

## Appendix M

### **Herd Composition: An Essential Element of White-tailed Deer Population and Harvest Management in Texas**

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#### **INTRODUCTION**

White-tailed deer management consists of a series of strategies, practices, and other actions taken on the part of landowners and land managers to produce and sustain populations of this important game animal. **Habitat management, population management, and harvest management** are all essential ingredients for accomplishing a successful white-tailed deer management program. It is the degree of importance that landowners or wildlife managers place on these different stages of management that will determine long term results. Knowledge of the composition of a deer herd is fundamental to making sound management decisions.

#### **Herd Composition - What Is It?**

**Herd composition** refers to the **ratio of bucks, does, and fawns in the population**. In addition, the ratio of does to bucks and fawns to does are also key population relationships used to implement and evaluate management and harvest strategies. An estimate of the **percent bucks, does, and fawns** in the total population is one of the most important factors that must be known before harvest rates can be formulated.

Deer are born at approximately a one-to-one sex ratio; however, few free ranging populations reflect this ratio. Herd composition is not static but changes throughout the year due to the cumulative influences of hunting pressure, reproduction, natural mortality (diseases, accidents, predation, etc.), range conditions and land use, and environmental factors such as rainfall patterns, temperatures, drought, or floods.

Although the exact number of deer living on most ranches is impossible to determine, various techniques are available that estimate their numbers. Techniques such as spotlight surveys, walking Hahn transects, mobile daytime census, and aerial counts are common methods used to estimate the relative density of deer. With each of these techniques, deer are counted on a given area of space or acreage. The number of deer observed divided by the number of acres sampled is expressed as acres per deer. An estimate of the total population can then be determined by expanding this figure to the total ranch acreage. For example, a 5000-acre ranch with an estimated density of 25 acres per deer has an estimated total deer population of 200 deer. Unless a significant number of observed deer are identified as to sex and age class, estimated herd composition is unknown. In most situations, not enough deer are identified while conducting these types of surveys (with the exception of helicopter counts) which must

be supplemented by additional **herd composition counts**.

### **When Do You Conduct Herd Composition Counts?**

Deer herd composition counts should be made during that time of the year when bucks, does, and fawns are most easily identifiable. The exact time of the year may vary across the state due to differences in fawning dates and antler formation on bucks. Counts initiated before peak fawning has occurred or prior to advanced antler formation will not provide data reflective of the population sex or age composition. Also, fawns are not actively up and moving with does until they are 6-8 weeks of age. It is recommended that deer herd composition counts in Texas be conducted during **August and September**. The differential size between fawns and adult deer is most evident during this period. The spotted hair coat on fawns begins to disappear during late September when molt occurs, making identification difficult unless a mature size deer is nearby. Fawns also begin to grow rapidly by this time, making positive identification difficult. Early fawns may be misidentified as yearlings on counts made after this time. Antler development on bucks has also progressed during this period so that they too are readily identifiable.

Herd composition counts should also be completed by the end of September to allow time for harvest rates to be calculated and preparations made for the upcoming archery and general gun seasons.

### **How Do You Make Herd Composition Counts?**

Herd composition counts can be made during any time of the day. However, since deer are most active during the **early morning and late evening**, efforts to observe deer during these periods are most productive. Identification of deer during spotlight counts is discouraged because they are too easily misidentified. Most counts can be made from a slow moving vehicle along ranch roads. Counts can be made at random, along a systematic route, or at specific locations where deer are feeding or congregating. Grain fields, food plots, water sources, natural crossings, or tree lines are good places to observe deer. Counts may also be made from hunting blinds or other stationary structures where deer are known to occur. **The use of binoculars or spotting scopes is recommended.**

Record **only** deer that can be identified as a buck, a doe, or a fawn. When a group of deer is observed, **do not** record **any** of the deer unless **all individuals** can be positively identified. If you see a deer but can not identify it - don't record it. Do not assume the identity of deer or counts will become biased. Fawns and mature bucks are usually easy to identify. Yearling bucks or spikes are often mistaken as does. Every effort must be made to be sure you properly identify all deer. Your objective is to observe a representative cross section of deer throughout the total population on your ranch.

Remember that many deer during this time of the year will still be in small family groups that may consist of a doe with this year's fawn or fawns, and her doe or buck yearling from the previous year. Other groups may consist of several does and their collective fawns. And, during August, bucks are often observed grouped away from the does. As

September progresses, buck become less tolerant of each other and begin to be observed more as singles.

Take your time when you see a deer. Often, there are other deer standing nearby that you won't see unless the group begins to move or run. Fawns may be hidden in tall grass and not seen until the doe begins to move away. Be patient!

Data should be recorded on a simple form that has columns for the date, bucks, does, fawns, and a total. When deer composition observations are completed, simply add the entries in each column to total the number of bucks, doe, and fawns. It is recommended that a minimum of **100** identified observations of deer be gathered. **The more the better!**

### **How Do You Determine Herd Composition from the Data?**

From your data sheet, **total** the columns for bucks, does, fawns, and add **them together**. This figure represents **total deer identified**. To determine estimated herd composition, **divide** each individual group (bucks, does, and fawns) by the **total identified deer figure**. For example, if a total of 100 deer were identified and 20 were bucks, 50 were does, and 30 were fawns, calculate herd composition as follows:

20 (# of identified Bucks) divided by 100 (total identified Deer)=.20 x 100 = **20% Bucks**  
50 (# of identified Does) divided by 100 (total identified Deer) = .50 x100 = **50% Does**  
30 (# of identified Fawns) divided by 100 (total identified Deer)=.30x100 = **30% Fawns**  
**100 Total Identified Deer** **100%**

In addition, **doe to buck** and **fawn to doe** ratios can also be determined. To determine the **doe to buck ratio**, **divide the number of identified does by the number of identified bucks**. To determine the **fawn to doe ratio**, **divide the number of identified fawns by the number of identified does**: For example:

Divide 50 (# identified Does) by 20 (# identified Bucks) = **2.50 Does per Buck**  
Divide 30 (# identified Fawns) by 50 (# identified Does) = **0.60 Fawns per Doe**

### **How Do You Use Herd Composition Data?**

Once you have estimated what your deer herd composition is and expressed it as **percent bucks, does, and fawns**, you may now apply these figures to your total estimated deer population. For example, a ranch containing 2,000 acres with an estimated deer density of one deer per 20 acres has an estimated population of 100 deer. Calculate herd composition as follows:

100 Total Deer X .20 percent (% identified Bucks) = **20 Bucks**  
100 Total Deer X .50 percent (% identified Does) = **50 Does**  
100 Total Deer X .30 percent (% identified Fawns) = **30 Fawns**  
**100 Total Deer**

With the knowledge of approximately how many bucks, does, and fawns are present on your ranch, you may now make important decisions about how many deer should be

harvested during the upcoming deer season. Buck to doe ratios and fawn to doe ratios also are good indicators of your progress toward obtaining your goals and objectives.

**Stand deer counts** may be conducted on properties of less than one section (640 acres) where spotlight counts or other census techniques may not be suited for gathering deer density information. This technique provides a systematic method of estimating deer density, albeit conservative, and composition information on small properties that may otherwise have difficulty meeting minimum data collection requirements. The technique requires one stand location per each 100 acres (i.e. 150 acres requires two stands). Five counts are conducted from each stand. It is not necessary to conduct simultaneous counts. One hour of observation during each count is required. It is recommended that the counts be conducted one hour after sunrise and/or one hour before sunset. Deer are recorded during these periods in the same manner as described in the proceeding paragraphs, with the exception that unidentified deer are also recorded. It is suggested that bucks be recorded as spikes, 3 to 5 points, and six points or more. The deer observed are totaled by buck, doe, fawn, and unidentified for each count period. These numbers are then added together for total deer by category and total deer observed at each individual stand for the five count periods. This information from each stand is added together for the total deer by category and total deer for the property for the five count periods. Divide each category total and the deer total by five to provide an estimate of composition and number of deer on the property. The unidentified deer need to be factored into each category according to the ratios or percentages. The stand count technique has always yielded a lower deer density estimate compared to spotlight counts on the same properties. This is because one is not likely to see every deer on 100 acres during a one-hour count period. The density estimates are relatively close to those of spotlight counts, however.

As an example, we will use a 275-acre property. Since there are over 249 acres, three stand locations are required. There is one stand on each 100-acre portion. The property owner has no assistants, so he or she is going to do the counts alone. The landowner makes one count in the morning and one in the evening. It will take seven and one-half days to complete the counts for the 15 one-hour count periods (3 stands X 5 counts each = 15 hours). The counts go as follows:

Stand #1	Bucks	Does	Fawns	Unidentified	
Count 1	3	6	3	1	
Count 2	1	5	3	3	
Count 3	2	8	4	0	
Count 4	5	4	2	2	
Count 5	<u>2</u>	<u>6</u>	<u>3</u>	<u>3</u>	
	13 +	29 +	15 +	9 =	66 Total Deer

Stand #2	Bucks	Does	Fawns	Unidentified
Count 1	4	4	4	4
Count 2	4	8	4	0
Count 3	2	4	2	1

Count 4	0	3	1	0	
Count 5	<u>1</u>	<u>6</u>	<u>3</u>	<u>2</u>	
	11 +	25 +	14 +	7 =	57 Total Deer

Stand #3	Bucks	Does	Fawns	Unidentified	
Count 1	6	9	5	5	
Count 2	3	10	5	1	
Count 3	5	10	5	3	
Count 4	6	8	4	0	
Count 5	<u>3</u>	<u>5</u>	<u>2</u>	<u>0</u>	
	23 +	42 +	21 +	9 =	<u>95</u> Total Deer

Total 47 + 96 + 50 + 25 = 218 Total Deer  
 218 Total Deer divided by 5 = 43.6 deer observed on average on 275 acres or **6.31** acres per deer

47 Bucks + 96 Does + 50 Fawns = 193 Identified Deer  
 96 Does divided by 47 Bucks = **2.04** Does per Buck  
 50 Fawns divided by 96 Does = **52%** Fawn Crop  
 47 divided by 193 = **24%** Bucks .24 X 25(unidentified deer) = 6 47 + 6 = 53 Bucks  
 96 divided by 193 = 50% Does .50 X 25(unidentified deer) = 13 96 + 13 = 109 Does  
 50 divided by 193 = **26%** Fawns .26 X 25(unidentified deer) = 6 50 + 6 = 56 Fawns

53 Bucks divided by 5 = 10.6 bucks observed on average on 275 acres or **25.94** acres per buck  
 109 Does divided by 5 = 21.8 does observed on average on 275 acres or 12.61 acres per doe  
 162 Adults divided by 5 = 32.4 adults observed on average on 275 acres or **8.49** acres per adult  
 56 Fawns divided by 5 = 11.2 fawns observed on average on 275 acres or 24.55 acres per fawn  
 Estimated population; 11 Bucks, 22 Does, & 11 Fawns

In most instances these data are used to make conservative doe and buck harvest recommendations on small properties. While these data can often be confidently extrapolated for use in harvest recommendation formulas, a more cautious approach is taken when the data sizes are limited. If 96 does were identified during the counts, one would not assume that any of the unidentified deer were necessarily does. The 96 doe would be divided by 5, which equals 19.2 doe. That number would then be multiplied by .2(20%), which equals 3.84 doe. Since one cannot harvest part of a deer, the harvest recommendation would be 3 doe on the 275 acres. The same approach would be taken for the buck harvest recommendation.