

A young white-tailed deer stands in a field of dry, brown grass. The deer is facing the camera, with its ears perked up and a white patch on its throat. The background is a soft-focus field of similar grass.

2023 INDIANA WHITE-TAILED DEER REPORT

2023 Indiana White-tailed Deer Report



Federal Aid in Wildlife Restoration Program

This program supports state fish and wildlife agencies to conserve, protect, and enhance fish, wildlife, their habitats, and the hunting, sport fishing and recreational boating opportunities they provide. This program was initiated in 1937 as the Federal Aid in Wildlife Act and created a system where by taxes are paid on firearms, ammunition and archery equipment by the public who hunts. Today this excise tax generates over a hundred million dollars each year that are dedicated to state wildlife restoration and management projects across the United States.

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Cover Photo: A white-tailed deer on farm land near Goose Pond Fish & Wildlife Area. DNR File.

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DNR File Photo

Chapter 1. 2023-2024 DEER REPORT OVERVIEW

Joe Caudell, *Indiana Department of Natural Resources*

Welcome to the 2023 Indiana White-tailed Deer Report. Every year, Indiana DNR publishes a comprehensive report of the state's deer herd and deer management research. The report includes deer hunting season results, use of depredation permits, deer-vehicle collision reports, disease monitoring efforts, survey results, and internal and external deer research projects. Historical reports are available at on.IN.gov/INdeerreport.

2023-2024 Deer Hunting Season

The 2023-2024 deer hunting season was composed of four statewide seasons: Youth (Sept. 23 and 24), Archery (Oct. 1 to Jan. 7), Firearms (Nov. 18 to Dec. 3), and Muzzleloader (Dec. 9-24). In addition to the four statewide seasons, the Special Antlerless Firearms season was closed for the 2023-2024 deer hunting season. Most resident deer licenses could be

purchased for \$39 and nonresident licenses for \$240. A deer license bundle was available for purchase at \$91 for residents and \$550 for nonresidents. The deer license bundle, which is valid in all deer seasons except the Deer Reduction Zone season, allows hunters to take up to three deer while attempting to satisfy statewide bag limits for Archery, Firearms, Muzzleloader, and Special Antlerless Firearms (when open) seasons. The three deer may be either two antlerless and one antlered, or three antlerless deer. A hunter may take only one antlered deer during all statewide seasons combined (Archery, Firearms, Muzzleloader, and Youth seasons). Resident landowners and lessees who own and/or lease Indiana farmland are exempt from needing deer licenses when hunting on their land. Hunters were required to register all harvested deer through the online CheckIN Game system within 48 hours of the kill of their deer.

Licensed youth, age 17 or younger, were eligible to participate in a youth-only season if accompanied by an adult at least 18 years old. Youth could take multiple deer (one antlered deer and the number of bonus antlerless deer per county quota) during this special season.

The statewide archery bag limit was two deer. Hunters could take one deer per license, for a total of either two antlerless or one antlered and one antlerless deer. Hunters were allowed to use crossbows throughout the entire archery season when in possession of a crossbow license. Any deer taken with a crossbow counted toward the hunter's two-deer archery bag limit.

The bag limit during Firearms season was one antlered deer. The bag limit for Muzzleloader season was one deer of either sex (antlered deer were only allowed for hunters who had yet to satisfy their one antlered bag limit across all statewide seasons). A single firearms license was required to hunt with any combination of shotgun, muzzleloader, rifle, or handgun during Firearms season. A muzzleloader license (separate from the firearms license) was required to hunt during Muzzleloader season.

Hunters could harvest additional deer beyond the statewide bag limits in designated Deer Reduction Zones. Beginning with an antlerless deer, hunters were allowed to harvest up to 10 additional deer under the Deer Reduction Zone bag limit, for a total of either 10 antlerless or one antlered ("earn-a-buck") and nine antlerless deer. Harvest of these additional deer required the possession of a Deer Reduction Zone license for each deer harvested. An antlered deer harvested under the Deer Reduction Zone license did not count toward a hunter's statewide bag limit of one antlered deer. However, deer harvested in designated Deer Reduction Zones with other license types (e.g., archery, bonus antlerless, and license bundle) counted toward statewide bag limits. The Deer Reduction Zone season opened Sept. 15, two weeks prior to the beginning of Archery season, and continued through Jan. 31.

There were multiple reserved draw hunts open to hunters with a valid deer hunting license. Reserved draw locations change annually. In 2023, reserved draw locations included Muscatatuck National Wildlife Refuge, Big Oaks National Wildlife Refuge, and Camp Atterbury Joint Maneuver Training Center, among others. For a complete list of reserved draw deer hunts, please visit on.IN.gov/reservedhunt.

Deer Control Permits and Deer-Vehicle Collisions

Deer control permits were issued to Indiana residents experiencing an economic loss of \$500 or more as a result of property damage caused by deer or where there was an identified disease risk to humans or

domestic livestock. Each depredation permit specified the number of deer a landowner was authorized to take under the permit. Permits were only valid on the permit holder's property, and the permit holder was allowed to designate assistants to remove deer in place of themselves. Depredation permits for deer are typically only issued outside of the deer hunting season.

Vehicle collisions involving deer and resulting in property damage of at least \$2,500 or injury to any person were reported to the Indiana State Police and Indiana Department of Transportation by local and state law enforcement agencies. Information collected included location of collision (e.g., county, coordinates, intersection, etc.) and road type (e.g., county road, state road, interstate, etc.). The number of deer-vehicle collisions and the number of deer taken with depredation permits are factors that influence the bonus antlerless quotas for the hunting season and locations of deer reduction zones.

Deer Health

Indiana DNR monitors deer health for major outbreaks of diseases such as epizootic hemorrhagic disease (EHD), bovine tuberculosis (bTB), and chronic wasting disease (CWD). In 2023, Indiana experienced mild or background EHD occurrences in many parts of the state. DNR received 46 reports of potential EHD cases involving 67 deer from 32 counties. Indiana DNR did not conduct bTB surveillance in Franklin County in 2023 because the level of bTB in the area was likely low to non-existent. A total of 1,750 deer were tested for CWD statewide in 2023-2024. Indiana had its first positive CWD in the state from the 2023-2024 hunting season in LaGrange County.

Surveys and Volunteer Monitoring

Surveys of hunters, landowners, and other people are tools Indiana DNR uses to manage the state's deer herd. Before 2017, paper surveys were mailed to a subset of Indiana hunters and landowners every three or four years to ask questions about harvest, deer damage, and opinions on the size and management of deer in Indiana. In 2023, hunters had the opportunity to complete an online survey immediately after checking in their deer and to participate in the Deer Management Survey to share their opinions of Indiana deer management. These surveys gather specific information about the deer that were harvested (e.g., sex, age, approximate size, etc.), the hunting experience associated with

those deer (e.g., number of does or bucks seen, and happiness with the hunt), how hunters feel about the state's deer population, and how they would like deer to be managed. Indiana DNR also solicits hunter and public participation in volunteer monitoring projects to collect valuable data on fawn:doe and buck:doe ratios to better understand the recruitment rates of populations at the county and regional levels.

Deer Research

Indiana DNR conducts research within its Deer Program and works with universities to conduct research on various topics related to deer management. In 2023, the Deer Program continued to work on CWD, the economics of deer management, and with a new method to estimate the age of deer using genetic markers. Internally, scientists in the Deer Program began estimating deer population densities in the state, examined the distribution of hunting pressure, and asked hunters their opinion about the use of various technologies for hunting on public lands.

Chapter 2. IMPROVEMENTS IN DEER MANAGEMENT

Joe N. Caudell and Carsten White,
Indiana Department of Natural Resources

Introducing the New Deer Research Biologist

In July 2024, Carsten White was hired as Indiana's new Deer Research Biologist. This position aids in expanding the internal research capacity of the Deer Program within Indiana DNR. Growing up, Carsten hunted for deer, turkey, and small game in Indiana. This fostered his appreciation for wildlife and the outdoors. He completed both his bachelor's and master's degrees at Purdue University Fort Wayne. His thesis focused on camera trap methodologies and detection models for gray fox in Indiana. Prior to starting as the Deer Research Biologist, Carsten worked with other wildlife, including bats, small mammals, reptiles, and amphibians. Currently, he is working on using various modes of surveying to estimate deer densities, sex ratios in deer, and fawn recruitment on Indiana public land.

Deer Density Measurements

Over the past five years, Indiana DNR has worked with Purdue University to develop a method of estimating deer densities that would be useful at a small scale and cost effective for the DNR to use statewide to estimate deer abundance. The first iteration for about one-third of the state is published in [Chapter 9](#) of this report. Moving forward, DNR will use a combination of aircraft, unmanned aerial vehicles, and game cameras to estimate deer abundance on both private and public land. Aircraft has been shown to be cost effective at recording images of deer in undeveloped areas over private land because it can cover large portions of the state in a relatively short amount of time. Drones and game cameras may be most cost-effective on public land, where a higher level of precision is needed. DNR has used these methods to measure changes in deer density in Franklin County during a severe epizootic hemorrhagic disease event and will use these methods to measure the recovery of the deer population. That technique will also be used for future outbreaks. Each year DNR will measure a portion of the state's deer population and report it in this annual report.

New Deer Hunting Rules Adopted for the 2025-2026 Deer Season

The Natural Resources Commission (NRC) adopted several new permanent hunting rules. Currently, there is confusion around the privileges allowed under each deer license, both among the public and the DNR employees responsible for interpreting and enforcing the deer hunting rules found in 312 IAC 9-3-2. Much of the confusion is a result of the multiple license types available for deer hunting, each having different limits of take and season bag limits. For example, redefining the bonus antlerless license as a multiple season antlerless license will simplify the privileges of a license holder and make it easy to determine what privileges a license holder has. Simplified regulations can also make hunting more accessible to individuals who are new to hunting deer and who may find license confusion to be a barrier of entry. Less confusing regulations will also lead to less staff time spent answering questions about license privileges from confused individuals. Below is a summary and brief justification:

Changes to 312 IAC 9-3-18.2: Creating a single license for archery and crossbow equipment

The NRC adopted the rule to eliminate the crossbow license by allowing individuals who use either a bow and arrow or a crossbow and bolt to purchase an archery license and use either equipment. The hope is this change will help reduce confusion among individual deer hunters and give a person an additional equipment option with the one license.

A recent survey of hunters found they were supportive of this change, although some do not consider crossbows to be "traditional" archery equipment. The change should not impact revenue for the DNR because an individual is still required to purchase a license, and most individuals use either a bow and an arrow or a crossbow to hunt, but not both. Since legalizing the use of a crossbow in 2012, less than 1% of resident and nonresident hunters have purchased both a crossbow and an archery license or used both equipment types in the same license year. As for hunters who use the deer license bundle, since 2016 there has never been more than 93 individuals check in a deer under both equipment types in a given year. Given these metrics, it is unlikely that eliminating the crossbow license and allowing crossbow use under an archery license would contribute to a significant revenue effect either from a decrease in archery or crossbow license sales or disincentivizing deer license bundle purchas-

es. It is also unlikely to result in a change in harvest. Currently, individuals who hunt using archery equipment can take an antlered or antlerless deer with an archery or a crossbow license, as long as they do not take more than one antlered deer in the regular deer seasons combined. However, the small percentage of individuals who purchase both an archery and a crossbow license could potentially save the cost of one license because a license holder could use either type of equipment with that one license.

A question in the 2022 Deer Management Survey asked about combining the archery and crossbow licenses into one license. We received 16,462 responses to this question. Of those, 73% supported this rule proposal (61% strongly supporting; 12% somewhat supporting), 12% were neutral, and 19% opposed (11% strongly opposing; 7% somewhat opposing).

In a 2021 survey, there were 894 archery-only respondents out of 16,462 total respondents (5.4%). Of those, 44% supported this proposal (31% strongly supporting; 13% somewhat supporting), 18% were neutral, and 38% opposed (30% strongly opposing; 8% somewhat opposing).

The DNR recognizes the desire of hunters to keep seasons specific to a type of equipment and to place certain limitations on others who hunt that season. However, one of the goals for the Deer Program is to simplify the rules that govern deer hunting so that hunters desiring to enter the sport are less confused by the myriad of regulations. The adopted rule change will simplify what license is needed for hunting during archery season and increase the value of the archery license.

312 IAC 9-3-2: Change the deer license bundle to a buck and two does

The NRC adopted the rule to change the deer license bundle to allow hunters to take one buck and two antlerless deer and removed the option of harvesting three antlerless deer. This was proposed to further simplify regulations for hunters. Landowners and tenants of farmland who are exempt from needing a license to hunt deer on their own farmland would not be affected by this change, nor would resident youth license holders or lifetime license holders. This will also reflect how the vast majority of hunters use this license because only a small fraction of hunters uses the license bundle to harvest three antlerless deer.

The DNR asked a question about changing the license bundle to allow hunters to only harvest one buck

and two does in the 2022 Deer Management Survey. There were 16,374 responses to this question. Of those, 62% of hunters supported the proposed rule (40% strongly supporting), 19% were neutral, 18% opposed (11% strongly opposing). This change would align with current harvest quotas (i.e., one buck and two does per county).

312 IAC 9-3-2: Creation of the multiple season antlerless deer license

The NRC adopted this license terminology to replace the bonus antlerless deer hunting license and allow an individual to take one antlerless deer per license using equipment authorized during the season in which they are hunting.

312 IAC 9-3-2: Creation of a statewide antlerless bag limit

The NRC adopted the change to permanent rule to create a statewide antlerless bag limit to go along with the current statewide antlered bag limit. The reason for this proposed change was that the current county bonus antlerless quota (CBAQ) system allows individuals to shoot socially unacceptable numbers of antlerless deer across multiple counties, assuming that individuals in each county take the maximum number of bonus antlerless deer available in each county. The new rules governing deer hunting will allow an individual to still take no more than one antlered deer during the regular deer seasons combined, as is allowed now, but it will also allow them to purchase up to six additional multiple season licenses to take antlerless deer in any of the regular deer seasons (e.g., archery, firearms, and muzzleloader). This is not expected to create a significant change in revenue for the DNR because there are fewer than 70 individuals that currently take more than seven deer during a regular deer season each year. There are very few, if any, individuals who take the permitted six antlerless deer under the current rules. There is a maximum number of antlerless deer allowed to be taken per county and a limit to the number of antlerless deer taken on certain DNR properties to help provide quality deer hunting opportunities. By implementing a statewide bag limit of six antlerless deer, the DNR will reduce the number of deer an individual may take, therefore reducing concerns about the unlimited number in the current CBAQ structure. The statewide antlerless limit will improve the perception of deer management by the DNR among residents who are concerned with high antlerless take allocations under current regulations. In the past, an emergency rule was

enacted each year to establish the bonus antlerless deer bag limits per county and other limitations on properties where a bonus antlerless deer may not be taken. The change does not affect military hunts, deer reduction zones, or other special licenses, so hunters will still have the opportunity to harvest additional deer if they desire.

The DNR asked a question about limiting the total number of antlerless deer that each hunter can harvest in Indiana to six antlerless deer in the 2022 Deer Management Survey, and there were 17,195 responses. Of those, 74% supported this to some degree (48% of those strongly supporting), 12% were neutral, and 14% opposed (7% opposing; 7% strongly opposing) this proposal.

312 IAC 9-3-2: Clarifying that the deer firearms license is buck-only

The NRC adopted the rule change to confirm in the language that the firearms license is “buck-only.” Hunters have been confused about the firearms license because it is “buck-only” compared to the archery, crossbow, and firearms licenses, which are “either-sex.” Hunters can harvest a doe with a firearm, but this currently has to be done using a bonus antlerless license (will be the multiple season antlerless deer license with the proposed changes). Therefore, the NRC adopted a rule change to clarify the rules so that it explicitly states that hunters using a firearms license can only take one antlered deer. This is consistent with the current firearms seasonal limit of one antlered deer in 312 IAC 9-3-4(c) and does not represent an actual change to what hunters can do. One antlered deer may be taken during the firearms season (312 IAC 9-3-4(f)), which is the one antlered deer that can be taken statewide in the regular deer seasons combined (312 IAC 9-3-2(t)).

312 IAC 9-3-2: Changing to the County Bonus Antlerless Quota to a County Antlerless Bag Limit

There are many hunters who dislike the current bonus antlerless quota (CBAQ) structure because it is confusing. The CBAQ is additive to the number of antlerless deer that can be taken using archery and crossbow equipment and muzzleloading firearms during muzzleloader season. Because there are also individual bag limits for these two seasons, hunters often struggle to determine how many antlerless deer they can harvest. Mistakes are frequently made when checking in deer, causing staff to spend time in the CheckIN Game system making corrections for hunters. Mistakes are also made when purchasing licenses because hunters

may be unaware of the bag limits for archery season and firearms season. Therefore, the NRC adopted a rule to change the CBAQ to a County Antlerless Bag Limit, which will provide a single number for the number of antlerless deer that can be harvested in that county, regardless of the equipment used to harvest antlerless deer.

The DNR asked a question about removing the “bonus” deer designation from rules in the 2022 Deer Management Survey, and there were 16,691 responses to this question. Of those, 64% of hunters supported this rule proposal (37% strongly supporting; 27% somewhat supporting), 24% were neutral, and 12% were opposed (6% opposing; 6% strongly opposing).

312 IAC 9-3-2: Prohibit hunters from harvesting antlerless deer on certain DNR properties with a firearm

The NRC has adopted a rule that will prevent hunters from harvesting an antlerless deer on Fish & Wildlife areas (FWAs), as well as a few other properties (Mississinewa Lake, Salamonie Lake, and Patoka Lake), using a firearm during firearms season. This is similar to the past emergency rule restricting the use of bonus antlerless licenses on FWAs. In a survey of deer hunters in 2022, hunters were asked their opinion of not allowing antlerless deer to be taken on FWAs with a firearm. There were 16,478 responses to this question, with 54% of hunters supporting this rule proposal (33% strongly supporting; 21% somewhat supporting), 29% were neutral, and 17% opposed this rule (9% strongly opposing; 8% somewhat opposing).

312 IAC 9-3-2: Replacement deer for deer harvested and determined to be unfit for consumption

The NRC has adopted a rule to allow a replacement deer to be taken for a deer that was legally harvested and found to have meat that is unfit for human consumption under 312 IAC 9-3-2(bb). An individual taking a deer that is unfit for human consumption is a common occurrence during deer season, with a peak during firearms season as this is when most individuals take their deer. Currently, DNR staff examine photographs, evaluate the condition based upon observations by biologists and conservation officers, or both. A decision is made whether to allow a person to take another deer if the staff determines the deer is inedible based on internal guidelines. If an individual calls with concern over the fitness of an antlerless deer, and there is evidence of systemic infection, DNR staff allow the individual to take another antlerless deer on the current license used

to hunt a deer. The process for determining the fitness of an antlerless deer for human consumption is simple and uniform because the only issue determined by the DNR is the usability of the meat to the individual.

When an individual calls regarding the fitness of a buck (antlered deer), there is often an issue regarding the desirability of the antlers to that individual. DNR staff found that some individuals who are dissatisfied with the antlers on their buck who can find something wrong with the carcass will call asking to be able to take another buck on their license. Additionally, some individuals see this as another opportunity to take a second buck in addition to the first buck if the meat of the first buck is not edible, and the individual believes they will get two sets of antlers for the year. If DNR staff decide that a buck is unfit for human consumption, DNR staff are required to make arrangements to collect the antlers. The process is lengthened because the individual must decide if they are willing to live with the antlers, but not have meat from the deer. The willingness of an individual to give up antlers often helps DNR staff determine whether the individual is trying to get another opportunity to shoot a second buck, or whether the individual has a real concern about the condition of the meat. Currently, DNR does not allow individuals who have taken a deer that cannot be eaten to keep the antlers to memorialize a hunt. The change would make the response to these calls more uniform for the individual. DNR staff would then offer to replace the meat with an antlerless deer privilege. This approach would be more consistent for the individual and would replace the meat portion of the deer without needing to take away the antlers on the buck that was taken. This is different from the process in which if the DNR suspects a disease, such as bovine tuberculosis, DNR staff confiscate the whole deer and allow the individual to take another deer on that same license. The current process will remain in place for a deer that the DNR confiscates for disease reasons.

312 IAC 9-3-3: Allowing .40 caliber muzzleloaders during muzzleloader season

The NRC has adopted a rule to allow the use of a .40 caliber muzzleloader, which will allow more individuals to use equipment currently unable to be used to hunt deer. A resident requested the use of this equipment previously. DNR examined the muzzle velocity and energy and found that an example of a .40 caliber muzzleloader (CVA Paramount HTR) loaded to the recommended powder specifications with a 225 grain

bullet is capable of a muzzle velocity of greater than 2,600 feet per second with an energy of greater than 3,500 ft. lbs. At 200 yards, the velocity is still greater than 2,200 feet per second with approximately 2,300 ft. lbs. of kinetic energy remaining. This is more than enough velocity and energy to kill a deer effectively at more than 200 yards with an expanding bullet.

312 IAC 9-3-3: Clarifying two pistol calibers for deer hunting

The NRC has adopted a rule to change the language in 312 IAC 9-3-3 to correct the terminology for a .25-20 Winchester and a .32-20 Winchester. This ammunition is currently allowed, but the terms need to accurately reflect the names of the cartridges used by the manufacturers.

312 IAC 9-3-3: Changing the dates for tree stands on public land in Deer Reduction Zones

The NRC has adopted a rule to allow portable tree stands and ground blinds to be placed on DNR properties between noon on Sept. 1 and Feb. 8 within a deer reduction zone. Allowing an individual to set up a stand on Sept. 1 gives the individual time to set up the deer stand prior to the start of the reduction zone season (Sept. 15) and allows the individual to leave it in place on the property until after the season ends. Therefore, these additional dates are proposed to be added in subsection (g) for properties that are in a deer reduction zone because the reduction zone season begins Sept. 15 and ends Jan. 31.

312 IAC 9-3-3: Allow hunters to retrieve deer using thermal or infrared detectors for retrieving deer

During the past several years, hunters have asked if DNR would allow the use of thermal and infrared detectors to locate and retrieve dead deer. DNR examined this issue and found the current language is inconsistent in that it is the only state law or rule that places a prohibition on equipment or methods used to retrieve a dead deer. 312 IAC 9-3-3 allows methods such as dogs and horses to be used to track or trail a dead deer. This change would also be consistent with IC 14-22-6-16, which prohibits the use of unmanned aerial vehicles to aid in hunting but allows their use to retrieve a dead wild animal. Therefore, the Natural Resources Commission has adopted a rule to allow the use of this equipment to retrieve legally harvested deer (but not when hunting deer).

312 IAC 9-3-4: Allow youth hunters to take no more than one deer on specific public land

The NRC has adopted a rule change to 312 IAC 9-3-4 that will limit youth hunters from taking more than one antlerless deer on certain DNR properties. This is currently the status quo and will not represent a change to current deer hunting regulations. In past years, this rule language has been established by emergency rule, but a new Indiana law prohibits the use of emergency rules for the purposes of establishing deer hunting regulations except under certain conditions (see HEA 1623-2023).

312 IAC 9-3-4: Removal of the 'A' designation for County Bonus Antlerless Quotas

The 'A' designation was historically used in counties to limit the harvest of bonus antlerless deer to the last half of firearms season. Recent data on the deer population has shown this is not necessary, especially with the switch from the County Bonus Antlerless Quota system to using a total antlerless bag limit to each county. All counties have a normal antlerless bag limit of at least one deer, and this is not expected to change in the near future.

312 IAC 9-3-4: Adding the Deer Reduction Zones to rule language

Regarding the changes in subsection (e), Deer Reduction Zones (DRZs) target areas that have high deer populations and high human density or use, resulting in concerns about deer and vehicle collisions and personal property damage. A DRZ has traditionally been established by an emergency rule to allow for changes as needed annually, but because of HEA 1623-2023 the DNR may no longer use emergency rules for this purpose. The DNR designates an area as a DRZ to manage deer conflicts through sport hunting. A DRZ provides individuals with additional opportunities to take a deer in that area. The goal is to reduce conflict between deer and humans, not to eliminate the deer population. Incorporating or increasing hunting helps manage deer populations and increases deer wariness of humans, which can also reduce conflicts.

The smallest deer management unit in the state has traditionally been the county; however, a DRZ allows the DNR to target areas within a county for management. This should allow deer in one part of a county to remain stable or increase while decreasing populations in another part of the same county. The approach coincides with the state's current deer management plan, which is

to strategically manage the state's deer herd. Therefore, in some areas of the state, there should be a larger deer population, while in others the population should be maintained or reduced. A DRZ allows managers to target such areas without reducing deer populations throughout an entire county.

Researchers identified potential areas with high conflict between humans and deer or high use by mapping areas with high human density and high rates of deer and vehicle collisions. Other conflicts may include reports of deer damage by landowners, requests for deer damage permits, requests by community leaders, or calls for assistance through DNR's district and urban biologists. The designation process results in two types of DRZs: (1) traditional; and (2) corridors. Traditional DRZs are established near or around urban areas and encompass a community. Alternatively, DRZ corridors are created along portions of major roadways to specifically address high rates of deer and vehicle collisions.

The increased allowable antlerless take and lengthened deer reduction zone season mean that the individuals who hunt deer can help address problem areas and potentially reduce the need for other measures, such as the use of deer damage permits. DRZs can increase opportunities to hunt deer in urban environments and help alleviate conflicts between humans and deer. The Indiana DNR Deer Program staff recently conducted an analysis to determine the effectiveness of DRZs in reducing deer and vehicle collisions. DNR staff found a decrease in deer and vehicle collisions within DRZs of approximately 15% after allowing individuals to take additional deer within DRZs. These results demonstrate the effectiveness of using targeted recreational hunting as a management tool to reduce deer and vehicle collisions.

312 IAC 9-3-4: Removing the bag limits for archery and muzzleloader licenses

The NRC has adopted a rule that would remove the season bag limits for deer taken with muzzleloader and archery licenses. Individuals will be able to take the number of antlerless deer allowed per county within the proposed new statewide bag limit using archery and muzzleloader licenses. Allowing an individual to take more than two antlerless deer on archery licenses and more than one antlerless deer on a muzzleloader license will reduce confusion about which license an individual is required to purchase and how to check in a deer that is taken during a hunt. DNR staff time is

wasted trying to explain the requirements of a license to an individual and correcting an accidental mistake an individual makes when checking in a deer. Therefore, this change will result in improved individual service, reduced staff time, and ease of understanding the rules without making a change to the harvest.

312 IAC 9-3-2 and 312 IAC 9-3-4: Switching to an Antlerless Bag Limit for each county

Since 2017, county bonus antlerless bag limits have been set on an annual basis by emergency rule to allow for changes each year. However, that is no longer an option under HEA 1623-2023; therefore, the county bag limits have been added to this rule. These county bag limits are established using the following: information on individual's desires for the deer population to change from the annual Deer Management Survey, trends in various deer population indices including deer-vehicle collisions, the Archer's Index, changes in effort to take deer, deer damage permits, and others; professional opinions of wildlife biologists and conservation officers; the effects of disease; and the effects of changes on individuals and the deer population. Most recently, the DNR has added data about deer density from the Northeastern, East Central, and Southern Deer Management Units (DMUs) from the Purdue Integrated Deer Management Project. Because the county antlerless bag limit will now be a combination of the various equipment bag limits and the county bonus bag limit, DNR staff used the following method to create the proposed antlerless bag limit for inclusion in the rule:

- Because prior county bonus antlerless quota decisions were based on the data gathered each year, using data from the county data available at <https://www.in.gov/dnr/fish-and-wildlife/wildlife-resources/animals/white-tailed-deer/county-data/>.
- DNR staff selected "normal" years (i.e., not a COVID year and not an epizootic hemorrhagic disease [EHD] recovery year). Most often, data from 2022 was selected unless a county was still in a recovery period from EHD. In those cases, 2018 was selected as the next best alternative.
- DNR staff examined the number of affected individuals and the number of deer that would not be taken at a proposed county bag limit (or the increase the take at a proposed county bag limit).
- DNR staff selected a bag limit at which very few hunters (less than 10) would be affected by this new bag limit and a number at which individuals were using the available bag limit. For example,

Steuben County could have a higher bag limit based on population data, but DNR staff have observed from experience that individuals will not use additional antlerless deer bag limits even if it is available. The DNR has seen cases in which individuals will decrease their personal take if they believe the county bag limit is too high. Therefore, the DNR will keep a designated county bag limit of three for Steuben rather than a four or five, even though the population would support a higher bag limit.

- Minor changes were made to try to keep the counties similar within Deer Management Units.

Currently, Franklin County and Fayette County have a low county bag limit to offset the effects of EHD. The DNR is proposing that the county bag limit be one beginning in 2024, and two beginning in 2025. The DNR will continue to review the data for these counties over time and make changes to get them to their target county bag limit of three for Fayette County and four for Franklin County.

312 IAC 9-3-2 (h): Removing the Late Antlerless Firearm Season

Indiana currently has a firearms season for antlerless deer from Dec. 26 through the first Sunday in January of the next year in counties with a bonus antlerless quota of four or more deer. This rule was initially enacted to try to significantly increase harvest of antlerless deer, but research on that season found that hunters just harvest antlerless deer later in the season in counties where that season is in place (see the 2020 Deer Report). DNR also surveyed hunters on their opinion about that season in 2021 and found that only 24% of hunters used the season in the previous year, and 38% of hunters reported hunting that season in the previous five-year period (see the 2020 Deer Report). When DNR asked what the general level of opposition or support was for that season, we found that 43% were supportive to some degree, and 27% were opposed to some degree. Because of the change in the bonus antlerless quota system, if this season were to be retained, DNR would need to either anchor this season to the new antlerless bag limit system or create a new method for enacting it. Therefore, because of the split interest by hunters for having this season, the low use by hunters, and the ineffectiveness at changing deer harvest, the Natural Resources Commission has repealed this rule.

Chapter 3.

2023-2024 DEER HUNTING SEASON

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Indiana Department of Natural Resources

Errors in Reporting

The online check-in system, CheckIN Game, was initiated in 2012 as an option for hunters and was made the primary game-checking system in 2015. Hunters who check in their game online occasionally make errors in reporting their harvest. Errors include checking in deer with the wrong sex indicated, incorrect licenses, or multiple entries of the same deer. Indiana DNR is constantly working throughout deer season to correct these errors so that harvest numbers are as accurate as possible. In many cases, this involves contacting hunters by telephone or email to determine what type of error has been made before a correction can be issued.

For this reason, the data in this document should be considered to have a certain amount of reporting error. Hunters or others who use these data should expect that the numbers reported in future Indiana White-tailed Deer Reports may change slightly based on corrections of errors. This is also true for the Deer Counter on the DNR Deer webpage (deer.dnr.IN.gov). Some hunters have observed the reported total harvest decreasing as the corrections to the data were made and have contacted the DNR to ask why.

Two error rates were calculated for this issue: an unreconciled error rate and a total error rate that includes both reconciled errors and unreconciled errors (Table 3-1). Typically, the numbers reported in this document only fluctuate by the unreconciled error rate because the reconciled errors have already been voided and are not included in the data. However, occasionally a statistic might have been calculated without

removing the voided transactions. Because error rates are relatively low, they have no effect on management decisions.

Harvest totals for the 2023 deer hunting season are current as of April 10, 2024. Additionally, harvest totals for the 2016-2022 seasons have been updated since previously reported. In this report, the updated totals are used in analyses and comparisons between years.

Harvest by Season

Harvest summary reports prior to 2016 did not include harvest numbers from Indiana State Park management hunts because those deer were checked in at the properties and reported separately by the Division of State Parks. Now that the deer check-in process is online for all hunters and hunts, deer harvested during State Park management hunts are included in the check-in database and can be reported with the state-wide totals.

Shed bucks are checked in as antlerless deer in the CheckIN Game system and do not count against a hunter's buck limit. However, for the purpose of analyzing the harvest data, antlered bucks and shed bucks are grouped as antlered deer, while does and button bucks are grouped as antlerless deer, unless specified.

A total of 121,263 harvested deer were reported in Indiana during the 2023 season, and the annual trend in harvest can be seen in Figures 3-1 and 3-2. The hunting season began with the Deer Reduction Zone on Sept. 15, followed by a youth-only weekend (Table 3-2). The number of deer harvested with archery equipment during the Deer Reduction Zone season was incorporated into Archery season totals, while deer harvested with firearms during Deer Reduction Zone season were incorporated into Firearms season totals (Tables 3-2 and 3-3). The percentage of antlered deer, antlerless deer, and button bucks for each season can be found in Figure 3-3.

Table 3-1. Error rates of hunter-reported deer harvests, 2017-2024. Total error includes reconciled and unreconciled errors. Reconciled errors have already been removed from the dataset.

	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024
% total error	1.3	0.57	0.23	0.26	0.23	0.26	0.28
% unreconciled error	0.17	0.13	0.13	0.16	0.13	0.15	0.18

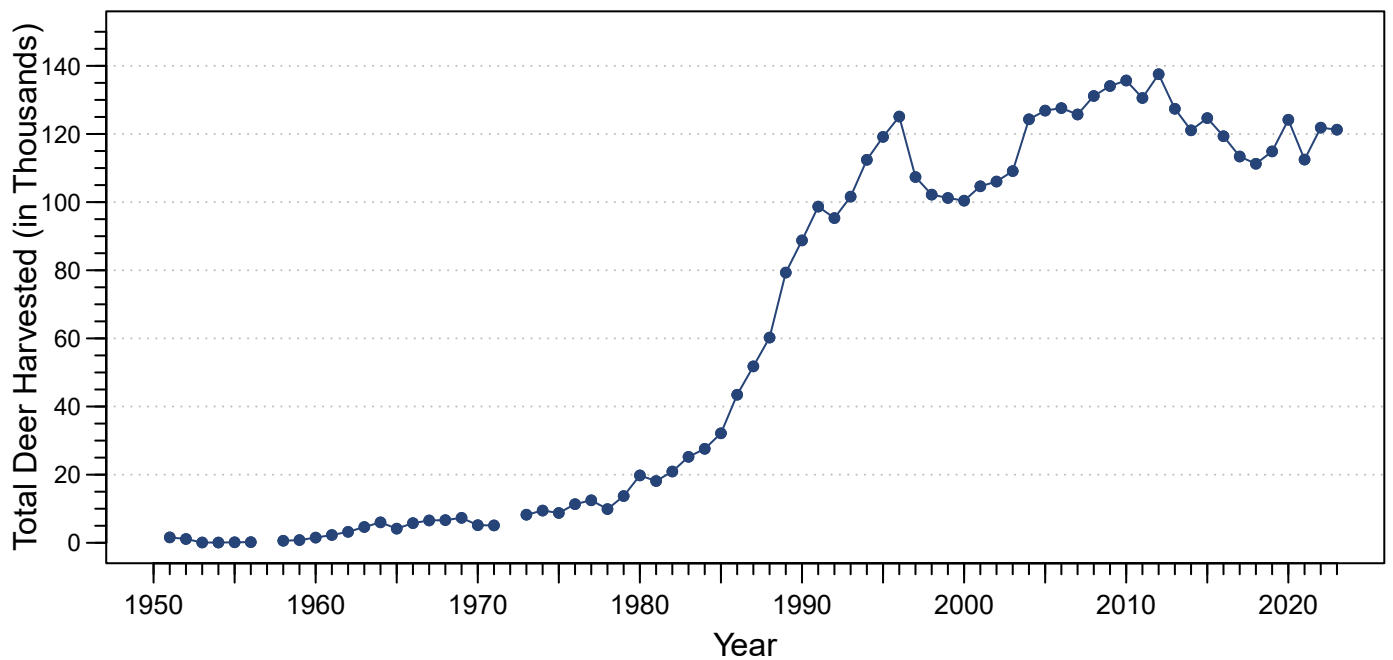


Figure 3-1. The total number of deer harvested in each Indiana deer season, 1951-2023. Totals include deer harvested in State Park Management Hunts, 1993-2023. Reporting error rates: $\pm 0.28\%$ (2023), $\pm 0.26\%$ (2022), $\pm 0.23\%$ (2021), $\pm 0.26\%$ (2020), $\pm 0.23\%$ (2019), $\pm 0.57\%$ (2018), and $\pm 1.30\%$ (2017).

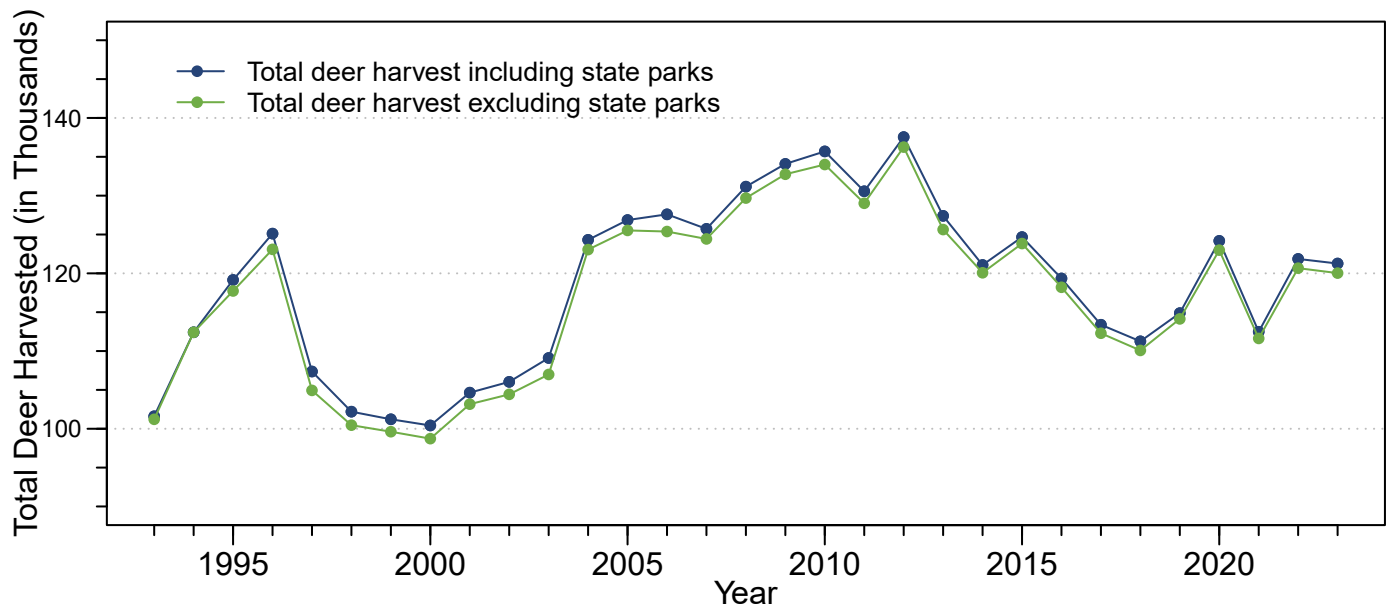


Figure 3-2. A comparison of the total number of deer harvested in each Indiana deer season, including and excluding deer harvested during State Park Management Hunts, 1993–2023. Reporting error rates: $\pm 0.28\%$ (2023), $\pm 0.26\%$ (2022), $\pm 0.23\%$ (2021), $\pm 0.26\%$ (2020), $\pm 0.23\%$ (2019), $\pm 0.57\%$ (2018), and ± 1.3 (2017).

Table 3-2. Number of deer harvested by season during the 2023 Indiana deer hunting season. Total harvest and percent of total harvest are labeled by each season. Values may not total 100 due to rounding. Reporting error rate: $\pm 0.28\%$ (2023).

Season	Antlered	Antlerless	Total
Youth Deer (23 - 24 Sept)	1,145 (0.9%)	1,575 (1.3%)	2,720 (2.2%)
Archery (1 Oct - 7 Jan)	18,751 (15.5%)	20,617 (17%)	39,368 (32.5%)
Firearms (18 Nov - 3 Dec)	36,021 (29.7%)	34,704 (28.6%)	70,725 (58.3%)
Muzzleloader (9 - 24 Dec)	2,303 (1.9%)	6,147 (5.1%)	8,450 (7%)
Totals	58,220 (48%)	63,043 (52%)	121,263 (100%)

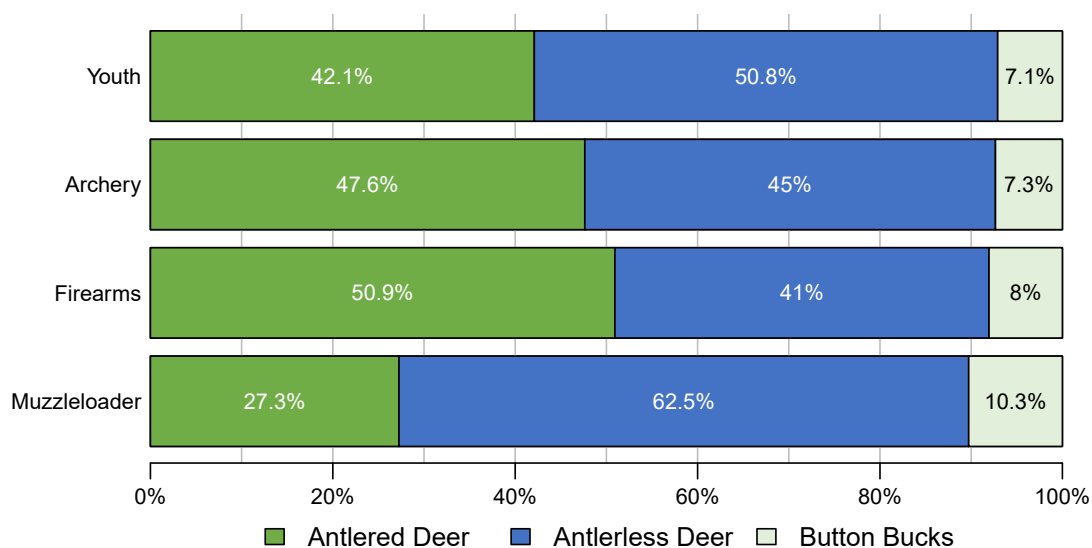


Figure 3-3. Composition of individual season harvests during the 2023 Indiana deer season. Reporting error rates: $\pm 0.28\%$ (2023).

Table 3-3. Antlered and antlerless daily harvest and percent of harvest by season and total harvest from the start of Firearms season through the end of Firearms season, Nov. 18-Dec. 3. Reporting error rate: $\pm 0.28\%$ (2023).

Date	Day	Antlered Deer	Antlered % of Daily Total	Antlerless Deer	Antlerless % of Daily Total	Total Deer	% of Season Total	% of Total Harvest
18-Nov	Sat	13,799	62.8	8,185	37.2	21,984	32.3	18.0
19-Nov	Sun	5,644	56.3	4,372	43.7	10,016	14.7	8.2
20-Nov	Mon	1,689	56.1	1,320	43.9	3,009	4.4	2.5
21-Nov	Tue	1,103	55.2	897	44.9	2,000	2.9	1.6
22-Nov	Wed	1,823	51.9	1,691	48.1	3,514	5.2	2.9
23-Nov	Thu	1,768	46.4	2,041	53.6	3,809	5.6	3.1
24-Nov	Fri	2,027	42.3	2,770	57.7	4,797	7.1	3.9
25-Nov	Sat	2,090	42.9	2,786	57.1	4,876	7.2	4.0
26-Nov	Sun	1,050	41.8	1,459	58.2	2,509	3.7	2.1
27-Nov	Mon	498	37.1	846	62.9	1,344	2.0	1.1
28-Nov	Tue	446	35.5	811	64.5	1,257	1.8	1.0
29-Nov	Wed	504	36.4	879	63.6	1,383	2.0	1.1
30-Nov	Thu	453	32.6	935	67.4	1,388	2.0	1.1
1-Dec	Fri	312	34.9	582	65.1	894	1.3	0.7
2-Dec	Sat	1,133	36.2	1,996	63.8	3,129	4.6	2.6
3-Dec	Sun	727	34.3	1,395	65.7	2,122	3.1	1.7
Total	NA	35,066	NA	32,965	NA	68,031	100.0	55.8

Table 3-4. Deer harvest by county, per square mile, and per square mile of deer cover during the 2023 Indiana deer hunting season. Reporting error rate: $\pm 0.28\%$ (2023).

County	Antlered Harvest	Antlerless Harvest	Total Harvest	Square miles in county	Percent of Deer Habitat in County	Square miles of deer cover	Antlered harvest per square mile of deer cover	Doe Harvest per square mile of deer cover	Total harvest per square mile of deer cover
Adams	370	454	824	340	9%	32	11.6	14.2	25.8
Allen	891	1131	2022	660	18%	117	7.6	9.7	17.3
Bartholomew	523	555	1078	409	37%	152	3.4	3.7	7.1
Benton	132	54	186	406	2%	9	14.7	6.0	20.7
Blackford	232	274	506	166	13%	21	11.0	13.0	24.1
Boone	256	213	469	423	9%	40	6.4	5.3	11.7
Brown	605	738	1343	316	90%	286	2.1	2.6	4.7
Carroll	505	594	1099	375	14%	52	9.7	11.4	21.1
Cass	724	679	1403	415	16%	67	10.8	10.1	20.9
Clark	584	543	1127	376	63%	237	2.5	2.3	4.8
Clay	599	610	1209	360	37%	133	4.5	4.6	9.1
Clinton	239	217	456	405	7%	26	9.2	8.3	17.5
Crawford	883	873	1756	309	88%	273	3.2	3.2	6.4
Daviess	555	748	1303	436	30%	129	4.3	5.8	10.1
Dearborn	811	915	1726	307	79%	244	3.3	3.8	7.1
Decatur	324	410	734	373	25%	93	3.5	4.4	7.9
Dekalb	1147	1254	2401	364	28%	102	11.2	12.3	23.5
Delaware	471	414	885	396	16%	63	7.5	6.6	14.0
Dubois	806	1017	1823	435	54%	236	3.4	4.3	7.7
Elkhart	851	1048	1899	468	25%	117	7.3	9.0	16.2
Fayette	300	111	411	215	35%	75	4.0	1.5	5.5
Floyd	314	345	659	149	73%	109	2.9	3.2	6.0
Fountain	640	657	1297	398	23%	91	7.0	7.2	14.3
Franklin	790	291	1081	391	62%	243	3.3	1.2	4.4
Fulton	671	819	1490	371	14%	52	12.9	15.8	28.7
Gibson	625	621	1246	499	22%	111	5.6	5.6	11.2
Grant	527	452	979	415	13%	53	9.9	8.5	18.5
Greene	969	1071	2040	546	61%	332	2.9	3.2	6.1
Hamilton	276	289	565	402	13%	54	5.1	5.4	10.5
Hancock	188	150	338	307	10%	31	6.1	4.8	10.9
Harrison	1190	1303	2493	486	75%	363	3.3	3.6	6.9
Hendricks	413	299	712	409	18%	72	5.7	4.2	9.9
Henry	345	301	646	395	18%	71	4.9	4.2	9.1
Howard	242	256	498	294	9%	26	9.3	9.8	19.2
Huntington	598	590	1188	388	17%	66	9.1	8.9	18.0
Jackson	825	828	1653	513	49%	250	3.3	3.3	6.6
Jasper	697	653	1350	561	13%	75	9.3	8.7	18.0
Jay	513	612	1125	384	13%	49	10.5	12.5	23.0
Jefferson	689	792	1481	363	68%	248	2.8	3.2	6.0
Jennings	728	835	1563	378	56%	210	3.5	4.0	7.4
Johnson	314	310	624	322	28%	89	3.5	3.5	7.0
Knox	470	432	902	524	16%	86	5.5	5.0	10.5
Kosciusko	1222	1417	2639	554	22%	119	10.3	11.9	22.2
Lagrange	1134	1818	2952	387	38%	148	7.7	12.3	19.9
Lake	614	845	1459	626	16%	98	6.3	8.6	14.9

Table 3-4 cont.

County	Antlered Harvest	Antlerless Harvest	Total Harvest	Square miles in county	Percent of Deer Habitat in County	Square miles of deer cover	Antlered harvest per square mile of deer cover	Doe Harvest per square mile of deer cover	Total harvest per square mile of deer cover
Laporte	901	1085	1986	613	28%	169	5.3	6.4	11.8
Lawrence	1067	1150	2217	452	77%	347	3.1	3.3	6.4
Madison	329	300	629	453	13%	58	5.7	5.2	10.8
Marion	157	286	443	403	10%	42	3.7	6.8	10.5
Marshall	1045	1230	2275	449	21%	97	10.8	12.7	23.5
Martin	706	933	1639	340	77%	261	2.7	3.6	6.3
Miami	818	851	1669	377	17%	64	12.8	13.3	26.1
Monroe	676	781	1457	411	78%	319	2.1	2.4	4.6
Montgomery	536	535	1071	505	13%	67	8.0	8.0	16.0
Morgan	673	714	1387	409	53%	217	3.1	3.3	6.4
Newton	473	472	945	403	16%	65	7.3	7.3	14.5
Noble	1243	1720	2963	417	30%	124	10.0	13.9	23.9
Ohio	266	203	469	87	83%	73	3.6	2.8	6.4
Orange	954	911	1865	408	74%	303	3.1	3.0	6.2
Owen	804	806	1610	387	73%	284	2.8	2.8	5.7
Parke	1031	1154	2185	450	45%	204	5.1	5.7	10.7
Perry	870	831	1701	386	83%	322	2.7	2.6	5.3
Pike	785	805	1590	341	55%	189	4.2	4.3	8.4
Porter	693	953	1646	522	24%	127	5.5	7.5	13.0
Posey	611	690	1301	419	23%	98	6.2	7.0	13.3
Pulaski	918	989	1907	434	15%	64	14.3	15.5	29.8
Putnam	1169	1034	2203	483	44%	210	5.6	4.9	10.5
Randolph	390	426	816	453	11%	48	8.1	8.9	17.0
Ripley	725	738	1463	448	56%	250	2.9	3.0	5.9
Rush	202	240	442	408	10%	42	4.8	5.7	10.5
Saint Joseph	608	713	1321	461	20%	94	6.5	7.6	14.1
Scott	340	409	749	193	63%	121	2.8	3.4	6.2
Shelby	278	267	545	412	13%	56	5.0	4.8	9.7
Spencer	572	620	1192	401	43%	174	3.3	3.6	6.9
Starke	712	879	1591	312	29%	90	7.9	9.8	17.7
Steuben	1490	1961	3451	322	41%	132	11.3	14.9	26.1
Sullivan	842	884	1726	454	37%	167	5.0	5.3	10.3
Switzerland	677	757	1434	224	84%	188	3.6	4.0	7.6
Tippecanoe	613	541	1154	503	19%	96	6.4	5.6	12.0
Tipton	114	83	197	260	4%	9	12.7	9.2	21.9
Union	258	328	586	165	27%	44	5.9	7.5	13.3
Vanderburgh	276	478	754	236	29%	69	4.0	6.9	10.9
Vermillion	492	504	996	260	32%	84	5.9	6.0	11.9
Vigo	802	668	1470	410	39%	158	5.1	4.2	9.3
Wabash	842	857	1699	421	20%	84	10.0	10.2	20.2
Warren	579	493	1072	366	21%	75	7.7	6.6	14.3
Warrick	683	639	1322	391	54%	213	3.2	3.0	6.2
Washington	1113	1165	2278	516	64%	332	3.4	3.5	6.9
Wayne	526	483	1009	404	26%	106	5.0	4.6	9.5
Wells	392	444	836	370	9%	33	11.9	13.5	25.3
White	521	571	1092	508	7%	35	14.9	16.3	31.2
Whitley	646	624	1270	338	19%	63	10.3	9.9	20.2

Harvest by County

The harvest by county is presented in Table 3-4. Harvest by county can vary widely. When thinking about the countywide harvest, it is important to consider the amount of deer cover present in a county (i.e., forested areas, land with dense bushes, woody wetlands, tallgrass prairies, etc.) as well as the distribution of that cover across the county. For instance, Benton County often has the lowest deer harvest per county while Steuben often has the highest harvest per county. However, when we look at harvest per square mile of deer cover, the harvest in these counties is far more similar (Table 3-4). The Indiana Deer Program defines deer cover based on the land cover types in the National Land Cover Dataset and includes deciduous forests, evergreen forests, mixed forests, shrub/scrub, grasslands, herbaceous wetlands, and woody wetlands. A deer's home range is the average area the deer travels within a year to find all the components necessary to live. Deer habitat would be land that includes these cover types plus an additional buffer around that land. So as a deer travels around the land, it has cover to provide security and a place to birth fawns, and it has areas for food and places to obtain water. This can shift throughout the year and over time and the land

changes in its yearly cycle or land use changes due to landowner's needs. Deer are an edge species, which means they thrive in areas where roads, fields, and the various cover types are interspersed within their home range. In counties with large swaths of uncut or uninterrupted forests, the land supports smaller deer populations per square mile of cover (such as Brown County) compared to counties that have less forests or cover but are more interspersed with other land uses such as farming (such as Steuben County). The resulting difference in deer density can lower the harvest per county or harvest per square mile of deer cover. So, when considering and evaluating the values presented in Table 3-4, it is important to understand the land use in that area and the arrangement of the elements (i.e., food, water, cover, etc.) in the deer's habitat.

Harvest per Hunter

Most hunters do not take advantage of the total number of deer that are available to be harvested. During the decision-making process for setting harvest bag limits for each county, this is considered. For example, during the past several deer seasons, the majority of hunters in Indiana harvested one deer and less than 1% statewide harvested more than four deer (Table 3-5).

Table 3-5. Number of deer harvested, and percentage harvested by individual successful hunters during the past five Indiana deer seasons. Reporting error rates: $\pm 0.28\%$ (2023), $\pm 0.26\%$ (2022), $\pm 0.23\%$ (2021), $\pm 0.26\%$ (2020), and $\pm 0.23\%$ (2019).

Number of Deer Harvested Per Hunter	2019 Hunters	2019 Percent of Total	2020 Hunters	2020 Percent of Total	2021 Hunters	2021 Percent of Total	2022 Hunters	2022 Percent of Total	2023 Hunters	2023 Percent of Total
1	58,173	70.83	61,439	70.05	60,488	73.13	61,804	70.83	62,000	71.41
2	17,605	21.43	18,919	21.57	16,531	19.99	18,618	21.34	17,905	20.62
3	4,779	5.82	5,536	6.31	4,469	5.40	5,323	6.10	5,182	5.97
4	1,056	1.29	1,198	1.37	825	1.00	1,008	1.16	1,134	1.31
5	339	0.41	388	0.44	252	0.30	322	0.37	394	0.45
6	109	0.13	136	0.16	85	0.10	111	0.13	114	0.13
7	39	0.05	59	0.07	34	0.04	36	0.04	58	0.07
8	22	0.03	21	0.02	13	0.02	20	0.02	17	0.02
9	5	0.01	8	0.01	6	0.01	7	0.01	8	0.01
10	3	0.00	5	0.01	2	0.00	1	0.00	4	0.00
11	2	0.00	1	0.00	2	0.00	1	0.00	2	0.00
12	1	0.00	0	0.00	0	0.00	0	0.00	1	0.00
13	0	0.00	0	0.00	0	0.00	1	0.00	0	0.00
14	1	0.00	0	0.00	0	0.00	0	0.00	2	0.00
15	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00
16	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
17	1	0.00	0	0.00	1	0.00	0	0.00	0	0.00
18	0	0.00	1	0.00	0	0.00	0	0.00	0	0.00

Harvest by Equipment Type

Eight types of equipment were legal for hunting deer during 2023, including archery (traditional and compound bows), crossbows, handguns, muzzleloaders, rifles, shotguns, air rifles, and air-launched arrows and bolts. However, we only have data for six types (Figure 3-4; Table 3-6): archery (traditional and com-

pound bows), crossbows, handguns, muzzleloaders, rifles, and shotguns. Air powered equipment was not included in the deer harvest system; therefore, we do not have statistics from the harvest report on that equipment use. Because that equipment is part of Firearms season, those numbers are included in the firearms category.

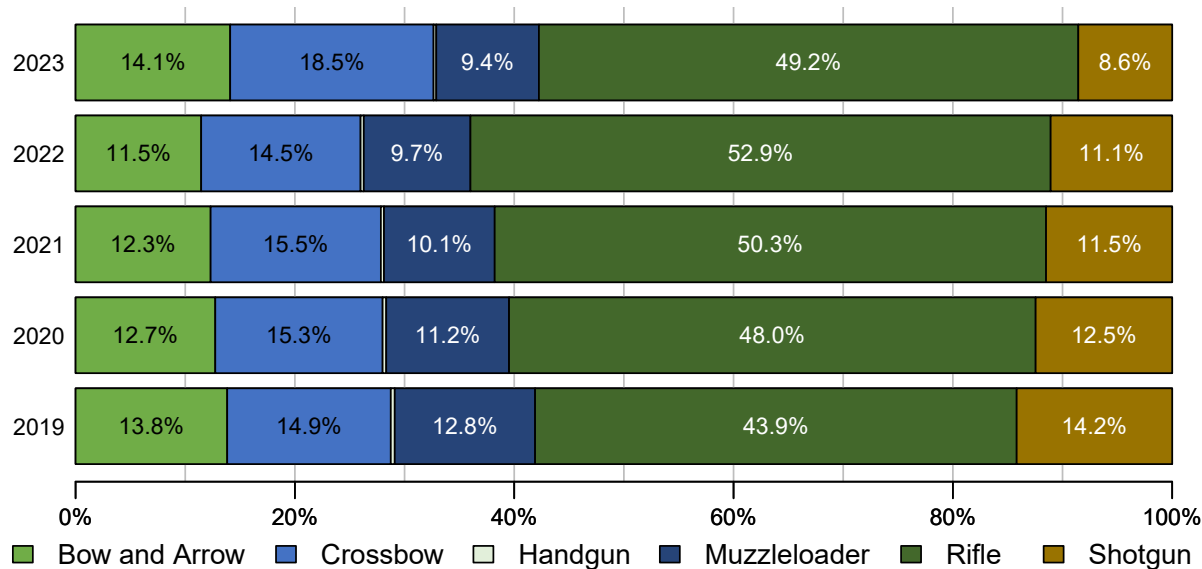


Figure 3-4. Percent harvest by equipment type, 2019-2023. Reporting error rates: $\pm 0.28\%$ (2023), $\pm 0.26\%$ (2022), $\pm 0.23\%$ (2021), $\pm 0.26\%$ (2020), and $\pm 0.23\%$ (2019).

Table 3-6. Number of deer harvested by type of legal hunting equipment across seasons, 2019-2023. Values within this table do not exactly equal those tallied by season (Figure 3-4) because multiple equipment types can be used during the Firearms season. Reporting error rates: $\pm 0.28\%$ (2023), $\pm 0.26\%$ (2022), $\pm 0.23\%$ (2021), $\pm 0.26\%$ (2020), and $\pm 0.23\%$ (2019).

Equipment	2019	2020	2021	2022	2023
Bow and Arrow	15,884 (13.8%)	15,819 (12.7%)	13,851 (12.3%)	13,957 (11.5%)	17,098 (14.1%)
Crossbow	17,136 (14.9%)	18,950 (15.3%)	17,462 (15.5%)	17,710 (14.5%)	22,490 (18.5%)
Handgun	415 (0.4%)	412 (0.3%)	322 (0.3%)	357 (0.3%)	298 (0.2%)
Muzzleloader	14,706 (12.8%)	13,906 (11.2%)	11,354 (10.1%)	11,853 (9.7%)	11,350 (9.4%)
Rifle	50,449 (43.9%)	59,630 (48.0%)	56,557 (50.3%)	64,471 (52.9%)	59,646 (49.2%)
Shotgun	16,292 (14.2%)	15,463 (12.5%)	12,935 (11.5%)	13,506 (11.1%)	10,381 (8.6%)

Harvest Age and Sex Structure

The age and sex structure of the 2023 deer harvest was 48.0% adult males, 44.0% adult females, and 8.0% male fawns (button bucks) (Table 3-7). Antlerless deer (does and button bucks) represent the highest proportion of the total deer harvest at 52.0% but dropped from an all-time high of 66% in 2012.

During opening weekend of Firearms season, DNR biologists have traditionally staffed check stations throughout the state to collect age-structure data and tissue samples for disease testing. Before the 2012 deer season, all deer had to be brought to a check station; therefore, age data collected during the opening weekend of Firearms season provided an unbiased method for determining the age structure of the harvest. All hunters had to check in deer online during the 2023 season; therefore, age estimates of adult deer, such as the proportion of yearling bucks in the harvest, became unreliable. Evaluation of the online check-in data for the opening weekend of Firearms season historically showed that hunters were more likely to report antlered bucks at check stations than online but were more likely to report button bucks online than at check stations, thus biasing estimates toward an older age structure than the actual harvest. Therefore, age class estimates of adult deer are unavailable until a valid, scientific method for correcting this bias is obtained.

Public Lands Harvest

A total of 9,698 deer were harvested on public lands in Indiana during the 2023-2024 season, which resulted in 8.0% of the total deer harvest. Public lands included state Fish & Wildlife areas (FWAs), state nature preserves, state parks, state forests, national wildlife refuges, national forests, conservation areas, and military lands (Tables 3-8, 3-9, 3-10, and 3-11).

Table 3-7. Number of deer harvested and percentage of total harvested by age and sex during the Indiana deer seasons from 1987-2023. Reporting error rate: $\pm 0.28\%$ (2023).

Year	Adult Males (%)	Adult Females (%)	Fawn Males (%)	Fawn Females (%)	Total
1987	29,530 (57%)	11,139 (21%)	6,164 (12%)	4,945 (10%)	51,778
1988	34,358 (57%)	13,170 (22%)	7,050 (12%)	5,656 (10%)	60,234
1989	40,503 (51%)	19,464 (24%)	10,737 (14%)	8,614 (11%)	79,318
1990	43,080 (48%)	23,680 (27%)	12,373 (14%)	9,630 (11%)	88,763
1991	41,593 (42%)	31,211 (32%)	14,626 (15%)	11,253 (11%)	98,683
1992	43,508 (46%)	25,387 (27%)	14,262 (15%)	12,157 (13%)	95,314
1993	44,424 (44%)	27,704 (27%)	14,751 (15%)	14,335 (14%)	101,214
1994	50,812 (45%)	32,466 (29%)	15,487 (14%)	13,651 (12%)	112,416
1995	47,098 (40%)	40,946 (35%)	16,398 (14%)	13,287 (11%)	117,729
1996	47,315 (38%)	39,913 (32%)	17,307 (14%)	18,551 (15%)	123,086
1997	42,537 (41%)	35,163 (34%)	14,039 (13%)	13,198 (12%)	104,937
1998	44,955 (45%)	30,711 (31%)	12,257 (12%)	12,538 (12%)	100,461
1999	46,371 (46%)	30,474 (31%)	11,645 (12%)	11,129 (11%)	99,618
2000	44,621 (45%)	31,986 (32%)	11,072 (11%)	11,046 (11%)	98,725
2001	48,357 (47%)	31,806 (31%)	11,230 (11%)	11,770 (11%)	103,163
2002	47,177 (45%)	35,357 (34%)	11,291 (11%)	10,603 (10%)	104,428
2003	49,533 (46%)	36,303 (34%)	10,262 (10%)	10,887 (10%)	106,986
2004	54,743 (44%)	41,749 (34%)	12,501 (10%)	14,065 (11%)	123,058
2005	52,488 (42%)	44,286 (35%)	13,030 (10%)	15,722 (13%)	125,526
2006	49,097 (39%)	45,257 (36%)	13,688 (11%)	17,339 (14%)	125,381
2007	49,375 (40%)	44,514 (36%)	13,313 (11%)	17,225 (14%)	124,427
2008	50,845 (39%)	46,666 (36%)	13,083 (11%)	19,154 (15%)	129,748
2009	52,878 (40%)	48,222 (36%)	13,040 (10%)	18,291 (14%)	132,431
2010	53,007 (40%)	49,911 (37%)	13,367 (10%)	17,719 (13%)	134,004
2011	50,717 (39%)	45,931 (36%)	13,058 (10%)	19,312 (15%)	129,018
2012	45,936 (34%)	54,983 (40%)	15,911 (12%)	19,418 (14%)	136,248
2013	46,240 (37%)	46,229 (37%)	14,100 (11%)	19,066 (15%)	125,635
2014	45,686 (38%)	46,760 (39%)	12,694 (11%)	14,933 (12%)	120,073
2015	51,075 (41%)	60,828 (49%)	12,765 (10%)	0	124,668
2016	51,646 (43%)	55,922 (47%)	11,774 (10%)	0	119,342
2017	44,884 (40%)	56,335 (50%)	12,167 (11%)	0	113,386
2018	47,256 (42%)	52,513 (47%)	11,483 (10%)	0	111,252
2019	51,646 (45%)	52,128 (45%)	11,108 (10%)	0	114,882
2020	55,446 (45%)	57,073 (46%)	11,661 (9%)	0	124,180
2021	53,751 (48%)	48,789 (43%)	9,941 (9%)	0	112,481
2022	58,552 (48%)	52,942 (43%)	10,360 (9%)	0	121,854
2023	58,220 (48%)	53,404 (44%)	9,639 (8%)	0	121,263

Table 3-8. Deer harvested during the 2023-2024 deer hunting season on public lands managed by Indiana DNR Division of Fish & Wildlife. Reporting error rate: $\pm 0.28\%$ (2023). For lands > 1 square mile, the harvest per square mile is reported.

Lands Managed by the Division of Fish & Wildlife	Antlered Deer Harvested	Button Bucks Harvested	Antlerless Deer Harvested	Total Deer Harvested	Square Miles of Property	Antlered Deer Harvested per Sq. Mile	Button Bucks Harvested per Sq. Mile	Antlerless Deer Harvested per Sq. Mile	Total Deer Harvested per Sq. Mile
FISH & WILDLIFE AREA	856	172	667	1,695	222.3	3.8	0.8	3.0	7.6
Atterbury	26	6	25	57	7.7	3.4	0.8	3.2	7.4
Blue Grass	7	1	3	11	4.0	1.8	0.3	0.8	2.8
Chinook	6	0	4	10	3.4	1.8	0.0	1.2	2.9
Crosley	22	3	4	29	6.7	3.3	0.4	0.6	4.3
Deer Creek	9	1	2	12	3.4	2.7	0.3	0.6	3.6
Fairbanks Landing	49	3	12	64	12.1	4.0	0.2	1.0	5.3
Glendale	27	10	47	84	12.9	2.1	0.8	3.6	6.5
Goose Pond	13	2	16	31	14.1	0.9	0.1	1.1	2.2
Hillenbrand	20	2	13	35	5.6	3.5	0.4	2.3	6.2
Hovey Lake	45	6	27	78	11.6	3.9	0.5	2.3	6.7
J.E. Roush Lake	57	21	46	124	13.4	4.2	1.6	3.4	9.2
Jasper Pulaski	69	9	40	118	12.8	5.4	0.7	3.1	9.2
Kankakee	11	1	9	21	7.0	1.6	0.1	1.3	3.0
Kankakee Sands (TNC)	25	3	9	37	13.1	1.9	0.2	0.7	2.8
Kingsbury	54	14	35	103	11.7	4.6	1.2	3.0	8.8
Lasalle	40	7	38	85	7.0	5.7	1.0	5.4	12.1
Pigeon River	143	47	156	346	18.4	7.8	2.6	8.5	18.8
Splinter Ridge	17	3	5	25	4.7	3.7	0.6	1.1	5.4
Stucker Fork	1	0	1	2	3.8	0.3	0.0	0.3	0.5
Sugar Ridge	42	2	29	73	13.0	3.2	0.2	2.2	5.6
Tri-County	28	9	31	68	5.6	5.0	1.6	5.6	12.2
Wabashiki	28	1	10	39	5.5	5.1	0.2	1.8	7.1
Wilbur Wright	5	1	7	13	1.7	3.0	0.6	4.1	7.7
Willow Slough	59	11	56	126	15.6	3.8	0.7	3.6	8.1
Winamac	53	9	42	104	7.6	7.0	1.2	5.5	13.7
CONSERVATION AREA	25	2	12	39	6.2	4.1	0.3	1.9	6.3
Sugar Creek	7	1	6	14	1.8	4.0	0.6	3.4	7.9
Wabash River	18	1	6	25	4.4	4.1	0.2	1.4	5.7
GAMEBIRD HABITAT AREA	7	3	2	12	2.3	3.1	1.3	0.9	5.2
Hufford	6	3	2	11	0.2				
Reynolds Creek	1	0	0	1	2.1	0.5	0.0	0.0	0.5
PUBLIC FISHING AREA	2	0	0	2	0.2				
Green Valley	2	0	0	2	0.2				
WETLAND CONSERVATION AREA	166	33	95	294	53.7	3.1	0.6	1.8	5.5
Aukiki	4	2	2	8	0.7				
Austin Bottoms	20	1	7	28	40.6	0.5	0.0	0.2	0.7
Barnes Seng	2	0	0	2	0.3				
Cedar Swamp	36	4	16	56	1.4	25.2	2.8	11.2	39.2
Curtis Lake	2	0	2	4	0.1				
Dick Blythe	4	0	0	4	0.3				
Durham Lake	8	0	6	14	0.8				
Fish Lake	2	2	2	6	0.4				
Galena	4	0	0	4	0.3				
Koontz Lake	2	0	0	2	0.1				
Lake Maxinkuckee	4	0	0	4	0.1				
Little Pigeon Creek	12	4	4	20	1.6	7.4	2.5	2.5	12.3
Lost Hill	2	0	0	2	0.6				
Mallard Roost	10	6	10	26	1.2	8.4	5.1	8.4	21.9
Manitou Lake Islands	0	4	0	4	0.3				
Marsh Lake	18	2	16	36	1.2	15.0	1.7	13.3	30.0
Menominee	18	2	14	34	1.5	12.0	1.3	9.4	22.7
Province Pond	2	2	0	4	0.3				
Rome City	4	0	2	6	0.1				
Swamper Bend	2	0	0	2	0.2				
Tern Bar Slough	8	4	10	22	1.3	6.1	3.0	7.6	16.8
Turkey Foot	0	0	2	2	0.2				
Whirlledge	2	0	2	4	0.1				
WILDLIFE MANAGEMENT AREA	40	9	26	75					
Ashcraft	0	1	0	1	0.1				
Driftwood	1	0	1	2					
Elk Creek	7	0	5	12					
Hindostan	2	0	1	3					
Horseshoe Bend	1	1	1	3					
Howat 80	1	0	0	1	0.1				
Huston Ditch	3	0	2	5					
Morgan Bluff	4	2	5	11	0.7				
Oak Grove	2	0	0	2	0.1				
Pisgah Marsh	1	0	0	1					
Randolph County	4	2	3	9	0.9				
Straight Line Slough	6	0	2	8					
White Oak	0	0	1	1					
White River Bend	8	3	5	16	1.1	7.2	2.7	4.5	14.4
RESOURCE AREA	5	1	0	6					
Deniston	5	1	0	6	0.6				

Table 3-9. Deer harvested during the 2023-2024 deer hunting season on public lands managed by Indiana DNR Division of State Parks. Deer harvested in state parks were taken during special state park management draw hunts. Reporting error rate: $\pm 0.28\%$ (2023).

Property	Antlered Deer Harvested	Button Bucks Harvested	Antlerless Deer Harvested	Total Deer Harvested	Approximate Square Miles of Property	Antlered Deer Harvested per Square Mile	Button Bucks Harvested per Square Mile	Antlerless Deer Harvested per Square Mile	Total Deer Harvested per Square Mile
STATE PARKS	488	181	564	1,233	57.0	8.6	3.2	9.9	21.6
Chain O'Lakes	26	19	46	91	4.2	6.1	4.5	10.8	21.4
Clifty Falls	13	0	12	25	2.4	5.5	0.0	5.1	10.5
Fort Harrison	15	9	22	46	2.7	5.6	3.4	8.3	17.3
Harmonie	54	20	53	127	5.4	10.0	3.7	9.8	23.5
Indiana Dunes	21	7	13	41	3.4	6.2	2.1	3.8	12.0
Lincoln	22	9	30	61	2.7	8.1	3.3	11.0	22.3
Ouabache	28	11	52	91	1.7	16.2	6.4	30.1	52.8
Prophetstown	18	5	13	36	3.1	5.8	1.6	4.2	11.5
Shades	50	17	44	111	4.8	10.4	3.5	9.1	23.0
Shakamak	13	5	16	34	4.3	3.0	1.2	3.7	7.9
Spring Mill	29	9	23	61	2.1	13.7	4.2	10.8	28.7
Tippecanoe River	62	19	69	150	4.3	14.4	4.4	16.0	34.8
Turkey Run	30	9	28	67	3.7	8.1	2.4	7.5	18.0
Versailles	92	25	111	228	9.4	9.8	2.7	11.9	24.4
Whitewater Memorial	15	17	32	64	2.7	5.6	6.4	12.0	24.0
NATURAL AREA	6	0	1	7	0.5	12.2	0.0	2.0	14.2
Cave River Valley	6	0	1	7	0.5	12.2	0.0	2.0	14.2
STATE RECREATION AREA	61	23	91	175	27.0	2.3	0.9	3.4	6.5
Deam Lake	6	2	4	12	2.0	3.0	1.0	2.0	5.9
Interlake	23	3	22	48	5.5	4.1	0.5	4.0	8.7
Lieber (Cagles Mill Lake)	18	5	18	41	12.6	1.4	0.4	1.4	3.2
Raccoon Lake	11	13	46	70	6.4	1.7	2.0	7.2	11.0
Starve Hollow	3	0	1	4	0.4	6.9	0.0	2.3	9.1

Table 3-10. Deer harvested during the 2023-2024 deer hunting season on public lands managed by Indiana DNR divisions of Forestry and Nature Preserves. Reporting error rate: $\pm 0.28\%$ (2023).

Property	Antlered Deer Harvested	Button Bucks Harvested	Antlerless Deer Harvested	Total Deer Harvested	Approximate Square Miles of Property	Antlered Deer Harvested per Square Mile	Button Bucks Harvested per Square Mile	Antlerless Deer Harvested per Square Mile	Total Deer Harvested per Square Mile
STATE FORESTS	533	103	483	1,119	238.9	2.2	0.4	2.0	4.7
Clark	50	7	43	100	40.0	1.3	0.2	1.1	2.5
Ferdinand	10	4	17	31	12.0	0.8	0.3	1.4	2.6
Frances Slocum	4	1	3	8	0.8	5.0	1.2	3.7	9.9
Greene-Sullivan	36	6	35	77	14.1	2.6	0.4	2.5	5.5
Harrison-Crawford	106	18	106	230	37.5	2.8	0.5	2.8	6.1
Jackson-Washington	69	14	65	148	28.1	2.5	0.5	2.3	5.3
Martin	46	11	53	110	11.0	4.2	1.0	4.8	10.0
Morgan-Monroe	73	17	59	149	38.3	1.9	0.4	1.5	3.9
Owen-Putnam	26	9	15	50	10.4	2.5	0.9	1.4	4.8
Pike	20	1	9	30	6.9	2.9	0.1	1.3	4.3
Salamonie River	16	2	9	27	1.5	10.7	1.3	6.0	18.1
Selmier	2	0	2	4	0.6	3.6	0.0	3.6	7.2
Yellowwood	75	13	67	155	37.8	2.0	0.3	1.8	4.1
NATURE PRESERVES	33	7	23	63	3.8	8.6	1.8	6.0	16.5
Beaver Lake	6	1	1	8	0.3	18.7	3.1	3.1	25.0
Bob Kern	3	1	0	4	0.5	6.4	2.1	0.0	8.5
Conrad Savanna	8	1	3	12	0.6	12.6	1.6	4.7	19.0
Hoosier Prairie	2	3	7	12	0.7	3.0	4.5	10.4	17.9
Judy Burton	2	0	2	4	0.2	9.8	0.0	9.8	19.7
Round Lake Wetland	1	0	0	1	0.2	4.6	0.0	0.0	4.6
Section Six Southern Flatwoods	3	1	5	9	0.6	4.8	1.6	8.0	14.3
Wabash Lowlands	8	0	5	13	0.7	11.9	0.0	7.4	19.3

Table 3-11. Deer harvested during the 2023-2024 deer hunting season on public lands managed by federal agencies. Special draw hunts were held on the military lands and national wildlife refuge properties. Reporting error rate: $\pm 0.28\%$ (2023).

Property	Antlered Deer Harvested	Button Bucks Harvested	Antlerless Deer Harvested	Total Deer Harvested	Approximate Square Miles of Property	Antlered Deer Harvested per Square Mile	Button Bucks Harvested per Square Mile	Antlerless Deer Harvested per Square Mile	Total Deer Harvested per Square Mile
MILITARY LANDS	253	35	227	515	153.0	1.7	0.2	1.5	3.4
Atterbury JMTC	109	18	139	266	52.3	2.1	0.3	2.7	5.1
Crane NSA	144	17	88	249	100.7	1.4	0.2	0.9	2.5
NATIONAL FORESTS	612	112	515	1,239	319.2	1.9	0.4	1.6	3.9
Hooiser	612	112	515	1,239	319.2	1.9	0.4	1.6	3.9
NATIONAL WILDLIFE REFUGE	263	38	214	515	127.6	2.1	0.3	1.7	4.0
Big Oaks	212	28	167	407	78.1	2.7	0.4	2.1	5.2
Muscatatuck	17	1	12	30	12.1	1.4	0.1	1.0	2.5
Patoka River	34	9	35	78	37.4	0.9	0.2	0.9	2.1

Deer Reduction Zones Harvest

Indiana Deer Reduction Zones (DRZs) are designated to target areas within the state that have high deer populations coupled with high human density, where the cultural carrying capacity has been exceeded due to concerns over local ecology, deer-vehicle collisions, or the amount of damage to personal property. DRZs aim to reduce deer-human conflict in these areas rather than to eliminate the deer population. Hunters may harvest up to 10 deer in the DRZs, 10 antlerless deer, or nine antlerless deer and one antlered deer after first harvesting an antlerless deer (i.e., earn-a-buck). An interactive map of the current DRZs

along with information and a video about how DRZs are developed can be found at on.in.gov/deer-reduction.

Approximately 5,397 deer were harvested in DRZs and applied toward the DRZ bag limits in 2023 (Tables 3-12 and 3-13), which accounted for 4.8% of the total 2023-2024 harvest. These deer were harvested within a DRZ county using a valid license type for DRZs (DRZ license, lifetime license, youth license, or landowner or military exemptions) and were marked that they applied to the “zone bag limit” in the CheckIN Game system. Deer harvested on any other license type within the boundaries of a DRZ counted toward the statewide bag limit.

Table 3-12. Number of antlered, antlerless, and total deer harvested within Deer Reduction Zones in 2021, 2022, and 2023. Reporting error rates: $\pm 0.28\%$ (2023), $\pm 0.26\%$ (2022), and $\pm 0.23\%$ (2021).

County	2021 Antlered	2021 Antlerless	2021 Total	2022 Antlered	2022 Antlerless	2022 Total	2023 Antlered	2023 Antlerless	2023 Total
Allen	85	387	472	97	409	506	121	441	562
Boone	4	14	18	5	18	23	5	18	23
Brown	14	73	87	14	97	111	15	101	116
Dearborn	45	171	216	30	153	183	20	157	177
Dekalb	17	72	89	28	84	112	24	101	125
Delaware	8	38	46	13	48	61	12	48	60
Elkhart	20	91	111	26	103	129	25	125	150
Fulton	7	37	44	6	46	52	6	40	46
Hamilton	38	137	175	33	152	185	43	131	174
Hendricks	10	43	53	13	56	69	20	43	63
Johnson	3	23	26	4	21	25	11	30	41
Kosciusko	28	171	199	46	203	249	39	198	237
Lagrange	29	153	182	32	174	206	39	210	249
Lake	106	495	601	122	530	652	142	537	679
Laporte	49	201	250	60	222	282	54	255	309
Madison	3	15	18	2	23	25	3	21	24
Marion	60	214	274	65	244	309	62	217	279
Monroe	19	45	64	12	60	72	13	46	59
Morgan	29	147	176	35	124	159	34	136	170
Porter	109	576	685	125	568	693	139	624	763
Saint Joseph	21	142	163	36	155	191	37	140	177
Steuben	41	203	244	53	237	290	49	253	302
Tippecanoe	8	65	73	20	83	103	20	58	78
Vanderburgh	49	282	331	60	274	334	71	322	393
Wabash	6	34	40	12	40	52	16	40	56
Warrick	14	43	57	14	48	62	16	69	85
Total	822	3,872	4,694	963	4,172	5,135	1,036	4,361	5,397
Percent Of Statewide Harvest Totals	1.6%	6.1%	4.1%	1.7%	6.1%	4.1%	1.9%	7.4%	4.8%

Table 3-13. Percentage of each Deer Reduction Zone (DRZ) county's total deer harvest that was counted as deer harvested in the DRZ in 2023. DRZ deer were defined as deer harvested within a DRZ county using a valid license type (DRZ license, lifetime license, youth license, or landowner or military exemptions) and indicated as counting toward the zone bag limit in the CheckIN Game system. Reporting error rate: $\pm 0.28\%$ (2023).

County	2023 Total DRZ Deer Harvest	2023 DRZ Antlered Harvest	2023 DRZ Antlerless Harvest	2023 Total County Harvest	% of total county harvest from DRZ	% of County Antlered Harvest from DRZ	% of County Antlerless Harvest from DRZ	DRZ size (sq. mile)	Total DRZ Harvest per square mile
Allen	562	121	441	2,022	27.8%	13.6%	39.0%	258.4	2.2
Boone	23	5	18	469	4.9%	2.0%	8.5%	24.4	0.9
Brown	116	15	101	1,343	8.6%	2.5%	13.7%	21.6	5.4
Dearborn	177	20	157	1,726	10.3%	2.5%	17.2%	32.1	5.5
Dekalb	125	24	101	2,401	5.2%	2.1%	8.1%	18.7	6.7
Delaware	60	12	48	885	6.8%	2.5%	11.6%	61.5	1.0
Elkhart	150	25	125	1,899	7.9%	2.9%	11.9%	74.9	2.0
Fulton	46	6	40	1,490	3.1%	0.9%	4.9%	8.3	5.5
Hamilton	174	43	131	565	30.8%	15.6%	45.3%	202.4	0.9
Hendricks	63	20	43	712	8.8%	4.8%	14.4%	70.1	0.9
Johnson	41	11	30	624	6.6%	3.5%	9.7%	57.7	0.7
Kosciusko	237	39	198	2,639	9.0%	3.2%	14.0%	57.4	4.1
Lagrange	249	39	210	2,952	8.4%	3.4%	11.6%	28.5	8.7
Lake	679	142	537	1,459	46.5%	23.1%	63.6%	360.4	1.9
Laporte	309	54	255	1,986	15.6%	6.0%	23.5%	99.6	3.1
Madison	24	3	21	629	3.8%	0.9%	7.0%	18.2	1.3
Marion	279	62	217	443	63.0%	39.5%	75.9%	402.6	0.7
Monroe	59	13	46	1,457	4.0%	1.9%	5.9%	10.9	5.4
Morgan	170	34	136	1,387	12.3%	5.1%	19.0%	77.8	2.2
Porter	763	139	624	1,646	46.4%	20.1%	65.5%	254.1	3.0
Saint Joseph	177	37	140	1,429	12.4%	6.1%	19.6%	131.1	1.4
Steuben	302	49	253	3,451	8.8%	3.3%	12.9%	35.4	8.5
Tippecanoe	78	20	58	1,154	6.8%	3.3%	10.7%	73.9	1.1
Vanderburgh	393	71	322	754	52.1%	25.7%	67.4%	135.5	2.9
Wabash	56	16	40	1,699	3.3%	1.9%	4.7%	8.1	6.9
Warrick	85	16	69	1,322	6.4%	2.3%	10.8%	49.2	1.7

Harvest by License Status

In 2023, 121,263 deer were harvested. Resident hunters harvested 95.5% of the total deer harvested in Indiana in 2023, while nonresidents harvested 4.5% of the total (Table 3-14). Annual license holders (license types purchased every year) harvested 62.4% of the

total deer. Lifetime license holders harvested 14.7%, and landowner-exempt hunters (landowners and lessees who hunted on their own land without a license) harvested 11.4% of deer in 2023. A large proportion of deer were harvested using a deer bundle license (43.3% resident deer bundle, 1.5% nonresident deer bundle).

Table 3-14. Number of deer harvested by resident and nonresident license types during the 2023 deer hunting season. Reporting error rate: $\pm 0.28\%$ (2023).

License Type	Resident Harvest	Non-Resident Harvest	Total	% Resident Harvest	% Non-Resident Harvest
Bonus Antlerless	3,065	176	3,241	2.5%	0.2%
Deer Archery	2,459	638	3,097	2.0%	0.5%
Deer Bundle	52,530	1,763	54,293	43.3%	1.5%
Deer Crossbow	2,294	452	2,746	1.9%	0.4%
Deer Firearm	6,280	1,555	7,835	5.2%	1.3%
Deer Military/Refuge	496	15	511	0.4%	0.0%
Deer Muzzleloader	505	70	575	0.4%	0.1%
Deer Reduction Zone	3,269	53	3,322	2.7%	0.0%
Early State Park Reduction	977	0	977	0.8%	0.0%
Landowner Exemption	13,766	269	14,035	11.4%	0.2%
Late State Park Reduction	283	1	284	0.2%	0.0%
Lifetime License	17,854	347	18,201	14.7%	0.3%
Military Exempt - IC 14-22-11-11	72	1	73	0.1%	0.0%
Youth Free Hunt Days	211	3	214	0.2%	0.0%
Youth Hunt/Trap	11,751	108	11,859	9.7%	0.1%
Total	115,812	5,451	121,263	95.5%	4.5%

Deer License Sales

The number of annual deer licenses sold in 2023 was 154,005 (excluding resident youth licenses) (Table 3-15). The number of privileges sold using annual licenses (number of deer legally allowed to be harvest-

ed, excluding those harvested by youth) was 310,957. Each deer license bundle included three deer privileges. These licenses figures do not include privileges used by landowners with exemptions or those individuals with lifetime licenses.

Table 3-15. Deer license sales in Indiana by license type, 2015-2023. Total license sale numbers are subject to change slightly as refunds or voids are made.

License Type	2015	2016	2017	2018	2019	2020	2021	2022	2023
Resident Deer License Bundle	65,604	68,997	67,731	67,963	69,683	79,881	80,974	73,330	76,449
Resident Archery/ Crossbow/Reduction Zone	29,258	24,796	25,044	24,794	24,512	25,380	22,801	24,134	25,933
Resident Firearm	43,991	40,577	37,254	34,575	29,627	26,671	24,265	26,177	26,279
Resident Muzzleloader	6,088	4,669	4,376	3,898	3,607	3,715	2,902	2,759	2,608
Resident Military/Refuge	1,277	1,343	1,355	1,611	1,613	1,081	1,504	1,514	1,757
Resident Bonus Antlerless	21,088	18,065	16,188	13,866	15,149	14,378	11,267	10,053	9,972
Nonresident	10,165	10,493	10,796	10,773	10,989	11,781	12,380	10,652	11,007
Youth	34,529	33,900	31,378	29,273	28,073	31,285	30,276	29,166	60,535
Total Licenses (Excluding Resident Youth)	177,471	168,940	162,744	157,480	155,180	162,887	156,093	148,619	154,005
Total Privileges (Excluding Resident Youth)	314,519	313,458	304,724	299,660	301,256	330,745	326,931	299,577	310,957

County Bonus Antlerless Quotas and Deer Population Indices

In 2016, the management goals of Indiana DNR shifted from that of general herd reduction to evaluating each county's deer population and incorporating the input of the public for maintaining the population, increasing the population, or lowering the population. This approach integrated with strategic harvest in Deer Reduction Zones (DRZ) has been adopted to provide a healthy deer population across the state while addressing human safety concerns along roadways that have historically experienced high levels of deer-vehicle collisions (DVC). County bonus antlerless quotas (CB-AQs) should be maintained at current levels if harvest remains steady unless population indices indicate that adjustments are necessary to increase or reduce local deer harvest in a county.

Deer Population Indices

Population indices are used in areas where deer population data is not available. A population index goes up or down in relation to the deer population density; however, it does not provide an estimate of the deer density. In general, these indices only provide a general idea of whether the population is stable, increasing, or decreasing. Every year, the Indiana DNR Deer Program, private lands biologists, and conservation officers work collectively to analyze trends in deer population and public opinion indices to determine whether CBAQs should be adjusted. The following population and public opinion indices are gathered through the Deer Management Survey (see [Chapter 7](#)), harvest reports, and public comment and are used in CBAQ evaluations: annual deer harvest, hunter success rate, hunter effort, Archer's Index deer observations, DVC rates, public opinion on deer population size, and public desire for changes in populations. Because these data sources are not true measurements but rather indices of the deer population, trends in these data over time are weighed and collectively inform the final decision of Indiana DNR when setting CBAQs for the fall deer season.

County Population Data

Since 2017, Indiana DNR has worked with Purdue University to develop cost effective methods for estimating deer density throughout the state. Indiana DNR has chosen a combination of methods, including a combination of drones and game cameras using distance sampling on Division of Fish & Wildlife's wildlife

management areas, game cameras on select private land (with permission), and crewed aircraft surveys using paired infrared and video cameras over the majority of Indiana's private lands (see [Chapter 9](#)). This population data is used with data on the recruitment rate of deer, harvest rates, other mortality rates (i.e., estimated deer-vehicle collisions and disease mortality), and the public opinion data collected through the Deer Management Survey (see [Chapter 7](#)) to determine the current population density, the current percentage of the deer population that is being used, trends in harvest rates by hunters, the current trend in the deer herd, and the public's desires to see the population increase, decrease, or remain stable.

County Bonus Antlerless Quotas 2023-2024.

After reviewing deer population and public opinion indices, the following changes will be made to CBAQs for the 2023-2024 deer hunting season (Table 3-16 and Figure 3-5):

- Increase most of the southern counties back to quota of 3 after a recovery period from the 2019 EHD outbreak and based on new estimates of deer density.
- Increase LaGrange, Steuben, Saint Joseph and Noble counties to a quota of 3 based on new estimates of deer density.
- Quota of 1 for Wayne, Union, Ripley, Dearborn, Ohio, and Henry counties based on the 2022 EHD outbreak.
- Reduce the quota in Fayette and Franklin to a zero (0) based on the 2022 EHD outbreak.

Southern Indiana – The deer herd likely recovered to population sizes similar to the period prior to the 2019 EHD outbreak. Population data collected from 2018-2021 suggests that 18% of the deer are currently being used on an annual basis, ranging from 5% (Floyd) to 23% (Orange). This means there is room for additional harvest (35% of the population can be harvested while maintaining a stable population). While we do not have population data for the counties in the Wabash DMU (Vermillion, Parke, Putnam, Clay, Vigo, and Sullivan), these counties were lowered in 2019 because of EHD, and these counties have usually been in sync with the southern Indiana counties. Therefore, we suggested increasing the allowable take by an additional antlerless deer per hunter.

Table 3-16. Indiana County Bonus Antlerless Quotas (CBAQ), 2017-2023. In some years, quotas were lowered in response to an epizootic hemorrhagic disease (EHD) outbreak, and this is represented by the preEHD column for the originally established CBAQ and EHDChg to represent the change in CBAQ due to EHD.

County	2017	2018	2019 preEHD	2019 EHDChg	2020	2021	2022 preEHD	2022 EHDChg	2023
Adams	2	1	1	1	1	1	1	1	1
Allen	3	2	2	2	2	2	2	2	2
Bartholomew	4	4	2	2	2	2	2	2	2
Benton	A	A	A	A	A	A	1	1	1
Blackford	1	1	1	1	1	1	1	1	1
Boone	4	2	2	2	2	2	2	2	2
Brown	4	4	4	2	3	3	2	2	3
Carroll	2	2	2	2	2	2	2	2	2
Cass	2	2	2	2	2	2	2	2	2
Clark	4	8	4	2	2	2	2	2	3
Clay	4	3	3	2	2	2	2	2	3
Clinton	2	2	2	2	2	2	2	2	2
Crawford	8	4	4	2	2	2	2	2	3
Daviess	1	1	1	1	2	2	2	2	2
Dearborn	4	4	3	2	2	2	2	2	1
Decatur	3	3	2	2	2	2	2	2	2
Dekalb	3	2	2	2	2	2	2	2	2
Delaware	4	2	2	2	2	2	2	2	2
Dubois	3	3	2	2	2	2	2	2	2
Elkhart	4	3	2	2	2	2	2	2	2
Fayette	4	3	2	2	2	2	2	1	0
Floyd	8	8	4	2	2	2	2	2	3
Fountain	4	2	2	2	2	2	2	2	2
Franklin	8	4	4	2	3	2	2	1	0
Fulton	3	2	2	2	2	2	2	2	2
Gibson	3	2	2	2	2	2	2	2	2
Grant	4	2	2	2	2	2	2	2	2
Greene	4	4	4	2	2	2	2	2	3
Hamilton	4	2	2	2	2	2	2	2	2
Hancock	3	1	1	1	1	1	2	2	2
Harrison	8	8	4	2	2	2	2	2	3
Hendricks	8	3	2	2	2	2	2	2	2
Henry	4	2	2	2	2	2	2	2	1
Howard	2	2	2	2	2	2	2	2	2
Huntington	2	2	2	2	2	2	2	2	2
Jackson	4	4	4	2	3	3	2	2	3
Jasper	4	3	2	2	2	2	2	2	2
Jay	1	1	1	1	1	1	1	1	1
Jefferson	8	4	4	2	2	2	2	2	3
Jennings	8	4	4	2	2	2	2	2	2
Johnson	8	3	2	2	2	2	2	2	2
Knox	4	2	2	2	2	2	2	2	2
Kosciusko	4	3	2	2	2	2	2	2	2
Lagrange	2	1	1	1	1	2	2	2	3
Lake	4	3	2	2	2	2	2	2	2

Table 3-16 cont.

County	2017	2018	2019 preEHD	2019 EHDChg	2020	2021	2022 preEHD	2022 EHDChg	2023
LaPorte	4	3	2	2	2	2	2	2	2
Lawrence	8	4	4	2	3	3	2	2	3
Madison	3	2	2	2	2	2	2	2	2
Marion	8	3	2	2	2	2	2	2	2
Marshall	2	2	2	2	2	2	2	2	2
Martin	4	4	4	2	3	3	2	2	3
Miami	2	2	2	2	2	2	2	2	2
Monroe	8	4	4	2	3	3	2	2	3
Montgomery	4	2	2	2	2	2	2	2	2
Morgan	3	3	3	2	3	3	2	2	3
Newton	2	2	2	2	2	2	2	2	2
Noble	3	3	2	2	2	2	2	2	3
Ohio	4	3	2	2	2	2	2	2	1
Orange	4	4	4	2	3	3	2	2	3
Owen	4	4	4	2	2	2	2	2	3
Parke	8	4	3	2	2	2	2	2	3
Perry	4	4	4	2	2	2	2	2	3
Pike	2	2	2	2	2	2	2	2	2
Porter	4	3	2	2	2	2	2	2	2
Posey	1	1	1	1	2	2	2	2	2
Pulaski	4	3	2	2	2	2	2	2	2
Putnam	4	4	3	2	2	2	2	2	3
Randolph	2	1	1	1	1	1	2	2	2
Ripley	8	4	4	2	3	2	2	2	1
Rush	2	1	1	1	1	1	2	2	2
Saint Joseph	4	3	2	2	2	2	2	2	3
Scott	4	4	4	2	2	2	2	2	2
Shelby	3	2	2	2	2	2	2	2	2
Spencer	3	3	2	2	2	2	2	2	2
Starke	4	3	2	2	2	2	2	2	2
Steuben	2	1	1	1	1	2	2	2	3
Sullivan	3	3	3	2	2	2	2	2	3
Switzerland	4	3	2	2	2	2	2	2	2
Tippecanoe	3	2	2	2	2	2	2	2	2
Tipton	A	A	A	A	A	A	1	1	1
Union	3	2	2	2	2	2	2	1	1
Vanderburgh	4	2	2	2	2	2	2	2	2
Vermillion	4	4	3	2	2	2	2	2	3
Vigo	4	3	3	2	2	2	2	2	3
Wabash	2	2	2	2	2	2	2	2	2
Warren	3	2	2	2	2	2	2	2	2
Warrick	2	2	2	2	2	2	2	2	2
Washington	8	4	4	2	2	2	2	2	3
Wayne	3	3	2	2	2	2	2	1	1
Wells	A	A	A	A	1	1	1	1	1
White	4	3	2	2	2	2	2	2	2
Whitley	1	1	1	1	1	1	2	2	2

2023-2024 County Bonus Antlerless Quotas

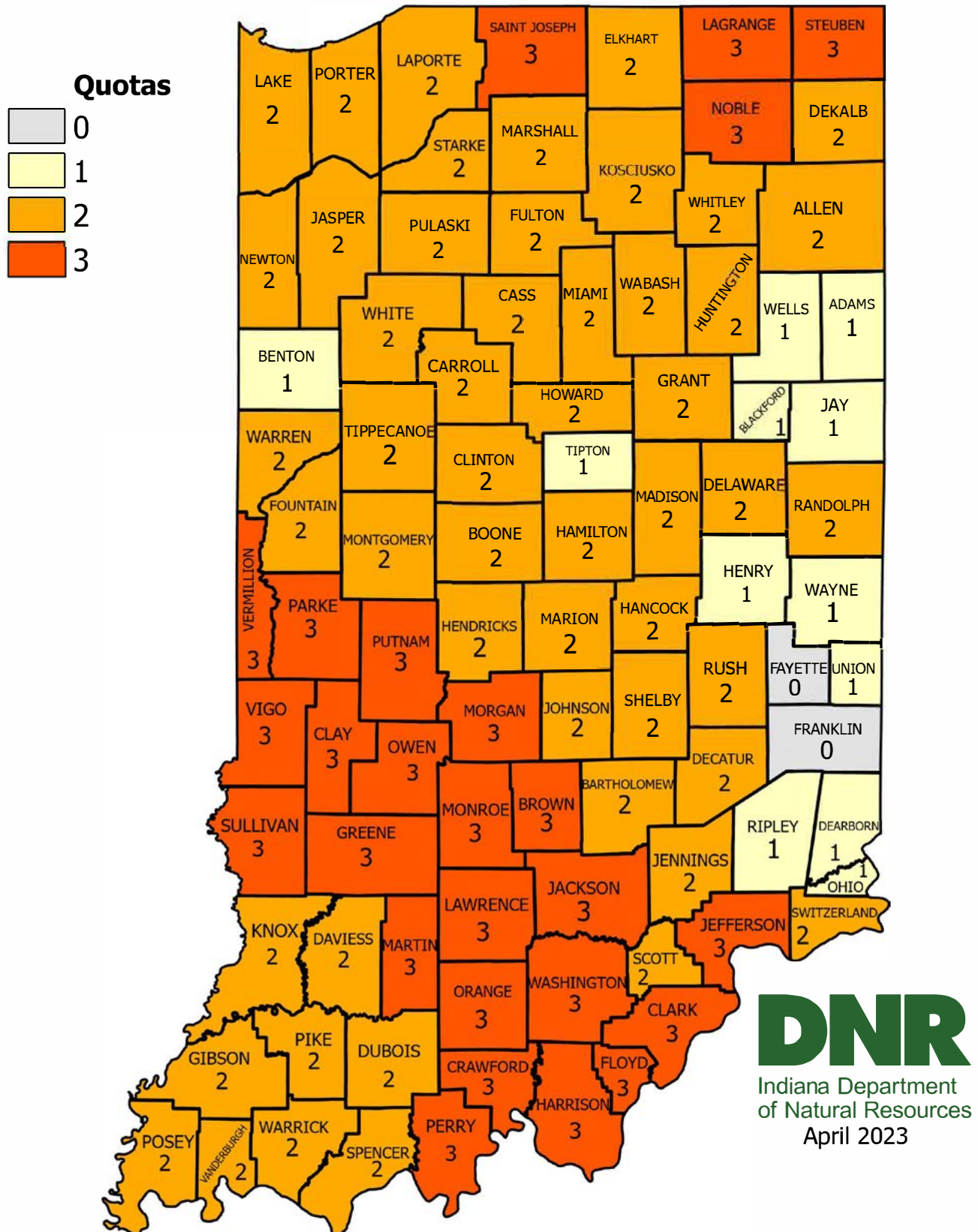


Figure 3-5. The County Bonus Antlerless Quotas for the 2023-2024 Indiana deer hunting season.

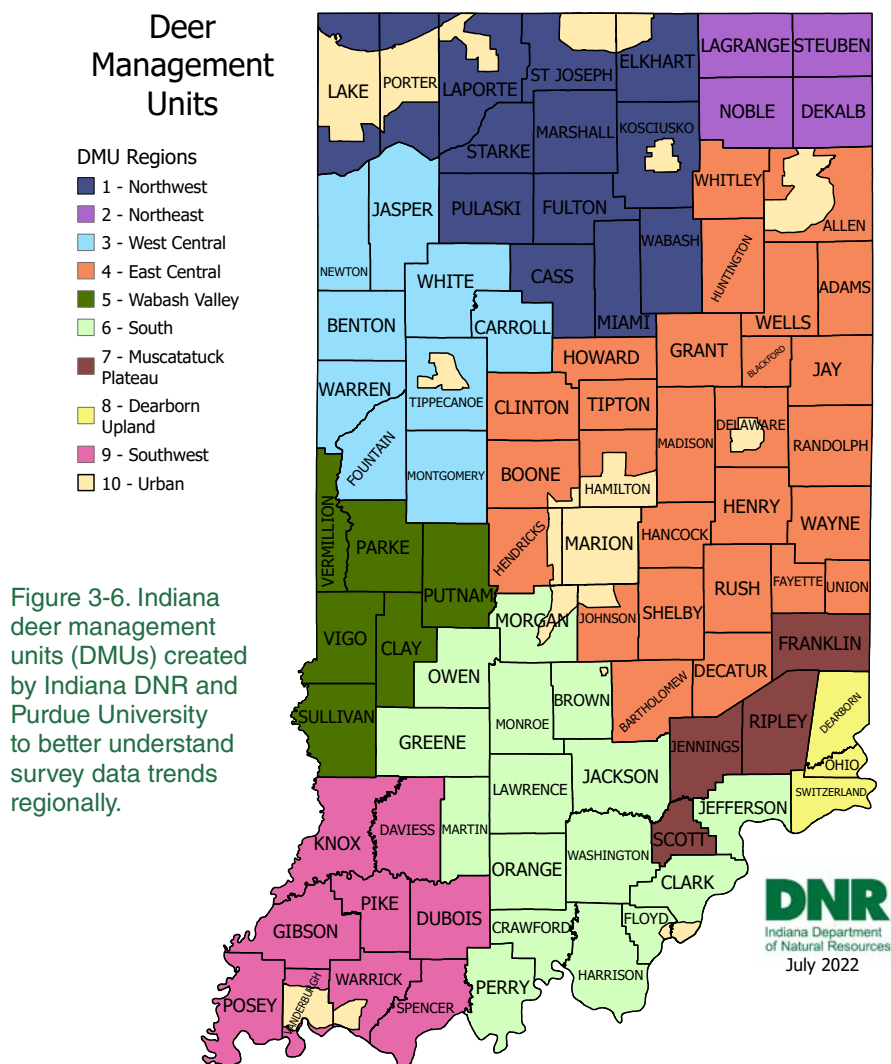
LaGrange, Steuben, Saint Joseph, and Noble Counties – These counties have some of the highest deer densities in the state. Population data collected from 2018-2021 suggests that only 19% of the available deer are harvested annually, with a range of 4% at the lowest (Saint Joseph) to 26% at the highest (Noble). This means there is room for additional harvest (35% of the population can be harvested while maintaining a stable population). Therefore, we recommended increasing the allowable take by an additional antlerless deer per hunter.

Wayne, Fayette, Union, Franklin, Henry, Ripley, Dearborn, and Ohio – These counties experienced a significant EHD event in 2022. Quotas in Wayne, Fayette, Union, and Franklin were reduced to a quota of 1 in 2022 because these areas showed a significant EHD event prior to Aug. 31. But Henry, Ripley, Dearborn, and Ohio also had significant EHD mortality after these

other counties. Therefore, we recommended that quotas in Wayne and Union remain at 1 and Henry, Ripley, Dearborn, and Ohio be lowered to 1. We recommended that Franklin and Fayette be reduced to a quota of zero (0) to allow the population the ability to recover from the EHD mortality event.

DMU Summaries

Indiana DNR analyzes deer data on a regional scale based on Deer Management Units (DMUs; Figure 3-6). DMUs are defined groupings of counties based on similar characteristics such as habitat, hunter density, and urban development. Trends in a DMU's indices influence the CBAQs for the counties within it. DMU-specific data is available in Appendix A: DMU Deer Data Sheets 2023. County-specific data referenced below is available on the new Indiana DNR Deer Data Dashboard at www.in.gov/dnr/fish-and-wildlife/wildlife-resources/animals/white-tailed-deer/county-data/





DNR file photo

Hunter Success and Hunters Afield

The number of Indiana deer hunting licenses sold each year represents the number of licensed hunters afield during the hunting season, but that number does not include all hunters attempting to harvest a deer in a given year. A portion of Indiana hunters have a lifetime license, which requires no annual purchase. These hunters are not tracked in yearly license sales data, and a hunter with a lifetime license is not necessarily still an active hunter. Indiana also allows for license exemptions for landowners and active military members who are not tracked in the license sales data. Lifetime license holders accounted for 16% of the deer harvest in 2023. More than 11% of deer were harvested by landowners or military-exempt hunters in 2023. Estimating the total number of hunters afield sheds light on how many hunters are using the resource and how they are using it (i.e., license or exemption type).

Indiana DNR defines a successful hunter as an individual who harvests at least one deer during the hunting season, regardless of how many deer the hunter attempted to harvest. Hunter success can be

calculated using license sales and harvest data: hunters who attempted to harvest a deer (i.e., hunters who purchased a license) compared to hunters who actually harvested a deer (i.e., hunters who bought a license and checked in a deer on that license). However, not every hunter is required to purchase an annual hunting license (e.g., lifetime license holders and landowner and military-exempt hunters), so with this method, success rates for lifetime and exempt license holders is assumed to be the same as those for annual licensed hunters. This calculation is not applicable at the county level because deer are not always harvested in the same county where a license was purchased.

Hunter success can also be calculated from hunter survey responses. During multiple years of the annual Deer Management Survey (DMS), hunters were asked to report the number of deer they wanted to harvest, the number of deer they harvested, and the license or exemption used to harvest the deer. This information allows us to calculate hunter success in a similar way to using the license sales and harvest data: the number of hunters who attempted to harvest a deer compared

to the number of those hunters who harvested a deer. Since the DMS was available for all hunters with a valid email address in the Indiana DNR system, this calculation captures all hunters regardless of license type or exemption, providing an accounting of success rates for lifetime license holders, landowners, and military-exempt hunters.

Hunter success rates themselves are an index that may indicate the relative herd size in an area (Roseberry and Woolf 1991). For example, a comparably high hunter success rate over time may mean it is becoming easier to harvest a deer because the deer population is increasing, while a low hunter success rate over time may mean it is becoming more difficult to harvest a deer because the deer population is decreasing in that area. These comparisons are useful for determining how the deer population is fluctuating over time in an area, which then helps set hunting quotas and regulations.

For the 2023-2024 hunting season, license sales, the deer management survey, and harvest data were used to estimate hunter success. We estimated success rates for all non-youth resident and nonresident annual license holders in our database for each deer season from 2015 to 2023. It was not possible to calculate youth success rates using the same methodology because youth licenses are not specific to deer. Success was defined as harvesting and checking in at least one deer during the 2023-2024 deer season using the same customer ID number that was used to purchase an annual deer license. To calculate success rate, we divided the number of successful hunters in each category by the total number of hunters in that category.

Resident License Success Rate (SRLR)=The number of non-youth hunters who purchased a resident annual deer license and checked in a deer using the same CID number/The total number of non-youth hunters who purchased a resident annual deer license

Nonresident License Success Rate (SRLNR)= The number of non-youth hunters who purchased a nonresident annual deer license and checked in a deer using the same CID number/The total number of non-youth hunters who purchased a nonresident annual deer license

Using the deer management survey, we estimated success rates for all non-youth resident and nonresident annual license holders, lifetime license holders, and license-exempt hunters who participated in the annual deer management survey for each deer season

from 2017 to 2023. Although hunters can hunt using multiple license types per season, we categorized them into a single category to avoid double counting. Any hunter who purchased an annual license was categorized as an annual license holder. Any hunter who hunted using a lifetime license and did not buy an annual license was categorized as a lifetime license holder. Any hunter who hunted using a license exemption and did not purchase an annual license or hunt on a lifetime license was categorized as license exempt. Like the license success rate, the survey success rate was calculated as the number of successful hunters in each category divided by the total number of hunters in that category.

Resident Survey Success Rate (SRSR)= The number of non-youth hunters who reported purchasing a resident annual deer license and checked in a deer under the resident annual license category/The total number of non-youth hunters who reported purchasing a resident annual deer license

Nonresident Survey Success Rate (SRSN)= The number of non-youth hunters who reported purchasing a nonresident annual deer license and checked in a deer under the nonresident annual license category/The total number of non-youth hunters who reported purchasing a nonresident annual deer license

Lifetime Survey Success Rate (SRSL)= The number of non-youth hunters who reported hunting using a lifetime license and checked in a deer under the lifetime license category/The total number of non-youth hunters who reported hunting using a lifetime license

Exemption Survey Success Rate (SRSE)= The number of non-youth hunters who reported hunting using a license exemption and checked in a deer under a license exemption category/The total number of non-youth hunters who reported hunting using a license exemption

We used harvest data and license success rates to calculate the number of hunters afield for each deer season from 2015 to 2023. For each year, we queried the number of unique hunters who checked in a deer under the following categories: resident annual license, nonresident annual license, lifetime license, landowner exemption, and military exemption. As with the deer management survey success rate calculation, hunters were exclusively assigned to a single category to avoid overestimating the number of hunters afield. To calculate the number of hunters afield, we divided the num-

ber of unique hunters in each category by the license success rate and summed the category estimates. We used the license success rates to estimate hunters afield, because survey responses appear to be biased toward successful hunters.

$$\text{Hunters Afield} = (HCD_{RAL}/SRL_R) + (HCD_{NAL}/SRL_N) + (HCD_{LL}/SRL_R) + (HCD_{LO}/SRL_R) + (HCD_{LO}/SRL_R) + (HCD_{ME}/SRL_R) + (HCD_Y/SRL_R)$$

Where,

HCD_{RAL} = Adult hunters who checked in a deer and purchased a resident annual deer hunting license

HCD_{NAL} = Adult hunters who checked in a deer and purchased a nonresident annual deer hunting license

HCD_{LL} = Hunters who checked in a deer using a lifetime license

HCD_{LO} = Hunters who checked in a deer using a land-owner exemption

HCD_{ME} = Hunters who checked in a deer using a military exemption

HCD_x = Youth hunters who checked in a deer and purchased a youth license

Results. –

The resident license and nonresident success rates are presented in Figure 3-7, Table 3-17, and Table 3-18.

Changes in survey success rates varied by type in 2023 (Figure 3-8).

Survey success rates were consistently higher than license success rates, with a mean difference of 0.14 (CI95 0.02) for resident annual hunters and 0.13 (CI95 0.02) for nonresident annual hunters, but they displayed similar trends until 2022. Both resident and nonresident license and survey success rates were lowest in 2017, increased until 2020, and decreased slightly in 2021. However, license success rates showed an increase in 2022 for both resident and nonresident hunters while survey success rates fell for both groups. In 2023, success rates fell for nonresident hunters in both the license and survey success rates. For resident hunters in 2023, license success rates decreased relative to 2022, but survey success rates increased. Generally, nonresident success rates have been equal to or lower than resident success rates.

Many of the license categories saw a rebound in the number of hunters afield in 2023 relative to the number of hunters afield in 2022 (Figure 3-9) with an estimated a total of 204,886 hunters afield (Figure 3-10 and Table 3-19).

Literature Cited

Roseberry, J. L. and A. Woolf. 1991. A Comparative Evaluation of Techniques for Analyzing White-tailed Deer Harvest Data. Wildlife Monographs 117: 3-59.



DNR file photo

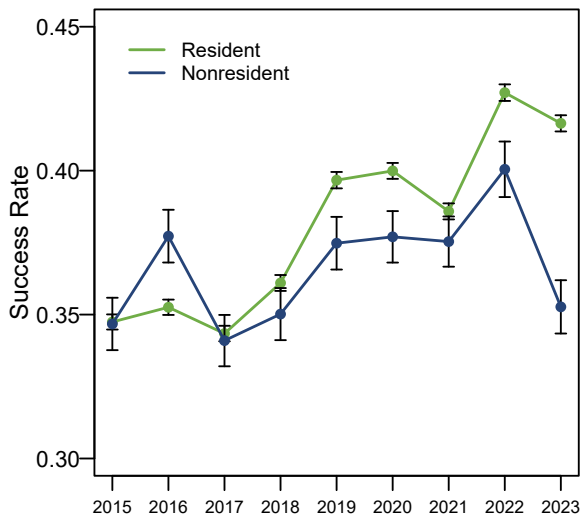


Figure 3-7. Trend in annual success rates of non-youth licensed resident and nonresident deer hunters who purchased an annual deer license and checked in at least one deer using the same Customer ID number.

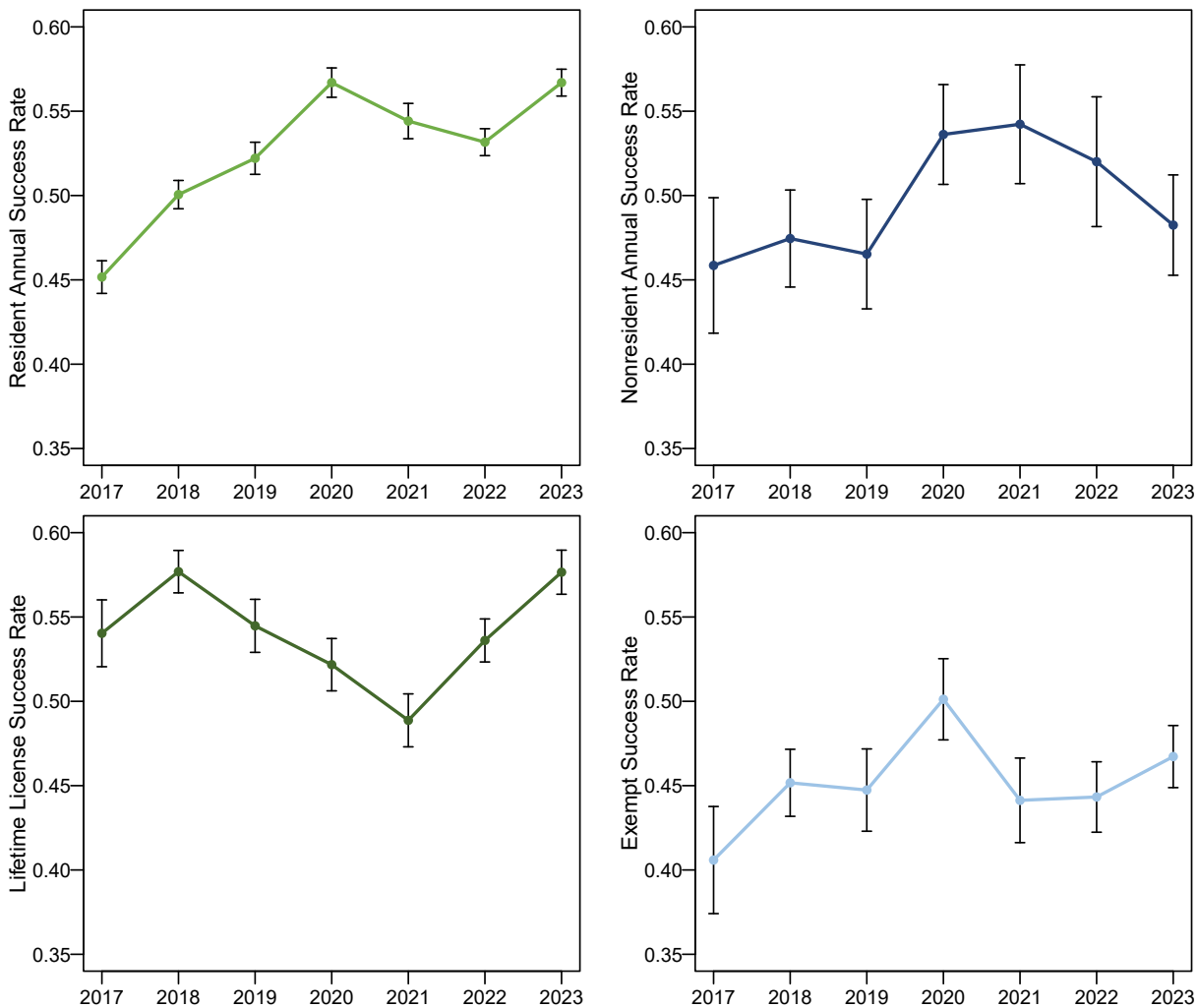


Figure 3-8. Trend in annual success rates of non-youth deer hunters who hunted using resident and nonresident annual licenses; lifetime licenses; military and landowner exemptions; and participated in the annual Deer Management Survey.

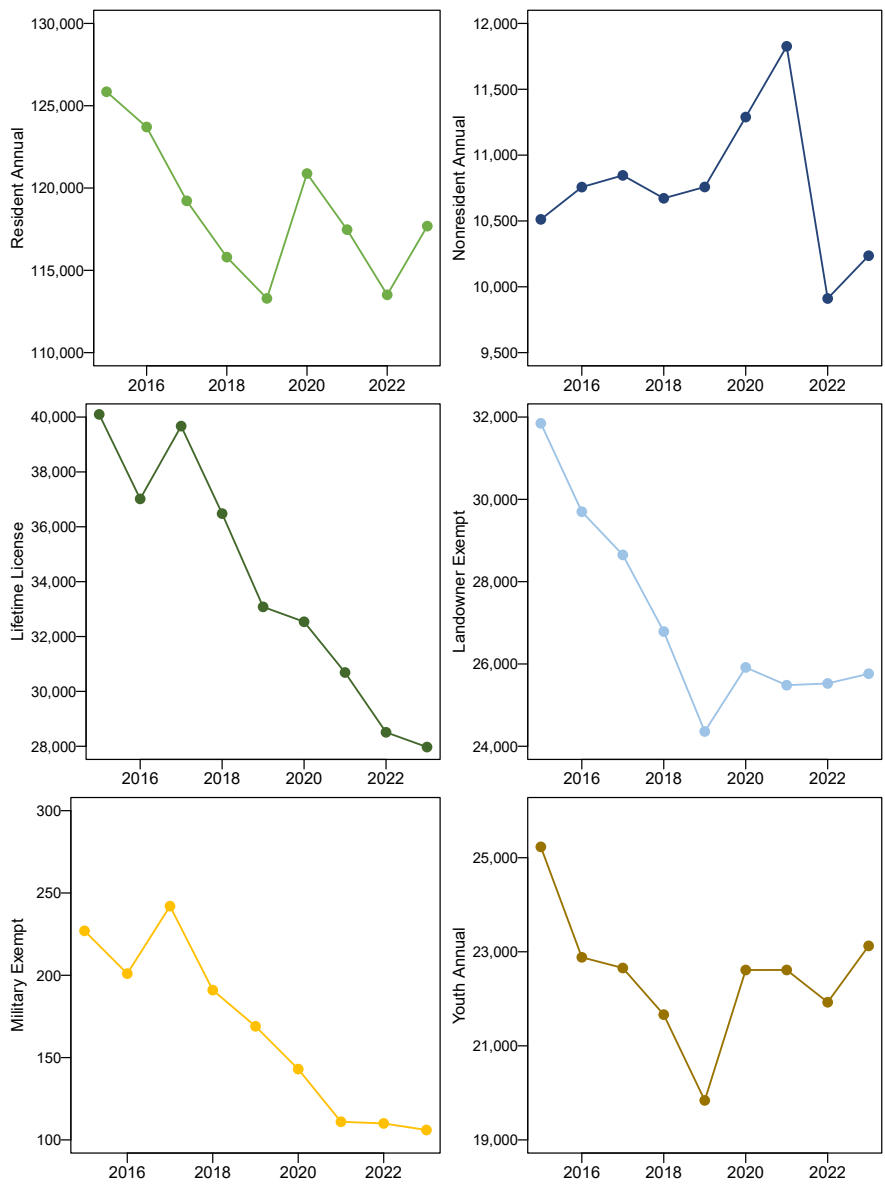


Figure 3-9. Estimated hunters afield in each license category, including resident annual license holders, nonresident annual license holders, lifetime license holders, landowner exemptions, military exemptions, and youth annual license holders.

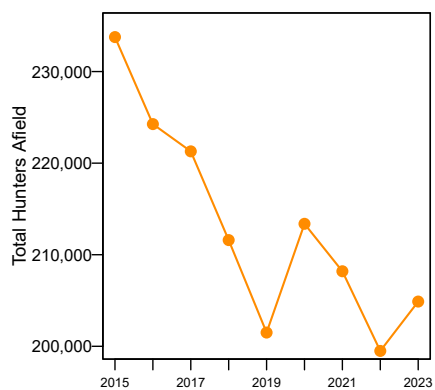


Figure 3-10. Trend in estimated hunters afield during Indiana deer hunting seasons, 2015-2016 through 2023-2024.

Table 3-17. Calculated annual success rates and 95% confidence intervals of non-youth licensed resident and nonresident deer hunters who purchased an annual deer license and checked in at least one deer using the same Customer ID number.

Season	All Resident Hunter Success Rate	All Resident Hunter Success Rate +- 95 % CI	Nonresident Success Rate	Non-resident Success Rate +- 95 % CI
2018	0.45	0.01	0.46	0.04
2019	0.50	0.01	0.47	0.03
2020	0.52	0.01	0.47	0.03
2021	0.57	0.01	0.54	0.03
2022	0.54	0.01	0.54	0.04
2023	0.53	0.01	0.52	0.04
2024	0.57	0.01	0.48	0.03

Table 3-18. Calculated annual success rates and 95% confidence intervals of non-youth licensed resident (separated by resident annual license purchasers, lifetime license holders, and exempt landowners) and nonresident deer hunters who purchased an annual deer license and checked in at least one deer using the same Customer ID number.

Season	Annual Resident Success Rate	Annual Resident Success Rate +- 95 % CI	Nonresident Success Rate	Non-resident Success Rate +- 95 % CI	Lifetime License Success Rate	Lifetime License Success Rate +- 95 % CI	Exempt Landowner Success Rate	Exempt Landowner Success Rate +- 95 % CI
2018	0.45	0.01	0.46	0.04	0.54	0.02	0.41	0.03
2019	0.50	0.01	0.47	0.03	0.58	0.01	0.45	0.02
2020	0.52	0.01	0.47	0.03	0.54	0.02	0.45	0.02
2021	0.57	0.01	0.54	0.03	0.52	0.02	0.50	0.02
2022	0.54	0.01	0.54	0.04	0.49	0.02	0.44	0.03
2023	0.53	0.01	0.52	0.04	0.54	0.01	0.44	0.02
2024	0.57	0.01	0.48	0.03	0.58	0.01	0.47	0.02

Table 3-19. Calculated estimated hunters afield during Indiana deer hunting seasons, 2015-2016 through 2023-2024.

Year	Resident Hunters Using Annual License	Nonresident Hunters Using Annual License	Estimated Hunters Using Lifetime License	Estimated Hunters Using Landowner Exempt	Military Exempt Hunters	Youth Hunters	Estimated Total Hunters Afield
2015	125,800	10,561	40,100	31,850	227	25,233	233,771
2016	123,669	10,794	37,005	29,689	201	22,875	224,233
2017	119,180	10,888	39,670	28,651	242	22,655	221,286
2018	115,755	10,718	36,490	26,795	191	21,669	211,618
2019	113,251	10,801	33,082	24,362	169	19,841	201,506
2020	120,829	11,339	32,532	25,912	143	22,609	213,364
2021	117,440	11,857	30,680	25,474	111	22,608	208,170
2022	113,500	9,922	28,507	25,526	110	21,927	199,492
2023	117,716	10,205	27,976	25,767	106	23,130	204,900

Chapter 4. DEER CONTROL PERMITS

Joe Caudell and Linnea Petercheff,
Indiana Department of Natural Resources

Deer control permits grant special permission to take deer outside of the deer hunting season and are issued when farmers and other landowners experience problems with deer. These permits reduce damage and other conflict with landowners and help alleviate future property damage from deer in localized areas. Deer control permits are not issued for large scale population control, and the number of deer taken on control per-

Table 4-1. Deer control permits issued by county in 2023, including the number of deer authorized to be taken and the number of deer taken per permit. Cumulative deer is the number of hunter-harvested deer plus the number of deer taken on control permits. The sum of permits per county is greater than the total number of permits issued because some permits were issued for multiple counties and are counted for each county. The number of deer taken per permit was divided among multiple counties on a single permit.

County	Permits Issued	Authorized Take	Deer Taken	Avg Deer Taken per Permit	% Cumulative Deer Taken	Bucks Taken	Button Bucks Taken	Does Taken	Deer Buried	Deer Incinerated	Deer Consumed or Donated
Adams	2	9	2	1.0	0.2%	0	1	1	0	0	0
Allen	3	24	8	2.7	0.4%	0	1	7	3	0	0
Bartholomew	2	17	4	2.0	0.4%	1	1	1	0	0	0
Benton	1	15	3	3.0	1.6%	0	0	3	0	0	0
Brown	12	217	127	10.6	8.6%	34	5	88	7	0	63
Cass	3	25	11	3.7	0.8%	1	0	10	10	0	0
Clark	5	70	44	8.8	3.8%	15	3	22	7	27	0
Clay	1	18	5	5.0	0.4%	2	0	3	1	0	3
Clinton	1	7	0	0.0	0.0%	0	0	0	0	0	0
Crawford	3	25	22	7.3	1.2%	1	2	18	2	1	1
Daviess	1	10	4	4.0	0.3%	0	1	3	0	0	0
Dearborn	12	92	33	2.8	1.9%	6	4	23	2	0	1
Decatur	1	13	2	2.0	0.3%	0	0	2	0	0	0
DeKalb	7	98	29	4.1	1.2%	9	4	16	2	0	8
Delaware	3	22	4	1.3	0.4%	2	0	2	0	1	0
Dubois	2	10	0	0.0	0.0%	0	0	0	0	0	0
Elkhart	6	49	9	1.5	0.5%	0	1	8	1	0	1
Fayette	1	15	9	9.0	2.1%	0	0	9	6	0	0
Floyd	6	52	26	4.3	3.8%	3	1	21	5	0	4
Fountain	2	40	10	5.0	0.8%	0	1	9	0	0	0
Franklin	12	73	31	2.6	2.8%	3	3	25	1	4	0
Fulton	6	82	38	6.3	2.5%	13	7	18	6	0	0
Gibson	2	40	0	0.0	0.0%	0	0	0	0	0	0
Grant	1	3	0	0.0	0.0%	0	0	0	0	0	0
Greene	1	10	0	0.0	0.0%	0	0	0	0	0	0
Hamilton	1	5	0	0.0	0.0%	0	0	0	0	0	0
Harrison	14	230	70	5.0	2.7%	10	6	54	26	0	4
Hendricks	1	5	0	0.0	0.0%	0	0	0	0	0	0
Henry	1	13	1	1.0	0.2%	0	0	1	0	0	0
Huntington	1	5	0	0.0	0.0%	0	0	0	0	0	0
Jackson	9	126	28	3.1	1.7%	3	4	20	15	2	0
Jay	1	10	8	8.0	0.7%	4	0	4	0	0	0
Jefferson	4	32	14	3.5	0.9%	2	2	10	13	0	0
Jennings	6	92	24	4.0	1.5%	2	2	20	2	1	6

Table 4-1 cont.

County	Permits Issued	Authorized Take	Deer Taken	Avg Deer Taken per Permit	% Cumulative Deer Taken	Bucks Taken	Button Bucks Taken	Does Taken	Deer Buried	Deer Incinerated	Deer Consumed or Donated
Johnson	2	16	8	4.0	1.3%	0	0	8	0	0	0
Knox	1	10	0	0.0	0.0%	0	0	0	0	0	0
Kosciusko	2	8	1	0.5	0.0%	0	0	1	0	0	1
Lagrange	11	159	68	6.2	2.3%	11	10	41	18	0	6
Lake	4	54	20	5.0	1.4%	2	2	16	0	0	0
LaPorte	6	117	108	18.0	5.2%	33	16	59	19	0	75
Lawrence	5	45	7	1.4	0.3%	0	1	6	7	0	0
Madison	1	10	3	3.0	0.5%	0	0	3	0	1	0
Marion	2	9	1	0.5	0.2%	0	1	0	0	0	1
Marshall	18	176	54	3.0	2.3%	6	6	41	24	0	1
Martin	1	8	3	3.0	0.2%	0	0	3	3	0	0
Miami	3	33	11	3.7	0.7%	4	1	6	5	0	0
Monroe	9	136	70	7.8	4.6%	2	12	54	35	0	5
Montgomery	3	46	6	2.0	0.6%	1	0	5	0	0	0
Noble	3	45	17	5.7	0.6%	5	0	10	2	0	1
Ohio	4	43	16	4.0	3.3%	6	0	10	6	0	0
Owen	3	51	8	2.7	0.5%	0	2	6	0	0	1
Parke	4	37	15	3.8	0.7%	2	0	13	1	1	5
Perry	5	95	34	6.8	2.0%	1	1	32	10	0	4
Porter	6	159	120	20.0	6.8%	34	19	65	22	0	78
Posey	6	78	53	8.8	3.9%	2	5	46	32	0	0
Pulaski	5	59	44	8.8	2.3%	5	8	25	6	0	20
Putnam	2	14	4	2.0	0.2%	0	0	4	4	0	0
Ripley	8	99	7	0.9	0.5%	1	0	6	0	0	0
Saint Joseph	2	40	0	0.0	0.0%	0	0	0	0	0	0
Scott	1	5	0	0.0	0.0%	0	0	0	0	0	0
Spencer	5	81	38	7.6	3.1%	2	2	32	14	0	1
Starke	5	60	27	5.4	1.7%	0	5	21	4	0	4
Steuben	8	105	20	2.5	0.6%	3	2	15	1	0	7
Sullivan	6	86	28	4.7	1.6%	2	3	22	10	0	0
Switzerland	5	48	31	6.2	2.1%	7	0	24	6	0	0
Tippecanoe	3	22	0	0.0	0.0%	0	0	0	0	0	0
Tipton	1	6	4	4.0	2.0%	3	0	0	1	0	0
Union	1	5	1	1.0	0.2%	0	0	1	0	0	0
Vanderburgh	3	40	3	1.0	0.4%	0	0	3	0	0	0
Vermillion	1	5	2	2.0	0.2%	0	1	1	1	0	0
Vigo	2	10	0	0.0	0.0%	0	0	0	0	0	0
Wabash	2	15	12	6.0	0.7%	0	1	11	5	0	2
Warrick	6	88	7	1.2	0.5%	0	0	7	0	0	0
Washington	14	269	197	14.1	8.0%	30	24	143	5	53	6
White	2	8	1	0.5	0.1%	0	0	1	0	0	0
Whitley	2	25	1	0.5	0.1%	0	1	0	1	0	0

mits is lower than the number of deer harvested during the hunting season in each county (Table 4-1). An exception is Marion County, where few deer were harvested by hunters because of limited access, and a comparatively large number of deer were removed using control permits. Typical problems in Indiana resulting from deer include browsing damage to crops, orchards, nurseries, vineyards, and plants used for landscaping (Table 4-2). Deer control permits are issued to landowners who demonstrate damage in excess of \$500, to address disease concerns from imminent threat (i.e., chronic wasting disease where it is in greater than 5% of the local population), to protect endangered species (e.g., Porter County), and for the safety of the public.

When permits expire, permit holders are required to report to the Indiana DNR the number of deer taken on the permit, the sex of the deer, the equipment used, and the disposal method for each deer taken. In 2023 prior to this report, Indiana DNR received reports from 235 of the 317 deer control permits issued statewide. A total of 1,533 deer were reported taken statewide on deer control permits, representing 1.3% of the cumulative deer taken, which is the total number of hunter-harvested deer and deer taken on control permits in the current year (Table 4-3). The breakdown by county of the sex of the deer taken and how they were used or disposed of can be found in Table 4-1. Some errors exist in the total number and the individual numbers of bucks, does, and button bucks reported taken on deer control permits due to permit-holder reporting error or due to the total take being split between counties for permits that cover multiple counties.

Table 4-2. Number of damage reports for each crop type or other reason for 2023 deer control permits. Some individuals reported multiple crops or reasons.

Crop or Reason for Permit	Number of Reports
Alfalfa	17
Cantaloupe	1
Corn	222
Cotton	1
Cut Flowers	2
Damage to Fence	1
Disease	1
Fruit Trees	15
Garden	2
Grapes	7
Hay	17
Landscaping	8
Milo	1
Nursery Stock	3
Popcorn	3
Public Safety	4
Pumpkins	9
Soy Beans	230
Sunflowers	1
Sweet Corn	5
Tree Farm	17
Truck Crops	10
Watermelon	3
Wheat	12
Wildflowers	1

Table 4-3. Running total of the number of permits issued, number of deer taken, and the percentage of the cumulative take (which is the number of deer taken on deer control permits divided by the number of deer harvested plus the number of deer taken on deer control permits). Prior to 2016, permits were issued in a different manner; therefore, the number of permits prior to 2016 are not reported.

Year	Permits Issued	Deer Taken	% Cumulative Take
2012	-	2,359	1.7%
2013	-	2,428	1.9%
2014	-	1,797	1.5%
2015	-	1,826	1.4%
2016	311	1,556	1.3%
2017	301	1,862	1.6%
2018	277	1,737	1.6%
2019	279	1,625	1.4%
2020	231	1,156	0.9%
2021	282	1,349	1.2%
2022	265	1,533	1.3%
2023	317	1,616	1.3%

Chapter 5. DEER-VEHICLE COLLISIONS

Joe Caudell and Emily McCallen,
Indiana Department of Natural Resources

Deer-vehicle collisions are reported by state and local police to the Indiana Department of Transportation (INDOT) anytime an accident report is completed for insurance purposes. These reports include information on the direction the vehicle was moving, location of the accident, type of road (e.g., county road, state road, interstate, etc.), road conditions, estimated cost of damage, and other data used in road safety analyses. INDOT provides data on deer-vehicle collisions to DNR each year for this report and for deer population analysis. This data set is especially valuable to the DNR because it is an independent data set that has been collected in a consistent way over a long period of time. Deer-vehicle collisions are also standardized across years and counties by using INDOT's statistics on Daily Vehicle Miles Traveled. Analyzing collisions per billion miles traveled accounts for changes in traffic volume among counties and allows for unbiased comparison of counties and years.

The total number of deer-vehicle collisions reported across the state increased from 15,854 in 2022 to 16,951 in 2023 (Figure 5-1; Table 5-1). The number of deer-vehicle collisions per billion miles traveled (DVC/BMT) was 206 DVC/BMT in 2023, an increase of 5.7% from 2022.

Most deer-vehicle collisions in 2023 occurred on state roads (34.8%) and county roads (30.8%; Table 5-2). U.S. Routes had the highest number of deer-vehicle collisions (91 DVC) per 100 miles of road in 2023 (Table 5-2).



DNR file photo

Nearly 50% of deer-vehicle collisions in 2023 occurred between September and December (Figure 5-3). Compared to 2022, the number of collisions during January, February, and September increased by 28.8%, 27.7%, and 13.4%, respectively. Collisions in all other months changed less than 10% from 2022. Additionally, deer-vehicle collisions occurred most often during dawn and dusk, which varied by month as daylight length changed (Figure 5-4).

The estimated economic cost of deer-vehicle collisions from damage to vehicles in 2023 was \$103.2 million, based on the average estimated cost per collision (Table 5-3). From 2018 to 2023, deer-vehicle collisions cost drivers a total of more than \$448 million (Table 5-3).

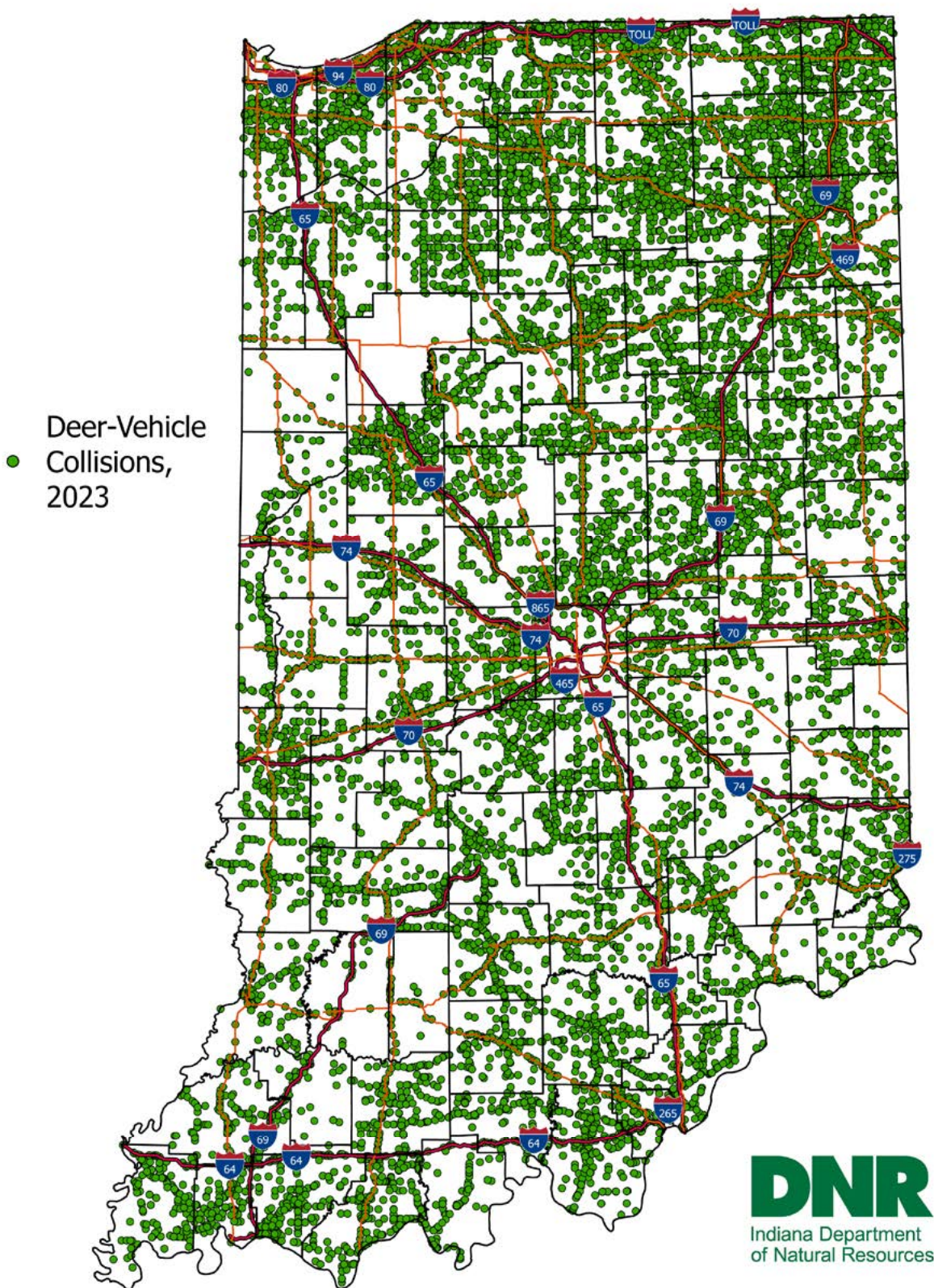


Figure 5-1. Locations of deer-vehicle collisions in Indiana in 2023. Almost all (99.9%) of the 16,951 deer-vehicle collisions reported to INDOT included GPS location data to map.

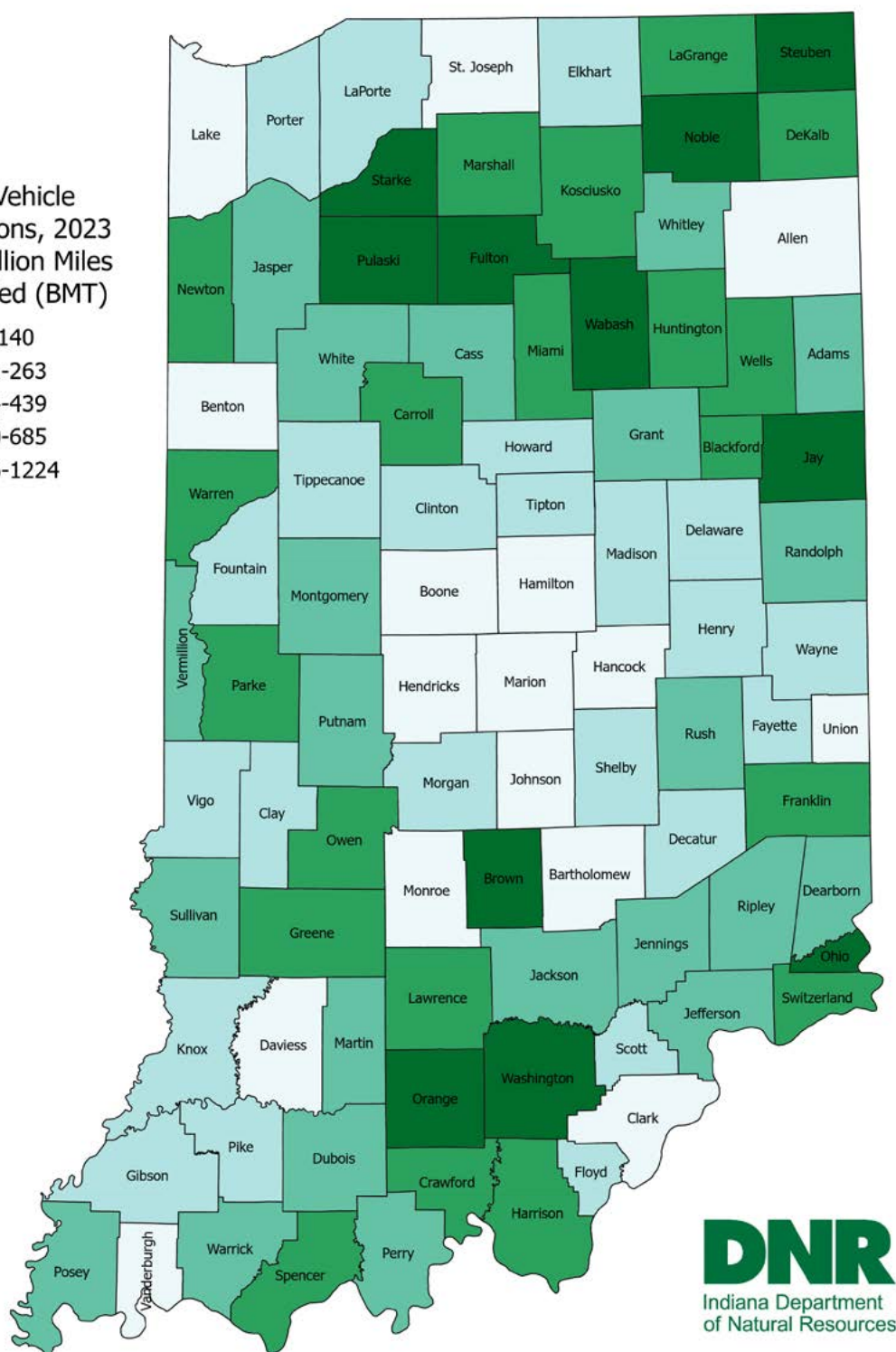
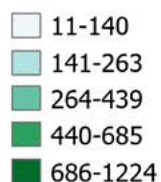
Table 5-1. Number of deer-vehicle collisions and collisions per billion miles traveled (BMT) by county in Indiana, 2012, 2022, and 2023. DVC/BMT provides a relative rate of deer-vehicle collisions given the number of miles driven in that county per year. Counties with high DVC/BMT have proportionally more deer-vehicle collisions per mile traveled than counties with lower DVC/BMT. Counties with low DVC/BMT may have a high number of deer-vehicle collisions that is offset by a high number of miles traveled (e.g., Lake County).

County	DVC 2021	DVC per BMT 2021	DVC 2022	DVC per BMT 2022	DVC 2023	DVC per BMT 2023
Adams	99	334.3	115	423.1	131	439.8
Allen	438	100.9	467	115	572	125.6
Bartholomew	141	129.6	111	110	123	111.3
Benton	20	128.3	12	95.9	17	105.8
Blackford	54	398.1	74	574	63	484.7
Boone	147	125.1	145	138.4	157	125.3
Brown	82	609.5	100	769.2	132	961.3
Carroll	116	435.8	146	557.1	149	546
Cass	186	440.5	155	410.5	164	383.8
Clark	156	102.9	139	115.7	191	126.5
Clay	79	195.9	98	252.2	68	161.2
Clinton	122	241.8	119	266.5	122	240.2
Crawford	65	290.5	83	376.7	114	497.8
Daviess	25	69.5	16	54.5	32	87
Dearborn	225	359.3	183	302.5	177	282.9
Decatur	95	213.1	75	167.7	89	192
Dekalb	342	526.7	316	498.1	315	472.9
Delaware	184	143.3	177	158.6	271	212.8
Dubois	156	335	150	349.3	199	421
Elkhart	303	150.7	269	144.6	341	164.1
Fayette	33	177	32	198.9	36	198.4
Floyd	123	131.3	105	127.8	134	150.2
Fountain	94	359	91	345.6	64	236.6
Franklin	148	640.4	107	473.4	112	489.7
Fulton	194	738.9	174	661.5	207	773.6
Gibson	143	245.2	145	259.8	137	231.8
Grant	191	236.4	217	293.9	266	330.2
Greene	238	637.2	252	683.6	250	669.4
Hamilton	259	76.2	189	58.2	262	73.3
Hancock	110	102.2	76	80.2	129	115.7
Harrison	211	461.8	176	425.3	224	490.3
Hendricks	205	110.4	185	105.5	236	120.6
Henry	116	171.1	92	147.4	128	185.6
Howard	113	149.3	118	175.4	152	198.2
Huntington	217	341.9	223	386.9	290	457
Jackson	212	311.5	153	245.6	188	272.9
Jasper	227	273.7	223	276	233	273.5
Jay	136	564.5	142	628.3	179	765.4
Jefferson	60	193.6	57	207.4	88	288.5
Jennings	86	261.6	95	320.9	124	378.8
Johnson	125	77.4	127	87.5	154	90.1
Knox	113	225.7	117	254.4	122	244.2
Kosciusko	493	622.3	547	716.1	546	670.4
Lagrange	204	406.3	250	519.5	251	486.6
Lake	262	41.5	273	50.2	287	45.3

Table 5-1 cont.

County	DVC 2021	DVC per BMT 2021	DVC 2022	DVC per BMT 2022	DVC 2023	DVC per BMT 2023
LaPorte	348	213.5	317	208.4	359	216.5
Lawrence	256	589.4	239	603.6	252	577
Madison	172	123.4	200	164.8	216	152
Marion	109	9.5	84	9.2	134	11.4
Marshall	358	597.6	325	585.3	419	685.6
Martin	15	114.5	25	244.1	41	315.6
Miami	227	491.2	228	508.3	284	589.1
Monroe	165	154.8	160	162.3	154	140.2
Montgomery	189	382.3	171	373.8	178	357.5
Morgan	149	156.8	146	160.3	193	201.8
Newton	101	390.9	108	449.4	129	498.8
Noble	311	719.7	301	718.5	385	867
Ohio	70	1546.9	54	1309.1	49	1112.4
Orange	119	623.9	125	692.8	142	763.7
Owen	75	367.5	86	448.4	116	543.9
Parke	155	752.9	144	720.4	125	634.8
Perry	105	422.1	77	317	78	317.3
Pike	24	122.1	11	60.9	31	159
Porter	396	166.8	361	168.7	442	184.6
Posey	124	334.4	113	313.6	145	393.7
Pulaski	203	1040.5	228	1178.9	237	1223.2
Putnam	154	270.9	147	275.8	173	295.6
Randolph	74	275.4	90	370.2	105	397.4
Ripley	158	429.3	115	342.2	120	328.9
Rush	52	226.9	45	213.4	64	280.5
Saint Joseph	86	114	339	121.2	395	131.7
Scott	94	266.8	53	193.9	55	160.9
Shelby	206	127.9	88	137.9	120	157.6
Spencer	347	578.1	187	569.3	228	637.1
Starke	174	699.5	187	772.7	191	750.7
Steuben	507	769.8	501	770	524	777
Sullivan	157	540.2	77	270.5	89	309
Switzerland	37	363.3	30	324.9	57	571.1
Tippecanoe	365	224.9	348	234.2	446	263.7
Tipton	51	179.7	61	222.7	59	199.7
Union	5	65	1	26.1	3	39.8
Vanderburgh	122	58.8	118	64.1	127	61
Vermillion	75	294.9	76	318.3	79	309.7
Vigo	193	157.7	198	188.1	196	159.6
Wabash	190	561.2	218	664.9	246	720.1
Warren	120	734.9	103	639.5	85	532.1
Warrick	264	342.5	249	332	274	350.8
Washington	132	457.8	177	660.5	214	771.5
Wayne	224	276	186	247.6	199	243.7
Wells	134	468.9	159	583.3	160	558.1
White	143	259.2	151	303.9	204	366.4
Whitley	193	424.6	154	405.4	198	430.3

Deer Vehicle
Collisions, 2023
per Billion Miles
Traveled (BMT)



DNR
Indiana Department
of Natural Resources

Figure 5-2. The number of deer-vehicle collisions per billion miles traveled (DVC/BMT) by county in Indiana in 2023.

Table 5-2. The number of deer-vehicle collisions in 2023 by road type and the number of deer-vehicle collisions per 100 miles of road. Collisions on unknown road types (7.7%) were proportionally distributed among the other road types.

Road Type	2023	% of total DVCs	Road Length (mi)	DVCs per 100mi of Road
County Road	5,217	30.8%	64,923.25	8
Interstate	1,270	7.5%	1,896.85	67
Local/City Road	1,962	11.6%	20,850.05	9
State Road	5,904	34.8%	7,149.49	83
US Route	2,599	15.3%	2,862.13	91

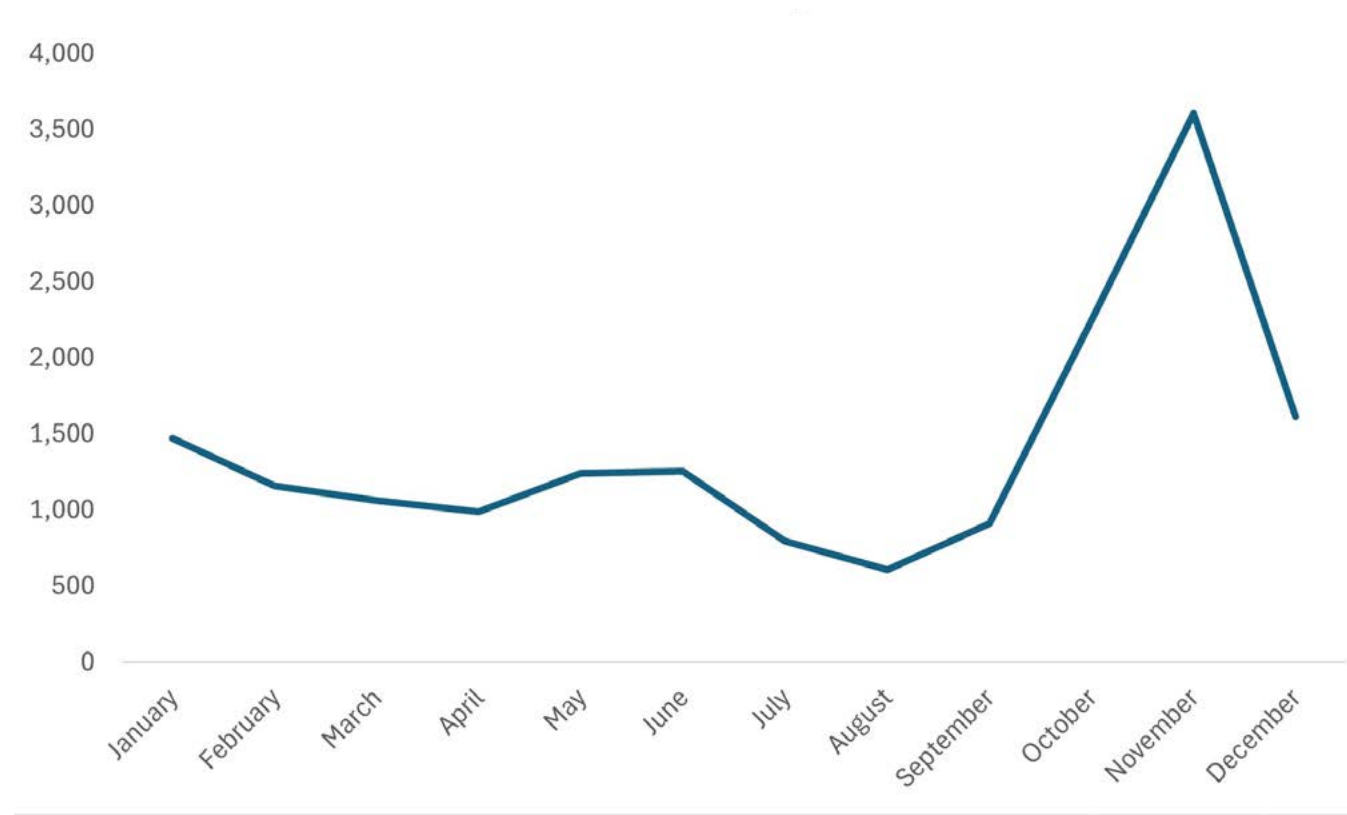


Figure 5-3. Number of deer-vehicle collisions by month in Indiana in 2023.

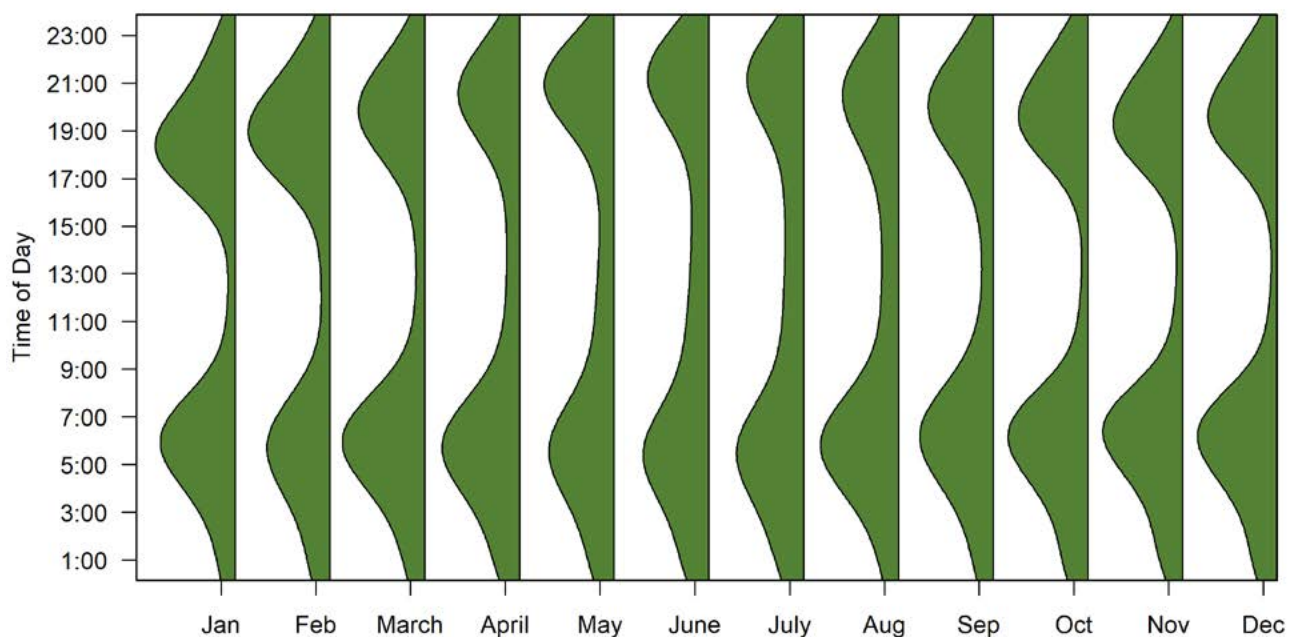


Figure 5-4. The proportion of deer-vehicle collisions by time of day in Indiana from 2021-2023.

Table 5-3. Reported economic loss due to deer-vehicle collisions in Indiana from 2018-2023. Collisions with an unknown estimate or an estimate of \$1,000 or less were not included. Total Damage Estimate 2018-2023 is calculated by multiplying the total number of collisions for that damage estimate range by the average value of damage.

Damage Estimate Range	2023 DVCs	2022 DVCs	2021 DVCs	2020 DVCs	2019 DVCs	2018 DVCs	Total Damage Estimate 2018-2023
\$1,001 to \$2,500	3,103 (18.8%)	3,721 (26.1%)	4,477 (30.3%)	4,503 (32.6%)	5,234 (35.1%)	5,365 (36.7%)	\$46,205,250
\$2,501 to \$5,000	6,907 (41.8%)	5,833 (40.8%)	5,949 (40.3%)	5,615 (40.7%)	6,063 (40.6%)	5,851 (40.0%)	\$135,817,500
\$5,001 to \$10,000	4,910 (29.7%)	3,697 (25.9%)	3,485 (23.6%)	3,015 (21.9%)	3,029 (20.3%)	2,826 (19.3%)	\$157,215,000
\$10,001 to \$25,000	1,386 (8.4%)	913 (6.4%)	749 (5.1%)	606 (4.4%)	542 (3.6%)	520 (3.6%)	\$82,530,000
\$25,001 to \$50,000	189 (1.1%)	101 (0.7%)	70 (0.5%)	47 (0.3%)	42 (0.3%)	40 (0.3%)	\$18,337,500
\$50,001 to \$100,000	32 (0.2%)	16 (0.1%)	11 (0.1%)	9 (0.1%)	10 (0.1%)	7 (0%)	\$6,375,000
Over \$100,000	13 (0.1%)	6 (0%)	1 (0%)	0 (0%)	1 (0%)	2 (0%)	\$2,300,000
Total Reports > \$1000	16,540	14,287	14,742	13,795	14,921	14,611	\$448,780,250

Chapter 6. DEER HEALTH

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Epizootic Hemorrhagic Disease

Epizootic hemorrhagic disease (EHD) is a virus spread to white-tailed deer by a biting midge (*Culicoides variipennis*). Often worse in drought years, outbreaks of EHD tend to occur in 5- to 10-year cycles. Deer can be reported as sick, dead, or in a group with a sick or dead animal via the Indiana DNR's online Sick or Dead Wildlife Report form (on.IN.gov/sickwildlife)

and by calls directly to DNR offices. In 2023, Indiana DNR received 46 reports of potential EHD cases involving 67 deer from 32 counties (Figure 6-1). Testing for EHD requires fresh samples of the spleen, liver, kidney, or blood. Indiana DNR tests deer to confirm only the presence of EHD in a county and not the total number of infected animals. A total of 7 deer from 7 counties were tested, and 1 (16%) deer from Posey County tested positive for EHD (Figure 6-1). Data indicated the EHD season was mild this year and mostly consisted of the number of reports expected each year. Maps of deer reported, tested, and confirmed to have EHD are updated daily and available at on.IN.gov/EHD.

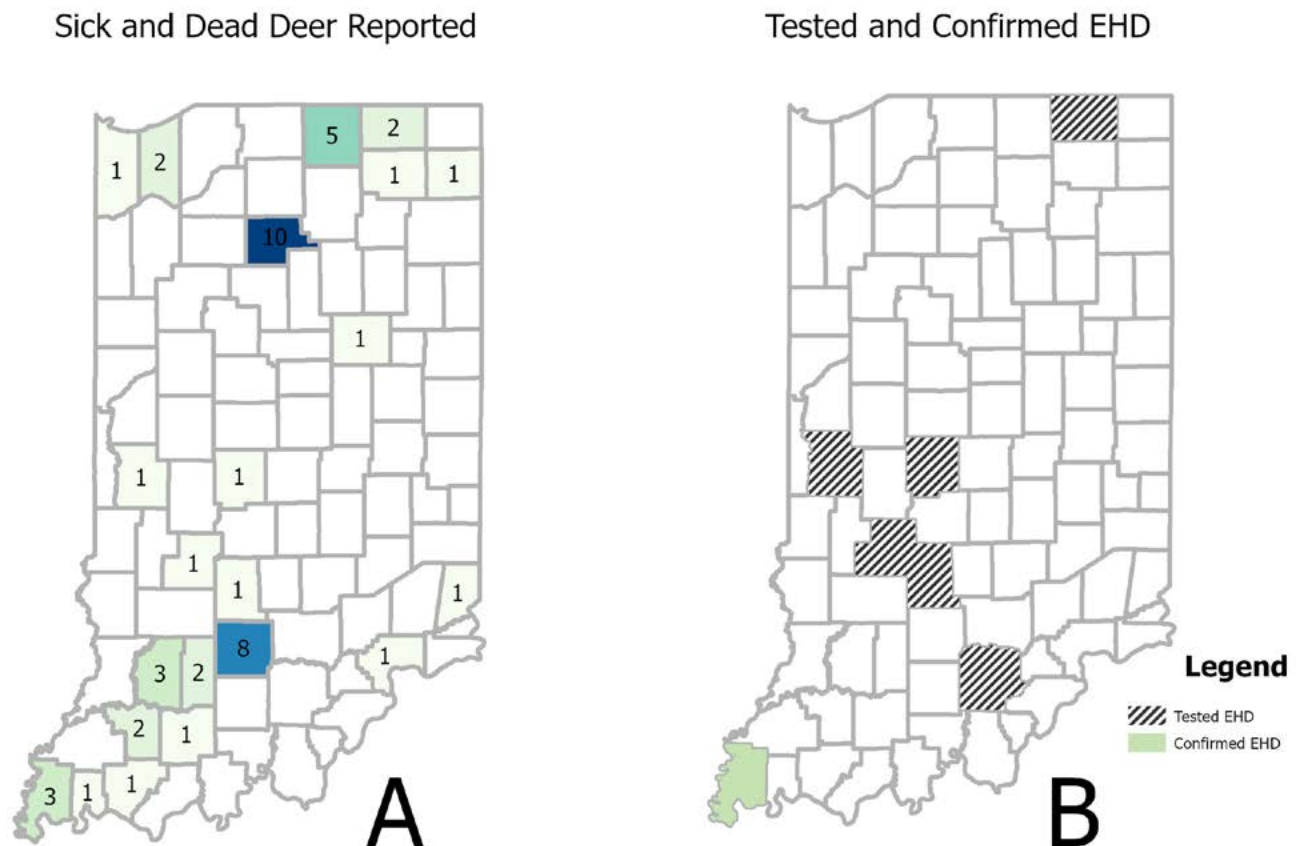


Figure 6-1. A. Counties where suspect EHD sick and dead deer were reported and total number of sick/dead deer reported in those counties in 2023. B. Counties where EHD samples were collected and a single county (Posey) where EHD was confirmed in 2023.

Chronic Wasting Disease

Chronic wasting disease (CWD) is a neurodegenerative disease that affects members of the cervid family, including white-tailed deer (*O. virginianus*), mule deer (*O. hemionus*), elk (*Cervis elaphus*), moose (*Alces alces*), and reindeer (*Rangifer tarandus*). CWD is in a class of prion-caused diseases known as transmissible spongiform encephalopathies (TSEs), like mad cow disease in cattle or scrapie in sheep. Prions are misfolded proteins that cause lesions in the brains of infected animals. CWD is shed in the saliva, feces, and urine of infected deer and transmitted either by direct deer-to-deer contact or through contact with contaminated soil or other material.

Despite considerable ongoing research related to CWD, there is no effective cure or vaccine. CWD is fatal to infected cervids. CWD attacks the animal's brain and causes behavioral changes, excessive saliva production, and loss of appetite. It leads to progressive degradation of body condition and eventual death. CWD has a long incubation period that averages from 18 to 24 months between infection and clinical signs. Infected animals often appear healthy in the early stages of the disease. In advanced stages, infected animals become abnormally thin or weak, may lose fear of humans, stand with legs wide apart, and hold their head and ears low. Most infected individuals rarely live more than 2.5 years from the time they are infected until death (B. Richards, USGS National Wildlife Health Center, personal communication).

CWD was first detected as a clinical syndrome in 1967 in captive mule deer at a Colorado research facility. In 1978, CWD was determined to be a spongiform encephalopathy and was found in captive deer and elk in Wyoming. Three years later, the disease was observed in free-ranging elk in Colorado. By 2002, it had been detected in nine states (Colorado, Illinois, Kansas, Minnesota, Montana, Oklahoma, South Dakota, Wisconsin, and Wyoming) and two Canadian provinces. As of December 2021, CWD had been found in wild and/or captive cervid herds in 28 states, four Canadian provinces, Finland, Norway, South Korea, and Sweden (Richards 2021).

CWD has been detected in white-tailed deer in all states bordering Indiana: in wild and captive deer in Ohio, in wild and captive deer in Michigan, in wild deer in Illinois, and in wild deer in Kentucky (Richards 2021). Ohio confirmed its first case of CWD in a wild white-tailed deer in December 2020. The positive animal

was found more than 60 miles from Indiana's eastern border (Ohio Department of Natural Resources 2020). In Michigan, the closest positive white-tailed deer was found approximately 30 miles from the Indiana border (Michigan Department of Natural Resources 2020). Illinois reported 176 new detections of CWD in wild deer during fiscal year 2020 (Dufford and McDonald 2020). The closest CWD cases in Illinois are approximately 25 miles from Indiana's western border. Kentucky confirmed its first case of CWD in a wild white-tailed deer in December 2023. The positive animal was found in Ballard County in western Kentucky, approximately 100 miles from the southern Indiana border.

Each year, Indiana DNR collects tissues from hunter-harvested deer throughout the state for CWD testing. Samples are collected as part of the statewide CWD surveillance program to monitor for the presence of the disease in Indiana. In 2023-2024, hunter harvested deer samples were collected using four methods (Figure 6-2):

1. Taxidermist Sampling Program
2. DNR Staffed Check Stations
3. Ball State University Partnership
4. DNR Fish and Wildlife Properties

Sick deer reported by the public are also tested through the statewide CWD surveillance program. The public was able to report sick deer online through the Sick/Dead Wildlife Report form.

In 2022, Indiana DNR targeted seven counties across the state for surveillance (Allen, Boone, Clark, Clinton, Harrison, Steuben, and Washington) based on the risk assessment (see 2021 Indiana White-tailed Deer Report). The methods for collecting CWD samples in 2022 included check stations at 10 meat processors on opening weekend, partnering with taxidermists in or around the target counties, or using CWD drop-off coolers at participating Fish & Wildlife area (FWA), State Fish Hatchery (SFH), or National Wildlife Refuge (NWR) properties.

In 2023, Indiana DNR expanded the taxidermist program to reach areas that had not been sampled thoroughly in the past. The taxidermist program has proven to be cost effective and is an efficient way to collect high value samples. In 2022, 20 taxidermists were signed up for the program across 16 counties, and 291 samples were collected by taxidermists. After expanding the program in 2023, 56 taxidermists participated across 35 counties in Indiana (Figure 6-2). These taxidermists collected 1,447 usable samples for

2023-2024 CWD Sample Collection Method Locations

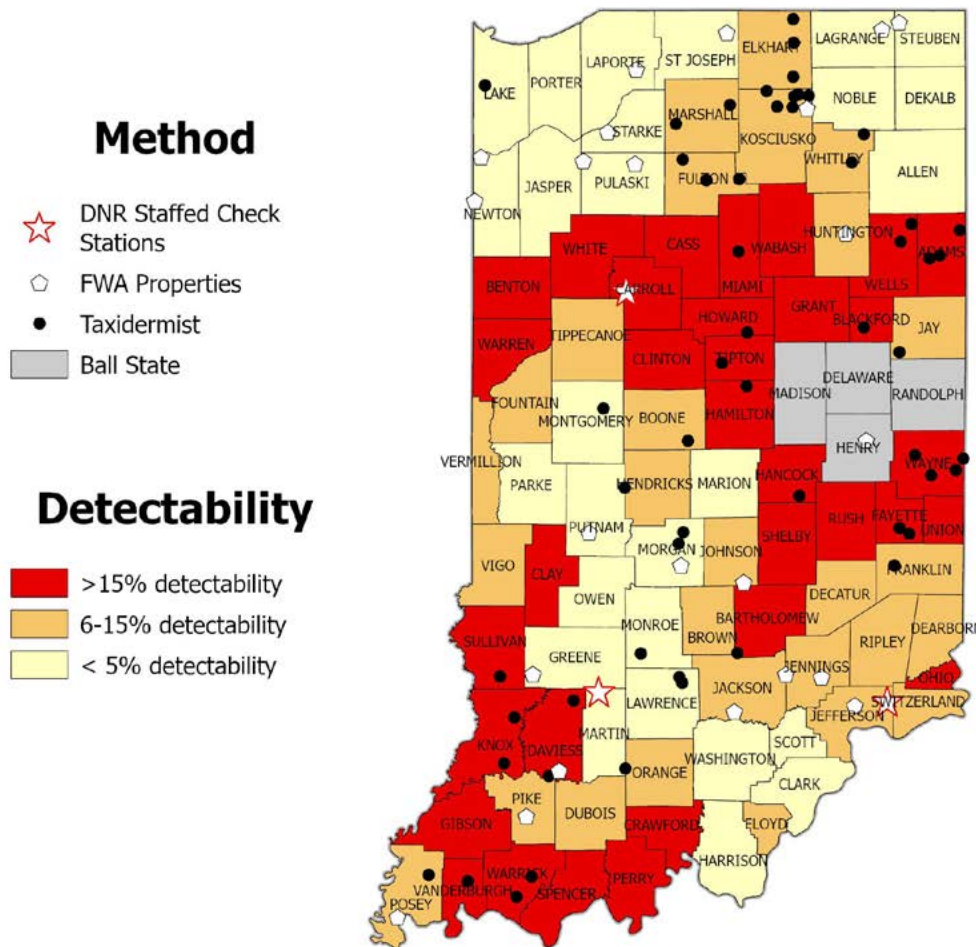


Figure 6-2. Chronic wasting disease surveillance methods and their locations across the state, 2023-2024. Colors represent detectability for previous years' sampling.

the CWD taxidermist program this year. For additional samples, DNR operated two check stations at deer processors during opening weekend of deer hunting season and continued using CWD drop-off coolers at participating properties. These efforts collected a total of 172 usable CWD samples.

DNR also partners with Ball State University, to collect CWD samples. Students in Ball State's The Wildlife Society (TWS) student chapter take full responsibility for organizing check stations, training, staffing, etc. in counties near the university. DNR conducts training at the beginning of the season and provides supplies. At the end of the season, Ball State TWS is compensated for their collections. This is not only beneficial to DNR, which is able to depend on Ball State to cover a particular area of the state, but also beneficial to the students doing the work, who are learning surveillance coordination and fundraising for their program all at once. Ball

State TWS collected 85 samples for the CWD season.

A total of 1,750 samples were collected between Feb. 1, 2023, and Feb. 1, 2024. Of these, 1,666 samples were hunter harvested, 11 were found dead, 10 were road killed, 8 were sick, 3 were targeted, and 47 were USDA urban deer. From the tested deer, Indiana detected its first positive CWD deer in LaGrange County. Of the 1,750 samples collected, 1,447 of these were collected from taxidermists, 85 from Ball State students, 47 from USDA, and 172 from properties/DNR staffed check stations. DNR uses a weighted surveillance point system developed by Jennelle et al. (2018) using Bayesian weighted surveillance approach to assign a value to each sample collected. The point goals are broken down by sex/age class of the deer harvested and the likelihood of detecting the disease, with adult males having the highest point value (3.23 points). Adult females were valued at 1.3 points, male yearlings

were valued at 1 point, and female yearlings were valued at 0.85 points. Fawns are not tested because their point value is essentially zero. Reaching a 5% prevalence target (i.e., to be 95% certain that the true CWD prevalence falls below 5%) required 58 points. We apply this point goal to each county. Our CWD samples were collected from 90 counties across the state, meeting the point goal in 35 of those counties. Additionally, the CWD detectability rates were calculated for all 92 counties based on sampling intensity (Figure 6-3). The detectability provides us with a calculated prevalence of CWD in free-ranging deer for which there is a 95% probability the true prevalence falls below. For example, if CWD is present in the deer population in Kosciusko County, there is a 95% chance that it occurs in less than 0.8% of the population (Jennelle et al. 2018) based on our sampling efforts.

Samples collected by staff during opening week-end of firearms season were submitted to Purdue University's Animal Disease and Diagnostic Lab for ELISA testing, and other samples were submitted to approved laboratories and tested using immunohistochemical (IHC) staining procedures. Results were posted online for hunters to access using the confirmation number for that hunter-harvested deer. Any positive deer would have resulted in a phone call to the hunter before the results were posted online.

To test the effectiveness of the taxidermist program on a larger scale, a cost comparison between prior years was done. This cost analysis included drive time, mileage, staff time, supplies, lab costs, and the taxidermist payments. The average cost for a taxidermist to collect a sample was \$47.63 (Table 6-1) compared to more than \$200 at a DNR staffed check stations in prior years.

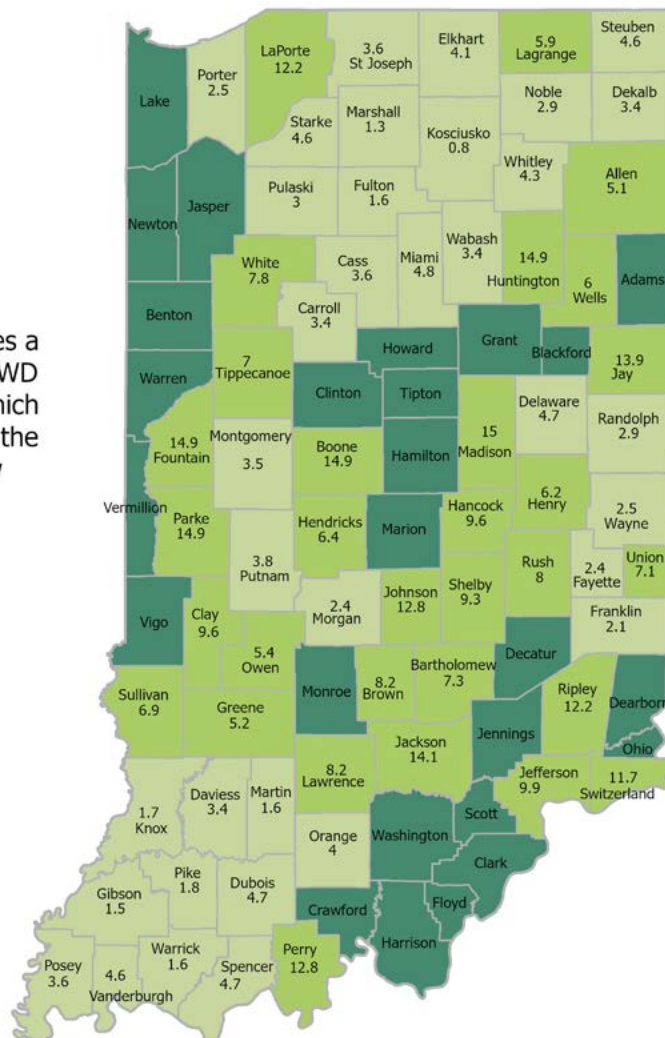


Table 6-1. Cost analysis of the 2023-2024 CWD taxidermist sampling program.

Cost Type (2023-2024)	Cost
Employee Pay Cost (\$16.80 per hour)	2,444.08
Driving Cost (\$0.49 per mile)	2,343.80
Samples recovered (\$10 each)	14,570
Supplies (total cost for season)	4,117.30
Supply cost per sample (\$1.42 each)	2,068.94
Testing cost per sample (\$30 each)	43,710
Total	69,254
Estimated cost per sample	4763

SARS-CoV-2 (Deer)

Indiana DNR's wildlife health program has actively been participating in the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) surveillance of SARS-CoV-2 infection and exposure in white-tailed deer for the past two years. In February 2024, DNR was notified that a deer had tested positive for active infection of SARS-CoV-2. During the 2022-2023 surveillance year, SARS-CoV-2 antibodies were detected in 65 of 315 deer samples, which was 20.6% of samples tested. These positive blood samples indicated exposure to the virus, but not an active infection. Since we know the deer herd was previously exposed to the virus, it is not surprising that we have now detected an active infection in 2024. There is no evidence that animals, including deer, play a significant role in the spread of SARS-CoV-2 to people. Based on the available information, the risk of animals spreading SARS-CoV-2 that leads to COVID-19 in people is low. Additionally, there is no evidence that people can get COVID-19 by preparing or eating meat from an animal infected with SARS-CoV-2, including wild game meat hunted in the United States.

Bovine Tuberculosis Surveillance

Bovine tuberculosis (bTB) is a chronic disease caused by the bacterium *Mycobacterium bovis*. Indiana DNR and other state and federal partners test wild white-tailed deer for bTB because it was found in Franklin County cattle in 2008, 2009, and 2016, and in Dearborn County in 2011. The disease was also detected in captive deer from a farm in Franklin County in 2009. Between 2009 and early 2021, a total of 4,144 wild hunter-harvested white-tailed deer were sampled in the bTB surveillance zones, and none of those deer tested positive for the disease.

In addition to testing hunter-harvested deer, small mammals and other deer have been sampled for bTB

on the affected 2016 cattle farm or from lands within a 1.5-mile radius of that farm since 2017. In 2020, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (USDA APHIS WS) collected 117 raccoons, 13 opossums, three groundhogs and one skunk from that area as targeted clean-up. As of early 2021, the total number of non-hunter-harvested deer and small mammals sampled in that area is 111 deer, 180 raccoons, 33 opossums, three groundhogs and one skunk. One wild raccoon tested positive for bTB in 2017. Another wild raccoon tested positive for bTB in 2020.

Since 2017-2018 deer hunting season, Indiana DNR has not conducted intensive bTB surveillance in Fayette and Franklin counties. However, Indiana DNR still responds to bTB suspect cases reported by the public (i.e., presence of nodules or lesions in the lung cavity). No bTB was detected from these investigations during the 2023-2024 deer hunting season.

Automated Animal Disease Report Form

The automated animal disease report form has remained active since its launch in mid-2020. The report form is used to track trends over time from reports of animals presenting with signs of disease or reports of animals that died under unusual circumstances. Deer are often the single most common animal reported. While reports of various animals come in year-round, the majority of reports about deer present between late July, when EHD becomes most prominent, and in December and January when antlered deer commonly die from brain abscesses.

While the report form is a tool to assist biologists in locating sick or dead wildlife, it is the responsibility of the biologists to use the information provided to investigate what caused the animal's condition. The biologists use evidence to hypothesize what happened to the deer and the deer are then classified into seven different categories: suspected EHD, suspected respiratory infection, other disease, injury, nontarget, tumor, or unknown death. Anyone can report sick or dead deer directly to Indiana DNR through the online Sick or Dead Wildlife Report form (on.IN.gov/sickwildlife). This form is useful for tracking reports of sick deer with clinical signs consistent with diseases of interest such as EHD and CWD. The person who reports a deer showing clinical signs of EHD, CWD, or other diseases of potential concern receives a phone call from a wildlife biologist or technician to verify the clinical signs and lack of obvious injury, assess if the animal's location is still known,

and determine whether to collect a sample or submit the animal for testing, if necessary.

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Chapter 7.

2023-2024 DEER MANAGEMENT SURVEY

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Understanding public opinion on topics and policies that affect deer hunting and management is an important part of the decision-making process for Indiana DNR. These data are used to set harvest regulations and to examine the potential effect of proposed regulatory changes. Since 2018, Indiana DNR has administered the Deer Management Survey to provide a convenient method for any interested hunter or non-hunter to share their opinions.

The Deer Management Survey consists of a core set of questions that remain the same every year to collect longitudinal data, with additional sets of unique questions that change each year to address emerging issues in state deer management. In the 2023 Deer Management Survey, the Indiana DNR asked several questions designed to assess opinions and behaviors related to the use of drones and cellular game cameras on public and private lands. The inclusion of specific questions should not be interpreted as a change or a desire for a particular regulation by Indiana DNR or the public.

The information gathered from these questions is often useful in answering questions from the public about Indiana DNR regulations, hunter behavior, and the need for programs designed to assist hunters (e.g., hunter access program). Here we report the results of the 2023 Deer Management Survey on these topics across the entire state. Questions regarding the desires of hunters and non-hunters about the direction of the size of the deer herd, number of deer desired and taken, and other questions related to the deer population status at the scale of counties or deer management units are reported on the online Deer Management Survey Dashboard and can be queried by county or deer management unit at IN.gov/dnr/fish-and-wildlife/wildlife-resources/animals/white-tailed-deer/deer-management-survey-results/.

Methods

The 2024 Deer Management Survey was sent to individuals that the Division of Fish & Wildlife had prior contact with and had an email address for. Individuals

included residents and nonresidents who had purchased any type of hunting, trapping, or fishing license since 2019; anyone who checked in a deer in the last five years; anyone who created an electronic account with Indiana DNR for other reasons (such as obtaining the survey); and anyone who signed up for the DNR Wild Bulletin newsletter. Because lifetime license holders and landowner hunters do not have to purchase a yearly license, they can only be surveyed if they harvest a deer, purchase another license type (e.g., fishing, deer reduction zone license, etc.), or sign up on Indiana DNR's electronic system specifically to receive the survey. Because of this, lifetime license holders and hunters who only use their landowner exemption and do not harvest a deer are likely underrepresented in the survey. Survey invitations were distributed via email in February and March 2024. The survey was developed in the program Qualtrics, all survey results were downloaded in March 2024, and descriptive statistics were generated using Program R.

Results and Discussion

General Demographics of Respondents

The 2024 Deer Management Survey was sent to 820,307 individuals who purchased some type of license(s) through the Indiana DNR online point of sale system (i.e., hunting, fishing, and trapping), had signed up for an Indiana DNR account or the Wild Bulletin newsletter, or had checked in a white-tailed deer within the past five years, all of which were dependent upon the individual providing a valid email address. Out of the surveys successfully sent, 40,301 were started, which is a response rate of 4.9% (Table 7-1). Because much of the survey is dependent upon potential respondents being assigned to a county for reporting, survey respondents had to include a county they hunted in or lived in to be included in the final data.

When residents of Indiana were asked ***Do you consider yourself a deer hunter even if you did not hunt during the 2023-2024 deer hunting season***, 29,641 residents indicated they were deer hunters while 7,128 residents indicated they were not deer hunters but wanted to provide input on deer management where they live (i.e., were resident non-hunters; Table 7-2). Of the Indiana hunters, 24,495 hunted during the 2023-2024 deer season (i.e., were active resident hunters). An additional 5,146 did not hunt in the past season but still wanted to provide input on deer around where they live in Indiana (i.e., were inactive resident hunters). Of

the nonresidents who responded to the survey, 1,303 reported they hunted during the 2023-2024 deer hunting season (i.e., were active nonresident hunters; Table 7-2).

Indiana hunters were asked about where they lived and hunted. Of the 23,413 hunters who responded, the most common responses were: *I hunt only in the county that I live in* (32.5%) and *I hunt mostly in the county that I live in, but I also occasionally hunt in other counties* (29.4%). These were followed by *I never hunt in the county that I live in, I only hunt deer in a different county* (21.6%). The remaining 16.5% occasionally hunt in the county that I live in, but mostly hunt in other counties.

We asked hunters what year they were born; 30,486 individuals responded, and 21.8% reported they were born prior to 1960, 23.9% were born in the 1960s, 21.6% were born in the 1970s, 18.6% were born in the 1980s, 10.9% were born in the 1990s, and 3.2% were born since 2000. We asked respondents if they were male or female, and 10.2% reported being female and 88.4% responded as male, with the remaining percentage opting not to report. We asked if respondents were veterans or currently serving in the military, and out of 30,276 respondents, 13.9% responded yes to being a veteran, and out of 30,259, 0.6% were currently serving in the military. We asked hunters to select **How many total years they had been a deer hunter and how many total years they have hunted deer in Indiana**.

A total of 25,019 hunters reported the number of total years they had been a deer hunter. Most (65.8%) reported they had been a hunter for more than 20 years total, followed by 17.5% who reported 10-20 years deer hunting experience, 7.8% who reported 6-10 years hunting, 7.2% who reported 2-5 years hunting, and just 1.7% who reported that this was their first year hunting deer. A total of 24,985 hunters reported the number of years they had hunted in Indiana. Most (57.7%) reported they had hunted deer in Indiana for more than 20 years, followed by 19.0% who reported 10-20 years of deer hunting in Indiana, 9.9% who reported 6-10 years hunting deer in Indiana, 10.3% who reported 2-5 years hunting in Indiana, and 3.1% who reported that this was their first-year hunting deer in Indiana. Hunters were asked to report on their level of engagement with deer hunting on a scale of 1 to 100; 25,377 hunters responded with a mean score of 82.3 (SD=20.3). When combined with the number of years hunting, this can be interpreted as the survey responses representing those of our most engaged hunters with a relatively high level of hunting experience.

Respondents were asked to report all types of equipment they used during the 2023-2024 deer season. A total of 25,680 hunters reported which type of equipment they used to hunt deer. The most common responses were high-powered rifles (56.6% of hunters), crossbows (42.7%), compound bows (36.6%), modern in-line muzzleloaders (29.3%), and shotguns (22.6%). Few respondents indicated that they used pistol-caliber rifles or other low-powered rifles (12.4%). Hunters used traditional muzzleloaders (7.7%), handguns (3.9%), traditional bows (2.7%), or modern recurve bows (1.0%) less often. Breech-loading muzzleloaders (0.9%), air rifles (0.1%), and arrow guns (0.1%) were all used by less than 1% of hunters. Most deer hunters (33.0%) reported hunting with two types of equipment, while 32.7% hunted with one, and 23.5% hunted with three equipment types. Only 10.8% of Indiana deer hunters used four or more types of equipment.

We asked hunters to select which license(s) they used in the 2023-2024 deer hunting season. A total of 25,455 hunters reported which license they used to hunt deer. The most reported answer was the license bundle (43.7% of hunters), followed by lifetime license (23.3%), landowner exemption (16.3%), and firearms license (12.8%). Few hunters used archery (8.1%), bonus antlerless (4.6%), deer reduction zone (3.6%), crossbow (4.4%), muzzleloader (2.1%), youth (1.1%), apprentice (0.4%), or military exemption (0.4%) licenses.

We asked hunters to report how many deer they wanted to harvest in the 2023-2024 deer hunting season by selecting from harvest combinations that included both bucks and does. A total of 25,262 hunters responded to this question. Most respondents (78.1%) wanted to harvest a buck. The most common combination was one buck and one doe (28.8%), followed by one buck and two does (21.7%) and just a single buck (21.5%). Very few individuals wanted to harvest one buck and three does (3.8%) or one buck and more than three does (2.2%). Only 1.3% reported wanting to harvest only a single doe. In total, under a quarter of hunters wanted to hunt a number of deer regardless of its sex (one deer 6.4%, two deer 7.3%, three deer 4.4%, four deer 1.1%, and more than four deer 1.4%).

Perceptions about Deer Populations and Management

Both hunters and non-hunters responded to a series of questions about deer population sizes and how harvest should change. Hunters were asked **How**

would you like to see the County Bonus Antlerless Quota change next year in [County] for the 2024-2025 deer hunting season? To avoid using terminology they may be unfamiliar with, non-hunters were asked **How would you like to see the number of does that can be harvested by hunters change in the next year in [County]?** (Figure 7-1). Hunters and non-hunters were asked **Please describe the size of the deer population in [County] during the 2023-2024 deer hunting season** (Figure 7-2), **How does the number of deer you saw in [County] during the 2023-2024 deer hunting season compare to the number you saw five years ago?** (Figure 7-3), and **How would you like to see the number of deer change in the next five years in [County]?** (Figure 7-4).

In the 2024 survey, asked about how quotas should change, most hunters and non-hunters responded that quotas should be maintained (56.0% and 50.8%, respectively). During the past seven years, the proportion of hunters who want to see quotas decrease has fallen, while the opinion of non-hunters has stayed relatively stable (Figure 7-1). Most hunters (50.9%) perceived the size of the deer population as low or too low, while only 22.0% of non-hunters felt the same. Conversely, 30.3% of non-hunters perceived the size of the deer population as high or too high, while only 8.4% of hunters felt the same. In both hunters and non-hunters, opinions about the size of the deer population have changed little over time (Figure 7-2).

Asked about how the deer population had changed over the last five years, most hunters responded that it was substantially, moderately, or slightly decreasing (21.1%, 15.4%, and 19.7%, respectively) or being maintained (20.4%). Most non-hunters responded that it was substantially, moderately, or slightly increasing (10.8%, 13.0%, and 20.4%, respectively) or being maintained (24.8%). Hunter perceptions about changes in the deer population have moderated over time while non-hunter perceptions have remained largely stable since 2018 (Figure 7-3).

Asked about how deer populations should change over the next five years, most hunters responded that populations should increase to some degree (60.4%). Another 19.0% responded that populations should be maintained. Responses from non-hunters were evenly distributed, with most indicating that the population should be maintained (35.2%). Fewer hunters have indicated that populations should be increased moderately or considerably over time (Figure 7-4). For non-hunters, as with the other deer population ques-

tions, these opinions show no clear trend over the last five years (Figure 7-4).

Hunters were asked a few attitudinal questions to rate their hunting satisfaction and experience. Hunters were asked, **How do you think the total deer harvested in this hunting county has changed compared to five years ago?** Most hunters reported that they thought total deer harvest had decreased (53.2%). An additional 26.3% reported they thought there was no change. Hunters were asked, **How does the number of deer you harvested in this hunting county in the most recent season compare to five years ago?** Most hunters thought there was some degree of decrease (53.2%). Over a third of respondents (37.9%) thought there was no change. For both questions, the distribution of answers has been relatively stable, though fewer hunters perceived a considerable decrease in total or personal harvest over time (Figure 7-5). Hunters were also asked **to describe the QUALITY of the bucks in this hunting county during the most recent deer hunting season.** Most (50.8%) hunters thought the bucks were of average quality, followed by low quality (27.7%). This hunter opinion has remained very stable since 2018 (Figure 7-6).

Respondents were also asked about attitudes toward management, including **On a scale of 0 (terrible) to 100 (excellent), how would you rate the job the Indiana DNR is doing managing deer STATEWIDE?** Non-hunters rated the DNR 76.4 ± 0.59 on average, while hunters rated it 69.9 ± 0.34 on average out of 100 (Figure 7-7). Both non-hunters and hunters were asked the same question about how well Indiana DNR is doing managing deer in their county. On average, non-hunters rated the DNR at 76.4 ± 0.63 , while hunters rated the DNR at 68.9 ± 0.37 out of 100 (Figure 7-8). Finally, hunters were asked, **On a scale of 0 (no enjoyment) - 100 (great enjoyment), how would you rate your overall enjoyment of your hunting experience during the 2023-2024 deer hunting season?** This rating has remained largely steady since 2018 (Figure 7-9). Hunters rated their enjoyment, on average, at 80.1 ± 0.30 out of 100.

Table 7-1. The number of Deer Management Survey invitations sent to Indiana hunters and non-hunters, the number of surveys started, and the resulting survey response rates, 2018-2024.

	2018	2019	2020	2021	2022	2023	2024
Survey Invitations Sent	269,389	370,986	469,044	346,048	1,012,126	801,760	820,307
Surveys Started	23,283	33,987	30,078	26,012	28,109	39,888	40,310
% Response rate	8.64	9.16	6.41	7.52	2.78	4.98	4.91

Table 7-2. Categories of individuals responding to the Deer Management Survey between 2018 and 2024.

Type	Description	Question Type	2018	2019	2020	2021	2022	2023	2024
Active Nonresident Hunters	Nonresident Indiana deer hunters who hunted during the most recent deer season	County where they hunt	676	1,318	1,066	1,210	921	875	1,303
Active Resident Hunters	Resident Indiana deer hunters who hunted during the most recent deer season	County where they hunt and county where they live (when they differ)	14,839	22,604	16,894	18,340	15,157	24,747	24,495
Inactive Resident Hunters	Resident Indiana deer hunters who did not hunt during the most recent deer season	County where they live	2,752	3,859	3,528	2,252	3,047	6,937	5,146
Resident Nonhunters	Indiana residents who are not deer hunters	County where they live	2,343	2,574	3,718	1,983	4,458	5,125	7,128
Invalid Responses	Participants who were not qualified to take the survey (nonresident nonhunters) and participants who did not answer enough questions to be categorized.	None	2,673	3,632	4,872	2,227	4,526	2,204	2,238
Total Reported	Total sample included for data analysis	All	20,610	30,355	25,206	23,785	23,583	37,684	38,072

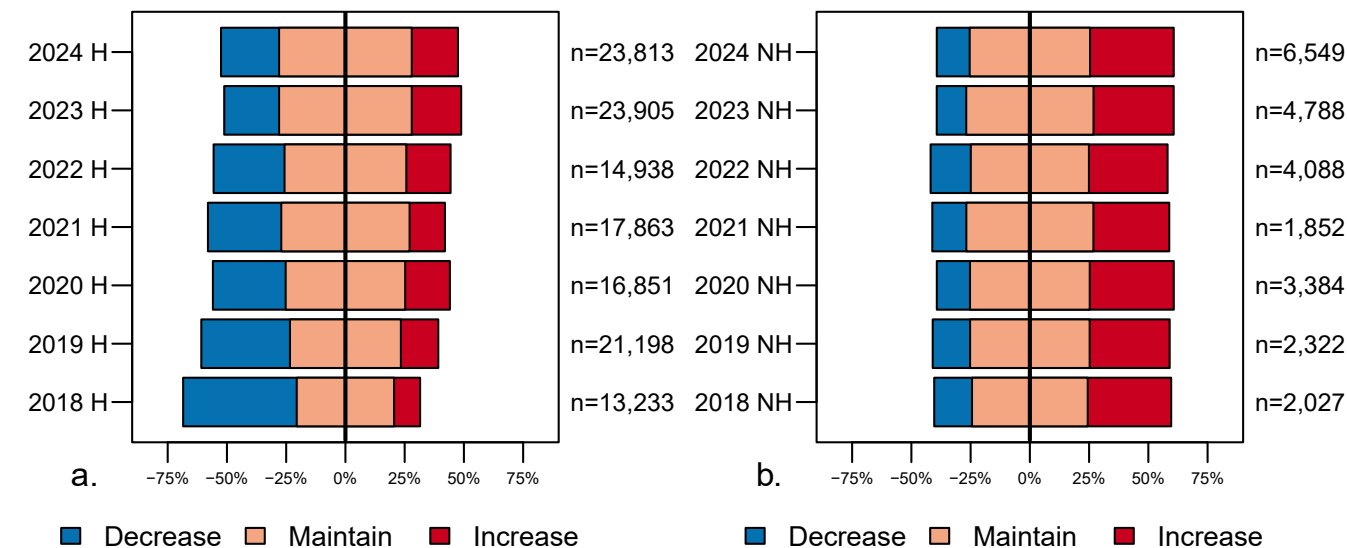


Figure 7-1. Hunter (a.) and non-hunter (b.) opinion on how the County Bonus Antlerless Quota should change the following year in Indiana.

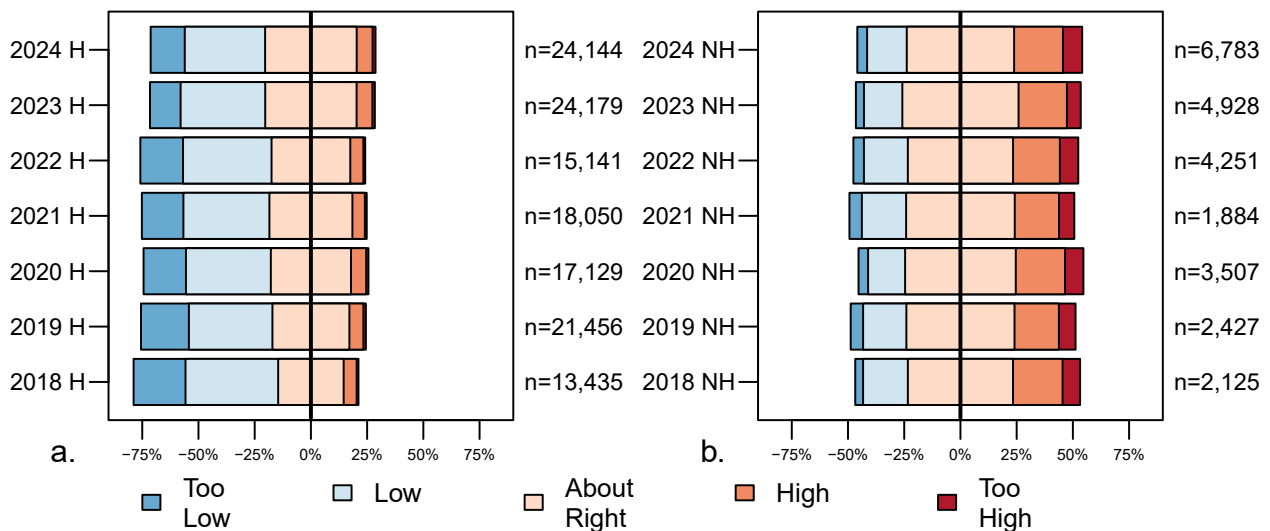


Figure 7-2. Hunters (a.) and non-hunters (b.) describe the current size of the deer population in the county where they hunt and/or live in Indiana.

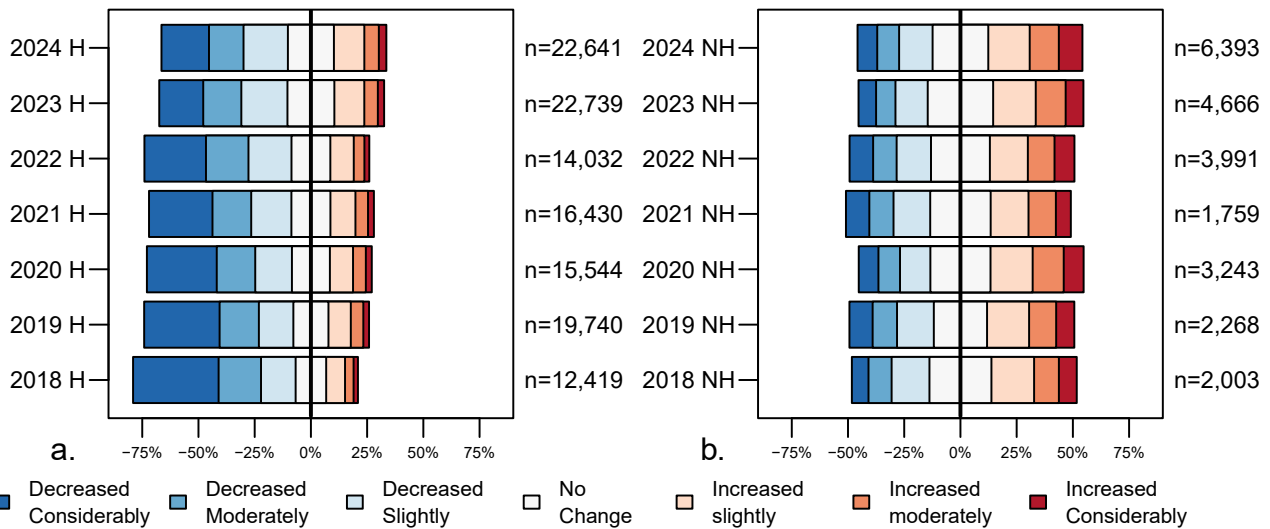


Figure 7-3. Hunters (a.) and non-hunters (b.) describe the number of deer seen now compared to five years ago in the county where they hunt and/or live in Indiana.

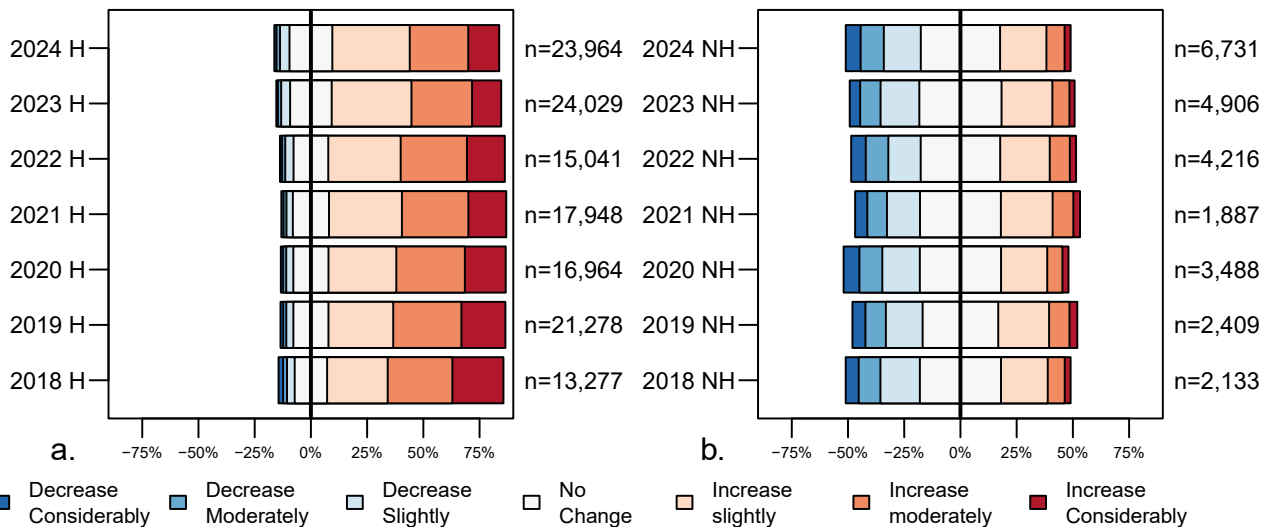


Figure 7-4. Hunters (a.) and non-hunters (b.) describe their desired change in the size of the deer population in the county where they hunt and/or live in Indiana.

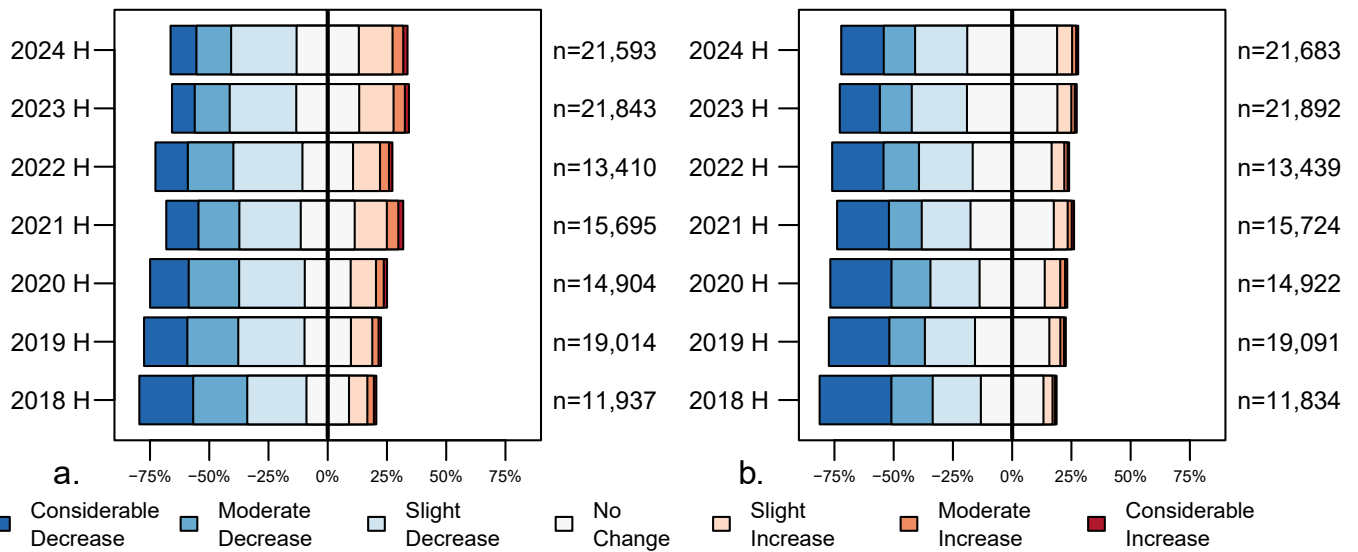


Figure 7-5. Hunter opinion on how the total number of harvested deer (a.) and their personal number of harvested deer (b.) in Indiana has changed over the last five years.

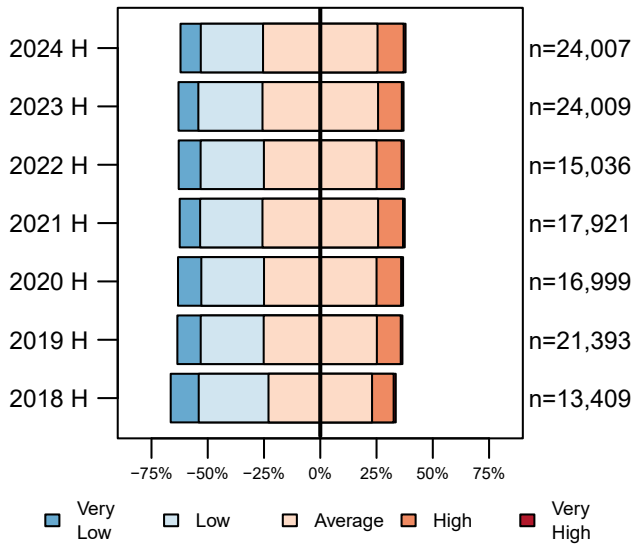


Figure 7-6. Hunters describe the quality of bucks in the county where they hunt in Indiana.

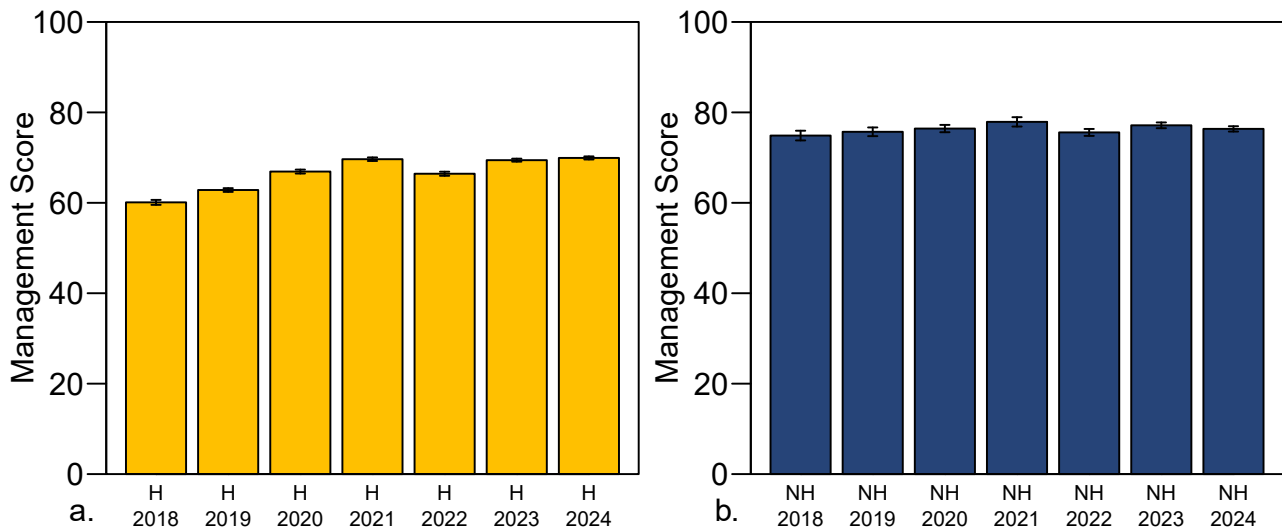


Figure 7-7. Hunters (a.) and non-hunters (b.) were asked to score the Indiana DNR's statewide deer management on a scale of 0 (poor) to 100 (excellent).

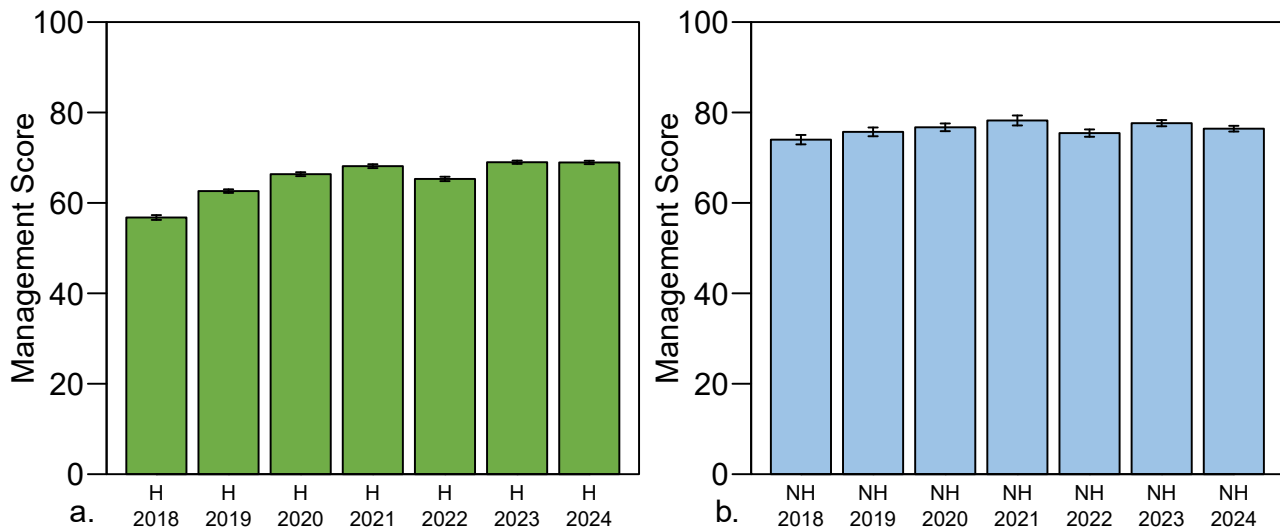


Figure 7-8. Hunters (a.) and non-hunters (b.) were asked to score the Indiana DNR's county deer management on a scale of 0 (poor) to 100 (excellent).

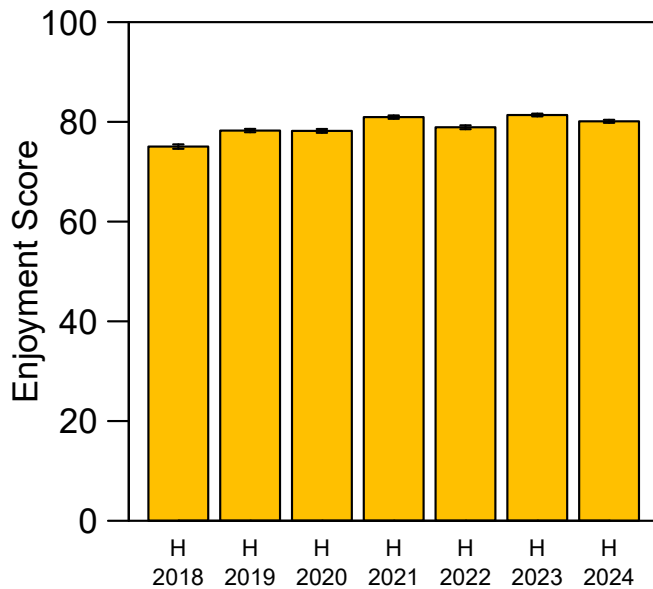


Figure 7-9. Hunters were asked to score their hunting experience on a scale of 0 (no enjoyment) to 100 (great enjoyment) during the previous Indiana deer season.

Chapter 8.

VOLUNTEER MONITORING

Volunteer monitoring is public participation in data collection and analysis of natural resources. The Indiana DNR seeks assistance from volunteers as an alternative way to collect data traditionally obtained by biologists. Volunteer monitoring provides people an opportunity to participate in resource management and allows for collection of a wider set of data from a broader scale, thus saving Indiana DNR time and resources. Currently, the Deer Program relies on volunteers for two projects: the Archer's Index and the After Hunt Survey.

ARCHER'S INDEX

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Archery hunters play an important role in monitoring the abundance of furbearers and other wildlife species in Indiana. Since the early 1990s, Indiana archery hunters have voluntarily shared their wildlife observations with Indiana DNR as a way to monitor trends in statewide wildlife populations. The partnership between archery hunters and Indiana DNR has provided a consistent and inexpensive method for monitoring many wildlife species. The Division of Fish & Wildlife (DFW) Furbearer Program currently manages the Archer's Index and has shared its data on deer observations for analysis in the White-tailed Deer Report. The complete Archer's Index report is available on a yearly basis and contains indices for a number of furbearer species. See previous Archer's Index reports by searching wildlife.IN.gov. Volunteers may sign up to participate in the Archer's Index at on.IN.gov/archersindex.

Methods

Prior to archery hunting season, hunters who volunteered to participate in the survey were sent a standardized survey form and directions for recording wildlife observations. Hunters were asked to record the number of hours spent hunting each day, noting either morning or evening hunts, and the total number of each wildlife species observed daily.

Historically, the survey ended on the same day as the early archery season, typically in late November; however, regulation changes were implemented in 2012 that extended the archery season to one continuous season that ended in early January. Since then, the

Archer's Index has ended one day prior to the opening of firearms season to ensure an unbiased and standard survey period. After the end of the survey period, participants returned their completed survey form to Indiana DNR.

Population indices were tabulated by dividing the total number of each wildlife species sighted by the total number of hours hunted. Observations per hour, fawn:doe ratios, and doe:buck ratios were calculated statewide and at a regional level based on the 10 deer management units (DMU) the Deer Research Program created in partnership with Purdue University to better understand deer trends across broad habitats. Statewide results are reported in this section, and regional results are reported in the DMU Data Sheets section. Bootstrapped confidence intervals (CI95) were calculated for observations per hour each year.

Results and Discussion

In 2023, a total of 317 hunters in 87 counties reported deer observations in the Archer's Index. Hunters observed a total of 13,426 deer in 14,314 hours during 4,469 observational periods ranging from 0.5 to 12 hours. Hunters observed an average of 0.98 deer per hour (CI95=0.95 – 1.01; Figure 8-1). A total of 3,914 bucks, 5,447 does, 3,014 fawns, and 1,051 deer of an undetermined age and sex were observed. From the Archer's Index, the statewide fawn:doe ratio was 0.55:1 (CI95=0.53 – 0.58), and the doe:buck ratio was 1.38:1 (CI95=1.32 – 1.44). Comparatively, the harvest doe:buck ratio was 0.79:1 (CI95=0.78 – 0.80; Figure 8-2).

The Archer's Index provides several trends or indices of the size, composition, and recruitment of the deer population and may be useful for monitoring how these populations change over time. Because these values have not been measured against a known population, it is unclear how closely the values from these indices reflect true population values. Therefore, the results of the Archer's Index can only be used to monitor trends of deer population and not the actual size. One potential bias proposed by critics of volunteer monitoring observer indices is that fawn observations may be underrepresented. Older fawns can look similar to young does, especially if the fawns are not traveling with their doe. Thus, fawn:doe ratios and recruitment data may become skewed. However, the period when the Archer's Index occurs (October to mid-November) is considered an ideal time to record fawn observations because bias from fawns not traveling with their mother is minimized. Fawns are likely at their smallest

body size, routinely traveling with their mother, and loss of the parent is minimized prior to firearms season. Furthermore, if the fawn:doe ratios are biased in favor of does, due to misidentified fawns, then the doe:buck ratio would likewise be skewed toward does. This does not appear to be the case for DNR's data, as doe:buck ratios are between 1.3:1 and 2.0:1 in most areas (see DMU sheets in the Appendices).

Fawn recruitment is the number of fawns that are born and survive to join the huntable population in the fall. The recruitment value is lower than the total number of fawns born each spring. Fawns die or are killed between birth and the hunting season due to predation, disease, exposure, abandonment, deer-vehicle collisions, haying operations, and other reasons. Therefore, the recruitment rate is almost always lower than the birth rate. For example, the reproductive characteristics of does were recently studied in Illinois. Green et al. (2017) found an average of 20.5% of recruited fawns and 85.5% of adult does were bred by the end of the breeding season. Their average litter size was 1.9 ± 0.54 fawns. In 2015, Illinois' reported statewide recruitment, based on its fawn:doe ratio, was 0.5:1 (QDMA 2016). Even though a large proportion of deer were bred, resulting in a high rate of births, fawns experienced a high rate of mortality. Fawn recruitment values can be used for several different purposes, including modeling for allowable buck and/or doe harvest and as an indicator of potential problems with a deer herd, such a slow growth rate.

Initially, it may appear that fawn:doe ratios are low for many of the DMUs and statewide; however, Indiana has similar fawn:doe ratios compared to nearby states, according to the 2015 recruitment data reported to QDMA (2019): Ohio (0.60:1), Illinois (1.18:1), Michigan (0.47:1; QDMA 2015), or the Midwest average (0.93; NDA 2021). Although these reported ratios are similar, caution should be taken when directly comparing fawn:doe ratios across states, because the respective methodologies they use to calculate the fawn:doe ratios differ. These differences are often based on how the data have been historically collected. For example, Ohio uses the ratio of fawns to does in the harvest, whereas Wisconsin calculates its fawn:doe ratios on a regional basis, using the total number of biologist observations of fawns and does (0.90:1 in 2017; QDMA 2019). It may seem that all states should use the same system, but for each state's deer management program, the long-term trend (i.e., index) is more important than a comparison with neighboring states. Therefore,

readers must understand how the data are collected in other states before comparing their data to Indiana's fawn:doe ratios.

Currently, Indiana has an approximately balanced pre-hunt sex ratio (1.38:1). Balanced doe:buck ratios are generally considered to be desirable because they increase the likelihood of all does being bred during the period when they are most receptive, a more condensed rut, and an earlier fawning season (Guynn and Hamilton 1986; Neuman et al. 2017).

Observations per hour is an index that can be used to examine long-term trends in the deer population. It is important to understand that this is an index of the population and does not represent population numbers or an expectation for hunters (i.e., if the average reported observation per hour is 0.98, hunters should not expect to see a deer every hour they are in the woods). Observations per hour for bucks have been level since 2011 but have increased slightly over time for total deer (Figure 8-2).

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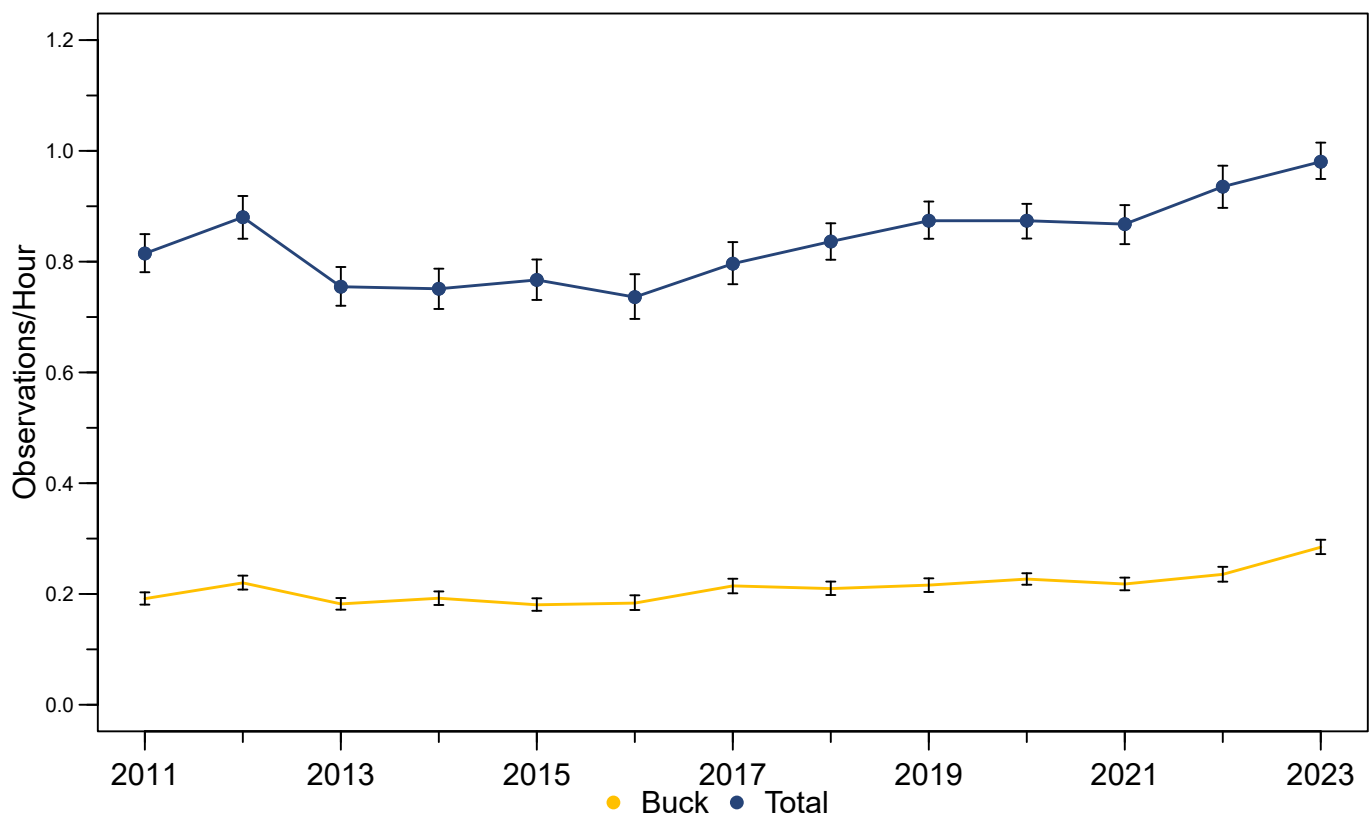


Figure 8-1. Annual average observations per hour of bucks and total deer reported in the Archer's Index.

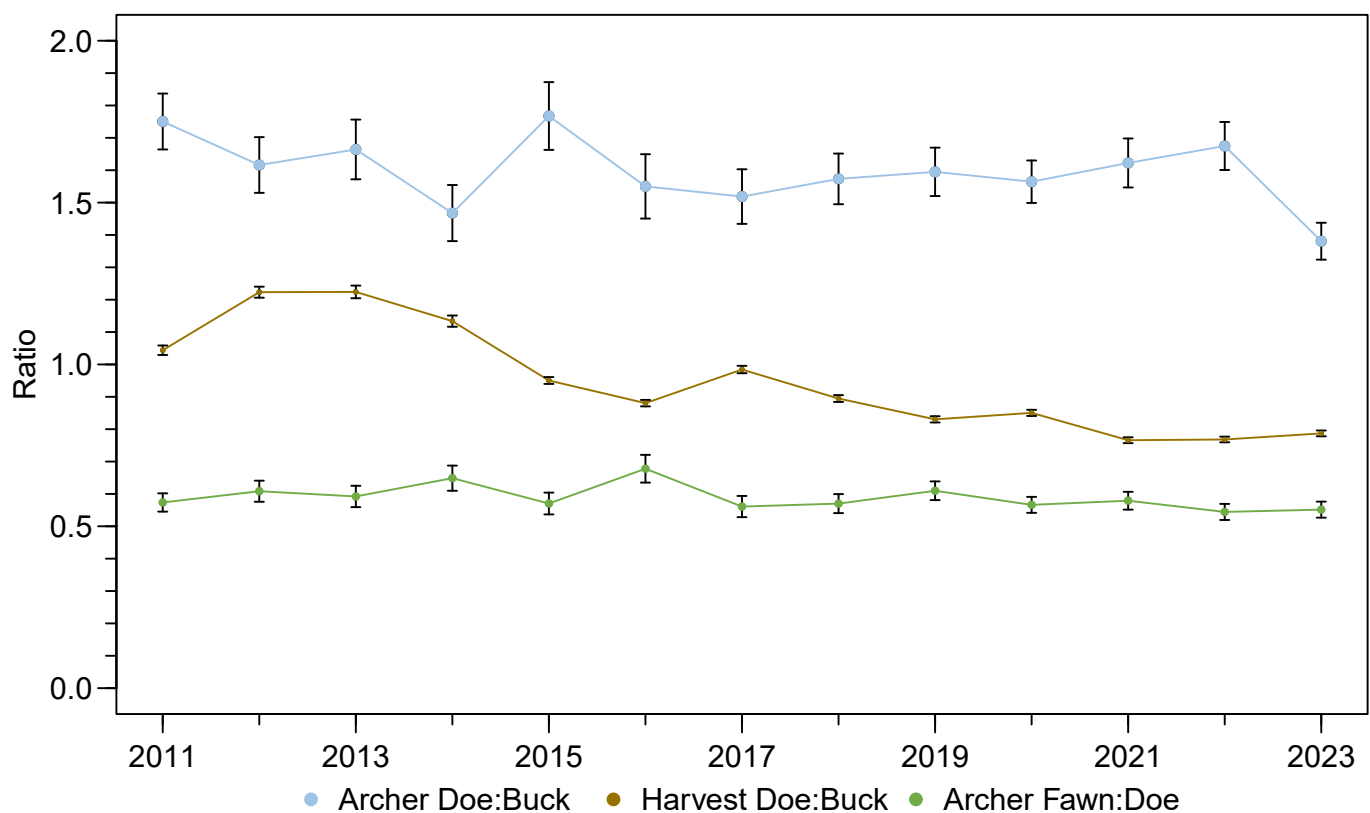


Figure 8-2. Statewide observation of doe:buck and fawn:doe ratios reported in the Archer's Index and the reported doe:buck harvest ratio from CheckIN Game data.

AFTER HUNT SURVEY

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For many years, Indiana DNR biologists examined deer at check stations where hunters brought their deer to record their harvest. Biologists recorded age, sex, and other biological information that was useful for managing the deer herd. In 2015, Indiana moved to an online system, CheckIN Game, to make the process more convenient for hunters. The After Hunt Survey was created in 2017 to allow hunters the opportunity to continue providing biological information about their harvested deer. The goal of the After Hunt Survey is for hunters to self-report on enough deer so that both hunters and managers can examine deer population biology, ecology, and demographics at the county level. The 2023-2024 deer season was the seventh year the After Hunt Survey was available. Because the sample size for most counties was insufficient to report results at the county level, results are reported at regional and statewide levels.

Methods

The After Hunt Survey was administered using Qualtrics, an electronic survey system. Hunters were asked to participate in the survey after they had checked in their deer. They could also access the survey later by visiting deer.dnr.IN.gov and clicking on the After Hunt Survey link under Deer Management. Questions were asked about the equipment used to harvest the deer, the location of harvest, the number of hours spent hunting for that deer, the hunter's opinion of that particular hunt, and biological information for that deer.

Results and Discussion

Sample Size. A total of 3,523 hunters responded. At least one response was received from each county; the highest number of responses was 89 from LaPorte County, and the smallest was from Benton County, with eight reports. To be able to assess data at the county level, 80-120 responses are needed from each county, depending on the number of categories for each question. If these numbers aren't obtained, data can be analyzed at a regional level based on nine of Indiana's 10 Deer Management Units (DMUs; see Figure 3-6). The number of responses per DMU ranged from 23 (Urban Unit) to 735 (South Unit; Table 8-1).

Deer Ages. Hunters were asked to age their deer using tooth wear and replacement patterns. Excluding incomplete responses, hunters did not report the ages of 330 does and 667 bucks, including 162 bucks that were going to be mounted. In total, hunters reported the age of 523 does and 729 bucks. Statewide, most deer were reported as 2.5 years old (Figure 8-3). There was an insufficient number of aged deer reported to summarize the age structure at the county level. Regional age structures were similar to the statewide distribution with a few exceptions (Table 8-2) because of the small sample size in many deer management units.

Lactation Rates. Lactation rates provide an estimate of fawn recruitment, which is especially useful in setting harvest quotas. Low fawn recruitment may warrant a change to quotas because it indicates fewer deer are surviving and entering next year's population. During the 2023-2024 season, 1,031 hunters who harvested a female deer reported that 31.3% were lactating and 68.7% were not. From October 1, 2023, to January 7, 2024, 25.1% of adult does age 2.5 years or older were reported still lactating. Lactation rates for does age 2.5 years or older obtained from all previous After Hunt Surveys depict a gradual decline as the season progresses. To report lactation rates at the county or regional level, especially for one season, the number of responses must increase substantially. The variation that results from the small sample size obtained does not allow for a reliable estimation of recruitment.

Hunter Experience. The After Hunt Survey asks several questions related to a particular hunting experience. On a scale of 0 (poor) to 100 (excellent), hunters were asked to rate their overall enjoyment of the hunt, the number of does and bucks they saw on the hunt, the quality of those bucks they observed, and how they felt Indiana DNR is managing deer in the county in which they hunt. In general, responses from quality of bucks, quantity of bucks, and quantity of does were bimodal, meaning most responses were either at the low end or the high end of the scale. Responses about the quality of bucks where the respondents hunted private land (mean score = 59.7; n=2,814) and on public land (mean score = 60.0, n = 267) were similar. Responses about the number of bucks seen where the respondents hunted private land (mean score = 58.4; n=2,845) and on public land (mean score = 58.6, n = 279) were similar. Responses about the number of does seen where the respondents hunted private land (mean

score = 66.5; n=2,915) and on public land (mean score = 62.4, n = 279) were also similar. Responses about how Indiana DNR was managing deer in the county in which the respondents hunted private land (mean score = 75.5; n=2,813) and how much they enjoyed their hunt on private lands (mean score = 91.6, n = 3,081) both indicated higher levels of satisfaction. Results were similar when respondents were asked about how Indiana DNR was managing deer in the county in which the respondents hunted public land (mean score = 77.1; n=270) and how much they enjoyed their hunt on public lands (mean score = 91.0, n = 305) both indicated higher levels of satisfaction.

Antler Characteristics. Hunters reported 89.8% of the bucks harvested on private land had a typical rack; the remaining 10.2% were nontypical. Hunters reported 90.0% of the bucks harvested on public land had a typical rack; the remaining 10.0% were nontypical.

The average number of points reported from harvested bucks averaged 3.8 on both the left side and right side of the antlers on private land and 3.5 (left) and 3.4 (right) on public lands. The average for the inside spread of the main beams was 13.6 inches on private land (n=1,225; SD=4.7) and 12.2 on public land (n=132; SD=4.7). The average total inches of antler, defined as the length of the main beam plus the length of each of the tines as measured from the center of the main beam along the longest portion of the tine, averaged 73.1 inches on private land (n=898; SD=59.4) and 56.5 inches on public land (n=103; SD=55.0).

Body Weights. Body weights can provide valuable information about the quality of deer and the relationship of recruitment to nutrition if data are frequently reported on small scales (i.e., county or 16-mile² grid level). Hunters (n=1,859) reported the field-dressed weight of their deer only if it had been weighed on a scale. Hunters (n=715) on private land reported that the average dressed weight of does was 102.7 lbs. (n=646; SD=43.1) and the average dressed weight of bucks was 148.3 lbs. (n=1,048; SD=54.3). Hunters (n=165) on public land reported that the average dressed weight of does was 93.6 lbs. (n=69; SD=93.6), and the average dressed weight of bucks was 135.8 lbs. (n=96; SD=50.6). Live weights can be estimated by multiplying the field-dressed weight by 1.26 as reported in Smart et al. (1973). The number of responses was insufficient to summarize body weights by age class at either the county or regional level. Self-reporting of deer body

weights by hunters needs to be significantly higher for this factor to inform management.

Hunter Effort. The number of hours it takes to harvest a deer can be used to calculate harvest per unit effort, which can serve as an index for deer population size. Because this index may have an inherent selective bias, it should be viewed with caution. For example, hunters may spend more time harvesting a particular buck than they would to harvest a doe.

Hunters reported they hunted an average of 27.5 hours (n=1,882; SD=68.0) on private land and 24.7 hours (n=186; SD=39.8) on public lands before harvesting their buck. During this time, hunters saw an average of 3.6 bucks (n=1,883; SD=4.6) and an average of 7.1 does (n=1,880; SD=13.0) on private land and 2.7 bucks (n=185; SD=3.9) and an average of 4.3 does (n=185; SD=7.8) on public land.

Hunters reported they hunted an average of 17.7 hours (n=1,194; SD=30.2) on private land and 12.5 hours (n=120; SD=20.6) on public lands before harvesting their doe. During this time, hunters saw an average of 5.8 does (n=1,196; SD=7.6) on private land and an average of 4.2 does (n=118; SD=4.7) on public land.

The After Hunt Survey has potential to provide valuable biological information from harvested deer, including age, sex, and reproductive status. It may also be used to develop an index of harvest per unit effort; however, additional research is needed to evaluate the utility of harvest per unit effort as an accurate estimator of population size. Reporting must increase significantly before information collected in the After Hunt Survey can be reliably applied at the regional, county, or subcounty level. Increasing promotion of the survey in the annual Indiana Hunting & Trapping Guide, media outlets, and on social media will help ensure a sufficient number of responses are obtained so this information can be used for management purposes.

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Table 8-1. Number of After Hunt Survey responses by Deer Management Unit, 2023-2024.

Deer Management Units	Number of Counties in Unit	Number of Responses	% of Total Responses
Dearborn Upland	3	121	3.4%
East Central	28	696	19.8%
Muscatatuck Plateau	4	127	3.6%
Northeast	4	267	7.6%
Northwest	13	709	20.1%
South	16	735	20.9%
Southwest	9	299	8.5%
Urban	1*	23	0.7%
Wabash Valley	6	262	7.4%
West Central	9	284	8.1%
Total Responses		3,523	

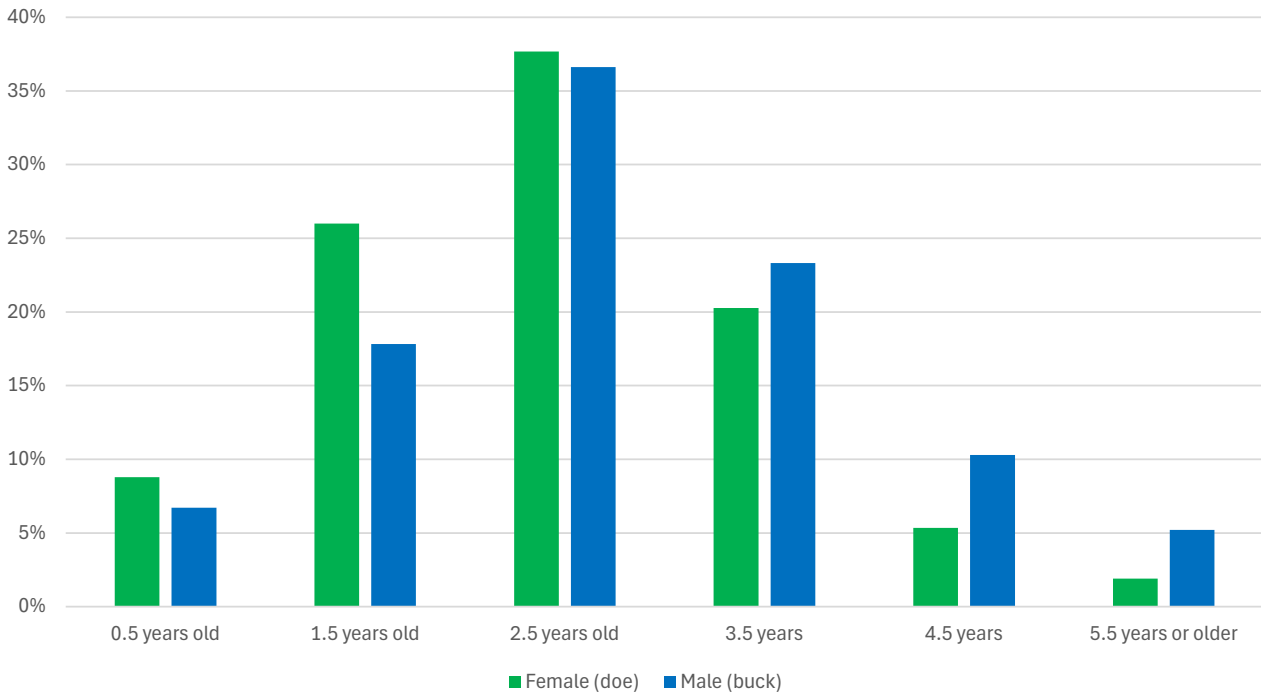


Figure 8-3. Age distribution of the statewide deer harvest reported in the 2023-2024 After Hunt Survey.

Table 8-2. Age distribution of harvested bucks and does by Deer Management Unit reported in the 2023-2024 After Hunt Survey.

DMU and Estimated Age	Female (doe)		Male (buck)		DMU and Estimated Age	Female (doe)		Male (buck)	
	% for DMU	Number of reports	% for DMU	Number of reports		% for DMU	Number of reports	% for DMU	Number of reports
Dearborn	2.7%	14	4.4%	32	South	20.7%	108	20.4%	149
0.5 years old (a fawn)	0.0%		12.5%	4	0.5 years old (a fawn)	11.1%	12	6.7%	10
1.5 years old (a yearling)	7.1%	1	18.8%	6	1.5 years old (a yearling)	22.2%	24	23.5%	35
2.5 years old	50.0%	7	34.4%	11	2.5 years old	37.0%	40	33.6%	50
3.5 years	28.6%	4	31.3%	10	3.5 years	22.2%	24	21.5%	32
4.5 years	7.1%	1	0.0%		4.5 years	4.6%	5	9.4%	14
5.5 years or older	7.1%	1	3.1%	1	5.5 years or older	2.8%	3	5.4%	8
East Central	17.6%	92	20.7%	151	Southwest	9.4%	49	9.2%	67
0.5 years old (a fawn)	9.8%	9	4.0%	6	0.5 years old (a fawn)	8.2%	4	9.0%	6
1.5 years old (a yearling)	26.1%	24	21.2%	32	1.5 years old (a yearling)	42.9%	21	11.9%	8
2.5 years old	34.8%	32	39.7%	60	2.5 years old	34.7%	17	37.3%	25
3.5 years	21.7%	20	23.2%	35	3.5 years	12.2%	6	31.3%	21
4.5 years	6.5%	6	8.6%	13	4.5 years	2.0%	1	10.4%	7
5.5 years or older	1.1%	1	3.3%	5					
Muscatatuck	3.3%	17	4.1%	30	Urban	0.8%	4	0.7%	5
0.5 years old (a fawn)	11.8%	2	6.7%	2	0.5 years old (a fawn)	0.0%		20.0%	1
1.5 years old (a yearling)	41.2%	7	20.0%	6	1.5 years old (a yearling)	50.0%	2	0.0%	
2.5 years old	29.4%	5	30.0%	9	2.5 years old	25.0%	1	60.0%	3
3.5 years	11.8%	2	30.0%	9	3.5 years	25.0%	1	20.0%	1
4.5 years	5.9%	1	6.7%	2					
5.5 years or older	0.0%		6.7%	2					
Northeast	9.4%	49	6.7%	49	Wabash	7.5%	39	7.3%	53
0.5 years old (a fawn)	2.0%	1	4.1%	2	0.5 years old (a fawn)	15.4%	6	7.5%	4
1.5 years old (a yearling)	22.4%	11	14.3%	7	1.5 years old (a yearling)	20.5%	8	13.2%	7
2.5 years old	42.9%	21	57.1%	28	2.5 years old	35.9%	14	20.8%	11
3.5 years	26.5%	13	12.2%	6	3.5 years	17.9%	7	26.4%	14
4.5 years	4.1%	2	8.2%	4	4.5 years	7.7%	3	24.5%	13
5.5 years or older	2.0%	1	4.1%	2	5.5 years or older	2.6%	1	7.5%	4
Northwest	19.9%	104	18.5%	135	West Central	9.0%	47	8.0%	58
0.5 years old (a fawn)	7.7%	8	8.9%	12	0.5 years old (a fawn)	8.5%	4	3.4%	2
1.5 years old (a yearling)	25.0%	26	12.6%	17	1.5 years old (a yearling)	25.5%	12	20.7%	12
2.5 years old	36.5%	38	41.5%	56	2.5 years old	46.8%	22	24.1%	14
3.5 years	19.2%	20	17.8%	24	3.5 years	19.1%	9	31.0%	18
4.5 years	8.7%	9	11.1%	15	4.5 years	0.0%		12.1%	7
5.5 years or older	2.9%	3	8.1%	11	5.5 years or older	0.0%		8.6%	5

Chapter 9. DNR DEER RESEARCH

Each year the Indiana DNR conducts various research to investigate questions related to deer management. These can be literature reviews to answer specific questions that have arisen, such as for a new policy; field work to estimate deer populations; or statistical analysis of existing data. In this section, we report on the internal research that was conducted in 2023 and some results of the 2024 Deer Management Survey.

Estimates of Deer Population Density

Carsten White,

Indiana Department of Natural Resources

At the conclusion of the five-year Integrated Deer Management Project in 2022, Purdue University and Indiana DNR began to develop maps displaying spatially explicit densities of white-tailed deer in three regional management units (RMUs) across the state. Delisle et al. (2023b) randomly deployed camera traps across the RMUs from 2019-2022 and used the data collected to develop a deer density surface model. This surface model was then paired with influential land cover and landscape composition covariates (e.g., landscape fragmentation, distance to wetlands, and anthropogenic development) that best predicted densities at the camera sites and beyond for complete RMU extrapolation.

On the developed maps, white-tailed deer densities are shown within five main groupings (<5 [black], 5-15 [purple], 16-25 [maroon], 26-40 [orange], and 41+ [yellow]) by how many deer per square mile were estimated within the spatially explicit model. In urban areas (depicted in white), data was not collected, thus no density estimates are currently available. To allow readers to easily view counties that have been sampled and those that still require density data to be collected

(depicted in tan), blocks of counties are shown in Figures 9-1 through 9-11.

Continued development of these density maps will proceed across all areas of the state beginning in early 2025. Until finer scale, spatially explicit models can be developed from the collected data, simplified maps containing estimated densities in covered or open habitat within an area will be shared (see Decatur/Fayette/Franklin counties in Figure 9-9). Areas not currently depicted will be prioritized, and regular updating of the density maps will occur every two to three years as sufficient data collection allows. After further work from Delisle et al. (2023a), density data will now be collected via aerial flights by crewed aircraft or unmanned aerial vehicles (UAVs; drones) due to the cost-effectiveness of sampling large areas of the state in a timelier manner. In the coming years, Purdue University students and Indiana DNR staff will perform these flights and use distance sampling to estimate deer densities to be used in the same spatially explicit model as previously used. Updates to the density maps will be made available in future Indiana White-tailed Deer Reports.

Literature Cited

- Delisle, Z. J., McGovern, P. G., Dillman, B. G., Reeling, C. J., Caudell, J. N., & Swihart, R. K. 2023a. Using cost-effectiveness analysis to compare density-estimation methods for large-scale wildlife management. *Wildlife Society Bulletin*, e1430. <https://doi.org/10.1002/wsb.1430>.
- Delisle, Z. J., Miller, D. L., & Swihart, R. K. 2023b. Modelling density surfaces of intraspecific classes using camera trap distance sampling. *Methods in Ecology and Evolution* 14:1287-1298 <https://doi.org/10.1111/2041-210X.14093>.

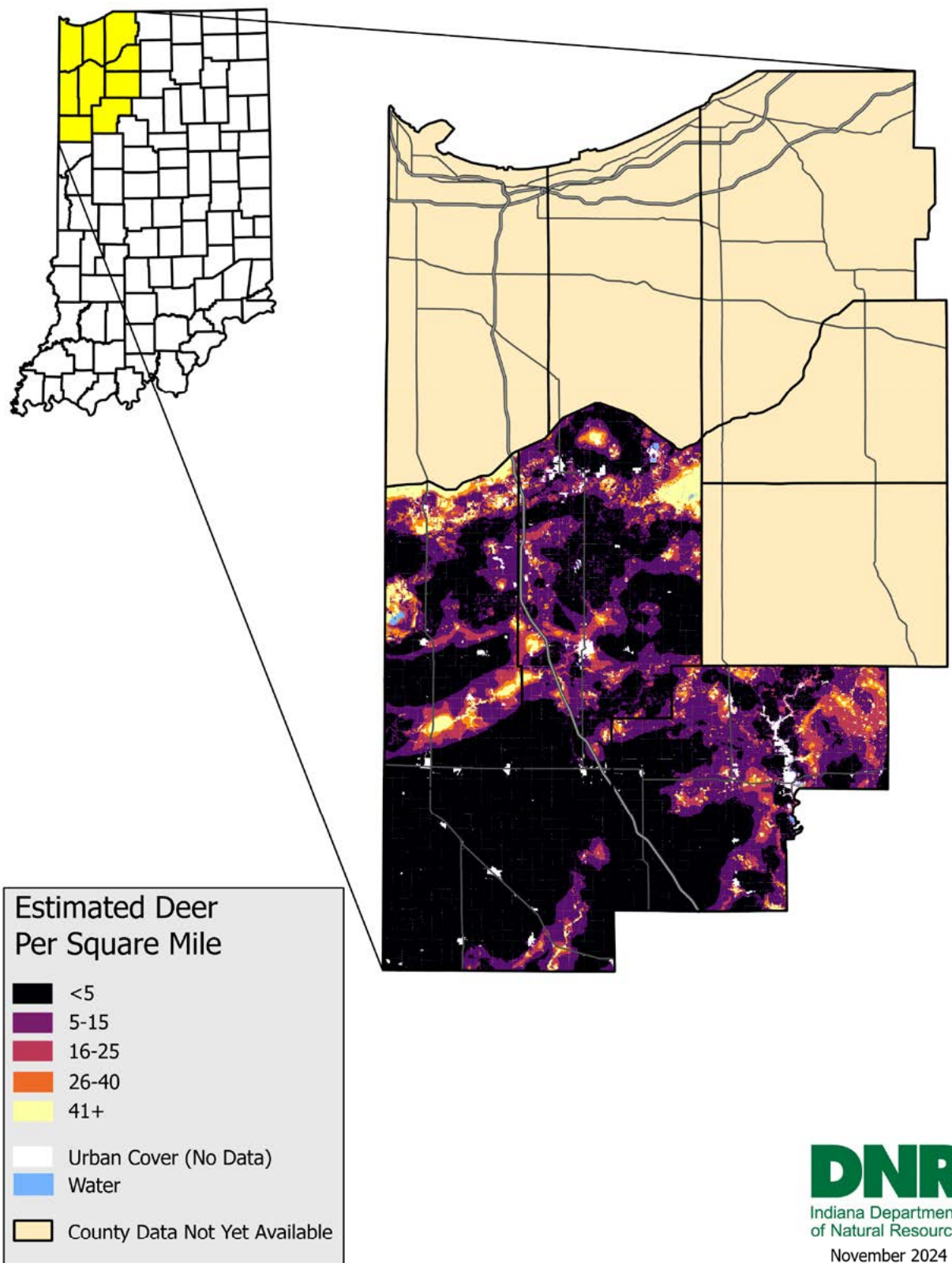


Figure 9-1. White-tailed deer densities from Lake, Porter, LaPorte, Newton, Jasper, Starke, Pulaski, Benton, and White counties in northwest Indiana. Spatially explicit deer densities are grouped into five categories (<5, 5-15, 16-25, 26-40, and 41+) by the estimated deer per square mile. Density data in urban areas (white) was not collected. Complete counties lacking density data are depicted in tan.

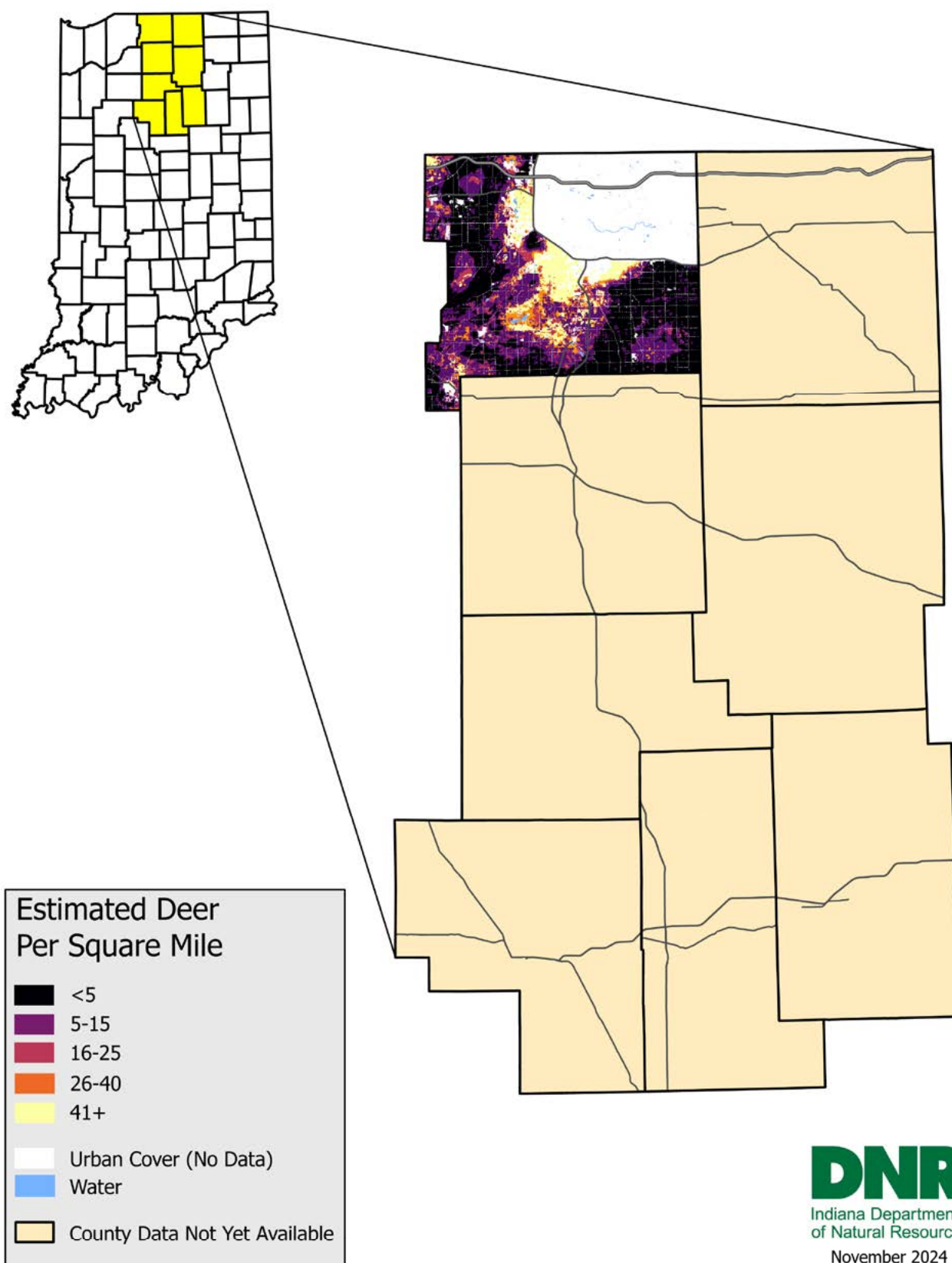


Figure 9-2. White-tailed deer densities from Saint Joseph, Elkhart, Marshall, Kosciusko, Fulton, Cass, Miami, and Wabash counties in north-central Indiana. Spatially explicit deer densities are grouped into five categories (<5, 5-15, 16-25, 26-40, and 41+) by the estimated deer per square mile. Density data in urban areas (white) was not collected. Complete counties lacking density data are depicted in tan.

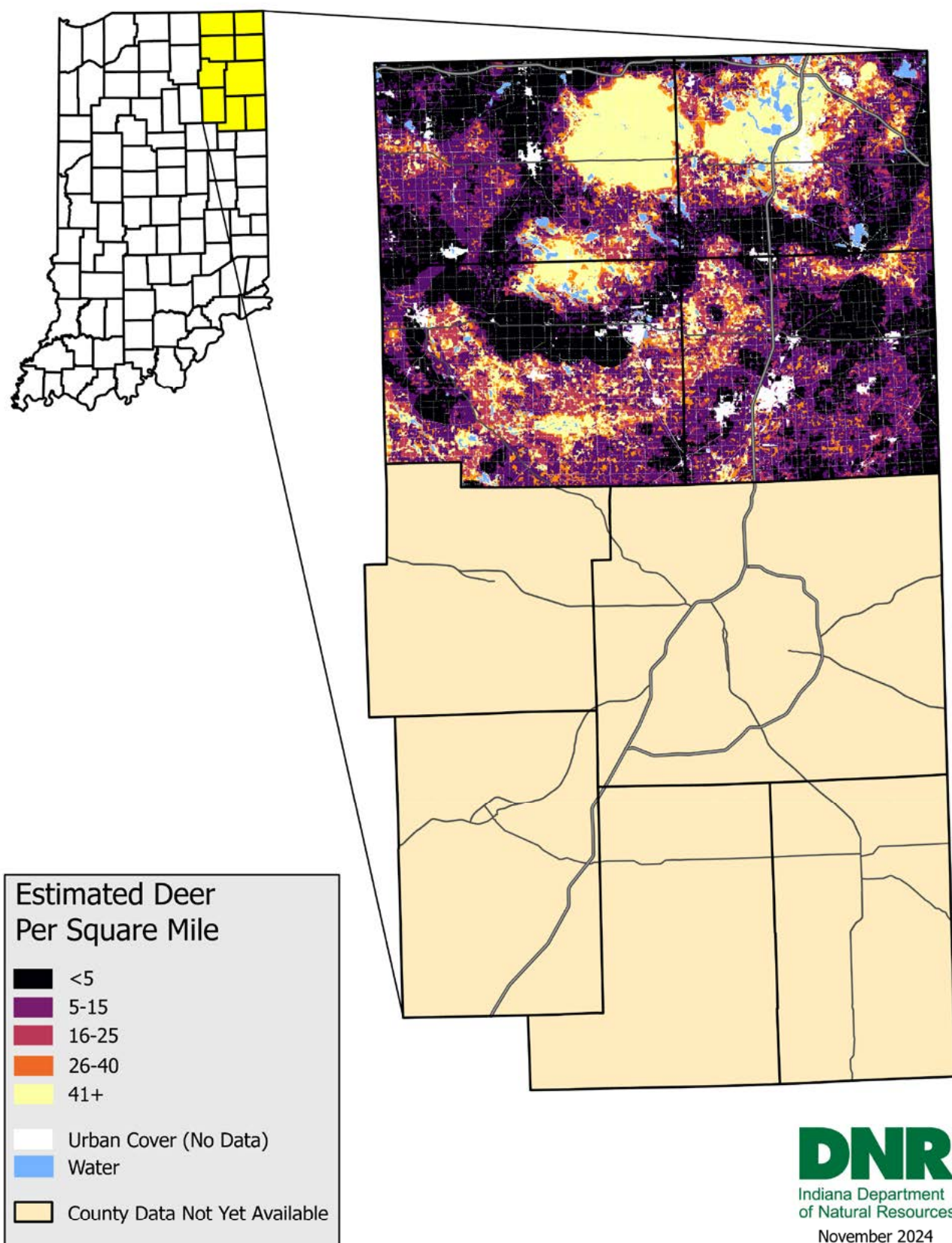


Figure 9-3. White-tailed deer densities from LaGrange, Steuben, Noble, DeKalb, Whitley, Allen, Huntington, Wells, and Adams counties in northeastern Indiana. Spatially explicit deer densities are grouped into five categories (<5, 5-15, 16-25, 26-40, and 41+) by the estimated deer per square mile. Density data in urban areas (white) was not collected. Complete counties lacking density data are depicted in tan.

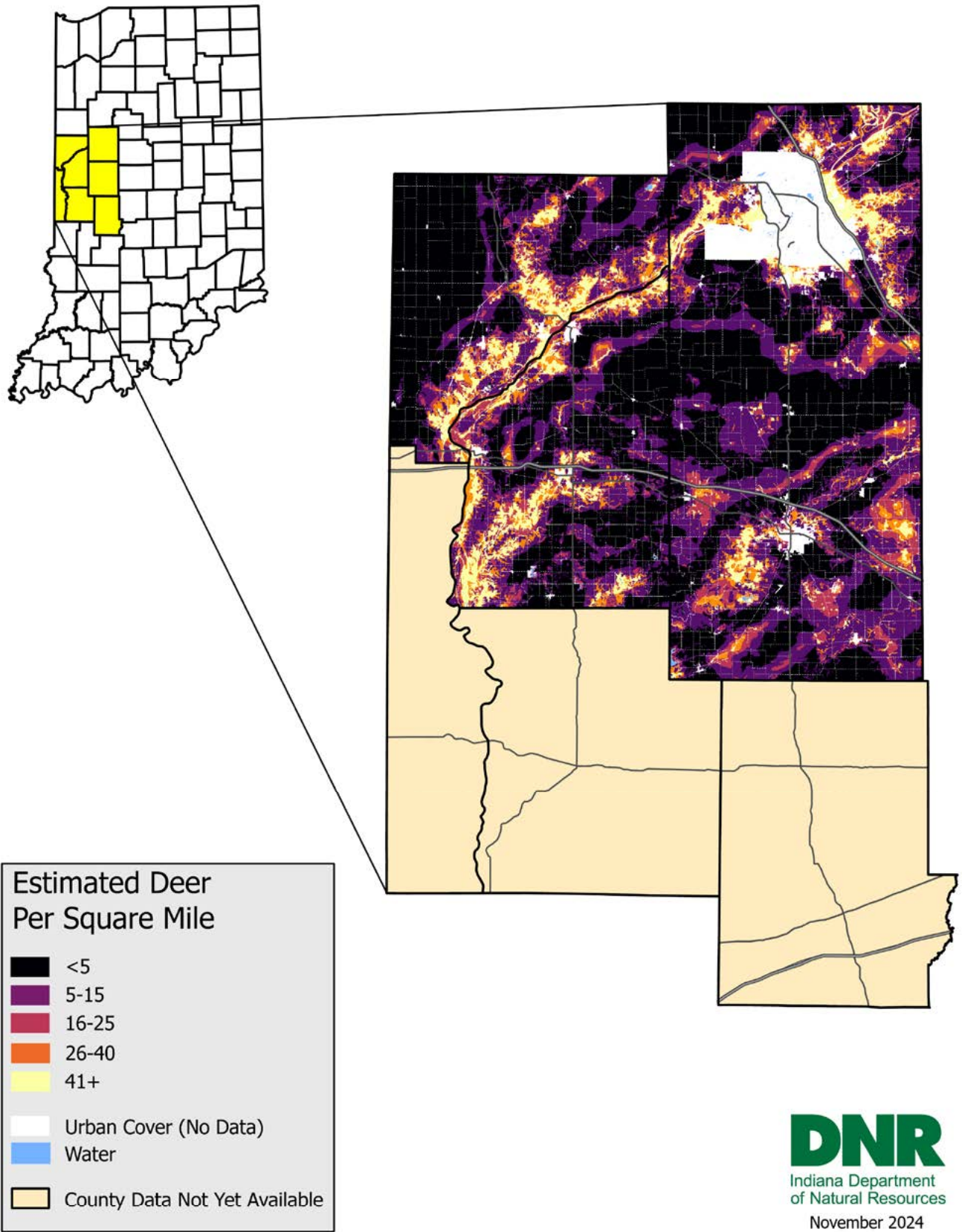


Figure 9-4. Spatially explicit white-tailed deer densities from Warren, Tippecanoe, Vermillion, Fountain, Parke, Montgomery, and Putnam counties in west-central Indiana. Spatially explicit deer densities are grouped into five categories (<5, 5-15, 16-25, 26-40, and 41+) by the estimated deer per square mile. Density data in urban areas (white) was not collected. Complete counties lacking density data are depicted in tan.

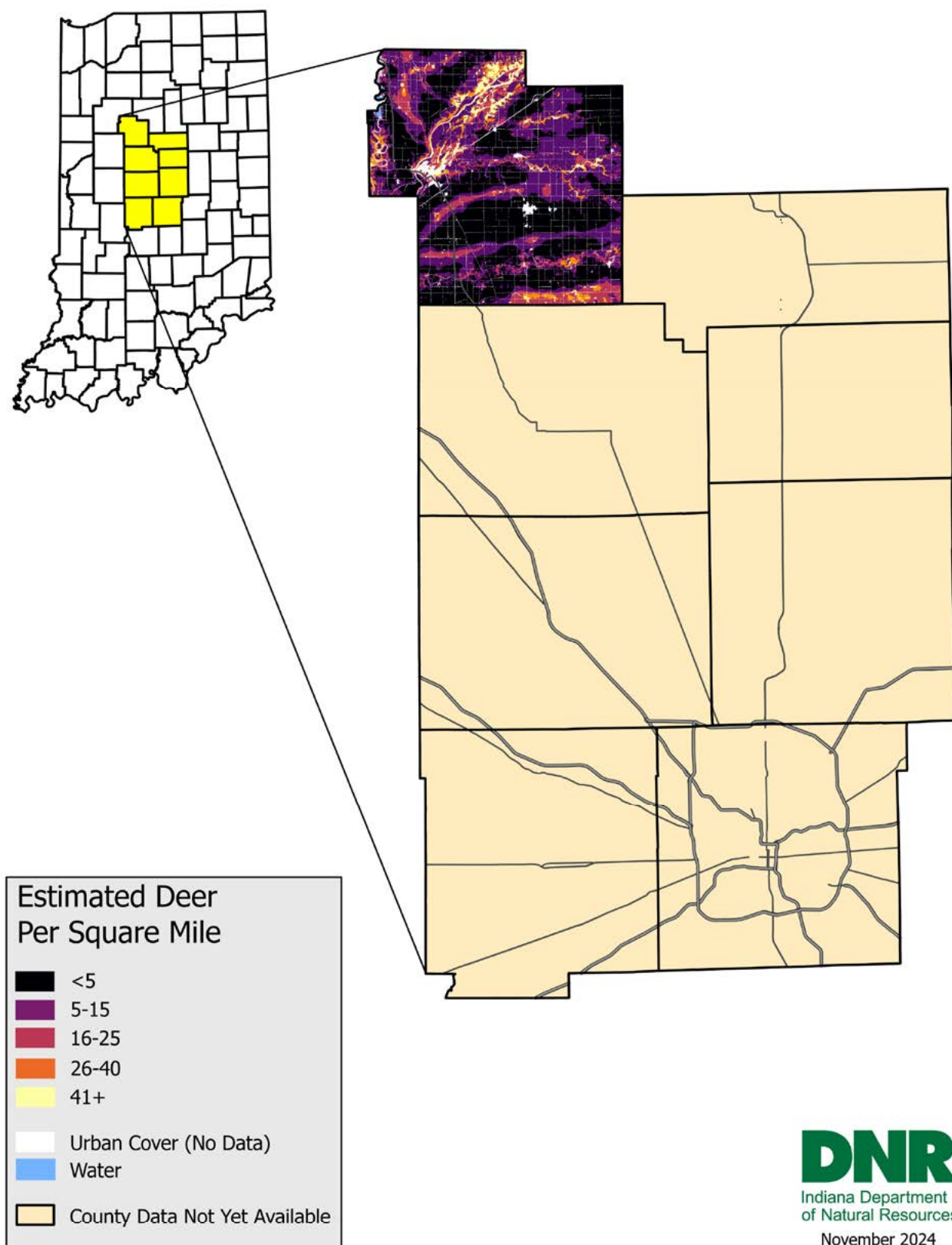


Figure 9-5. White-tailed deer densities from Carroll, Clinton, Howard, Tipton, Boone, Hamilton, Hendricks, and Marion counties in central Indiana. Spatially explicit deer densities are grouped into five categories (<5, 5-15, 16-25, 26-40, and 41+) by the estimated deer per square mile. Density data in urban areas (white) was not collected. Complete counties lacking density data are depicted in tan.

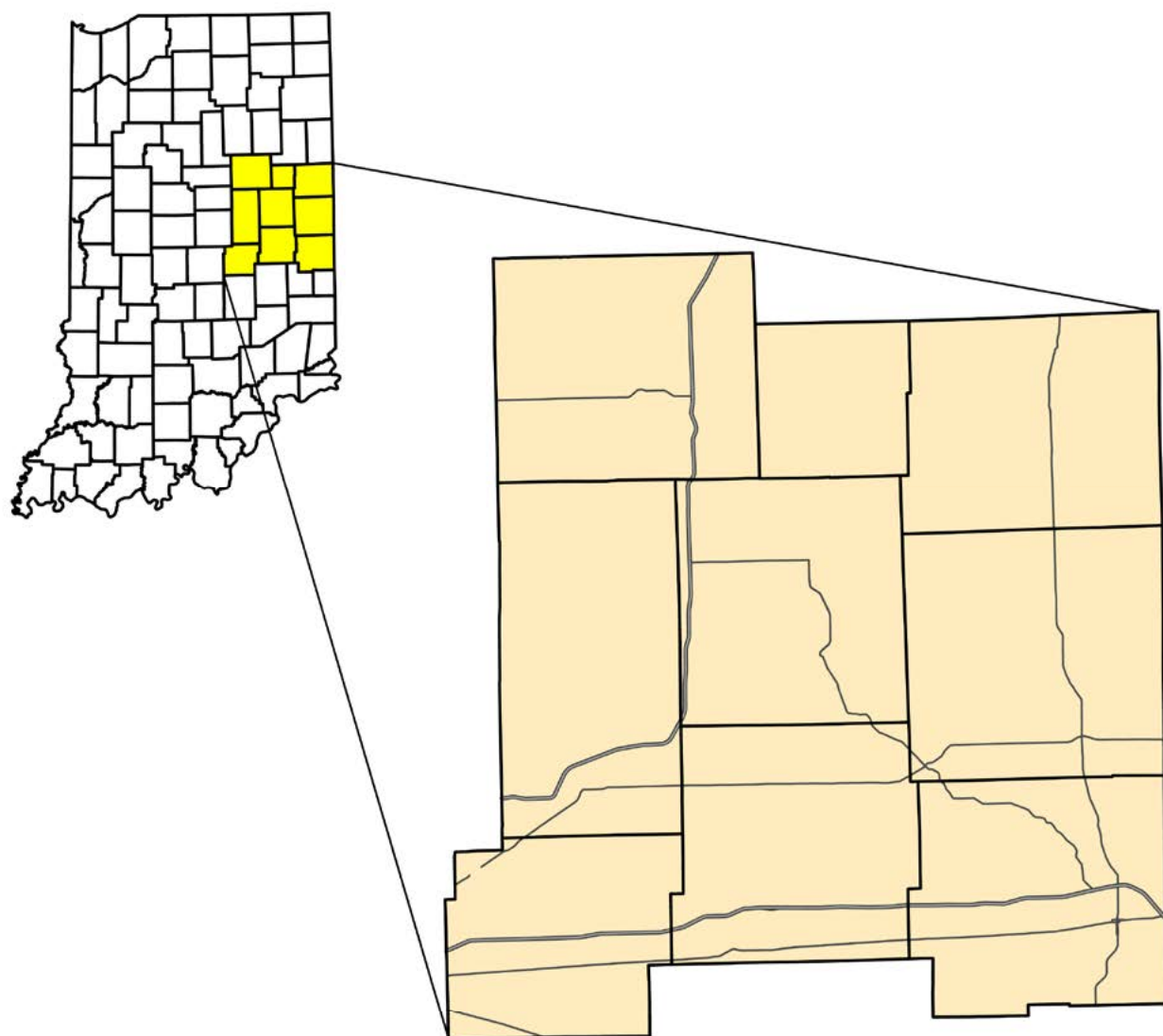


Figure 9-6. White-tailed deer densities from Grant, Blackford, Jay, Madison, Delaware, Randolph, Hancock, Henry, and Wayne counties in east-central Indiana. Spatially explicit deer densities are grouped into five categories (<5, 5-15, 16-25, 26-40, and 41+) by the estimated deer per square mile. Density data in urban areas (white) was not collected. Complete counties lacking density data are depicted in tan.

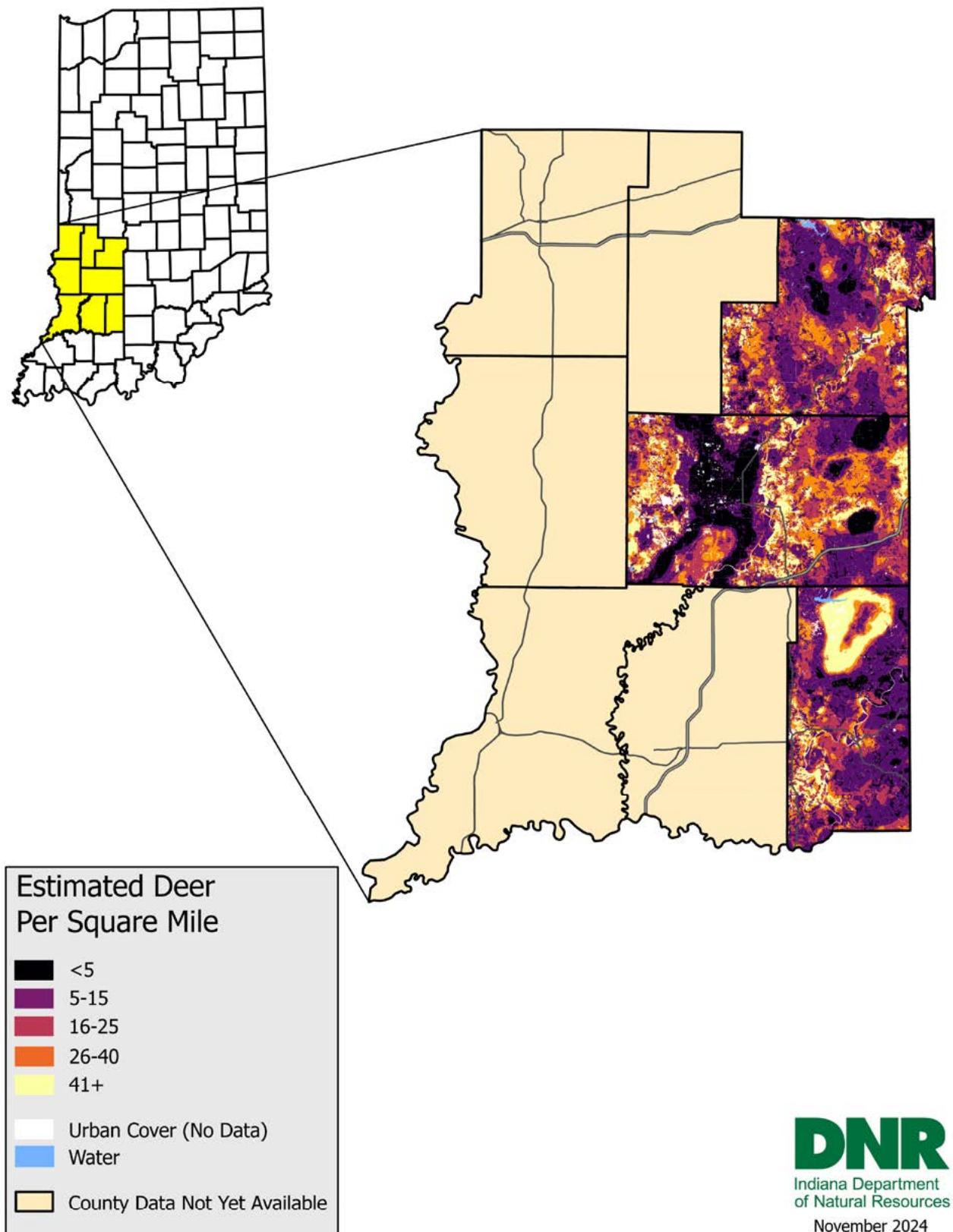


Figure 9-7. White-tailed deer densities from Vigo, Clay, Owen, Sullivan, Greene, Knox, Daviess, and Martin counties in southwest Indiana. Spatially explicit deer densities are grouped into five categories (<5, 5-15, 16-25, 26-40, and 41+) by the estimated deer per square mile. Density data in urban areas (white) was not collected. Complete counties lacking density data are depicted in tan.

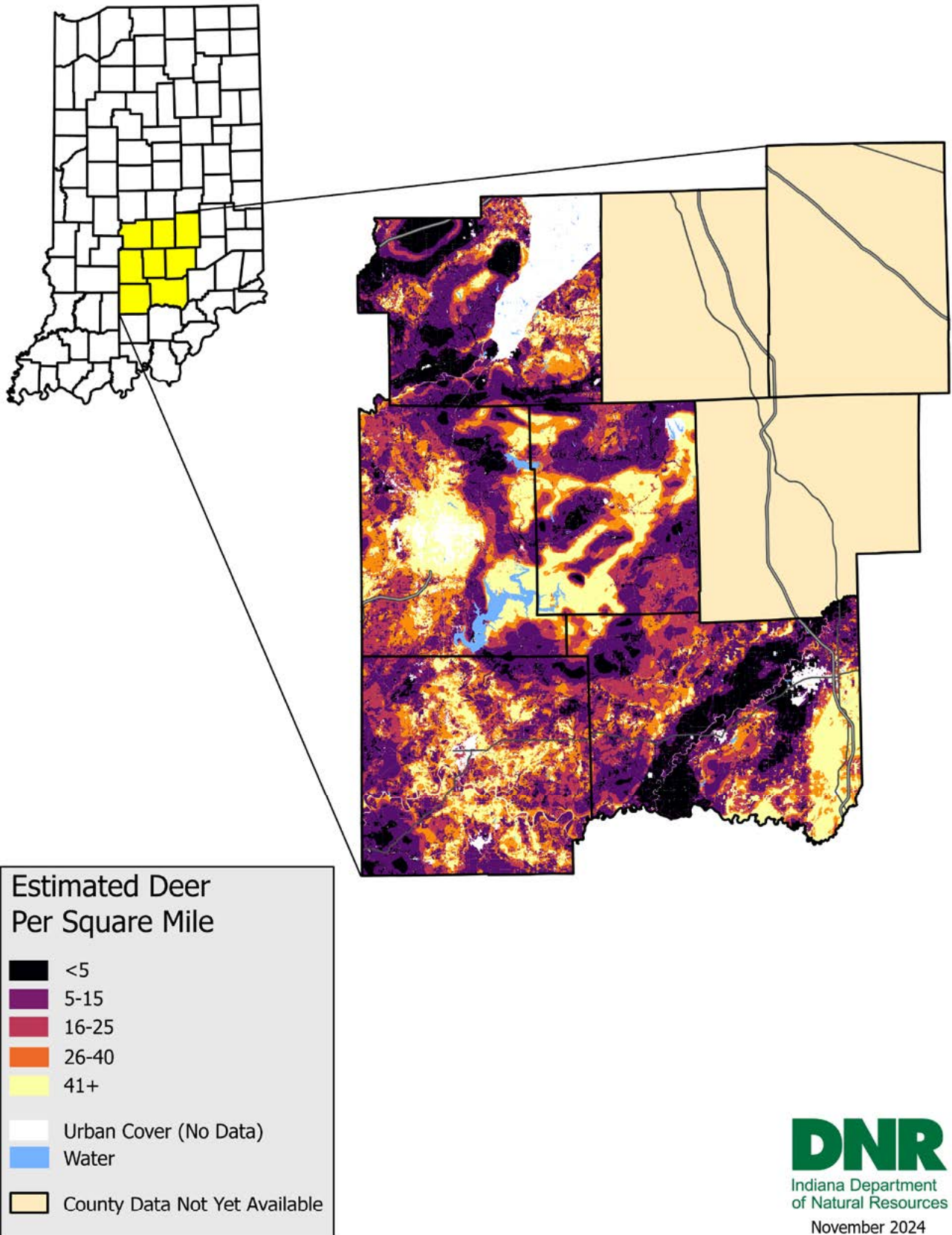


Figure 9-8. White-tailed deer densities from Morgan, Johnson, Shelby, Monroe, Brown, Bartholomew, Lawrence, and Jackson counties in south-central Indiana. Spatially explicit deer densities are grouped into five categories (<5, 5-15, 16-25, 26-40, and 41+) by the estimated deer per square mile. Density data in urban areas (white) was not collected. Complete counties lacking density data are depicted in tan.

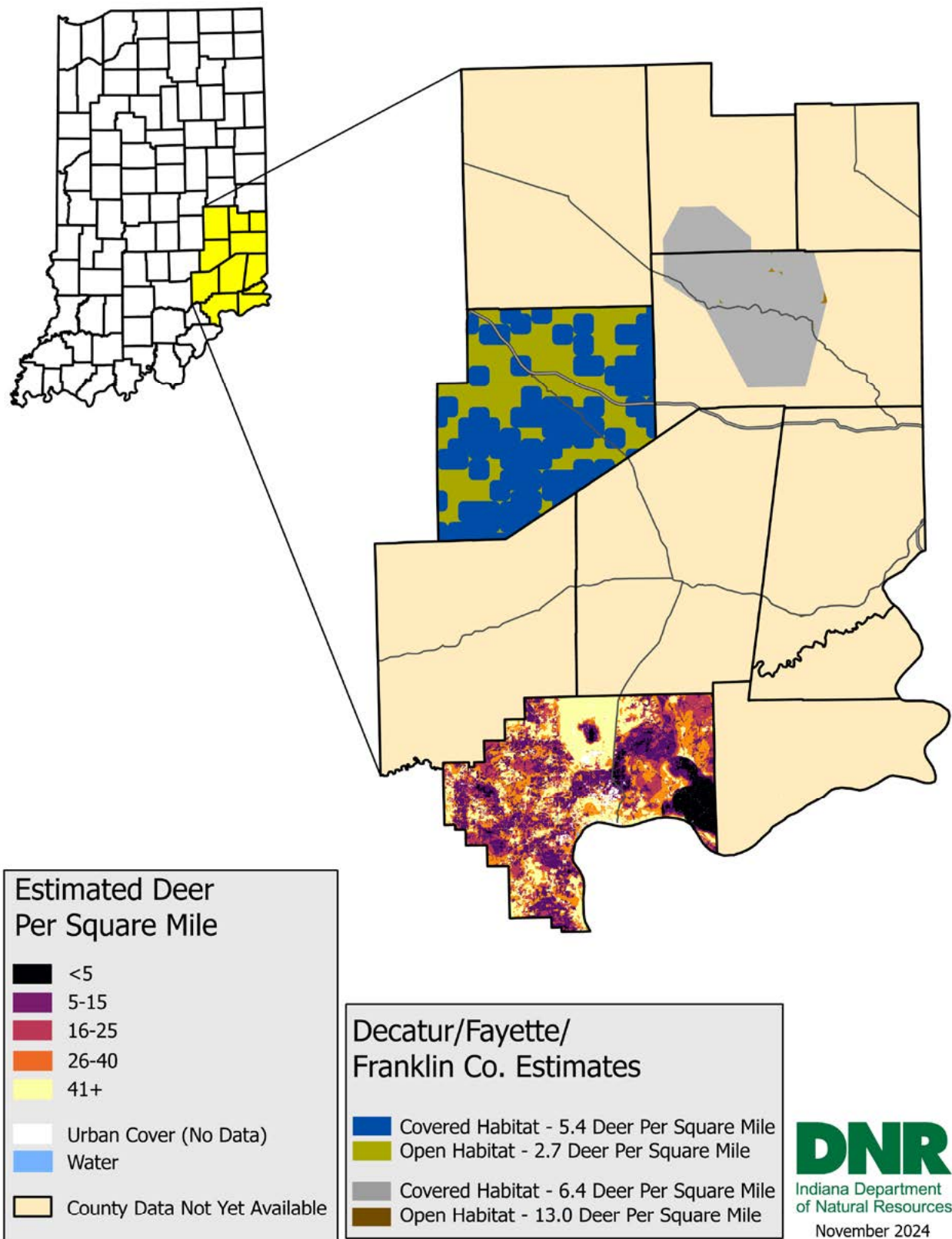


Figure 9-9. White-tailed deer densities from Rush, Fayette, Union, Decatur, Franklin, Jennings, Ripley, Dearborn, Jefferson, Ohio, and Switzerland counties in southeast Indiana. Spatially explicit deer densities are grouped into five categories (<5, 5-15, 16-25, 26-40, and 41+) by the estimated deer per square mile. Deer densities determined using conventional distance sampling are categorized by the density in open areas (i.e., farm fields, grasslands, and pastures) and density in cover (i.e., forest cover, woody wetlands, and other cover types). Density data in urban areas (white) was not collected. Complete counties lacking density data are depicted in tan.

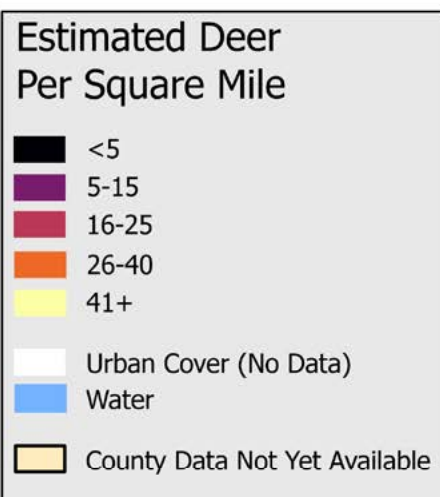
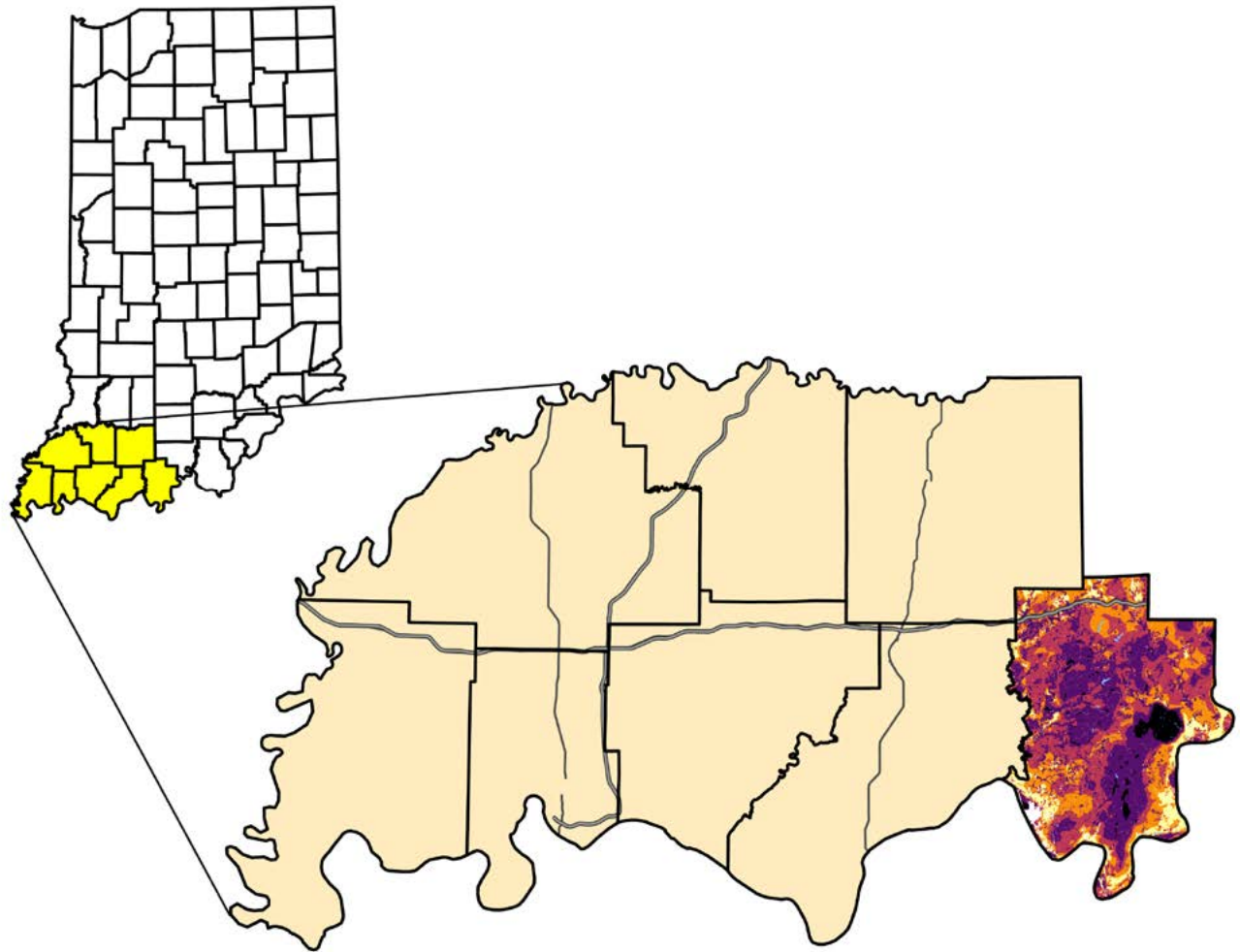


Figure 9-10. White-tailed deer densities from Posey, Gibson, Vanderburgh, Pike, Warrick, Dubois, Spencer, and Perry counties in far southwest Indiana. Spatially explicit deer densities are grouped into five categories (<5, 5-15, 16-25, 26-40, and 41+) by the estimated deer per square mile. Density data in urban areas (white) was not collected. Complete counties lacking density data are depicted in tan.

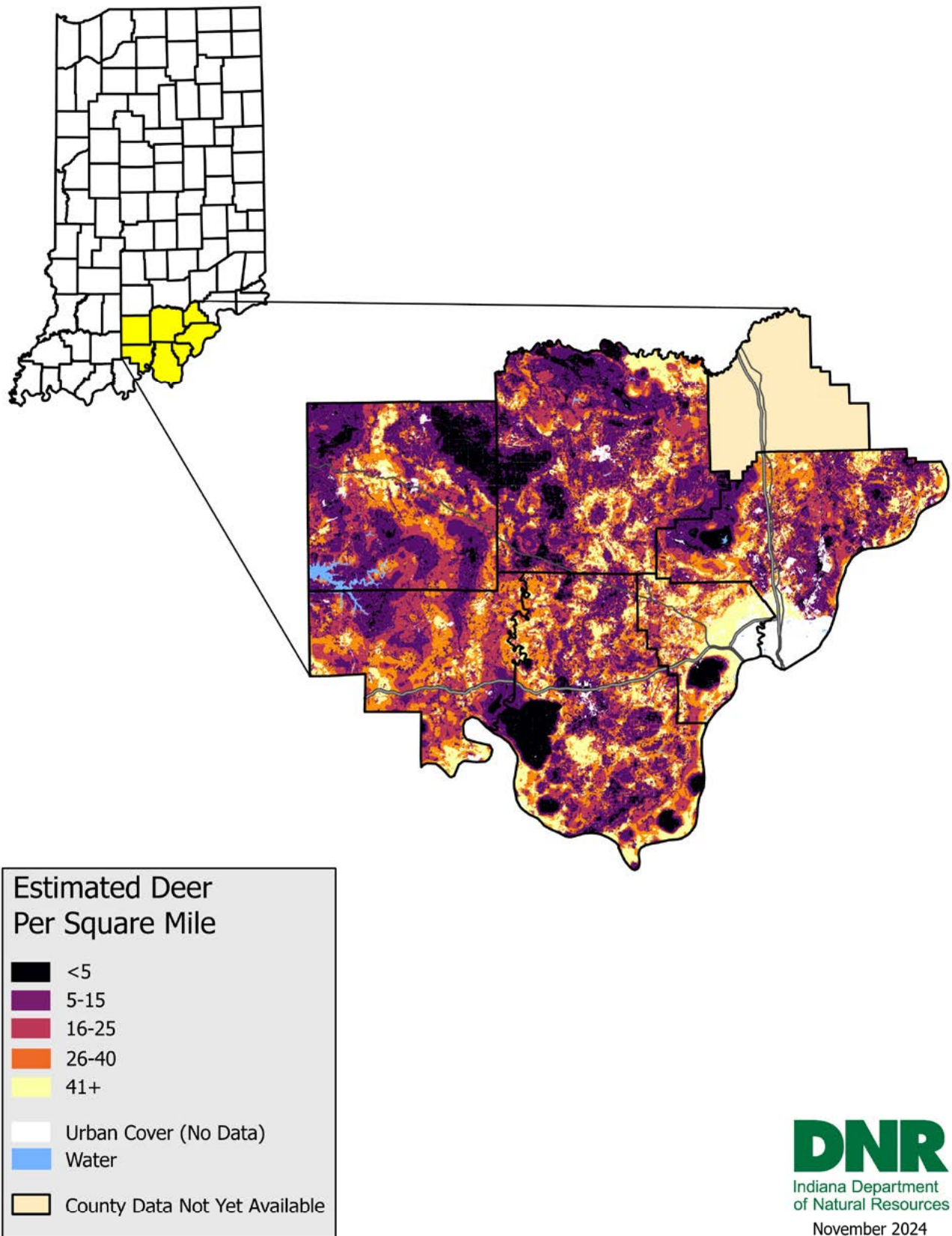


Figure 9-11. White-tailed deer densities from Orange, Crawford, Washington, Harrison, Scott, Clark, and Floyd counties in far south-central Indiana. Spatially explicit deer densities are grouped into five categories (<5, 5-15, 16-25, 26-40, and 41+) by the estimated deer per square mile. Density data in urban areas (white) was not collected. Complete counties lacking density data are depicted in tan.

Opinions Toward the Use of Drones to Recover Deer and the Use of Cellular Cameras for Deer Hunting on Public Land in Indiana

Joe N. Caudell,

Indiana Department of Natural Resources

The use of cellular cameras that provide real-time photos of wildlife to hunters is a controversial topic. Some see this technology as unfair chase because it allows hunters to pattern and find game such as white-tailed deer without going into the field. Another concern is that others may use this technology to make a final determination on where to hunt because of where a particular buck is moving on a particular day or time of day. For instance, a hunter who can afford an array of these cameras on various game trails may sit in a parking lot until a desired buck “trips” one of these cameras, allowing the hunter to choose a stand that will have the highest likelihood of harvesting that particular animal. Others see this technology as another way to increase engagement with the outdoors, even when one does not have the time to get outside.

There is no general agreement if the use of cellular trail cameras that provide real-time photos is fair chase. Organizations such as the Boone and Crockett Club and the Pope and Young Club consider the use of this technology for harvesting game as unfair chase. Any game harvested with the use of real-time camera technology (including both cellular game cameras and drones) would make that animal ineligible for inclusion in either the Boone and Crockett records program (B&C Position Statement – Big Game Records Eligibility, Revised November 30, 2022, <https://www.boone-crockett.org/bc-position-statement-big-game-records-eligibility>) or the Pope and Young records program (Pope & Young position statement on Cellular Trail Cameras / Technology; <https://pope-young.org/Position-Statements>). Other organizations such as the National Deer Association (NDA) do not share this concern. The NDA supports the use of all trail cameras in the pursuit of game (<https://deerassociation.com/nda-releases-official-position-statement-on-trail-camera-use/>). Several states, including Kansas, Nevada, and Utah, have banned the use of cellular game cameras on public land while other states such as Montana and New Hampshire have limitations on the use of cellular game cameras that fall short of a total ban. (<https://www.nrahl.org/articles/2023/4/10/kansas-joins-handful-of-states-banning-trail-cam-use-on-public-lands/>).

Another technological advancement affecting hunting is the use of drones or unmanned aerial vehicles to aid hunters in recovering deer. Some see this as a benefit because it helps hunters find deer that may have otherwise been lost; however, others see this as a way to cheat because if a bigger buck is seen, hunters may opt to ignore the loss of the first deer to hunt the second. Because of recent policy activity toward the use of cellular game cameras and drones, the Indiana Division of Fish & Wildlife (DFW) Deer Program asked a series of questions about the use of these two technologies in the 2024 Deer Management Survey.

Methods and Results

The Annual Deer Management Survey was deployed using Qualtrics on January 30, 2024, and sent via email to 820,335 individuals who had either signed up for the DFW Wild Bulletin, had purchased a hunting or fishing license in the past five years, or had checked in a deer in the past five years. The questions regarding cellular game cameras were limited to individuals who self-identified as deer hunters, and 27,651 individuals responded to at least one of these questions.

On a scale of 0 to 100, we asked deer hunters what their level of engagement was with deer hunting. Of those who responded (n=25,377), 3.1% selected a score between 0 and 25, 5.3% selected a score between 26 and 50, 19.2% selected a score between 51 and 75, and 72.4% selected a score between 76 and 100. The average score for all respondents was 82.3. Therefore, the results of this survey reflect hunters with a high average level of engagement.

Asked “How favorable or unfavorable is your opinion of hunters using cellular game cameras to aid in hunting deer on PUBLIC LAND, or have you not heard enough about cellular game cameras yet to have an opinion?”, 27,561 hunters responded, and 13.9% of respondents selected very favorable, 18.9% selected favorable, 28.9% were neutral, 12.4% were unfavorable, 12.3% were very unfavorable, 2.9% were unsure, and 10.6% had not heard enough to form an opinion. When respondents were presented with the following information “Cellular game or trail cameras (i.e., game cameras that text or email a photograph to the user) are used to aid hunters in hunting deer. Hunters use these types of cameras to know when a particular buck is traveling through a particular location without needing to visit their camera to retrieve the photograph. This technol-

ogy helps hunters gain information to achieve their hunting goals more easily. Additionally, hunters can review photographs of deer passing by their cameras at any time.”, responses changed slightly, and 27,336 responded. Of those, 12.7% selected very favorable, 28.0% selected favorable, 31% were neutral, 14.9% selected unfavorable, and 13.4% selected very unfavorable. When hunters were presented with the same additional information above and asked if “The use of cellular game cameras for deer hunting should be illegal on PUBLIC LAND,” 26,774 hunters responded, and 15.7% selected strongly agree, 15.9% selected agree, 31.1% selected neutral, 21.3% selected disagree, and 16.0% selected strongly disagree.

When asked “How favorable or unfavorable is your opinion of hunters using cellular game cameras to aid in hunting deer on PRIVATE LAND, or have you not heard enough about cellular game cameras yet to have an opinion?”, 27,602 hunters responded, and 26.7% of respondents selected very favorable, 24.9% selected favorable, 25.1% were neutral, 6.2% were unfavorable, 7.0% were very unfavorable, 1.8% were unsure, and 8.3% had not heard enough to form an opinion. When respondents were presented with the following information “Cellular game or trail cameras (i.e., game cameras that text or email a photograph to the user) are used to aid hunters in hunting deer. Hunters use these types of cameras to know when a particular buck is traveling through a particular location without needing to visit their camera to retrieve the photograph. This technology helps hunters gain information to achieve their hunting goals more easily. Additionally, hunters can review photographs of deer passing by their cameras at any time,” responses changed slightly in a positive direction, and 27,352 responded. Of those, 22.3% selected very favorable, 37.8% selected favorable, 24.3% were neutral, 7.3% selected unfavorable, and 8.4% selected very unfavorable.

Asked “How favorable or unfavorable is your opinion of hunters using unmanned aerial vehicles (UAVs; also called drones) equipped with infrared technology as an aid for recovering deer shot on PUBLIC LAND, or have you not heard enough about drones being used to recover deer yet to have an opinion?”, 25,583 hunters responded. Of those, 21.2% selected very favorable, 23.3% selected favorable, 14.2% were neutral, 10.8% were unfavorable, 16.8% were very unfavorable, 2.5% were unsure, and 11.2% had not heard enough to form an opinion. When respondents were presented with the following information “Unmanned aerial vehicles (UAVs;

also called drones) equipped with infrared technology could be used to track deer that have been shot by hunters. This is either done by the hunters with their own drone, or a private business that hunters pay to aid them in recovering the deer they have already shot. Infrared technology allows the drone pilot to more easily find deer because the body heat of the deer stands out against the cooler background,” the opinions of the 26,462 respondents became more positive, but also more polarized. Of those responding, 18.0% selected very favorable, 30.2% selected favorable, 22.1% were neutral, 13.5% selected unfavorable, and 16.2% selected very unfavorable.

Asked “How favorable or unfavorable is your opinion of hunters using unmanned aerial vehicles (UAVs; also called drones) equipped with infrared technology as an aid for recovering deer shot on PRIVATE LAND, or have you not heard enough about drones being used to recover deer yet to have an opinion?”, 27,567 hunters responded. Of those, 28.4% selected very favorable, 25.7% selected favorable, 13.9% were neutral, 7.4% were unfavorable, 12.8% were very unfavorable, 2.0% were unsure, and 9.9% had not heard enough to form an opinion. When respondents were presented with the following information “Unmanned aerial vehicles (UAVs; also called drones) equipped with infrared technology could be used to track deer that have been shot by hunters. This is either done by the hunters with their own drone, or a private business that hunters pay to aid them in recovering the deer they have already shot. Infrared technology allows the drone pilot to more easily find deer because the body heat of the deer stands out against the cooler background,” the opinions of the 26,467 respondents became more positive, and 24.6% selected very favorable, 35.3% selected favorable, 19.1% were neutral, 8.0% selected unfavorable, and 12.9% selected very unfavorable.

Discussion

In general, highly engaged hunters in Indiana mostly approve of the use of game cameras on public land and approve of the use of drones to recover deer, although only by a relatively small margin. The overall results of this survey were similar to those of other surveys on new and emerging equipment used for hunting. We often see that a similar portion of hunters approve of new equipment because they want to use this new equipment, a similar portion is ambivalent about the use of that equipment, and a similar portion is opposed to new innovations that may impact how

they hunt or affect the deer that are taken around them. Because of advances in technology that are directed at hunting or can be used for hunting, this trend is likely to continue, and agencies will continue to struggle to strike a balance between the desires of hunters and fair chase.

2023-2024 Hunting Pressure Across Indiana

Carsten White,
Indiana Department of Natural Resources

The DNR Deer Program commonly receives questions from hunters about the amount of hunting pressure within a given area. While in the past, the DNR did not monitor changing hunting pressure across the state, the annual Deer Management Survey asked where respondents hunted the past deer season within Indiana. From survey responses, we can estimate hunting pressure per square mile and monitor changes from year to year.

The core questions within the annual Deer Management Survey remain the same every year; however, additional sets of unique questions are also posed to respondents that address emerging issues in state deer management. The 2024 survey asked questions de-

signed to assess the opinions of respondents on deer herd size and quality in the areas where they live and/or hunt. The inclusion of specific questions should not be interpreted as a change or a desire for a particular regulation by DNR or the public. For more information on the survey, please see Chapter 7 of this report.

The 2024 Deer Management Survey asked what 4x4-mile grid cell within Indiana each respondent hunted. Since not every hunter in Indiana responds to the survey, we corrected the number of individuals hunting in each grid by the estimated fraction of Indiana hunters who responded to the question.

We found high numbers of hunters within the northern and southern portions of Indiana, while hunter numbers were lower in the central part of the state (Figure 9-12). The pattern of hunting pressure across the state determined by the respondents to the 2024 survey mirrors the same patterns noticed with data from the 2023 survey.

The results from this survey are not meant to be estimates of the true number of hunters in each 4x4-mile grid cell. Instead, readers should interpret this map as a spatially explicit index of hunting pressure (i.e., where hunting pressure is high versus low).

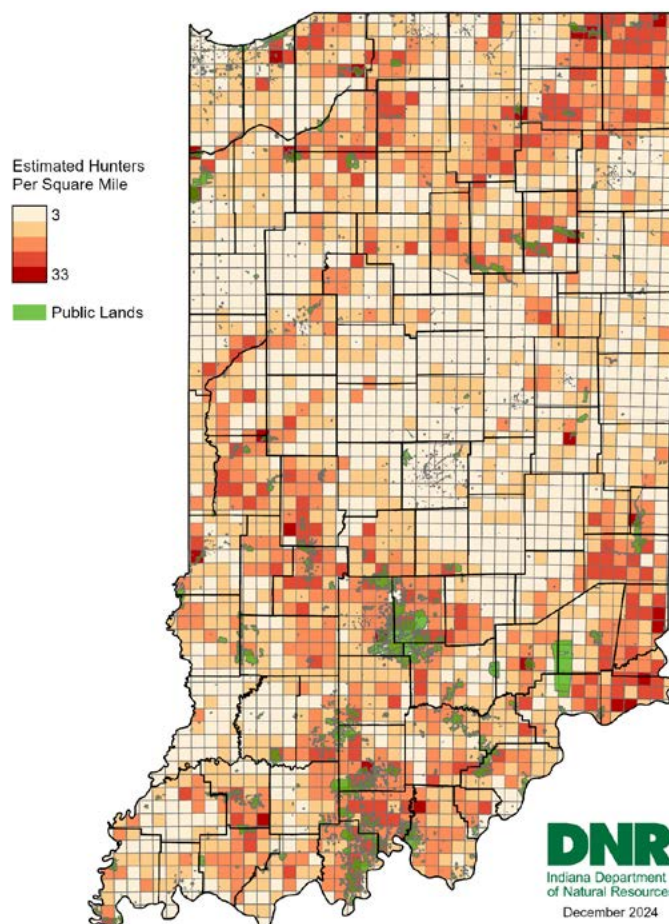


Figure 9-12. Estimated number of hunters within 4x4 mile grid cells of Indiana. Public lands are depicted in green.

Chapter 10.

EXTERNAL DEER RESEARCH

Studies described in the External Deer Research chapter are projects being conducted by university partners to better understand deer and inform management decisions in Indiana.

MITIGATING SPREAD OF CHRONIC WASTING DISEASE THROUGH AN ECOLOGICAL TRAP

Cost: \$383,860 federal dollars; \$0 state dollars
Grant Period: October 1, 2020 – December 31, 2024

Project Personnel

- Dr. Patrick Zollner – Principal Investigator, Purdue University
- Dr. Aniruddha Belsare – Research Scientist (Academic Research), Emory University
- Jonathan Brooks – Ph.D. Student, Graduate Research Assistant, Purdue University
- Dr. Zhao Ma – Professor of Natural Resource Social Science, Purdue University
- Lan Zhao – Research Scientist, Purdue University
- I Luk Kim – Ph.D. Candidate, Graduate Research Assistant, Purdue University
- Dr. Joe N. Caudell – DNR Project Liaison, Indiana Division of Fish & Wildlife

Project Overview

Disease outbreaks are an increasingly common cause of severe declines in wildlife populations. One disease with the potential to cause declines in large ungulates such as white-tailed deer is chronic wasting disease (CWD). CWD has been detected in free-ranging cervids in 25 states, including Illinois, Michigan, and Ohio; however, as of the 2021 deer hunting season, CWD has not been detected in Indiana. The nearest documented occurrences of CWD to Indiana come from four infected deer near Kankakee, Illinois. These occurrences were approximately 30 miles from the Indiana boarder. Given the history of CWD spread and its proximity to Indiana, there is a clear need to consider strategies that may mitigate the risk of CWD infecting Indiana's white-tailed deer populations.

Forested corridors along the Kankakee River provide one of the most likely routes by which CWD-infected deer may enter Indiana. This narrow strip of permanent forest cover amid a landscape dominated

by agriculture connects Indiana deer populations to the portion of Illinois where CWD has been detected. Given the significance of this forested cover for deer movement, it may be possible to reduce the likelihood of CWD spreading to Indiana by establishing an artificial ecological trap (AET) in this corridor. An AET is an area that white-tailed deer perceive as favorable but will actually decrease survival through greater harvest mortality. This increased mortality could be accomplished by establishing a deer management zone with increased hunting pressure or implementing a sharpshooter culling program within a focal area.

Measuring the effect of an AET as a preventive measure against CWD spread along the Kankakee River through field experiments would be challenging. Quantitative approaches like mathematical models or computer simulations provide an effective alternative to investigate such questions. One approach that is particularly well suited to modeling disease in mammal populations is agent-based modeling. An agent-based model (ABM) of CWD spread in white-tailed deer would virtually represent deer movement and behaviors across a digital landscape. The virtual deer are given characteristics such as age, sex, and disease infection status and perform actions in the virtual landscape such as moving, giving birth, dying, and transferring infection. By tracking the location and number of infected individuals over time, we can estimate population-level metrics such as disease prevalence and rate of contact. ABMs make it easier to simulate rare events and individual differences in behaviors like dispersal because they track each individual deer within a population. Similarly, ABMs make no assumptions about rates of contact because those emerge from model inputs specifying the behavior of individuals.

ABMs are useful tools for wildlife managers to compare the relative effectiveness of different AET scenarios; however, implementing an AET in the real world requires stakeholder support. For example, deer hunters must be willing to harvest more deer or allow sharpshooters to cull deer to implement an AET. Furthermore, landowners must be willing to allow hunters or sharpshooters to harvest deer on their land. Although stakeholder cooperation is critical for effective CWD management, stakeholders have resisted these policies in some states. This resistance stems from a number of factors, including conflict with traditions, a lack of certainty about disease spread, and mistrust. To successfully implement an AET along the Kankakee River, wildlife management agencies would benefit from

addressing these barriers to stakeholder acceptance.

One way to reduce stakeholder barriers to acceptance is by providing information about how implementation of an AET will affect deer populations; however, information does not always lead to action. The Theory of Planned Behavior provides a framework that can be used to predict whether an individual will engage in a behavior. This theory states that the best predictor of behavior is the individual's plans, and an individual's planned behaviors result from attitudes toward the behavior, perceived ability to successfully engage in the behavior, and norms of important social groups regarding the behavior. The Theory of Planned Behavior has been successfully used to explain willingness to engage in waste recycling and pro-climate behaviors. By considering the behavior that information is intended to promote or discourage in the context of the Theory of Planned Behavior, management agencies can improve the likelihood that information on CWD will lead to support for disease control policies.

The objectives of this project are to (1) simulate the spread of CWD along the Kankakee River under different CWD management scenarios using an ABM and (2) develop a web-based tool that the public can use to compare simulations across different scenarios and use the Theory of Planned Behavior to investigate how use of this tool affects stakeholders' support of various scenarios for mitigating the spread of CWD into Indiana.

We will implement the OvCWD model framework in northwest Indiana and northeast Illinois to simulate CWD spread in a white-tailed deer population. The OvCWD framework represents the landscape as a grid with cells that correspond to a 1.0 square mile area. Each grid cell represents the percent of forested land within that area. We determined the percent forest cover of each cell using the National Landcover Database data. The model begins by placing virtual deer on the landscape based on the percentage of forest cover. The number of deer initially placed within each cell is a function of estimates of deer density in the scientific literature and from Indiana DNR data (Delisle, personal communication; Boggess and Vaught, 2020; Nixon et al., 2021). Each virtual deer is assigned characteristics including sex, age, herd membership, and infection status. The model represents the passage of time by simulating each deer's location and status every month for 10 to 25 years. During each run, virtual deer perform actions such as giving birth, dying, dispersing to another grid cell, or transferring infection. This simulates real-world processes such as population

dynamics and CWD spread. By modifying parameters like the probability of dying in the model, we can emulate different approaches to addressing CWD. The effectiveness of each CWD management scenario can then be compared by summarizing the deer population size and CWD prevalence at the end of a time period. Scenarios we test will include countywide increased hunting, subcounty increased hunting, and targeted sharpshooter culling.

Knowledge gained from the comparisons of scenarios with the ABM will have a larger impact if it is communicated to stakeholders in an understandable way. One way to do this is using a web tool that allows stakeholders to select control scenarios and view a summary of outcomes from those choices. This stakeholder version of the ABM allows anyone to construct scenarios by manipulating the timing, duration, and location of the AET to reduce the deer population and see the predicted impacts upon CWD transmission. In addition to building a tool for displaying ABM results in a way that increases public acceptance of management decisions, we will also test how the visual elements included in the user interface affect stakeholder willingness to engage in action to prevent CWD spread. To do this, we will create a version of the tool that displays an illustration of healthy deer or CWD-infected deer, depending on the prevalence of CWD in the scenario selected. Images of sick deer have been shown to evoke strong emotions regarding CWD (Stinchcomb et al., 2022) and may increase stakeholder intention to prevent CWD spread. Before using the tool, users will take a survey assessing their willingness to take action to prevent CWD spread. The survey will be designed in a Theory of Planned Behavior context (Ajzen, 1991). In this context, willingness to act is a function of individual attitudes, the attitudes of socially relevant peers, and perceived ability to perform the action. Users will take the same survey again after using the tool, a process that will provide data to evaluate how inclusion of illustrations changes willingness to engage in actions to reduce CWD spread.

Objective 1 - Develop one technique (model) to assess how different artificially manipulated population densities will affect deer movements by September 30, 2022.

Jonathan Brooks, the Ph.D. student working on this project, began in January of 2021 and took two classes during the spring and summer semester that helped him develop the skills needed to code this model.

He then began developing a model, but by late September we decided that the most efficient pathway to accomplishing all the project objectives on time would be for him to adapt the code from an existing model developed by collaborator Dr. Belsare to be used for our ecological trap questions in Indiana. This change in our approach to model development created a temporary slowdown that means we did not have model results in time to share them with SSG for them to use those results to begin developing the public facing tool. The benefit of this change in approach is that we are working with a well-established modeling framework. Our switch to this new approach was greatly facilitated by an early December 2021 trip that Brooks took to Emory University to visit Dr. Belsare and work directly with him on how to develop an Indiana ecological trap application of his framework. Since that visit, Brooks has completed a functional version of the model and has run and evaluated the results of 288 parameter sets. We began disseminating our findings to scientists and agency biologists. In March 2022, Brooks and Dr. Belsare organized a workshop for agency personnel from the Indiana DNR and the Ohio DNR. This workshop introduced attendees to how the model works and how it can be applied for CWD management. Brooks also presented results from model simulations at the American Society of Mammologists conference in June 2022 and The Wildlife Society conference in November 2022. Based on discussion with the Indiana DNR deer biologist about the results Brooks has obtained from the model to date, he has adjusted the model structure. Specifically, he has added a compensatory mechanism to increase recruitment of fawns when deer densities are low. This new feature is currently being tested, but when we are confident in it, we will use it to simulate a new set of results that will be much more realistic and useful as a decision-making tool.

Objective 2 - Conduct one investigation to assess public acceptance of management options by December 31, 2023.

Early in 2022, Brooks began collaboration with SSG staff members Dr. I Luk Kim and Dr. Lan Zhao to build a web app. This web app will enable members of the public to interactively view results of the control scenarios simulated during Objective 1. In September of 2022, Brooks expanded the design of the web app to include an image of healthy or sick deer. The inclusion of images was added to test how the presence of such images influences the willingness of web app users to support

CWD control programs. Brooks has nearly finished working with artist Gaby Sincich to produce drawings of healthy and sick deer to be used in this web app. In collaboration with Dr. Zhao Ma of Purdue University's FNR Department, he has designed a pre/post survey to assess web app user willingness to support CWD management. Once the results from the updated version of the model from Objective 1 are complete, that data will be input into the web app. After the addition of that new data, beta testing will begin and be followed by any revisions and then distribution of that tool and analysis of data collected via the pre/post survey.

Objective 3 – Conduct one investigation to compare the cost-effectiveness of CWD management strategies used by other agencies by December 31, 2024

No work was conducted on this objective in 2023.

WHITE-TAILED DEER AND FURBEARER ECONOMICS

Cost: \$725,606 federal dollars; \$0 state dollars

Grant Period: January 1, 2021 – December 31, 2025

Project Personnel

- Dr. Carson Reeling – Project Co-Lead Investigator, Purdue University
- Dr. Mo Zhou – Project Co-Lead Investigator, Purdue University
- Dr. John Lee – Project Co-Lead Investigator, Purdue University
- Dr. Zhao Ma – Co-Principal Investigator, Purdue University
- Dr. Richard Melstrom – Project Co-Lead Investigator, Loyola University – Chicago
- Dr. Robert Swihart – Project Co-Lead Investigator, Purdue University
- Dr. Joe N. Caudell – DNR Project Liaison, Indiana Division of Fish & Wildlife
- Geriann Albers – DNR Project Liaison, Indiana Division of Fish & Wildlife

Indiana's deer and furbearers generate economic value from both consumptive and nonconsumptive uses. Consumptive uses of deer and furbearers primarily include hunting and trapping. The direct economic value hunters receive from hunting takes the form of surplus, equal to the maximum amount a hunter would be willing to give up to obtain a hunting opportunity. Indirect values take the form of changes in regional

incomes spurred by hunting-related spending. Hunters may buy equipment, incur travel costs to reach a hunting site, and may pay processing fees upon completing the hunt. These expenditures increase incomes of related business owners. Nonconsumptive uses of deer and furbearers include wildlife watching and the “existence” values individuals receive from knowing their state contains a healthy deer and furbearer population. Of course, deer and furbearers can also generate economic damages through vehicle collisions and damage to crops and other property. White-tailed deer are involved in more than 14,000 deer-vehicle collisions per year in Indiana alone. Additionally, deer and furbearers can serve as vectors for infectious disease.

Efficient deer and furbearer management in Indiana requires weighing the economic benefits from consumptive and nonconsumptive uses against the associated economic damages and management activity costs, yet these benefits and costs for Indiana are not well known. The overarching goal of our research involves quantifying the value of economically important white-tailed deer and furbearer species (beavers, coyotes, gray and red foxes, long-tailed weasels, minks, muskrats, opossum, raccoons, river otters, and striped skunks). Our objectives are to:

1. Estimate the benefits of consumptive uses of white-tailed deer.
2. Estimate the benefits of consumptive uses of furbearers.
3. Estimate the nonconsumptive benefits and costs of white-tailed deer and furbearers.
4. Assess the distributional effects of outdoor activities and deer-and-furbearer management.
5. Derive an integrated dynamic model of hunter and nonhunter behavior and deer and furbearer population dynamics to simulate the effects of various management decisions on the economic value of deer and furbearers.

The consumptive value of white-tailed deer and furbearers (Objectives 1 and 2) is derived primarily from hunting and trapping. The surplus hunters and trappers receive from harvesting these species depends on the number of hunting and trapping trips taken—that is, on the demand for trips. We will estimate a model of deer hunters’ demand for trips using existing Deer Management Survey data collected by the Indiana DNR. This survey collects information on hunters’ site choices and trip frequency, among other details. We can use this

information to estimate the cost of hunting trips. This information, along with data on trip frequency, will allow us to estimate the demand for deer hunting trips among deer hunters and, hence, the surplus from consumptive uses of deer.

No such survey exists for furbearer harvesters. We will develop and conduct a survey of licensed Indiana hunters and trappers to collect this information. This survey will collect information on (i) participation in furbearer harvesting, trip frequency, harvest locations, methods and harvest quantity, (ii) spending on hunting for different game species and hunting events (e.g., predator hunting tournaments), and (iii) hunter and trapper demographics, including income, residential location, and age. We can use the harvest and trip-demand models to estimate economic values from furbearer hunting.

We will estimate nonconsumptive values for deer and furbearers (Objective 3) with data collected from a separate household survey. We will conduct the survey in two stages. The first stage will collect data about nonconsumptive activities related to deer and furbearers, including viewing, photography, and the value of deer and furbearers’ ecological role from Indiana households. The survey instrument used in this stage will include questions to assess individuals’ knowledge and experience with these species and their related ecosystem services, a discrete choice experiment to measure their preferences for different levels of deer and furbearers on the landscape, and demographics. We will use the data from the first stage to measure the value of deer and furbearers’ ecological role. The first part of the survey will also serve to screen households that have experienced deer and furbearer damages. The second stage of the survey will follow up with these households to measure the quantity and value of damages and any spending on repairs and mitigation associated with deer- and furbearer-related damages.

Using the data collected from objectives 1 and 2, we will assess the total economic contributions made by outdoor activities related to hunting and trapping in Indiana (Objective 4), with a static input-output (I-O) model that tracks the flow of goods and services among interconnected sectors within an economic system, at one point in time. Then we will calculate two types of multipliers typically used in I-O analysis to measure the total or partial effects relative to the direct effect. The type-I multiplier is defined as the sum of direct and indirect effects divided by the direct effects, indicating industrial integration or linkage relative to

the economic system of interest. The type-II multiplier is calculated as the total effects divided by the direct effect, thus capturing consumption patterns of households and their impacts on the economic system. Next, we will analyze how changes in recreational behavior and government regulations will affect the participants' expenditures in different sectors as well as in the economy-wide impacts.

Finally, we will combine the information derived from outputs from objectives 1–4 into an integrated bio-economic model that can simulate the effects of management decisions on the economic value of deer and furbearer populations. We can calibrate these models given data on species populations, growth rates, net migration, and harvest. Data on deer populations for various deer management units in Indiana are available through an ongoing DNR-funded project overseen by our co-investigators. We will work with contacts at DNR to obtain data for calibrating models of furbearer population dynamics.

Objective 1 - Estimate the benefits of consumptive uses of white-tailed deer.

We developed a set of recreation demand models to estimate consumptive uses for deer for Objective 1. Each demand model relates an individual's decision about where to hunt with location characteristics using utility theory, as described in the proposal's conceptual model. We estimated these models using several sources of hunting, land cover, and land use data, with different sources of hunting data producing different models. We worked with Emily McCallen, biometrician at Indiana DNR, to collect hunting data from the 2019 Deer Management Survey, 2019 harvest check-in records, and customer characteristics. We based one demand model on survey responses about the county in which a respondent spent the most time hunting in the past season. We estimated two versions of this demand model with and without the participation option, by including or excluding respondents who reported not going on a hunt. We based another model on the locations of harvested deer in the check-in data. We found the three model versions often yield qualitatively similar predictions and estimates of hunting value. For example, all the models estimate that Indiana hunters value keeping Allen County open for hunting at about \$0.31/trip, or \$3.1 million if there are 10 million hunting trips in Indiana in a year. Important exceptions include the effects of population density and developed land on location choice and consumptive values; the check-in

model attributes a larger effect of developed land on these outcomes while the survey data-based models attribute a larger effect of population density. A manuscript describing and contrasting these models has been accepted for publication in *Human Dimensions of Wildlife*. The next task is to integrate a measure of deer population into the models. We have also developed a novel zonal travel cost modeling approach to estimate demand for deer hunting trips (or recreational trips more broadly) using aggregate site visitation data, which is often more commonly and cheaply available to wildlife managers than individual-level survey data. A paper outlining this approach was recently accepted in *Land Economics*.

Objective 2 – Estimate the benefits of consumptive uses of furbearers.

In year 1 of the project (10/20–10/21), we developed and implemented the furbearer harvester survey for Objective 2. We sent the survey to a random sample of 2,000 licensed furbearer hunters and trappers and received 421 completed surveys. A main goal of this survey was to elicit harvesters' willingness to pay (WTP) for bobcat harvest licenses. Bobcat hunting and trapping are currently not permitted in Indiana but are being considered by the Indiana DNR. We found a mean willingness to pay between \$10.40 and \$26.40 depending on the bag limit and harvest quota. The total statewide economic outputs of hunting and trapping activities were estimated to be \$238.7 million and \$6.7 million, respectively. A paper describing these results was recently published in the *Journal of Agricultural and Applied Economics*.

Objective 3 - Estimate the nonconsumptive benefits and costs of white-tailed deer and furbearers.

In year 2 of the project (10/21–10/22), we focused on three distinct activities. First, we implemented the household surveys to estimate nonconsumptive values for deer and furbearers from Objective 3. We divided our work into two separate surveys. The first was meant to elicit Hoosiers' WTP for seeing different wildlife species in recreational settings at Indiana State Parks and State Recreation Areas. We sent a two-wave mail survey to 7,500 Indiana residents in summer 2022 containing a choice experiment and questions on wildlife perceptions. We processed the data in late summer. Analysis and WTP estimation are ongoing. Statistical estimation of WTP is complicated by the fact that many respondents that we randomly selected do not visit

state parks or recreation areas. These respondents are likely to have systematically different preferences for wildlife than those who visit, and we have had to write custom statistical routines to estimate WTP in this context. We expect to have final results by the end of the spring 2023 semester. The second survey is meant to elicit Hoosiers' WTP for seeing or avoiding different wildlife species around their home. Our intent is to send this survey to another random sample of 7,500 Indiana residents. This survey contains yet another choice experiment along with questions meant to elicit homeowner estimates of damages caused by various wildlife species around their property. We designed the survey in fall 2022 and distributed the surveys in January 2023. Data from the returned surveys is coded and ready for analysis; however, our graduate student funding was exhausted by the end of spring 2023. We applied for an extension on this project in late 2023 and obtained funds to hire a postdoctoral research associate to conduct the analysis. In addition, the postdoc will lead the development of a follow-up survey of homeowners in which we plan to apply averting expenditure methods to estimate the monetary value of damages from deer and furbearers. This work will provide detailed estimates of benefits and damages from these species.

Objective 4 – Assess the distributional effects of outdoor activities and deer and furbearer management.

The last activity involved finalizing the economic impact assessments with updated information and analyzing sector-wise responses to demand shocks in hunting and trapping activities. For the 2020 hunting season, the total economic impacts of furbearer hunting were roughly \$143.9 million, of which about \$81.7 million was direct output. The output multiplier was 1.76, meaning for every dollar produced from hunting activities, an additional \$0.76 was generated. Demand shocks of hunting were transmitted mostly through daily and season expenditures on hunting. The majority of the spending made daily impacted the retail sector, including gasoline and groceries. Restaurants were also primary beneficiaries of changes in these expenses. Warehousing and storage were the most affected among all indirectly impacted industries. For the seasonal expenses category, retail-sporting goods were most impacted, followed by general merchandise stores, dogfood manufacturers, and truck transportation. During the 2020 trapping season, the total economic impact generated from these activities was

roughly \$2.5 million, out of which about \$1.4 million were direct output. Similarly, demand shocks in trapping were most felt by retail sectors selling general merchandise, gasoline, and restaurants in the daily spending category. Retail industries that sell clothing, sporting goods, and general merchandise were most impacted in the seasonal spending category, followed by trucking and the production of synthetic dyes and pigments. Shocks in spending on durable items were captured mainly by boat building, motor vehicles and parts dealers, and truck trailer manufacturers, as well as small arms, ordnance, and accessories manufacturers. We will further update the results of sector-wise responses to demand shocks by comparing the effects across different years.

Objective 5 – Derive an integrated dynamic model of hunter and nonhunter behavior and deer and furbearer population dynamics. Use the model to simulate the effects of various management decisions on the economic value of deer and furbearers.

No work on this phase of the project in 2023.

TESTING AND VALIDATION OF TELOMERE-BASED AGE ESTIMATES IN WILDLIFE

Cost: \$383,860 federal dollars; \$0 state dollars
Grant Period: October 1, 2022 – June 30, 2025

Project Personnel

- Dr. Andrew DeWoody – Principal Investigator, Purdue University
- Jarred Brooke – Research Scientist (Academic Research), Emory University
- Julia Buchannan-Schwanke – Ph. D. Candidate, Graduate Research Assistant, Purdue University
- Dr. Joe N. Caudell – DNR Project Liaison, Indiana Division of Fish & Wildlife
- Geriann Albers – DNR Project Liaison, Indiana Division of Fish & Wildlife

Project Overview

Determining the age structure of wildlife and fishery populations remains difficult because current methodologies (e.g., tooth wear and replacement in deer or the use of otoliths in bony fishes) are largely subjective and of questionable validity (Hamlin et al. 2000; Foley et al. 2021; Osborne et al. 2022). Furthermore, they often rely on harvest-based sampling, are cost prohibitive,

biased, incompatible with management objectives, and/or simply too imprecise for use when sample sizes are large (Rolandsen et al. 2008; Veiburg et al. 2020; Watter et al. 2021). Quantitative, objective, and validated methods of aging are needed for use by resource managers.

Reliable methods of aging wildlife are needed to inform effective management practices that are often based on population demographic models. Without accurate age and associated data (e.g., age-at-maturity), managers cannot reliably estimate population growth rates. This compromises the development of sustainable population targets and harvest quotas. For example, desert bighorn, pronghorn, and white-tailed deer management are all driven (at least in principle) by sex- and age-based population models; however, aging methods for all three species are suspect (Lubinski 2001; Hamlin et al. 2008; Schindler et al. 2017). Accurate age structure data (often age-at-harvest) can also be an important source of auxiliary data when developing integrated population models for harvested wildlife species (Fieberg et al. 2010; Allen et al. 2018; Furnas et al. 2018; Norton 2018). Here, we propose to develop and test DNA-based aging methods in white-tailed deer and coyotes. If successful, this DNA-based aging approach has the potential to be applied to many other taxa such as turkey, feral hogs, largemouth bass, sturgeon, and steelhead.

Telomeres are DNA sequences at the end of chromosomes that function much like the “aglets” at the end of bootlaces; they serve to protect the integrity of the broader structure (chromosomes or laces). Telomeres consist of repeated sequences of nucleotides that allow for DNA replication without the loss of terminal bases or rearrangement of the chromosomal DNA (Blackburn 1991; Allsopp et al. 1992). Like aglets, telomeres also wear with age but do so in a fashion that can be accurately measured in terms of their length; that is, they get shorter over time. Hudon et al. (2021) showed that the polymerase chain reaction, when conducted using a quantitative, real-time thermal cycler, can be used with species-specific primers (derived from ultraconserved elements) to measure telomere length. This means that if calibrated using animals of known age, telomere measurements have the potential to accurately age animals. Though this aging technique has not yet been tested in wildlife (or fish) of known age, in principle one could age deer or most other species this way. This DNA-based approach to individual inference is not without precedence; determining sex via DNA has long been

validated and is straightforward in many taxa, including deer (e.g., Cathey et al. 1998; Furnas et al. 2018). For example, a tissue plug from a harvested deer carcass, an ear punch, feces, or naturally shed antlers may all be viable sources of DNA that could be used to assess the sex and the age structure of a deer herd. When validated, DNA techniques such as those we propose could be combined with recent advances in population modeling, offering managers increasingly detailed inference into population demography to meet management goals most effectively.

Methylation is a process that involves the addition of a methyl group to certain cytosine nucleotides (“CpG sites”) in a DNA molecule (Lamka et al. 2022). Methylation is an epigenetic modification that does not alter the underlying DNA sequence of G’s, A’s, T’s, and C’s, but it is often involved in regulating gene expression (i.e., tuning the amount of gene products produced). Genomic patterns of DNA methylation across nucleotide sites can vary as a function of chronological age. This phenomenon is often referred to as “epigenetic aging.”

In humans, methylation at key CpG sites is remarkably accurate at predicting individual age across a wide variety of tissues and cell types (Horvath 2013). The Horvath Clock uses a weighted sum of DNA methylation levels at 323 CpG sites across the human genome, where weights at each site are determined based on an original training dataset. His multi-tissue age predictor in humans has a Pearson correlation coefficient ($r = 0.96$ between estimated methylation age and true chronological age). Methylation assays are now emerging in wildlife biology too, and they appear to have much greater discriminatory power than do telomere assays (Laine et al. 2023; Le Clerq et al. 2023). For example, a recent paper describes a remarkably accurate methylation clock in brown bears ($r = 0.98$; Nakamura et al. 2023).

While most wildlife biologists use the tooth wear and replacement technique as the preferred method for aging due to the minimal costs associated, this method is of questionable accuracy and repeatability (Hamlin et al. 2000; Asmus and Weckerly 2011; Storm et al. 2014). Cementum annuli analysis is more accurate, but the accuracy still varies by the observer/expert and by species (Hamlin et al. 2000; Veiburg et al. 2020). The list price for basic cementum annuli aging by commercial labs such as Matson’s and Wildlife Analytical Laboratories can range from \$15-\$75/sample, whereas the RT-PCR cost (not including labor) is similar and has the potential to be <\$10/sample (Mahoney et al. 2004).

Objective 1 – Validate telomeric DNA-based age estimates and methylation aging estimates against an existing set of known-aged white-tailed deer, and coyotes and/or other wild mammals.

M.S. student Julia Buchanan-Schwanke began working on this project in May 2023. She spent her summer learning basic laboratory procedures needed for the project. Once she had done so, in September 2023, she began experimenting with the telomere assays. She has already made substantial progress on optimizing one of six potential telomere assays, though she has made no attempts to systematically genotype known-aged animals. All of the DNA from available coyote blood samples (2021 & 2022) and deer tissue (2021) has been extracted and is ready for aging assays. Our pilot studies of collecting DNA with nasal swabs and transferring the mucus to “FTA cards” was generally unsuccessful because the DNA yield (quality and quantity) was subpar; however, those same swabs stored in a more economical lysis buffer yielded reasonable DNA. The lysis buffer extractions are now in progress, and we expect them to be finished in February or March. Buchanan-Schwanke also took two courses in the fall 2023 semester. The first helped improve her modeling abilities, and the second was an introduction to teaching in natural resources, which is a requirement for all FNR graduate students.

The most important update with regard to Objective 1 is a press release by Texas Parks and Wildlife Department (TPWD). In brief, on December 1, 2023, TPWD notified the public that a case of chronic wasting disease had been detected in their captive, pedigreed, and known-aged deer herd, and the entire herd was euthanized. Unfortunately, TPWD did not notify us ahead of time so that we could collect DNA samples from these animals. This is still a developing situation, and we are in the process of evaluating our options (i.e., collecting DNA samples from other captive herds).

Objective 2 – Compare telomeric aging and methylation aging with tooth wear/replacement and cementum annuli using the same animals and/or additional wild mammals from various age classes to determine the most accurate aging methodology.

In addition to courses and lab work, Buchanan-Schwanke attended The Wildlife Society’s national conference in Louisville, Kentucky during November 2023. For her November 2023 field work, she and Dr. DeWoody (project primary investigator) traveled to the

USDA-APHIS captive coyote facility in Logan, Utah and helped collect blood samples from the facility’s fall round-up. Those samples were shipped to Purdue on December 6, 2023, and processing (i.e., DNA extractions) will begin as soon as possible.

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Appendix A.

DMU DEER DATA SHEETS 2023

A detailed explanation of how to read and interpret the DMU Deer Data Sheets is available in the [2018 Indiana White-tailed Deer Report](#) (Page 140).

DMU 1: Northwest

5/23/2024

Total Square Miles: 6,022

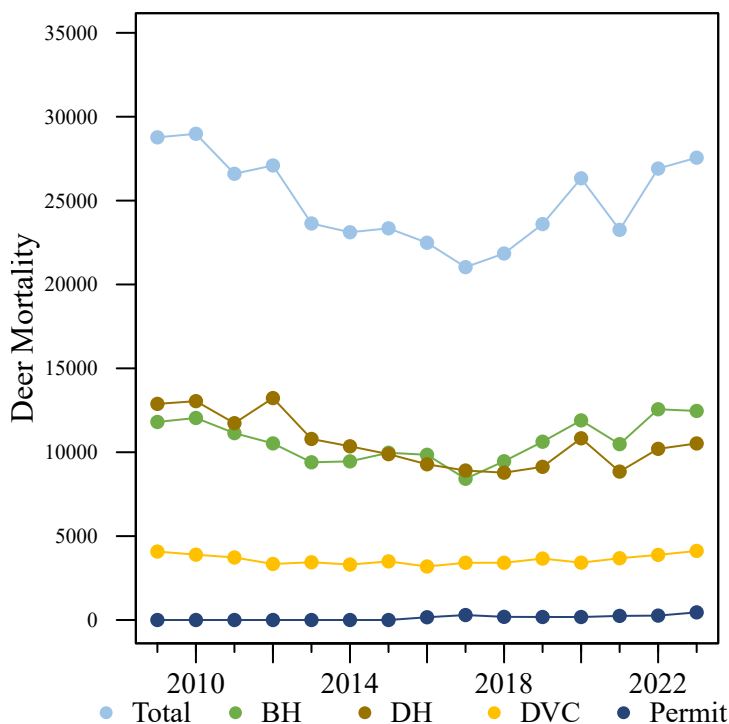
Square Miles of Deer Habitat: 1,245

Percent Deer Habitat: 21

Table 1. Total harvest, buck harvest, and doe harvest (error < 1 percent). Damage permits are issued by DNR to landowners to control deer damage. Deer vehicle collisions (DVC) and miles traveled are reported by the Indiana Department of Transportation. Mean CBAQ is the average county bonus antlerless quota of all counties in the DMU. The trend in total harvest, buck harvest, doe harvest, and DVCs are in standard deviations (SD) and are equivalent to effect size. A change greater than 2 SD is considered both a large and statistically significant effect size.

Year	Total	Total Trend in SD	Buck Harvest	Buck Trend in SD	Buck Harvest per SQ MI Habitat	Doe Harvest	Doe Trend in SD	Doe Harvest per SQ MI Habitat	% Doe in Harvest	Damage Permit Deer Taken	DVC per Billion Miles Traveled	DVC Trend in SD	Mean CBAQ
2009	24,688		11,806		9.5	12,882		10.3	52.2		256.6		6.3
2010	25,088	1.3	12,043	1.2	9.7	13,045	1.3	10.5	52.0		241.1	-1.3	6.4
2011	22,870	-0.4	11,139	-0.8	8.9	11,731	-0.2	9.4	51.3		232.8	-2.7	7.1
2012	23,755	-0.2	10,527	-3.3	8.5	13,228	1.4	10.6	55.7		206.4	-3.4	6.8
2013	20,195	-4.5	9,402	-3.3	7.6	10,793	-2.8	8.7	53.4		210.4	-1.4	5.8
2014	19,810	-1.8	9,456	-1.4	7.6	10,354	-1.9	8.3	52.3		200.0	-1.4	4.4
2015	19,854	-1.1	9,968	-0.5	8.0	9,886	-1.5	7.9	49.8		207.3	-0.6	4.3
2016	19,132	-1.2	9,849	-0.3	7.9	9,283	-1.4	7.5	48.5	165	185.7	-2.0	4.6
2017	17,327	-1.8	8,418	-3.1	6.8	8,909	-1.2	7.2	51.4	295	194.4	-0.8	3.3
2018	18,245	-0.9	9,463	0.1	7.6	8,782	-1.4	7.1	48.1	188	191.6	-0.8	2.6
2019	19,757	0.8	10,626	2.0	8.5	9,131	-0.5	7.3	46.2	180	201.4	0.7	2.0
2020	22,730	3.6	11,899	2.7	9.6	10,831	3.8	8.7	47.7	179	186.4	-1.1	2.0
2021	19,329	-0.1	10,482	0.3	8.4	8,847	-0.7	7.1	45.8	245	196.9	0.8	2.0
2022	22,763	1.6	12,561	1.8	10.1	10,202	1.0	8.2	44.8	263	207.6	2.4	2.0
2023	22,984	1.2	12,461	1.2	10.0	10,523	1.1	8.5	45.8	455	218.4	2.6	2.1

(a) Cumulative Known Deer Mortality



(b) Archer Deer Observations

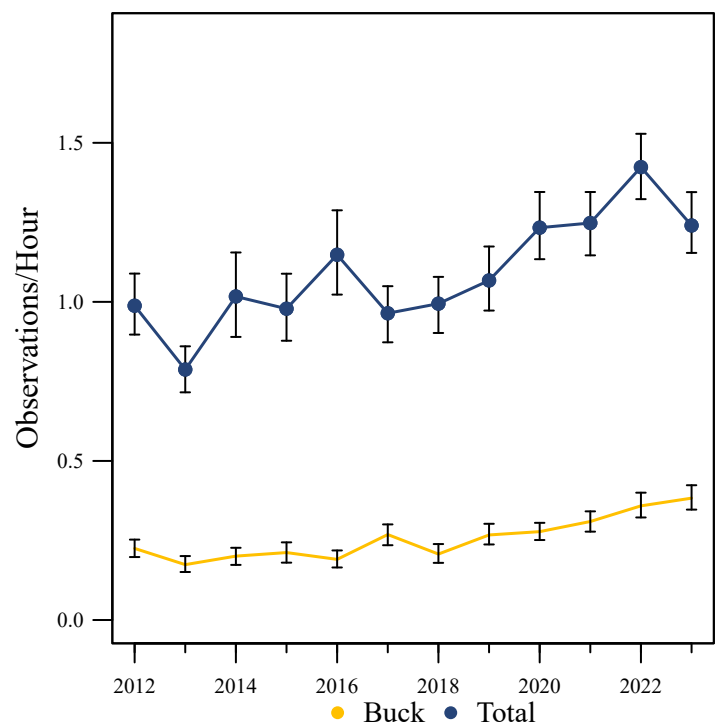


Figure 1. (a) The total known annual deer mortality based on buck harvests (BH), doe harvests (DH), deer vehicle collisions (DVC), and deer permit takes. (b) Total deer and buck observations per hour based on the Archer's Index.

DMU 1: Northwest

5/23/2024

Total Square Miles: 6,022

Square Miles of Deer Habitat: 1,245

Percent Deer Habitat: 21

Table 2. Estimated number of antlered (A) and antlerless (AL) deer harvested per hunter. Estimated totals may not match exactly with total number of deer harvested. Reporting errors are examined and investigated as they are located; therefore, subsequent reports may contain corrected totals.

Year	Total Hunters	0 A	1 A	2 A	3 A	0 AL	1 AL	2 AL	3 AL	4 AL	5 AL	6 AL	7 AL	8 AL	9 AL	10 AL
2016	14,283	6,488	7,740	54	1	5,665	6,580	1,580	347	72	24	13	2	0	0	0
2017	12,917	6,368	6,488	61	0	4,630	6,398	1,492	292	82	14	4	3	2	0	0
2018	13,603	6,088	7,428	86	1	5,356	6,340	1,535	302	47	13	6	2	0	0	1
2019	14,758	6,011	8,633	113	1	6,077	6,839	1,580	199	38	15	5	2	2	0	0
2020	16,468	6,993	9,329	145	1	6,327	7,703	2,058	289	63	15	6	5	0	0	0
2021	14,541	5,951	8,472	118	0	6,131	6,587	1,550	208	41	12	7	2	1	1	0
2022	16,644	6,142	10,348	151	3	7,171	7,283	1,862	248	62	11	4	1	0	1	1
2023	16,799	6,368	10,248	178	5	7,203	7,306	1,932	278	59	12	6	0	1	1	0

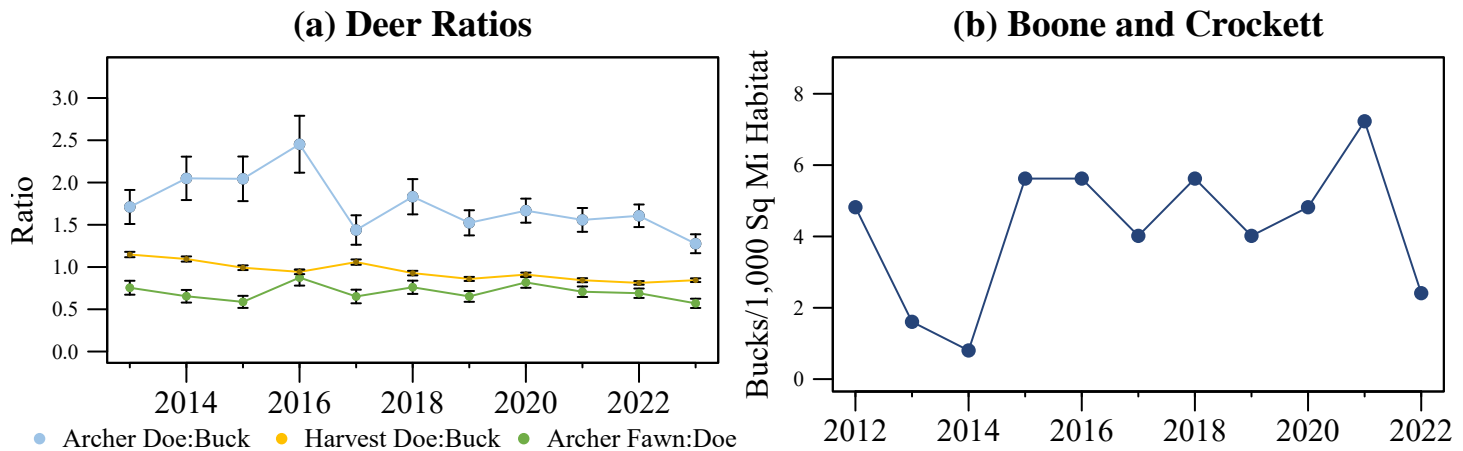


Figure 2. (a) Annual doe:buck ratios and fawn:doe ratios based on the Archer's Index and harvest records. (b) The number of Boone and Crockett bucks (minimum 160 score) per 1,000 square miles of deer habitat.

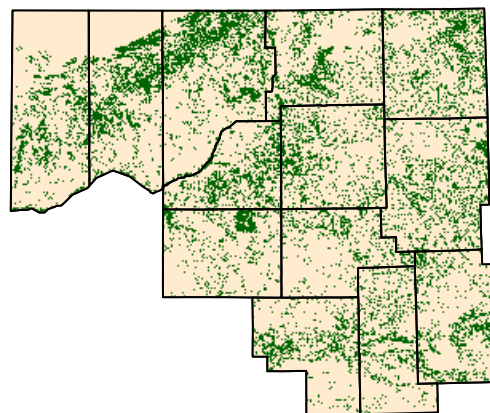
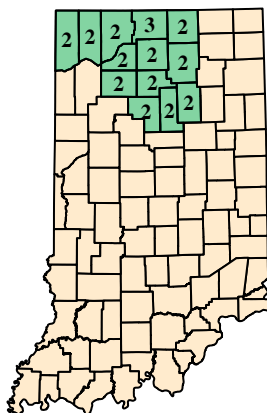


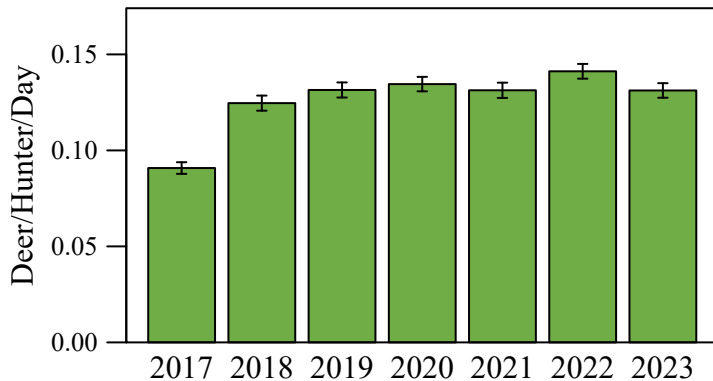
Figure 3. (a) Counties included in DMU 1 for summarizing harvest and deer management survey statistics. Labels are the 2023 county bonus antlerless quotas. (b) Green represents the land use types classified as deer habitat in DMU 1.

DMU 1: Northwest

5/23/2024

Deer Management Survey Results

(a) Buck Firearm Harvest Effort



(b) Doe Firearm Harvest Effort

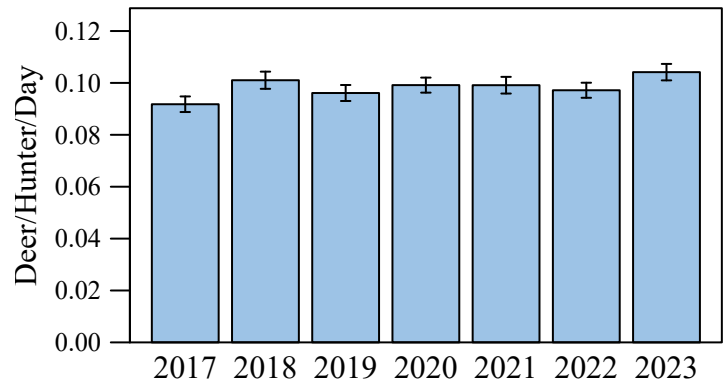
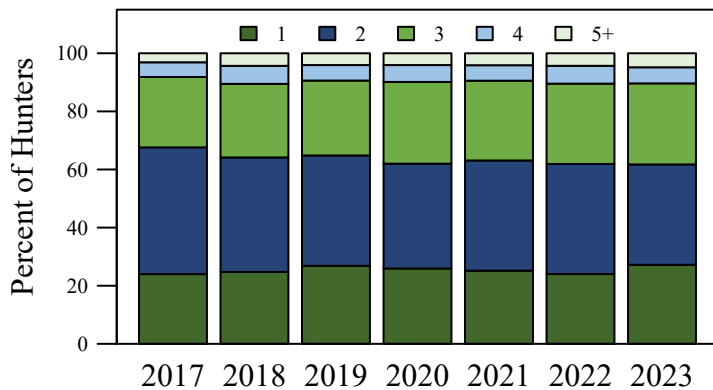


Figure 4. Firearm harvest effort is the number of bucks (a) and does (b) killed by firearms per hunter divided by the mean number of days hunted per hunter during the firearm season based on data reported in the deer management survey. Larger values (i.e. taller bars) indicate less effort required to harvest a deer.

(a) Number of Deer Desired



(b) Estimated Success

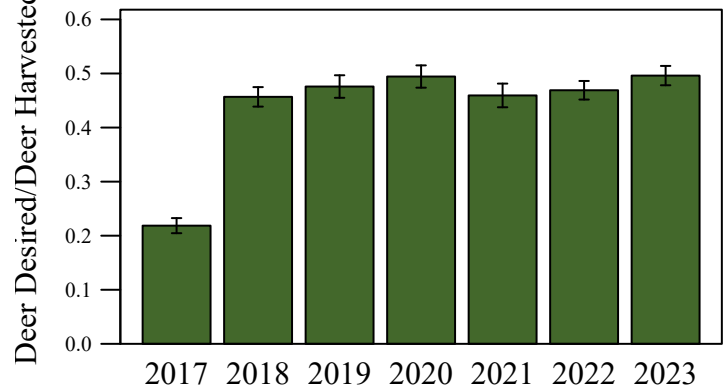
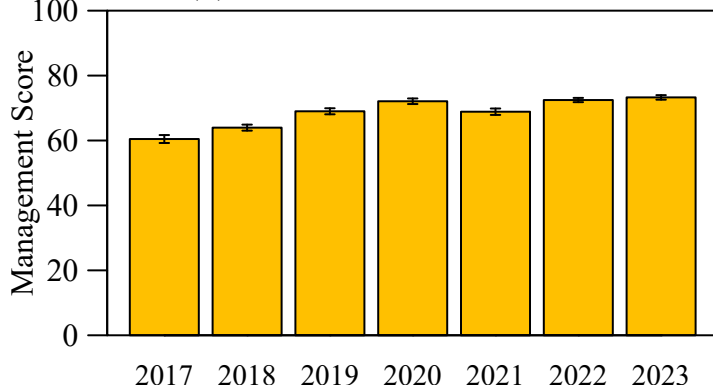


Figure 5. (a) The annual percent of hunters wishing to harvest each number of deer as reported in the deer management survey. (b) Success rate is estimated from the deer management survey as the Number of Harvested Deer/Number of Deer Desired (reported only; does not account for attempts that were not made). Larger values (i.e. taller bars) indicate greater success.

(a) Hunter State Satisfaction



(b) Nonhunter State Satisfaction

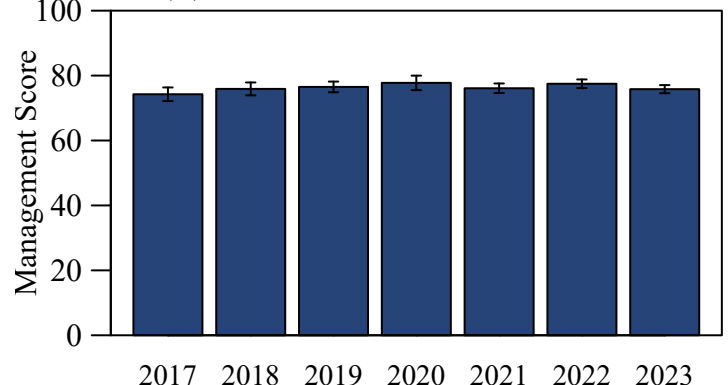


Figure 6. Hunters (a) and nonhunters (b) were asked to score the DNR's statewide deer management on a scale of 0 (poor) to 100 (excellent).

DMU 1: Northwest

5/23/2024

Deer Management Survey Results

Hunter Satisfaction

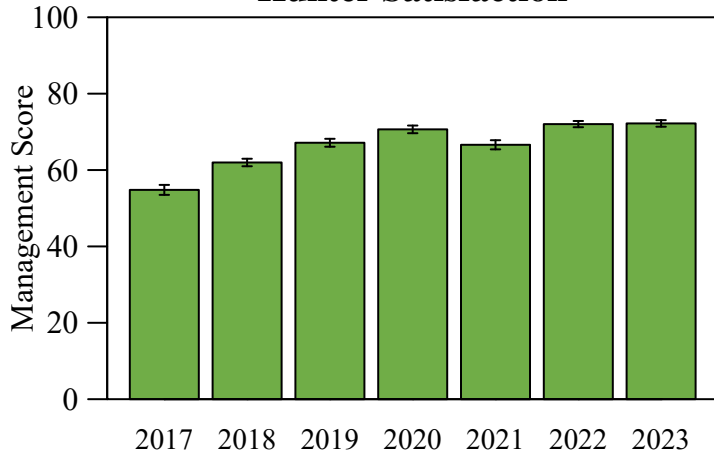


Figure 7. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 1 where they hunt.

Resident Hunter Satisfaction

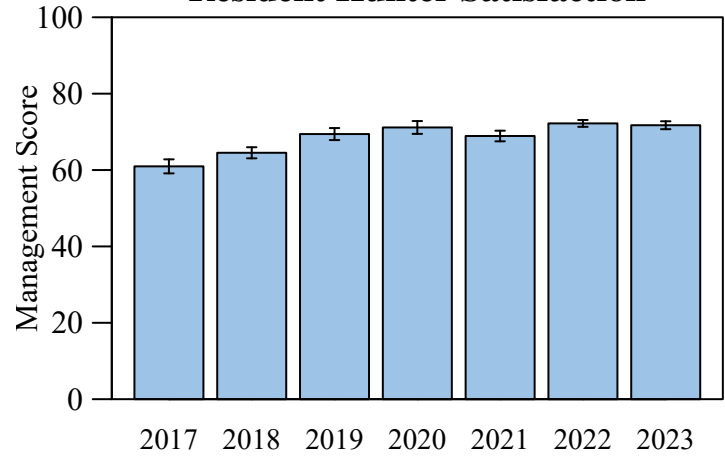


Figure 8. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 1 where they live.

Resident Nonhunter Satisfaction

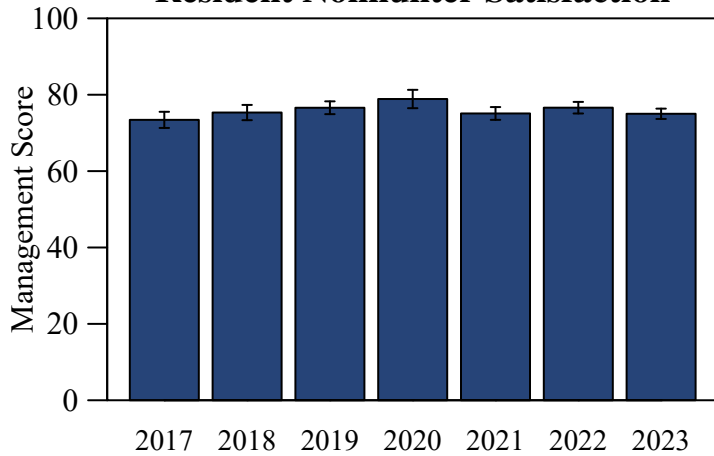


Figure 9. Nonhunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 1 where they live.

Hunter Population Size

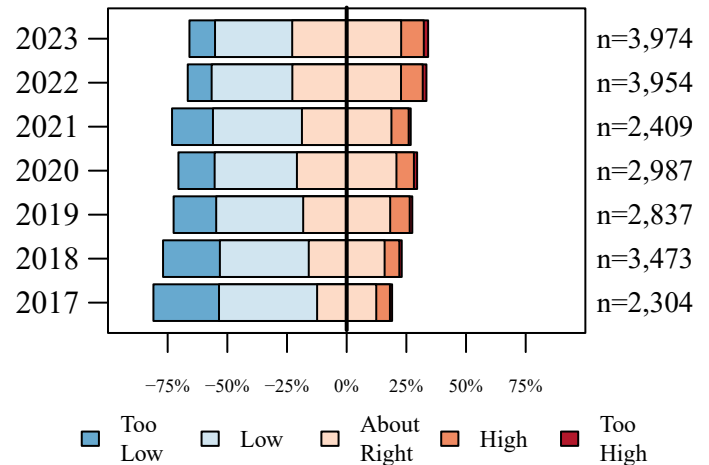


Figure 10. The current size of the deer population described by hunters in the county where they hunt in DMU 1.

Resident Hunter Population Size

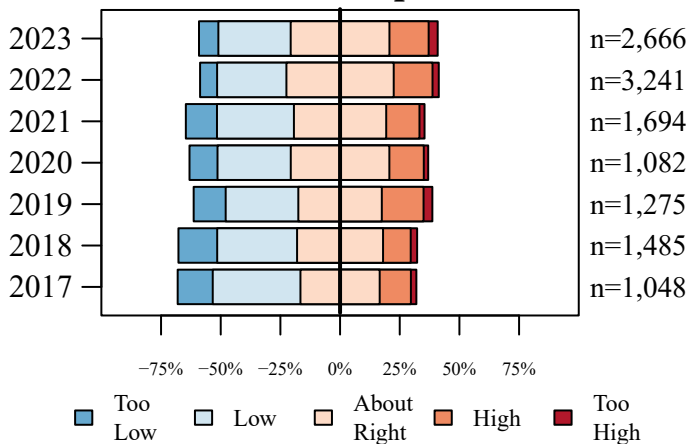


Figure 11. The current size of the deer population described by hunters in the county where they live in DMU 1.

Resident Nonhunter Population Size

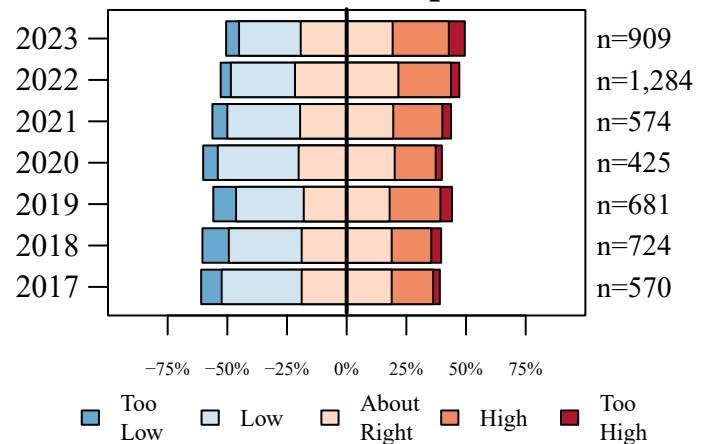


Figure 12. The current size of the deer population described by nonhunters in the county where they live in DMU 1.

DMU 1: Northwest

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Deer Management Survey Results

Hunter Perceived Change

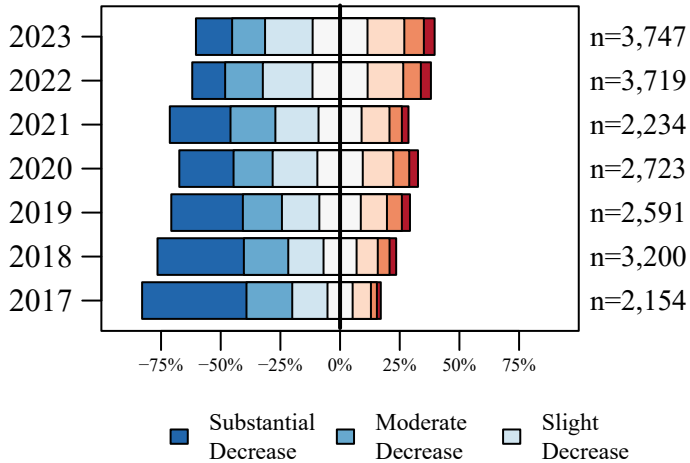


Figure 13. The number of deer seen compared to five years ago described by hunters in the county where they hunt in DMU 1.

Resident Hunter Perceived Change

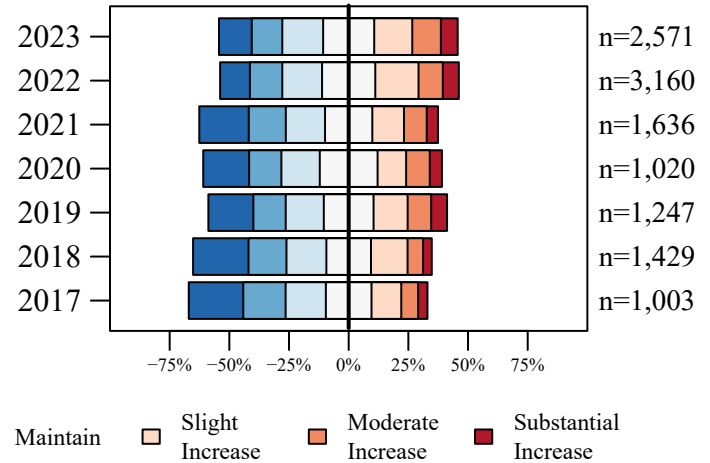


Figure 14. The number of deer seen compared to five years ago described by hunters in the county where they live in DMU 1.

Resident Nonhunter Perceived Change

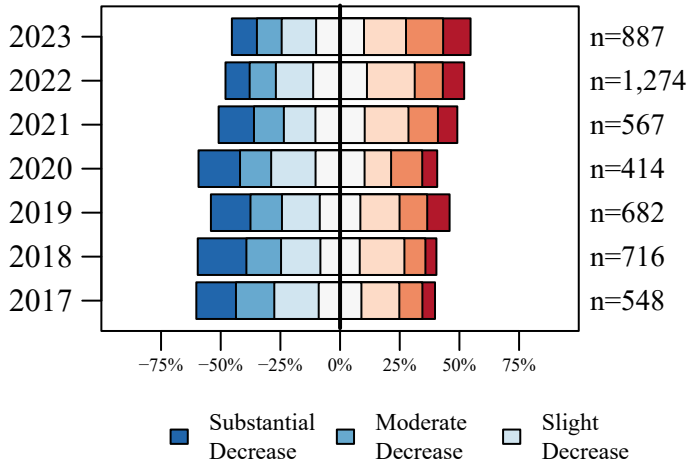


Figure 15. The number of deer seen compared to five years ago described by nonhunters in the county where they live in DMU 1.

Hunter Desired Change

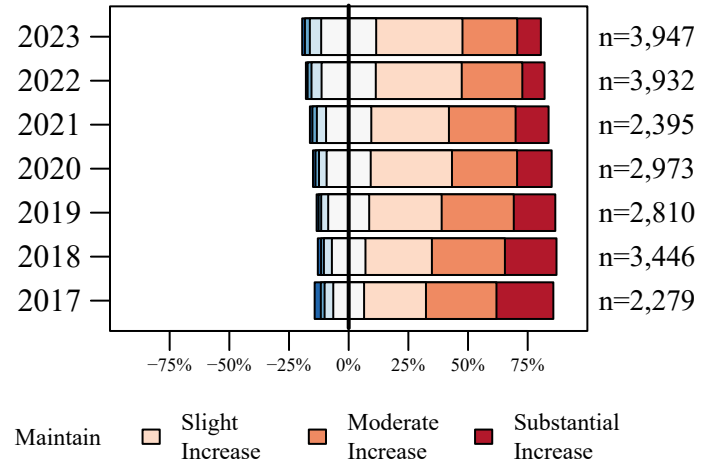


Figure 16. The desired change in the size of the deer population described by hunters in the county where they hunt in DMU 1.

Resident Hunter Desired Change

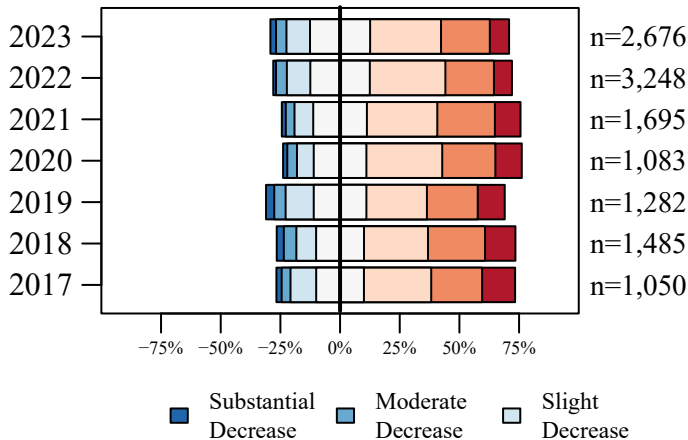


Figure 17. The desired change in the size of the deer population described by hunters in the county where they live in DMU 1.

Resident Nonhunter Desired Change

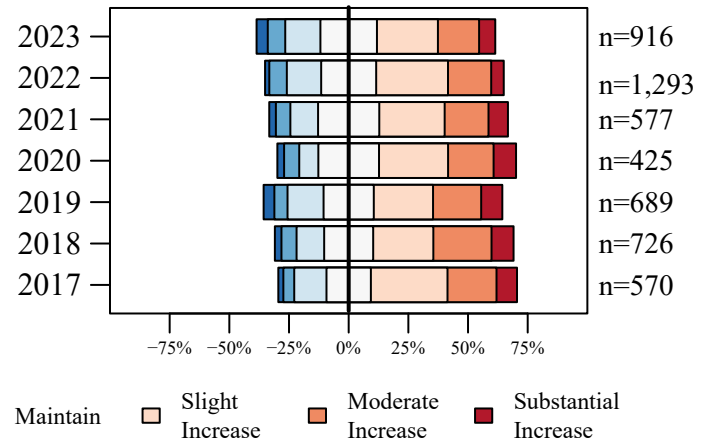


Figure 18. The desired change in the size of the deer population described by nonhunters in the county where they live in DMU 1.

DMU 1: Northwest

5/23/2024

Deer Management Survey Results

Hunter Buck Quality

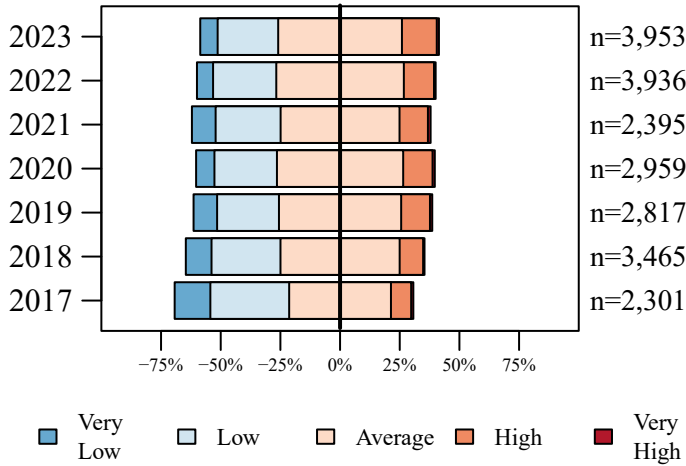


Figure 19. Hunters describe the quality of bucks in the county where they hunt in DMU 1.

Resident Hunter Buck Quality

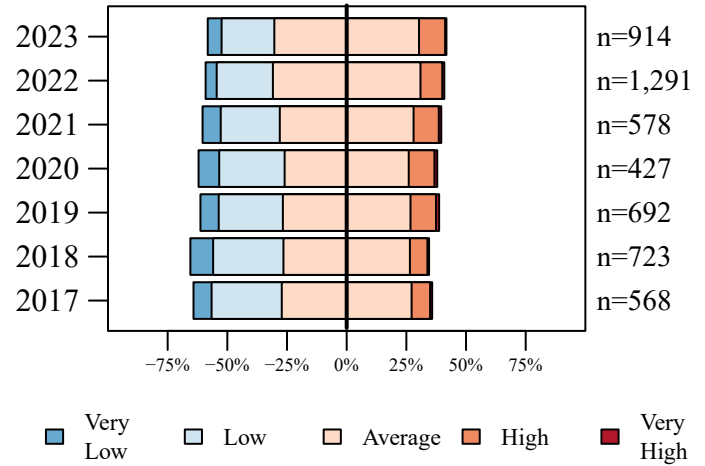


Figure 20. Hunters describe the quality of bucks in the county where they live in DMU 1.

Personal Harvest Change

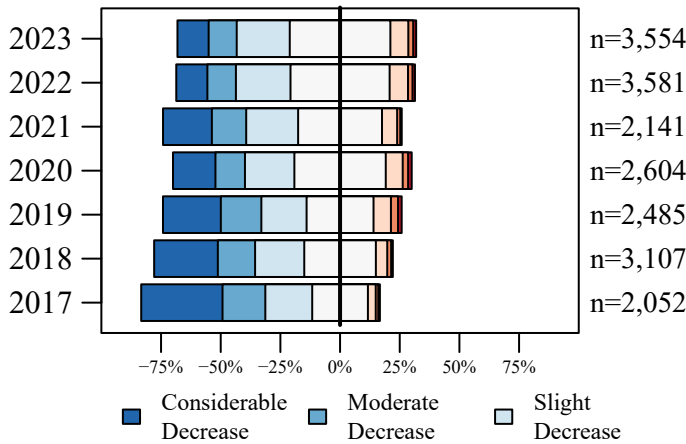


Figure 21. Opinion of hunters on how their personal number of harvested deer has changed over the last five years in a county in DMU 1.

Total Harvest Change

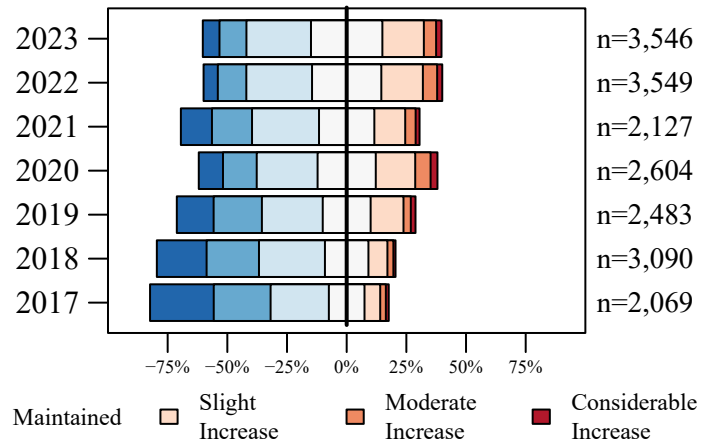


Figure 22. Opinion of hunters on how the total number of harvested deer has changed over the last five years in a county in DMU 1.

Hunter CBAQ

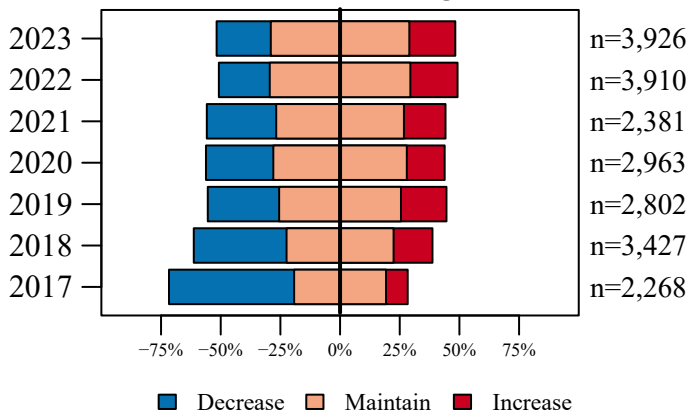


Figure 23. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they hunt in DMU 1.

Resident Hunter CBAQ

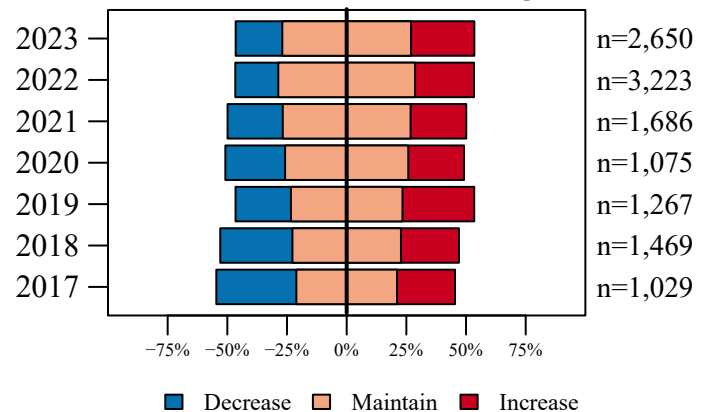


Figure 24. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they live in DMU 1.

DMU 1: Northwest

5/23/2024

Deer Management Survey Results

Resident Nonhunter CBAQ

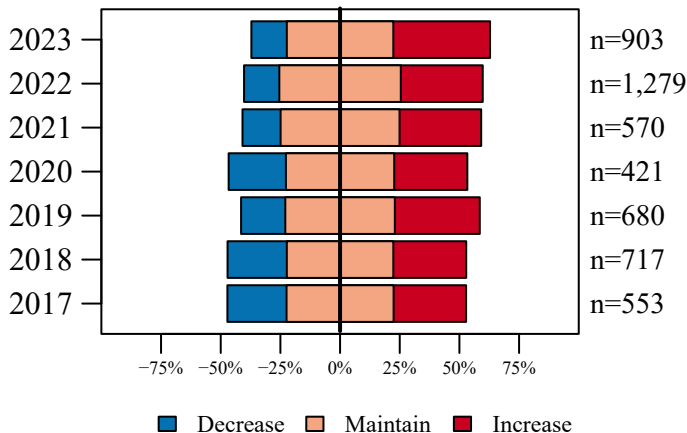


Figure 25. Opinion on how the County Bonus Antlerless Quota should change from nonhunters in the county where they live in DMU 1.

Hunter Opinion

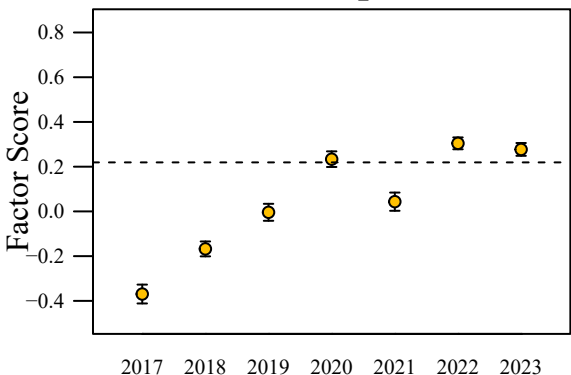


Figure 26. Hunter opinion scores over five years of the deer management survey. The score was aggregated using factor analysis of questions asked only to hunters. The dashed line represents the score if all questions are answered neutrally.

Population Size Opinion

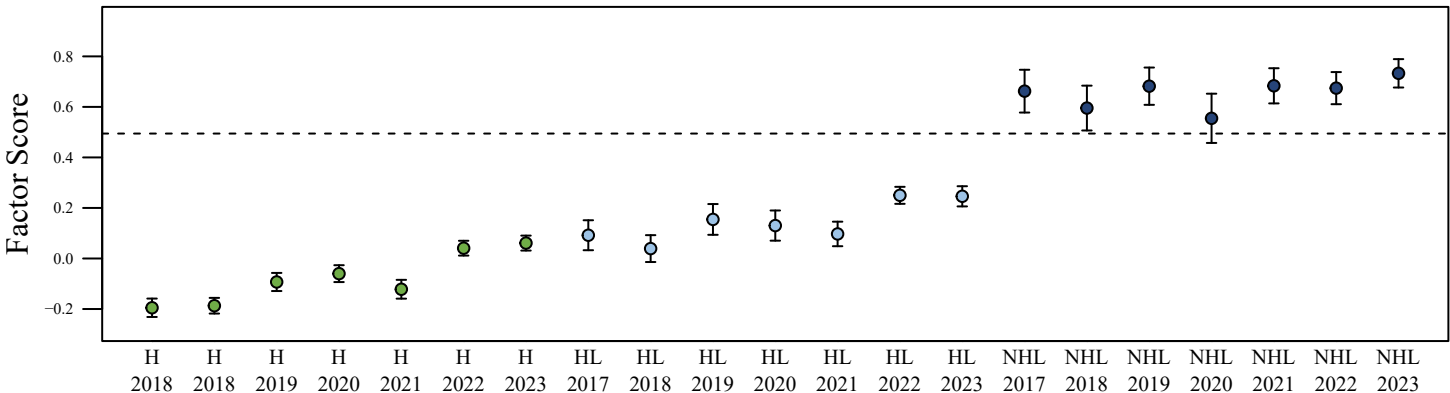


Figure 27. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer population size. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

Deer Management Opinion

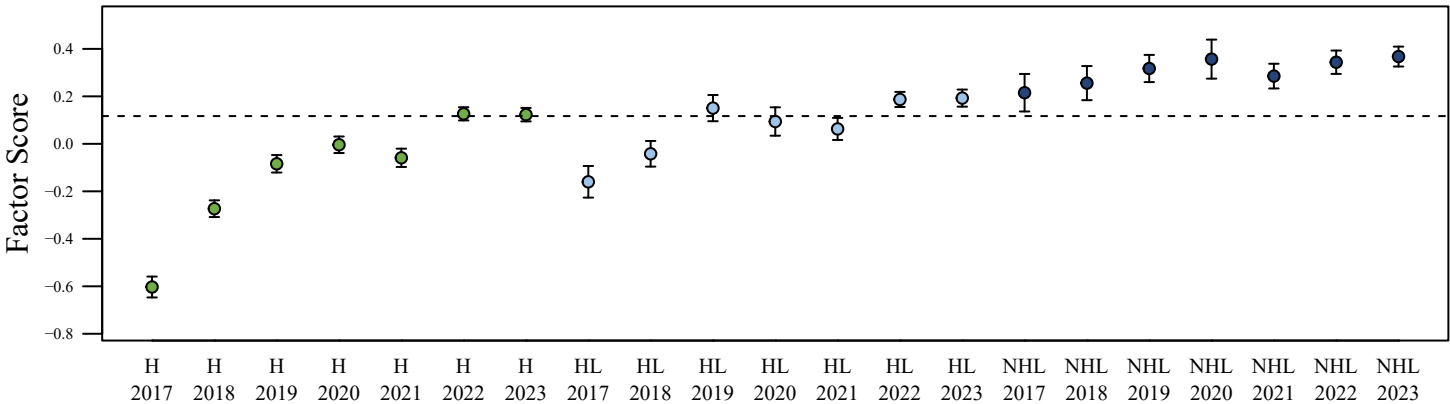


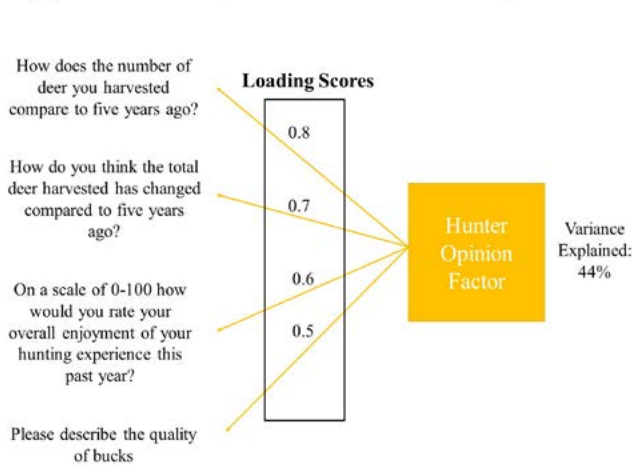
Figure 28. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer management. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

DMU 1: Northwest

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Deer Management Survey Results

(a) Factor Analysis Results: Hunter Questions



(b) Factor Analysis Results: All Group Questions

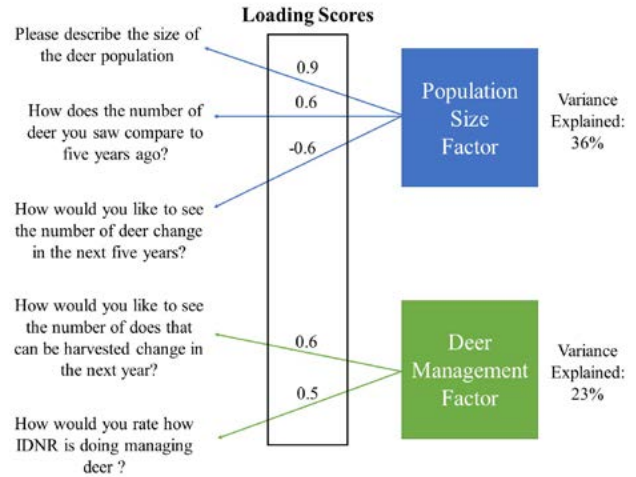


Figure 29. Results from two factor analyses used to develop the hunter opinion (a), population opinion (b), and management opinion (b) scores. Higher loading scores indicate a stronger correlation between the original question and the derived factor. These figures are included to help interpret Figure 26, Figure 27, and Figure 28.

DMU 2: Northeast

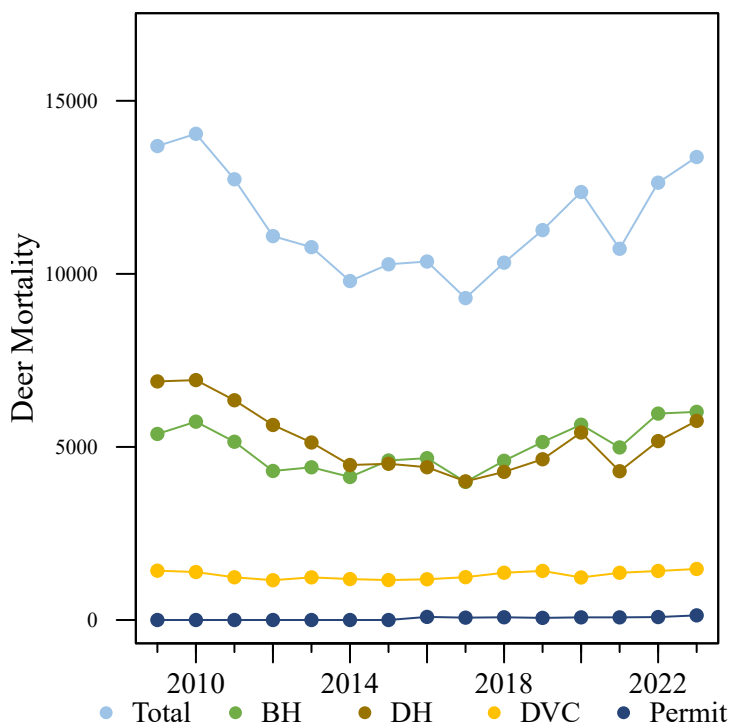
5/23/2024

Total Square Miles: 1,490
Square Miles of Deer Habitat: 506
Percent Deer Habitat: 34

Table 1. Total harvest, buck harvest, and doe harvest (error < 1 percent). Damage permits are issued by DNR to landowners to control deer damage. Deer vehicle collisions (DVC) and miles traveled are reported by the Indiana Department of Transportation. Mean CBAQ is the average county bonus antlerless quota of all counties in the DMU. The trend in total harvest, buck harvest, doe harvest, and DVCs are in standard deviations (SD) and are equivalent to effect size. A change greater than 2 SD is considered both a large and statistically significant effect size.

Year	Total	Total Trend in SD	Buck Harvest	Buck Trend in SD	Buck Harvest per SQ MI Habitat	Doe Harvest	Doe Trend in SD	Doe Harvest per SQ MI Habitat	% Doe in Harvest	Damage Permit Deer Taken	DVC per Billion Miles Traveled	DVC Trend in SD	Mean CBAQ
2009	12,268		5,375		10.6	6,893		13.6	56.2		588.9		6.0
2010	12,661	1.6	5,730	2.2	11.3	6,931	1.1	13.7	54.7		577.0	-0.6	6.0
2011	11,499	-0.3	5,150	-0.3	10.2	6,349	-0.3	12.5	55.2		519.2	-6.9	8.0
2012	9,941	-3.7	4,306	-4.3	8.5	5,635	-2.9	11.1	56.7		491.8	-2.7	8.0
2013	9,540	-2.0	4,412	-1.4	8.7	5,128	-2.5	10.1	53.8		533.1	-0.4	5.0
2014	8,610	-1.9	4,132	-1.4	8.2	4,478	-2.2	8.8	52.0		515.9	-0.6	4.0
2015	9,123	-0.8	4,609	-0.2	9.1	4,514	-1.2	8.9	49.5		507.5	-0.6	3.5
2016	9,090	-0.6	4,676	0.4	9.2	4,414	-1.0	8.7	48.6	90	523.6	0.7	3.5
2017	7,994	-2.5	3,989	-2.0	7.9	4,005	-1.6	7.9	50.1	68	554.9	2.6	2.5
2018	8,880	0.0	4,600	0.8	9.1	4,280	-0.6	8.5	48.2	79	605.9	4.3	1.8
2019	9,785	2.3	5,141	2.3	10.2	4,644	1.5	9.2	47.5	61	634.2	2.3	1.5
2020	11,058	3.2	5,642	2.5	11.2	5,416	4.3	10.7	49.0	77	548.0	-0.3	1.5
2021	9,284	-0.1	4,986	0.3	9.9	4,298	-0.5	8.5	46.3	77	608.4	0.8	2.0
2022	11,132	1.5	5,963	1.8	11.8	5,169	1.2	10.2	46.4	85	625.2	0.9	2.0
2023	11,767	1.7	6,014	1.4	11.9	5,753	1.9	11.4	48.9	134	641.2	1.1	2.8

(a) Cumulative Known Deer Mortality



(b) Archer Deer Observations

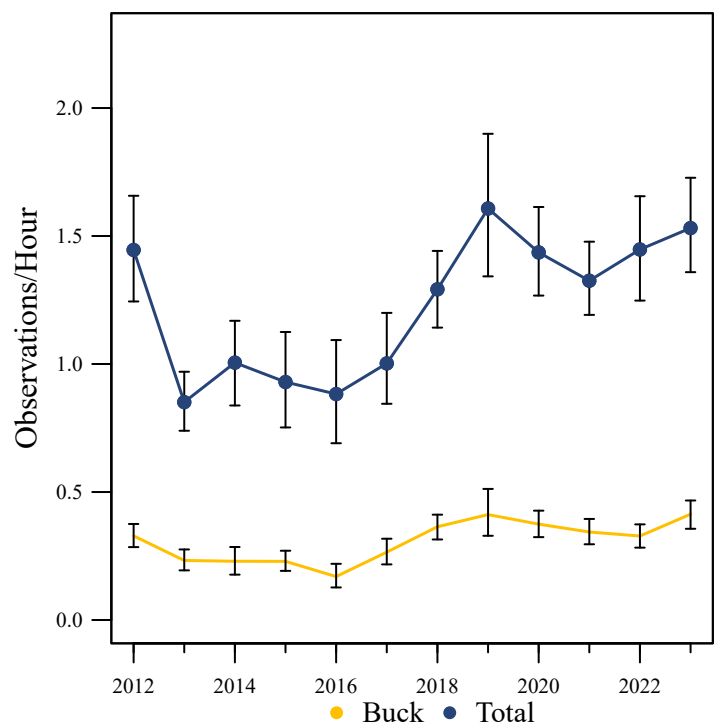


Figure 1. (a) The total known annual deer mortality based on buck harvests (BH), doe harvests (DH), deer vehicle collisions (DVC), and deer permit takes. (b) Total deer and buck observations per hour based on the Archer's Index.

DMU 2: Northeast

5/23/2024

Total Square Miles: 1,490
Square Miles of Deer Habitat: 506
Percent Deer Habitat: 34

Table 2. Estimated number of antlered (A) and antlerless (AL) deer harvested per hunter. Estimated totals may not match exactly with total number of deer harvested. Reporting errors are examined and investigated as they are located; therefore, subsequent reports may contain corrected totals.

Year	Total Hunters	0 A	1 A	2 A	3 A	0 AL	1 AL	2 AL	3 AL	4 AL	5 AL	6 AL	7 AL	8 AL	9 AL	10 AL
2016	6,866	3,128	3,726	11	1	2,729	3,175	772	147	36	7	0	0	0	0	0
2017	6,172	3,009	3,157	6	0	2,307	3,051	691	104	16	2	1	0	0	0	0
2018	6,874	3,127	3,716	31	0	2,693	3,401	662	100	15	2	0	1	0	0	0
2019	7,487	3,189	4,261	37	0	2,988	3,682	712	87	13	2	1	1	1	0	0
2020	8,193	3,583	4,558	52	0	3,090	3,990	971	109	28	5	0	0	0	0	0
2021	7,101	2,927	4,131	42	1	2,979	3,306	716	79	17	1	3	0	0	0	0
2022	8,310	3,278	4,979	53	0	3,512	3,724	936	114	17	2	4	1	0	0	0
2023	8,443	3,482	4,909	51	1	3,308	3,865	1,006	205	42	10	6	1	0	0	0

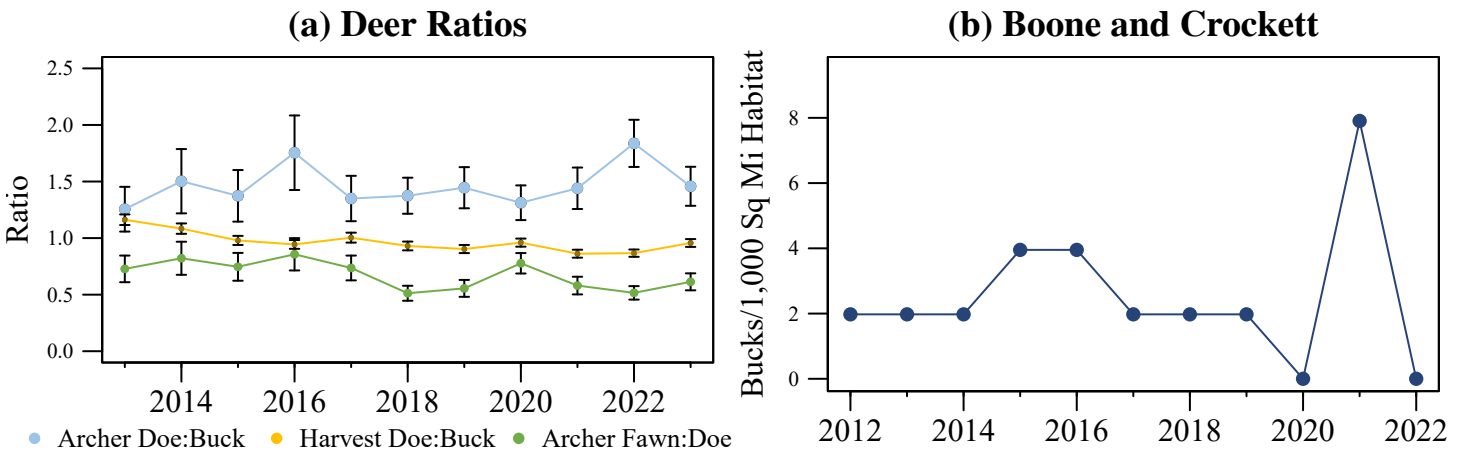
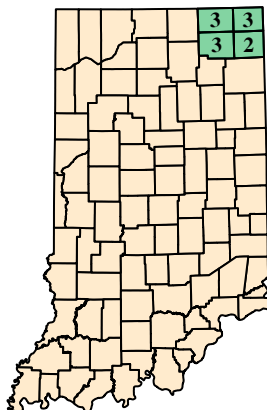


Figure 2. (a) Annual doe:buck ratios and fawn:doe ratios based on the Archer's Index and harvest records. (b) The number of Boone and Crockett bucks (minimum 160 score) per 1,000 square miles of deer habitat.

(a) Counties in DMU 2



(b) Deer Habitat in DMU 2

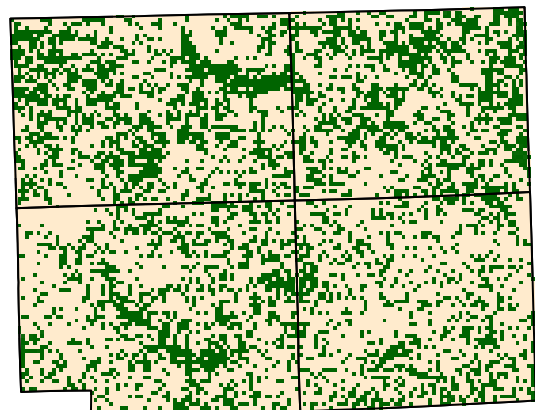


Figure 3. (a) Counties included in DMU 2 for summarizing harvest and deer management survey statistics. Labels are the 2023 county bonus antlerless quotas. (b) Green represents the land use types classified as deer habitat in DMU 2.

DMU 2: Northeast

5/23/2024

Deer Management Survey Results

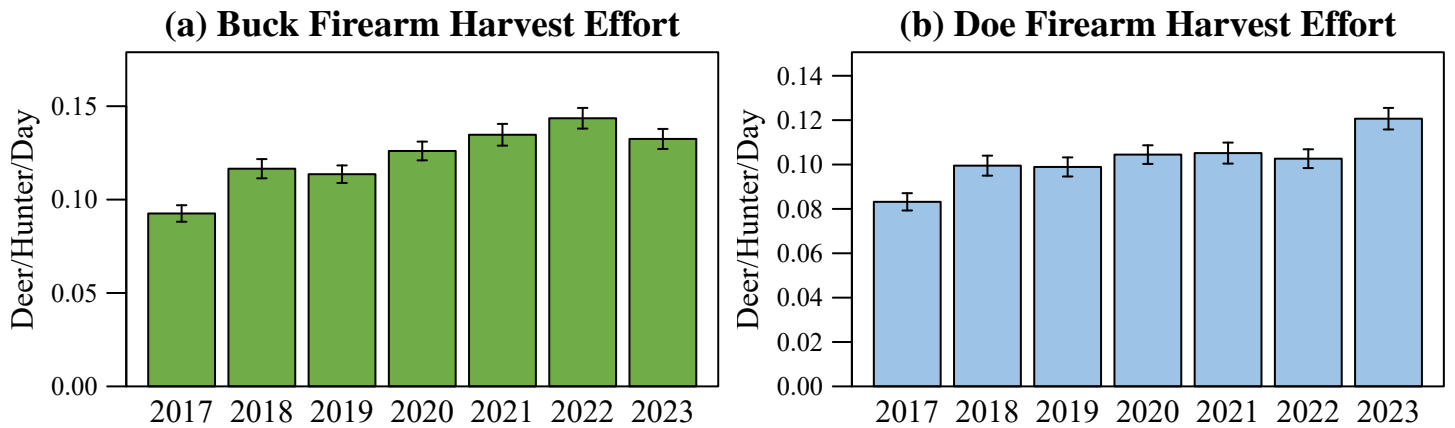


Figure 4. Firearm harvest effort is the number of bucks (a) and does (b) killed by firearms per hunter divided by the mean number of days hunted per hunter during the firearm season based on data reported in the deer management survey. Larger values (i.e. taller bars) indicate less effort required to harvest a deer.

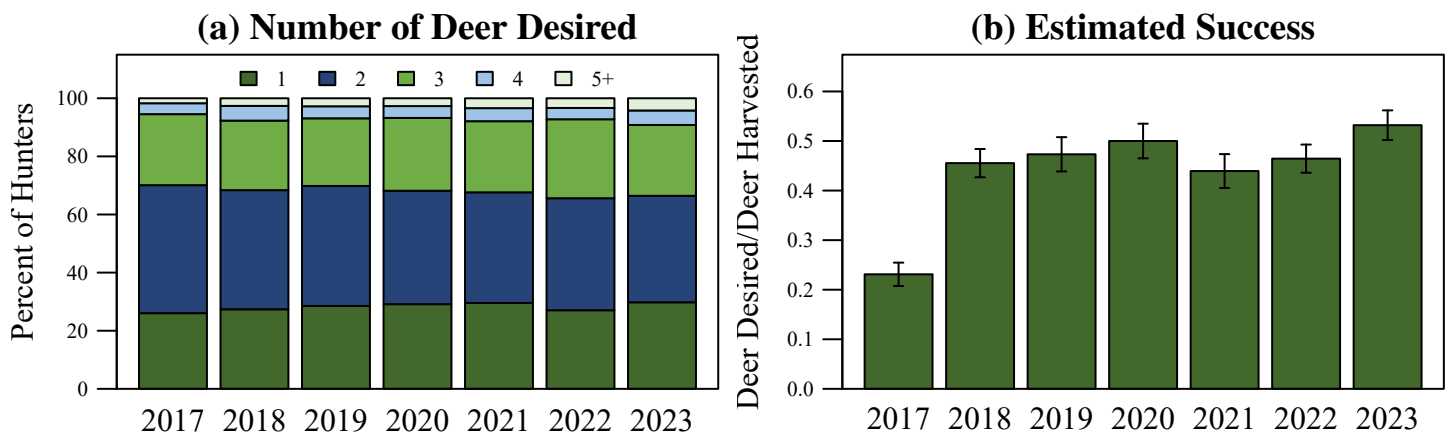


Figure 5. (a) The annual percent of hunters wishing to harvest each number of deer as reported in the deer management survey. (b) Success rate is estimated from the deer management survey as the Number of Harvested Deer/Number of Deer Desired (reported only; does not account for attempts that were not made). Larger values (i.e. taller bars) indicate greater success.

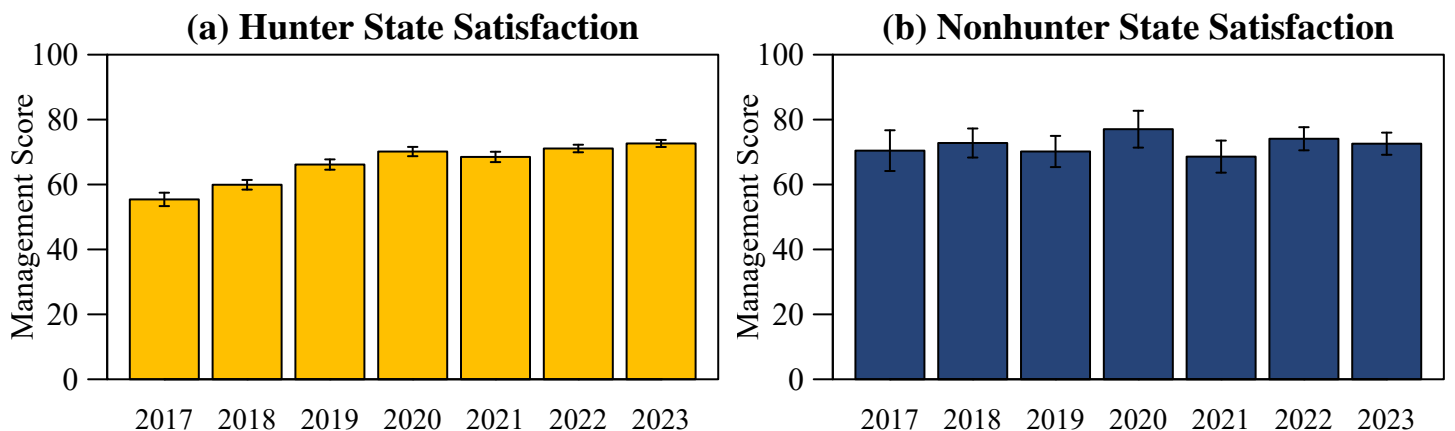


Figure 6. Hunters (a) and nonhunters (b) were asked to score the DNR's statewide deer management on a scale of 0 (poor) to 100 (excellent).

DMU 2: Northeast

5/23/2024

Deer Management Survey Results

Hunter Satisfaction

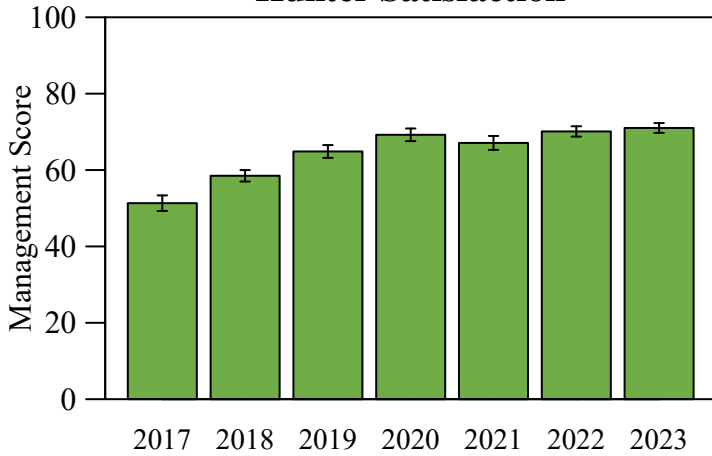


Figure 7. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 2 where they hunt.

Resident Hunter Satisfaction

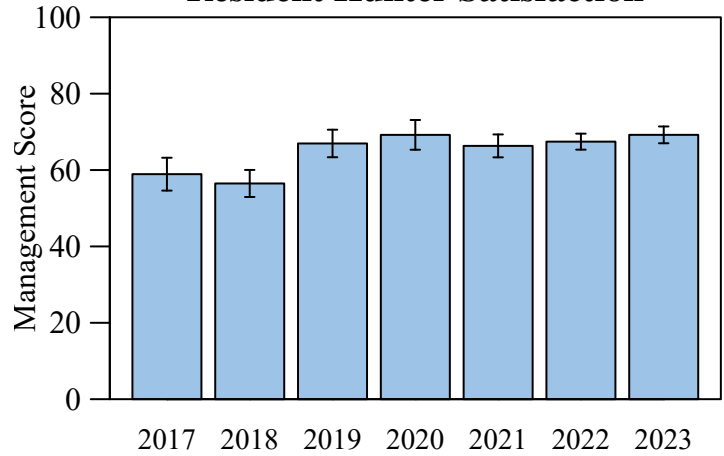


Figure 8. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 2 where they live.

Resident Nonhunter Satisfaction

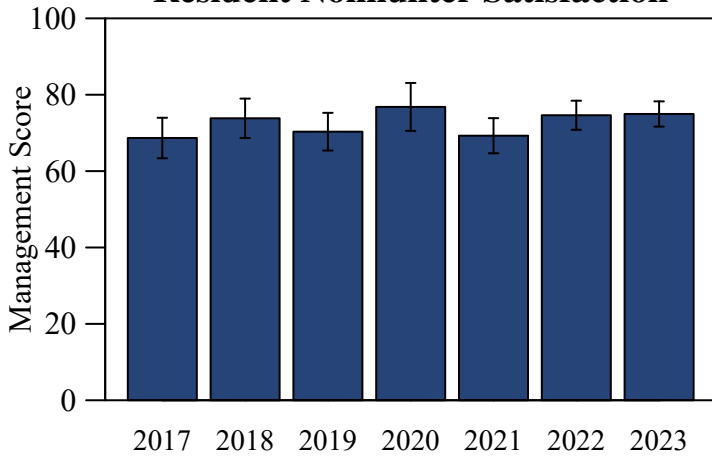


Figure 9. Nonhunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 2 where they live.

Hunter Population Size

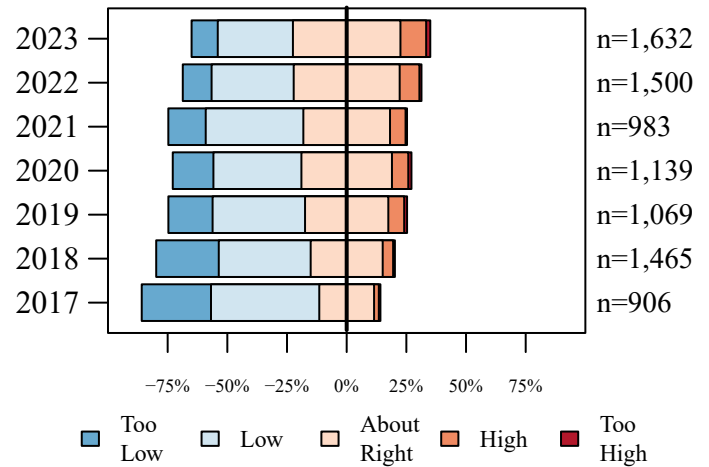


Figure 10. The current size of the deer population described by hunters in the county where they hunt in DMU 2.

Resident Hunter Population Size

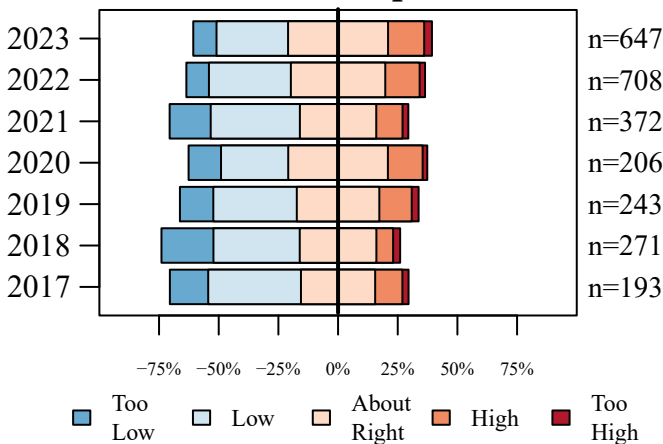


Figure 11. The current size of the deer population described by hunters in the county where they live in DMU 2.

Resident Nonhunter Population Size

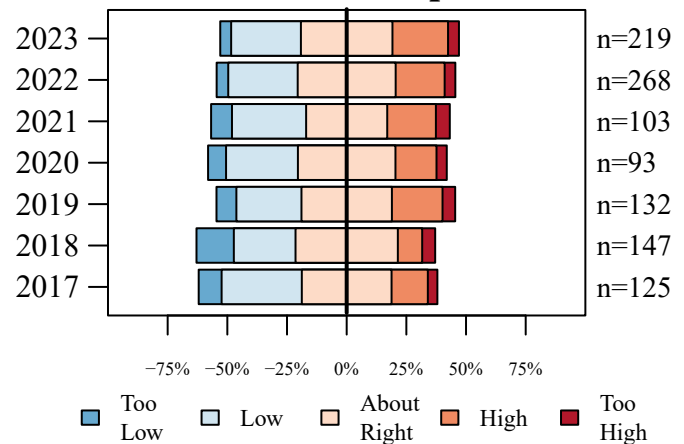


Figure 12. The current size of the deer population described by nonhunters in the county where they live in DMU 2.

DMU 2: Northeast

5/23/2024

Deer Management Survey Results

Hunter Perceived Change

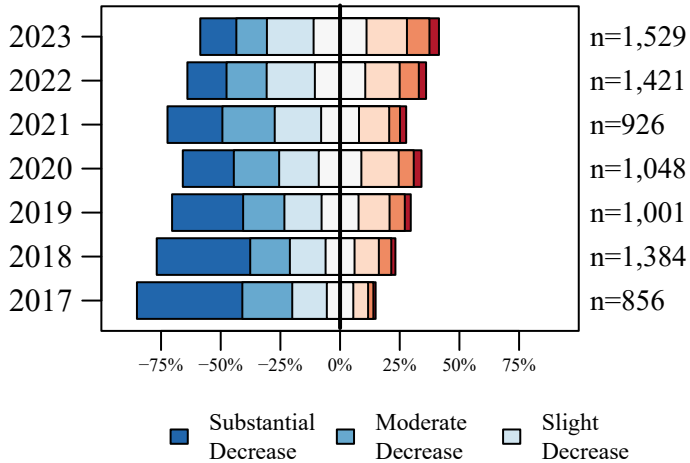


Figure 13. The number of deer seen compared to five years ago described by hunters in the county where they hunt in DMU 2.

Resident Hunter Perceived Change

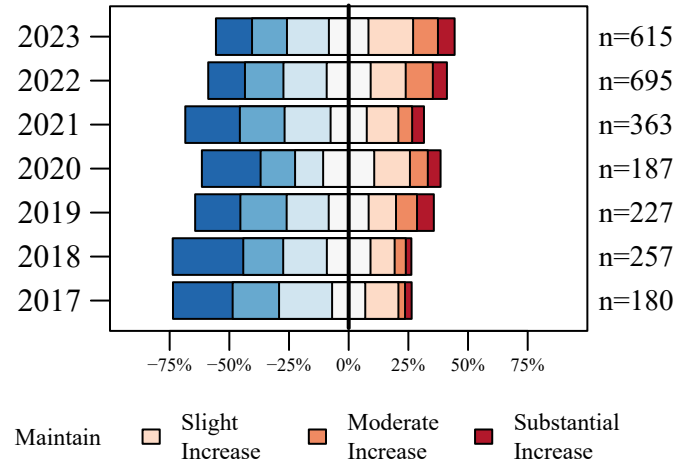


Figure 14. The number of deer seen compared to five years ago described by hunters in the county where they live in DMU 2.

Resident Nonhunter Perceived Change

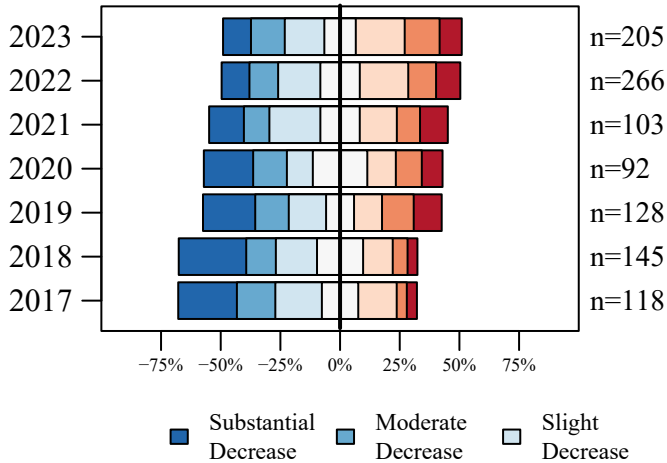


Figure 15. The number of deer seen compared to five years ago described by nonhunters in the county where they live in DMU 2.

Hunter Desired Change

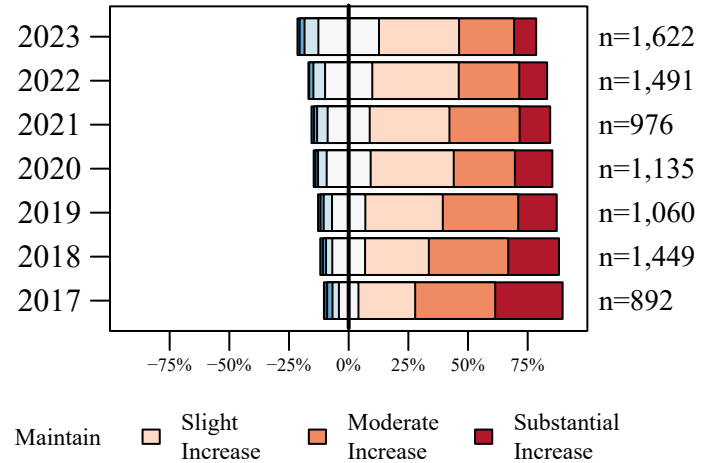


Figure 16. The desired change in the size of the deer population described by hunters in the county where they hunt in DMU 2.

Resident Hunter Desired Change

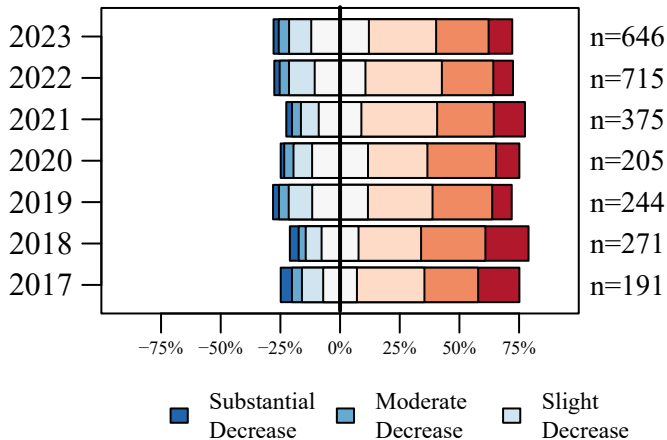


Figure 17. The desired change in the size of the deer population described by hunters in the county where they live in DMU 2.

Resident Nonhunter Desired Change

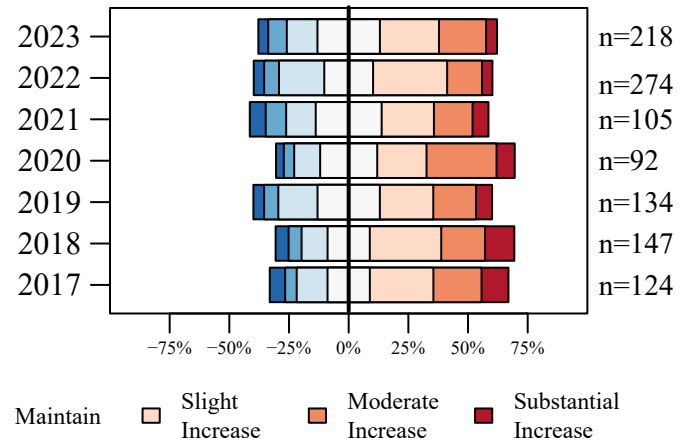


Figure 18. The desired change in the size of the deer population described by nonhunters in the county where they live in DMU 2.

DMU 2: Northeast

5/23/2024

Deer Management Survey Results

Hunter Buck Quality

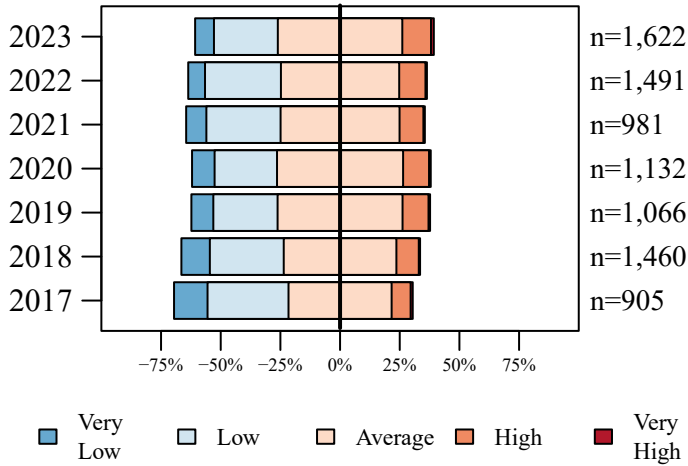


Figure 19. Hunters describe the quality of bucks in the county where they hunt in DMU 2.

Resident Hunter Buck Quality

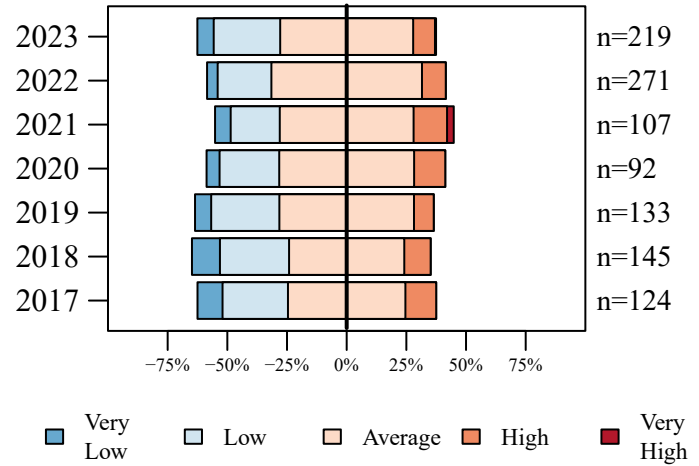


Figure 20. Hunters describe the quality of bucks in the county where they live in DMU 2.

Personal Harvest Change

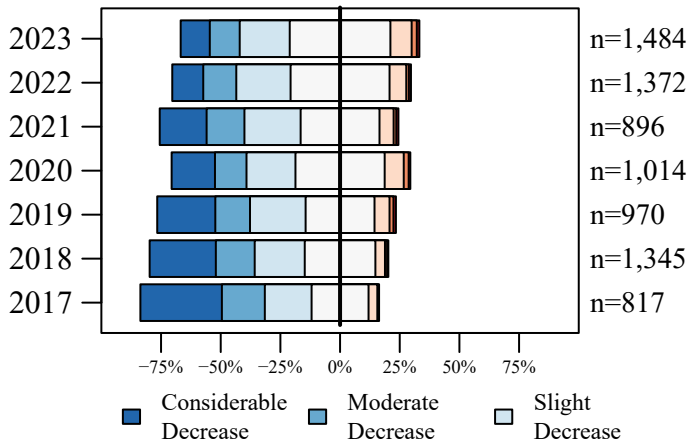


Figure 21. Opinion of hunters on how their personal number of harvested deer has changed over the last five years in a county in DMU 2.

Total Harvest Change

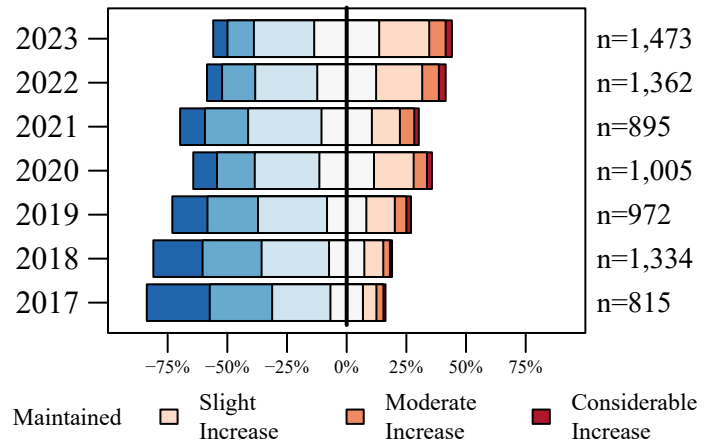


Figure 22. Opinion of hunters on how the total number of harvested deer has changed over the last five years in a county in DMU 2.

Hunter CBAQ

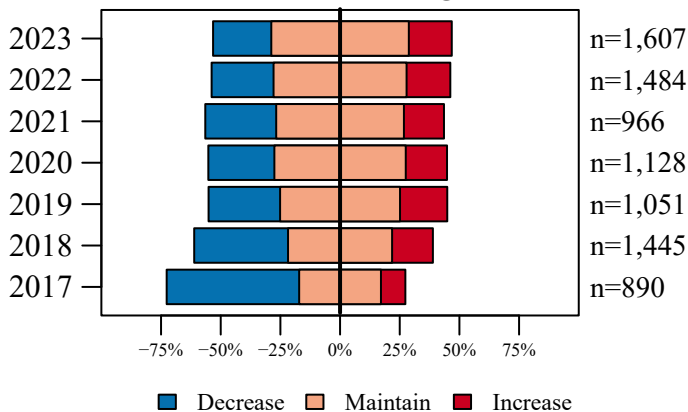


Figure 23. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they hunt in DMU 2.

Resident Hunter CBAQ

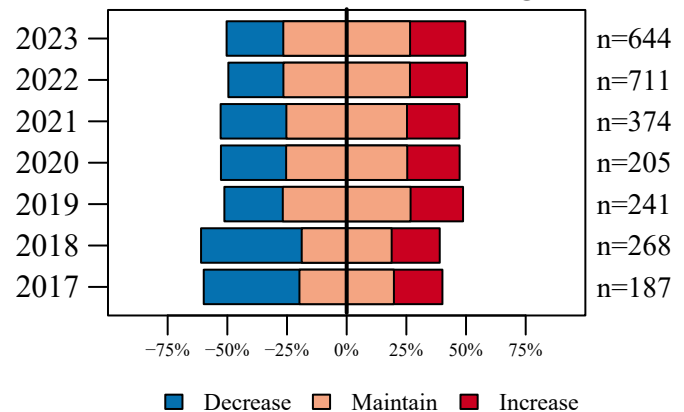


Figure 24. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they live in DMU 2.

DMU 2: Northeast

5/23/2024

Deer Management Survey Results

Resident Nonhunter CBAQ

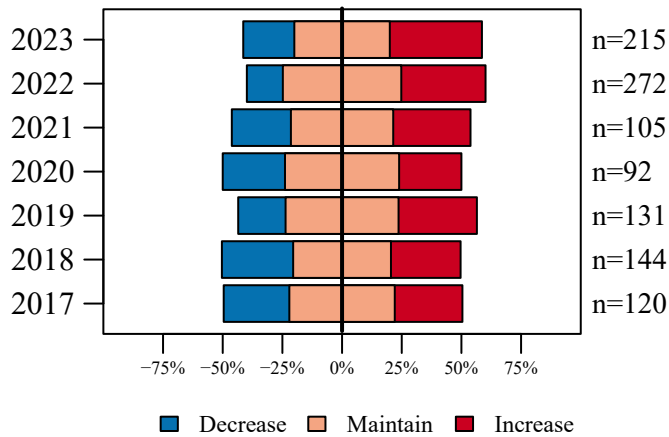


Figure 25. Opinion on how the County Bonus Antlerless Quota should change from nonhunters in the county where they live in DMU 2.

Hunter Opinion

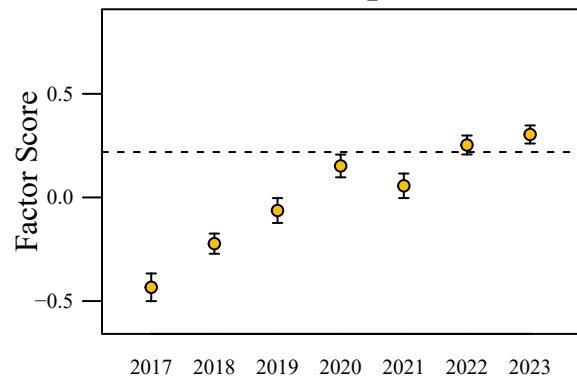


Figure 26. Hunter opinion scores over five years of the deer management survey. The score was aggregated using factor analysis of questions asked only to hunters. The dashed line represents the score if all questions are answered neutrally.

Population Size Opinion

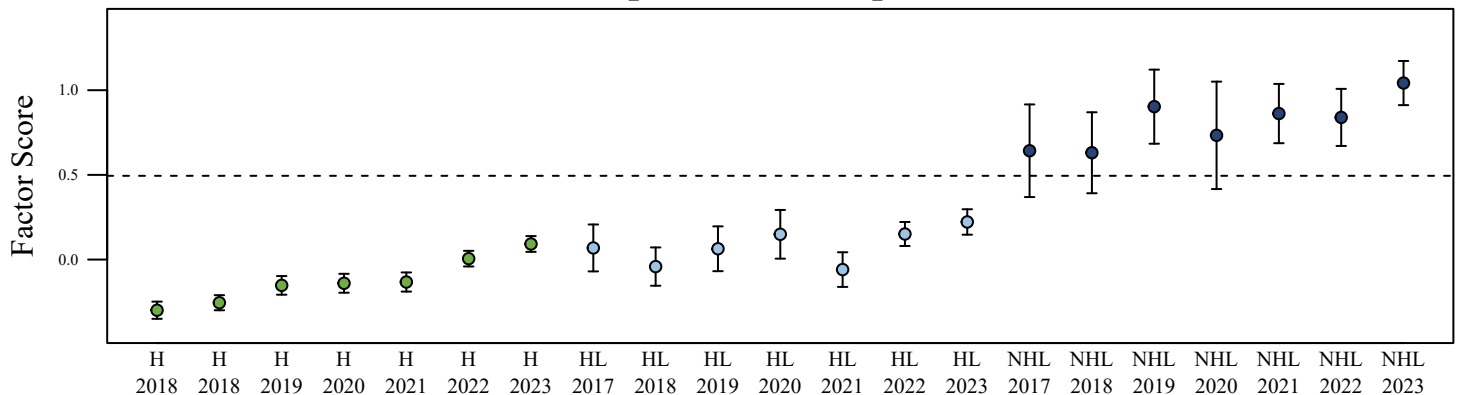


Figure 27. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer population size. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

Deer Management Opinion

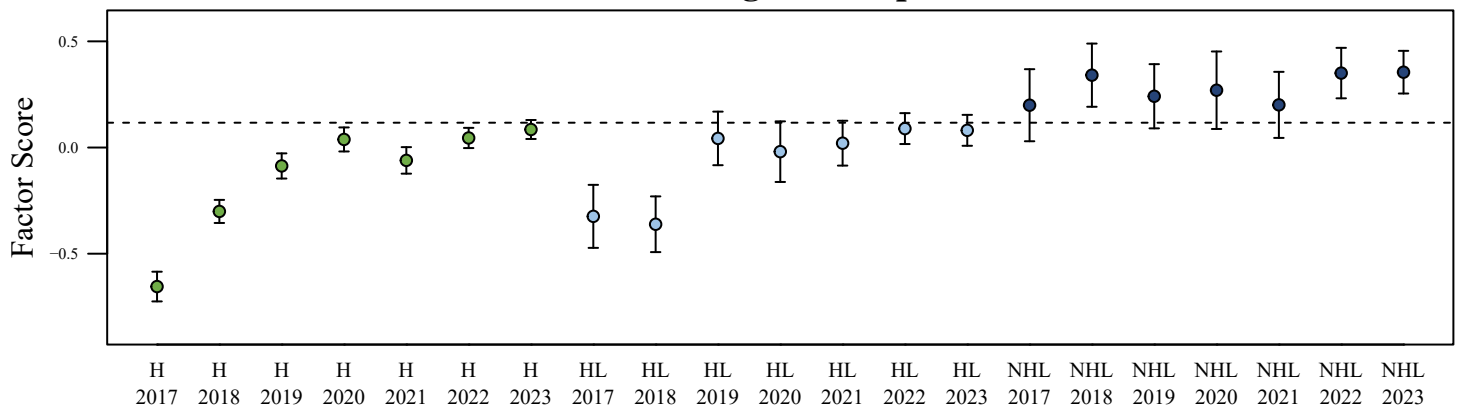


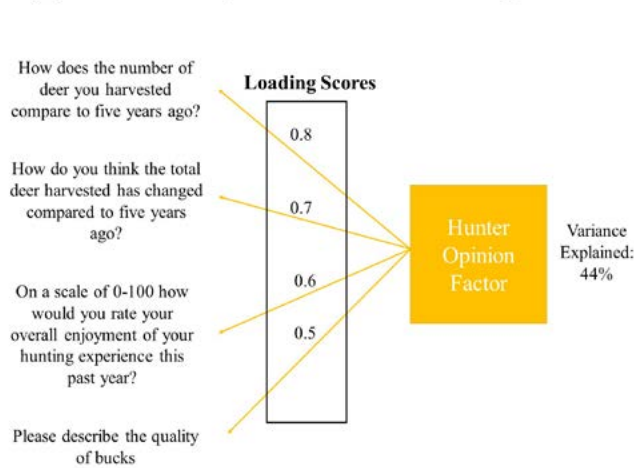
Figure 28. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer management. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

DMU 2: Northeast

5/23/2024

Deer Management Survey Results

(a) Factor Analysis Results: Hunter Questions



(b) Factor Analysis Results: All Group Questions

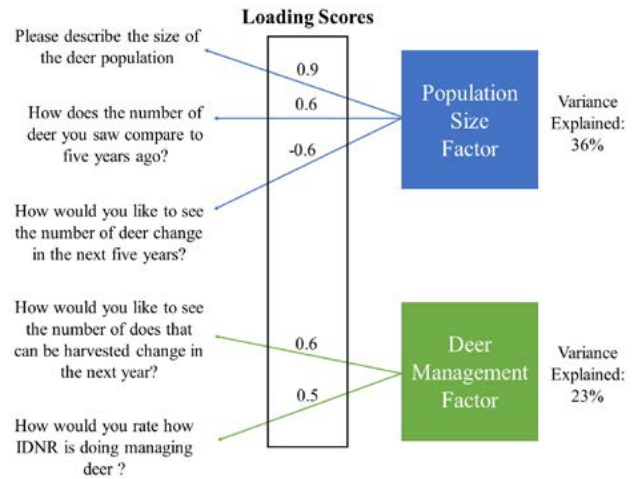


Figure 29. Results from two factor analyses used to develop the hunter opinion (a), population opinion (b), and management opinion (b) scores. Higher loading scores indicate a stronger correlation between the original question and the derived factor. These figures are included to help interpret Figure 26, Figure 27, and Figure 28.

DMU 3: West Central

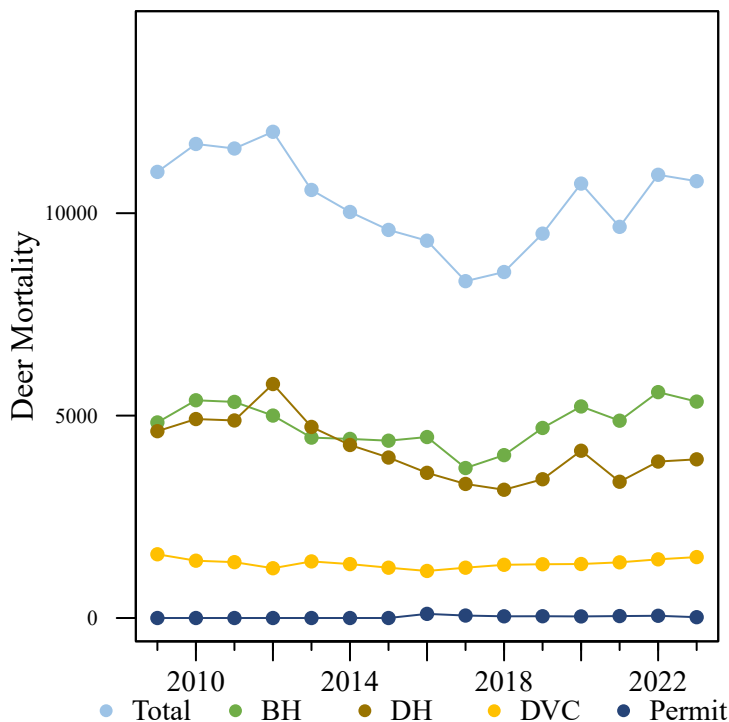
5/23/2024

Total Square Miles: 4,025
Square Miles of Deer Habitat: 565
Percent Deer Habitat: 14

Table 1. Total harvest, buck harvest, and doe harvest (error < 1 percent). Damage permits are issued by DNR to landowners to control deer damage. Deer vehicle collisions (DVC) and miles traveled are reported by the Indiana Department of Transportation. Mean CBAQ is the average county bonus antlerless quota of all counties in the DMU. The trend in total harvest, buck harvest, doe harvest, and DVCs are in standard deviations (SD) and are equivalent to effect size. A change greater than 2 SD is considered both a large and statistically significant effect size.

Year	Total	Total Trend in SD	Buck Harvest	Buck Trend in SD	Buck Harvest per SQ MI Habitat	Doe Harvest	Doe Trend in SD	Doe Harvest per SQ MI Habitat	% Doe in Harvest	Damage Permit Deer Taken	DVC per Billion Miles Traveled	DVC Trend in SD	Mean CBAQ
2009	9,446		4,831		8.6	4,615		8.2	48.9		343.1		5.3
2010	10,294	3.0	5,379	3.3	9.5	4,915	2.0	8.7	47.7		308.4	-2.1	5.3
2011	10,218	1.4	5,338	1.3	9.4	4,880	1.3	8.6	47.8		301.7	-2.1	5.9
2012	10,781	2.4	5,001	-0.6	8.9	5,780	5.5	10.2	53.6		271.4	-2.5	5.9
2013	9,176	-1.6	4,456	-2.8	7.9	4,720	-0.5	8.4	51.4		309.3	-0.2	5.4
2014	8,698	-2.0	4,424	-1.5	7.8	4,274	-1.5	7.6	49.1		293.9	-0.5	4.3
2015	8,344	-1.7	4,380	-1.2	7.8	3,964	-1.7	7.0	47.5		274.4	-1.5	4.3
2016	8,057	-1.3	4,471	-0.6	7.9	3,586	-1.6	6.3	44.5	102	257.4	-2.0	4.2
2017	7,017	-1.9	3,705	-3.3	6.6	3,312	-1.4	5.9	47.2	61	276.3	-0.2	2.9
2018	7,191	-1.3	4,023	-0.8	7.1	3,168	-1.4	5.6	44.1	42	290.3	0.4	2.1
2019	8,123	0.4	4,695	1.5	8.3	3,428	-0.5	6.1	42.2	44	292.5	1.0	1.8
2020	9,358	2.7	5,226	2.5	9.2	4,132	2.1	7.3	44.2	39	290.8	0.9	1.8
2021	8,240	0.3	4,874	0.8	8.6	3,366	-0.4	6.0	40.8	48	298.6	1.1	1.8
2022	9,445	1.6	5,580	1.7	9.9	3,865	1.0	6.8	40.9	55	311.3	2.6	1.9
2023	9,266	0.8	5,346	0.8	9.5	3,920	0.8	6.9	42.3	20	318.8	2.5	1.9

(a) Cumulative Known Deer Mortality



(b) Archer Deer Observations

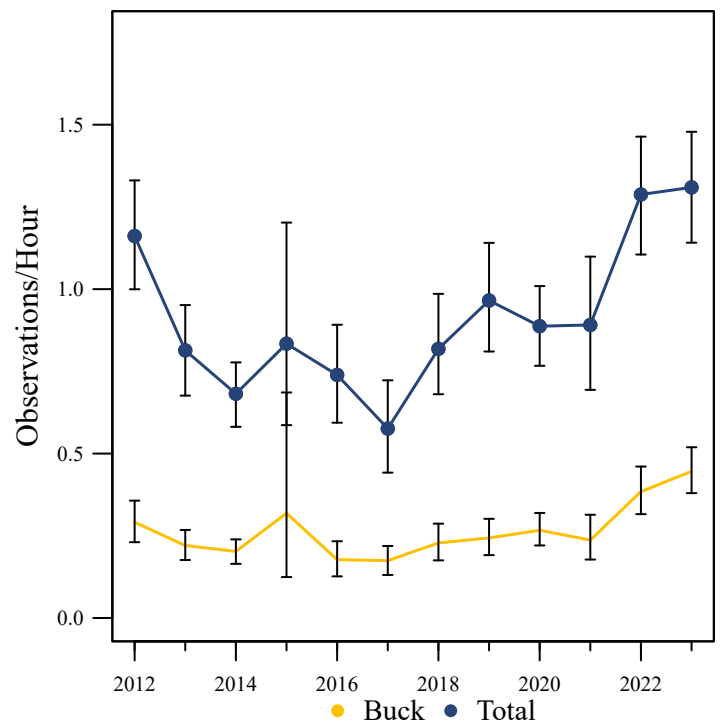


Figure 1. (a) The total known annual deer mortality based on buck harvests (BH), doe harvests (DH), deer vehicle collisions (DVC), and deer permit takes. (b) Total deer and buck observations per hour based on the Archer's Index.

5/23/2024

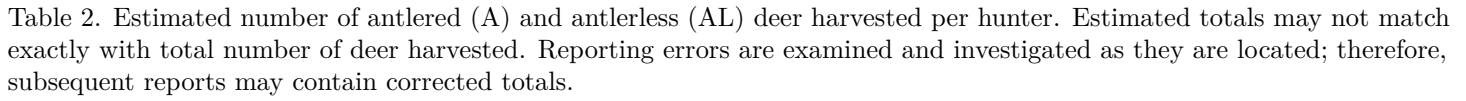


Figure 1 consists of two line graphs. Graph (a), titled '(a) Deer Ratios', shows three ratios from 2013 to 2023: Archer Doe:Buck (blue line), Harvest Doe:Buck (orange line), and Archer Fawn:Doe (green line). All ratios show a general downward trend over the decade. Graph (b), titled '(b) Boone and Crockett', shows the number of bucks per 1,000 square miles of habitat from 2012 to 2022. The population fluctuates significantly, with a notable dip in 2018 and a peak in 2019.

(a) Deer Ratios

Year	Archer Doe:Buck	Harvest Doe:Buck	Archer Fawn:Doe
2013	1.6	1.05	0.4
2014	1.2	0.95	0.65
2015	1.2	0.85	0.85
2016	1.8	0.8	0.55
2017	1.0	0.85	0.8
2018	1.3	0.75	0.4
2019	1.5	0.7	0.6
2020	1.5	0.75	0.35
2021	1.8	0.65	0.35
2022	1.3	0.65	0.55
2023	1.15	0.7	0.5

(b) Boone and Crockett

Year	Bucks/1,000 Sq Mi Habitat
2012	5.3
2013	3.5
2014	3.5
2015	5.3
2016	5.3
2017	8.8
2018	1.8
2019	10.5
2020	7.0
2021	8.8
2022	10.5



DMU 3: West Central

5/23/2024

Deer Management Survey Results

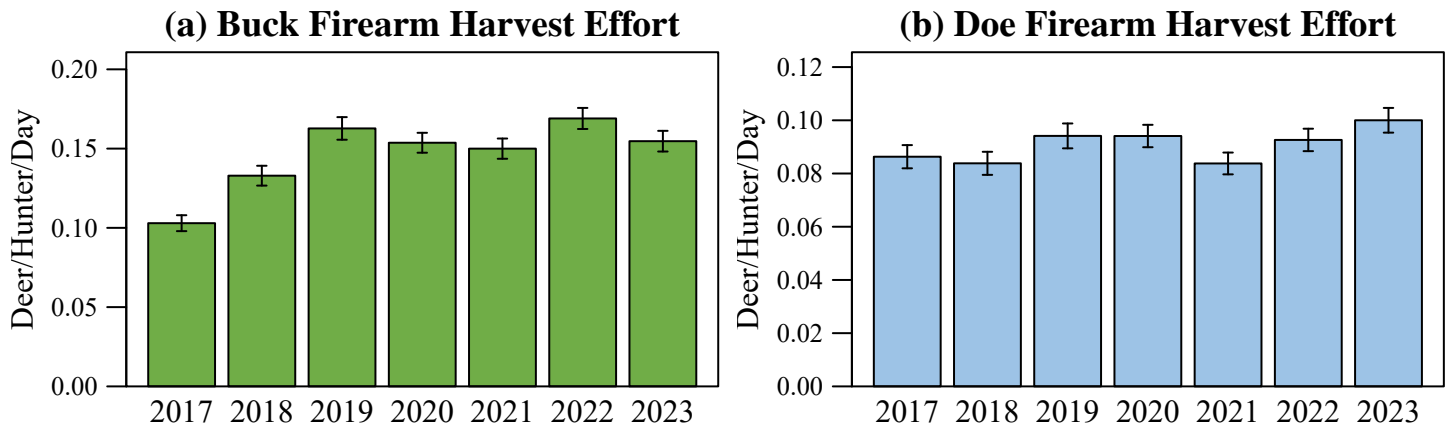


Figure 4. Firearm harvest effort is the number of bucks (a) and does (b) killed by firearms per hunter divided by the mean number of days hunted per hunter during the firearm season based on data reported in the deer management survey. Larger values (i.e. taller bars) indicate less effort required to harvest a deer.

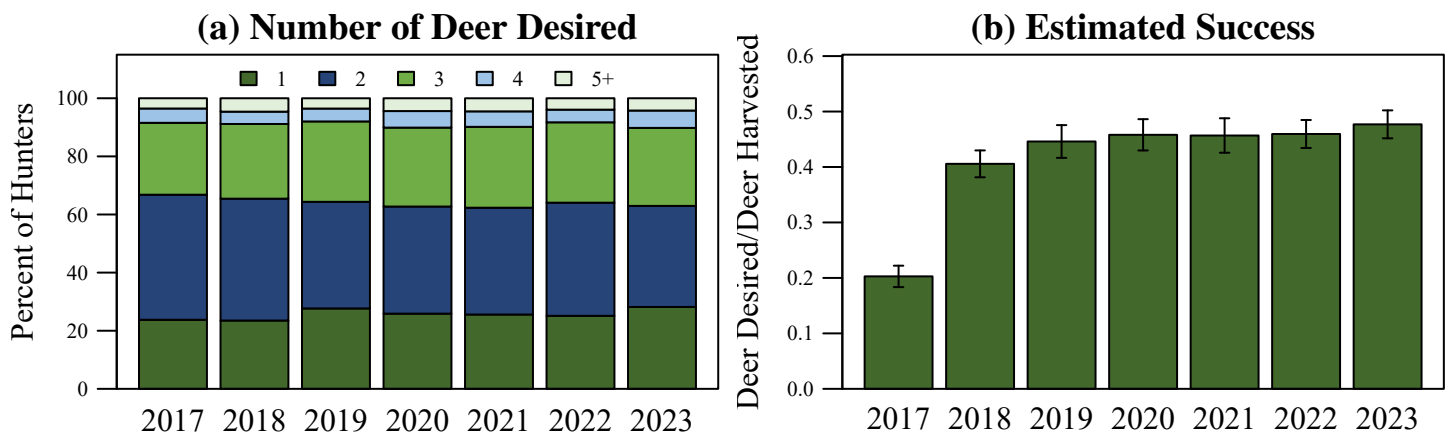


Figure 5. (a) The annual percent of hunters wishing to harvest each number of deer as reported in the deer management survey. (b) Success rate is estimated from the deer management survey as the Number of Harvested Deer/Number of Deer Desired (reported only; does not account for attempts that were not made). Larger values (i.e. taller bars) indicate greater success.

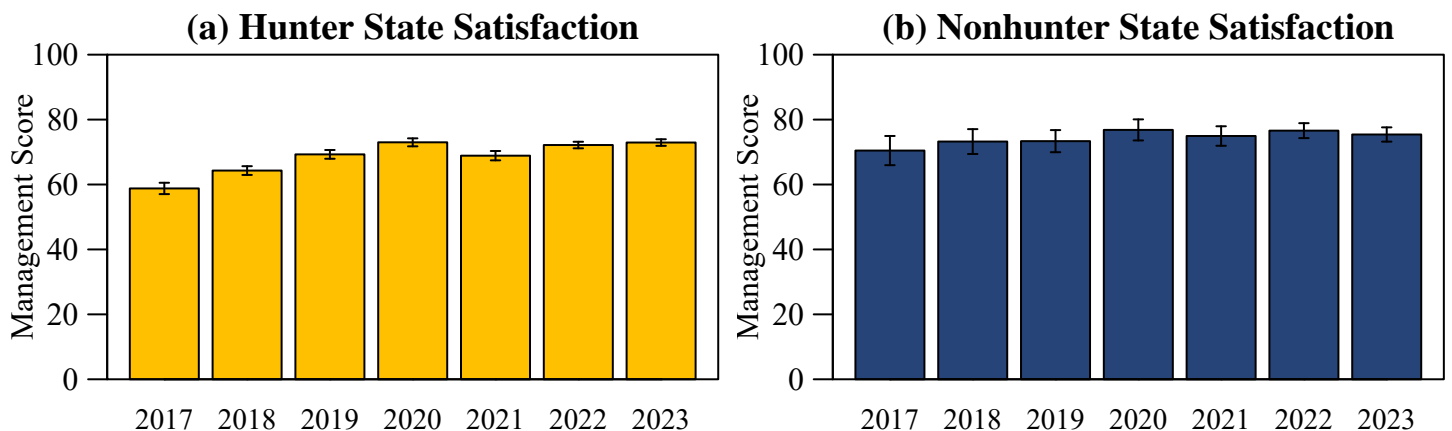


Figure 6. Hunters (a) and nonhunters (b) were asked to score the DNR's statewide deer management on a scale of 0 (poor) to 100 (excellent).

DMU 3: West Central

5/23/2024

Deer Management Survey Results

Hunter Satisfaction

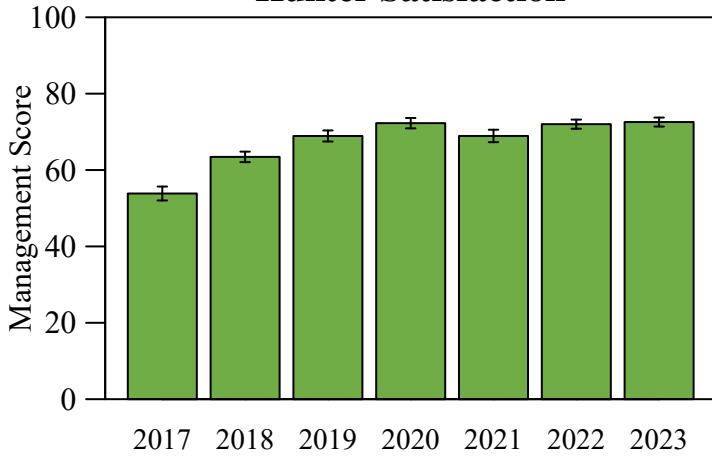


Figure 7. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 3 where they hunt.

Resident Hunter Satisfaction

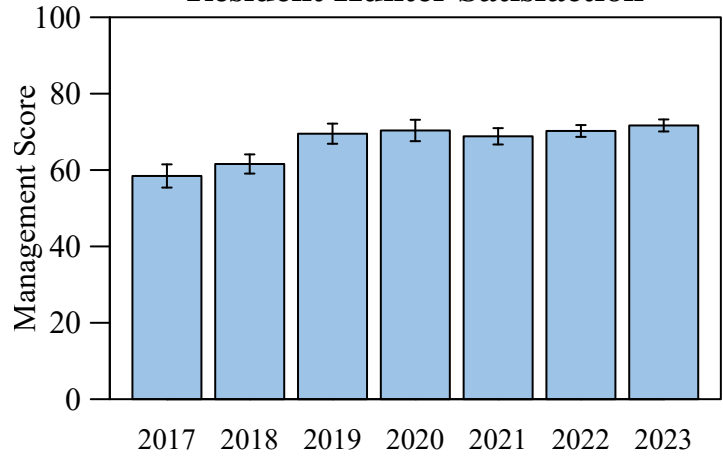


Figure 8. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 3 where they live.

Resident Nonhunter Satisfaction

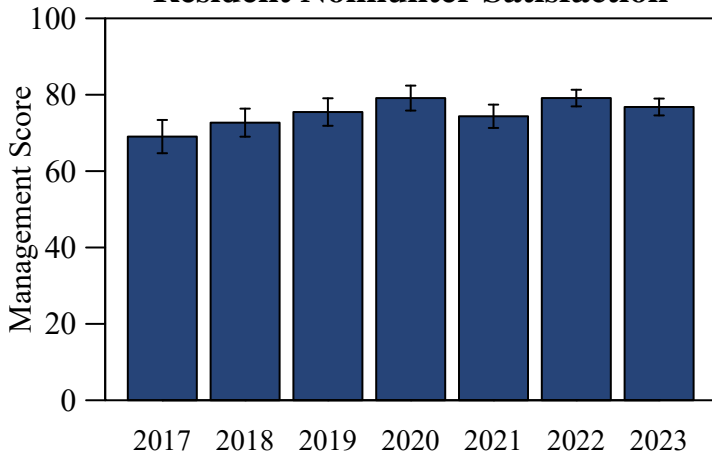


Figure 9. Nonhunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 3 where they live.

Hunter Population Size

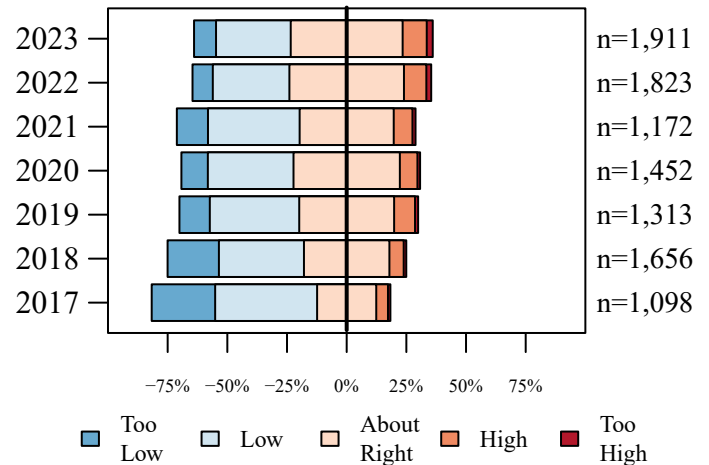


Figure 10. The current size of the deer population described by hunters in the county where they hunt in DMU 3.

Resident Hunter Population Size

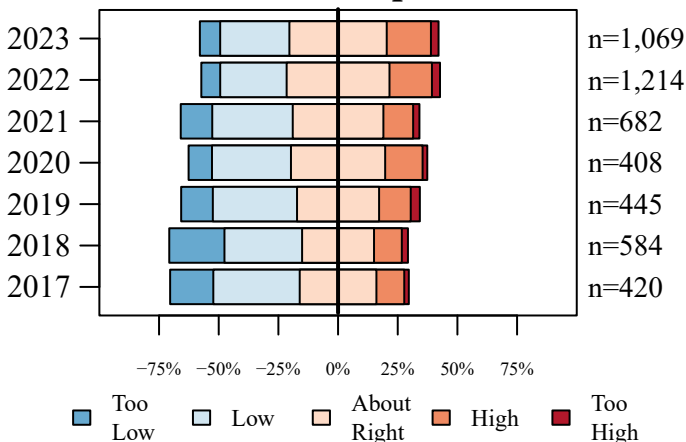


Figure 11. The current size of the deer population described by hunters in the county where they live in DMU 3.

Resident Nonhunter Population Size

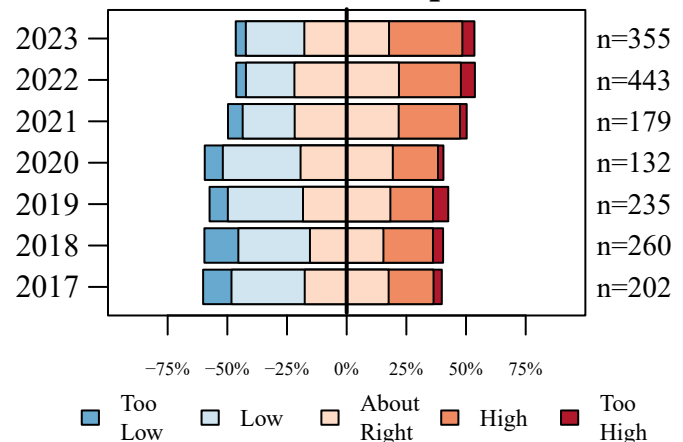


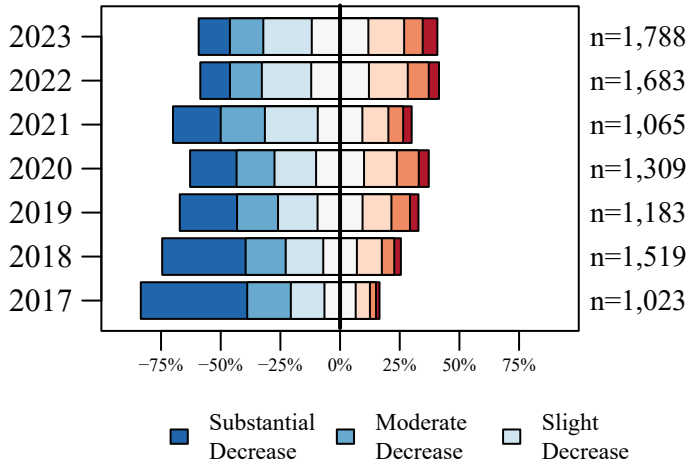
Figure 12. The current size of the deer population described by nonhunters in the county where they live in DMU 3.

DMU 3: West Central

5/23/2024

Deer Management Survey Results

Hunter Perceived Change



Resident Hunter Perceived Change

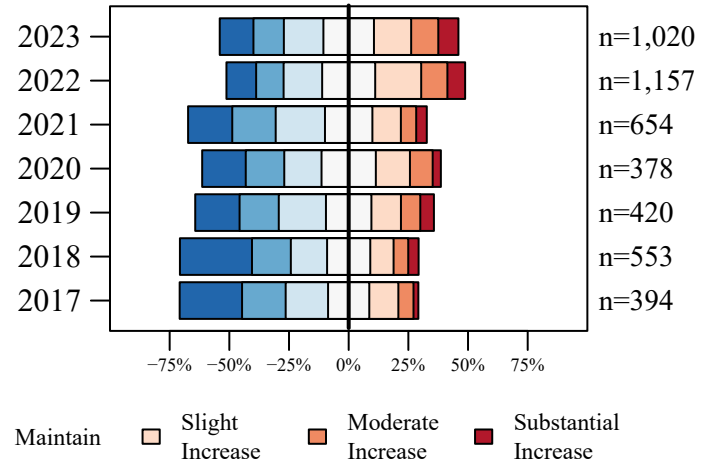
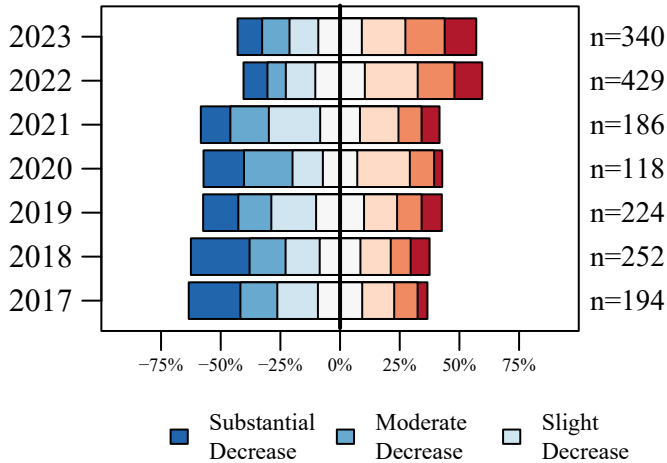


Figure 13. The number of deer seen compared to five years ago described by hunters in the county where they hunt in DMU 3.

Figure 14. The number of deer seen compared to five years ago described by hunters in the county where they live in DMU 3.

Resident Nonhunter Perceived Change



Hunter Desired Change

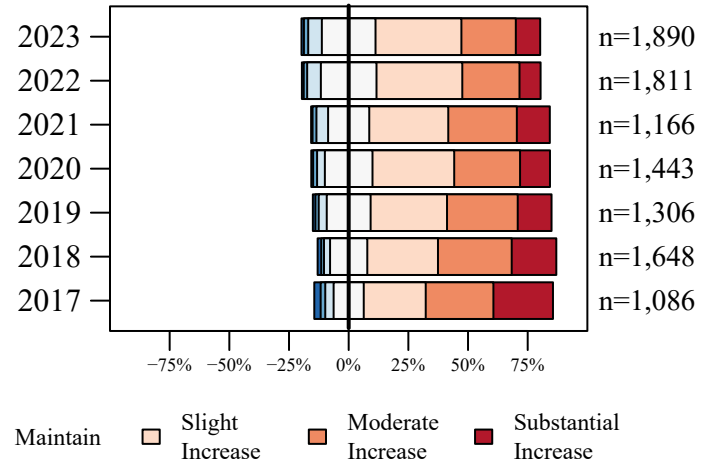
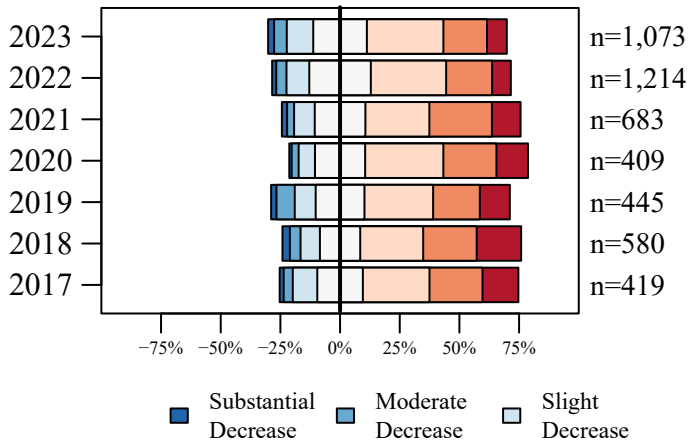


Figure 15. The number of deer seen compared to five years ago described by nonhunters in the county where they live in DMU 3.

Figure 16. The desired change in the size of the deer population described by hunters in the county where they hunt in DMU 3.

Resident Hunter Desired Change



Resident Nonhunter Desired Change

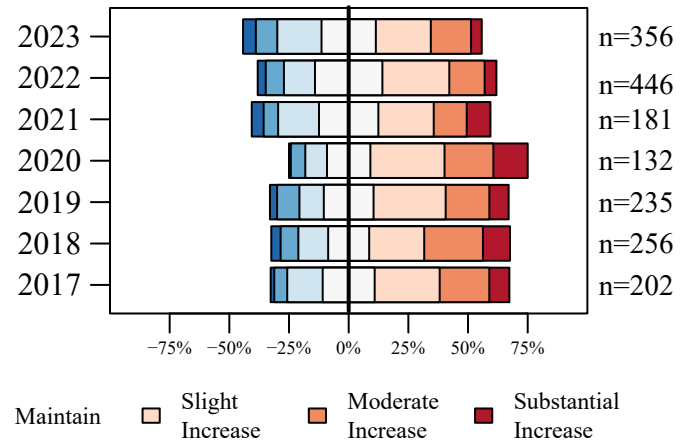


Figure 17. The desired change in the size of the deer population described by hunters in the county where they live in DMU 3.

Figure 18. The desired change in the size of the deer population described by nonhunters in the county where they live in DMU 3.

DMU 3: West Central

5/23/2024

Deer Management Survey Results

Hunter Buck Quality

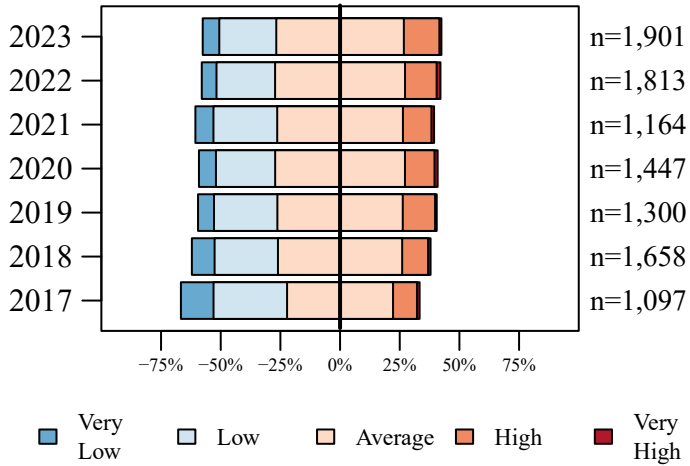


Figure 19. Hunters describe the quality of bucks in the county where they hunt in DMU 3.

Resident Hunter Buck Quality

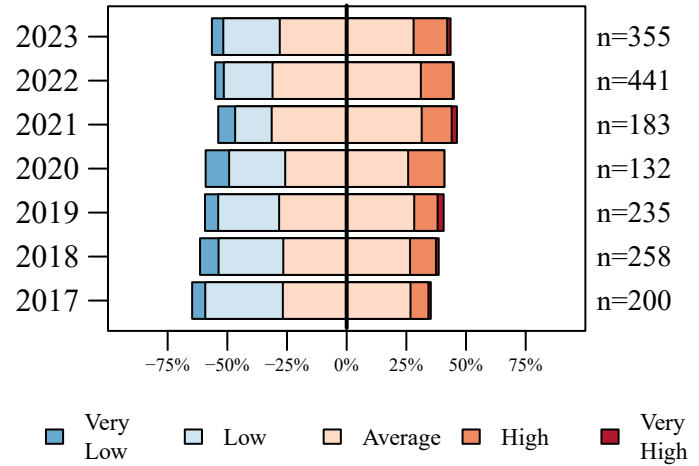


Figure 20. Hunters describe the quality of bucks in the county where they live in DMU 3.

Personal Harvest Change

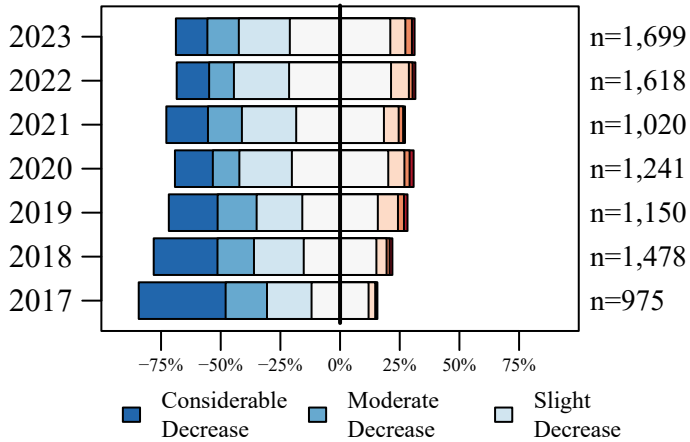


Figure 21. Opinion of hunters on how their personal number of harvested deer has changed over the last five years in a county in DMU 3.

Total Harvest Change

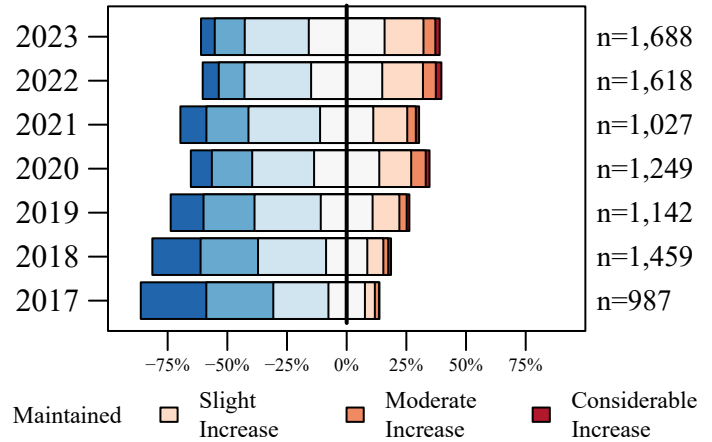


Figure 22. Opinion of hunters on how the total number of harvested deer has changed over the last five years in a county in DMU 3.

Hunter CBAQ

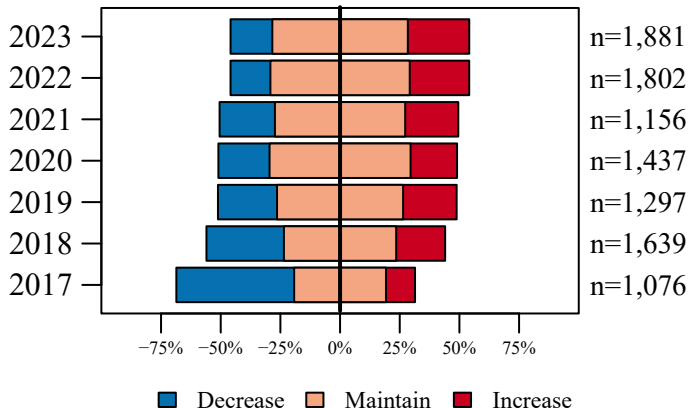


Figure 23. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they hunt in DMU 3.

Resident Hunter CBAQ

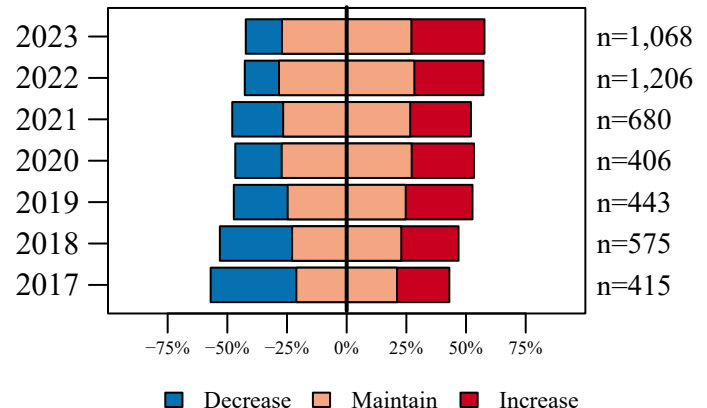


Figure 24. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they live in DMU 3.

DMU 3: West Central

5/23/2024

Deer Management Survey Results

Resident Nonhunter CBAQ

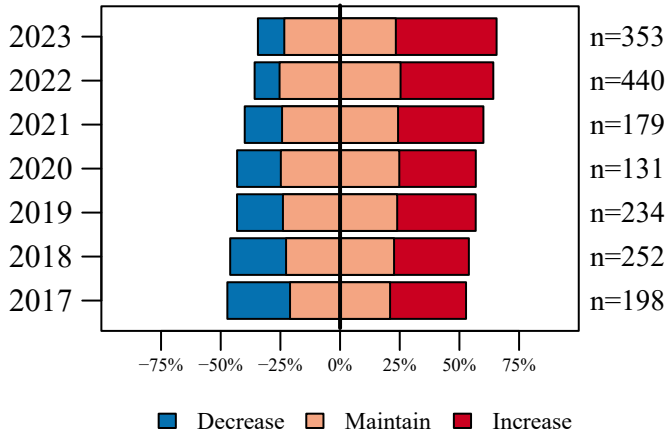


Figure 25. Opinion on how the County Bonus Antlerless Quota should change from nonhunters in the county where they live in DMU 3.

Hunter Opinion

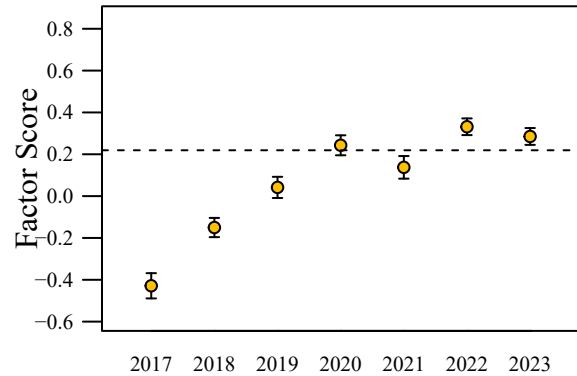


Figure 26. Hunter opinion scores over five years of the deer management survey. The score was aggregated using factor analysis of questions asked only to hunters. The dashed line represents the score if all questions are answered neutrally.

Population Size Opinion

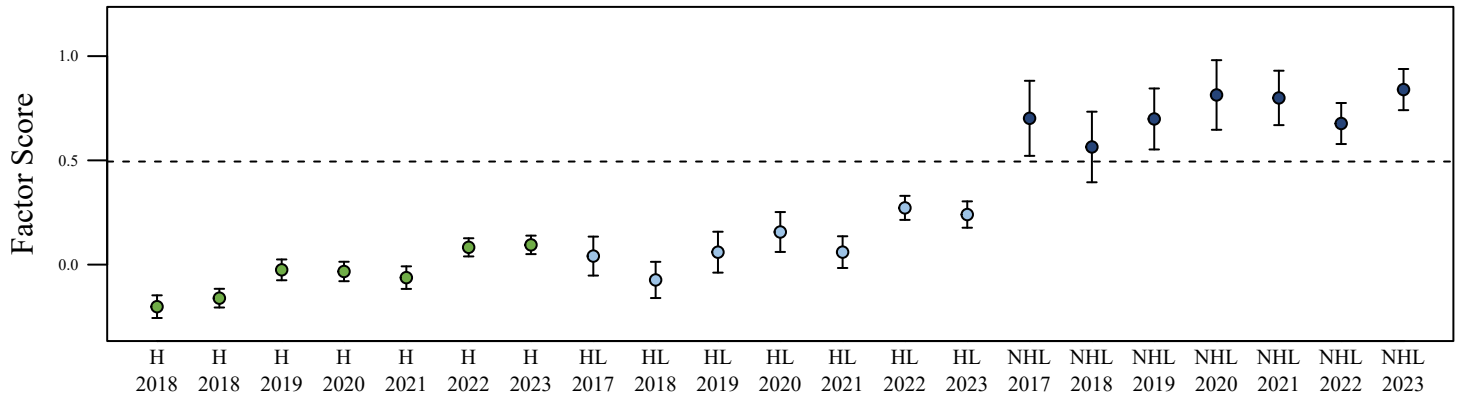


Figure 27. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer population size. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

Deer Management Opinion

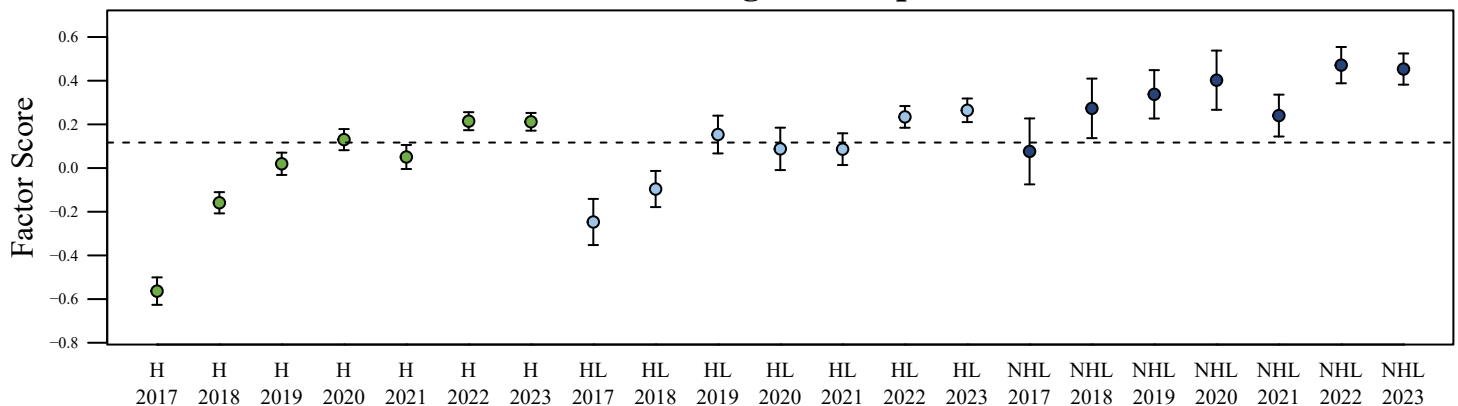
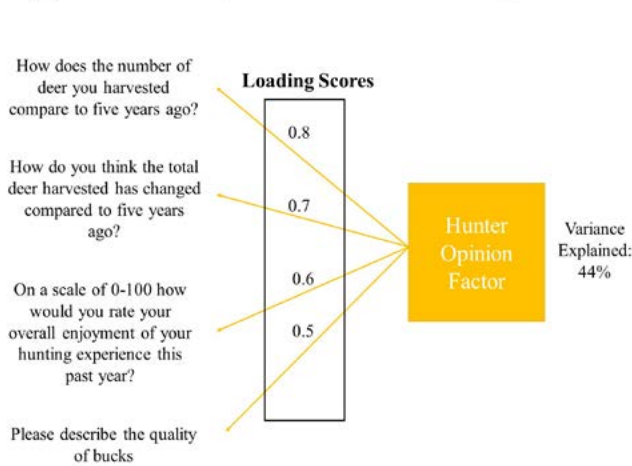


Figure 28. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer management. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

(a) Factor Analysis Results: Hunter Questions



(b) Factor Analysis Results: All Group Questions

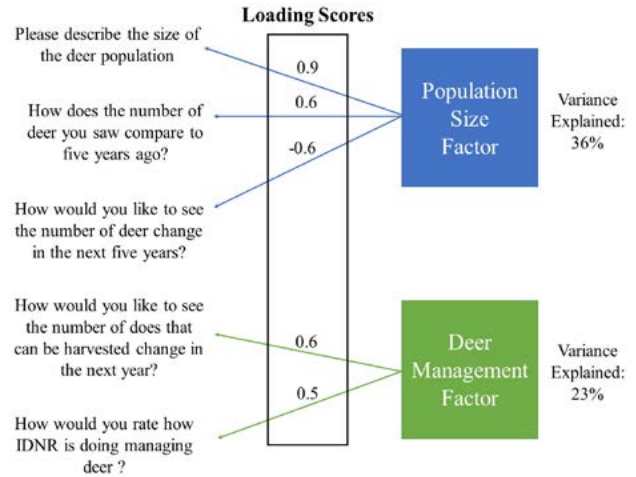


Figure 29. Results from two factor analyses used to develop the hunter opinion (a), population opinion (b), and management opinion (b) scores. Higher loading scores indicate a stronger correlation between the original question and the derived factor. These figures are included to help interpret Figure 26, Figure 27, and Figure 28.

DMU 4: East Central

5/23/2024

Total Square Miles: 9,965

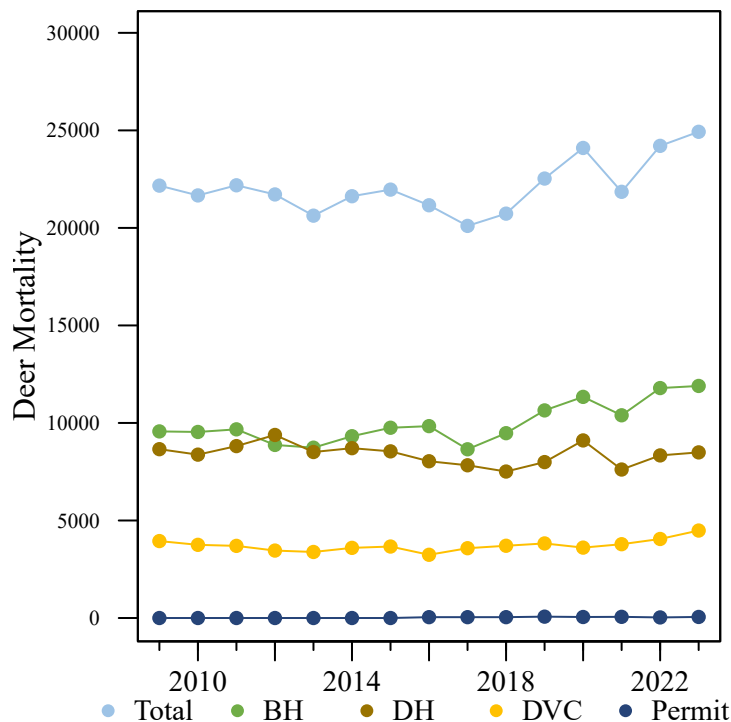
Square Miles of Deer Habitat: 1,589

Percent Deer Habitat: 16

Table 1. Total harvest, buck harvest, and doe harvest (error < 1 percent). Damage permits are issued by DNR to landowners to control deer damage. Deer vehicle collisions (DVC) and miles traveled are reported by the Indiana Department of Transportation. Mean CBAQ is the average county bonus antlerless quota of all counties in the DMU. The trend in total harvest, buck harvest, doe harvest, and DVCs are in standard deviations (SD) and are equivalent to effect size. A change greater than 2 SD is considered both a large and statistically significant effect size.

Year	Total	Total Trend in SD	Buck Harvest	Buck Trend in SD	Buck Harvest per SQ MI Habitat	Doe Harvest	Doe Trend in SD	Doe Harvest per SQ MI Habitat	% Doe in Harvest	Damage Permit Deer Taken	DVC per Billion Miles Traveled	DVC Trend in SD	Mean CBAQ
2009	18,223		9,567		6.0	8,656		5.4	47.5		174.5		3.2
2010	17,914	0.7	9,538	0.6	6.0	8,376	0.6	5.3	46.8		164.3	-1.3	3.5
2011	18,487	1.2	9,673	0.8	6.1	8,814	1.7	5.5	47.7		162.1	-1.9	3.9
2012	18,258	0.5	8,873	-2.0	5.6	9,385	3.6	5.9	51.4		150.8	-2.5	3.8
2013	17,243	-1.5	8,733	-1.6	5.5	8,510	-0.4	5.4	49.4		146.7	-1.8	3.5
2014	18,029	0.0	9,321	0.1	5.9	8,708	-0.1	5.5	48.3		154.2	-0.5	3.4
2015	18,299	0.7	9,755	1.3	6.1	8,544	-0.6	5.4	46.7		155.7	0.0	3.3
2016	17,875	-0.4	9,838	1.2	6.2	8,037	-2.1	5.1	45.0	44	136.5	-3.0	3.3
2017	16,481	-3.4	8,651	-1.3	5.4	7,830	-1.7	4.9	47.5	43	149.3	0.1	3.0
2018	16,985	-0.8	9,476	0.4	6.0	7,509	-2.2	4.7	44.2	43	152.3	0.5	1.9
2019	18,638	1.4	10,644	2.6	6.7	7,994	-0.3	5.0	42.9	69	155.3	0.7	1.6
2020	20,441	3.1	11,337	2.3	7.1	9,104	3.0	5.7	44.5	51	145.3	-0.6	1.6
2021	18,006	-0.1	10,393	0.4	6.5	7,613	-0.8	4.8	42.3	60	151.0	0.4	1.6
2022	20,125	1.3	11,789	1.6	7.4	8,336	0.5	5.2	41.4	30	159.5	2.4	1.7
2023	20,390	1.1	11,898	1.3	7.5	8,492	0.6	5.3	41.6	54	173.4	4.0	1.7

(a) Cumulative Known Deer Mortality



(b) Archer Deer Observations

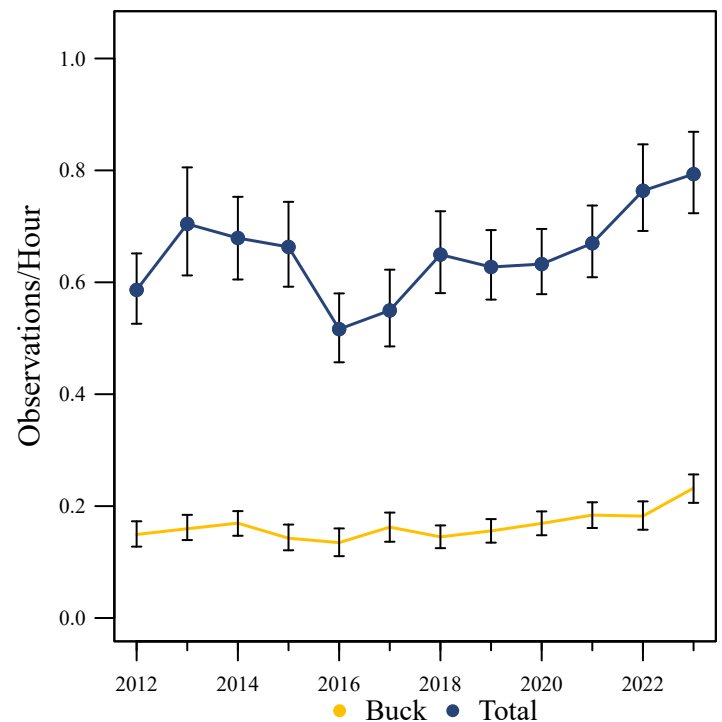


Figure 1. (a) The total known annual deer mortality based on buck harvests (BH), doe harvests (DH), deer vehicle collisions (DVC), and deer permit takes. (b) Total deer and buck observations per hour based on the Archer's Index.

DMU 4: East Central

5/23/2024

Total Square Miles: 9,965
Square Miles of Deer Habitat: 1,589
Percent Deer Habitat: 16

Table 2. Estimated number of antlered (A) and antlerless (AL) deer harvested per hunter. Estimated totals may not match exactly with total number of deer harvested. Reporting errors are examined and investigated as they are located; therefore, subsequent reports may contain corrected totals.

Year	Total Hunters	0 A	1 A	2 A	3 A	0 AL	1 AL	2 AL	3 AL	4 AL	5 AL	6 AL	7 AL	8 AL	9 AL	10 AL
2016	14,211	6,526	7,628	55	2	5,968	6,705	1,277	203	42	7	4	4	1	0	0
2017	12,981	6,363	6,573	43	1	4,976	6,470	1,311	182	33	9	0	0	0	0	0
2018	13,655	6,203	7,404	48	0	5,709	6,596	1,197	126	21	4	1	1	0	0	0
2019	14,887	6,256	8,578	51	2	6,468	7,035	1,274	90	12	3	3	0	1	0	1
2020	16,167	7,044	9,064	59	0	6,725	7,811	1,473	135	19	3	1	0	0	0	0
2021	14,507	5,932	8,517	57	1	6,585	6,601	1,213	95	9	2	1	0	1	0	0
2022	15,909	6,219	9,613	77	0	7,173	7,300	1,286	128	12	8	1	0	1	0	0
2023	16,281	6,203	10,002	74	1	7,606	7,279	1,267	105	17	5	2	0	0	0	0

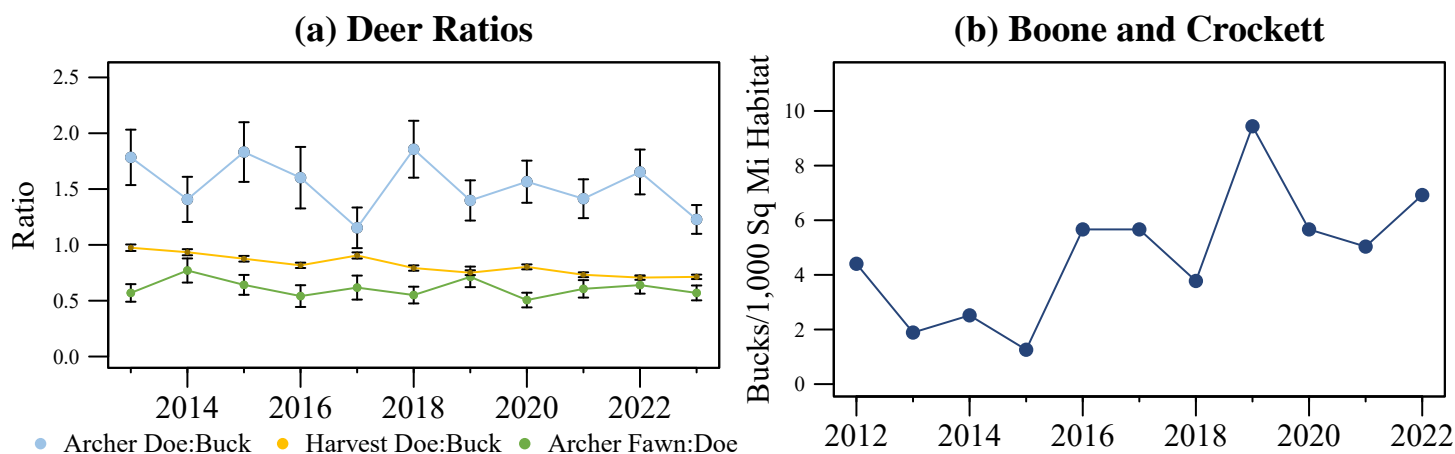


Figure 2. (a) Annual doe:buck ratios and fawn:doe ratios based on the Archer's Index and harvest records. (b) The number of Boone and Crockett bucks (minimum 160 score) per 1,000 square miles of deer habitat.

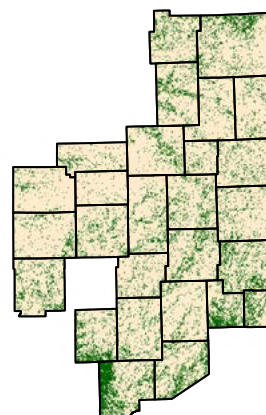
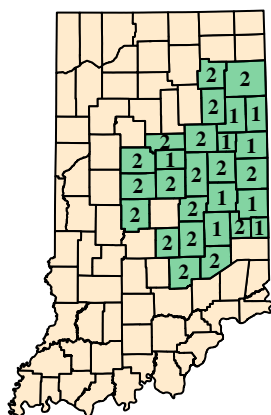


Figure 3. (a) Counties included in DMU 4 for summarizing harvest and deer management survey statistics. Labels are the 2023 county bonus antlerless quotas. (b) Green represents the land use types classified as deer habitat in DMU 4.

DMU 4: East Central

5/23/2024

Deer Management Survey Results

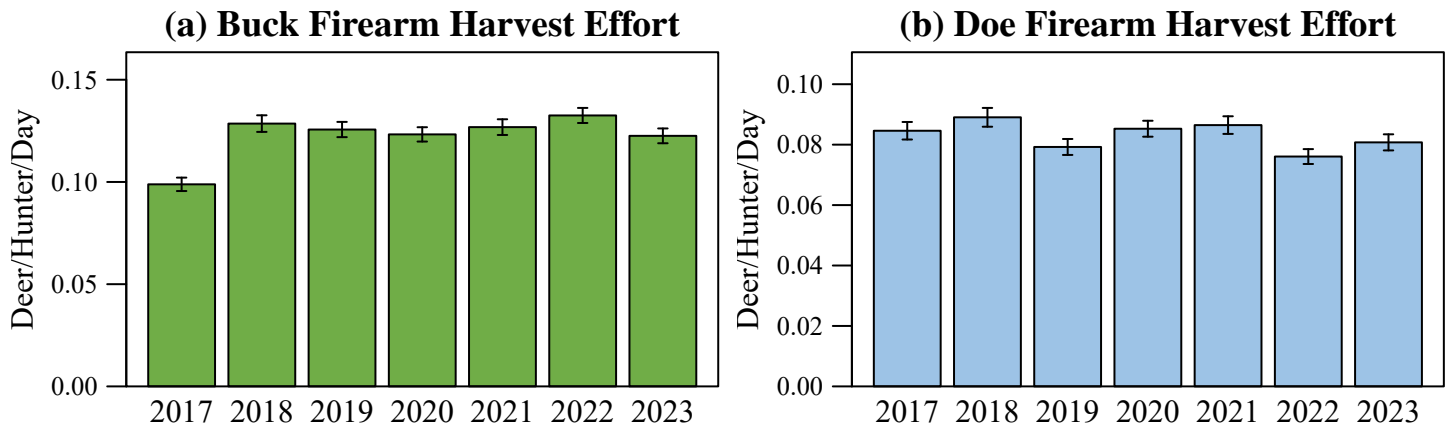


Figure 4. Firearm harvest effort is the number of bucks (a) and does (b) killed by firearms per hunter divided by the mean number of days hunted per hunter during the firearm season based on data reported in the deer management survey. Larger values (i.e. taller bars) indicate less effort required to harvest a deer.

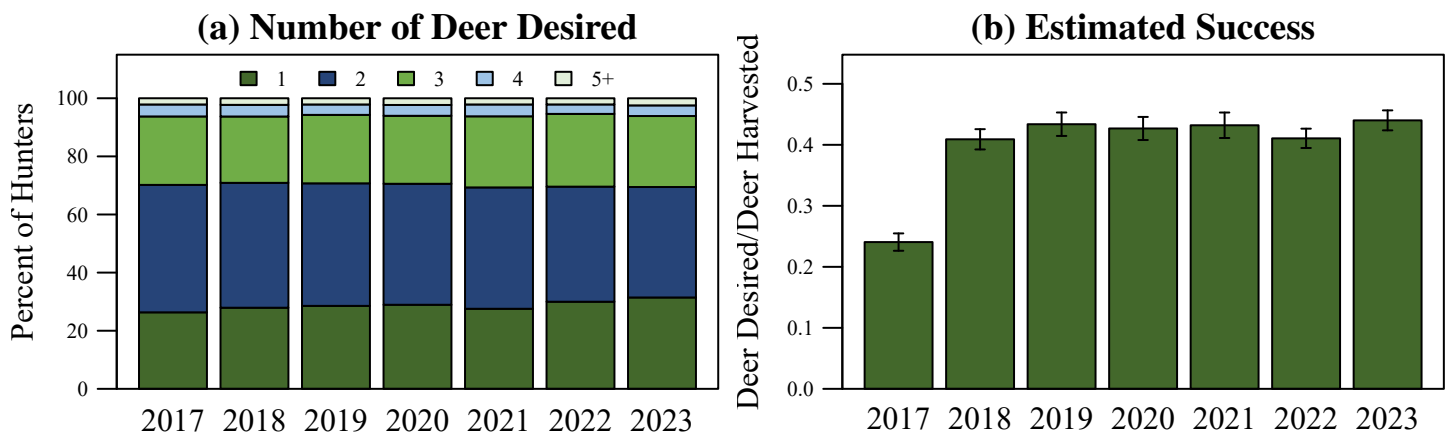


Figure 5. (a) The annual percent of hunters wishing to harvest each number of deer as reported in the deer management survey. (b) Success rate is estimated from the deer management survey as the Number of Harvested Deer/Number of Deer Desired (reported only; does not account for attempts that were not made). Larger values (i.e. taller bars) indicate greater success.

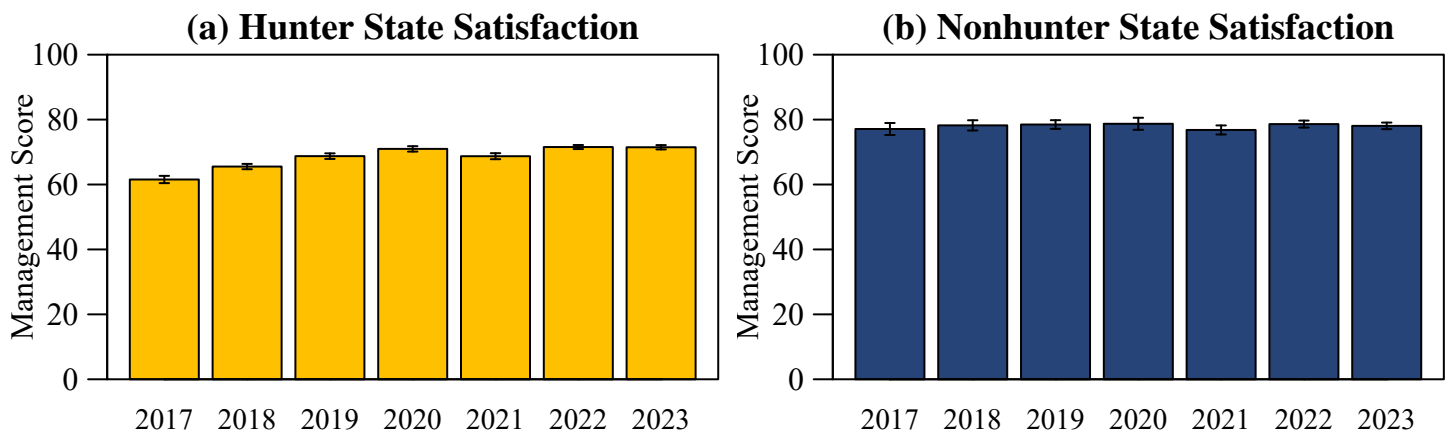


Figure 6. Hunters (a) and nonhunters (b) were asked to score the DNR's statewide deer management on a scale of 0 (poor) to 100 (excellent).

DMU 4: East Central

5/23/2024

Deer Management Survey Results

Hunter Satisfaction

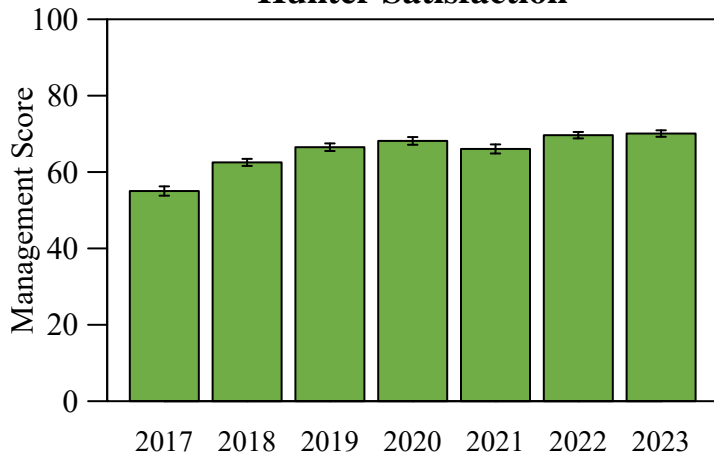


Figure 7. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 4 where they hunt.

Resident Hunter Satisfaction

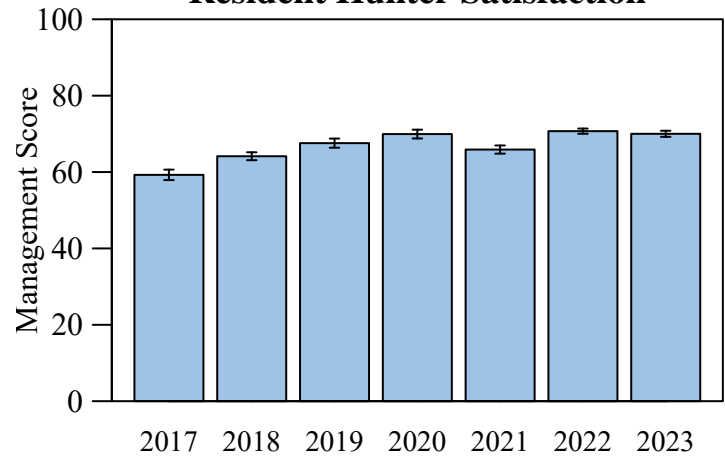


Figure 8. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 4 where they live.

Resident Nonhunter Satisfaction

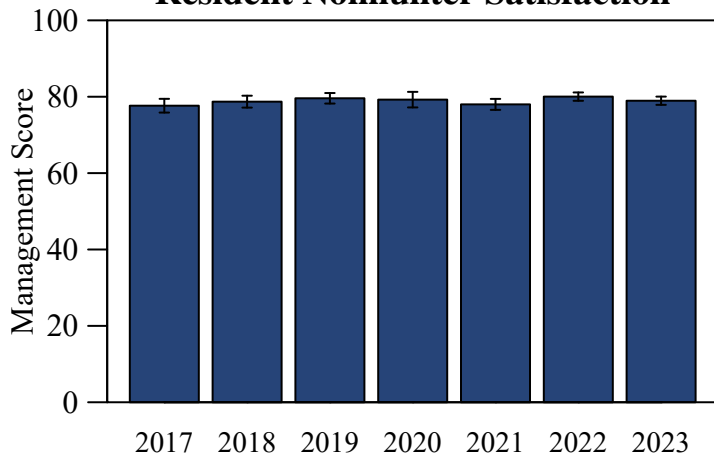


Figure 9. Nonhunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 4 where they live.

Hunter Population Size

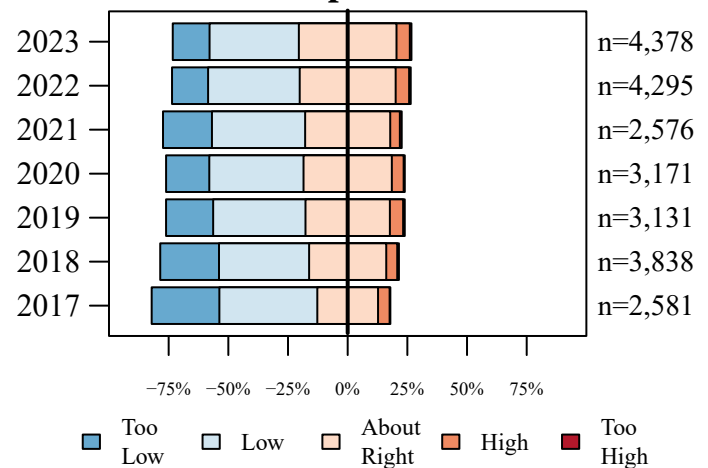


Figure 10. The current size of the deer population described by hunters in the county where they hunt in DMU 4.

Resident Hunter Population Size

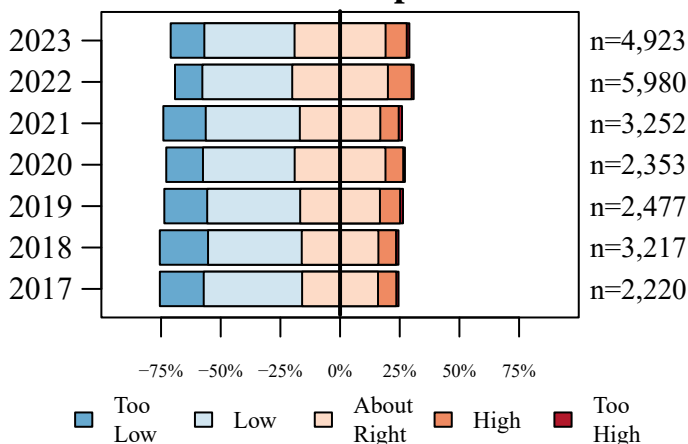


Figure 11. The current size of the deer population described by hunters in the county where they live in DMU 4.

Resident Nonhunter Population Size

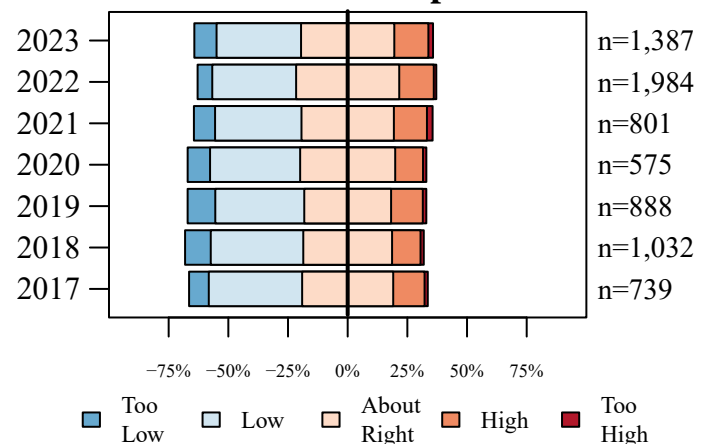


Figure 12. The current size of the deer population described by nonhunters in the county where they live in DMU 4.

DMU 4: East Central

5/23/2024

Deer Management Survey Results

Hunter Perceived Change

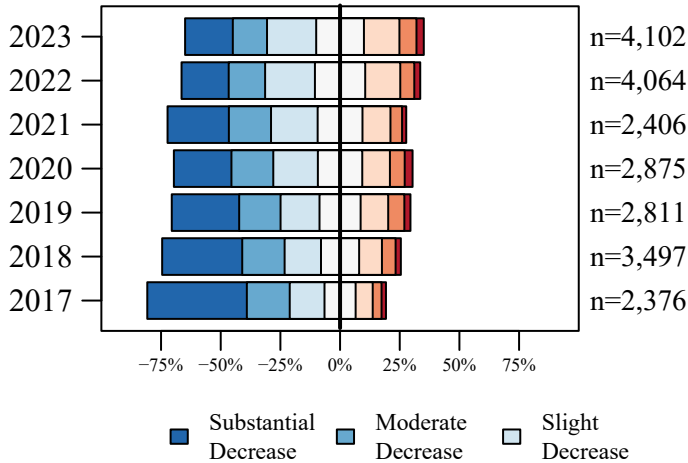


Figure 13. The number of deer seen compared to five years ago described by hunters in the county where they hunt in DMU 4.

Resident Hunter Perceived Change

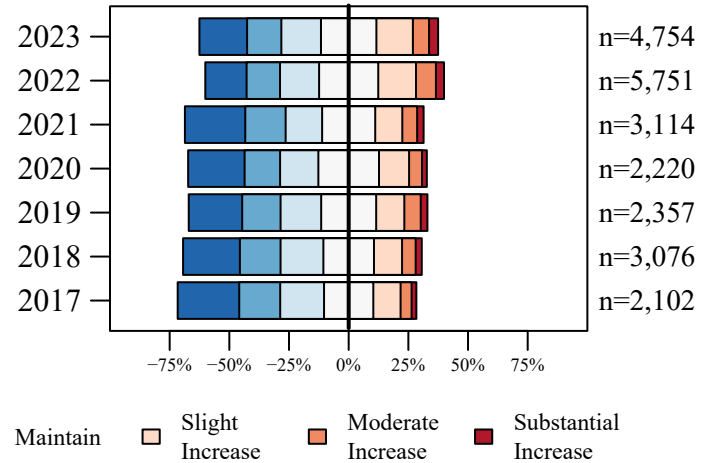


Figure 14. The number of deer seen compared to five years ago described by hunters in the county where they live in DMU 4.

Resident Nonhunter Perceived Change

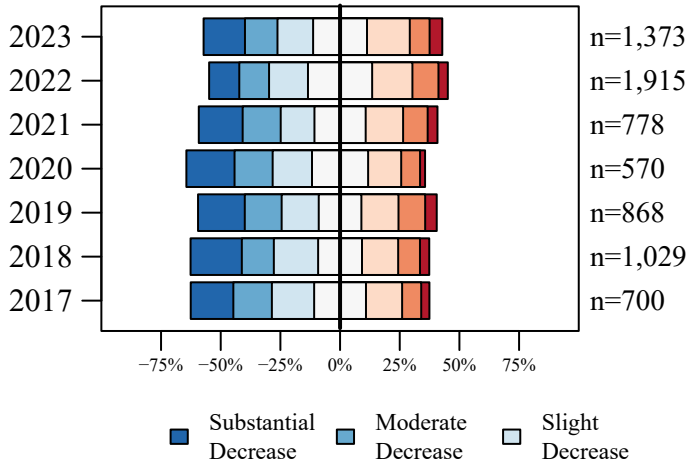


Figure 15. The number of deer seen compared to five years ago described by nonhunters in the county where they live in DMU 4.

Hunter Desired Change

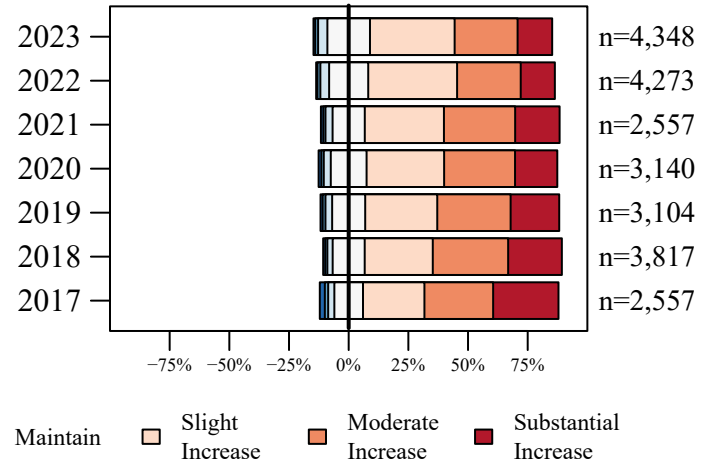


Figure 16. The desired change in the size of the deer population described by hunters in the county where they hunt in DMU 4.

Resident Hunter Desired Change

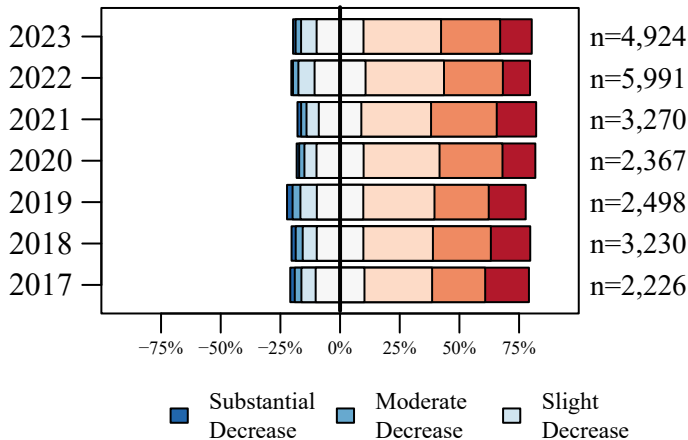


Figure 17. The desired change in the size of the deer population described by hunters in the county where they live in DMU 4.

Resident Nonhunter Desired Change

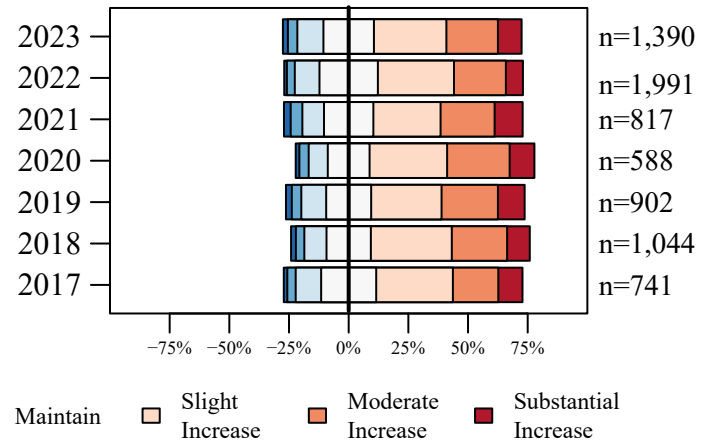


Figure 18. The desired change in the size of the deer population described by nonhunters in the county where they live in DMU 4.

DMU 4: East Central

5/23/2024

Deer Management Survey Results

Hunter Buck Quality

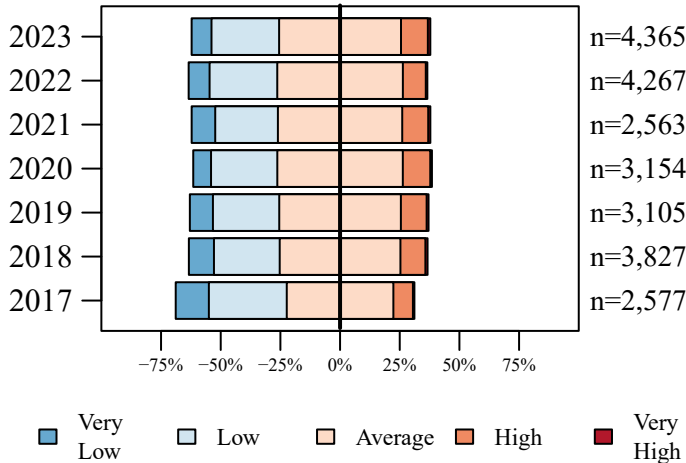


Figure 19. Hunters describe the quality of bucks in the county where they hunt in DMU 4.

Resident Hunter Buck Quality

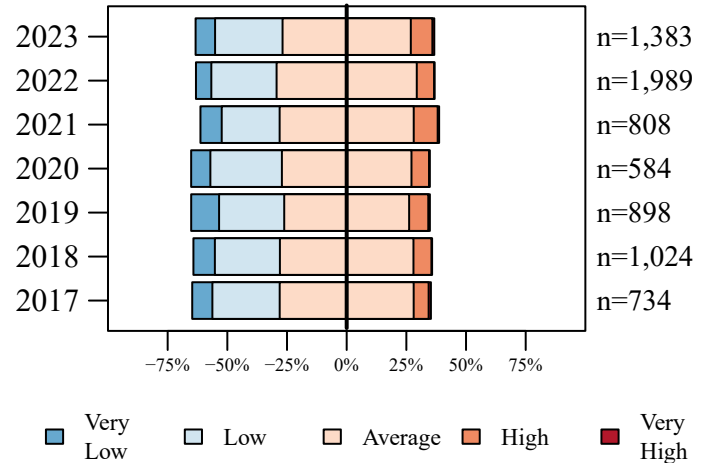


Figure 20. Hunters describe the quality of bucks in the county where they live in DMU 4.

Personal Harvest Change

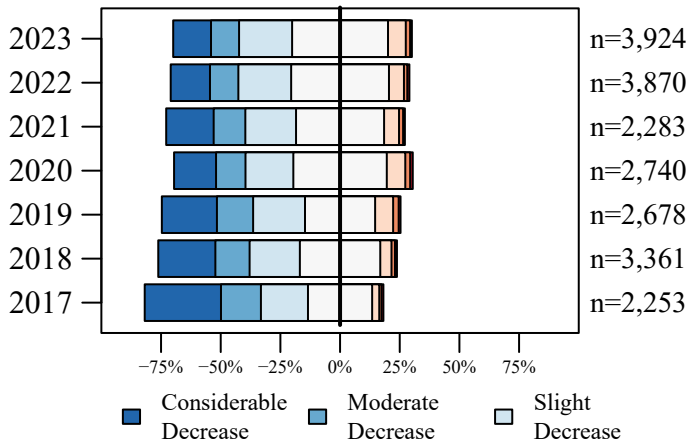


Figure 21. Opinion of hunters on how their personal number of harvested deer has changed over the last five years in a county in DMU 4.

Total Harvest Change

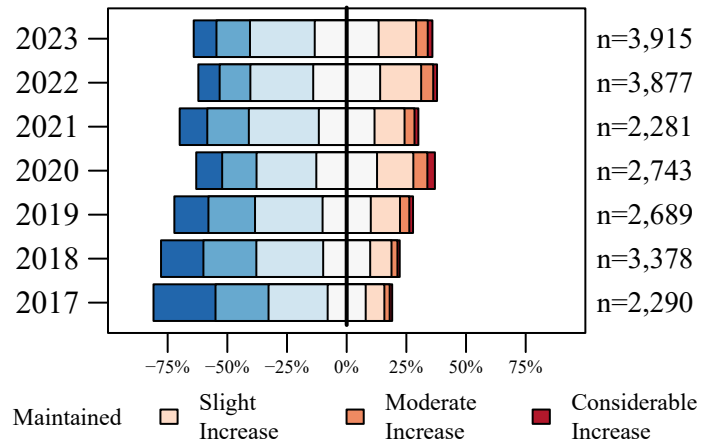


Figure 22. Opinion of hunters on how the total number of harvested deer has changed over the last five years in a county in DMU 4.

Hunter CBAQ

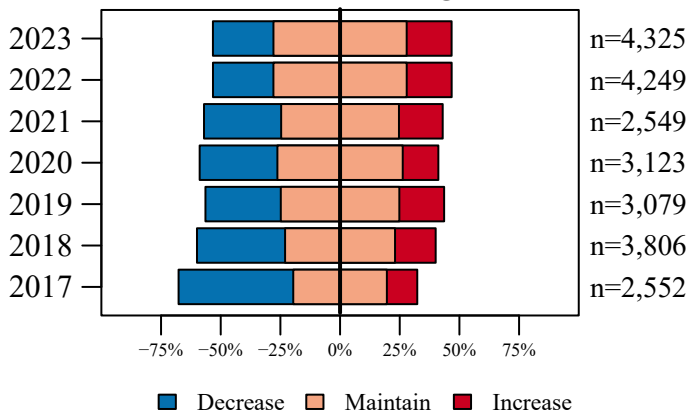


Figure 23. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they hunt in DMU 4.

Resident Hunter CBAQ

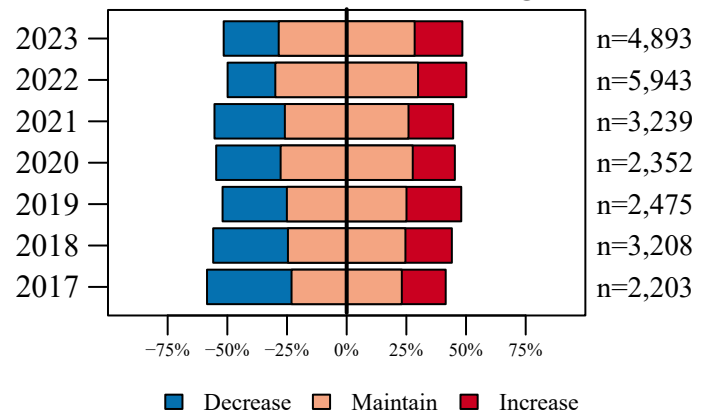


Figure 24. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they live in DMU 4.

DMU 4: East Central

5/23/2024

Deer Management Survey Results

Resident Nonhunter CBAQ

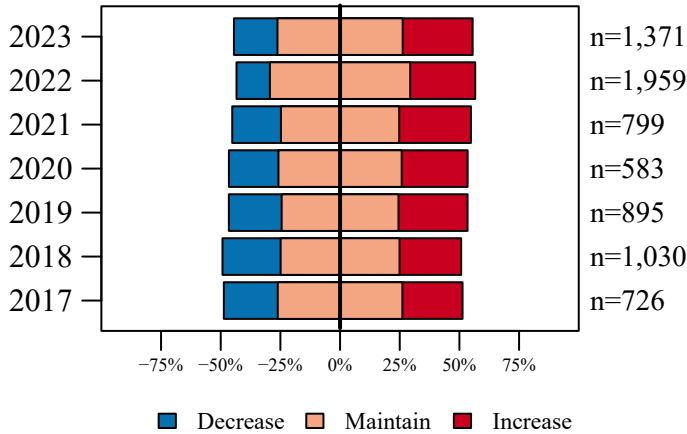


Figure 25. Opinion on how the County Bonus Antlerless Quota should change from nonhunters in the county where they live in DMU 4.

Hunter Opinion

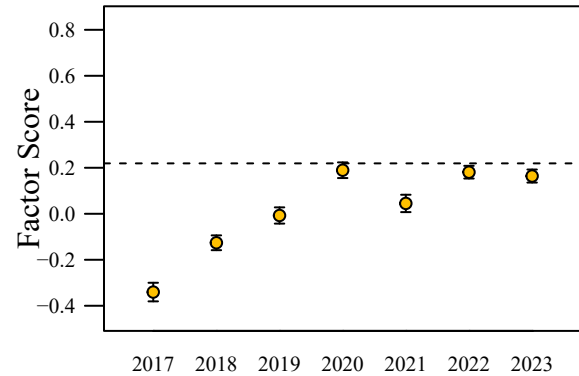


Figure 26. Hunter opinion scores over five years of the deer management survey. The score was aggregated using factor analysis of questions asked only to hunters. The dashed line represents the score if all questions are answered neutrally.

Population Size Opinion

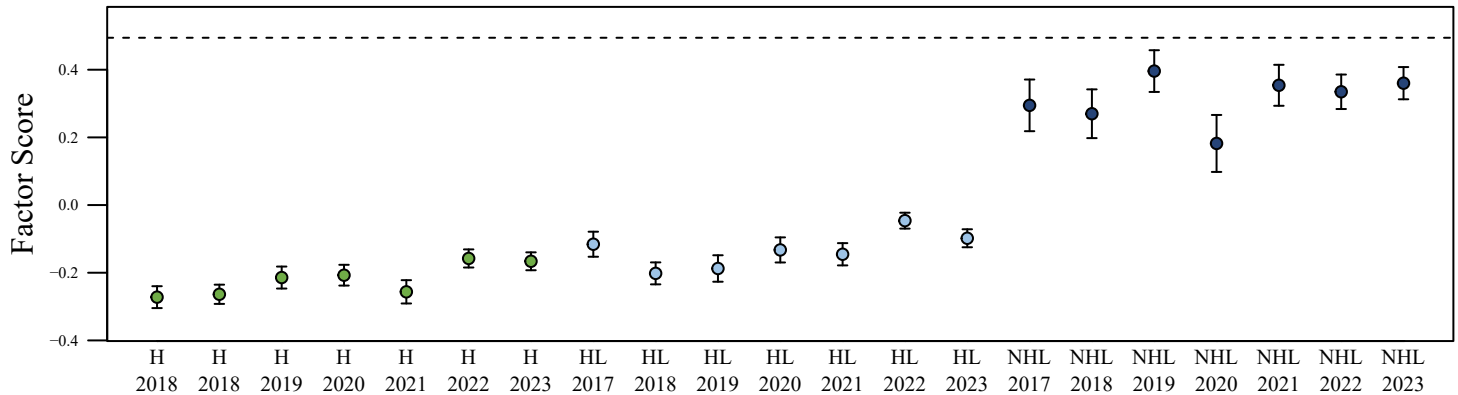


Figure 27. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer population size. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

Deer Management Opinion

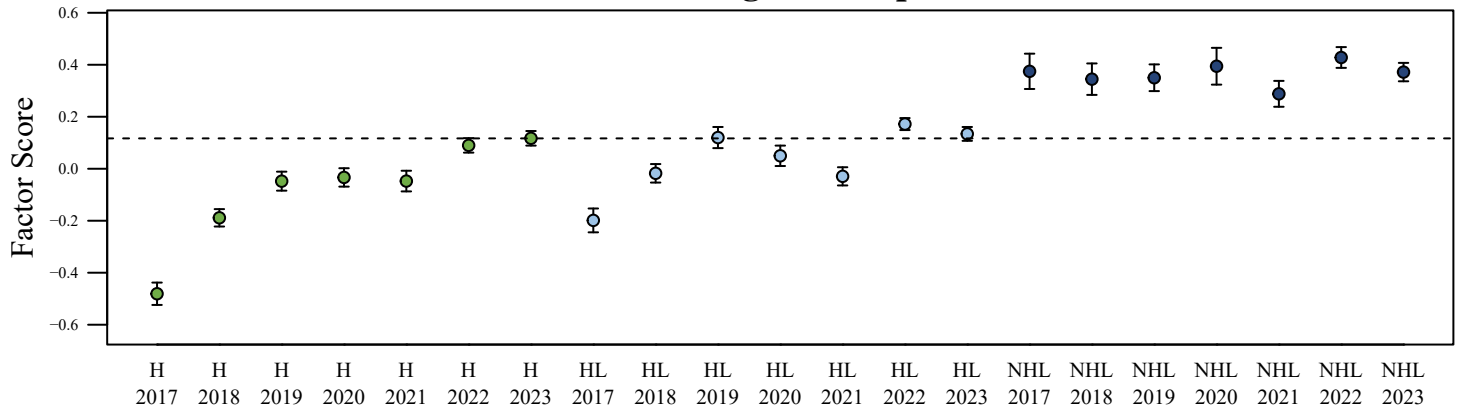
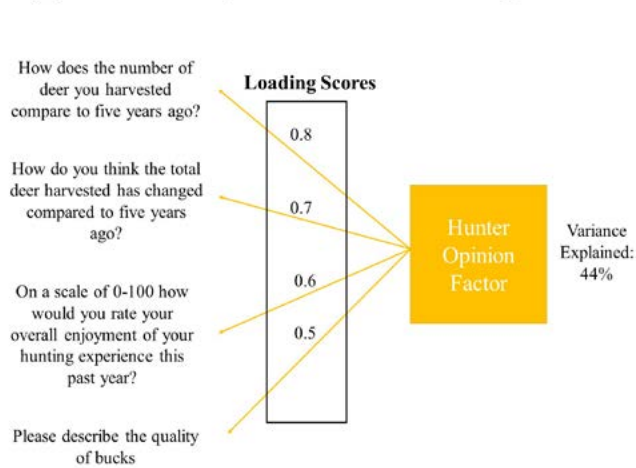


Figure 28. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer management. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

(a) Factor Analysis Results: Hunter Questions



(b) Factor Analysis Results: All Group Questions

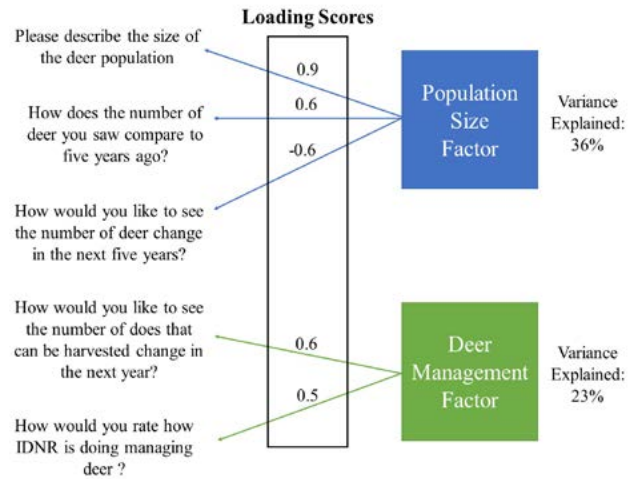


Figure 29. Results from two factor analyses used to develop the hunter opinion (a), population opinion (b), and management opinion (b) scores. Higher loading scores indicate a stronger correlation between the original question and the derived factor. These figures are included to help interpret Figure 26, Figure 27, and Figure 28.

DMU 5: Wabash

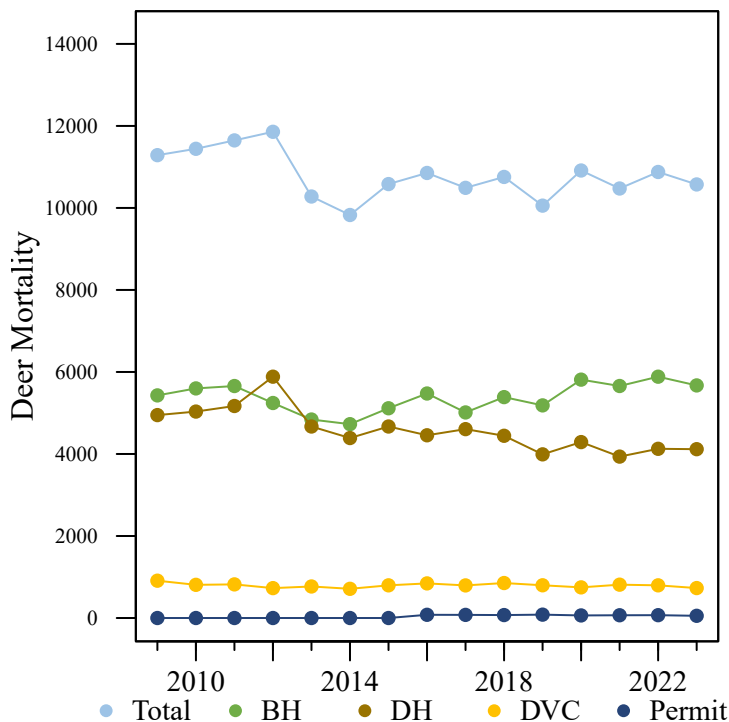
5/23/2024

Total Square Miles: 2,416
Square Miles of Deer Habitat: 957
Percent Deer Habitat: 40

Table 1. Total harvest, buck harvest, and doe harvest (error < 1 percent). Damage permits are issued by DNR to landowners to control deer damage. Deer vehicle collisions (DVC) and miles traveled are reported by the Indiana Department of Transportation. Mean CBAQ is the average county bonus antlerless quota of all counties in the DMU. The trend in total harvest, buck harvest, doe harvest, and DVCs are in standard deviations (SD) and are equivalent to effect size. A change greater than 2 SD is considered both a large and statistically significant effect size.

Year	Total	Total Trend in SD	Buck Harvest	Buck Trend in SD	Buck Harvest per SQ MI Habitat	Doe Harvest	Doe Trend in SD	Doe Harvest per SQ MI Habitat	% Doe in Harvest	Damage Permit Deer Taken	DVC per Billion Miles Traveled	DVC Trend in SD	Mean CBAQ
2009	10,377		5,429		5.7	4,948		5.2	47.7		289.6		5.8
2010	10,633	1.6	5,599	1.3	5.9	5,034	1.3	5.3	47.3		259.4	-0.5	6.7
2011	10,827	1.7	5,657	1.5	5.9	5,170	1.5	5.4	47.8		265.2	-0.7	6.7
2012	11,128	1.6	5,243	-0.8	5.5	5,885	3.1	6.1	52.9		237.9	-2.1	7.3
2013	9,510	-2.2	4,840	-2.8	5.1	4,670	-1.1	4.9	49.1		253.7	-0.6	6.0
2014	9,116	-2.2	4,727	-1.9	4.9	4,389	-1.7	4.6	48.1		236.8	-1.3	5.3
2015	9,785	-0.5	5,115	-0.2	5.3	4,670	-0.6	4.9	47.7		267.1	1.3	5.2
2016	9,931	-0.2	5,475	1.0	5.7	4,456	-0.8	4.7	44.9	78	284.5	2.2	5.2
2017	9,619	-0.4	5,013	-0.2	5.2	4,606	-0.3	4.8	47.9	76	268.7	0.6	4.5
2018	9,831	0.8	5,387	1.2	5.6	4,444	-0.9	4.6	45.2	72	288.1	1.5	3.5
2019	9,176	-1.5	5,185	0.1	5.4	3,991	-4.4	4.2	43.5	82	269.4	0.0	2.0
2020	10,103	1.5	5,813	3.0	6.1	4,290	-0.5	4.5	42.5	63	251.4	-2.4	2.0
2021	9,594	-0.4	5,658	0.9	5.9	3,936	-1.8	4.1	41.0	67	275.9	0.2	2.0
2022	10,011	1.0	5,885	1.4	6.1	4,126	-0.4	4.3	41.2	69	270.1	0.0	2.0
2023	9,789	0.1	5,672	0.3	5.9	4,117	-0.2	4.3	42.1	54	245.4	-1.9	3.0

(a) Cumulative Known Deer Mortality



(b) Archer Deer Observations

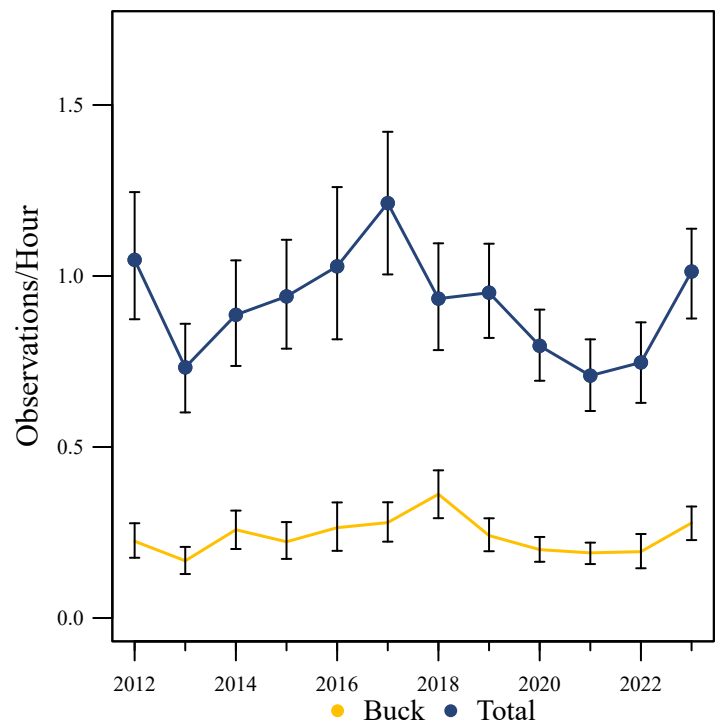


Figure 1. (a) The total known annual deer mortality based on buck harvests (BH), doe harvests (DH), deer vehicle collisions (DVC), and deer permit takes. (b) Total deer and buck observations per hour based on the Archer's Index.

DMU 5: Wabash

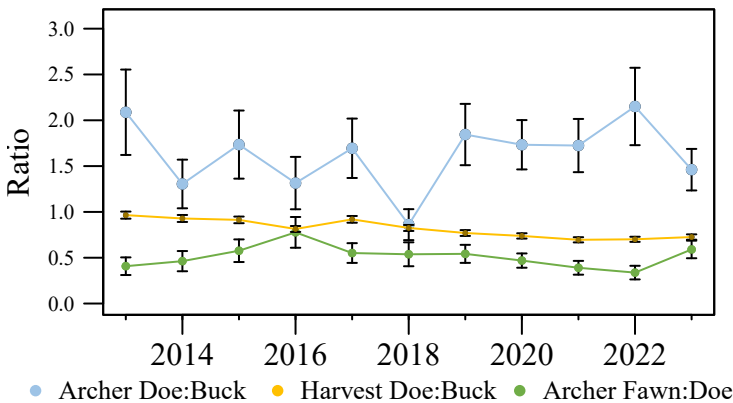
5/23/2024

Total Square Miles: 2,416
Square Miles of Deer Habitat: 957
Percent Deer Habitat: 40

Table 2. Estimated number of antlered (A) and antlerless (AL) deer harvested per hunter. Estimated totals may not match exactly with total number of deer harvested. Reporting errors are examined and investigated as they are located; therefore, subsequent reports may contain corrected totals.

Year	Total Hunters	0 A	1 A	2 A	3 A	0 AL	1 AL	2 AL	3 AL	4 AL	5 AL	6 AL	7 AL	8 AL	9 AL	10 AL
2016	7,573	3,006	4,557	9	1	3,454	3,158	763	143	42	9	2	1	1	0	0
2017	7,115	3,098	4,007	7	3	2,974	3,036	872	157	55	11	7	3	0	0	0
2018	7,379	2,930	4,436	12	1	3,262	3,101	818	166	28	3	1	0	0	0	0
2019	7,083	2,844	4,230	9	0	3,127	3,085	784	76	8	3	0	0	0	0	0
2020	7,784	2,820	4,946	18	0	3,662	3,229	804	73	15	1	0	0	0	0	0
2021	7,554	2,663	4,884	7	0	3,697	3,089	704	58	5	1	0	0	0	0	0
2022	7,805	2,664	5,130	10	1	3,853	3,123	764	53	12	0	0	0	0	0	0
2023	7,542	2,626	4,897	19	0	3,667	3,038	721	98	14	1	2	1	0	0	0

(a) Deer Ratios



(b) Boone and Crockett

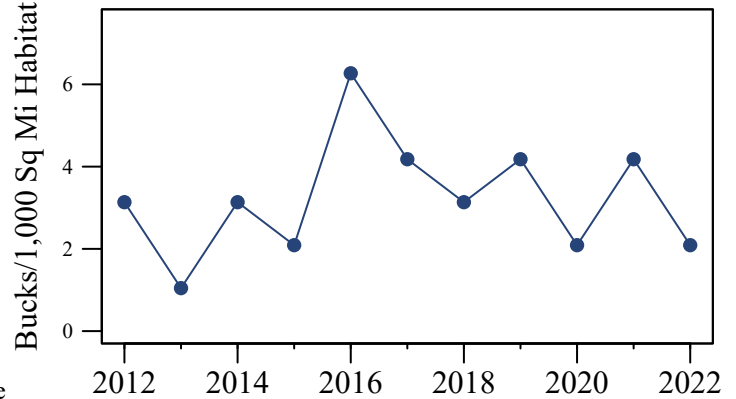
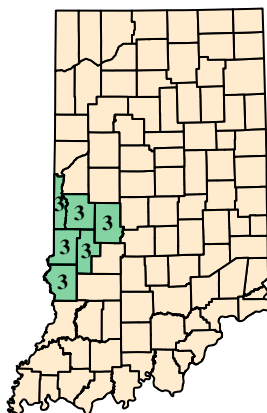


Figure 2. (a) Annual doe:buck ratios and fawn:doe ratios based on the Archer's Index and harvest records. (b) The number of Boone and Crockett bucks (minimum 160 score) per 1,000 square miles of deer habitat.

(a) Counties in DMU 5



(b) Deer Habitat in DMU 5

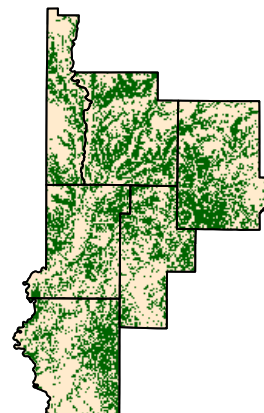


Figure 3. (a) Counties included in DMU 5 for summarizing harvest and deer management survey statistics. Labels are the 2023 county bonus antlerless quotas. (b) Green represents the land use types classified as deer habitat in DMU 5.

DMU 5: Wabash

5/23/2024

Deer Management Survey Results

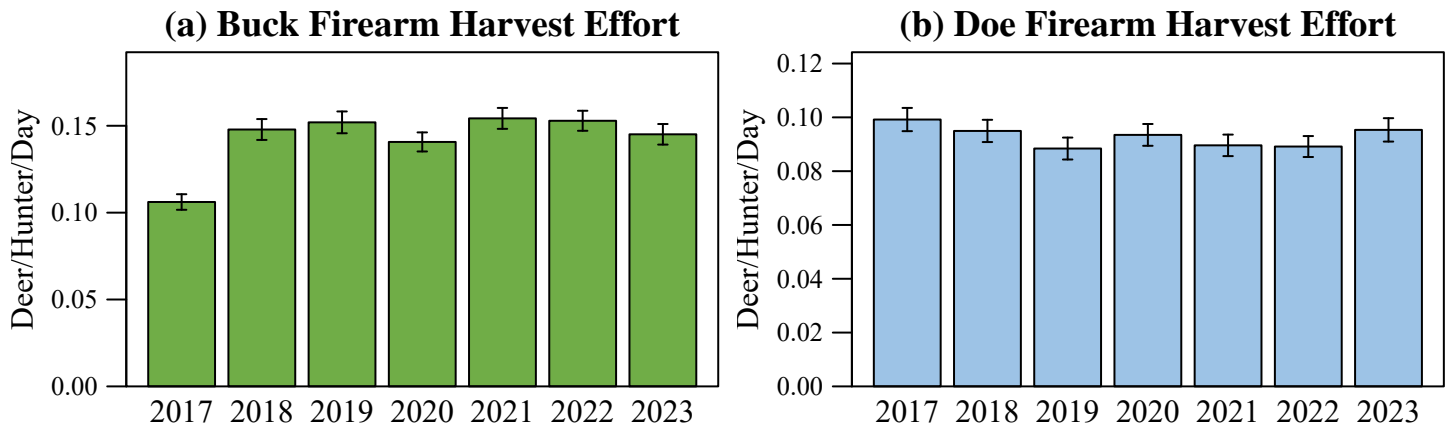


Figure 4. Firearm harvest effort is the number of bucks (a) and does (b) killed by firearms per hunter divided by the mean number of days hunted per hunter during the firearm season based on data reported in the deer management survey. Larger values (i.e. taller bars) indicate less effort required to harvest a deer.

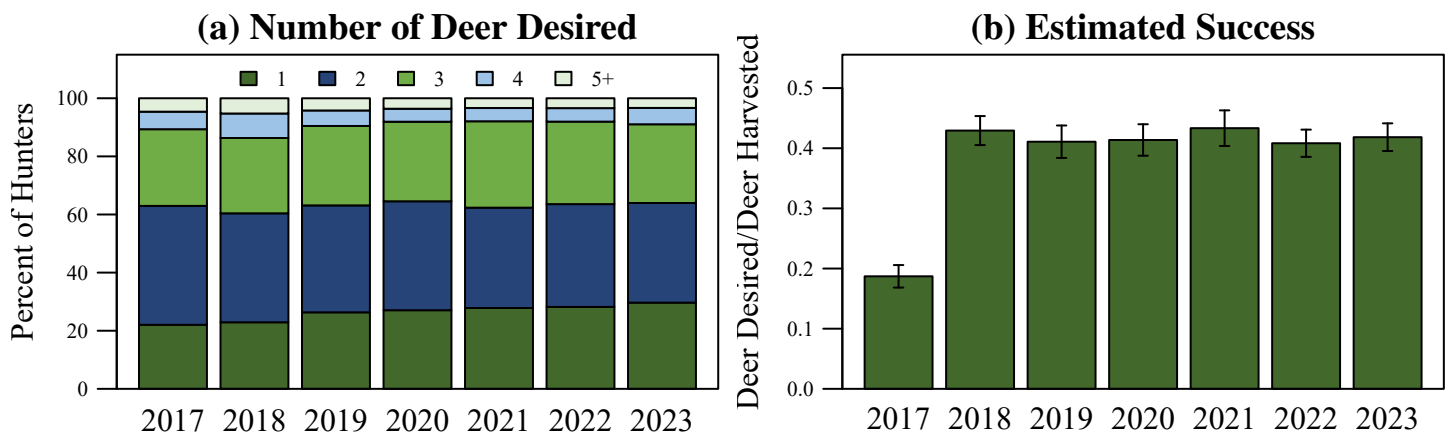


Figure 5. (a) The annual percent of hunters wishing to harvest each number of deer as reported in the deer management survey. (b) Success rate is estimated from the deer management survey as the Number of Harvested Deer/Number of Deer Desired (reported only; does not account for attempts that were not made). Larger values (i.e. taller bars) indicate greater success.

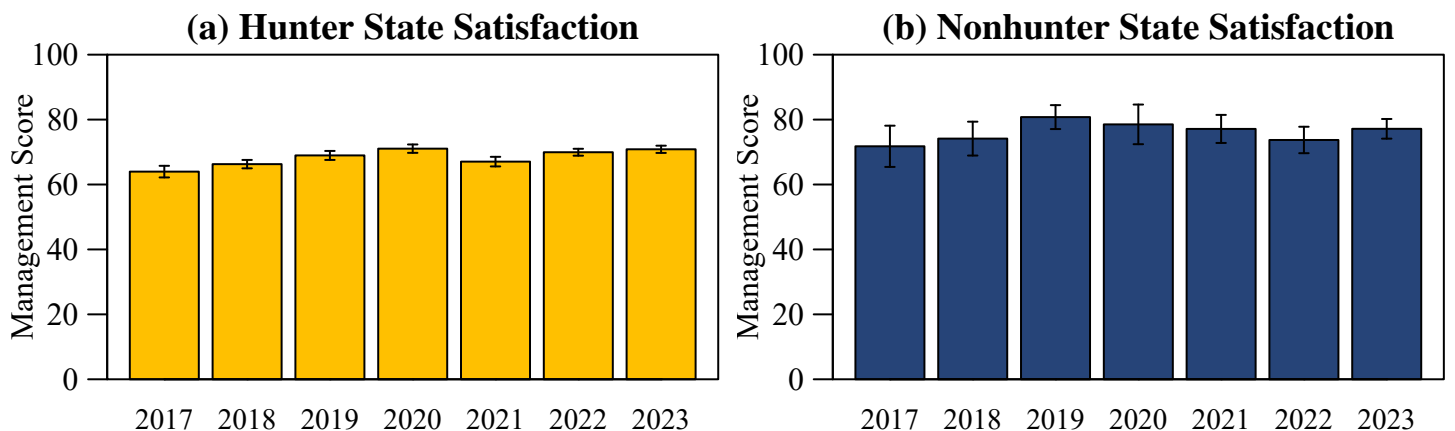


Figure 6. Hunters (a) and nonhunters (b) were asked to score the DNR's statewide deer management on a scale of 0 (poor) to 100 (excellent).

DMU 5: Wabash

5/23/2024

Deer Management Survey Results

Hunter Satisfaction

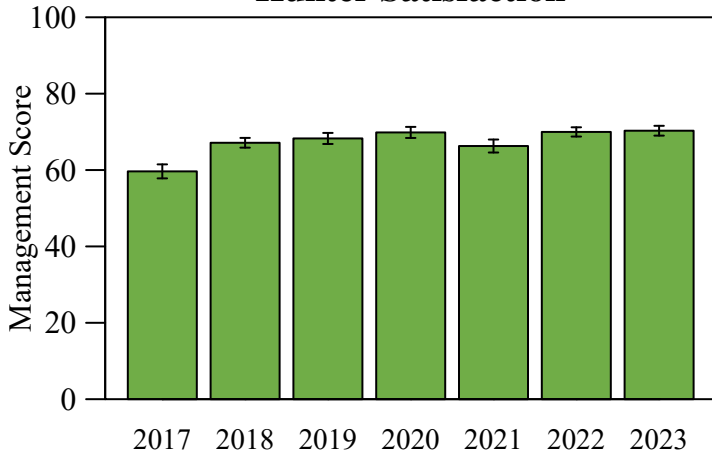


Figure 7. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 5 where they hunt.

Resident Hunter Satisfaction

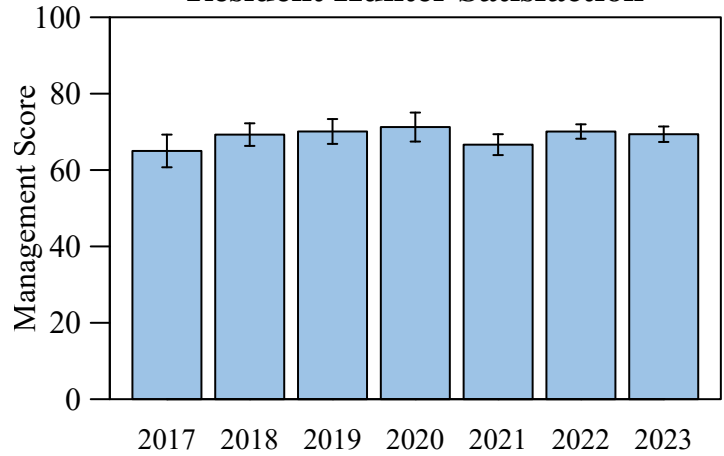


Figure 8. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 5 where they live.

Resident Nonhunter Satisfaction

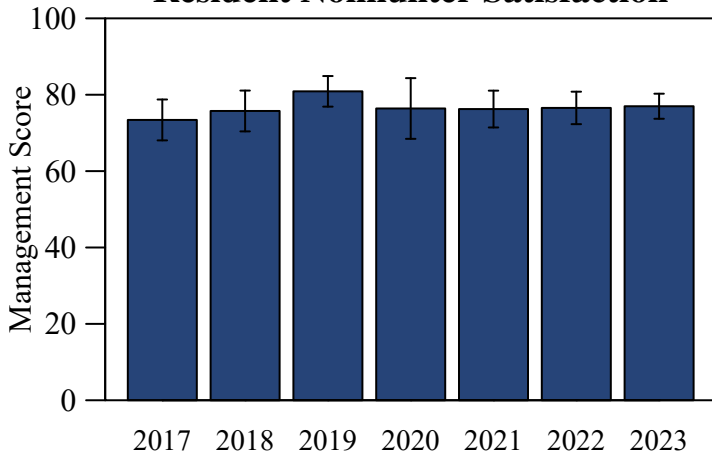


Figure 9. Nonhunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 5 where they live.

Hunter Population Size

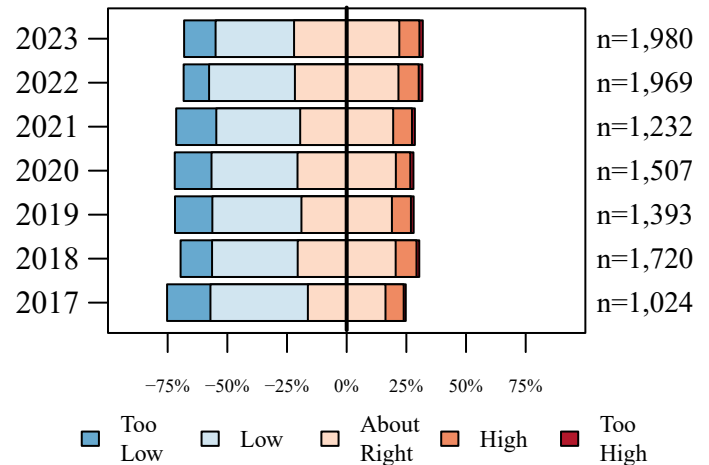


Figure 10. The current size of the deer population described by hunters in the county where they hunt in DMU 5.

Resident Hunter Population Size

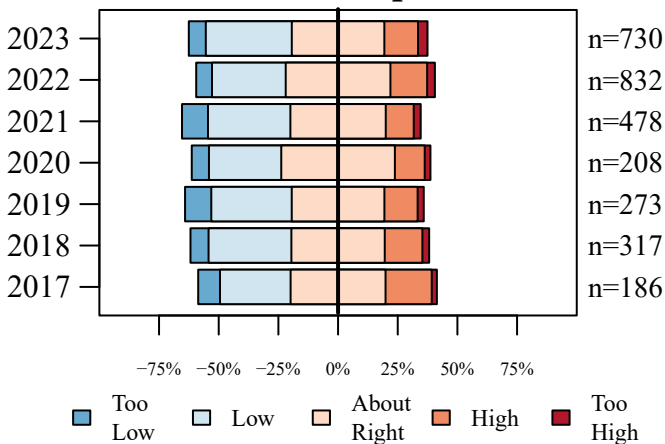


Figure 11. The current size of the deer population described by hunters in the county where they live in DMU 5.

Resident Nonhunter Population Size

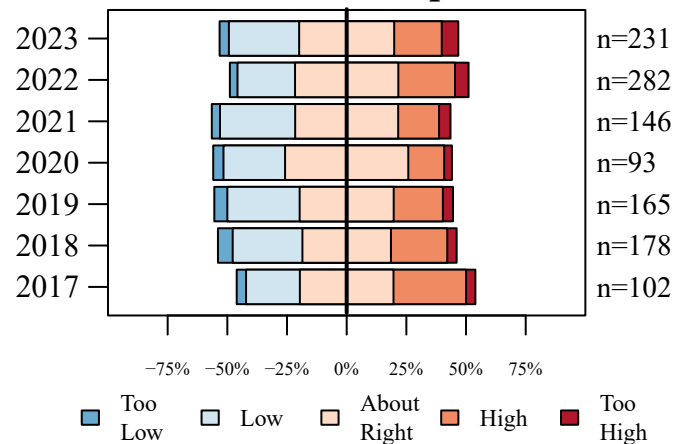


Figure 12. The current size of the deer population described by nonhunters in the county where they live in DMU 5.

DMU 5: Wabash

5/23/2024

Deer Management Survey Results

Hunter Perceived Change

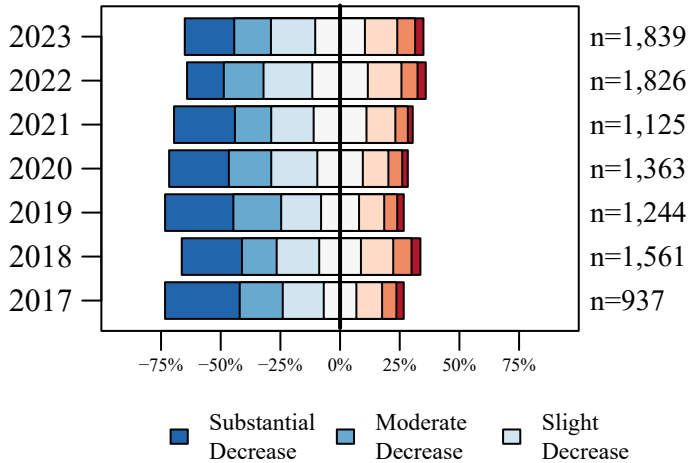


Figure 13. The number of deer seen compared to five years ago described by hunters in the county where they hunt in DMU 5.

Resident Hunter Perceived Change

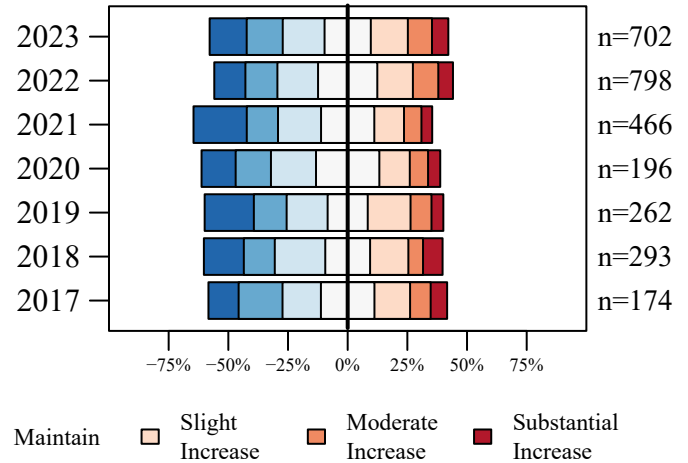


Figure 14. The number of deer seen compared to five years ago described by hunters in the county where they live in DMU 5.

Resident Nonhunter Perceived Change

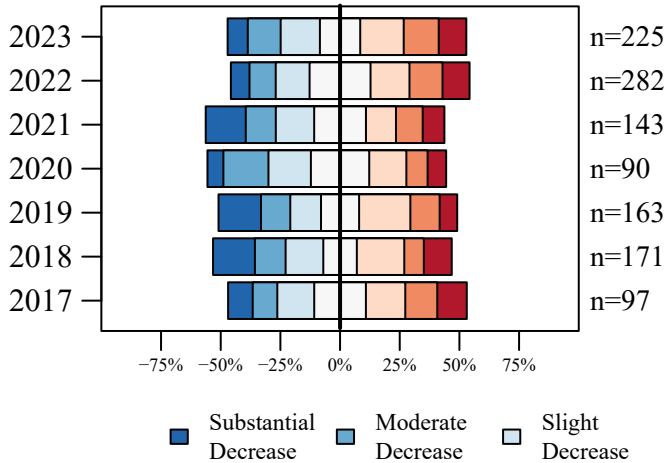


Figure 15. The number of deer seen compared to five years ago described by nonhunters in the county where they live in DMU 5.

Hunter Desired Change

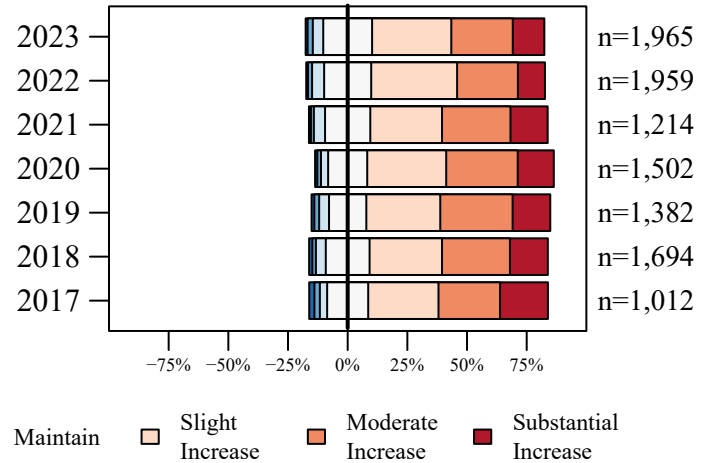


Figure 16. The desired change in the size of the deer population described by hunters in the county where they hunt in DMU 5.

Resident Hunter Desired Change

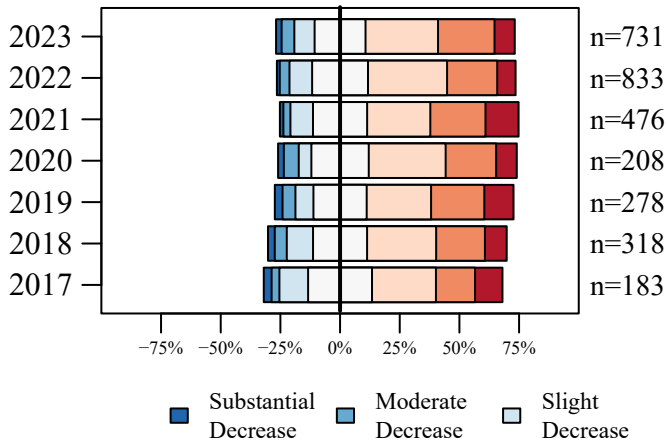


Figure 17. The desired change in the size of the deer population described by hunters in the county where they live in DMU 5.

Resident Nonhunter Desired Change

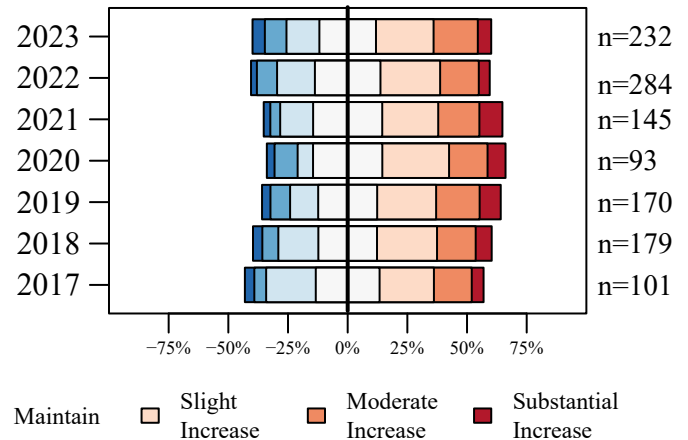


Figure 18. The desired change in the size of the deer population described by nonhunters in the county where they live in DMU 5.

DMU 5: Wabash

5/23/2024

Deer Management Survey Results

Hunter Buck Quality

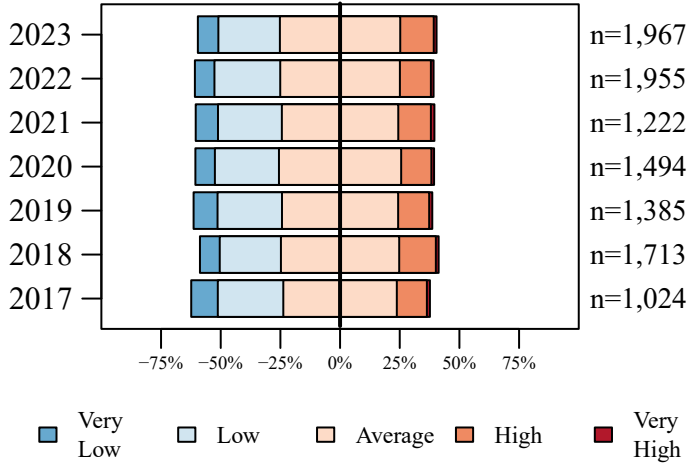


Figure 19. Hunters describe the quality of bucks in the county where they hunt in DMU 5.

Resident Hunter Buck Quality

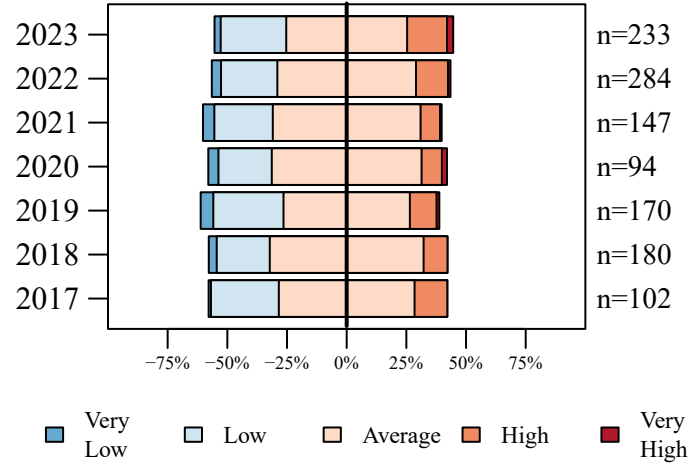


Figure 20. Hunters describe the quality of bucks in the county where they live in DMU 5.

Personal Harvest Change

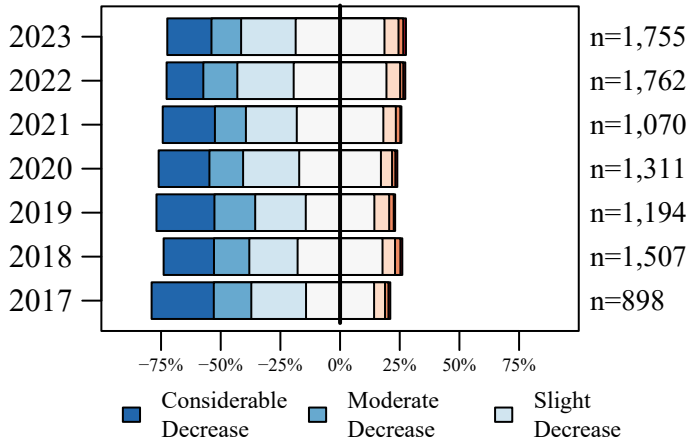


Figure 21. Opinion of hunters on how their personal number of harvested deer has changed over the last five years in a county in DMU 5.

Total Harvest Change

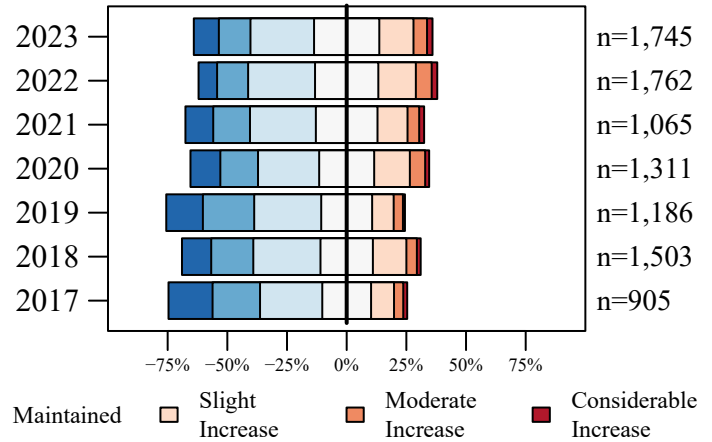


Figure 22. Opinion of hunters on how the total number of harvested deer has changed over the last five years in a county in DMU 5.

Hunter CBAQ

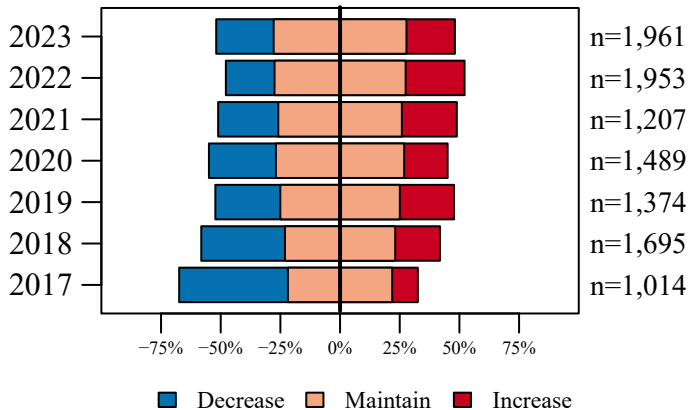


Figure 23. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they hunt in DMU 5.

Resident Hunter CBAQ

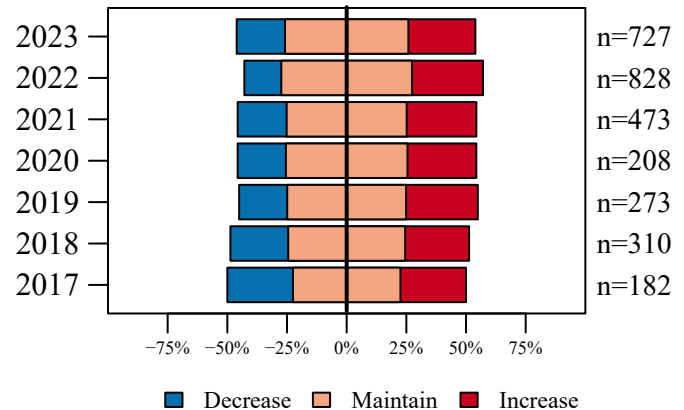


Figure 24. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they live in DMU 5.

DMU 5: Wabash

5/23/2024

Deer Management Survey Results

Resident Nonhunter CBAQ

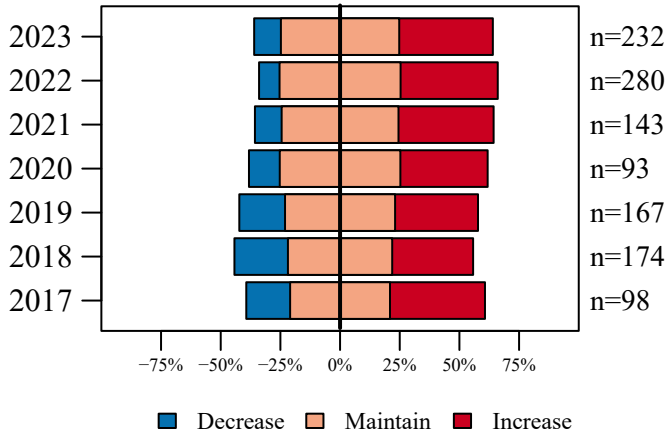


Figure 25. Opinion on how the County Bonus Antlerless Quota should change from nonhunters in the county where they live in DMU 5.

Hunter Opinion

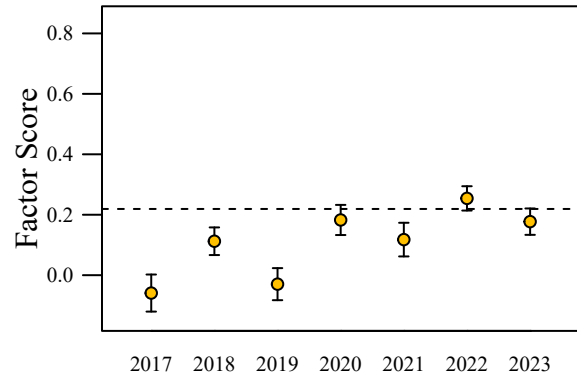


Figure 26. Hunter opinion scores over five years of the deer management survey. The score was aggregated using factor analysis of questions asked only to hunters. The dashed line represents the score if all questions are answered neutrally.

Population Size Opinion

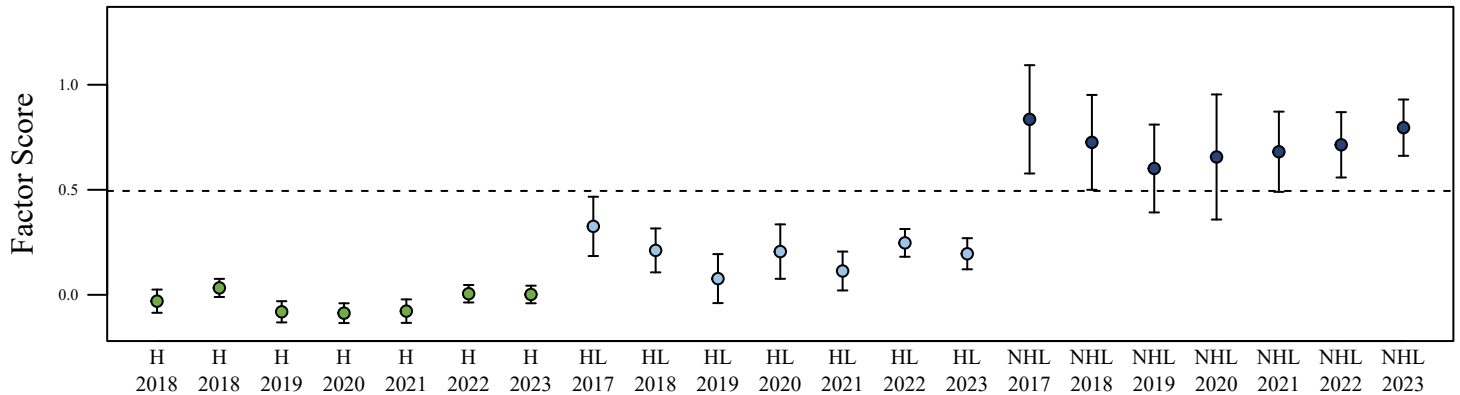


Figure 27. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer population size. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

Deer Management Opinion

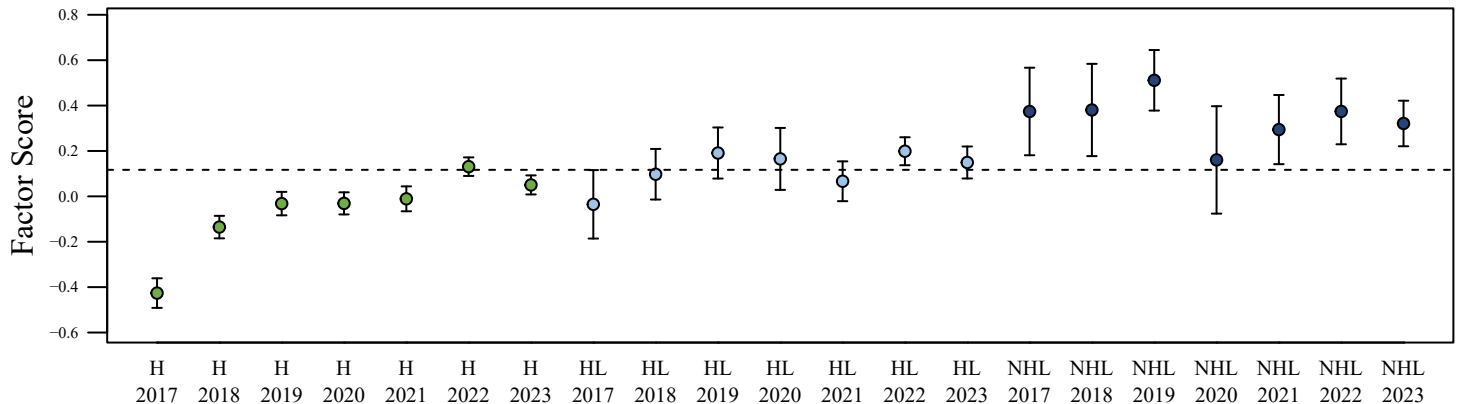
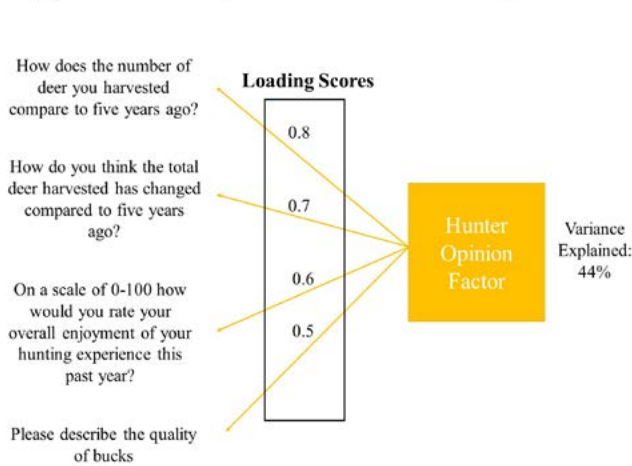


Figure 28. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer management. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

(a) Factor Analysis Results: Hunter Questions



(b) Factor Analysis Results: All Group Questions

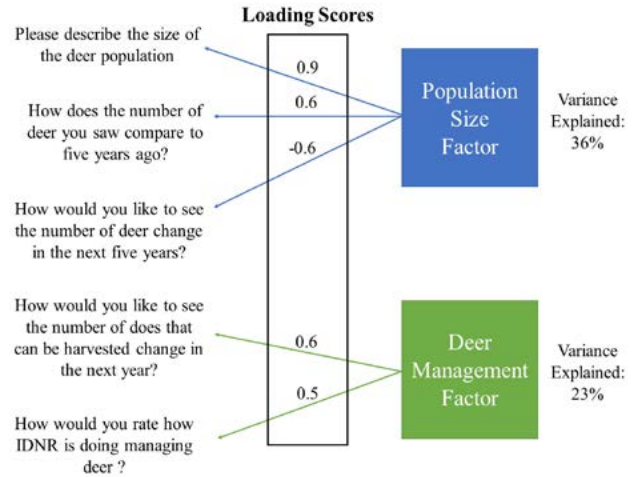


Figure 29. Results from two factor analyses used to develop the hunter opinion (a), population opinion (b), and management opinion (b) scores. Higher loading scores indicate a stronger correlation between the original question and the derived factor. These figures are included to help interpret Figure 26, Figure 27, and Figure 28.

DMU 6: South

5/23/2024

Total Square Miles: 6,368

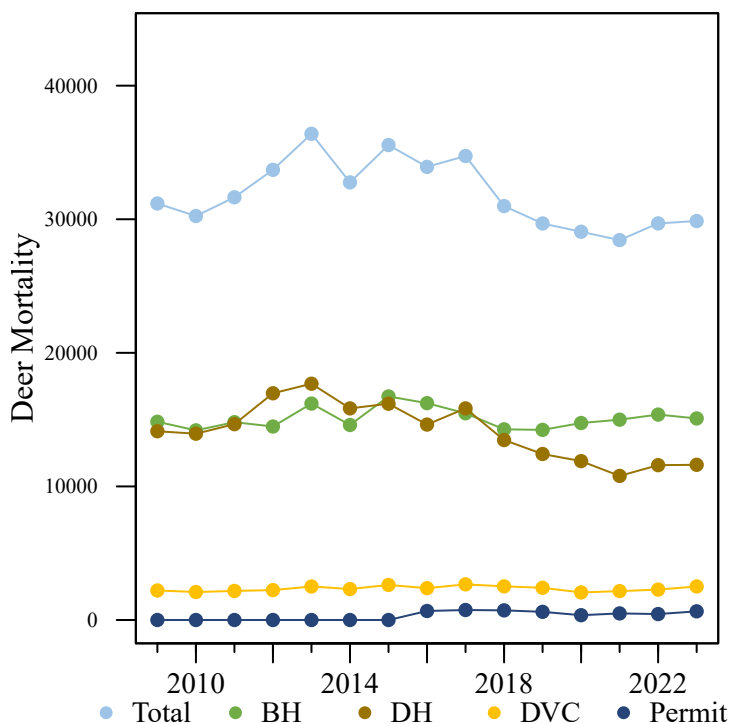
Square Miles of Deer Habitat: 4,482

Percent Deer Habitat: 70

Table 1. Total harvest, buck harvest, and doe harvest (error < 1 percent). Damage permits are issued by DNR to landowners to control deer damage. Deer vehicle collisions (DVC) and miles traveled are reported by the Indiana Department of Transportation. Mean CBAQ is the average county bonus antlerless quota of all counties in the DMU. The trend in total harvest, buck harvest, doe harvest, and DVCs are in standard deviations (SD) and are equivalent to effect size. A change greater than 2 SD is considered both a large and statistically significant effect size.

Year	Total	Total Trend in SD	Buck Harvest	Buck Trend in SD	Buck Harvest per SQ MI Habitat	Doe Harvest	Doe Trend in SD	Doe Harvest per SQ MI Habitat	% Doe in Harvest	Damage Permit Deer Taken	DVC per Billion Miles Traveled	DVC Trend in SD	Mean CBAQ
2009	28,970		14,840		3.3	14,130		3.2	48.8		278.6		5.0
2010	28,143	-0.4	14,197	-0.5	3.2	13,946	-0.1	3.1	49.6		263.7	-1.0	5.4
2011	29,468	1.3	14,809	0.9	3.3	14,659	1.4	3.3	49.7		275.0	-0.5	5.7
2012	31,458	3.2	14,485	0.3	3.2	16,973	5.2	3.8	54.0		283.3	0.6	5.6
2013	33,888	3.5	16,201	4.9	3.6	17,687	2.3	3.9	52.2		316.5	5.7	5.3
2014	30,442	0.0	14,599	-0.4	3.3	15,843	0.2	3.5	52.0		293.6	0.5	6.1
2015	32,927	1.0	16,736	2.4	3.7	16,191	0.2	3.6	49.2		332.1	2.3	5.9
2016	30,864	-0.4	16,234	0.8	3.6	14,630	-1.4	3.3	47.4	675	301.0	0.0	5.9
2017	31,315	-0.4	15,475	-0.2	3.5	15,840	-0.4	3.5	50.6	749	335.9	1.6	5.7
2018	27,746	-2.8	14,274	-1.9	3.2	13,472	-2.3	3.0	48.6	722	314.6	-0.1	4.7
2019	26,660	-2.1	14,233	-1.2	3.2	12,427	-2.4	2.8	46.6	612	299.6	-0.9	2.0
2020	26,639	-1.3	14,746	-0.6	3.3	11,893	-1.7	2.7	44.6	360	254.0	-3.7	2.4
2021	25,784	-1.3	14,997	0.0	3.3	10,787	-1.8	2.4	41.8	495	265.5	-1.2	2.4
2022	26,971	-0.3	15,379	1.2	3.4	11,592	-0.7	2.6	43.0	444	280.0	-0.4	2.0
2023	26,706	-0.1	15,089	0.7	3.4	11,617	-0.4	2.6	43.5	650	308.6	1.0	2.9

(a) Cumulative Known Deer Mortality



(b) Archer Deer Observations

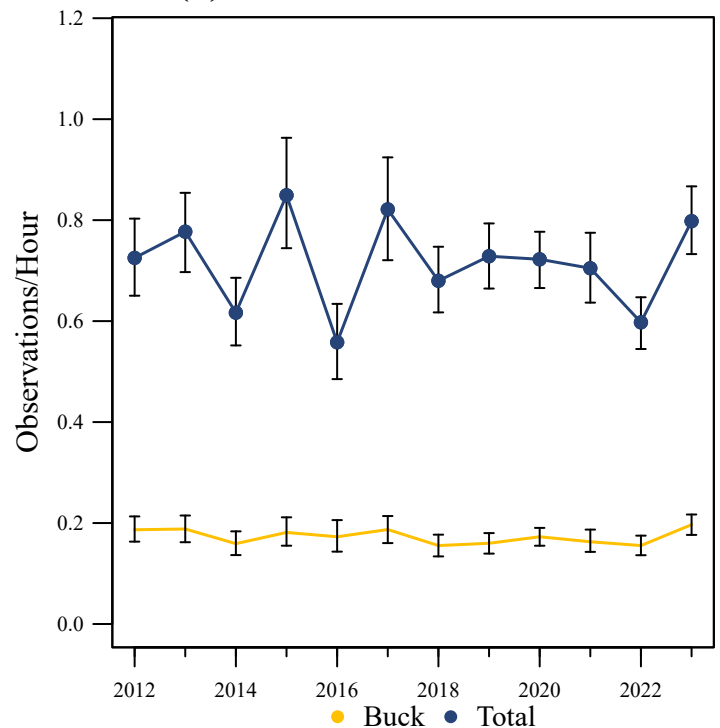


Figure 1. (a) The total known annual deer mortality based on buck harvests (BH), doe harvests (DH), deer vehicle collisions (DVC), and deer permit takes. (b) Total deer and buck observations per hour based on the Archer's Index.

5/23/2024

Total Square Miles: 6,368
Square Miles of Deer Habitat: 4,482
Percent Deer Habitat: 70

Table 2. Estimated number of antlered (A) and antlerless (AL) deer harvested per hunter. Estimated totals may not match exactly with total number of deer harvested. Reporting errors are examined and investigated as they are located; therefore, subsequent reports may contain corrected totals.

Year	Total Hunters	0 A	1 A	2 A	3 A	0 AL	1 AL	2 AL	3 AL	4 AL	5 AL	6 AL	7 AL	8 AL	9 AL	10 AL
2016	23,189	10,040	13,087	60	2	9,839	10,155	2,439	518	163	51	16	5	2	0	1
2017	22,834	10,709	12,071	52	2	8,741	10,404	2,787	614	195	51	25	8	8	1	0
2018	20,707	9,465	11,176	63	3	8,301	9,297	2,429	504	133	33	7	2	0	0	0
2019	20,569	9,206	11,287	74	2	8,422	9,403	2,473	228	36	6	0	0	0	0	0
2020	20,849	8,527	12,255	65	2	9,337	9,106	2,126	240	34	2	4	0	0	0	0
2021	20,504	7,851	12,590	61	1	9,810	8,565	1,923	180	20	5	0	0	1	0	0
2022	21,241	8,183	12,972	84	2	9,915	9,063	2,072	155	28	7	1	0	0	0	0
2023	20,841	8,000	12,767	67	7	9,787	8,682	2,069	262	32	6	2	0	1	0	0

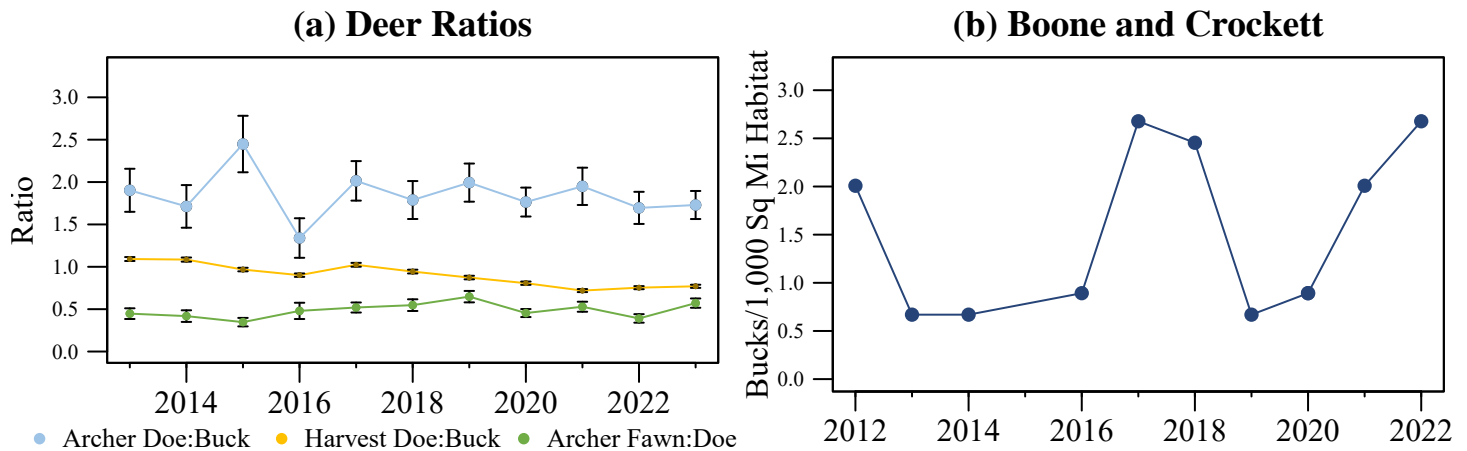
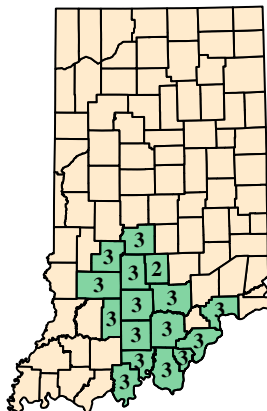


Figure 2. (a) Annual doe:buck ratios and fawn:doe ratios based on the Archer's Index and harvest records. (b) The number of Boone and Crockett bucks (minimum 160 score) per 1,000 square miles of deer habitat.

(a) Counties in DMU 6



(b) Deer Habitat in DMU 6

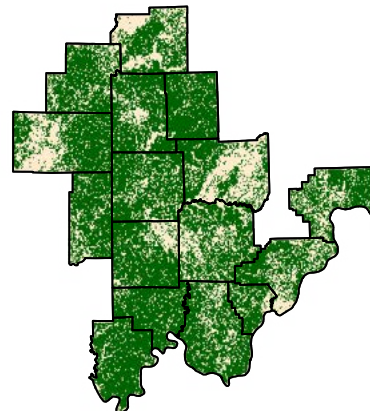


Figure 3. (a) Counties included in DMU 6 for summarizing harvest and deer management survey statistics. Labels are the 2023 county bonus antlerless quotas. (b) Green represents the land use types classified as deer habitat in DMU 6.

DMU 6: South

5/23/2024

Deer Management Survey Results

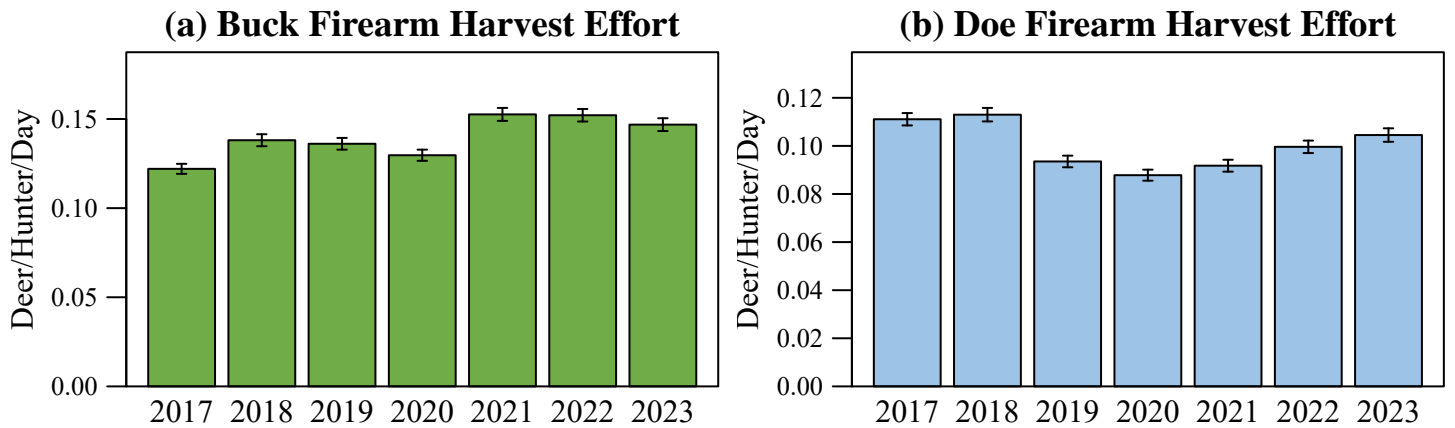


Figure 4. Firearm harvest effort is the number of bucks (a) and does (b) killed by firearms per hunter divided by the mean number of days hunted per hunter during the firearm season based on data reported in the deer management survey. Larger values (i.e. taller bars) indicate less effort required to harvest a deer.

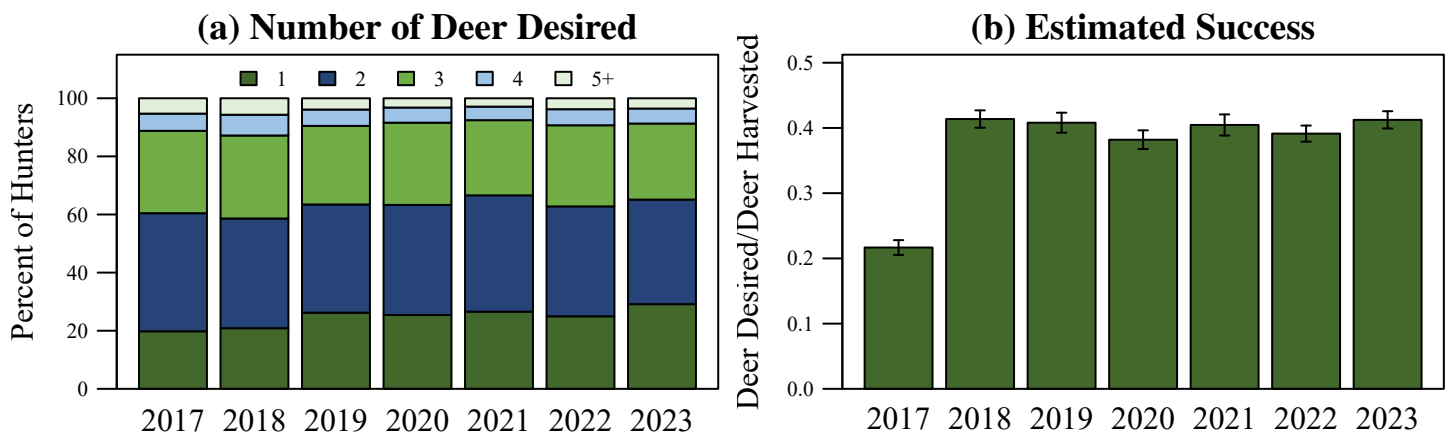


Figure 5. (a) The annual percent of hunters wishing to harvest each number of deer as reported in the deer management survey. (b) Success rate is estimated from the deer management survey as the Number of Harvested Deer/Number of Deer Desired (reported only; does not account for attempts that were not made). Larger values (i.e. taller bars) indicate greater success.

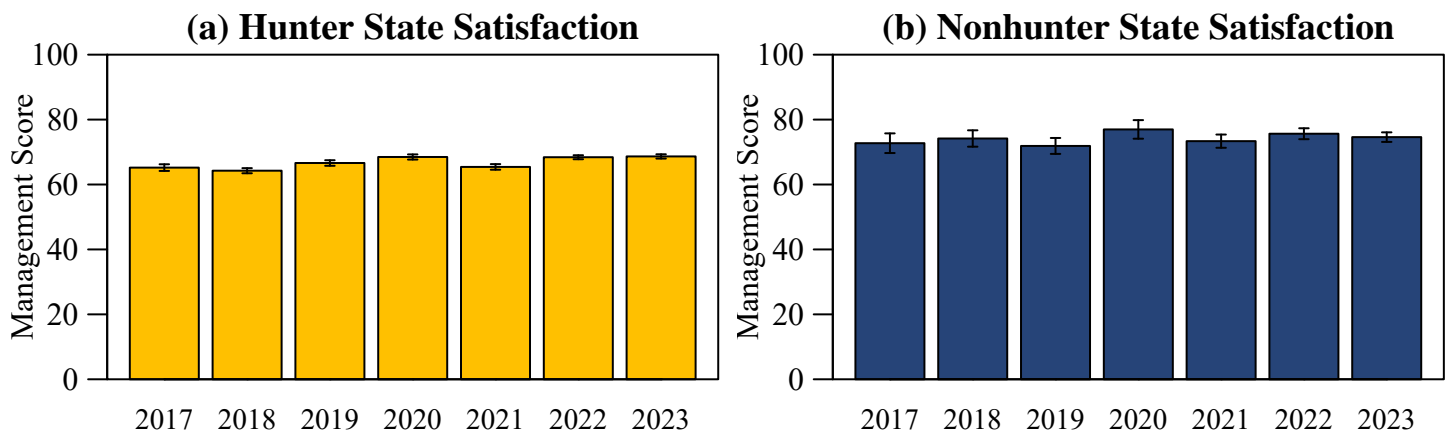


Figure 6. Hunters (a) and nonhunters (b) were asked to score the DNR's statewide deer management on a scale of 0 (poor) to 100 (excellent).

DMU 6: South

5/23/2024

Deer Management Survey Results

Hunter Satisfaction

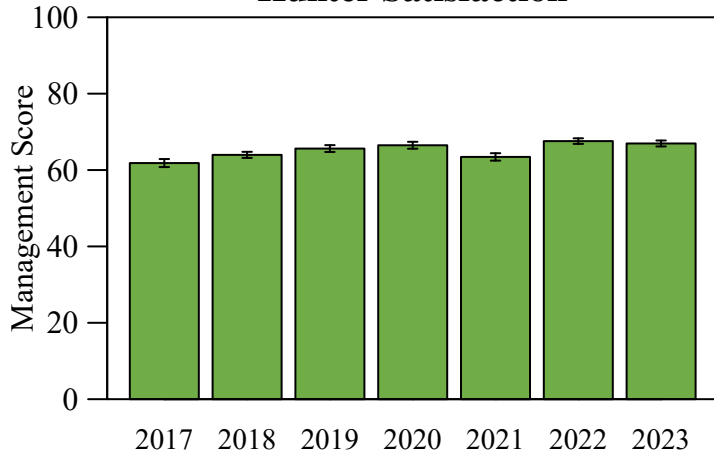


Figure 7. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 6 where they hunt.

Resident Hunter Satisfaction

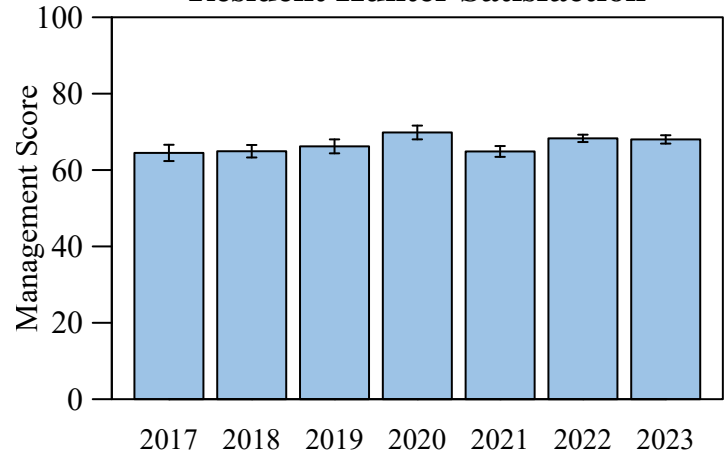


Figure 8. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 6 where they live.

Resident Nonhunter Satisfaction

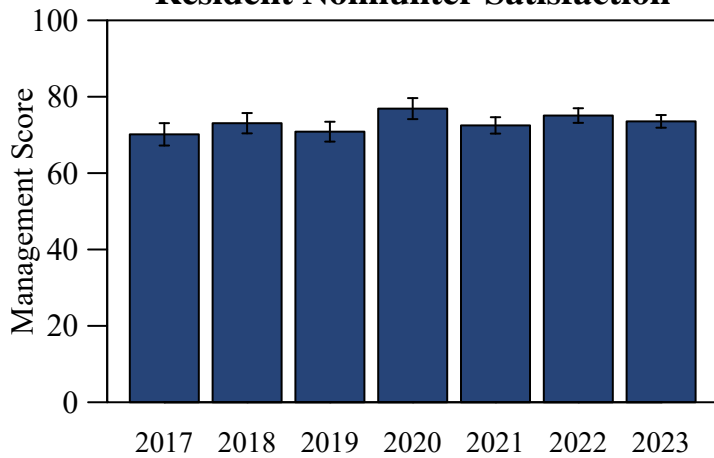


Figure 9. Nonhunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 6 where they live.

Hunter Population Size

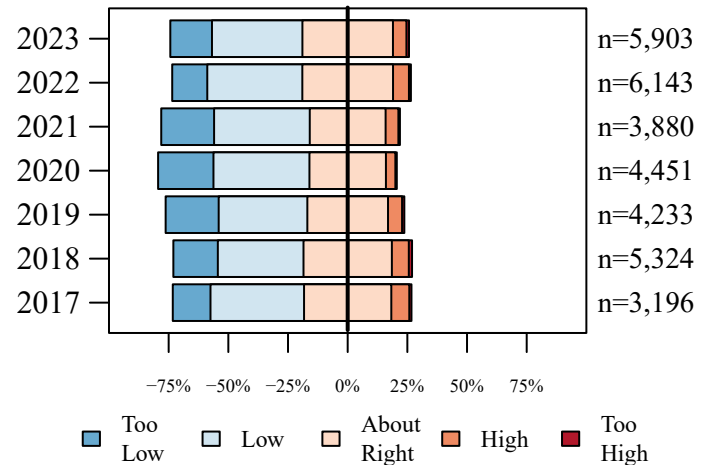


Figure 10. The current size of the deer population described by hunters in the county where they hunt in DMU 6.

Resident Hunter Population Size

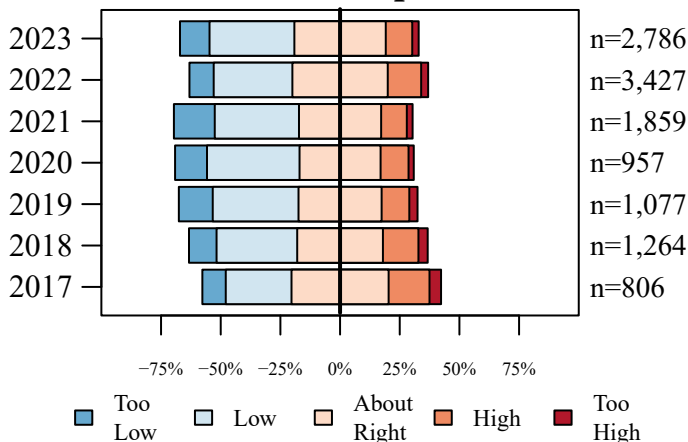


Figure 11. The current size of the deer population described by hunters in the county where they live in DMU 6.

Resident Nonhunter Population Size

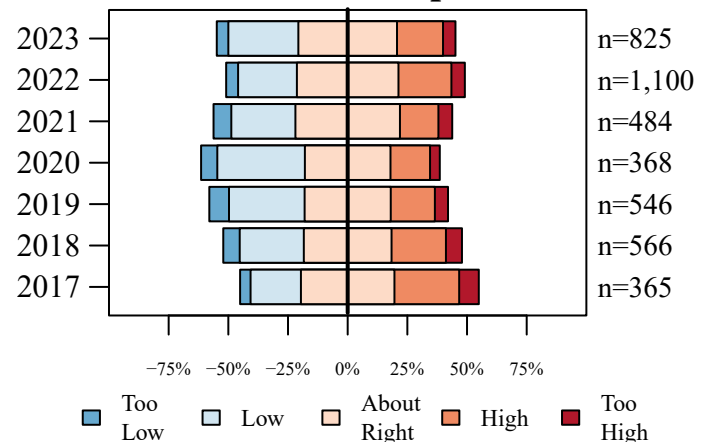


Figure 12. The current size of the deer population described by nonhunters in the county where they live in DMU 6.

DMU 6: South

5/23/2024

Deer Management Survey Results

Hunter Perceived Change

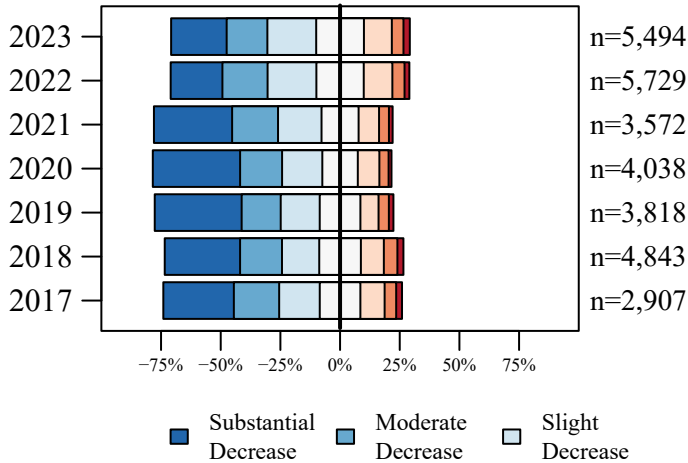


Figure 13. The number of deer seen compared to five years ago described by hunters in the county where they hunt in DMU 6.

Resident Hunter Perceived Change

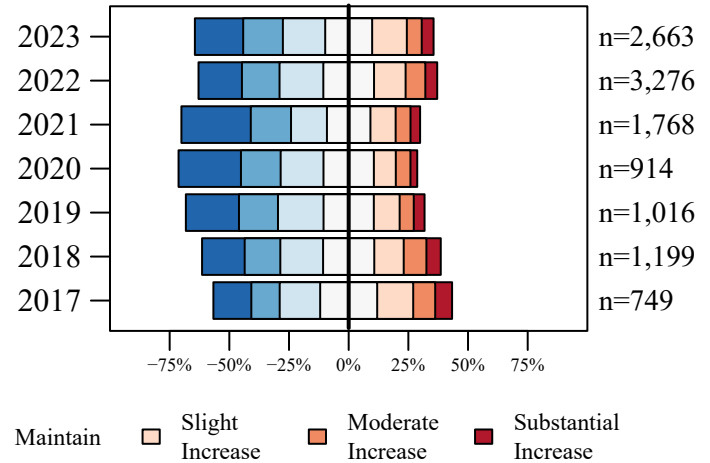


Figure 14. The number of deer seen compared to five years ago described by hunters in the county where they live in DMU 6.

Resident Nonhunter Perceived Change

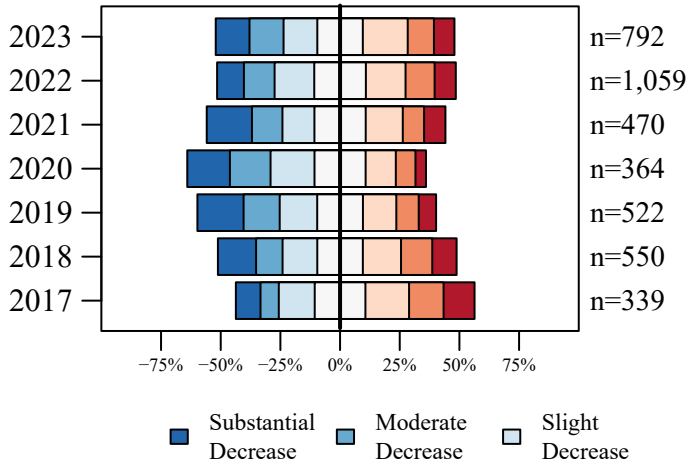


Figure 15. The number of deer seen compared to five years ago described by nonhunters in the county where they live in DMU 6.

Hunter Desired Change

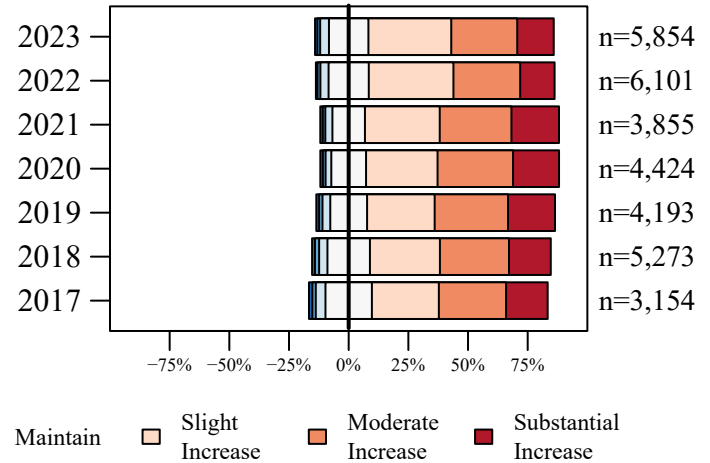


Figure 16. The desired change in the size of the deer population described by hunters in the county where they hunt in DMU 6.

Resident Hunter Desired Change

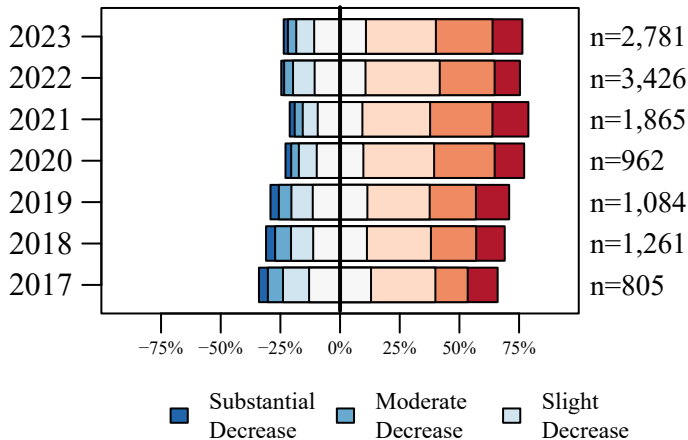


Figure 17. The desired change in the size of the deer population described by hunters in the county where they live in DMU 6.

Resident Nonhunter Desired Change

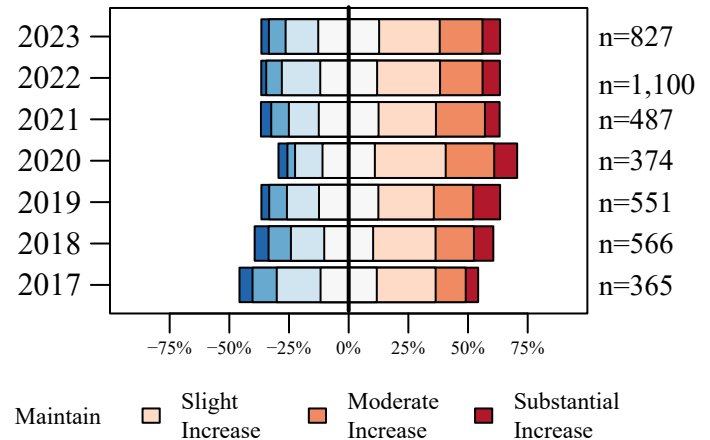


Figure 18. The desired change in the size of the deer population described by nonhunters in the county where they live in DMU 6.

DMU 6: South

5/23/2024

Deer Management Survey Results

Hunter Buck Quality

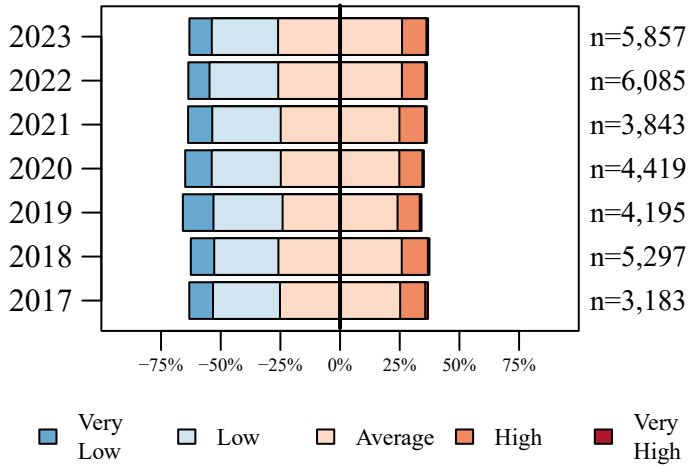


Figure 19. Hunters describe the quality of bucks in the county where they hunt in DMU 6.

Resident Hunter Buck Quality

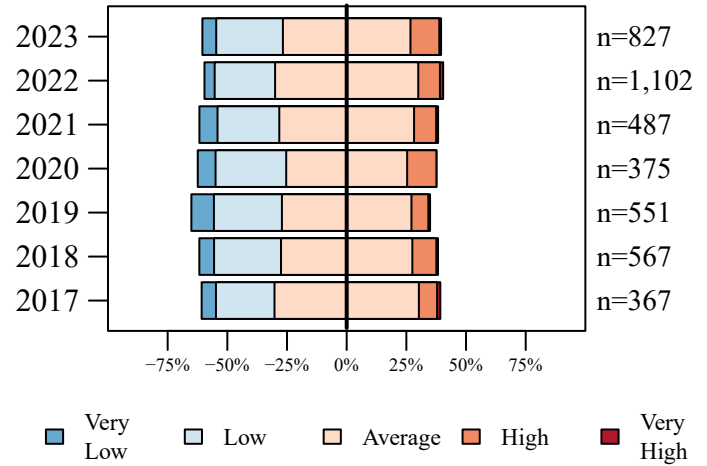


Figure 20. Hunters describe the quality of bucks in the county where they live in DMU 6.

Personal Harvest Change

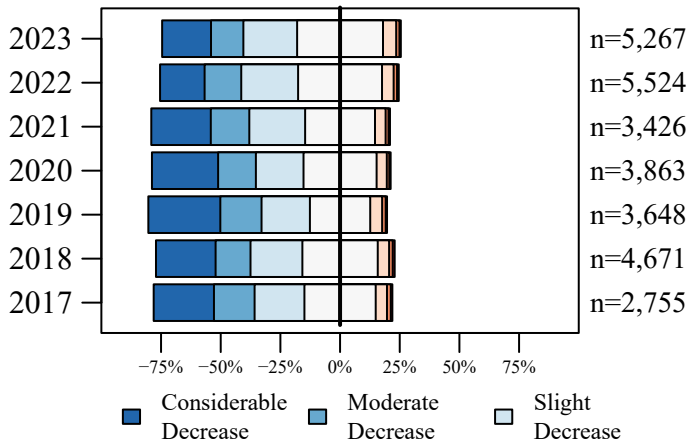


Figure 21. Opinion of hunters on how their personal number of harvested deer has changed over the last five years in a county in DMU 6.

Total Harvest Change

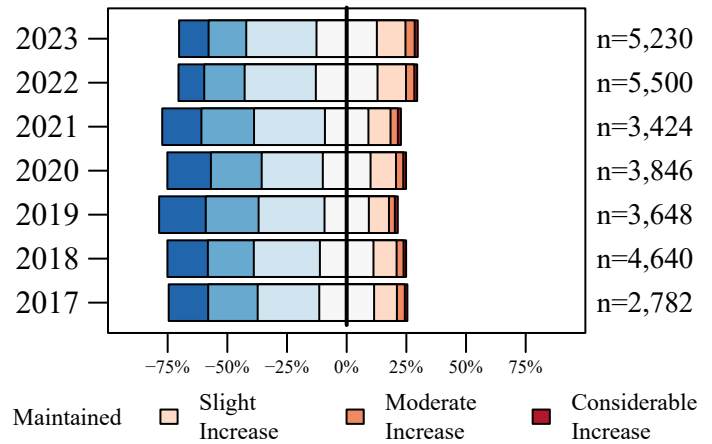


Figure 22. Opinion of hunters on how the total number of harvested deer has changed over the last five years in a county in DMU 6.

Hunter CBAQ

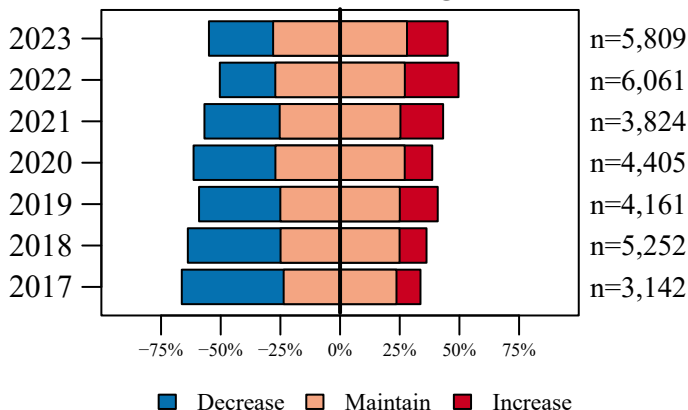


Figure 23. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they hunt in DMU 6.

Resident Hunter CBAQ

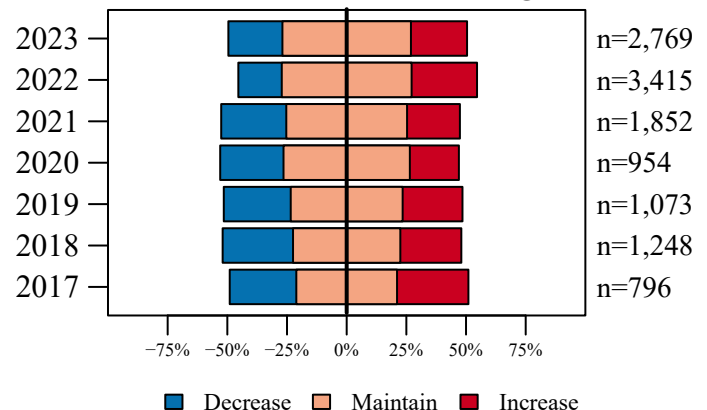


Figure 24. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they live in DMU 6.

DMU 6: South

5/23/2024

Deer Management Survey Results

Resident Nonhunter CBAQ

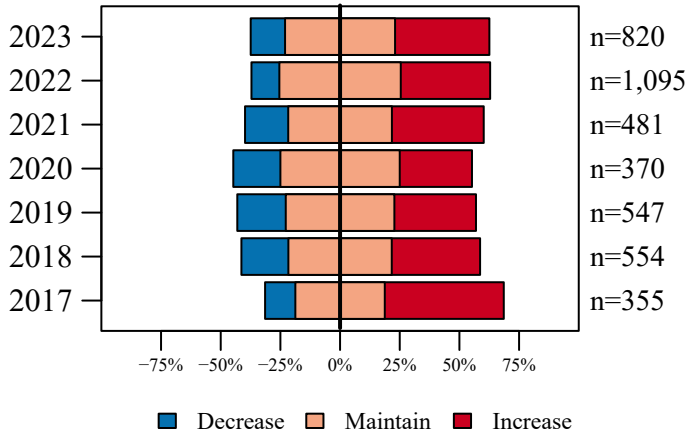


Figure 25. Opinion on how the County Bonus Antlerless Quota should change from nonhunters in the county where they live in DMU 6.

Hunter Opinion

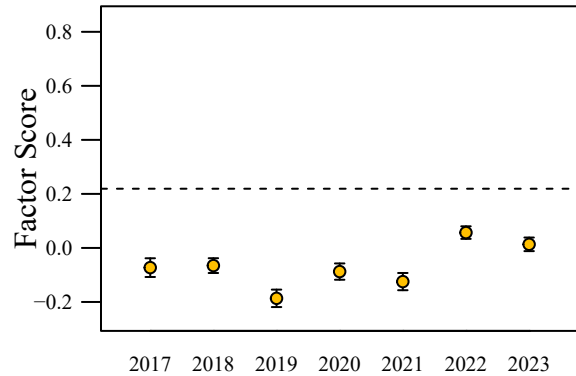


Figure 26. Hunter opinion scores over five years of the deer management survey. The score was aggregated using factor analysis of questions asked only to hunters. The dashed line represents the score if all questions are answered neutrally.

Population Size Opinion

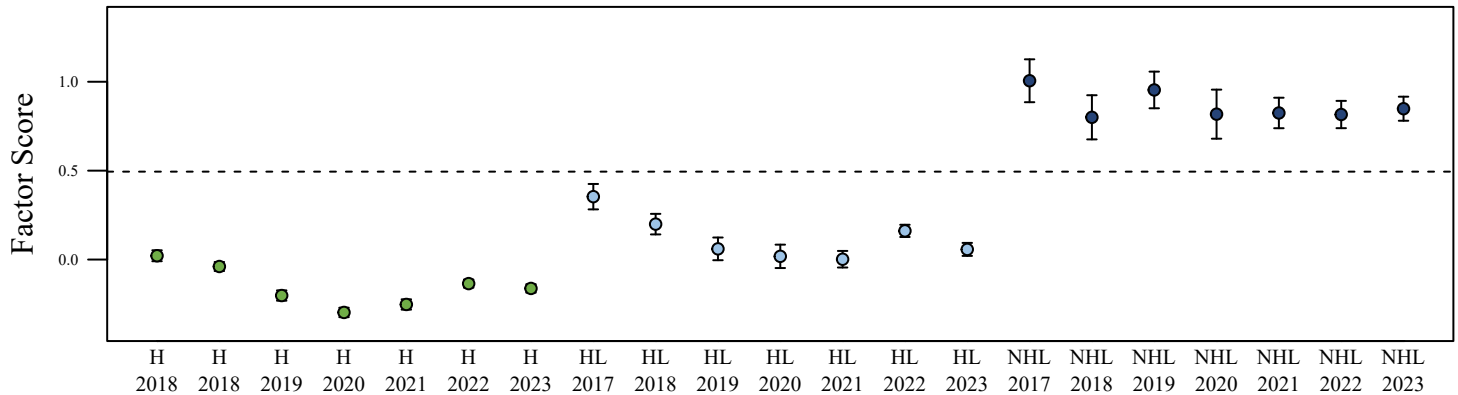


Figure 27. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer population size. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

Deer Management Opinion

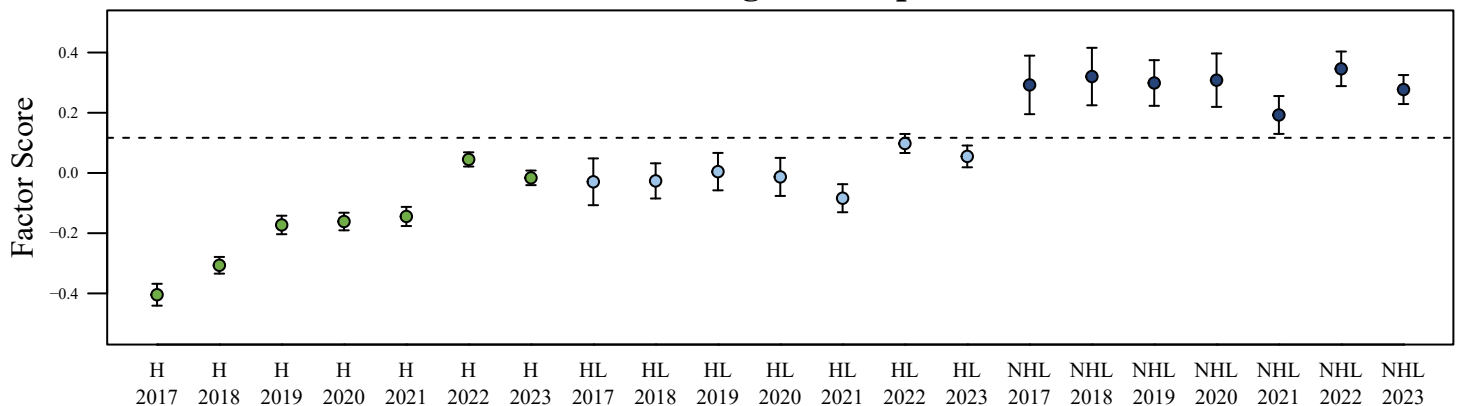


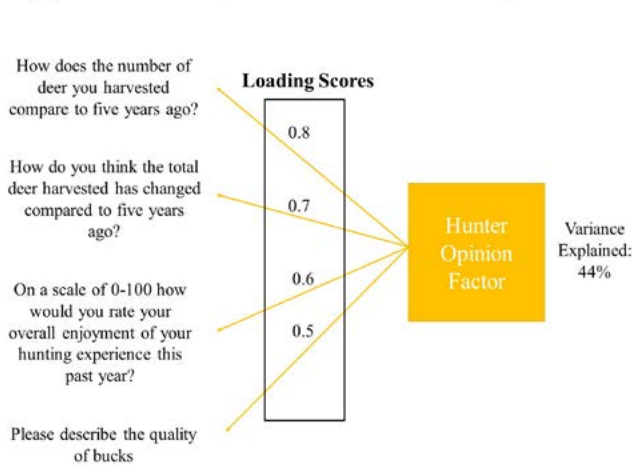
Figure 28. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer management. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

DMU 6: South

5/23/2024

Deer Management Survey Results

(a) Factor Analysis Results: Hunter Questions



(b) Factor Analysis Results: All Group Questions

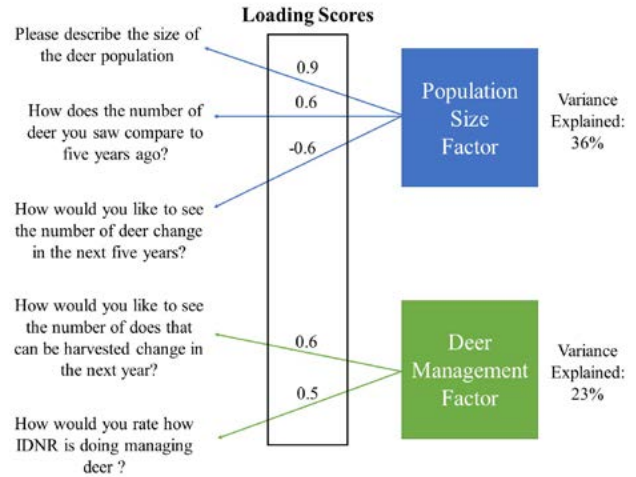


Figure 29. Results from two factor analyses used to develop the hunter opinion (a), population opinion (b), and management opinion (b) scores. Higher loading scores indicate a stronger correlation between the original question and the derived factor. These figures are included to help interpret Figure 26, Figure 27, and Figure 28.

DMU 7: Muscatatuck

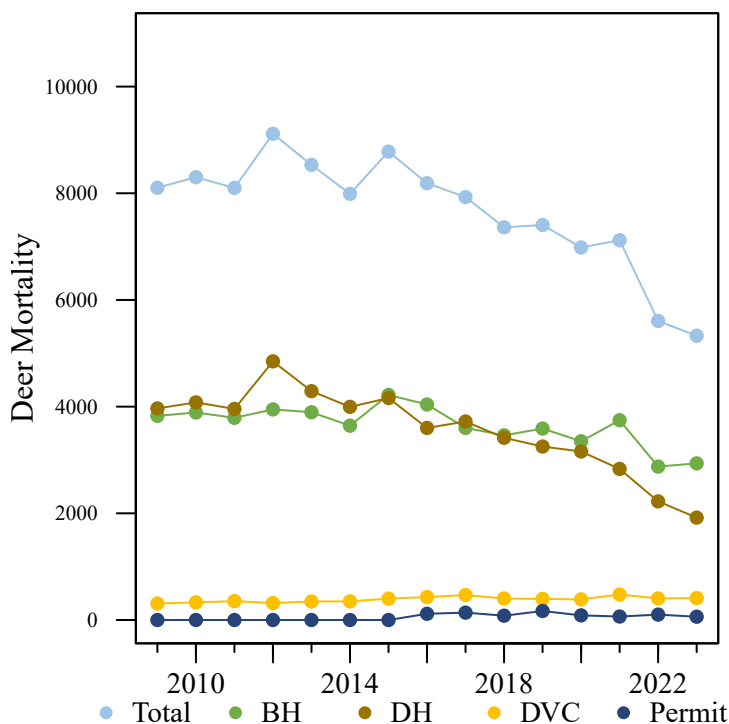
5/23/2024

Total Square Miles: 1,410
Square Miles of Deer Habitat: 824
Percent Deer Habitat: 58

Table 1. Total harvest, buck harvest, and doe harvest (error < 1 percent). Damage permits are issued by DNR to landowners to control deer damage. Deer vehicle collisions (DVC) and miles traveled are reported by the Indiana Department of Transportation. Mean CBAQ is the average county bonus antlerless quota of all counties in the DMU. The trend in total harvest, buck harvest, doe harvest, and DVCs are in standard deviations (SD) and are equivalent to effect size. A change greater than 2 SD is considered both a large and statistically significant effect size.

Year	Total	Total Trend in SD	Buck Harvest	Buck Trend in SD	Buck Harvest per SQ MI Habitat	Doe Harvest	Doe Trend in SD	Doe Harvest per SQ MI Habitat	% Doe in Harvest	Damage Permit Deer Taken	DVC per Billion Miles Traveled	DVC Trend in SD	Mean CBAQ
2009	7,794		3,828		4.6	3,966		4.8	50.9		239.0		6.0
2010	7,970	1.5	3,890	1.4	4.7	4,080	1.7	5.0	51.2		256.3	0.6	6.0
2011	7,747	0.7	3,790	0.7	4.6	3,957	0.7	4.8	51.1		275.5	2.0	7.0
2012	8,797	1.9	3,948	0.9	4.8	4,849	3.0	5.9	55.1		248.7	-0.2	8.0
2013	8,185	0.5	3,895	0.6	4.7	4,290	0.4	5.2	52.4		272.8	1.4	7.0
2014	7,639	-1.1	3,643	-3.7	4.4	3,996	-0.6	4.8	52.3		275.4	1.1	7.0
2015	8,380	0.7	4,219	3.2	5.1	4,161	-0.2	5.0	49.7		315.3	4.0	7.0
2016	7,641	-1.1	4,040	0.7	4.9	3,601	-1.8	4.4	47.1	117	339.5	2.6	7.0
2017	7,323	-1.6	3,602	-1.6	4.4	3,721	-1.0	4.5	50.8	138	370.3	2.2	7.0
2018	6,878	-2.2	3,462	-1.6	4.2	3,416	-1.9	4.1	49.7	81	318.7	0.1	4.0
2019	6,841	-1.3	3,589	-0.6	4.4	3,252	-1.8	3.9	47.5	169	314.2	-0.3	2.0
2020	6,510	-1.4	3,351	-1.3	4.1	3,159	-1.4	3.8	48.5	87	307.6	-1.0	2.5
2021	6,577	-1.0	3,745	0.5	4.5	2,832	-2.6	3.4	43.1	65	382.3	2.1	2.0
2022	5,100	-5.4	2,876	-4.5	3.5	2,224	-3.2	2.7	43.6	101	322.3	-0.5	1.8
2023	4,856	-2.1	2,937	-1.4	3.6	1,919	-2.2	2.3	39.5	62	325.5	-0.1	2.0

(a) Cumulative Known Deer Mortality



(b) Archer Deer Observations

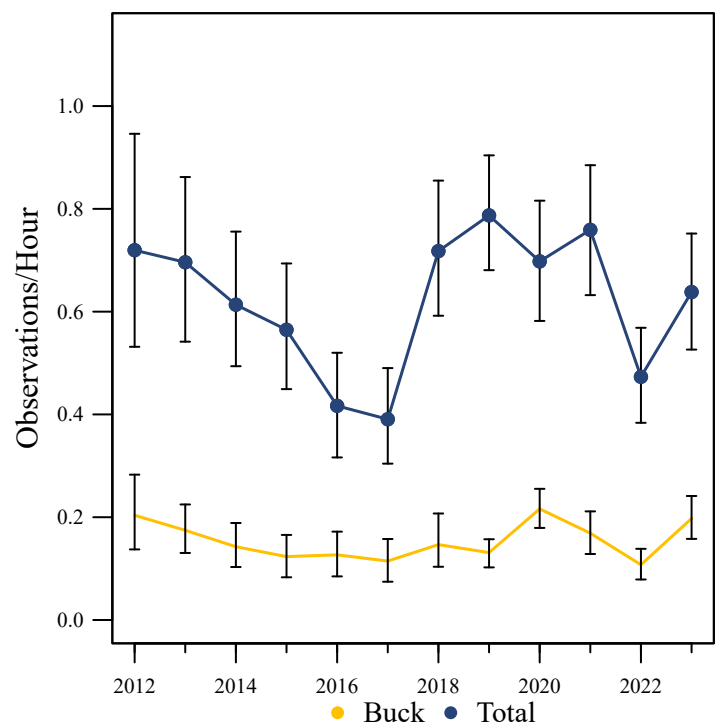


Figure 1. (a) The total known annual deer mortality based on buck harvests (BH), doe harvests (DH), deer vehicle collisions (DVC), and deer permit takes. (b) Total deer and buck observations per hour based on the Archer's Index.

DMU 7: Muscatatuck

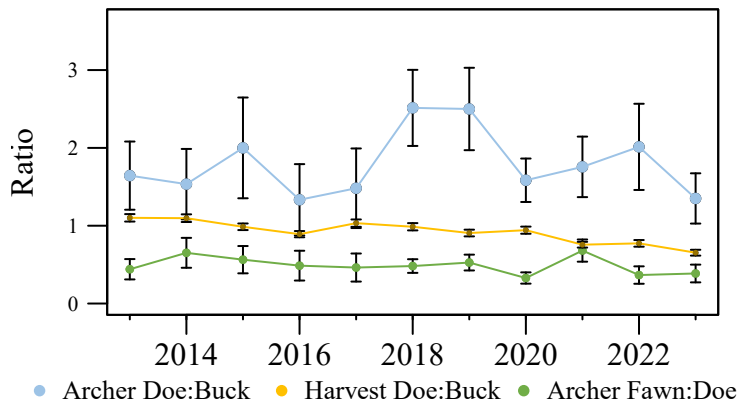
5/23/2024

Total Square Miles: 1,410
Square Miles of Deer Habitat: 824
Percent Deer Habitat: 58

Table 2. Estimated number of antlered (A) and antlerless (AL) deer harvested per hunter. Estimated totals may not match exactly with total number of deer harvested. Reporting errors are examined and investigated as they are located; therefore, subsequent reports may contain corrected totals.

Year	Total Hunters	0 A	1 A	2 A	3 A	0 AL	1 AL	2 AL	3 AL	4 AL	5 AL	6 AL	7 AL	8 AL	9 AL	10 AL
2016	5,548	2,428	3,051	69	0	2,288	2,388	652	161	36	14	5	2	0	1	1
2017	5,280	2,566	2,699	15	0	2,014	2,367	638	159	61	25	11	2	2	1	0
2018	5,010	2,408	2,589	13	0	1,864	2,290	648	162	39	7	0	0	0	0	0
2019	5,230	2,415	2,802	11	2	2,041	2,474	626	71	18	0	0	0	0	0	0
2020	4,906	2,264	2,629	12	1	1,916	2,252	631	91	13	3	0	0	0	0	0
2021	5,186	2,141	3,034	11	0	2,303	2,289	558	30	5	0	1	0	0	0	0
2022	4,129	1,838	2,286	5	0	1,743	1,995	368	20	2	1	0	0	0	0	0
2023	3,999	1,434	2,547	18	0	2,058	1,629	296	12	4	0	0	0	0	0	0

(a) Deer Ratios



(b) Boone and Crockett

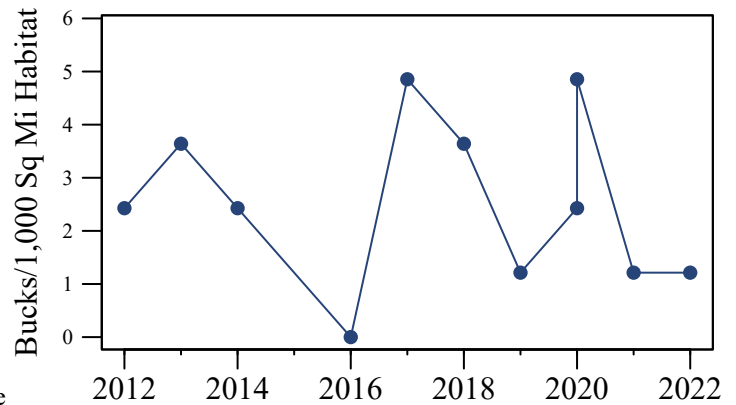
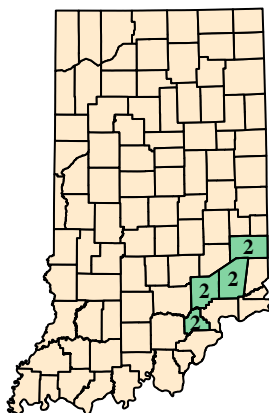


Figure 2. (a) Annual doe:buck ratios and fawn:doe ratios based on the Archer's Index and harvest records. (b) The number of Boone and Crockett bucks (minimum 160 score) per 1,000 square miles of deer habitat.

(a) Counties in DMU 7



(b) Deer Habitat in DMU 7

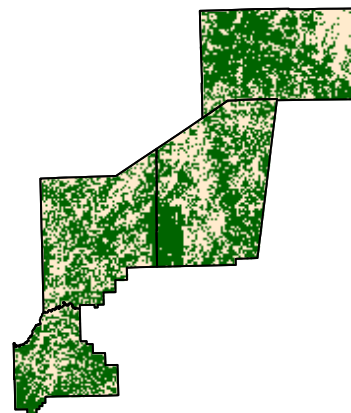


Figure 3. (a) Counties included in DMU 7 for summarizing harvest and deer management survey statistics. Labels are the 2023 county bonus antlerless quotas. (b) Green represents the land use types classified as deer habitat in DMU 7.

DMU 7: Muscatatuck

5/23/2024

Deer Management Survey Results

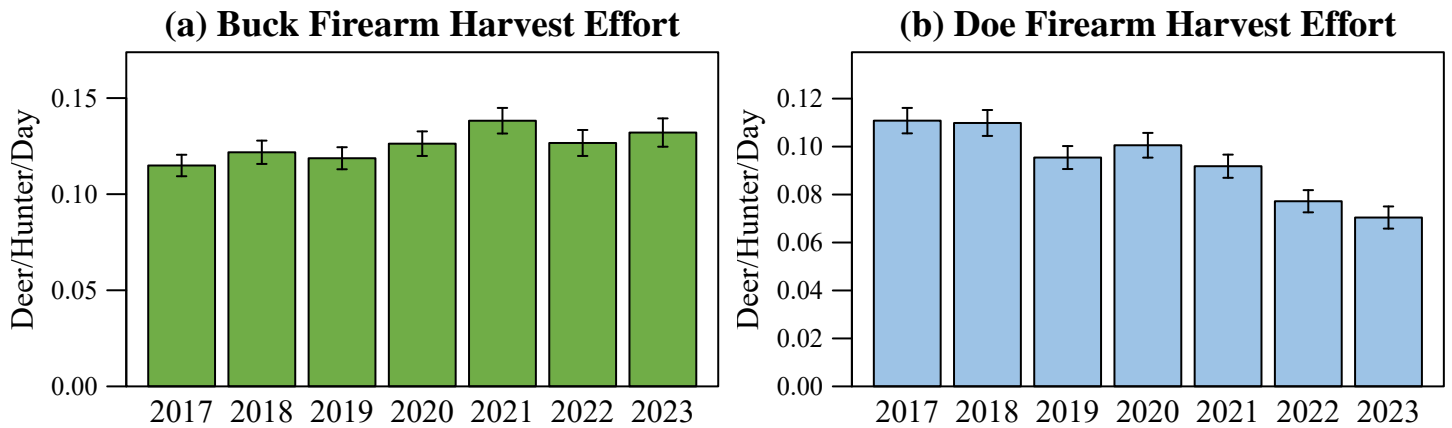


Figure 4. Firearm harvest effort is the number of bucks (a) and does (b) killed by firearms per hunter divided by the mean number of days hunted per hunter during the firearm season based on data reported in the deer management survey. Larger values (i.e. taller bars) indicate less effort required to harvest a deer.

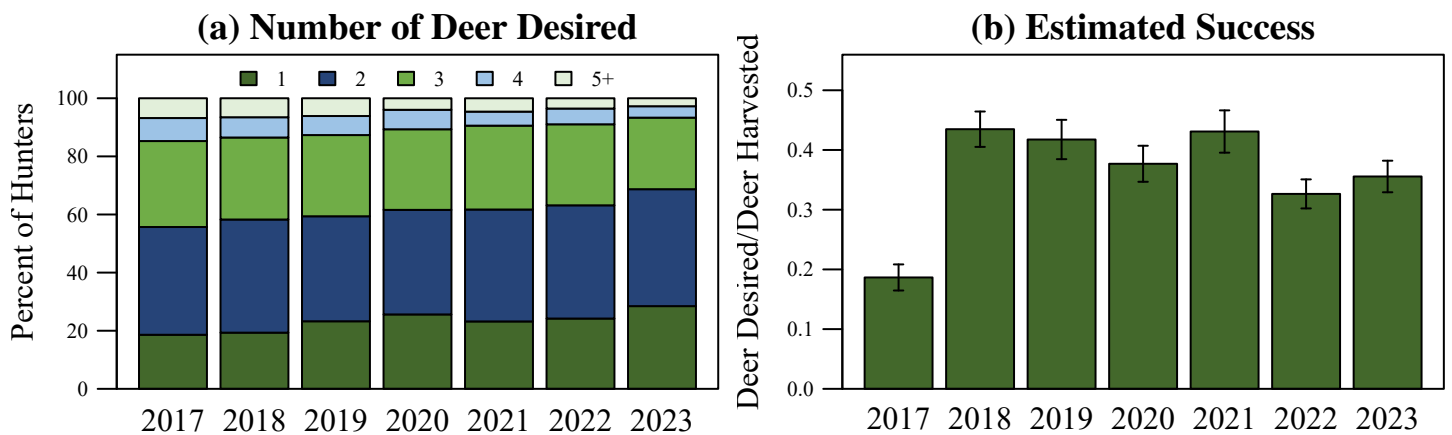


Figure 5. (a) The annual percent of hunters wishing to harvest each number of deer as reported in the deer management survey. (b) Success rate is estimated from the deer management survey as the Number of Harvested Deer/Number of Deer Desired (reported only; does not account for attempts that were not made). Larger values (i.e. taller bars) indicate greater success.

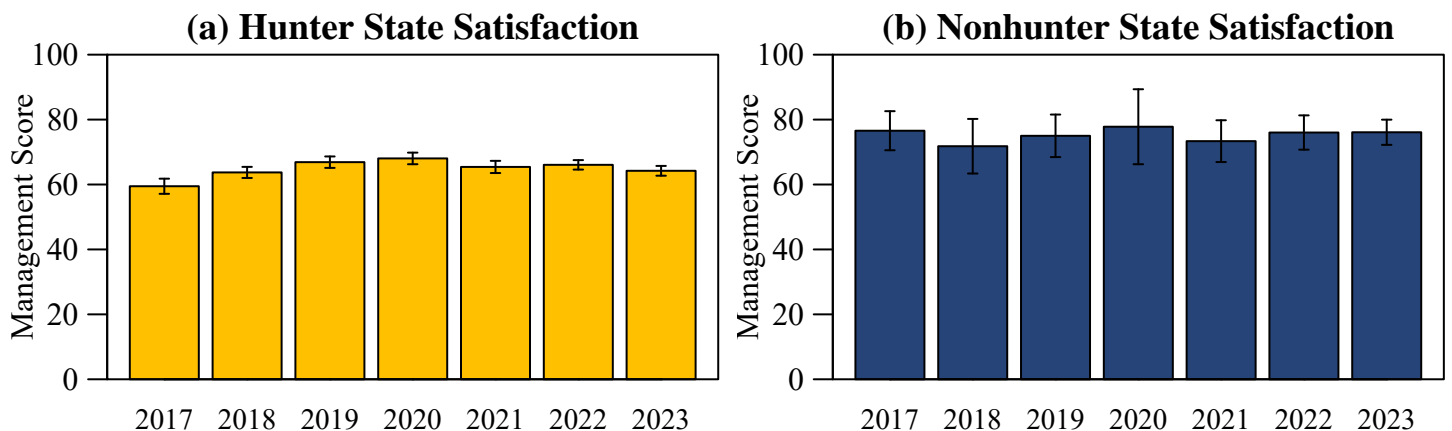


Figure 6. Hunters (a) and nonhunters (b) were asked to score the DNR's statewide deer management on a scale of 0 (poor) to 100 (excellent).

DMU 7: Muscatatuck

5/23/2024

Deer Management Survey Results

Hunter Satisfaction

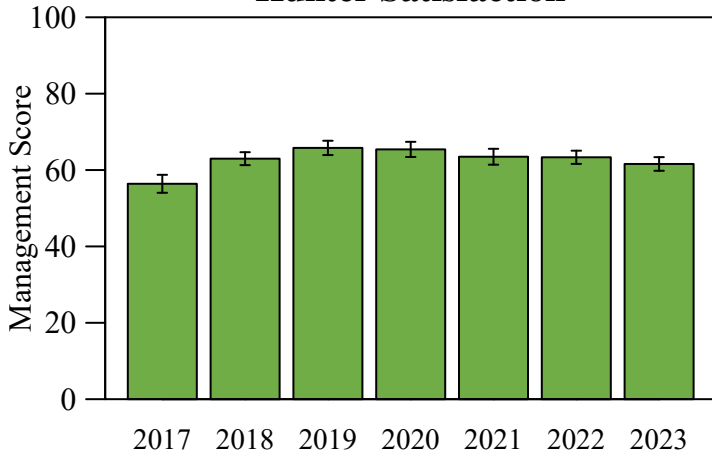


Figure 7. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 7 where they hunt.

Resident Hunter Satisfaction

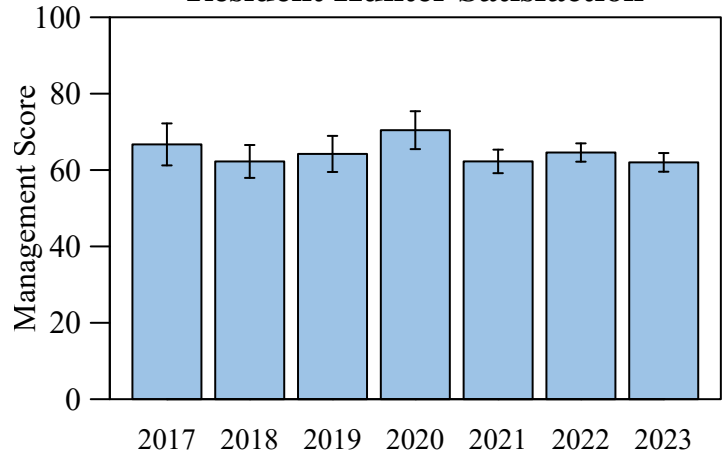


Figure 8. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 7 where they live.

Resident Nonhunter Satisfaction

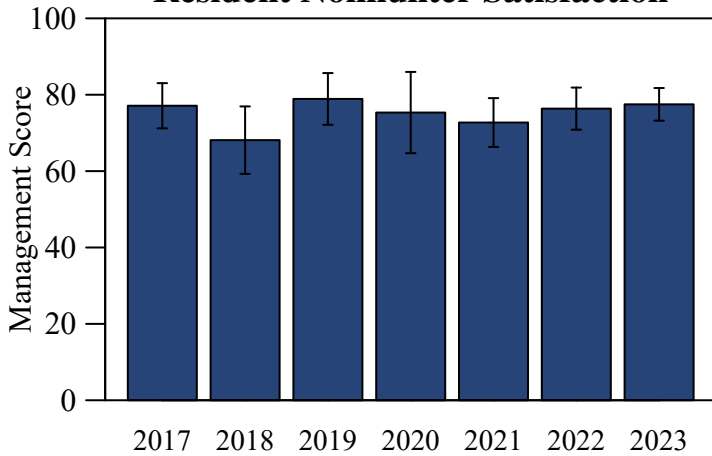


Figure 9. Nonhunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 7 where they live.

Hunter Population Size

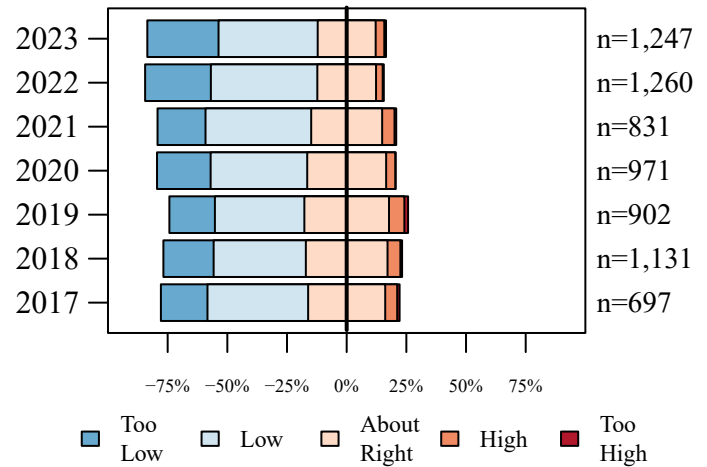


Figure 10. The current size of the deer population described by hunters in the county where they hunt in DMU 7.

Resident Hunter Population Size

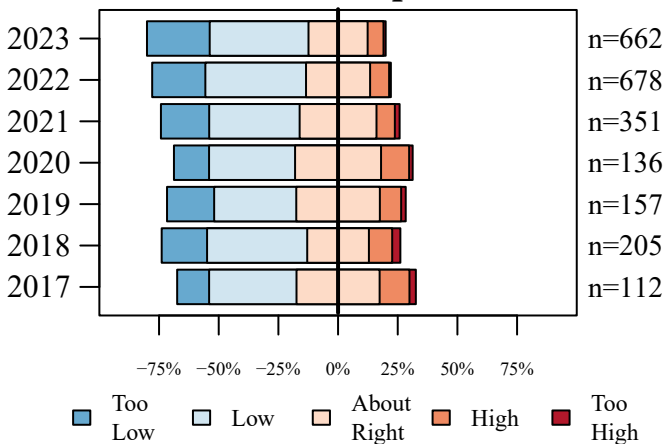


Figure 11. The current size of the deer population described by hunters in the county where they live in DMU 7.

Resident Nonhunter Population Size

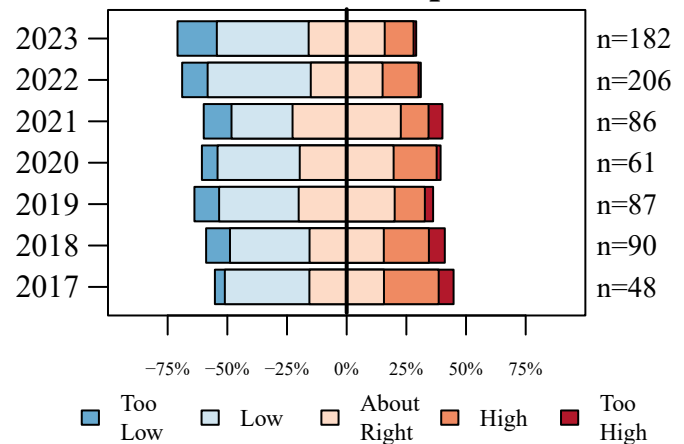


Figure 12. The current size of the deer population described by nonhunters in the county where they live in DMU 7.

DMU 7: Muscatatuck

5/23/2024

Deer Management Survey Results

Hunter Perceived Change

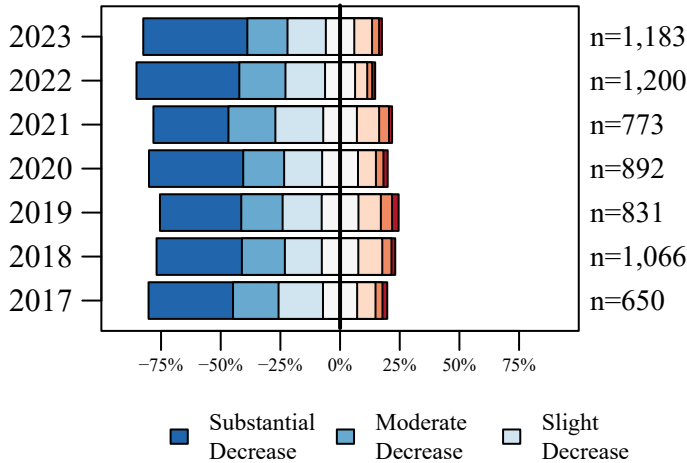


Figure 13. The number of deer seen compared to five years ago described by hunters in the county where they hunt in DMU 7.

Resident Hunter Perceived Change

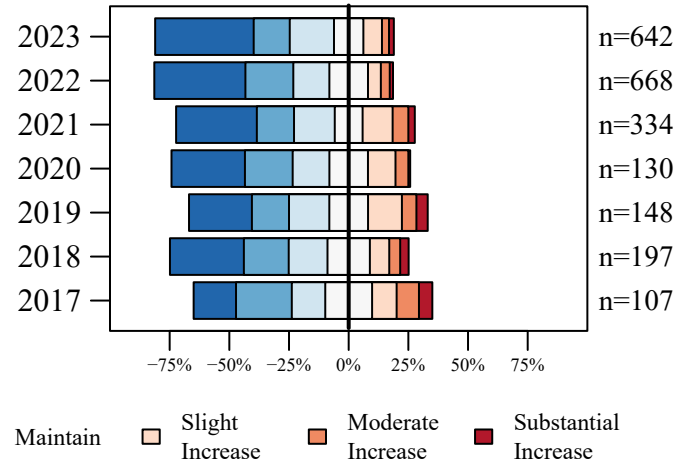


Figure 14. The number of deer seen compared to five years ago described by hunters in the county where they live in DMU 7.

Resident Nonhunter Perceived Change

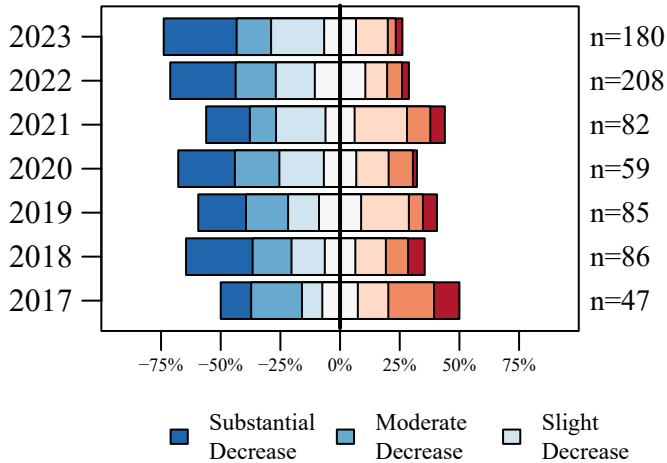


Figure 15. The number of deer seen compared to five years ago described by nonhunters in the county where they live in DMU 7.

Hunter Desired Change

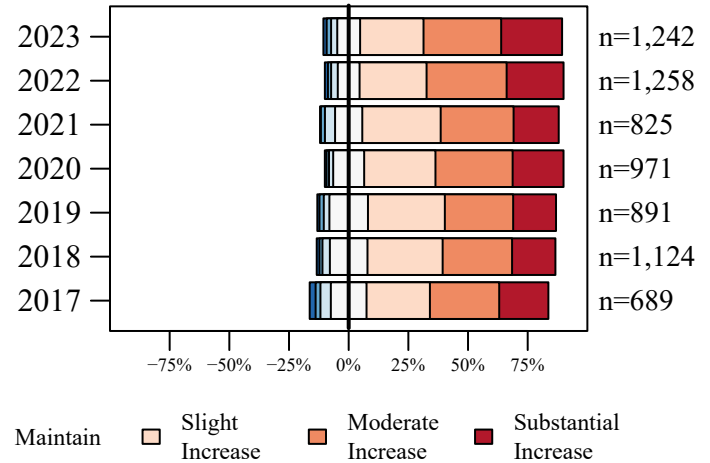


Figure 16. The desired change in the size of the deer population described by hunters in the county where they hunt in DMU 7.

Resident Hunter Desired Change

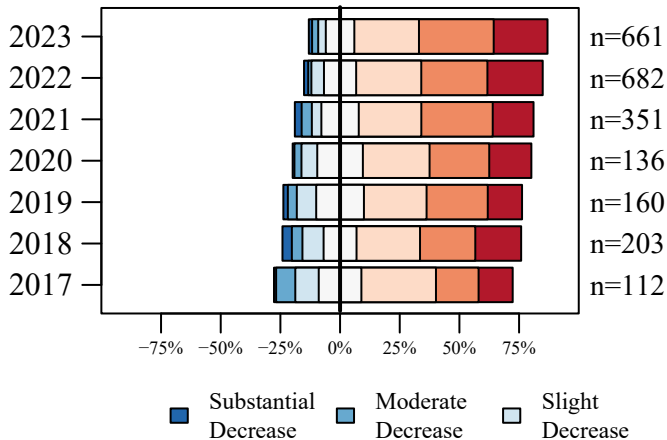


Figure 17. The desired change in the size of the deer population described by hunters in the county where they live in DMU 7.

Resident Nonhunter Desired Change

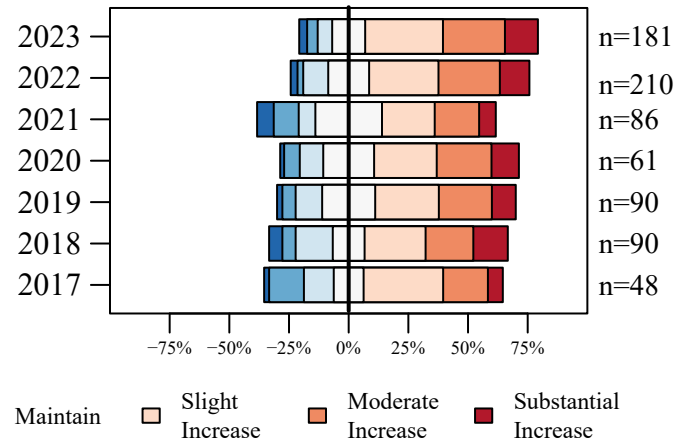


Figure 18. The desired change in the size of the deer population described by nonhunters in the county where they live in DMU 7.

DMU 7: Muscatatuck

5/23/2024

Deer Management Survey Results

Hunter Buck Quality

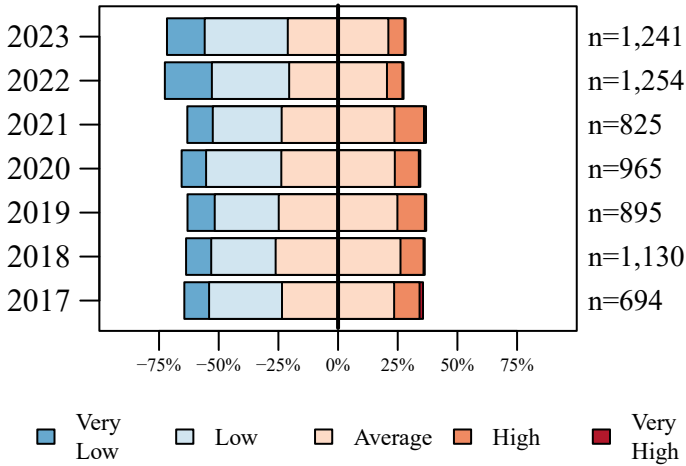


Figure 19. Hunters describe the quality of bucks in the county where they hunt in DMU 7.

Resident Hunter Buck Quality

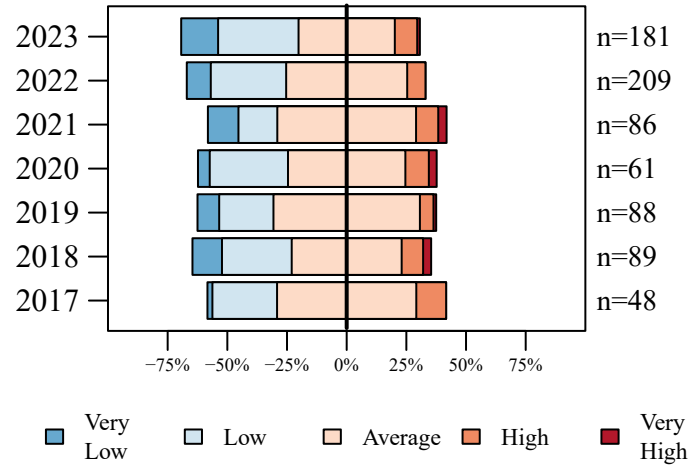


Figure 20. Hunters describe the quality of bucks in the county where they live in DMU 7.

Personal Harvest Change

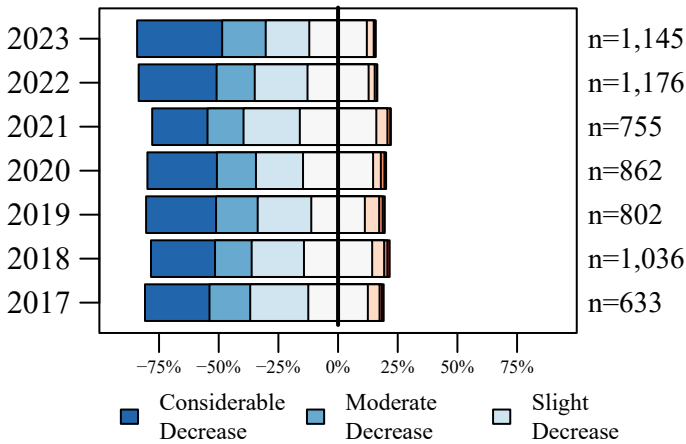


Figure 21. Opinion of hunters on how their personal number of harvested deer has changed over the last five years in a county in DMU 7.

Total Harvest Change

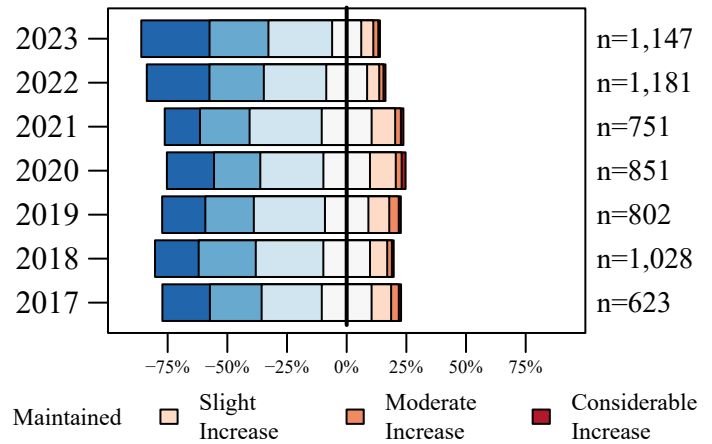


Figure 22. Opinion of hunters on how the total number of harvested deer has changed over the last five years in a county in DMU 7.

Hunter CBAQ

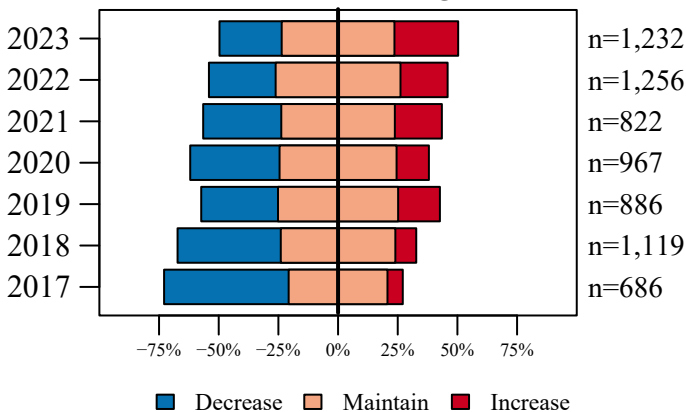


Figure 23. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they hunt in DMU 7.

Resident Hunter CBAQ

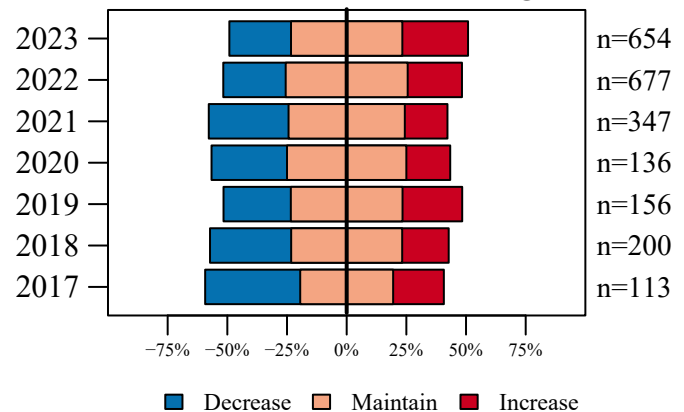


Figure 24. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they live in DMU 7.

DMU 7: Muscatatuck

5/23/2024

Deer Management Survey Results

Resident Nonhunter CBAQ

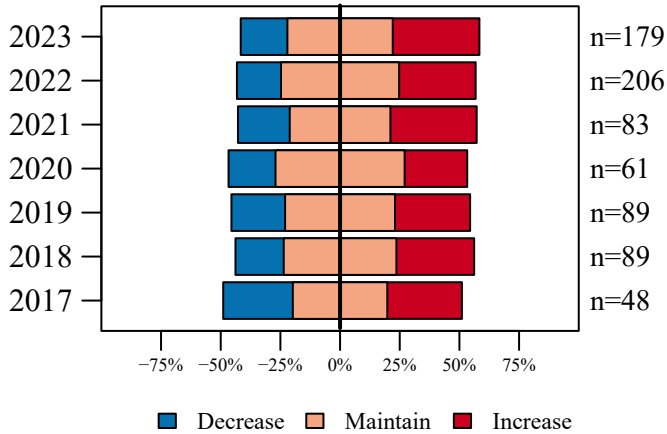


Figure 25. Opinion on how the County Bonus Antlerless Quota should change from nonhunters in the county where they live in DMU 7.

Hunter Opinion

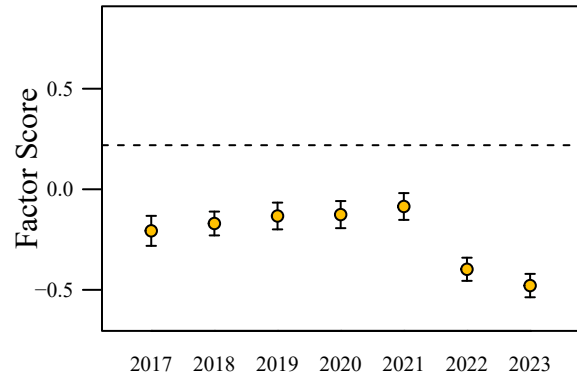


Figure 26. Hunter opinion scores over five years of the deer management survey. The score was aggregated using factor analysis of questions asked only to hunters. The dashed line represents the score if all questions are answered neutrally.

Population Size Opinion

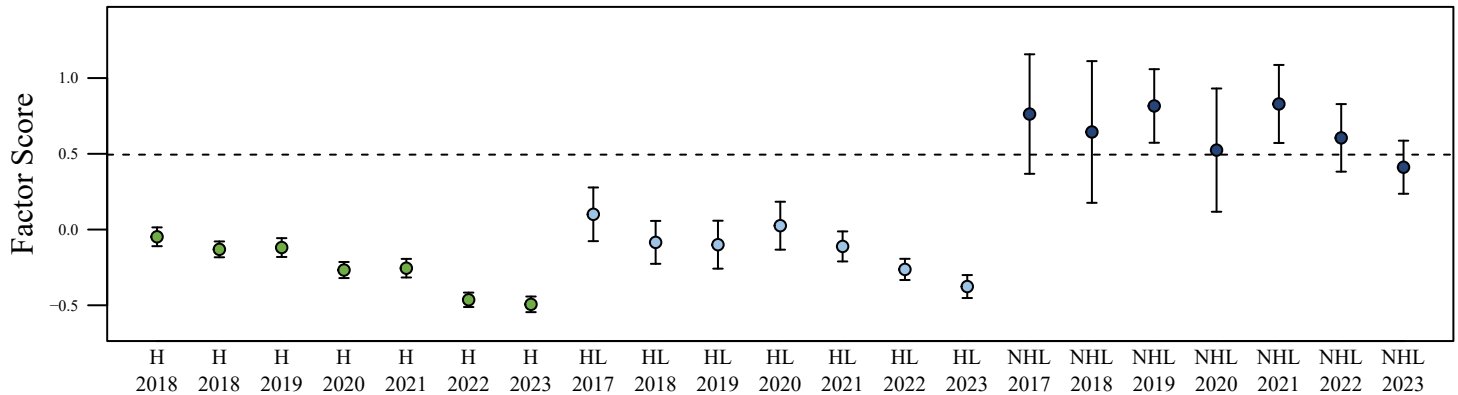


Figure 27. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer population size. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

Deer Management Opinion

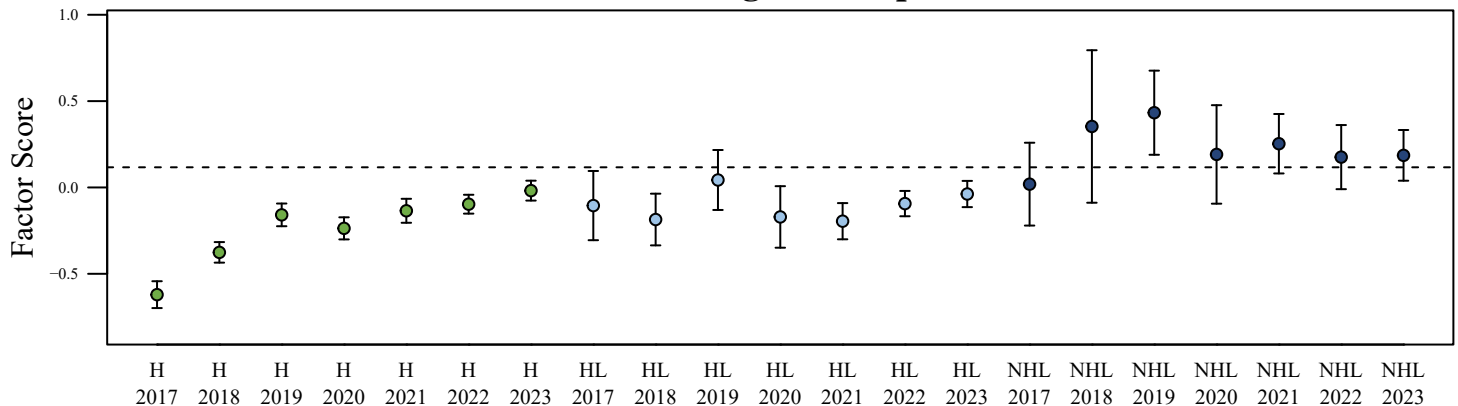
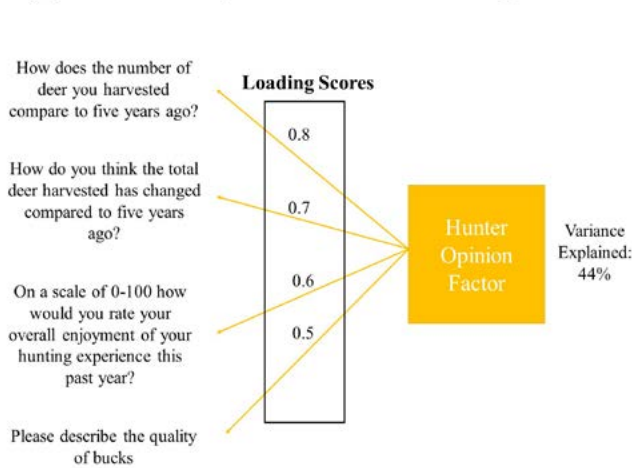


Figure 28. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer management. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

(a) Factor Analysis Results: Hunter Questions



(b) Factor Analysis Results: All Group Questions

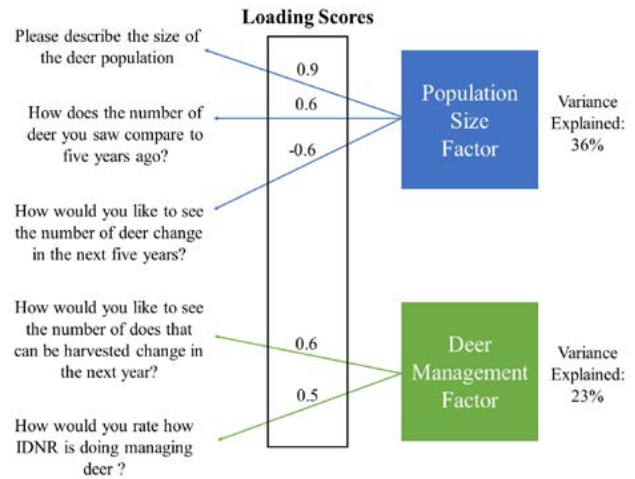


Figure 29. Results from two factor analyses used to develop the hunter opinion (a), population opinion (b), and management opinion (b) scores. Higher loading scores indicate a stronger correlation between the original question and the derived factor. These figures are included to help interpret Figure 26, Figure 27, and Figure 28.

DMU 8: Dearborn

5/23/2024

Total Square Miles: 618
Square Miles of Deer Habitat: 504
Percent Deer Habitat: 82

Table 1. Total harvest, buck harvest, and doe harvest (error < 1 percent). Damage permits are issued by DNR to landowners to control deer damage. Deer vehicle collisions (DVC) and miles traveled are reported by the Indiana Department of Transportation. Mean CBAQ is the average county bonus antlerless quota of all counties in the DMU. The trend in total harvest, buck harvest, doe harvest, and DVCs are in standard deviations (SD) and are equivalent to effect size. A change greater than 2 SD is considered both a large and statistically significant effect size.

Year	Total	Total Trend in SD	Buck Harvest	Buck Trend in SD	Buck Harvest per SQ MI Habitat	Doe Harvest	Doe Trend in SD	Doe Harvest per SQ MI Habitat	% Doe in Harvest	Damage Permit Deer Taken	DVC per Billion Miles Traveled	DVC Trend in SD	Mean CBAQ
2009	7,264		3,444		6.8	3,820		7.6	52.6		567.6		8.0
2010	7,333	1.6	3,403	1.3	6.8	3,930	1.9	7.8	53.6		614.9	0.3	8.0
2011	7,323	1.0	3,353	0.8	6.7	3,970	1.4	7.9	54.2		511.7	-1.7	8.0
2012	7,849	2.1	3,333	0.5	6.6	4,516	5.2	9.0	57.5		486.7	-1.5	8.0
2013	6,226	-2.0	2,789	-1.8	5.5	3,437	-1.6	6.8	55.2		512.5	-0.7	8.0
2014	6,077	-1.9	2,733	-2.0	5.4	3,344	-1.5	6.6	55.0		462.9	-1.5	6.7
2015	6,023	-1.2	3,108	0.0	6.2	2,915	-2.0	5.8	48.4		540.3	0.4	5.3
2016	5,514	-1.4	2,965	-0.3	5.9	2,549	-1.8	5.1	46.2	175	424.9	-2.7	4.0
2017	5,205	-1.3	2,537	-1.8	5.0	2,668	-0.9	5.3	51.3	130	438.6	-1.1	4.0
2018	4,684	-2.6	2,353	-2.2	4.7	2,331	-1.6	4.6	49.8	174	415.6	-1.2	3.3
2019	4,733	-1.3	2,586	-0.5	5.1	2,147	-1.6	4.3	45.4	127	499.3	0.9	2.0
2020	4,921	-0.6	2,549	-0.5	5.1	2,372	-0.5	4.7	48.2	107	409.6	-1.0	2.0
2021	4,452	-1.6	2,478	-0.5	4.9	1,974	-2.2	3.9	44.3	102	429.3	-0.2	2.0
2022	4,046	-2.7	2,200	-3.3	4.4	1,846	-1.7	3.7	45.6	130	364.5	-2.1	2.0
2023	3,629	-2.8	2,020	-2.6	4.0	1,609	-2.3	3.2	44.3	80	367.7	-1.1	1.3

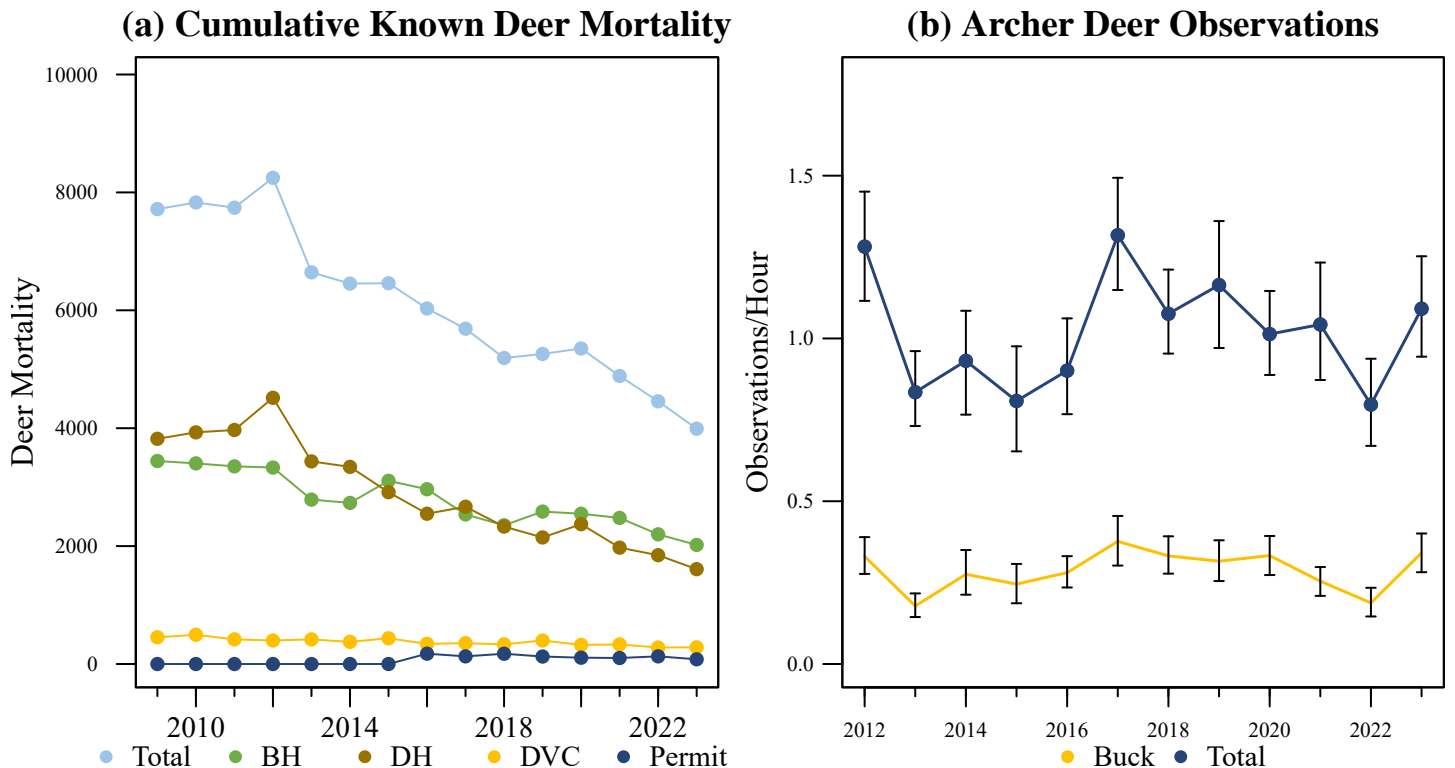


Figure 1. (a) The total known annual deer mortality based on buck harvests (BH), doe harvests (DH), deer vehicle collisions (DVC), and deer permit takes. (b) Total deer and buck observations per hour based on the Archer's Index.

DMU 8: Dearborn

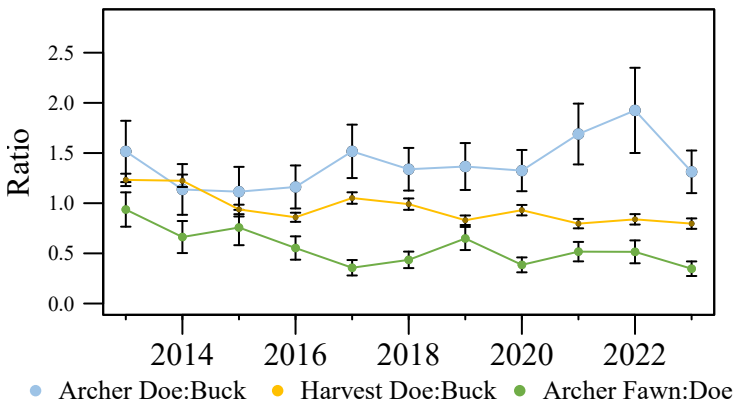
5/23/2024

Total Square Miles: 618
Square Miles of Deer Habitat: 504
Percent Deer Habitat: 82

Table 2. Estimated number of antlered (A) and antlerless (AL) deer harvested per hunter. Estimated totals may not match exactly with total number of deer harvested. Reporting errors are examined and investigated as they are located; therefore, subsequent reports may contain corrected totals.

Year	Total Hunters	0 A	1 A	2 A	3 A	0 AL	1 AL	2 AL	3 AL	4 AL	5 AL	6 AL	7 AL	8 AL	9 AL	10 AL
2016	4,164	1,739	2,389	36	0	1,847	1,740	452	94	29	1	1	0	0	0	0
2017	3,772	1,787	1,979	6	0	1,467	1,634	486	141	37	5	2	0	0	0	0
2018	3,425	1,550	1,868	7	0	1,354	1,514	421	107	24	4	0	0	0	1	0
2019	3,619	1,459	2,151	9	0	1,595	1,560	412	34	14	3	0	1	0	0	0
2020	3,710	1,594	2,098	18	0	1,543	1,646	441	66	10	3	1	0	0	0	0
2021	3,454	1,327	2,108	19	0	1,592	1,468	358	28	4	2	2	0	0	0	0
2022	3,093	1,257	1,826	10	0	1,376	1,300	372	32	7	5	0	1	0	0	0
2023	2,942	1,195	1,740	7	0	1,363	1,326	227	16	5	3	2	0	0	0	0

(a) Deer Ratios



(b) Boone and Crockett

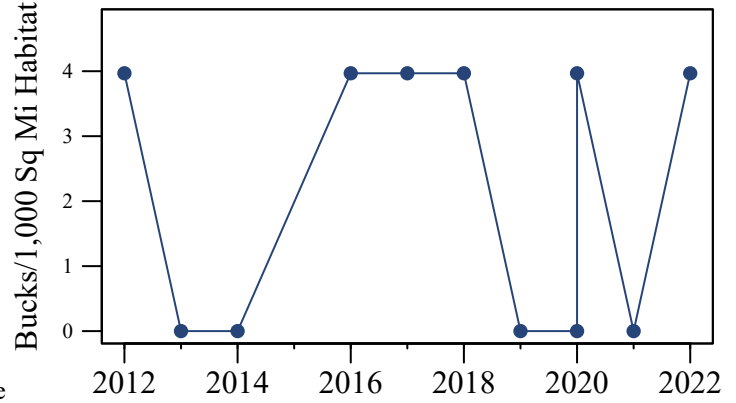
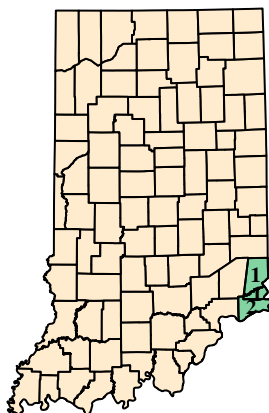


Figure 2. (a) Annual doe:buck ratios and fawn:doe ratios based on the Archer's Index and harvest records. (b) The number of Boone and Crockett bucks (minimum 160 score) per 1,000 square miles of deer habitat.

(a) Counties in DMU 8



(b) Deer Habitat in DMU 8

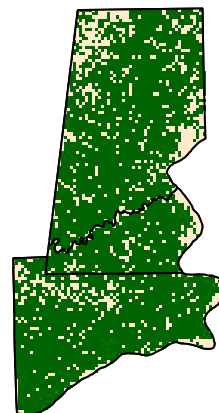


Figure 3. (a) Counties included in DMU 8 for summarizing harvest and deer management survey statistics. Labels are the 2023 county bonus antlerless quotas. (b) Green represents the land use types classified as deer habitat in DMU 8.

DMU 8: Dearborn

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Deer Management Survey Results

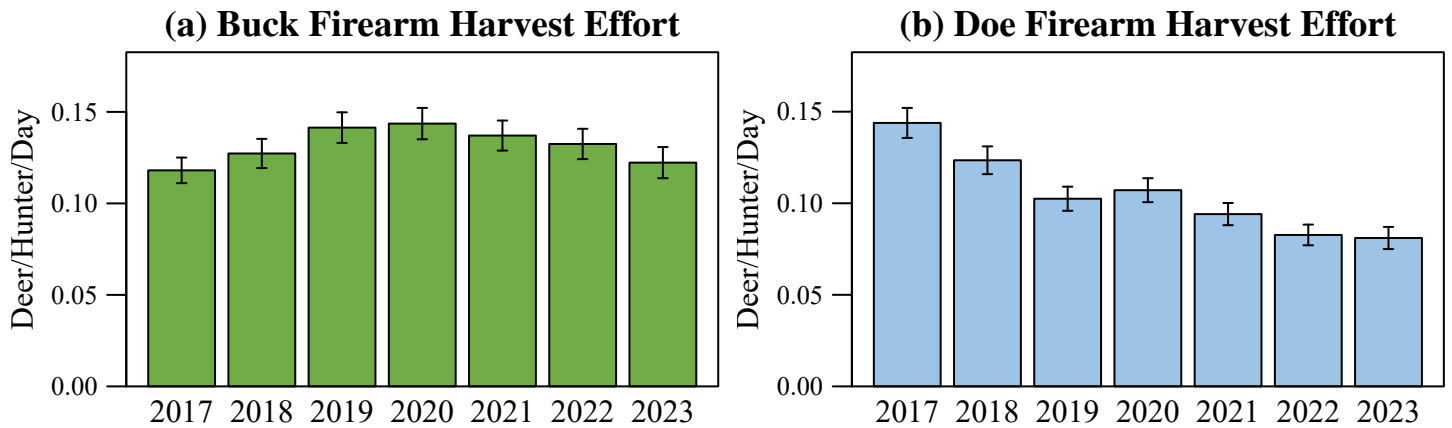


Figure 4. Firearm harvest effort is the number of bucks (a) and does (b) killed by firearms per hunter divided by the mean number of days hunted per hunter during the firearm season based on data reported in the deer management survey. Larger values (i.e. taller bars) indicate less effort required to harvest a deer.

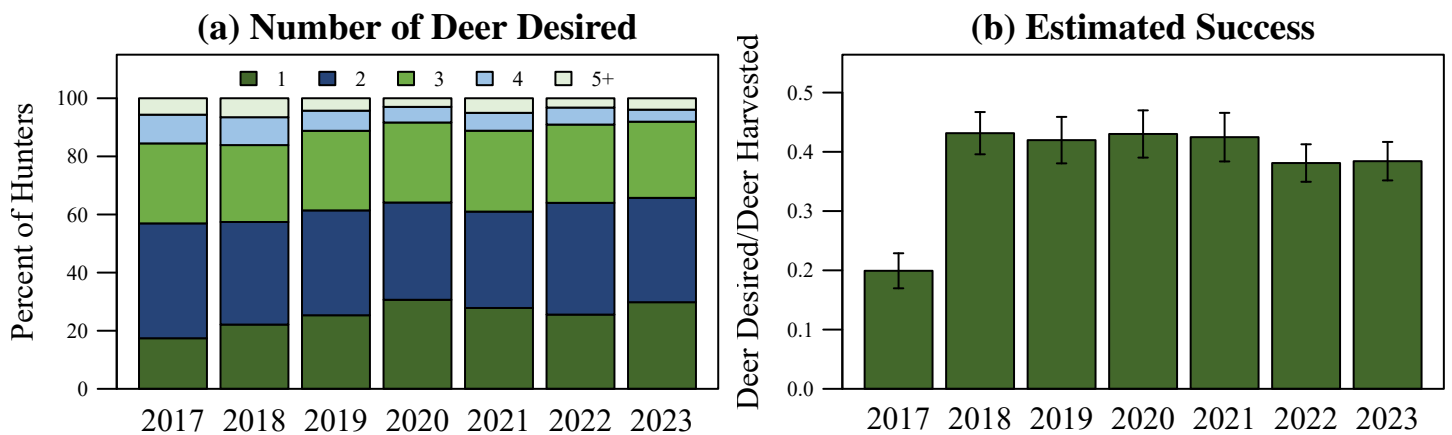


Figure 5. (a) The annual percent of hunters wishing to harvest each number of deer as reported in the deer management survey. (b) Success rate is estimated from the deer management survey as the Number of Harvested Deer/Number of Deer Desired (reported only; does not account for attempts that were not made). Larger values (i.e. taller bars) indicate greater success.

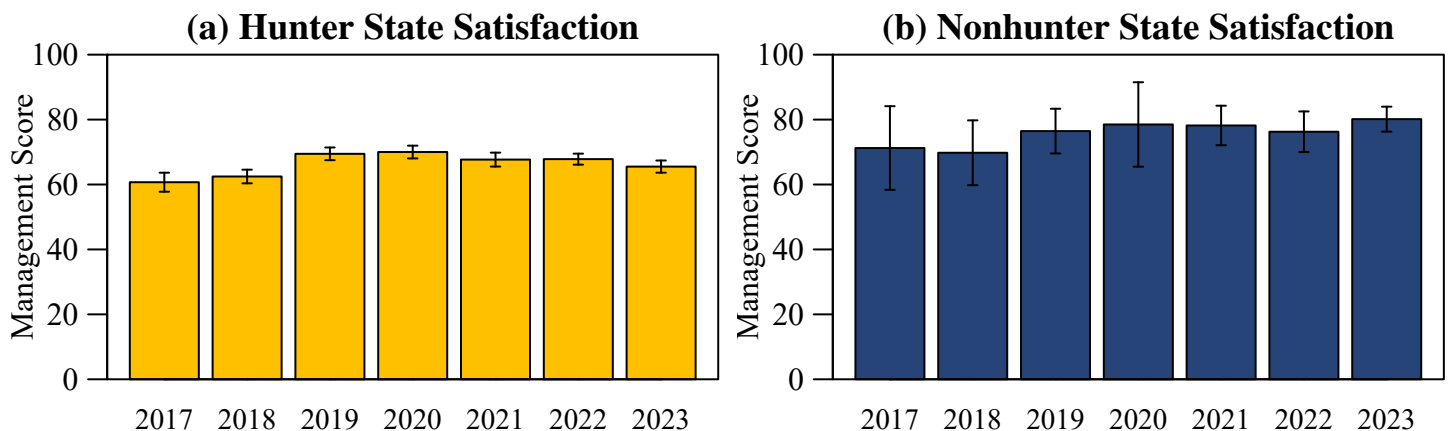


Figure 6. Hunters (a) and nonhunters (b) were asked to score the DNR's statewide deer management on a scale of 0 (poor) to 100 (excellent).

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Deer Management Survey Results

Hunter Satisfaction

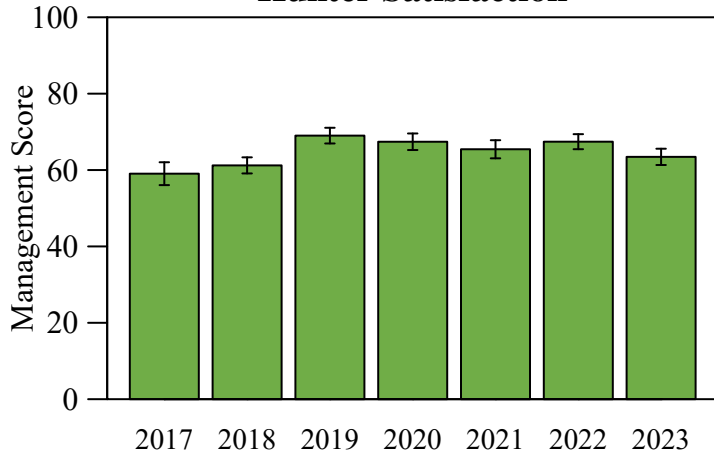


Figure 7. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 8 where they hunt.

Resident Hunter Satisfaction

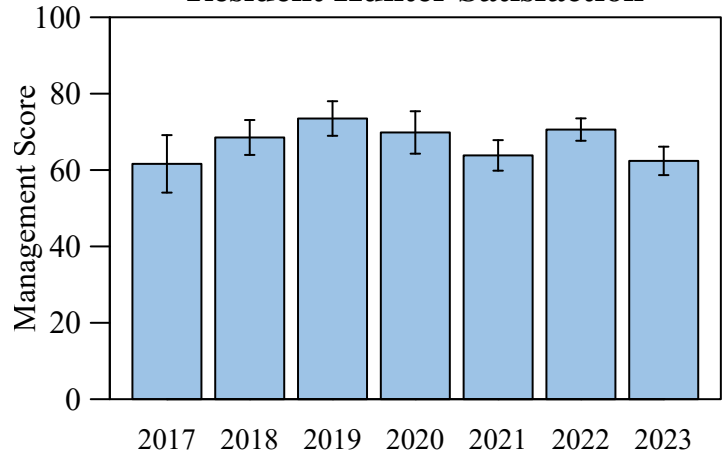


Figure 8. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 8 where they live.

Resident Nonhunter Satisfaction

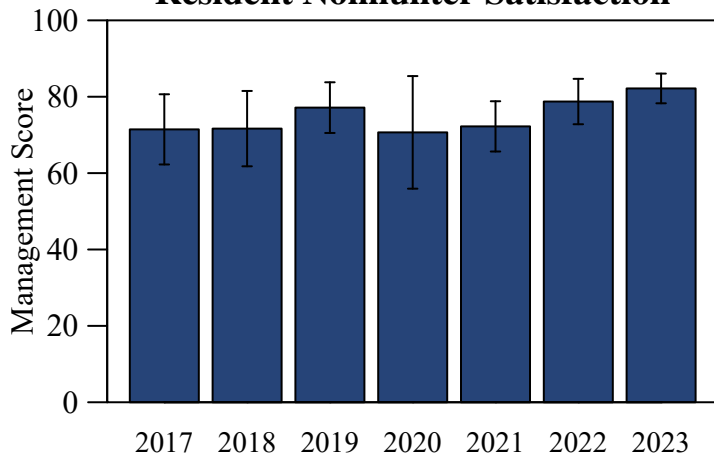


Figure 9. Nonhunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 8 where they live.

Hunter Population Size

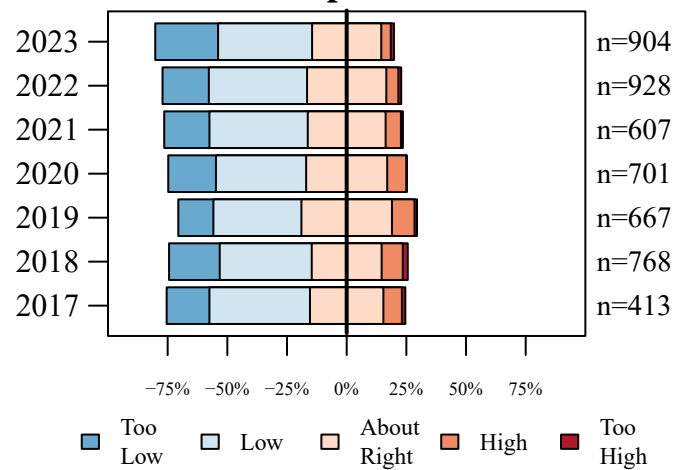


Figure 10. The current size of the deer population described by hunters in the county where they hunt in DMU 8.

Resident Hunter Population Size

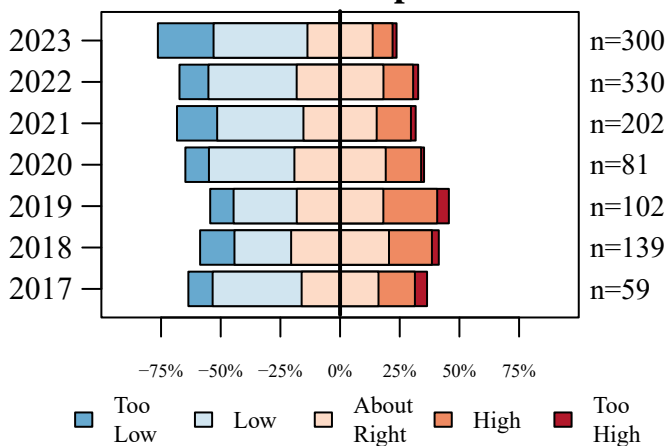


Figure 11. The current size of the deer population described by hunters in the county where they live in DMU 8.

Resident Nonhunter Population Size

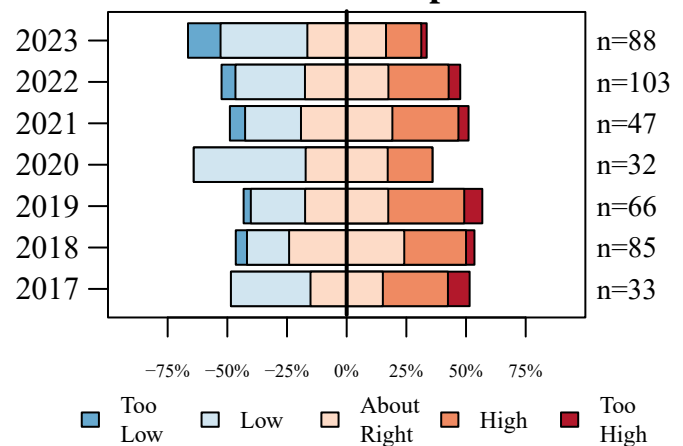


Figure 12. The current size of the deer population described by nonhunters in the county where they live in DMU 8.

DMU 8: Dearborn

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Deer Management Survey Results

Hunter Perceived Change

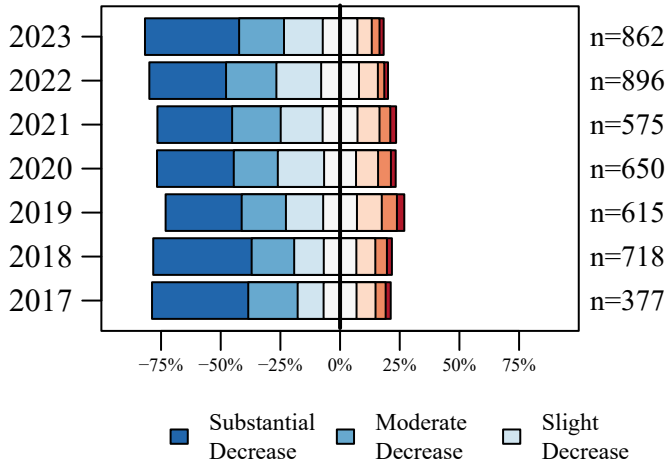


Figure 13. The number of deer seen compared to five years ago described by hunters in the county where they hunt in DMU 8.

Resident Hunter Perceived Change

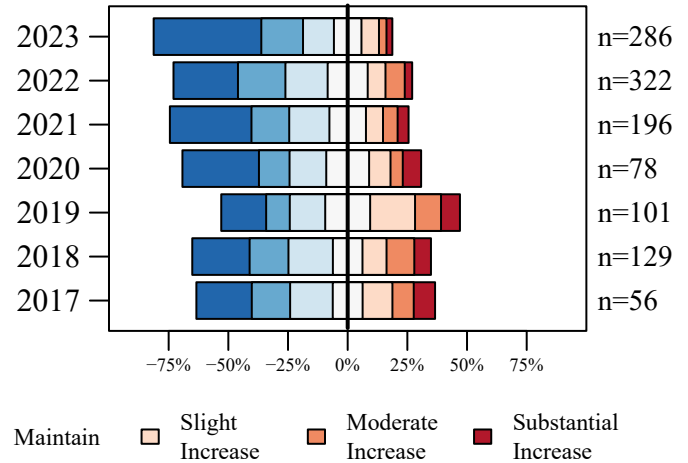


Figure 14. The number of deer seen compared to five years ago described by hunters in the county where they live in DMU 8.

Resident Nonhunter Perceived Change

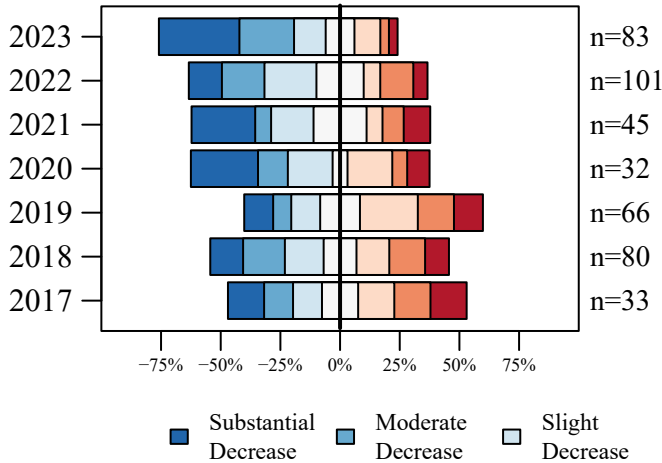


Figure 15. The number of deer seen compared to five years ago described by nonhunters in the county where they live in DMU 8.

Hunter Desired Change

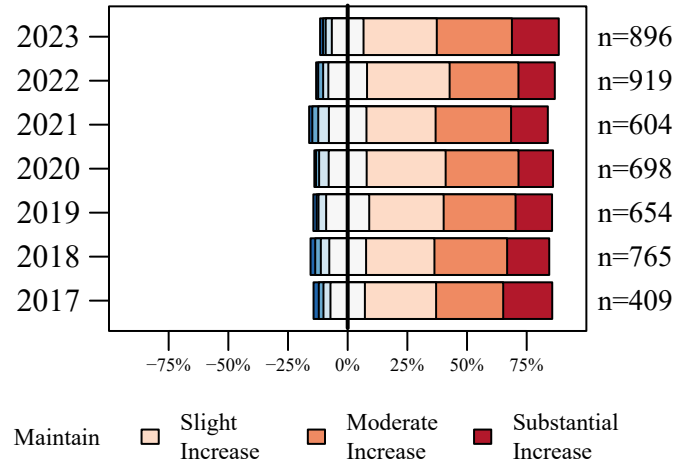


Figure 16. The desired change in the size of the deer population described by hunters in the county where they hunt in DMU 8.

Resident Hunter Desired Change

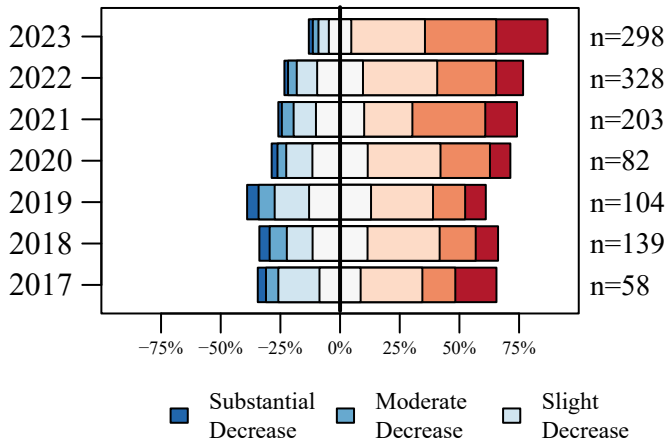


Figure 17. The desired change in the size of the deer population described by hunters in the county where they live in DMU 8.

Resident Nonhunter Desired Change

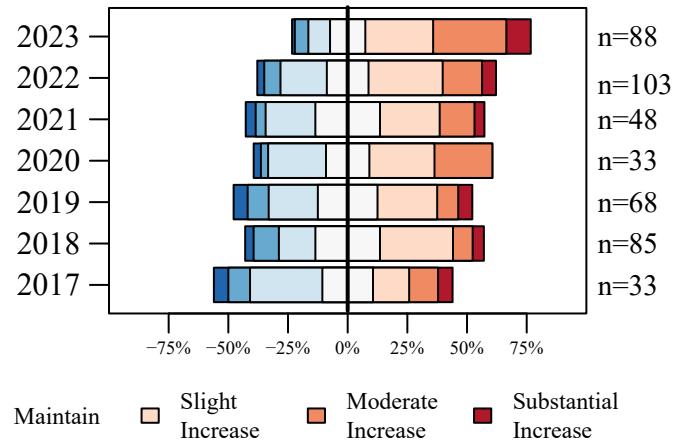


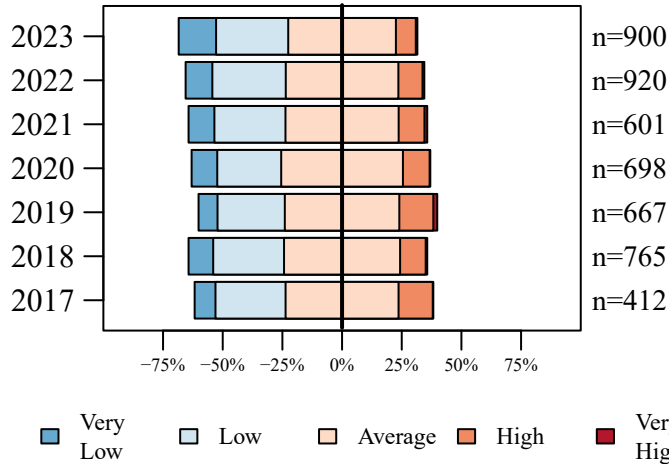
Figure 18. The desired change in the size of the deer population described by nonhunters in the county where they live in DMU 8.

DMU 8: Dearborn

5/23/2024

Deer Management Survey Results

Hunter Buck Quality



Resident Hunter Buck Quality

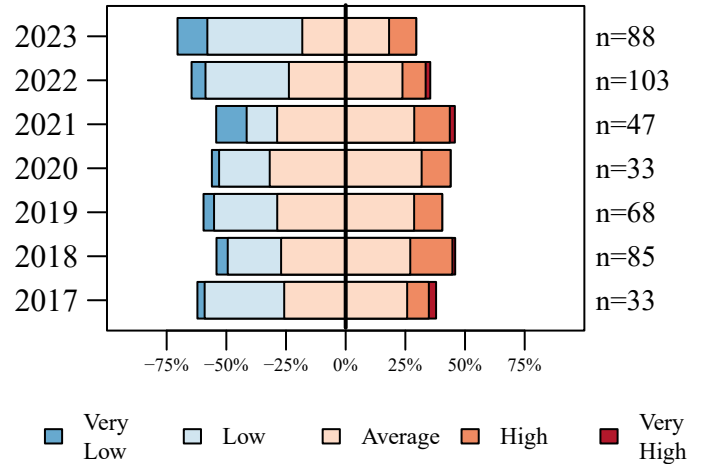


Figure 19. Hunters describe the quality of bucks in the county where they hunt in DMU 8.

Figure 20. Hunters describe the quality of bucks in the county where they live in DMU 8.

Personal Harvest Change

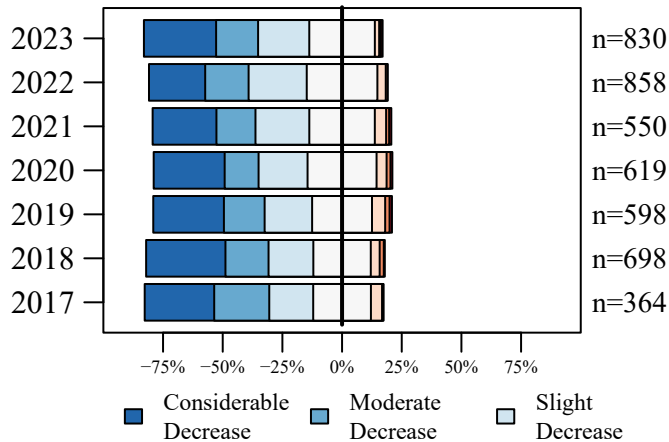


Figure 21. Opinion of hunters on how their personal number of harvested deer has changed over the last five years in a county in DMU 8.

Total Harvest Change

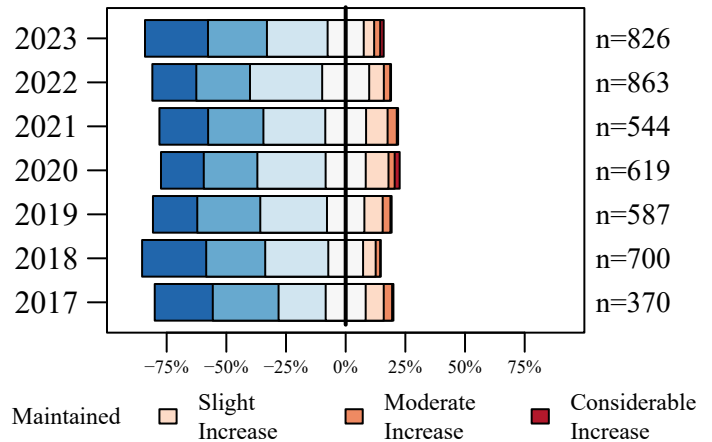


Figure 22. Opinion of hunters on how the total number of harvested deer has changed over the last five years in a county in DMU 8.

Hunter CBAQ

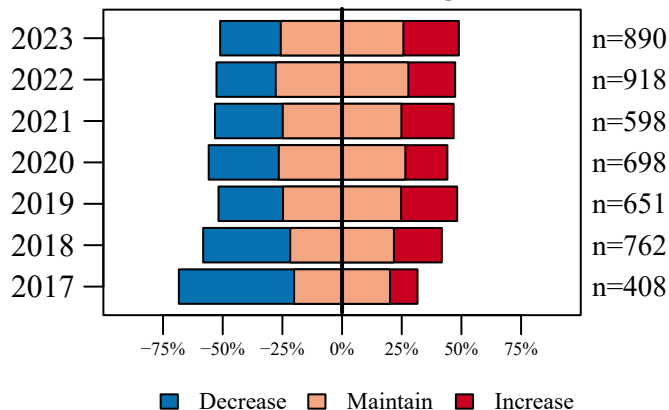


Figure 23. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they hunt in DMU 8.

Resident Hunter CBAQ

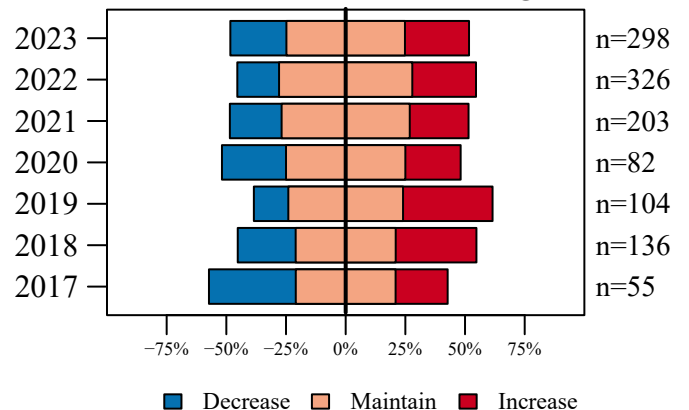


Figure 24. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they live in DMU 8.

DMU 8: Dearborn

5/23/2024

Deer Management Survey Results

Resident Nonhunter CBAQ

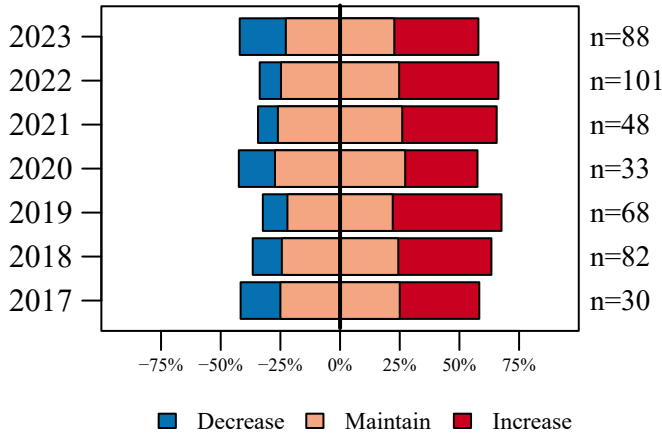


Figure 25. Opinion on how the County Bonus Antlerless Quota should change from nonhunters in the county where they live in DMU 8.

Hunter Opinion

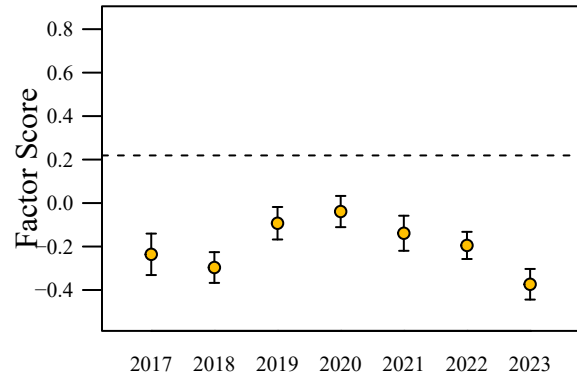


Figure 26. Hunter opinion scores over five years of the deer management survey. The score was aggregated using factor analysis of questions asked only to hunters. The dashed line represents the score if all questions are answered neutrally.

Population Size Opinion

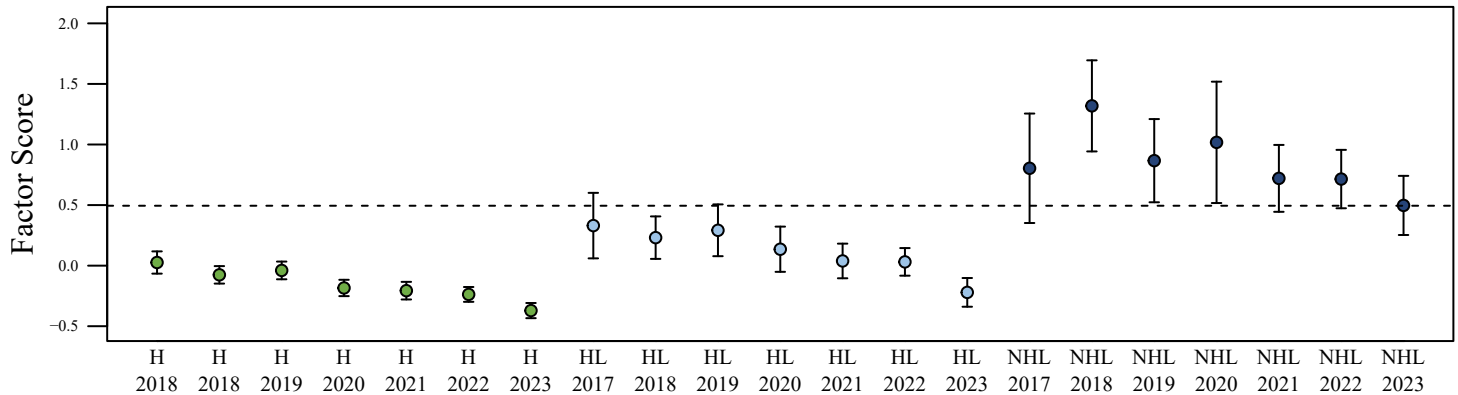


Figure 27. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer population size. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

Deer Management Opinion

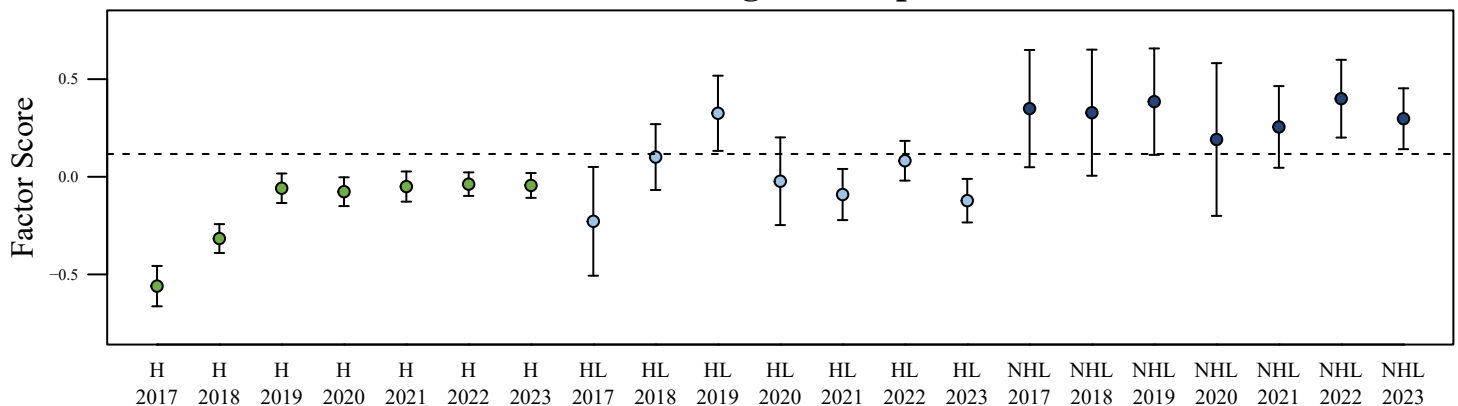


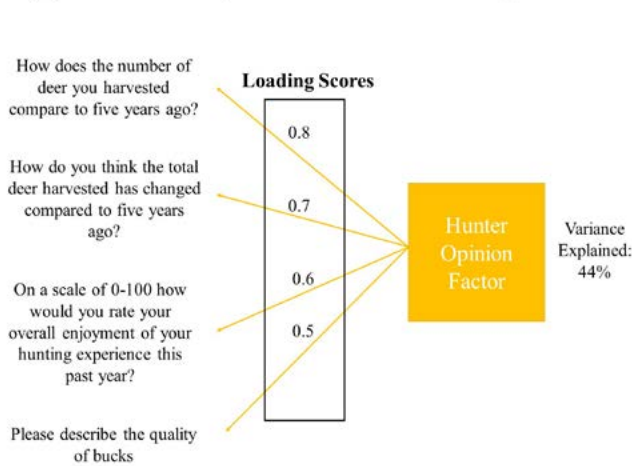
Figure 28. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer management. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

DMU 8: Dearborn

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Deer Management Survey Results

(a) Factor Analysis Results: Hunter Questions



(b) Factor Analysis Results: All Group Questions

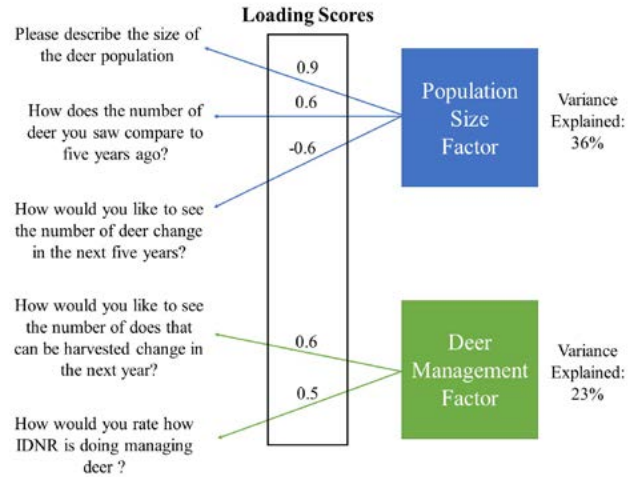


Figure 29. Results from two factor analyses used to develop the hunter opinion (a), population opinion (b), and management opinion (b) scores. Higher loading scores indicate a stronger correlation between the original question and the derived factor. These figures are included to help interpret Figure 26, Figure 27, and Figure 28.

DMU 9: Southwest

5/23/2024

Total Square Miles: 3,682

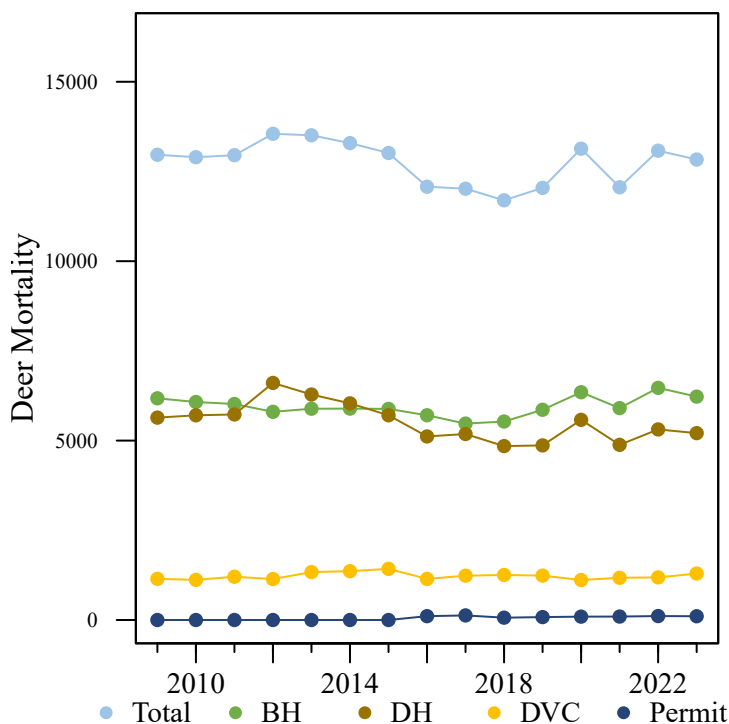
Square Miles of Deer Habitat: 1,305

Percent Deer Habitat: 35

Table 1. Total harvest, buck harvest, and doe harvest (error < 1 percent). Damage permits are issued by DNR to landowners to control deer damage. Deer vehicle collisions (DVC) and miles traveled are reported by the Indiana Department of Transportation. Mean CBAQ is the average county bonus antlerless quota of all counties in the DMU. The trend in total harvest, buck harvest, doe harvest, and DVCs are in standard deviations (SD) and are equivalent to effect size. A change greater than 2 SD is considered both a large and statistically significant effect size.

Year	Total	Total Trend in SD	Buck Harvest	Buck Trend in SD	Buck Harvest per SQ MI Habitat	Doe Harvest	Doe Trend in SD	Doe Harvest per SQ MI Habitat	% Doe in Harvest	Damage Permit Deer Taken	DVC per Billion Miles Traveled	DVC Trend in SD	Mean CBAQ
2009	11,818		6,178		4.7	5,640		4.3	47.7		226.3		4.8
2010	11,780	-0.5	6,075	-0.5	4.7	5,705	-0.6	4.4	48.4		219.0	0.0	4.7
2011	11,747	-0.3	6,019	-0.3	4.6	5,728	-0.3	4.4	48.8		238.5	2.1	4.7
2012	12,409	1.6	5,802	-0.9	4.4	6,607	4.0	5.1	53.2		224.7	0.0	4.7
2013	12,172	0.6	5,888	-1.0	4.5	6,284	0.8	4.8	51.6		260.3	3.5	4.4
2014	11,929	-0.2	5,891	-0.7	4.5	6,038	0.1	4.6	50.6		265.0	1.9	3.9
2015	11,589	-1.5	5,883	-0.5	4.5	5,706	-1.0	4.4	49.2		276.0	1.7	3.9
2016	10,822	-3.5	5,706	-2.4	4.4	5,116	-2.5	3.9	47.3	107	219.0	-1.6	3.6
2017	10,657	-1.8	5,474	-4.5	4.2	5,183	-1.3	4.0	48.6	128	232.4	-0.6	2.6
2018	10,377	-1.6	5,531	-1.3	4.2	4,846	-1.6	3.7	46.7	65	231.7	-0.8	2.0
2019	10,725	-0.5	5,859	0.8	4.5	4,866	-1.1	3.7	45.4	81	224.2	-0.8	1.8
2020	11,927	2.4	6,348	3.5	4.9	5,579	1.3	4.3	46.8	94	199.5	-1.6	2.0
2021	10,787	-0.2	5,905	0.3	4.5	4,882	-0.8	3.7	45.3	96	207.3	-1.0	2.0
2022	11,781	1.5	6,470	1.8	5.0	5,311	0.8	4.1	45.1	110	208.3	-0.7	2.0
2023	11,433	0.5	6,225	0.5	4.8	5,208	0.3	4.0	45.6	105	226.6	0.9	2.0

(a) Cumulative Known Deer Mortality



(b) Archer Deer Observations

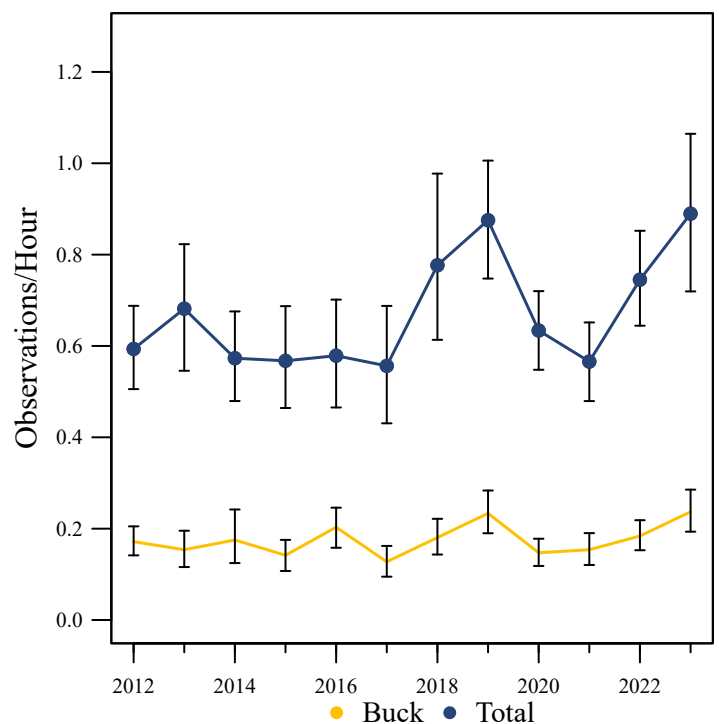


Figure 1. (a) The total known annual deer mortality based on buck harvests (BH), doe harvests (DH), deer vehicle collisions (DVC), and deer permit takes. (b) Total deer and buck observations per hour based on the Archer's Index.

DMU 9: Southwest

5/23/2024

Deer Management Survey Results

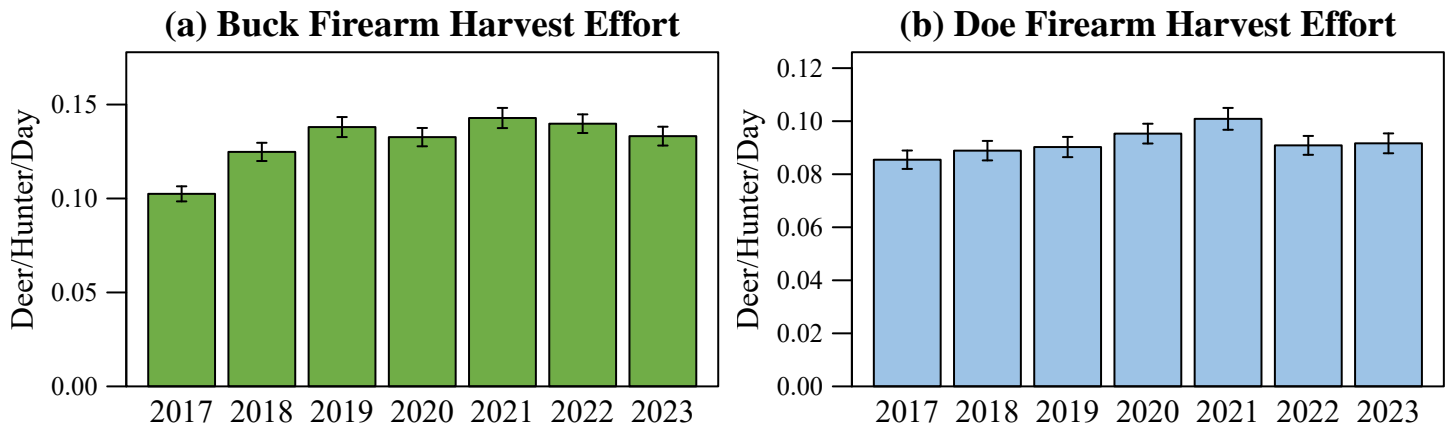


Figure 4. Firearm harvest effort is the number of bucks (a) and does (b) killed by firearms per hunter divided by the mean number of days hunted per hunter during the firearm season based on data reported in the deer management survey. Larger values (i.e. taller bars) indicate less effort required to harvest a deer.

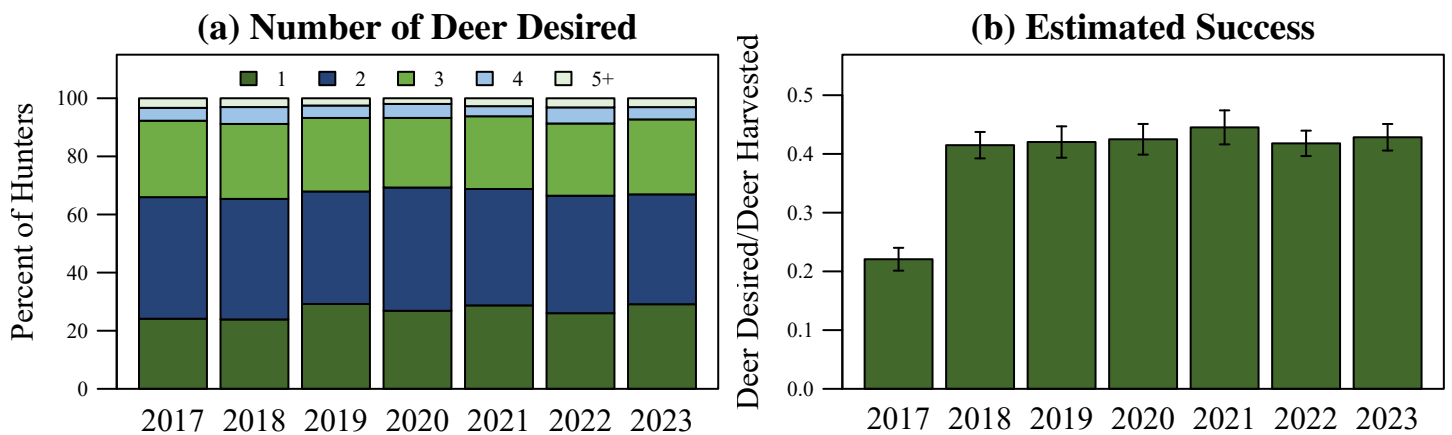


Figure 5. (a) The annual percent of hunters wishing to harvest each number of deer as reported in the deer management survey. (b) Success rate is estimated from the deer management survey as the Number of Harvested Deer/Number of Deer Desired (reported only; does not account for attempts that were not made). Larger values (i.e. taller bars) indicate greater success.

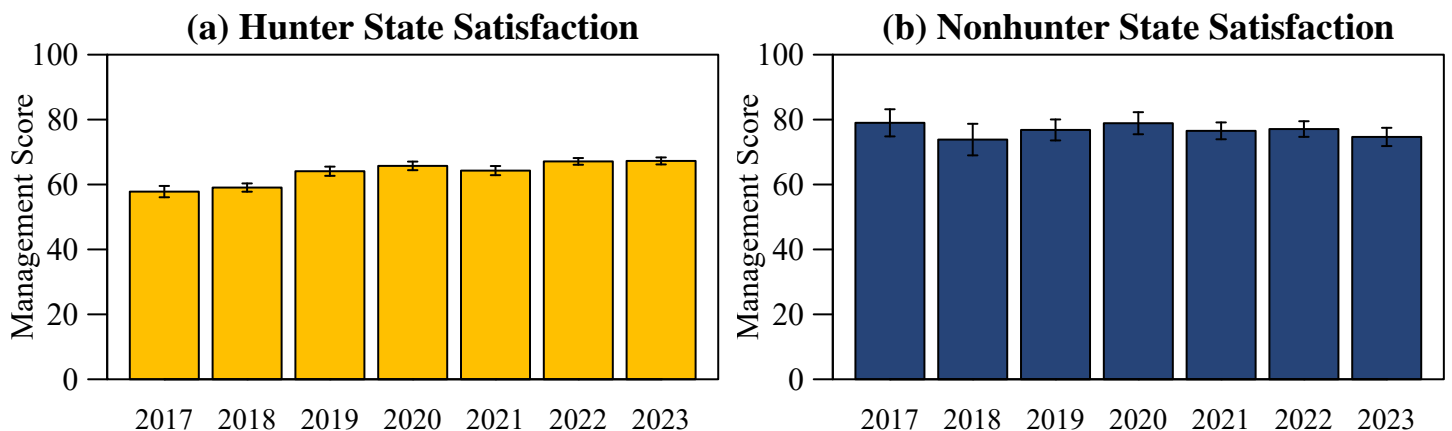


Figure 6. Hunters (a) and nonhunters (b) were asked to score the DNR's statewide deer management on a scale of 0 (poor) to 100 (excellent).

DMU 9: Southwest

5/23/2024

Deer Management Survey Results

Hunter Satisfaction

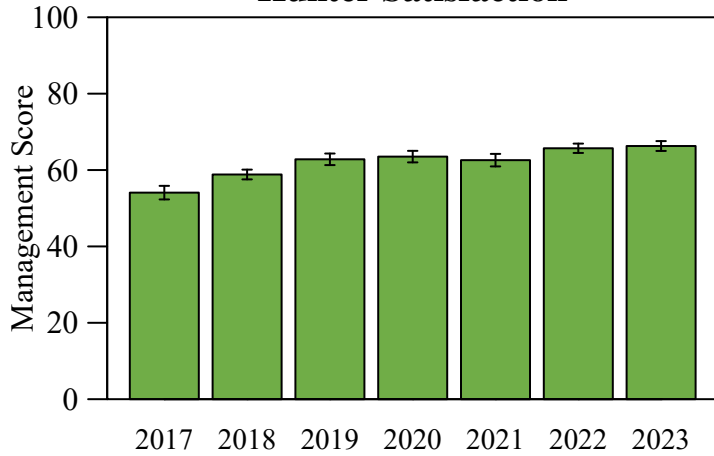


Figure 7. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 9 where they hunt.

Resident Hunter Satisfaction

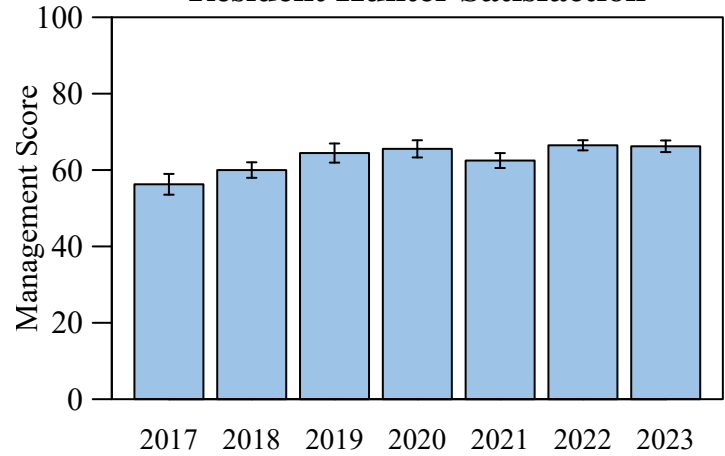


Figure 8. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 9 where they live.

Resident Nonhunter Satisfaction

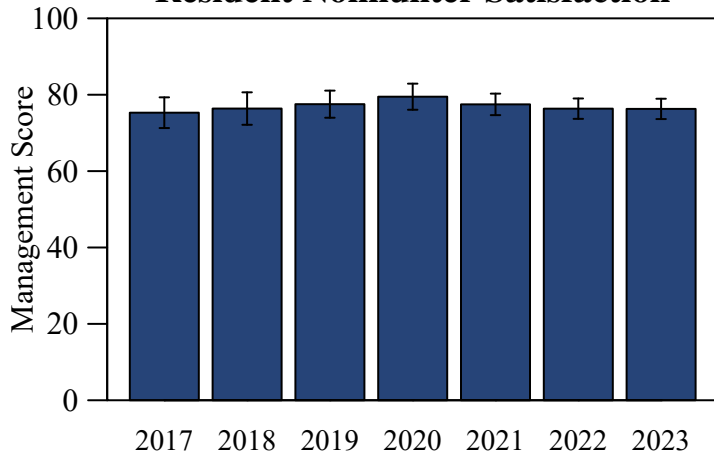


Figure 9. Nonhunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 9 where they live.

Hunter Population Size

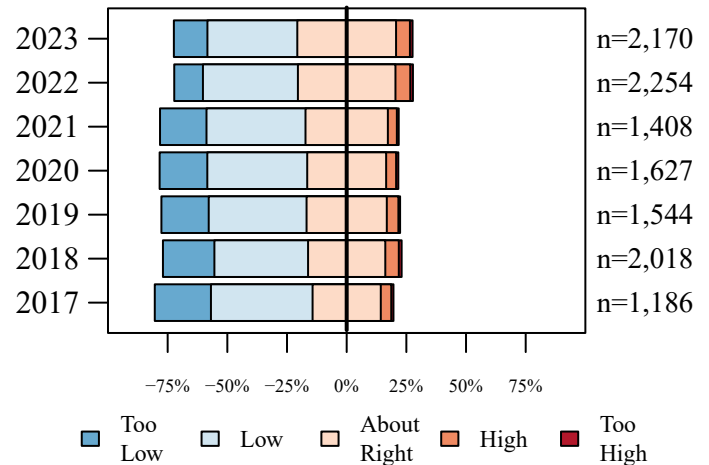


Figure 10. The current size of the deer population described by hunters in the county where they hunt in DMU 9.

Resident Hunter Population Size

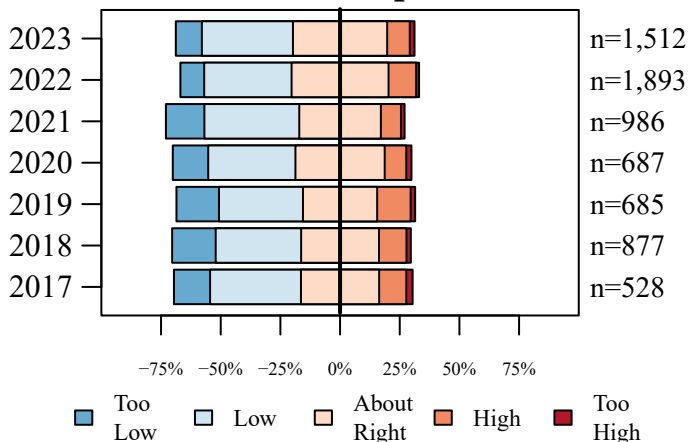


Figure 11. The current size of the deer population described by hunters in the county where they live in DMU 9.

Resident Nonhunter Population Size

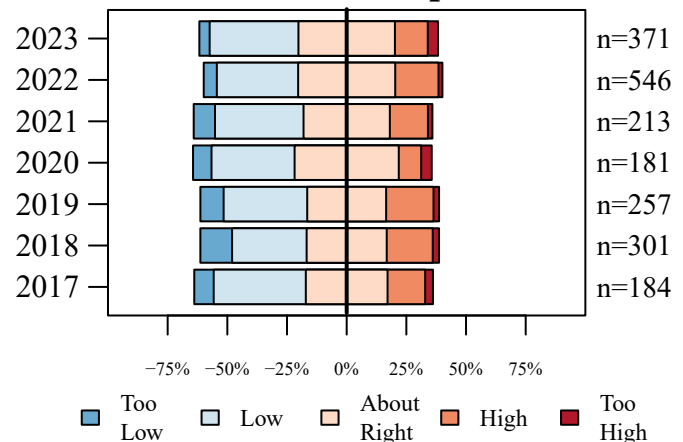


Figure 12. The current size of the deer population described by nonhunters in the county where they live in DMU 9.

DMU 9: Southwest

5/23/2024

Deer Management Survey Results

Hunter Perceived Change

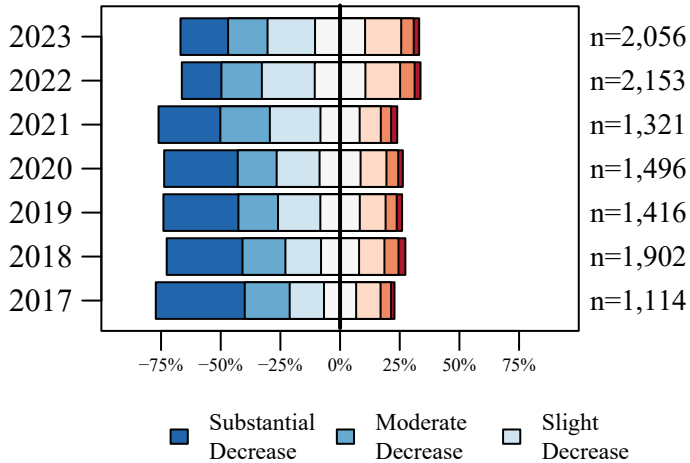


Figure 13. The number of deer seen compared to five years ago described by hunters in the county where they hunt in DMU 9.

Resident Hunter Perceived Change

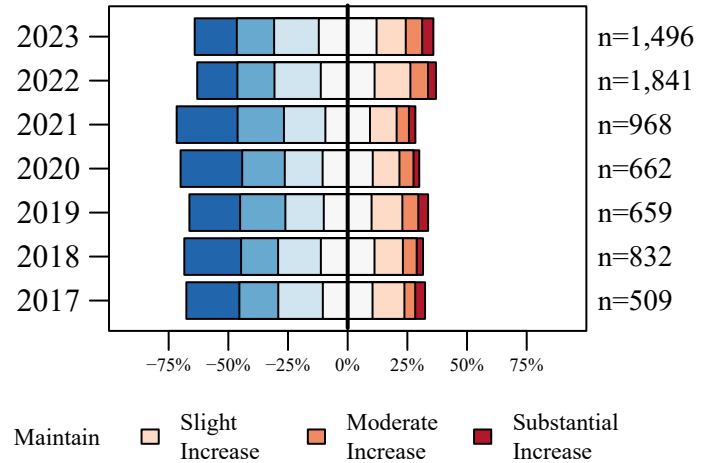


Figure 14. The number of deer seen compared to five years ago described by hunters in the county where they live in DMU 9.

Resident Nonhunter Perceived Change

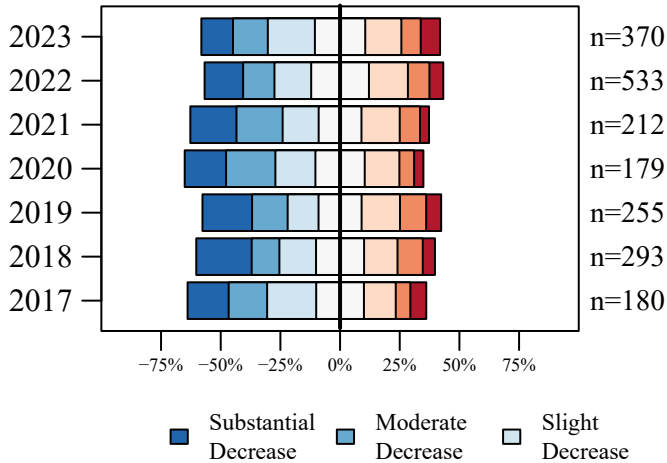


Figure 15. The number of deer seen compared to five years ago described by nonhunters in the county where they live in DMU 9.

Hunter Desired Change

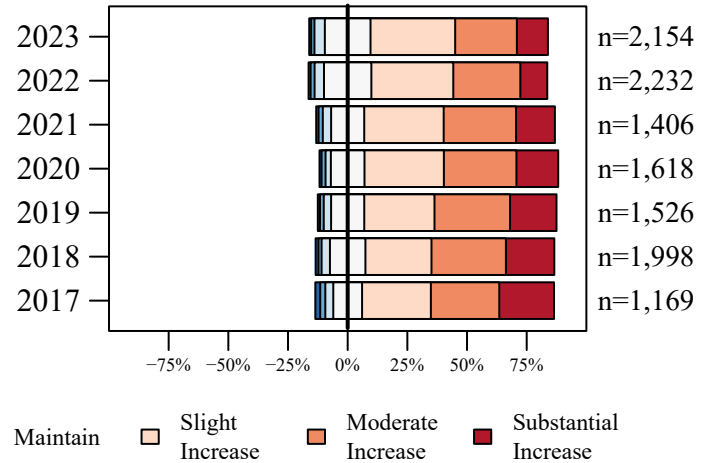


Figure 16. The desired change in the size of the deer population described by hunters in the county where they hunt in DMU 9.

Resident Hunter Desired Change

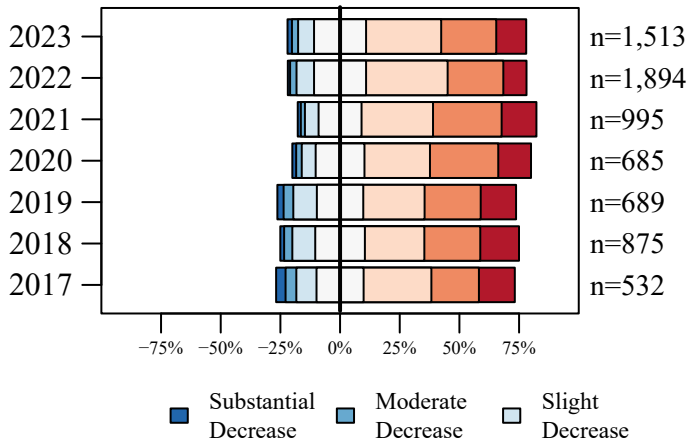


Figure 17. The desired change in the size of the deer population described by hunters in the county where they live in DMU 9.

Resident Nonhunter Desired Change

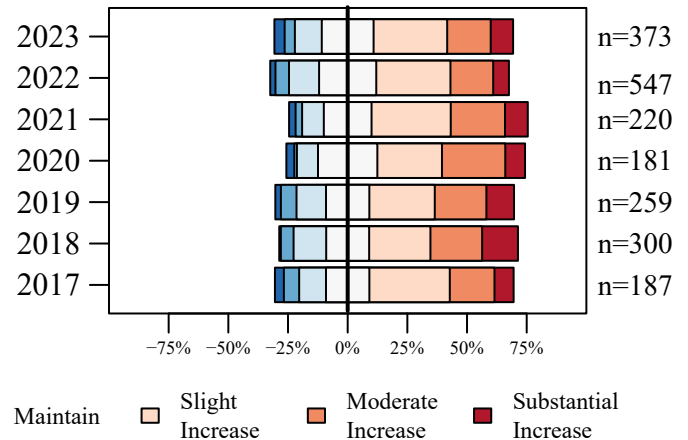


Figure 18. The desired change in the size of the deer population described by nonhunters in the county where they live in DMU 9.

DMU 9: Southwest

5/23/2024

Deer Management Survey Results

Hunter Buck Quality

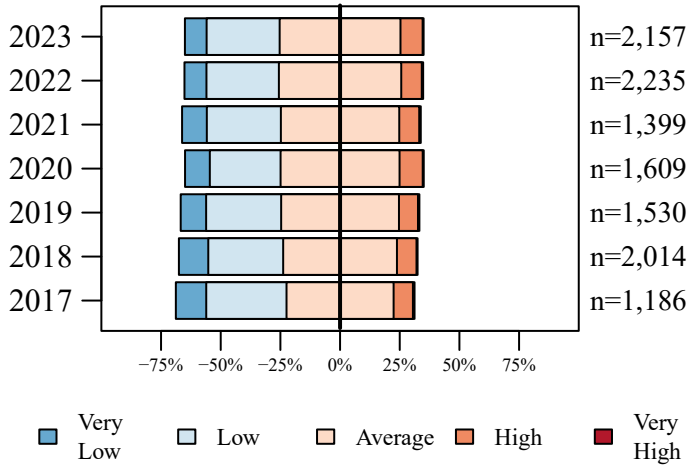


Figure 19. Hunters describe the quality of bucks in the county where they hunt in DMU 9.

Resident Hunter Buck Quality

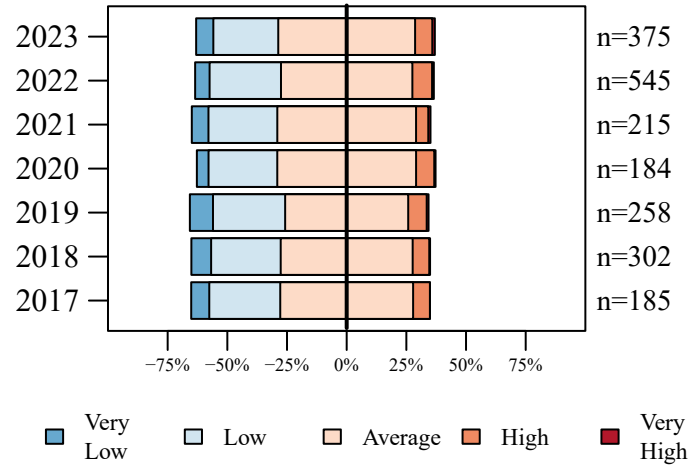


Figure 20. Hunters describe the quality of bucks in the county where they live in DMU 9.

Personal Harvest Change

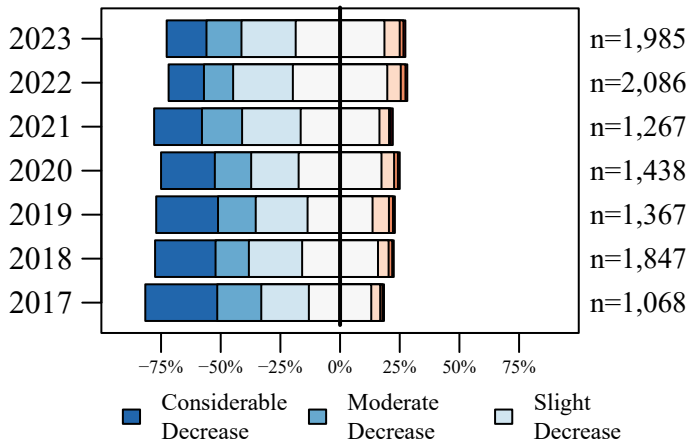


Figure 21. Opinion of hunters on how their personal number of harvested deer has changed over the last five years in a county in DMU 9.

Total Harvest Change

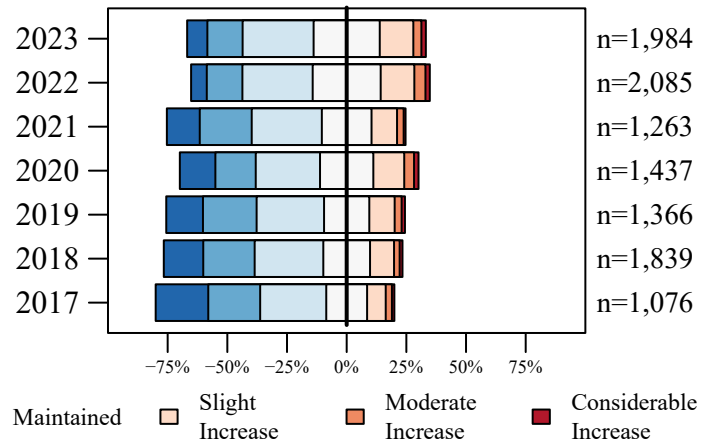


Figure 22. Opinion of hunters on how the total number of harvested deer has changed over the last five years in a county in DMU 9.

Hunter CBAQ

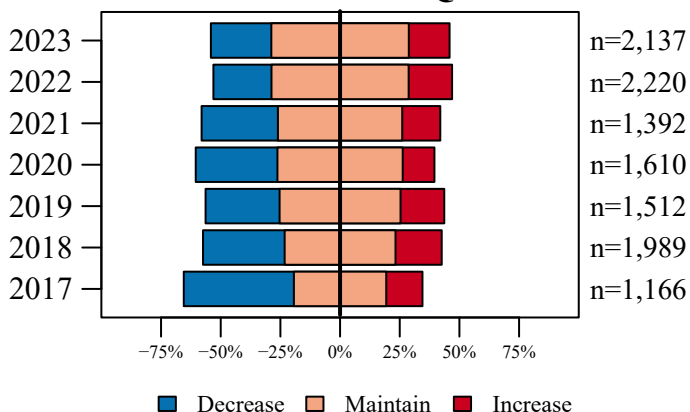


Figure 23. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they hunt in DMU 9.

Resident Hunter CBAQ

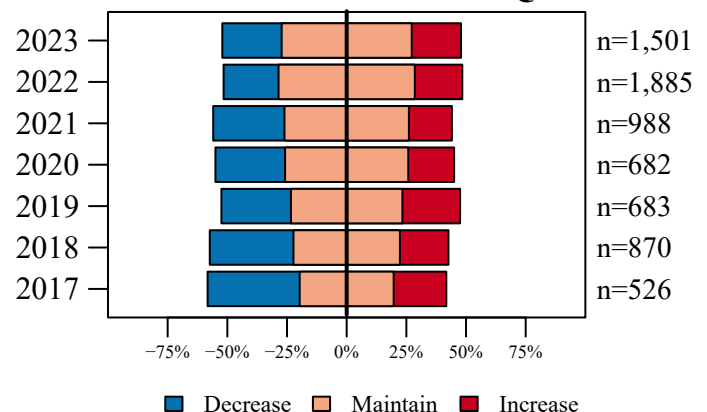


Figure 24. Opinion on how the County Bonus Antlerless Quota should change from hunters in the county where they live in DMU 9.

DMU 9: Southwest

5/23/2024

Deer Management Survey Results

Resident Nonhunter CBAQ

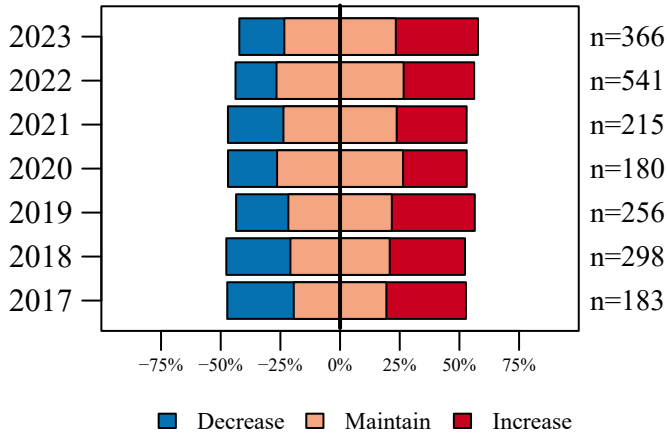


Figure 25. Opinion on how the County Bonus Antlerless Quota should change from nonhunters in the county where they live in DMU 9.

Hunter Opinion

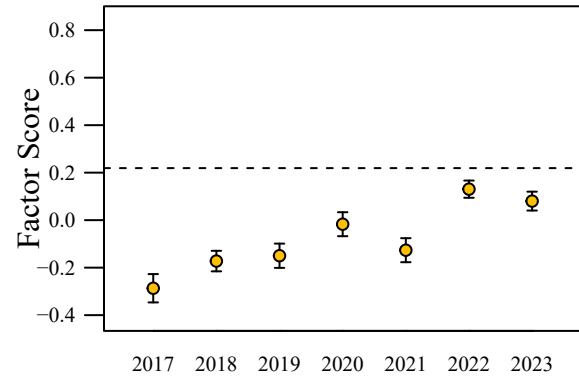


Figure 26. Hunter opinion scores over five years of the deer management survey. The score was aggregated using factor analysis of questions asked only to hunters. The dashed line represents the score if all questions are answered neutrally.

Population Size Opinion

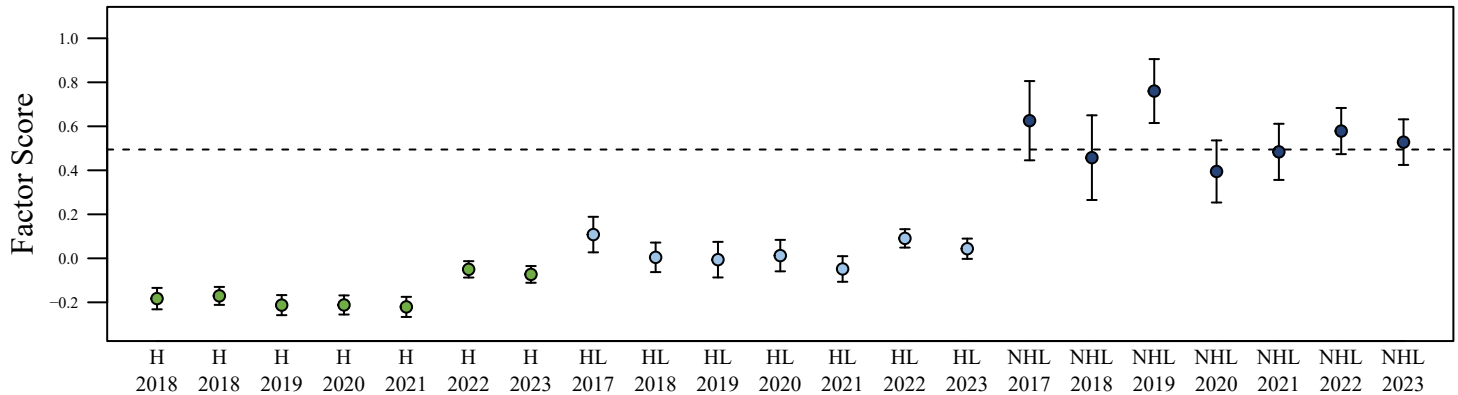


Figure 27. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer population size. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

Deer Management Opinion

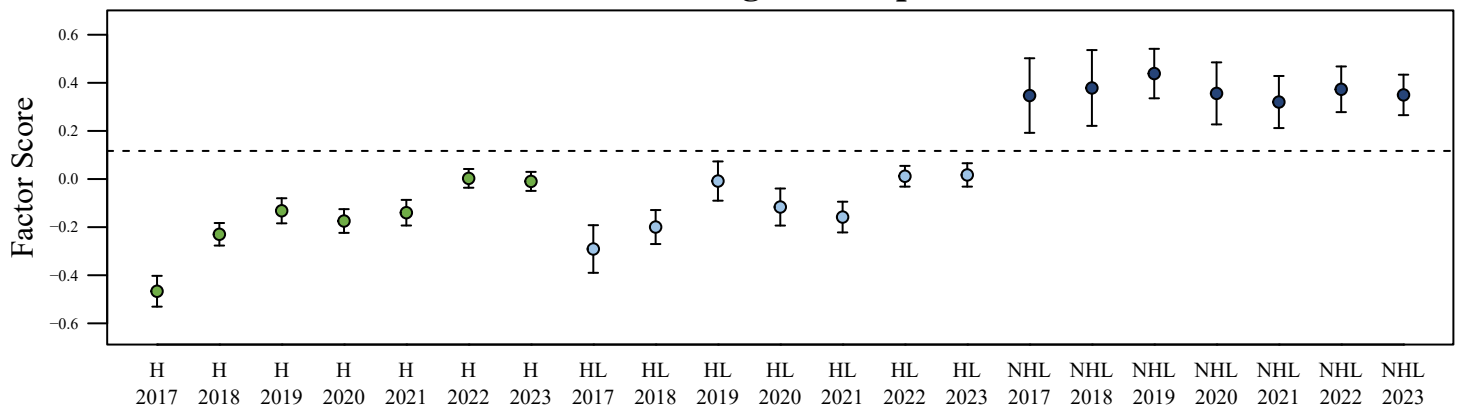
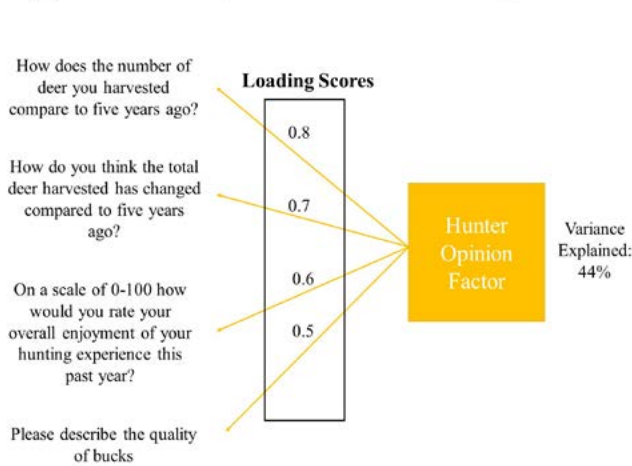


Figure 28. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer management. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

(a) Factor Analysis Results: Hunter Questions



(b) Factor Analysis Results: All Group Questions

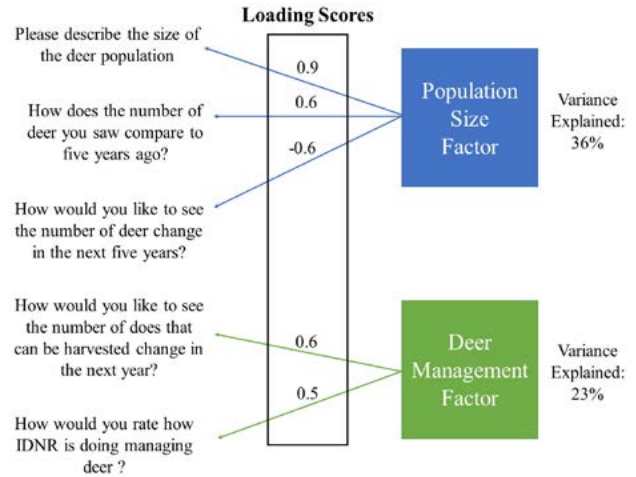


Figure 29. Results from two factor analyses used to develop the hunter opinion (a), population opinion (b), and management opinion (b) scores. Higher loading scores indicate a stronger correlation between the original question and the derived factor. These figures are included to help interpret Figure 26, Figure 27, and Figure 28.

DMU 10: Urban

5/23/2024

Total Square Miles: 403
Square Miles of Deer Habitat: 42
Percent Deer Habitat: 10

Table 1. Total harvest, buck harvest, and doe harvest (error < 1 percent). Damage permits are issued by DNR to landowners to control deer damage. Deer vehicle collisions (DVC) and miles traveled are reported by the Indiana Department of Transportation. Mean CBAQ is the average county bonus antlerless quota of all counties in the DMU. The trend in total harvest, buck harvest, doe harvest, and DVCs are in standard deviations (SD) and are equivalent to effect size. A change greater than 2 SD is considered both a large and statistically significant effect size.

Year	Total	Total Trend in SD	Buck Harvest	Buck Trend in SD	Buck Harvest per SQ MI Habitat	Doe Harvest	Doe Trend in SD	Doe Harvest per SQ MI Habitat	% Doe in Harvest	Damage Permit Deer Taken	DVC per Billion Miles Traveled	DVC Trend in SD	Mean CBAQ
2009	351		224		5.3	127		3.0	36.2		12.4		8
2010	352	1.0	191	0.2	4.5	161	2.1	3.8	45.7		11.6	-0.4	8
2011	375	1.4	207	0.5	4.9	168	1.8	4.0	44.8		12.2	0.3	8
2012	501	7.5	179	-1.9	4.3	322	8.1	7.7	64.3		9.0	-2.1	8
2013	510	1.9	203	0.3	4.8	307	1.6	7.3	60.2		11.2	-0.1	8
2014	469	0.6	166	-2.0	4.0	303	1.0	7.2	64.6		9.5	-1.3	8
2015	444	0.0	167	-1.3	4.0	277	0.3	6.6	62.4		10.5	-0.1	8
2016	416	-0.8	166	-0.9	4.0	250	-0.4	6.0	60.1	3	9.8	-0.5	8
2017	448	-0.5	187	0.7	4.5	261	-1.1	6.2	58.3	174	11.0	1.2	8
2018	435	-0.6	170	-0.5	4.0	265	-0.6	6.3	60.9	123	10.0	-0.5	3
2019	444	0.1	196	2.8	4.7	248	-1.1	5.9	55.9	100	7.6	-4.3	2
2020	493	4.3	196	1.4	4.7	297	3.1	7.1	60.2		8.7	-0.8	2
2021	428	-0.7	174	-0.6	4.1	254	-0.5	6.0	59.3	94	9.5	0.1	2
2022	480	1.2	209	2.0	5.0	271	0.3	6.5	56.5	80	9.2	-0.1	2
2023	443	-0.5	197	0.5	4.7	246	-1.1	5.9	55.5	1	11.4	2.5	2

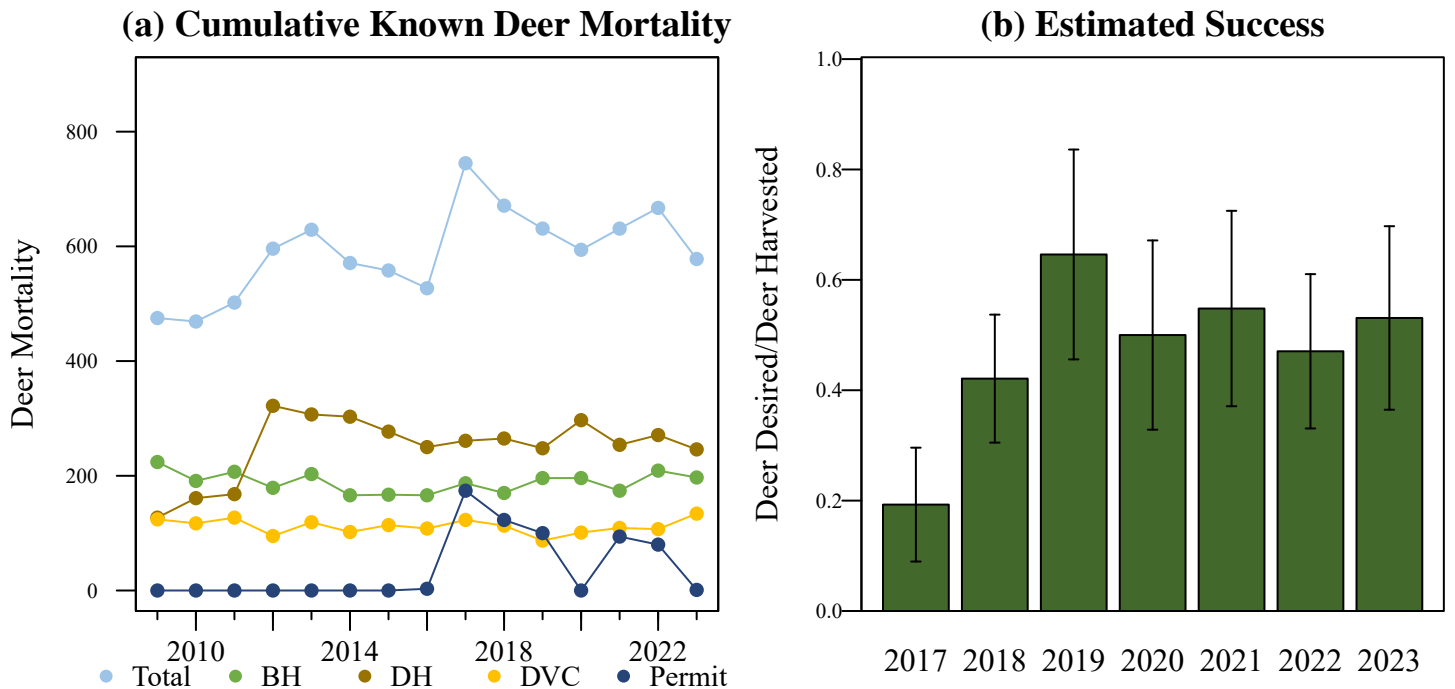


Figure 1. (a) The total known annual deer mortality based on buck harvests (BH), doe harvests (DH), deer vehicle collisions (DVC), and deer permit takes. (b) Success rate is estimated from the deer management survey as the Number of Harvested Deer/Number of Deer Desired (reported only; does not account for attempts that were not made). Larger values (i.e. taller bars) indicate greater success.

DMU 10: Urban

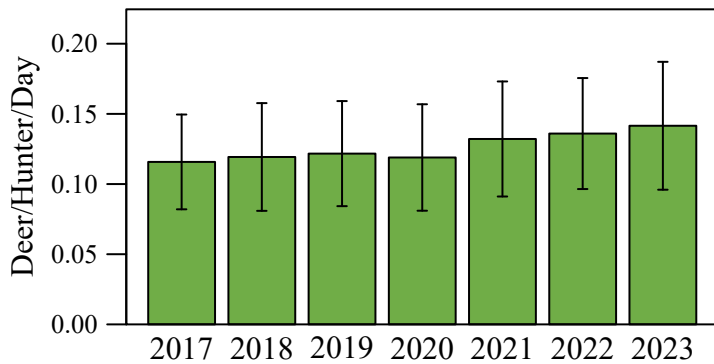
5/23/2024

Total Square Miles: 403
Square Miles of Deer Habitat: 42
Percent Deer Habitat: 10

Table 2. Estimated number of antlered (A) and antlerless (AL) deer harvested per hunter. Estimated totals may not match exactly with total number of deer harvested. Reporting errors are examined and investigated as they are located; therefore, subsequent reports may contain corrected totals.

Year	Total Hunters	0 A	1 A	2 A	3 A	0 AL	1 AL	2 AL	3 AL	4 AL	5 AL	6 AL	7 AL	8 AL	9 AL	10 AL
2016	313	182	127	4	0	71	211	24	6	1	0	0	0	0	0	0
2017	316	187	120	9	0	65	206	35	8	0	2	0	0	0	0	0
2018	303	179	120	4	0	63	188	40	10	1	1	0	0	0	0	0
2019	311	186	112	13	0	64	198	40	8	1	0	0	0	0	0	0
2020	337	190	140	7	0	64	227	32	8	6	0	0	0	0	0	0
2021	311	171	134	6	0	63	220	22	6	0	0	0	0	0	0	0
2022	335	179	145	11	0	70	228	29	5	3	0	0	0	0	0	0
2023	310	164	135	11	0	71	202	27	10	0	0	0	0	0	0	0

(a) Buck Firearm Harvest Effort



(b) Doe Firearm Harvest Effort

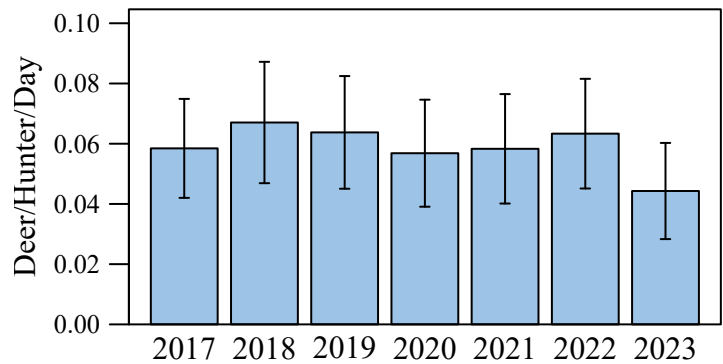
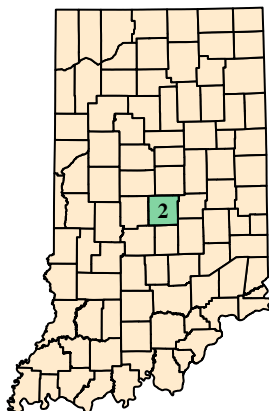


Figure 2. Firearm harvest effort is the number of bucks (a) and does (b) killed by firearms per hunter divided by the mean number of days hunted per hunter during the firearm season based on data reported in the deer management survey. Larger values (i.e taller bars) indicate less effort required to harvest a deer.

(a) Counties in DMU 10



(b) Deer Habitat in DMU 10

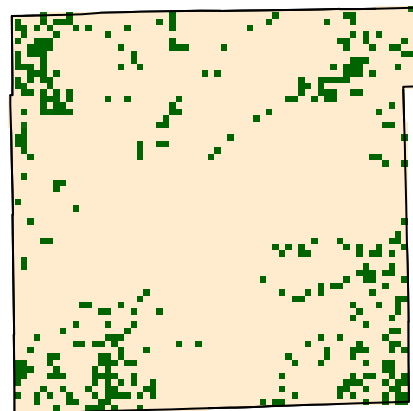


Figure 3. (a) Counties included in DMU 10 for summarizing harvest and deer management survey statistics. Labels are the 2023 county bonus antlerless quotas. (b) Green represents the land use types classified as deer habitat in DMU 10.

DMU 10: Urban

5/23/2024

Deer Management Survey Results

(a) Hunter State Satisfaction

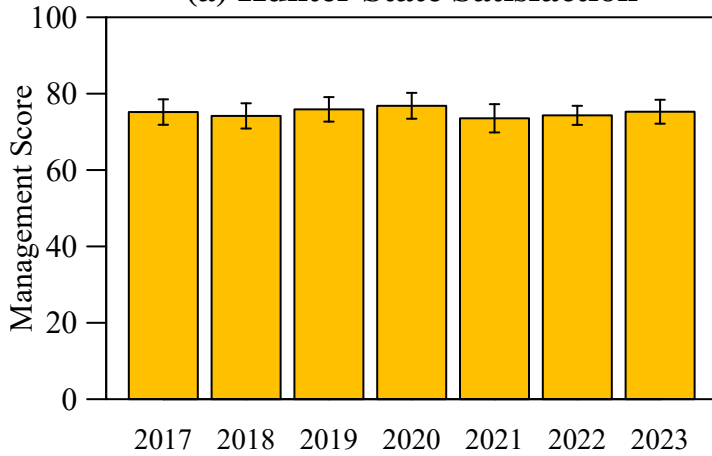


Figure 4. Hunters were asked to score the DNR's state deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 10 where they live.

(b) Nonhunter State Satisfaction

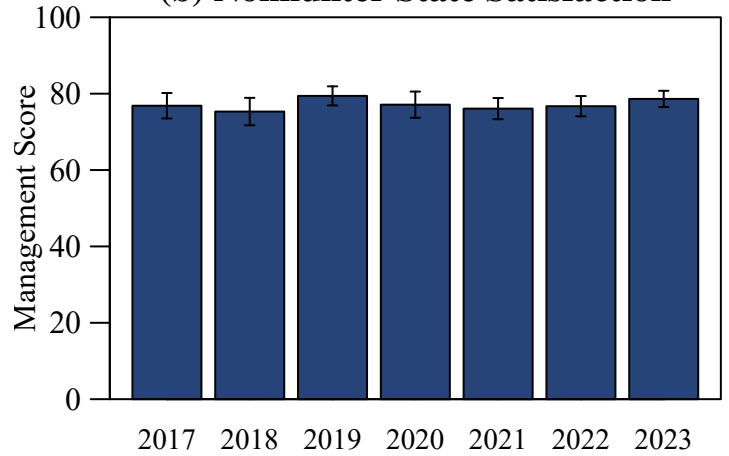


Figure 5. Nonhunters were asked to score the DNR's state deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 10 where they live.

Hunter Satisfaction

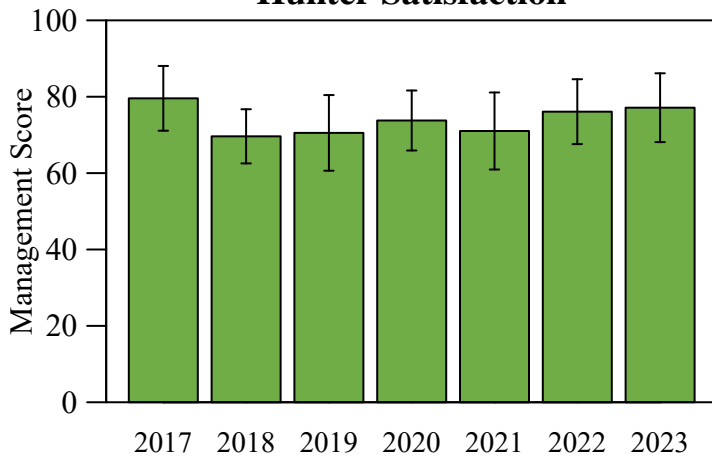


Figure 6. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 10 where they hunt.

Resident Hunter Satisfaction

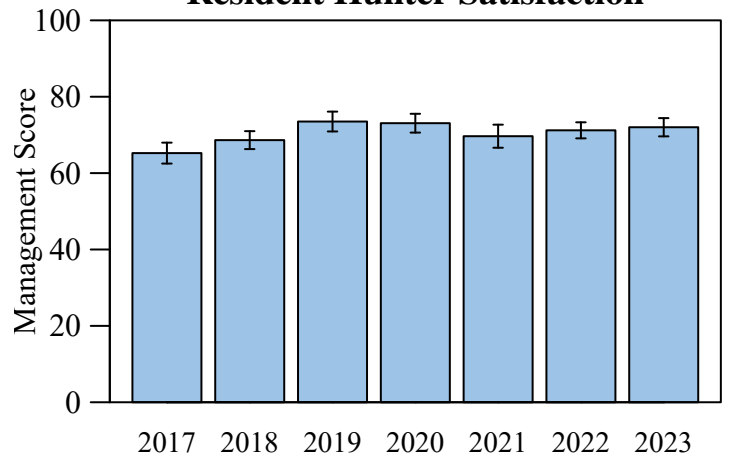


Figure 7. Hunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 10 where they live.

Resident Nonhunter Satisfaction

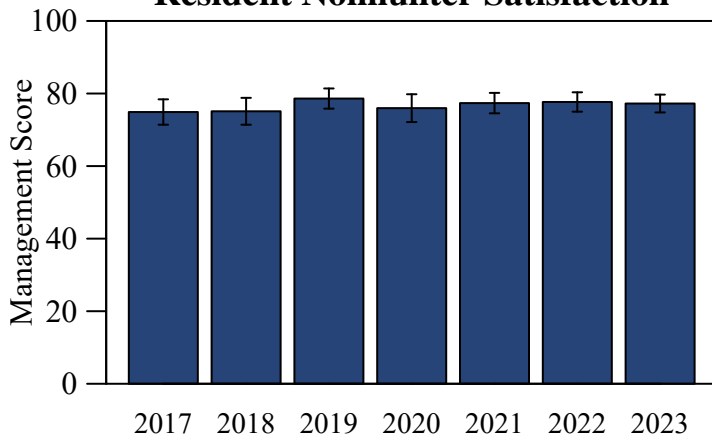


Figure 8. Nonhunters were asked to score the DNR's county deer management on a scale of 0 (poor) to 100 (excellent) for the county in DMU 10 where they live.

Hunter Opinion

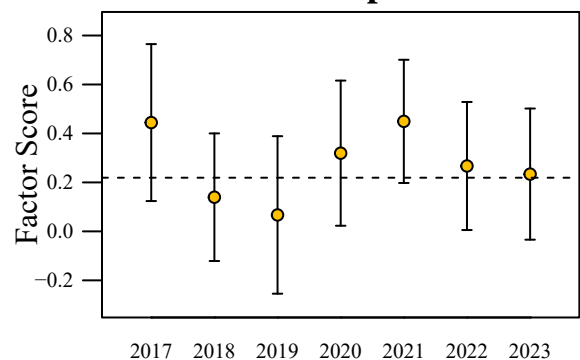


Figure 9. Hunter opinion scores over five years of the deer management survey. The score was aggregated using factor analysis of questions asked only to hunters. The dashed line represents the score if all questions are answered neutrally.

DMU 10: Urban

5/23/2024

Deer Management Survey Results

Population Size Opinion

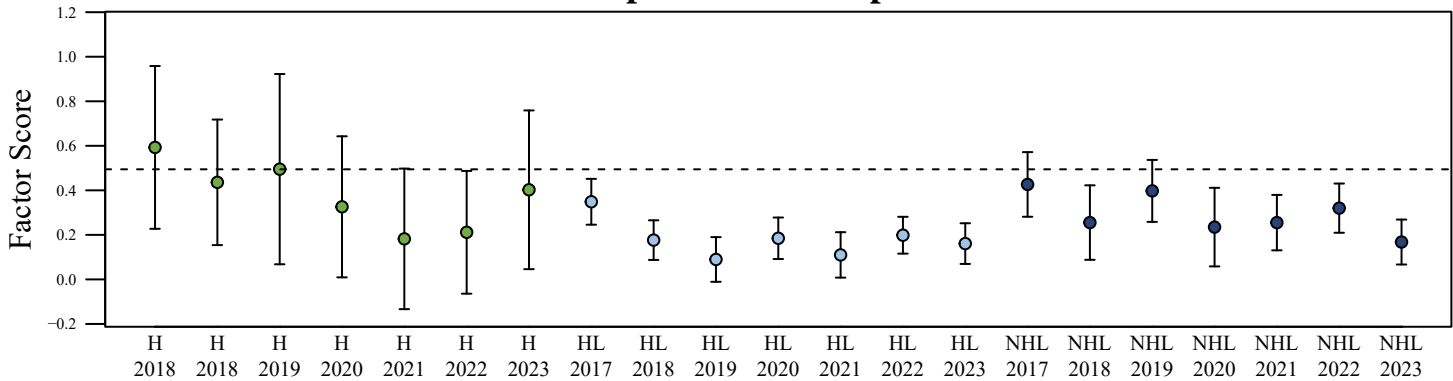


Figure 10. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer population size. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

Deer Management Opinion

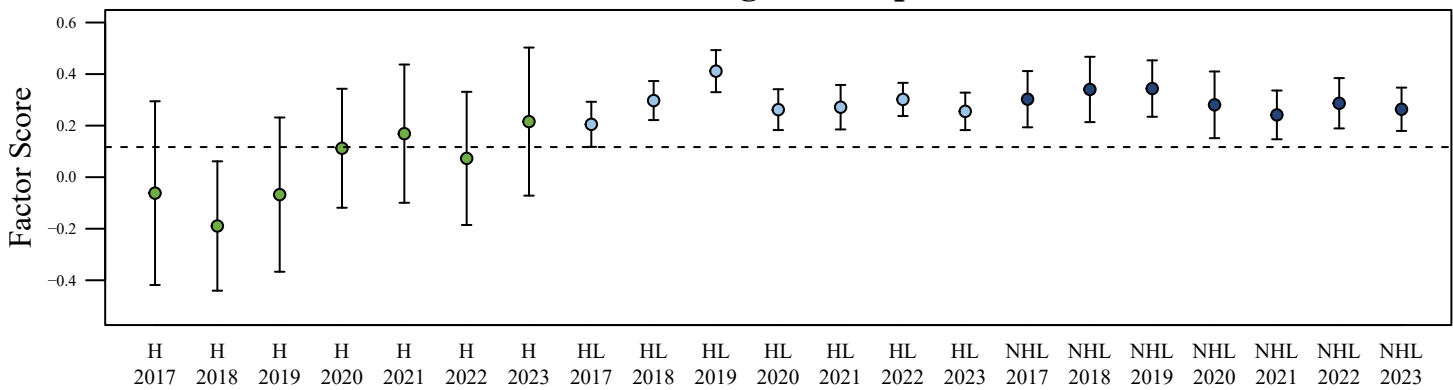
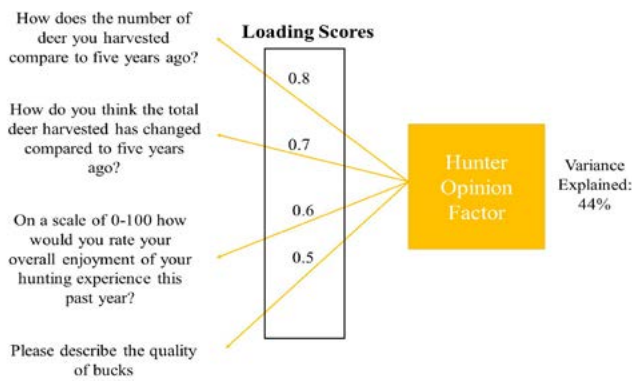


Figure 11. The opinion of nonhunters (NHL) and hunters in the county where they live (HL) and hunters in the county where they hunt (H) on deer management. The score was aggregated using factor analysis of questions asked to all participants. The dashed line represents the score if all questions are answered neutrally.

(a) Factor Analysis Results: Hunter Questions



(b) Factor Analysis Results: All Group Questions

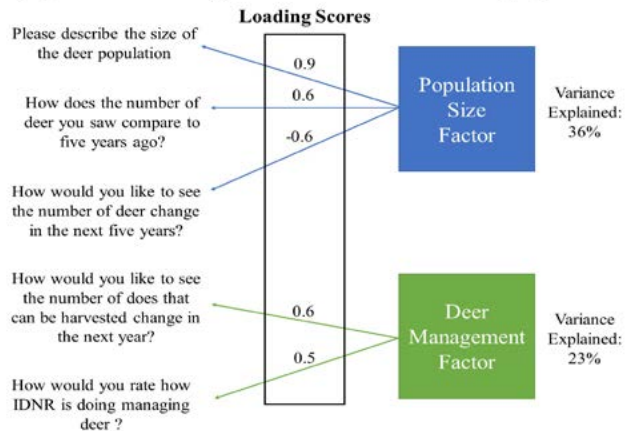


Figure 12. Results from two factor analyses used to develop the hunter opinion (a), population opinion (b), and management opinion (b) scores. Higher loading scores indicate a stronger correlation between the original question and the derived factor. These figures are included to help interpret Figure 26, Figure 27, and Figure 28.

