## **Understanding Hunter Avidity**

Applying the Hunter Avidity Model to Increase Hunting Participation



Study Conducted by
Sportsmen's Alliance Foundation
Archery Trade Association
RTS Strategies
Responsive Management

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# Understanding Hunter Avidity: Applying the Hunter Avidity Model to Increase Hunting Participation

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#### **Sportsmen's Alliance Foundation**

Evan Heusinkveld, President/CEO

801 Kingsmill Parkway Columbus, OH 43229 614/888-4868

#### **Archery Trade Association**

Jeff Poole, President and CEO
Dan Forster, Vice President and Chief Conservation Officer

P.O. Box 70 New Ulm, MN 56073 507/233-8130

#### **RTS Strategies**

**Rob Sexton** 

#### **Responsive Management National Office**

Mark Damian Duda, Executive Director
Martin Jones, Senior Research Associate
Tom Beppler, Senior Research Associate
Steven J. Bissell, Ph.D., Qualitative Research Associate
Andrea Criscione, Senior Research Associate
Patrick Doherty, Research Associate
Gregory L. Hughes, P.E., Research Associate
Amanda Center, Research Associate
Dunya Shihab, Survey Center Manager
Alison Lanier, Business Manager

130 Franklin Street Harrisonburg, VA 22801 540/432-1888

Email: mark@responsivemanagement.com www.responsivemanagement.com

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#### **EXECUTIVE SUMMARY**

Understanding hunter avidity is essential to impactful outreach, as not all licensed hunters participate at the same level: hunters vary substantially in terms of their license purchasing behavior, experience, interest, and overall connection to hunting (as well as their connection to conservation itself). While efforts to increase the number of licensed hunters are valuable and important, efforts to increase the avidity of existing participants is important, as well. Understanding what drives varying levels of hunting avidity will facilitate improved outreach and management strategies targeted to all segments of hunters.

The primary purpose of this project was to provide guidance in applying the Hunter Avidity Model that was developed in a previous Multistate Conservation Grant project, and which is described in Chapter 3 of this report. The Hunter Avidity Model is, in turn, built on the Outdoor Recreation Adoption Model (ORAM), and the melding of these two models facilitates a targeted approach to recruitment, retention, and reactivation (R3) efforts. The Hunter Avidity Model itself is presented on page 25 of the body of the report.

The first Hunter Avidity project consisted of new survey research with hunters in 10 states, analyses of hunting license databases from those states, and the development of the preliminary Hunter Avidity Model. The second project entailed follow-up research to test and refine the Hunter Avidity Model based on the new findings, including the results of testing of outreach material that looked at themes associated with hunter avidity.

The 10 states that participated in the research were Alabama, Florida, Indiana, Kansas, Maine, New Jersey, North Carolina, Oklahoma, Oregon, and West Virginia. The full study methodology is discussed in the last chapter of this report.

Following are the key takeaways from the overall Hunter Avidity Model initiative.

#### UNDERSTANDING DIFFERENT MEASURES OF HUNTER AVIDITY

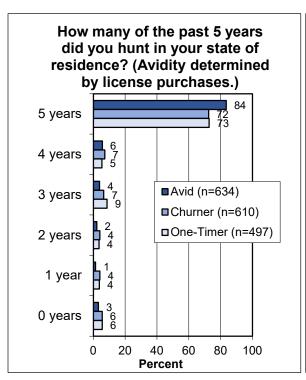
Hunter avidity may be assessed through hunters' license purchases or through the self-reported characteristics of their hunting participation via surveys. While both approaches can provide insights into hunter behavior, they may also yield distinctly different results regarding avidity. This study looked at hunter avidity in 10 states using two different approaches. In one approach, hunters' level of avidity was assigned based on licenses purchased as shown in the databases—referred to as the database avidity. To allow a comparison of the databases to hunters' reported participation, a survey was administered that asked about the number of years hunted within the previous 5 years, and this was used to define avidity a second way—referred to as self-reported avidity. Each approach categorized hunters into one of three avidity level categories, as defined on the following page:

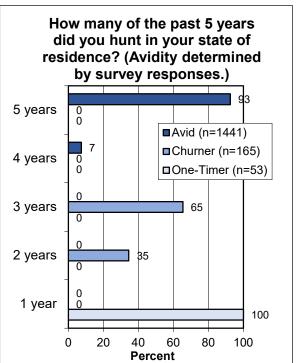
License Database Avidity	Self-Reported Avidity			
Avid: Purchased at least 4 of the past 5 years or	Avid: Hunted at least 4 of the past			
purchased a lifetime license in the 5-year time period.	5 years.			
<ul> <li>Churner: Purchased a license in 2 or 3 of the 5 years (and none of the licenses were a lifetime license).</li> </ul>	• Churner: Hunted in 2 or 3 of the 5 years.			
<ul> <li>One-Timer: Purchased a license in only 1 of the 5 years (and the license was not a lifetime license).</li> </ul>	• One-Timer: Hunted in only 1 of the 5 years.			

Lacking the ability to regularly survey hunters regarding their hunting participation, many agencies may be limited to assessing hunter avidity through the first method—analyzing databases to examine license purchases as a proxy for hunting participation and avidity. Such analyses may be useful, but agencies must be aware of the differences between the two avidity measures as well as the potential limitations of license databases to explore participation and avidity.

License databases are limited to a binary indicator of hunting participation: in a given year, a hunter either purchases or does not purchase a hunting license. License databases may also include information such as the purchaser's location (useful for categorizing hunters on an urban-rural continuum), age, gender, and the type of license the hunter purchased.

This combined information, however, still may not be sufficient for conclusively determining hunter avidity. As an example of the sometimes-stark differences that exist between measurements of avidity based on license sales and by self-reported hunting participation, consider the two graphs below. The graph on the left shows the breakdown of avidity levels based on license purchases, while the graph on the right shows the breakdown based on self-reported survey responses.





Based on the avidity levels established for the analysis, the graph on the left would not seem to make intuitive sense: One-Timers, by definition, are individuals who purchased a license in only 1 of the 5 years (and the license was not a lifetime license). Yet 73% of One-Timers in the database analysis indicated in the survey that they hunted all 5 of the past 5 years. Similarly, about three quarters of Churners (in the database analysis, those who purchased a license in 2 or 3 of the 5 years) indicated hunting all 5 years. The participation results in the graph on the right, based on the self-reported survey responses, are more straightforward and align with the given avidity levels because the question was used to define avidity (in the self-defined approach).

In short, the database analysis found that many hunters went hunting in years in which they were not in the database as license purchasers, which can happen for several reasons. They could have gone hunting out of state. Also, they could have gone hunting in-state for a species or where a license is not needed (for instance, some hunting can be done on private land without a license). Alternately, they could have had a license exemption for another reason. Finally, a few may have hunted illegally without a license.

Another possible explanation is that there are inaccuracies in the databases wherein some hunters who had purchased a license are not shown in the database—this can happen when slightly different names are used (e.g., the hunter purchases a license using his full name one year including a middle name but then purchases a license another year without the middle name, although the analysts for this project completed checks on the databases for these occurrences to correct them). Also, respondent memory may be slightly off wherein some hunters "remember" that they went hunting more years than they actually did (this is known as telescoping).

While license databases offer one measure of hunter avidity, it is important to recognize their potential limitations. One difficulty with assessing hunter avidity through license databases alone is knowing the accuracy of the databases used to identify hunters. Potential limitations of databases include the following:

- A single hunter can be in the system multiple times, and de-duplication measures may not always catch those duplicates.
- De-duplication measures may incorrectly remove a license holder who should be included. Two entries in the database with the same name at the same address might be a duplicate or might be a father-son, both with a license, for instance.
- A person new to a state may be misidentified as a new hunter who is actually a quite experienced hunter. It is sometimes difficult to differentiate an actual new hunter from a new-to-the-state hunter.
- Some entries in a database will have bogus or bad data. For instance, people may not
  want to enter their actual email address and so enter "1234@aol.com" or other things
  that the system does not catch as an error. Sometimes users may have unintentional
  typos in their purchase information, even if they made the entries themselves.
- In some cases, a license holder may not be in the system because of a problem with the transfer of data to the database—primarily in those places where paper forms are used for some license transactions.

The potential limitations of license databases must be recognized when using databases to plan and inform R3 outreach strategies. License database analyses that assess hunter avidity over a specific time period (for example, 5 years or 10 years) are essentially snapshots in time. In this way, a person identified as a "One-Timer" in a database (meaning someone who purchased a hunting license in only 1 year of the period of interest) may not be a true newcomer to hunting. A One-Timer license purchaser may be someone returning to hunting after a break (i.e., a reactivated individual, not a new recruit) or someone who is appearing in the database as a One-Timer for another reason altogether (recall the list of potential database issues above).

Another confounding factor is out-of-state license purchasers. An Avid hunter might hunt 5 years in their home state and only 1 year out of state. In the out-of-state license database, that Avid hunter would be classified as a One-Timer based on that single nonresident license purchase.

These possibilities must be accounted for when states implement outreach strategies based on database impressions. The messages and other outreach tactics that are most effective among true newcomers are not the same as the messages that resonate with reactivated One-Timers.

# UNDERSTANDING THE EXTENT OF CHURN AMONG HUNTING LICENSE PURCHASERS

Year-to-year churn among hunting license purchasers is often substantial, even though relatively consistent overall license sales from year to year may suggest that the same people are buying licenses. Churn refers to the proportion of hunters who participate some years but not others. The license database analyses conducted for this project suggest that the level of year-to-year churn among hunting license purchasers in a given state can be substantial, perhaps even more than some agencies realize.

As mentioned previously, one aspect of this study examined hunter avidity based on license purchases over a 5-year period (the assumption being that the purchase of a hunting license is a reasonable indicator of participation in hunting). Purchasers were then categorized as One-Timers (those who purchased a license in only 1 of the 5 years, and the license was not a lifetime license), Churners (purchased a license in 2 or 3 of the 5 years, and none of the licenses were a lifetime license), or Avids (purchased at least 4 of the 5 years or purchased a lifetime license in the 5-year time period).

The table below shows the breakdown of One-Timers, Churners, and Avids in the 10 states whose license databases were analyzed:

Percentage of Hunters in the License Databases by Avidity Category							
	One-Timer	Churner	Avid				
Alabama	43.9	28.0	28.1				
Florida	54.8	27.6	17.6				
Indiana	35.1	26.2	38.7				
Kansas	43.2	29.4	27.4				
Maine	35.4	26.5	38.1				
New Jersey	29.8	26.6	43.6				
North Carolina	44.2	29.8	25.9				
Oklahoma	57.5	25.7	16.8				
Oregon	34.4	30.8	34.8				
West Virginia	33.4	24.4	42.2				

In summary, Avid hunters make up anywhere from 16.8% to 43.6% of the total number of license purchasers in a state database. Most license holders, meanwhile, are either Churners or One-Timers—not consistent license purchasers. Churners account for 24.4% to 30.8% of those in the databases, while One-Timers make up anywhere from 29.8% to 57.5% of license purchasers.

Part of the overall Hunter Avidity Model project entailed focus group discussions with fish and wildlife agency personnel; during these discussions, the breakdown of Avids, Churners, and One-Timers in the databases was presented to focus group participants. At least one participant speculated that the relatively high percentage of One-Timers in the state database might be due to the number of individuals who are cited for hunting without a license and who are then forced to buy a temporary license that year (the person not showing up in the license database again during the 5-year period might suggest that they went back to hunting without a license in subsequent years).

A surface-level analysis of overall hunting license sales in a state over a certain period could show relatively consistent sales from year to year, perhaps leading the agency to assume that many of the same individuals were buying licenses year after year. Such a conclusion, however, might ignore the possibility of substantial churn among license purchasers—in other words, a flat trendline in license sales could obscure the extent to which many individuals move in and out of regular license purchasing from year to year.

The implication is that overall license sales alone may not provide an entirely accurate look at recruitment, retention, and reactivation trends: in any given year, some hunters are dropping out, some are starting to hunt for the first time or returning to hunting after a break, and some are continuing to hunt following the preceding year. These considerations may be less important to organizations that are most concerned with national trends in hunting participation and license sales; on the other hand, state agencies that take a more targeted and nuanced approach to R3 will need to keep them in mind.

There are often notable demographic differences between the avidity groups. For instance, Avids are more likely to be male compared to the other groups; One-Timers are most likely to be female (note, however, that all three groups are overwhelmingly male). Avids have the largest percentage in the 55 and over age range, followed by One-Timers. Avids are the most likely of the three groups to not have a college degree; One-Timers are the most likely to have a bachelor's degree or higher.

Another analysis looked at the gender breakdown of Avid license purchasers, finding that the difference in the ratio of male to female Avids ranged from 7.6% to 26.4%, as shown in the table below.

Percentage of Gender Group That Are Avid							
	Female Male Differe						
Oklahoma	11.2	18.8	7.6				
Maine	31.5	39.3	7.8				
Florida	10.8	18.7	7.9				
Oregon	27.0	37.1	10.1				
West Virginia	30.4	43.7	13.3				
Kansas	14.7	29.0	14.3				
Alabama	15.7	30.2	14.5				
North Carolina	12.8	27.6	14.8				
New Jersey	21.8	44.9	23.1				
Indiana	15.7	42.1	26.4				

#### MOST IMPORTANT DRIVERS OF HUNTER AVIDITY

Hunter avidity is primarily driven by two factors: generational age, specifically the "Boomer II" generation born between 1955 and 1964, and residence in a rural area. The first phase of the project combined the database analyses (including a Multinomial Logistic Regression analysis) with a probability-based survey of hunters in the 10 states to identify the variables most correlated with hunter avidity. The database analyses looked at avidity level as defined by license purchases, location (urban-rural continuum), generational age, gender, and license type. The survey built on these analyses by further exploring an extensive number of other variables related to hunter characteristics and participation, as well as opinions and attitudes toward hunting (for example, days hunted in a typical year, total years hunted, species hunted and harvested, use of various types of hunting equipment, hunting locations, mentoring experience, satisfactions with and motivations for hunting, and more).

Despite many different variables being tested, and the survey identifying numerous differences between Avids, Churners, and One-Timers, hunter generational age (specifically, those from the "Boomer II" generation born between 1955 and 1964) and residence in a rural area were found to be the most associated variables in distinguishing Avids from Churners and One-Timers.

Notably, generational age and area of residence are not factors over which agencies and R3 specialists have any control—they are external factors specific to the identities of hunters themselves. This does not mean, however, that R3 efforts will not be able to encourage greater

avidity among hunters (or to create more license-buying hunters in general). Indeed, R3 efforts in recent years appear to have helped boost female participation in hunting and encourage increased interest in hunting among nontraditional audiences such as racial/ethnic minorities.<sup>1</sup> The conclusion of this study is simply that, despite numerous variables being explored, generational age and location (specifically, residence in a rural area) remain the most important determinants of hunter avidity.

Note that the importance of age cohort as a primary driver of hunting avidity is broadly consistent with the findings of a 2017 study conducted for the Council to Advance Hunting and the Shooting Sports by Chase & Chase Consulting; this research determined that "hunting and fishing participation is not dictated by age, but by the generation that a person belongs to." The report further identified the cohort of individuals born between 1960 and 1980 as the generation most likely to hunt and fish.<sup>2</sup>

Even though generational age and residence in a rural area are the most important factors correlated with hunter avidity, there are many notable differences between Avid, Churning, and One-Time hunters. The survey of hunters in the 10 states conducted as part of the first phase of the project identified many differences between the three categories of hunters, as summarized in the following table:

Variable / Topic Area	Differences Between the Groups
Days hunted in typical year	Large differences between the groups: Avids have the most days, Churners are in between, and One-Timers have the least annual days hunted.
Total years hunted	Large differences, with Avids longer than the others, although the other two groups are similar.
Ever taken children hunting	Large differences, but only between Avids (the most likely to mentor) and the other two groups, as the latter were similar to one another.
Species hunted	Avids have a greater rate, compared to the other avidity groups, of hunting deer, wild turkey, squirrel, coyote, waterfowl, and mourning dove. Except for wild turkey, Churners and One-Timers are similar to one another on species sought. Regarding wild turkey, One-Timers have a greater rate of hunting it than do Churners.
Harvest success	Avids had a statistically significant higher percentage in the top harvest success category, compared to the other groups.
Hunting equipment	Avids are markedly higher for every equipment type; One-Timers had the lowest rates of use.
Private land hunted on	Avids much more likely to hunt any private land.
Public land	Avids and Churners are about the same, with One-Timers at the bottom.
Paid for access	Avids lead the other groups by a lot.

<sup>&</sup>lt;sup>1</sup> The 2022 Special Report on Hunting and the Shooting Sports, produced by the Council to Advance Hunting and the Shooting Sports and The Outdoor Foundation, found that 27% of hunters in 2021 were female, compared to 16% a decade ago. The report is available at <a href="https://cahss.org/our-research/2022-special-report-on-hunting-and-the-shooting-sports/">https://cahss.org/our-research/2022-special-report-on-hunting-and-the-shooting-sports/</a>.

Also, a 2021 study that entailed surveys of 17,203 undergraduate students at public universities across 22 states found that "potential hunters were more likely to be females or racial and ethnic minorities, and less likely to experience social support for hunting." The full citation for this study is as follows:

Vayer, V., Larson, L., Peterson, M., Lee, K., Kelly, M., Winkler, R., & et. al. (2021). Diverse University Students Across the United States Reveal Promising Pathways to Hunter Recruitment and Retention. *Journal of Wildlife Management*, 85(5), 1017-1030. http://doi.org/10.1002/jwmg.22055

<sup>&</sup>lt;sup>2</sup> Chase & Chase Consulting. (2017). *The Future of Hunting and Fishing*. Conducted for the Council to Advance Hunting and the Shooting Sports.

Variable / Topic Area	Differences Between the Groups
Typical travel distance	No marked differences.
Farthest have traveled	Avids travel the farthest.
Hunted out of state	Avids are the most likely, Churners are next, and One-Timers are the least likely.
Ratings of satisfactions	Almost no differences between the groups.
Top single motivation for hunting	Almost no differences, with the exception of "to get meat": One-Timers are the most likely to choose this, well above Avids.
Various motivations for hunting	Avids give higher ratings to all motivations. "Mentoring" as a reason to hunt drops markedly in importance among Churners and One-Timers; "to get meat" as a reason rises in importance among those two groups.
Crossover activities	Fishing: Avids have a higher rate, Churners are next, and One-Timers are the lowest. Recreational shooting: large differences, from 83% of Avids down to 68% of One-Timers. Archery: large differences, with Avids the most likely to have done archery.
Involvement in organizations	Large differences, with Avids the most likely, followed by Churners, and then One-Timers.
Grew up in a hunting house	Differences emerged between Avids and the other two groups, with Avids the most likely to grow up in a hunting house.
Demographic characteristics	Avids are more likely to be male, to be in the older age ranges, and to be rural, compared to the other groups.

#### BEST PRACTICES AND IMPLEMENTATION GUIDANCE

When planning email and social media outreach, agencies should incorporate specific themes that will help to encourage greater hunter avidity. One aspect of the second phase of the project entailed the testing of outreach materials that incorporated themes identified in the first phase that were found to resonate with Avids, Churners, and One-Timers. These themes emerged from the research on motivations for hunting and the variables that were found to be correlated with hunter avidity, specifically how One-Timers and Churners may be encouraged to hunt more.

First, agencies should think of One-Timers as at least two distinct groups: beginners and experienced hunters who are lapsing. Beginning hunters are moved along through the avidity levels by having a place to hunt, harvest success, and getting meat. As they become more avid, their participation in several other activities—namely fishing, target shooting, and archery—may increase. Cause and effect on those other activities likely goes both ways—avidity in one of the other activities may increase the interest and opportunity to hunt, and avidity in hunting may increase the interest and opportunity to participate in those other activities.

Lapsing hunters are reinvigorated by something new. This something new can be a species not previously hunted or a type of equipment not previously used, but it also can be a hunting companion. Mentoring is higher among Avids: while they may be more likely to mentor somebody because they are avid, it also may be that some get more active in hunting because of their mentoring of somebody else.

The analyses also suggest that harvest success is important for increasing hunter avidity. Despite what hunters say regarding the importance of harvest success as a reason for hunting—

which is downplayed in favor of simply connecting with nature and being with family—the Avids had better harvest success. Again, this can go both ways, as more avid hunters learn more techniques that make them more successful, but some hunters certainly become more avid prompted in part by their hunting success.

Access is an important component to increasing avidity: the evidence suggests that more avid hunters have more opportunities on private land. The typical travel distance did not vary greatly among the three avidity groups. This suggests that hunters' avidity is likely to increase if they feel confident that they will have hunting access, even if it is not necessarily nearby.

With these findings in mind, outreach materials were developed based on the following themes: *New Species, Meat, Someone New, Somewhere New, Hunting Access, Prepare for Harvest*, and *New Equipment*. The material was then tested with Avids, Churners, and One-Timers in a survey administered in the second phase of the project.















#### Photo credits:

- New Species, from left to right/top to bottom: iStock, Michigan Wildlife Council, iStock, iStock
- Meat, from top left to bottom right: iStock, Christian Jung, iStock, Michigan Wildlife Council
- Someone New, from left to right/top to bottom: NEAFWA, Jenny Risher, Matt Harlow, Jenny Risher
- Somewhere New, from left to right/top to bottom: Pheasants Forever, Inc., Pheasants Forever, Inc., NEAFWA, Pheasants Forever, Inc.
- Hunting Access, from left to right/top to bottom: NEAFWA, Southeast Deer Partnership, Pheasants Forever, Inc., Pheasants Forever, Inc.
- Prepare For Harvest, from left to right/top to bottom: iStock, Jenny Risher, Pheasants Forever, Inc., iStock, Mike Olson
- New Equipment, from left to right/top to bottom: NEAFWA, Scott Einsmann, Jenny Risher, Pheasants Forever, Inc.

Hunters rated the effectiveness of three aspects of each outreach material: the message or tagline, the images, and the general concept or idea of the message. This method was used so that the message/tagline could be separated from the images in the rating, as a hunter might like a message/tagline but not like the images. The ratings used a 0 to 10 scale, where 0 was not at all effective and 10 is extremely effective.

In the results, **New Species**, **Meat**, and **Someone New** were the three top-rated outreach materials overall. While there were few marked differences in the ratings given by the three avidity groups, Churners most commonly gave the lowest ratings, while One-Timers most commonly gave the highest ratings (Avids were mostly in the middle).

Therefore, for all hunter avidity levels, effective outreach to increase hunter avidity should focus on at least one of the following three concepts:

- Hunting for a new species
- Hunting for meat
- Hunting with someone new

Regarding more targeted outreach, further analysis of the ratings by specific demographic groups within the three avidity levels suggests the following:

- Female Avid hunters react well to **New Species**, **Meat**, and **Prepare for Harvest**.
- Avid hunters 18 to 34 years old react well to *Meat* and *Hunting Access*.
- Avid hunters 55 years old and older react well to Someone New.
- Churners who are 55 years old and older react well to outreach materials that focus on **Someone New, Hunting Access**, and **New Equipment**.

Agencies should consider addressing prominent constraints and potential barriers to hunting specific to each avidity group. The second survey administered to hunters for this project explored a range of potential constraints and barriers to hunting. To the extent possible, agencies should attempt to address these constraints in outreach or supplemental information provided to hunters at different avidity levels. The major observations regarding constraints include the following:

- Work and family obligations are less of a constraint for Avids and much more of a
  constraint for Churners and One-Timers. Avids may carve out the time to hunt
  regardless of other things going on in their lives; alternately, it may be that Avids, being
  slightly older than Churners and One-Timers, simply have fewer obligations in general.
- Another factor which affects Churners and One-Timers much more than Avids is access.
  The research suggests that Avids have ready places to hunt and know where to go, while
  the other groups are less sure of this. This is also seen in the results regarding crowding,
  as another facet of access is knowing places to hunt that are not crowded. The provision
  of user-friendly tools to locate hunting access may especially help to increase avidity
  among One-Timers and Churners.
- One-Timers, compared to Avids and Churners, have a much greater fear of injury from other hunters. Agencies may therefore wish to emphasize aspects of hunter safety and conservation law enforcement to One-Timers specifically.
- Finally, a factor affecting Churners and One-Timers more than Avids is having someone to hunt with. Avids generally have a social support network for hunting, while the other groups may not. Information regarding mentoring programs may help to bolster participation among Churners and One-Timers.

Agencies should consider the guidance in this report regarding license database categorization and labeling of purchasers to assist with targeted marketing and outreach to Avids, Churners, and One-Timers. Acknowledging the potential limitations of license databases to assess churn, labeling and querying databases remains one of the most cost-effective tools for exploring hunter avidity. After considering some of the nuances and potential limitations of license database analyses previously discussed, agencies may wish to apply the research findings by categorizing and labeling hunting license holders according to the three avidity groups. These labels can then be used to measure license sales lift following distribution of outreach and license purchase reminders. The agency's hunter license database would need to be labeled using the coding instructions provided in Chapter 6 of this report (treatment and control groups would need to be established within the database). Additionally, the practical findings from this research regarding resonant themes, important barriers, and characteristics related to hunter avidity likely have applications for agency outreach beyond strictly license databases.

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#### 1. BACKGROUND

Understanding hunter avidity is essential to impactful outreach, as not all licensed hunters participate at the same level: hunters vary substantially in terms of their license purchasing behavior, experience, interest, and overall connection to hunting (as well as their connection to conservation itself). While efforts to increase the number of licensed hunters are valuable and important, efforts to increase the avidity of existing participants is important, as well. Understanding what drives varying levels of hunting avidity will facilitate improved outreach and management strategies targeted to all segments of hunters.

This project's primary purpose was to provide direction in applying the Hunter Avidity Model that was developed in a previous Multistate Grant program upon which this project builds. The Hunter Avidity Model is, in turn, built on the Outdoor Recreation Adoption Model (ORAM), and the melding of these two models facilitates a targeted approach to recruitment, retention, and reactivation (R3) efforts. Note that an explanation and discussion of ORAM is included in the third chapter of this report, "Development of the Avidity Model."

Through the 2020 Modern Multistate Conservation Grant Program, Responsive Management created a *Hunter Avidity Model* to provide valuable insights to state agencies and the R3 outreach community. The previous grant analyzed avidity using two methods that were the results from a survey of hunters as well as an analysis of license databases. States have a treasure trove of license sales data, which shows whether an individual purchased a hunting license or not. It is important that states extract nuanced insights regarding the avidity of their hunting license buyers. Thus, the researchers used the survey to ask participation questions and compare survey responses with license sales to gain insight in using the databases and applying the Hunter Avidity Model effectively for R3 outreach. The application of the Hunter Avidity Model will facilitate targeted R3 outreach and regulatory strategies to encourage hunters' progression through the ORAM to avid participation. This project will benefit hunter R3 in all 50 states.

#### 1.1. SUMMARY OF THE RESEARCH STEPS

The full methodology is included in the final chapter of this report, "Detailed Methodology," but a summary is included here to help explain to the reader the results that are presented.

#### PRECURSOR STUDY STEPS

Because this study builds on the previous study, a quick summary of the methods used in that previous study are pertinent. Hereinafter, that previous study will be referred to as the "precursor study" or the "precursor research." That study was issued under separate cover, titled *Development of a Hunter Avidity Model to Assess and Improve R3 Participation*, as the culmination of the previous Multistate Grant effort (Multistate Grant No. F21AP00191-00).

The precursor study entailed three overall efforts, with subtasks as shown:

- Identification of potential variables that were used as indicators of avidity and that were included in the Hunting Avidity Model.
  - Contacting states and obtaining state databases.
  - Statistically analyzing the databases obtained.
  - Examining past hunter surveys to assess variables that might relate to avidity.
- Survey of a representative sample of hunters nationwide. The survey respondents were able to be linked to the database analyses.
  - Developing the survey instrument.
  - Preparing the sample for surveying.
  - Establishing contact protocols.
  - Selecting modes of data collection.
  - Administering the survey.
- The development of the Hunter Avidity Model for use in R3 outreach. This included the development of recommendations on its use for R3.
  - Statistically analyzing survey data.
  - Considering those survey data with the previous analyses of the databases.
  - Developing the Model based on the findings.

In this precursor study, the researchers defined the levels of avidity as shown below. Note that other definitions were considered and could have been used, but the study used these definitions in part to ensure robust sample sizes within each level in the database analyses and surveys.

- Avid: Purchased at least 4 of the past 5 years or purchased a lifetime license in the 5-year time period.
- Churner: Purchased a license in 2 or 3 of the 5 years (and none of the licenses were a lifetime license).
- One-Timer: Purchased a license in only 1 of the 5 years (and the license was not a lifetime license).

Avidity in the precursor study also was examined based on the responses to the hunter survey that was administered (this is explained further in Chapter 2). In this method, hunters' responses on the number of years that they had hunted out of the previous 5 years were used to determine avidity, as follows:

- Avid: Hunted at least 4 of the past 5 years in the 5-year time period.
- Churner: Hunted in 2 or 3 of the 5 years.
- One-Timer: Hunted only 1 of the 5 years.

Throughout the report, these three groups are compared. Because the level of avidity defines distinct groups used in the analyses, they are referred to using proper nouns: Avids, One-Timers, and Churners.

#### **SURVEY OF STATE AGENCIES**

To help determine the operational capacity of states to potentially apply the Hunter Avidity Model in R3 efforts and to locate participants for the focus groups that followed, the researchers conducted a survey of R3 professionals, marketing coordinators, and database managers in the state fish and wildlife agencies. The first step in the process was developing a sample database with the appropriate agency staff members by researching agency websites.

The survey questionnaire then was developed to accomplish three primary goals. The first goal was to obtain information about the types of campaigns that states were doing. The second goal was to identify challenges that states would have in using the Hunter Avidity Model. The final goal was to locate participants for the next phase of the project, the focus groups with professionals.

The questionnaire was kept short in length and was sent to the people within each agency that had been identified through the research of the agency websites. The survey recipients had the ability to forward the survey to others within their agency and/or to suggest additional survey recipients. The survey link was sent using Microsoft Outlook and was personalized to each survey recipient to increase the likelihood of email delivery and the avoidance of agency spam filter settings. Two reminder messages were sent to those who had not responded to the survey.

#### FOCUS GROUPS OF STATE AGENCY PERSONNEL INVOLVED IN R3

Responsive Management conducted three virtual focus groups with survey respondents who had indicated in the survey that they would be willing to participate in a 1-hour discussion to hear a presentation about the precursor study and to give input concerning their hunting R3 marketing campaigns. Representatives from all four Association of Fish and Wildlife Agencies (AFWA) regions participated in the discussions.

The presentation at the start of the focus groups reviewed the research findings from the precursor study and presented the Hunter Avidity Model, which was overlayed with the ORAM. Some of the key findings from the research were presented and discussed, and then the focus group was opened for questions and discussion. Specific discussion questions were asked about hunter churn, applying research to hunter R3 marketing campaigns, and current agency campaigns geared towards increasing hunting license sales or reducing hunter churn.

#### SURVEY OF HUNTERS TO TEST OUTREACH TAGLINES, IMAGES, AND CONCEPTS

A survey of hunters was developed to explore constraints to hunting as well as the efficacy of outreach materials. This first required that sample outreach materials be developed, based on the previous research. Once the materials were developed, they were incorporated into an online survey. The survey also included questions about demographic characteristics and the residential areas in which hunters grew up and now live for use in further analyses.

Concomitant to the development of the survey, state hunting license databases were obtained and used for sampling for the survey. Although the survey was online, the sample itself was a scientific, probability-based sample pulled from the hunting license databases of hunters with email addresses, and only those invited through email to participate in the survey could take

the survey. The survey could not be accessed through a general internet search. At the conclusion of the survey, Responsive Management deleted the license databases from its database system. Responsive Management does not maintain lists of hunters for surveys from hunting license data (what would sometimes be referred to as a panel). The survey data were analyzed using IBM SPSS Statistics.

#### 1.2. PRESENTATION OF DATA IN THIS REPORT

This report starts with a summary of the findings of the precursor study in Chapter 2 and a description of the Model and an explanation of its development in Chapter 3. The report then moves into the specific tasks of this Multistate Grant project, with Chapter 4 devoted to the survey of state agencies to determine their operational capacity. Chapter 5 looks at the fine tuning of the Hunter Avidity Model through focus groups of professionals. Chapter 6 then explores the best ways to apply the Hunter Avidity Model in R3 efforts; the chapter looks at a survey of hunters and explains how databases can be used to identify hunter avidity. Finally, Chapter 7 contains a detailed explanation of the methodology used in both the precursor study and this study.

#### 2. SUMMARY OF PRECURSOR AVIDITY RESEARCH

This section summarizes the important findings of the research that was used in the development of the Hunter Avidity Model (which is discussed in the third section of this report). In these findings, the three avidity groups (Avids, Churners, and One-Timers) are discussed, including the differences in those three groups.

#### 2.1. ANALYSES OF DATABASES

After the avidity levels were defined, hunters in the databases were categorized into one of the three avidity levels. Subsequently, analyses were performed on those avidity levels in those databases.

Several variables were available in the databases:

- Avidity level (based on the years that hunters had purchased licenses).
- Location (on the urban-rural continuum).
- Age.
- Gender.
- License type.

In the analyses of the databases, all variables in the database analyses were found to be correlated with avidity level to some degree and merited further exploration in the survey.

The probability-based survey of hunters was the next task in the project. For the survey sampling, those same databases were used. This allowed the survey responses to be compared to the database information on the questions about number of years hunting.

# 2.2. COMPARISON OF AVIDITY LEVELS DETERMINED BY DATABASE VERSUS SURVEY RESPONSES

In the order of the tasks of the precursor study, this comparison came after the administration of the survey to hunters (which is reported in chapter section 2.3), but it is discussed here because it affected the way the findings of that chapter section are reported.

In one data run, hunters' level of avidity was assigned based on licenses purchased as shown in the databases—referred to as the *database avidity*. To allow a comparison of the databases to hunters' reported participation, the survey asked about the number of years hunted within the previous 5 years, and this was used to define avidity a second way—referred to as *self-reported avidity*.

For database avidity, the definitions are as follows:

- Avid: Purchased at least 4 of the past 5 years or purchased a lifetime license in the 5-year time period.
- Churner: Purchased a license in 2 or 3 of the 5 years (and none of the licenses were a lifetime license).
- One-Timer: Purchased a license in only 1 of the 5 years (and the license was not a lifetime license).

For self-reported avidity, the definitions are as follows:

- Avid: Hunted at least 4 of the past 5 years.
- Churner: Hunted in 2 or 3 of the 5 years.
- One-Timer: Hunted in only 1 of the 5 years.

One finding was that many hunters went hunting in years in which they were not in the database as license purchasers. It may be that some were hunting legally (some hunting is allowed without a license), but others may have been hunting illegally. Additionally, it may be that there are inaccuracies in the databases wherein some hunters who had purchased a license are not shown in the database—this can happen when slightly different names are used (e.g., the hunter purchases a license using his full name one year including a middle name but then purchases another year without the middle name, although the analysts for this project completed checks on the databases for these occurrences to correct them). Also, respondent memory may be slightly off wherein some hunters "remember" that they went hunting more years than they actually did. One confounding factor was out-of-state license purchasers. Avid hunters might hunt all 5 years in their home states and hunt only 1 year out of state. In that out-of-state's license database, that avid hunter would be classified as a One-Timer based on that single nonresident license purchase.

In general, there were usually differences between groups that appeared in the self-reported avidity data run that did not appear in the database avidity data run. This was the most common difference in the data runs that occurred.

Also common was the situation where differences between groups appeared in both data runs and were the same direction for both data runs. This happened frequently, as well, but usually the differences were greater in the self-reported avidity data run. (The term, "same direction," refers to a situation where both data runs show that, for instance, Avids have the highest percentage giving a particular response while One-Timers have the lowest percentage. This would be in contrast to a situation where Avids have the highest percentage giving a particular response in one data run but One-Timers have the highest percentage giving that response in the other data run.)

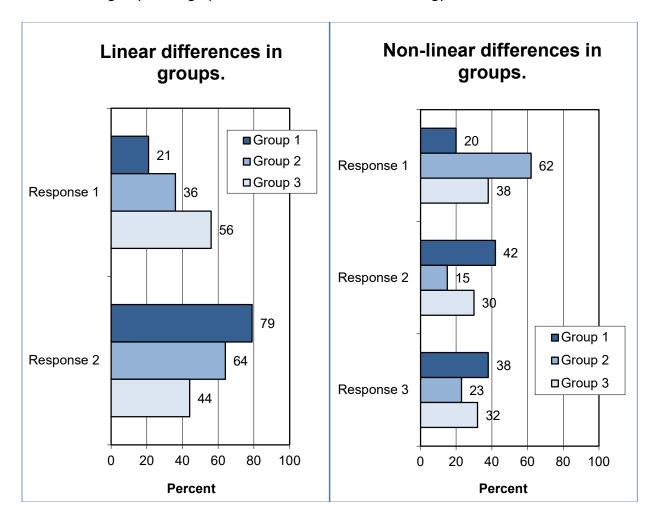
The findings of the survey are reported in the next chapter section, which takes into account the implications of this comparison.

#### 2.3. FINDINGS OF THE PROBABILITY-BASED SURVEY OF HUNTERS

The findings are organized thematically, starting with the results regarding measures of basic avidity levels. The analyses focused on the differences between the three avidity groups: Avids, Churners, and One-Timers. In these analyses, the years that respondents had been hunting were used to define avidity (self-reported avidity) rather than the avidity level as defined based on the years of license purchase in the databases, as discussed below.

In the comparison of the two ways to define avidity (self-reported or database-defined), the findings generally pointed in the same direction. In other words, the differences in the groups were similar in either analysis, but the differences were sometimes slightly more marked in the analysis using the self-defined avidity levels. The labels on the graphs include an (S) to indicate that the results shown are from the data run based on self-defined avidity.

Note that a *linear difference* refers to situations where, for instance, Avids have the highest percentage giving a particular response, Churners have the next-highest percentage, and One-Timers have the lowest percentage. Non-linear would be, for instance, Avids giving the highest percentage, Churners giving the lowest percentage, and One-Timers being in the middle of those two groups. The graphs below illustrate this terminology.

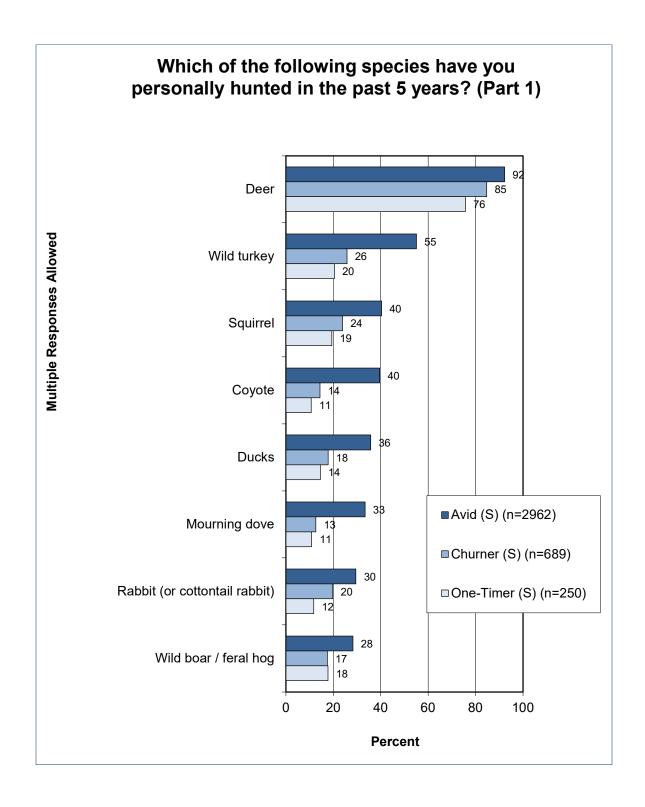


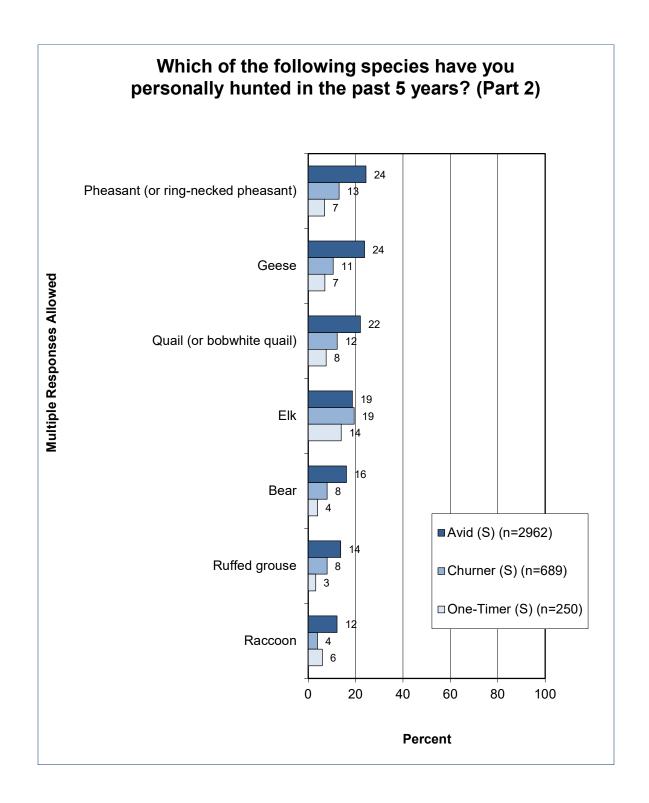
#### BASIC AVIDITY MEASURES: YEARS HUNTED, DAYS HUNTED, MENTORING

- Days hunted in typical year: Large differences, and linear in that Avids have the most days, Churners are in between, and One-Timers have the least annual days hunted.
- Total years hunted: Large differences, with Avids longer than the others, although the other two groups are similar.
- Ever taken children hunting: Large differences, but only between Avids (the most likely to mentor) and the other two groups, as the latter were similar to one another.
- Nearly all hunters do some mentoring activities: either taking their own kids, taking
  friends or acquaintances hunting, or otherwise helping hunters if not actually going with
  them. Avids do this mentoring at a slightly greater rate than Churners and One-Timers—
  the latter groups are statistically the same.

#### **SPECIES HUNTED AND HARVEST**

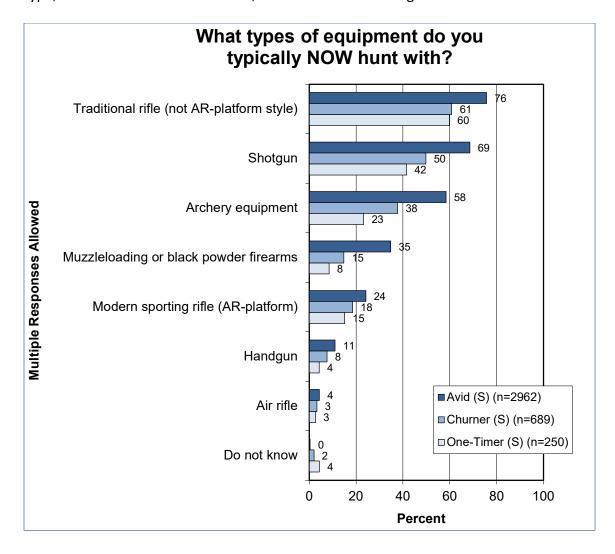
- In species hunted, Avids have a greater rate, compared to the other avidity groups, of hunting deer, wild turkey, squirrel, coyote, waterfowl, and mourning dove. And except for wild turkey, Churners and One-Timers are similar to one another on species sought.
   Regarding wild turkey, One-Timers have a greater rate of hunting it than do Churners. (See graphs on the following pages.)
- Avids had higher harvest success. (Cause and effect is not determined, but it likely goes both ways: avidity makes for more harvest, more harvest makes for more avidity. Some hunters may become more avid because they start to have more harvest success, while other hunters who are avid may then, through experience, become more efficient hunters.) Nonetheless, Avids had a statistically significant higher percentage in the top harvest success category, compared to the other groups. (Several survey questions were used to determine an overall harvest level. This included number of years hunted and years harvested six species or types of species: deer, bear, turkey, waterfowl, elk, and moose.)





#### **HUNTING EQUIPMENT**

• Types of equipment now hunt with: Avids are markedly higher for every equipment type, and the differences are linear, with One-Timers having the lowest rates of use.



- While Avids had higher rates of use of any type of shooting equipment, which means that they also had a higher rate of people using multiple types of equipment, there was not any marked differences in percentages who had stopped using a particular type of equipment. There was interest in learning if Avids might be more inclined to drop the use of particular equipment to specialize in a single type—those who stop firearm hunting to hunt with archery equipment would epitomize this. However, rates of dropping any type of equipment show no meaningful relationships to avidity level. (Dropping was determined by two questions, the first asking what equipment hunters have used in the past and the second asking about equipment used now.)
- Types of equipment bought: There are similar findings to the equipment used, with Avids on top at the highest rates of purchase. There are large differences between the groups that are linear.

#### **HUNTING LOCATIONS**

Substantial differences were found, as shown in the table that follows.

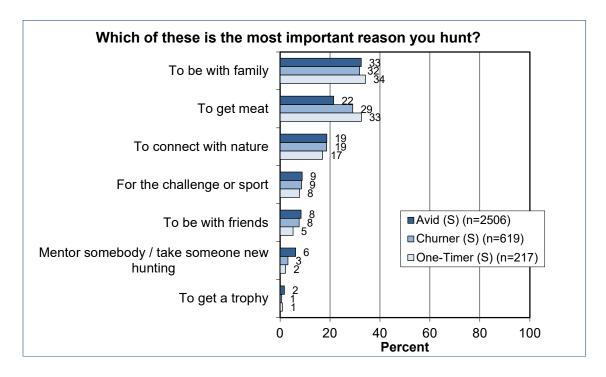
Type of Land Hunted On	Avidity Level Comparison
Any private	Avids much more likely to hunt any private land.
Owned by you or family	Avids much more likely to have used this type of land.
Owned by friend or neighbor	Avids much more likely to have used this type of land.
Hunting club	Avids much higher than either other group.
Public land	Avids and Churners are about the same, with One-Timers at the
Public land	bottom.
Paid for access	Avids lead the other groups by a lot.
Typical travel distance*	No marked differences.
Farthest have traveled*	Marked linear differences, with Avids travelling the farthest.
Hunted out of state	Avids are the most likely, Churners are next, and One-Timers are the least likely.

<sup>\*</sup> One question asked hunters to indicate their *typical* travel distance; another question asked them the farthest they had travelled to hunt.

 In typical travel distance, the most important finding is that all three avidity groups have roughly the same median distance—there just are not marked differences.

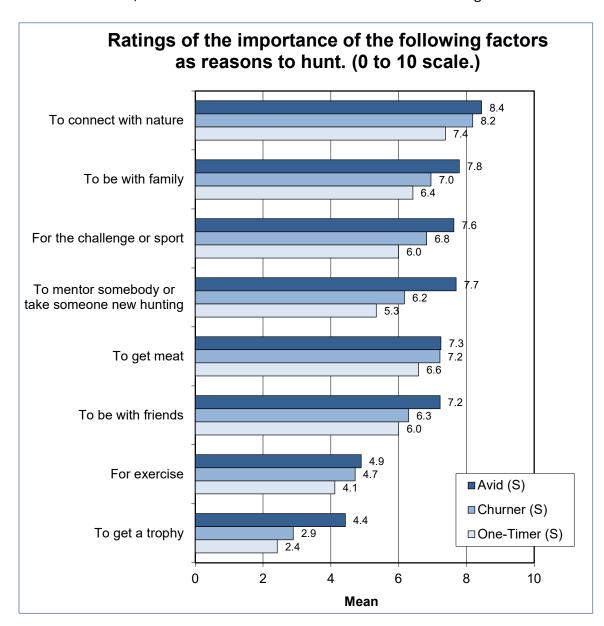
#### SATISFACTIONS WITH AND MOTIVATIONS FOR HUNTING

- Ratings of satisfactions: Almost no differences.
- Top *single* motivation for hunting: Almost no differences. (This question asked hunters to choose the single most important reason to hunt.)
  - Exception is *To get meat*: One-Timers are the most likely to choose this; well above Avids.



In this next series of questions, hunters rated the importance of various motivations for hunting, using a 0 to 10 scale, with 0=not at all important and 10=extremely important. (This is in contrast to the above graph that shows the single most important reason for hunting; in this series, hunters rated them all.)

- Avids give higher ratings to all motivations, and the differences are linear.
  - Mentoring as a reason to hunt drops markedly in importance among Churners and One-Timers.
  - To get meat as a reason rises in importance among those two groups.
  - Otherwise, the other motivations are about the same in ranking.



The motivation questions were asked regarding when the hunter first started hunting compared to now. Specifically, hunters rated the importance of each motivation to them when they started hunting and then rated the importance of the motivations now, using a 0 to 10 scale where 0 is not at all important and 10 is extremely important.

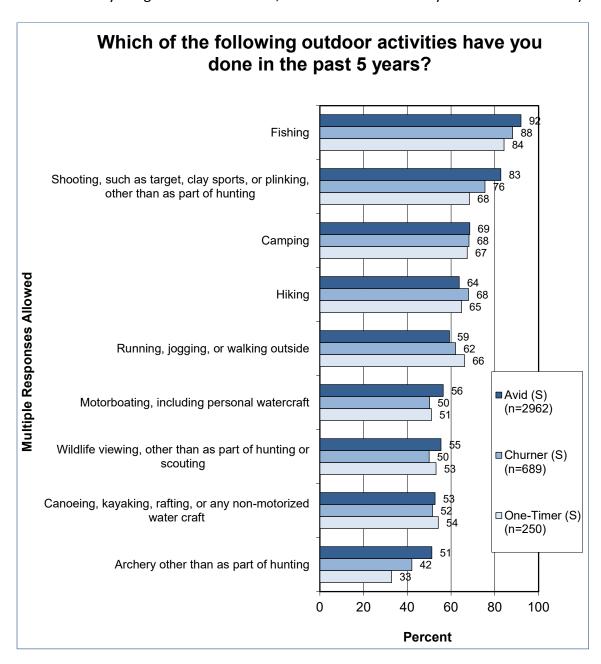
- Hunting for the challenge, for the meat, and to be with friends all increase in importance for Avids but stay the same or drop for the other groups.
  - The first table shows the mean ratings of each motivation among the groups when they first hunted and now. For each avidity group, the difference was calculated (on unrounded numbers). These differences are then shown by themselves in the second table for comparison among avidity groups.

Mean Ratings of the Importance of Motivations to Hunt When First Hunted and Now												
	Avid (S) (First)	Avid (S) Now	Difference Avid	Churner (S) (First)	Churner (S) Now	Difference Churner	One-Timer (S) (First)	One-Timer (S) (Now)	Difference One-Timer	Total (First)	Total (Now)	Difference Total
To be with family	7.7	7.8	0.1	7.5	7.0	-0.5	7.4	6.4	-1.0	7.6	7.5	-0.1
To be with friends	6.8	7.2	0.4	6.2	6.3	0.1	6.4	6.0	-0.4	6.6	7.0	0.3
To get meat	6.7	7.3	0.5	7.1	7.2	0.1	6.9	6.6	-0.3	6.8	7.2	0.4
To get a trophy	4.4	4.4	0.0	3.2	2.9	-0.3	3.0	2.4	-0.6	4.1	4.0	-0.1
For the challenge or sport	7.0	7.6	0.7	6.7	6.8	0.1	6.5	6.0	-0.5	6.9	7.4	0.5
For exercise	3.3	4.9	1.6	3.7	4.7	1.0	3.6	4.1	0.5	3.4	4.8	1.4
To connect with nature	7.0	8.4	1.5	7.3	8.2	0.9	6.8	7.4	0.6	7.0	8.3	1.3

Difference in Mean Ratings of the Importance of Motivations to Hunt When First Hunted and Now						
	Difference Difference Difference Avid Churner One-Timer					
To be with family	0.1	-0.5	-1.0	-0.1		
To be with friends	0.4	0.1	-0.4	0.3		
To get meat	0.5	0.1	-0.3	0.4		
To get a trophy	0.0	-0.3	-0.6	-0.1		
For the challenge or sport	0.7	0.1	-0.5	0.5		
For exercise	1.6	1.0	0.5	1.4		
To connect with nature	1.5	0.9	0.6	1.3		

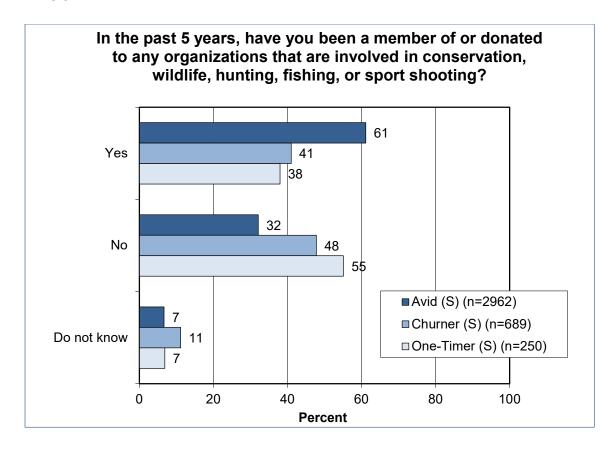
#### **CROSSOVER ACTIVITIES**

- The survey asked about other activities that hunters might have done in the previous
   5 years. Marked differences were found in some activities. In particular:
  - Fishing: Avids have a higher rate, Churners are next, and One-Timers are the lowest.
  - Recreational shooting: Large differences: from 83% of Avids down to 68% of One-Timers.
  - o Archery: Large linear differences; Avids are the most likely to have done archery.



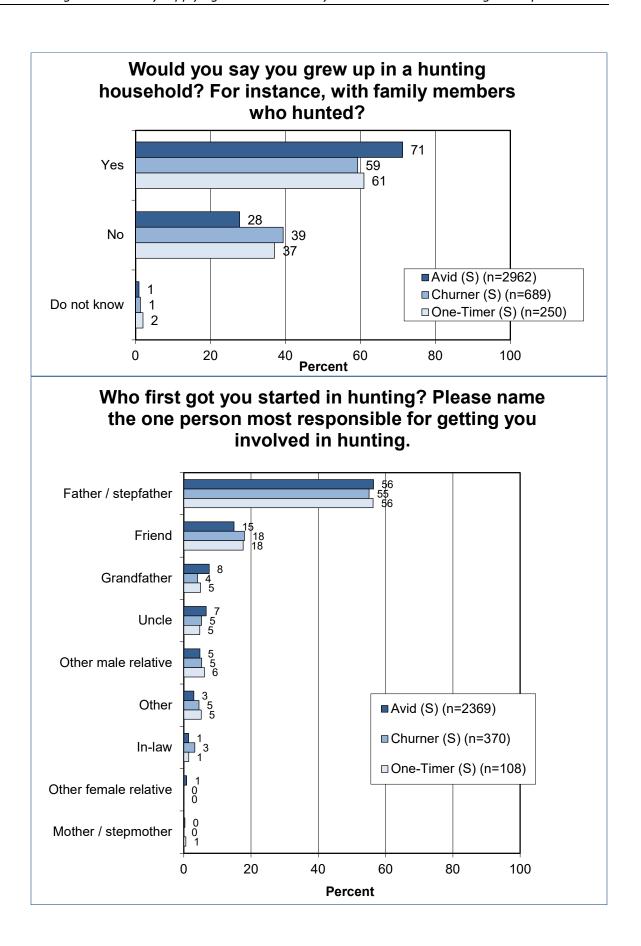
#### INVOLVEMENT IN ORGANIZATIONS

• Large differences, with Avids the most likely, followed by Churners, and then One-Timers.



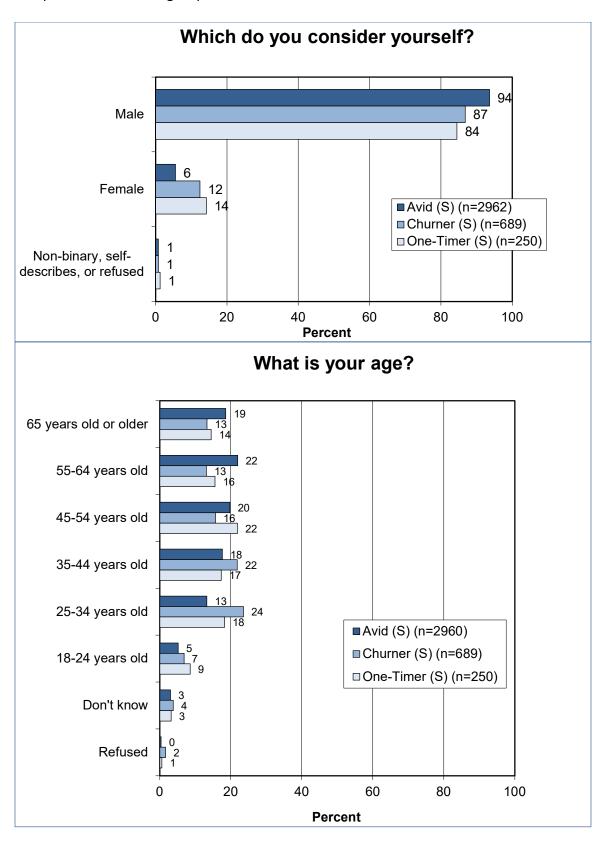
#### INTRODUCTION TO HUNTING

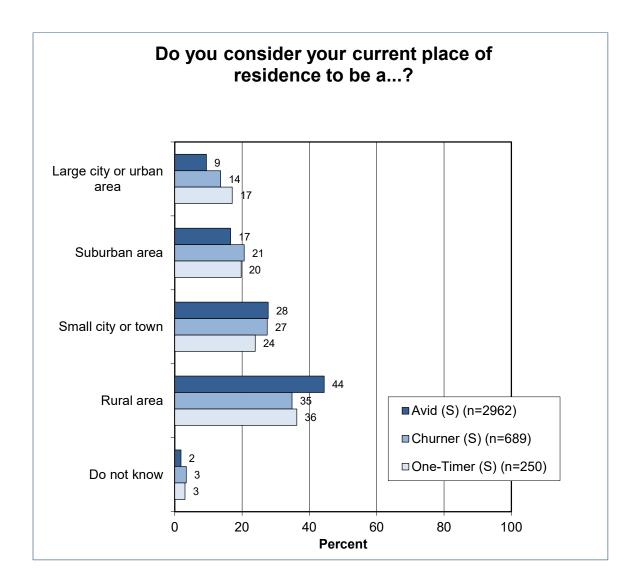
- Grew up in hunting house: Differences emerged between Avids and the other two groups, with Avids the most likely to grow up in a hunting house. (See graph on the next page.)
- Who first got the hunter started: No marked differences. (Graph for this is also on the next page.)



#### **DEMOGRAPHIC CHARACTERISTICS**

 Avids are more likely to be male, to be in the older age ranges, and to be rural, compared to the other groups.





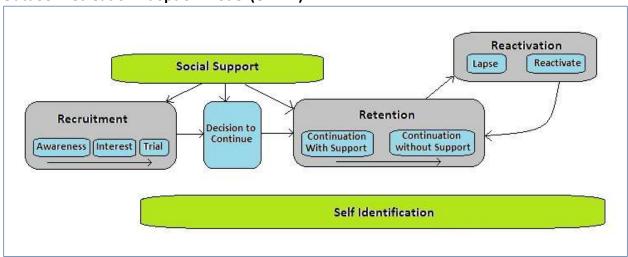
### 3. DEVELOPMENT OF THE HUNTER AVIDITY MODEL

The Hunter Avidity Model starts with ORAM (as a reminder, ORAM refers to the Outdoor Recreation Adoption Model), which is described first, followed by a discussion of ORAM as it relates to avidity levels. Then each part of the Model is examined in the context of the above results.

## 3.1. ORAM AND ITS RELATIONSHIP TO RECRUITMENT, RETENTION, AND REACTIVATION

People go through stages when they become recreation participants. The first three stages of the ORAM (awareness, interest, and trial activity) are addressed by recruitment efforts. These initial stages lead to the next stages: the decision to continue, continuing participation with social support, and then continuing participation without social support. These continuation stages are addressed by retention efforts. Individuals who do not continue to participate are referred to as lapsed participants—the remaining stages of the ORAM. Lapsing may be further divided into individuals who are short-term lapsed and those who are long-term lapsed. These lapsed stages are addressed by reactivation efforts.

### **Outdoor Recreation Adoption Model (ORAM)**



Note that not all participants go through all the stages—the Model is not meant to be strictly linear from beginning to end but contains loops—as some people move through the continuation stages into the lapsed stages and then back into the continuation stages (if they become reactivated), and some (ideally) stop at the continuation without support stage. The Model was recreated based on the figure in Appendix A of *AFWA President's Task Force on Angler R3* published in 2018.

### 3.2. ORAM AND AVIDITY LEVELS

In broad terms, Avids are in the "continuation without support" stage of ORAM. They self-identify as hunters, and they show robust participation.

Churners can be in almost any stage, but they most fit into either the "continuation with support" stage or the "reactivate" stage.

One-Timers also can be in any stage, but they most fit into the "trial" stage leading into the "decision to continue" node, although they also fit into the "lapse" stage leading into (the hunting community would hope) the "reactivate" stage.

### 3.3. RECRUITMENT

Beginning hunters in general, although there are exceptions, go for only a few days in a given year to start. At this stage, harvest may still be elusive.

There is evidence that early recruitment is positively associated with avidity. Avid hunters started earlier than did Churners and One-Timers.

### 3.4. DECISION TO CONTINUE

Although many hunters say that harvest is not their favorite aspect of hunting, there is evidence that harvest success is associated with avidity. This, in turn, suggests that some harvest success is a factor in the decision to continue.

In general, three motivations become more important as hunters gain experience: connecting with nature, for the challenge or sport, and for exercise. These motivations for hunting should be tapped into and encouraged to develop avid hunters. On the other hand, the motivations of being with family and being with friends fall for many hunters. One nuance of the findings on motivations is that being with friends gains in importance more so for Avids than for Churners and One-Timers. The need for social support to continue in the progression is evident.

### 3.5. RETENTION: CONTINUATION WITH SUPPORT

Hunters start to approach a high number of days hunting.

Harvest levels at this stage are in the middle and starting to approach the high harvest success of Avids.

At this stage, hunters may or may not be specializing in shooting equipment. The analyses found that Avids use every type of equipment at a greater rate than do Churners and One-Timers. This implies that Avids are more likely to use multiple types of equipment, relative to the other groups.

Crossover activities have some association with hunting participation—other surveys by Responsive Management have shown that hunting initiation is more effective among people

who already do outdoor activities. The survey found that Avids had higher rates of sport/target shooting, archery, fishing, and motorboating compared to the other groups.

### 3.6. RETENTION: CONTINUATION WITHOUT SUPPORT

At this stage, hunters are hunting many days.

Hunters plan to go hunting every year when in this stage.

The overwhelming majority of avid hunters do mentoring activities. However, with the exception of those in the recruitment part of the Model (i.e., before the decision to continue node), all hunters do mentoring activities: the survey found relatively robust percentages of Churners and One-Timers also had done mentoring.

Avid hunters have a greater rate of hunting most important species (important in terms of the number who hunt them) compared to Churners and One-Timers. Related to the species hunted is harvest success—the analyses found a correlation between harvest success and being an avid hunter.

At this stage, Avids show signs of specialization in the use of archery and muzzleloaders, which they use more than do the other groups. (They may, however, still be using multiple types of equipment, as there is evidence that they use multiple types more than do the other groups.) They buy hunting clothing, tree stands, and hunting dogs at a higher rate than the other avidity groups, as well.

### 3.7. REACTIVATION

It was apparent that hunters in this stage had or continue to mentor other hunters—an obvious conduit to reactivating themselves. While Avids are the most likely to mentor, very large percentages of all groups do so, and Churners and One-Timers are not different (only the Avids showed a statistically significant difference).

### 3.8. SOME NOTABLE CHARACTERISTICS THAT DID NOT HAVE DIFFERENCES

The use of AR-platform rifles does not seem to have a strong correlation to hunting avidity—purchases of AR-platform rifles and associated equipment and supplies are not much different among avidity groups, and hunting with AR-platforms among the avidity groups shows less difference than other firearms (for all firearms, Avids have a higher rate of using them for hunting, but the difference between Avids and the other groups is lowest for AR-platform rifles and handguns).

There was interest in testing whether the dropping of use of certain equipment had any relationship with avidity—in other words, were avid hunters stopping the use of some types of firearms or equipment in favor of using other equipment? Were they dropping rifles to hunt with archery or muzzleloaders? The survey did not find marked differences in the rates of dropping the use of any types of equipment among the avidity groups. Therefore, it appears that all avidity groups are dropping the use of some types of equipment in favor of others.

Avids had higher rates of using private land in general and higher rates of using private land owned by a friend/neighbor or a family member and private land that is leased/part of a hunting club, and Avids have a higher rate of using land enrolled in a hunting access program.

Travel distance does not show any marked correlation to avidity.

In the ratings of four possible satisfactions with hunting that were asked about in the survey, there were no marked differences. Those satisfactions were harvesting game, seeing game, harvesting large animals, and getting the bag limit. This is hunters' stated rating of importance; note that elsewhere actual harvest success was correlated to a higher level of avidity, even if their stated rating of the importance of harvesting game does not show differences among groups.

Regarding who first took hunters hunting, there are no marked differences in first hunting companions among Avids, Churners, and One-Timers. They all most commonly were first taken by their father.

### 3.9. HUNTER AVIDITY MODEL

As shown in the model on the following page, One-Timers should be thought of as at least two distinct groups: beginners and experienced hunters who are lapsing.

Beginning hunters are moved along through the avidity levels by having a place to hunt, harvest success, and getting meat. As they become more avid, their participation in several other activities—namely fishing, target shooting, and archery—may increase. Cause and effect on those other activities probably goes both ways—avidity in one of the other activities may increase the interest and opportunity to hunt, and avidity in hunting may increase the interest and opportunity to participate in those other activities.

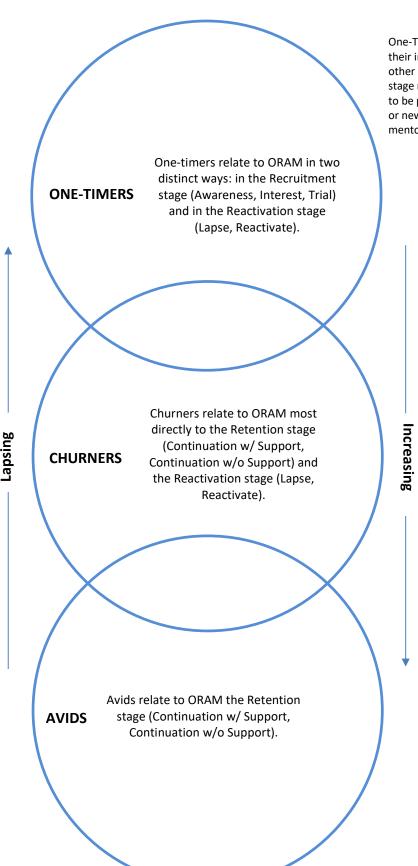
Lapsing hunters are reinvigorated by something new. This something new can be a species not previously hunted or a type of equipment not previously used, but it also can be a hunting companion. Mentoring is higher among Avids: while they may be more likely to mentor somebody because they are avid, it also may be that some get more active in hunting because of their mentoring of somebody else.

The analyses suggest that harvest success is important for moving hunters through the Hunter Avidity Model. Despite what hunters say regarding the importance of harvest success as a reason for hunting—which is downplayed in favor of simply connecting with nature and being with family—the Avids had better harvest success. Again, this can go both ways, as more avid hunters learn more techniques that make them more successful, but some hunters certainly become more avid prompted in part by their hunting success.

Growing up in a hunting household showed itself to be an important variable in producing avid hunters. While agencies and the industry cannot control that among the population as a whole, they can certainly control it in the audience that they target for outreach. It is of utmost importance that children of a hunting family be encouraged to hunt.

Access is an important component to increasing avidity: the evidence suggests that more avid hunters have more opportunities on private land—their family's land or neighbors' and friends' land. The typical travel distance did *not* vary greatly among the three avidity groups. This suggests that access need not necessarily be nearby, but it needs to be guaranteed.

Because the Hunter Avidity Model requires a full page to be legible, it starts on the following page.



One-Timers in the Recruitment stage need their interest in hunting itself piqued. On the other hand, One-Timers in the Reactivation stage need interest in some aspect of hunting to be piqued—new species, new equipment, or new hunting companions through mentoring.

As avidity increases, there are also increases in: Days hunting.

Use of equipment of all types.

Purchasing of all equipment types.

Hunting of various species

Hunting of various species.

Harvest success.

Use of private land (both family land and land of neighbor/friend).

Participation in fishing, shooting, archery. Percentage who grew up in hunting household.

Total years of hunting experience was higher for Avids than for the other groups. This suggests that hunting is a sport that grows more important the more a person does it. However, age/health is one of the top constraints—many hunters age out rather than lose interest.

Some characteristics do not appear to be related to higher avidity.

The person who introduced the hunter to hunting does not appear to play an important role: Avids, Churners, and One-Timers have no marked differences in who introduced them to hunting.

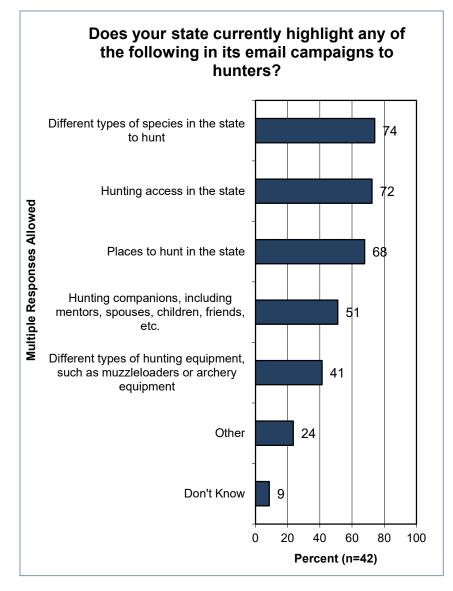
Typical travel distance is not much different among the groups. It suggests that access is important (see use of private land above), but not necessarily the *location* of that access—it does not have to be nearby, but access is needed.

Motivations: Avids give higher ratings to all motivations, and the differences are linear. In looking at the ranking, two motivations differ among the groups. Mentoring as a reason to hunt drops in importance among Churners and One-Timers; to get meat as a reason rises in importance among those two groups. Otherwise, the other motivations are about the same in ranking.

# 4. SURVEY TO DETERMINE OPERATIONAL CAPACITY OF STATES

As indicated in the Background chapter of this report, the project included a survey of R3 professionals, marketing coordinators, and database managers in the state fish and wildlife agencies. In the analyses, each state was weighted to be equal to every other state. The 42 respondents represent 28 agencies in 27 states that participated in the survey.





About three quarters of states that were surveyed indicated that their email campaigns to hunters highlight types of species available and hunting access. About two thirds highlight places to hunt in the state. In a second tier, half of the states highlight hunting companions, and less than half highlight different types of equipment.

The primary purpose of the survey, other than to locate professionals to participate in the next step, was to determine the challenges states might have using the Hunter Avidity Model in agency R3 campaigns. The greatest challenge to implementing the Model is having a database with 5 consecutive years of license purchase data. Oftentimes, states switch vendors, licensing systems, or structures, making it difficult to merge many years into one file, which is a needed step to labeling the records by the 3 hunter avidity types and identifying the target markets.

A second challenge that the survey identified relates to how individual hunters can appear in the database. Some states have unique identification numbers for hunters that the hunter uses year after year, even if that hunter changes address. In states that do not use unique identification numbers, the same hunter may appear in the database as two hunters because of changes to any of the supporting information used to identify that hunter. (And even in states that use an identifier, a hunter can purchase a license one year, obtain an identification number, then purchase a license a second year forgetting his identification number and receiving a second identification number.)

Some examples of how this can happen are shown below:

- A hunter can purchase a license as John Smith one year and John A. Smith another year (i.e., somewhat arbitrarily using the middle initial the second year). While the database manager would be able to see the same address associated with these two names, there is no definite way to know if this is the same person, as a father and son could be living at the same address. Indeed, two entries with the exact same name and address also could be a father-son duo if they did not use "Sr." and Jr." in their names when they purchased a license.
- A hunter can change addresses and be in the database twice, with no feasible way to determine if the database is showing two people with the same name in different locations or one person who has moved within the time period.

Another constraint to using the Model in R3 efforts consists of a broad range of reasons that prevent states from linking license databases to R3 marketing efforts. These can include technical reasons (for instance, issues with a license database format), legal reasons (laws preventing databases to be used in marketing), or logistical reasons (for instance, no staff available to prepare the database for use in an R3 marketing effort).

## 5. FINE TUNING THE MODEL: FOCUS GROUPS WITH AGENCY PROFESSIONALS

The focus groups for this project entailed showing focus group participants a presentation of findings of the research to date and soliciting feedback on those findings. Specifically, the presentation showed the research findings from the precursor study and the draft Hunter Avidity Model, which was overlayed with ORAM, and then the meeting was opened for discussion and questions. Specific discussion questions were asked about hunter churn, applying research to hunter R3 marketing campaign strategies, and current agency campaigns geared towards increasing hunting license sales or reducing hunter churn. The discussion questions can be found in Appendix A.

The first slide of research findings showed the database analysis with the percentage of license holders who are classified as Avids, Churners, and One-Timers, according to license sales databases. The slide showed that large percentages of license holders are either Churners (43%) or One-Timers (29%)—not consistent license purchasers. A much lower percentage, 31% of license holders, are Avid hunting license buyers. A focus group participant commented that, on average, the high percentage of Churners was not entirely surprising, but the high percentage of One-Timers in the participant's state was surprising; reflecting on the findings, this focus group participant commented that a person she knows in law enforcement saw the slide. The volume of field citations for hunting without a license prompted them to wonder if unlicensed hunters were not skewing the percentages. The officer indicated that there were repeat offenders who would buy a temporary license when caught and then do the same thing the following year.

Another participant from a western state indicated that what they felt was the state's percentage of Avids was much higher than the percentage that was shown in the license database analysis from the first avidity study. The participant asked a question about whether youth who hunt would affect the avidity rates as shown by the database analysis, as they had seen many youths taking advantage of youth hunts and being drawn multiple times for multiples species. Youth ages 18 and under drew tags more frequently than hunters over 18 years old. The focus group participant's point was that if youth were not removed from the database analysis, the percentage of Churners or One-Timers could be artificially inflated. Responsive Management assured him that only adult license holders were included in the database analysis.

Most focus group participants indicated that they used research or research models for R3 marketing purposes. There was agreement that states needed to use research and be as sophisticated as possible in their R3 marketing efforts to reach hunters in their various experience levels. A participant from the Oklahoma Department of Wildlife Conservation reported that they had run some email campaigns using their Brandt system during COVID specifically to try to retain a percentage of the large influx of new hunters. The campaign was called "Operation Retention" and received a national award for its success. The campaign did not use specific messaging but did follow the ORAM and emphasized continued support, customer engagement, new hunting opportunities, and new R3 marketing content.

A participant from Missouri said that their marketing department has specifically been using research to try to reduce hunter churn and reach new hunters, and their efforts had been successful. Interestingly, the participant said that the state's efforts with fishing had been less effective than with hunting.

A participant from another midwestern state commented that using the ORAM terminology was very helpful when its marketing department needed to communicate marketing goals and strategies with agency administrators because administrators were quite familiar with ORAM terminology and less familiar with marketing terminology. The participant stated that their agency goal from a license sales perspective is to maintain sales each year by ensuring that the marketing funnel is large enough to result in stable hunting license sales. They are most concerned with ensuring that the top of the funnel is large enough to maintain consistent sales. (The marketing funnel stages are somewhat like the ORAM stages: awareness, interest, desire, action, and loyalty.) The agency would like to know if the rate at which a hunter moves down the funnel is the same as it was 10 years ago, and how and if the percentages of Avids, Churners, and One-Timers have changed from 10 years ago. They were not as concerned about the percentage of Avid hunters because, as with several other states, they were dealing with issues such pressures on resources stemming from various recreationist groups and general crowding. Their top focus is maintaining consistent license sales. With the need to balance license sales and limited resources, the participant observed that the most ideal yet least realistic situation would be an increase in sales and fewer hunter days in the field.

As can be expected, state needs vary in terms of their R3 marketing objectives, as wildlife management and financial goals vary from state-to-state. For example, a participant from the North Dakota Game and Fish said their agency did not need to market to deer hunters due to the limited deer hunting opportunities; they have lotteries and crowding concerns. By contrast, a participant from the Maine Department of Inland Fisheries and Wildlife said that their agency would be interested in sending a targeted R3 marketing campaign to hunters in their southeastern region to encourage an increase in deer hunting participation, possibly starting a season a little earlier to create and advertise a new opportunity. He was particularly interested in how to market to and gain the interest of non-avid hunters knowing that the Boomer II generation is aging out of the sport.

A participant from Texas noted that "tradition" is not the key message to market to hunters anymore, particularly if the goal is to attract younger and more diverse hunters whose parents and grandparents did not hunt. The same participant went on to say that the current marketing message could potentially be focused on sustainability, nutrition, or conservation, depending on what the new culture of hunting was. There was concern raised over the agency not focusing on the social support component of the ORAM. Their marketing staff reported that the agency sends a high volume of emails with the intent to recruit and reactive hunters and target first-time license buyers; the email content includes information on how to increase hunting knowledge and skills. But the agency does not know how to approach addressing the need for hunters to have social support to continue with the sport. The moderator suggested starting small by keeping attendees of special R3 events, such as Becoming an Outdoors Woman events, in touch via email or Facebook, which past R3 research has shown to be effective.

A participant mentioned the high effectiveness of Fishbrain<sup>3</sup> for keeping the fishing community active and involved with the sport and that a parallel Huntbrain is needed for the hunting community. The agency could not launch it themselves because of staff and monetary resources limitations. It seemed the agency had several internal challenges related to addressing hunting participation, and recent discussions had opened the possibility of focusing on shooting due to the level of existing opportunities for the sport.

Texas has its unique challenges with offering hunting access, a key component of the Hunter Avidity Model and an important driver of hunting avidity. In Texas, travel distances are greater than most states, and over 90% of the land is privately owned. Similarly, a midwestern state participant commented that most of their state was also privately owned, making access an issue that was not likely to improve given the strong state economy with rapid development and building starts.

A follow-up email was sent to focus group participants thanking them for their participation in the discussion and asking for any additional comments or questions related to the research. A link to the PowerPoint presentation was provided to participants, and the email once again requested that states share current or planned hunting R3 marketing campaigns with Responsive Management to assist with conducting follow-up research.

<sup>&</sup>lt;sup>3</sup> Fishbrain is a mobile app and online platform for anglers that provides map-based tools, social networking features, fishing forecasts, fishing forecasts including weather, lunar cycles, tidal charts, map functionality, predicted fish activity, previous user-catches, analysis of species behavior and data-backed recommendations on fishing gear. Fishbrain is used by anglers to find new spots to fish and see exact catch locations on maps, which include depth information and user-generated tips and ratings. (source: https://en.wikipedia.org/wiki/Fishbrain)

## 6. PILOT TESTING: APPLYING THE MODEL TO SUPPORT INCREASING HUNTER AVIDITY

Pilot testing the use of the Hunter Avidity Model in R3 campaigns is enhanced by knowing the constraints to hunting participation that hunters face as well as the encouragement to which they respond. Therefore, a survey was administered to hunters from samples of hunting license databases to explore these issues. The survey was online so that specific outreach materials could be tested—outreach materials that were developed based on the previous components of this study and the precursor study. Any pilot testing of the use of the Model would need this information. The survey instrument with the images is included as Appendix B.

The results that follow show the avidity breakdown by self-reported years of hunting rather than by avidity determined by the database. The labels on the graphs include an (S) to indicate that the results shown are from the data run based on self-defined avidity.

### 6.1. CONSTRAINTS TO HUNTING PARTICIPATION

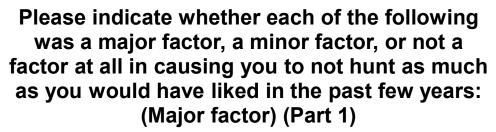
Avid hunters are less constrained by any factor than are Churners and One-Timers, as shown by the graphs that follow. In particular, work and family obligations are less of a factor to Avids, which suggests that they may carve out the time to hunt regardless of other things going on in their lives. Alternately, it may be that Avids have fewer obligations: they are slightly older than Churners and One-Timers and perhaps have fewer demands on their time from children, for instance. However, the former—that they make the time to hunt—would seem to be more of a factor than that they actually have fewer obligations.

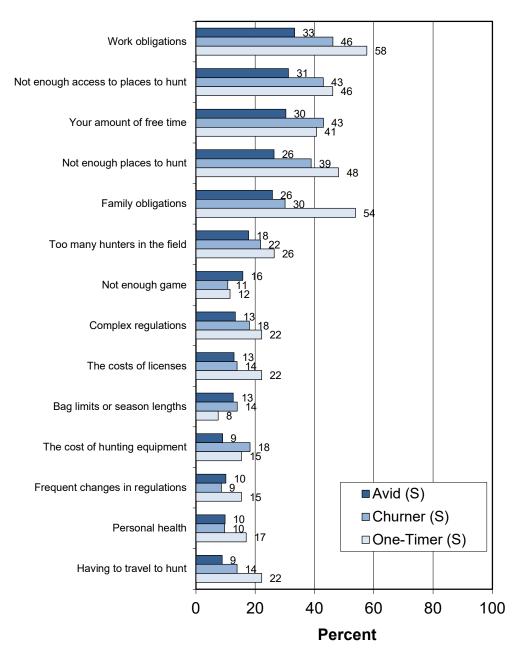
Another factor which affects Churners and One-Timers much more than Avids is access. This suggests that Avids have ready places to hunt and know where to go, while the other groups are less sure of this. This is manifested not only in the two access items in the graphs that follow but also with crowding—another facet of access is knowing places to hunt that are not crowded.

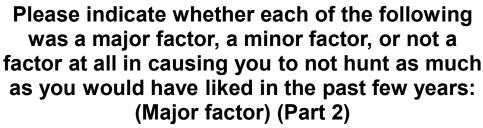
An interesting finding is that One-Timers have much higher fear of injury from other hunters, when looking at major and minor factor together. On this, Churners are much like Avids—only the One-Timers differ on this.

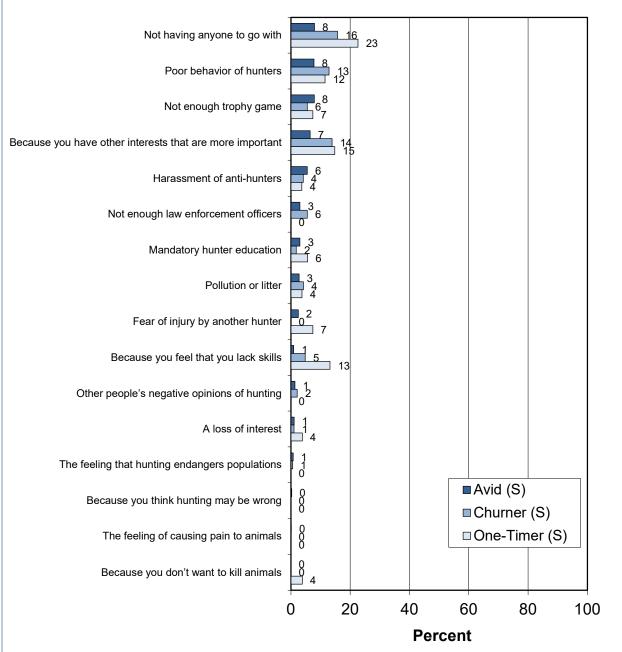
Finally, a factor affecting Churners and One-Timers more than Avids is having someone to hunt with. The Avids have a social support group (only 8% say nobody to hunt with is a major constraint), while the other groups may not (16% of Churners and 23% of One-Timers say that nobody to hunt with is a major factor).

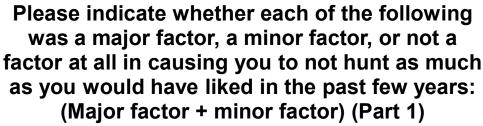
These graphs are presented on the following page. The first two graphs show the percentages of the groups saying that the constraints were *major* factors. The second set of two graphs show the percentages saying that the constraints were *major* or *minor* factors.

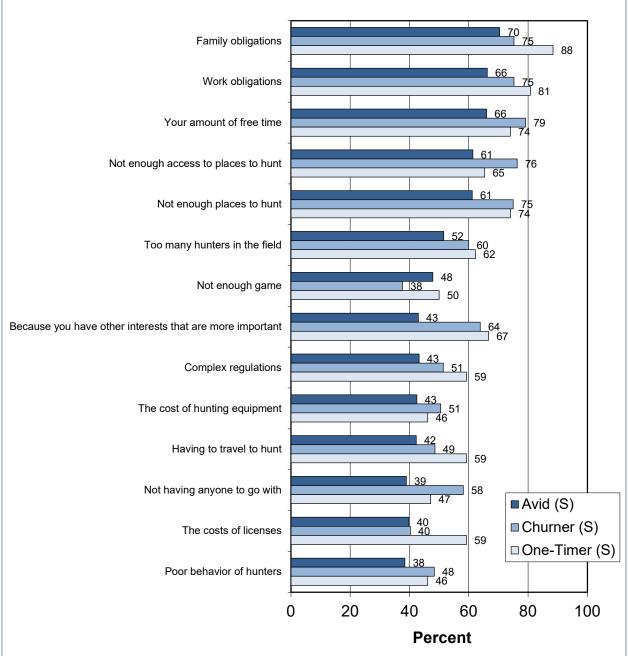


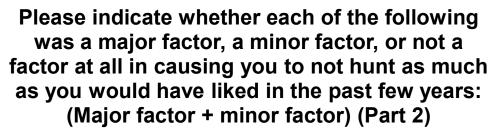


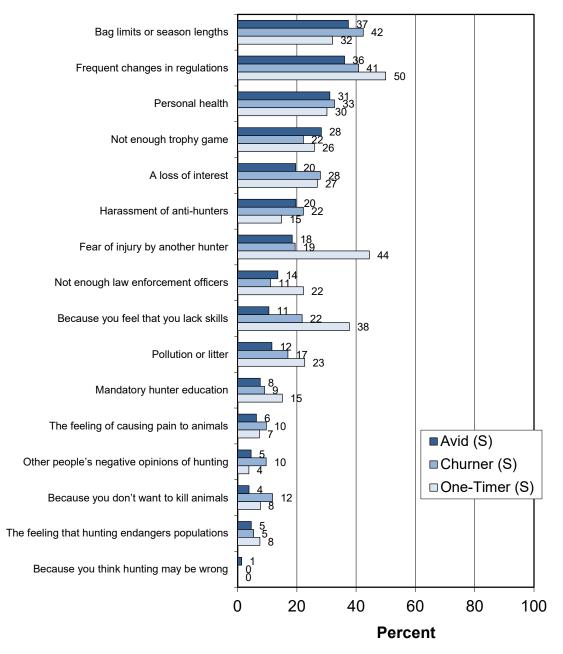






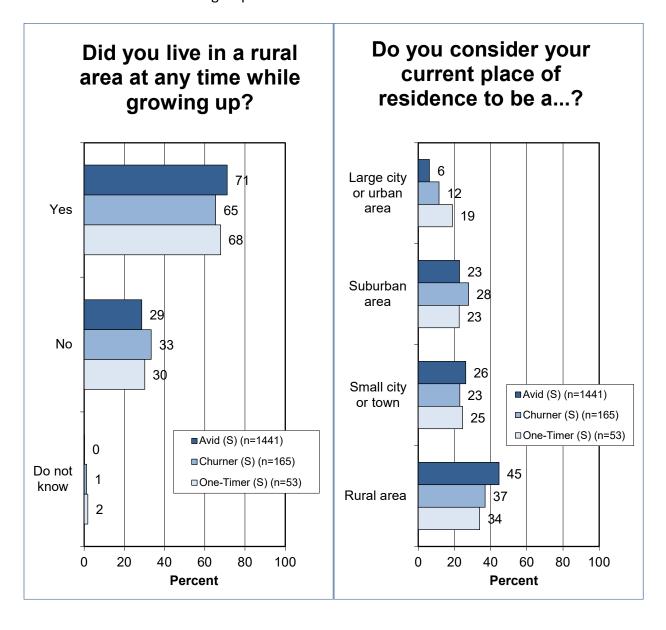






### 6.2. URBAN AND RURAL RESIDENCY

The survey also explored type of residential area in which hunters grew up as well as the area in which they now live. Hunting participation in general has been shown to be correlated to living in rural areas—this is intuitive, as the hunter is nearer to a place to hunt and is more immersed in a hunting culture in a rural area. While the majority of hunters lived in a rural area at some time while growing up, with only slight differences in avidity group, Avid hunters are more likely than hunters from the other groups to live in a rural area now.



### 6.3. RATINGS OF R3 OUTREACH MATERIALS

Seven R3 outreach themes were tested in the survey. They are shown below, followed by a discussion of the ratings given to them.

## **New Species**



Photo credit from left to right/top to bottom (iStock, Michigan Wildlife Council, Istock, Istock)

### Meat



Photo credit from top left to bottom right (Istock, Christian Jung, Istock, Michigan Wildlife Council)

### Someone New



Photo credit from left to right/top to bottom (Northeast Association of Fish and Wildlife Agencies, Jenny Risher, Matt Harlow, Jenny Risher)

### Somewhere New

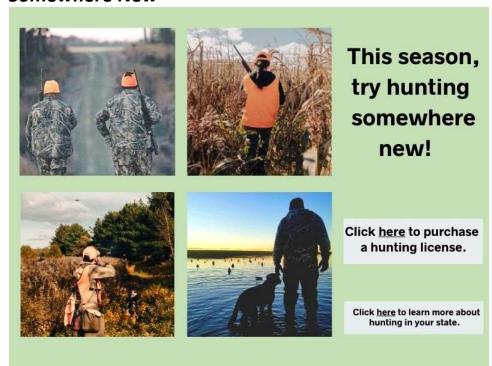


Photo credit from left to right/top to bottom (Pheasants Forever, Inc., Pheasants Forever, Inc., Northeast Association of Fish and Wildlife Agencies, Pheasants Forever, Inc.)

### **Hunting Access**



Photo credit from left to right/top to bottom (Northeast Association of Fish and Wildlife Agencies Southeast Deer Partnership, Pheasants Forever, Inc., Pheasants Forever, Inc.)

## **Prepare for Harvest**



Photo credit from left to right/top to bottom (Istock, Jenny Risher, Pheasants Forever, Inc. Istock\_Mike Olson)

### **New Equipment**

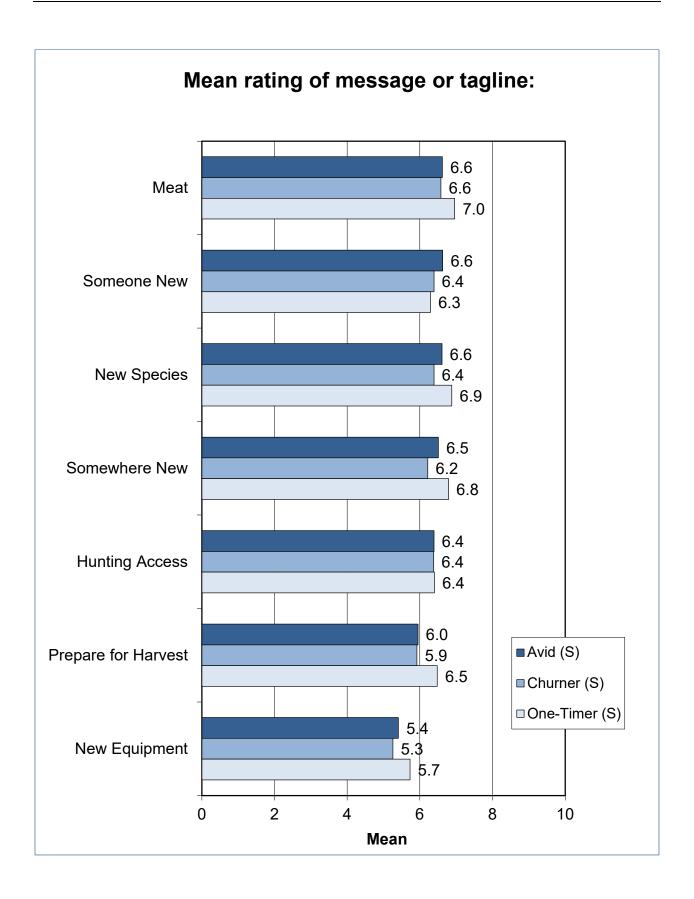


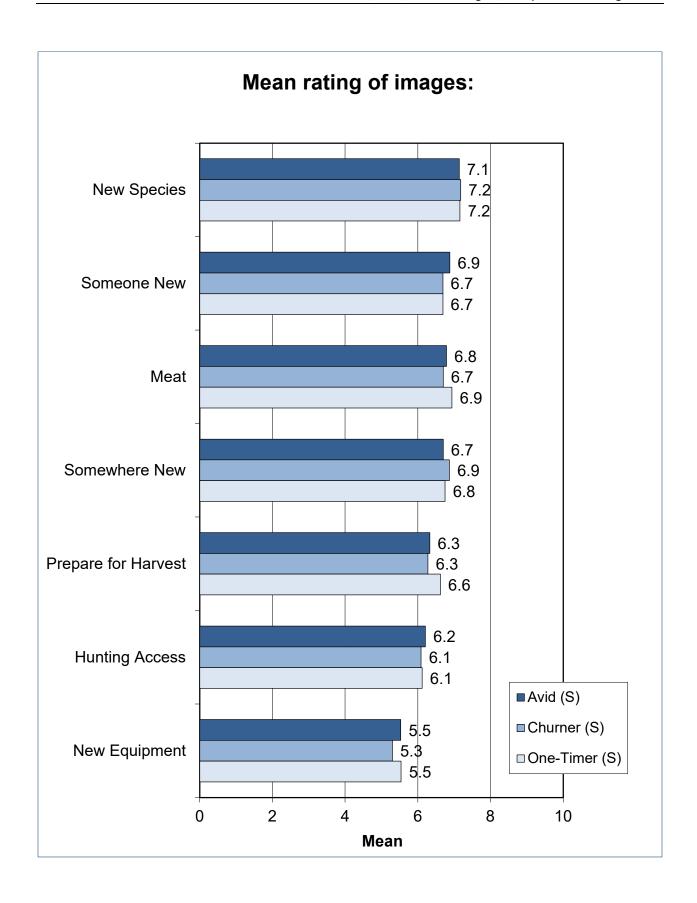
Photo credit from left to right/top to bottom (Northeast Association of Fish and Wildlife Agencies, Scott Einsmann, Jenny Risher, Pheasants Forever, Inc.)

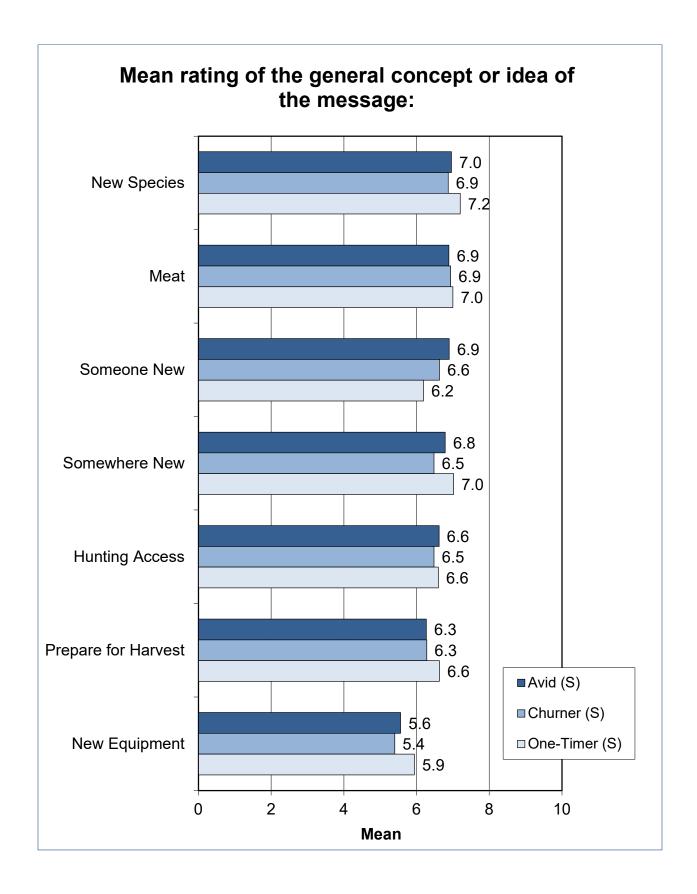
Hunters rated the effectiveness of three aspects of these R3 outreach materials, which were presented to them in the online survey: the message or tagline, the images, and the general concept or idea. This method was used so that the message/tagline could be separated from the images in the rating, as a hunter might like a message/tagline but not like the images. The ratings used a 0 to 10 scale, where 0 was not at all effective and 10 is extremely effective.

The R3 outreach materials are presented above in the rough order of effectiveness. New species, the meat, and someone new were the three top-rated materials overall. However, in the mean ratings, there were few marked differences in the ratings given by the three avidity groups. In fact, the largest difference in mean occurs in the rating of the message/tagline for preparing for harvest, where One-Timers had a mean rating of 6.5 while Churners had a mean rating of 5.9. All other differences in means were at 0.5 or less.

To further analyze the ratings, tabulations were made for comparisons. These tables are presented and discussed following the three graphs of ratings that start on the next page.







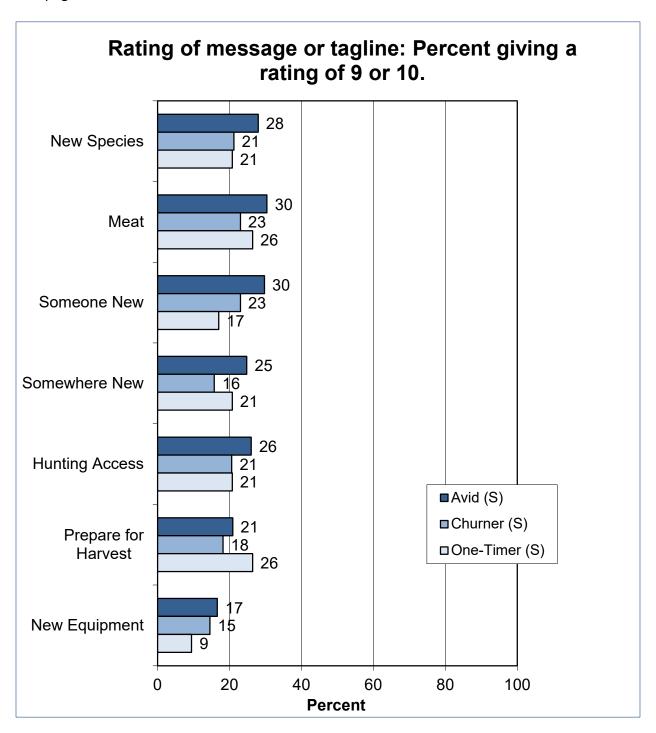
The first table shows the ratings by Avids, Churners, and One-Timers side by side. Churners most commonly gave the lowest rating (shaded red only if the rating was by itself—not tied—at the bottom). Meanwhile, One-Timers most commonly gave the highest ratings (shaded green again only if the rating was by itself at the top). Avids are mostly in the middle—neither more nor less likely to be swayed by the R3 outreach materials.

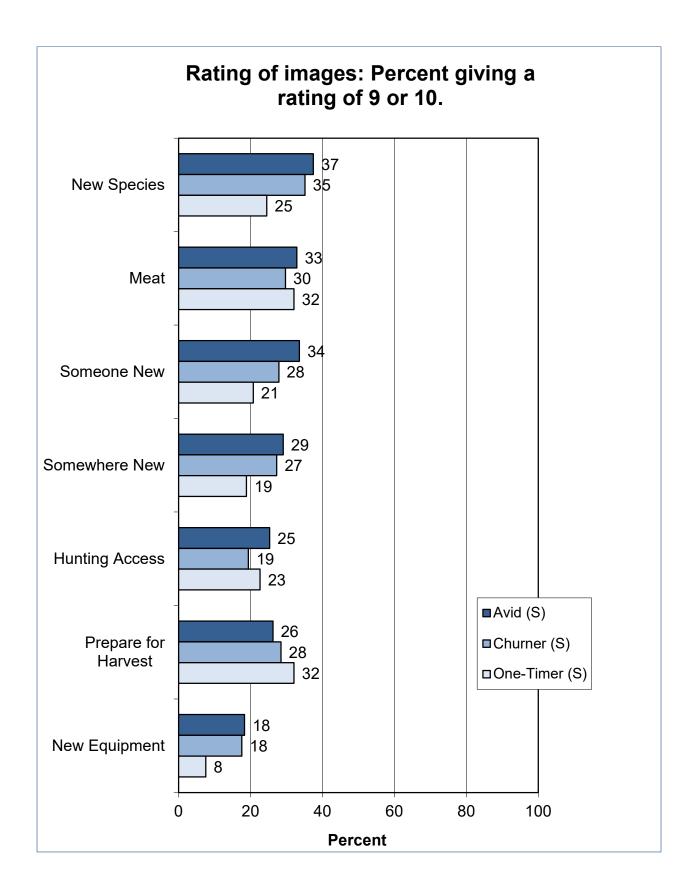
Mean R3 Outreach Material Ratings (0 to 10 Scale)						
	Avid (S)	Churner (S)	One-Timer (S)			
Mean rating of message or tagline:						
New Species	6.6	6.4	6.9			
Meat	6.6	6.6	7.0			
Someone New	6.6	6.4	6.3			
Somewhere New	6.5	6.2	6.8			
Hunting Access	6.4	6.4	6.4			
Prepare for Harvest	6.0	5.9	6.5			
New Equipment	5.4	5.3	5.7			
Mean rating of images:						
New Species	7.1	7.2	7.2			
Meat	6.8	6.7	6.9			
Someone New	6.9	6.7	6.7			
Somewhere New	6.7	6.9	6.8			
Hunting Access	6.2	6.1	6.1			
Prepare for Harvest	6.3	6.3	6.6			
New Equipment	5.5	5.3	5.5			
Mean rating of the general concept or idea:						
New Species	7.0	6.9	7.2			
Meat	6.9	6.9	7.0			
Someone New	6.9	6.6	6.2			
Somewhere New	6.8	6.5	7.0			
Hunting Access	6.6	6.5	6.6			
Prepare for Harvest	6.3	6.3	6.6			
New Equipment	5.6	5.4	5.9			

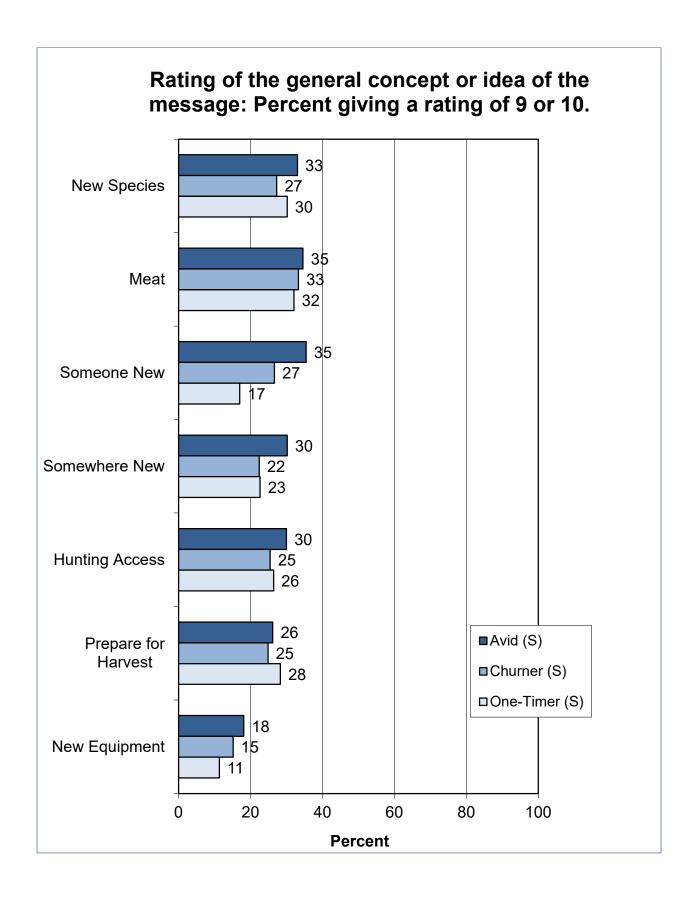
The second table shows the ratings of the three aspects side by side. This table suggests that the concepts and images were, in general, rated slightly higher than the messages/taglines by each group.

	Messages/Taglines	Images	Concept	Mean of All Three
Avid (S)				
New Species	6.6	7.1	7.0	6.9
Meat	6.6	6.8	6.9	6.8
Someone New	6.6	6.9	6.9	6.8
Somewhere New	6.5	6.7	6.8	6.7
Hunting Access	6.4	6.2	6.6	6.4
Prepare for Harvest	6.0	6.3	6.3	6.2
New Equipment	5.4	5.5	5.6	5.5
Churner (S)				
New Species	6.4	7.2	6.9	6.8
Meat	6.6	6.7	6.9	6.7
Someone New	6.4	6.7	6.6	6.6
Somewhere New	6.2	6.9	6.5	6.5
Hunting Access	6.4	6.1	6.5	6.3
Prepare for Harvest	5.9	6.3	6.3	6.2
New Equipment	5.3	5.3	5.4	5.3
One-Timer (S)				
New Species	6.9	7.2	7.2	7.1
Meat	7.0	6.9	7.0	7.0
Someone New	6.3	6.7	6.2	6.4
Somewhere New	6.8	6.8	7.0	6.9
Hunting Access	6.4	6.1	6.6	6.4
Prepare for Harvest	6.5	6.6	6.6	6.6
New Equipment	5.7	5.5	5.9	5.7

One additional analysis looked at the percentages of the groups giving the R3 outreach materials high ratings—a 9 or 10. This shows the percentages with strong reactions to the outreach materials. These graphs show that Avids often have a higher percentage who react strongly to the outreach materials. The exception is prepare for harvest, for which One-Timers react more strongly than the other groups. These graphs appear below and on the following two pages.

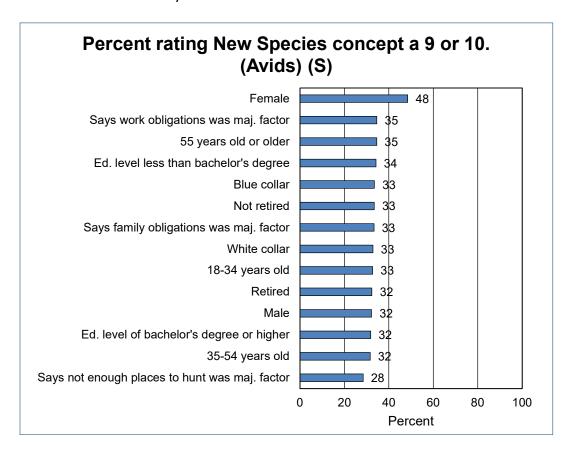


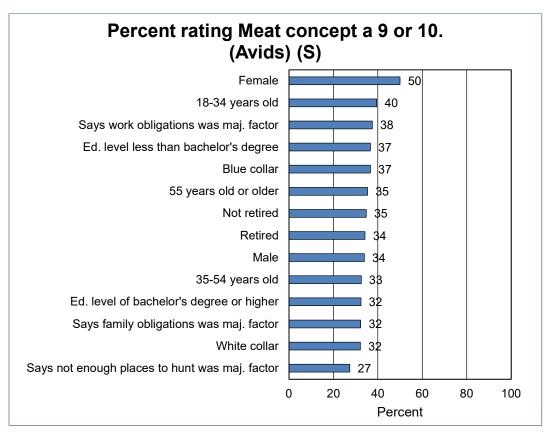


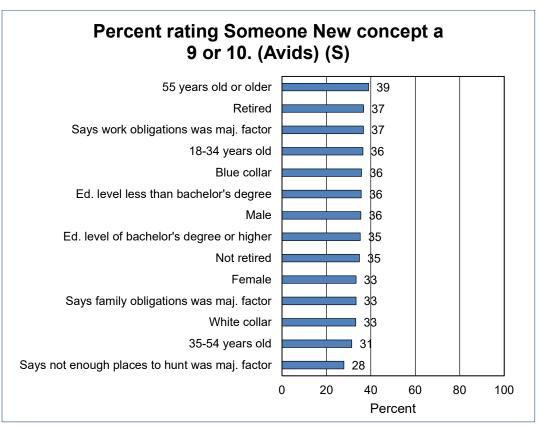


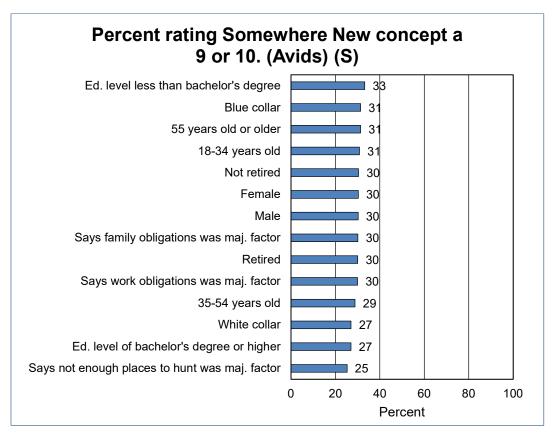
Demographic analyses were then run on those who gave high ratings to the R3 outreach materials. There were enough Avids and Churners in the data for this analysis to be run; the number of One-Timers in the data was too small for this analysis to be run. Among the findings for Avids (the graph below and the next three pages):

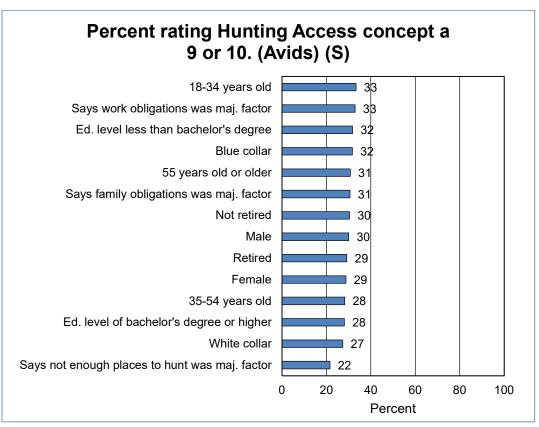
- Female Avid hunters react well to New Species, Meat, and Prepare for Harvest.
- Avid hunters 18 to 34 years old react well to Meat and Hunting Access.
- Avid hunters 55 years old and older react well to Someone New.

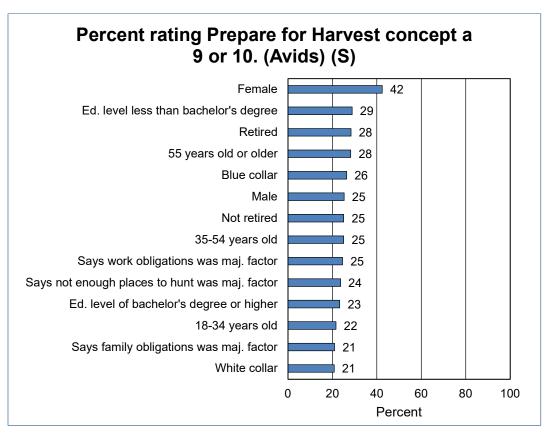


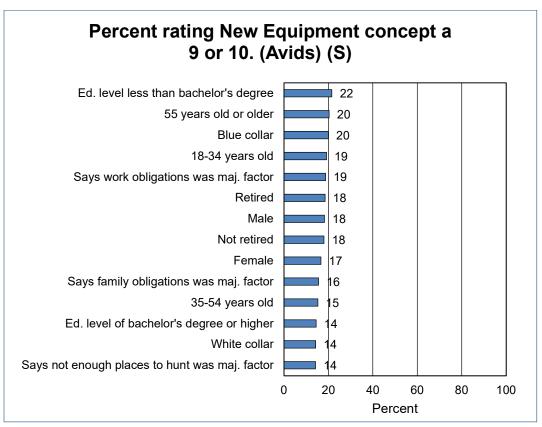






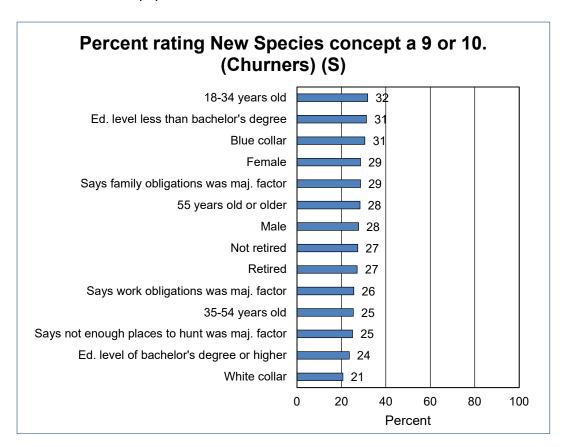


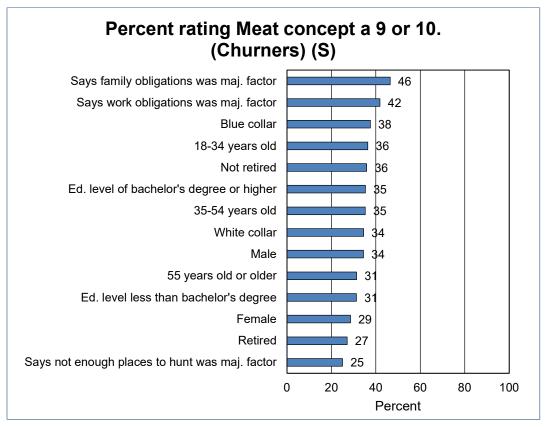


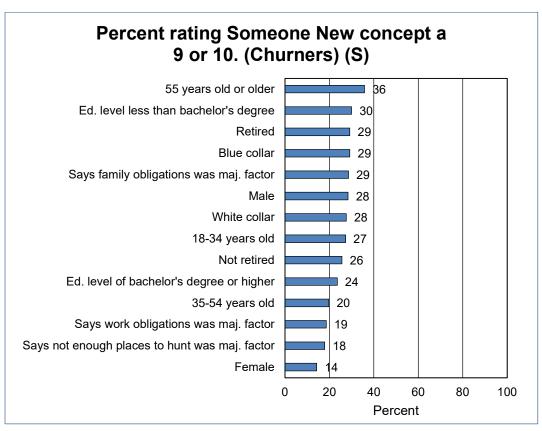


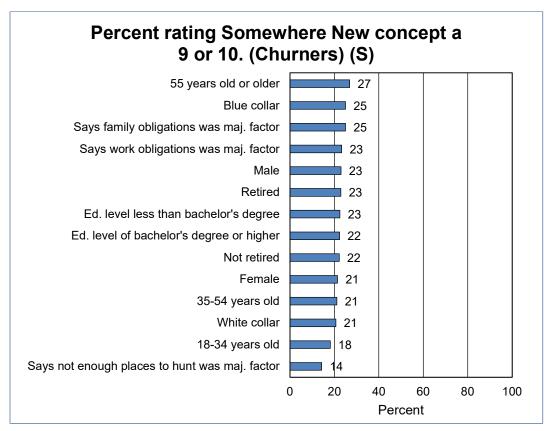
Among the findings for Churners (the graph below and the next three pages):

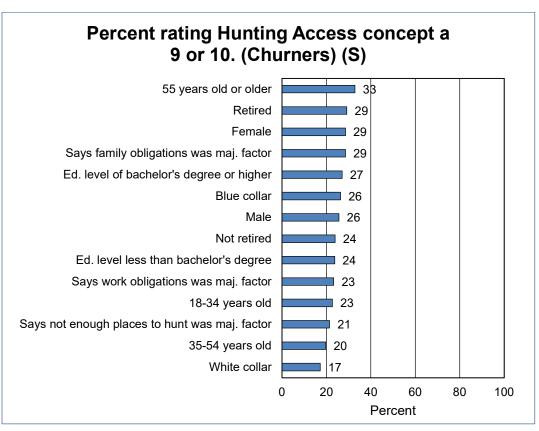
- Churning hunters with a high level of family and work obligations react well to the Meat and Prepare for Harvest.
- Churners who are 55 years old or older react well to Someone New and Hunting Access and New Equipment.

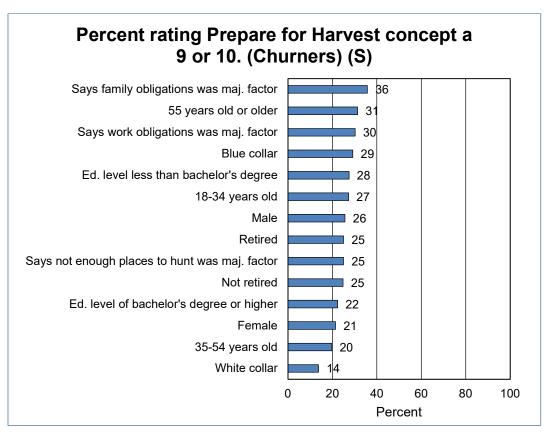


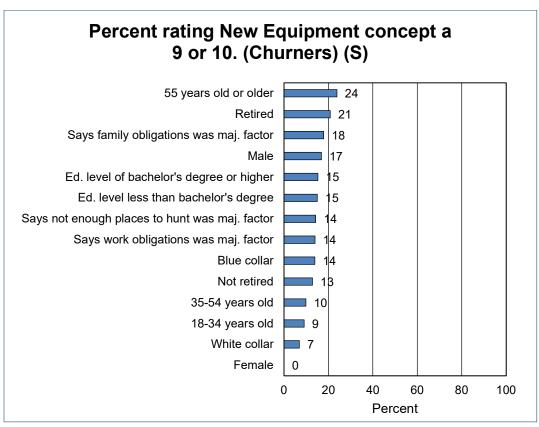








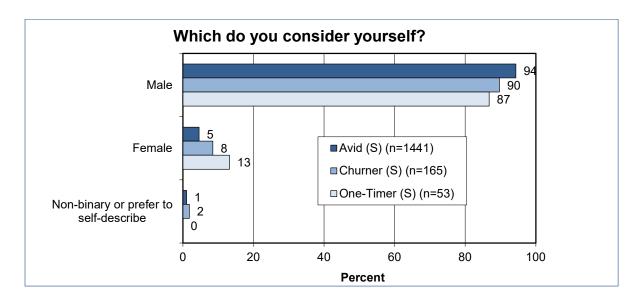


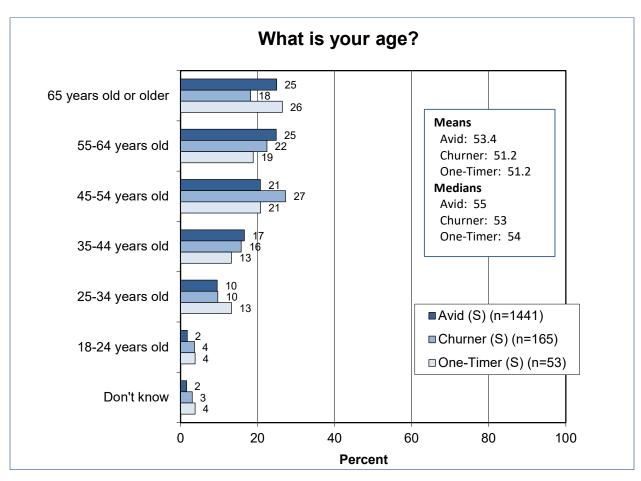


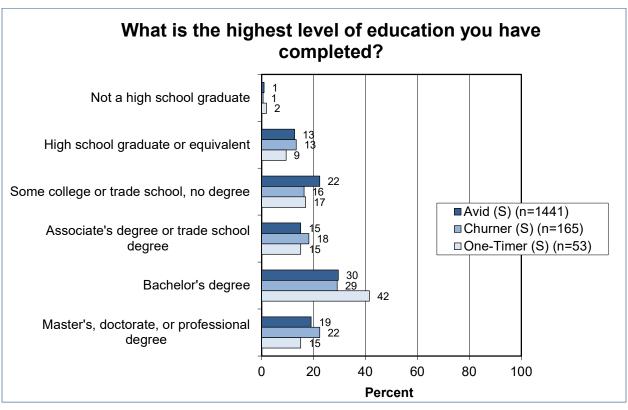
## 6.4. CHARACTERISTICS OF HUNTER AVIDITY GROUPS

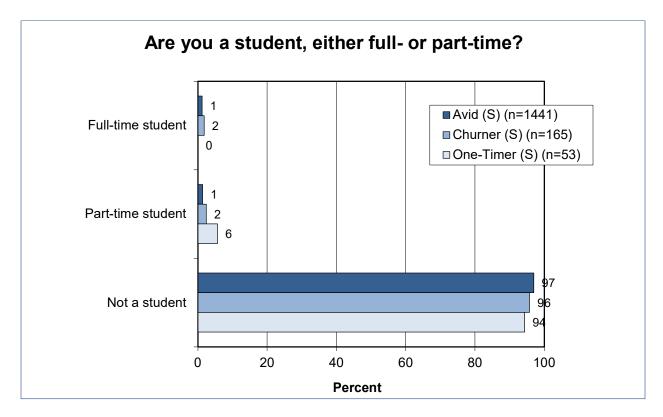
The survey gathered information on gender, age, education, and employment. (It also asked about the residential area in which hunters live and grew up, which were previously shown.) From the demographic information, the following finds emerge:

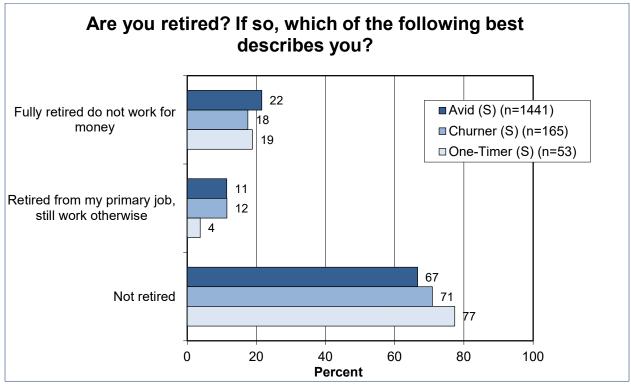
- Avids are more likely to be male compared to the other groups, and the differences are linear, with One-Timers most likely to be female. (Although, all three groups are overwhelmingly male.)
- The mean and median ages of the three groups are quite similar. However, the percentages in the various age ranges show some differences in the groups:
  - Avids and One-Timers are quite similar in that both have 47% in the 25 to 54 age range (the most common range for having a family with children at home); however, 53% of Churners are in that age range. In simple terms, Churners are more often in that family range. This suggests a scenario where they might be more avid in their hunting but have obligations.
  - Avids have the largest percentage in the 55 and over age range. Next are the One-Timers. This shows two factors at play: the generational ages of Boomers and older are associated with hunting; and age and physical shape associated with aging causes people to drop out of hunting—manifested by the One-Timers having a relatively high percentage in the 55 and older age range.
- Avids are the most likely of the groups to not have a college degree (36% of them, compared to 30% of Churners and 28% of One-Timers). One-Timers are the most likely to have a bachelor's or higher degree (57% of One-Timers, compared to 52% of Churners and 49% of Avids). This may be a manifestation of the hunting culture being more prominent in rural areas, while rural areas have lower rates of residents who graduate with a bachelor's degree (see the Brookings Institution's Brown Center Chalkboard, "What Is the Status of Educational Opportunity in Rural America," by Jessica Drescher and Gabrielle Torrance, published July 20, 2022).
- Avids are the most likely to be retired; One-Timers are the least likely.
- One-Timers are the most likely to be in one of the white collar occupations.

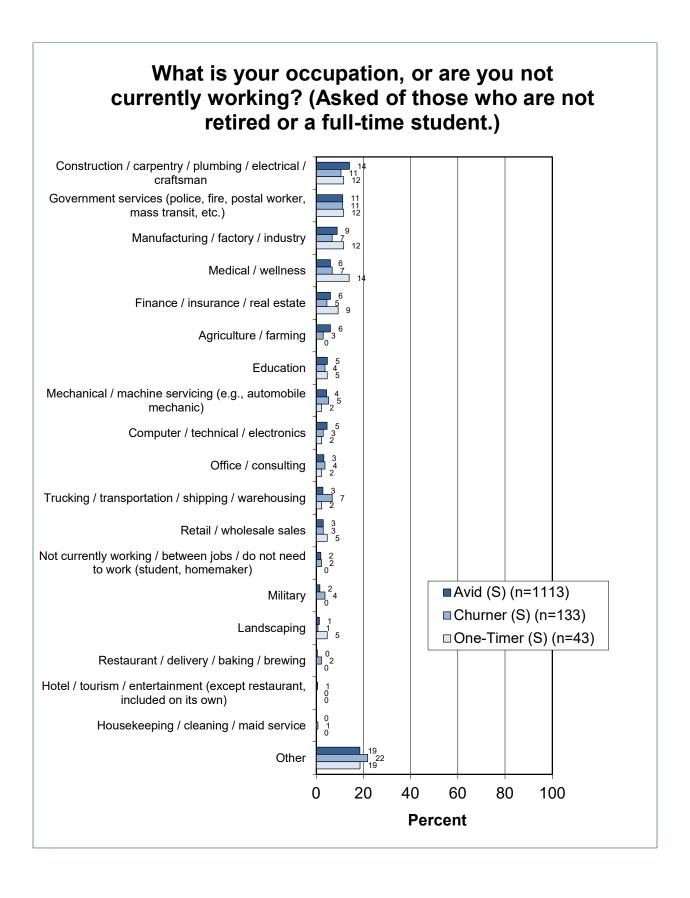












The occupations were categorized into blue collar and white collar for analyses that were run, as shown in the table below. This categorization is imperfect, but it is nonetheless useful for analyses.

Blue Collar	White Collar
Construction / carpentry / plumbing / electrical /	Medical / wellness
craftsman	Medical / Welliness
Government services (police, fire, postal worker, mass	Finance / insurance / real estate
transit, etc.)	Tillance / ilisurance / real estate
Manufacturing / factory / industry	Education
Agriculture / farming	Computer / technical / electronics
Mechanical / machine servicing (e.g., automobile	Office / consulting
mechanic)	Office / consulting
Trucking / transportation / shipping / warehousing	
Retail / wholesale sales	
Military	
Landscaping	
Restaurant / delivery / baking / brewing	
Hotel / tourism / entertainment (except restaurant,	
included on its own)	
Housekeeping / cleaning / maid service	

As mentioned, the breakdown is imperfect. For instance, a person can be employed in medical/wellness as a hospital cafeteria worker or an orderly, which are not white collar occupations, but they are put into the white collar category in this breakdown. Likewise, a person can work in agriculture as a plant researcher, which would be a white collar occupation yet be classified as a blue collar occupation in the analysis. Even with these potential imperfections of the blue collar-white collar breakdown, it was felt that the analysis might still prove useful.

The table below shows the percentage of each avidity group in white collar and blue collar occupations. The percentages for each group do not sum to 100% because of retired people and students.

Avidity Group	Percentage in White Collar Occupations	Percentage in Blue Collar Occupations
Avids (S)	19	42
Churners (S)	18	44
One-Timers (S)	26	40

### 6.5. APPLYING THE MODEL TO STATE DATABASES

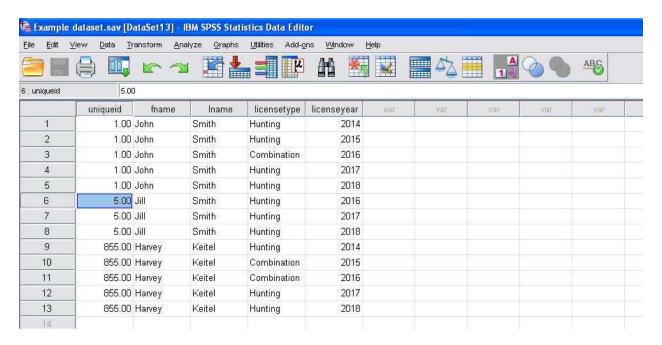
In addition to determining important differences in avidity groups through the survey of hunters, the project may help agencies apply the findings by defining avidity groups within their databases of licensed hunters. While the measures of avidity showed marked differences when self-identified avidity was compared to license database avidity (further explained below), the state agencies only have license database avidity to work with. Furthermore, as license databases become more accurate, the self-identified avidity and license database avidity will merge. (Self-identified avidity refers to determining avidity based on survey responses regarding the number of years within the past 5 that hunters had hunted. License database avidity refers to determining avidity based on the number of years of license purchases made by the individual hunter. A problem with the former is memory issues of the respondents; a problem with the latter is that databases are not always accurate. For instance, the same person could be in the license database with slightly different names, such as John Doe one year and John Q. Doe another year. Databases are becoming more accurate by using identification numbers that stay with the hunter each time a license purchase is made, eliminating the possibility that a person ends up in the database as two different people.)

The following guide is based on the procedures the researchers used in categorizing hunters in the databases. These steps can be followed by agencies to define avidity. Note that Responsive Management used these license databases for this study and afterwards deleted them from their database management system. Responsive Management does not maintain license hunter lists. All data retained at the conclusion of the project does not include any information that could identify individual hunters in the survey.

This guide is for databases in which there is a unique ID number available for each customer and that all license records are already in one database and resident only. If there is a database for each license year, it is necessary to merge them into one file before starting. For this guide, the researchers are using SPSS, but there are analogous processes in other commonly used database management programs such as SQL and R. The guide starts on the next page.

Any code in this guide will be highlighted in blue to set it apart. The dummy dataset below is used for illustrative purposes. For each of the 3 individual people in this dataset, there are 5 records: one for each year in which they purchased a license. Note that an actual hunting database will have more columns than this example, but the principles are the same no matter how many columns.

1) The first step is to move all the data for each person onto a single line.



To move the data onto a single line per person, it is necessary to run a "cases to vars" transformation. The researchers will be using some simple syntax to manipulate the data. First, for this transformation to work, the data need to be sorted in ascending order on the variable used as the key. For this particular dataset, the key is the first column, "uniqueid." Make sure to sort by that column (or whatever the unique id variable is) *before* running the transformation.

In SPSS the syntax is very simple. Once the data have been sorted by the unique ID, simply run the following two lines of syntax:

# casestovars /id=uniqueid.

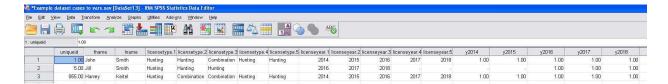
After running this syntax, the following dataset is produced. (Save the result as a separate dataset.) What is noticeable is that some variables remain the same (the ID and names). The variables that change are the "licensetype" and "licenseyear" variables, which SPSS splits into 5 variables each because the maximum rows any one person had in the database was 5 rows.



2) Next, for this dataset, the researchers use the following syntax to add a year variable with a license purchase count by year. Note that numbers in the top two lines in the syntax need to reflect the number of variables created by the cases to vars transformation.

```
vector years = licenseyear.1 to licenseyear.5. loop #a = 1 to 5. if years(#a) = 2014 y2014 = 1. if years(#a) = 2015 y2015 = 1. if years(#a) = 2016 y2016 = 1. if years(#a) = 2017 y2017 = 1. if years(#a) = 2018 y2018 = 1. end loop. exe.
```

Running this syntax yields the following. Note that there are now five additional variables for the license type and five additional variables for the license year, created by the vector. The number of additional variables will always be the maximum number of rows for any one individual (in the example, 5 rows).



3) Next, the researchers needed to calculate the number of years each person had a license. (In this particular dataset everyone bought a license each year.) The newly created year variables need to be summed. This can be done with a single line of syntax.

compute totalyears = SUM(y2014,y2015,y2016,y2017,y2018). Exe.

Note that there is now a variable called "totalyears" that contains the sum of the years. The last step is to categorize this variable into avidity levels. For this study, those who purchased 4 or 5 years are "Avid," those who purchased 2 or 3 years are "Churners," and those who purchased only 1 year are "One-timers."

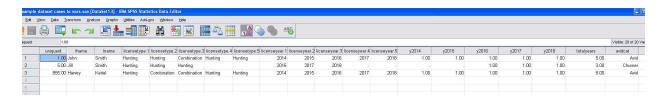
4) The final syntax categorizes each individual into a hunter avidity level (variable name: avidcat):

recode totalyears (1=3) (2 thru 3=2) (4 thru 5=1) into avidcat. Exe.

Value labels avidcat

- 1 "Avid"
- 2 "Churner"
- 3 "One-timer".

This produces the following, in which all individuals are categorized by avidity under the variable "avidcat" (in this case, two individuals in the database are Avids because they bought a license every year, while one individual is a Churner).



Following these steps successfully categorizes hunters in databases into avidity levels.

# 7. DETAILED METHODOLOGY

This section discusses the following methodology for the research presented in this report:

- The research presented in Chapters 2 and 3 that was originally conducted as part of the precursor study on which the current project is based.
- The survey of state agencies presented in Chapter 4.
- The focus groups with agency professionals presented in Chapter 5.
- The survey of hunters presented in Chapter 6.

### 7.1. PRECURSOR STUDY

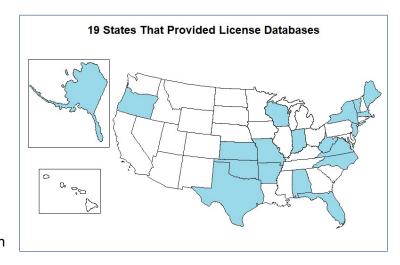
The precursor study had four components:

- The acquisition of databases.
- The initial analyses of those databases.
- The acquisition of new data: survey of hunters.
- The final analyses of data and development of the Hunter Avidity Model.

#### **OBTAINING DATABASES FOR ANALYSES AND SURVEY SAMPLING**

The initial component of the precursor study was the acquisition of state license databases, used in the analyses that identified potential variables to use in the creation of the Hunter Avidity Model and used in the survey research. Note that the databases were used only for research and were deleted from Responsive Management's database system upon the completion of research; Responsive Management does not maintain samples of licensed hunters.

Responsive Management contacted every state fish and wildlife agency to try to obtain a licensed hunter sample. In the end, 19 states were willing to participate, and confidentiality agreements were made between Responsive Management and each participating state that required one. The participating states' fish and wildlife agencies then provided samples of licensed hunters for use in this project. These 19 states are shown in the accompanying map.



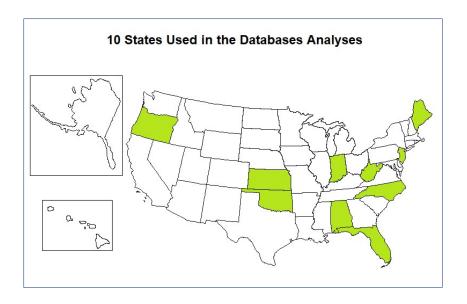
Each database was examined to determine which ones could be used in the analyses and subsequent surveying. The most important criterion was that there be 5 years of license records because a measure of avidity that was envisioned was the number of years out of 5 that the hunter had bought a license. Also essential was an identifier attached to the license holder (not attached to the particular license or the single license buying transaction but to the

license holder across all license purchases) so that multiple licenses bought by a single person all have the same identifier attached; otherwise, the years of license records could not be used.

The multi-modal survey had to be conducted in the same states as these analyses of the databases. Therefore, another essential criterion was the inclusion of contact information. Specifically, the database needed to have at least some records with email addresses and/or telephone numbers. Additionally, the databases were examined to inventory other variables that might be useful in analyses: address (i.e., location of residence), gender, and age.

Of the 19 states that provided databases, 10 included the necessary information to be used in this project. The following table shows the information available in those 10 states that provided license databases.

Variables A	vailable in th	e State Datal	oases					
State	Years of Records (need 5 years)	Customer ID	Tracks All Licenses Bought	Email Address (for use in the survey)	Phone Number (for use in the survey)	Address	Gender	Age
AL	5	Yes	Yes	Yes	Yes	Yes	No	Yes
FL	5	Yes	Yes	No	Yes	Yes	No	Yes
IN	5	Yes	Yes	Yes	Yes	Yes	Yes	Yes
KS	5	Yes	Yes	Yes	No	Yes	Yes	Yes
ME	5	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NC	5	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NJ	5	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ОК	5	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OR	5	Yes	Yes	No	Yes	Yes	Yes	Yes
WV	5	Yes	Yes	Yes	Yes	Yes	Yes	Yes



#### INITIAL ANALYSES OF DATABASES

The initial analyses of the databases looked at the variables available. Statistical analyses were then performed on those variables.

#### **Identification of Variables Available in the Databases**

Several variables were available in the databases: avidity level, location, age, gender, and license type.

#### **Avidity**

Having 5 years of records available allowed the determination of the number of the years in the database that the license holder had purchased a license, with the maximum being all 5 years. Because lifetime license purchases typically do not entail any further license purchases, lifetime license holders were considered in a different way in the definitions, as explained below.

The levels of avidity based on this measure were labeled and defined as follows:

- Avid: Purchased at least 4 of the past 5 years or purchased a lifetime license in the 5-year time period.
- Churner: Purchased a license in 2 or 3 of the 5 years (and none of the licenses were a lifetime license).
- One-Timer: Purchased a license in only 1 of the 5 years (and the license was not a lifetime license).

The analyses explored how this avidity variable was affected by other variables: location, generation, gender, and license type(s). These are explained below.

#### Location

Having zip codes available allowed for a categorization of the hunters in the database on a rural-urban continuum with out-of-state residency added in as a locationally defined group. Rural and urban designations of in-state hunters were based on the Economic Research Service Rural-Urban Continuum Codes, a classification scheme that distinguishes metropolitan counties by the population size of their metro area and nonmetropolitan counties by degree of urbanization and adjacency to a metro area. These codes are available by zip code, which allowed for integration into the databases. In addition, any zip codes out of the state of the licensing state or any nonresident licenses triggered the categorization as an out-of-state hunter.

Based on the information above, a location variable was created that reflected three different groups:

- Rural residents.
- Urban residents.
- Out-of-state residents.

### Generational Age

Included with the databases was an indication of age, either the age itself or the birthdate of the license holder. For the age variable, the generations were defined as being born in the years indicated:

Post War: 1928-1945
Boomer I: 1946-1954
Boomer II: 1955-1964
Gen X: 1965-1980
Millennials: 1981-1996
Gen Z: 1997 or later

There is a generation before "Post War" called "WWII," which refers to those who would have been old enough to legally enlist in the military during World War II; there were not enough respondents in that category to be included in the analyses. The Post War label refers to the fact that people born in that time were not legally able to enlist in the military during that war (even though some did so), making them "Post War."

#### Gender

This variable was included in most of the databases, as recorded by the state fish and wildlife agencies. In Alabama and Florida, the gender variable was not available in the databases. For those states, a software package maintained by the R Foundation as part of the Comprehensive R Archive Network (CRAN) called "Predict Gender from Names Using Historical Data" was used to impute gender name. This package considers the name and spelling as well as historical data on male/female ratios in the state on people who had that name at the time of the person's birth (i.e., also considering the time period that the name was given). More information can be found at the website, "The R Project for Statistical Computing" (r-project.org).

#### License Type

Each states has its own suite of license types. For the analyses, each state's licenses were categorized into logical groupings. This categorization was not exactly the same in each state simply because license types varied in each state.

### Analyses of Variables' Effects on Avidity

For each state included in the analyses, license holders were first categorized into groups based on the avidity variable. Subsequently, the other variables were tested to see how they affected the avidity variable.

#### SURVEY OF HUNTERS IN THE PRECURSOR STUDY

This section explains the sampling, questionnaire design, and survey administration.

## **Sampling for the Precursor Survey of Hunters**

Responsive Management developed the samples of hunters who were surveyed from the license databases provided by the states.

## **Questionnaire Design for the Precursor Survey of Hunters**

The survey instrument was developed by Responsive Management with input from reviewers from hunting- and shooting-related organizations. The development of the instrument was also based on the initial analyses of the databases and identification of possible variables that might correlate to avidity. The questionnaire was computer coded for both telephone surveying and online surveying. The telephone questionnaire was coded using Responsive Management's computer-assisted telephone interviewing (CATI) system. An important aspect of this CATI system is that the computer controls which questions are asked, but each telephone survey is administered by a live interviewer.

The online questionnaire was coded in an online survey platform. Note that the online survey was closed, meaning that it was available only to hunters who were specifically selected for the survey and who were sent a survey link. Hunters could complete the survey only once. The survey could not be accessed through a general internet search.

For both the online and telephone versions of the questionnaire, the survey was programmed to automatically skip questions that did not apply and to substitute phrases in the questionnaire based on previous responses, as necessary, for logic and flow. There were slight differences between the telephone and online versions of the questionnaire to accommodate each survey mode, but otherwise the telephone and online versions were identical. Responsive Management conducted pretests of the survey questionnaire in both modes to ensure proper wording, flow, and logic. Both the online and telephone versions produced data that could be exported directly into Responsive Management's data analyses programs.

The survey questionnaire included several types of questions:

- Closed-ended questions have an answer set from which to choose.
- Single response questions: Some questions allow only a single response.
- Multiple response questions: Other questions allow respondents to give more than one response or choose all that apply. Those that allow more than a single response are indicated on the graphs with the label, "Multiple Responses Allowed."
- Scaled questions: Many closed-ended questions (but not all) are in a scale, such as one that ranges from 0 to 10.
- Series questions: Many questions are part of a series, and the results are primarily
  intended to be examined relative to the other questions in that series (although results
  of the questions individually can also be valuable). Typically, results of all questions in a
  series are shown together.

## Multi-Modal Survey Administration for the Precursor Survey of Hunters

Once the samples were pulled, the contact method was determined. For hunters selected for the survey, those with an email address were contacted using that mode, and the remaining hunters were contacted by telephone (both landlines and cell phones were called). The emails were sent on behalf of the Sportsmen's Alliance and the U.S. Fish and Wildlife Service, assuring potential respondents of the legitimacy of the survey. Those contact attempts with email addresses that were determined to be to invalid were put back into the telephone sample so that attempts could be made to reach them by telephone.

Regarding the email contact, the first invitations to participate in the survey were sent to hunters in June 2022, with reminder email messages sent 4 days after the initial email (for those who had not responded to the initial email). A copy of the initial email is shown on the following page. The initial and reminder emails included a link to the survey for each respondent, as well as a contact at Responsive Management for technical concerns about taking the survey.



Hello [contact("first name")] [contact("last name")] [contact("role")],

As a valued member of the hunting community, we would like to invite you to participate in a study on hunting participation. This study is being conducted under a grant from the U.S. Fish and Wildlife Service (FWS) and the Association of Fish and Wildlife Agencies (AFWA), in partnership with a group of state fish and wildlife agencies, including the [invite("custom 3")]. As a licensed hunter, your feedback is very important to this study and to future management decisions.

### **Click Here to Start the Survey**

Please consider responding to this survey by July 16.

This study is being conducted to assess licensed hunters' participation, preferences, and experiences regarding hunting across the U.S., including hunting both in and outside your current state of residence. Our records for this study show that you have purchased a [contact("region")] hunting license (this includes both resident and nonresident licensed hunters of the state) in the past 5 years.

Responsive Management, an independent research firm that specializes in natural resource and fish and wildlife issues, has partnered with the [invite("custom 3")] and other state fish and wildlife agencies to conduct this study. If you need technical assistance with the survey, please contact Responsive Management via email at <a href="mailto:research@responsivemanagement.com">research@responsivemanagement.com</a>.

You are one of only a small number of licensed hunters in your state randomly chosen to participate in this study. To ensure that results truly represent hunters, it is important that we hear from you. Your answers will be kept completely confidential and will not be associated with your name in any way.

Thank you for your time and willingness to participate and share your opinions: [invite(survey\_link)]

Sincerely, Mark Damian Duda Executive Director Responsive Management For the telephone phase of the survey, telephone interviews were conducted Monday through Friday from noon to 9:00 p.m. and Saturday from noon to 7:00 p.m., local time, using interviewers with experience conducting computer-assisted surveys about hunting and natural resources. A five-callback design was used to maintain the representativeness of the telephone sample, to avoid bias toward people easy to reach by telephone, and to provide an equal opportunity for all to participate. When an hunter could not be reached on the first call, subsequent calls were placed on different days of the week and at different times of the day.

For quality control, the Survey Center Managers monitored the telephone interviews in real time and provided feedback to the interviewers. To ensure the integrity of the telephone survey data, Responsive Management has interviewers who have been trained according to the highest industry standards originally established by the Council of American Survey Research Organizations (the survey industry trade association that has since merged with Marketing Research Association to form The Insights Association). Methods of instruction included lecture and role-playing.

The Survey Center Managers and other professional staff conducted briefings with the interviewers prior to the administration of the survey. Interviewers were instructed on type of study, study goals and objectives, handling of survey questions, interview length, termination points and qualifiers for participation, interviewer instructions within the survey questionnaires, reading of the survey questions, skip patterns, and probing and clarifying techniques necessary for specific questions in the survey questionnaire.

After obtaining the completed questionnaires (both the telephone and online versions), the Survey Center Managers and/or statisticians checked each completed survey to ensure clarity and completeness. In addition, the survey included proprietary quality control code to further ensure the quality of the data.

Responsive Management obtained 3,960 completed surveys from the ten states included in the precursor study, as shown in the table that follows. The project goals included full regional representation, so there were both statewide goals and regional goals that were met.

Region State	oal	Complete	d Surveys		
kegion	Maine         250           New Jersey         250           Alabama         200           Florida         200           North Carolina         200           West Virginia         200           Indiana         250           Kansas         250           Oklahoma         200           est         Oregon         500	by Region	by State	by Region	
Ni a utila a a a t	Maine	250	F00	482	000
Northeast	New Jersey	250	500	487	969
	Alabama	200		405	
Cauthaast	Florida	200	900	248	1 267
Southeast	North Carolina	200	800	335	1,367
	West Virginia	200		379	
	Indiana	250		275	
Midwest	Kansas	250	700	597	1,124
	Oklahoma	200		252	
West	Oregon	500	500	500	500
Total		2,	500	3,9	060

## **Analyses of Data From the Precursor Survey of Hunters**

The databases and survey data were analyzed using IBM SPSS Statistics as well as proprietary software developed by Responsive Management. The final part of the research project entailed the development of the Hunter Avidity Model for use in R3 outreach. Tasks within this part of the overall effort included the analysis of survey data and the consideration of those survey data with the previous analyses of the databases. Both of these analyses efforts were used to develop the Hunter Avidity Model.

## 7.2. SURVEY OF AGENCY R3 PROFESSIONALS

The study included a survey of R3 professionals including marketing coordinators and database managers in the state fish and wildlife agencies. This survey was conducted to help determine the operational capacity of states to potentially apply the Hunter Avidity Model in R3 efforts and to locate participants for the focus groups that followed.

#### DEVELOPING SAMPLE DATABASE FOR THE SURVEY OF AGENCY R3 PROFESSIONALS

The first step in the process was developing a sample database with the appropriate agency staff members by researching agency websites and the R3 community website. Responsive Management compiled a list of state agency R3 coordinators, marketing managers, and database managers who would be able to provide valuable feedback on research results. This consisted of the agency staff members who would be most likely to be using research to drive R3 marketing decisions, familiar with prior R3 research, and/or experienced with R3 marketing campaign launches.

# QUESTIONNAIRE DESIGN FOR THE SURVEY OF AGENCY R3 PROFESSIONALS

Responsive Management staff developed the survey questionnaires, based on the results from the first grant, *Development of a Hunter Avidity Model to Assess and Improve R3 Participation*, and additional analysis completed to test and understand the hunter avidity model draft. The survey questionnaire was developed to accomplish three primary goals:

- To obtain information about the types of campaigns that states were doing.
- To identify challenges that states would have in using the Hunter Avidity Model.
- To locate participants for the next phase of the project, the focus groups with professionals.

The survey questionnaire was coded for online surveying and tested internally by Responsive Management prior to launch.

# CONTACT PROCEDURES AND SURVEY ADMINISTRATION FOR THE SURVEY OF AGENCY R3 PROFESSIONALS

The questionnaire was sent to the people within each agency that had been identified through the research of the agency websites. The survey recipients had the ability to forward the survey to others within their agency and/or to suggest additional survey recipients. The survey link was sent using Microsoft Outlook and was personalized to each survey recipient to increase the likelihood of email delivery and the avoidance of agency spam filter settings. Two reminder messages were sent to those who had not responded to the survey.

The survey asked recipients if they would be willing to participate in a discussion group about the research where they could learn more about the study results from the precursor study and to gather state input on how this research and the Hunter Avidity Model could be applied to their current or future R3 marketing efforts.

Each potential respondent was contacted up to three times by email with an invitation to the survey. The initial email message was tailored to the specific person and informed the potential respondent of the purpose of the project and the sponsoring organizations, provided a link to the survey for either completion or review, provided contact information for any questions about the project to a Responsive Management staff member, and provided contact information to Responsive Management staff for any questions or assistance.

The first contact was made through Responsive Management's Outlook email system to help the message get through to the potential respondents and avoid spam filters. The email provided links to the questionnaire and contacts for any questions or assistance. Only those who had not responded to previous emails received follow-up email invitations through the online surveying platform. Responsive Management obtained 42 completed questionnaires from agency personnel.

The surveys included a link that could be forwarded to a more appropriate person within the agency, if necessary, thus ensuring that the researchers heard from as many appropriate respondents as possible. Throughout survey administration, researchers sent survey links and follow-up communications to contacts who were in the initial sample database as well as those who had been referred by those initial contacts.

#### ANALYSIS OF DATA FROM THE SURVEY OF AGENCY R3 PROFESSIONALS

The overall analysis included both quantitative and qualitative methods. Some of the data collected were analyzed quantitatively using IBM SPSS. Other data—the extensive responses to open-ended questions (those questions that did not have an answer set but allowed respondents to say whatever came to mind)—were analyzed qualitatively. For these questions, Responsive Management's research associates reviewed the completed responses and made general notes and observations based on them, known as qualitative research.

### 7.3. FOCUS GROUPS WITH AGENCY R3 PROFESSIONALS

Responsive Management scheduled three virtual focus groups with survey respondents who had indicated in the agency survey that they would be willing to participate in a 1-hour discussion to hear a presentation about the first avidity study and give input concerning their hunting R3 marketing campaigns. Mark Damian Duda, Executive Director of Responsive Management, conducted these discussions on the following dates:

- Thursday, November 11, 2022
- Friday, November 12, 2022
- Monday, November 14, 2022

Representatives from all four AFWA regions attended the discussions.

The presentation at the start of the focus groups reviewed the research findings from the precursor study and presented the Hunter Avidity Model, which was overlayed with the ORAM. Some of the key findings from the research were presented and discussed, and then the focus group was opened for questions and discussion. Specific discussion questions were asked about hunter churn, applying research to hunter outreach campaigns, and current agency campaigns geared towards increasing hunting license sales or reducing hunter churn. Some participants also gave general feedback on the overall research results or reacted to the research findings.

A follow-up email was sent to focus group participants thanking them for their participation in the discussion and asking for any additional comments or questions related to the research. A link to the PowerPoint presentation was provided to participants. A copy of the email is shown below.

Dear [Focus Group Participant First Name],

Thank you for attending our meeting and listening to our presentation on our Multistate Conservation Grant study, **Development of a Hunter Avidity Model to Assess and Improve R3.** The input we are receiving from states attending these meetings has been extremely valuable in helping to guide our team to further analyze and refine the research findings from the first phase of this study.

Your input is also helping to guide how we will test the research findings in the second stage of this study. Here is a link to the presentation Mark Duda gave if you would like to review it again or share it with anyone in your agency: Click here for a PowerPoint PDF file.

We welcome any further input or questions you may have about the research, and all thoughts, suggestions, observations, and questions are welcome via email to either Mark Duda at mark@responsivemanagement.com or Alison Lanier at alison@responsivemanagement.com.

Additionally, if you have any examples of one or more hunting R3 campaigns, we would love to see what you are currently implementing. If you would like to be involved in helping us test this research in the coming months, please let us know and we will talk about that.

We greatly appreciate your time. Have a great week!

Sincerely,

Alison Lanier

# 7.4. SURVEY OF HUNTERS

The project entailed a quantitative online survey administered to licensed hunters ages 18 years old or older who had emails in the databases.

#### **SAMPLE OF HUNTERS**

Databases were obtained from eight states: Alabama, Indiana, Kansas, Maine, North Carolina, New Jersey, Oklahoma, and West Virginia. For each state, samples were pulled for three strata: Avids, Churners, and One-Timers (defined previously). Within each strata, the sampling was probability-based, pulling 1,000 hunters with emails in each strata in each state. The sample included any hunter who had a valid license or permit at any time from 2015 to 2020. The sample included some of those who had been randomly pulled in the precursor survey.

#### **QUESTIONNAIRE DESIGN**

The survey questionnaire was developed by Responsive Management and coded for online surveying. Responsive Management conducted pretests of the survey questionnaire to ensure proper wording, flow, and logic and to test survey functionality on desktop and mobile devices. The questionnaire included internal quality control checks to help ensure that the data obtained were of high quality.

The questionnaire included sample R3 outreach materials to gauge hunters' reactions to various themes, taglines, and images. Seven sample R3 outreach pieces were created based on seven variables from the Hunter Avidity Model that were shown to be positively associated with hunting avidity. These seven concepts tested in the survey were as follows:

- Hunting for a new species.
- Hunting for the meat.
- Hunting with someone new.
- Hunting somewhere new.
- Hunting where there is plentiful access.
- Hunting with new equipment.
- Hunting for the harvest.

Hunters were asked to rate the sample R3 outreach materials by their overall tagline and message, a collage of images, and the overall outreach concept. The survey also included questions about hunting constraints and demographic characteristics.

The types of questions contained in the survey were previously described in the section, "Questionnaire Design for the Precursor Survey of Hunters."

#### **ONLINE SURVEY ADMINISTRATION**

The survey was administered online, but the online survey was closed, meaning that it was available only to hunters who were specifically selected for the survey and who were sent a survey link. Hunters could complete the survey only once. The survey could not be accessed through a general internet search.

All selected respondents were contacted via email up to three times. An example of this initial email invitation used for licensed hunters follows. A reminder email was sent to nonrespondents approximately 4 days after the first invitation.

### Dear Hunter,

We are interested in your feedback as part of a study on hunting participation being conducted under a grant from the U.S. Fish and Wildlife Service and the Association of Fish and Wildlife Agencies, in partnership with your state's fish and wildlife agency. The study will assess licensed hunters' experiences hunting both in and outside of their current state of residence. Your feedback is very important to this study and to future management decisions, and if you choose to participate *your answers will be kept completely confidential and will not be associated with your name, license, or contact information in any way.* Click Here to Start the Survey.

Please note that you may have received an invitation to participate in a similar survey last year, which was administered as part of the first phase of the project. This follow-up survey is a different questionnaire; even if you completed the survey last year, we would still greatly appreciate your participation in this follow-up survey.

Than you for your time and willingness to participate.

Responsive Management, an independent research firm that specializes in natural resource and fish and wildlife issues, has partnered with state fish and wildlife agencies to conduct this study. If you need technical assistance with the survey, please contact Responsive Management via email at <a href="mailto:research@responsivemanagement.com">research@responsivemanagement.com</a>.

Click Here to Start the Survey.

Sincerely,

Alison Lanier, Senior Research Associate

After the online surveys were obtained, the Survey Center Managers and statisticians checked each survey to ensure clarity and completeness. Responsive Management obtained 1,659 completed interviews.

### **ANALYSIS OF DATA**

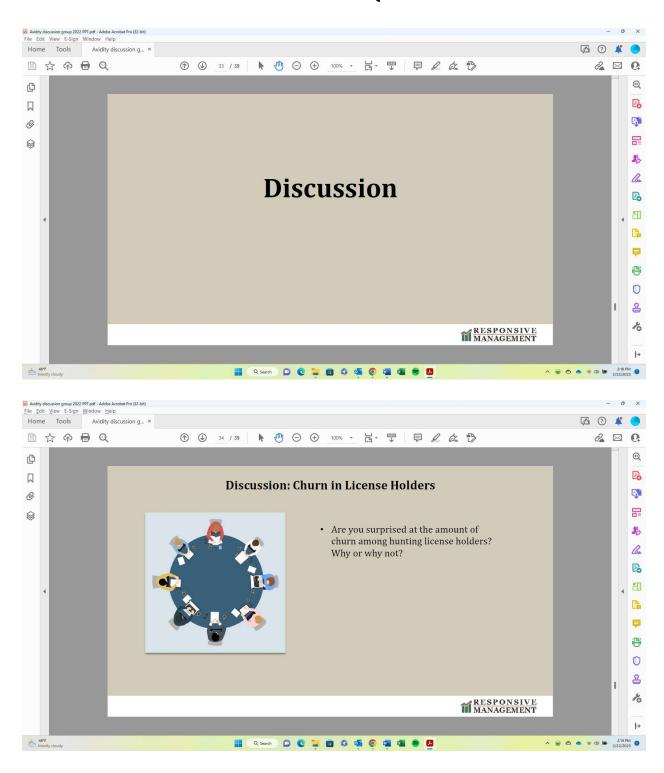
The analysis of data was performed using IBM SPSS Statistics as well as proprietary software developed by Responsive Management.

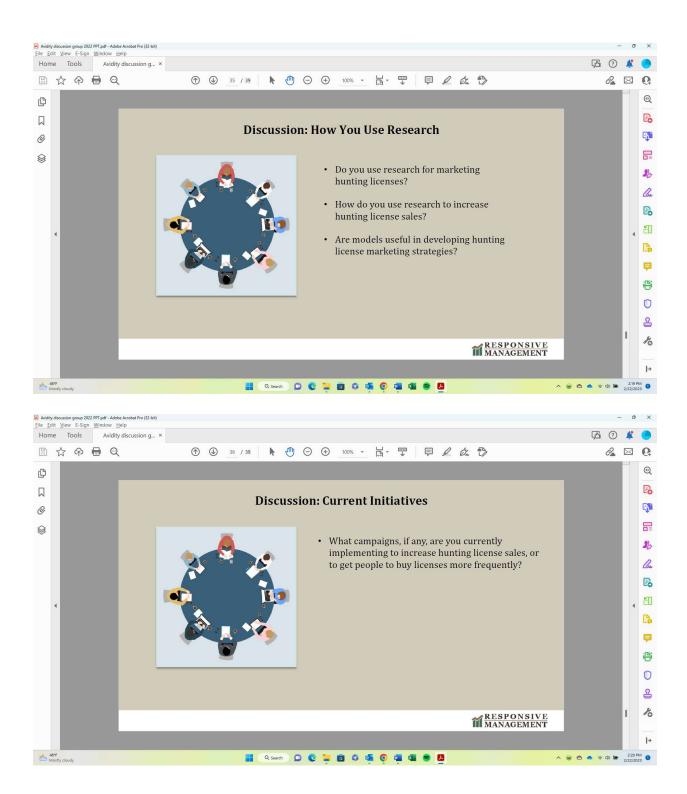
# **APPENDICES**

The following appendices are included in this section:

- Appendix A: Focus Group Discussion Questions
- Appendix B: Hunter Survey With Image Collages

# **APPENDIX A: FOCUS GROUP DISCUSSION QUESTIONS**





## APPENDIX B: HUNTER SURVEY WITH IMAGE COLLAGES



# A Study on Hunting Participation in the U.S.



# **Hunter Survey Grant Study**

This study on hunting participation is being conducted under a grant from the U.S. Fish and Wildlife Service and the Association of Fish and Wildlife Agencies, in partnership with your state's fish and wildlife agency, to assess licensed hunters' experiences. Your feedback is very important to this study and to future management decisions, and if you choose to participate your answers will be kept completely confidential and will not be associated with your name, license, or contact information in any way.

Please note that you may have received an invitation to participate in a similar survey last year, which was administered as part of the first phase of the project. This follow-up survey is a different questionnaire; even if you completed the survey last year, we would still greatly appreciate your participation in this follow-up survey.

Thank you for your time and willingness to participate.

Please click "Next" below to begin the survey.

If you are on a mobile device and do not see a "Next" button, please click the small forward arrow at the bottom right of your screen to continue and to move forward throughout the survey. It may look similar to this:



(If you do not see a "Next" button or a small arrow at the bottom right, please consider accessing the survey on a different device, preferably a desktop or laptop computer, as both privacy and display settings specific to some devices may prevent the survey from displaying fully or correctly.)

Responsive Management, an independent research firm that specializes in natural resource and fish and wildlife issues, has partnered with state fish and wildlife agencies to conduct this study. If you need technical assistance with the survey, please contact Responsive Management via email at research@responsivemanagement.com.

Screeners
Are you 18 years old or older?*
Did you have a hunting license in the past 5 years?*
Hunting Participation Confirmation
How many of the past 5 years did you hunt <u>IN your state of residence?</u>
(enter number) (If you are unsure, please give your best estimate. If you cannot estimate at a please enter 99 to indicate that you do not know.)*
How many of the past 5 years did you hunt <u>OUTSIDE your state of residence?</u>
(enter number) (If you are unsure, please give your best estimate. If you cannot estimate at a please enter 99 to indicate that you do not know.)*
License Purchases and Hunting Participation
Did you have a hunting license for the 2021-2022 season?*
() Yes
( ) No
( ) Do not know
Did you hunt during any of the 2021-2022 seasons? (Hunted anywhere, in any state or outside of the U.S.)*
() Yes
() No
( ) Do not know
Do you have a hunting license for the 2022-2023 seasons?*
() Yes
( ) No
( ) Do not know

Have you hunted during any of the 2022-2023 s	seasons? (Hunted anywhere, in any state o
outside of the U.S.)*	

- () Yes
- () No
- () Do not know

Logic: Hidden unless: "Do you have a hunting license for the 2022-2023 seasons?" is one of the following answers ("No", "Do not know")

How likely are you to get a hunting license for the 2022-2023 seasons?\*

- () Extremely likely
- () Very likely
- () Somewhat likely
- () Not at all likely
- () Do not know

### **Instructional Text**

Fish and wildlife agencies often send out messages that are designed to encourage people to buy a license and go hunting. We would like your opinion on some examples of these types of messages. Please note that the examples are for research purposes only—instructions in the example messages to "click <u>here</u> to purchase a hunting license" and "click <u>here</u> to learn more about hunting in your state" do not include actual working links.

# **Hunting Access**



Photo credit from left to right/top to bottom (Northeast Association of Fish and Wildlife Agencies Southeast Deer Partnership, Pheasants Forever, Inc., Pheasants Forever, Inc.)

	0	1	2	3	4	5	6	7	8	9	10	DK
How aboutthe message or tagline?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe images?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe general concept or idea of the message?	()	()	()	()	()	()	()	()	()	()	()	()

# **Someone New**











Click <u>here</u> to purchase a hunting license.

Click here to learn more about hunting in your state.

Photo credit from left to right/top to bottom (Northeast Association of Fish and Wildlife Agencies, Jenny Risher, Matt Harlow, Jenny Risher)

	0	1	2	3	4	5	6	7	8	9	10	DK
How aboutthe message or tagline?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe images?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe general concept or idea of the message?	()	()	()	()	()	()	()	()	()	()	()	()

# **New Species**



Photo credit from left to right/top to bottom (iStock, Michigan Wildlife Council, Istock, Istock)

	0	1	2	3	4	5	6	7	8	9	10	DK
How aboutthe message or tagline?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe images?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe general concept or idea of the message?	()	()	()	()	()	()	()	()	()	()	()	()

# **New Equipment**



Photo credit from left to right/top to bottom (Northeast Association of Fish and Wildlife Agencies, Scott Einsmann, Jenny Risher, Pheasants Forever, Inc.)

	0	1	2	3	4	5	6	7	8	9	10	DK
How aboutthe message or tagline?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe images?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe general concept or idea of the message?	()	()	()	()	()	()	()	()	()	()	()	()

# **Somewhere New**











Click <u>here</u> to purchase a hunting license.

Click here to learn more about hunting in your state.

Photo credit from left to right/top to bottom (Pheasants Forever, Inc., Pheasants Forever, Inc., Northeast Association of Fish and Wildlife Agencies, Pheasants Forever, Inc.)

	0	1	2	3	4	5	6	7	8	9	10	DK
How aboutthe message or tagline?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe images?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe general concept or idea of the message?	()	()	()	()	()	()	()	()	()	()	()	()

# **Prepare for Harvest**





# This season, prepare for your harvest!





Click <u>here</u> to purchase a hunting license.

Click here to learn more about hunting in your state.

Photo credit from left to right/top to bottom (Istock, Jenny Risher, Pheasants Forever, Inc. Istock\_Mike Olson)

	0	1	2	3	4	5	6	7	8	9	10	DK
How aboutthe message or tagline?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe images?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe general concept or idea of the message?	()	()	()	()	()	()	()	()	()	()	()	()

# Meat



Photo credit from top left to bottom right (Istock, Christian Jung, Istock, Michigan Wildlife Council)

	0	1	2	3	4	5	6	7	8	9	10	DK
How aboutthe message or tagline?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe images?	()	()	()	()	()	()	()	()	()	()	()	()
How aboutthe general concept or idea of the message?	()	()	()	()	()	()	()	()	()	()	()	()

# **Potential Constraints to or Dissatisfactions with Hunting**

Following is a list of things that may have caused you to not hunt as much as you would have liked in the past few years.

Please indicate whether each was a major factor, a minor factor, or not a factor at all in causing you to not hunt as much as you would have liked in the past few years.

	Major factor	Minor factor	Not a factor	Do not know	
What about because you	()	()	()	()	
feel that you lack skills?	( )	( )	( )	( )	
What about personal health?	()	()	()	()	
What about not having anyone to go with?	()	()	()	()	
What about too many hunters in the field?	()	()	()	()	
What about the feeling that hunting endangers populations?	()	()	()	()	
What about pollution or litter?	()	()	()	()	
What about bag limits or season lengths?	()	()	()	()	
What about mandatory hunter education?	()	()	()	()	

# **Potential Constraints (cont'd)**

Following is a list of things that may have caused you to not hunt as much as you would have liked in the past few years.

Please indicate whether each was a major factor, a minor factor, or not a factor at all in causing you to not hunt as much as you would have liked in the past few years.

	Major factor	Minor factor	Not a factor	Do not know
What about because you don't want to kill animals?	()	()	()	()
What about a loss of interest?	()	()	()	()
What about work obligations?	()	()	()	()
What about family obligations?	()	()	()	()
What about poor behavior of hunters?	()	()	()	()
What about not enough access to places to hunt?	()	()	()	()
What about the cost of hunting equipment?	()	()	()	()
What about not enough game?	()	()	()	()
What about frequent changes in regulations?	()	()	()	()
What about other people's negative opinions of hunting?	()	()	()	()

# **Potential Constraints (cont'd)**

Following is a list of things that may have caused you to not hunt as much as you would have liked in the past few years.

Please indicate whether each was a major factor, a minor factor, or not a factor at all in causing you to not hunt as much as you would have liked in the past few years.

	Major factor	Minor factor	Not a factor	Do not know
What about because you think hunting may be wrong?	()	()	()	()
What about because you have other interests that are more important?	()	()	()	()
What about your amount of free time?	()	()	()	()
What about the feeling of causing pain to animals?	()	()	()	()
What about not enough places to hunt?	()	()	()	()
What about fear of injury by another hunter?	()	()	()	()
What about having to travel to hunt?	()	()	()	()
What about not enough law enforcement officers?	()	()	()	()
What about the costs of licenses?	()	()	()	()
What about complex regulations?	()	()	()	()
What about not enough trophy game?	()	()	()	()
What about harassment of anti-hunters?	()	()	()	()

# **Background Information**

Great, we are just about through. The final questions are for background information and help us analyze the results.

Did you live in a rural area <i>at any time while growing up</i> ?* ( ) Yes ( ) No ( ) Do not know
When you were growing up, did you live in a?* () Large city or urban area () Suburban area () Small city or town () Rural area () Lived in multiple areas or moved around a lot () Do not know
Do you consider your <i>current</i> place of residence to be a?* () Large city or urban area () Suburban area () Small city or town () Rural area () Do not know
In what state do you live?* [DROP DOWN LIST OF STATES]
What is the highest level of education you have completed?*  () Not a high school graduate () High school graduate or equivalent () Some college or trade school, no degree () Associate's degree or trade school degree () Bachelor's degree () Master's, doctorate, or professional degree () Do not know
Are you a student, either full- or part-time?*  ( ) Full-time student ( ) Part-time student ( ) Not a student ( ) Do not know

Are you retired?  If so, which of the following best describes you?*  ( ) Fully retired; do not work for money  ( ) Retired from my primary job, still work otherwise  ( ) Not retired  ( ) Do not know
Logic: Show/hide trigger exists. Hidden unless: (#25 Question "Are you a student, either full-or part-time?" is one of the following answers ("Part-time student", "Not a student", "Do not know") AND #26 Question "Are you retired? If so, which of the following best describes you?" is one of the following answers ("Retired from my primary job, still work otherwise", "Not retired", "Do not know"))
What is your occupation, or are you not currently working?*  () Not currently working / between jobs / do not need to work (student, homemaker) () Agriculture / farming () Computer / technical / electronics () Construction / carpentry / plumbing / electrical / craftsman () Education () Finance / insurance / real estate () Government services (police, fire, postal worker, mass transit, etc.) () Hotel / tourism / entertainment (except restaurant, included on its own below) () Housekeeping / cleaning / maid service () Landscaping () Manufacturing / factory / industry () Mechanical / machine servicing (e.g., automobile mechanic) () Medical / wellness () Military () Office / consulting () Restaurant / delivery / baking / brewing () Retail / wholesale sales () Taxi / Uber / Lyft / limo service () Trucking / transportation / shipping / warehousing () Other (please specify)::
Logic: Hidden unless: #27 Question "What is your occupation, or are you not currently working?" is one of the following answers [ANYTHING BUT "Not currently working"]
Which of the following describes your current job? (If you have more than one job, please think about the job that is of most importance to you.)*  [] I work exclusively or almost exclusively at a desk  [] My work rarely or never entails sitting at a desk  [] Neither of these

[] Do not know

Logic: Hidden unless: #27 Question "What is your occupation, or are you not currently working?" is one of the following answers [ANYTHING BUT "Not currently working"]

Which of the following describes your current job? (If you have more than one job, please think

about the job that is of most importance to you.)*  [] I work outdoors most of the time  [] I work indoors most of the time  [] None of these  [] Do not know
Logic: Hidden unless: #27 Question "What is your occupation, or are you not currently working?" is one of the following answers [ANYTHING BUT "Not currently working"]
Which of the following describes your current job? (If you have more than one job, please think about the job that is of most importance to you.)*  [] I work at the same site most of the time  [] I work at different sites most of the time  [] None of these  [] Do not know
Which of these categories best describes your total household income before taxes last year?* () Under \$20,000 () \$20,000-\$39,999 () \$40,000-\$59,999 () \$60,000-\$79,999 () \$80,000-\$99,999 () \$100,000-\$119,999 () \$120,000 or more () Do not know
What races or ethnic backgrounds do you consider yourself?*  [] White or Caucasian  [] Black or African-American  [] Hispanic or Latino  [] Native American or Alaskan native or Aleutian  [] Native Hawaiian  [] Middle Eastern  [] East Asian  [] South Asian  [] African (NOT African-American)  [] Other (please specify):

What is your age?
(If necessary, enter 999 to indicate that you do not know.)*
Which do you consider yourself?* ( ) Male ( ) Female ( ) Non-binary ( ) Prefer to self-describe:::
Thank You!
Thank you for taking our survey. Your time is very much appreciated and your response is very important to this research in understanding hunting participation.