Appendix

A.1 Demand for Bonus Antlerless Licenses

Here we derive the expression for equation (4) in the main text, which is the expected demand for bonus antlerless licenses. For a hunter with characteristics $\mathbf{Z}$ and who wants to harvest $d(\mathbf{Z})$ total deer, this expectation is

(A1)

$$\sum_{j\in J^1}\sum_{\delta=0}^{d(\mathbf{Z})-\bar{d}_j} \delta \Pr(\text{Buy license } j \cap \text{Meet bag limit for license } j \cap \text{Buy } \delta \text{ bonus licenses}).$$

By the chain rule, we can rewrite (A1) as

(A1′)

$$\sum_{j\in J^1}\sum_{\delta=0}^{d(\mathbf{Z})-\bar{d}_j} \delta \begin{bmatrix}\Pr(\text{Buy } \delta \text{ bonus licenses}|\text{Meet bag limit for license } j \cap \text{Buy license } j) \\ \times \Pr(\text{Meet bag limit for license } j|\text{ Buy license } j)\Pr(\text{Buy license } j)\end{bmatrix}.$$

We know from the main text that

$$\Pr(\text{Buy license } j) = \pi_j^1(\mathbf{X}^1, \mathbf{Z}, \boldsymbol{\theta})$$

and

$$\Pr(\text{Meet bag limit for license } j|\text{ Buy license } j) = p^{\bar{d}_j}.$$

It remains to find

$$\Pr(\text{Buy } \delta \text{ bonus licenses}|\text{Meet bag limit for license } j \cap \text{Buy license } j),$$

or the density of the number of bonus antlerless licenses purchased conditional on the maximum number of deer the hunter is willing to harvest being greater than the bag limit for license *j*. We call this $\Pr\left(\delta\middle|d(\mathbf{Z})-\bar{d}_j\right)$ in the main text. For illustration, suppose $d(\mathbf{Z})-\bar{d}_j = 4$. (It is straightforward to show that the following holds for any value of $d(\mathbf{Z})-\bar{d}_j$.) Figure A1 shows all possible outcomes diagrammatically. The probability this hunter purchases only one bonus antlerless license equals the probability that (i) they purchase the first license and do not harvest a deer (the path shown by the dashed line in Figure A1) or (ii) they purchase the first license, harvest a deer, but opt not purchase a second license (the path shown by the dotted line in Figure A1). Mathematically, this probability is

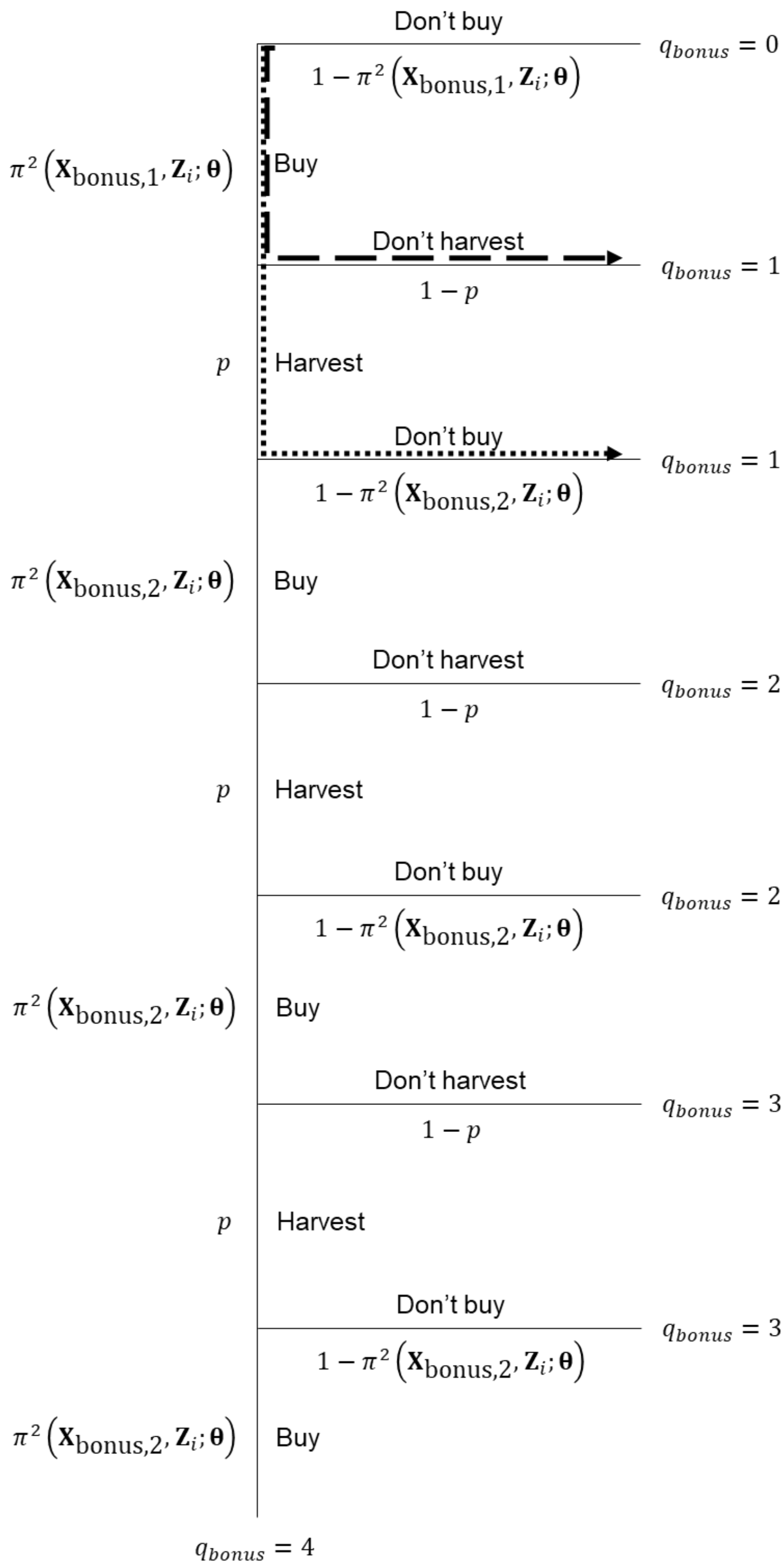

Figure A.1 Probability tree for calculating equation (4)

(A2)

$$\begin{aligned}\Pr\left(\delta = 1 \middle| d(\mathbf{Z}) - \bar{d}_j\right) &= \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})(1-p) \\ &\quad + \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})p\left[1 - \pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right] \\ &= \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})\left[1 - p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right].\end{aligned}$$

Likewise,

(A3)

$$\begin{aligned}\Pr\left(\delta = 2 \middle| d(\mathbf{Z}) - \bar{d}_j\right) &= \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})(1-p) \\ &\quad + \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})p\left[1 - \pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right] \\ &= \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\left[1 - p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right]\end{aligned}$$

and

(A4)

$$\begin{aligned}\Pr\left(\delta = 3 \middle| d(\mathbf{Z}) - \bar{d}_j\right) &= \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})\left[p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right]^2(1-p) \\ &\quad + \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})\left[p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right]^2 p\left[1 - \pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right] \\ &= \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})\left[p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right]^2\left[1 - p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right].\end{aligned}$$

Finally,

(A5) $$\Pr\left(\delta = 4 \middle| d(\mathbf{Z}) - \bar{d}_j\right) = \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})\left[p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right]^3.$$

We can write (A2)–(A4) more generally as

$$\Pr\left(\delta \middle| d(\mathbf{Z}) - \bar{d}_j\right) = \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})\left[p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right]^{\delta-1}\left[1 - p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right]$$

for $0 < \delta < 4$. Likewise, we can rewrite (A5) as

$$\Pr\left(\delta \middle| d(\mathbf{Z}) - \bar{d}_j\right) = \pi^2(\mathbf{X}_{\text{bonus},1}, \mathbf{Z}; \boldsymbol{\theta})\left[p\pi^2(\mathbf{X}_{\text{bonus},2}, \mathbf{Z}; \boldsymbol{\theta})\right]^{\delta-1}, \qquad \delta = 4.$$

These are the expressions written under equation (4) in the main article text. Substituting these relationships into (A1′) and then integrating over the joint distribution of hunter characteristics $f(\mathbf{Z})$ gives expression (4) in the main text.

A.2 Conditional Logit Specification Tests

The simplest possible econometric specification for our choice model would be a standard conditional logit model. This specification assumes independence of irrelevant alternatives (IIA), which can imply unrealistic substitution patterns across alternatives in the choice set. Hausman and McFadden (1984) describe a specification test for the conditional logit model. This test is meant to determine whether the parameters from a conditional logit model are statistically different from a restricted conditional logit model in which one of the choice alternatives is deleted. The logic is that if IIA holds, then deleting one of the alternatives should not affect the relative probability of choosing the remaining options, and hence the estimated parameters should be the same across the restricted and unrestricted models.

Formally, we estimate a conditional logit model using our full dataset and obtain the parameter vector $\widehat{\boldsymbol{\theta}}_0$ and covariance matrix $\widehat{\boldsymbol{\Sigma}}_0$. We then drop choice alternative m = 1, 2 one at a time and re-estimate the model to obtain the restricted parameter vector and covariance matrix $\widehat{\boldsymbol{\theta}}_{mr}$ and covariance matrix $\widehat{\boldsymbol{\Sigma}}_{mr}$.[1] We wish to test the null hypothesis that $\Delta_m = \widehat{\boldsymbol{\theta}}_{mr} - \widehat{\boldsymbol{\theta}}_0 = \mathbf{0}$. The test statistic is

$$T = \left(\widehat{\boldsymbol{\theta}}_{mr} - \widehat{\boldsymbol{\theta}}_0\right)'\left(\widehat{\boldsymbol{\Sigma}}_{mr} - \widehat{\boldsymbol{\Sigma}}_0\right)^{-1}\left(\widehat{\boldsymbol{\theta}}_{mr} - \widehat{\boldsymbol{\theta}}_0\right),$$

which has a $\chi^2_{\mathrm{rank}(\widehat{\boldsymbol{\Sigma}}_{mr} - \widehat{\boldsymbol{\Sigma}}_0)}$ distribution. Table A.2 shows the resulting test statistics. Given the critical value for rejecting the null hypothesis at the 5 percent level is 15.51, we can clearly reject it in both cases.

Table A.1 Specification Tests of the Conditional Logit Model

Alternative dropped	Test statistic $T \sim \chi^2_8$
1	105.7834
2	103.4638

A.3 Counterfactual Simulation Details

As described in the main text, we use the Krinsky-Robb procedure to sample values of our parameters from their estimated asymptotic distributions, then use these parameters to calculate the distribution of changes in license demand following changes in license attributes, along with changes in license revenue and compensating variation.

Formally, we set $\widehat{\boldsymbol{\theta}}^r_m = \widehat{\boldsymbol{\theta}}_m + \widehat{\mathbf{C}}_m \boldsymbol{\eta}^r,\ m \in \{\mathrm{GMM}, \mathrm{MLE}\}$, where $\widehat{\mathbf{C}}_m$ is a lower triangular matrix comprising the Cholesky decomposition of the estimated asymptotic covariance matrix corresponding to the parameter estimates $\widehat{\boldsymbol{\theta}}_m$ and $\boldsymbol{\eta}^r$ is an k-dimensional vector of independent draws from a standard normal distribution.

[1] The test statistic is not defined for the case in which we drop alternative 3—the opt-out choice—since the associated alternative-specific constant is undefined.

Given $\widehat{\boldsymbol{\theta}}_m^r$, we estimate baseline license demands as $N_0\mathbf{q}\left(\mathbf{X}^1;\widehat{\boldsymbol{\Theta}}_m^r\right)$ and $N_0\mathbf{q}_{\text{bonus}}\left(\mathbf{X}^2;\widehat{\boldsymbol{\Theta}}_m^r\right)$, where N_0 is the initial number of hunters, $\widehat{\boldsymbol{\Theta}}_{\text{GMM}}^r = \widehat{\boldsymbol{\theta}}_{\text{GMM}}^r$ and $\widehat{\boldsymbol{\Theta}}_{\text{MLE}}^r = \left[\boldsymbol{\alpha}^r\ \widehat{\boldsymbol{\theta}}_{\text{GMM}}^r\right]$, $\boldsymbol{\alpha}^r$ is a vector of alternative-specific constants (ASCs) calibrated as in (6) to ensure the simulated license demand matches observed demand, and $\mathbf{q}(\cdot)$ and $q_{\text{bonus}}(\cdot)$ are defined as in (2) and (4).

The change in license structure results in different license attributes, $\breve{\mathbf{X}}^1$ and $\breve{\mathbf{X}}^2$, which will result in different levels of license demands across the different license types. Further, changing license structure may induce entry and exit from the market for licenses. The estimates from Table 3 in the main text reveal that utility will decrease following the change in license structure, and hence we would not see entry into the market following these changes. Still, we describe how we would model entry here to keep the exposition general. We estimate the number of hunters who exit from the license market following the change to $\breve{\mathbf{X}}^1$ and $\breve{\mathbf{X}}^2$ as N_0 times the probability a hunter opts out following a change in license attributes conditional on hunting in the baseline case. We denote this probability $\omega^{\text{out}}\left(\breve{\mathbf{X}}^1,\widehat{\boldsymbol{\Theta}}_m^r\right)$. Of course, we do not observe $\omega^{\text{out}}\left(\breve{\mathbf{X}}^1,\widehat{\boldsymbol{\Theta}}_m^r\right)$, so instead we calculate it from our estimated model by simulation. Briefly, we simulate a large number (10,000) of hunter choices $\psi_{ij}\left(\mathbf{X}^1,\widehat{\boldsymbol{\Theta}}_m^r\right)$ and $\psi_{ij}\left(\breve{\mathbf{X}}^1,\widehat{\boldsymbol{\Theta}}_m^r\right)$ for the baseline and counterfactual cases, respectively, where $\psi_{ij}\left(\mathbf{X},\widehat{\boldsymbol{\Theta}}_m^r\right) = 1$ if $U\left(\mathbf{X}_j;\widehat{\boldsymbol{\Theta}}_m^r\right) + \epsilon_{ij}^r \geq U\left(\mathbf{X}_{j'};\widehat{\boldsymbol{\Theta}}_m^r\right) + \epsilon_{ij'}^r, \forall j' \in \{0, J^1\}$ and zero otherwise. We use the same draws of ϵ_{ij}^r when simulating choices under both the MLE and GMM models. We then calculate the proportion of simulated hunters for whom $\psi_{i0}\left(\mathbf{X}^1;\widehat{\boldsymbol{\Theta}}_m^r\right) = 0$ and $\psi_{i0}\left(\breve{\mathbf{X}}^1;\widehat{\boldsymbol{\Theta}}_m^r\right) = 1$. We repeat this calculation a large number (1,000) of times. The probability a hunter opts out conditional on hunting prior to the change in license structure is then the average of these proportions. To find the number of entrants, we first estimate the total number of potential hunters under the original attributes as $N_1\left(\widehat{\boldsymbol{\Theta}}_m^r\right) = N_0\left[1-\pi_0^1\left(\mathbf{X}^1;\widehat{\boldsymbol{\Theta}}_m^r\right)\right]^{-1}$.

We multiply the share of these hunters that opt out under the original attributes by the probability an individual purchases a license after the change in attributes conditional on opting out prior to the change, which we denote $\omega^{\text{in}}\left(\breve{\mathbf{X}}^1;\widehat{\boldsymbol{\Theta}}_m^r\right)$ and again calculate via simulation. The resulting change in demand for license *j* is

$$\left(N_0\left[1-\omega^{\text{out}}\left(\breve{\mathbf{X}}^1;\widehat{\boldsymbol{\Theta}}_m^r\right)\right] + \left[N_1\left(\widehat{\boldsymbol{\Theta}}_m^r\right) - N_0\right]\omega^{\text{in}}\left(\breve{\mathbf{X}}^1;\widehat{\boldsymbol{\Theta}}_m^r\right)\right)\hat{\pi}_j^1\left(\breve{\mathbf{X}}^1;\widehat{\boldsymbol{\Theta}}_m^r\right) - N_0\hat{\pi}_j^1\left(\mathbf{X}^1;\widehat{\boldsymbol{\Theta}}_m^r\right).$$

For bonus antlerless licenses, the change in demand is

$$\left(N_0\left[1-\omega^{\text{out}}\left(\breve{\mathbf{X}}^1;\widehat{\boldsymbol{\Theta}}_m^r\right)\right] + \left[N_1\left(\widehat{\boldsymbol{\Theta}}_m^r\right) - N_0\right]\omega^{\text{in}}\left(\breve{\mathbf{X}}^1;\widehat{\boldsymbol{\Theta}}_m^r\right)\right)q_{bonus}\left(\breve{\mathbf{X}}^2;\widehat{\boldsymbol{\Theta}}_m^r\right) - q_{bonus}\left(\mathbf{X}^2;\widehat{\boldsymbol{\Theta}}_m^r\right).$$

We repeat this procedure a large number (r = 1, …, 1,000) of times, then use the results to calculate the mean change in demand, license revenues, and compensating variation along with the 95% confidence intervals reported in Figure 3 of the main text. MATLAB code that can be used to replicate our results is available from the authors.

A.4 Supplementary Tables Referred to in the Main Text

The table below compares the distribution of our sample respondents with those from the population of hunters in the Indiana Department of Natural Resources license sales database.

Table A.2 Demographics of the Resident Hunter Population and Sample[a]

	Percentage of:	
Characteristic	Population	Sample[b]
Gender		
Male	90.45	92.42
Female	9.55	7.58
Age		
Less than 16	0.01	-
16 - 17	0.06	-
18 - 24	10.87	6.94
25 - 34	23.57	18.29
35 - 44	23.34	17.86
45 - 54	19.16	18.37***
55 - 64	15.79	21.40
65 - 74	5.98	15.11
75+	1.23	2.02
Income[a]		
< $20,000	0.35	5.80
$20,000 - $29,999	2.24	5.18
$30,000 - $39,999	7.87	7.81***
$40,000 - $49,999	15.36	9.82
$50,000 - $74,999	48.99	22.51
$75,000 - $99,999	19.78	19.64***
$100,000 - $149,999	4.92	18.56
$150,000 +	0.48	10.67

[a] The IDNR only collects income on gender, age, and mailing address when selling deer licenses. We calculate population income for each individual in the IDNR database as the corresponding census block group-level median household income from the US Census Bureau's 2019 American Community Survey.
[b] *** indicates the sample proportion is significantly the same as the population proportion at a 1% level.

A.5 Survey Instrument

The document starting on the following page is one block of our survey instrument.

Land Economics 99(4), November 2023
"Combining Aggregate Demand and Discrete Choice Data with Application to Deer License Demand in Indiana"
by Carson Reeling, Dane Erickson, Yusun Kim, John G. Lee, and Nicole J. O. Widmar

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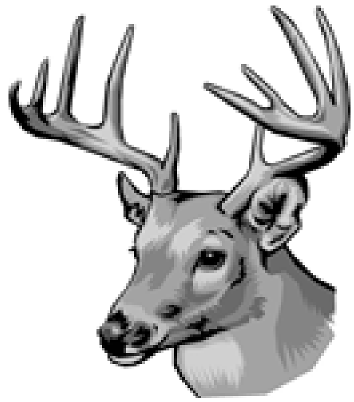
Survey – Indiana Deer License Structure

- Conducted by Purdue University -



Your participation in this survey is voluntary. You may choose to participate by completing and returning this questionnaire. If you choose, you are free not to fill out the questionnaire (or particular questions). If you wish to comment on any questions, please feel free to use the space in the margins. Your responses will be kept in strict confidence.

If you have any questions, comments, or concerns regarding this survey, please contact:

- **Dr. Carson Reeling at Purdue University by phone: (765) 496-6197 or email: creeling@purdue.edu**
- **Dr. Nicole Widmar at Purdue University by phone: (765) 494-2567 or email: nwidmar@purdue.edu**

Definitions

We will refer to the following terms in this survey, defined here for clarity:

- Antlerless deer: A female deer or "button buck" with no antler that is longer than 3 inches.
- Antlered deer: A male deer that has at least one antler that is at least 3 inches long.

We will also ask you about your preferences for hunting during different seasons. For reference, the seasons during the most recent year were

Season	Dates (2020/2021)
Archery	Oct. 1 – Jan. 3
Firearm	Nov. 14 – Nov. 29
Muzzleloader	Dec. 5 – Dec. 20

Part 1: Hunting Habits and Preferences

Q1.1 Have you hunted deer in the last 5 years?

☐ Yes ☐ No

Q1.2 You would consider yourself a(n):

☐ Beginning hunter
☐ Casual hunter
☐ Intermediate hunter
☐ Experienced hunter

Q1.3 What kind of equipment do you typically hunt with? (Select all that apply.)

☐ Bow
☐ Crossbow
☐ Muzzleloader
☐ Firearm (rifle, shotgun, or pistol)

Q1.4 How many deer do you want to harvest in a typical season? (Please write a number.)

Antlered________ Antlerless________

Q1.5 In which Indiana county do you primarily hunt?

____

Q1.6 How many days do you go deer hunting in a typical year in which you hunt?

__________days

Q1.7 What type of land do you usually hunt?

☐ Public ☐ Private

Q1.8 Do you hunt for deer exclusively with a landowner exemption?

☐ Yes ☐ No

Q1.8-1 If you answered "No" to Q1.8 above, then which type of deer license do you typically buy? (Select all that apply.)

☐ Archery ☐ Bonus antlerless
☐ Firearm ☐ Youth
☐ Muzzleloader ☐ Reduction zone
☐ Deer bundle ☐ Crossbow

Q1.9 What do you think about the price of a single license for deer hunting? (The current price is $24.)

☐ Very expensive
☐ Expensive
☐ Moderate
☐ Cheap
☐ Very cheap

Q1.10 What do you think about the price of the deer bundle? (The current price is $65.)

☐ Very expensive
☐ Expensive
☐ Moderate
☐ Cheap
☐ Very cheap

Chronic wasting disease (CWD) is a serious neurological disease affecting white-tailed deer. It is a member of a group of diseases called transmissible spongiform encephalopathies (TSEs), or prion diseases. CWD is spread through bodily fluids like feces, saliva, blood or urine and is transmitted either through direct contact or indirectly through environmental contamination of soil, plants, food or water. CWD is similar to mad cow disease in cattle and scrapie in sheep. Although it has been associated with captive deer and elk in the past, CWD is also found in free-ranging white-tailed deer in several Midwestern states close to Indiana, including Michigan, Illinois, and Wisconsin. The US Centers for Disease Control have never identified human cases of CWD infection in humans, although it may pose risks to nonhuman primates. CWD has never been detected in an Indiana deer.

Q1.11 Suppose that CWD were detected in Indiana deer. For each hypothetical prevalence level below, please indicate how your deer hunting and consumption behavior would change.

Hypothetical % of deer in population infected	I will hunt as usual, and eat deer meat if I harvest a deer.	I will hunt as usual but only eat deer meat if I am able to test it for CWD first	I will hunt as usual and eat deer meat but my family will not.	I will hunt as usual but no longer eat deer meat.	I will NOT hunt as usual and hunt in a different county.	I will NOT hunt deer in Indiana, but will go out of state to hunt deer.	I will not go hunting at all.
0.1%	□	□	□	□	□	□	□
1%	□	□	□	□	□	□	□
10%	□	□	□	□	□	□	□
20%	□	□	□	□	□	□	□
30%	□	□	□	□	□	□	□
50%	□	□	□	□	□	□	□
100%	□	□	□	□	□	□	□

Q1.12 Suppose that CWD were detected in Indiana deer. For each hypothetical prevalence level below, please indicate how your typical deer hunting effort (days spent hunting) reported in Q1.6 above would change.

Hypothetical % of deer in population infected	Decrease by:					Increase by:			
	100%	75%	50%	25%	0%	25%	50%	75%	≥100%
0.1%	◻	◻	◻	◻	◻	◻	◻	◻	◻
1%	◻	◻	◻	◻	◻	◻	◻	◻	◻
10%	◻	◻	◻	◻	◻	◻	◻	◻	◻
20%	◻	◻	◻	◻	◻	◻	◻	◻	◻
30%	◻	◻	◻	◻	◻	◻	◻	◻	◻
50%	◻	◻	◻	◻	◻	◻	◻	◻	◻
100%	◻	◻	◻	◻	◻	◻	◻	◻	◻

Part 2: License Structure

The next several questions will ask you to evaluate different deer hunting licenses. Please note that the Indiana Department of Natural Resources is not currently proposing to change the actual deer license offerings available to hunters. Our goal here is simply to understand your opinions on the features of deer licenses.

Each question will present you with a choice set with two license options. The options may differ in price, the season in which you can hunt, and the bag limit. You will be asked to indicate which option, if any, you would purchase if only these licenses were offered for sale. You will also have the option to choose neither license option.

An example is shown in the table below. License A allows the buyer to harvest one antlered deer and two antlerless deer during the archery season and costs $72. License B allows the buyer to harvest one antlered deer during the muzzleloader season and costs $12.

Choice	License A	License B	No choice
Bag limit	1 antlered + 2 antlerless	1 antlered	I would not purchase either of these licenses
Equipment/Season	Archery	Muzzleloader	
Price	$72.00	$12.00	
I would choose:	◻	◻	◻

The questions begin on the next page.

Q2.1 Please imagine that you face the following three deer hunting license choices. Which license would you be most likely to purchase? Please choose between License A, License B, or No choice. You may only indicate one choice per choice set.

Choice	License A	License B	No choice
Bag limit	1 antlerless	1 antlered	I would not purchase either of these licenses
Equipment/Season	Any	Muzzleloader	
Price	$12.00	$31.20	
I would choose:	◻	◻	◻

Q2.1-1 Given your choice in Q2.1 above, please indicate how your hunting effort (days spent hunting) reported in Q1.6 above would change. (Please check one.)

Decrease by:				No change	Increase by:			
100%	**75%**	**50%**	**25%**	**0%**	**25%**	**50%**	**75%**	**≥100%**
◻	◻	◻	◻	◻	◻	◻	◻	◻

Q2.2 Please imagine that you face the following three deer hunting license choices. Which license would you be most likely to purchase? Please choose between License A, License B, or No choice. You may only indicate one choice per choice set.

Choice	License A	License B	No choice
Bag limit	1 antlered + 2 antlerless	1 antlered	I would not purchase either of these licenses
Equipment/Season	Firearm	Any	
Price	$19.20	$12.00	
I would choose:	◻	◻	◻

Q2.2-1 Given your choice in Q2.2 above, please indicate how your hunting effort (days spent hunting) reported in Q1.6 above would change. (Please check one.)

Decrease by:				No change	Increase by:			
100%	**75%**	**50%**	**25%**	**0%**	**25%**	**50%**	**75%**	**≥100%**
◻	◻	◻	◻	◻	◻	◻	◻	◻

Q2.3 Please imagine that you face the following three deer hunting license choices. Which license would you be most likely to purchase? Please choose between License A, License B, or No choice. You may only indicate one choice per choice set.

Choice	License A	License B	No choice
Bag limit	1 antlered	1 antlered + 2 antlerless	I would not purchase either of these licenses
Equipment/Season	Any	Archery	
Price	$19.20	$12.00	
I would choose:	☐	☐	☐

Q2.3-1 Given your choice in Q2.3 above, please indicate how your hunting effort (days spent hunting) reported in Q1.6 above would change. (Please check one.)

Decrease by:				No change	Increase by:			
100%	75%	50%	25%	0%	25%	50%	75%	≥100%
☐	☐	☐	☐	☐	☐	☐	☐	☐

Q2.4 Please imagine that you face the following three deer hunting license choices. Which license would you be most likely to purchase? Please choose between License A, License B, or No choice. You may only indicate one choice per choice set.

Choice	License A	License B	No choice
Bag limit	1 antlered	1 antlered + 2 antlerless	I would not purchase either of these licenses
Equipment/Season	Archery	Firearm	
Price	$31.20	$36.00	
I would choose:	☐	☐	☐

Q2.4-1 Given your choice in Q2.4 above, please indicate how your hunting effort (days spent hunting) reported in Q1.6 above would change. (Please check one.)

Decrease by:				No change	Increase by:			
100%	75%	50%	25%	0%	25%	50%	75%	≥100%
☐	☐	☐	☐	☐	☐	☐	☐	☐

Q2.5 Please imagine that you face the following three deer hunting license choices. Which license would you be most likely to purchase? Please choose between License A, License B, or No choice. You may only indicate one choice per choice set.

Choice	License A	License B	No choice
Bag limit	1 antlered + 2 antlerless	1 antlerless	I would not purchase either of these licenses
Equipment/Season	Any	Archery	
Price	$72.00	$19.20	
I would choose:	☐	☐	☐

Q2.5-1 Given your choice in Q2.5 above, please indicate how your hunting effort (days spent hunting) reported in Q1.6 above would change. (Please check one.)

Decrease by:				No change	Increase by:			
100%	75%	50%	25%	0%	25%	50%	75%	≥100%
☐	☐	☐	☐	☐	☐	☐	☐	☐

Q2.6 Please imagine that you face the following three deer hunting license choices. Which license would you be most likely to purchase? Please choose between License A, License B, or No choice. You may only indicate one choice per choice set.

Choice	License A	License B	No choice
Bag limit	1 antlered + 2 antlerless	1 antlered + 2 antlerless	I would not purchase either of these licenses
Equipment/Season	Muzzleloader	Archery	
Price	$36.00	$72.00	
I would choose:	☐	☐	☐

Q2.6-1 Given your choice in Q2.6 above, please indicate how your hunting effort (days spent hunting) reported in Q1.6 above would change. (Please check one.)

Decrease by:				No change	Increase by:			
100%	75%	50%	25%	0%	25%	50%	75%	≥100%
☐	☐	☐	☐	☐	☐	☐	☐	☐

Q2.7 Please imagine that you face the following three deer hunting license choices. Which license would you be most likely to purchase? Please choose between License A, License B, or No choice. You may only indicate one choice per choice set.

Choice	License A	License B	No choice
Bag limit	1 antlered + 1 antlerless OR 2 antlerless	1 antlered	I would not purchase either of these licenses
Equipment/Season	Any	Archery	
Price	$72.00	$19.20	
I would choose:	☐	☐	☐

Q2.7-1 Given your choice in Q2.7 above, please indicate how your hunting effort (days spent hunting) reported in Q1.6 above would change. (Please check one.)

Decrease by:				No change	Increase by:			
100%	75%	50%	25%	0%	25%	50%	75%	≥100%
☐	☐	☐	☐	☐	☐	☐	☐	☐

Q2.8 Please imagine that you face the following three deer hunting license choices. Which license would you be most likely to purchase? Please choose between License A, License B, or No choice. You may only indicate one choice per choice set.

Choice	License A	License B	No choice
Bag limit	1 antlered + 2 antlerless	1 antlered + 2 antlerless	I would not purchase either of these licenses
Equipment/Season	Archery	Any	
Price	$31.20	$72.00	
I would choose:	☐	☐	☐

Q2.8-1 Given your choice in Q2.8 above, please indicate how your hunting effort (days spent hunting) reported in Q1.6 above would change. (Please check one.)

Decrease by:				No change	Increase by:			
100%	75%	50%	25%	0%	25%	50%	75%	≥100%
☐	☐	☐	☐	☐	☐	☐	☐	☐

Q2.9 Please imagine that you face the following three deer hunting license choices. Which license would you be most likely to purchase? Please choose between License A, License B, or No choice. You may only indicate one choice per choice set.

Choice	License A	License B	No choice
Bag limit	1 antlered + 1 antlerless OR 2 antlerless	1 antlered + 2 antlerless	I would not purchase either of these licenses
Equipment/Season	Archery	Muzzleloader	
Price	$12.00	$31.20	
I would choose:	☐	☐	☐

Q2.9-1 Given your choice in Q2.9 above, please indicate how your hunting effort (days spent hunting) reported in Q1.6 above would change. (Please check one.)

Decrease by:				No change	Increase by:			
100%	75%	50%	25%	0%	25%	50%	75%	≥100%
☐	☐	☐	☐	☐	☐	☐	☐	☐

Q2.10 Please imagine that you face the following three deer hunting license choices. Which license would you be most likely to purchase? Please choose between License A, License B, or No choice. You may only indicate one choice per choice set.

Choice	License A	License B	No choice
Bag limit	1 antlered + 2 antlerless	1 antlered + 1 antlerless OR 2 antlerless	I would not purchase either of these licenses
Equipment/Season	Any	Archery	
Price	$36.00	$31.20	
I would choose:	☐	☐	☐

Q2.10-1 Given your choice in Q2.10 above, please indicate how your hunting effort (days spent hunting) reported in Q1.6 above would change. (Please check one.)

Decrease by:				No change	Increase by:			
100%	75%	50%	25%	0%	25%	50%	75%	≥100%
☐	☐	☐	☐	☐	☐	☐	☐	☐

Q2.11 If you chose the option of not buying a license for any of the questions above, please state why you made this choice.

Part 3: About You

Q3.1 You identify as:
☐ Male ☐ Female ☐ Other

Q3.2 You are _____ years old
☐ 16 to 17 ☐ 45 to 54
☐ 18 to 24 ☐ 55 to 64
☐ 25 to 34 ☐ 65 to 74
☐ 35 to 44 ☐ 75+

Q3.3 Choose the group with which you most closely identify
☐ White
☐ Hispanic or Latinx
☐ Black or African American
☐ Asian
☐ American Indian or Alaska Native
☐ Pacific Islander or Native Hawaiian
☐ Multiracial
☐ Prefer not to answer

Q3.5 Your annual, pre-tax household income is:
☐ < $20,000 ☐ $50,000 - $74,999
☐ $20,000 - $29,999 ☐ $75,000 - $99,999
☐ $30,000 - $39,999 ☐ $100,000 - $149,999
☐ $40,000 - $49,999 ☐ $150,000 +

Q3.6 Your county of legal residence is:

______________________________.

Q3.4 What is the highest level of schooling that you have completed?
☐ Less than grade 11
☐ Graduated high school or equivalent
☐ Some college
☐ Associate's degree or equivalent
☐ Bachelor's degree
☐ Graduate degree

Q3.7 Please use the space below to write any comments or questions you have about this survey.