Prolific White-tailed Deer
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Deer are prolific!

When conditions are just right they increase at an astonishing rate. It is becoming harder year by year to astonish people with examples of fecundity and some of our more public spirited scientists dealing in such matters have been forced to extreme limits to obtain any notice at all. Leaving out of mind for the moment the Dionne affair, just recently a little insect no bigger than the head of a pin was accused of being able to start a succession that if unchecked during a single summer would bulk up to eight hundred million tons or better. Periodically, promoters of get-rich-quick schemes point out the remarkable fecundity of the muskrat. Take a pair, they say, that produce four litters averaging six each the first year, that makes twenty-six, thirteen females producing four litters of six each makes three hundred twenty-five the second year, thirty-eight hundred forty the third year, forty-six thousand the fourth (Editors note: we won't be responsible for the author's arithmetic beyond this point). This phenomenon has seldom been more pointedly set forth than in Ellis Parker Butler's "Pigs is Pigs" which recounts the troubles of an express agent trying to collect a few extra cents due from the consignee on a pair of guinea pigs which in the delay produced enough progeny to practically overflow the station house. However, we have diverged long enough from our subject as stated, so let us now add to the list our story of the prolific white-tailed deer (Odocoileus virginianus borealis (Miller)).

First, we're willing to wager that four adult female deer and two mature bucks can produce a herd of one hundred sixty deer in six fawning seasons. The reason we're willing to make such an apparently unguarded statement is that this actually happened. Let us recount the story.

Once upon a time (1926) two sections of land, mixed oak forests and abandoned farm land, leatherleaf bog and tamarack swamp, were surrounded by a high woven wire fence topped off with several strands of barbed wire

unfriendly to trespassers. In this enclosure were placed four does and two bucks. Concerning them the owner stated: "For your information you are advised that the six deer were received in March, 1928, four arriving March 5th and two March 13th. They comprised two bucks and four does, and as they were all aged deer we naturally presumed that the four does were bred and probably dropped fawns the following May or June." These deer were obtained from the Cleveland Cliffs Company on Grand Island, Michigan.

Deer did not appear especially common on the area during the summer of 1931. On two occasions groups of boys took long hikes about the tract, largely in the hope of seeing deer, but failed both times. However, during the fall of 1931, deer trails to the old apple orchards were well marked, and frequently as many as a dozen could be seen there at dusk. After the leaves had fallen, some browsing on red osier dogwood was noticeable near the trails bordering marshes and swamps.

Deer browsing became more apparent in the winter of 1932-33 on red osier dogwood, on sumac (Rhus glabra and Rhus typhina), and on the junipers and red cedars. Other evidences of a multiplying deer population were the number of pawed places found during the rut, and the increased number of trees that showed rubbing of antlers. These trees were usually red cedar, but sometimes other trees such as ash, cherry, and hickory were rubbed.

It became apparent that before long some reliable count of the number of deer present would be highly desirable. Tract counts were useless since the deer were confined. Counts by a single person were proved to be of little value, since the deer counted on a single field trip seldom equalled the number that had been seen at one time on previous occasions. It was decided that a drive with a number of persons participating would give the best results. No opportunity of effecting this occurred during the winter of 1932-33, but on December 9, 1933, a number of people came to take part in such a drive.

About thirty people participated. The plan used is best illustrated by the hands of a clock. The hour hand would represent a line of stationary counters and the minute hand the driving line. By the time the "minute hand-driving line" had made a complete revolution around the area all the deer would have been driven by the stationary "hour hand-counting line" or would have dashed back through the driving line and been counted there. So it worked. Six men of some experience with deer were placed in the counting line with instructions to distinguish if possible bucks, does, and fawns. The rest of the group with the more agile members on the faster moving outer end of the line composed the driving line. Seventy-five to a hundred feet was the normal distance between persons, but each was instructed to keep in sight of his companion to the right and count all deer that came through the line on that side.

When the drive got underway there was no lack of excitement. At times deer appeared to bound from every clump of trees or bushy thicket, while sometimes they seemed to spring magically from nowhere. Some of them ran ahead of the line while many were entirely confused and dashed back through the noisy driving line. The most spectacular part of the drive, however, occurred at the finish when all the deer that had been moving ahead of the driving line broke cover by the dozens and streaked between the counters through the open stretch where the stationary line, was located.

The drive completed, the counts of each participant were collected and totaled. The figure was one hundred sixty. One hundred sixty in six years from an investment of six deer! We who were familiar with the area were astonished. (Editor's note: The author says you should be astonished, too).

The probability that this count was entirely accurate is remote. Several sources of error existed, but from what we could tell the tendency was for one to offset the other. For instance, in certain places a few deer may have slipped back through the driving line unnoticed while in

other places a few may have been counted twice when the line was temporarily disarranged. It is certain that the stationary counters total of ninety-six is an absolute minimum. (It is interesting to note that sixty percent were driven past the counters, while forty percent went back through the driving line). We felt, however, that the count of one hundred sixty was fairly close and accurate enough for all practical purposes.

After we had reflected on the matter for a while and recovered from our surprise, we got out pencil and paper to do some figuring. We were curious to know how closely our results tallied with those obtained from *Breeding Potential Tables. We wished especially to make comparisons of totals and sex and age ratios. We felt also that if there was fairly close agreement between our results and those obtained from computations we would have enough confidence to roughly predict the future trend of the herd and determine what steps should be taken to manage it. We used Breeding Potential Tables found in Aldo Leopold's "Game Management" (1933, table p. 455). We chose the group which bear their first young at two years of age and have two young at a time as being most representative of deer. We thought that our error should be in having the computed totals too high rather than too low (just to be on the safe side.) The table used is as follows:

SPECIES BEARING FIRST YOUNG AT TWO YEARS
NUMBER OF YOUNG PER YEAR 2.0

Year (Jan. 1st)	Total	Young	Yearlings	Adults
1	2	0	0	2
2	4	2	0	2
3	6	2	2	2
4	10	4	2	4
5	16	6	4	6
6	26	10	6	10
7	42	16	10	16
8	68	26	16	26
9	110	42	26	42
10	178	68	42	68
11	288	110	68	110

*(A formal, statistical method of counting chickens before they are hatched).

The reader if he is good at figures will realize that the seventh line is the one that applies to this case because the does were adult and presumably carrying young when they were released. (We have underlined the correct line for ourselves and others equally poor at figures). Since we started with four does it is necessary to multiply each of the figures in line seven by four in order to compare them with the tallies of our drive.

The method of arriving at the computed totals for each age and sex is as follows:

AGE COMPOSITION OF THE HERD

	Total	Young	Yearlings	Adults
Breeding Potential Table 7th yr.	42	16	10	16
Breeding (4 does at start)	168	64	40	64
Herd composition of 160 instead of 168 deer	160	62	38	60

SEX COMPOSITION OF THE HERD

Fawns (all deer under 1½ years)	62
Bucks (half of 40 yearlings and 64 adults)	49
Does (half of 40 yearlings and 64 adults)	49
Total	160

The results of the drive compared with computed totals are as follows:

	Bucks	Does	Fawns	Total
COUNTERS TALLY	26	49	21	96
COMPUTED	30	30	36	96
DRIVERS TALLY	18	33	13	64
COMPUTED	20	20	24	64
TOTAL TALLY	44	82	34	160
COMPUTED	49	49	62	160

In both cases it will be noted that the counted number of bucks and the computed number is close. The fact that fewer bucks were counted than were estimated may be accounted for in three ways: Either a few spike bucks were counted as does or fawns; or the sex ratio inclines towards the females; or a combination of both.

The results obtained *from* the drive may be summarized as follows:

1. A good estimate of the number of deer on the tract: 80 to the square mile.

2. A figure of 96 that is an absolute minimum.

3. A good indication that does and fawns are not easily distinguished at this time of year (December).

4. Experience in conducting a deer drive.

5. Concrete evidence that management practices would have to be put into effect immediately *on this troat!*

It is doubtful if any game manager would have been brave enough to set up management procedures for the herd without evidence nearly as reliable as the drive that has just been recounted to back his judgment. This furnished good evidence that if the herd continued to increase as it had in the past the yearly totals would have been somewhat as follows:

$$1934 \ldots \ldots \ldots 272 \text{ deer}$$
$$1935 \ldots \ldots \ldots 440 \text{ "}$$
$$1936 \ldots \ldots \ldots 712 \text{ "}$$
$$1937 \ldots \ldots \ldots 1152 \text{ "}$$

This would result in almost one deer per acre in 1937. Game experts have been hard pressed to find one unit of game per acre for any kind of game to say nothing of a big game animal like a deer existing in such concentrations. Deer experts would regard one hundred deer to the square mile as ~~very abundant~~ *an extremely heavy population* in wild land areas, whereas on this tract there would be <u>six</u> times that many.

Following the drive ~~The~~ situation on this tract was handled by shooting off the excess *deer* each year. The herd has probably not been kept as low as it should be to prevent all inroads on vegetation, but for the most part the forage remains in good condition and the esthetic features of the tract have not been destroyed by overbrowsing.

of
          No comparison of the carrying capacity/this southern Michigan

fenced tract with equal areas of northern Michigan wild land has been

made or is intended. The difference in snow depth between northern Michigan

with one to three feet or more compared with southern Michigan which usually

has at most a few inches that remains but a short time, makes the feeding

habits of the deer in each place much different. Likewise, the vegetation

in northern and southern Michigan differs considerably in the variety of

plants present.   However, the experience with deer increase on this

controlled tract gives a good indication of why irruptions of deer have

occurred in dozens of localities all over the United States in wild lands

that are especially favorable for them.

10-29-37

The Museum ~~University~~ of Zoology has kindly granted permission for
the use of the data upon which this article is based. It was obtained
on the Edwin S. George Reserve, a wildlife research area owned by the
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author was serving as curator of the tract.