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Resource Management & Research Report Indiana State Parks

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Title: 2016 State Park Deer Reduction Results

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Abstract: The year 2016 marked the twenty-third anniversary of deer reductions in Indiana State Parks. The first reduction hunt was held in 1993 as an effort to mitigate damage to vegetation and unique habitat by an overpopulation of white-tailed deer (*Odocoileus virginianus*) in Brown County State Park. Multiple parks have hosted deer reduction hunts annually since 1995 and have included up to 21 parks and 1 natural area per year. The decision to initiate reductions at individual parks has been based on scientific vegetation monitoring. Decisions to continue reductions at individual parks are made annually using harvest data and consideration to occurrences of or rare, threatened, and endangered flora that could be affected by excessive browsing by deer. In 2016, 4,809 hunter efforts were used to assist 17 parks and 1 natural area. The result was a harvest of 1,219 deer. Daily standby drawings were held at 3 parks. Such drawings are conducted from time-to-time to reduce the impact of originally drawn hunters not showing up or not returning on the second day of each hunt. The 2016 harvest yielded a mean harvest per effort of 0.27 which is higher than the program target of 0.22-0.20.

Introduction

White-tailed deer (*Odocoileus virginianus*) have thrived in Indiana State Parks since they were reintroduced to Indiana in the middle 20th century. Mild winters, absence of once present natural predators, and a decades-long lack of human hunting within protected state park boundaries resulted in excessive browsing by deer that compromised the overall composition, structure, and function of most natural communities throughout the state park system. Browse lines and small, malnourished deer were a common sight at most state park properties by the late 1980's.

The first deer reduction hunt was held in 1993, with 466 hunters harvesting 392 deer. Since 1995, as many as 21 parks, 22 if including Cave River Valley Natural Area (CRV), have held reduction hunts in the same year (Table 1.). The decision to initiate reductions at any one park has been supported by data from monitoring particular herbaceous species at individual parks. Once parks begin reduction, harvest data are incorporated into annual decisions regarding habitat recovery and whether specific parks require a reduction the following year. Research indicates that vegetation and habitat begin to recover from overbrowsing at a property once a rate of firearm harvest per effort (H/E) lowers to 0.22-0.20 and/or a harvest per square mile (H/Mi².) is between 12 & 16 deer. Hunters are drawn for each park to fit a density of one hunter per 15-20 acres. Parks where archery is regularly used (Clifty Falls and Fort Harrison) due to urban interface, have an H/E target of 0.10-0.08 and one hunter per 7-10 acres. Participants have been

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allowed to take up to three deer each (up one of which could be antlered). These deer are in addition to regular statewide bag limits.

Table 1. Number of State Parks and Deer Harvest 1993-2016		
Year	Number of Parks	Total Deer
1993	1	392
1994	0	0
1995	5	1,422
1996	7	2,027
1997	9	2,430
1998	10	1,735
1999	10	1,599
2000	15	1,697
2001	13	1,483
2002	14	1,609
2003	20	2,121
2004	15	1,253
2005	16	1,336
2006	17	2,213
2007	18	1,300
2008	17	1,468
2009	17	1,334
2010	16	1,689
2011	22	1,546
2012	14	1,292
2013	22	1,763
2014	19	1,004
2015	14	806
2016	18	1,219
Total Deer:		34,738

2016 Summary

Eighteen state parks (including 1 natural area) required deer reduction in 2016. The first two-day hunt was held November 14 & 15 and the second was held November 28 & 29. A total of 1,219 deer were harvested with 4,809 hunter efforts across two, 2-day reductions. The mean 2016 H/E was 0.27, which is a fairly large increase over the 2015 H/E of 0.24.

November 13 and 14 saw cool, clear weather, but were unseasonably warm in most areas. November 27 was a rainy day for most properties, hampering harvest efforts. November 28 was drier but was again warmer than average.

The overall mean no-show rate was 44%. This is slightly lower than the current 5 year mean no-show rate of 46%. This percentage represents the number of total hunters who participated each day of the hunt compared to the total number of hunters who were drawn for each hunt.

The data for H/E continue to indicate relative stability from 2007 to 2016, compared to the gradual decline from prior years. There were slight increases in 2010 and 2012, but the generally stable trend holds true. The 2016 mean H/E of 0.27 represents a slight increase from 2015, but is not outside the range of variation of the last 10 years (Figure 1). This held the 5 year mean H/E steady at 0.27, or 0.07 above the target. Five firearms properties fell at or below the target H/E threshold after the 2015 reduction and will not require reductions in 2016. Both archery parks, however, remain far above target harvest rates. These parks will likely continue to require annual reductions for some time.

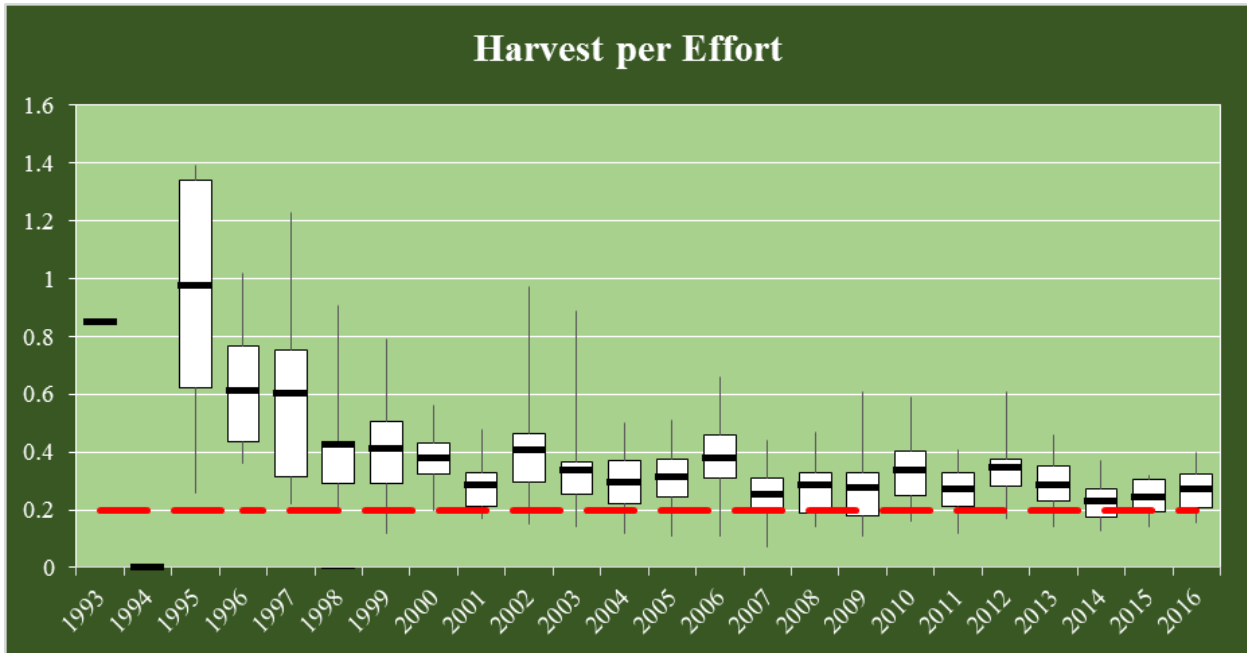


Figure 1. 1993-2016 Harvest per Effort. The center black bar indicates the mean H/E for each year. The white box indicates the first and third quartile. The whiskers (vertical black lines) represent the minimum and maximum H/E for each year. The red dashed line highlights the target of 0.20 H/E for firearms properties. Only one property was hunted in 1993 and no properties were hunted in 1994.

The trend for $H/Mi.^2$ is very similar to that of H/E. The data for $H/Mi.^2$ also supports relative stability from 2007 to 2016. The 2016 mean $H/Mi.^2$ did increase from 16.1 in 2015 to 20.1 this year (Figure 2). This was likely due to higher than normal harvest rates at several properties, which themselves may be attributed to exceptional weather for the first hunt day. The 5 year mean $H/Mi.^2$ stands at 19.8, slightly below the target for the second consecutive year. Eight firearms properties fell at or below the target $H/Mi.^2$ threshold after the 2016 reduction. As with H/E, both archery parks remain far above target harvest rates.

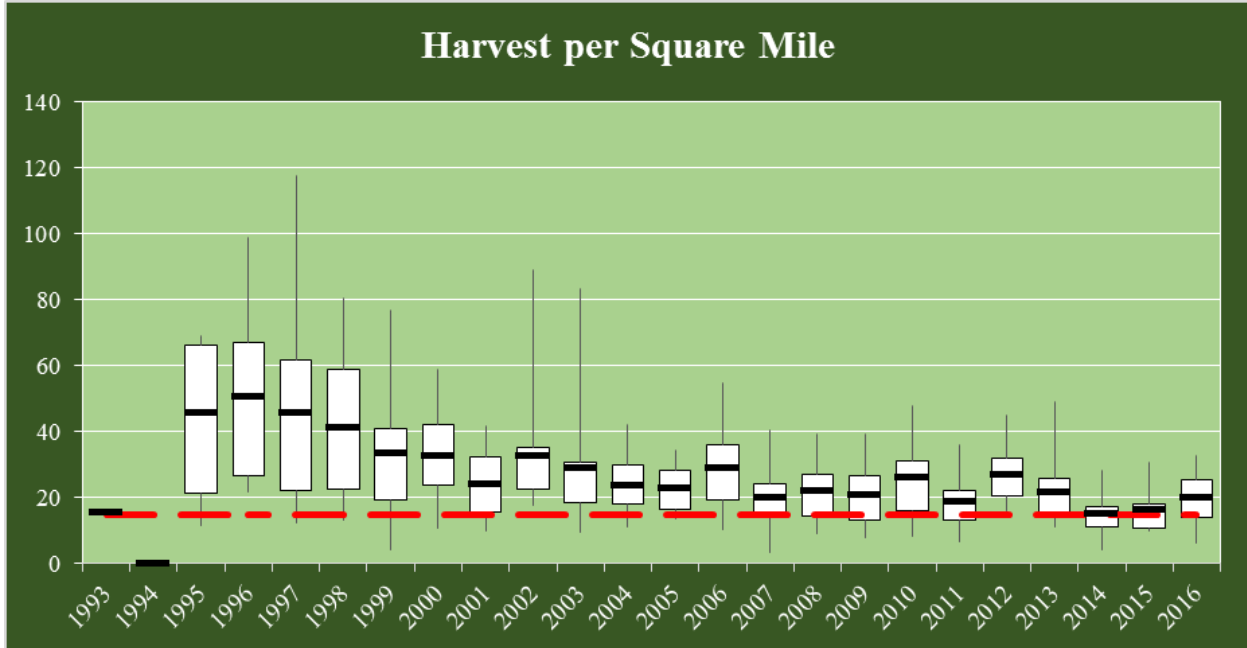


Figure 2. 1993-2016 Harvest per Square Mile. The center black bar indicates the mean H/Mi.² for each year. The white box indicates the first and third quartile. The whiskers (vertical black lines) represent the minimum and maximum H/Mi.² for each year. The red dashed line highlights the target of 15 H/Mi.² level for firearms properties. Only one property was hunted in 1993 and no properties were hunted in 1994.

Adult Buck Harvest

The mean adult buck harvest has increased steadily since the reduction program began. The current 5 year mean adult buck harvest is 35%. A decade ago (2006) the 5 year mean was 30%. The 2016 mean adult buck harvest is 35%, which is less than the 2015 mean adult buck harvest of 41%. In 2016, 5 parks, or 33% of the properties, harvested more than 40% adult bucks (Figure 3). This is down from 57% in 2015. The current 5 year mean for the percentage of parks exceeding a 40% adult buck harvest is 38%. This is much higher than the 5 year mean from a decade ago (2006) of 12%.

Overall, 2016 showed improvement in the adult buck percentage, but the long term trend still points towards an increase in selective harvesting of adult bucks. At a few properties, the adult buck harvest consistently exceeds 40% of the total harvest. Such parks may need to switch into a disincentive model for hunters to help ensure that over-selective hunting is not occurring. Examples include “earn a buck” and antler removal by park staff at check stations. One must first harvest an antlerless deer before harvesting an antlered deer within the “earn a buck” model.

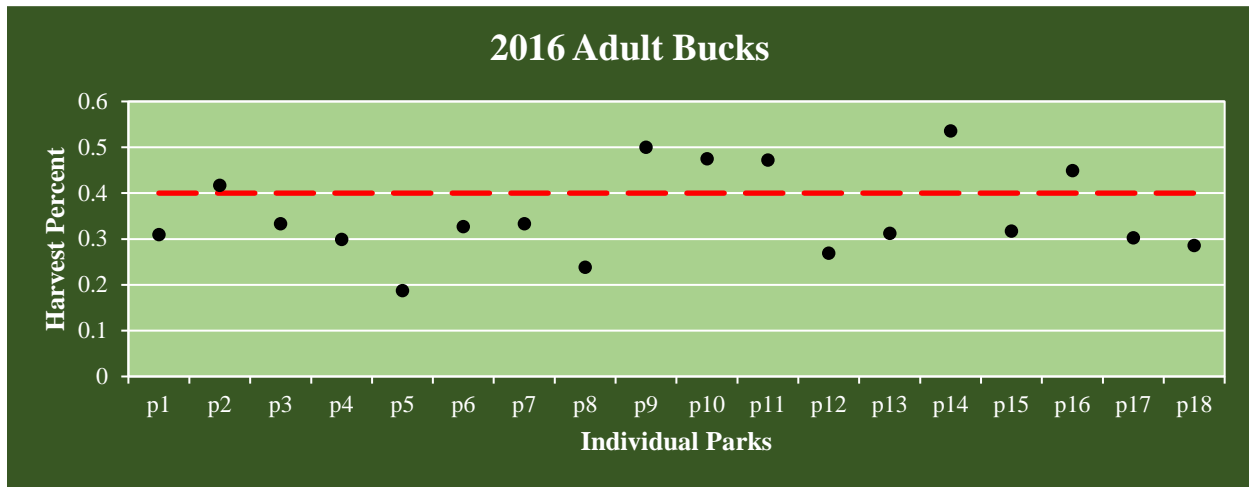


Figure 3. 2016 Adult Buck Harvest Percentage. Each label (p1-p18) represents 1 of the 18 properties hunted in 2016. Names are not given as to avoid encouraging selective harvest on these properties.

Standby Drawing

Standby drawings are sometimes held at parks in an attempt to fill spots left vacant by originally drawn hunters. The objective is to increase hunting pressure on deer. Participating properties are selected based on several factors, but they are generally experiencing no-show rates greater than 50% in recent years. These parks are also laid out in such a way that facilitates an ample staging area for the drawing while providing staff ability to monitor and control potential standby hunters' entry into the park.

Participants in the standby drawing are chosen daily onsite and have to meet the same criteria as those originally drawn (Indiana residents or in possession of a lifetime license for harvesting deer, 18 years of age by the date of the first hunt, and possession of a valid license to hunt deer in Indiana). Given the timing of the hunts and the elevated success rates, parks generally expect no-show rates between 25-30%. The average no-show rate for the first day of each hunt in 2016 was 34%. The overall average no-show rate was 44%. This is slightly lower than the current 5 year average no-show rate of 46%.

Standby drawings were held at 3 properties in 2016, primarily in parks with historically high no-show rates. At 1 of the 3 properties, standby hunters significantly increased the overall harvest. At the remaining 2 properties, the effects remain to be seen. The success of standby drawings continues to be monitored and explored throughout the park system.

Summary

Though cumulative harvest rates seem to have stalled slightly higher than desirable in recent years, statistics continue to illustrate overall success for the deer reduction program. The program has performed well at coming closer to target harvest levels in the previous few years, although 2016 showed a slight uptick in harvest. This was likely due to excellent weather the first day of the reduction.

Though some parks are more successful than others at achieving a maintenance phase of taking a year off every few years, the data have and continue to indicate habitat recovery as well as sustained deer populations. It should be reiterated that park reductions are not intended to manage populations for optimal recreational hunting. The goal is simply to reduce the impact of browsing to a level that allows some of Indiana’s rarest and most unique habitat to thrive and benefit multiple species.

As noted in previous reports, browse lines and emaciated deer are no longer a problem in state parks. The extreme overabundance issues of the 1990s have been corrected. However, less obvious damage persists throughout the parks as a legacy of decades of chronic deer herbivory. In some areas, unpalatable plant species such as pawpaw (*Asimina triloba*) and spicebush (*Lindera benzoin*) are overrepresented in the understory. In addition to competing with other fauna for limited resources within park boundaries, deer continue to impact rare, threatened, and endangered flora as well as valuable habitat such as oak forests. Other impacts included compromised understory structure for ground and shrub nesting songbirds. The 2016 effort was once again a success in helping reduce and maintain browse effects. Cumulative 2016 harvest numbers are consistent with recent positive trends (Table 2). At the individual park level, certain locations experienced relatively high harvests, while others were low enough to warrant removal from the 2017 reductions.

Although there has been some concern voiced about the potential of overharvesting, it is clear that deer populations are still being sustained within parks. Harvest rates at parks consistently remain very well above harvest rates on public properties open to deer hunting, such as reservoirs. Deer hunting continues to be a viable recreational pursuit year in and year out in such public hunting areas. A random sampling of harvest data from state reservoir properties on the first and second weekend of regular deer firearms season revealed an average H/E of 0.05. Park properties generally take a year off once the H/E is equal or below 0.20-0.22.

Table 2. 2016 Parks Requiring Reduction and Resulting Harvest	
Property	Harvest
Brown County	156
Cave River Valley	16
Chain O' Lakes	117
Charlestown	127
Clifty Falls	42
Fort Harrison	49
Indiana Dunes	36
McCormick's Creek	48
Ouabache	42
Pokagon	52
Prophetstown	20
Shakamak	41
Spring Mill	52
Summit Lake	39
Tippecanoe River	105
Turkey Run	40
Versailles	161
Whitewater Memorial	76
Total	1,219

This resource management and research report is issued to provide a quick source of information on issues related to wildlife or natural areas management in Indiana State Parks. Any information provided is subject to further analysis, and therefore is not for publication without permission.

2016 State Park Deer Reduction Results

It should be noted that harvest numbers alone have limited value in determining the success of a reduction hunt. Many factors such as park acreage, weather, rate of participation, and other local variables can influence an individual park's harvest from year to year. For this reason, H/E is the primary indicator of success rather than harvest numbers alone.

Parks requiring reductions in 2017 will be listed and made available along with online applications for 2017 reserved hunts in July at <http://www.in.gov/dnr/fishwild/5834.htm> along with other IDNR reserved hunts.