
CARRYING CAPACITY ANALYSIS

YO RANCLANDS PROPERTY

±10,300 ACRES

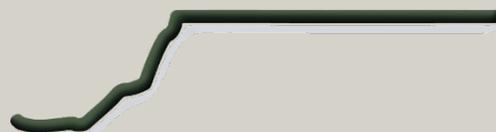
KERR COUNTY

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Plateau

Land & Wildlife
Management

OVERVIEW

This report is intended to convey recommendations from the Desktop Carrying Capacity Analysis conducted for the YO Ranchlands property, +/- 10,300 acres in Kerr County, on September 17, 2020. The goal of the desktop carrying capacity analysis is to determine if increasing the mixed exotic herd population from 1,389 animals to 2,000-2,500 animals is feasible for the Ranchlands. Increasing a mixed exotic herd population will require that yearly harvest recommendations be met or slightly exceeded to help control the population and protect the rangelands.

The United States Department of Agriculture's (USDA) web soil survey software program was used to determine the soil types found on the Ranchlands. Each soil type present on the property accounts for a specific acreage and has a specific productivity value, (based on the type of vegetation that should be found in that soil type) and provides production values (expected pounds of forage). The production number given for the different soil types is based on a climax community of vegetation (a habitat that remains relatively unchanged by human's interference or other factors).

Two analyses were run for the Ranchlands, one with the entire acreage of the ranch being suitable acreage for forage and one where the amount of suitable acreage was reduced. Since the Ranchlands is not a climax community, the available useable acreage was reduced to account for the encroachment of juniper and other semi-invasive vegetation. The amount of useable acreage was reduced by 25 percent. Stocking rates were also calculated for the property with and without a 25 percent reduction, to show the difference in the expected pounds of forage on the Ranchlands and what a possible stocking rate would look like.

The production potential of the property was run for unfavorable years (as opposed to "normal" or "favorable" rainfall years). We recommend using stocking rates for an unfavorable year to reduce the risk of damage to the land from drought, other natural disasters, or over grazing. Stocking at an unfavorable rate reduces the stress to vegetation from constant browsing or grazing pressure. A lower stocking rate is also preferred to reduce damaging the land and vegetation during a drought or other acts of nature, and allows a property to recover more quickly.

RESULTS

CURRENT POPULATION

The goal for species composition on the Ranchlands in 2010 was:

- White-tailed deer=25%
- Axis= 30%
- Blackbuck=20%
- Fallow= 10%
- Sika= 15%

The 2020 spotlight survey estimated there was about 1,386 native and non-native ungulates on the property, which results in 238 AUs (animal units) and 7.4 acres available per animal. The current estimated population provides about 43 acres for each animal unit, which varies depending on the species, for example, 7 white-tailed deer = 1 AU.

Table.1. Current estimated population and Animal Units.

Kind, Class, Sex of stock/wildlife	AU Equivalent	Number of Animals	Animal Units
White-tailed Deer	0.13	388	49
Axis	0.23	540	122
Blackbuck	0.15	250	36
Fallow	0.21	111	23
Sika	0.19	97	18
Total Animals and Animal Units		1386	262

Ranch Acreage: 10300

Acres Per Animal Unit **39**

Acre per Animal Unit **7.4**

Table. 2. 2020 Estimated Species Composition.

Species	% of Population
White-tailed	28%
Axis	39%
Blackbuck	18%
Fallow	8%
Sika	7%

SOIL SURVEYS AND STOCKING RATES

From the USDA’s web soil survey, for the entire 10,300 acres, should be able to produce approximately 17 million pounds of forage annually. This could theoretically (based on a climax community) supports approximately 440 AUs. The Ranchlands is not in the ideal climax community and the climax vegetation that should be able to grow in the 10 soil types are either low in abundance or non-existence.

Table. 3. Soil Production during an Unfavorable Year.

Unfavorable Year		
Soil type	Grazeable Acreage	Productions (lbs. of forage)
BdcB	57.6	120,960
BdMB	1,025.4	1,972,870
EcHE	1,745.7	2,611,567
HaEC	4,996.7	8,244,555
HaPC	1,330.7	2,157,065
HERF	182.0	296,296
MudB	57	134,064
NoHB	276.7	346,428
PTD	666.6	939,906
TTC	54.1	60,213
TOTAL	10392.5	16,883,924

Stocking rates for a 440 AU population with the 2010 percentage goals would resemble the following:

Table. 4. Target AUEs and population per species using the 2010 composition goals.

Kind, Class, Sex of stock/wildlife	AU Equivalent	Number of Animals	Animal Units
White-tailed Deer	0.13	625	78
Axis	0.23	750	169
Blackbuck	0.15	500	73
Fallow	0.21	250	51
Sika	0.19	375	69
Total Animals and Animal Units		2,500	440

Ranch Acreage: 10,300
 Acres Per Animal Unit 23
 Acres Per Animal 4.1

Increases in brush density, particularly juniper, can reduce available forage for some species. Taking this into consideration the amount of productive acreage was reduced by 25% to provide the most conservative estimate possible. Areas with dense canopy cover reduce available browse species, grasses, and forbs for native and non-native wildlife. The 25% reduction in available acreage resulted in a decrease in production to about 12 million pounds, which could support 330 AUs in an unfavorable year.

Table. 5. Soil Production during an Unfavorable Year with a 25% reduction of available acreage.

Unfavorable Year			
Soil type	Grazeable Acreage	Grazeable Ac adjusted	Productions (lbs of forage)
BdcB	57.6	43.2	90,720
BdMB	1,025.4	769.0	1,479,604
EcHE	1,745.7	1208.2	1,807,467
HaEC	4,996.7	3747.5	6,183,416
HaPC	1,330.7	997.6	1,617,069
HERF	182.0	136.5	222,222
MudB	57	43.0	101,136
NoHB	276.7	207.8	260,134
PTD	666.6	500.2	705,282
TTC	54.1	40.8	45,438
TOTAL	10,392.5	7,693.8	12,512,489

Stocking rates for a 330 AU population with the 2010 percentage goals would resemble to following:

Table. 6. Target AUEs and population per species using the 2010 percentage.

Kind, Class, Sex of stock/wildlife	AU Equivalent	Number of Animals	Animal Units
White-tailed Deer	0.13	469	59
Axis	0.23	563	127
Blackbuck	0.15	375	54
Fallow	0.21	188	38
Sika	0.19	281	52
Total Animals and Animal Units		1,875	330

Ranch Acreage: 10,300

Acres Per Animal Unit 31

Acres Per Animal 5.5

The table below shows what the population might look like while using the current estimated population and percent compositions, while trying to increase the overall herd population to 330 AUs or 440 AUs. The available acreage per animal decreases. Reduction of axis populations would help increase acreage per animal and be beneficial to the land and other wildlife species.

Table. 7 and 8. 2020 Current species composition from Table 2 with the 330 AUs and 440 AUs with no reduction in Axis population.

Kind, Class, Sex of stock/wildlife	AU Equivalent	Number of Animals	Animal Units
White-tailed Deer	0.13	519	65
Axis	0.23	722	163
Blackbuck	0.15	333	48
Fallow	0.21	148	30
Sika	0.19	130	24
Total Animals and Animal Units		1852	330

Ranch Acreage: 10300
 Acres Per Animal Unit **31**
 Acres Per Animal 5.6

Kind, Class, Sex of stock/wildlife	AU Equivalent	Number of Animals	Animal Units
White-tailed Deer	0.13	625	78
Axis	0.23	963	217
Blackbuck	0.15	444	64
Fallow	0.21	198	40
Sika	0.19	173	32
Total Animals and Animal Units		2469	432

Ranch Acreage: 10300
 Acres Per Animal Unit **24**
 Acres Per Animal 4.2

The AUs and potential stocking rates are based on available vegetation on the Ranchlands, no numbers were generated to reflect any type of supplemental feeding regime by the landowners. Operations should not rely heavily on supplemental feeding to increase the population of deer species on a property, as those should be considered supplements to improve the overall nutritional plane of animals to improve growth and quality.

DISCUSSION

As the Ranchlands determines which stocking rate route they may want to implement going forward, it is important to remember these stocking rates and AUs are based on no supplemental feeding regime occurring on the Ranchlands, only on what vegetation should be occurring based on soils types. Increasing a mixed species population has many variables to consider before implementing. The most important being how long will the land be able to withstand constant grazing and browsing pressure before it starts to suffer?

We recommended stocking, for any type of wildlife operation, based on an unfavorable year. To avoid over stocking the property, help protect the land, help reduce stress of overgrazing on the vegetation, and allow recovery time for vegetation. Stocking at a higher rate is easier for a traditional livestock operation because in drought times or lean times, you can quickly remove animals from the property. With an exotic operation, quickly removing animals from a property is not as easily accomplished. Supplemental feeding is conducted on the Ranchlands and helps provide additional food sources to the wildlife (native and non-native) and the ability to support more AUs. We do not recommend relying heavily or solely on supplemental feeding, instead managing the herd (harvesting) and land (through selective brush management) to promote a landscape of healthy native vegetation.

Reducing axis populations would allow for an increase in available acreage overall and increase other deer species populations. Axis easily out compete all other species and reducing their densities would be beneficial to all aspects of managing the land and exotic herds.

