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Analysis of Deer Spotlighting Data in Morristown NHP

Purpose of Program

Deer spotlighting program began in Morristown National Historical Park in the winter of 1984, the purpose of which was to provide an indication of the number deer within the park. Since then, deer spotlighting has been conducted about 4 times a year in 2 week intervals. The data collected provides a valuable record into the number of deer present in the park.

To implement spotlighting, a set route is driven on the park's tour road. Data is collected on any deer spotted. Data collected includes location, sex (male or female - adult only), cover (open or wooded), activity (active or bedded), time spotted, and age (adult or fawn). The information then stored in MS Excel for storage and analysis.

Population Trends in the Data

Population fluctuations seen in the spotlighting data can be due to a multitude of reasons. There are a few though which likely accounts for the patterns seen in the spotlighting data here a Morristown NHP.

I. Habitat Condition

The habitat in Morristown National Historical Park has become increasingly marginal over the years. Higher numbers of deer have in many cases overbrowsed native plants in the park. This left an opening that prolific exotic species such as Japanese Barberry (*Berberis thunbergii*), Japanese Wire Grass (*Microstegium vimineum*) have filled.

As exotics take over the understory, native species continue to dwindle. Deer are unable to browse on these exotics because of the plants defenses. Japanese Barberry gets its common name from the thorny spines present on its branches. With the exception of young shoots, deer are unable to browse on this shrub. Japanese Wire Grass has a chemical in it that is unpalatable to deer. Without herbivory to keep these species in check, both have progressed to the point where they are the only understory in many areas.

It is these marginal conditions which likely contribute to the population drops seen in 1988 and 1992 to 1994. During these years, J. Barberry and J. Wire Grass continued to spread though the park. It is possible that in time, populations in the area dropped enough to leave room for another rise. This could partially account for the rises seen in 1986, 1990 and 1995.

II. Increases and Decreases in Fawning

(Note: Fawn numbers were not collected before 1990).

Habitat conditions contribute greatly to the number of fawns born year after year. When population levels drop, competition for resources is reduced, bringing about better conditions. A corollary to this is that conditions become better for breeding. Deer take advantage of this in two ways. Normally, does will give birth to twins. Incidents of twins decreases as habitat becomes more marginal. It is likely that the previous reduction of population freed up resources, so does were able to resume normal reproduction patterns. Female fawns can also breed at 6 months of age instead of the normal 1 ½ years of age provided that habitat conditions are exceptionally good (Hall, 1984). Prior to each population increase, an increase in the amount of fawns counted can be observed the

previous year. The natural reduction of deer numbers may have left enough resources to permit increased fawning. The result, more deer.

The reverse is true for decreases in fawning levels. As habitat becomes more marginal, does give birth to fewer fawns. Instead of giving birth to twins, does may only give birth to a single fawn or, in extreme cases, none at all. As a result, pressure on the herd is reduced. Individually, the doe will not require as much food during the winter season. Population-wise, there are less deer competing for limited resources during the next season. With less young deer to replace older deer, the herd size drops due to attrition.

This trend is also seen in the deer spotlighting data. In 1991, there was a drop in the number of fawns seen. The next year, the overall population began to dip. Even fewer fawns were counted in 1992. The drop in the number of fawns continued until 1994. In this year, a slight increase can be seen. The following year brought about a dramatic increase in the number of deer counted. Subsequently, fawn levels rose again. The only time this pattern does not stay in effect is when the Lewis Morris deer cull began at the end of 1996.

III. Lewis Morris Deer Cull

Since the winter of 1996, the Morris County Parks commission annual deer cull in Lewis Morris County Park as a method to control the high deer population. An immediate effect on the number of deer counted can be seen shortly afterward. For instance, despite the higher number of fawns counted in 1996, there was no increase in the number of deer counted in 1997. Instead, a sharp decrease was observed. This coincides with the first year the cull was conducted. Successive hunts have not been able to cull as many deer

from the Lewis Morris herd. Only 13 deer were removed during the 1998 hunt. Thus it is likely that it won't impact the number of deer counted in 1999.

Deer Demographics

Most of the deer counted have been marked unknown. This is because the ability to tell sex and age is limited in spotlighting. It is usually only possible to tell the difference between male, female and fawn during specific times of the year.

One reason is that male deer can only be distinguished by the presence of antlers. Males lose their antlers between late December to early January, with annual growth beginning again in mid-March to April (Halls, 1984). When males have no antlers, any deer seen must be marked as unknown. It can still be difficult to distinguish males from females. Between the small antler size and the dark of night, it can be difficult to distinguish male from female during the spring and summer months. This is a primary reason why most of the deer observed are marked as unknown. As the year progresses, visual assessment of sex becomes possible.

When demographics can be determined, female deer dominate. This pattern can be accounted to deer behavior. The low number of males is due to their movement patterns. Males tend not to occupy the same areas as females, forming their own "bachelor" groups elsewhere (Halls, 1984). Jockey Hollow is primarily an area occupied by females and their fawns. When male deer are spotted, it is often during the breeding season.

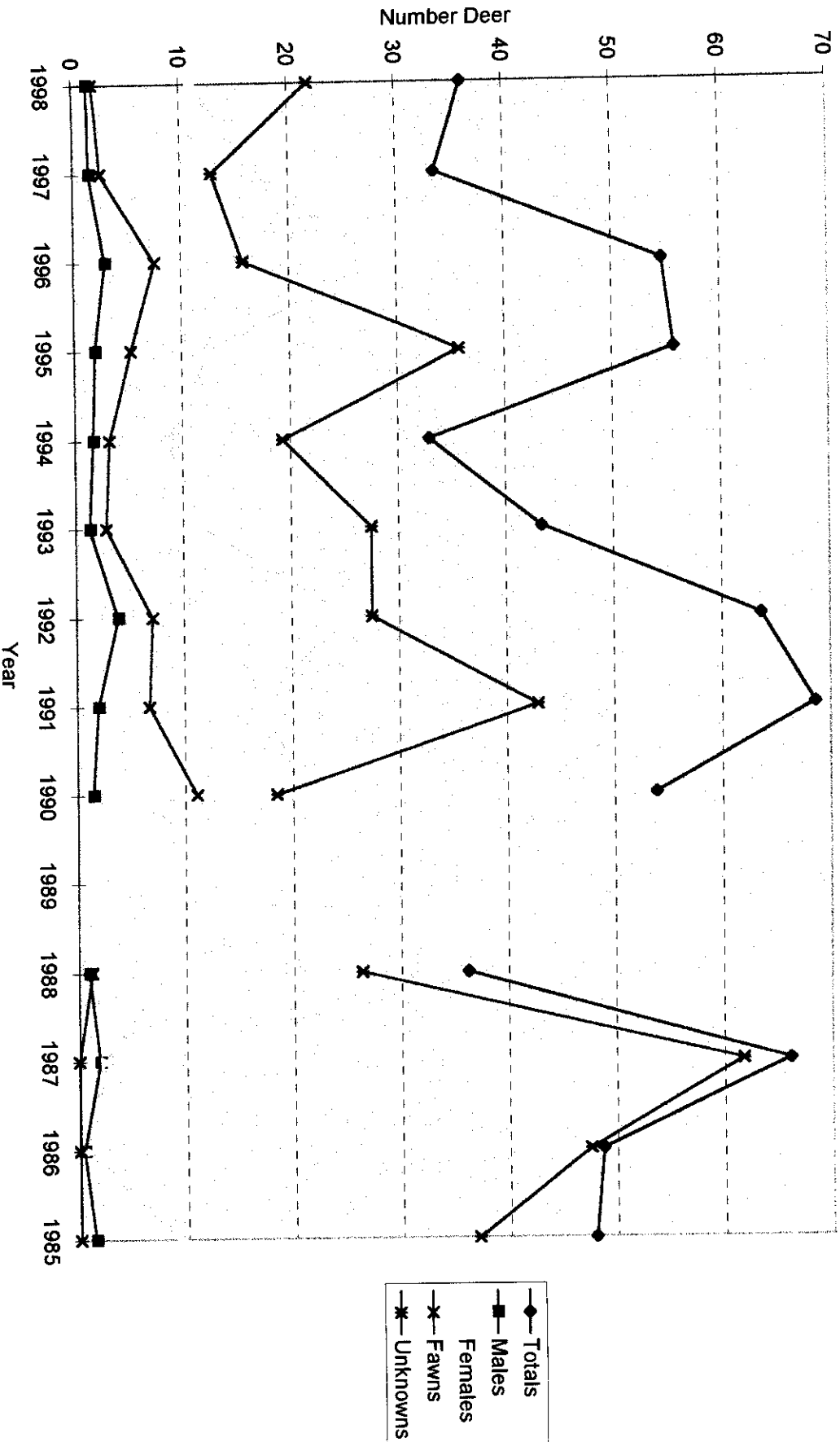
Conclusion

Deer spotlighting is a valuable tool in resource management. It provides a simple method of tracking an approximate size and make-up of a deer herd. In Morristown NHP, spotlighting has shown how large the herd size has risen to at times. During the early days of spotlighting, counting 100 or more deer was a common occurrence. High numbers were still counted well into the 1990's. Recently though, the count has started to decline. As of late, it is rare to count over 60. This shows that deer numbers are likely dropping, possibly due in part to the Lewis Morris hunt. But, this is by no means an accurate count of deer in the park. Only a small area along the tour road is sampled. Instead, it provides an approximate look into number of deer in the park.

Reference Cited:

Halls, Lowell K. (editor). 1984. White-Tailed Deer: Ecology and Management. A Wildlife Management Institute Book. Harrisburg, PA: Stackpole Books. 870pp.

Deer Spotlighting Averages Jockey Hollow and New Jersey Brigade



Deer Spotlighting Averages (Jockey Hollow and New Jersey Brigade)

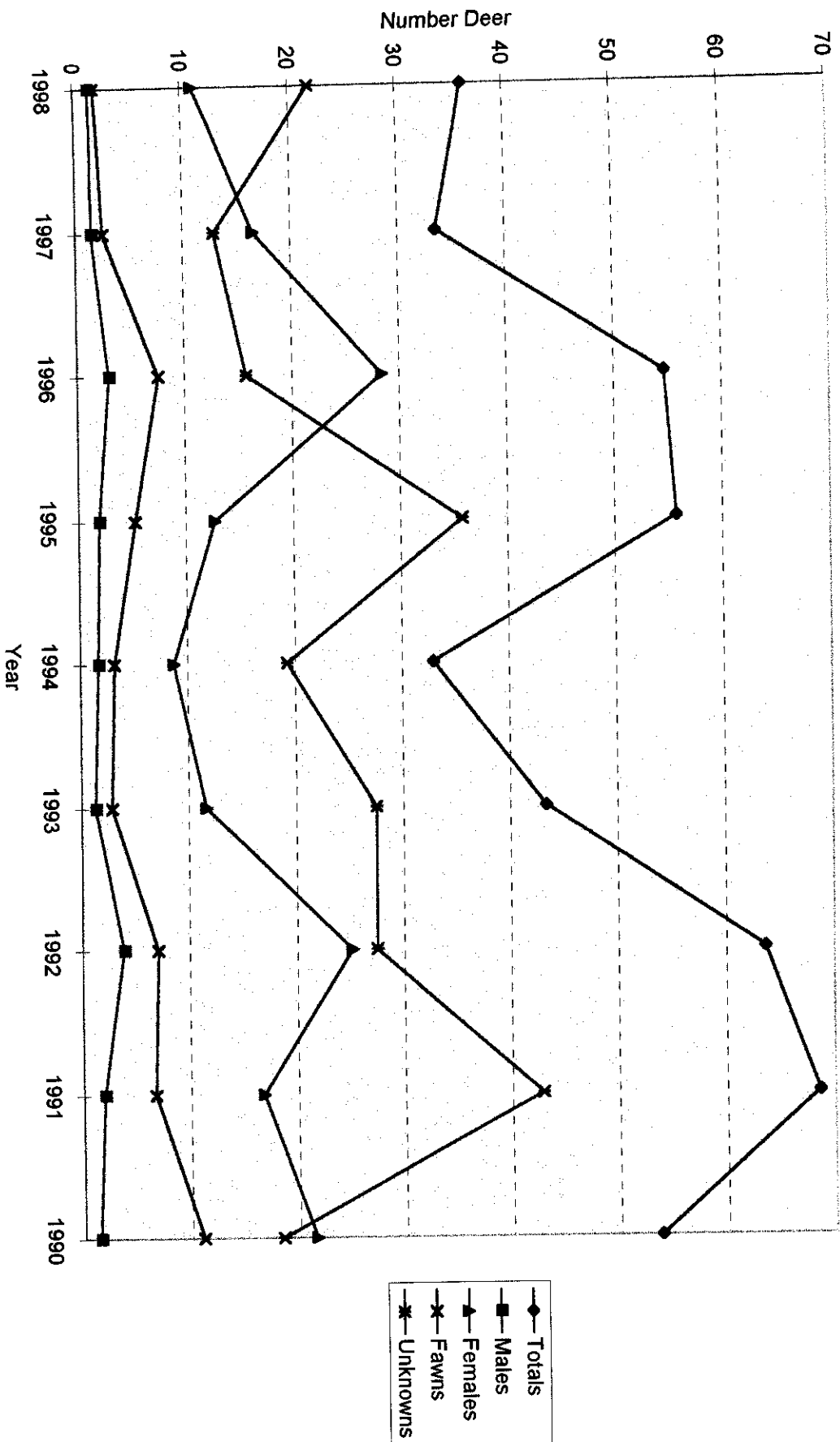


Figure 1

Deer Spotlighting Averages (Jockey Hollow Only)

