

2014 WHITE-TAILED DEER SPOTLIGHT SURVEY RESULTS AND TREND DATA FOR THE SPIRIT LAKE RESERVATION

CARRIE DUAFALA, BIOLOGIST
SPIRIT LAKE NATION FISH AND WILDLIFE DEPARTMENT

Abstract

The 2014 deer survey was completed during the September and October of 2014, taking place over 5 weeks. Each route was surveyed 5 different times. Surveys started ½ hour after sunset and continued until completed, an average of 2.5 hours. Approximately 20,770 acres of the reservation, or 6% was surveyed during this time. During the survey, 39 male deer were counted, 308 female deer and 90 unknown deer. An estimated population total of 7896 animals were calculated. This estimated population is comprised of 9% male deer, 70% female deer, and 21% unknown sex deer.

Trend data was compiled from previous years of completing the fall spotlight surveys. The purpose for looking at the trend data was to see the trend of the deer population, especially the buck population. Trend data shows the buck populations continuing to decline if no steps are taken for the reversal of this trend.

Spotlight Survey

Spotlight surveys are a reliable method to estimate wildlife populations in small areas. Surveys are completed along established routes in which visibility estimates were completed prior to start of the survey. The established routes traverse the area to be surveyed so that all habitat types are represented and are not set up to only cover areas with higher deer populations. Routes used for the 2014 survey were established in 2006 with a new route established 2013 to take place of a route no longer accessible. These routes average 16 miles in length each and cover wetlands, forests, agricultural fields, and abandoned properties. Routes were randomly chosen without regard to areas known for good hunting/observations.

The Fort Totten route wound through Fort Totten and Crow Hill, the Hamar route went from the river to the lake, and the Eddy County route was south of Woodlake through the Eddy County part of the reservation (Appendix A.). Survey routes were driven a total of five times each during this survey period.

Driving of these routes started shortly after sunset and ended before midnight. The sun set times were taken off the website www.timeanddate.com. These routes were driven about 5 mph throughout the survey and both sides of the vehicle were scanned with a 3 million candle watt spotlight. Driving direction of the route changed every week to prevent time bias of when the deer are coming out to feed in the evenings. The numbers of deer observed during the spotlight survey were recorded, as well as sex and age if this could be determined. Every deer seen was counted. Deer observed are identified through binoculars; if a positive sex cannot be established then the deer is marked as an unknown.

Results

The 2014 survey was completed during the months of September and October. Even though hunting on the Spirit Lake Reservation has started during the survey, hunting pressure is not typically great until later in the season. The fall of 2014 was warm and relatively precipitation free.

The breakdown of deer observed for all routes were: 39 male deer, 308 female deer, and 90 unknown for a total of 437 deer. Also observed were coyotes, badgers, mink, cottontail rabbits, hares, and domestic cats. Calculations were done for a population estimate of 7896 deer.

Deer per acre = Total Area Surveyed / (Total number of deer observed/number of times routes were driven)

Deer per acre = 4154.07 / (437/5)

Deer per acre = 47.53 (This is read: one deer for every 47.53 acres)

Estimated Deer Population = Total # of Reservation Acres/ Deer per acre

Estimated Deer Population = 375,286/47.53

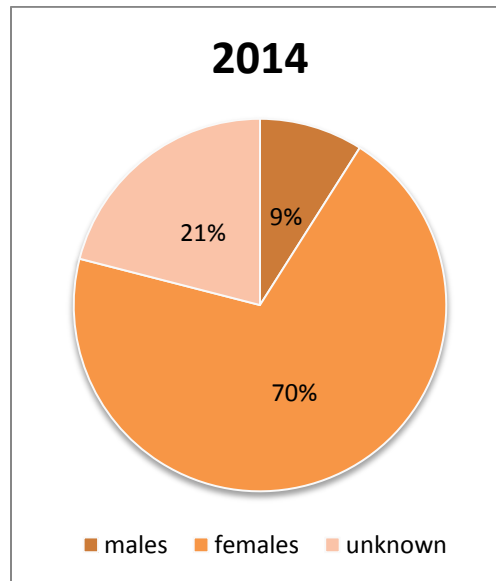
Estimated 2013 Deer Population = 7896

Figure 1. Acres per deer breakdown

	Ft. Totten	Hamar	Eddy Co.	totals	male	female	unknown
Total Number Deer	136	122	179	437	39	308	90
ST DEV of Deer	7.46	14.31	19.34	13.97	1.99	8.41	4.16
Total Area Surveyed	1422.80	1413.19	1318.07	4154.07	4154.07	4154.07	4154.07
Acres per Deer	52.31	46.33	22.09	47.53	532.57	67.44	230.78

Percentages of the sex ratios were also compiled showing that the Spirit Lake Reservation has a much skewed population estimate of 09% male deer (both bucks and spikes) and 70% females (both adult and yearlings). Twenty one (21%) percent of the population observed were unknown or deer that sex could not be determined.

Figure 2. Sex Ratio Percentages



Trend Data

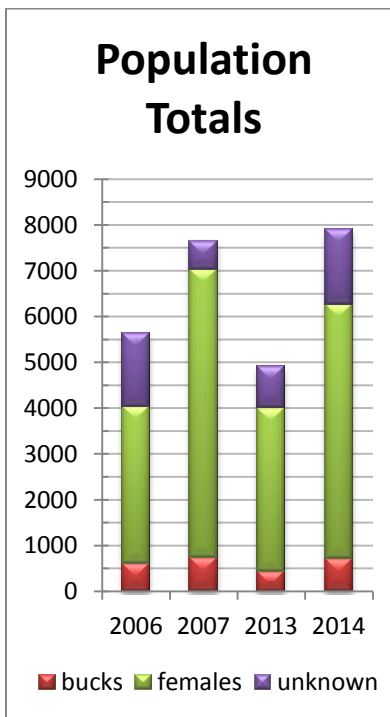
The Spirit Lake Nation Fish and Wildlife Office has four years of Spotlight Survey Data; 2006, 2007, 2013 and 2014. A survey was attempted in 2008, but was not completed in the same manor.

Data from 2006 shows a population estimate of 5533 deer on the reservation with the breakdown ratios as follows: 11% male deer, 61% female deer, and 28% unknown. The 2007 data shows a population estimate of 7648 deer on the reservation and the breakdown is as follows: 10% male deer, 82% female deer, and 8% unknown. The 2013 data shows a decline in population numbers over all, but the sex ratios are similar; 9% male deer, 72% female deer, and 18% unknown (Fig 3 and Fig 4).

Figure 3. Population totals and sex ratios for 2006, 2007, 2013, and 2014

Population Totals		males	%	females	%	unknown	%
2006	5533	614	11%	3433	61%	1591	28%
2007	7648	737	10%	6289	82%	623	8%
2013	4915	452	9%	3560	72%	903	18%
2014	7896	705	9%	5565	70%	1626	21%

Figure 4. Population totals with estimated sex ratio breakdown



Data was compared from just the two sites that remained the same for the four years, Fort Totten and Hamar (Fig 5.). We find that there is a significant difference ($p > 0.05$) between the deer per acre in both the Fort Totten and the Hamar sites for each year the survey was run.

Figure 5. Deer per Acre between the Fort Totten and Hamar Study Sites

	2006		2007		2008		2013		2014	
	Fort Totten	Hamar	Fort Totten	Hamar	Fort Totten	Hamar	Ft. Totten	Hamar	Fort Totten	Hamar
Total Number Deer	78	43	189	74	96	56	40	102	136	122
St. Dev of Deer	6.27	7.27	21.46	5.26	19.80	16.97	7.21	8.17	7.46	14.31
Acres Observed	1155.63	960.39	1751.60	1621.80	1751.60	1621.80	1422.80	1413.19	1422.80	1413.19
Acres/deer	0.34	0.22	0.54	0.23	0.27	0.17	177.85	69.27	52.31	46.33
deer/acre	2.96	4.47	1.85	4.38	3.65	5.79	0.01	0.01	0.02	0.02
male deer	4	5	17	10	16	2	10	4	11	7
female deer	52	23	150	57	35	50	20	86	99	80
Unknown	22	15	22	7	19	30	11	12	30	35
%	5%	12%	9%	14%	17%	4%	25%	4%	8%	6%

Graphing out the percent of male deer found in the population and introducing a trend line shows that the male population, at this time, is decreasing (Fig 6.). This suggests that the male deer are being heavily hunted on the reservation. By running a parametric T-test on just the male numbers observed on the two overlapping sites for each of the four years, a significant difference was found ($p > 0.05$) between the buck populations observed at each site, with more bucks observed at the Fort Totten site (Fig 7.).

Figure 6. Male Deer Percentages for All Routes 2006, 2007, 2013, and 2014 with Trend Line extending two years

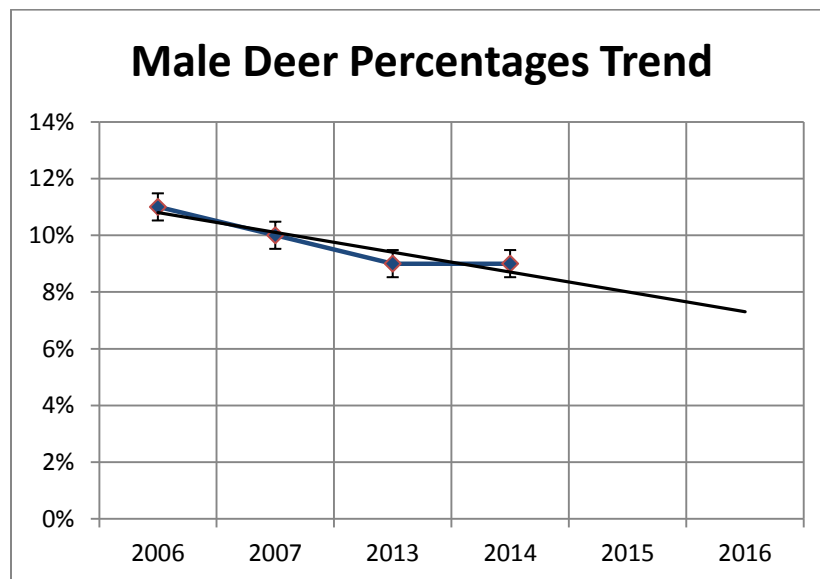


Figure 7. Number of Males Observed at the Fort Totten and Hamar Sites

	FT	H
2006	4	5
2007	17	10
2013	10	4
2014	11	7

Parametric T test, 1 tailed

0.055081

Ho: there is no difference in the number of bucks observed between the Fort Totten and Hamar survey sites.

N=4, df=3, 95% Conf. Level

Reject $p > 0.05$

What the numbers mean

There are two options to consider when examining the data. One option being that having low male deer numbers simply means that the death rate far exceeds the birth rate of the male deer on the reservation. The second option would be that the birth rate and the death rate are remaining consistent without growth. Either way it is examined, the male deer population is not growing.

The birth rate to death rate ratio is not known for the Spirit Lake Reservation at this time, so empirical data is nonexistent. More surveys in these areas are needed. Death rates can be found out through hunter surveys. These surveys are collected every year through the Spirit Lake Nation Fish and Wildlife Office, yet few residents of the reservation participate with the survey.

What can be done

Healthy populations of white-tailed deer should be close to a 1:1 ratio, which is 50% male to 50% female, although there is room for some variation. However, if a population is kept at a highly skewed population sex ratio, the health of the entire herd diminishes. Simple solutions for restoring the population sex ratio on the Spirit Lake Reservation is to limit or close buck season entirely for at least two years, with limiting buck season and/or antler restrictions for up to 10 years after. This practice will allow the buck population to rebound with more adult bucks being observed. Surveys should be completed yearly until the population sex ratios reach a more balanced ratio. With the closure/limit of buck season, more does should be taken out of the population. There are more options in dealing with the skewed sex ratios on the Reservation but all options deal with limiting hunting of bucks on the Spirit Lake Reservation.

A second option would be limiting the number of bucks harvested per hunter on the reservation to one for a few years. Again a Spotlight Survey would be completed every fall to determine if the trend is reversing.

A third option would be to use the antler restriction principle, or set limits based on the number of tines a deer possesses on one side of the rack. The method has worked in many states across the United States, but it is uncertain how effective this method would be on the Spirit Lake Reservation.

A fourth option would be to allow buck hunting by lottery only. A set number of buck tags would be offered each year and given out by a lottery system only. This could be for Tribal members only, Reservation residents only, or for everyone.

A fifth option would be to charge a fee for getting a buck tag to everyone on the reservation, regardless of enrollment. This system would be similar to the Standing Rock Reservation practices.

For any the methods to work, full cooperation from all parties (hunters, Tribal members, Tribal enforcement personnel, and state officials) must take place. To obtain full data for all parameters, more participation must be present from Tribal members and Reservation residents in completing harvest surveys, more spotlight surveys need done, and a birth rate study needs to be completed on the Reservation.

Appendix A. Spotlight Survey Routes

