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Resource Management & Research Report Indiana State Parks

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Title: 2020 State Park Deer Management Hunt Results

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Abstract: The year 2020 marked the 27th anniversary of deer management hunts in Indiana State Parks. The first management 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 management hunts annually since 1995 and have included up to 21 parks and one natural area. The decision to start management hunts at individual parks has been based on scientific vegetation monitoring. Decisions to continue management hunts at individual parks are made annually using harvest data and consideration of occurrences of rare, threatened, and endangered flora that could be affected by excessive browsing by deer. In 2020, 5,043 hunter efforts were used to assist 16 parks and one recreation area. The result was a harvest of 1,243 deer. Daily standby drawings were held at two 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 2020 harvest yielded a mean harvest per effort of 0.25, which is slightly above 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 1980s.

The first deer management 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 management hunts in the same year (Table 1.). The decision to start management hunts at any one park has been supported by data from monitoring particular herbaceous species at individual parks. Once parks begin management hunts, harvest data are incorporated into annual decisions regarding habitat recovery and whether specific parks require a management hunt the next 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 harvest per square mile (H/Mi²) is between 12 and 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 (Fort Harrison and Trine SRA) due to urban interface or size, have a H/E target of 0.10-0.08 and one hunter per 7-10 acres.

2020 State Park Deer Management Hunt Results

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

| Table 1. Number of State Park and Deer Harvest 1993-2020 | | |
|--|-----------------|---------------|
| 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 |
| 2017 | 18 | 1,158 |
| 2018 | 19 | 1,302 |
| 2019 | 17 | 775 |
| 2020 | 17 | 1,243 |
| Total Deer: | | 39,216 |

2020 Summary

Seventeen state parks (including one recreation area) required deer management hunts in 2020. The first two-day hunt was held Nov. 16 and 17 and the second was held Nov. 30 and Dec. 1. A total of 1,243 deer were harvested with 5,043 hunter efforts across two, two-day hunts. The mean 2020 H/E was 0.25, which is an increase above the 2019 H/E of 0.22. In 2020, Trine State Recreation Area (SRA) hosted its third hunt. Archery equipment was required, and 21 hunter efforts yielded two deer harvested, for a H/E of 0.10 and a H/Mi² of 6.9.

Nov. 16 and 17 saw cool, sunny weather in the 40s throughout the state, with temperatures rising into the 50s or above in southern Indiana. Nov. 30 was colder, with temperatures in the 20s and 30s and intermittent snow and rain. Winds were heavy in most areas. Dec. 1 was also cold, but winds were generally lighter and there was little to no precipitation.

The mean no-show rate was 47%. This is slightly higher than the current five-year mean no-show rate of 46%. This percentage represents the number of total hunters who participated in the hunt compared to the total number of hunters who were drawn to hunt.

The data for H/E continue to indicate relative stability from 2007 to 2020, compared to the gradual decline from prior years. There were slight increases in 2010 and 2012, but the generally stable trend holds true. The 2020 mean H/E of 0.25 represents an increase from 2019, but is not far outside the range of variation of the last 10 years (Figure 1). The five-year mean H/E remained at 0.26, or 0.06 above the target. Six firearms properties fell at or below the target H/E threshold after the 2020 hunts and will likely not require hunts in 2021. One archery property fell at or below the target H/E threshold, but the other is above target harvest rates. These parks

will likely continue to require annual hunts for some time.

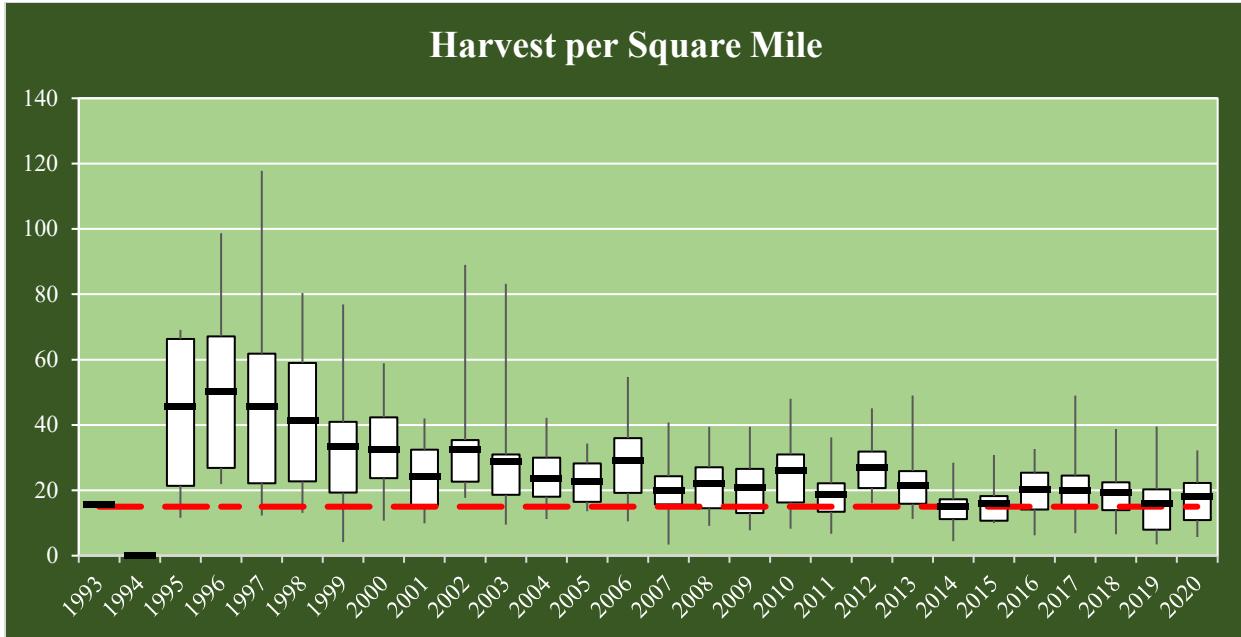


Figure 1. 1993-2020 Harvest per Effort. The center black bar indicates the mean H/E for each year. The white box indicates the first and third quartile. The whiskers (vertical black lines) represent the minimum and maximum H/E for each year. The red dashed line highlights the target of 0.20 H/E for firearms properties. Only one property was hunted in 1993, and no properties were hunted in 1994.

The trend for H/Mi.² is similar to that of H/E. The data for H/Mi.² also support relative stability from 2007 to 2020. The 2020 mean H/Mi.² did increase from 15.9 in 2019 to 18.1 this year (Figure 2). The five-year mean H/Mi.² increased to 18.7, slightly below the target for the third consecutive year. Seven firearms properties fell at or below the target H/Mi.² threshold after the 2019 hunts. As with H/E, one archery property remains above target harvest rates.

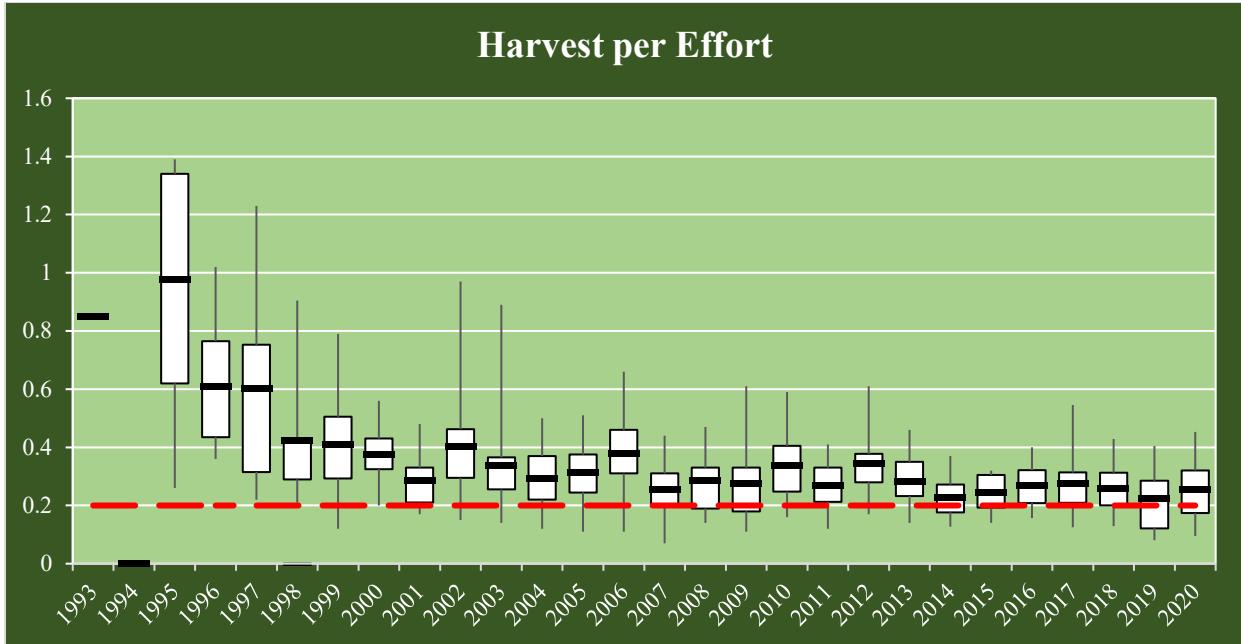


Figure 2. 1993-2020 Harvest per Square Mile. The center black bar indicates the mean H/Mi.² for each year. The white box indicates the first and third quartile. The whiskers (vertical black lines) represent the minimum and maximum H/Mi.² for each year. The red dashed line highlights the target of 15 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 management hunt program began. The current five-year mean adult buck harvest is 36%. A decade ago (2010) the five-year mean was 32%. The 2020 mean adult buck harvest is 35%, which is just below the 2019 mean adult buck harvest of 37%. In 2020, seven parks, or 41% of the properties, harvested more than 40% adult bucks (Figure 3). The current five-year mean for the percentage of parks exceeding a 40% adult buck harvest is 36%. This is much higher than the five-year mean from a decade ago (2010) of 18%.

Overall, 2020 showed consistency with the last few years in the adult buck percentage, but the long-term trend still points toward 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.

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, on-site, and have to meet the same criteria as those originally drawn (Indiana residents or those 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 2020 was 34%. The overall average no-show rate was 47%. This is slightly higher than the current five-year average no-show rate of 46%.

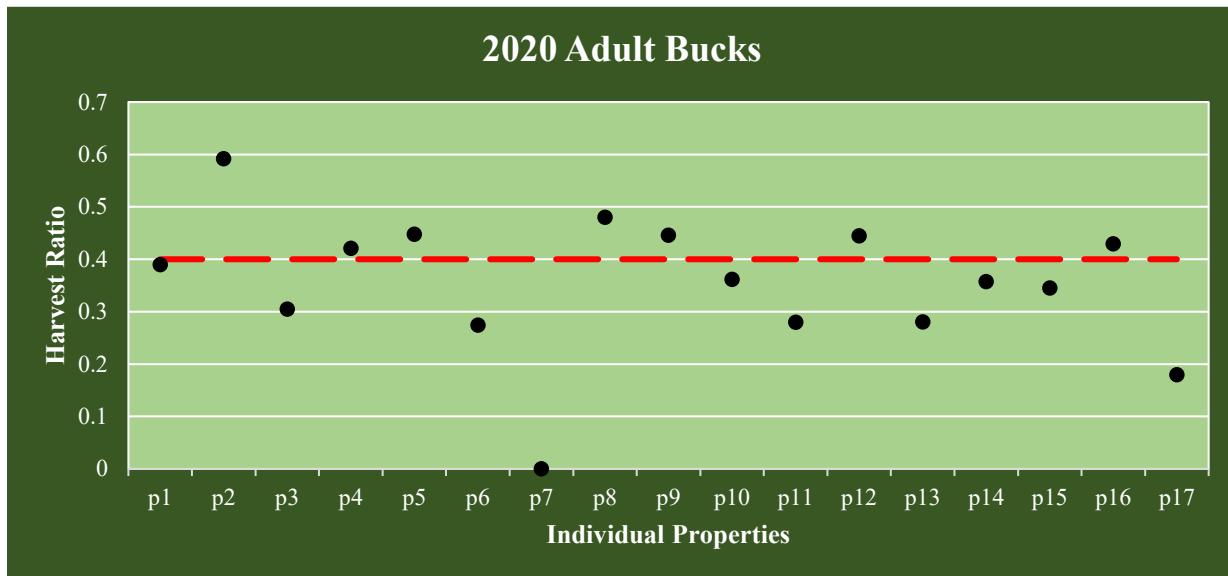


Figure 3. 2020 Adult Buck Harvest Percentage. Each label (p1-p17) represents one of the 17 properties hunted in 2020. Names are not given as to avoid encouraging selective harvest on these properties. The lowest and highest rates were at properties with very low harvest levels.

Standby drawings were held at two properties in 2020, in parks with historically high no-show rates. Standby hunters at these parks continue to contribute significantly to the harvest total. The success of standby drawings continues to be monitored and explored throughout the park system.

Summary

Though there is year to year variation in harvest per effort, statistics continue to illustrate overall success for the deer management program. The program has performed well at coming closer to target harvest levels in the previous few years with 2020 showing overall average harvest metrics.

Though some parks are more successful than others at achieving a maintenance phase of taking a year off from management hunts every few years, the data have and continue to indicate habitat recovery as well as sustained deer populations. It should be reiterated that park management hunts 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 distinctive 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 affect rare, threatened and endangered flora as well as valuable habitat such as oak forests. Other impacts include compromised understory structure for ground- and shrub-nesting songbirds. Areas with high amounts of deer browse are also more susceptible to colonization by invasive plant species, such as Japanese stiltgrass (*Micostegium vimineum*). Invasive plant species further complicate ecological restoration and have severe negative impacts on wildlife habitat and plant diversity. Ongoing resource management projects will address lingering vegetation issues with mechanical and chemical treatment of target plant species.

The 2020 effort was once again a success in helping reduce and maintain browse effects. Cumulative 2020 harvest numbers are consistent with recent trends (Table 2). At the individual park level, certain locations experienced relatively high harvests, while others were low enough to warrant removal from the 2021 management hunts.

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 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

Table 2. 2020 Parks Requiring Management Hunts and Resulting Harvest

| Property | Harvest |
|---------------------|--------------|
| Brown County | 143 |
| Chain O'Lakes | 135 |
| Charlestown | 49 |
| Fort Harrison | 59 |
| Harmonie | 65 |
| Lincoln | 47 |
| McCormick's Creek | 29 |
| Ouabache | 50 |
| Pokagon | 39 |
| Potato Creek | 132 |
| Prophetstown | 25 |
| Shades | 72 |
| Spring Mill | 59 |
| Trine | 2 |
| Turkey Run | 76 |
| Versailles | 205 |
| Whitewater Memorial | 56 |
| Total | 1,243 |

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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.

It should be noted that harvest totals alone have limited value in determining the success of a management 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 management hunts in 2021 will be listed and applications made available in July at wildlife.IN.gov/5834.htm along with other DNR reserved hunts.