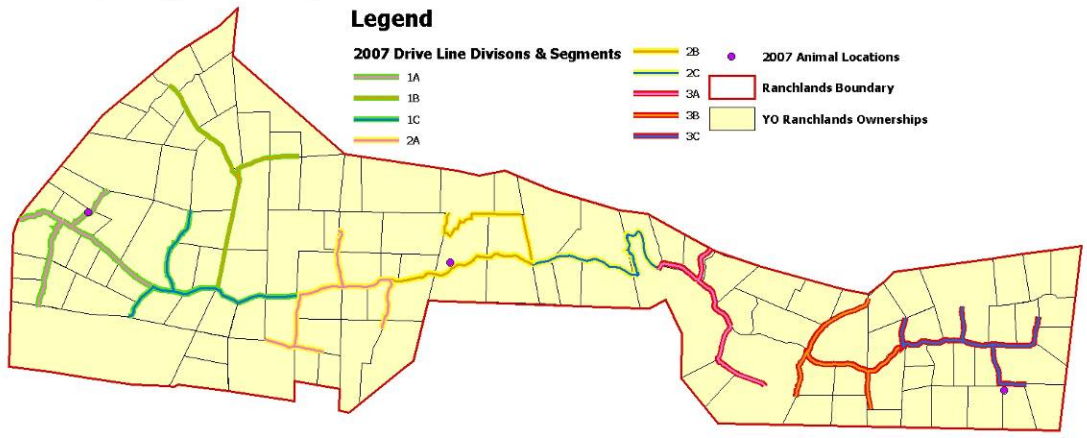
Surveyed Deer Locations by Species





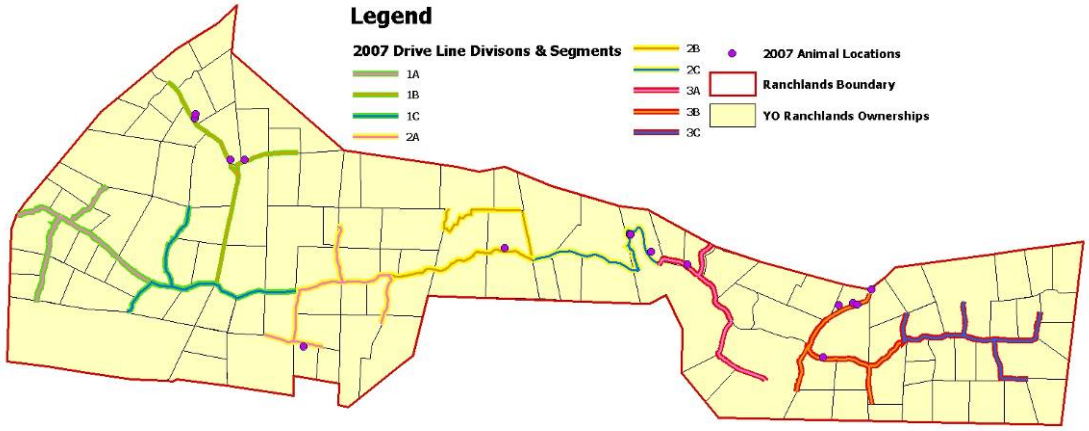
YO Ranchlands
2007 Spotlight Survey Lines

Sika



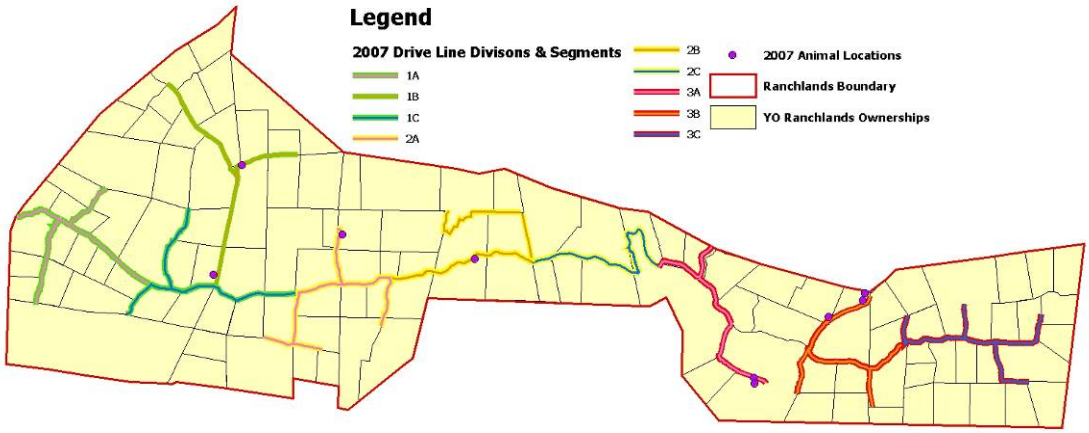
YO Ranchlands
2007 Spotlight Survey Lines

Fallow



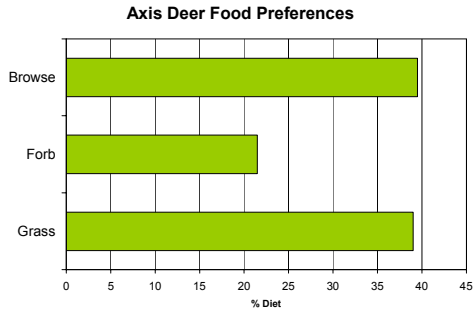
YO Ranchlands
2007 Spotlight Survey Lines

Blackbuck



Exotic & White-tailed Deer Information

Axis Deer



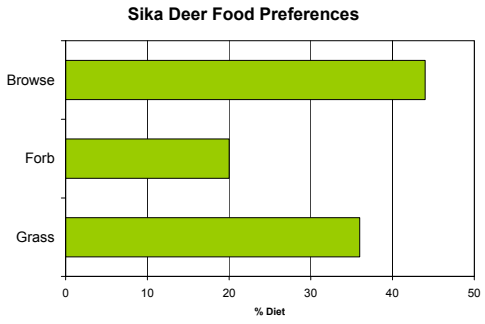
Diet Class : Highly Adaptable, Prefers Grass & Forbs

Breeding Season : Year-round, Summer Peak

Gestation : 7.5 months Offspring : Twin Fawns

Competition with White-tailed Deer : High

Sika Deer



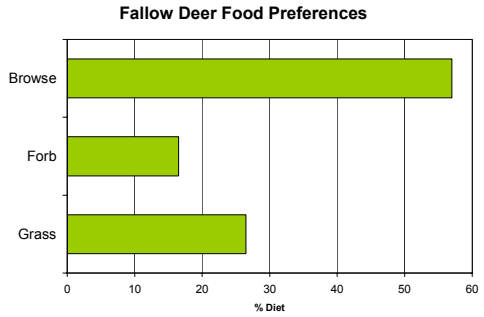
Diet Class : Highly Adaptable, Prefers Browse & Grass

Breeding Season : Fall Peak

Gestation : 7.5 months Offspring : Single Fawn

Competition with White-tailed Deer : Moderate

Fallow Deer



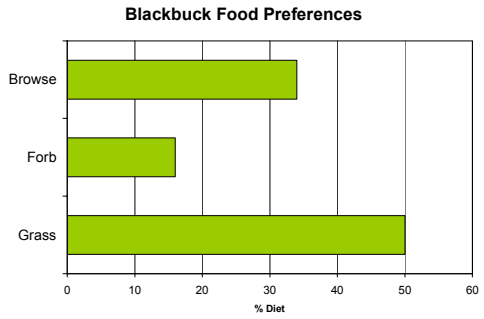
Diet Class : Prefers Browse

Breeding Season : Fall Peak

Gestation : 7.5 months Offspring : Single Fawns

Competition with White-tailed Deer : Moderate

Blackbuck



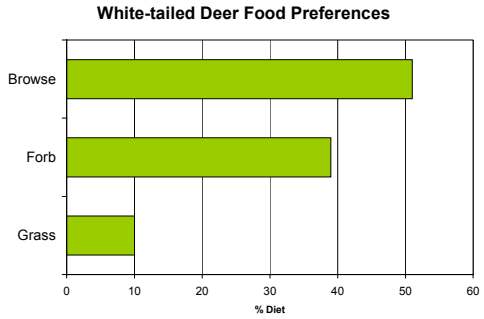
Diet Class : Prefers Grass & Browse

Breeding Season : Year-round, Spring & Fall Peaks

Gestation : 5 months Offspring : Single Fawns

Competition with White-tailed Deer : Low - Moderate

White-tailed Deer



Diet Class : Browse & Forbs, Can't Use Mature Grass
Breeding Season : Fall Peak
Gestation : 7 months Offspring : Single & Twin Fawns

- Axis are more aggressive at defending preferred food sources than the other deer species.
- Sika are more aggressive than Fallow or White-tailed but less aggressive than Axis.
- White-tailed and Fallow deer nearly equally aggressive at defending preferred food and water. Both species are significantly less aggressive than Axis or Sika.
- Axis are more prolific than any of the other species present on the YO Ranchlands

Plateau Land & Wildlife Management, Inc.

Contact Information

Dripping Springs Office

P.O. Box 1251
Dripping Springs, Texas 78620

Phone: (512) 894-3479
Fax: (512) 858-2652
Toll Free: (888) 289-9409

- Brad Krimmel – Business Development Director
- John Melnar – Business Development Coordinator
- Amy Greer – Senior Biologist: Wildlife Management Services
- Keith Olenick – Senior Biologist: Wildlife Planning Services
- Mark Gray – Senior Biologist: Wildlife Planning Services
- Jennifer Colvin – Wildlife Plan Administrator
- Stephen Parker – Lead Wildlife Technician

San Antonio Office

Phone: (210) 538-5936
Fax: (512) 858-2652
Toll Free: (888) 804-7383

- Glenn Rodgers – Business Development Coordinator
- Matt Applegath-Priour – Wildlife Information & Data Systems Manager
- Shane Kiefer - Senior Biologist: Wildlife Planning Services

Weatherford Office

Phone: (817) 447-7965
Fax: (817) 295-5661
Toll Free: (800) 390-7386

- Danny Brosius – Business Development Coordinator
- Ryan Walser - Senior Biologist: Wildlife Planning Services