

A Rancher's Guide for Monitoring Elk, Deer and Pronghorn Antelope Populations

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Much emphasis is put on the positive and negative effects of agricultural operations on wildlife populations. This publication describes a simple, accurate and economical method for use by ranch operators to monitor deer, elk and pronghorn antelope populations. The collected data reflect the amount of change in the population from year to year. This change is referred to as the "trend" of the population.

A *trend* is different from a *population estimate*. A population estimate is the total number of animals on the range. A trend indicates whether the population is increasing, decreasing or remaining stable. Trends are most valuable when averaged over a several-year period. Any one year may not reflect population changes.

The trend of the wildlife population may be used to indicate potential impacts on habitat. It may also be utilized to help determine proper harvest of big game species. Ranchers involved in fee hunting operations need to know if their harvest program is increasing or decreasing the population. Over a period of years, the trend of deer, elk or antelope populations is a good indicator of the productivity and related stability of herds.

Trend data collected over several

years may be useful during agency-rancher consultations. Often land management agencies decrease livestock density when range forage is over-utilized. Population trend data may be used to indicate whether the over-utilization is the result of livestock or an increasing game population. Properly collected, trend data may indicate whether subsequent management should involve livestock stocking adjustments or changes in game harvest.

This MontGuide describes two types of surveys. Both the *track count survey* and the *observation survey* have advantages and disadvantages. In deciding which survey is best for you, consider the assumptions and methodology of each. Select the method you believe will give the most accurate information while considering the unique aspects of your particular ranch.

Track Count Survey

Track counts are reliable indicators of population trends. The underlying assumption is that the number of tracks increases proportionally to an increase in population. If the population decreases, the number of tracks decreases proportionally. This is a very simple and economical way to monitor populations of deer, elk and pronghorn antelope. How-

ever, to successfully gather information that will be comparable from year to year, you must adhere to two basic rules:

1. Keep the survey simple. The person who succeeds you in conducting the survey may not be as interested as you. A survey that takes minimum time and effort is much more likely to be conducted annually. Also, as the survey becomes more complicated, the variability between observers becomes more significant in terms of accuracy.

2. Keep the survey consistent. If you make changes in the route, time or season the survey is conducted, or the mode of conducting it, the information obtained will not be comparable between years. Because these are trend counts, the methodology must be consistent.

The following track survey was designed to monitor deer population trends. The same steps apply in use of this system to monitor elk or pronghorn antelope populations.

Time of Year

If possible, the survey should be conducted after a snowfall. Select a four-week period when snowfall is likely to be sufficient for observation of tracks along a route. Surveying during periods with snow cover:

1. Allows collection of more data.
2. Reduces variability in observer skill.

3. Eliminates bias associated with track observations on bare ground.

Conduct the survey on the *first* three mornings after a snowfall during the selected four-week period. Observed tracks should be marked or brushed out, so they will not be recounted the following day.

Obviously, in areas where snowfall is limited or non-existent, the survey will have to be conducted on bare ground. Data collection will be reduced, and the accuracy of the method is somewhat less. If roads are sandy, and tracks can be observed easily, then the loss of accuracy is less significant. Many areas where antelope are present have a lack of snow. However, these same areas usually have sandy roads. It is highly recommended that these roads be dragged with a bushy tree or old bedsprings the day before each survey is conducted. If the survey is to be conducted on bare ground, the survey days selected should be in close succession and in spring at a time when roads are not frozen. Observed tracks should be marked or brushed out so they will not be recounted the following day.

Time of Day

The survey should be started one hour after sunrise. This allows detecting animal movement the morning of the survey and also provides time to conduct the survey before snow-melt makes fresh tracks difficult to distinguish from old ones.

Selecting the Route

Select a 10-mile route. These do not have to be successive miles. You can select areas deer normally utilize every year and skip areas where deer are rarely found. The beginning point and ending point of each segment must have identifiable features. The route you select *must* be the same each year.

Mode of Travel

Automobile travel is recommended. The route can be covered

in less time in an automobile than on foot or horseback. In addition, continuation of the survey is more likely if successors can follow roads in the comfort of a vehicle.

If it is necessary to travel by foot, horseback or snowmobile, the route must be clearly marked and more time allotted for the survey.

What to Count

Count the sets of tracks that cross the survey route. Deer, elk or antelope entering and leaving the road without crossing are not counted. Deer, elk or antelope walking down the road but not crossing until they are beyond the designated route segment are not counted. Deer, elk or antelope that cross the route several times are counted several times. Remember, consistency from year to year is the goal. Try to eliminate variation between observers.

Observers should try to differentiate deer, elk or antelope from other animal tracks. In areas where hogs, sheep, deer, elk, antelope and other animals occur with each other, observers should be familiar with track and track-pattern differences to minimize mistakes.

As a minimum, run this survey three days in close succession each year. The more days surveyed, the more accurate the data will be.

Number of Observers

One person can normally survey the route alone under snow conditions. It may be necessary for a driver to concentrate on driving and a passenger to observe tracks. This is fine if the same procedure is followed every year. If a passenger and driver do the survey the first year, there must be both observers in all succeeding years. It should also be specified if *only* the passenger or *both* the passenger and the driver observe tracks. Either method can be used, but it must remain consistent year after year.

Checking for tracks on a sandy road is easier if an observer rides on

the hood of the vehicle. Obvious safety considerations make this a hazardous choice and should only be used with sufficient precautions.

What to Record

In addition to the actual number of tracks, several things must be recorded the day the survey is conducted. The sample "Track Count Tally Sheet" (Appendix A) provides a format for entering this information. Most of the sheet is self-explanatory. A "Remarks" space is provided to include unforeseen events such as breakdowns, delays and elaborations.

A column is provided for segments of the route. These may represent one-mile increments if the route is continuous, or it may be the segment number if the route continues intermittently. The segment beginning and ending points should be clearly identified along the route and described in detail on a route information sheet.

Each time tracks are observed, the segment in which they occur, as well as the number of tracks observed, should be recorded.

A "Track Route Information Sheet" (Appendix A) must also be prepared as a permanent record of survey methodology. The "Description of Route" section is very important. If the permanent markers along the route are lost, the recorded information should be sufficient to re-establish both the route itself and the segments. In addition to a map, include descriptions of permanent natural and man-made characteristics such as road crossings, prominent trees and outcroppings.

The "Track Route Information Sheet" will also be the permanent record of the survey itself. Each year record the result of each of the three surveys and the average tracks observed.

Supplementary Route

Initially you may be tempted to increase the length of the survey

route or the number of days it is conducted. This is fine, but make it a *supplement* to the basic survey route. Also, to avoid confusion, keep the records separate from those of the basic survey route. This is recommended because individuals often start a population monitoring program with much enthusiasm, which has a tendency to wane when time, effort and monetary conflicts arise. It is much better to have a supplementary route that can be conducted, when possible, or abandoned without jeopardizing the entire monitoring program.

Observation Survey

The same basic principles apply to observation surveys that were outlined for the track survey. Again it is important to emphasize simplicity and consistency. Observation surveys can be used to monitor deer, elk and antelope populations.

An observation survey can be conducted instead of, or in addition to, track count surveys. The observation survey also gives a population trend, not an absolute number.

The observation survey has some advantages and disadvantages. The big advantage is that observation of animals is more interesting to conduct than a track survey. Other advantages are: it does not require ground cover conducive to track sightings, and it allows a sex and age ratio to be determined at the same time the population trend is being obtained.

Disadvantages include: less data collection because the animals must be observed, and a loss of accuracy results from the variation among observers in their skill of spotting animals. The second disadvantage can be minimized by selecting experienced observers and using the same persons whenever possible.

Time of Year

August is the best time to observe animals if a sex and age ratio is

desired. Fawns and calves are moving with adults, and adult males are easily distinguished from adult females at that time.

If total population trend is the primary consideration, maximum observations of adult and yearling animals can be made in December and January. This will give an index of adults, but it does not give information of fawn or calf drop.

If only one survey can be conducted, the August survey is recommended. Observation surveys should be conducted on at least four days in close succession.

Do *not* conduct surveys when a storm, minimum visibility or another weather extreme occurs.

Time of Day

The survey should be started a quarter of an hour before sunrise. Animals are usually feeding during this period and are most easily observed.

Selecting the Route

Select a 15-mile route. They do not have to be successive miles, but remember to count only animals you observe while you are within the designated route segments.

Mode of Travel

Automobile travel at approximately 15 miles per hour is recommended. Observations can be conducted from horseback or on foot, but these are normally not as efficient in terms of time spent and information collected.

What to Count

Count only the animals you see while you are within the route segment. Do not count animals twice, and do not use binoculars to increase counts. You may use binoculars to determine sex or age of animals spotted with the unaided eye. Remember, try for consistency from year to year.

Keep records of numbers of females, males, this year's fawns or calves and unknowns observed (sex

Track Count Summary

The preceding guidelines may seem long and complicated, but their purpose is to answer most questions that might arise. The basic survey can be summarized as follows:

1. Select the best time of year to observe tracks. This period *must* be the same every year.
2. Select a 10-mile survey route that is usually used by deer, elk or antelope year after year. This route *must* be the same every year.
3. Survey and record tracks on three days in close succession.
4. Keep detailed, permanent records.

Observation Route Summary

The basic observation route can be summarized as follows:

1. Select a time of year to conduct the survey. This *must* be the same each year.
2. Select a 15-mile route that usually has good deer, elk or antelope populations. This *must* be the same each year.
3. Survey and record observations on four days in close succession.
4. Keep detailed, permanent records.

and/or age not determined).

As a minimum, run the observation route four days in close succession each year. The more days surveyed, the more accurate the data will be.

Number of Observers

Two persons (driver and passenger) are recommended as observers. Remember, the same number of

observers must be utilized every year or results are not comparable between years. To minimize variability, use the same observers each year if possible.

What to Record

The "Observation Route Tally Sheet" (Appendix B) is similar to that used for the track count. Numbers of females, males, fawns or calves, and unknowns are recorded along with weather, information and remarks.

The "Observation Route Information Sheet" (Appendix B) is also similar to that used for the track survey. Columns for sex and age are included.

Using the Information

Comparison of the information collected in different years will indicate whether the population is up, down or stable.

The first year's survey provides base data, but will not provide any immediate information on the trend of the herd. However, sex and age ratio information can be determined from observation data, and concentration areas relative to the entire route can be determined from either track or observation route data.

The second year the survey is conducted, a determination of the trend of the herd can be made. The percentage change in tracks or observations from the previous year could indicate the change in the population. Remember that trend data is most valuable over several years. In any one year, counts may fluctuate due to precipitation, snow, etc.

Example

On a basic observation survey conducted in 1993, an average of 50 deer were observed for the four days.

Date	Does	Bucks	Fawns	Unknown	Total
Aug. 1, 1993	20	10	10	0	40
Aug. 2, 1993	15	10	10	10	45
Aug. 4, 1993	30	15	10	5	60
Aug. 5, 1993	20	10	15	10	55

Average for Year	21.25	11.25	11.25	6.25	50
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The following year, 1994, the basic observation survey resulted in an average of 55 deer observed each day.

Date	Does	Bucks	Fawns	Unknown	Total
Aug. 3, 1994	35	10	15	5	65
Aug. 4, 1994	25	10	5	10	50
Aug. 5, 1994	30	10	15	5	60
Aug. 7, 1994	25	5	10	5	45

Average for Year	28.75	8.75	11.25	6.25	55
%Change from 1993	+35.29	-22.2	0	0	+10%

In the example above, the information indicates the herd increased 10% from 1993 to 1994. The number of does observed increased 35.29%, the number of bucks observed decreased 22.2% and the number of fawns and unidentified observations did not change.

Wildlife management decisions resulting from trend information are entirely dependent upon conditions within a given area. If overbrowsing conditions exist, and the survey indicates the population is increasing, it may be wise to look into a herd reduction program. In another area, where a historically over-harvested population exists, an increasing trend might indicate the response of the herd to underutilized habitat.

Accuracy

It is important to understand that accuracy of population trend estimates are increased when larger numbers of animals or tracks are observed. If less than 15 sightings or tracks are recorded, the survey should be conducted an additional day each year to be sure the averages are representative of the true population. The three- and four-day survey periods are usually sufficient, but in areas of low game concentrations additional days may be necessary.



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TRACK ROUTE INFORMATION SHEET

Survey period: From _____ to _____

Description of route (also see attached map)

Mode of travel: _____

Observer names: Driver _____ Passenger _____

Track Route Record

Survey No.	Date	Tracks Observed
1	_____	_____
2	_____	_____
3	_____	_____
		Average

1	_____	_____
2	_____	_____
3	_____	_____
		Average

1	_____	_____
2	_____	_____
3	_____	_____
		Average

1	_____	_____
2	_____	_____
3	_____	_____
		Average

1	_____	_____
2	_____	_____
3	_____	_____
		Average

OBSERVATION ROUTE INFORMATION SHEET

Survey period: From _____ to _____

Description of route (also see attached map)

Mode of travel: _____

Observer names: Driver _____ Passenger _____

Observation Route Record

Survey No.	Date	Females	Males	Fawns or Calves	Unknown	Total
1	_____	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____	_____
3	_____	_____	_____	_____	_____	_____
4	_____	_____	_____	_____	_____	_____
Average	_____	_____	_____	_____	_____	_____
1	_____	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____	_____
3	_____	_____	_____	_____	_____	_____
4	_____	_____	_____	_____	_____	_____
Average	_____	_____	_____	_____	_____	_____
1	_____	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____	_____
3	_____	_____	_____	_____	_____	_____
4	_____	_____	_____	_____	_____	_____
Average	_____	_____	_____	_____	_____	_____
1	_____	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____	_____
3	_____	_____	_____	_____	_____	_____
4	_____	_____	_____	_____	_____	_____
Average	_____	_____	_____	_____	_____	_____