

License Preferences among Iowa's Hunters and Anglers

For:
Iowa Department of Natural Resources

By:
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EXECUTIVE SUMMARY:

Southwick Associates conducted a survey of hunters and anglers on behalf of the Iowa Department of Natural Resources (DNR) in March 2011 to gain a better understanding of sportsmen's preferences for fishing and hunting privileges in a combination license. The survey was developed in consultation with the Iowa DNR and mailed to a random sample of 5,000 people who purchased a hunting and/or fishing privilege in Iowa in 2009 or 2010. Over 2,000 anglers returned completed surveys by early April.

A conjoint analysis of sportsmen's choices, when presented with a wide range of alternative combinations of fishing and hunting privileges and prices, estimates their relative preference and their willingness to pay for individual privileges. A spreadsheet-based decision support tool (filename: IADNR_DST.xls) that accompanies this report provides users with the ability to see how different combinations of privileges and prices affect anglers' probability of choosing one license over another. Combination licenses were presented at three different price levels including the face value of the privileges (plus habitat fee and agent fee, as appropriate) and at 10% and 20% discounts.

In addition to exploring preferences for different combination licenses, the survey sought to determine anglers' and hunters' interest in several proposed new licenses and permits. These include a permit that would allow an angler to use an extra rod while fishing in addition to the two rods that are permissible under current regulations. Also presented was a "Conservation Legacy" designation for sportsmen who paid a premium price for a combination license. The "Conservation Legacy" designation was described as including a "Conservation Legacy" window/bumper decal, a hat, and a 1-year subscription to Iowa Outdoors magazine.

Result Highlights:

- Over 71% of Iowa sportsmen are somewhat likely or very to purchase a 3-year license if one was available
 - The likelihood of purchasing a 3-year license declines with age
 - Sportsmen who only fish or both fish and hunt are the most likely to purchase a 3-year license; sportsmen who only hunt are less likely to buy a 3-year license
 - Based on the proportion of Iowa sportsmen who are "very likely" to buy a 3-year license, an estimated \$600,000 additional revenue annually could be gained from the availability of 3-year hunting and fishing licenses¹.
- Overall, approximately 14% of sportsmen expressed willingness to pay an additional fee for a "Conservation Legacy" designation with a combination hunting and fishing license.
 - Interest in a "Conservation Legacy" designation declines with age
 - Sportsmen who both fish and hunt are the most likely to purchase
 - While the percent of combination license buyers who would purchase the "Conservation Legacy" option declines steadily as the price of the option rises, the greatest total revenue from the sale of the option would be achieved at a price of approximately \$35.00.

¹ This should be considered the upper limit of expected revenue since survey respondents may over-represent their actual purchase behavior if a 3-year license is available.

- Maximum potential annual revenue from sales of the “Conservation Legacy” option is estimated to be approximately \$512,000.²
- Overall, approximately 16% of Iowa anglers would be willing to pay an additional fee for a permit that allows them to fish with an extra pole in addition to the two poles allowed under current fishing regulations.
 - Interest in an extra-pole permit declines steadily with age.
 - Sportsmen who both fish and hunt are the most likely to purchase and extra-pole permit
 - Maximum total revenue from sales of an extra-pole permit would be achieved at a price of approximately \$10.00
 - Maximum potential annual revenue from sales of “Extra Pole” permits is estimated to be approximately \$450,000.³
- A conjoint analysis of selected fishing and hunting privileges in a combination license was applied to different types of Iowa sportsmen.
 - Among all Iowa sportsmen:
 - The combination with the highest probability of purchase at current prices is one that includes fishing and hunting privileges with a deer permit, followed closely by a combination hunting and fishing license.
 - The fishing privilege was the most highly valued privilege, followed by deer hunting, and then small game hunting
 - The inclusion of a trout permit in a combination license would make the license less attractive to the average Iowa sportsman
 - The inclusion of a turkey hunting privilege has no effect on the probability of purchase by the average Iowa sportsman
 - Among Iowa sportsmen who purchased only a hunting license (no fishing license) in the past two years, the inclusion of additional hunting or fishing privileges in a combination license has no effect on the probability of purchase of the license.
 - Among Iowa sportsmen who purchased only a fishing license (no hunting privileges) in the past two years, the inclusion of most additional hunting or fishing privileges in a combination license has no effect on the probability of purchase of the license.
 - Among Iowa sportsmen who both hunt and fish:
 - The combination with the highest probability of purchase at current prices is one that includes fishing and hunting privileges with a deer permit.
 - The small game hunting privilege was the most highly valued privilege, followed by the fishing privilege and then the deer hunting privilege
 - The inclusion of a trout permit or turkey hunting privilege has no effect on the probability of purchase by the sportsmen who both hunt and fish

² This should be considered the upper limit of expected revenue since survey respondents may over-represent their actual purchase behavior if a “Conservation Legacy” option is available.

³ This should be considered the upper limit of expected revenue since survey respondents may over-represent their actual purchase behavior if a “Conservation Legacy” option is available.

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INTRODUCTION:

A mail survey of anglers was conducted for the Iowa Department of Natural Resources (DNR) to better understand preferences for hunting and fishing privileges among Iowa's sportsmen. The goal was to provide information for improving the menu of license offerings, including the possible creation of new licenses. The survey included questions about fishing and hunting activity, interest in new types of licenses, and specialized questions for a conjoint analysis of individual privileges in various combinations.

Goals:

- Determine customer interest in several new types of licenses, including 3-year licenses, an extra fishing pole permit, and a "Conservation Legacy" designation for combination licenses.
- Determine the specific combination licenses most preferred by Iowa sportsmen.

Objectives:

- Measure anglers' willingness to pay for a permit that would enable them to fish with an extra pole in addition to the two poles that are permitted under current regulations.
- Measure anglers' willingness to pay for a "Conservation Legacy" designation on selected combination licenses that would include a bumper/window decal and cap with a "Conservation Legacy" insignia, and an annual subscription to "Iowa Outdoors" magazine.
- Measure sportsmen's interest in purchasing 3-year licenses.
- Measure the relative desirability of different combinations of individual fishing and hunting privileges.
- Measure the value that sportsmen assign to individual privileges in a combination license.

SURVEY DESCRIPTION:

A mail survey was conducted of 5,000 recent DNR customers selected at random from the population of all Iowa residents who purchased either fishing or hunting privileges in 2009 or 2010. On February 23rd, an advance postcard was mailed to all 5,000 customers alerting them to the upcoming survey. One week later, a questionnaire and cover letter were mailed to the 5,000 customers. One week after the questionnaire was sent, a reminder/thank-you postcard was mailed on March 9th to all 5,000 customers. By March 18th, 3,434 people who received the survey still had not responded. Due to a shortage of printed envelopes, a second questionnaire could not be mailed to all non-respondents. Instead, a random sample of 3,000 customers was drawn from among the 3,434 who still had not responded. A second questionnaire was mailed to the 3,000 selected non-respondents on March 28th. By April 12th, 2,019 completed surveys had been returned and entered into an electronic data file for analysis. By April 20th, an additional 145 surveys had been returned but are not included in the analysis due to

time constraints. The overall response rate for the survey was 45.1%⁴. Details of the survey mailout and response are presented in Table 1.

Table 1. Survey response summary.

Initial mailout	5,000
Undeliverable surveys	204
Net mail out	4,796
Completed surveys	2,164
Response rate	45.1%
Surveys included in the analysis	2,019

The sportsmen who responded to the survey exhibit higher levels of activity for both hunting and fishing activity than the average sportsman in Iowa. Table 2 shows that the survey respondents were almost twice as likely as the survey respondents to buy some form of sporting license (hunting or fishing) every year between 2006 and 2010. While this suggests that perhaps avid sportsmen are more likely to respond to surveys, the result is due primarily to the criteria used to define the sampling frame. The sample was drawn from all DNR customers who purchased a hunting and/or fishing license in 2009 and/or 2010. Sportsmen who purchased most recently are more likely, on average, to have purchased more frequently over the past five years than sportsmen whose last license purchase may have been four or five years ago. Therefore, it should be expected that the mailing list includes sportsmen who have purchased more licenses over the past five years than the average DNR customer.

A comparison of avidity between sportsmen on the mailing list and those who responded to the survey does show that those who responded are somewhat more avid than the sample drawn for the survey. The differences are most pronounced between respondents who either purchase very frequently (five out of five years) or very infrequently (one or two out of five years).

Table 2. Avidity of survey respondents compared to all Iowa sportsmen.

Number of years purchased any license: 2006-2010	All Iowa Sportsmen	Mailing List	Survey Respondents
1	32.6%	19.3%	12.4%
2	17.7%	15.3%	11.2%
3	12.5%	13.7%	11.3%
4	11.1%	15.9%	15.1%
5	26.1%	35.8%	49.9%
TOTAL	100.0%	100.0%	100.0%

NOTE: numbers in red indicate statistically significant differences within the row.

⁴ The cut-off date for completed surveys included in the survey was set to April 12th to allow adequate time for data entry and analysis.

Questionnaire design:

The survey questionnaire was designed in partnership with the DNR to ensure that the desired information was collected and that appropriate wording was used in the questions. Two survey questions included variable prices to gauge customers' willingness to pay for the "Extra pole" permit and the "Conservation Legacy" option. Five different price points were designated for each of these two questions and randomly distributed across the 5,000 surveys. Each price point appeared in 1,000 questionnaires.

The conjoint question presented respondents with two license options. Respondents were asked to indicate which license option they would purchase today, assuming that their current license was expiring. A third option allowed respondents to indicate that they would not buy either of the presented license options. The two license options included different combinations of fishing and hunting privileges. Although each questionnaire presented respondents with one price for each option, various prices were presented across all of the questionnaires and set at the current price for the combined privileges (including the habitat fee and agent fee, as appropriate) and at prices discounted 10% and 20% below the combined current price. Forty-five different versions of the conjoint question were created and randomly distributed across the 5,000 questionnaires.

Samples of the questionnaire and all survey materials are provided in Appendix A.

Sample weighting:

Upon completion of data entry, survey respondents were compared to the original mailing list on the basis of age, gender and previous license purchases. Table 3 and Table 4 show that the respondents were older than the typical DNR customer and were more likely to have purchased hunting privileges and less likely to have purchased fishing privileges. To correct for this bias in the sample, proportional weights were calculated across age and license purchases. All analyses in this report are based on the weighted sample data.

Table 3. Age distribution of survey respondents compared to original mail list.

Age	Mail List	Survey Respondents
Under 18	5.4%	5.5%
18 to 24	12.3%	6.7%
25-44	37.2%	27.3%
45 to 64	36.7%	47.2%
65 and older	8.5%	13.4%
Total	100.0%	100.0%
Number of observations	5,000	2,017

Table 4. License purchases of survey respondents compared to original mail list.

Permits purchased 2009 or 2010	Mail List	Survey Respondents
Small Game	32.5%	41.2%
One Deer	17.1%	21.6%
Two Deer	9.8%	13.6%
Turkey (Spring or Fall)	7.0%	10.9%
Fishing	73.6%	69.6%
Trout	7.3%	9.5%
Number of observations	5,000	2,017

HUNTING AND FISHING ACTIVITY:

Respondents were asked a series of questions about their fishing and hunting activity over the previous twelve months (i.e., the 2010 season). Fifty-four percent of respondents indicated that they hunted last year and 81.5% said that they fished last year (Table 5). These figures correspond somewhat closely to actual license sales in 2010. Based on the license sales records provided by the DNR, 47.4% of customers purchased a hunting privilege last year and 76.4% of customers purchased a fishing license. One reason that the survey respondents reported slightly higher activity than license sales may be due to a modest tendency among survey respondents to overestimate how recently they last went hunting or fishing.

Table 5. Hunting and fishing activity reported by Iowa sportsmen in the previous twelve months.

	Hunted	Fished
	<i>percent</i>	
Yes	53.8%	81.5%
No	46.2%	18.5%
Total	100.0%	100.0%
Number of responses:	1,881	1,882

The level of activity among hunters and anglers in Iowa is quite similar except for the larger proportion of anglers who fished 51 or more days. As a result, the average number of days of activity is higher for anglers (26.6 days) than for hunters (22.5 days) (Table 6).

Table 6. Days of hunting and fishing by Iowa sportsmen in the previous twelve months.

	Hunted	Fished
	<i>percent</i>	
1 to 5	23.2%	24.1%
6 to 10	18.7%	19.6%
11 to 20	20.2%	20.5%
21 to 50	28.7%	23.3%
51 or more	9.2%	12.5%
Total	100.0%	100.0%
Number of responses:	1,014	1,462
Average days:	22.5	26.6

Deer hunting is by far the most popular activity among Iowa hunters. Almost 85% of hunters in Iowa participated in deer hunting last year. The second most popular game species in Iowa, upland game, was targeted by a little over one half as many hunters (44.6%). Small game (38.8%) and Spring turkey (28.6%) are other types of hunting that were pursued by at least one-fourth of hunters (Table 7).

Table 7. Species targeted by Iowa hunters in the previous twelve months.

Species Hunted	%
Deer	84.6%
Spring Turkey	28.6%
Fall Turkey	6.5%
Upland bird	44.6%
Waterfowl	16.4%
Other migratory birds	1.9%
Small Game	38.8%
Furbearer	21.8%
Other	2.0%
Total	100.0%
Number of responses:	1,020

Anglers in Iowa are most likely to fish for sunfish and bluegill (76.9%), followed by Crappie (64.1%), (Catfish (60.6%) and Black bass (51.6%). All other species of fish were targeted by less than one-half of Iowa anglers. Notably, fewer than 13% of Iowa anglers fish for trout (Table 8).

Table 8. Species targeted by Iowa anglers in the previous twelve months.

Species Fished	%
Any species of sunfish and bluegill	76.9%
Crappie	64.1%
Trout	12.9%
Temperate bass	22.8%
Black bass	51.6%
Catfish	60.6%
Walleye	37.3%
Muskie	12.4%
Any other species	12.1%
Total	100.0%
Number of responses:	1,478

Most (94.3%) of the sportsmen who hunted and/or fished in Iowa in the past two years plan to purchase a license in 2011 (Table 9).

Table 9. Iowa sportsmen who plan to purchase a hunting or fishing license in 2011.

	%
No	5.7%
Yes	94.3%
Total	100.0%
Number of responses:	1,841

INTEREST IN NEW LICENSES:

The survey included questions to assess interest among Iowa sportsmen in three potential new licenses including licenses that would be valid for three years (3-year licenses), a permit for anglers that would allow them to fish with an extra pole, and a “Conservation Legacy” option that could be purchased by sportsmen who buy selected combination licenses.

3-year licenses:

The survey presented respondents with the following question:

“The Iowa Department of Natural Resources is considering fishing and hunting licenses that would be valid for 3 years. These would be offered in addition to the current annual licenses. The price would be the same as three annual licenses except you would need to pay the \$1.50 transaction fee only the first year. How likely would you be to purchase a 3-year license compared to three annual licenses?”

As shown in Table 10, more than one-third of Iowa sportsmen (37.9%) reported that they would very likely purchase a 3-year license if it was available. Including those who would be somewhat likely to purchase, over 71% of all Iowa sportsmen are potential customers for a 3-year license.

Table 10. Likelihood that Iowa sportsmen would purchase a 3-year license, if offered.

Purchase 3-year License	%
Very unlikely	17.3%
Somewhat unlikely	11.5%
Somewhat likely	33.3%
Very likely	37.9%
Total	100.0%
Number of responses:	1,715

NOTE: numbers in red indicate statistically significant differences within the column.

To better understand the best target audience for selling 3-year licenses we examined the likelihood of purchase by different age groups of sportsmen and the type of activity in which they participated most recently in the last two years (2009 and 2010). Customers most likely to purchase a 3-year license are young sportsmen age 18 to 24 (Table 11). Among that age group, over 44% reported that they would very likely buy a 3-year license. That age category, however, represents a fairly small number of Iowa sportsmen, accounting for approximately 12% of all customers (Table 3). Customers in the next highest age group, 25 to 44, have the second-highest likelihood of purchasing a 3-year license (39.9%). That age group is the largest in Iowa, accounting for over 37.2% of all sportsmen (Table 3).

The likelihood of purchasing a 3-year license generally declines with age. Only one-fourth of sportsmen age 65 and older would be very likely to purchase a 3-year license, while over one-third of those sportsmen would be very unlikely to purchase.

Table 11. Likelihood that Iowa sportsmen would purchase a 3-year license, if offered, by age of sportsmen.

	Age of Sportsman				
	Under 18	18 to 24	25 to 44	45 to 64	65 and older
Very unlikely	15.6%	11.8%	14.8%	22.9%	33.8%
Somewhat unlikely	10.9%	11.0%	11.5%	10.9%	13.5%
Somewhat likely	37.9%	33.0%	33.8%	33.0%	27.0%
Very likely	35.5%	44.2%	39.9%	33.2%	25.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Number of responses:	106	134	527	909	173

NOTE: numbers in red indicate statistically significant differences within the row.

Anglers are more likely than hunters to be very likely to buy a 3-year license (Table 12). Among sportsmen who only fish, 39.5% would be very likely to purchase. A similar proportion (38.6%) of sportsmen who both fish and hunt would also likely buy a 3-year license. By contrast, only about one-fourth of sportsmen who only hunt would be very likely to purchase a 3-year license. An equal percentage of hunt-only sportsmen (26.4%) would be unlikely to purchase a 3-year license. That is considerably higher than the 16.0% to 17.5% of anglers who would be very unlikely to purchase.

Table 12. Likelihood that Iowa sportsmen would purchase a 3-year license, if offered, by type of sportsmen.

	Type of sportsman		
	Angler only	Both	Hunter only
Very unlikely	17.5%	16.0%	26.4%
Somewhat unlikely	9.1%	12.9%	14.5%
Somewhat likely	33.9%	32.5%	32.3%
Very likely	39.5%	38.6%	26.8%
Total	100.0%	100.0%	100.0%
Number of responses:	876	538	435

NOTE: numbers in red indicate statistically significant differences within the row.

Interest in 3-year licenses among anglers and hunters was measured based on their license purchase history over the three-year period from 2008 to 2010. A goal of selling 3-year licenses is to lock in three years of license revenue among sportsmen who might otherwise purchase a license fewer than three years. If the interest in 3-year licenses rests mainly among sportsmen who already buy every year, then offering a 3-year license is unlikely to increase license sales revenue.

Table 13 shows that there is little difference in the likelihood of purchase between anglers who purchased a fishing license one, two or all three years between 2008 and 2010 (this includes anglers regardless of whether they also purchased any hunting privilege during that period). Although the percent of anglers who reported that they

were “very likely” to purchase a 3-year license rises as the frequency of purchase increases between 2008 and 2010, the differences are not statistically significant.

Table 13. Likelihood of purchasing a 3-year license among Iowa anglers, by purchase frequency from 2008 to 2010.

Anglers likelihood to purchase	Years purchased fishing license: 2008-2010		
	1 year	2 years	3 years
Very unlikely	18.0%	16.1%	18.5%
Somewhat unlikely	10.0%	10.7%	10.6%
Somewhat likely	37.7%	34.4%	29.8%
Very likely	34.3%	38.8%	41.1%
Total	100.0%	100.0%	100.0%
	N=400	N=396	N=732

NOTE: numbers in red indicate statistically significant differences within the row at 95% confidence level.

By tracking the cohort of anglers who purchased a fishing license⁵ in 2008 to determine how many went on to purchase (or not) fishing licenses in the next two years we can estimate the additional revenue that might have been gained from sales of a 3-year fishing license in 2008 (Table 14). In 2008, 287,991 sportsmen purchased an annual fishing license. Of those, 68,101 did not buy again in 2009 or 2010. In the survey, 34.3% of anglers who bought only one license between 2008 and 2010 reported that they would “very likely” purchase a 3-year license. Based on that figure, we estimate that 23,358 anglers who bought a fishing license only on 2008 (and not in 2009 or 2010) might buy a 3-year license generating \$1.2 million in potential revenue⁶. The remaining single-year license buyers would not buy again and generate \$783,005 in revenue between 2008 and 2010. Applying similar logic to anglers who bought two and three years between 2008 and 2010 we estimate total potential revenue during 2008 to 2010 from sales of annual and 3-year licenses to be \$12.8 million compared to \$11.5 million actual revenue from sales of annual licenses, or an average gain of \$430,346 per year. This estimate does not include any revenue from anglers in 2009 or 2010 that not part of the 2008 cohort.

Table 14. Actual and estimated potential revenue between 2008 and 2010 from sales of annual and 3-year fishing licenses to anglers who bought an annual license in 2008.

# Annual Licenses: 2008-2010	Actual		Potential License Buyers		Potential Revenue		
	Buyers 2008	Revenue 2008-10	3-year License	Annual License	3-year License	Annual License	TOTAL
1	68,101	\$1,191,768	23,358	44,743	\$1,226,288	\$783,005	\$2,009,293
2	69,726	\$2,440,410	27,058	42,668	\$1,420,541	\$1,493,383	\$2,913,924
3	150,164	\$7,883,610	61,764	88,400	\$3,242,622	\$4,640,988	\$7,883,610
TOTAL	287,991	\$11,515,788	112,180	175,811	\$5,889,450	\$6,917,376	\$12,806,826

⁵ Applies only to sportsmen who purchased an annual fishing license (License type 1) in 2008.

⁶ Assumes revenue of \$52.50 per 3-year license which is equal to three times the revenue of a single annual license (\$17.50).

The likelihood of buying a 3-year license among hunters based on purchase frequency is shown in Table 15. There is little difference between hunters who purchased a license one, two or all three years between 2008 and 2010 (this includes hunters regardless of whether they also purchased any fishing privilege during that period). Although the percent of hunters who reported that were “very likely” to purchase a 3-year license rises as the frequency of purchase increases between 2008 and 2010, the differences are not statistically significant.

Table 15. Likelihood of purchasing a 3-year license among Iowa hunters, by purchase frequency from 2008 to 2010.

Hunters	Years purchased hunting license: 2008-2010		
	1 year	2 years	3 years
Very unlikely	20.0%	20.2%	19.4%
Somewhat unlikely	10.7%	16.8%	13.1%
Somewhat likely	36.4%	30.3%	31.7%
Very likely	32.8%	32.8%	35.7%
Total	100.0%	100.0%	100.0%
	N=138	N=181	N=741

NOTE: numbers in red indicate statistically significant differences within the row at 95% confidence level.

By tracking the cohort of hunters who purchased a hunting license⁷ in 2008 to determine how many went on to purchase (or not) hunting licenses in the next two years we can estimate the additional revenue that might have been gained from sales of a 3-year hunting license in 2008 (Table 16). In 2008, 177,711 sportsmen purchased an annual hunting license. Of those, 26,949 did not buy again in 2009 or 2010. In the survey, 32.8% of hunters who bought only one license between 2008 and 2010 reported that they would “very likely” purchase a 3-year license. Based on that figure, we estimate that 8,852 hunters who bought a hunting license only on 2008 (and not in 2009 or 2010) might buy a 3-year license generating \$464,719 in potential revenue. The remaining single-year license buyers would not buy again and generate \$316,701 in revenue between 2008 and 2010. Applying similar logic to hunters who bought two and three years between 2008 and 2010 we estimate total potential revenue in 2008 through 2010 from sales of annual and 3-year licenses to be \$8.3 million compared to \$7.8 million actual revenue from sales of annual licenses, or an average gain of \$169,320 per year. This estimate does not include any revenue from hunters in 2009 or 2010 that not part of the 2008 cohort.

Table 16. Actual and estimated potential revenue from sales of 3-year hunting licenses to hunters who bought an annual license in 2008.

# Annual Licenses: 2008-2010	Actual		Potential License Buyers		Potential Revenue		
	Buyers	Revenue	3-year License	Annual License	3-year License	Annual License	TOTAL
1	26,949	\$471,608	8,852	18,097	\$464,719	\$316,701	\$781,420
2	34,538	\$1,208,830	11,323	23,215	\$594,441	\$812,536	\$1,406,977
3	116,224	\$6,101,760	41,527	74,697	\$2,180,149	\$3,921,611	\$6,101,760
TOTAL	177,711	\$7,782,198	61,701	116,010	\$3,239,309	\$5,050,848	\$8,290,158

⁷ Applies only to sportsmen who purchased an annual hunting license (License type 2) in 2008.

“Conservation Legacy” designation:

The survey presented respondents with the following question:

“The Iowa DNR is considering a “Conservation Legacy” option to be offered exclusively with some combination licenses. For an additional fee, “Conservation Legacy” hunters would receive a “Conservation Legacy” window/bumper decal, a hat, and a 1-year subscription to Iowa Outdoors magazine. If the combination license costs \$75, would you pay an additional \$xx for these features?”

Five different versions of the question were randomly distributed across the 5,000 questionnaires created for the survey. Each version of the question presented the respondent with a different price for the “Conservation Legacy” option, ranging from \$20.00 to \$40.00 in five-dollar increments. As expected, the percentage of sportsmen who would be willing to purchase the “Conservation Legacy” option decreases as the proposed price increases (Table 17). Among sportsmen who were presented with the option to purchase the “Conservation Legacy” designation for \$20.00, 17.4% indicated that they would buy it and 82.6% indicated that they would not buy it. Only 9.4% of sportsmen who were presented with an option to purchase the “Conservation Legacy” at a price of \$40.00 indicated that they would buy it.

Table 17. Willingness to pay an additional fee for a proposed “Conservation Legacy” option with selected combination licenses.

Additional Fee	Pay extra for Conservation Legacy option?			Number of observations
	No	Yes	Total	
\$20.00	82.6%	17.4%	100.0%	303
\$25.00	83.3%	16.7%	100.0%	344
\$30.00	85.4%	14.6%	100.0%	346
\$35.00	87.8%	12.2%	100.0%	369
\$40.00	90.6%	9.4%	100.0%	344
Total	86.0%	14.0%	100.0%	1,706

NOTE: numbers in red indicate statistically significant differences within the column.

To determine the best target audience for the “Conservation Legacy” option, we examine the percentage of sportsmen who indicated that they would purchase the option at different price points, by the sportsman’s age. Overall, customers most likely to purchase are young sportsmen age 18 to 24 (Table 18). Approximately one-fourth of people in that group reported that they would purchase the option. As noted earlier, however, that age represents a fairly small number of Iowa sportsmen and accounts for approximately 12% of all customers (Table 3). Approximately 14% and 11% of customers in the largest age groups, 25 to 44 year olds and 45 to 64 year olds, would buy the Legacy option. Combined, those two age groups account for 73.9% of all sportsmen in Iowa (Table 3).

Table 18. Percent of sportsmen who indicated that they would purchase a "Conservation Legacy" option at different prices, by age of sportsman.

Additional Fee	Age of Sportsman				
	Under 18	18 to 24	25 to 44	45 to 64	65 and older
	--- percent who responded "yes" ---				
\$20.00	17.9%	23.3%	16.4%	15.6%	26.2%
\$25.00	17.3%	25.6%	19.6%	12.6%	5.5%
\$30.00	5.9%	30.9%	18.2%	8.0%	0.0%
\$35.00	10.0%	29.2%	8.9%	12.5%	3.7%
\$40.00	0.0%	19.2%	9.1%	8.4%	4.5%
Total	9.4%	25.6%	14.1%	11.3%	7.8%
Number of responses:	95	121	506	850	134

The effect of avidity on sportsmen's interest in the conservation Legacy designation was examined by comparing the respondents' license purchase history over five years from 2006 through 2010. To increase sample size in each avidity category, the annual totals were combined into three categories: purchased a license one or two years, purchased a license three or four years, and purchased a license every year. Because the Conservation Legacy was presented as an option with the purchase of a combination license, we examined purchase frequency only for those sportsmen who purchased both a hunting and a fishing license in the same year. Table 19 shows that there is no discernible pattern or statistically significant differences between the frequency that sportsmen have hunted and fished in the past five years and their interest in the Conservation Legacy option.

Table 19. Effect of avidity on willingness to purchase a "Conservation Legacy" designation at different prices.

Additional Fee	Number of years hunted and fished: 2006 to 2010					
	1 or 2 years		3 or 4 years		5 years	
	No	Yes	No	Yes	No	Yes
\$20.00	75.6%	24.4%	74.4%	25.6%	80.1%	19.9%
\$25.00	78.1%	21.9%	83.8%	16.2%	82.8%	17.2%
\$30.00	82.4%	17.6%	92.7%	7.3%	76.0%	24.0%
\$35.00	93.9%	6.1%	77.9%	22.1%	87.9%	12.1%
\$40.00	80.6%	19.4%	92.8%	7.2%	92.0%	8.0%
Total	82.2%	17.8%	84.4%	15.6%	84.0%	16.0%
Number of responses:	N=230	N=45	N=180	N=31	N=252	N=48

NOTE: numbers in red indicate statistically significant differences within the row at 95% confidence level.

Overall, sportsmen who both hunt and fish are the most likely to buy the "Conservation Legacy" option. This is not unexpected, since the phrasing of the question makes clear that the option would be offered exclusively with selected combination licenses. Whether the availability of the "Conservation Legacy" option would be a sufficient inducement for people who normally only fish or only hunt to buy a combination license is unclear, although the results suggest that is a clear possibility. Twelve percent of

sportsmen who bought only a fishing license in the past two years and 10.5% of those who bought only a hunting license in the past two years said that they would buy the option, compared to 18.0% of sportsmen who bought both a hunting and a fishing license (Table 20).

Table 20. Percent of sportsmen who indicated that they would purchase a "Conservation Legacy" option at different prices, by type of sportsman.

Additional Fee	Type of sportsman		
	Angler only	Both	Hunter only
\$20.00	15.0%	21.4%	17.0%
\$25.00	15.1%	20.1%	14.5%
\$30.00	12.4%	19.6%	11.4%
\$35.00	11.7%	17.6%	5.8%
\$40.00	8.8%	12.0%	6.1%
Total	12.6%	18.0%	10.5%
Number of responses:	794	530	390

NOTE: numbers in red indicate statistically significant differences within the row.

Because we know the total number of Iowa sportsmen who buy both hunting and fishing licenses, we can use the information from Table 20 to estimate the total annual revenue that might be generated from sales of the "Conservation Legacy" option at different price points.

Table 21 shows the percent of sportsman who bought both hunting and fishing privileges in 2010 and who indicated that they would buy the Legacy option. There were 97,355 total sportsmen last year who bought both hunting and fishing privileges. Applying the percent who responded "yes" to the total combination buyers yields the expected number of total sportsmen who would respond "yes" if the option were available. The number of estimated option buyers is the result of a simple regression smoothing technique. Multiplying the number of estimated buyers at each price point by the price equals the total estimated revenue at each price point.

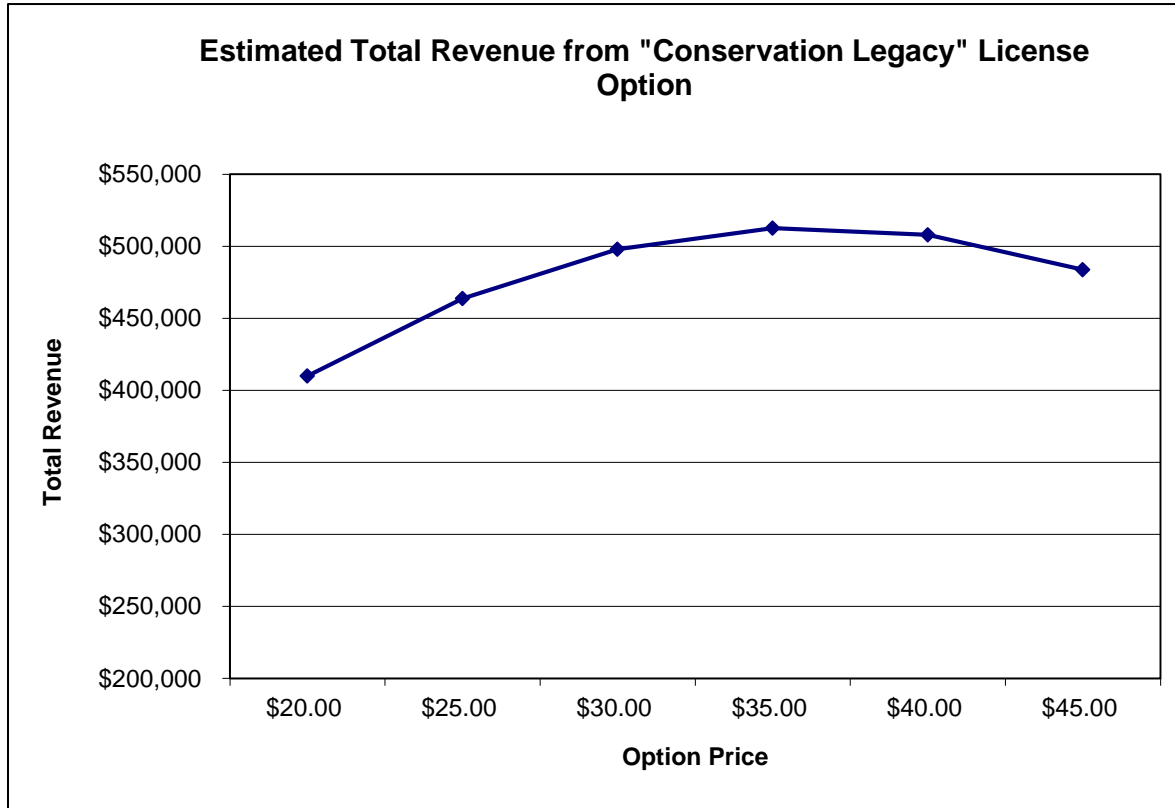
Table 21. Estimated buyers and total annual revenue from sales of a "Conservation Legacy" option to combination license buyers at different price points.

Additional Fee	Percent Responding "Yes"	Number Responding "Yes"	Estimated Option Buyers*	Total Revenue
\$20.00	21.4%	19,579	20,494	\$409,884
\$25.00	20.1%	18,390	18,545	\$463,636
\$30.00	19.6%	17,932	16,597	\$497,899
\$35.00	17.6%	16,103	14,648	\$512,675
\$40.00	12.0%	10,979	12,699	\$507,964
\$45.00	na	na	10,750	\$483,764
Estimated combination buyers:			97,355	

*Estimate is based on a regression equation used to smooth the estimated number of buyers.

The estimated total revenue at different price points is displayed graphically in Figure 1. Maximum estimated revenue would be achieved at a price of approximately \$35.00. Recognizing some people might say “yes” but decide not to purchase when it is time to open their wallets, it is advisable to consider these as the upper bound of potential revenue..

Figure 1. Estimated total revenue from sales of "Conservation Legacy" license options.



“Extra Pole” permit :

The survey presented respondents with the following question:

“Currently, Iowa fishing licenses allow you to use 2 fishing poles. Would you pay an additional \$x for a permit that allowed you to use a third pole?”

Five different versions of the question were randomly distributed across the 5,000 questionnaires created for the survey. Each version of the question presented the respondent with a different price for the “Extra pole” permit, ranging from \$4.00 to \$12.00 in two-dollar increments. As expected, the percentage of sportsmen who would be willing to purchase the “Extra pole” permit generally decreases as the proposed price increases (Table 22). Among sportsmen who were presented with the option to purchase the “Extra pole” designation for \$4.00, 22.8% indicated that they would buy it and 77.2% indicated that they would not buy it. Only 9.2% of sportsmen who were

presented with an option to purchase the “Extra pole” at a price of \$12.00 indicated that they would buy it. There is a notable exception to the overall relationship between price and willingness to buy. At \$10.00, the percent of sportsmen willing to purchase the permit (16.9%) is higher than the percent willing to buy at \$8.00 (13.3%). It is not clear why this anomaly occurs.

Table 22. Willingness to pay an additional fee for a proposed "Extra pole" permit.

Additional Fee	Pay extra for third pole?			Number of observations
	No	Yes	Total	
\$4.00	77.2%	22.8%	100.0%	339
\$6.00	83.0%	17.0%	100.0%	361
\$8.00	86.7%	13.3%	100.0%	326
\$10.00	83.1%	16.9%	100.0%	349
\$12.00	90.8%	9.2%	100.0%	336
Total	84.1%	15.9%	100.0%	1,711

NOTE: numbers in red indicate statistically significant differences within the column.

To determine the best target audience for the “Extra pole” option, we examined the percentage of sportsmen who indicated that they would purchase the permit at different price points, by the age of the sportsman. Overall, customers most likely to purchase are very young sportsmen under the age of 18. Twenty-eight percent of people in that age group reported that they would purchase the option. This age group represents only 5.4% of DNR customers (Table 3). Approximately 18% and 11% of customers in the largest age groups, 25 to 44 year olds and 45 to 64 year olds, would buy the “Extra pole” permit. Combined, those two age groups account for 73.9% of all sportsmen in Iowa (Table 3).

Table 23. Percent of sportsmen who indicated that they would purchase an "Extra pole" permit at different prices, by age of sportsman.

Additional Fee	Age of Sportsman				
	Under 18	18 to 24	25 to 44	45 to 64	65 and older
	--- percent who responded "yes" ---				
\$4.00	37.0%	37.2%	27.2%	14.0%	4.1%
\$6.00	25.6%	35.1%	18.0%	11.5%	0.0%
\$8.00	34.2%	12.7%	11.3%	13.4%	5.7%
\$10.00	31.5%	22.4%	20.7%	10.5%	6.7%
\$12.00	9.3%	0.0%	15.0%	3.9%	14.9%
Total	28.0%	23.8%	18.0%	10.7%	6.2%
Number of responses:	95	122	502	855	137

The effect of avidity on angler's interest in an extra pole permit was examined by comparing the respondents' license purchase history over five years from 2006 through 2010. To increase sample size in each avidity category, the purchases were combined into three categories: purchased a license one or two years, purchased a license three or four years, and purchased a license every year. Because the extra pole permit is of interest only to anglers, we examined purchase frequency based only on the purchase of a fishing license each year, regardless of whether they purchased a hunting license any year. Table 24 shows that there is no discernible pattern or statistically significant differences between the frequency that anglers have fished in the past five years and their interest in an extra pole permit.

Table 24. Effect of avidity on anglers' willingness to purchase an "Extra Pole" permit at different prices.

Additional Fee	Number of years fished: 2006 to 2010					
	1 or 2 years		3 or 4 years		5 years	
	No	Yes	No	Yes	No	Yes
\$4.00	81.0%	19.0%	75.7%	24.3%	74.1%	25.9%
\$6.00	77.1%	22.9%	89.4%	10.6%	80.9%	19.1%
\$8.00	89.8%	10.2%	88.8%	11.2%	84.1%	15.9%
\$10.00	81.3%	18.7%	89.0%	11.0%	81.4%	18.6%
\$12.00	92.2%	7.8%	93.4%	6.6%	84.6%	15.4%
Total	84.2%	15.8%	87.9%	12.1%	80.9%	19.1%
Number of responses:	N=451	N=72	N=423	N=52	N=475	N=95

NOTE: numbers in red indicate statistically significant differences within the row at 95% confidence level.

Overall, anglers are the most likely to buy the "Extra pole" permit. This is not unexpected, since the permit is of direct interest to anglers and of little use to sportsmen who do not fish. Nevertheless, a little more than nine percent of people who bought only hunting privileges over the past two years indicated a willingness to buy the "Extra pole" permit. It may be that at least some portion of those sportsmen have fished in the past and would consider fishing again if an "Extra pole" permit were available. Conversely, it may also be an indication that sportsmen overestimate their likelihood to purchase licenses in the future. In any case, sixteen percent of sportsmen who bought only a fishing license in the past two years and 19.2% of those who bought both fishing and hunting privileges said that they would buy the permit if it was available (Table 25).

Table 25. Percent of sportsmen who indicated that they would purchase an "Extra pole" permit at different prices, by type of sportsman.

Additional Fee	General type of sportsman		
	Angler only	Both	Hunter only
	--- percent who responded "yes" ---		
\$4.00	21.0%	27.2%	18.4%
\$6.00	20.8%	17.2%	8.1%
\$8.00	11.7%	16.8%	10.8%
\$10.00	18.1%	18.7%	9.5%
\$12.00	8.8%	14.9%	1.2%
Total	16.0%	19.2%	9.3%
Number of responses:	803	525	383

NOTE: numbers in red indicate statistically significant differences within the row.

Because we know the total number of Iowa sportsmen who are anglers (i.e. they purchased a fishing license), we can use the information from Table 25 to estimate the total annual revenue that might be generated from sales of the "Extra pole" permit at different price points. Table 26 shows the percent of sportsmen who purchased a fishing license in 2010 who indicated that they would buy the "Extra pole" permit. Applying the percent who responded "yes" to the total number of Iowa anglers (298,758) yields the expected number of anglers who would respond "yes" if the permit were available. The number of estimated permit buyers is the result of a simple regression smoothing technique to adjust for the sharp rise in survey respondents who said "yes" at the \$10.00 price. Multiplying the number of estimated buyers at each price point by the price equals the total estimated revenue at each price point.

Table 26. Estimated buyers and total revenue from sales of an "Extra pole" permit at different price points.

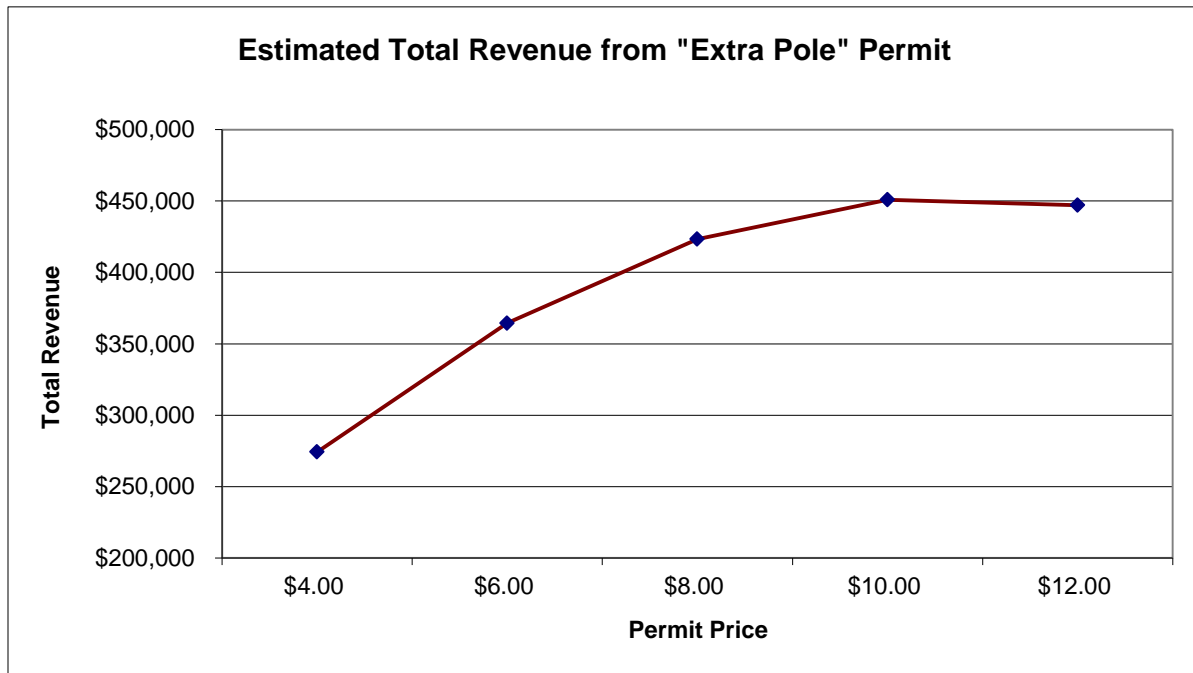
Additional Fee	Percent of Anglers Responding "Yes"	Number Responding "Yes"	Estimated Buyers*	Total Revenue
\$4.00	24.8%	74,087	68,576	\$274,304
\$6.00	18.6%	55,694	60,748	\$364,487
\$8.00	15.0%	44,941	52,920	\$423,357
\$10.00	18.1%	54,166	45,091	\$450,913
\$12.00	12.0%	35,710	37,263	\$447,157
Estimated total anglers:			298,758	

Estimate is based on a regression equation used to smooth the estimated number of buyers.

The total revenue is displayed graphically in Figure 2. The maximum total estimated revenue would be achieved at a price of approximately \$10.00. Recognizing some

people might say “yes” but decide not to once its time to open their wallets, it is advisable to consider these as the upper limits on expected revenue.

Figure 2. Estimated total revenue from sales of "Extra pole" fishing permits.



CONJOINT ANALYSIS:

The survey used a special technique known as conjoint analysis to identify which individual hunting and fishing privileges were the most important to customers when packaged together in combination licenses. This methodology also estimates how much sportsmen are willing to pay for various combinations of privileges. Ultimately, it is possible to measure the relative probability that sportsmen will choose one combination license over another.

Conjoint Analysis (CA) was developed to help manufacturers understand which product features, or attributes, most influence consumer preferences. For this study, each hunting or fishing privilege is considered an attribute of a combination license. In CA approaches, the researcher chooses the attributes and prices to be explored, creates a list of different licensing options – each with a different set of attributes - and then asks consumers to select or rank their preferred profiles. The responses are then statistically analyzed to identify the relative importance of each attribute. By incorporating price as an attribute within each license’s profile, it is possible to estimate the consumers’ willingness to pay for each of the attributes.

Conjoint Design:

To apply the conjoint technique to hunting and fishing licenses, various privileges were designated as features of a combination license. With the exception of price, each attribute had two levels: either the privilege was part of the combination license or it was not. Each profile had three price levels: the sum of the current prices for each privilege if purchased separately; a price that reflected a 10% discount on the current prices; and a price that reflected a 20% discount on the current prices. All prices included a single agent fee and a habitat fee if the combination included at least one hunting privilege. The privileges that were included in the combination licenses and their current prices are shown in Table 27. In addition, the conjoint questions included a new deer privilege (that does not currently exist) that would include both gun and bow hunting privileges and allow the holder to take two bucks across the both seasons.

Table 27. Prices for selected hunting and fishing privileges in Iowa in 2010.

License type	Price
Resident annual fish	\$19.00
Resident trout fee	\$12.50
Resident annual hunt	\$19.00
Resident deer (gun, bow or muzzleloader)	\$28.50
Resident turkey	\$24.50
Resident Habitat Fee*	\$13.00

**All hunters aged 16-65 are required to purchase one habitat stamp per year. Some exemptions apply.*

The nature of hunting and fishing regulations in Iowa (and in most states) creates additional complexities in developing alternative combinations of privileges and prices. For example, anyone purchasing a deer permit must also have a basic hunting license,

and anyone purchasing a trout permit must also have purchased a fishing license. Also, anyone purchasing a combination license that includes any number of hunting privileges must also pay a single habitat fee. Each license transaction includes a \$1.50 agent fee. In the case of a combination license, the buyer pays only one transaction fee, regardless of the number of privileges included in the license. These requirements dictated the ultimate design of the profiles tested in the conjoint survey.

Conjoint surveys require respondents to make decisions based on comparing products with different combinations of attributes. With seven different attributes (six different privileges plus the price attribute) and multiple levels for each attribute (privileges had two levels; price had three levels), there are many possible combinations. An orthogonal design was used to reduce the number of different profiles that were generated and distributed across the surveys with little loss in statistical reliability.

In the choice-based conjoint (CBC) method used in this study, 45 different versions of the survey were created. In each version of the survey, respondents were asked to indicate their preference between two different product profiles or indicate that they would not purchase either of the two presented options. An example of one version of the conjoint question is shown in Figure 3.

Figure 3. Sample conjoint question in a survey of Iowa sportsmen.

For the purpose of this survey, please assume that any licenses you have are now expiring and you are going to purchase a fishing or hunting license today. When buying your new license, you learn that several new combination licenses are also available. Please check one box to indicate the license option that you would buy today. By purchasing a combination license, you pay only one transaction fee of \$1.50, rather than a transaction fee for each individual license sold.

Sporting Privileges Included:	OPTION #1	OPTION #2	OPTION #3
Annual Hunting (small game only)		✓	I would not buy any of these combinations
Deer (gun or bow or muzzleloader)		✓	
Deer (gun AND bow – allows two bucks)		✓	
Spring Turkey	✓		
Annual Fishing	✓		
Trout	✓		
Price*	\$69.00	\$80.10	
Select ONE option:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**All prices include the Habitat Fee, where necessary.*

Results of the conjoint analysis:

The survey questionnaire was presented to a random sample of sportsmen that represents all of the DNR's recent customers. To measure the preferences of different types of sportsmen, we conducted analyses on separate groups of respondents based on their license purchases over the previous two years (2009 and 2010). Previous license sales were based on license records provided by the DNR. The respondents are divided into four groups:

- All respondents (represents DNR's total customer base)
- Sportsmen who only hunt (purchased one or more hunting privileges and no fishing privileges)
- Sportsmen who only fish (purchased one or more fishing privileges and no hunting privileges)
- Sportsmen who both hunt and fish (purchased both hunting and fishing privileges)

NOTE: The results of the statistical models were used to develop a spreadsheet-based decision support tool for different types of sportsmen. The spreadsheet tool enables users to compare two licenses with different features and prices and see the likelihood that sportsmen will choose either one. The tool also includes a facility for users to see the additional dollar amount that sportsmen are willing to pay for one license set compared to another. Readers interested in exploring how price and privileges in a combination license affect purchase decisions are encouraged to explore the decision support tool found in the spreadsheet file named "IADNR_DST.xls". Additional directions for using the tool are included in the spreadsheet.

All Respondents (DNR's total customer base):

Table 28 presents the attributes tested in the survey, based on responses from all license customers. The third column shows that all variables in the model, with the exception of the turkey privilege, have a statistically measurable effect on consumers' preferences ($P > \text{ChiSq}$ is 0.05 or less). This means that the inclusion or absence of a turkey privilege in a combination license is not likely to affect a sportsman's purchase decision, all else being equal.

Table 28. Parameter estimates for sporting privileges included in the model for ALL Sportsmen.

Hunt/Fish Privilege	Parameter	Prob > ChiSq
Hunt	+0.8893	0.0003
Deer1	+0.7615	<.0001
Deer2	+0.5789	0.0032
Turkey	-0.3009	0.1248
Fish	+1.3774	<.0001
Trout	-0.8956	<.0001
Price	-0.0269	<.0001

The positive signs on the second column's parameters indicate that the presence of a privilege has a positive effect on sportsmen's purchase decisions. The exception is for the trout privilege – adding a trout privilege to a combination license will make that license less attractive to the average Iowa sportsman. As expected, price has a negative effect, meaning that sportsmen are more likely to buy a license with a lower price if everything else is equal.

The size of the parameter gives some indication of the relative importance of each privilege. Privileges with a larger parameter have a greater effect on sportsmen's purchasing decisions. For example, across all sportsmen, the availability of a fishing privilege is of the highest importance. This is an expected finding since three-fourths of Iowa sportsmen fish compared to fewer than one-half (47%) who hunt. Therefore, there is a higher probability that the average sportsmen would buy a combination license containing a fishing privilege compared to the presence of a hunting privilege. Figure 4 presents an example from the accompanying spreadsheet-based decision support tool that shows the probability that the average sportsman will select a combination small game / deer / fishing license compared to a standalone fishing license at current prices (including applicable habitat fees and agent fees). It shows that, given the privileges in license options A and B, option A with only a basic fishing privilege would be preferred by four percent more Iowa license customers (52% - 48%) over option B which offers hunting privileges in addition to fishing licenses.

Figure 4. Example of model output for all Iowa sportsmen.

Hunt/Fish Privilege	Option A		Option B	
Hunt	1	0.88932	1	0.88932
Deer1	0	0	0	0
Deer2	0	0	0	0
Turkey	na	na	na	na
Fish	0	0	1	1.37743
Trout	0	0	0	0
Price	\$30.50	-0.819535	\$48.00	-1.28976
Probability:		29%	71%	

Average willingness-to-pay among all sportsmen:

Although the DNR has no competition in the marketplace for hunting and fishing licenses, it is important to understand the value that sportsmen place on individual privileges in setting license prices. The model provides some guidance with respect to the additional amount sportsmen are willing to pay for some privileges within a combination license.

Table 29 shows sportsmen’s willingness to pay for selected privileges. In an earlier table (Table 28), it was shown that the fishing privilege was the most important feature of a combination license to the average sportsmen. This translates into the privilege on which sportsmen overall are willing to spend the most amount of money. A combination license that includes a fishing privilege can be expected to sell for more than one without that privilege.

Table 29. Sportsmen’s willingness-to-pay for selected hunting and fishing privileges.

Hunt/Fish Privilege	Willingness-to-pay
Hunt	\$ 33.10
Deer1	\$ 28.34
Deer2	\$ 21.54
Fish	\$ 51.26
Trout	\$ -33.33

This is considerably higher than the current standalone fishing license price of \$19.00 (including agent fee). While this finding confirms the results of an earlier license pricing study⁸ which suggested that fishing licenses in Iowa could withstand a price increase, care should be exercised in interpreting that there would be no loss of fishing license buyers if the price were increased to the significantly higher levels in Table 29. In fact, the earlier study found that price did not have a statistically significant effect on the number of licenses sold over the past 35 years and that a modest increase in price would not result in a significant decrease in the number of fishing license sales. It is unclear what effect a *substantial* price increase might have on license sales, or total revenue as there has not been such a large price increase historically for inclusion in the model’s calculations. Nevertheless, these results, coupled with the earlier price analysis suggest that there is room to increase the price of fishing licenses without a significant loss of anglers.

⁸ “Sales and Revenue Forecasts of Fishing and Hunting Licenses in Iowa”, Southwick Associates, October, 2010.

Sportsmen who ONLY HUNT:

Table 30 presents the model that was fitted to the responses of sportsmen in the survey who purchased only hunting privileges. The third column of the table shows that no privilege except the basic hunting license has any effect on the purchase decisions by this group of sportsmen ($Pr > ChiSq$ is 0.05 or less). The price parameter also is not statistically significant, suggesting that these results cannot be used to estimate willing to pay for any license privileges among this group of sportsmen.

The results suggest that sportsmen who have purchased only a hunting privilege in the past are unlikely to be enticed to purchase additional privileges simply by packaging multiple privileges in a combination license. This seems a reasonable finding since these sportsmen could have purchased multiple separate privileges in prior years but chose not to do so.

Table 30. Parameter estimates for sporting privileges included in the model for sportsmen who previously purchased only hunting privileges.

Hunt/Fish Privileges	Parameter	Prob > ChiSq
Hunt	1.1489	0.0044
Deer1	0.0314	0.9403
Deer2	0.1724	0.6897
Turkey	-0.8923	0.0217
Fish	0.2195	0.7501
Trout	-0.6391	0.3531
Price	-0.0077	0.5789

Sportsmen who ONLY FISH:

Table 31 presents the model that was fitted to the responses of sportsmen who purchased only fishing privileges in the past two years and no hunting privileges. The third column of the table shows that only the fishing and deer hunting privileges have any effect on the purchase decisions by this group of sportsmen (Pr > ChiSq is 0.05 or less). The signs (positive or negative) on the statistically significant privileges are in the expected direction – the presence of additional features is expected to have a positive effect on sportsmen’s purchase decisions, while price has a negative effect.

The results suggest that there are limited opportunities to persuade anglers to purchase a license with added hunting privileges. Anglers might be willing to add a deer hunting privilege to a fishing license, but not a small game privilege. Because the deer privilege also requires the purchase of a small game license, the model suggests that fishing-only sportsmen are unlikely to purchase a small game / deer/ fishing permit. This seems a reasonable finding since fishing-only sportsmen already have the opportunity to purchase these additional privileges but have chosen not to do so.

Table 31. Parameter estimates for sporting privileges included in the model for sportsmen who previously purchased only a fishing license.

Fluorocarbon Feature	Parameter	Prob > ChiSq
Hunt	+0.2837	0.6927
Deer1	+1.9626	0.002
Deer2	+0.6723	0.2413
Turkey	+0.0703	0.8961
Fish	+1.6669	<.0001
Trout	-0.0830	0.7684
Price	-0.0482	0.0054

Sportsmen who both FISH and HUNT:

Table 32 presents the results of the model fitted to the responses of sportsmen who purchased both hunting and fishing privileges in 2009 and/or 2010. The third column of the table shows that all privileges except turkey hunting and trout stamps have a statistically significant effect on these sportsmen's preferences of privileges in a combination license (Prob > ChiSq < 0.5).

The signs (positive or negative) on all of the privileges are in the expected direction – the presence of a hunting or fishing privilege has a positive effect on sportsmen's purchase decisions (the parameter on trout stamps is negative, but is not statistically significant). Price has a negative effect, meaning that sportsmen are more likely to buy a license with a lower price if everything else is equal.

Table 32. Parameter estimates for privileges included in the model for Sportsmen who both fish and hunt.

All Sportsmen	Parameter	Prob > ChiSq
Hunt	+2.3199	<.0001
Deer1	+0.9306	0.0013
Deer2	+1.1665	0.0017
Turkey	+0.3159	0.3417
Fish	+1.4747	0.0007
Trout	-0.3455	0.1271
Price	-0.0287	0.0012

Figure 5 presents an example from the accompanying spreadsheet-based decision support tool that shows the probability that the average sportsman who hunts and fishes will select a combination small game / deer / fishing license compared to a standalone small game hunting license at current prices (including applicable habitat fees and agent fees). The results show that, if sportsmen who normally buy both hunting and fishing licenses had to choose between a single small game hunting privilege for \$30.50, or a license that also provides deer and fishing privileges for \$75.00, nearly three times more would choose the combination license.

Figure 5. Example of model output for all Iowa sportsmen who hunt and fish.

Hunt/Fish Privilege	Option "A"		Option "B"	
	Hunt	1	2.3199	1
Deer1	0	0	1	0.93061
Deer2	0	0	0	0
Turkey	na	na	na	na
Fish	0	0	1	1.47471
Trout	na	na	na	na
Price	\$30.50	-0.87596	\$75.00	-2.154
Probability:		24%	76%	

Average willingness-to-pay among sportsmen who both HUNT and FISH:

Table 33 shows angler's willingness to pay for selected hunting and fishing privileges. Generally, the willingness to pay is higher among this selected group of sportsmen than among sportsmen in general (Table 29). Since this group likely includes more avid sportsmen (they both hunt and fish), it is reasonable to expect that they would be more willing to pay higher prices for the privileges. Any direct marketing efforts to promote combination licenses should be targeted at these individuals and not at customers who previously have only purchased a fishing or hunting privilege and not the other.

Table 33. Sportsmen's willingness-to-pay for selected privileges.

Hunt/Fish Privilege	Willingness-to-pay
Hunt	\$ 80.78
Deer1	\$ 32.40
Deer2	\$ 40.61
Turkey	\$ 11.00
Fish	\$ 51.35
Trout	\$ -12.03

The combination preferences of Iowa sportsmen are summarized in Figure 6 that shows the relative probabilities sportsmen will choose licenses with different set of privileges when presented with all possible combinations. The green bars indicate the specific combination of privileges in a license. The percentages in the two right-most columns indicate the probability that sportsmen would select any one combination compared to all other combinations. Turkey permits are not included in the summary because it has no effect on the preferences for any type of combination license. Among all sportsmen, the most preferred combinations are licenses that include hunting and fishing privileges (15%) or a license that combine hunting and fishing privileges with a deer tag (15%). If presented with the availability of all types of combination licenses, standalone fishing license would be preferred by 13% of sportsmen and standalone hunting license would be preferred by only 6% of all sportsmen.

Figure 6 also shows the relative preferences of sportsmen who already buy both hunting and fishing privileges. These sportsmen are perhaps the primary audience for combination licenses. The model results for this group showed that the presence of a trout permit has not effect on their preference and is not included in the set of combination options. Among this group of sportsmen, the combination license with the highest probability of purchase at current prices is one that includes hunting and fishing privileges with a deer tag (27%). The next most preferred combination is one with basic hunting and fishing privileges (23%). Standalone hunting and fishing permits are preferred by fewer than 10% of these sportsmen.

Figure 6. Probability of purchasing combinations of privileges at current prices, by all sportsmen and those who both hunt and fish.

Type of Privilege in Combination					All Sportsmen	Both Hunt and Fish
Hunt	Deer1	Deer2	Fish	Trout		
■					5.9%	8.8%
■	■				6.1%	10.3%
■	■	■			2.5%	7.0%
			■		13.0%	5.2%
			■	■	9.7%	
■			■		14.6%	23.2%
■	■		■		15.2%	27.1%
■	■	■	■		6.3%	18.4%
■			■	■	10.8%	
■	■		■	■	11.2%	
■	■	■	■	■	4.7%	
Total for all possible combinations:					100%	100%

Avidity and preference for privilege combinations:

To examine the effect of avidity on the preference for combinations of privileges, we examined the license purchase history for each of the survey respondents and categorized them as either low-avidity or high-avidity depending on their frequency of license purchases between 2006 and 2010. Low-avidity anglers are sportsmen who purchased a fishing license (regardless of their purchases of any hunting privileges) one or two years during the five-year period. High-avidity anglers are sportsmen who purchased a fishing license (regardless of their purchase of any hunting privileges) every year between 2006 and 2010.

Table 34 shows the results of models based on the responses of low-avidity and high avidity anglers. The inclusion of a small game, turkey, or trout privilege with a fishing license has no statistically significant effect on the probability that a low-avidity angler would purchase that combination license (Prob>ChiSq > 0.05). For frequent license buyers (i.e., high-avidity) the inclusion of a trout stamp reduces the probability of purchase. This is likely due to the fact that most anglers in Iowa do not fish for trout.

Interestingly, including a deer permit with a fishing license is an attractive option to both low-avidity and high-avidity anglers. However, since a deer tag cannot be purchased without a hunting license, it is unclear what the overall effect would be on the probability that anglers would purchase a combination license that includes fishing, hunting and deer privileges.

Table 34. Model parameter estimates for low-avidity and high-avidity anglers.

Privilege	Anglers: Low avidity		Anglers: High avidity	
	Parameter	Prob > ChiSq	Parameter	Prob > ChiSq
Hunt	0.78379	0.1562	0.54504	0.3144
Deer1	1.41415	0.0011	0.89034	0.0122
Deer2	1.17212	0.0085	1.06501	0.0226
Turkey	0.42740	0.3507	-0.23239	0.5531
Fish	1.73186	<.0001	1.98398	<.0001
Trout	-0.41838	0.0723	-1.04726	<.0001
Price	-0.04482	0.0008	-0.02541	0.0187

Table 35 shows the results of models based on the responses of low-avidity and high avidity hunters. Sportsmen who hunt infrequently (i.e., low-avidity hunters) are unlikely to be affected in their license purchases by the inclusion of any sporting privileges beside the basic small game privilege. Deer, turkey, fishing or trout privileges all have no statistically significant effect on the probability that a low-avidity hunter would purchase any combination license (Prob>ChiSq > 0.05). Avid hunters have a clear preference for combination licenses that include several privileges. The overwhelming priority is for a basic hunting privilege followed by fishing and deer privileges that have roughly equal priority for these hunters.

Table 35. Model parameter estimates for low-avidity and high-avidity hunters.

Privilege	Hunters: Low avidity		Hunters: High avidity	
	Parameter	Prob > ChiSq	Parameter	Prob > ChiSq
Hunt	1.04108	0.0463	2.62898	<.0001
Deer1	0.24237	0.6349	0.61742	0.0181
Deer2	-0.62473	0.2757	0.80585	0.0123
Turkey	-0.52547	0.3129	-0.09355	0.7684
Fish	-0.15981	0.8004	0.88754	0.0184
Trout	-0.04289	0.9310	-0.45382	0.0749
Price	-0.00028	0.9870	-0.02804	0.0021

The combination preferences of anglers and hunters is summarized in Figure 7 that shows the relative probabilities sportsmen will choose licenses with different combinations based on their fishing or hunting avidity. The green bars indicate the specific combination of privileges in a license, and the percentages in the four right-most columns indicate the relative preference for each combination by each type of

sportsman. Low-avidity anglers show no probability of purchasing any license that includes anything other than a basic fishing privilege. Therefore, reading down the column of low-avidity anglers their relative probability of purchase for a standalone fishing license is 100%. Presented with a choice between a basic fishing license and a combination fishing and trout license, high-avidity anglers would split 57% / 43% between the two type of licenses, respectively. Similar to low-avidity anglers, low-avidity hunters showed no probability of purchasing a license other than a basic hunting license. High-avidity hunters, however, show interest in several combination licenses. The most preferred licenses among this group are ones that combine fishing and hunting privileges (25%) or fishing and hunting privileges with a deer tag (22%). A standalone fishing license is preferred by only 4% of high-avidity hunters.

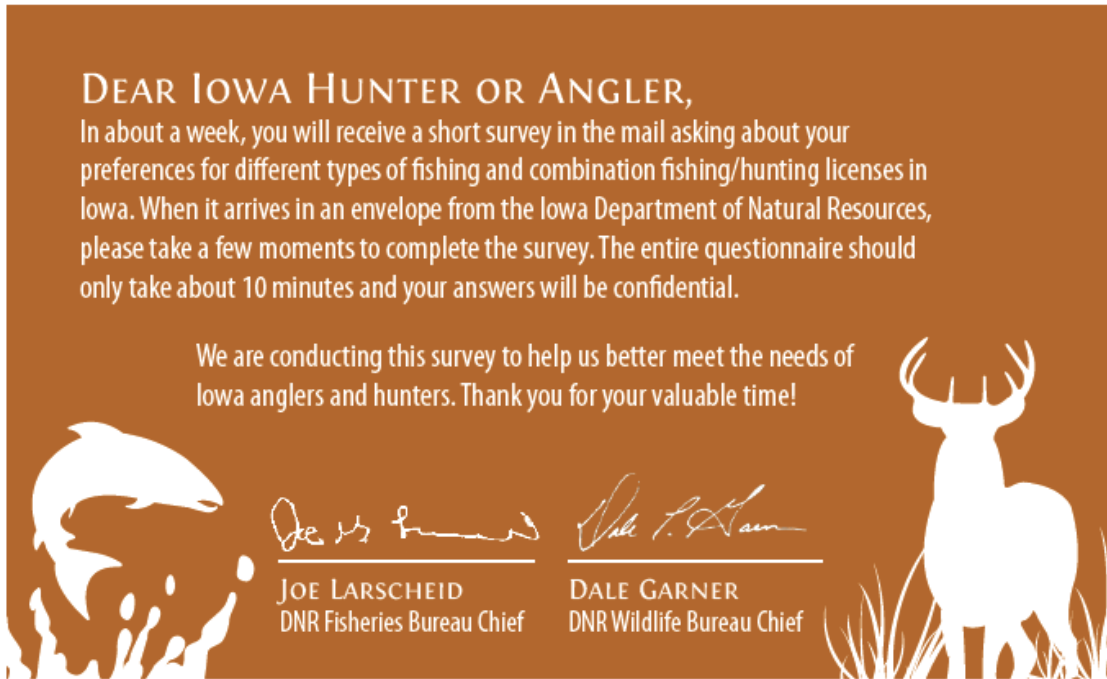
Figure 7. Probability of purchasing combinations of privileges at current prices, by avidity of past fishing and hunting purchases.

Type of Privilege in Combination					Angler Avidity		Hunter Avidity	
Hunt	Deer1	Deer2	Fish	Trout	Low	High	Low	High
■					-	-	100%	16.8%
■	■				-	-	-	14.6%
■	■	■			-	-	-	7.2%
			■		100%	56.9%	-	4.1%
			■	■	-	43.1%	-	
■			■		-	-	-	25.0%
■	■		■		-	-	-	21.7%
■	■	■	■		-	-	-	10.7%
Total for all desired combinations:					100%	100%	100%	100%

APPENDIX A

Iowa Department of Natural Resources Hunting and Fishing License Survey Materials


Advance Postcard:




DEAR IOWA HUNTER OR ANGLER,

In about a week, you will receive a short survey in the mail asking about your preferences for different types of fishing and combination fishing/hunting licenses in Iowa. When it arrives in an envelope from the Iowa Department of Natural Resources, please take a few moments to complete the survey. The entire questionnaire should only take about 10 minutes and your answers will be confidential.



We are conducting this survey to help us better meet the needs of Iowa anglers and hunters. Thank you for your valuable time!



JOE LARSCHIED
DNR Fisheries Bureau Chief



DALE GARNER
DNR Wildlife Bureau Chief



Reminder Postcard:

DEAR IOWA HUNTER OR ANGLER,

Recently, you received a survey about your preferences for fishing and combination fishing/hunting licenses. If you already completed and returned the questionnaire, please accept our sincere "Thank-you!" The information you provided will be valuable in helping us serve you better.

If you have not yet completed the survey, please take a few minutes to do so today. Your information is very important to the success of the study. If you need a replacement survey, call Julie Tack with the DNR at 515-281-8665 and a new one will be sent to you.

Thank you for your valuable time.



A handwritten signature in dark brown ink, which appears to read "Joe Larscheid". The signature is written in a cursive style.

JOE LARSCHIED
DNR Fisheries Bureau Chief

A handwritten signature in dark brown ink, which appears to read "Dale Garner". The signature is written in a cursive style.

DALE GARNER
DNR Wildlife Bureau Chief



Cover Letter for First Mailing:



TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

February 2011

Dear Hunter or Angler:

The Iowa Department of Natural Resources is considering ways to improve the menu of fishing and hunting licenses in Iowa. Because you are a valued participant in Iowa's outdoor recreation, we need your help to determine the best license options to meet your needs.

Please take a few minutes to complete the attached survey. Only a few people were randomly selected to participate, so it is especially important your input is included. Even if you only hunt or fish occasionally, we still would like to hear from you.

When you have completed the survey, simply return it in the enclosed postage-paid envelope. Your responses will be kept fully confidential.

Thank you for taking time to provide valuable input about fishing and hunting license options in Iowa.

Sincerely,

Handwritten signature of Joe Larscheid in black ink.

Joe Larscheid
Fisheries Bureau Chief

Handwritten signature of Dale Garner in black ink.

Dale Garner
Wildlife Bureau Chief



WWW.IOWADNR.GOV

502 EAST 9TH STREET | DES MOINES, IOWA 50319-0034
PHONE 515-281-5918 | FAX 515-281-6794

Cover Letter for Second Mailing:



TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

March 2011

Dear Hunter or Angler:

Earlier this month, the Department of Natural Resources sent you a survey about hunting and fishing licenses in Iowa. Many hunters and anglers have already responded, but we have not yet received your completed questionnaire.

We are conducting the survey to better understand the types of license options that best meet your needs. Information that you provide is very valuable to this study because you were randomly selected to represent other hunters and anglers in Iowa. Therefore, it is very important that we hear from you.

Please take a few minutes to respond to this survey and return it in the postage-paid envelope. Your responses will be kept confidential.

Thank you for taking the time to participate in this important study.

Sincerely,

Handwritten signature of Joe Larscheid in black ink.

Joe Larscheid
Fisheries Bureau Chief

Handwritten signature of Dale Garner in black ink.

Dale Garner
Wildlife Bureau Chief



WWW.IOWADNR.GOV

502 EAST 9TH STREET | DES MOINES, IOWA 50319-0034
PHONE 515-281-5918 | FAX 515-281-6794

Questionnaire:

Iowa Department of Natural Resources
Hunting and Fishing License Survey

1) In the past 12 months, how many days did you hunt in the state of Iowa?

_____ days

_____ I did not hunt in Iowa in the past 12 months – skip to question #3

2) Please mark the types of hunting you have experienced in Iowa in the past 12 months: (check all that apply)

- Deer
- Spring turkey
- Fall turkey
- Upland bird (pheasant, quail, etc.)
- Waterfowl
- Other migratory birds (rail, snipe, woodcock, etc.)
- Small game (rabbit, squirrel, jack rabbit, etc.)
- Furbearer (fox, coyote, etc.)
- Other, please specify: _____

3) In the past 12 months, how many days did you fish in the state of Iowa?

_____ days

_____ I did not fish in Iowa in the past 12 months – skip to question #5

4) Please mark the types of fishing you've experienced in Iowa in the past 12 months:

- Any species of sunfish and bluegill
- Crappie
- Trout
- Temperate bass (white, yellow, hybrid)
- Black bass (large-mouth or small-mouth)
- Catfish
- Walleye, sauger and/or saugeye
- Muskie and/or Northern pike
- Any other species

5) Do you plan to purchase a hunting or fishing license in 2011?

- | | |
|------------------------------|--|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No – if “No”, skip to question #7 |
|------------------------------|--|

New Combination Licenses

The Iowa Department of Natural Resources is considering a range of new combination licenses to better meet the needs of hunters and anglers. We need your help to determine which types of licenses should be considered. Feedback from this survey and wildlife abundance will help determine which licenses might eventually be offered. It also is possible that no new licenses may be offered.

For reference, below are prices for the CURRENT fishing and hunting licenses. These prices include a \$1.50 transaction fee for each license sold.

License type	Price
Resident annual fish	\$19.00
Resident trout fee	\$12.50
Resident annual hunt	\$19.00
Resident deer (gun, bow or muzzleloader)	\$28.50
Resident turkey (Fall or Spring)	\$24.50
Resident Habitat Fee*	\$13.00

**All hunters aged 16-65 are required to purchase one habitat stamp per year. Some exemptions apply.*

- 6) For the purpose of this survey, please assume that any licenses you have are now expiring and you are going to purchase a fishing or hunting license today. When buying your new license, you learn that several new combination licenses are also available. Please check one box to indicate the license option that you would buy today. By purchasing a combination license, you pay only one transaction fee of \$1.50, rather than a transaction fee for each individual license sold.

Sporting Privileges Included:	OPTION #1	OPTION #2	OPTION #3
Annual Hunting (small game only)		✓	I would not buy any of these combinations
Deer (gun or bow or muzzleloader)		✓	
Deer (gun AND bow – allows two bucks)		✓	
Spring Turkey	✓		
Annual Fishing	✓		
Trout	✓		
Price*	\$69.00	\$80.10	
Select ONE option:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**All prices include the Habitat Fee, where necessary.*

- 7) The Iowa DNR is considering a “Conservation Legacy” option to be offered exclusively with some combination licenses. For an additional fee, “Conservation Legacy” hunters would receive a “Conservation Legacy” window/bumper decal, a hat, and a 1-year subscription to Iowa Outdoors magazine. If the combination license cost \$75, would you pay an additional \$35 for these features?

Yes No

8) The Iowa Department of Natural Resources is considering fishing and hunting licenses that would be valid for 3 years. These would be offered in addition to the current annual licenses. The price would be the same as three annual licenses except you would need to pay the \$1.50 transaction fee only the first year. How likely would you be to purchase a 3-year license compared to three annual licenses?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Very unlikely	Somewhat unlikely	Somewhat likely	Very likely

9) Currently, Iowa fishing licenses allow you to use 2 fishing poles. Would you pay an additional \$6 for a permit that allowed you to use a third pole?

<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------------------------	-----------------------------

10) Please rate the overall level of effectiveness and service provided by the Iowa Department of Natural Resources in its efforts to provide for the State's fishing, hunting and conservation needs:

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Very poor	Poor	Not sure	Good	Excellent

11) If you have any comments you wish to share with the Iowa Department of Natural Resources, please provide them here.

Thank you for completing our survey!

Your confidential responses will be combined with others and used by the Iowa Department of Natural Resources to help us better meet your sporting needs. Your responses will never be shared with anyone outside of the survey team and our third-party contractor hired to conduct the survey.